APPENDIX E

WORK RESTRICTIONS, SEQUENCE OF WORK AND CONTROL STRATEGY AND SHUTDOWN SCHEDULE

[Page Left Intentionally Blank]

WORK RESTRICTIONS, SEQUENCE OF WORK, AND CONTROL STRATEGY

PART 1 – GENERAL

The work restrictions, sequence of work, and control strategy described below are contract requirements during construction of the Sherman Road Brackish Water Transmission Pipeline project. These requirements are applicable during all work required for the construction; construction of the proposed 24-inch pipeline; connections to existing water pipelines; installation of pipeline appurtenances; construction of the pipeline maintenance launching and receiving stations; start-up and testing of the facilities, and District acceptance of the proposed facilities: including all work described in Section 00100 Special Conditions SC-02, shown on the contract drawings, or required by these specifications.

All work shall be completed in accordance with these specifications and the contract drawings.

1.01 General Requirements

A. The work sequence and restrictions presented herein do not include all items affecting completion of the work, but are intended to describe some of the critical events necessary to minimize disruption of the existing facilities and to ensure compliance with permit requirements. It is Contractor's responsibility to identify any additional constraints for completion of the work, and keep the existing systems and facilities fully operational at all times.

B. Contractor shall comply with shutdown constraints to keep the existing facilities operational as required by the District.

C. Prior to beginning construction, Contractor shall excavate, expose, and determine ("pothole") the exact size, elevation, and horizontal location of each and every potential interference, including, but not limited to, all facilities specifically shown (location and/or depth) on the Drawings. In addition, Contractor shall field verify all locations and dimensions at connections with existing piping systems. If necessary, Contractor shall revise the plans or dimensions in order to meet the tie-in time constraint without violating the intent of the design. All Contractor revisions shall be approved by the District prior to any work.

D. Only District's Operations personnel will be allowed to operate existing valves for water system(s) shut-down operations and placing water system(s) back in operation.

E. Contractor shall protect existing water pipelines from contamination during connection/tie-in procedures.

F. Whenever possible, Contractor shall complete all connection/tie-in work without shutting down the existing water system. If shutdowns are required, multiple shutdowns are not allowed.

G. Contractor shall complete all possible portions of new construction and/or modifications to existing facilities, prior to making any connection to existing facilities. All parts, fabrications, and other components necessary to complete the work during the shutdown and startup must be at the job

site prior to final scheduling of the shutdown unless otherwise authorized herein or by District.

H. Contractor shall include in their lump sum bid the cost for makeup piping necessary to connect to the exact location of existing pipe joints and fittings. The exact location of each existing joint is not shown on the Drawings.

I. Contractor shall submit a detailed Work Plan/Sequence for each construction activity and/or shutdown, participate in a work plan/sequence review meeting with District staff, and receive District's approval prior to scheduling any shutdown. Alternative equivalent construction methods and sequences must be submitted to the District in a timely manner to allow for review, revisions, and approval prior to scheduling of the shutdown. Unless specifically indicated otherwise, no more than 6 hours of shutdown of any existing facility shall be allowed.

J. Contractor shall be responsible for all dewatering, evacuation of all fluids and gases from the existing facilities, proposed work area, nuisance water in excavations for pipelines and abandonments, and all other work associated with making connections to the existing facilities with the specified shutdown limitations. Contractor shall consider the distinct possibility that the existing water system line valves will not achieve 100% closure and may cause water leakage during the tie-in procedures and abandonments; therefore, Contractor may need to continuously dewater existing water pipelines during their tie-in work. Contractor shall include all costs associated with dewatering, including pumping and dechlorination, in their bid price for the respective pipeline connection/tie-in work.

K. Contractor shall include in their bid the costs of making connections to the existing items within the specified shutdown limitations and providing all temporary facilities for all items requiring a shutdown of more than 6 hours, unless specified otherwise, in addition to all temporary facilities specifically required otherwise.

L. Any proposed modifications to the Sequence of Work provided herein shall be submitted in writing to District for approval. If approved, said modified Sequence of Work shall be implemented by Contractor at no additional cost to District. Any proposed modifications to the specified Sequence of Work shall reflect the necessary changes to all other project components.

M. Contractor shall work with District to provide adequate public outreach to notify residents of shutdowns. Refer to Special Conditions Section SC-16 for public outreach details.

In accordance with the operational limitations of the existing transmission and distribution systems, the following sections generally describe the work restrictions and sequencing constraints.

1.02 Constraints on Sequence and Scheduling of Work

A. All components of the work must be completed in a phased sequence to ensure that the operation and control of the District's existing and proposed system components are maintained with continuous operation and control of the District's existing water transmission, and distribution system. Contractor shall schedule all work such that all existing pipelines remain functional during all components of the project work. Except as allowed for during short duration shutdowns identified hereafter, water and sewer pipelines must be maintained in operation at all times during

the construction activities.

B. Interruptions of the existing District facility operations shall be scheduled and coordinated with the District, and shall not exceed the duration specified herein. Night work shall be required where specified.

C. Contractor shall conduct work in a manner that will not impair the operational capabilities of essential elements of the District's existing water transmission and distribution system and sewage conveyance system or reduce the operating capacity of said facilities.

D. Contractor shall include costs in their bid price for compliance with the specific sequencing limitations and all the constraints, temporary facilities, and the related general factors pertaining to maintaining the full operational capacity of the District's existing water transmission and distribution system facilities and sewage conveyance system, and all related systems.

E. Prior to commencing work, Contractor shall submit for District's approval, a detailed project schedule with narrative descriptions for his proposed Sequence of Work including required valve closure and opening coordination of work. The project schedule shall be provided in accordance with the General Conditions, Section F – Labor and Construction, and as specified herein. The schedule shall show all construction activities and sub-activities, address all work restrictions and constraints, and include critical events that may impact the operation of existing facilities. The submittal shall clearly identify the work that will require shutdowns, or interruptions of the District's existing transmission and distribution system and the duration of shutdowns/interruptions.

F. Refer to the Shutdown Coordination Table at the end of this Appendix for specific details.

1.03 Interruption of Existing District Facilities

A. Contractor shall execute the work while the District's existing water transmission systems and distribution systems and the District’s sewer collections system are in operation.

B. Contractor shall indicate required shutdowns of existing facilities or interruptions of existing operations on his Baseline Schedule as well as Progress Schedule Updates. Shutdowns will be permitted to the extent that existing operation of the existing water transmission and distribution systems will not be jeopardized and identified constraints and restrictions are satisfied.

C. Unless specified otherwise, Contractor shall submit three separate written notifications EMWD for each required shutdown of existing facilities at least 30 days, 1 week, and 48 hours prior to any planned date of shutdown. No customer services are anticipated to be turned off during work under this contract except as note herein.

D. Each request will be evaluated based on the Facility's ability to reliably meet capacity demands.

E. Contractor shall not begin alterations until District's written permission has been received.

F. Isolation of individual facilities will require valve closures. All valves shall be operated by District's staff except angle meter stops. Contractor shall not operate any existing valve.

G. Contractor shall minimize shutdown times by thorough advanced planning. At the time of shutdown, Contractor shall have onsite all equipment, materials, and labor necessary to perform the required work. Contractor shall pre-assemble piping as much as possible to meet strict shutdown timeframes.

H. Where required to minimize distribution and transmission system interruptions and while complying with the specified sequencing constraints, Contractor shall provide temporary pumping, piping, power, lighting, controls, instrumentation, and safety devices. Contractor shall provide a detailed temporary facilities plan ahead of commencing work for review describing the proposed scope and general arrangement of the temporary work. Note that a highline is required for this project, see other sections for details.

I. Where applicable, Contractor shall schedule shutdowns to avoid the summer high peak demand.

1.04 Access

A. Contractor shall provide safe, continuous access to all existing facilities, pipelines, valves and appurtenances for District staff.

B. Contractor shall maintain complete unobstructed access to each property - residential, commercial, or otherwise - at all times during construction. Contractor shall be responsible for providing emergency vehicle access to each property. When driveways may be blocked by construction activities, the Contractor shall notify affected property owners 72 hours in advance.

1.05 Utilities

A. Maintain in service all electrical, telephone, water, gas, sanitary facilities, and other utilities within the project area. Provide temporary utilities when necessary.

B. Contractor shall provide advance notice to and utilize the services of Underground Services Alert (USA) for location and marking of underground utilities operated by utility agencies other than the District. Contractor to call 811 for marking of underground utilities

C. Provide a minimum of 72 hours advance notice to District's Inspector for marking/locating District's underground facilities.

1.06 Work Sequence

A. General Requirements

1. All temporary and permanent piping and tees with valves and adaptors shall be assembled in advance, prior to commencing shutdown work.

2. Notification to District Construction Administrator, or designee, shall be 48 hours prior to start of construction.

B. Detailed Sequence of Work

The anticipated construction sequence is presented below. Additional details regarding each connection are provided in Part 3. The Contractor may submit to the District Representative an alternate sequence for approval. The District reserves the right to reject the proposed alternate construction sequence.

The anticipated construction sequence is described as follows:

1. Submit to District the anticipated timeframe/schedule of construction

2. Construct 24-inch brackish water pipeline and appurtenances within Sherman Road with exception of the interconnections at Mapes Road and Ellis Ave.

3. Flush, disinfect, and hydrostatically test the 24-inch brackish water pipeline and appurtenances within Sherman Road.

4. Expose and verify the existing pipe conditions at the proposed connection points at Mapes Road and Ellis Ave.

5. Dewater and legally dispose of the estimated 39,000 gallons of brackish water on the isolated segment of the existing 24-inch PVC brackish water pipeline in Ellis Road.

6. Remove interfering portions of existing 24-inch PVC brackish water pipeline in Ellis Road and construct the 24-inch tee connection (including the 24-inch gate valve).

7. Connect to new 24-inch brackish water pipeline at Ellis Ave and close new 24-inch valve on branch of tee.

8. Re-pressurize the existing 24-inch PVC brackish water pipeline in Ellis Road.

9. Dewater and legally dispose of the estimated 60,000 gallons of brackish water on the isolated segment of the existing 24-inch PVC brackish water pipeline in Mapes Road.

10. Remove the interfering portions of the existing 24-inch PVC brackish water pipeline in Mapes Road and install 24-inch tee connection (including the 24-inch gate valve). Remove the interfering portions of the existing 24-inch PVC brackish water pipeline in Sherman Road an install 24-inch maintenance receiving station per contract documents (if performed separately, requires dewatering estimated 60,000 gallons of brackish water again).

11. Connect to the new 24-inch brackish water pipeline at Mapes Road and close new 24-inch valve on branch of tee.

12. Re-pressurize the existing 24-inch PVC brackish water pipeline in Mapes Road.

13. Open the new 24-inch valves on both tees at Ellis Ave and Mapes Road and put new 24-inch brackish water pipeline and appurtenances within Sherman Road into service.

14. Isolate the existing 24-inch brackish water pipeline and appurtenances within Sherman Road by closing of the 24-inch valves per the Shutdown Coordination Table on Drawing G-3.

15. Dewater and legally dispose of the estimated 55,000 gallons of brackish water from the existing 24-inch brackish water pipeline and appurtenances within Sherman Road.

16. Construct pipeline maintenance launching station per contract documents on the existing 24-inch brackish water pipeline within Sherman Road.

17. Flush, disinfect, and hydrostatically test the existing 24-inch brackish water pipeline and appurtenances within Sherman Road.

18. After successful flushing, disinfection, and hydrostatic testing, put the existing 24-inch brackish water pipeline and appurtenances within Sherman Road back into service.

1.07 Miscellaneous Items

A. For all other facilities not indicated above, Contractor shall also coordinate and submit details of any other connections to or modifications of the existing facilities or any other construction impacting the existing facilities to District for review and approval. No more than 6 hours of shutdown shall be allowed for any other connection to or modification of the existing facilities unless specifically approved otherwise in writing by District. Temporary facilities will be required for approved shutdowns lasting longer than 6 hours. The timing of any such shutdowns shall be as required by the District. Contractor shall include in his bid the costs of making connections to the existing items within the specified shutdown limitations and providing all temporary facilities for all facilities requiring a shutdown of more than 6 hours.

PART 2 - EXECUTION

2.01 Coordination of Work

A. Contractor shall maintain overall coordination of work execution.

B. Contractor shall obtain schedules from subcontractors and suppliers and accept responsibility for correctness.

C. Contractor shall incorporate schedules from subcontractors and suppliers into Progress Schedule to plan for and comply with work, sequencing, and shutdown constraints.

2.02 Work by Others

A. Where proper execution of the work depends upon work by others, inspect and promptly report discrepancies and defects.

B. EMWD staff will operate all existing valves in the system.

2.03 General Requirements for Execution of Work

A. Locate temporary facilities in a manner that minimizes interference to District's operation and maintenance personnel.

B. Unless otherwise specified, install temporary pipelines of the same size as its connection to the existing facility at the downstream end of the pipeline.

C. Provide piping of suitable material for the material being conveyed.

PART 3 – Anticipated Implementation for Pipeline

3.01 Key Issues Impacting Project Implementation

A. Minimize shutdowns by pre-assembly of connections where possible. Pothole connection points and confirm existing pipeline type and diameters prior to ordering or construction of fittings.

B. Contractor must make provisions for appropriate air gap and traffic barriers for dewatering equipment to provide a safe working environment for contractor employees, EMWD personnel and the general public.

C. Competent Contractor Personnel must be on site at all times during dewatering to the sewer or other approved facilities. If dewatering is to occur during off-shift hours, Contractor must make provisions for personnel to be on-site at all times.

D. Note all dewatering quantity estimates are approximate and do not include any possible valve leak by. Refer to Index Map, Shutdown table and Exhibits shown in the contract documents. And refer to shutdown table on plans for additional information.

3.02 Basic Strategy

A. The anticipated construction sequence is given in Section 1.06 herein. Contractor to submit any modifications or deviations for District approval.

3.03 Installation of Connection at Mapes Road

Refer to Item No. 1 on the Shutdown Table. This requires the Contractor to install a 24-inch tee and valve on the existing 24-inch PVC brackish water transmission pipeline. Contractor is to minimize the length of work proposed by potholing, pre-assembly, pre-excavation and/or other means prior to EMWD shutting down the impacted pipelines.

3.04 Installation of Connection at Ellis Ave

Refer to Item No. 2 on the Shutdown Table. This requires the Contractor to install a 24-inch tee and valve on the existing 24-inch PVC brackish water transmission pipeline. Contractor is to minimize the length of work proposed by potholing, pre-assembly, pre-excavation and/or other means prior to EMWD shutting down the impacted pipelines.

3.05 Construction of 24-inch Pipeline Maintenance Launching and Receiving Stations on Existing 24-inch Pipeline in Sherman Road

Refer to Items Nos. 3 & 4 on the Shutdown Table. This requires the Contractor to construct 24-inch pipeline maintenance launching (Item No. 4) and receiving (Item No. 3) stations on the existing 24-inch PVC brackish water transmission pipeline within Sherman Road.

Item Nos. 1 and 3 require dewatering the same affected segment of existing pipe and are recommended to be completed concurrently.

Item No. 4 shall be conducted after the new 24-inch PVC parallel transmission main within Sherman Rad is placed into service. The existing 24-inch Sherman Road brackish water pipeline shall be isolated utilizing existing valves at Ellis Avenue and Vista Road.