

Section 8 - PER, Design, and Construction Submittal Requirements

- I. Introduction - To reduce paper and to further implement the Enterprise Project Management (Unifier) system, the Engineering Division has implemented standards for storage of plans, Bid Documents, Operations and Maintenance (O&M) manuals, and shop drawings. Engineering's Project archival systems must maintain the official records of shop drawings, O&M manuals, and all other project-related correspondence until the project is closed out. Paper submittals from the FIRM will only be required when requested by HRSD staff or as otherwise detailed in the Professional Services Agreement/Amendment.

- II. Requirements for Submittals – The FIRM shall follow the requirements detailed in the listed paragraphs. Attachment A to this section is a tabular summary of the following submittal requirements.
 - A. Provide all stages of PER, plan, specification submittals, and supporting analysis in Portable Document Format (PDF). PDF files shall be formatted with bookmarks, and each submittal shall be a single PDF as opposed to a collection of PDF files for individual chapters, plan sheets, etc.

 - B. For pipeline projects, seamless AutoCAD files (a seamless file is an individual file containing the entire proposed pipeline improvements) are to be prepared and submitted to HRSD for the purpose of populating the GIS with new / relocated / rehabilitated pipelines. Show locations of pipeline alignment, pump stations, metering valves, gate/plug valves, air vents, etc., in support of establishing a numbering scheme for Valve Guides. The timing and content of submittals are as follows:
 1. Prepare and submit a “seamless” AutoCAD file showing the proposed improvement limits at the 50% design stage. This information will be used to show the overall limits and alignment of the project.

 2. Prepare and submit a “seamless” AutoCAD file with the proposed improvements and delineations for proposed Valve Guides at the Conformed Drawing submittal stage. The GIS /CAD group will review the proposed Valve Guide locations and layouts and will assign numbers for Interim and Final Valve Guides. The HRSD Project Manager will coordinate with the FIRM to incorporate these assigned asset numbers into the generated Valve Guides.

 3. Submit to the HRSD Project Manager, unless otherwise detailed in the Professional Services Agreement / Amendment, the following:
 - a. One (1) AutoCAD seamless file of the project limits at the 50% design stage.

- b. One (1) AutoCAD seamless file of proposed improvements and proposed Valve Guide delineations at the Conformed Documents stage.
 - c. The Project Manager shall submit to the FIRM the assigned Valve Guide numbering scheme for the production of Interim and Final Valve Guides.
- C. Interim Record Drawing submittals must be submitted to the HRSD Project Manager a minimum of 5 business days in advance of the scheduled tie-in for the force main project or HRSD taking operational possession of the constructed facility. The FIRM will incorporate this requirement into the Construction Bid Documents.
 - 1. Interim Record Drawings shall be prepared by the FIRM and transmitted to the HRSD Project Manager along with the tie-in plan. The Project Manager will review the Interim Record Drawings for accuracy and completeness. Any required revisions will be coordinated with the FIRM and the corrected version resubmitted back to the HRSD Project Manager.
 - 2. Interim Record Drawings shall be in the following format: PDF scan of the Interim Record Drawings.
 - 3. Refer to Section 6 - Drawings, Record Drawings, and Valve Guides in this manual for the latest information to be included with Record Drawings.
 - 4. Submit to the HRSD Project Manager, unless otherwise detailed in the Professional Services Agreement / Amendment, the following:
 - a. One (1) PDF scan of the Interim Record Drawings in Unifier.
- D. The Interim Valve Guide submittal must be a minimum of 5 business days in advance of the scheduled tie-in for force main project or HRSD taking operational possession of the constructed facility. The FIRM shall incorporate this requirement into the Construction Bid Documents.
 - 1. Interim Valve Guides shall be prepared by the FIRM and transmitted to the HRSD Project Manager along with the tie-in plan. The Project Manager will review the Interim Valve Guides for accuracy and completeness. Any required revisions will be coordinated with the FIRM, and the corrected version shall be resubmitted back to the HRSD Project Manager.

Interim Valve Guides shall be the following formats (a) AutoCAD “dwg”, and (b) PDF.

2. Submit to the HRSD Project Manager unless, otherwise detailed in the Professional Services Agreement / Amendment, the following:
 - a. One (1) AutoCAD dwg file of each Interim Valve Guide in Unifier.
 - b. One (1) PDF file of each Interim Valve Guide in Unifier.
- E. Final Record Drawings submittal at project Final Completion stage. Refer to Section 6 – “Drawings, Record Drawings, and Valve Guides” in this manual for the latest information to be included with Record Drawings.
1. Final Record Drawings to be prepared by the FIRM and transmitted to the HRSD Project Manager. The Project Manager will review the Final Record Drawings for accuracy and completeness. Any required revisions will be coordinated with the FIRM, and the corrected version shall be resubmitted to the HRSD Project Manager.
 2. Final Record Drawings shall be in the following formats:
 - a. AutoCAD dwg for each plan sheet,
 - b. A single PDF file for each volume of Record Drawings,
 - c. Full-size paper prints (*HRSD Project Manager to determine the need*).
 3. Submit to the HRSD Project Manager, unless otherwise detailed in the Professional Services Agreement / Amendment, the following:
 - a. Four (4) 24” x 36” full-size paper copies of Final Record Drawings (*HRSD Project Manager to determine the need*).
 - b. One (1) PDF file of each volume of Final Record Drawings in Unifier.
 - c. One (1) AutoCAD dwg file of each Final Record Drawing sheet in Unifier.
- F. Final Valve Guides shall be prepared by the FIRM and submitted at the Final Completion stage. Refer to Section 6 – “Drawings, Record Drawings, and Valve Guides” in this manual for the latest information to be included with Valve Guides.
1. Final Valve Guides to be transmitted to the HRSD Project Manager. The HRSD Project Manager will review the Final Valve Guides for correct numbering assignment as determined by the HRSD

GIS/CAD group and for completeness. Any required revisions will be coordinated with the FIRM and the corrected version shall be resubmitted back to the HRSD Project Manager.

2. Final Valve Guides shall be in the following formats (a) AutoCAD “dwg” and (b) PDF.
 3. Submit to the HRSD Project Manager, unless otherwise detailed in the Professional Services Agreement / Amendment, the following:
 - a. Four (4) 8½” x 11” paper copies of each Final Valve Guide (*HRSD Project Manager to determine the need*).
 - b. One (1) AutoCAD dwg file of each Final Valve Guide in Unifier.
 - c. One (1) PDF file of each Final Valve Guide in Unifier.
- G. Shop Drawings for each project shall be submitted to HRSD’s Project Manager. Refer to Master Specification 01340 Submittals in Section 41 in this manual for further information. The following is in addition to Unifier submittals. Contractor Submittals shall be initially submitted by email from the Contractor to the FIRM for review, and only the final version of the submittals shall be submitted in Unifier. Before the start of construction, the FIRM, Contractor, and HRSD shall determine which submittals will also be reviewed by HRSD staff before submission in Unifier. HRSD must review any “or equal” submissions by the Contractor. The format for Shop Drawings is to be PDF and distributed by the Project Manager as follows:
1. For force mains and gravity sewers – portable media containing PDF files at Substantial Completion stage to the appropriate Director of Interceptor Operations or in Unifier.
 2. For pump stations, PRS, flow meters, pressure sensors, and other mechanical systems for Interceptor Systems – portable media containing PDF files prior to Substantial Completion stage to the appropriate Director of Interceptor Operations, Operations Support Systems Manager, and Director of Electrical and Instrumentation, or in Unifier.
 3. For treatment plants and outfalls – portable media containing PDF files prior to Substantial Completion or before taking operational ownership of a process or component to the Operations Support Systems Manager, the Director of Electrical and Instrumentation, and to the appropriate Director of Treatment, or in Unifier.
- H. Operations and Maintenance (O&M) Manuals for each project shall be submitted to HRSD’s Project Manager. Refer to Master Specification 01340

Submittals in Section 41 in this manual for further information. The Operation & Maintenance Manual Equipment List is included in Attachment B. The sheet in this spreadsheet labeled as “O&M Manual Equipment List” shall be prepared and submitted in Excel format to HRSD at the 100% design stage. HRSD Asset Management and Operations will review and approve the proposed list of equipment that would require O&M Manual submittal. This form will provide HRSD with the data to populate the Computerized Maintenance Management System (CMMS) and establish the system and process hierarchy. This form along with the “Equipment Record” in this spreadsheet shall be submitted in Excel format prior to substantial completion in accordance with Master Specification 01340 Submittals. The following is in addition to Unifier submittals.

- I. The format for O&M manuals is to be PDF and distributed by the Project Manager as follows:
 1. For pump stations, PRS, flow meters, pressure sensors and other mechanical systems for Interceptor Systems – portable media containing PDF files prior to Contractor / FIRM component training or operational ownership to appropriate Director of Interceptor Operations, Operations Support Systems Manager, and Director of Electrical and Instrumentation.
 2. For treatment plants – portable media containing PDF files prior to Contractor/FIRM component training or operational ownership to Operations Support Systems Manager, Director of Electrical and Instrumentation, and to the appropriate Director of Treatment.

- J. Conformed Documents specifics are defined in Section 16 – “Preparation of and Format for Conformed Documents”. The following is in addition to Unifier submittals. HRSD’s Project Manager shall make the necessary copies of the received PDF version of Conformed Documents for each project and distribute as follows:
 1. For force mains and gravity sewers – portable media containing PDF files prior to Pre-Construction Meeting to the appropriate Director of Interceptor Operations.
 2. For pump stations, PRS, flow meters, pressure sensors and other mechanical systems for Interceptor Systems – portable media containing PDF files prior to Pre-Construction Meeting to the appropriate Director of Interceptor Operations, Operations Support Systems Manager, and Director of Electrical and Instrumentation.
 3. For treatment plants and outfalls – portable media containing PDF files prior to Pre-Construction Meeting to Operations Support

Systems Manager, and the appropriate Director of Electrical and Instrumentation and Director of Treatment.

- K. X, Y, Z Coordinates of Installed Pipelines
1. Per Section 01323 of the Master Specifications, X, Y, Z coordinates shall be collected in a digital spreadsheet by the Contractor containing top-of-pipe elevations at each joint, fitting, valve, air vent, and connection point. Accuracy must be sub-foot for horizontal (X, Y) and 0.1-ft for vertical (Z). An updated spreadsheet must be reviewed by the FIRM monthly and provided with each Contractor pay application. The digital spreadsheet shall be directly compatible with ArcGIS software without requiring any additional re-formatting, such as a Shapefile, File Geodatabase, or properly formatted Excel or CSV files. A sample spreadsheet is included in Attachment C.
- L. Soil Resistivity/Corrosivity Analyses, when performed to support project design, must be submitted in accordance with the following requirements:
1. One (1) PDF file of each soil resistivity/corrosivity report, separate from the Conformed Specifications package, uploaded to Unifier under Professional Services Deliverable
 2. HRSD standard soil data spreadsheet (1) populated with analysis and result values. A blank template is included as Attachment D of Section 8 Key required attributes include:
 - a. Date of field measurement or soil sample collection
 - b. Name of soil corrosivity analysis firm
 - c. Soil sample and field resistivity measurement locations as Virginia State Plane coordinates to an accuracy of ± 5 ft.
 - d. Various soil resistivity and chemistry attributes.
- M. Plats, when required for fee simple acquisitions or easements, must be submitted per the requirements of Section 9 of the Design and Construction Standards
- N. Precondition Assessment and Damage Mitigation Reports must be completed as per the requirements of Section 12 of the Design and Construction Standards. Deliverables will be:
1. Stage 1 and 2 Reports: One (1) PDF file uploaded to Unifier under Professional Services Deliverables

2. Stage 3 Documentation: Provided to HRSD Project Manager via a secure file transfer mechanism.

III. Attachments

- A. Major Submittals List
- B. Equipment Record Template
- C. XYZ Spreadsheet
- D. Soil Corrosivity DB Template
- E. [PER Minimum Required Table of Contents Chapters](#)
- F. Interceptor Project GIS Deliverables Flow Chart

End of Section