

Section 18 - Expectations for Construction Administration and Construction Inspection

- I. Introduction - HRSD has for many years relied upon FIRMs to provide construction administration and inspection as a natural extension of design and preconstruction phase services for all types of HRSD infrastructure. To document and disseminate our expectations for construction inspectors and/or resident engineers, this Section was developed and intended to be followed. This document provides minimum expectations and is therefore not comprehensive with listing all the skills, knowledge, and abilities that inspectors or resident architects/engineers (RA/RE) must possess to be successful.

Typically, the agreement between HRSD and the FIRM for construction phase services including project management, technical consultation and resident inspection during construction through either the Construction Administration Services or the Field Engineering and Inspection Services as mutually agreed by HRSD and the FIRM will refer to this section of the HRSD Design and Construction Standards for clarification between services covered under Construction Administration and Construction Inspection. HRSD expects the FIRM to perform these tasks as required as the prime administrator and inspector on the construction project with HRSD providing only general oversight and coordination.

The expectations in this Section are coded based on HRSD's general experience to indicate whether the individual tasks are a primary responsibility (P) or secondary responsibility (S) as appropriate under the Lump Sum Construction Administration Services (CA) or the Unit Price Field Engineering and Inspection Services (CI). The FIRM may propose different primary and/or secondary responsibilities during negotiations based on their organization and qualifications of staff.

- II. Organization of this Section - This document has been divided into main categories as follows:
 - A. General Expectations
 - B. Preconstruction
 - C. General Procedures
 - D. Tie-In, Shutdown, and Diversion Procedures
 - E. Line Stop Procedures
 - F. Trenchless Crossing Procedures
 - G. Damage Assessment and Claims Procedures
 - H. Training
 - I. Record Keeping

J. Staffing

K. Verifications

III. General Expectations

CA	CI	EXPECTATION / TASK
	P	Inspectors should understand the importance of their role in achieving the highest quality construction outcomes and have the technical knowledge, tact, and good judgment to effectively perform observation duties.
	P	Inspectors to fully understand the extent of responsibilities; accepts responsibility; does not overlook potential problems; does not overstep authority; understands supervisor's expectations; and records all verbal instructions in daily reports.
	P	Inspectors' extent of responsibilities includes requiring work in accordance with plans and specifications; does not direct work; points out issues; reviews with supervisor policies and authority to stop Contractor's operations for safety violations or construction deficiencies.
	P	Inspectors to review and be familiar with HRSD, FIRM and Contractor's organization, chain of command and team members.
	P	Inspectors to review and be familiar with administrative and reporting procedures. These procedures should be discussed between the FIRM, Inspectors, Contractor, HRSD, and other stakeholders at the preconstruction meeting.
	P	Inspectors to review and be familiar with contract documents, addenda, changes and other revisions.
	P	Inspectors to review and be familiar with the Bid Documents (drawings and specifications) related to required work, materials and equipment, omissions, discrepancies in and/or between plans and specifications and existing site conditions, common details, trouble areas, and overlooked items.
	P	Inspectors to review and be familiar with shop drawings related to layout, material and equipment, omissions, discrepancies, conformance with actual work performed and equipment installed.
	P	Inspectors to review and be familiar with contract schedule to anticipate work activities and to review time-sensitive submittals and shop drawings.
	P	Inspectors to review and be familiar with permits, approvals and other rights of entry documents issued by federal, state, and railroad or city/county agencies.
	P	Inspectors to interact with Contractor's personnel in business-like, cooperative, and personal manner; with understanding and without prejudice; while protecting interests of HRSD, FIRM and the Public. Inspector and Resident Architect / Resident Engineer (RA/RE) to be "firm yet fair" with Contractor.

CA	CI	EXPECTATION / TASK
	P	Inspectors to be always courteous and helpful to the public. If representatives from the Media or other interested parties ask questions or enter the work zone, inform HRSD Project Manager, HRSD Public Information Specialist and/or Director of Communication as soon as possible. Inspectors are not to represent HRSD with the Media or other similar groups/individuals.
	P	Inspectors to always avoid dictating directions to Contractor's personnel unless specified in the Contract documents; discussing issues directly with Contractor's crew unless the Contractor's designated supervisor is present; taking part in any workforce dispute; and giving specific safety related directions to Contractor unless imminent danger conditions are observed.
	P	Inspectors to observe Contractor's work activities for conformance with plans, specifications, and other contract documents.
	P	Inspectors to comprehend the specifications, conditions of the contract, and plans.
	P	Inspectors to be knowledgeable of HRSD definitions of conflict when situations arise in construction that are not accurately shown on the plans.
	P	Inspectors to be knowledgeable of personal safety issues and informing Contractor on observed unsafe conditions and/or practices.
	P	Inspectors to follow HRSD and regulatory requirements for personal protective equipment (PPE) for the environments and conditions to be encountered.
S	P	Inspectors to understand the importance of specialized inspection, be knowledgeable of them, and processes the necessary certifications where applicable. Types of specialized inspections include, but are not limited, to cathodic protection systems, coating systems, instrumentation and monitoring systems, and pump station and pressure reducing station start-ups.
	P	Inspectors to understand the importance of protective coatings and cathodic protection, and to be knowledgeable of their application/installation, including but not limited to, knowing the proper methods for application/installation and repairs and how to test/inspect the systems to ensure proper application/installation and repair.
S	P	Inspectors to be knowledgeable of how to address issues with inquiring residents, regulators, jurisdictional inspectors, fire marshal, and OSHA.
	P	Inspectors to exercise good judgment and know when to call for assistance. Inspectors should be very cautious and should avoid making "Deals" in the field affecting cost, time, and/or quality.
S	P	Inspectors to assist FIRM and HRSD staff as requested.

CA	CI	EXPECTATION / TASK
	P	Inspectors to be able to enter trenches, manholes, tanks, and other facilities they are responsible to inspect with proper entry and safety equipment and following HRSD safety procedures, their own safety protocols / procedures, and other agency safety procedures per the job site. Inspector shall communicate needs with Contractor and FIRM, as appropriate, to perform inspections, including, but not limited, trench shoring, ladder, confined space gear and certification.
P	S	FIRM is responsible to provide all tools, equipment, and training, necessary to perform inspections to include PPE and safety equipment/gear.

IV. Preconstruction

CA	CI	EXPECTATION / TASK
P	S	FIRM and Inspector(s) to conduct pre-construction conference.
P	S	FIRM and Inspector(s) to coordinate with Contractor to establish survey reference points for horizontal and vertical control.
	P	Inspector(s) and Contractor to jointly conduct the preconstruction field survey including the capture of dry day and post rain event photos and video prior to mobilization to the site. Inspectors shall inform HRSD Project Manager when this is planned, as HRSD personnel may desire to be present.
S	P	Inspector(s) and FIRM to review requirements of preconstruction surveys and vibration baseline.
P		FIRM to prepare conformed sets of contract documents by date of preconstruction meeting for distribution to HRSD staff. FIRM to ensure the "Conformed Documents" properly incorporates all addenda. The "Conformed Documents" needs to be checked prior to distribution.
	P	Inspector(s) to be in possession of and use the Conformed Documents
P	S	The FIRM to schedule a meeting between the RA/RE, Field Staff, and HRSD at commencement of construction to discuss expectations and roles of the individuals involved.

V. General Procedures

CA	CI	EXPECTATION / TASK
P		FIRM to issue Notice to Proceed (NTP) to Contractor.
P		FIRM to conduct correspondence with Contractor as required facilitating the project, and forward one (1) copy of all project correspondence to HRSD.
P		FIRM to review and approve schedule of values submitted by Contractor.
P		FIRM to review and approve shop drawings, equipment submittals, construction drawings and erection drawings submitted by Contractor for compliance with the construction plans and specifications.

CA	CI	EXPECTATION / TASK
P		For Virginia Clean Water Revolving Loan Fund (VCWRLF) projects, FIRM to review and approve Contractor submittals related to the American Iron & Steel requirement as well as maintain documents, certifications and tracking system for VDEQ audits if requested.
P		For Virginia Clean Water Revolving Loan Fund (VCWRLF) projects, FIRM to review, approve, and retain documents related to Contractor's compliance with the Davis Bacon wage classification requirements and submit wage certifications from Contractor's payment requests to VDEQ.
P		FIRM to review and approve laboratory, mill and shop tests reports of equipment and materials submitted by Contractor.
P		FIRM to prepare proposals, work change directives and change orders as required, prepare independent estimates of cost and time impacts, negotiate acceptable agreements with Contractor for HRSD approval, and document all time and material work orders on a daily basis.
P	S	FIRM and Inspector(s) to review progress schedule submitted by Contractor, monitor actual progress, and prepare as built progress schedule as required.
P	S	FIRM and Inspector(s) to conduct shop and field tests for pipe, machinery, equipment, and materials including any off-site witness tests as required by Contract Documents.
P	S	FIRM to contract for and administer outside testing services procured by HRSD for concrete, soils and specialty testing as specified.
S	P	Inspector(s) to assist FIRM with field testing efforts and specialty inspections as required.
P	S	FIRM and Inspector(s) to respond to requests for information, inquiries, proposals, and suggestions submitted by Contractor.
P	S	FIRM and Inspector(s) to resolve changed site conditions and design conflicts and prepare supplemental drawings and sketches to resolve conflicts as required.
P	S	FIRM and Inspector(s) to review and approve requests for progress payments submitted by Contractor for compliance with the work performed.
P	S	FIRM and Inspector(s) to conduct periodic on-site job meetings with Contractor to discuss schedule, progress, problems, coordination of activities with existing HRSD facilities, etc.
P	S	FIRM to provide specialized inspection for mechanical, electrical, instrumentation and control, etc. as required.
P	S	FIRM and Inspector(s) to reject unsatisfactory work performed and equipment and materials submitted by Contractor.
P	S	FIRM and Inspector(s) to notify HRSD of project status and potential problems.
P	S	FIRM and Inspector(s) to review operation and maintenance manuals submitted by Contractor.
P	S	FIRM and Inspector(s) to review performance tests for equipment and processes.

CA	CI	EXPECTATION / TASK
P	S	FIRM and Inspector(s) to conduct substantial completion and final inspections, prepare punch lists and establish warranty period.
P	S	FIRM and Inspector(s) to assist in resolving warranty issues.
P	S	FIRM and Inspector(s) to assist in startup of new facilities and troubleshooting.
	P	Inspector(s) to coordinate activities of Contractor with other consultants and/or contractors working on the site.
	P	Inspector(s) to coordinate activities of Contractor with HRSD to prevent interference or interruption of safe and reliable operation of existing HRSD facilities.
	P	Inspector(s) to coordinate preparation of spare parts lists and turnover of spare parts to HRSD by Contractor.
P	S	FIRM and Inspector(s) to coordinate equipment and system training by equipment vendors.
	P	Inspector(s) to attend daily, weekly, and monthly progress meetings as appropriate.
	P	Inspector(s) to inform supervisor promptly of observed deficiencies in materials, equipment, workmanship, or other adverse conditions; slowdowns, delays and slippages in progress or ability to meet schedules and deadlines; any situation or condition that may result in a dispute or claim; safety related concerns; and concerns raised by the Public, locality inspectors or other individuals at the site.
	P	Inspector(s) to coordinate with Contractor to ensure site is clean, organized and picked-up daily.
	P	Inspector(s) to inspect materials and equipment for conformance with approved shop drawings, plans, specifications, and any change orders, potential change orders, Request for Information (RFI) etc. This must be performed immediately after materials or equipment is delivered. Any discrepancies need to be brought to the attention of the RA/RE immediately.
	P	Inspector(s) to have copies of all approved shop drawings in the field for review and to understand the purpose of materials and equipment.
	P	Inspector(s) to observe installation of all buried pipe, valves, fittings and other buried assets. Inspector(s) to staff up accordingly to match Contractor's work crews.
	P	Inspector(s) to advise HRSD Safety Division and HRSD Project Manager of uncorrected unsafe conditions immediately.
S	P	Inspector(s) and FIRM to carefully review Contractor payment claims and reject / return to Contractor if supporting material is not complete (diversity statement, X-Y-Z table of installed pipe, and other contract requirements).
S	P	Inspector(s) to confirm stored material prior to payment claim.
S	P	Inspector(s) and FIRM to review monthly with Contractor status of "As-Built" record keeping and tie approval of monthly pay request from Contractor to meeting these requirements.

CA	CI	EXPECTATION / TASK
P	S	Inspector(s) shall coordinate with Contractor and FIRM on changes to contract drawings to facilitate the FIRM's development of accurate record drawings, including changes resulting from addenda, requests for information, field orders, change orders, and equipment and material substitutions.
S	P	Inspector(s), FIRM and Contractor to coordinate work schedule, sequence of construction, and timely notifications to residents in affected areas in advance of work commencing. Efforts may involve door hangers. Advanced notification efforts are intended to minimize complaints from residents and businesses about lack of awareness of project schedules and impacts.
	P	Inspector(s) to have a copy of the Contractor's Emergency Action Plan (EAP) and must be thoroughly familiar with its content.
	P	Inspector(s) shall be in possession of the most up to date emergency contact information for all involved parties and key individuals.
	P	Inspector(s) to attend and actively participate in regularly scheduled construction progress meetings per requirements of Contract Documents.
S	P	RA/RE / Inspector(s) and FIRM to be knowledgeable of Work Change Directives, field orders, Contractor proposed alternate products and when to use these.
S	P	Inspector(s) and FIRM to be knowledgeable of individuals responsible for construction activities and authority of each.
	P	RA/RE / Inspector(s) need to respond promptly on RFIs and Change Proposals.
	P	Inspector(s) need to receive field copies of all RFI's, Change Orders, Field Orders etc. This information should be marked up on their plans and specifications as required.
	P	RA/RE / Inspector(s) to coordinate with Contractor on providing proper notification of shutdowns to affected parties including HRSD Operations and Locality field crews to be involved.
	P	RA/RE / Inspector(s) to notify HRSD if Contractor attempts to operate a HRSD, Locality, or Private main line valve or air vent.
	P	Inspector(s) may be interviewed by HRSD staff if a specific incident or accident occurs on the site (may include, but not limited to, HRSD Project Manager, HRSD Safety Manager - safety / injury issues; HRSD Water Quality Department - spills / SSO; HRSD Real Estate Manager - insurance / damage claim by resident or motorist).
S	P	Inspector(s) to report any accidents or interruptions of existing HRSD facility operations to HRSD.
S	P	Inspector(s) and FIRM to request pump station keys back from Contractor / subcontractors following Final Completion being achieved for a project involving access to a HRSD pump station.
S	P	Inspector(s) and FIRM to be knowledgeable of definition and procedures to achieve Substantial Completion. Warranty period commences after Substantial Completion is achieved.

CA	CI	EXPECTATION / TASK
S	P	Inspector(s) and FIRM to be knowledge of definition and procedures to achieve Final Completion following Substantial Completion.
S	P	Inspector(s) to coordinate with Contractor on force main projects to complete condition assessment activities on HRSD assets (pipelines, valves, etc.) as required in Contract Documents.
S	P	Inspector(s) to notify HRSD and FIRM when any previously unknown utility or obstruction that causes a vertical or horizontal change to the intended buried pipe alignment to obtain an approvable resolution. Inspector shall verify these changes are recorded on the Interim and Final Record Drawings along with the utility or obstruction that resulted in the change if the utility or obstruction remains following pipe installation.
	P	Inspector(s) to be aware of all work performed for others by Contractor outside the limits of the project when and only if prior approval granted by HRSD's Project Manager for Contractor to perform this work.
	P	Inspector(s) to track the listed required inspections related to ductile iron pipe: proper storage and handling to include checking for ovality after pipe is stored for a long period of time; interior coatings; cutting or tapping lined pipe in accordance with proper procedures in manufacturer's installation guide; proper reapplication of coatings after cutting/tapping per manufacturer's recommendation; proper installation of restraint system or restrained joints per manufacturer's recommendations; proper cadwelding directly onto pipe to avoid damage of interior coating; and proper wire connection to bonding plates.
	P	Inspector(s) to track the listed required inspections related to PVC pipe: proper storage on and off-site to include checking for signs of UV degradation; proper handling of pipe; proper bedding and backfill in accordance with the contract documents for PVC pipe; proper installation to include looking out for over insertion of spigot into bell, over deflection of joints beyond manufacturer recommendations, and proper fusing procedures; installation of tracer systems (such as wire, tape, balls) in accordance with the specifications; use proper tapping saddles for field taps to prevent pipe fractures; proper handling to prevent cracks; proper restraint system per manufacturer recommendations.
	P	Inspector(s) to track the listed required inspections related to HDPE pipe: proper storage and handling to include inspecting for excessive gouges in pipe; proper installation to include looking out for expansion and contraction per manufacturer recommendations, proper fusing of pipe per manufacturer's guidelines (environment and cooling time); monitoring (fusing) and testing is performed and recorded as recommended by the manufacturer or specified by Contract Documents; and installation of tracer systems (such as wire, tape, balls) in accordance with the specifications.

CA	CI	EXPECTATION / TASK
	P	Inspector(s) to track the listed required inspection on delivery and installation of valves: proper storage and handling of valve to include exercising the valve prior to installation to ensure operability; proper location for valve replacement/installation to include coordinating with HRSD prior to installation and coordinating with FIRM to revise HRSD valve guide; valve is one specified in Contract Documents to include verifying gear ratio and capture legible photo of nameplate on both valve and actuator (if they exist) and provide to HRSD; valve coating intact and not damaged; operating nut or actuator if remotely controlled are intact and not damaged; proper installation per manufacturer's guidelines and Contract Documents to include checking the valve is installed in the proper flow direction, and the valve and valve box are properly aligned (vertically plumb); confirm valve opens and closes in correct direction; and record number of turns required to open/close (perform twice).
	P	Inspector(s) to track the listed required inspection for ball valves and corporation stops: inspect valves for barbs for HRSD Air Vent Verification Rod passing; install corporation stops fully opened; verify proper height/clearance in air vent housing; verify alignment of ball valve; and verify frame and cover set correctly for final restoration.
	P	Inspector(s) to use HRSD Air Vent Verification Rod and check-out / check-in procedure.
	P	Inspector(s) to track the listed required inspection for check valves: confirm operation of swing arm/lever and verify proper flow direction (arrow on valve).
	P	Inspector(s) to track the listed required inspection for sanitary sewer manholes: proper storage and handling of manholes to include checking manhole is not damaged; confirm manufactured or field installed openings/penetrations are in correct location (vertical and horizontal); inspect for proper channel and benching; inspect correct height; inspect concrete and joint material; inspect drop connections into manhole; riser ring installation for frame and cover set properly for final pavement or restoration; coatings are intact and not damaged when applied prior to delivery; and coatings applied per manufacturer's guidelines and tested when applied on site.
	P	Inspector(s) to track the listed issues related to pipe trench: measurement and payment in accordance with the contract requirements; use of proper trench box along with necessary steel sheeting; proper trench width for pipe installation; proper dewatering of the pipe trench; excavation for pipe bells; proper installation of trace wire and pipe warning tape during backfilling operations; trench safety issues.

CA	CI	EXPECTATION / TASK
	P	Inspector(s) to track the listed issues related to pipe joints: Inspector shall have pocket guide for pipe installation as published by pipe manufacturer; use feeler gage to confirm proper gasket installation; review manufacturer's "stab" joint limit marking on the pipe spigot; proper gasket lubrication practices; dispose of damaged gaskets. (Feeler gauge to be documented on daily reports)
	P	Inspector(s) to track the listed required inspections for external pipeline corrosion prevention: proper wire type and insulation colors being installed per Contract Documents; bond cables properly across joints and bonding pads are factory installed prior to the application of the interior lining for pipes to be bonded; proper affixing of wires to pipe to included weld/brazing is done properly to make a strong attachment (test) and not damage the pipeline interior coating; check for proper system isolation (designed cathodic protection (CP) system is providing protection for only area/assets it is designed to protect) to include verifying system is properly isolated and the isolation is working (check for electrical continuity at isolation); periodically check for electrical continuity along CP system; placement of sacrificial anodes in accordance with design and manufacturer's recommendations; verify proper installation of polyethylene encasement bags in accordance with the manufacturer recommendations; tape wrap products to be heat shrunk to fit properly; properly apply field coatings to steel pipe field welds for horizontal directional drill (HDD) pipe in accordance with the manufacturer's recommendations; and pipeline appurtenances are properly protected from external corrosion to include verifying what, if any, corrosion protection should be applied to the appurtenances and fasteners.
	P	Inspector(s) to track the listed required inspections for internal pipeline corrosion prevention: blisters or spalled areas are not present; proper handling of pipe; proper cutting or tapping of lined pipe in accordance with manufacturer's recommendation, Contract Documents and approved by HRSD; field applied repair coatings are in accordance with manufacturer's recommendations for applicability, temperature, environment, cure time and surface preparation.

VI. Tie-In, Shutdown and Diversion Procedures

CA	CI	EXPECTATION / TASK
S	P	RA/RE, Inspector(s), and FIRM to review / approve Contractor shutdown / diversion plan / tie-in plan for constructability. Issues for postponing a planned event include Contractor not having adequate time or resources to accomplish what has been submitted; and Contractor not complying fully with the pre-tie-in check list and not ready to accomplish tie-in.

CA	CI	EXPECTATION / TASK
S	P	Inspector(s) and FIRM to review the “point of no return” for a planned tie-in and engage Contractor, HRSD, and Locality in a recommendation to postpone tie-in if necessary. These conditions may be related to changed field conditions, changed weather conditions, excessive flows to handle, Contractor behind planned sequence of events schedule, or malfunctioning equipment.
	P	Inspector(s) to verify proper clear space is maintained under each assembled pipe joint for checking bolts and being able to observe leaks at all pipe joints and fittings not hydrostatically tested.
	P	Inspector(s) to visually observe and check assembled pipe sections for proper assembly, tightened bolts, and thrust restraint.
	P	Inspector(s) to verify proper remedy for any leaks noted from visual observations under line pressure.
S	P	Inspector(s) and FIRM to collect measurements, sketches, and photographs, and review X-Y-Z coordinates collected by Contractor for assembled pipe in the tie-in area.

VII. Line Stop Procedures

CA	CI	EXPECTATION / TASK
S	P	RA/RE, Inspector(s), and FIRM to review and approve Contractor’s Line Stop Plan for implementation and contingencies.
	P	Inspector(s) to verify Contractor is using the most recent version of HRSD’s Line Stop Checklist from <u>HRSD Design and Construction Standards</u> , latest edition.

VIII. Trenchless Crossing Procedures

CA	CI	EXPECTATION / TASK
S	P	RA/RE, Inspector(s), and FIRM to review and approve Contractor’s trenchless crossing plan for constructability and contingencies.
	P	Inspector(s) to confirm Contractor is using the most recent version of HRSD’s Trenchless Crossing Checklist from <u>HRSD Design and Construction Standards</u> , latest edition.
	P	Inspector(s) to monitor potential settlement and void formation in areas of casing and entry/exit pits.
S	P	Inspector(s) and FIRM to track the listed requirements related to bore and jacked casing installation: proper horizontal and vertical alignment; monitor for settlement by visual inspection; conduct pre & post ground penetrating radar (GPR) measurements for voids; upon digging pits, verify soil and groundwater conditions in the geotechnical report and identify potential issues; if conditions are extreme reconsider method of trenchless crossing; conduct soil stabilization prior to work; review Contractor’s method of sealing ends; determine how to handle unknowns as undocumented obstructions prior to beginning work; determine exactly where end of casing, if unsuccessfully completed.

IX. Damage Assessment and Claims Procedures

CA	CI	EXPECTATION / TASK
S	P	Inspector(s) and FIRM to coordinate with Contractor to include an agenda item at each construction progress meeting related to damage claims and resident complaints.
S	P	Inspector(s) and FIRM to notify and compile information to report of any accidents or resident/business report of damages.
S	P	Inspector(s) and FIRM to notify HRSD Project Manager of any damage reported by residents, property owners or the traveling public.

X. Training

CA	CI	EXPECTATION / TASK
	P	Inspector(s) to be trained for confined space entry and OSHA Standard 29 CFR Part 1926 Safety & Health Regulations for Construction, Sub-parts A thru Z. Confined space entry OSHA 29 CFR 1910.146(g)(4) and OSHA 10-hour Construction Safety & Health.
	P	Inspector(s) to complete training on VDOT Basic Work Zone Traffic Control.
	P	Inspector(s) to be knowledge of and in compliance with regulatory and HRSD procedures for asbestos handling and disposal.
	P	NACE Level 2 certification required for all inspector(s) overseeing coatings and lining related work.
	P	Certified Electrical Inspector – Master certification required for all inspector(s) overseeing electrical related work.
	P	Inspector(s) to have both NASSCO ITCP for CIPP and Manhole Rehabilitation project work.
	P	Inspector(s) to be familiar with and in compliance with HRSD Hot Work Permit requirements.
S	P	Inspector(s) and FIRM to be trained on and proficient with HRSD's Unifier (Unifier) Enterprise Project Management System.

XI. Record Keeping

CA	CI	EXPECTATION / TASK
P	S	FIRM and Inspector(s) to maintain complete set of project files at the job site as required (or full access to digital files) and provide this set of project files to HRSD at the completion of the project.
	P	Inspector(s) to prepare daily report including activities and completed tasks; difficulties; controversial issues involving questionable items or disputes; deficiencies and violations; instructions given and received; progress and delays including actions taken or contemplated to minimize delays; equipment in use by Contractor; materials and equipment delivered for installation; photographic documentation of the work; and spare parts provided by Contractor or Vendors.

CA	CI	EXPECTATION / TASK
	P	Inspector(s) to maintain daily records, photographs, temporary valve guides, drawing markups to compare to Contractor records for dispute resolution. These records to be incorporated into the HRSD Unifier Project Management System.
	P	Inspector(s) to capture sufficient photographs of utility crossings, fittings installed with GPS digital camera where appropriate.
P	S	FIRM, RA/RE, and Inspector(s) to include detailed information on monthly status report that accompanies FIRM's payment request on the activities anticipated in the next 30 days. In particular, field activities that involve HRSD Operations staff assistance.
S	P	Inspector(s) and FIRM to confirm Contractor is collecting X-Y-Z field information where required per <u>HRSD Design and Construction Standards</u> and in accordance with the Contract Documents.
	P	Inspector(s) to confirm turns open and close for new valves being installed and verify information correctly input on the Interim and Final Valve Guides.
S	P	Inspector(s) and FIRM to record the serial numbers on all new valves and the actuators for inclusion on records transmitted to HRSD for each valve location.
	P	Inspector(s) shall take required measurements and document these. Examples include location of building service connection tee-wye, end of service connection piping, location of valves and fittings, location of utility crossings.
	P	Inspector(s) shall prepare sketches to include pertinent buried items, end of service connections, utility crossings, other items that will be buried, and all ties taken.
	P	Inspector(s) shall take required swing ties to include measurements to two or more permanent structures.
S	P	Inspector(s) and FIRM to observe on going work by Contractor for compliance with the construction plans and specifications with emphasis on critical construction activities such as placement of reinforcing steel and concrete, items being covered up or embedded, pipe laying and testing, equipment placement and testing, etc.
S	P	RA/RE, Inspector(s), and FIRM to prepare and distribute the Substantial Completion punch list and the Final Completion punch list to Contractor and other parties.
	P	Inspector(s) to document any concerns or plan deviations raised by HRSD Operations staff visiting the construction site and discuss with HRSD Project Manager for resolve.

XII. Staffing

CA	CI	EXPECTATION / TASK
P	S	FIRM to provide proper inspection coverage for multiple construction crews where work can be covered up quickly as with buried pipe installation and coatings / linings preparation work.

CA	CI	EXPECTATION / TASK
P	S	FIRM to provide proper inspection coverage during tie-ins and 24/7 critical construction activity periods. Contingency planning for backup personnel for exhaustive work schedule and planned or unplanned leave.

XIII. Verification

CA	CI	EXPECTATION / TASK
	P	Inspector(s) to verify proper storage and protection of materials and equipment.
	P	Inspector(s) to verify Contractor stays within permitted easement limits (does not enter onto private property without acquiring easement) and does not park in unauthorized areas. Inspector(s) to immediately notify HRSD Project Manager if Contractor is not in compliance.
S	P	Inspector(s) and FIRM to verify traffic maintenance plan consistent with Contract Documents and locality approved permit and notify HRSD Project Manager and Contractor if Contractor is not in compliance.
S	P	Inspector(s) and FIRM to verify Contractor's efforts are meeting all environmental/erosion control requirements in the Contract Documents. Inspector(s) to notify HRSD Project Manager if Contractor is not in compliance.
	P	Inspector(s) to verify proper setup by Contractor and procedures are followed for hydrostatic testing of new pipelines. Inspectors to notify Contractor of missed steps that will delay the planned test.
	P	Inspector(s) to verify proper setup by Contractor and procedures followed for soil density testing as required for installation of new buried pipelines.
	P	Inspector(s) to verify pipe (gravity and force main) installed on proper grade to avoid sags or unplanned high point in the pipe. Inspectors to notify Contractor and HRSD Project Manager of any installation that deviates from Contract Documents or approved Work Directives / Change Orders.
	P	Inspector(s) to verify pipe handling procedures for each pipe material being used. Use of a forklift without padded forks (insert fork into fitting) is not allowed for handling fittings to protect inside linings nor chains allowed for lifting pipe or fittings with exterior coatings that may be damaged because of this action.
	P	Inspector(s) to verify other testing to witness and record information including vacuum testing of manholes, concrete cylinder/strength, concrete air entrainment, concrete slump.
S	P	Inspector(s) and FIRM to track the following verifications related to Asbestos Cement pipe installation: confirm pipe outside diameter (OD) and compare to manufacturer published data and shop drawings; and connect new pipe to existing Asbestos Cement pipe with proper adaptors (refer to manufacturer recommendations).

CA	CI	EXPECTATION / TASK
S	P	Inspector(s) and FIRM to track the following verifications related to Asbestos Cement pipe demolition: certified firm to handle Asbestos Cement pipe; break collar verses saw cutting to avoid air/friable particles; follow manufacturer and HRSD safety procedures for handling and transport; proper personal protective equipment and equipment for demolition.
S	P	Inspector(s) and FIRM to track the following required verifications related to Miss Utility coordination: record when "Miss Utility" ticket request called in; record differences marked in field vs. contract plans; review Contractor's test pit work plan for utility location verification in advance of excavation to avoid conflicts.
S	P	Inspector(s) and FIRM to track the following required verifications related to bedding and backfill: advance written authorization/approval required for additional excavation of unsuitable materials; review of Contractor's disposal plan for unsuitable excavated materials (dispose to approved sites and not in environmentally sensitive areas); backfill and bedding meet contract specifications (free of boulders, debris and shall be dry); proper backfill compaction in specified lifts, compaction testing where required.
S	P	Inspector(s) and FIRM to track the following verifications related to pipe rehabilitation: review Contractor's diversion pumping systems; review Contractor's plan to provide adequate advance notice to affected customers and to avoid or assure customer service interruptions are minimal; verify proper cure times for materials to be used; be aware of effects of temperature variation; follow manufacturer recommendations; inspect to ensure Contractor has taken accurate measurements to all connections; immediately upon pipe lining/curing reestablish service or other connections; verify that all customers are reconnected; adequate grouting between host pipe and liner pipe; ensure adequate support (water pressure if possible) of liner prior to grouting; mix shall be suitable for filling annular space; install grout holes along pipe where possible; inspect grouted pipe where possible.
	P	Inspector(s) to verify with Contractor proper grade and surface elevations intent of Contract Documents verses actual ground elevations.

End of Section