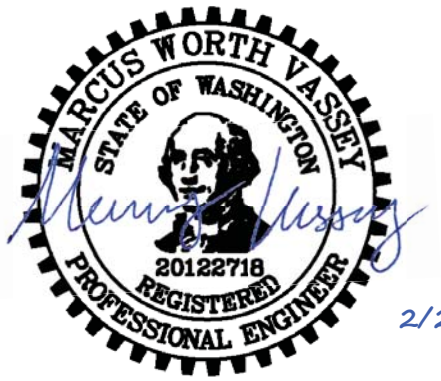
Appendix A
Lakewood Water District Specifications

This appendix contains specifications for the Lakewood Water District portion of project work. These specifications are for a typical water main project in the street right-of-way so some details (such as street repair) and some restoration details are included in the City of Lakewood's project specifications that this is an appendix to.

CERTIFICATION

The technical material and data contained in this document were prepared under the supervision and direction of the undersigned, whose seal, as a professional engineer licensed to practice as such, is affixed below.



2/2/2021

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LAKEWOOD WATER DISTRICT

GRAVELLY LAKE WATER MAIN REPLACEMENT
JOB # 748

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Appendix A – Contract Drawings

Division 0

Bidding and Contract Requirements

DIVISION 0 – BIDDING AND CONTRACT REQUIREMENTS

SECTION 00850 – DRAWING INDEX

The Parametrix, Inc., Contract Drawings titled "Gravelly Lake Water Main Replacement" for the Lakewood Water District dated November 2020, consist of the following drawings:

1 WATER MAIN PLAN AND PROFILE WASHINGTON BLVD SW STA 250+00 TO STA 262+00
2 WATER MAIN PLAN AND PROFILE INTERLAKKEN DR SW STA 900+00 TO STA 905+00
3 WATER MAIN PLAN AND PROFILE GRAVELLY LAKE DR SW STA 1000+00 TO STA 1004+19
4 WATER MAIN PLAN AND PROFILE WASHINGTON BLVD SW STA 262+00 TO STA 267+00
5 WATER MAIN PLAN AND PROFILE GRAVELLY LAKE DR SW STA 1005+50 TO STA 1010+50
6 WATER MAIN PLAN AND PROFILE GRAVELLY LAKE DR SW STA 1010+50 TO STA 1015+50
7 WATER MAIN PLAN AND PROFILE GRAVELLY LAKE DR SW STA 1015+50 TO STA 1020+50
8 WATER MAIN PLAN AND PROFILE GRAVELLY LAKE DR SW STA 1020+50 TO STA 1024+50
9 WATER MAIN PLAN AND PROFILE GRAVELLY LAKE DR SW STA 1024+50 TO STA 1028+50
10 WATER MAIN PLAN AND PROFILE GRAVELLY LAKE DR SW STA 1028+50 TO STA 1033+50
11 WATER MAIN PLAN AND PROFILE GRAVELLY LAKE DR SW STA 1033+50 TO STA 1038+50
12 WATER MAIN PLAN AND PROFILE GRAVELLY LAKE DR SW STA 1038+50 TO STA 1043+50
13 WATER MAIN PLAN AND PROFILE GRAVELLY LAKE DR SW STA 1043+50 TO STA 1048+50
14 WATER MAIN PLAN AND PROFILE GRAVELLY LAKE DR SW STA 1048+50 TO STA 1053+50
15 WATER MAIN PLAN AND PROFILE GRAVELLY LAKE DR SW STA 1053+50 TO STA 1056+50
16 WATER MAIN PLAN AND PROFILE NYANZA ROAD SW STA 1200+00 TO STA 1204+50
17 WATER MAIN PLAN AND PROFILE NYANZA ROAD SW STA 1204+50 TO STA 1208+00
18 WATER MAIN PLAN AND PROFILE GRAVELLY LAKE DR SW STA 1058+00 TO STA 1061+50
19 WATER MAIN PLAN AND PROFILE GRAVELLY LAKE DR SW STA 1061+50 TO STA 1063+00
20 LAKEWOOD WATER DISTRICT DETAILS
21 LAKEWOOD WATER DISTRICT DETAILS
22 LAKEWOOD WATER DISTRICT DETAILS
23 LAKEWOOD WATER DISTRICT HYDRANT AND METER REPLACEMENT 12101 GRAVELLY
24 LAKEWOOD WATER DISTRICT HYDRANT AND METER REPLACEMENT 12221 GRAVELLY
25 LAKEWOOD WATER DISTRICT HYDRANT AND METER REPLACEMENT 12623 GRAVELLY
26 LAKEWOOD WATER DISTRICT HYDRANT AND METER REPLACEMENT 12706 GRAVELLY
27 LAKEWOOD WATER DISTRICT HYDRANT AND METER REPLACEMENT 12793 GRAVELLY
28 LAKEWOOD WATER DISTRICT HYDRANT AND METER REPLACEMENT DETAILS

END OF SECTION 00850

Division 1

General Requirements

DIVISION 1 – GENERAL REQUIREMENTS

SECTION 01010 – SUMMARY OF THE WORK

1. GENERAL

a. The work to be performed under this Contract includes furnishing and installing approximately 8,640 linear feet of 6-, 8-, 12-, and 16-inch-diameter ductile iron pipe (DIP), 14 fire hydrants, valves, appurtenances, replacement and reconnection of 89 water services, connections to the existing water main and restoration. The Contractor shall provide and install all water system materials including water main, fittings, valves, fire hydrants, and water service materials in public Right-of-Way and private property. The District will not furnish any water main pipe or service materials for this project.

b. Prior to any construction, the Contractor shall video record (in digital format) the entire length of the project and the affected portions of the side streets. Video recording shall be performed in both directions and shall show locations of hydrants, valves and water services as well as existing cracks or damage to any facility. The District will also video record the project area prior to construction.

c. The project generally consists of, but is not limited to, furnishing and installing the following, complete and in proper working order:

(1) Furnishing and installing DIP water main and appurtenances.

(2) Furnishing and installing gate valves and fire hydrants.

(3) Furnishing and installing all water service materials.

(4) Providing, installing and placing restorative items including gravel and crushed rock, asphalt, thrust blocking and landscaping.

(5) Providing temporary erosion and sediment control.

(6) Providing temporary traffic control.

(7) Providing utility protection and maintenance.

(8) Video recording the existing work site.

(9) Providing safety equipment and following safety procedures in compliance with State and Federal standards.

END OF SECTION 01010

DIVISION 1 – GENERAL REQUIREMENTS

SECTION 01060 – PERMITS, RIGHTS OF ENTRY, AND NOTIFICATION

1. GENERAL

   a. Portions of the work to be performed under this Contract are located on property not owned or under the control of the District. The Contractor shall comply with the conditions of such permits, easements, or rights of entry which allow the use of such property.

   b. In the event a conflict between these permits and Contract Documents occurs, the Lakewood Water District inspector shall decide in the best interest of the District, appealable to the Superintendent, then the General Manager, if necessary, whose decision shall be final.

2. RIGHT-OF-WAY PERMIT - CITY OF LAKEWOOD PUBLIC WORKS DEPARTMENT

   a. Right-of-Way Permit from the City of Lakewood is not required as it is covered under an Interlocal Agreement.

   b. If employees of the City of Lakewood should instruct or direct the Contractor to perform work which is not a part of this Contract, the Contractor shall immediately notify the Owner and a Change Order will be considered for the additional work. If the Contractor should proceed with such additional work without a Change Order, no payment shall be made to the Contractor for such work.

3. NOTIFICATION

   a. Notification of water shut-off shall require 24-hour notice and be approved by LWD. Contractor shall provide door hangers approved by LWD prior to distribution.

   b. Contractor shall provide notification to customers prior to construction activity adjacent to their property.

END OF SECTION 01060

DIVISION 1 – GENERAL REQUIREMENTS

SECTION 01150 – MEASUREMENT AND PAYMENT

1. GENERAL

a. The Contractor shall furnish and install all water system materials including water main, valves, fittings, fire hydrants and water service materials including PVC casing, polyethylene service pipe of all sizes, valves, connectors and adapters and shall provide all labor and other necessary materials such as crushed rock, backfill gravel, concrete thrust blocking, concrete roadway panels, asphalt, trenching, backfill and compaction and restoration.

b. The Contract price paid for each item shall constitute full compensation for all costs of furnishing and installing all necessary materials and providing and furnishing all other material, equipment, and supplies and for performing all labor and operations for completion of the Work as specified in these Contract Documents.

c. No measurement for payment will be made for any Lump Sum Bid Item.

d. It is the intent of this project and the listed bid items that the Work shall result in a complete, satisfactory and proper operating system. All construction required to complete the Work as specified in these Contract Documents, but not specifically mentioned in this section, shall be considered incidental to those Bid Items for which payment is made.

e. The quantities for all items not listed as lump sum (LS) have been entered into the Proposal only to provide a common proposal for bidders. Actual quantities will be determined in the field as the work progresses, and will be paid at the original bid price, regardless of final quantity, these bid items shall not be subject to the provisions of 1-04.6 of the WSDOT Standard Specifications.

2. BID ITEM DESCRIPTIONS

a. **Mobilization**

(1) Measurement for payment of mobilization shall be as a lump sum. No more than 10 percent of the Bid Subtotal will be allowed for this item.

(2) The lump sum price for mobilization shall be considered full compensation for all labor, materials, equipment and tools necessary or incidental to perform mobilization, including establishment of the Contractor's field office and storage yard.

(3) Also included in this bid item shall be all costs to apply for the City of Lakewood Business License.

(4) No partial payment will be made for this bid item. Payment of this bid item will not be made until 10 percent of the total original bid amount is earned from other bid items.

b. **Potholing**

(1) Potholing shall be measured per each hole excavated, no matter how many utilities were identified/located.

(2) The unit contract price for potholing per each shall be full compensation for all labor, tools, equipment, and materials necessary to expose the locations of existing utilities, record vertical and horizontal locations, backfill, and compact excavated areas per the City of Lakewood Standard Details. This unit price shall also include the cost for rescheduling work as required to allow LWD time (up to 7 working days) to issue any design modifications as may be required.

(3) Potholing locations will be as directed by the District's inspector or shown on the Plans. Any additional potholes the contractor deems necessary over the bid amount shall be considered incidental to the contract.

c. **Traffic Control**

(1) Measurement for payment of traffic control shall be as a lump sum.

(2) The lump sum price for traffic control shall be considered full compensation for all labor, materials, equipment and tools necessary or incidental to furnishing and performing traffic control. The lump sum price includes, but not limited to, providing flaggers, signs and warning lights, traffic impact attenuator vehicle, and barricades and preparing and submitting a traffic control plan for the City of Lakewood to review and approve.

(3) Payment will be made based on an approximate percentage of water main and asphalt restoration installed.

d. **Furnish and Install __-Inch Water Main**

(1) Measurement for payment for furnishing and installing DIP Water Main of the size listed in the Bid Form shall be by linear foot (measured horizontally) of pipe laid and tested, and shall be measured along the pipe through fittings including hydrant tees, valves and couplings. The length of reducers shall be considered as length of the larger pipe size.

(2) The unit price per linear foot for each size and kind of pipe material shall be considered full compensation for all labor, materials, equipment and tools necessary or incidental to the work including, but not limited to, trench excavation, bedding with approved native material, hauling unsuitable or excess material to an approved site, furnishing, laying and jointing pipe, backfilling, compaction, dewatering, concrete thrust blocking, installing locking gaskets or restrained joint pipe, disinfecting the pipeline, testing, temporary blow-offs, flushing, and cleanup for water main, complete-in-place and ready for use.

(3) Payment for all work required and specified under the Contract, except for those items segregated in the Bid Form, shall be included in the unit price paid per foot of Furnish and Install___-Inch Water Main or Reconnect Existing Water Service.

(4) Also specifically included in the bid price for this item are all costs with placing approved suitable native material as pipe bedding or backfill as shown on the Plans, included in the specifications and as allowed by the District. Crushed surfacing top course (5/8-inch minus crushed rock) used as pipe bedding and backfill shall be paid under a separate bid item.

(5) Also included in the unit price bid for this item, but not limited to, shall be all costs and expenses involved in maintaining and/or replacing all public or private utilities,

including protection and/or replacement of City of Lakewood storm infiltration trenches as noted on the Plans, landscaping, structures or improvements which may have to be moved, or which may in any way be damaged by operations of the Contractor.

(6) Payment for clearing, grubbing, tunneling to avoid structures and tree roots, tree removal, and pavement marking restoration to match existing is considered incidental to the work of constructing the water main, and all costs thereof shall be included in the unit price bid for each size of water main. All other restoration (removal and reinstallation or replacement) including but not limited to, crushed rock shoulders, asphalt and concrete pavement, temporary pavements, pavement saw cutting, sodding, seeding, fertilizing, mulching, planting, topsoil, bark, etc. required to match existing is considered incidental and shall be included in this bid item.

(7) Payment for installation of fittings, bends, hydrants and valves will be made under other respective bid items.

(8) Payment for installation of 6-inch DIP used for fire hydrant runs is included in the unit price for fire hydrant assembly.

(9) Payment for installation of 4-inch, 6-inch, 8-inch, 12-inch, and 16-inch ductile iron nipples or spools used in connections to the existing system is included in the unit price for connection to the existing system. Payment for longer lengths of 4-inch, 6-inch, 8-inch, 12-inch and 16-inch ductile iron pipe used in connections to existing system shall be included in the unit price for connection to the existing system.

(10) Partial payment for furnish and install water mains will be made as follows:

(a) Payment as determined by the Engineer, not exceeding 65 percent of the unit price, less retainages, for mains installed with backfill complete.

(b) Payment as determined by the Engineer, not exceeding 75 percent of the unit price, less retainages, for mains installed with backfill, testing and disinfection complete.

(c) Payment for the full unit price, less retainages, for mains installed with backfill, testing, disinfection and restoration complete.

e. **Furnish and Install __-Inch Gate Valve**

(1) Measurement for payment for furnishing and installing gate valves of the size listed in the Bid Form shall be per each valve installed and tested in place.

(2) The unit price per each for each size valve shall be considered full compensation for all labor, materials, equipment and tools necessary or incidental to the work including, but not limited to, trench excavation, bedding, laying and jointing pipe and fittings to valves, backfilling, concrete collar around valve boxes and valve clusters, furnishing and installing valve boxes and valve markers, painting valve boxes and valve markers and all associated cleanup.

(3) Payment for the 6-inch gate valves used on fire hydrant runs shall be included in the unit price for fire hydrant assembly.

(4) No partial payment for gate valves will be made.

f. **Furnish and Install 2-Inch Blowoff Assembly**

(1) The unit price bid per each for the "Furnish and Install 2 In. Blowoff Assembly" shall be full pay for furnishing all labor, materials, tools, and equipment necessary to complete the assembly according to the Plans and Specifications, including furnishing and placing the valve in a chamber, complete. The assembly shall include furnishing and placing all accessories such as connections to existing piping, gate valve box, adapters, piping, and appurtenances.

g. **Furnish and Install Fire Hydrant Assembly**

(1) Measurement for payment for furnishing and installing fire hydrant assemblies shall be per each fire hydrant assembly installed and tested in place.

(2) The unit price bid per each for fire hydrant assembly shall include all costs to furnish and install the fire hydrant assembly. Costs shall also include, but not be limited to, excavation, bedding with approved native material, hauling unsuitable or excess material to an approved site, bollards, laying and jointing pipe, backfilling, compaction, dewatering, concrete thrust blocking, disinfecting the pipeline, testing, flushing, cleanup.

(3) Payment includes furnishing and installation of the entire fire hydrant assembly including the tee on the main, foster adapters, auxiliary gate valve and valve box, 6-inch DIP hydrant runs, fire hydrant, all fittings and restraints, blocking, gravel, concrete pad and all other items required for the installation of the fire hydrant assembly complete.

(4) Payment also includes all costs to carefully remove the existing hydrants and hydrant valve boxes and deliver them in good condition to the District's maintenance or storage yard, cap and abandon existing hydrant piping, backfill voids, and restore area to match existing.

(5) Partial payment for fire hydrant assembly will be made as follows:

(a) Payment as determined by the Engineer, not exceeding 90 percent of the unit price, less retainages, for fire hydrant assemblies installed and tested.

(b) Remaining payment of the unit price bid, less retainages, for removal and delivery of existing hydrant and materials and site restoration.

(6) Also included in this bid item are all costs to cut and cap existing main to be abandoned, including furnishing and installing ductile iron caps or plugs utilized in the abandonment of existing mains.

h. **Connection to Existing System**

(1) Measurement for payment for connection to the existing system shall be per each connection made to the District's existing water main and tested in place.

(2) The unit price per each for each connection to existing system shall be considered full compensation for all labor, materials, equipment and tools necessary or incidental to the work including, but not limited to, potholing to verify connection depth, trench excavation, bedding, furnishing, laying and jointing pipe and fittings, backfilling, temporary and permanent blocking, testing, flushing, disinfecting the pipeline, and cleanup. Permanent bends and fittings installed will be paid for under separate bid item.

(3) Also included in this bid item are all costs to cut and cap existing main to be abandoned, including furnishing and installing ductile iron caps or plugs utilized in the abandonment of existing mains.

(4) Also included in this item are all costs of coordination with the District for system shut-downs and notification to affected water users.

(5) Also included in this item are all costs to furnish and install 4-inch, 6-inch, 8-inch, and 12-inch ductile iron nipples or spools used in connections to the existing system. Also included are all longer lengths of 4-inch, 6-inch, 8-inch, 12-inch, and 16-inch, ductile iron pipe used in the connections. 6-inch DIP used for fire hydrant runs will be paid for under separate bid item for fire hydrant assembly.

(6) Connection to an existing or new water service line will not be counted as a connection to the existing system.

(7) A connection to the existing system shall be a cut-in connection.

(8) No partial payment for connection to existing system will be made.

i. **Furnish and Install D.I. Fittings**

(1) Measurement for payment of DIP fittings shall be per each fitting furnished and installed, including thrust block or mechanical joint restraints ("megalug").

(2) The unit price per each for bends and fittings shall be considered full compensation for all labor, materials, equipment and tools necessary or incidental for furnishing and installing bends, fittings, foster adapters, and installing thrust blocks or mechanical joint restraints ("megalug").

(3) No payment under this bid item will be made for fire hydrant tee. Payment for fire hydrant tee shall be made under separate bid item for fire hydrant assembly.

(4) No payment under this bid item will be made for ductile iron caps or plugs utilized in the abandonment of existing mains. Payment for caps or plugs shall be made under separate bid item for connection to existing system.

(5) No payment under this bid item will be made for ductile iron fittings utilized for temporary blow-offs or temporary connections used for flushing and testing the new main. These temporary fittings are incidental to the unit price for the ductile iron water main bid items.

(6) No partial payment for this item will be made.

j. **Reconnect Existing _____ Water Service**

(1) Measurement for payment of Reconnect Existing 5/8-inch, 1-inch, or 2-inch Water Service shall be per each water service installed and customer service re-established.

(2) The unit contract price bid per each Reconnect Existing 5/8-inch, 1-inch, or 2-inch Water Service depends on the location of the water service with respect to the roadway centerline.

(a) Reconnect Existing 5/8-inch, 1-inch, or 2-inch Near Side Water Service shall be for water services located on the same side of the roadway centerline as the new water main.

(b) Reconnect Existing 5/8-inch, 1-inch, or 2-inch Far Side Water Service shall be for water services located on the opposite side of the roadway centerline as the new water main.

(3) The unit contract price bid per each for Reconnect Existing 5/8-inch, 1-inch, or 2-inch Water Near Side or Far Side Water Service shall be full pay for all work and materials to reconnect the water service per the standard details including from the new main to the new meter box location or within 5 feet of the existing location, to reconnecting to the existing customer's service line on the customer side of the water meter. Where the new meter box is shown outside the noted radius on the Plans or directed to be located outside of the noted radius by the District in the field, payment for Additional 5/8-inch, 1-inch, or 2-inch, Water Service Pipe customer side will be made under separate bid item.

(4) Bid item includes excavation, backfill, furnishing, and installation of all water service materials, including 5/8-inch, 1-inch, or 2-inch polyethylene service pipe, corporation stop, saddle, couplings and fittings, tracing wire, 2.5-inch or 3-inch Schedule 40 PVC sleeve jacked or bored under the roadway for far side water service, meter setter, meter box, Lakewood Water District-provided meter box lid, front ball angle stops, single angle check valve and reconnect to the existing customer's service with 5/8-inch, 1-inch, or 2-inch polyethylene (Contractor to field verify size and match) service pipe to re-establish service including all required service pipe, clamps, fittings, and adapters on the customer side of the meter.

(5) Also included are all costs to remove the existing water meter from the existing meter box, protect, relocate and install in the new meter box. All existing water meters will be reused.

(6) Also included are all costs to remove and dispose of the existing meter box, meter setter, angle stop, and check valve, cap and abandon existing service piping, backfill void with native material from new meter box excavation and finish to match existing landscaping.

(7) Also included are all costs to tunnel and horizontal directional drill under existing pavement, sidewalk, roadway lanes, rockeries, walls, fences, etc. as necessary to reconnect the water service.

(8) Also included are all restoration costs necessary to match existing conditions.

(9) Also included are all costs to pipe burst, bypassing of water main and service, pipe joining, and insertion and reception pits.

(10) Also included are all costs by the Contractor to keep clean, and to re-clean if necessary, the customer's existing service line to prevent foreign matter from entering the service line. Should the customer experience problems with their service or reduced flow following construction due to plugging of the line, the Contractor shall employ a plumber to provide necessary cleaning or repairs and shall be responsible for all costs. If the Contractor fails to immediately correct the problem, the District will coordinate the repairs and deduct the cost of the repair from any monies or payments due the Contractor.

(11) Also included are all required notifications and coordination with the District and customer during service transfer to the new main.

(12) Payment will be made per each customer service re-established. No partial payment for reconnect existing ___-inch water service will be made.

k. **Service Work and Restoration on Private Property _____**

(1) Measurement for payment of Service Work and Restoration on Private Property _____ shall be per Lump Sum.

(2) The lump sum price for Service Work on Private Property _____ shall be considered full compensation for all labor, materials, equipment and tools necessary to complete the work on the specified private property or properties to reconnect the water service per the standard details including all work on the costumer side of the meter setter or the specified property as shown on the Plans and restore any items as called out on the Plans including, but not limited to, pavement repair and replacement and landscape restoration.

(a) Also included are all costs to remove the existing water meter from the existing meter box, protect, relocate, and install in the new meter box. All existing water meters will be reused.

(b) Also included are all costs to remove and dispose of the existing meter box, meter setter, angle stop, and check valve, cap and abandon existing service piping, backfill void with native material from new meter box excavation and finish to match existing landscaping.

(c) Also included are all costs to tunnel and horizontal directional drill under existing pavement, sidewalk, roadway lanes, rockeries, walls, fences, landscaping, etc. as necessary to reconnect the water service.

(d) Also included are all restoration costs necessary to match existing conditions.

(e) Also included are all costs to pipe burst, bypassing of water main and service, pipe joining, and insertion and reception pits.

(f) Also included are all costs by the Contractor to keep clean, and to re-clean if necessary, the customer's existing service line to prevent foreign matter from entering the service line. Should the customer experience problems with their service or reduced flow following construction due to plugging of the line, the Contractor shall employ a plumber to provide necessary

cleaning or repairs and shall be responsible for all costs. If the Contractor fails to immediately correct the problem, the District will coordinate the repairs and deduct the cost of the repair from any monies or payments due the Contractor.

(g) Also included are all required notifications and coordination with the District and customer during service transfer to the new main.

(3) Payment will be made per lump sum. No partial payment for Service Work and Restoration on Private Property _____will be made.

l. **Trench Excavation Safety System**

(1) Measurement for payment of trench excavation safety systems shall be as a lump sum.

(2) The lump sum price for trench excavation safety systems shall be considered full compensation for all labor, materials, equipment and tools necessary to provide shoring in accordance with federal, state and local safety requirements.

(3) The Contractor shall include costs for all shoring needed to protect the work, adjacent property and improvements, utilities, structures, etc., and to provide safe working conditions in the trench.

(4) Trench safety shall include ditch box, sheeting or shoring. Trench widening will not be considered. The Lakewood Water District inspector must verify safety equipment in use.

(5) Payment will be made based on the approximate percentage of water main installed.

m. **Siltation Control**

(1) Measurement for payment of siltation control shall be as a lump sum.

(2) The lump sum price bid for siltation control shall be full compensation for all costs of controlling, preventing and cleanup of silt or soil erosion, including catch basin "socks" for catching of silt. Costs shall also include costs to satisfactorily maintain the facilities including periodic cleanup and disposal of silt if necessary, and final cleanup and removal of the facilities.

(3) Costs shall also include use of a water truck to wash pavement or moisten disturbed dirt areas if, in the opinion of the District or the City of Lakewood, dust created by the Contractor's operations is excessive.

(4) Payment will be made based on an approximate percentage of water main and asphalt restoration installed.

SECTION 01150 – MEASUREMENT AND PAYMENT (CONTINUED)

n. **Compaction Tests**

(1) Measurement for payment of compaction tests of trench backfill and/or crushed rock shall be per each, where required in the Pierce County Right-of-Way.

(2) The unit price for compaction tests shall be considered full compensation for all labor, materials, equipment and tools necessary or incidental to furnishing and performing trench backfill and subgrade compaction tests.

(3) Areas that have failed to achieve the required compaction and that must be re-excavated, re-compacted, and re-tested shall be done so at the Contractor's expense and no additional compensation will be made for re-excavation, re-compaction and re-testing.

(4) No measurement or payment will be made for compaction tests of asphalt pavement. Compaction tests of asphalt pavement shall be incidental to the asphalt pavement bid item.

(5) No partial payment for compaction tests will be made.

END OF SECTION 01150

DIVISION 1 – GENERAL REQUIREMENTS

SECTION 01200 – PROJECT MEETINGS

1. GENERAL

a. Prior to submission of a bid, it is recommended that the Contractor attend the on-site pre-bid meeting and project walk-through held by the District to discuss the project and bidding process.

b. Prior to award of the Project, the Contractor (Owner and job foreman) may be requested to attend a pre-award meeting with the District and water system customers in the construction area.

c. Prior to beginning the construction, the Contractor shall attend a pre-construction meeting with the District, Engineer, and invited representatives of agencies and utilities as the District may decide.

d. Progress meetings shall be held for the project and shall be scheduled as needed for the completion of the work.

e. After completion of the work, a walk-through with representatives of the Contractor, District, Engineer, and the City of Lakewood with a punch list may be required prior to final approval of the completion of the contract. No additional compensation will be paid to the contractor for this walk-through.

END OF SECTION 01200

DIVISION 1 – GENERAL REQUIREMENTS

SECTION 01300 - SUBMITTALS

1. GENERAL

a. Shop Drawing submittals are required for all items to be provided by the Contractor on this Contract. Submit three (3) copies of each submittal to:

Lakewood Water District
11900 Gravelly Lake Drive
Lakewood, WA 98496-0729
Attn: Ian Black, Superintendent

b. All submittals required by the Contract including construction schedules, shop drawings, samples, product data, etc. shall be submitted in the quantity indicated, and attached to a Contract Submittal Cover Sheet.

c. Each submittal shall be consecutively numbered in the space provided. Assign new numbers to re-submittals, but reference the previous submittal numbers used.

d. Complete all information required under the Contractor's Submittal Section of the form including number of copies, whether the submittal is a new submittal, re-submittal, or additional copies, the manufacturer and product number, and a description of the item.

e. The Engineer/District's Project Manager will process the submittal and complete the Engineer's/District's Project Manager action part of the form.

f. A separate submittal form shall be used for submittals required under each separate Division of the specifications.

g. The Contractor shall sign the submittal indicating that is has satisfied the review and coordinating responsibilities of the Contract with respect to submission of shop drawings and submittals.

h. The following number of copies of each type of submittal shall be submitted:

		No. of Copies
(1)	Construction Schedule, submittal schedule	2
(2)	Shop drawings	3
(3)	Product data	3
(4)	Samples/materials	2
(5)	Applications for payments	2
(6)	Affidavits of compliance	2
(7)	Permits (Electrical, waste discharge, etc.)	2
(8)	List of subcontractors	2
(9)	Biweekly construction schedule	2
(10)	Construction record drawings	2
(11)	Operation and maintenance manuals	2
(12)	Miscellaneous certificates, certificate of insurance, affidavits and submittals	2

SECTION 01300 - SUBMITTALS (CONTINUED)

2. CONSTRUCTION SCHEDULE/SUBMITTAL SCHEDULE

a. The Contractor shall submit, within fifteen (15) days after Notice to Proceed, a time scaled critical path method (CPM) network schedule diagram of the project for the entire construction period consisting of two (2) separate interrelated progress schedules involving a construction activity schedule and a submittal schedule.

b. The Contractor is responsible for creating, updating, revising, and costs of all schedules and the execution of the plan described by the schedules.

c. The initial schedules shall be submitted to the Engineer/District's Project Manager by the Contractor and reviewed by the Engineer/ District's Project Manager as appropriate for meeting the scheduling requirements of the contract prior to the Contractor submitting for or receiving any progress payments.

d. The Construction Schedule shall:

(1) Be an "Activity on the Arrow" type CPM schedule clearly identifying the activity and time required for the activity.

(2) Be plotted to a calendar day based horizontal time scale.

(3) Clearly display the specific start and completion date of every activity in the schedule (basing the plotting of the CPM schedule on a time scaled calendar shown at the top of the schedule will fulfill this requirement), and the critical path of activities.

(4) Show a logical sequence of the Work to be accomplished.

(5) Show the order and interdependence of the Contractor's planned activities.

(6) Have all activities broken down such that no individual CPM activity element is of a duration greater than twenty (20) calendar days.

(7) Identify phases or major areas of construction of the CPM schedule by logically grouping activities and indicating phase of area in large print.

(8) Indicate any required actions of District or Engineer affecting progress or completion date.

(9) Be updated by the Contractor at minimum monthly intervals and show actual as-built progress for all executed activities and show the scheduling of all future activities. Both the display of the as-built and scheduled future activities shall meet the scheduling requirements of the Contract.

(10) Clearly display the precedence of submittal schedule activities, i.e., the nodal point on the construction schedule by which a particular submittal - review - fabrication and delivery must be accomplished.

e. The Submittal Schedule shall:

(1) Be a schedule of all shop drawings, product data, certification submittals, all other submittals, and required permits.

(2) Be "an activity on the arrow" type schedule. The schedule is intended to be a bar chart rather than network type of diagram, however, any interdependence in the submittal schedule shall be clearly displayed by using network type diagramming.

(3) Be plotted to a calendar day based horizontal time scale.

(4) Clearly display all submittals required for the Project and the associated specification section.

(5) Clearly indicate on schedule:

(a) Submittal date.

(b) Time allotted for Engineer's/ District's Project Manager review fourteen (14) days minimum; the Engineer and District's Project Manager will indicate if time proposed is adequate for review. May require schedule revision by Contractor.

(c) Time required to fabricate and deliver to Site and the date and node from the construction schedule which is dependent upon the individual related submittal.

(6) Be updated at minimum monthly intervals and show actual as-built progress for all executed activities and show the scheduling of all future activities. The display of as-built and scheduled future activities shall meet the scheduling requirements of the contract.

f. Monthly updates for the purpose of indicating progress of the Work shall consist of a vertical time line superimposed on the time scaled calendar based CPM schedules (both construction and submittal schedules which have been reviewed by and are still considered by the Engineer District's Project Manager / as appropriate for meeting the scheduling requirements of the contract) intersecting the calendar on the reporting date and passing somewhat vertically down through the schedule intersecting the individual Work activities under construction or consideration at the point representing percent of completion for each individual activity (i.e., Activity 50% complete, - bi-sect the arrow with the time line). Monthly updated schedules shall be submitted by the Contractor as a part of his monthly progress payment request submittal package.

g. When in opinion of the District or the Contractor, the Contractor's Work progress is generally not conforming to the representations of the schedules to such a degree as to significantly reduce the effectiveness of the schedules as a management tool, the Contractor shall revise its schedules. The revised schedule shall show as-built progress for all executed activities and shall show the scheduling of the Engineer/ District's Project Manager by the Contractor and be reviewed by the Engineer/ District's Project Manager as appropriate for meeting the scheduling requirements of the contract prior to the Contractor submitting for or receiving any further progress payments.

h. If allowed by the City of Lakewood, Pierce County and Lakewood Water District, the Contractor shall furnish such manpower, materials, facilities and equipment and shall work such hours, including night shifts, overtime operations and Sunday and Holidays as may be necessary or allowable to insure the prosecution and completion of the Work in accordance with the reviewed and currently updated progress schedules. If Work actually in place falls behind the currently reviewed and updated Construction and Submittal Schedules, and it becomes apparent from the current schedules that Work will not be completed within the Contract Time, the Contractor agrees that it will, as necessary, take some or all of the following actions at no additional cost to the District to improve its progress:

(1) Increase manpower in such quantities and crafts as will substantially eliminate, in the judgment of the District, the backlog of Work;

(2) Increase the number of working hours per shift, shifts per working day, working days per week, or the amount of equipment, or any combination of the foregoing, sufficiently to substantially eliminate, in the judgment of the District, the backlog of Work; and

(3) Reschedule activities to achieve maximum practical concurrency of accomplishment of activities.

i. The Contractor shall include as part of its initial and monthly submittal of its Construction Schedule, the estimated amount of all monthly applications for Payment for the duration of the Contract. The estimate amount shall include the amount of retention specified and sales tax. The Contractor shall update the estimate at each monthly application for Payment.

3. BI-WEEKLY CONSTRUCTION SCHEDULE

a. Each week the Contractor shall present and discuss a detailed two (2) week bar graph type schedule of the next two (2) full calendar weeks that the Contractor intends to execute.

b. The intent of this requirement is for the Contractor to display in detail all the work he will execute during the following two (2) full calendar weeks to allow both the Contractor and District forces to preplan and coordinate how each will fulfill their requirements under the contract during that period.

4. LIST OF SUBCONTRACTORS

a. Concurrently with the initial submittal of the Construction Schedule, the Contractor shall submit its List of Subcontractors and Suppliers. The list shall establish the items of work proposed to be accomplished by Subcontractors and Suppliers and shall give the name and address of each. Notice shall be given for any change in the Subcontractors or Suppliers made by the Contractor throughout the course of the work.

SECTION 01300 - SUBMITTALS (CONTINUED)

5. SHOP DRAWINGS AND PRODUCT DATA

a. Shop drawings and product data shall be complete and legible. Shop drawings and product data shall include, as applicable, equipment outlines and dimensions, foundation requirements, piping and wiring diagrams and shall give complete information for installation, erection, maintenance and repair, and identification of parts for ordering replacements.

b. All shop drawings and product data prepared by subcontractors or suppliers shall all be submitted and coordinated through the Contractor. Any shop drawing or product data submitted directly to the Engineer/ District's Project Manager without being processed through the Contractor will be returned without review.

c. Shop drawings and product data shall not be smaller than 8-1/2 inches by 11 inches and shall not be larger than 24 inches by 36 inches.

d. Shop drawings and submittals shall contain the following information for all items:

(1) Shop or equipment drawings, dimensions, and weights.

(2) Catalog information.

(3) Manufacture's specifications.

(4) Special handling instructions.

(5) Maintenance requirements.

(6) Wiring and Control diagrams.

(7) List on Contract exceptions.

e. By approving and submitting shop drawings and samples, the Contractor warrants that they have determined and verified all field measurements, field construction criteria, materials, catalog numbers, and similar data, and have checked and coordinated each shop drawing with the requirements of the work on the contract documents.

f. The District will pay the costs and provide review services for a first and second review of each item. Additional reviews shall be paid by the Contractor by withholding the appropriate amounts from each payment estimate.

g. The Contractor is responsible for identifying the shop drawings and submittals required for this project. Items that are installed but have not been approved through the submittal process may be rejected and must be removed and replaced with an approved product.

h. Specific submittal requirements are listed in each section of these specifications. Contractor shall keep complete and up to date copy of all submittals and review responses at the job site readily available to the Engineer and District for inspection.

SECTION 01300 - SUBMITTALS (CONTINUED)

6. SAMPLES AND MATERIALS

a. Samples and materials shall be submitted as specified in such quantities or sizes as are determined reasonable by the Engineer.

b. Samples and materials shall be submitted and coordinated directly by the Contractor as for shop drawings and product data.

7. CONSTRUCTION RECORD DRAWINGS

a. At the beginning of construction, the Contractor shall set aside one (1) complete set of prints of the Contract Drawings, upon which it shall record or cause its various subcontractors to record, all deviations in construction, especially pipe and conduit locations, underground utilities and all deviations due to Change Orders. Notations and changes shall be done in a neat and legible manner as prescribed by the Engineer/ District's Project Manager. At intervals of approximately 7 days, the Contractor shall permit the Engineer/ District's Project Manager to examine and verify that the construction record drawings are being kept up to date. The Engineer will not recommend to the District to make payment of a Partial Payment Request if it is determined that the construction record drawings are not current at the time of the Partial Payment Request. Upon completion of the Project and prior to receiving Final Payment for the Work, the Contractor shall deliver two (2) sets of engineered quality as-built plans to the Engineer/ District's Project Manager before Final Payment will be made. Field copies and/or hand prepared drawings will not be accepted. Plans shall be made on clean, unmarked prints for this project in accordance with the following standards:

(1) yellow markings or highlights = deleted items

(2) red markings = new or modified items

b. The Contractor shall provide "as-built" information on all items and Work shown on the plans showing details of the finished product including dimensions, locations, outlines, changes, manufacturers, etc. The information must be in sufficient detail to allow the District's personnel to locate, maintain, and operate the finished product and its various components.

8. OPERATION AND MAINTENANCE MANUALS

a. The Contractor shall furnish complete bound Operation and Maintenance Manuals in the number specified covering all equipment furnished under this Contract as follows:

(1) Information shall be typewritten, published literature or detailed Shop Drawings, size 8-1/2 inches by 11 inches or accordion-folded to this size.

(2) All data included shall be the manufacturer's preprinted technical literature. Copies of the technical literature made by xerography or similar process will not be accepted.

(3) Information shall be arranged and identified with divider sheets and identifying tabs shall be used for separation of items.

(4) Information shall include manufacturer's maintenance, operation and parts lists.

(5) Information shall cover the exact equipment provided and contain no "marked-up" general catalog data.

(6) A complete set of Shop Drawings shall be incorporated in each manual.

(7) One (1) unbound copy of each volume of the Operations and Maintenance Manuals shall be submitted to the Engineer/ District's Project Manager for approval by 50% payment on the Project and prior to preparation of the final copies specified below.

(8) After approval of the submitted Operation and Maintenance Manual, the Contractor shall deliver to the Project Manager 3 hard copy sets and 2 electronic copies of acceptable manufacturer's operating and maintenance instructions covering pumps, motors, generator, transfer switch, telemetry, controls, and electrical equipment and systems installed on the Project requiring operational and/or maintenance procedures and for any additional items indicated by the Engineer, including coatings furnished under this contract. The front cover shall be imprinted with the title of the project, the name of the District, the name of the Engineer, and the name of the Contractor. The binding edge shall be imprinted with the name of the project, District and the year of completion of the project.

(9) The operating and maintenance instruction shall include, as a minimum, the following data for each coating and item of mechanical and electrical equipment:

(a) Products:

i. Equipment identification including brand name, model and serial numbers.

ii. Date of manufacture and date of installation on job site.

iii. Complete set of as-built elementary wiring and on-line diagrams.

iv. Complete parts list, by generic title and identification, number, complete with exploded views of each assembly.

(b) Maintenance:

i. Recommended spare parts.

ii. Lubrication schedule including the application lubricant designation available from Standard Oil Company of California.

iii. Recommended preventative maintenance procedures and schedules. Schedule shall be provided for daily, weekly, monthly, quarterly, semi-annually and annually.

iv. Disassembly and re-assembly instructions including parts and identification and a complete parts breakdown for all equipment.

v. Weights of individual components of each item of equipment weighing over 50 pounds.

vi. Names, location, and telephone number of the nearest suppliers and spare parts warehouse.

vii. All manufacturers' warranties. Include name, address, and telephone number of the manufacturers' representative to be contacted for warranty, parts, or service information.

viii. Cleaning, repair, and maintenance instructions for each coating system.

ix. Provide videotapes, video CDs or DVDs utilized in the manufacturers' instruction program for the owner.

(c) Operation:

i. Recommended trouble-shooting and start-up procedures.

ii. Recommended step-by-step operating procedures.

iii. Emergency operation modes, if applicable.

iv. Normal shutdown procedures.

v. Long term shutdown (mothballing) procedures.

vi. Equipment specification and guaranteed performance data.

vii. General manuals which describe several items not in the contract will not be accepted unless references to irrelevant equipment are neatly eradicated or blocked out.

9. APPLICATION FOR PAYMENT

a. Applications for Payment shall be according to the provisions of Articles 13 and 14 of Section 00700 General Conditions and submitted on the application forms, of which copies will be provided to the Contractor, with all such invoices and other documents justifying such applications.

b. Applications for payment shall be submitted under the cover of a contract submittal cover sheet which shall also have attached, the monthly scheduling update, and updated cash flow schedule. The application for payment will not be processed until such time as the updated schedules are received. If such schedules are received after the deadline for recommendation to the District has passed, no recommendation for payment will be made.

c. Application for payment must be made to the Engineer/ City of Lakewood's Project Manager. The District's Engineer will track pay quantities and coordinate the correct quantities with the Contractor each month. Conflicts in the pay request between the Contractor and the Engineer must be resolved prior to receipt of the City. Unresolved issues shall be documented by the Engineer and signed by the Contractor for the City's consideration without obligation for payment.

SECTION 01300 - SUBMITTALS (CONTINUED)

10. SUBSTITUTIONS

a. Any product or construction method that does not meet these specifications will be considered a substitution. Substitutions must be approved prior to their installation or use on this project.

(1) Prior to Bid Opening:

(a) Before opening bids, the District may consider written requests from product suppliers or prime bidders for substitutions. All requests for substitution must be received by District a minimum of 5 working days prior to bid opening. Requests shall be accompanied by drawings and specifications in sufficient detail to allow the District to determine whether or not the substitute proposed is equal to that specified. All requests shall include a listing of any significant variations in material or methods from those specified. If there are no variations, a statement to that fact shall be included in the request for approval. The determination as to whether or not a proposed substitute is acceptable shall rest solely with the District. Approval of substitutions will be only by addendum. The Bidder shall include, in its Bid, all costs for any modifications required to adopt the substitute.

(2) After Contract Execution:

(a) Within thirty (30) days after the date of the Contract, the District shall consider formal requests from the Contractor for a substitution of products in place of those specified. Submit two (2) copies of each request for a substitution. Data shall include the necessary change in construction methods, including a detailed description of the proposed method and related drawings illustrating the methods. An itemized comparison of each proposed substitution with product or method specified shall be provided.

b. In making a request for a substitution, the Contractor represents that it has investigated the proposed product or method and has determined that it is equal or superior to the product specified. The Contractor shall coordinate the installation of accepted substitutions into the Work, making changes that may be required for the Work to be completed. The Contractor waives all claims for additional costs related to substitutions.

END OF SECTION 01300

DIVISION 1 – GENERAL REQUIREMENTS

SECTION 01400 – QUALITY CONTROL AND TESTING

1. GENERAL

a. Contractor shall be responsible for obtaining and payment for all testing on the job site as specified by the City of Lakewood, including compaction testing.

b. Compaction testing shall be required when installing water main. Minimum compaction shall be 95 percent of maximum density.

c. Compaction tests shall be taken as directed by the City of Lakewood and the District. Compaction testing shall be performed by an approved geotechnical or testing firm under the direction of a professional engineer registered in the State of Washington. Copies of the reports shall be furnished to the District's inspector and the City of Lakewood's inspector within 24 hours of testing.

d. Compaction testing of all trench lines may be performed at 4 feet below pavement subgrade and at subgrade every 150 feet.

e. Compaction testing for pavement may be performed at subgrade and on the top course at 150-foot intervals.

END OF SECTION 01400

DIVISION 1 – GENERAL REQUIREMENTS

SECTION 01500 – TEMPORARY FACILITIES AND CONTROLS

1. GENERAL

a. The Contractor shall comply with such Laws which apply to the Work with respect to his operations and temporary controls of its operations. Temporary controls shall be provided by the Contractor as required by such local, State and Federal statutes, ordinances, laws and regulations and these Contract Documents. All costs for said temporary controls shall be included in the Contract prices and no additional compensation shall be made. Temporary controls shall be provided for the Contractor's operations including, but not limited to, noise, dust and debris, air pollution, water runoff, erosion and pollution, and rodents and pests.

b. The Contractor shall be liable for the payment of all fines and penalties resulting from failure to comply with any Federal, State and local control regulations.

2. NOISE CONTROL

a. The Contractor shall take all reasonable measures for the suppression of noise resulting from work operations. Mobile engine driven cranes, loaders and similar material handling equipment; engines used in stationary service for standby power; and air compressors for high and low pressure service shall be equipped with exhaust and air intake silencers designed for the maximum degree of silencing. The type of silencer required is that for use in critical noise problem locations such as high density residential, hotel, and hospital areas.

b. The Contractor shall also conduct Work consistent with such local noise control regulations as may be applicable.

3. AIR POLLUTION

a. The Contractor shall comply with the regulations of the local air pollution control authorities or with the regulations of the Department of Ecology, whichever are more stringent. In performing Work on this Contract, the Contractor shall not cause or allow the discharge of particulate matter, or the emission of air contaminants or odor bearing gases in excess of the limits specified under any local or regional air pollution regulations which may be relevant. The Contractor shall maintain air quality within the national emission standards for hazardous air pollutants.

4. DUST AND DEBRIS

a. The Contractor shall provide control measures to prevent dust and debris from contaminating the Site and neighborhood. All control measures shall be satisfactory to the District.

5. WATER RUNOFF, EROSION, AND POLLUTION, HAZARDOUS WASTE AND SOLID WASTE DISPOSAL

a. Temporary water pollution, runoff and erosion control Work shall consist of temporary control Work which may be shown on the plans or specified in these Contract Documents, be a permit requirement, or be a requirement of local, State or Federal statues, ordinances, laws, and regulations. This Work is intended to provide prevention, control, and abatement of water pollution and erosion within the limits of the project and to prevent damage to the Work, adjacent property, streams and other bodies of water.

b. The Contractor shall exercise all necessary precautions throughout the term of the Contract to prevent pollution, erosion, siltation, and damage to property; shall provide for the flow of all water courses, including streams, ditches, drains, and combined sewers, intercepted during the progress of the Work; and shall completely restore the same in a good condition as the Contractor found them, or shall make such final provisions for them as the District may direct. The Contractor shall not obstruct the gutter or ditch line of any street but shall use all proper measures to provide for the free passage of surface water. The Contractor shall make provisions to take care of all surplus water, mud, silt, slickings, or other run-offs pumped from excavations or resulting from sluicing or other operations.

c. Avoid creating conditions conducive to pests and rodents. Comply with regulations governing the use of chemicals to control pests and rodents.

d. Hazardous materials shall be defined by applicable laws and regulations. Undisclosed hazardous material contamination, if encountered will constitute a changed Site condition. The District may retain a separate contractor to dispose of undisclosed hazardous material encountered. Furnish containers for storage of spent chemicals used during construction operations. Dispose of chemicals and hazardous materials in accordance with applicable regulations.

e. The Contractor shall supply solid waste transfer containers. Daily remove all debris such as spent air filters, oil cartridges, cans, bottles, combustibles, paper, cardboard, and litter. Take care to prevent trash from blowing onto adjacent property. Encourage personnel to use refuse containers. Convey contents to a sanitary landfill.

f. Washing of concrete containers where waste water may reach adjacent property or natural water courses will not be permitted. Remove any excess concrete to the sanitary landfill.

6. TEMPORARY UTILITIES

a. Sanitary facilities: Provide and maintain self-contained portable sanitary facilities for the Contractor's, Subcontractor's, Engineer's, and District's use. Facilities shall comply with applicable regulations and shall be serviced, cleaned, and disinfected weekly.

b. Temporary Water and Power: Provide water and power if needed.

c. Water for portions of construction shall be furnished by the District at no cost to the Contractor. The water for construction to be furnished by the District include the following uses:

(1) Water for hydrostatic testing.

(2) Water for flushing the main.

(3) Water for disinfection of the main.

d. The Contractor is responsible for proper disposal of test and flush water. Chlorinated water shall not be flushed, drained or directed into the storm drains or ditch systems.

SECTION 01500 – TEMPORARY FACILITIES AND CONTROLS (CONTINUED)

7. TEMPORARY CONSTRUCTION

a. The Contractor is solely and exclusively responsible for the design, construction, and maintenance of all temporary construction including forms, falsework, shoring, scaffolding, stairs, ladders, and all other similar items.

b. Construct adequate and safe forms and falsework, to rigidly support partially completed structures. Provide temporary bridges and decking to maintain vehicular and pedestrian access. Design and construct temporary forms, falsework, bridges, and decking in accordance with applicable regulations and codes.

8. BARRICADES, FENCES, AND ENCLOSURES

a. Provide temporary barricades, guard rails, ladders, stairs, guards, and barricades to protect persons in accordance with applicable regulations.

9. PROTECTION OF INSTALLED WORK

a. Provide temporary and removable protection for installed products. Control activity in immediate work area to minimize damage.

b. Provide heavy planking to protect curbs, gutters, culverts, paving, existing buildings, on-site piping, fences, and similar surfaces from damage by heavy equipment or vehicles.

10. SECURITY

a. Provide security and facilities to protect the Work, and existing facilities, and District's operations from unauthorized entry, vandalism, or theft.

11. TRAFFIC REGULATION

a. Conduct operations so as to offer the least possible obstruction and inconvenience to public traffic. Do not overload or damage paved or improved surfaces, sidewalks, curbs, or gutters.

b. Provide temporary barricades, lights, flag persons, and other means to safely control pedestrian and vehicular traffic entering and leaving the project site and on the project site.

c. Develop and follow a traffic control plan in accordance with the Manual on Uniform Traffic Control Devices. Submit traffic control plan to the District for review and comment by the City of Lakewood as a condition of the Right-of-Way permit.

d. Contractor shall limit all interference with the daily operations of the Lakewood Fire Department. Contractor must maintain existing Fire Department access to station garage, office, and training facilities. Contractor shall not block access for Fire Department emergency vehicles including trucks, engines, paramedic units and command vehicles.

12. CONSTRUCTION STORAGE AREA

a. The District's Headquarters storage yard is available to the Contractor for storage of project materials and equipment. The Contractor shall coordinate with the District the use of the

designated area including delivery, protection and removal of materials. The Contractor will be responsible for all unloading and loading of materials to and from the yard.

b. Store and service equipment at the designated Contractor's storage area where all oil wastes shall be collected in containers. Oil wastes shall not be allowed to flow onto the ground or into surface waters. Containers shall be required at the Site for the disposal of materials such as paint, paint thinners, solvents, motor oil, fuels, resins, and other environmentally deleterious substances. No dumping of surplus concrete or grout on the site will be permitted.

13. FIRE PREVENTION

a. Take steps to prevent fires including, but not limited to the following:

(1) Provide spark arrestors on all internal combustion engines.

(2) Store and handle flammable liquids in accordance with the Flammable and Combustible Liquids Code, NFPA 30.

(3) Provide fire extinguishers at hazardous locations or operations, such as welding.

(4) Provide "fire watch" personnel during all potentially hazardous activities and locations such as welding.

END OF SECTION 01500

DIVISION 1 – GENERAL REQUIREMENTS

SECTION 01570 – TRAFFIC REGULATIONS

1. GENERAL

   a. The Contractor shall be responsible for controlling and maintaining traffic including detours and street closures within the project area. All costs for controlling and maintaining traffic shall be included in the contract price for Traffic Control and no additional compensation shall be made.

   b. No work shall be performed by the Contractor until traffic control plans have been approved, notifications have been made and all traffic control devices are in place.

   c. Closure of more than one lane of traffic will not be allowed.

2. TRAFFIC CONTROL DEVICES

   a. The Contractor shall provide and maintain all traffic control and maintenance devices such as flagmen, advance warning sign barricades, traffic cones, flashers, etc., at its own expense. The use of these control and maintenance devices shall be in accordance with the current edition of the "Manual on Uniform Traffic Control Devices for Streets and Highways" as prepared by the National Joint Committee on Uniform Traffic Control Devices and any other applicable codes or standards. Such devices shall be operated 24 hours of the day if required for the maintenance and control of the traffic.

   b. The Contractor shall implement the traffic control plans included in these Contract Documents. If no traffic control plans are included as part of the Contract Documents, then the Contractor shall develop its own plans and submit said plans to the District for forwarding to the City of Lakewood for approval.

3. CLOSURES, RESTRICTIONS, AND NOTICES

   a. Streets where improvements are to be constructed may be closed to through traffic except as restricted herein and in the permit and easement provisions. Local traffic shall have access during non-working hours. No street shall be closed until such closure has been approved by the Owner and agency with jurisdiction. Streets shall be opened to through traffic as soon as the work has been completed, and no street shall be closed for a period longer than 48 hours. All traffic control devices required for the closure, partial closure, and detours shall be in place according to the approved traffic control plan and all notices shall be made prior to the closure.

   b. The Contractor shall provide 48 hours written notification to the Owner, Police Department and Fire Department prior to any street closure. This notification shall include the name(s) of street(s) or location of alley(s) to be closed, the time of commencement and completion of the closure, the schedule of operations, proposed detour routes and a signing plan.

   c. Emergency traffic such as police, fire and disaster units shall be provided access at all times. The Contractor shall be liable for any damages which result from its failure to provide such access.

SECTION 01570 – TRAFFIC REGULATIONS (CONTINUED)

d. The Contractor shall maintain convenient access for local traffic to driveways, houses, and buildings along the line of work. Such access shall be maintained as near as possible to that which existed prior to the commencement of construction. The Contractor shall notify all property owners and tenants of street and alley closures, or other restrictions which may interfere with their access. Notification shall be at least 24 hours in advance for residential property, and at least 48 hours in advance for commercial property.

e. Where parking is a hazard to through traffic or to the construction work, it shall be restricted either entirely or during the time when it creates a hazard. Signs for this purpose shall be furnished, placed and maintained by the Contractor on any street which is directly involved in the construction work.

f. Postal service shall be maintained in accordance with the requirements of the U.S. Post Office Department. It shall be the Contractor's responsibility to be aware of and follow these requirements. Notice shall be given to the post office, school districts, public transits, refuse disposal companies and all other non-emergency public services regarding the progress and location of the work and closures which may affect the service's or utilities operations.

g. Notification of water shut-off shall require 24-hour notice and be approved by LWD. Contractor shall provide door hangers approved by LWD prior to distribution.

h. Contractor shall provide notification to customers prior to construction activity adjacent to their property.

4. EXISTING SIGNS AND TRAFFIC CONTROL DEVICES

a. Existing traffic and street name signs which will interfere with construction shall be removed by the Contractor and stored in a safe place. These signs shall not be removed until the Owner and agency with jurisdiction has so directed, and until necessary measures have been taken to safeguard traffic after signs have been removed. Preservation and maintenance of the signs shall be the sole responsibility of the Contractor. Upon completion of restoration, the Contractor shall reset such signs in their original permanent location.

END OF SECTION 01570

DIVISION 1 – GENERAL REQUIREMENTS

SECTION 01700 – CONTRACT CLOSEOUT

1. GENERAL

a. FINAL CLEANUP: Prior to Final Inspection, clean the entire construction area and all other areas affected by the performance of Work under this Contract. Perform cleaning using personnel specializing in and skilled in cleaning and maintenance work. Perform repair Work using personnel skilled in executing the type of Work being repaired. Perform all Work to the highest trade standards applicable to that type of Work.

i. Remove all temporary construction, signs, tools, equipment, excess material, and debris.
ii. Remove all lumps, splatters, spots, and stains caused by paint, adhesive, asphalt, concrete, mortar, sealant, or other foreign material from exposed or finished surfaces. Remove all temporary labels.
iii. Repair, patch, or replace new or existing Work including pavement, sidewalks, curbs, gutters, catch basins, gratings, manholes, covers, landscaping, plant materials, and other items that have been damaged, broken, crackled, or chipped as a result of performing this Work.
iv. Sweep, clean and wash down all exterior pavement. Remove all hazardous material and material that my cause sediment in drainage systems prior to wash-down. Remove all grease and oil stains on pavement caused by Contractor's equipment.

b. CONTRACTOR'S ACTION LIST OF ITEMS TO BE CORRECTED AND/OR COMPLETED
i. During construction, the Contractor shall maintain an action list of items to be corrected and/or completed. The Contractor shall regularly add items and update the list as information becomes available or as requested by the Engineer/District's Project Manager. The Contractor shall deliver a current copy of the list to the Engineer/District's Project Manager at each progress meeting.

c. SEMI-FINAL INSPECTION/SUBSTANTIAL COMPLETION
i. See General Conditions. When the Contractor considers the Work nearly complete, the Contractor shall review the Contract Documents, inspect the Work, and use the contractor's action list to prepare a Contractor's Punch List of all deficient or uncompleted items. The Contractor shall complete or correct items on the Punch List. When the Work is Substantially Complete in accordance with General Conditions, the contractor shall notify the Engineer/District's Project Manager in writing that the Contractor has reviewed the Contract Documents, inspected the Work, and believes that the Work is Substantially Complete and ready for Semifinal Inspection.
ii. See General Conditions. On receipt of the Contractor's Punch List and notice that the Work is ready for Semifinal Inspection, the Engineer/District's Project Manager will inspect the Work. The Engineer/District's Project Manager may add additional items to the Contractor's Punch List, may find that the Work is not ready for inspection, is ready for inspection but not Substantially Complete, or that the Work is Substantially Complete. When the Engineer/District's Project Manager finds the Work is Substantially Complete, he will prepare a Final Punch List and a notice of Substantially Complete, which will state the date of Substantial Completion and the time agreed to by the District and the Contractor (not to exceed twenty (20) days) in which the Work shall be fully complete and ready for Final Inspection.

SECTION 01700 – CONTRACT CLOSEOUT (CONTINUED)

d. FINAL INSPECTION, FINAL COMPLETION, AND FINAL PAYMENT

i. See General Conditions. When the Contractor has completed or corrected all the items on the Engineer's Final Punch List, the Contractor shall give the Engineer/District's Project Manager written notice that the Work is ready for Final Inspection. When the Engineer/District's Project Manager finds the Work acceptable and fully complete in accordance with the Contract Documents, and upon receipt of a final Application for Payment and all final submittals, the Engineer/District's Project Manager will recommend that the District issue a Notice of Final Completion, make Final Payment, and Accept the Work stating that to the best of the Engineer's/District's Project Manager knowledge, information, and belief, and on the basis of the Engineer's/District's Project Manager observations and inspection, the Work has been fully completed in accordance with the terms and conditions of the Contract Documents.

ii. Final Submittals include:

(a) Operation and Maintenance Manuals and Parts Lists.
(b) Record Drawings.
(c) Extra Materials.
(d) Special Guarantees.
(e) Insurance Certificate showing required continuation of coverage beyond Final Payment. See General Conditions.
(f) Release of Liens. See General Conditions.
(g) Waiver of Claims by Contractor. See General Conditions.
(h) And any other submittals required by the Contract Documents and not previously received.

iii. The District will record the Notice of Final Completion at the County Recorder's Office.

iv. The District will make Final Payment to the Contractor thirty-five (35) days after recording the Notice of Final Completion.

e. RECORD DRAWINGS

i. The Contractor shall maintain on the Site, a complete set of Contract Documents and a complete file of all Addenda, Contract modifications, and Favorable Reviewed submittals. The Contractor shall prepare a set of Record Drawings concurrently with the construction of the Work and in accordance with the General Conditions and the following:

(a) Show the invert elevation of all gravity piping and the top of pipe, top of conduit or top of protective concrete encasement for other utilities. Elevations shall be related to a permanent visible elevation bench mark set at the site by the Contractor.
(b) Show the horizontal location of underground utilities measured from permanent visible physical features such as face of building, face of tank, or centerline of manhole.
(c) Comply with detailed requirements in technical specification sections describing the type of information required on Record Drawings. The Contractor's copy of Contract Documents, Contract modifications, and Record Drawings shall be available to the Engineer/District' Project Manager for weekly verification that the records are being currently updated.

ii. Submit Record Drawings and obtain acceptance prior to completion.

SECTION 01700 – CONTRACT CLOSEOUT (CONTINUED)

f. EXTRA MATERIALS: Deliver specified extra materials and parts to District. Itemize all items on a transmittal letter in duplicate and obtain signature of receiving party. Submit copies of signed transmittals for all specified extra materials and parts prior to completion.

END OF SECTION 01700

Division 2

Site Work

DIVISION 2 – SITE WORK

SECTION 02001 – STANDARD SPECIFICATIONS

1. GENERAL

a. Work shall be in accordance with Lakewood Water District's Design/Construction Specifications & Standards (most current edition).

b. Portions of the Work shall be in accordance with the "Standard Specifications for Road, Bridge and Municipal Construction, 2020 Edition," prepared by Washington State Department of Transportation hereinafter referred to as the "Washington Standard Specifications", "Washington Specifications" or "Standard Specifications". The words Engineer, department, secretary, State or other similar terms used in the Washington Specification shall be substituted by the word District. References to measurements and payments in the Standard Specifications shall not apply to this Contract.

c. The detailed specifications herein contained shall supersede any provisions of the Washington Standard Specifications in conflict herewith.

d. The following detailed engineering specifications shall be used in conjunction with the Lakewood Water District's Design/Construction Specifications & Standards (most current edition) and the Washington Standard Specifications, and the Washington Standard Specifications are hereby made a part of this Contract.

e. Any inconsistency in the parts of the contract shall be resolved by following this order of precedence (e.g., 1 presiding over 2, 2 over 3, 3 over 4, and so forth):

(1) Addenda,

(2) Bid Form,

(3) Technical Specifications,

(4) Contract Plans,

(5) Lakewood Water District's Design/Construction Specifications & Standards (most current edition),

(6) WSDOT Standard Specifications for Road, Bridge, and Municipal Construction,

(7) WSDOT/APWA Standard Plans for Road, Bridge, and Municipal Construction.

END OF SECTION 02001

DIVISION 2 – SITE WORK

SECTION 02102 – CLEARING AND GRUBBING

1. GENERAL

a. The Work specified in this Section shall consist of clearing and grubbing those areas as shown or specified.

b. Clearing shall include the removal and disposal of all vegetative growth such as trees, shrubs, brush and other vegetation, down timber, rotten wood, rubbish and other objectionable materials, except such objects which are designated to remain. It shall include, but not be limited to, the removal of buildings, fences, lumber, trash piles and other obstructions interfering with the construction.

c. Grubbing shall include the removal and disposal of all stumps, roots, vegetative matter and all structures in or upon the ground, the removal of which is not prescribed as CLEARING, such as wood curbs, planking, wooden culverts, wooden catch basins, drains, stairways, etc.

d. The limits of clearing and grubbing will be as required for the Contractor's operations unless otherwise shown or specified. It shall be the Contractor's responsibility to determine these limits providing they do not extend beyond the property, right-of-way or easement lines. the limits of clearing and grubbing shall be to such width as will provide for the excavation of the trench, storage area alongside the trench for excavated material and backfill, storage area for pipe and materials and any haul roads which may be necessary.

e. Claims for damages for trees and shrubbery designated to remain shall be paid by the Contractor as specified in the Special Conditions.

2. MATERIALS

a. Grubbing material and removed concrete panels within roadway sections shall be disposed of in accordance with City of Lakewood standards.

3. CONSTRUCTION DETAILS

a. Clearing

(1) Within the limits described, all vegetative growth such as trees, shrubs, brush, logs, fences, upturned stumps and roots of down trees shall be removed and disposed. All trees shall be felled within the area to be cleared. Where the tree limb structure interferes with utility wires, or where the trees to be felled are in close proximity to utility wires, the trees shall be removed in such a manner so as to eliminate the possibility of damage to the utility.

(2) All buildings, fences, lumber piles, trash and other obstructions, except utility poles, within the area to be cleared shall be removed and disposed by the Contractor.

(3) All fences adjoining any excavation or embankment that may be damaged or buried shall be carefully removed and placed or set aside on the adjoining property. Upon completion of backfilling and cleanup, the fence shall be replaced in its original location. Materials damaged by removal shall be replaced with new materials of equal or better quality than the existing fence at no additional cost to the Owner.

(4) Low limbs of existing ornamental trees that are not to be removed which will interfere with the Contractor's operation shall be trimmed. The trimming shall be performed in a professional manner by competent personnel prior to machine operations and in such a manner as the Owner may direct.

b. Grubbing

(1) Within the limits described, all stumps, roots, foundations and planking embedded within the ground shall be removed and disposed. Piling shall be removed to a minimum depth of 2 feet below subgrade or 2 feet below original ground, whichever is lower.

(2) Where it is necessary to remove stumps and where there are surface or subsurface improvements, the Contractor shall be responsible for determining which of the agencies, public or private, have underground or service utilities in the vicinity of the stump to be removed; and further, it shall notify each agency and request its assistance in locating its service.

(3) Where telephone cable and/or ducts, water mains, gas mains, steam mains, and sewer trunks exist and are likely to be damaged, special care shall be taken, and roots of stump shall be cut off in such a manner that the existing utility installations will not be damaged in any way.

(4) Regardless of the cooperation of affected agencies and utilities, the Contractor shall be responsible for any damage to services and utilities that are attributable to its operations, and shall be responsible for the necessary repairs thereto.

(5) Any damage resulting from the Contractor's operations to existing improvements within the area to be grubbed but which are not required to be removed by the grubbing shall be repaired by the Contractor and at the Contractor's expense. The Contractor will not be held responsible for damages to such improvements if the damage occurred previous to beginning of the Contract.

c. Waste Disposal Site

(1) All debris and refuse generated by clearing and grubbing operations except as otherwise specified, shall be hauled to a disposal site obtained by the Contractor. No stock piling of waste will be permitted. The Contractor's operations shall conform to all local, State, and Federal regulations regarding disposal of material.

END OF SECTION 02102

DIVISION 2 – SITE WORK

SECTION 02103 – REMOVAL OF EXISTING STREET IMPROVEMENTS

1. GENERAL

   a. The work specified in this Section shall consist of removing and disposing various existing street improvements, such as pavements, structures, pipe, wedge curbs, curbs and gutters, and other items necessary for construction of the Project.

2. MATERIALS (NOT USED)

3. CONSTRUCTION

   a. General

      (1) The removal of existing street improvements shall be conducted in such a manner as not to damage existing utilities or any portion of the existing street improvements that are to remain. Any deviation in this matter will obligate the Contractor at its own expense to repair, replace or otherwise make proper restoration.

      (2) All pavement shall be removed to the limits and in accordance with the details as shown or specified. The limits of pavement removal shall be exceeded only where specifically approved by the Owner. Pavement removal shall not be extended to existing expansion joints or paving cracks outside the indicated removal limits except with the approval of the Owner or as directed on the plans.

      (3) Existing pavement shall be cut clean to vertical and straight lines. Concrete saw, jackhammer or other means shall be used for cutting existing pavements. Cutting of pavements with excavation equipment will not be permitted. Cuttings shall be marked out ahead of construction to a width so as to provide the required setback from the edges of actual excavation as shown or specified. In the event the trench excavation becomes wider than the initial cut in the surfacing, the surfacing material shall be recut to the minimum setback from all edges of the actual excavation at no additional cost to the Owner. Anticipated depth of existing asphalt is expected to range between 2 and 4 inches based on core samples.

      (4) All castings, pipe and other material taken from removed improvements shall become the Contractor's property for disposal except that existing fire hydrants, valve boxes and lids and other items noted on the plans for salvage which are removed shall be salvaged and delivered to the District's maintenance yard.

   b. Removal of Cement Concrete Pavement, Driveways, Sidewalks

      (1) The breakline for removal of existing cement concrete roadway panels overlaid with asphalt pavement shall be established by saw cutting. The depth of the saw cut shall be as required to produce a uniform cut through the total depth of the asphalt/concrete pavement layer without spalling, cracking or otherwise damaging pavement outside the removal limits.

(2) Cement concrete driveway and/or sidewalk shall be removed to existing adjacent and convenient construction or expansion joints or as directed by the District. The driveway and/or sidewalk shall be replaced in kind following installation of the water facilities. Exposed gravel driveway shall be replaced to match existing.

(3) The Contractor will not be allowed to begin pavement removal until there is a clean break along the line to insure that pavement and curbs, outside of the breakline will not be accidentally damaged while lifting the broken pavement with excavating equipment. Mechanical-type pavement breakers may be used up to within 18 inches of the breakline.

c. Removal of Asphalt Pavements

(1) Asphalt concrete pavement, bituminous road mix, multiple lift bituminous surface treatments and any combination thereof to be removed in connection with construction shall be removed to clean straight lines by sawcutting.

d. Removal of Catch Basins, Manholes, Curb Inlets, Sumps, etc.

(1) Where structures or installations of concrete, brick, blocks, etc. interfere with the construction, they shall be removed and replaced, or abandoned where shown. Where structures are to be abandoned, all pipe openings in and out of the structure shall be properly plugged water tight with concrete, or with mortar and masonry, blocks and bricks.

(2) Where the structure is to be removed, the void shall be backfilled as specified for trench backfill in Section 02221 – TRENCHING, BACKFILLING, AND COMPACTING.

(3) Where the structure is to be abandoned in place, the top two feet of the structure below subgrade or the top two feet below original ground, whichever is lower shall be removed and the remaining structure void shall be backfilled as specified for trench backfill in Section 02221 – TRENCHING, BACKFILLING, AND COMPACTING.

e. Existing Stakes and Marks

(1) All section, section subdivision, plat, property corner, USED, USC, USGS and any official monuments or bench marks shall be carefully preserved or referenced and replaced. In the event any such monument or marker is disturbed as a result of the Contractor's operations, the monument or marker shall be reset by a registered land surveyor in accordance with state, county and/or local agency requirements as applicable.

f. Removal of Existing Water Main

(1) All existing water main, fittings, valves and other appurtenances that interfere with proposed facilities shall be removed and disposed of by the Contractor. This includes, but is not limited to, asbestos cement (AC) pipe where indicated on the Plans or as directed by the District.

(2) To cut or remove existing AC pipe, a fee and permit is required from the Puget Sound Air Pollution Control Agency. In addition, Washington State Department of Labor and Industries requires that the operators removing asbestos be certified.

(3) If possible, connections to existing AC pipe shall be completed by carefully disassembling the AC piping without sawcutting the pipe and connecting at existing

pipe joints with appropriate transition couplings. Connection at an existing joint may require longer D.I pipe nipples or spools than may ordinarily be required.

(4) AC pipe required to be removed shall be disposed of at an approved disposal facility. The Contractor shall be responsible for all fees, certifications and permits, and work shall be performed in accordance with requirements of the various agencies.

(5) The Contractor shall conduct all work related to existing asbestos materials in accordance with WISHA safety regulations and provisions of WAC 296-62-077, WAC 295-65 and the requirements of the Puget Sound Air Pollution Control Agency Regulation III Article 4 (206 343-8800). Advance notice of work, including the application to perform an asbestos project, and the appropriate fee will be required. The application must be completed online at http://www.pscleanair.org/regulated/asbestos. The Contractor shall provide a copy of the application to the Lakewood Water District and the Engineer prior to the start of construction.

(6) Work crews shall be provided with proper protective clothing and equipment. Waste asbestos materials and materials, clothing, etc. used in asbestos handling and removal shall be disposed of in a manner consistent with the regulations and provisions cited above.

(7) The Contractor (person or organization removing asbestos with certified asbestos workers) shall assume ALL risk and all liability for the removal and disposal of the asbestos, and the Contractor shall comply with all federal, state and local laws, statutes and regulatory regulations and requirements including, but not limited to, the requirements relating to environmental pollutants and the requirements relating to the removal and disposal of asbestos. The Contractor shall insure that the asbestos removal is pursuant to all state and federal laws and regulations. The Contractor shall be responsible for any and all fines or penalties which may be levied due to the Contractor's violation of any of the aforementioned laws and regulations.

(8) The Contractor shall conform to General Conditions 24.4.14 regarding additional insurance for projects containing asbestos.

END OF SECTION 02103

DIVISION 2 – SITE WORK

SECTION 02202 – SHEETING AND BRACING – SHORING

1. GENERAL

   a. The Work specified in this Section shall consist of furnishing, placing, maintaining and, except as otherwise shown or specified, the removal of all shoring necessary to protect the work, existing improvements and to provide safe working conditions in excavations in accordance with all local, State and Federal safety codes.

   b. The Contractor shall obtain any permits necessary for its sheeting, bracing and shoring operations.

2. MATERIALS (NOT USED)

3. CONSTRUCTION

   a. The method of shoring shall be according to the contractor's design. The design, planning, installation and removal, if required, of all sheeting and bracing shall be accomplished in such a manner as to maintain the required excavation or trench section and to maintain the undisturbed state of soils below and adjacent to the excavation.

   b. Damages resulting from improper support or from failure to support excavations shall be the sole responsibility of the Contractor.

   c. In trenching operations, the use of horizontal strutting below the barrel of pipe or the use of pipe as support for trench bracing will not be permitted.

   d. Sheet piling and timbers in trench excavations shall be withdrawn in a manner so as to prevent subsequent settlement of the pipe or additional backfill loading which might overload the pipe.

   e. That portion of cribbing or sheeting extending below the springline or rigid pipe, or below the crown elevation of flexible pipe, shall be left in place unless satisfactory means of reconsolidating bedding or side support, disturbed by cribbing or sheeting removal, can be demonstrated.

   f. If a movable box is used in lieu of cribbing or sheeting, and the bottom cannot be kept above the springline of rigid pipe or the crown elevation of flexible pipe, the bedding or side support shall be carefully reconsolidated behind the movable box prior to placing initial backfill.

   g. When the construction sequence of structures requires the transfer of bracing to the completed portions of any structure, the Contractor shall secure written acceptance of the Owner prior to the installation of such bracing.

END OF SECTION 02202

DIVISION 2 – SITE WORK

SECTION 02203 – CONTROL OF WATER

1. GENERAL

   a. The Work specified in this Section shall consist of providing for the control and removal of water to keep excavations free of water during construction.

   b. The Contractor shall obtain any permits necessary for their control of water operations.

2. MATERIALS (NOT USED)

3. CONSTRUCTION

   a. All excavation and placement of backfill and fill shall be carried out in the dry. The Contractor shall provide all necessary machinery, appliances and equipment to keep excavations free from water during construction, and shall dewater and dispose of the water so as not to cause injury to public or private property, or to cause a nuisance or a menace to the public. The Contractor shall at all times have on hand sufficient pumping equipment and machinery in good working condition for all emergencies, including power outage, and shall have available at all times competent workmen for the operation of the pumping equipment. The dewatering systems shall not be shut down between shifts, on holidays or weekends, or during work stoppage without written permission from the District.

   b. Before dewatering is started, the Contractor shall obtain approval from the District for the method, installation and details of the dewatering system it proposes to use. Except where piling is used, open and cased sumps shall not be used as primary dewatering for excavations deeper than 3 feet below the static water table.

   c. The control of groundwater shall be such that softening of the bottom of excavations, or formation of quick conditions or boils during excavation shall be prevented. Dewatering systems shall be designed and operated so as to prevent removal of the natural soils.

   d. During excavating, construction of structures, installing pipelines and sewers, placing of structure and trench backfill and the placing and setting of concrete, excavations shall be kept free of water except as specified. The Contractor shall control surface runoff so as to prevent entry or collection of water in excavations. The static water level shall be drawn down a minimum of 1 foot below the bottom of the excavation so as to maintain the undisturbed state of the foundation soils and allow the placement of any fill or backfill to the required density. Dewatering systems shall be installed and operated so that the groundwater level outside the excavation is not reduced to the extent that would damage or endanger adjacent structures or property.

   e. The release of groundwater to its static level shall be performed in such a manner as to maintain the undisturbed state of the natural foundation soils, prevent disturbance of compacted backfill and prevent floatation or movement of structures, pipelines or sewers.

   f. Trench water shall not be allowed to enter the pipe at any time.

   g. The Contractor shall make provisions to take care of all surplus water, mud, slickings, and runoff pumped from excavations or resulting from sluicing or other operations and shall be

responsible for any damage of whatever nature resulting from its failure to provide for the adequate control of runoff.

END OF SECTION 02203

DIVISION 2 – SITE WORK

SECTION 02221 – TRENCHING, BACKFILLING, AND COMPACTING
(for Water Mains)

1. GENERAL

a. The Work specified in this section shall consist of trenching, backfilling and compacting for the installation of water mains and appurtenances.

b. All excavation shall be unclassified.

c. Unsuitable or excess excavated material shall be hauled to a disposal site obtained by the Contractor. The Contractor's operations shall conform to all local, State and Federal regulations regarding disposal of material.

d. Native material may be suitable for use as backfill or bedding materials where specified or indicated on the Plans if it meets the requirements for the specified materials, is approved for use by the District and is not made unsuitable by the Contractor's operations.

e. The Contractor shall exercise sound engineering and construction practices in its trenching, backfilling and compacting operations so that no damage will occur to any foundation, structure, pole, pipeline, utility or other facility. If, as a result of the Contractor's operations, there is damage to or the potential for damage to any foundation, structure, pole, pipeline, utility or other facility, the Contractor shall immediately take remedial action at no additional cost to the District. No act, representation, or instruction of the District shall, in any way, relieve the Contractor from liability for damages or costs that result from its operations. All properties and improvements shall be in as good condition as existed prior to the Work.

f. Prior to beginning trench excavation for pipe installation, the Contractor shall excavate and expose the existing pipes at the locations where the new pipe being installed will connect. After the existing pipes are exposed, the elevation of the pipes shall be determined so that excavation grade and horizontal alignment can be established between all points of connections to the existing water lines. The connection detail between the new and existing water lines shall be verified. The Engineer shall be notified upon any discrepancies in potholed elevations versus the elevations shown on the Plans.

g. The Contractor shall retain and pay for the services of an independent testing laboratory for testing, analysis and examination of backfill and bedding materials to be used to establish the materials gradation and to establish the moisture-density relationship curves in accordance with ASTM D-1557. Costs associated with field density tests to meet Pierce County or City of Lakewood requirements shall be the Contractor's responsibility.

h. On public works projects in which trench excavation will exceed a depth of four feet, any contract therefore shall require adequate safety systems for the trench excavation that meet the requirements of the Washington Industrial Safety and Health Act, Chapter 49.17 RCW. This requirement shall be included in the cost estimates and bidding forms as a separate bid item. The costs of trench excavation safety systems shall not be considered as incidental to any other contract item and any attempt to include the trench excavation safety systems as an incidental cost is prohibited.

SECTION 02221 – TRENCHING, BACKFILLING, AND COMPACTING (CONTINUED)

2. MATERIALS

a. General Trench Backfill and Pipe Bedding

(1) Pipe bedding is material placed in the trench from 4 inches below the bottom of the pipe to 6 inches above the top of the pipe. Backfill is material placed in the excavation above the pipe bedding. All material shall be clean, free of roots, brush, sticks, wood, metal, debris, junk, broken concrete, brick, pavement, lumps of clay and frozen material. The maximum size of stone shall be the size as specified for each class of material. Unless otherwise specified, all material passing the No. 200 sieve shall be non-plastic.

(2) All material shall be of such moisture content, size and gradation that the required compaction can be readily attained. Material containing moisture in excess of the moisture content required for the specified density as determined by laboratory compaction tests shall not be used.

(3) Crushed rock shall be composed of hard, durable and sound pieces having a specified gravity of not less than 2.65 and a loss not to exceed 35 percent when subjected to test according to ASTM C 131 at 400 revolutions.

b. Trench Backfill Material

(1) Crushed Rock: Crushed rock shall be used for trench backfill as shown in the Plans or as directed by the District and shall conform to Crushed Surfacing Top Course in accordance with Standard Specifications Section 9-03.9(3).

(a) Gravel Surfaced Areas: Crushed rock shall be used as a topping course for the gravel surface as shown in the Plans.

(2) Native Excavated Material: Native material excavated from the trench may be used for trench backfill as shown in the Plans or as directed by the District if the material is judged suitable by the District. Maximum size of stone shall not exceed 6”.

(a) Asphalt or Concrete Pavement Areas: Native material may be used for trench backfill below the crushed rock if the material is judged suitable by the District.

(b) Gravel Surfaced Areas: Native material may be used for trench backfill if the material is judged suitable by the District.

c. Pipe Bedding Material

(1) Crushed Rock: Crushed rock shall be used for pipe bedding as shown in the Plans or as directed by the District and shall conform to Crushed Surfacing Top Course in accordance with Standard Specifications Section 9-03.9(3).

(2) Native Excavated Material: Native material excavated from the trench may be used for pipe bedding and trench backfill if the material is judged suitable by the District. Maximum size of stone shall not exceed 1.5 inches.

SECTION 02221 – TRENCHING, BACKFILLING, AND COMPACTING (CONTINUED)

3. EXECUTION

a. Trenching

(1) The Contractor shall perform all excavation of every description and of whatever materials encountered to the depths, lines and grades as shown on the Plans or specified. The Contractor may use any method of excavation which will not damage or endanger adjacent structures or property or disturb the natural or fill soils at, below and adjacent to the excavation unless otherwise shown or specified.

(2) Where, in the opinion of the District, the undisturbed condition of the natural soils below the excavation grades as shown on the Plans or specified is inadequate for the support of the pipeline, the Contractor shall overexcavate to adequate supporting soils and refill the excavated space to the proper elevation in accordance with the procedure specified for foundation stabilization. The excavating of unsuitable material and furnishing and placement of foundation rock in excess of the quantities shown will be paid for by Change Order as specified in these Contract Documents.

(3) Should the excavation be carried below the lines and grades as shown on the Plans or specified because of the Contractor's operations, the Contractor shall refill such excavated space to the proper elevation with foundation rock or pipe bedding with no additional cost to the District. Should the natural or fill foundation soils be disturbed or loosened because of the Contractor's operations, they shall be recompacted or removed and the space refilled as directed at no additional cost to the District.

(4) For each complete pipe laying operation, the maximum distance from completed subsequent backfill to the most advanced point of excavation shall not be greater than 100 feet in unimproved areas and 3 pipe lengths in improved areas. The trench at the end of the day shall not be excavated to grade more than 5 feet in advance of the last pipe laid nor left unbackfilled to the original surface for more than the length of the last pipe laid, except that in travelled rights-of-way, no trench shall be left unbackfilled.

(5) The maximum and minimum trench widths shall be as shown on the Plans. The maximum trench width, as measured at the top of the pipe, shall be inclusive of all sheeting, lagging and bracing. The banks of the trenches where required to control trench width and protect adjacent structures shall be sheeted and braced at no additional cost to the District. At structures, the maximum trench width shall be increased to provide a 1-1/2 foot clear distance around the outside of any structure. Wherever the maximum allowable trench width is exceeded for any reason, the Contractor shall provide improved bedding and/or extra strength pipe as directed by the District at no additional cost to the District.

(6) At locations shown on the Plans or as specified, the top 1 foot of topsoils within the limits of the excavation shall be stripped for the purpose of replacing it in the same area. The topsoil shall be removed in a uniform depth and be stored in such a manner that it will not become mixed with the underlying soils.

(7) During excavation procedures, material suitable for backfill shall be stockpiled. Materials unsuitable for backfill or in excess of requirements shall be disposed of

as specified. Suitable excavated material stockpiled for use as backfill shall be protected from contamination or damage by weather.

(8) Prior to machine excavating near trees and shrubbery designated to remain, the Contractor shall make exploratory excavations which will expose the tree roots two (2) inches or larger in diameter. When excavating near trees, the top edge of the excavation shall not be closer than 8 feet horizontally from the tree unless shown otherwise on the Plans. Where roots may be damaged by construction equipment, the Contractor shall hand dig or tunnel to install the pipeline as noted on the Plans. Tree roots two (2) inches or larger in diameter shall not be cut. The Contractor shall install sheeting and shoring as required to maintain the banks of the excavation around the roots of trees. Additional requirements for tree preservation shall be in accordance with Lakewood Municipal Code – 18A.50.300.

(9) In non-travelled areas, the backfilling over the trench shall be slightly crowned. The remaining area shall be finished off to uniform contour to properly drain, and the entire surface graded to result in a neat appearing surface. In the event of natural cross drainage, a depressed section shall be formed through the crowned backfill to allow continued drainage.

(10) Areas in public right-of-way but not in traveled roadway shall be backfilled and finished as stated above. In case of the trench being in and along a natural drain ditch, the ditch shall be reformed to the original size and slope to allow proper drainage.

(11) Immediately after backfilling, the Contractor shall remove all excess dirt from the roadways by brushing, washing, graders or other means. All damage to existing ditches, culverts, driveways, etc., shall be repaired at this time. Damage to and repair of existing roadways shall be completed at a time directed by the District.

b. Backfilling and Bedding

(1) General

(a) The placement of bedding, initial backfill and subsequent backfill shall be performed so that the pipe or its protective coating shall not be damaged.

(b) All trenches in which settlement occurs after repaving shall be reopened to the depths necessary for correction of the deficient backfill and rebackfilled and compacted and the surface restored.

(2) Foundation Stabilization

(a) At the locations shown on the Plans, specified, or as directed by the District, where the undisturbed condition of the natural soils below the excavation grades shown or specified is inadequate for the support of the planned pipeline, the trench bottom shall be brought to grade for bedding and pipe installation after stabilization. Stabilization shall be accomplished by the following method to provide a foundation capable of supporting the pipe in its proper location.

(b) Crushed Surfacing Base Course in accordance with Standard Specification Section 9-03.9(3) shall be worked into the in-place soft subsoils to the extent necessary to accomplish the required stabilization. The completed trench bottom shall not contain a top layer of more than 2 inches thick containing aggregate unmixed with native material.

(3) Bedding

(a) Bedding shall consist of leveling the bottom of the trench or the top of foundation stabilization material and furnishing and placing bedding material under the pipe and along the sides to the dimensions as shown on the Plans or specified.

(b) Bedding material shall be of the type shown on the Plans or as specified. Bedding shall be placed in at least 2 lifts, the first lift shall be placed before the pipe is laid and shall be spread smoothly so that the pipe is uniformly supported along the barrel. The depth shall be as shown on the Plans or as specified. No blocking of any kind shall be used to adjust the pipe to grade. Bell holes shall be dug as required to assure uniform support along the pipe barrel. After the pipe has been properly laid, subsequent lifts of not more than 6 inches in thickness shall be installed up to the pipe springline. Lifts shall be brought up together on both sides of the pipe and shall be carefully worked under the pipe haunches by means of slicing with a shovel, vibration, or other procedures approved by the District.

(4) Initial Backfill

(a) After the pipe has been properly laid and bedded, initial backfill consisting of additional bedding material shall be placed and compacted around the pipe and to 6" above the top of the pipe. The class of backfill shall be as shown on the Plans or specified. No further backfilling will be permitted until the initial backfill has been approved.

(5) Subsequent Backfill

(a) After the initial bedding and backfill has been placed and approved, backfill material shall be placed and compacted. The class of backfill shall be as shown on the Plans or specified. Subsequent backfill in travelled ways under asphalt and concrete areas shall be in successive layers not exceeding 8 inches in loose thickness except in the top 2 feet the thickness shall not exceed 4 inches and each layer shall be compacted to the density specified. In non-travelled ways, the Contractor may backfill and compact in layers in thicknesses of the Contractor's selection so long as the desired density is obtained.

c. Compacting

(1) All compaction shall be by mechanical equipment. Water settling shall not be considered as an alternative to mechanical compaction. Compaction within 2 feet of existing or new structures shall be by hand held equipment.

(2) Compaction for bedding, initial backfill and subsequent backfill shall be to the percent of the maximum density as determined by ASTM D 1557, as listed below:

Bedding	95%
Initial Backfill	95%
Subsequent Backfill	
In travelled ways	95%
In non-travelled ways	95%

(3) Placing of backfill shall be delayed at locations designated by the District for the procurement of samples of compacted backfill for testing. Provided further, that if the test indicates insufficient density of the compacted backfill about the pipe, the Contractor will be required to remove the backfill above the compacted backfill, continue compacting the backfill until the proper density is obtained, and replace the backfill above the compacted backfill, all at the Contractor's expense.

END OF SECTION 02221

DIVISION 2 – SITE WORK

SECTION 02480 – LANDSCAPE RESTORATION

1. GENERAL

a. The Work specified in this Section shall consist of restoring all landscaping improvements which are disturbed by the Contractor's operation.

b. Shrubs and bushes in the street right of way immediately adjacent to a new or existing water meter location shall be removed as necessary for installation of the water service but not replaced. The District will designate to the Contractor how much clear area is required at each particular meter box location which will allow proper access for District personnel to maintain and read the meter.

c. Unless designated to be removed, all landscape improvements within the construction area on public right-of-way and private property shall be protected and left in place, or removed and replanted or replaced. Where it is necessary to remove existing landscaping improvements, the improvements shall be restored to their original condition to the satisfaction of the District. Landscaping improvements damaged by the Contractor's operations shall be replaced at no cost to the District.

d. Removed topsoil that is damaged as a result of the Contractor's neglect, and is deemed unacceptable by the District, shall be replaced with new topsoil.

e. When the Contractor's scheduling or delays carry work beyond the most favorable planting season, or when weather conditions are such that satisfactory results are not likely to be obtained for any stage of the planting operations, the Contractor will stop the work and it shall be resumed only when the desired results are likely to be obtained or when corrective measures and procedures are adopted.

f. The Contractor shall submit samples of imported topsoil, imported sod and seed to the District for approval.

g. The Contractor shall replace all dead plants and grasses, and plants not in a vigorous, thriving condition, disturbed by the Contractor's operations when weather conditions permit as directed by the District during the one-year warranty period.

2. MATERIALS

a. Imported topsoil shall consist of fertile, friable soil, preferably of a loamy character, typical of the topsoil common to the locality, and it shall contain a normal amount of organic matter. It shall be obtained from arable land and shall be free from subsoil, refuse and other deleterious substances. It shall be reasonably free from brush, roots, heavy clay, sticks, roots of noxious weeds or grasses and other litter, and shall contain no stones or gravel larger than 1/2 inch in diameter. It shall be free of toxic amounts of either acid or alkaline elements and be capable of sustaining healthy plant life.

b. Seed

(1) Grasses, legumes, or cover crop seed shall conform to the standards for "Certified" grade seed or better, as outlined by the State of Washington Department of

Agriculture "Rules for Seed Certification" latest edition. Seed shall be furnished in standard containers on which shall be shown the following information:

(a) Common name of seed.

(b) Lot number.

(c) Net weight.

(d) Percentage of purity.

(e) Percentage of germination (in cases of legumes, percentage of germination to include hard seed).

(f) Percentage of weed seed content and inert material clearly marked for each kind of seed, in accordance with applicable State and Federal laws.

(2) Upon request, the Contractor shall furnish to the District duplicate copies of a statement signed by the vendor certifying that each lot of seed has been tested by a recognized seed testing laboratory within 6 months before the date of delivery to the project.

(3) Seed which has become wet, moldy, or otherwise damaged in transit or storage will not be accepted.

(4) Grass seed for erosion control turf and open areas shall be of the following variety and quality:

Kind and Variety of Seed in Mixture	% by	Minimum % Weight Pure Seed	Minimum % Germination
Creeping Red Fescue	40	39.2	90
Colonial Bentgrass	10	9.8	85
Perennial Rye	40	9.2	90
White Dutch Clover (preinoculated)	10	9.8	90
Weed Seed		0.5% max.	
Inert and Other Crop		1.5% max.	
TOTAL		100%	

(5) Seed for lawn restoration shall be a mixture of seed prepared specifically for the Pacific Northwest and shall be selected to match the lawn being restored.

(6) Grass seed shall be applied at 80 pounds per acre for erosion control turf and open areas and 100 pounds per acre for lawn restoration.

c. Imported Sod

(1) All imported sod shall comply with the State and Federal laws, including quarantines, with respect to inspection, plant diseases and insect infestation. Sod

shipments shall have a certificate of origin and/or certification of approved treatment when shipment originates in known infected areas. All sod shipments shall contain a "State of Washington Nursery Inspection" sticker issued by the Washington State Department of Agriculture, Division of Plant Industries. Sod shall be mature, densely-rooted grass, composed of types of grasses as approved by the District, and shall possess the following characteristics:

(a) Uniformity.

(b) Acceptable color.

(c) Freedom from serious weeds and weed seeds.

(d) Adequate sod strength for handling.

(e) A minimum amount of thatch.

d. Mulch

(1) Wood Cellulose

(a) Wood cellulose fiber mulch shall be specially processed wood fiber containing no growth or germination inhibiting factors and shall be dyed a suitable color to facilitate inspection of the placement of the material. It shall be manufactured in such a manner that after addition and agitation in slurry tanks with water, the fibers in the material will become uniformly suspended to form a homogenous slurry. When hydraulically sprayed on the ground, the material shall allow the absorption and percolation of moisture.

(b) Each package of the cellulose fiber shall be marked by the manufacturer to show the air dry weight content. All mulch material must be acceptable to the District.

(2) Straw

(a) All straw mulch material shall be in an air dried condition free of noxious weeds, weed seeds, and other materials detrimental to plant life. Straw shall be seasoned before baling or loading. Straw mulch so provided shall be suitable for spreading with mulch blower equipment. Asphalt emulsion for use to anchor mulch material in place shall be a standard CSS-1 emulsion.

(3) Peat Moss

(a) Peat moss shall be a natural domestic product of either sphagnum, moss, reed or sedge peat, taken from a fresh water site, free from lumps, roots and stones.

e. Plant Materials

(1) All plant materials shall meet the grades established by American Standard for Nursery Stock.

(2) All plants shall consist of live woody or herbaceous plant material which are vigorous, well formed, with well developed fibrous root system, free from dead branches, lichens, and from damage caused by an absence or an excess of heat or moisture, insects, disease, mechanical or other causes detrimental to good plant development. Evergreen plants shall be well foliated and of good color. Deciduous trees which have solitary leaders shall have only the lateral branches thinned by pruning.

(3) Root balls of plant materials shall be solidly held together by a fibrous root system and shall be composed only of the earth in which the plant has been actually growing. The ball shall be securely wrapped with jute burlap or other packing material not injurious to the plant life. Root balls shall be free of weed or foreign plant growth.

(4) All plant materials shall comply with State and Federal laws with respect to inspection for plant diseases and insect infestation.

(5) All plant materials shall be nursery grown stock. Plant material gathered from native stands shall be held under nursery conditions for a minimum of one full growing season and shall be free of all foreign plant material and meet all of the requirements of these specifications.

(6) Plants which have been determined by the District to have suffered damage as the result of girdling of the roots, stem or a major branch; have deformities of the stem or major branches; have a lack of symmetry; have dead or defoliated tops or branches; or have any defect, injury or condition which renders the plant unsuitable for its intended use, shall be rejected.

f. Fertilizer

(1) Fertilizer shall be a standard commercial grade of organic or inorganic fertilizer of the kind and quality specified herein. It may be separate or in a mixture containing the percentage of total nitrogen, available phosphoric acid and water-soluble potash in the amounts specified. All fertilizers shall be furnished in standard guaranteed statement of analysis clearly marked, all in accordance with State and Federal laws.

(2) Acceptable commercial fertilizer may be supplied in one of the following forms:

(a) A dry free-flowing granular fertilizer suitable for application by agricultural fertilizer spreader.

(b) A soluble fertilizer ground to a fineness that will permit complete suspension of insoluble particles in water, suitable for application by power sprayer.

(c) A granular or pelleted fertilizer, suitable for application by blower equipment.

(d) A non-volatile liquid fertilizer.

(3) Fertilizers used in the various types of landscape restoration shall be recommended by the manufacturer for the specific use intended and shall be formulated for specific use in the Pacific Northwest.

3. CONSTRUCTION

a. General

(1) All areas disturbed by the Contractor's operations shall be restored to a condition equal to or better than the original condition as determined by the District.

(2) The exact times for planting will be determined by actual weather conditions. The normal satisfactory period for lawn installation is April 15 to October 1. Plant materials shall not be planted during freezing weather or in frozen ground.

b. Lawn Removal and Replacement and Lawn Planting

(1) Existing lawns disturbed by the Contractor's operations shall be restored by either replacement of existing sod, if suitable for removal and replacement, placement of imported sod, or seeding from April 15th to September 15th. The method of replacement shall be as shown on the Contract Drawings or as specified. If not shown or specified, the Contractor shall determine which method to use except that seeding shall only be performed during satisfactory growing seasons.

(2) Existing sod which is to be used for replacement shall be removed by cutting the sod into convenient sized squares or strips and cutting to an uniform depth of not less than 2-inch of root system. The sod shall be stored in convenient locations and shall be maintained in a dampened condition until the sod is replaced. In no case shall sod not be replaced within 10 days of removal. Native sod shall be replaced in the lawn from which it was removed.

(3) All areas to receive sod or be seeded shall be carefully shaped and graded to allow for placement of 3-inches of topsoil. The subgrade shall be rototilled to a depth of 4-inches and lightly compacted with all large clods, rocks and debris removed. Topsoil shall be placed to a minimum depth of 3-inches and compacted with a lawn roller. The topsoil shall be raked, dampened and fertilized immediately prior to placement of sod or seed. The grade shall be established so that the top of sod, or topsoil for seeding shall be flush with all curbs, sidewalks or existing lawns.

(4) Sod shall be placed to the proper grade and placed tightly against the adjacent sod. Upon placement, the sod shall be dampened and rolled with a lawn roller. Edges of sod pieces shall be staggered, and on sloped areas sod shall be placed with the longest dimension parallel to the toe or top of the slope.

(5) Lawn seed shall be applied at the rate and method as recommended by the seed manufacturer. Seed shall be raked into the surface soil to a depth of 1/8 to

1/4 inch. Peat moss shall be placed to a uniform depth of 1/5 inch and compacted with a lawn roller. Apply sufficient water to fully moisten.

(6) Lawn maintenance shall commence immediately upon placement of sod or seed. The Contractor shall maintain the seeded areas for a period of 90 days after placing and maintain the sod areas for a period of 90 days including mowing, watering and fertilizing.

(7) Fertilizers shall be applied at the rate and method as recommended by the fertilizer manufacturer and shall be recommended by the manufacturer for the intended use.

c. Plant Removal, Replacement, and Planting

(1) General

(a) All existing landscaping plants, trees, shrubbery, ground cover and flowers shall be removed, stored and replanted in accordance with standard horticultural practices by an experienced landscape gardener.

(b) Plant material for replacement of existing plants damaged by removal or during construction operations shall be of like species, size and appearance.

(c) Any confusion between nomenclature of plant materials may be resolved by the District or such expert as it may select.

(d) Pipe to be laid in trenches in close proximity to trees which cannot be removed and replaced shall be laid in hand-dug trenches or tunnels.

(e) Planting layout shall be as existed prior to construction, and as approved by the District.

(f) In mixed planting areas, trees shall be planted first, followed by larger shrubs, low shrubs and the final planting of ground cover and flowers.

(2) Planting

(a) Planting areas which, in the opinion of the District, require cultivating shall be cultivated to a depth of 6 inches and all rocks, sticks, roots and other debris shall be removed before any plants are planted.

(b) Planting pits for trees and shrubs shall be dug 12 inches greater in diameter than the diameter of the root ball or natural spread of the roots. Depth of hole shall provide a minimum backfill under roots or root ball of 6 inches. Depth of planting pits for bulbs, bedding plants and ground cover shall be 12 inches below finish grade.

(c) Use topsoil beneath and around cavity between plant ball or roots and pit sides. Bare root plants shall be set in the plant hole with roots spread out in a natural position. Backfill material shall then be worked in around the roots filling all voids. Firming or tamping of backfill material around roots

shall be done in such a manner so as not to damage the roots. Balled and burlapped material shall have all strings or cords cut, and the burlap shall be laid back from the top half of the ball. This shall be done only after the plant has been placed in its final position and before completion of backfill. Till balance of cavity with planting soil.

(d) Use root transplanting compounds and herbicides for bulbs and plants to prevent disease and assure best plant growth.

(e) A shallow rain basin consisting of a ridge of earth 1 to 3 inches high and equal in diameter to the planting hole shall be left around each plant. Immediately after a plant is planted and basin constructed, the basin shall be filled with water.

(f) Support trees immediately after planting by staking and/or guying to maintain trees in plumb position.

(g) Fertilize all trees, shrubs and ground cover at time of planting.

(h) The Contractor shall take adequate and proper care of all plant material and work done on the project until the project is complete and accepted by the District. Adequate and proper care shall include, but is not limited to, keeping all plant material in a healthy, growing condition by watering, cultivating, pruning, spraying and any other necessary operations.

d. Erosion Control Turf and Open Area Seeding

(1) General: A cover crop shall be sown in areas other than landscaped area that are excavated or disturbed during construction and at locations as shown on the Plans and specified.

(2) Cultivation: The surface to be treated shall be cultivated or loosened to a depth of 3 inches. The operation shall be done at right angles to the natural flow of water on the slope.

(3) Compaction: Unless seed is covered with soil during seed application, a cleated roller, crawler tractor, or similar equipment that forms longitudinal depressions at least 2 inches deep shall be used for compaction and preparation of the surface to be seeded. The entire area shall be uniformly covered with longitudinal depressions formed perpendicular to the natural flow of water on the slope. The area shall be compacted and prepared within 3 weeks of the time for seeding. If, in the opinion of the District, water is required to condition the soil for leaving depressions in the soil surface, it shall be applied in the amount designated by the District.

(4) Seeding

(a) Seeding shall not be done during windy weather or when the ground is frozen, excessively wet or otherwise untillable. Seed shall be at the rate and mix specified. Seed may be sown by one of the following methods:

i. A hydro-seeder which utilizes water as the carrying agent and maintains continuous agitation through paddle blades. It shall have an operating capacity sufficient to agitate, suspend and mix

into a homogenous slurry, the specified amount of seed and water or other material. Distribution and discharge lines shall be large enough to prevent stoppage and shall be equipped with a set of hydraulic discharge spray nozzles which will provide a uniform distribution of the slurry.

ii. Blower equipment with an adjustable disseminating device capable of maintaining a constant, measured rate of material discharge that will insure an even distribution of seed at the rates specified.

iii. Helicopters properly equipped for aerial seeding.

iv. Power-drawing drills or seeders.

(b) Areas in which the above methods are impractical may be seeded by hand methods.

(c) The seed shall be applied in a separate application prior to fertilizing and mulching. The seed shall have a tracer added to visibly facilitate uniform application. This tracer shall not be harmful to plant and animal life. If wood cellulose fiber is used as a tracer, the application rate shall not exceed 250 pounds per acre.

(5) Fertilizing

(a) A fertilizer shall be applied at the rate of 300 pounds per acre. Content of nutrients shall be as follows:

Total Nitrogen.....12%
Available Phosphoric Acid 12%
Water Soluble Potash 12%

(b) The fertilizer shall be applied in accordance with the procedures and requirements for seeding.

(6) Mulching

(a) Mulching material shall be furnished, hauled and spread on seeded areas within 48 hours after seeding.

(b) Distribution of straw mulch shall be by a mulch spreader which utilizes forced air to blow mulch material on seeded areas. The spreader shall produce a uniform distribution of straw without cutting or breaking it into short stalks.

(c) Wood cellulose fiber used as mulch may be applied with seed and fertilizer in one operation with a hydro-seeder.

(d) Areas not accessible by mulching equipment shall be mulched by hand methods.

(e) Straw mulch shall be applied at the rate of 2,000 pounds per acre.

(f) Wood cellulose fiber mulch shall be applied at the rate of 1,400 pounds per acre.

(7) Maintenance

(a) The Contractor shall protect all areas involved against vehicle and pedestrian traffic by use of warning signs and barricades.

(b) The Contractor shall reseed and fertilize and mulch area failing to show a uniform stand of grass after germination of seed and areas which have been damaged through any cause before final inspection.

END OF SECTION 02480

DIVISION 2 – SITE WORK

SECTION 02500 – PAVING AND SURFACING

1. GENERAL

a. The Work specified in this Section shall consist of paving, surfacing and restoring all streets, roadways and paved areas damaged or removed by the Contractor's operations and constructing new access roads and parking areas. Roadway restoration shall also include the repair and/or replacement of all wedge curbs, curbs and gutters, sidewalks, gravel shoulders, and driveways damaged or removed by the Contractor's operations.

b. The Contractor shall be responsible for all roadway restoration required due to its operations. Restoration shall result in construction of roadways, curbs, gutters, sidewalks, gravel shoulders, and driveways equal to or better than the original and the minimum shall be as shown on the Plans or specified.

2. MATERIALS

a. Gravel Base

(1) Gravel base shall meet the requirements for Gravel Base as specified in Section 9-03.10 of the Washington State Specifications.

b. Crushed Surfacing

(1) Crushed surfacing base course and top course shall meet the requirements for Crushed Surfacing as specified in Section 9-03.9(3) of the Washington State Specifications.

c. Asphalt Concrete Pavement

(1) Asphalt concrete pavement shall meet the requirements of hot mix asphalt (HMA) as specified in Section 5-04.2 of the Washington State Specifications. Asphalt grade shall be HMA Class ½" PG 58H-22 as specified by the City of Lakewood.

d. Cement Concrete Pavement

(1) Finished and unfinished cement concrete pavement, sidewalk, curb and gutter and thrust blocking shall meet the requirements for Cement Concrete Pavement as specified in Section 5-05.2 of the Washington State Specifications and shall be Class 3000.

(2) Cement concrete used for the restoration of the concrete roadway panels or driveways shall be Class 4000.

e. Soil Sterilant

(1) Soil sterilant shall be Simazine (Princep-80W or Princep-4G) as manufactured by Ciba-Geigy.

SECTION 02500 – PAVING AND SURFACING (CONTINUED)

3. CONSTRUCTION

a. General

(1) Paving and surfacing shall be scheduled to accommodate the demands of traffic and shall be performed as promptly as possible to provide maximum safety to public travel.

(2) Unfavorable weather conditions relative to application and placement of asphalt materials as defined in Section 5-04.3 of the Washington State specifications shall be determined by the Owner. The Contractor shall not place pavement in unfavorable conditions.

(3) The Contractor shall backfill and compact all trenches and place and maintain a temporary 2-inch thick crushed surfacing base course and a 2-inch thick cold mix patching on all streets and paved driveways, except as noted on the Plans. The Contractor shall remove the temporary base and asphalt, and subsequent backfill to the required depth at such time as the permanent pavement repair can be completed as specified herein. Permanent asphalt thickness shall be 4 inches or shall match the thickness of the existing asphalt, whichever is greater.

(4) The cutting, removal and disposal of existing improvements shall be as specified in Section 02103—Removal of Existing Street Improvements.

(5) The placing and compaction of backfill, and the preparation and compaction of the subgrade shall be as shown and specified in Section 02221—Trenching, Backfilling, and Compacting.

(6) The adjustment of utility structures encountered on the project to finished grade shall be as specified in Section 02501—Adjustment of New and Existing Utility Structures to Finished Grade.

b. Asphalt Concrete Pavement

(1) Asphalt concrete pavement shall be constructed in accordance with the requirements of Section 5-04 of the Washington State Specifications.

(2) If approved by the District, asphalt concrete pavement may be spread by use of a spreader box. The spreader box shall be capable of spreading the material in widths applicable to the specified typical section and thicknesses. The pavement shall be raked and screeded to the required evenness and texture. The spreader box shall be operated at the forward speeds to provide continuous uninterrupted operation.

(3) The edges of all existing asphalt pavements and all castings shall be painted with hot asphalt cement or asphalt emulsion immediately before placing the asphalt patching material. The asphalt pavement shall then be placed, leveled, and compacted to conform to the adjacent paved surface. Immediately thereafter, all joints between the new and original asphalt pavement shall be painted with hot asphalt or asphalt emulsion and be covered with dry paving sand before the asphalt solidifies.

SECTION 02500 – PAVING AND SURFACING (CONTINUED)

c. Cement Concrete Pavement

(1) Cement concrete pavement shall be constructed in accordance with the requirements of Section 5-05 of the Washington State Specifications. The design age of the concrete shall be determined by the Contractor based upon the urgency of opening the street to traffic. Construction and contraction joints shall be furnished where directed by the District. The concrete panel patch shall be dowelled to the existing remaining concrete panel with epoxy coated dowel bars core-drilled into the existing panel as shown on the Plans. Concrete panel restoration shall match the thickness of the existing concrete. Existing concrete panel thickness is unknown but is assumed to be 9 inches thick.

d. Gravel or Crushed Surfacing

(1) Crushed surfacing shall be constructed in accordance with Section 4-04.3 of the Washington State Specifications. Gravel shoulders and driveways shall be restored with a minimum thickness of 3 inches of crushed surfacing top course (5/8-inch minus crushed rock).

e. Driveways

(1) Driveways removed or damaged by the Contractor's operations shall be replaced to the same grades, elevations and dimensions of the original driveway.

f. Cement Concrete Driveway Entrances

(1) This work shall consist of construction of cement concrete driveway entrances to the limits shown on the Contract Drawings in conformance with WSDOT Section 8-06.

(2) Driveway entrances shall be considered to be that portion of the private driveways which require removal and replacement for replacement of an existing water service. "Cement Concrete Driveway Entrance" shall be constructed and finished as specified for driveways. Driveways shall be 6-inch-thick slabs and not reinforced.

END OF SECTION 02500

DIVISION 2 – SITE WORK

SECTION 02501 – ADJUSTMENT OF NEW AND EXISTING UTILITY STRUCTURES TO FINISHED GRADE

1. GENERAL

   a. The work specified in this Section shall consist of adjusting all new and existing utility structures encountered on the project to finished grade.

   b. Owners of private utilities in street and road rights-of-way, pursuant to franchises or to rights claimed under the laws of the United States of America, or the State of Washington, will be responsible for all adjustments and relocations of their facilities. These agencies will locate and make all adjustments to their respective structures at no charge to the Contractor.

   c. The Contractor shall be responsible for all adjustments and relocations of publicly owned street improvements and utility structures.

   d. The Contractor shall schedule its work and cooperate to the fullest extent so that structure adjustments by others can be accomplished. The Contractor shall do all pavement patching which may be necessary after adjustment of structures.

2. MATERIALS

   a. Materials for use in pavement restoration shall be as specified in Section 02500 – PAVING AND SURFACING.

   b. Materials for use in structure construction shall match existing materials for existing structures.

3. CONSTRUCTION

   a. Manholes, Catch Basins, and Similar Structures

      (1) Manholes, catch basins and similar structures shall be brought to proper grade. The profiles and manhole rim elevations if shown on the Plans are approximate and the final grade shall be determined during construction.

      (2) Gravel or Crushed Surfacing

         (a) New manholes, catch basins and similar structures constructed in gravel or crushed surfacing shall be constructed to a point approximately 8 inches below the subgrade and covered with a temporary wood cover. Existing structures encountered shall be cut off and be covered in a similar manner. The Contractor shall carefully reference each structure so that they may be easily found upon completion of the surface restoration.

SECTION 02501 – ADJUSTMENT OF NEW AND EXISTING
UTILITY STRUCTURES TO FINISHED GRADE (CONTINUED)

(b) After placing crushed surfacing, the manholes and manhole castings shall be constructed to the finished grade. Excavating necessary for bringing structures to grade shall center about the structures and be held to a minimum area necessary. At the completion of the structures adjustment, the void around the structures shall be backfilled and compacted with materials which will result in the section required on the typical roadway section.

(3) Bituminous Surface Treatment

(a) New and existing manholes, catch basins and similar structures in the bituminous surface treatment shall be adjusted in the same manner as specified for gravel or crushed surfacing except where bituminous surface treatment is to be placed, the manhole castings shall be installed from 1/2 inch to 1 inch higher than the roadway surface, as the District may direct. The castings shall be protected from being covered with asphalt and surfacing.

(4) Cement Concrete Pavement

(a) New and existing manholes, catch basins and similar structures in cement concrete pavement shall be adjusted in the same manner as specified for gravel or crushed surfacing except that final adjustments shall be made and the frame shall be set after forms (if required) have been placed and checked. In placing the cement concrete pavement, extreme care shall be taken not to alter the position of the frame in any way.

(5) Asphalt Concrete Pavement

(a) Manholes and similar structures in asphalt concrete pavement shall not be adjusted until the pavement is completed, at which time the center of each structure shall be carefully relocated from references previously established by the Contractor. The asphalt concrete pavement shall be cut and removed to a neat circle, the diameter of which shall be equal to the outside diameter of the cast iron frame plus 2 feet. Base material shall be removed to permit removal of the temporary cover. The structure and castings shall be constructed to finished grade.

(b) The cast iron frame shall be placed on the adjustment sections and wedged up to the desired grade. Cement concrete pavement shall be placed so that the entire volume of the excavation up to within, but not to exceed 1-1/2 inches of the finished pavement surfaces.

(c) On the following day, the cement concrete, the edges of the asphalt concrete pavement, and the outer edge of the casting shall be painted with hot asphalt. Asphalt concrete shall then be placed and compacted with hand tampers and a patching roller. The completed patch shall match the existing paved surface for texture, density, and uniformity of grade. The joint between the patch and the existing pavement shall then be painted with hot asphalt emulsion and shall be immediately covered with dry paving sand before the asphalt or emulsion solidifies.

SECTION 02501 – ADJUSTMENT OF NEW AND EXISTING
UTILITY STRUCTURES TO FINISHED GRADE (CONTINUED)

b. Adjustment of Inlets

(1) The final alignment and grade of cast iron frames for new and old inlets to be adjusted to grade shall be established from the forms or adjacent pavement surfaces. The final adjustment of the top of the inlet shall be performed in a similar manner to that for manholes. With curb and gutters, that portion of the cast iron frame not embedded in the gutter section shall be solidly embedded in cement concrete. The cement concrete shall extend a minimum of 6 inches beyond the edge of the casting and shall be left 1-1/2 inches below the top of the frame so that the asphalt concrete pavement will butt the cast iron frame. The cement concrete and edge of the casting shall be painted with hot asphalt or asphalt emulsion before placement of the asphalt concrete pavement. Adjustments to inlet structure shall be constructed in the same manner and of the same material as the existing inlet structure.

c. Adjustment of Monuments and Cast Iron Frame and Cover

(1) Monuments and monument castings shall be adjusted to grade in the same manner as for manholes.

d. Adjustment of Valve Box Castings

(1) Adjustment of valve box castings shall be made in the same manner as for manholes. Contractor shall be responsible to remove and dispose of old valve boxes. If located in pavement, gravel shall be placed in hole with asphalt patch.

e. Furnishing Castings

(1) The Contractor shall provide new castings of the type specified for all new utility structures constructed as part of the project. Where adjustments of existing manholes, catch basins, inlets, valve boxes, etc., are required, existing castings shall be removed, cleaned and reset as specified. Castings damaged by the Contractor shall be replaced with new castings at no additional cost to the Owner.

END OF SECTION 02501

DIVISION 2 – SITE WORK

SECTION 02502 – FINISHING AND CLEANUP

1 . GENERAL

a. The Work specified in this Section shall consist of the finishing and cleanup of all areas disturbed by the Contractor's operations.

2. MATERIALS (NOT USED)

3. CONSTRUCTION

a. After all other work embraced in the Contract is completed, the entire work area including roadways, planting area, sidewalk areas, shoulder, driveways, alley and side street approaches, slopes, ditches, utility trenches and construction areas shall be neatly finished to the lines, grades and cross-sections as shown on the Plans or specified.

b. Slopes, sidewalk areas, planting areas, and roadway shall be smoothed and finished to the required cross-section and grade by means of a grading machine insofar as it is possible to do so without damaging existing improvements, trees and shrubs. Machine dressing shall be supplemented by hand work to meet requirements outlined herein, to the satisfaction of the District.

c. Upon completion of the cleaning and dressing, the Project shall appear uniform in all respects. All graded areas shall be true to line and grade as shown on the typical sections and as required by the District. Where the existing planting is below sidewalk and curb, the area shall be filled and dressed out to the walk regardless of limits shown on the Plans. Wherever fill material is required in the planting area, it shall be left high enough to allow for final settlement; nevertheless, the raised surface shall present a uniform appearance.

d. All large rocks shall be removed from the entire construction area and shall be disposed of as required for other waste material. In no instance shall the rock be thrown onto private property. Overhang on slopes shall be removed and slopes dressed neatly so as to present a uniform well sloped surface.

e. All windrows of earth at the outer lateral limits of the Project shall be removed entirely. Trash of all kinds resulting from clearing and grubbing or grading operations shall be removed and disposed of at a site obtained by the Contractor. Where machine operations have broken down brush and trees beyond the lateral limits of the Project, the Contractor shall remove and dispose of same at its own expense.

f. Drainage facilities such as inlets, catch basins, culverts, and open ditches shall be cleaned of all debris which is the result of the Contractor's operations.

g. The Contractor shall remove and dispose of all construction stakes.

h. All pavements and oil mat surfaces, whether new or old, shall be cleaned. Existing improvements such as Portland cement concrete curbs, curb and gutters, walls, sidewalks and other facilities which have been sprayed by the asphalt cement shall be cleaned to the satisfaction of the District. Casting for manholes, monuments, water gates, lamp poles, vaults, and other similar installations which have been sprayed with the asphalt material shall be cleaned to the satisfaction of the District.

SECTION 02502 – FINISHING AND CLEANUP (CONTINUED)

i. The Contractor shall flush all streets at the conclusion of the work. Flusher shall be of a pressure type and approved by the District. Sidewalks shall be hand broomed.

j. Projects where all or a portion of the construction is in undeveloped area, the entire area which has been disturbed by the construction shall be shaped so that upon completion, the area will present a uniform appearance, blending into the contour of the adjacent properties. All other requirements outlined previously shall be met, except that it will not be necessary to pick up rocks unless so specified.

k. Where by permission of the property owner, spoil is dumped on private property, the Contractor will not be required to perform any work beyond that described in the easement obtained by the District for use of the land.

l. Contractor shall be responsible for disposing of old fittings legally if not left buried in-place.

m. All road crossings shall be patched and paved within one week of successful pressure test and bacteriological result. Inspector shall make final decision on any weather delays. Failure to perform patch and pavement work within the limited time shall allow the District to contract with a separate Contractor and back- charge the selected Contractor.

n. Existing hydrants shall be the Contractor's responsibility until delivered to the District's Shop or storage yard. The Contractor shall protect the existing hydrant during removal, storage and transportation. Existing hydrants if not delivered shall be valued at $300.

o. Contractor shall be responsible to remove and dispose of old meter boxes, meter setters, service piping and associated valves.

END OF SECTION 02502

DIVISION 2 – SITE WORK

SECTION 02713 – LAKEWOOD WATER DISTRICT SPECIFICATIONS

1. INSPECTIONS AND INSPECTORS

   a. The District Inspector is required to be on site during installation of the water system. The Inspector will attempt to be present at the project site, but the Contractor shall be required to coordinate with the Inspector during all phases of the water system installation.

   b. A pre-construction meeting will be required prior to the commencement of the work. This meeting will introduce the Inspector from Lakewood Water District, discussion of any concerns, and a general walk through of the proposed job.

   c. The Lakewood Water District Inspector is not a safety inspector; however, if he/she determines that inspection is needed in any areas, he/she can make the Contractor meet safety requirements.

   d. As-Built measurements must be taken daily and a copy given to the Lakewood Water District Inspector.

2. CONSTRUCTION MATERIALS

   a. GENERAL

      (1) The Contractor will provide all water system materials (except meters and radio transmitters), pipe bedding and backfill materials, material for restoration and all required labor for installation of the complete facility.

      (2) In lieu of flanges on ductile iron fittings and valves, Foster Adaptors manufactured by Infact Corporation, or approved equal, will be used to allow mechanical joint restraint.

   b. WATER MAINS

      (1) Water Mains: Water mains shall be constructed and tested in accordance with Section 7-09.1 through 7-09.5 of the Standard Specifications. Bacteriological test samples will be taken by the District, but at the Contractor's expense. All of the following will be inspected by Lakewood Water District Inspectors after the successful installations are completed.

      (2) Pipe for Water Mains: Pipe for water mains 4-inch and larger shall be ductile iron and shall be thickness Class 50 or greater, with Tyton or approval equal joints. Pipe shall be in accordance with ANSI Standard A21.51 (AWWA C-151). Pipe shall be cement lined in accordance with ANSI Standard A21.4 (AWWA C-104).

      (3) Polyvinyl Chloride (PVC) Pipe (4 inches and over): Where water main is specifically designated PVC on the Plans, PVC pipe for water mains shall meet the requirements of ANSI/AWWA C900 or ANSI/AWWA C905. PVC pipe shall have the same outside dimensions as ductile iron pipe. PVC pipe for distribution pipelines shall be a minimum of SDR 14. Pipe shall be listed by Underwriter's Laboratories, Inc. PVC pipe shall be considered flexible conduit. Joints shall meet the requirement of ASTM D3139 using a restrained rubber gasket conforming to ASTM F477. Solvent welded pipe points are not permitted. Tracer wire shall be UL

listed, type UF, 12-gauge copper taped to the top of the pipe to prevent movement during backfilling. The wire shall be laid loosely enough to prevent stretching and damage. The wire shall be wrapped to a convenient accessible location within each valve box or valve chamber.

(4) Domestic And Imported Ductile Iron Fittings: All domestic (USA-made only) and imported (made by other countries) ductile iron fittings shall conform to the latest ANSI/AWWA C110 Specifications or ANSI/AWWA C153 for Mechanical Joint Compact Ductile Iron Class 350 fittings. All fittings shall be epoxy-coated ductile iron or have cement-mortar lining conforming to ANSI/AWWA C104. Mechanical joint glands supplied with the above domestic "ductile iron" fittings shall be ductile iron in accordance with the above specifications. Imported fittings shall be manufactured by Sigma Corporation or a District-approved equal.

c. GATE VALVES

(1) Gate valves shall conform to the latest AWWA standards. Rated for cold water, 200 PSI working pressure. They shall be non-rising stem, counterclockwise opening with mechanical joint ends. Valve stems shall be provided with O-ring seals. The valves shall be as manufactured by the Mueller® Company or AVK and be resilient seat gate valves.

(2) Tapping Sleeve and Gate Valve Assembly shall be furnished with flanged inlet end connections. The outlet ends shall conform in dimensions to the AWWA Standards for hub or mechanical joint connections, except that the outside of the hub shall have a large flange for attaching a drilling machine. The seat opening of the valve must permit a diameter cut no less than 1/2 inch smaller than the valve size. Valves specifically designed for tapping meeting the requirements of AWWA C500, and valves meeting the requirements of AWWA C509, will be permitted. Tapping valves shall be of the same type as other valves on the project. Tapping sleeves shall be cast iron, ductile iron, stainless steel, epoxy-coated steel, or other approved material.

d. VALVE BOXES

(1) Valve boxes shall be installed over valve operators. Boxes shall be two piece, adjustable, cast iron (with extension pieces, if necessary). Top Section 045/046 lid. Commonly called Seattle or Tacoma top and lid.

(2) The word "water" or "ww" shall be cast in relief in the top. Valve operating nut deeper than 40 inches must use valve nut extension.

(3) Fire Systems must have locking top and lid (Tyler).

e. WATER SERVICES

(1) One-inch water services shall be IPS, SIDR 7, 200 PSI, ASTM D2239 polyethylene pipe with a meter riser installed as shown on the Plans. 1-1/2-inch and 2-inch water services shall be CTS, SDR9, 200 PSI, ASTM D2737 polyethylene pipe with a meter riser installed as shown on the Plans. The water service piping shall be one continuous piece, without joints, between corporation stop and meter riser

assembly. All connections to plastic tubing type services shall be made by using Mueller® Insta-tite® fittings.

(2) Water services shall be installed a minimum of 3 feet below finished grade. Service pipe shall be wrapped with 12 gauge copper tracing wire, extending from the main to the meter box. Tracer wire shall be attached to the saddle and extend minimum of 12 inches into meter box. Water services shall extend to the new meter box and from the new meter box to connect with the existing customer's service line as shown on the Plans. Contractor shall field verify the material of the customer's existing service line and provide an appropriate pressure rated adapter/coupling to transition materials to make the connection. Water services located on the side of the street opposite from the water main shall be installed in a 2.5-inch PVC (3-inch sleeve for 2-inch service pipe), schedule 40, solvent weld joint casing/sleeve jacked or pushed under the existing roadway pavement.

(3) Installation of the plastic valve box and curb stop on the customer side of the line setter as noted on the Plans is at the option and cost of the property owner. Prior to installation, the Contractor shall verify with the property owner whether or not the plastic valve box and curb stop is desired for the Contractor's stated price. If desired, the Contractor will receive payment directly from the property owner for the materials and installation of the plastic valve box and curb stop.

(4) All connections to plastic tubing type services shall be made by using 3/4-inch and 1-inch Mueller Instatite fittings or Ford Brass fittings. The 1-1/2-inch and 2-inch service connections shall be made with Mueller 110 compression fittings or Ford Brass fittings.

(5) The Contractor shall take extra care when installing water service assemblies to ensure that no debris enters the water service line which could cause problems with the homeowner. If shortly after installation of the water service assembly the homeowner alerts the District to a water service problem, the Contractor shall respond immediately to resolve the issue at their own cost.

f. CONCRETE THRUST BLOCKING AND RESTRAINED JOINT PIPE

(1) If restrained pipe/fitting length shown on in Detail 2 of the LWD Details is not achievable, thrust blocks shall also be used. See Detail 3 of the LWD Details.

(2) Concrete thrust blocking shall be poured at bends, tees, and crosses and pipe ends. Blocking shall be in accordance with the details shown on the Plans. Place 4-mil plastic between concrete blocking and fittings. No concrete is to get on bolt threads. Restrained joint PVC pipe (Diamond Lok-21, Eagle Loc 900), mechanical joint restraints ("megalug" by EBBA Iron, or equivalent), and restrained joint ductile iron pipe (Field Loc 350 gaskets) shall be used in lieu of thrust blocks, where feasible.

(3) Additional blocking measures, such as concrete curb blocks or mechanical joint restraints, may be required if existing soils will not support the thrust.

(4) Concrete shall be cured for at least two days prior to any pressure test of the pipe. Adequate shackling or joint restraint ("megalug" or restrained joint pipe) followers shall be provided where required by the District.

SECTION 02713 – LAKEWOOD WATER DISTRICT SPECIFICATIONS (CONTINUED)

g. FIRE HYDRANTS

(1) General: All hydrant lateral pipe shall be Class 52, or greater, ductile iron with "megalugs" on the valve follower and hydrant follower. Place one-inch washed rock around hydrant weep hole, then place 6 mil plastic sheeting over the washed rock before placing the backfill around the hydrant. All fire hydrants shall be buried to grade within three (3) inches of the marked bury line on the hydrant.

(2) Mueller A423 Super Centurion 250:

(a) Fire hydrants shall comply in all respects with latest A.W.W.A. (502), UL (246), and FM (1510) specification. Having a working pressure of 250 pounds P.S.I. and a hydrostatic test pressure of 500 pounds P.S.I. Hydrants shall be – 5-1/2 inch main valve opening, two 2-1/2 inch N.S.T. Hose Nozzles, one 4-1/2 inch N.S.T. Pumper Nozzle, fitted with Storz adapter, 4 foot bury, 6 inch M.J. Bottom Connections or flange connection, 1-1/4 inch operating nut. Open left, painted X-3472 CASE YELLOW (high grade alkyd-type, high gloss enamel intended for use on primed exterior and interior wood or metal). Repainting of hydrants may be required by the District Inspector.

(b) They shall be of a compression type design with the main valve opening against the pressure and closing with the pressure. Hydrants shall be of dry top design complete with weather seal on one piece bronze operating nut, self-lubricating sealed oil reservoir to provide positive continuous lubrication. Reservoir to be factory pre-filled with the proper type and amount of oil. All threaded and bearing parts metal to metal, metal to rubber in the bonnet section shall be automatically and fully lubricated each time the hydrant is cycled, full opened to full closed. The bonnet casting of the fire hydrant shall be a one-piece casting forming an integral lubricant reservoir with a minimum of two "O-RING" seals at the base of the bonnet. Lubrication of the hydrant shall be through a filler plug located in the bonnet of the hydrant, through which level of the lubricant can be checked. Lubrication shall not be through a fitting in the Operating Nut. All hydrants shall be of the traffic type, and shall be provided with a two piece breakable Flange and with a Breakable Stem Coupling.

(c) The Breakable Stem Coupling shall be made of stainless steel and shall be of the Torque-Diverting Type. Breakable flanges shall be of the 8-bolt design. Breakable bolts or Breakable Lugs are NOT ACCEPTABLE. Breakable stem couplings made of CAST IRON or of ALUMINUM are NOT ACCEPTABLE. A main valve Travel Stop shall be provided in the Shoe as an integral part of the Shoe. The internal ferrous surfaces of the Shoe shall be epoxy lined with a two part Thermo setting epoxy. All hydrants shall be furnished with a minimum of two drain valves and the drain valve facings shall made of either rubber or a polyethylene material.

(d) The drain valve facings shall be retained in position by stainless steel screws. The Seat Ring shall thread into a bronze drain ring forming an all-bronze drainway. All pressure seals shall be rubber "O-Rings". The area of the lower stem, which is reduced in a diameter, shall be sealed away from moisture by means of compression of the rubber main valve "O-Rings". All

barrel flanges shall be an integrally cast part of the upper and lower barrels with the exception of those breakable flanges which are designed to break on traffic impact. All lower Bury castings shall be one piece up to and including a 6-foot Bury Fire Hydrant. The operating nut, Thrust collar, and Treaded Stem drive shall be one piece bronze. A friction reduction agent shall be located between the Thrust collar and hold down nut in the Bonnet section. All internal bronze parts shall contain less than 16% ZINC. All bolting material below ground shall be of full 3/4-inch diameter. If the bolt is less than 3/4, it shall be made of Silicon Bronze or 303 Stainless steel. If the lower barrel is made of Ductile Iron, then all below ground connecting parts, including the shoe, shall be of Ductile Iron. A raised bury line shall be integrally cast on the lower barrel to indicate ground line for proper hydrant setting.

(e) There shall be no springs used in the internal construction of the hydrant.

(f) All hydrants must be cleaned and painted if necessary.

(3) American AVK High Pressure—250 PSI:

(a) Fire hydrants shall comply in all respects with latest A.W.W.A. (502), UL (246), and FM (1510) specification. Having a working pressure of 250 pounds P.S.I. and a hydrostatic test pressure of 500 pounds P.S.I. Hydrants shall be – 5-1/2 inch main valve opening, two 2-1/2 inch N.S.T. Hose Nozzles, one 4-1/2 inch N.S.T. Pumper Nozzle, fitted with Storz adapter, 4 foot bury, 6 inch M.J. Bottom Connections or flange connection, 1-1/4 inch operating nut. Open left, painted Sherwin Williams PPG-95-8002. Repainting of hydrants may be required by the District Inspector.

(b) Stainless Steel Stem—The stem is made of stainless steel, having optimum elongation and tensile resistance capabilities.

(c) The stainless steel stem threads are rolled in a separate cold pressing process in order to maintain the stainless steel structure and increase its strength. Furthermore, this method ensures smooth thread edges and consequently low operating torques.

(d) The Stainless Steel stem is 100 percent lead free.

(e) Body and Bonnet Assembly—The effective assembly of the valve body and bonnet ensures a durable tightness. A round rubber bonnet gasket fits into a recess in the valve bonnet preventing it from being blown out by pressure surges.

(f) Stainless steel (304) bonnet bolts are countersunk into the valve bonnet and body of the valve. Encircled by the bonnet gasket and sealed with hot melt. Thus there is no risk of corrosion, as the bolts are not exposed to the medium or soil. Furthermore the bonnet bolts do not require re-torquing to ensure a proper seal of the bonnet and valve assembly.

(g) Warranty—Ten-year warranty that covers both the cost of the defective valve and the reasonable cost to either repair or replace the defective valve.

SECTION 02713 – LAKEWOOD WATER DISTRICT SPECIFICATIONS (CONTINUED)

h. WATER METER YOKES

(1) Yokes with check valve assembly, for 5/8-inch by 3/4-inch meter is the standard. One-inch to 2-inch meters will normally be fitted with angle stops and angle checks, Mueller® manufactured.

(2) The meter box will be made of concrete or plastic and shall be of sufficient depth to expose the bottom pipe and allow a minimum of 10 inches from the top of the meter to the bottom of the lid.

i. VAULT COVERS

(1) Valve box and vault covers shall be designed to carry the appropriate traffic loadings. When located in the street section, they shall be designed to carry H-20 loading.

j. BLOW OFF ASSEMBLY

(1) Blow off assembly shall be installed as per the Lakewood Water District standard 2-inch blow off-assembly detail drawing. No assembly shall be installed closer than 18 inches from or further than three feet from the end of the pipe.

k. BEDDING

(1) Bedding material shall be placed a minimum of 4 inches under, around and to a level of 6 inches above the top of the pipe. In some locations, in the opinion of the District, existing backfill material may be used as bedding. Where the excavation is required below the normal grade line because of poor soil conditions, the base shall be course sand or crushed rock. Bedding material shall be course sand. Compaction of the trench backfill must be by mechanical tamping to a density of 95 percent as required by the Lakewood Water District. All road crossings must conform to City of Lakewood specifications.

l. DETECTABLE MARKING TAPE

(1) Detectable marking tape shall be installed along the entire length of the water main, buried a maximum of 12 inches below final grade. Tape shall consist of inert polyethylene plastic that is impervious to all known alkalis, acids, chemical reagents, and solvents likely to be encountered in the soil. Tape shall blue and have a metallic foil core. Tape shall be imprinted continuously over its length with "WATER" and "CAUTION" in permanent black ink, prominently shown. The width of the tape shall be as recommended by the manufacturer based on the depth of installation.

m. HORIZONTAL DIRECTIONAL DRILLING

(1) The Contractor may use a lubricant to ease the pipe installation. Bentonite may be used and should consist of a refined, processed, natural, high-swelling, montmorillonite clay containing polymers and admixtures as necessary. Any lubricant used shall be a safe, non-toxic, non-contaminating product suitable for exposure to groundwater.

(2) The Contractor shall select, design, and engineer the equipment necessary to install the pipe as specified and as shown on the Plans. The directional drilling machine, cutting head, spoils control system, guidance control system, power supply, installation and removal systems, shaft location and configuration, shoring system, and other necessary items shall be designed by the Contractor for the specific application intended. The Contractor shall make all necessary arrangements for obtaining water at their expense.

(3) Contractor will supply portable mud tanks or construct temporary mud pits within the easement limits to contain excess drill fluids during construction. All drilling fluids shall be disposed of off-site at a legal dump site.

(4) The Contractor shall pull the HDPE pipe through the excavated hole in a manner that will not damage, degrade, crack, scratch, or deform the pipe as to prevent its capability of maintaining working pressure and allowable surge pressure as dictated by the manufacturer.

(5) The Contractor shall provide adequate protection at the head of the pipe string prior to beginning the pulling operation to prevent damage to the pipe from tensile or other forces. Contractor shall provide adequate support rollers for the pipe during pullback to prevent damage to the pipe.

(6) Contractor will continuously monitor the longitudinal pulling forces during pipe pullback and shall limit the longitudinal pull on the pipe so that the finished installation can withstand working and surge pressures of the potable water it will carry as well as external forces from soil and stream water loads.

(7) The Contractor shall maintain the integrity of the pipe, existing utilities, and adjoining properties during installation.

(8) The pipe shall be installed within the property lines as shown on the Plans. The vertical location of the pipe shall meet the minimum cover requirements specified in the Plans. The Contractor shall monitor pipe installation and immediately notify the Owner during installation if the pipe has not been installed within the specified tolerances. Upon request, the Contractor shall provide the Engineer with field notes, survey data, and other information the Contractor has acquired to determine pipe location. Any pipe installed outside of the specified tolerances shall be replaced at the Contractor's expense.

(9) Alignment tolerances shall be within 5 feet plus or minus vertically and without limit horizontally except that it must be at all times within the limits shown on the Plans.

(10) Any pipe section that has been damaged during construction shall be repaired or replaced at the Contractor's expense. Cracking, buckling, separation, or distortion of the pipe or pipe joints rendering the pipe incapable of working or surge pressures of the finished construction shall constitute damage. All repair procedures shall be designed and stamped by a registered Professional Engineer licensed in the state of Washington and submitted to the Owner for approval. The Contractor's Engineer shall certify in writing that the repair was performed under their direct supervision and equals or exceeds the design strength of the pipe.

(11) In the event the Contractor must abandon the drill hole before its completion, the Contractor shall seal the borehole and re-drill. Costs for such actions shall be dictated by the Schedule of Prices.

(12) Upon complete installation of the HDPE pipe and end fittings and prior to connections to other pipe, the pipe shall be tested under a hydrostatic pressure test in strict accordance with the manufacturers' procedures for pressure testing. All equipment, fittings, and supplies necessary for performing the test shall be furnished and operated by the Contractor.

n. PIPE BURSTING

(1) An itemized list detailing the installation procedures to be used shall be submitted. This shall include estimated times for each task, the number of required excavations, and any other items unique to each process.

(2) Polyethylene pipe joining shall be performed by personnel trained in the use of thermal butt-fusion equipment and recommended methods for new pipe connections. Electrofusion shall not be used unless specifically permitted by the Engineer. Personnel directly involved with installing the new pipe shall receive training in the proper methods for handling and installing the polyethylene pipe. Training shall be performed by a qualified representative.

(3) Any nationally recognized standards for pipe bursting shall be submitted.

(4) All related ASTM standards or any nationally recognized standards for HDPE pipe shall be submitted.

(5) Detailed description and physical properties of any lubricants to be used for pipe bursting shall be submitted for the Engineer's approval.

(6) Pipe Bursting shall be in accordance with the following requirements:

(a) The Contractor shall provide temporary overland service to the connections and must maintain water service to customers at all times.

(b) Insertion and Reception Pits- Insertion and reception pits shall be excavated to allow for the launch and termination of the new pipe with the pipe bursting equipment.

(c) Pipe Joining: The polyethylene pipe shall be assembled and joined at the site using the thermal butt-fusion method to provide a leak proof joint. Threaded or solvent-cement joints and connections are not permitted. The electrofusion method shall not be used unless specifically permitted by the Engineer.

(d) All equipment and procedures used in thermal butt-fusion shall be used in strict compliance with the manufacturer's recommendations. Fusing shall be accomplished by personnel certified as fusion technicians by a manufacturer of polyethylene pipe and/or fusing equipment. The Contractor shall submit copies of certification cards of employees to be performing HDPE fusion work. All certifications must be current.

(e) The butt-fused joint shall be properly aligned and shall have uniform roll-back beads resulting from the use of proper temperature and pressure. The joint surfaces shall be smooth. The fused joint shall be watertight and shall have tensile strength equal to that of the pipe. All joints shall be subject to acceptance by the Engineer and/or his representative prior to insertion. All defective joints shall be cut out and replaced at no cost to the District. Any section of the pipe with a gash, blister, abrasion, nick, scar, or other deleterious fault greater in depth than ten percent (10%) of the wall thickness, shall not be used and must be removed from the site. However, a defective area of the pipe may be cut out and the joint fused in accordance with the procedures stated above. In addition, any section of pipe having other defects such as concentrated ridges, discoloration, excessive spot roughness, pitting, variable wall thickness or any other defect of manufacturing or handling as determined by the Engineer and/or his representative shall be discarded and not used. All fused HDPE pipe joints shall be internally debeaded.

(f) The pipe bursting method shall at least consist of a bursting head, which will be pulled through the existing pipe to break it into fragments and form a tunnel for the new pipe. The maximum outside diameter of the bursting head shall be greater than the maximum inside diameter of the existing sewer pipe, and shall form a tunnel with a maximum diameter no larger than the maximum outside diameter of the new pipe.

(g) The new pipe shall be installed to match the alignment and invert of the existing pipe with some lowering allowance due to varied diameters of the new and existing pipe.

(h) Equipment used to perform the work shall be located away from residences as much as possible, so as to lessen the noise impact. Provide silencers or other devices to reduce machine noise as required to meet requirements.

(i) The Contractor shall install all pulleys, rollers, bumpers, alignment control devices and other equipment required to protect the pipe from damage during installation. Lubrication may be used as recommended by the manufacturer. Under no circumstances will the pipe be stressed beyond its yield stress.

o. DESIGN/CONSTRUCTION SPECIFICATIONS & STANDARDS

(1) The applicable provisions in the current Lakewood Water District *DESIGN/CONSTRUCTION SPECIFICATIONS & STANDARDS* (available on the District's Website) shall apply for any issues not covered or clear within the Project Specifications.

END OF SECTION 02713