SECTION 02050

DEMOLITION AND REMOVALS

PART 1 - GENERAL

1.01 DESCRIPTION

The work of this Section describes requirements for the demolition, abandonment, removal, salvage and disposal of existing facilities or improvements as necessary for the performance of the Work in accordance with the Contract Documents. Demolition and removal work shall conform to the applicable Sections of these Specifications.

1.02 RELATED SECTIONS

A. Section 01354 – Hazardous Material Procedure

B. Section 01610 – Transporting and Handling Materials and Equipment

C. Section 01560 – Temporary Environmental Controls

1.03 REFERENCE STANDARDS

A. Except as otherwise indicated in this Section, the Contractor shall comply with the latest edition of the Standard Specifications for Public Works Construction.

1.04 SUBMITTALS

A. Affidavit of Compliance: Prior to commencing with demolition work, the Contractor shall submit an affidavit of compliance to the District detailing the final disposition for items and materials to be removed from the site. Said affidavit shall list the locations of all disposal sites utilized, and shall include the Contractor's certification that those sites are legal for the disposal of the subject items or materials. The affidavit shall include a similar list of recyclers and Contractor's certification, if utilized.

B. Receipts: The Contractor shall submit receipts from all disposal sites and recyclers utilized for the disposal of materials removed from the site. Said receipts shall account for the entire quantities of all materials removed from the site.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 RECORD DOCUMENTS

The Contractor shall obtain copies of available record drawings at Contractor’s expense and review the documents in order to familiarize himself with the existing conditions and facility operations prior to commencing with the work of this Section or this Contract, and to schedule and complete the required demolition and construction operations necessary within the specified number of working days.

3.02 ISOLATION OF PIPELINES

The District will operate all valves required for isolation of any facilities to be demolished or removed, or for new pipeline connections. Some water flow-by may occur through closed valves and the Contractor will be required to manage the water during the Work. The Contractor shall provide 14-calendar days advance notice to the District for isolation of facilities which must include an approved plan at that time. See Section 01043 for coordination with District Operations.

3.03 PROTECTION OF ITEMS TO REMAIN

A. The Contractor shall be responsible to protect from damage any items not noted for removal including, but not limited to, existing vegetation and landscaping, electrical and mechanical equipment, above- or below-grade structures, or piping.

B. The Contractor shall repair or replace items that are not noted for removal and that are damaged by the Contractor's operations during any phase of the Work to the satisfaction of the District and at Contractor's expense.

3.04 SALVAGE BY DISTRICT

A. The District may wish to salvage certain items of existing equipment and may perform its salvage operations with its own forces prior to the Contractor’s initiation of demolition work.

B. The following shall not entitle the Contractor to any additional compensation:

1. The District's election to perform its salvage operations after the date and time of bid opening.

2. The District’s election to salvage items after the Contractor has initiated demolition work.

3. The District’s election to not salvage items that are noted for salvage in the Contract Documents or are otherwise implied as being subject to salvage.

4. Salvage of items by the District that are not shown on the Drawings.

3.05 SALVAGE BY CONTRACTOR

A. The Contractor shall obtain written notification from the District that salvage operations are complete prior to proceeding with demolition or salvage work.

B. All equipment remaining after the District's salvage operations are completed shall be salvaged or removed and disposed of by the Contractor at the Contractor’s expense.

C. Items to be salvaged shall be removed and handled with care to prevent damage and transported to a storage area designated by the District. Damage to salvaged items resulting from the Contractor’s operations shall be repaired or replaced to the satisfaction of the District and at the Contractor’s expense.

D. The list of items to be salvaged by the Contractor for the District is as follows:

1. _____

3.06 DEMOLITION, REMOVAL, AND ABANDONMENT

A. The Contractor shall comply with all pertinent regulations of OSHA and local codes and practices.

B. Conduits or structures shall not be abandoned until their use is no longer required. The Contractor shall notify the District in advance of the intended culvert or pipe abandonment.

C. The Contractor shall demolish or dismantle and remove all items that are noted for demolition and removal in the Contract Documents and that will interfere with the planned construction, or as otherwise ordered by the District.

D. The Contractor shall demolish, or dismantle and remove, all abandoned conduits or structures that are encountered during the prosecution of the work and which interfere with the construction of the work upon the approval of the District. The voids or openings resulting from the removal of a portion of a conduit or structure shall be plugged with concrete at least 6 inches thick in accordance with SSPWC Section 306-5.

E. Conduits that are proposed to be abandoned in place shall be cut at the limits of the abandonment and shall be plugged with concrete at least 6 inches thick in accordance with SSPWC Section 306-5.

F. When slurry filling of conduits is specified on the plans or ordered by the District, the conduits shall be abandoned by injecting cement-aggregate slurry conforming to SWPWC Class 100-E-100 concrete or a 2-sack, cement-sand slurry to completely fill the conduit. The slurry shall be placed by the tremie method through openings in the conduit that are spaced at least every 200 feet along the conduit or as approved by the District to allow for complete filling of the conduit. The Contractor shall verify that the volume of slurry injected into the conduit is sufficient to fill the conduit within the limits of abandonment.

G. If an existing water line that was previously connected to the cut-and-plugged line will be re-pressurized, the open end of the line to remain active shall receive a plug, cap or blind flanged and a thrust block shall be cast behind the plug, cap or blind flange in accordance with the District's standard drawings or as approved by the Engineer.

H. Where valves, blow-offs, or other appurtenances are to be abandoned or are connected to conduits that are to be abandoned, all surface and above-ground components shall be removed to a depth of one foot below grade. All below-grade piping shall be plugged or capped at the cut end. Valve well covers shall be removed and salvaged to the District and valve wells shall be slurry filled with a 2-sack, cement-sand slurry to allow for paving after the slurry has attained sufficient strength. Paving is to be repaired in like kind to the satisfaction of the agency having jurisdiction over the street or the District, and the paving thickness shall exceed the thickness of the existing pavement by one inch.

I. The site shall be kept neat and orderly during the demolition to the maximum extent practical. Public right-of-way and private property shall be kept free of debris at all times. Stockpiles of demolished items or materials shall be removed from the site on a

daily basis or stored in waste containers which shall be emptied on a weekly basis or as conditions require in order to manage the accumulation of waste. Accumulations of flammable materials shall not be permitted.

J. Unless otherwise indicated in the bid schedule, payment for demolition and removal shall be included in the contract price for the item of work for which such demolition or removal is appurtenant thereto and no separate payment shall be made.

3.07 DISPOSAL AND RECYCLING

A. All items removed from the site shall be transported to and disposed of in a legal manner. All disposal sites and recycling facilities shall be approved by the District prior to initiation of the Work.

1. Concrete or asphalt concrete debris shall be transported to a recycler of such materials.

2. Hazardous materials shall be handled and disposed of in accordance with all applicable laws, codes, and regulations. Contractor shall refer to Section 01354 Hazardous Material Procedure.

END OF SECTION

SECTION 02130

REMOVAL AND RESURFACING OF PAVEMENT SURFACES

PART 1 – GENERAL

1.01 DESCRIPTION

A. Street pavement and surfaces shall be removed and replaced in conformance with details shown on the Plans and as specified herein. Resurfacing of existing pavement and surfaces damaged or removed in connection with the construction of project improvements, including all appurtenances, shall conform to the provisions of permits issued by the local governing body, agency or association having jurisdiction of public and private streets for Work performed within the rights-of-way of the respective governing body, agency or association (i.e., County of San Diego).

1.02 RELATED WORK DESCRIBED ELSEWHERE

The Contractor shall refer to the following Specification Section(s) for additional requirements:

A. Section 01570 – Traffic Regulations

B. Section 02200 - Earthwork

C. Section 02223 – Trenching, Backfilling and Compaction

D. Section 02510 - Asphalt Concrete Pavement

E. Section 03300 - Cast-in Place Concrete

1.03 SUBMITTALS

A. Submittals shall be provided as required in the related section(s) of the Specifications for the appropriate material.

PART 2 – MATERIALS AND EXECUTION

2.01 EARTHWORK

A. Earthwork shall conform to the provisions of the standard specifications.

2.02 PAVEMENT REMOVAL

A. General: Pavement or existing road surfacing shall be removed as noted on the plans and as specified herein prior to proceeding with excavation operations. Surplus material shall be removed and disposed of at Contractor's expense as specified. Prior to removal of existing surfacing, pavement cuts for pipelines shall be made as shown on the Plans and/or specified herein. All pavement cuts for pipelines shall be neat and straight along both sides of the trench and parallel to the alignment of the pipe to provide an unfractured and level pavement joint for bonding existing surfacing with pavement replacement.

Where saw cut edges are damaged subsequent to saw cutting, the edges shall again be saw cut to neat, straight lines prior to resurfacing operations. All cut edges shall provide clean, solid vertical faces free from all loose material. Where large irregular surfaces are removed, such trimming or cutting as hereinafter provided shall be parallel to the roadway centerline or at right angles to same. All cut edges shall provide clean, solid vertical faces free from all loose material.

B. Portland Cement Concrete Surfaces: Concrete pavement, including cross gutters, curbs and gutters, sidewalks, driveways, and concrete surfaces of whatever nature, shall be saw cut to a minimum depth of two inches (2") prior to removal in accordance with details shown on the Plans or as specified herein. Said saw cut shall be made at the edge of the trench and/or excavation. If a saw cut falls within 3 feet of a construction joint, cold joint, expansion joint, or edge, the concrete shall be removed to the joint or edge. With the written permission of the Engineer, pneumatic tools or other approved equipment may be used to cut concrete pavement within the limits of the excavation. In such an event, saw cuts as provided herein, shall be made after backfilling and the additional (remnant) concrete pavement shall be removed and disposed of by the Contractor at his expense prior to resurfacing.

C. Plant Mix Surfacing (Asphalt Concrete Pavement): Areas surfaced with asphalt concrete pavement shall be initially saw cut at the limits of the trench and/or excavation prior to removal of surfacing. Pavement saw cutting within the right-of-way of the roads will be as required by local governing bodies.

D. Road-Mixed Surfacing: Areas surfaced with road-mixed surfacing shall be cut at the limits of the trench and/or excavation prior to removal of existing surfacing. Cuts may be made with pneumatic tools or other approved equipment. Additional trimming of pavement edges prior to resurfacing may be required by the agency having jurisdiction over the roadway.

2.03 ASPHALT CONCRETE RESURFACING

A. In all areas in which the surface is removed, broken or damaged by equipment, or in which the ground has caved in or settled due to the installation of the improvements, the surface shall be restored to the original grade and crown section by the CONTRACTOR at its own expense. In the absence of specific designation on the Plans, and where the street has been improved with roadway surface, base course, curb, sidewalk or gutter, trenches, or damaged sections shall be restored with the type of improvement conforming to that which existed at the time the CONTRACTOR entered upon the work. Prior to resurfacing, the existing surface shall be removed as provided above. All work shall match the appearance of the existing improvements and finished pavement shall not deviate from existing grade by more than 1/8-inch in 10-feet and shall be free from ruts, depressions and irregularities. Where large irregular surfaces are to be resurfaced, existing surfacing shall be cut and removed as provided herein. Asphaltic emulsion per the standard specifications shall be applied to the vertical faces of all asphaltic concrete pavements against which the pavement replacement materials are to be placed. The completed surface, when ready for acceptance, shall be thoroughly compacted, true to grade and cross section, and shall be free from ruts, depressions and irregularities.

B. Resurfacing of asphalt concrete shall be per San Diego Regional Standard Drawings or City of Escondido Standard Drawings G-2-E, G-3-E,G-4-E, G-5-E and/or G-6-E as applicable.

C. Prior to resurfacing, the existing surfacing shall be removed as provided above. All Work shall match the appearance of the existing improvements.

D. Asphalt concrete construction shall conform to Section 02510.

E. Trench paving shall overlap at least twelve inches (12") on each side of the trench and shall be hand raked prior to compaction so that the overlapped section will join smooth and neat with the existing pavement. The resulting contact edge between the new and existing pavement on each side of the trench shall parallel the existing trench centerline and result in a straight and neat join line.

2.04 RESURFACING OF CONCRETE SURFACES

A. Unless otherwise specified, portland cement concrete pavement surfaces shall be replaced in kind with 560-C-3250 concrete to a thickness equal to that removed, or as specified on the plans. Aggregate base, if it exists beneath the existing portland cement concrete paving, shall be replaced to a thickness equal to the existing or as specified on the plans.

B. Portland Cement concrete sidewalks and driveways shall be replaced to the nearest score line or over a sufficient width to replace any portions of the sidewalk or driveway damaged, fragmented, cracked or otherwise made unusable as a result of construction operations. Minimum thickness of concrete shall be 4-inches in walkways, 6-inches in residential driveways, and 8-inches in commercial driveways.

2.05 PORTLAND CEMENT CONCRETE

A. Portland cement concrete for the reconstruction of existing surface improvements in accordance with San Diego Regional Standards and shall conform to the concrete class specified for the type of construction in accordance with Section 201-1.1.2 of the Standard Specifications for Public Works Construction (SSPWC or Greenbook), latest edition..

B. Portland cement concrete shall be placed to the limits of pavement removal applicable to portland cement concrete surfaces as specified in this Section.

2.06 TEMPORARY PAVING (HOT MIX) AND DETOURS

A. All pavement removal for trenching operations shall be replaced with a minimum of 4-inches of compacted temporary asphalt concrete as specified above after aggregate base compaction is approved by the geotechnical engineer. Cold mix will not be allowed under any circumstances.

B. Cross streets and all accesses shall be paved with temporary pavement on the same day that excavation is made. Temporary pavement shall be maintained so that a smooth traversable surface is available at all times for vehicular traffic, free from ruts, depressions, holes, and loose gravel. Cost for detours and temporary paving shall be at the CONTRACTORS expense.

PART 3 – EXECUTION

3.01 GRINDING

A. All grinding for recessed trench plating and asphalt concrete overlay shall be accomplished per the standard specifications.

3.02 TEMPORARY SURFACING

A. The CONTRACTOR shall promptly place temporary surfacing on all areas where existing surfacing has been disturbed and shall maintain such surfacing for the period of time required by the DISTRICT. Temporary resurfacing shall be constructed in accordance with the following requirements.

1. The subgrade shall be uniformly watered sufficiently to eliminate all dust, but not to such extent as to form mud or pools of water. The street and surrounding area shall be cleared of rubbish and debris. The street shall be swept with a power sweeper with spray nozzle and the surrounding area shall be cleaned thoroughly, at least weekly, or more frequent as conditions dictate.

2. The temporary resurfacing shall then be spread over the prepared foundation material and rolled with an 8-ton tandem roller in such a manner that after rolling, the temporary resurfacing shall present a smooth surface for traffic, shall not be less than 4-inches in compacted thickness and shall be maintained free from bumps and depressions until permanent resurfacing is placed. The finished surface of said temporary resurfacing shall be flush with the adjoining pavement grade.

3. The temporary resurfacing shall be left in place until permanent resurfacing is constructed.

3.03 PERMANENT RESURFACING

A. In order to obtain a satisfactory junction with adjacent surfaces, the CONTRACTOR shall grind 12-inches beyond the saw cut edges to a depth of 1-1/2 inches so as to provide a clean, sound, vertical joint before permanent replacement of an excavated or damaged portion of pavement. Damaged edges of pavement along excavations and elsewhere shall be trimmed back by saw cutting in straight lines. All pavement restoration and other facilities restoration shall be constructed to finish grades compatible with adjacent undisturbed pavement. CONTRACTOR is responsible for the replacement of traffic detector loops damaged or removed during construction which are associated with existing traffic controls.

3.04 RESTORATION OF SIDEWALKS OR PRIVATE DRIVEWAYS

A. Wherever sidewalks or private roads have been removed for purposes of construction, the CONTRACTOR shall place suitable temporary sidewalks or roadways promptly after backfilling and shall maintain them in satisfactory condition and the CONTRACTOR shall maintain said temporary sidewalks or roadways until the final restoration thereof has been completed. The sidewalks or driveways shall be removed and replaced in kind to the nearest joint.

END OF SECTION

SECTION 02140

DEWATERING

PART 1 - GENERAL

1.01 DESCRIPTION

A. This Section includes materials, installation, maintenance, operation, and removal of temporary dewatering systems. The Contractor shall perform site dewatering necessary to lower and control groundwater levels and hydrostatic pressures to allow excavation and construction to be performed properly under drained and stable conditions.

B. Dewatering operations shall be adequate to provide worker protection and the protection of the work. The responsibility for conducting the dewatering operation in a manner which will protect the Work and adjacent structures and facilities rests solely with the Contractor. The cost of repairing any damage to adjacent structures and restoration of facilities shall be the responsibility of the Contractor.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 02223 – Trenching, Backfilling and Compaction

B. Section 02270 – Temporary Soil Erosion and Sediment Control

1.03 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. For projects that create more than one acre of ground disturbance area, the Contractor shall develop and implement a site-specific Storm Water Pollution Prevention Plan (SWPPP) and comply with all aspects of the Storm Water General Permit in accordance with Section 02270.

B. For projects that create one acre or less of ground disturbance area, the Contractor shall prepare a Water Pollution Control Plan or other stormwater management plan meeting the requirements of the County of San Diego stormwater ordinances, as applicable, in accordance with Section 02270.

C. The Contractor shall obtain all required permits and approvals and comply with California Regional Water Quality Control Board General Waste Discharge Requirements for Groundwater Remediation and Dewatering Waste Discharges.

D. Prior to pipeline flushing and/or dewatering operations, the Contractor shall file a Notice of Intent with the California Regional Water Quality Control Board under applicable conditional waivers for the discharge of water from pipelines.

E. The Contractor shall obtain all required permits and approvals and comply with the California Regional Water Quality Control Board General Waste Discharge Requirements for Groundwater Remediation and Dewatering Waste Discharges.

1.04 CONTRACTOR SUBMITTALS

A. The Contractor shall submit the following in accordance with Section 01300:

1. Before starting excavation in areas of known or anticipated groundwater, the Contractor shall submit Shop Drawings including a detailed plan, schedule, and description of the dewatering of excavations. The Shop Drawings shall include: the proposed type of dewatering system; the arrangement, location, and depths of system components; a complete description of the equipment and instrumentation to be used with installation, operation and maintenance procedures; a description of the Contractor's means and methods for measuring groundwater levels and piezometric water levels; and the methods for disposal of dewatering effluent.

2. Before starting excavations below groundwater, the Contractor shall submit copies of well installation permits.

3. Before starting excavations below groundwater, the Contractor shall submit copies of its permit for dewatering discharges to the local sewer agency or Regional Water Quality Control Board permit for dewatering discharges to the environment, whichever is applicable.

4. The Contractor shall submit copies of well destruction permits, as applicable.

B. The Contractor shall submit a daily report that includes the following information:

1. Groundwater levels and piezometric water levels in observation wells (if any).

2. Changes in elevation of settlement monitoring points to detect settlement in adjacent structures.

3. The average dewatering flow rate.

4. Water quality test results as required by the Regional Water Quality Control Board or local sewer agency, as applicable.

1.05 QUALITY ASSURANCE

A. These provisions shall apply continuously during the construction of the work.

B. The Contractor shall conduct a demonstration of the proposed dewatering system and shall provide verification that adequate personnel, materials and equipment are available.

C. The Contractor shall maintain adequate control to ensure that the stability of excavated or constructed slopes is not adversely affected by water, that erosion is controlled, and that flooding of excavations or damage to structures does not occur.

D. Where critical structures or facilities exist immediately adjacent to areas of proposed dewatering, the Contractor shall establish points for settlement monitoring and shall observe these points at frequent intervals to detect any settlement which may occur. The monitoring frequency shall be determined based on recommendations of the soils engineer or District, the nature of the critical structure or facility, and the distance from

the excavation. The minimum frequency shall be twice per working day (once at the beginning of the work day and once at the conclusion of the work day).

E. The Contractor shall comply with Regional Water Quality Control Board or local sewer agency requirements for any discharge of groundwater to the environment or sanitary sewer, whichever is applicable. The Contractor shall comply with Regional Water Quality Control Board Waste Discharge requirements under the latest applicable Board Orders. Before starting dewatering operations, the Contractor shall obtain authorization, as required, for the disposal of groundwater. The Contractor shall comply with all applicable sampling, testing, monitoring, and reporting requirements.

1.06 DESIGN CRITERIA

A. Dewatering, treatment, and disposal of water shall be performed in conformance with all applicable local, state, and Federal laws and permits issued by Jurisdictional Regulatory Agencies.

1. A permit is required from the Regional Water Quality Control Board for discharge of groundwater to storm drains or surface waters.

2. Sewer systems shall not be used as drains for dewatering trenches or excavations, nor for disposal of collected or accumulated groundwater, without the approval of the Agency of Jurisdiction.

3. Groundwater shall not be applied to land without the approval of the landowner or the Agency of Jurisdiction.

PART 2 - PRODUCTS

2.01 MATERIALS AND EQUIPMENT

A. Dewatering, where indicated, includes well points, sump pumps, temporary pipelines for water disposal, rock or gravel placement, observation wells and other means including standby pumping equipment maintained on the jobsite continuously.

B. The Contractor shall provide piezometers for monitoring groundwater levels. The Contractor shall provide other instruments and measuring devices as required.

PART 3 - EXECUTION

3.01 GENERAL REQUIREMENTS

A. The site shall be graded to facilitate drainage and runoff shall be diverted from the excavation. Surface runoff shall be collected in shallow ditches around the perimeter of the excavation, drained to sumps, and pumped or drained by gravity away from the excavation.

B. The Contractor shall install and maintain an adequate system to lower and control the groundwater to permit excavation, construction of structures, and placement of fill or backfill materials to be performed under drained and stable conditions.

C. Sufficient dewatering equipment shall be installed to pre-drain the water-bearing strata below the bottom of foundations, drains, sewers and other subsurface structures or excavations.

D. The hydrostatic head in water-bearing strata below foundations, drains, sewers, pipelines and other subsurface structures or excavations shall be reduced to below the structure or excavation subgrade at all times.

E. The system shall be placed into operation before excavation below groundwater level is started. The system shall be operated continuously 24 hours a day, 7 days a week until drains, sewers and structures have been constructed, fill or backfill materials have been placed, and dewatering is no longer required.

F. Dewatering shall at all times be conducted to preserve the undisturbed bearing capacity of the subgrade soils at proposed bottom of excavation. Provide and maintain means and devices to remove and dispose of all water entering the excavation during pipe laying, until cement mortar of pipe joints has set hard, during concrete placement and initial curing, and during backfill placement.

G. Do not drain trench water through the pipeline under construction.

H. Flotation of structures and facilities shall be prevented by maintaining a positive and continuous removal of water from locations which will not create an adverse hydraulic gradient beneath or adjacent to the structures.

I. If foundation soils are disturbed or loosened by the upward seepage of water or an uncontrolled flow of water, the affected areas shall be excavated and replaced with drain rock at no additional cost to the District.

J. If well points or wells are used, they shall be adequately spaced to provide the necessary dewatering and shall be sandpacked and/or other means shall be used to prevent pumping of fine sands or silts from the subsurface. The Contractor shall continuously monitor the dewatering operation for indications of subsurface soil migration and shall make necessary adjustments as warranted with notice to the Engineer.

K. Water and debris shall be disposed of in a legal manner in compliance with permit requirements and SSPWC Subsection 306-3.3 without damage to adjacent property. No water shall be drained into Work built or under construction. Before disposal, water shall be filtered to remove sand and fine soil particles and treated in accordance with permit requirements.

L. The release of groundwater to its original level shall be performed in a manner that avoids disturbance of foundation soils, prevents disturbance of compacted backfill, and prevents flotation or movement of structures.

M. Provide and maintain means and devices to remove and dispose of all water entering the trench excavation during the time the trench is being prepared for the pipe laying, during the laying of the pipe, until cement mortar of exterior joints has set hard, when concrete is being deposited and during the hydration process, and until the backfill at the pipe zone and trench zone has been completed.

END OF SECTION

SECTION 02200

EARTHWORK

PART 1 - GENERAL

1.01 WORK OF THIS SECTION

A. The CONTRACTOR shall provide all labor, equipment, materials and incidentals to perform all earthwork required for construction of the work as shown on the approved plans and as specified herein. Work includes the loosening, removing, loading, transporting, depositing, and compacting all soil, rock, and other earth materials, wet and dry. The CONTRACTOR shall comply with all local, state, and federal safety and health standards, laws and regulations.

B. The CONTRACTOR shall refer to the related Section for excavations for pipelines and structures.

1.02 DEFINITIONS

A. Fill material is defined as material used to raise the level of a portion of the site to the line and grade indicated.

B. Backfill material is defined as material used to refill an excavation. Backfill material is defined as starting 1 foot above the top of the pipe or conduit, or at the subgrade for cast-in-place structures such as vaults and valve boxes.

1.03 RELATED SECTIONS

A. The Work of the following Sections applies to the Work of this Section. Other Sections, not referenced below, shall also apply to the extent required for proper performance of this Work:

1. Section 01300 - Shop Drawings and Submittals
2. Section 02140 - Dewatering
3. Section 02222 - Protecting Existing Underground Utilities
4. Section 02223 - Trenching, Backfilling, and Compacting

1.04 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. Except as otherwise indicated in this Section, the CONTRACTOR shall comply with the latest adopted edition of the Standard Specifications for Public Works Construction (SSPWC) together with the latest adopted editions of the Regional and Supplement Amendments. Pipe zone and base material will conform in all respects to the latest edition of the DISTRICT Standards.

B. The Work of this Section shall comply with current versions, with revisions, of the following:

1. California Building Code.

2. Construction Safety Orders, Division of Industrial Safety, State of California.

3. California Department of Transportation Traffic Manual.

1.05 CONTRACTOR SUBMITTALS

A. The CONTRACTOR shall submit the following in compliance with the related Sections:

1. A copy of this specification section, with addendum updates included, and all referenced and applicable sections, with addendum updates included, with each paragraph check-marked to indicate specification compliance or marked to indicate requested deviations from specification requirements. Check marks shall denote full compliance with a paragraph as a whole. If deviations from the specifications are indicated, and therefore requested by the CONTRACTOR, each deviation shall be underlined and denoted by a number in the margin to the right of the identified paragraph, referenced to a detailed written explanation of the reasons for requesting the deviation. The remaining portions of the paragraph not underlined will signify compliance on the part of the CONTRACTOR with the specifications. The DISTRICT shall be the final authority for determining acceptability of requested deviations. Failure to include a copy of the marked-up specification sections, along with justification(s) for any requested deviations to the specification requirements, with the submittal shall be sufficient cause for rejection of the entire submittal with no further consideration.

2. The CONTRACTOR's detailed plan showing the design and calculations for all shoring, bracing, sloping of the sides of excavation, or other provisions for worker protection against the hazard of caving ground during the excavation of trenches or structure excavation. The CONTRACTOR’s detailed plan shall include a description of the methods, schedule and equipment, including trench shields, to be used for earthwork operations. The CONTRACTOR’S plan shall identify the locations of temporary soil stockpiles. The CONTRACTOR’s detailed plan shall be submitted before starting any trench or structure excavation 5-feet deep or over. The CONTRACTOR shall be in possession of the DISTRICT's written acceptance of the detailed plan before starting any trench or structure excavation 5-feet deep or over. If the CONTRACTOR’s detailed plan varies from the shoring system established in the Construction Safety Orders of the State of California, the CONTRACTOR’s detailed plan shall be prepared and signed by a civil or structural engineer licensed in the State of California.

3. A copy of the excavation permit issued by the California Department of Industrial Safety.
4. Samples of imported material in accordance with SSPWC Subsection 306-1.3.5.
5. Such other samples of materials as the DISTRICT may require.
6. An agricultural soil evaluation about the suitability of proposed topsoil.

PART 2 - PRODUCTS

2.01 FILL AND BACKFILL MATERIALS

A. General: Fill and backfill material shall consist of select material obtained from the excavation, imported material, bedding material, or unclassified material. The CONTRACTOR shall import, at his own expense, materials in excess of the approved material obtained from excavation as required to complete the fill, backfill, and grading work as indicated.

B. Select Material: Select material shall consist of primarily granular material obtained from the excavation which is free of vegetation, organic matter, rubbish, debris, rocks larger than 4-inches in diameter and other unsuitable material, has an expansion index less than 30 (less than 20 for footings and floor slabs), has a plasticity index of 10 or less, has a liquid limit of 30 or less, and is approved as select material by the DISTRICT.

C. Imported Material: Imported material shall conform to the same specifications as select material defined above. In addition, the imported materials shall comply with SSPWC subsection 306-1.3.5. Imported material placed in areas to be planted shall be able to support normal plant growth. The CONTRACTOR shall obtain approval by the DISTRICT before transporting imported material.

D. Unclassified Material: Unclassified material shall conform to SSPWC Subsection 300-4.

2.02 ROCK PRODUCTS

A. Rock products, consisting of crushed rock, rock dust, gravel, sand, and stone for riprap shall be clean, hard, sound, durable, uniform in quality and free of disintegrated material, organic matter, oil, alkali, or other deleterious substance, and shall unless otherwise specified conform to the requirements of SSPWC Subsection 200-1, including the Regional and Supplement Amendments.

2.03 UNTREATED BASE MATERIALS

A. Untreated base materials shall conform to the requirements of SSPWC Subsection 200-2.

B. Materials for use as untreated base or subbase shall be:

1. Crushed Aggregate Base.

2.04 TOPSOIL

A. Topsoil shall be designated as Class A (imported) and shall conform to the requirements of SSPWC Subsection 212-1.1. The CONTRACTOR shall submit an agricultural soil evaluation regarding the suitability of the proposed topsoil.

PART 3 - EXECUTION

3.01 GENERAL

A. The CONTRACTOR shall perform earthwork as necessary to complete the work as shown on the Contract Drawings and specified herein. The CONTRACTOR shall take the necessary precautionary measures to prevent dust or other nuisances which might be created by reason of its activities.

B. All types of earthwork, including trench, structural and general excavation, fill, backfill and compaction, shall conform to applicable requirements of the SSPWC Section 300 and to the requirements of the Contract Documents.

C. Pursuant to California Code of Regulations, Title 8, Section 1541, the CONTRACTOR shall notify the Regional Notification Center and known owners of underground facilities in the area who are not members of the Regional Notification Center of the proposed excavation at least two working days before the start of excavation.

3.02 SITE PREPARATION

A. Areas to be excavated, filled, graded, or to be occupied by permanent construction or embankments shall be prepared by clearing, grubbing, and stripping. Clearing, grubbing, and stripping shall conform to the applicable requirements of SSPWC Subsection 300-1. The CONTRACTOR shall provide for a Storm Water Pollution Prevention Plan in accordance with the requirements of the related Section.

3.03 EXCAVATION

A. General: Except when specifically provided to the contrary, excavation shall include the removal of all materials of whatever nature encountered, including all obstructions of any nature that would interfere with the proper execution and completion of the work. Unless otherwise directed, the removal of said materials shall conform to the lines and grades shown. Unless otherwise provided, the entire construction site shall be stripped of all vegetation and debris, and such material shall be removed from the site prior to performing any excavation or placing any fill. The CONTRACTOR shall furnish, place, and maintain all supports and shoring that may be required for the sides of the excavations, and all pumping, ditching, or other measures for the removal or exclusion of water as required by the standard specifications, Dewatering. Excavations shall be sloped or otherwise supported in a safe manner in accordance with the rules, orders, and regulations of the Division of Industrial Safety of the State of California.

B. Unclassified Excavation: Unclassified excavation shall consist of all excavation, including roadways, unless separately designated.

1. Unsuitable material shall be excavated and disposed of in accordance with the requirements of SSPWC Subsection 300-2.2.

2. Wet material, if unsatisfactory for the specified use on the project solely because of high moisture content, may be processed to reduce the moisture content, or may be required to be removed and replaced with suitable material in accordance with the requirements of SSPWC Subsection 300- 2.2.2.

3. The removal and disposal of slide and slipout material shall be in accordance with SSPWC Subsection 300-2.4.

4. Excavation slopes shall be finished in conformance with the lines and grades shown, and in accordance with SSPWC Subsection 300-2.5.

5. Surplus material shall be legally disposed of off-site, and in accordance with SSPWC Subsection 300-2.6.

C. Pipeline and Utility Excavation: See the standard specifications.

D. Excavation in Lawn Areas:

1. Where excavation occurs in lawn areas, the sod shall be carefully removed and stockpiled to preserve it for replacement. Excavated material may be placed on the lawn; provided, that a drop cloth or other suitable method is employed to protect the lawn from damage. The lawn shall not remain covered for more than 72 hours. Immediately after completion of backfilling, the sod shall be replaced in a manner so as to restore the lawn as near as possible to its original condition. CONTRACTOR shall provide new sod if removed sod has remained stockpiled for more than 72 hours.

2. The CONTRACTOR shall restore the lawn irrigation system removed or damaged due to excavation operations to a condition equal to the previous condition.

E. Excavation in Vicinity of Trees: Except where trees are shown to be removed, trees shall be protected from injury during construction operations. No tree roots over 2- inches in diameter shall be cut without written permission of the DISTRICT. Trees shall be supported during excavation by means previously reviewed and accepted by the DISTRICT.

F. Rock Excavation:

1. Rock excavation shall include removal and disposal of the following: (1) all boulders measuring 1/3 of a cubic yard or more in volume; (2) all rock material in ledges, bedding deposits, and unstratified masses which cannot be removed without systematic drilling and blasting; (3) concrete or masonry structures which have been abandoned; and (4) conglomerate deposits which are so firmly cemented that they possess the characteristics of solid rock and which cannot be removed without systematic drilling and blasting.

2. Rock excavation shall be performed by the CONTRACTOR, however, should the quantity of rock excavation be affected by any change in the scope of the work, an appropriate adjustment of the contract price will be made.

3.04 FILL AND BACKFILL

A. General:

1. Backfill shall be placed in accordance with the DISTRICT Design Standards.
2. Backfill shall not be dropped directly upon any structure or pipe. Backfill shall not be placed around or upon any concrete structure until the concrete has cured and has attained sufficient strength to withstand the loads imposed. Backfill around water retaining structures shall not be placed until the structures have been tested, and the structures shall be full of water while backfill is being placed.

B. Placing and Spreading of Materials:

1. Materials shall be placed and spread evenly in layers. When compaction is achieved using hand operated mechanical equipment the layers shall be evenly spread so that when compacted, each layer shall not exceed 4 inches in thickness. When compaction is performed with larger ride-on compaction equipment, the layers shall be spread so that when compacted, each layer shall not exceed 9 inches in thickness. Compaction by using flooding and jetting methods shall not be performed.
2. During spreading, each layer shall be thoroughly mixed as necessary to promote uniformity of material in each layer. Bedding materials shall be brought up evenly around the pipe so that when compacted, the material will provide uniform bearing and side support.
3. Where the material moisture content is below the optimum moisture content water shall be added before or during spreading until the proper moisture content is achieved.
4. Where the material moisture content is too high to permit the specified degree of compaction the material shall be dried until the moisture content is satisfactory.

C. Compaction Requirements

1. The relative compaction of fill, backfill, and base material shall be in accordance with SSPWC Section 300, with the following exceptions:
   a. Subgrade where trench has been over-excavated: 90%
   b. Fill beneath structures, including water-containing structures: 95%
   c. All trench backfill: Minimum 90%. Refer to Contract Drawings and Standard Details.
2. The CONTRACTOR shall be responsible for all costs associated with testing and shall be performed by an approved third party testing laboratory.
3. In case the tests of the fill or backfill show non-compliance with the specified compaction or density requirements, the CONTRACTOR shall accomplish such remedy as may be necessary to assure compliance. The CONTRACTOR will be responsible for all Subsequent testing to show compliance with the specifications, and the CONTRACTOR shall pay all costs for retesting of fill or backfill caused by non-compliance with these specifications, and at no cost to the DISTRICT.

3.05 PREPARATION OF SUBGRADE

A. The preparation of subgrade for pavement, curbs and gutters, driveways, sidewalks and other roadway structures shall be in accordance with SSPWC Subsection 301.

3.06 UNTREATED BASE

A. Aggregate base material shall be spread and compacted in accordance with SSPWC Subsection 301-2.

3.07 TEMPORARY STOCKPILES

A. Locations of temporary stockpiles shall be approved by the DISTRICT.

B. Temporary stockpiles shall not be allowed to surcharge buried pipe, conduits, or other structures.

END OF SECTION

SECTION 02222

PROTECTING EXISTING UNDERGROUND UTILITIES

PART 1 - GENERAL

1.01 DESCRIPTION

A. This section includes materials and procedures for protecting existing underground utilities.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 02223 – Trenching, Backfilling, and Compacting

PART 2 - MATERIALS

2.01 REPLACEMENT IN KIND

A. Except as indicated or as specifically authorized by the DISTRICT, reconstruct utilities with new material in accordance with DISTRICT Standards of the same size and type. Where materials are not specifically addressed in DISTRICT Standards, reconstruct utilities with new material of the same size, type, and quality as those being replaced.

PART 3 - EXECUTION

3.01 GENERAL

A. Replace in kind street improvements, such as curbs and gutters; fences; signs; paved surfaces; etc, that are cut, removed, damaged, or otherwise disturbed by the construction.

B. Where utilities are parallel to or cross the pipeline trench but do not conflict with the permanent work to be constructed, follow the procedures given below and as indicated on the Drawings. Notify the utility AGENCY a minimum of 72 hours in advance of the crossing construction and coordinate the construction schedule with the utility AGENCY's requirements. For utility crossings not shown on the Drawings, CONTRACTOR shall immediately notify the DISTRICT who will promptly investigate the conditions.

C. Determine the true location and depth of utilities and service connections which may be affected by or affect the work. Determine the type, material, size (outside diameter), and condition of these utilities. This pothole work shall take place prior to construction of the water or sewer utility in order to provide sufficient lead time to resolve unforeseen conflicts, order materials and take appropriate measures to ensure that there is no delay in work. Expose utilities in advance of the pipeline construction as required by the General Provisions.

3.02 PROCEDURES

A. Protect in Place: Protect existing utilities in place, unless abandoned, and maintain the utility in service, unless otherwise specified.

B. Cut and Plug Ends: Cut abandoned utility lines, fill with concrete two feet into line and plug the ends with brick and mortar or concrete plug. Dispose of the cut pipe as unsuitable material.

C. Remove and Reconstruct: Preservation of all laterals and utilities in their existing location shall govern. However, if the CONTRACTOR encounters an existing lateral or utility, which would otherwise cause the new or existing utility to not perform as it is or was intended, then the CONTRACTOR shall remove the utility and, after passage, reconstruct it with new materials. The DISTRICT shall decide at its sole discretion the applicability to which relocation is warranted.

D. Provide temporary service for the disconnected utility, prior to permanent repair.

3.03 COMPACTION

A. Utilities Protected in Place: Backfill and compact under and around the utility so that no voids are left. Where utilities are concrete encased, use the alternative construction method (2-sack cement sand slurry) for backfill around the utility.

3.04 ADJACENT PARALLEL UTILITIES

A. Protect existing parallel utilities from any disturbances and repair the lines and associated appurtenances if they are damaged in any way. All costs incurred for protection of utilities or any costs incurred due to the presence of the lines, whether or not they lie within the new construction, shall be borne in full by the CONTRACTOR.

END OF SECTION

SECTION 02223

TRENCHING, BACKFILLING AND COMPACTION

PART 1 – GENERAL

1.01 DESCRIPTION

A. This Section includes all labor, materials, equipment, testing, and incidentals for trench excavation, backfilling, and compacting. The work performed under this Section shall be constructed to the lines, grades and cross sections indicated on the Drawings, specified herein, or ordered by the Engineer in writing.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 00700 – General Conditions

B. Section 00800 – Supplementary Conditions

C. Section 01300 – Record Drawings and Submittals

D. Section 01410 – Testing Laboratory Services

E. Section 01530 – Protection of Work, Property and Existing Utilities

F. Section 02140 – Dewatering

G. Section 02350 – Excavation Support Systems

1.03 REFERENCE STANDARDS

A. The publications listed below form part of this specification to the extent referenced and are referred to in the text by the basic designation only. Reference shall be made to the latest edition of said standards unless otherwise called for.

1. ASTM D1556 - Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method

2. ASTM D2922 - Standard Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)

3. ASTM D3017 - Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth)

4. ASTM D1557 - Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3(2,700 kN-m/m3))

5. ASTM D4253 - Standard Test Methods for Maximum Index Density and Unit Weight of Soils Using a Vibratory Table

6. ASTM D4254 - Standard Test Methods for Minimum Index Density and Unit Weight of Soils and Calculation of Relative Density

7. ASTM D75 - Standard Practice for Sampling Aggregates

8. ASTM C90 - Standard Specification for Load bearing Concrete Masonry Units

9. ASTM A82 - Standard Specification for Steel Wire, Plain, for Concrete Reinforcement

1.04 GENERAL REQUIREMENTS

A. Requirements of the Standard Specifications for Public Works Construction (SSPWC) apply to this Section. In the event of conflicting requirements between the SSPWC and the County of San Diego Standards, the County of San Diego Standards shall take precedence. In the event of conflicting requirements for the Pipe Zone between either the SSPWC or the County of San Diego Standards and the District's Standards, the District Standards shall take precedence.

B. Conform to the requirements and provisions of the permits issued by jurisdictional agencies in addition to the requirements of these Specifications. If a permit is not required, the work shall conform to the standards of the agency in whose right of way the work is performed in addition to the requirements of these Specifications.

C. The Contractor shall be responsible for all measures necessary during the performance of the work to protect the project area and adjacent properties which would be affected by this work from storm damage, flood hazard, caving of trenches and embankments, and sloughing of material until final acceptance of the work. The Contractor shall be responsible for maintaining completed work until the entire project, or portions thereof, are accepted by the District.

D. Whenever imported borrow for pipe zone or trench backfill is required, the Contractor shall furnish imported material and shall include the cost of this work in the bid. The Contractor shall be responsible for the excavation and disposition of unsuitable or surplus material by approved means of conveyance away from the working area. Conform to applicable requirements for disposition as specified in the SSPWC.

E. The cost of materials that are rejected by the Engineer for nonconformance with this Section and their removal from the site shall be borne by the Contractor.

F. All equipment used for pavement removal, trench excavation and backfill compaction shall be of the size and type approved by the Engineer. The approval of specific equipment or pavement removal methods shall not relieve the Contractor of any damage to adjacent ground, existing improvements, or improvements installed under the Contract. The Contractor shall make his own determination in this regard.

G. In the event that obstructions are encountered during the progress of the work and are not generally shown on the Drawings and which will require Drawing revisions, the Engineer shall have the authority to order the deviation from line or grade. The Contractor shall not make any such deviation without the approval of the Engineer. Should any deviations in line and grade be permitted by the Engineer in order to reduce the amount

of rock excavation or for other similar convenience to the Contractor, any additional costs for thrust blocks, valves, extra pipe, concrete, or other costs shall be per the unit prices listed in the Contractor's bid or such other prices approved by the District. Changes to line or grade necessitated by the Contractor's inadequate potholing prior to trenching shall be made at the sole expense of the Contractor.

1.05 SAFETY PRECAUTIONS

A. The Contractor shall observe safety precautions in all phases of the Work including trench shoring, bracing, lighting, and barricades as dictated by reason and by the Safety Orders of the Division of Industrial Safety, State of California (CAL/OSHA). The Contractor shall obtain an exemption letter or trenching permit from the California Division of Industrial Safety (CAL/OSHA) and comply with Labor Code Section 6705, Excavation Plans for Worker Protection, and shall submit a copy of the exemption letter or trenching permit with excavation drawings to the District prior to excavation work.

B. Nothing in this Section is intended to relieve the Contractor of the responsibility to carefully examine the Contract Documents and the site where the Work is to be performed; to familiarize himself with all the local conditions and federal, state, and, local laws, ordinances, rules, and regulations that may affect the performance of any Work; to study all surveys and investigations regarding subsurface and latent physical conditions pertaining to the site; to perform additional surveys and investigations as the Contractor deems necessary to complete the Work for the Contractor's bid price; and to correlate the results of all such data with the requirements of the Contract Documents.

1.06 SUBMITTALS

A. Submit shop drawings in accordance with Section 01300.

B. Submit testing laboratory report(s) verifying that imported material is asbestos-free and conforms to the specified gradations or characteristics, and laboratory test reports for physical properties of backfill materials as identified in this Section.

C. Submit plans for excavation support systems in accordance with Section 02350.

1.07 OBSTRUCTIONS

A. The Contractor's attention is directed to the possible existence of pipe and other underground improvements which may or may not be shown on the Plans. The Contractor shall preserve and protect any such improvements whether shown on the Plans or not and expose such improvements in advance of the pipeline construction to allow for changes in the alignment as necessary. Where it is necessary to remove and replace or to relocate such improvements in order to prosecute the work, they shall be removed, maintained, and permanently replaced by the Contractor at his expense. Existing underground utilities shall be protected in place.

1.08 COMPACTION TESTING

A. The Contractor shall engage a qualified representative to perform inspection of the removal and replacement of unsuitable materials, and the placement and compaction of all fill and backfill within the limits of earthwork for the project. All work shall be done

in accordance with these Specifications and as ordered and approved by the Engineer or permit conditions. The costs of all such inspections and tests will be paid for by the Contractor.

B. Materials sampling and testing shall conform to the following:

1. The in-place soil dry unit weight shall be determined by the sand cone method, ASTM D1556 or by nuclear methods, ASTM D2922 and D3017. The testing frequency will be determined by the Engineer and shall not be less than one test per 100 linear feet of trench for each foot of backfill thickness exclusive of pavement subgrade soil testing.

2. The laboratory moisture-dry unit weight relationship of soils shall be determined by ASTM D1557-91. The testing frequency will be determined by the Engineer and shall not be less than one test for each soil type used or encountered in the backfill operations.

3. The relative density of cohesionless soils shall be determined by ASTM D4253 and D4254. The testing frequency will be determined by the Engineer and shall not be less than one test for each soil type used or encountered in the backfill operations.

4. Samples of backfill materials shall be obtained in accordance with ASTM D75.

C. "Relative compaction" is the ratio, expressed as a percentage, of the in-place dry density to the laboratory maximum dry density.

D. The Contractor shall make excavations for compaction tests at the locations and to the depths designated by the qualified representative and shall backfill and compact the excavations upon completion of testing. When tests indicate that the compaction is less than the specified relative compaction, the Contractor shall rework those areas until tests indicate that the specified relative compaction has been obtained.

1.09 UTILITY PROTECTION

The Contractor’s attention is directed to the possible existence of pipe and other underground improvements which may or may not be shown on the Drawings. Preserve and protect any such improvements whether shown on the Drawings or not. Expose such improvements in advance of the pipeline construction to allow for changes in the alignment as necessary and report any unknown condition to the District before proceeding with the work. Where it is necessary to remove and replace or to relocate such improvements in order to prosecute the work, they shall be removed, maintained, and permanently replaced by the Contractor at his expense. The cost of repair or replacement of utilities or structures damaged by the Contractor’s operations shall be borne by the contractor. Protect existing underground utilities in accordance with Section 01530.

1.10 WATER FOR CONSTRUCTION

Water supplied by the District, for whatever needs and uses, shall be paid for in accordance with the rates and rules of the District or the water purveyor unless otherwise agreed to in writing by the District.

1.11 DEFINITIONS

A. PIPE BASE

The pipe base shall be defined as a layer of material immediately below the bottom of the pipe and extending over the full trench width in which the pipe is bedded. Thickness of pipe base shall be a minimum of 6 inches.

B. PIPE ZONE

The pipe zone shall include the full width of trench from the bottom of the pipe to a horizontal level 12 inches above the top of the pipe. Where multiple pipes are placed in the same trench, the pipe zone shall extend from the bottom of the lowest pipe to a horizontal level above the top of the highest or topmost pipe. Thickness of pipe zone above the highest top of pipe shall be a minimum of 12 inches.

C. TRENCH ZONE

The trench zone includes the portion of the trench from the top of the pipe zone to the bottom of the pavement zone or to the existing surface in unpaved areas.

D. PAVEMENT ZONE

The pavement zone includes the asphalt concrete or portland cement concrete, aggregate base and the upper 12 inches of soil subgrade over the trench zone.

E. TRENCH ROCK

For the purposes of trench excavation, trench rock shall be defined as follows:

a) Limestone, sandstone, granite, or similar rocks in solid beds or masses in either original of stratified position which can be removed only by breaking using drilling and blasting, hydraulic fracturing, or pneumatic tools, and all boulders of 1cubic yard in volume or larger.

b) Massive rock or concretions encountered in the excavation that cannot be excavated without blasting by the equivalent of a Caterpillar 320E track-type hydraulic excavator rated at not less than 150-horsepower flywheel power (nominal) and in good working order and equipped with a 24-inch wide heavy duty rock bucket with a bucket digging force of not less than 28,000 pounds and a stick digging force of not less than 19,700 pounds.

Trench rock shall not include materials such as individual rocks or boulders, concrete, hardpan, or other materials that can be removed by conventional excavation with the equipment specified herein and with additional effort.

PART 2 – PRODUCTS

2.01 SOIL BACKFILL - TRENCH ZONE

A. Soil backfill used above the pipe zone shall be excavated soil free of asbestos, organic matter, rocks greater than 2 inches in maximum dimension, clods, clay balls, broken pavement and other deleterious materials. The coarser materials shall be well distributed throughout the finer material. Backfill materials that are obtained from trench excavated materials to the extent such material is available, shall be screened during the trenching operation. Hand selecting of rocks from earth as it is placed into the trench will not be permitted in lieu of the specified screening. Under no circumstances will native earth backfill be allowed or used in the pipe base or pipe zone areas.

2.02 IMPORTED MATERIAL FOR BACKFILL - TRENCH ZONE

Imported material shall conform to that specified in this Section for soil backfill or imported sand.

2.03 IMPORTED SAND - PIPE BASE AND PIPE ZONE

Imported sand used in the pipe base and pipe zone shall consist of natural or manufactured granular material or a combination thereof with a Sand Equivalent of not less than 30 and free of organic material, mica, loam, clay and other deleterious substances. Imported sand shall be free of sharp, angular fragments that may, in the sole opinion of the Engineer, damage protective polyethylene encasement and shall have the following gradation or approved similar:

U.S. Standard Sieve Size	Percent Passing By Weight
3/8-inch	100
No.4	95-100
No.30	30-50
No.100	2-20
No.200	0-5

2.04 ROCK BACKFILL FOR FOUNDATION STABILIZATION

Rock backfill shall be used in areas where trench subgrade, as determined by the Engineer, is unsuitable for placement of pipe due to loose, soft, or otherwise deleterious materials. Rock backfill shall consist of crushed or natural rock having ASTM C131 test grading of A and the following gradation:

U.S. Standard Sieve Size	Percent Passing By Weight
3 inches	100
1-1/2 inch	70-100
3/4-inch	60-100
No. 4	25 – 60
No. 30	0 – 10
No. 200	0 – 5

2.05 GRANULAR MATERIAL FOR STRUCTURAL BACKFILL

A. Granular material for structural backfill shall be free of asbestos, organic materials, clay balls, and shall have the following gradation:

U.S. Standard Sieve Size	Percent Passing By Weight
1-inch	100
3/4-inch	90 - 100
1/2-inch	40-70
3/8-inch	20 - 50
No. 4	0-10
No. 8	0 – 5

B. Whenever the phrase “structural backfill material” is used in these Specifications, it shall mean granular material for structural backfill as described above in 2.05 A and shall be referenced as No.67.

C. Excavated material may be used for structural backfill provided it conforms to the Specifications for structural backfill material.

2.06 SLURRY BACKFILL

Slurry backfill for trenches shall consist of cement-sand slurry conforming to Class 100-E-100 per the SSPWC, Table 201-1.1.2 (A).

2.07 CONCRETE FOR BELOW GROUND INSTALLATIONS

A. Concrete for anchors, collars, encasements, supports, and thrust blocks shall be Class A for reinforced items and Class C for un-reinforced items per Specification Section 03300, except use rapid set concrete mix where indicated. Concrete slurry backfill, when required, shall be in accordance with Table 201-1.1.2 (A), 100-E-100 of the Standard Specifications for Public Works Construction (Green Book), latest edition.

B. Provide anchor blocks at valves in pipe having rubber gasket bell and spigot or unrestrained mechanical joints.

C. Provide support blocks at all valves, depending on Geotechnical Investigation results. Typical support of valves shall be accomplished by compacted Class 2 aggregate base, unless geotechnical conditions dictate otherwise.

D. Provide thrust blocks at fittings in pipe having rubber gasket bell and spigot or unrestrained mechanical joints.

E. Items B, C, and D shall be in accordance with the Standard Drawings.

2.08 TRENCH CUT OFF WALLS

A. Provide ASTM C 90, Grade N I, hollow load bearing concrete masonry units, medium weight, moisture controlled, average compressive strength over gross area of 1,000 psi. Nominal face dimensions: 8 inches by 8 inches by 16 inches.

B. Provide ladder conforming to ASTM A 82.

C. Mortar and grout shall be a mixture of cement, sand, and water. Mortar shall consist of not more than one part cement to two and one half parts sand by damp loose volume. The quantity of mixing water shall be not more than necessary for handling and placing.

2.09 WATER FOR COMPACTION

Water used in compaction shall have a maximum chloride concentration of 500 mg/l, a maximum sulfate concentration of 500 mg/l, and shall have a pH of 7.0 to 9.0. Water shall be free of acid, alkali, or organic materials injurious to the pipe or coatings. Salt water will not be allowed.

2.10 WOVEN GEOTEXTILE

Woven geotextile fabric shall conform to the requirements for Geosynthetics Type 270WS in accordance with the requirements of SSPWC Section 213-2.

PART 3 – EXECUTION

3.01 COMPACTION REQUIREMENTS

A. Unless otherwise shown on the Drawings, otherwise described in the Specifications or required by the agency having jurisdiction over the area of the work, relative compaction in pipe trenches shall be a minimum as follows:

1. Pipe base: 95% relative compaction.

2. Pipe zone: 95% relative compaction.

3. Backfill above pipe zone not beneath paving: 90% relative compaction.

4. Backfill above pipe zone in paved areas: 95% relative compaction.

5. Rock backfill for foundation stabilization: 80% relative density.

6. Imported sand backfill for overexcavation: 90% relative compaction.

3.02 SIDEWALK, PAVEMENT, AND CURB REMOVAL

A. Cut and remove bituminous and concrete pavements regardless of the thickness, and curbs and sidewalks prior to excavation of the trenches with a pavement saw, hydrohammer, or pneumatic pavement cutter. Impact type pavement breakers will not be permitted within 5 feet of existing utilities.

B. The pavement cut width shall be at least equal to the required width of the trench at ground surface.

C. Haul pavement and concrete materials from the site. Do not reuse in trench backfill.

3.03 SHEETING, SHORING, AND BRACING OF TRENCHES

A. Trenches shall have sheeting, shoring, and bracing conforming with 29CFR 1926, Subpart P Excavations, CAL/OSHA requirements, and the DISTRICT's requirements.

3.04 DEWATERING

A. Refer to Section 02140.

3.05 BLASTING

A. No blasting is anticipated to be required for this project. No blasting will be allowed without prior approval.

3.06 TRENCH WIDTH

A. Pipe trench widths in the pipe zone will be limited as follows:

Pipe Diameter	Minimum Trench Width	Maximum Trench Width
4" through 12"	O.D. + 12"	O.D. + 16"
14" through 48"	O.D. + 16"	O.D. + 24"

B. Trench width at the top of the trench will not be limited except where width of excavation would undercut the structural support of adjacent structures and footings. Where shoring or encasement is required, trench widths shall be increased accordingly.

3.07 LENGTH OF OPEN TRENCH

A. Limit the length of open trench to the lessor of 300 feet in advance of pipe laying, or the length of pipe to be installed in one working day considering excavation, pipe laying, appurtenant construction, and backfill.

B. Complete backfilling and temporary or first layer paving not more than 150 feet in the rear of pipe laying.

C. Where pipelines are located beneath or adjacent to existing paved roads, backfill all trenches at the end of each workday and place temporary or first layer of paving. Clean all new and adjacent existing paved surfaces of residual excavated and backfill materials. Perform dust control operations in these areas with a brush or vacuum type mobile street sweeper. No open trenches will be allowed in these areas.

D. Where open trenches are not required to be backfilled at the end of the day per these Specifications but in the opinion of the Engineer pose a hazard to the public, the trench shall be surrounded with temporary chain link fence panels or be backfilled.

E. Provide ingress and egress to buildings and property at all times. Provide steel covering for vehicular access.

3.08 DISPOSAL OF EXCESS EXCAVATED MATERIAL

Dispose of excess excavated material offsite. Contractor shall make his own arrangements for the disposal of the excess material and bear all costs incidental to such disposal. In open terrain, excess material may be disposed of within the right of way by spreading, provided that rocks or lumps which cannot be readily covered by spreading are removed.

3.09 TRENCH EXCAVATION

A. Perform all excavation in accordance with the safety requirements of this Section and applicable regulations regardless of the type, nature, or condition of the material encountered. Do not commence excavation prior to acceptance of the Contractor's plans for the excavation support system.

B. During trench excavation, place the excavated material only within the working area or within the areas shown on the Drawings. Do not obstruct any roadways or streets. Conform to federal, state, and local codes governing the safe loading of trenches with excavated material.

C. Remove loose cobble or boulders from the sidewalls of trenches before allowing workers into the excavation, or protect with sheathing or other methods

D. Do not operate excavation equipment within 5 feet of existing structures or utilities or newly completed construction. Excavate with hand tools in these areas.

E. Excavate the trench to the lines and grades shown on the Drawings with allowance for pipe thickness, sheeting and shoring if used, and for pipe base. Trench depth shall accommodate the pipe and the pipe base at the elevations shown in the profile on the Drawings. In the absence of such profile, the top of pipe shall have adequate cover to resist construction loads and have at least 4 feet of cover for pipe greater than 12 inches in diameter or 3 feet for pipe 12 inches in diameter or less.

F. If the trench is excavated below the required subgrade, refill any part of the trench excavated below the subgrade at no additional cost to the District with imported sand or crushed rock backfill. Place the refilling material over the full width of trench in compacted layers not exceeding 6 inches deep to the established grade with allowance for the pipe base.

G. Construct trenches in rock by removing rock to a minimum of 6 inches below bottom of pipe and pipe bells and backfilling with imported sand.

H. Prior to lowering pipe in place, the trench bottom shall be prepared to provide firm and uniform bearing over the entire length of the pipe barrel and a bearing width at least equal to one-half the outside diameter of the pipe. Adjustments to line and grade shall be made by scraping or by filling and tamping the subgrade. Wedging or blocking beneath the pipe will not be permitted.

3.10 TRENCH EXCAVATION IN BACKFILL OR EMBANKMENT AREAS

A. Excavate trenches for pipe in backfill or embankment areas in accordance with one of the following procedures:

1. Construct and compact the embankment to an elevation of 1-foot minimum over the top of the largest pipe to be installed. Excavate trench in the compacted embankment. Place pipe base material, install pipe, and backfill with pipe zone material. Construct embankment as specified in the Section 02200.

2. Excavate trench in the completed backfill or embankment. Place pipe base material, install pipe, and backfill with pipe zone material. Place and compact backfill above the pipe zone to the same relative compaction as the adjacent embankment as specified in the Section 02200.

3.11 FOUNDATION STABILIZATION

A. After the required excavation has been completed, the Engineer will inspect the exposed subgrade to determine the need for any additional excavation. It is the intent that additional excavation be conducted in all areas within the influence of the pipeline where unacceptable materials such as soft, spongy or deleterious materials exist at the exposed grade. Overexcavation shall include the removal of all such unacceptable material that exists directly beneath the pipeline to the trench width and to a depth sufficient to remove the deleterious materials, or 2 feet, whichever is less.

B. Backfill the trench to the design subgrade of the pipe base with rock backfill material for foundation stabilization. Line the trench with woven geotextile fabric, and then place the rock backfill over the full width of the trench and compact in layers not exceeding 8 inches deep to the required grade. Woven geotextile fabric is to line the trench bottom and sides, and shall fully encase the rock backfill. The woven geotextile fabric is to overlap at seams a minimum of 2-feet.

3.12 CONCRETE FOR BELOW GROUND INSTALLATIONS

A. Encase pipe with concrete to the line and dimensions indicated or place concrete between the undisturbed ground and the pipe or fittings to be restrained or supported. Quantity or bearing area of the concrete against undisturbed ground shall be as shown on the Standard Drawings, Drawings, or as directed by the Engineer. Provide temporary support of pipe, fittings, or valves and place concrete such that the pipe joints, fittings, or valves are accessible for repairs. Consolidate the concrete during placement to eliminate voids. Do not backfill adjacent to the concrete or subject the concrete to pipeline pressure until the concrete has achieved the design strength per Section 03300.

B. Provide concrete anchor blocks at all valves in pipe having rubber gasket bell and spigot or unrestrained mechanical joints.

C. Provide concrete support blocks at isolation valves.

D. Provide thrust blocks at fittings in pipe having unrestrained, rubber gasket bell and spigot or mechanical joints. Do not provide thrust blocks for ductile iron pipe with restrained joints or steel pipe having welded, flanged, or butt strap joints unless detailed on the Drawings or otherwise required.

3.13 TRENCH CUT-OFF WALLS

A. Install trench cut-off walls at the locations shown on the Drawings, and at 50 feet on center on slopes 30 percent and steeper. Hand cut trench walls neat to the dimensions required by the Standard Drawings and to accomplish compaction of backfill adjacent to the wall. Reinforced masonry cutoff walls shall be reinforced with ladder steel as the wall is laid and with blocks fully bedded in mortar and fill all block cells with mortar. Cut blocks to fit around the pipe and mortar in place. Provide weep holes in the wall to relieve hydrostatic pressure. Provide one 1/2-inch diameter weep hole for each 1.5 square foot of wall in the trench pipe zone. Place backfill in layers being evenly brought up on each side of the cut-off wall. Compact the backfill with hand operating compaction equipment. Give special attention to placing backfill in slot in trench walls.

3.14 PIPE INSTALLATION AND TRENCH BACKFILLING

A. Pipe zone and trench zone backfill materials shall, to the extent practical, be moisture conditioned prior to placement into the trench. However, in no event shall backfill materials be compacted at less than the moisture content specified herein. All materials shall be within 2 percent of optimum moisture content at the time of compaction.

B. Place the specified thickness of pipe base material (imported sand) over the full width of trench and compact to the specified relative compaction. Grade the top of the pipe base ahead of the pipe laying to provide firm, continuous, uniform support along the full length of the trench for the pipe, fittings, and valves. The requirement for closely fitting the pipe to the bedding material as specified in this Section will be strictly enforced.

C. Excavate bell holes at each joint to permit proper assembly and inspection of the entire joint. Fill and compact the area excavated for the joints with the pipe base material.

D. Pipe shall normally be laid up grade. Any pipe which is not in true alignment, both vertical and horizontal, or shows any undue settlement after laying shall be replaced when so ordered by the Engineer. No pipe shall be laid which is damaged including cracks, checks, or spalls or any other defect deemed by the Engineer to render the pipe unacceptable and all such sections shall be permanently removed from the work.

E. At all times when the work of installing pipe is not in progress, the ends of the pipeline shall be kept tightly closed with suitable plywood or sheet metal bulkheads to prevent the entrance of animals, unauthorized persons, water, or foreign materials from entering the pipe.

F. After the pipeline has been bedded and cement mortar on exterior joints has set hard (as applicable), place pipe zone material (imported sand) simultaneously on both sides of the pipe, fittings, and valves, keeping the level of backfill the same on each side. Carefully place the material around the pipe so that the pipe barrel is completely supported and that no voids or uncompacted areas are left beneath the pipe. Use particular care in placing material on the underside of the pipe to prevent lateral movement during subsequent backfilling. Do not drop sharp, heavy pieces of material directly onto the pipe or the tamped material around the pipe.

G. Backfill imported sand in the pipe zone by hand and compact by mechanical means and in layers not to exceed 8 inches in compacted thickness. Jetting or ponding for

compaction will not be permitted. Care shall be exercised in backfilling to avoid damage to pipe coatings and polyethylene encasement. Damage to polyethylene wrap (i.e., abraded, torn, or overly stretched) will be repaired or replaced at the expense of the Contractor.

H. After backfilling in the pipe zone is completed, inspected and approved, place detectable warning tape prior to commencing trench zone backfill. Place and compact native earth backfill or imported backfill material in layers not to exceed 8 inches in compacted thickness. Compact each layer to the specified relative compaction for the trench zone by mechanical means; jetting or ponding will not be permitted. Do not permit free fall of the material until at least 2 feet of cover is provided over the top of the pipe.

3.15 MECHANICAL COMPACTION OR HAND TAMPING

A. Place imported sand and backfill materials in uniform layers of the indicated thickness. Compact each layer to the required minimum relative compaction at the optimum moisture content. Do not use heavy compaction equipment with an overall weight in excess of 125 pounds until backfill has been completed to a depth of 2 feet over the top of pipe.

3.16 SLURRY BACKFILL

A. Use a cement-sand slurry trench backfill where it is specified on the Drawings, where required by the requirements of regulatory or utility agencies, or where soil compaction is rendered infeasible by the Engineer. Slurry backfill shall not be used where, in the opinion of the Engineer, it will impede subsurface drainage.

B. Slurry shall be thoroughly consolidated with tampers or vibrators. Allow slurry to cure for a minimum of 48 hours before pavement resurfacing unless otherwise approved by the Engineer.

C. A tack coat shall be applied to the surface of the slurry prior to placing asphalt concrete paving.

3.17 SLOPE PROTECTION

A. Install erosion and sediment control best management practices to all disturbed soil areas and along the boundary of the work site. Refer to Section 02270.

B. Upon the completion of ground disturbing activities and after final clean-up, cultivate areas to be seeded to break up compaction of the soil surface resulting from earthwork operations. Apply a mixture of wood or cellulose fiber mulch, tackifier, and seed to all soil areas disturbed by construction or as ordered by the Engineer in accordance with Section 02270. Use fertilizers or soil amendments where so specified or required for the success of revegetation to at least 70% vegetative cover.

3.18 FINAL CLEAN-UP

A. After backfilling, grade the ground surface to the contours of the original ground and match the adjacent undisturbed ground. Clear surfaces free of all disturbed vegetation,

rubbish and other construction waste. Dispose offsite of all excavated surplus soil or surface rocks which cannot be readily covered by spreading.

B. Replace in kind street improvements, such as curbs and gutters, barricades, traffic islands, signalization, fences, signs, mail boxes, etcetera that are cut, removed, damaged, or otherwise disturbed by the construction.

END OF SECTION

SECTION 02270

TEMPORARY SOIL EROSION AND SEDIMENT CONTROL

PART 1 - GENERAL

1.01 DESCRIPTION

A. The Contractor shall implement a temporary soil erosion and sediment control program for all earthwork and demolition activities including clearing and grubbing; trenching; grading; and pavement grinding, cutting, or removal. Such program shall conform to all applicable federal, state and local laws and regulations including National Pollution Discharge Elimination System (NPDES) requirements.

B. In compliance with the local, State and Federal regulations regarding storm water management during construction, the CONTRACTOR shall not allow any debris, waste materials or pollutants, originating from the CONTRACTOR's operations, to enter the storm drainage system. The CONTRACTOR shall be fully responsible for developing and implementing a Storm Water Pollution Prevention Plan (SWPPP).

C. In the event that a project-specific Storm Water Pollution Prevention Plan (SWPPP) is not required, the CONTRACTOR is responsible providing supporting documentation provided by a Qualified SWPPP Developer (QSD) in accordance with the General Permit for developing, and shall submit a Water Pollution Control Plan (WPCP), as required by applicable jurisdictional agency requirements including those of NPDES general permit(s) governed by the Regional Water Quality Control Board.

D. In the absence of a project-specific Storm Water Pollution Prevention Plan (SWPPP), Water Pollution Control Plan (WPCP), or other stormwater management plan prepared by or on behalf of the District for storm water and non-storm water management purposes, the Contractor shall prepare its own project-specific storm water and non-storm water management plan and furnish all required Permit Registration Documents that shall meet the minimum requirements of applicable local, state and federal laws and regulations:

1. County of San Diego, Stormwater Standards Manual, Appendix A to the Watershed Protection, Stormwater Management and Discharge Control Ordinance No. 9424 (An Excerpt from the San Diego County Code of Regulatory Ordinances)

2. Order WQ 2014-0194-DWQ, General Order No. CAG140001, Statewide National Pollutant Discharge Elimination System (NPDES) Permit for Drinking Water System Discharges To Waters of The United States

3. Order No. R9-2007-0001, National Pollutant Discharge Elimination System ("NPDES") Permit No. CA0108758, as amended

4. Order No. 2009-0009-DWQ (as amended), National Pollutant Discharge Elimination System ("NPDES") General Permit for Storm Water Discharges

Associated with Construction and Land Disturbance Activities, NPDES No. CAS000002

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 02140 – Dewatering

B. Section 02223 – Trenching, Backfilling, and Compaction

C. Section 02510 – Asphalt Concrete Paving

1.03 STORM WATER POLLUTION PREVENTION MEASURES

A. The CONTRACTOR shall contain and remove any and all waste or pollutants generated by the CONTRACTOR's construction operations using the appropriate Best Management Practices (BMPs) by preparing a SWPPP. The SWPPP shall be submitted for approval to the DISTRICT and the appropriate regulatory agencies in accordance with the standard specifications. The SWPPP shall be written, amended, and certified by a Qualified SWPPP Developer (QSD) in accordance with the General Permit.

B. The CONTRACTOR shall be responsible throughout the duration of the construction period for installing and maintaining the applicable BMPs and for removing and legally disposing of temporary control measures, wastes and pollutants at an off-site location. The CONTRACTOR shall ensure all BMPs and temporary control measures required by the General Permit and the SWPPP are implemented by a Qualified SWPPP Practitioner (QSP) in accordance with the General Permit. Unless otherwise directed by the DISTRICT or specified elsewhere in these specifications, the CONTRACTOR's responsibility for BMP implementation shall continue throughout any temporary suspension of work.

C. The CONTRACTOR is responsible for all treatment necessary to ensure water is disposed of in a legal manner.

D. In accordance with the General Permit and the SWPPP, the CONTRACTOR shall develop a Rain Event Action Plan (REAP) within 48 hours prior to any likely precipitation event.

1.04 RESPONSIBILITIES, CONSEQUENCES, AND REMEDIES

A. Conformance with the provisions of this section shall not relieve the CONTRACTOR from the CONTRACTOR's responsibilities of the Contract Documents.

B. For purposes of this section, costs and liabilities include, but are not limited to, fines, penalties and damages whether assessed against the DISTRICT or the CONTRACTOR, including those levied under the Federal Clean Water Act and the State Porter-Cologne Water Act.

C. If solid or liquid materials or waste, hazardous or otherwise, or pollutants originating from the CONTRACTOR's operation enter the storm drain system or water courses, the CONTRACTOR will be required to thoroughly clean up the affected storm drain

facilities and water courses to the satisfaction of the DISTRICT. If the CONTRACTOR fails to clean up the affected facilities as required, the DISTRICT will issue a stop-work order and take necessary actions to ensure the cleanup of the affected facilities.

D. The CONTRACTOR shall be responsible for all costs, including fines, the DISTRICT's cost of defense, the cost of cleanup by others ordered by the DISTRICT, and liabilities imposed by law as a result of the CONTRACTOR's failure or negligence in complying with the requirements specified herein.

1.05 SUBMITTALS

A. General

1. SWPPP, WPCP or other stormwater management plan approved by the agency of jurisdiction.

2. Manufacturers' catalog data and samples of materials used for erosion and sediment control purposes including physical properties, application, and installation instructions:

   a. Fiber rolls

   b. Silt fence fabrics

   c. Fabric for gravel-filled bags

   d. Erosion control mats

3. Submit records for hydraulically applied erosion control materials that indicate

   a. Compliance with the specified application rates,

   b. Areas treated and quantity of materials applied,

   c. Application date and time.

B. Seed

1. At least 60 days before seed application, submit proof that the order for seed required for the Contract has been placed and accepted by the seed vendor. Include the seed's botanical names, quantity ordered, and the anticipated date of delivery.

2. Submit a copy of the analysis report for each seed species before application. Submit seed labels. Seed labels must show:

   a. Seed variety including botanical name and common name

   b. Lot number or other lot identification

c. Origin

d. Net weight

e. Percent pure live seed

f. Percent total viability

g. Percent by weight inert matter

h. Percent by weight other crop seed

i. Percent by weight weed seed

j. Name of restricted noxious weed seed by number per pound of seed

k. Name and address of the supplier or grower responsible for the analysis

C. Tackifier

1. Submit a certificate of compliance for tackifier and bonded fiber matrix in accordance with Section 01300 before application. Certificates of compliance must include:

a. SDS

b. Product label

c. Report of acute and chronic toxicity tests on aquatic organisms complying with EPA methods

d. List of ingredients, including chemical formulation

e. Properties of polyacrylamide in tackifier including:

1) Percent purity by weight

2) Percent active content

3) Average molecular weight

4) Charge density

1.06 QUALITY CONTROL

A. Seed

1. Seed must be tested for purity and germination by a seed laboratory certified by the Association of Official Seed Analysts or by a seed technologist certified by the Society of Commercial Seed Technologists.

2. Tests must be performed within 12 months before application.

PART 2 - PRODUCTS

2.01 GENERAL

Materials used for temporary erosion and sediment control purposes including, but not limited to, gravel bags, fiber rolls, erosion control blankets, silt fences, etc. shall be of commercial grade and intended for use in achieving compliance with applicable water pollution control regulations and standards.

2.02 FIBER ROLLS

A. Fiber roll shall have a minimum functional longevity of one year and comply with the following requirements:

1. Prefabricated roll filled with rice or wheat straw, wood excelsior, or coconut fiber.

2. Rolls shall be covered with biodegradable jute, sisal, or coir fiber netting secured tightly on each end.

3. Rolls shall comply with one of the following:

a. 8 to 10 inches in diameter, 10 to 20 feet long, and at least 1.1 pounds per foot.

b. 10 to 12 inches in diameter, at least 10 feet long, and at least 3 pounds per foot.

B. Rope shall be biodegradable, such as sisal or manila, with a minimum diameter of 1/4 inch.

C. Wood stakes for anchoring fiber rolls shall be 3/4 -inch-square and 24 inches long.

2.03 SILT FENCE

A. Silt fence fabric shall comply with the following or as approved by the Engineer.

Property	Test method	Requirement	
		Woven	Nonwoven
Grab breaking load, 1-inch grip in each direction (min, lb)	ASTM D4632	120	120
Apparent elongation, in each direction (min, percent)	ASTM D4632	15	50
Water flow rate, average roll value, (min and max, gal per minute/sq ft)	ASTM D4491	10–100	100–150

Permittivity (min, sec^{-1})	ASTM D4491	0.05	1.1
Apparent opening size, average roll value (max, inches)	ASTM D4751	0.023	0.012
UV resistance, retained grab breaking load, 500 hours (min, percent)	ASTM D4355	70	70

2.04 GRAVEL FILLED BAG

A. A gravel-filled bag must:

1. Be a geosynthetic bag;

2. Have inside dimensions from 24 to 32 inches long and from 16 to 20 inches wide;

3. Have a bound opening sewn with yarn, bound with wire, or secured with a closure device;

4. Weigh from 30 to 50 pounds when filled with gravel.

B. Gravel for a gravel-filled bag must be from 3/8- to 3/4-inch in diameter and must be clean and free of clay balls, organic matter, and other deleterious materials.

2.05 FIBER

A. Fiber must be wood fiber, cellulose fiber, alternate fiber, or a combination of these fibers.

B. Wood fiber must be a long-strand, whole-wood fiber thermo mechanically processed from clean whole wood chips.

C. Cellulose fiber must be made from natural or recycled pulp fiber, such as wood chips, sawdust, newsprint, chipboard, corrugated cardboard, or a combination of these materials.

D. Alternate fiber must be a long strand, whole natural fiber made from clean straw, cotton, corn, or other natural feed stock.

E. Fiber must:

1. Disperse into a uniform slurry when mixed with water.

2. Contain 3/8-inch fiber strands for at least 25 percent by total volume.

3. Have at least 40 percent retained when passed through a no. 25 sieve.

4. Have an initial moisture content of no more than 15 percent of its dry weight when tested under California Test 226. The moisture content must be marked on the packaging.

5. Have a water holding capacity, by weight, of at least 1,200 percent when tested under ASTM D7367.

6. Be nontoxic to plants and animal life.

7. Be free of synthetic or plastic materials, lead paint, printing ink, varnish, petroleum products, seed germination inhibitors, and chlorine bleach.

8. Contain less than 250 ppm of boron.

9. Be colored to contrast with the area where it is to be applied. The coloring agent must be biodegradable, nontoxic, and free from copper, mercury, and arsenic, and must not stain concrete or painted surfaces.

2.06 TACKIFIER

A. Tackifier must be:

1. free from growth or germination inhibiting factors,

2. nonflammable,

3. nontoxic to aquatic organisms,

4. functional for a minimum of 180 days.

B. Tackifier must be one of the following:

1. Plant based natural high-molecular-weight polysaccharide. Plant-based tackifier must be a high viscosity hydrocolloid that is miscible in water, and labeled as either guar, psyllium, or starch, as follows:

a. Guar gum based tackifier must be derived from the ground endosperm of the guar plant, Cyanmopsis tetragonolobus. It must be treated with dispersing agents for easy mixing. It must be able to be diluted at the rate of 1 to 5 pounds per 100 gallons of water.

b. Psyllium based tackifier must be manufactured from the finely ground, mucilloid coating of Plantago ovata or Plantago ispaghula seeds and able to dry and form a firm but rewettable membrane.

c. Starch based tackifier must be a nonionic, water-soluble, granular material derived from corn, potato, or other plant-based source.

C. Prepackaged liquid or dry powder polymeric emulsion blend. Prepackaged tackifier must be an anionic formulation with a residual monomer content not exceeding 0.05 percent by weight. The tackifier must contain and be labeled with one of the following as the primary active ingredients:

1. Acrylic copolymers and polymers.

2. Polymers of methacrylates and acrylates.

3. Copolymers of sodium acrylates and acrylamides.

4. Polyacrylamide and copolymer of acrylamide.

5. Hydrocolloid polymers.

2.07 BONDED FIBER MATRIX

A. Bonded fiber matrix must be a hydraulically-applied material composed of fiber and tackifier and may also include seed and fertilizer.

B. Fiber for bonded fiber matrix must be 100 percent wood fiber and comply with the specifications for Fiber in this Specification Section, except that at least 50 percent is retained when passed through a No. 25 sieve.

C. Tackifier for bonded fiber matrix must:

1. Be bonded to the fiber or prepackaged with the fiber by the manufacturer;

2. Contain a minimum of 10 percent of the combined weight of the dry fiber, activating agents, and additives;

3. Be an organic, high viscosity colloidal polysaccharide with activating agents or a blended hydrocolloid-based binder.

2.08 SOIL AMENDMENTS

A. Soil conditioner shall be Life by Wil-Gro or Humic Compost, 3/8-inch screened by AgriService, Oceanside, CA or approved equal.

B. Agricultural gypsum shall be commercially processed agricultural grade and packaged gypsum with a minimum 80 percent grade containing a minimum of 14 percent sulphur. Gypsum shall be in pelletized form to minimize dust.

2.09 SEED

A. Seed shall consist of a mixture of annual native California species formulated for rapid growth.

B. Shall be 95-percent pure and have a minimum of 85 percent germination. Seed with a germination rate lower than the minimum rate shown may be used if authorized. Deliver seed to the job site in unopened, separate containers with the seed tag attached.

C. Seed mix shall contain:

1. Bromus carinatus "Cucamonga" (cucamonga brome)

2. Festuca microstachys (small fescue)

3. Trifolium ciliolatum (tree clover)

D. Seed mix must not contain:

1. Prohibited noxious weed seed,

2. More than 1.0 percent total weed seed by weight.

E. Seeding rate: 32 lbs per acre.

F. Height range: 30-36 inches.

PART 3 - EXECUTION

3.01 GENERAL

A. The Contractor shall develop erosion control or pollution prevention plans and reports required by the governing agency, as applicable.

B. The Contractor shall take all precautionary actions and implement and maintain all necessary BMPs to prevent discharges to any portion of the storm drain conveyance system, streams, or water bodies including the discharge of pollutants from activities such as paving operations, soil stockpiles, concrete waste washouts, cold-milling, vehicle and equipment fueling. Handle, store, or legally dispose of all construction materials or excavated soils properly.

C. Avoid excavation, grading, and paving activities during wet weather. Sweep the streets on which construction activity occurs on a daily basis. Avoid washing soil, aggregate, concrete, or any other debris or pollutant (visible or non-visible) without proper containment or onto a street. Use vacuum with all concrete sawing operations.

D. Keep the amount of exposed soil areas to a minimum during the rainy season. Cover material and excavated soil stockpiles with secured tarps or plastic sheeting.

E. Grade disturbed surfaces to provide positive drainage and to prevent ponding of water. Surface water shall be controlled to prevent water damage or deposition of sediment to all adjoining and downstream properties. Construct diversion dikes and drainage swales around work sites. Cover and seal catch basins if work in their vicinity may allow debris or deleterious liquids to enter.

F. Install silt fences, desilting basins, erosion control blankets, gravel bags, drainage inlet protection, stabilized construction entrances and any other erosion or sediment control measures to reduce sediment escape from the construction site to the maximum extent practical in compliance with manufacturer’s recommendations and applicable regulations.

G. At a minimum, provide erosion and sediment control measures prior to or immediately following clearing, grubbing, grading, or backfilling operations in the following locations:

1. At the lowest end and at the perimeter of disturbed soil areas where storm water runoff will be discharged from the site.

2. At additional locations for sediment control as required by the Contract Documents and NPDES requirements.

H. Check and repair leaking equipment away from construction sites. Keep equipment in proper working order and free of oil, grease, or fuel leaks and immediately contain any leaks with drip pans or absorbent material. Designate a location away from storm drains for equipment refueling. Clean up all spills using dry methods.

3.02 SWPPP PREPARATION AND IMPLEMENTATION

A. The CONTRACTOR, as a registered QSD/QSP or under the direction of a registered QSD/QSP, shall develop and implement a project specific SWPPP based on the CONTRACTOR's construction activities to ensure compliance with the State Water Resources Control Board (SWRCB) General Permit for Storm Water Discharges Associated with Construction Activity in accordance with the standard specifications. The SWPPP shall be kept on file with any amendments and made available upon request of the DISTRICT or representative from the Regional Water Quality Control Board or the SWRCB.

B. Amendments or changes to the SWPPP shall be performed by the CONTRACTOR and QSD and are a requirement. All costs for implementing and maintaining the General Permit conditions and SWPPP and BMP requirements shall be borne by the CONTRACTOR.

3.03 SELECTIVE BMPS FOR STORM WATER POLLUTION PREVENTION

A. The CONTRACTOR shall incorporate some or all of the following BMPs, as applicable, into the CONTRACTOR's site-specific SWPPP for this project.

1. Material Handling and Storage

a. Non-hazardous Materials

(1) Designated Delivery and Storage Area: The CONTRACTOR shall propose, within the CONTRACTOR's staging site, an area that is suitable for material delivery and storage. To the maximum extent practicable, these areas shall be away from gutters, catch basins, drainage courses or creeks. The CONTRACTOR shall submit the proposed areas to and shall obtain approval from the DISTRICT in writing prior to bringing in materials.

(2) Storage of Granular Material: The CONTRACTOR shall store granular material at least ten feet (10') away from any inlet or curb return and shall prevent the granular materials from entering the storm system, drainage courses or creeks. During wet weather or when rain is forecast within 24 hours, the CONTRACTOR shall cover granular materials with

a tarpaulin and surround the material with sandbags or other approved heavy objects.

b. Hazardous Materials

(1) Hazardous materials include, but are not limited to, petroleum products, friable products containing asbestos, antifreeze, paints, thinners, solvents, pesticides, herbicides and various other toxic chemicals.

(2) The CONTRACTOR shall propose, within the CONTRACTOR's staging site, an area that is suitable for hazardous material delivery and storage. To the maximum extent practicable, the area shall be away from inlets, gutters, drainage courses or creeks. The CONTRACTOR shall submit the proposed area to and shall obtain the approval from the DISTRICT in writing prior to bringing in hazardous materials.

(3) The CONTRACTOR shall label and store all hazardous materials and hazardous wastes in accordance with applicable regulation.

(4) The CONTRACTOR shall keep all hazardous materials or waste in containers and fully covered to avoid contamination of storm runoff.

(5) The CONTRACTOR shall keep an accurate, up-to-date inventory, including Materials Safety Data Sheets (MSDSs), of hazardous materials and hazardous wastes stored on-site to assist emergency response personnel in the event of a hazardous material incident.

2. Hazardous Material Usage

a. The CONTRACTOR shall follow all local, State and Federal policies, laws and regulations governing the use of hazardous materials.

3. Vehicle and Equipment Cleaning, Maintenance and Fueling

a. Cleaning: The CONTRACTOR shall not clean or wash vehicles or equipment on-site or in the streets. If allowed by the DISTRICT in writing, cleaning and washing shall be performed in a designated and bermed area approved by the DISTRICT using water only. No soaps, solvents, degreasers, steam cleaning equipment or similar methods are permitted. The CONTRACTOR shall not allow wash water to flow into streets, gutters, storm drain system, drainage courses or creeks.

b. Maintenance and Fueling: The CONTRACTOR shall perform maintenance and fueling of vehicles or equipment in a designated, bermed area or over a drip pan that will prevent waste, leaks or spills from entering streets, gutters, storm drain system, drainage courses or creeks. The CONTRACTOR shall inspect all vehicles and equipment arriving on-site for leaking fluids and shall promptly repair leaking vehicles and equipment. Drip pans shall be used to catch leaks until

repairs can be made. Shut-off valves on equipment must be working properly.

4. Spill Prevention and Control

   a. If hazardous materials are used on the project, the CONTRACTOR shall keep a stockpile of spill clean-up materials, such as rags or absorbents, readily accessible on-site.

   b. Above-ground storage tanks and their installations shall comply with all local, State and Federal requirements.

   c. The CONTRACTOR shall immediately contain and prevent spills or leaks from entering the storm drain system, drainage courses or creeks and shall properly clean up and dispose of the spills or leaks. The CONTRACTOR shall not wash the spills or leaks into streets, gutters, storm drain system, drainage courses or creeks and shall not bury the spills or leaks.

5. Disposal of Hazardous Waste

   a. Unless the CONTRACTOR is a licensed hazardous waste handler, the CONTRACTOR shall contract with a licensed hazardous waste handler to remove and dispose of hazardous waste materials unless the waste quantities to be transported are below threshold limits for transportation as specified in the State and Federal regulations.

   b. The CONTRACTOR shall arrange for regular hazardous waste collection to comply with limits for storage of hazardous waste.

   c. The CONTRACTOR may dispose of dry, empty paint cans, buckets, paintbrushes, rollers, rags and drop cloths in the trash.

   d. The CONTRACTOR shall dispose of hazardous waste at facilities authorized for treatment, storage and disposal of hazardous waste only.

6. Street Sweeping

   a. At the end of each day or as directed by the DISTRICT, the CONTRACTOR shall sweep roadways of all debris and excess materials attributed to the CONTRACTOR’s operations.

7. Water Usage

   a. The CONTRACTOR shall use the least amount of water necessary for dust control and street sweeping operations.

   b. The CONTRACTOR shall not use water to flush dust and debris down the street in place of street sweeping.

8. Dumpsters and Portable Sanitary Facilities

a. If dumpsters or portable sanitary facilities are used, they shall be stationed at least ten feet (10') away from storm drain facilities.

b. The CONTRACTOR shall arrange for regular waste collection to keep dumpsters and portable sanitary facilities from overflowing and shall regularly inspect these facilities for leaks. If a leak is discovered, the CONTRACTOR shall arrange for the repair or replacement of facilities that leak. The CONTRACTOR shall not wash the dumpsters or portable sanitary facilities on-site.

9. Earthwork

a. The CONTRACTOR shall maximize the control of erosion and sediment by using the Best Management Practices for erosion and sedimentation control described in the California Stormwater Quality Association (CASQA) Stormwater Best Management Practice Handbook or ABAG Manual of Standards for Erosion and Sediment Control Measures.

10. Dewatering

a. The CONTRACTOR shall route water through a control device, such as a sediment trap, sediment basin or Baker tank, to remove settleable solids prior to discharging the water into the storm drain system. Refer to the CASQA Stormwater Best Management Practice Handbook for these sediment control measures.

b. Approval of the control device shall be obtained in advance from the DISTRICT and the Regional Water Quality Control Board (RWQCB).

c. Filtration of the water following the control device may be required on a case-by-case basis.

d. If the RWQCB and DISTRICT determine that the dewatering operation would not generate an appreciable amount of settleable solids, the control device may be waived.

11. Saw Cutting

a. During saw cutting or grinding operation, use as little water as possible.

b. During saw cutting, the CONTRACTOR shall cover or barricade catch basins using filter fabric, straw bales, sandbags or fine gravel dams to keep slurry out of the storm drain system. When protecting a catch basin, the CONTRACTOR shall ensure that the entire opening of the catch basin is covered. Refer to CASQA Stormwater Best Management Practice Handbook for these control measures.

c. The CONTRACTOR shall shovel, absorb or vacuum saw cut slurry and pick up the waste as the work progresses prior to moving to the next

location, as specified elsewhere in these specifications or as directed by the DISTRICT.

d. If saw cut slurry enters catch basins, the CONTRACTOR shall, at the CONTRACTOR's cost, clean up the storm drain system immediately.

12. Concrete, Grout and Mortar Related Work

a. Material Handling

(1) The CONTRACTOR shall avoid mixing excess amounts of fresh concrete or cement mortar on-site.

(2) The CONTRACTOR shall store concrete, grout and mortar away from storm drain facilities or drainage courses and shall ensure that these materials do not enter the storm drain system.

b. Washing of Concrete Truck and Tools

(1) The CONTRACTOR shall not wash out concrete trucks or equipment into streets, gutters, storm drain system, drainage courses or creeks.

(2) The CONTRACTOR shall perform washing of concrete trucks and tools off-site.

3.04 CONTRACTOR TRAINING AND AWARENESS

A. The CONTRACTOR shall train all employees and subcontractors on the storm water pollution prevention requirements contained in these specifications.

B. The CONTRACTOR shall inform subcontractor of the storm water pollution prevention contract requirements and include appropriate subcontract provisions to ensure that these requirements are met.

C. The CONTRACTOR shall post warning signs in areas treated with chemicals.

3.05 BMP MAINTENANCE

A. To ensure proper implementation and effectiveness of the BMPs, the CONTRACTOR shall regularly inspect, maintain, repair and/or replace the deployed BMPs throughout the construction site. The CONTRACTOR shall identify corrective actions and the time needed to address any deficient BMPs or reinitiate any BMPs that have been discontinued. The CONTRACTOR shall keep written records of all BMP inspections, maintenance and corrective actions.

B. The frequency of the BMP inspection shall be as follows:

1. Prior to a forecast storm

2. After any precipitation that causes runoff

3. At 24-hour intervals during extended rain events

4. Routinely, at a minimum of once every week

C. If the CONTRACTOR or the DISTRICT identifies a deficiency in the deployment or functioning of a BMP, the deficiency shall be corrected immediately. If requested by the CONTRACTOR and approved by the DISTRICT in writing, the deficiency may be corrected at a later time or date but the corrective action shall not be later than the onset of the subsequent rain event. The correction of deficient BMPs shall be at no additional cost to the DISTRICT.

3.06 EROSION CONTROL

A. During all phases of construction, the CONTRACTOR shall perform the work in a manner which will minimize soil erosion and prevent water pollution from site runoff by utilizing the following:

1. Proper scheduling of work and careful construction practices.

2. Grading disturbed surfaces to provide positive drainage and prevent ponding of water.

3. Installing desilting basins, gravel bag dikes, silt fences and other erosion control measures to prevent sediment escape from the construction site and to maintain runoff quality.

3.07 FIBER ROLLS

A. Before installing fiber roll remove obstructions from the ground, including rocks, clods, and debris greater than 1 inch in diameter.

B. Install fiber roll approximately parallel to the slope contour. For any 20-foot section of fiber roll, prevent the fiber roll from varying more than 5 percent from level. Install fiber roll on slopes at the following spacing unless shown otherwise:

1. 10 feet apart for slopes steeper than 2:1 (horizontal:vertical)

2. 15 feet apart for slopes from 2:1 to 4:1 (horizontal:vertical)

3. 20 feet apart for slopes from 4:1 to 10:1 (horizontal:vertical)

4. 50 feet apart for slopes flatter than 10:1 (horizontal:vertical)

C. Type 1 fiber roll installation consists of placing and fastening as follows:

1. Place in a furrow that is from 2 to 4 inches deep.

2. Fasten with wood stakes every 4 feet along the length of the fiber roll.

3. Fasten the ends of the fiber roll by placing a stake 6 inches from the end of the roll.

4. Drive the stakes into the soil so the top of the stake is less than 2 inches above the top of the fiber roll.

D. Type 2 fiber roll installation consists of placing and fastening as follows:

1. Fasten with notched wood stakes and rope.

2. Drive stakes into the soil until the notch is even with the top of the fiber roll.

3. Lace the rope between stakes and over the fiber roll. Knot the rope at each stake.

4. Tighten the fiber roll to the surface of the slope by driving the stakes further into the soil.

E. If soil conditions do not allow driving stakes into the soil, drill pilot holes to facilitate driving of the stakes.

F. Maintain fiber roll in a way that provides sediment holding capacity and reduces runoff velocities as follows:

1. Remove sediment from behind the fiber roll if sediment is 1/3 of fiber roll height above ground.

2. Repair or adjust the fiber roll if rills or other evidence of concentrated runoff occur beneath the fiber roll.

3. Repair or replace the fiber roll if they become split, torn, or unraveled.

4. Add stakes if the fiber roll slumps or sags.

5. Replace broken or split wood stakes.

6. Remove sediment deposits, trash, and debris from fiber roll as needed. If removed sediment is deposited within project limits, it must be stabilized and not exposed to erosion by wind or water.

3.08 TEMPORARY SILT FENCE

A. Construct a temporary silt fence with silt fence fabric, posts, and fasteners assembled at the job site or with prefabricated silt fence.

B. If prefabricated silt fence is used, attach the fabric to the posts by inserting the posts into the sewn pockets. If the fence is assembled at the job site:

1. Fasten the fabric to the posts with staples or nails if wood posts are used

2. Fasten the fabric to the posts with tie wires or locking plastic fasteners if steel posts are used

3. Space the fasteners no more than 8 inches apart

C. Place a temporary silt fence parallel with the slope contour. For any 50-foot section of temporary silt fence, do not allow the base elevation of the fence to vary by more than 1/3 of the height of the fence above the ground.

1. Place the bottom of the fabric in a 6-inch-deep trench.

2. Secure it with the posts placed on the downhill side of the fabric.

3. Backfill the trench with soil and compact by hand or mechanical methods to secure the fabric in the trench.

4. Join separate sections to form reaches not more than 500 feet without openings.

5. Secure the end posts of each section by wrapping the tops of the posts with at least 2 wraps of 16- gauge tie wire.

3.09 HYDROMULCH AND HYDROSEED

A. Apply hydromulch to all disturbed soil areas with hydraulic spray equipment that mixes fiber, tackifier, fertilizer, and other erosion control materials specified. If applying hydroseed, add seed to hydromulch. Seed may be dry applied to small areas not accessible by hydroseeding equipment if authorized.

B. Add water to hydromulch and hydroseed materials as recommended by the manufacturer and mix sufficiently to ensure an even application. A dispersing agent may be added to the mixture if authorized.

C. Equipment must have a built-in continuous agitation and discharge system capable of producing a homogeneous mixture and a uniform application rate.

D. Apply materials in locations, rates, and number of applications shown and as follows:

1. Start application within 60 minutes after adding seed to the tank.

2. Apply in successive passes as necessary to achieve the specified application rate.

3. Apply all hydromulch or hydroseed materials shown for a single area within 72 hours.

E. After the final application, do not allow pedestrians or equipment on the treated areas.

3.10 DRY SEED

A. Apply dry seed and fertilizer at the rates shown after job site preparation. Scarify areas to a minimum depth of 1 inch. Apply and incorporate materials into the soil to a maximum depth of 1/4-inch by dragging or raking.

3.11 BONDED FIBER MATRIX

A. Apply bonded fiber matrix materials in the locations, rates, and number of applications shown and as follows:

1. Apply in successive passes as necessary to achieve the specified application rate.

2. Form a continuous uniform mat with no gaps between the mat and the soil surface as follows:

a. Apply in 2 or more directions if necessary.

b. Apply in layers as necessary to avoid slumping and aid drying.

3.12 MAINTENANCE

A. The Contractor shall maintain erosion and sediment control measures for proper functioning before, during, and after storm events and until such time that the site of Work is prepared for permanent drainage and erosion control measures.

B. The Contractor shall conduct site inspections of the erosion and sediment control measures prior to forecasted storm events and after the actual storm to evaluate the adequacy and effectiveness of such measures. The Contractor shall implement modifications as necessary for compliance with NPDES regulations.

C. The Contractor shall submit inspection reports (pre- and post-rain, quarterly, annual, as required) to the Engineer in accordance with applicable regulations. The inspection reports shall include, at a minimum, the date of the inspection, the individual(s) who performed the inspection, the observations, and any modifications implemented. The Contractor shall post inspection schedules and reports within the field office or with the District, as applicable.

D. The Contractor shall remove sediment from desilting basins as required for proper operation.

E. The Contactor shall repair all damaged erosion and sediment controls and any erosion damage within the construction area for the duration of the Contract.

F. The Contactor shall annually certify in writing that the construction activity complies with applicable NPDES permit(s). The certification shall be based upon the site inspections required by permits or in this Section. The Contactor shall submit the written certification to the Engineer.

G. The Contactor shall immediately notify the Engineer in writing if construction activity is not or has not been in compliance with any of the NPDES permit requirements. The notification shall identify the nature of noncompliance and include a time schedule to achieve compliance.

H. Additional site inspections and/or sampling and analysis may be required at the request of the applicable Regional office of the California Regional Water Quality Control Board or the Engineer.

I. Materials installed for erosion and sediment control purposes shall remain in place and in proper working order at the time of acceptance by the District unless otherwise specified for removal by the Contractor in the Contract Documents.

END OF SECTION

SECTION 02350

EXCAVATION SUPPORT SYSTEMS

PART 1 - GENERAL

1.01 DESCRIPTION

This Section provides specifications for sheeting, shoring, bracing, or other excavation support systems for worker protection from the hazard of caving ground during the excavation of trenches.

1.02 SAFETY AND HEALTH REGULATIONS

A. The Contractor shall comply with Safety and Health Regulations for Construction, promulgated by the Secretary Standards Act, as set forth in Title 9 C.F.R. Copies of these regulations may be obtained from Labor Building, 14th and Constitution Avenue NW, Washington, DC 20013.

B. The Contractor shall also comply with the provisions of the Federal Occupational Safety and Health Act (OSHA), as amended, and with all applicable State of California, Department of Industrial Relations, Construction Safety Orders (Cal-OSHA) requirements.

1.03 QUALITY ASSURANCE

A. The Contractor's attention is directed to Section 6705 of the California Labor Code which requires plans showing the design of all shoring, bracing, sloping of excavation side slopes, or other provisions for worker protection against the hazard of caving ground during excavation of trenches 5 feet or greater in depth.

B. Sheeting, shoring, bracing or alternative excavation support systems shall comply in all respects to with the requirements of Article 6 of the Construction Safety Orders of the Division of Industrial Safety. The Contractor’s attention is directed to the provisions of Section 1541.1, Requirements for Protective Systems. It shall be the Contractor’s responsibility to provide the additional strength required to support the sides of the excavations against loads which may exceed those employed to derive the criteria set forth in the Construction Safety Orders.

C. The Contractor shall observe safety precautions in all phases of the Work including trench shoring, bracing, lighting, and barricades as dictated by reason and by the Safety Orders of the Division of Industrial Safety, State of California (CAL/OSHA). Nothing in this Section is intended to relieve the Contractor of the responsibility to carefully examine the Contract Documents and the site where the Work is to be performed; to familiarize himself with all the local conditions and federal, state, and, local laws, ordinances, rules, and regulations that may affect the performance of any Work; to study all surveys and investigations regarding subsurface and latent physical conditions pertaining to the site; to perform additional surveys and investigations as the Contractor deems necessary to complete the Work for the Contractor’s bid price; and to correlate the results of all such data with the requirements of the Contract Documents.

D. The requirements of this Section and applicable regulations are to be considered the minimum to be provided by the Contractor. The Contractor shall be solely responsible for any and all liabilities which may arise from his failure to provide an adequate excavation support system as necessary to support the excavation under any or all of the loading conditions which may exist or arise during construction of the project.

1.04 SPECIFICATIONS AND STANDARDS

A. Except as otherwise indicated, the current editions of the following apply to the Work of this Section:

1. ASTM A 36 Structural Steel

2. ASTM A 328 Steel Sheet Piling

3. AWS D1.1 Structural Welding Code-Steel

4. UBC Chapter 25, Wood

5. WCLIB Grading Rules

6. WWPA Grading Rules

7. AISC Manual of Steel Construction

8. AASHTO, Section on Steel Tunnel Liner Plate

1.05 SUBMITTALS

A. The following shall be submitted in accordance with Section 01300:

B. Trenching support drawings:

1. Pursuant to Section 6705 of the California Labor Code, prior to commencing trench or structure excavations that are 5 feet deep or greater, the Contractor shall submit to the District and shall be in receipt of the District's written acceptance of the Contractor's detailed plan showing the design of all shoring, bracing, sloping of excavation side slopes, or other provisions for worker protection against the hazard of caving ground during excavation of trenches 5 feet or greater in depth. The plan shall be prepared by a civil or structural engineer licensed in the State of California and regularly engaged in the preparation of such plans.

2. The registered civil or structural engineer shall certify that the plan complies with the CAL/OSHA Construction Safety Orders. If, however, the plan does not comply with the Safety Orders, the registered civil or structural engineer shall certify that the plan is not less effective than the shoring, bracing, sloping or other provisions of the Safety Orders. Each copy of the plan shall have an original seal and "wet" signature of the civil or structural engineer registered in the State of California.

3. If the Contractor's trench protection system includes the use of a shield, the shield design shall be approved by the Division of Industrial Safety. Structural details shall indicate the maximum pressure the shield can safely withstand and the trench configuration and supporting calculations indicating the maximum pressure against the shield. The Contractor shall use braced sheeting as required by the Engineer in lieu of a shield in cases where the trench is located near critical existing facilities or is excavated in zones of dry, cohesionless soils.

4. Subsurface investigations may have been conducted on behalf of the District at the project site. If so, these investigations are identified in the Contract Documents and the records of such investigations are available for inspection at the District's business office. The detailed plan showing the design of the shoring, bracing, etc. which the Contractor is required to submit to the Engineer in advance of excavation will not be accepted by the Engineer if the plan is based on subsurface conditions which are more favorable than those revealed by the investigations conducted on behalf of the District; nor will the plan be accepted if it is not based on design soil parameters and criteria set forth in the subsurface investigations conducted on behalf of the District.

5. The detailed plan showing the design of shoring, bracing, etc. shall include surcharge loads for adjacent embankments, structures, stockpiles, vehicle traffic, construction equipment and other loadings which are reasonably expected to occur. The plan shall indicate the minimum horizontal distances from the top of the excavation to the near side of the surcharge loads for all trench conditions.

6. Nothing contained in this Section shall be construed as relieving the Contractor of the full responsibility for providing shoring, bracing, sloping or other provisions which are adequate for worker protection. The District's review of the Contractor's drawings prepared and submitted pursuant to this Section will not relieve the Contractor of its responsibilities for worker protection under this or any other Section.

7. The Contractor shall obtain an exemption letter or trenching permit from the California Division of Industrial Safety (CAL/OSHA) and comply with Labor Code Section 6705, Excavation Plans for Worker Protection, and shall submit a copy of the exemption letter or trenching permit with excavation drawings to the District prior to excavation work.

C. Drawings for the proposed excavation support system for each construction component where excavation support systems will be used shall include the following, as applicable:

1. Arrangement and details for each excavation support system, supporting design calculations, and construction methods to be used for the installation of each system.

2. Soldier pile installation methods, connection details, bracing preloading, and jacking procedures.

3. Depths below the excavation bottom elevation to which the support system will be installed.

4. Elevations of ground surface, struts, and shores, as applicable.

5. Permissible depth to which excavation may be carried before supports must be installed and preloaded.

6. The full excavation depth load to be carried by various support system members.

7. Bracing loads for various stages of excavation, bracing removal, and concrete placement.

8. Preloads as required.

9. Proposed sequence of strut and shore removal as applicable and as related to concrete placement and backfilling operations.

D. The above Shop Drawings shall be coordinated with other shop drawing submittals for work specified elsewhere in which support of excavation is required.

E. The proposed method of installing sheet piling shall include sequence of installation, template, and equipment description.

F. The Contractor shall submit a contingency plan for alternative procedures to be implemented if the excavation support system is found to perform unfavorably.

1.06 DESIGN CRITERIA

A. Shop Drawings with supporting calculations for the various excavation support systems shall be prepared in accordance with the following criteria:

1. Design the excavation support system and all components to support the earth pressures, unrelieved hydrostatic pressures, utility loads, equipment, traffic, and construction loads including impact, and other surcharge loads in such manner as will allow the safe and expeditious construction of the permanent structures; to maintain the undisturbed state of the soils adjacent to the trench and at and below the excavation bottom; and to prevent settlement, lateral movement, or damage to adjacent ground, buildings, structures, roadways and utilities.

B. The design, planning, installation and removal of all lagging, sheeting, shoring, sheet piling, or bracing shall be accomplished in such a manner as.

1. Design support members to resist the maximum loads expected to occur during the excavation and support removal stages.

2. Maximum vertical center-to-center spacing of supports shall be 16 feet between top 2 support levels and 12 feet below second support level unless specifically designed for alternate support conditions. If decking beams are not required, install the uppermost bracing tier at a vertical distance of not more than 6 feet below the top of the excavation.

3. Where water flows from the face of excavation, the maximum height of unsupported excavation shall not exceed 15 inches.

4. In running sand and silt, provide positive means for securing timber lagging to the soldier piles to avoid shifting or falling off of the lagging, and positive means for containing such material behind lagging.

5. No portion of the excavation support system's vertical face will be permitted to penetrate the design lines as indicated on the Drawings for the permanent structure to be constructed within the excavation.

6. Vertical support capacity shall be provided for wall systems and internal bracing elements, for loads due to vertical force components of tieback anchors, the weight of the structural systems themselves, and live load on any portion of the system.

7. Support system members shall not be spliced.

8. The use of horizontal strutting below the barrel of a pipe or the use of a pipe as a support will not be permitted.

9. The support system design shall allow for eccentricities resulting from field fabrication and assembly.

C. Timber Support Systems and Members:

1. Basis for determination of minimum allowable working stress: UBC Chapter 25.

2. The minimum thickness of timber lagging between soldier piles spaced 5 to 7 feet center-to-center shall be 3 inches for excavations up to 25 feet in depth, and 4 inches for excavations deeper than 25 feet. Contractor’s shop drawings, design, and calculations shall indicate thickness required for actual site conditions and system used.

3. For other conditions and types of lagging, design calculations shall be submitted.

1.07 PROJECT CONDITIONS

A. Utility agencies shall be notified and caution exercised while exposing utility facilities by hand or other methods approved by utility owner.

B. If existing utility facilities interfere with the proposed method of support, the method shall be modified in a manner that will protect the facility and accommodate the proposed Work. Shop Drawings shall be revised and resubmitted along with design calculations required to account for the modified support method and to show the actual location of the existing utilities.

C. Provisions shall be made for contingencies as follows:

1. Monitor performance of support system components, for both vertical and horizontal movement, at regular intervals not to exceed 3 days.

2. Provide contingency plan for alternative procedures to be implemented if unfavorable performance is evidenced.

3. Keep materials and equipment on hand as necessary to implement contingency plan.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Steel sheet piling shall be continuous interlocking type ASTM A328 of appropriate shape and provided with at least one 2-1/2-inch-diameter handling hole on the centerline of the web located at least 6 inches from each end of the sheet pile.

B. Fabricated connections and accessories, steel H-piles, WF shapes, and other structural steel shall conform to the requirements of ASTM A36, unless otherwise approved.

C. Concrete:

1. For encasement of steel soldier piles below the final level of excavation, 2,500 psi shall be used.

2. For encasement of soldier piles above the final level of excavation, lean concrete shall be used, the strength of which shall be adequate to support the excavated faces of the augured hole.

D. Wood lagging shall be dimension lumber with minimum allowable stress of 1,100 psi.

1. The stress grade of the lagging shall be in conformance with the allowable stresses of the UBC, Chapter 25.

2. Lumber shall be grade marked by WWPA or WCLIB with species and grade conforming to those shown on approved Shop Drawings.

PART 3 - EXECUTION

3.01 GENERAL

A. Furnish, install, maintain, and remove, as applicable, excavation support systems as required by Federal, State or local safety requirements.

B. The support system shall extend from the excavation bottom to an elevation which is adequate to prevent lateral movement and to support applied vertical loads. In areas where additional excavation is required below the design excavation subgrade, provisions shall be made to prevent movement of excavation supports.

C. Damage to existing utilities during installation of excavation support system shall be avoided.

D. Water control measures shall be provided in accordance with dewatering requirements specified elsewhere.

E. If, in the opinion of the District, sufficient or proper supports have not been provided, the District may order additional supports to be placed at the expense of the Contractor. Compliance with such order shall not relieve the Contractor from the responsibility for the sufficiency of such supports.

3.02 SOLDIER PILES

A. Soldier piles shall be installed by pre-boring or other approved pre-excavation methods to the design tip elevation shown on approved Shop Drawings. Prevent pre-bored or other pre-excavated holes from collapsing.

B. Pre-bored holes shall be filled with structural concrete from the bottom of the hole to the design excavation subgrade. The remaining pile length shall be filled with lean concrete completely encasing the pile.

C. Concrete shall be placed from the bottom of the hole upwards by means of a tremie pipe connected to a hopper.

3.03 SHEETING AND LAGGING

A. Sheeting and lagging shall be installed with no gaps exceeding 1/2-inch. As installation progresses, the voids between the excavation face and the lagging or sheeting shall be backfilled with sand or soil and rammed into place. Materials such as burlap or geosynthetic drainage panels shall be used where necessary to allow drainage of groundwater without loss of soil or packing material.

B. If unstable material is encountered, suitable measures shall be taken to retain it in place or to otherwise prevent soil displacement.

C. Extend the lagging or sheeting down to final subgrade.

D. A sufficient quantity of material shall be on hand for sheeting, shoring, bracing, and other operations for protection of work and for use in case of accident or emergency.

3.04 STEEL SHEET PILING

A. Steel sheet piling may be used only where existing subsurface conditions are suitable for installation of sheet piling to the full depth of penetration required and to proper alignment and plumb as specified herein without damage to the sheet piling or rupture of its interlocks. The use of steel sheet piling will not be permitted where boulders, rock or other materials or subsurface obstructions may prevent the proper installation of sheet piling.

B. Steel sheet piling shall be installed plumb with each pile interlocked with adjoining piles for its entire length so as to form a continuous diaphragm and bearing tightly against original ground. Install sheeting to the depth(s) required by the approved Drawings. Exercise care during installation so that interlocking members can be extracted, if required, without damage to adjacent ground or structures. The installation equipment shall be suitable for the type and nature of the subsurface materials anticipated and adjacent structures to be encountered. The equipment and methods of installation, cutting, and splicing shall conform to the approved Shop Drawings.

C. Liner plate shall be installed to proper line, grade and dimensions which will enable final liner to be placed in accordance with tolerances specified by the Engineer. Annular voids shall be filled with grout where ordered by the Engineer.

3.05 INTERNAL BRACING SUPPORT SYSTEM

A. All bracing and support members shall be installed and maintained in tight contact with each other and with the surface being supported.

B. Bracing members shall be preloaded by jacking the struts and shores in accordance with the loads, procedures, and sequence shown or specified on the approved Shop Drawings. Coordinate excavation work with bracing installation and preloading. Use steel shims and steel wedges welded or bolted in place to maintain the preloading force in the bracing after release of the jacking pressure. Use procedures that will produce uniform loading without appreciable eccentricities, overstressing, or support member distortion.

C. Struts shall be provided with intermediate bracing to prevent distortion or buckling under the maximum design loads. Provide diagonal bracing as necessary to maintain the stability of the system. Web stiffeners, plates, or angles shall be provided as needed to prevent rotation, crippling, or buckling of connectors at points of bearing between structural steel members.

D. Excavations shall not extend more than 2 feet below the elevation of the support member about to be placed. The support member shall be installed and preloaded immediately after installation and prior to continuing excavation.

3.06 REMOVAL OF SUPPORT SYSTEMS

A. Where removal is required wholly or in part, such removal shall be performed in a manner that will not disturb or damage adjacent new or existing construction, utilities, or structures. Fill all voids immediately with lean concrete or other approved means.

B. All elements of support systems shall be removed to a minimum depth of 6 feet below final ground surface. However, when a structure that is cast against the sheeting or shoring system extends above the 6-foot limit, removal of the system shall be to the top of the structure.

C. All damage to property resulting from removal of the support system shall be promptly repaired at no cost to the District. The Construction Manager shall be the sole judge as to the extent and determination of the materials and methods for repair.

END OF SECTION

SECTION 02510

ASPHALT CONCRETE PAVEMENT

PART 1 – GENERAL

1.01 DESCRIPTION

This Section describes requirements for asphalt concrete pavement construction and sealing for roads, parking areas, and other paved areas as shown on the Drawings, as required by permit conditions from the agency having jurisdiction of the street in which the Work will occur, and as specified herein.

1.02 RELATED WORK DESCRIBED ELSEWHERE

The Contractor shall refer to the following Specification section(s) for additional requirements:

A. Section 01015 – General Requirements

B. Section 01300 – Submittals

C. Section 01410 – Testing Laboratory Services

D. Section 02223 – Trenching, Backfilling, and Compaction

E. Section 02530 – Adjusting Utility Access Covers

F. Standard Specifications for Public Works Construction (SSPWC), "Greenbook", latest edition

G. Regional Supplement to the Standard Specifications for Public Works Construction (Regional Supplement), latest edition adopted by the San Diego Regional Standards Committee

H. State of California, Department of Transportation, Standard Specifications (State Standard Specifications), latest edition.

1.03 SUBMITTALS

Contractor shall furnish submittals in accordance with the requirements of Section 01300. The following submittals are required:

A. Submit copies testing laboratory reports certifying that aggregate base material is asbestos-free and conforms to the specified gradations or characteristics.

B. Submit copies testing laboratory reports certifying that asphalt concrete materials conform to the physical requirements of the governing jurisdiction.

C. Submit copies testing laboratory reports certifying that the mix design for slurries and sealers, including emulsion-aggregate slurry, conforms to the physical requirements of the governing jurisdiction and/or the Greenbook.

D. Any other submittals required by permit conditions or by the agency having jurisdiction of the street in which the Work will occur.

1.04 PAVING LIMITS

The following work area limits shall apply to pavement construction or sealing; however, the limits specified by the agency having roadway jurisdiction shall govern.

A. Reconstruction of existing asphalt concrete pavements including aggregate base along the trenches for the pipeline alignments shown on the Drawings.

B. Construction of asphalt concrete overlays (and related cold milling) where specified on the Drawings.

1.05 MEASUREMENT AND PAYMENT

A. Unless specifically included in a separate bid item of work, payment for the work in this Section shall include, but is not limited to, the protection of existing pavements adjacent to the Work and the removal and off-site, legal disposal of existing pavement or base materials where required for the Work and shall be included as part of the lump-sum or unit-price bid amount for which such work is appurtenant thereto unless a separate item of work is included in the bid schedule for the items defined in this Section.

B. Refer to Section 01410 for the payment of testing or inspection services.

1.06 TESTING FOR COMPACTION

A. The CONTRACTOR will be responsible for all costs associated with compaction testing of asphalt concrete pavement and shall provide test results to the DISTRICT as described herein and in the standard specifications.

B. Determine the density of existing soil in place by the Sand Cone Method, ASTM D1556.

C. Determine laboratory moisture-density relations of soils by ASTM D1557.

D. Determine relative density of cohesionless soils by ASTM D4253 and D4254.

E. Sample backfill materials by ASTM D75.

F. “Relative compaction” is the ratio, expressed as a percentage of the in-place dry density to the laboratory maximum dry density.

G. Compaction shall be deemed to comply with the specifications when no more than one test of any three consecutive tests falls below the specified relative compaction. The one test shall be no more than three percentage points below the specified compaction. The CONTRACTOR shall pay the costs of any testing and retesting of work not conforming to the Specifications.

1.07 TEST STANDARDS

A. ASTM

1. ASTM D75 – Standard Practice for Sampling Aggregates

2. ASTM D979 – Standard Practice for Sampling Bituminous Paving Mixtures

3. ASTM D1556 – Standard Test Method for Density and Unit Weight of Soil in Place by Sand-Cone Method

4. ASTM D1557 – Standard Test Methods for Laboratory Compaction of Soil Modified Effort

5. ASTM D1561 – Standard Practice for Preparation of Bituminous Mixture Test Specimens by Means of California Kneading Compactor

6. ASTM D2041 – Standard Test Method for Theoretical Maximum Specific Gravity and Density of Bituminous Paving Mixtures

7. ASTM D2216 – Standard Test Methods for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

8. ASTM D2950 – Standard Test Method for Density of Bituminous Concrete in Place by Nuclear Methods

9. ASTM D4253 – Standard Test Methods for Maximum Index Density and Unit Weight of Soils Using a Vibratory Table

10. ASTM D4254 – Standard Test Methods for Minimum Index Density and Unit Weight of Soils and Calculation of Relative Density

11. ASTM D4829 – Standard Test Method for Expansion Index of Soils

12. ASTM D6938 – Standard Test Methods for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)

B. Caltrans

1. California Test 111 – Developing Density and Moisture Calibration Tables for Nuclear Gages

2. California Test 125 – Sampling Highway Materials and Products Used in the Roadway Structural Sections

3. California Test 304 – Preparation of Bituminous Mixtures for Testing

4. California Test 308 – Bulk Specific Gravity and Weight per Cubic Foot of Bituminous Mixture

5. California Test 375 – Determining the In-Place Density and Relative Compaction of Hot Mix Asphalt Pavement Using Nuclear Gages

6. California Test 384 – Method of Test to Determine Combined Gradations for Hot Mix Asphalt (HMA) using up to 25% Reclaimed Asphalt Pavement (RAP)

C. "Relative compaction" for soils is the ratio, expressed as a percentage, of the in-place dry unit weight to the laboratory maximum dry unit weight. For asphalt concrete, it shall be the percentage of the in-place total density to the laboratory maximum density.

D. Compaction shall be deemed to comply with the Specifications when no more than one test of any three consecutive tests falls below the specified relative compaction. The one test shall be no more than two percentage points below the specified compaction. The Contractor shall pay the costs of any re-testing of work not conforming to the Specifications.

PART 2 – MATERIALS

2.01 GENERAL

A. Materials for pavement construction, reconstruction, or sealing shall conform to the requirements of the SSPWC as amended by the Regional Supplement. In the event of conflicting requirements between the SSPWC and the City of Escondido or County of San Diego standards or permit conditions, the standards of the agency having jurisdiction of the street in which the Work will occur shall supersede.

B. The requirements for rubberized asphalt, if allowed by the agency of jurisdiction, shall be as specified in the local agency standards.

2.02 SOIL STERILANT

Sterilant shall be Oust as manufactured by DuPont, Polybor Chromate as manufactured by U.S. Borax, or approved equal.

2.03 AGGREGATE BASE COURSE

A. Unless otherwise specified, aggregate base materials shall conform to crushed aggregate base per SSPWC Section 200-2.2. The Contractor may elect to use materials conforming to Section 200-2.5, Processed Miscellaneous Base of the SSPWC with the approval of the governing agency.

B. Class 2 aggregate base shall conform to Section 26-1.02B, 3/4-inch maximum size, of the State Standard Specifications.

2.04 PRIME COAT

Prime coat shall be liquid asphalt, Grade SC-250 or MC-70 as specified in Section 203-2 of the SSPWC.

2.05 TACK COAT

A. If paving over existing pavement, a tack coat shall be applied and shall conform to SS-1h emulsified asphalt in accordance with 203-3 of the SSPWC.

B. Tack coat conforming to Caltrans requirements shall be PG 64-10 or PG 64-16 per Section 92 of the State Standard Specifications.

2.06 ASPHALT CONCRETE - GREENBOOK

Materials for asphalt concrete shall conform to the applicable provisions of Section 203-6.4 of the SSPWC and the following provisions.

A. Composition and grading of aggregate and asphalt binder shall conform to Class C2 (Dense, Medium) per Table 203-6.4.3 (A) or as specified by the agency having jurisdiction of the street on which the materials are to be placed.

B. If separate base and finish courses of asphalt concrete are to be placed, composition and grading of aggregate and asphalt binder for the paving base course may conform to Class B (Dense, Medium Coarse) per Table 203-6.4.3 (A) upon the approval of the agency having jurisdiction of the street on which the materials are to be placed.

C. In private streets, driveways, and parking areas, composition and grading of aggregate and asphalt binder shall conform to Class D2 (Dense, Fine) per Table 203-6.4.3 (A)

D. Asphalt binder shall be Performance Grade PG 64-10 paving asphalt conforming to Section 203-1.

2.07 ASPHALT CONCRETE - CALTRANS

Materials for asphalt concrete shall conform to the applicable provisions of Section 39 of the State Standard Specifications and the following:

A. Asphalt concrete shall be Type A HMA per Section 39-2.02.

B. Aggregate gradation shall conform to 3/4-inch maximum size per Section 39-2.02B(4)(b). For finish course or overlay paving, aggregate gradation shall conform to 1/2-inch maximum size.

C. Asphalt binder content shall be based on a Job Mix Formula per Section 39-2.02A.

D. Asphalt binder shall conform to PG 64-10 per Section 92 of the State Standard Specifications.

2.08 EMULSION-AGGREGATE SLURRY

Emulsion-aggregate slurry shall conform to SSPWC Section 203-5 with tests and certifications in accordance with Section 203-1.3.

A. Emulsified asphalt shall consist of SS-1h or CSS-1h per SSPWC Section 203-3.2. The use of quick-set asphalt emulsion shall be subject to the approval of the agency having jurisdiction of the street to receive slurry seal.

B. Composition and grading of the aggregate and asphalt emulsion shall conform to Type II per Section 203-5.3 in public streets and Type I elsewhere.

2.09 SEAL COAT

Seal coat for asphalt concrete pavements shall conform to Section 302-5.10 of the Regional Supplement.

2.10 PAVEMENT STRIPING AND MARKINGS

A. Traffic striping and markings shall conform to SSPWC Section 210-1.6 and shall be similar in type and color to the existing striping and markings.

B. Materials for traffic stripes and pavement markings conforming to Caltrans requirements shall conform to Section 84-2 of the State Standard Specifications.

2.11 PAVEMENT MARKERS

Pavement markers and adhesives shall conform to SSPWC Section 214. Markers shall be similar in kind and color to the existing markers.

PART 3 – EXECUTION

3.01 GENERAL

A. Existing pavements of whatever nature that are adjacent to the Work area shall be protected from damage by the Contractor's operations by the use of trench plates, protective mats, rubber-tired equipment (excavation or otherwise), and/or limiting the maximum payloads for materials exported or imported to the site. The Contractor shall document the distressed pavement areas that exist prior to mobilization and submit the documentation for review in accordance with Section 01300, submit the proposed method for the protection of pavements prior to mobilization onto the site, and shall not commence excavation activities until the method of pavement protection is accepted, in writing, by the Engineer. Acceptance by the Engineer does not relieve the Contractor from the responsibility to implement measures to protect existing pavements from damage, and pavements that are damaged because of the Contractor's failure to implement reasonable measures for their protection, in the sole opinion of the Engineer, shall be replaced by the Contractor at no additional expense to the District.

3.02 SUBGRADE PREPARATION

A. Compaction of trench backfill below the pavement subgrade soils shall conform to the requirements of Section 02223 or governing agency requirements, whichever is more stringent.

B. Scarify the upper 6 inches of the pavement subgrade soils; bring to within 2 percentage points of optimum moisture content; and compact to a relative compaction of 95 percent.

3.03 SOIL STERILANT

A. Unless required by the governing road jurisdiction, soil sterilant will not be required in areas of existing pavement removal and replacement.

B. Soil sterilant shall be spread uniformly upon the prepared subgrade at the manufacturer's recommended rate. For new roadway construction, apply from outside of curb to opposite outside of curb for the full width of roadway or parking area to be paved or surfaced.

3.04 AGGREGATE BASE COURSE

A. Base material shall be furnished, placed and compacted for asphalt concrete pavements or portland cement concrete pavements where ordered or as shown on the drawings and specified herein.

B. Spreading and compacting shall conform to Section 301-2 of the SSPWC. The requirements for compacted lift thickness will be strictly enforced.

C. Placement and compaction of Class 2 aggregate base shall conform to Section 26-1.03 of the State Standard Specifications.

3.05 COLD MILLING OF EXISTING PAVEMENT

Cold milling of existing pavement shall conform to SSPWC Section 302-1 and the following:

A. Unless otherwise specified on the Contract Documents or by the agency having jurisdiction of the street, the nominal depth of profile milling shall be 1-1/2 inches minimum below the existing pavement surface.

B. The nominal depth of profile milling in areas outside of public right-of-way that are to receive Class D or Class E paving shall be 1 inch minimum below existing pavement surface.

3.06 PRIME COAT

After completion of the subgrade, a prime coat of liquid asphalt as specified in this Section shall be pressure-spray applied at a rate of approximately 0.25 gallons per square yard. If aggregate base is specified, the prime coat shall be applied after completion of the base course. Liquid asphalt shall be prevented from spraying on adjacent ground, structures, curbing and fencing.

3.07 TACK COAT

A. Apply tack coat to existing pavement, between pavement lifts, and to vertical surfaces of curbs, gutters and pavement joints in accordance with Section 302-5.4 of the SSPWC.

B. For Caltrans requirements, apply tack coat per Section 39-2.01C(3)(f).

3.08 ASPHALT CONCRETE PAVEMENT

Asphalt concrete construction shall conform to Section 302-5 of the SSPWC.

A. Asphalt concrete pavement shall be spread in one or more courses as required for lift thickness requirements of Table 302-5.5 (A) of the SSPWC by means of an asphalt paving machine. It shall be spread to a depth to achieve a compacted thickness as shown on the Plans. If the thickness of new asphalt concrete pavement is not specified, place to

a total thickness of 4 inches minimum, or 1 inch thicker than the existing pavement section, whichever is greater or to the standards of the agency having jurisdiction over the work.

B. The completed surface shall be thoroughly compacted, smooth and true to grade and cross-section, and free from ruts, humps, depressions and irregularities. When a straight edge is laid on the finished surface and parallel to the centerline, the surface shall not vary more than one-eighth (1/8) of an inch in 10 feet.

C. Compaction shall achieve a density of 95 percent of the density obtained using California Test 304.

3.09 EMULSION-AGGREGATE SLURRY

Emulsion-aggregate slurry shall be applied to asphalt concrete pavements as specified on the Drawings or in this Section, or as required by permit conditions or governing agency requirements. Slurry shall be applied in accordance with SSPWC Section 302-4 and the mix design shall be approved by the Engineer.

A. The Contractor shall provide the District with unlimited access at all times.

B. All pavement cracks greater than ¼-inch wide that are in areas to receive slurry seal shall be sealed with liquid asphalt conforming to Greenbook Section 203.2 prior to the application of the slurry seal.

C. If approved by the governing authority, the Contractor shall have the following options:

1. Close the paved area to traffic until the slurry has achieved sufficient set, in the opinion of the Engineer, to be opened to traffic without tracking or damage.

2. Apply sand or rock dust at the rate of at least 6 pounds per square yard to eliminate tracking or damage to the slurry. Apply sand or rock dust at least four (4) hours after the application of the slurry, and open the paved area to vehicle traffic as soon as cover sand is placed. The Contractor shall remove and dispose of excess sand per Section 302-5.10 of the Regional Supplement but not more than seven (7) days after its application.

3.10 SEAL COAT

The application of seal coat shall conform to the requirements of Section 302-5.10 of the Regional Supplement.

3.11 APPLYING PAVEMENT STRIPING AND MARKINGS

A. Apply traffic striping, markings, and all other directional information to new paved surfaces and existing surfaces that were damaged by the construction

B. Use traffic paint that matches the color of the existing traffic striping and markings.

C. Apply per Section 310-5.6 of the SSPWC. Wait a minimum of 10 days prior to the placement of permanent traffic striping and markings and the placement of pavement,

slurry, or seal coat. Apply a second coat of paint to all areas where the first coat of paint bled, curled, or discolored.

D. Application of pavement stripes and markings conforming to Caltrans requirements shall conform to Section 84-2 of the State Standard Specifications.

3.12 INSTALLING REFLECTIVE PAVEMENT MARKERS

A. After the application of all pavement striping and markings, install markers on new paved surfaces and existing surfaces that were damaged by the construction.

B. Use markers that are reflective and match the color or combination of colors of the existing markers within the area of work. Install markers along the alignment and match spacing of the existing, as directed by the Engineer, and in accordance with Section 312 of the SSPWC.

3.13 INSTALLING FIRE HYDRANT MARKERS

A. Install a blue reflective marker opposite each new or relocated fire hydrant. Place the marker on the pavement and locate 6 inches off the centerline of the traffic striping or reflective pavement markers towards the hydrant. Install markers in accordance with Section 85 of the State Standard Specifications. Where existing fire hydrants have been relocated or removed from service, dislodge the existing blue marker from the pavement and dispose.

3.14 ADJUSTING UTILITY ACCESS COVERS

A. See Section 02530.

END OF SECTION

SECTION 02530

ADJUSTING UTILITY ACCESS COVERS

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Adjusting Manhole Covers

B. Adjusting Valve Covers

C. Adjusting Survey Monument Covers

1.02 RELATED SECTIONS

A. Section 02510 - Asphalt Concrete Pavement

1.03 REFERENCES

A. State of California Standard Specifications, Current Edition.

B. Standard Specifications for Public Works Construction (SSPWC), Current Edition.

C. San Diego Regional Standard Drawings, Current Edition.

1.04 SUBMITTALS

A. Manhole Extension Ring. Contractor shall supply manufacturer information including materials, dimensional data and installation instructions.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Concrete. Class 560-C-3250, per Section 201-1 of the SSPWC.

B. Manhole Extension Ring. As manufactured by Southbay Foundry or an approved equivalent product.

PART 3 - EXECUTION

3.01 GENERAL

A. All existing utility access frames and covers and frames and grates, including sewer manholes, valve covers, and survey monument covers, shall be adjusted to grade by the Contractor, upon completion of asphalt concrete resurfacing in accordance with the provisions of Section 301-1.6 of the SSPWC and in accordance with the Contract Documents.

B. Existing survey monuments that are disturbed during construction shall be reconstructed in accordance with San Diego Regional Standards and a corner record filed with the County of San Diego.

C. Prior to placing new asphalt, the Contractor shall make locations measurements to each utility cover and monument. During paving operations, the Contractor shall mark, in the newly placed surfacing, the locations of each utility access cover. The method of marking shall be subject to the approval of the Engineer.

D. The covers shall not be raised to final grade until the resurfacing has been completed.

E. At the option of the Contractor, manhole extension rings may be used and shall be installed per manufacturers' specifications.

3.02 INSTALLATION OF NEW SURVEY MONUMENT COVERS

A. Prior to resurfacing, new covers and frames shall be installed for all existing survey monuments which are damaged by the prosecution of the work. Covers and frames shall be installed in accordance with San Diego Regional Standard Drawing M-10. Covers and frames shall be installed at an elevation suitable for flush finish following resurfacing.

END OF SECTION

SECTION 02950

HIGHLINING FOR WATERMAINS

PART 1 - GENERAL

1.01 WORK OF THIS SECTION

A. The CONTRACTOR shall provide, furnish and install all materials, equipment, and labor necessary to bypass sections of the existing water main line with a temporary above-ground supply line (highline) in phases as indicated in the Contract Documents. Some portions of the highline system will be trenched and buried as shown or specified to avoid interference with roadways and walkways. All materials shall be NSF 61 approved.

B. All costs related to procure highline materials and components, and to install, test, disinfect, connect, operate, maintain, and dismantle the highline system, as specified, shall be the at the CONTRACTOR's expense.

C. The highline piping shall be installed along both sides of streets to supply water service connections to consumer's water meters. In no case shall a meter service connection be routed across a roadway, driveway, or other area subject to vehicular traffic.

D. The highline system shall provide continuous full service to connected water services until the new water main line is installed, tested and accepted by the DISTRICT. The work shall be organized, scheduled, and performed to provide minimum disruption of water services during installation and dismantling of the highline system.

E. The CONTRACTOR shall properly flush, disinfect, and leak test the highline prior to placing it in service according to AWWA C-650-16 to maintain public health and safety. Bacteriological sampling and testing shall be performed by the DISTRICT's Laboratory at the CONTRACTOR's expense.

F. The CONTRACTOR shall continually maintain the highline system as specified.

G. The CONTRACTOR shall be aware that improper installation, pressure control, or operation of the highline may result in direct and/or subsequent damage, including but not limited to: burst pipes, damaged domestic water heaters, water and erosion damage to water users' property, and related public health and safety issues. In this regard, maintenance and monitoring of the highline system is of the utmost importance for a safe and reliable potable water supply.

H. On completion of the new water main line, the CONTRACTOR shall reconnect services to normal supply from the new water main, dismantle the highline system and appurtenances, and restore streets, curbs and gutters, cross gutters, landscape, irrigation, and other disturbed facilities within ten working days of acceptance of the new complete water main line, services, and appurtenances.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. The work of the following Specifications, Divisions, or Sections apply to the work of this Section. Work of other Sections of the Specification, not referenced below, shall also apply to the extent required for proper performance of this work.

1. Section 01300 – Shop Drawings and Submittals
2. Section 02960 – Temporary Sewer Bypass Pumping

1.03 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

A. All reference specifications, codes, and standards shall be the latest edition, including all approved DISTRICT supplements and amendments, unless a specific code issue date, edition, or adoption date is specified. The order of precedence shall be as defined in the Contract Documents.

B. Codes and Safety Regulations: All equipment, products, materials, and their installation shall be as specified and shall be in accordance with the applicable parts of the following codes and safety regulations.

1. Uniform Fire Code.
2. Uniform Mechanical Code.
3. Uniform Plumbing Code.
4. DISTRICT Approved Materials List
5. State of California, Water Resources Control Board, Division of Drinking Water publication titled, “Approved for Service Isolation in California Public Water Systems.”
6. DISTRICT Standard Drawings.
7. Applicable City, local, state, and federal codes and regulations.

C. Commercial and Industrial Standards: All equipment, products, materials, and their installation shall be as specified and shall be in accordance with the following commercial and industrial standards.

1. ANSI/AWWA C 606 Grooved and Shouldered Pipe Joints.
2. ASTM A 53 Specification for Pipe, Steel, Black and Hot-Dipped Zinc Coated, Welded and Seamless.
3. ASTM A 123 Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
4. ASTM A 153 Standard Specification for Zinc Coating (Hot-Dipped) on Iron and Steel Hardware
5. ASTM A 307 Specification for Carbon Steel Bolts and Studs, 6,000 PSI Tensile Strength.
6. ASTM A D1784 Standard Specification for Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly(Vinyl Chloride) (CPVC) Compounds

7. AWWA C 511 Standard for Reduced Pressure Principal Backflow Prevention Assembly

8. AWWA C 651 Disinfecting Water Mains

D. Testing Laboratories: All water sampling and bacteriological testing shall be performed by the following testing laboratory:

1. DISTRICT approved third party certified laboratory

1.04 CONTRACTOR SUBMITTALS

A. Submittals shall be made in conformance with standard specifications.

B. Submit catalog data for all highline materials and components.

C. Temporary fire hydrants shall be required on all bypass pipe and shall be serviceable at all times.

D. Submit highline system installation including temporary fire hydrant locations and detail drawings prior to the start of fabrication or assembly of each phase of the highline system to the DISTRICT. This plan must include the detailed locations of each fire hydrant, service connection, location of highline, etc. The plan must be drawn in on the DISTRICT's Atlas books. This plan must include phase numbers which correspond to a written plan. The plan must also include an Emergency Contact Plan for disturbance and monitoring of the highline.

E. Submit a highlining schedule prior to the start of fabrication or assembly of any part of the highline system to the DISTRICT.

F. Submit traffic control drawings and an approved Traffic Control Plan prior to the start of fabrication or assembly of each phase of the highline system to the DISTRICT.

1.05 QUALITY ASSURANCE

A. Flushing, disinfecting, and testing requirements are specified in Paragraph 3.3.

B. The highline system shall be flushed, hydrostatic tested for leaks, and disinfected, and shall pass the specified bacteriological tests prior to connection to user systems as described herein.

PART 2 - PRODUCTS

2.01 GENERAL

A. The CONTRACTOR shall provide all stocks of pipe, fittings, adapters, materials, and components required for a complete and operable highline system installation.

1. The CONTRACTOR shall provide only products and materials which meet the specified requirements.

2. At the CONTRACTOR's option, highlining products and materials shall be either:

a. New products and materials purchased specifically for this project.

b. Previously used products and materials provided that these products and materials shall have been used only in potable water service. These products and materials shall perform as new or have been refurbished to perform as new.

c. Certification as to the material use for potable water service shall be submitted by the CONTRACTOR to the DISTRICT.

3. Products and materials provided for this project shall be of current manufacture and shall be products of manufacturers specializing in the manufacture of such products and materials.

4. Products and materials shall be suitable for the intended purpose, free of defects, and recommended by the manufacturer for the application intended.

5. Products and materials provided for this project shall be selected from the DISTRICT's Approved Materials List, wherever applicable.

B. The highline system shall NSF 61 certified and be sized to meet the water demands of the system.

1. Hoses shall be used only at corners and curves and for connections to user's service meters.

2. PVC piping shall be used only for service connections. In no case shall PVC piping be used in driveways, roadways, or other locations subject to being driven over by vehicular traffic.

2.02 PIPE

A. Galvanized steel pipe.

1. Pipe fabrication shall conform to ASTM A 53 or other equal ASTM galvanized pipe standard.

2. Minimum wall thickness shall be Schedule 40 (0.154 inches) and entire system shall be H20 traffic rated.

3. Pipe ends shall be machine cut or rolled for grooved couplings and fittings in compliance with ANSI/AWWA C 606.

B. PVC pipe.

1. PVC pipe shall not be run on streets, driveways, roadways, or any other location being driven over by vehicular traffic.

2. Pipe fabrication shall conform to ASTM D 1784.

3. The PVC pipe material shall contain ultraviolet (UV) light inhibitors and shall be rated for outdoor use when exposed to direct sunlight.

4. Minimum wall thickness shall be Schedule 80 (0.218 inches).

5. Minimum pressure and temperature rating shall be 350 PSIG at 73 degrees Fahrenheit.

6. Pipe ends shall be machine cut for grooved couplings and fittings in compliance with ANSI/AWWA C 606 or shall be solvent weld PVC ends with adapters to grooved couplings.

2.03 FITTINGS AND COUPLINGS

A. Fittings and couplings, including tees, reducing tees, laterals, wyes, elbows, pipe couplings, reducers, caps, plugs, and adapters, shall have standard flexible grooved joint connections in compliance with ANSI/AWWA C 606. Minimum pressure rating shall be 350 PSIG.

1. Housing material shall be ductile iron coated with the manufacturer's standard painting system. Coupling gasket material shall be standard EPDM (ethylene-polypropylene diene monomer) rubber.

2. Couplings shall be Victaulic Style 75 or equal.

3. Victaulic Style 791 or equal tamper-resistant boltless couplings with locking pins may be used in lieu of bolted couplings.

4. The branch outlet of reducing tees shall be 1-inch male pipe thread. All connections of standard tees shall be grooved.

5. Victaulic Style 72 or equal Outlet Couplings with 1-inch female threaded outlets may be used in lieu of reducing tees and couplings.

6. Grooved elbows with 113, 222, 45 and 90-degree bend angles will be required to configure the highline piping system to existing bends and contours at the work site.

B. Meter connections.

1. For meters up to 1-inch size, the connections shall be 90-degree, long radius, brass elbow couplings with a swivel meter nut on one end and male pipe threads on the other.

a. The swivel meter nut shall be sized to fit the specific meter. The male pipe thread end shall be fitted with a galvanized steel "Chicago" 2-lug, quarter-turn, quick disconnect hose fitting-to-female pipe thread fitting.

2. For meters larger than 1-inch, the connections shall be elbows with a 2-bolt Class 125 flange on one end and female pipe threads on the other.

a. The flange shall be sized to fit the specific meter. The female pipe thread end shall be fitted with a short pipe thread to grooved connection adapter nipple.

b. Alternatively, the assembly can be a 2-bolt Class 125 flange-to-male pipe thread fitting, a threaded pipe elbow, and a short pipe thread-to-grooved connection adapter nipple.

C. Bushings, reducers, and adapters.

1. The CONTRACTOR shall be responsible for all fit-up and connections in the system and shall provide all bushings, reducers, and adapters required to connect the highline system to the existing fire hydrants, meters, and other facilities at the project site. All bushings, reducers, and adapters shall be provided at no additional cost to the DISTRICT.

D. Pipe-to-hose adapters.

1. For 1-inch hoses, the adapter shall be a 1-inch, galvanized steel, “Chicago” 2-lug, quarter-turn, quick disconnect hose-to-female pipe thread fitting.

E. Fire hydrant-to-pipe connectors.

1. Shall be a brass or bronze 2-inch female fire hydrant thread to 2-inch male pipe thread fitting.

2.04 BOLTS AND FASTENERS

A. Bolts and fasteners, including bolts, nuts, and washers, shall meet the minimum requirements of ASTM A 307, and shall be hot dipped galvanized according to ASTM A 153.

2.05 VALVES

A. Pipe shutoff valves shall be 2-inch, lever handle, two-position, manual ball valves with grooved mechanical connections in compliance with ASTM C 606. Minimum pressure rating shall be 200 PSIG.

1. Housing material shall be ductile iron coated with the manufacturer’s standard painting system. Seal material shall be standard EPDM rubber.

B. Curb stop valves shall be bronze full-port ball valves without handles.

1. Seats shall be molded Buna-N rubber or other approved material. The ball shall be Teflon-coated brass or bronze. Approved plastic ball materials will be considered as substitutes.

2. Size shall be 1-inch with female pipe thread connections. Other sizes and end connections may be required to accommodate specific user connections.

2.06 HOSES

A. User connection.

1. For meters up to 1-inch, the hose shall be a 1-inch standard general service air compressor hose with EPDM cover and 300 WP rating. End connections shall be galvanized steel, “Chicago” 2-lug, quarter-turn, quick disconnect fittings banded to the hose.

B. Curves and curbs.

1. Hose shall be 2-inch standard general service air compressor hose with EPDM cover and 300 WP rating. End connections shall be galvanized steel grooved mechanical end fittings in compliance with ASTM C 606 banded to the hose.

2.07 CHECK VALVES

A. Check valves shall be swing check type with grooved mechanical connections in compliance with ASTM C 606. Minimum pressure rating shall be 200 PSIG.

B. Housing material shall be ductile iron coated with the manufacturer's standard painting system. Seal material shall be standard EPDM rubber.

2.08 BACKFLOW PREVENTERS

A. Shall meet the requirements within the DISTRICT Standard Drawings.

B. Shall meet the requirements of AWWA C 511.

2.09 PRESSURE REGULATORS

A. Shall be 2-inch pipe size and bronze or ductile iron construction. Materials, coatings, seals, diaphragms, and trim shall be approved for potable water service. Connections shall be pipe threaded union couplings.

B. Pressure ratings and regulation ranges shall be approved for the pressure zones involved.

2.10 TEMPORARY ASPHALT (COLD MIX)

A. Temporary asphalt (cold mix) shall conform to SSPWC 306-1.5.1, Temporary Resurfacing.

B. The cost of the temporary asphalt (cold mix) used in conjunction with the highline installation shall be included in the price bid for the water highline.

2.11 PIPE SUPPORTS

A. Shall be adjustable type and fabricated from galvanized carbon steel.

2.12 SAFETY BARRICADES AND TRAFFIC CONE MARKERS

A. Traffic cone markers and fold-up safety barricades shall conform to the latest editions of the California Manual on Uniform Traffic Control Devices (California MUTCD or CA MUTCD) Standards.

B. Materials shall be polyvinyl chloride (PVC), high molecular weight polyethylene (HMWPE), or equal industrial plastic materials. Cones and barricades shall be weighted to prevent blowing over in high winds.

C. Safety barricades shall be provided with durable, weatherproof, and removable labels.

1. Labels shall be imprinted with the following in letters not less than 12-inches high: "24- Hour Emergency Phone: (760) 745-5522". Below this, imprint the following in letters not less than 1-inch in height: "RINCON DEL DIABLO MUNICIPAL WATER DISTRICT".

2. Emergency telephone information shall be attached to the lower barricade crossbar, shall not interfere with the reflective striping on the upper crossbar, and shall be attached to both sides of the barricade.

3. The label attaching method shall be durable and labels shall remain in place for the duration of the project. The CONTRACTOR shall replace any labels which become separated from the barricade at no additional cost to the DISTRICT.

4. Letters shall be black on white background.

5. Labels shall be removed from barricades at the completion of the project. Barricades so labeled shall be used only for Water Utilities Department projects.

PART 3 - EXECUTION

3.01 GENERAL

A. Authorization.

1. The CONTRACTOR shall not start fabrication or assembly of any part of the highline system without review of submittals and written authorization by the DISTRICT.

B. Workmanship.

1. CONTRACTOR workmanship shall meet the accepted standards of the trades involved.

2. Highline piping systems shall be installed and maintained such that they are neat, orderly, and leak-free, and shall be arranged to minimize interference with, or present a hazard to, normal usage of streets, sidewalks, driveways, and other affected facilities.

3. Highline piping systems shall be installed in such a manner that they do not interfere with normal storm water drainage.

4. Excess materials and debris shall be removed from the project site by the end of the working day on which they are generated.

C. User Notification.

1. In addition to the written notification required elsewhere in the Contract Documents, the CONTRACTOR shall prepare and distribute a second written notification within twenty-four hours prior to starting work on any highline phase. This notification shall be delivered door-to-door to water users in the affected area. A copy shall be delivered to the DISTRICT on the date of user notification. The notification shall include information on fire protection service outages/fire watch requirements.

2. The CONTRACTOR shall also notify affected users whenever the water service must be shut off for short periods of time.

   a. This includes times when an individual user service is switched from the main line to the highline (and vice-versa) and when portions of the highline must be isolated to repair leaks or damage.

   b. This notice shall be oral and shall be made by CONTRACTOR personnel knocking on user’s doors immediately prior to shutting off the water service.

   c. The CONTRACTOR shall coordinate the work to minimize the duration of shutdowns and outages.

D. Emergency Telephone.

1. The 24-hour Emergency Services telephone number which shall be listed in user notifications, imprinted on safety barricades, and posted in the work area is (xxx) xxx-xxxx.

2. On receipt of notification of a problem in the work area, the 24-hour Emergency Services telephone dispatcher shall notify the DISTRICT, CONTRACTOR, or Emergency Services as appropriate.

E. Repair and Maintenance.

1. The CONTRACTOR shall maintain the temporary asphalt (cold mix) protective ramps for the duration of the highline installation. All cold mix damage discovered or reported during working hours shall be repaired that same day before CONTRACTOR personnel leave the site.

2. During working hours the CONTRACTOR shall repair and maintain the highline system. This shall include damage or plugging of the user meters and service lines which occurs as a result of highlining activities.

a. All leaks or damage shall be repaired within two hours of discovery or reporting. All leaks or damage discovered or reported during working hours shall be repaired that same day before CONTRACTOR personnel leave the site. This repair criterion shall apply to leaks or damage arising for any reason, including vandalism and damage by CONTRACTOR personnel, equipment, or work activities.

b. When the repair involves any disassembly of the system, disinfect and flush the affected components according to AWWA C651.

c. Repair work shall be inspected and approved by the DISTRICT. At the sole discretion of the DISTRICT, the CONTRACTOR shall be back-charged for non- responsive or otherwise unacceptable repair and maintenance work.

F. Problem Reporting.

1. All highline system problems discovered or reported and corrective actions taken shall be documented in the CONTRACTOR’s Daily Log and reported to the DISTRICT.

G. Fire Department and Utility Coordination.

1. The CONTRACTOR shall submit a copy of the project written user notification to the local Fire Department office not less than five days prior to commencing work on the water system.

2. The CONTRACTOR shall submit a copy of the highline written user notification to the local Fire Department office within twenty-four hours prior to commencing work on any phase of the highlining system.

3. The CONTRACTOR shall submit written notification to the local Fire Department office on the date that each phase of the highline is activated and deactivated.

4. On the date of transmittal, copies of all Fire Department correspondence shall be delivered to the DISTRICT.

H. Traffic Control.

1. The CONTRACTOR shall provide traffic control during highline installation and dismantling activities as required by the project approved Traffic Control Plan, as shown on the Contract Drawings, or as directed by the DISTRICT.

I. Schedules and Timing.

1. The CONTRACTOR shall coordinate highlining operations such that the overall water main replacement project schedule is not affected or delayed.

3.02 INSTALLATION

A. Highline Piping System.

1. The highline piping system shall be installed in phases as shown on Contract Drawings and/or as directed by the DISTRICT.

2. Piping phases shall be installed in loop systems as shown on the Contract Drawings with a fire hydrant connection to the water supply at each end.

3. The highline piping system shall be inspected and approved in writing by the DISTRICT prior to charging the system with potable water or connecting to any user service line.

4. Shutoff valves shall be installed at each fire hydrant connection, along the piping runs at the middle of each block, on either side of highline tee fittings for user connections to meters larger than 1-inch, and at the ends of cul-de-sac blind runs to permit flushing. The lever handles shall be removed from the valves to prevent unauthorized operation.

5. The two-bolt grooved couplings or swing clamp devices shall be installed with the bolts oriented downward. This orientation permits the pipe to be laid closer to the curb and is less susceptible to damage by auto traffic. Also, to prevent damage to auto tires, coupling bolts shall not extend beyond the thickness of the nut when installed and tightened.

B. Fire Hydrant Connection.

1. The fire hydrant connection shall be as shown on the approved drawings.

2. Elbows of different bend angles shall be used as required to align the connection fittings parallel to the sidewalk or curb.

3. Pressure regulators shall be installed where shown on Approved Drawings, when the fire hydrant is located in a pressure zone higher than all or part of the affected service area, or in any situation where pressures in the affected service area may exceed safe ratings.

4. In situations where the fire hydrant is located such that piping must cross a sidewalk, piping shall be routed under the sidewalk surface in a 12-inch wide by 12-inch minimum deep (approximate dimensions) saw cut trench. The trench backfill and temporary asphalt surface shall be tamped and compacted to provide a smooth, safe surface for the duration of the highlining installation. Routing the pipe above the sidewalk shall not be permitted.

5. Provide barricades and cones as required by the approved Traffic Control Plan and to ensure public safety.

C. User Connection.

1. Connection to meters sized up to 1-inch shall be as shown on the Approved Drawings. Adapters may be required to connect to specific meters.

2. Connection to meters 1-1/2-inch and larger shall be submitted to and reviewed by the DISTRICT on a case-by case basis.

   a. A shutoff valve in the user connection line shall be provided at the highline tee fitting.

   b. Meters 1-1/2-inch and larger typically have 2-bolt flanged connections. Provide adapters as required to connect to specific meters.

   c. Sidewalk crossings may be routed above ground and ramped with temporary asphalt (cold mix). and as required elsewhere in this Section.

   d. Field cut, groove, and fit 2-inch galvanized steel pipe as required to make user connections. Sections of the highline piping shall be cut such that service tees are as close as possible to the user meters and service connection hose or piping length is minimized.

3. Provide barricades and cones as required by the approved Traffic Control Plan, at service tees and meters, and as required to ensure public safety.

D. Roadway Crossing and Trenching.

1. Wherever piping is required to cross a roadway, piping shall be routed below the roadway surface in a 12-inch wide by 12-inch minimum deep (approximate dimensions) saw cut trench. Routing the pipe above the roadway shall not be permitted.

2. The trench backfill and temporary asphalt surface shall be tamped and compacted to provide a smooth, safe surface for the duration of the highlining installation.

E. Driveway or Handicapped Access Crossing.

1. Wherever the highline piping crosses an auto driveway or handicapped access ramp, the piping shall be provided with temporary asphalt (cold mix) crossing ramps which shall be H20 traffic rated.

2. The temporary asphalt (cold mix) crossing ramps shall be tamped and compacted to provide a smooth, safe surface for the duration of the highlining installation. Slopes shall not exceed those shown.

3. The temporary asphalt (cold mix) crossing ramps shall be constructed such that they do not interfere with normal storm water or other drainage flows. They shall not divert drainage flows either into the street or onto adjacent properties. Where required to achieve proper drainage, sections of galvanized steel piping shall be installed in the crossing ramp parallel to the highline piping to allow for drainage past the crossing ramp. All crossing ramp installations shall be inspected and approved by the DISTRICT.

F. Corners and Curves.

1. Routing the highlining system around corners and curves shall typically be accomplished by use of hose.

2. A shutoff valve shall be installed at each end of the curve.

3. Portions of corners and curves with driveways or handicapped access ramps shall be crossed with galvanized steel pipe as described elsewhere. Use of hose shall not be permitted at these crossings.

4. Corners and curves with bend radii too short to be accommodated by hose shall be routed with short sections of galvanized steel pipe and grooved elbows of different bend angles. Pipe shall be cut, grooved, and fitted in the field as required.

5. Portions of the piping and fittings extending 12 inches or more from the curb shall be protected with an asphalt cold mix covering of not less than 2-inch thickness above the pipe and fittings. The cold mix shall be sloped over the pipe and tamped in place to provide a durable surface.

3.03 START-UP PROCEDURES

A. System leak test. The CONTRACTOR shall:

1. Charge the system with available water pressure, bleed the system of air, and verify that the entire system is filled.

2. Visually inspect the system for leaks and repair any leaks discovered. The system will not be accepted by the DISTRICT until all leaks are repaired.

B. User Hook-up and Service Change. The CONTRACTOR shall:

1. Coordinate work such that user service downtime is minimized. Any single service downtime shall not exceed thirty minutes.

2. Notify the user as specified prior to connection of the user to the highline system.

3. Disinfect hoses, fittings, and other highline user connections according to AWWA C651 prior to connection to user meters.

4. Flush the highline connection, including the meter adaptor on the hose, with potable water until the effluent is clear and free of debris.

5. Shut off and disconnect the user water meter from the existing water main service line. Ensure that no dirt or debris enters to meter or meter connection. Remove any dirt or debris which may enter and plug the meter.

6. Move or bend aside the existing water main service line to provide room for the highline service line. Ensure that the water main service line is not damaged. Some soil may need to be removed from the bottom of the meter box to allow bending of the line.

7. Connect the user water meter to the highline water service line. Use approved adaptors as required to make the connection. Open the shutoff valve to activate the connection.

8. Flush each user system from the hose bibb closest downstream to the water meter - until the effluent is clear and free of debris.

9. Verify proper flow and operation of the system. Clean plugged meters or regulators as required. Reset regulators as required after disturbance of the system to achieve proper service pressures.

C. Shutdown of Water Main.

1. The CONTRACTOR shall notify the DISTRICT after all highline user water meter connections are made and activated. The DISTRICT will inspect the system and issue a written approval to cut and plug the main line.

2. The CONTRACTOR shall coordinate the shutdown of the water main with the DISTRICT after receiving approval from the DISTRICT.

3. As stated elsewhere in the Contract Documents the shutdown of the water main line shall be performed by DISTRICR personnel only. Notification in accordance with the Water Utilities Manual must be given to DISTRICT personnel before shutdown of waterline. Cutting and plugging operations shall be complete within ten working days of CONTRACTOR notification to the DISTRICT.

3.04 RESTORATION OF NORMAL SERVICE

A. Flushing of the New Water Main.

1. The CONTRACTOR shall not flush the new water main with water from the highline system without written approval of the DISTRICT.

B. User Hook-up to the New Main Line.

1. Restoration of user service to the new water main shall be in accordance with Specification Section 15041.

C. Shutdown of Highline System.

1. The CONTRACTOR shall shut down the highline system by closing the fire hydrant valves only after all water user services have been transferred to the new water main line.

3.05 DISASSEMBLY OF HIGHLINE SYSTEM

A. Disassembly.

1. After restoration of normal service to water users, the CONTRACTOR shall fully disassemble the highline system and remove all highline construction materials and debris from the area by the end of the working day.

B. Restoration of Streets and Other Facilities.

1. The CONTRACTOR shall repair or replace all disturbed facilities to a condition equal to or better than the existing condition.

END OF SECTION

SECTION 02960

TEMPORARY SEWER BYPASS PUMPING

PART 1 - GENERAL

1.01 DESCRIPTION

A. The CONTRACTOR shall provide a complete sewer bypassing system including, but not limited to, the following:

1. Developing a sewer bypassing plan.
2. Developing a spill prevention and emergency response plan.
3. Submitting and obtaining approval from the DISTRICT for the sewer bypassing plan and the spill prevention and emergency response plan.
4. Implementing the bypassing and spill prevention and emergency response plan.
5. Providing bypassing in accordance with the approved plans throughout the duration of the Work.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. The Work of the following Sections applies to the Work of this Section. Work of other Sections of the Specification, not referenced below, shall also apply to the extent required for proper performance of this Work.

1. Section 01000 – General Requirements
2. Section 01300 – Shop Drawings and Submittals
3. Section 01570 – Traffic Regulations
4. Section 02950 – Highlining for Watermains
5. Section 15000 – General Piping Systems and Appurtenances

1.03 SUBMITTALS

A. All submittals required by this Specification shall be provided to the DISTRICT for approval within 10-days of receiving the Notice to Proceed. No construction activities related to bypassing shall begin prior to the approval of the required submittals by the DISTRICT. Approval of the CONTRACTOR'S Bypassing and Spill Prevention and Emergency Response Plan in no way relieves the CONTRACTOR of his responsibility to maintain sewage service or provide sewer bypassing at all times during construction and to prevent any spills.

B. Bypassing Plan

1. The CONTRACTOR shall design the bypass system to handle the flows of the system. Contractor shall assume the sewer lines are flowing half full at the slopes indicated on the Contract Drawings for the purposes of estimating the flow rate.

2. The CONTRACTOR shall develop and submit to the DISTRICT, for review and approval, a written Bypassing plan including sequence of work outlining how sewage flows will be maintained and bypassed during construction. The bypassing plan shall include, but not be limited to:

   a. A primary and 100% redundant backup pumping system, each capable of handling the peak flow of the system, which shall be onsite and available 24 hours a day.

   b. A flow monitoring plan describing the method of monitoring and showing the location of upstream and downstream monitoring units for all of the construction locations.

   c. Bypassing of service laterals as necessary to ensure the maximum amount of time a connection is out of service is 8-hours in accordance with the standard specifications.

3. The bypassing plan shall be developed in conjunction with the traffic control plans in order to minimize the impact to the community. See the standard specifications.

C. Spill Prevention and Emergency Response Plan

1. The CONTRACTOR shall develop and submit to the DISTRICT, for review and approval, a written Spill Prevention and Emergency Response Plan. The Spill Prevention and Emergency Response Plan shall be developed to prevent and respond to any construction related sewage spills. The plan shall include, but not be limited to:

   a. Identification of all nearby waterways, channels, catch basins and entrances to underground storm drains

   b. Furnishing of all the necessary materials, supplies, tools equipment, labor and other services to prevent sewage from coming into contact with these areas.

   c. Arrangements for an emergency response unit comprised of emergency response equipment and trained personnel to be immediately dispatched to the Site in the event of sewage spill(s).

   d. An emergency notification procedure, which includes an emergency response roster with telephone numbers and arrangements for backup personnel and equipment and an emergency notification roster of designated DISTRICT representatives.

   e. Direct phone numbers (no voicemail) for 3 CONTRACTOR representatives who shall be accessible and available at all times to respond immediately to any construction related emergency.

1.04 RESPONSIBILITIES OF CONTRACTOR

A. The CONTRACTOR shall observe and comply with all Federal, State, and local laws, ordinances, codes, orders, and regulations which in any manner affect the conduct of the work, specifically as it relates to sewage and prevention of sewage spills. The

CONTRACTOR shall be fully responsible for preventing sewage spills, containing any sewage spills, recovery and legal disposal of any spilled sewage, paying any and all fines, incurring and handling any penalties, claims, or liability arising from negligently causing or allowing a sewage spill, failure to prevent a sewage spill, or any violation of any law, ordinance, code, order, or regulation as a result of the spillage.

PART 2 - MATERIALS

2.01 GENERAL

A. All equipment and tools used for sewer bypassing shall be designed to prevent any and all sewage leaks or spills.

B. All equipment used as part of the bypassing system shall not cause a significant noise impact to the community in accordance with local noise ordinances. If noise complaints from residents occur due to the CONTRACTORS activities, the CONTRACTOR shall immediately replace the noise generating equipment or reduce the noise generated with mitigating devices to the satisfaction of the DISTRICT.

C. Sewage shall be conveyed/pumped in closed conduits and disposed of in a sanitary sewer system. Sewage shall not be permitted to flow in trenches or be covered by backfill.

D. Suction and discharge manholes shall be sealed to prevent odors.

E. Access to driveways may not be blocked by the bypass pipe. Lay flat pipe, a raised platform above bypass pipe or a shallow trench may be used to provide access to residents.

F. If bypass piping must cross any major arterial streets/roads, piping must be installed in a shallow trench. Lay flat piping or raised traffic platforms across these streets will not be allowed. Trench shall be backfilled or covered with recessed, secured trench plating.

G. All shallow trenching shall be backfilled and paved in accordance with the standard specifications following demobilization of sewer bypass. All costs to install, maintain, backfill, and pave temporary shallow trenching shall be included in Contractor’s bid item for sewer bypassing and no additional compensation shall be made therefor.

H. If deemed necessary due to lack of preparedness on the Contractor’s part, the DISTRICT has the option to clean up the sewage spill caused by the Contractor. Clean up costs incurred by the DISTRICT shall be recoverable in addition to the penalties from the Contractor’s progress payments.

2.02 PUMPING EQUIPMENT

A. All pumps used for sewer bypassing shall be the submersible type and shall only be operated below ground in the sewer manhole or other sewer facility. The use of above ground pumps or pumps not specifically designed for submersible service are not allowed.

B. The pumps shall be sized to fit in manholes or other confined areas necessary to successfully complete the sewer bypassing. The CONTRACTOR shall ensure all equipment used for bypassing will operate under the conditions required and the

CONTRACTOR will be responsible for all costs associated with changes to the bypassing system due to inappropriate equipment or non-conformance with the Contract Documents.

C. Electric or fuel/generator driven pumps shall be used. The CONTRACTOR shall provide an emergency standby power generator, sized to operate the bypass system at a minimum, to be used to operate the submersible pumps if electrical power is lost during the progress of the Work and a sewage spill will occur. The generator shall meet all requirements per the standard specifications.

D. The pumps shall be specifically intended for use with raw sewage and shall be capable of passing a 3-inch diameter solid.

E. Regardless of power used the total noise of any equipment used by the CONTRACTOR as part of the bypassing system shall be under 68 dba as measured standing thirty (30) feet from the equipment.

PART 3 - EXECUTION

3.01 GENERAL

A. The CONTRACTOR shall observe and comply with the DISTRICT policy of "ZERO SPILLS".

B. The CONTRACTOR shall exercise care not to damage existing public and private improvements, interrupt existing services and/or facility operations which may cause a sewage spill. Any reasonably anticipated utility and/or improvement which is damaged by the CONTRACTOR shall be immediately repaired at the CONTRACTOR'S expense. In the event that the CONTRACTOR damages an existing utility or interrupts an existing service which causes a sewage spill, the CONTRACTOR shall immediately notify the DISTRICT representatives. The CONTRACTOR shall request and obtain from the DISTRICT an emergency roster of the designated DISTRICT representatives with their respective telephone numbers including cellular phone numbers. The CONTRACTOR shall take all measures necessary to prevent further damage or service interruption, and to control, contain and clean up the resultant impacts of the damage, service interruption and any resulting sewage spill(s).

C. The CONTRACTOR shall continuously monitor the flow levels downstream and upstream of the construction location to detect any possible failure that may cause a sewage backup and spill. The CONTRACTOR shall include the means and methods of monitoring the flow in their Sewer Bypassing Plan.

3.02 SEWAGE SPILLS

A. In case of sewage spill, the CONTRACTOR shall act immediately, within fifteen minutes – without instructions from the DISTRICT – to control the spill and take all appropriate steps to contain it in accordance with their Spill Response Plan.

B. The CONTRACTOR shall immediately notify the DISTRICT representatives of the sewage spill(s) and all remedial actions taken.

C. The CONTRACTOR shall, within 24 hours from the occurrence of the spill, submit to the DISTRICT a draft written report describing the following information related to the spill: the location on a current Thomas Bros. guide map; the nature and volume; the date and time; the duration; the cause; the type of remedial and/or preventive actions taken; and the water body impacted and results of any necessary monitoring. The DISTRICT will review the draft report, and if revisions are required, the CONTRACTOR shall make those revisions and submit the final report to the DISTRICT within 24 hours of the receipt of comments. Requests for additional compensation for the handling of the spill shall be submitted to the Engineer as a construction claim. The CONTRACTOR shall assure the validity, accuracy, and correctness of the claim under penalty of perjury. The Engineer may institute further corrective actions, as deemed necessary, to fully comply with existing law, ordinance, code, order or regulation. The CONTRACTOR shall be responsible for all costs incurred for the corrective actions.

D. It shall be the CONTRACTOR's responsibility to assure that all field forces, including Subcontractors, know and obey all safety and emergency procedures, including the Spill Response Plan, to be maintained and followed at the Site.

3.03 SEWER BYPASSING

A. The CONTRACTOR shall provide temporary means to maintain and handle the sewage flow in the existing system as required to complete the necessary construction.

B. The CONTRACTOR shall size the bypass system to handle the peak flow of the system. The CONTRACTOR shall provide a redundant, identically sized, one- hundred percent (100%) backup bypass system. The CONTRACTOR shall utilize the backup system to mitigate any additional wet weather flows, perform the necessary maintenance and repairs on the primary bypass system, and exercise and ensure the operability of the backup system. Each pump, including the backup pumps, shall be a complete unit with its own suction and discharge piping. The CONTRACTOR shall operate the backup bypass system for a minimum of twenty- five percent (25%) of the time on a weekly basis. The backup bypass system shall be fully installed and operationally ready at all times.

C. Prior to the full operation of the bypass system, the CONTRACTOR shall demonstrate, to the satisfaction of the DISTRICT, that both the primary and backup bypass systems are fully functional and adequate, and shall certify the same, in writing, in a manner acceptable to the DISTRICT.

D. The CONTRACTOR shall provide all equipment necessary to minimize the noise generated by the bypassing operations. Noise levels from the complete bypassing system shall not exceed the levels allowable under the local jurisdictional codes and requirements.

E. The CONTRACTOR shall continuously (while in use) monitor the operation of the bypass system and all impacted facilities. The CONTRACTOR shall submit, as part of their bypass plan, their system monitoring procedure and frequency. The CONTRACTOR shall maintain a log of the monitoring in a manner acceptable to the Engineer.

F. The CONTRACTOR shall continuously monitor the flow levels downstream and upstream of the bypass to detect any possible failure that may cause a sewage backup and/or spill. The CONTRACTOR shall include the means and methods of monitoring the flow in their

Bypassing Plan. The CONTRACTOR shall provide flow monitoring data to the DISTRICT on a weekly basis in a format acceptable to the DISTRICT.

G. The CONTRACTOR shall routinely inspect and maintain the bypass system, including the backup system. The CONTRACTOR shall submit as part of their Bypassing Plan their maintenance procedures and frequency. The CONTRACTOR shall maintain a log of all pertinent inspection, maintenance and repair records in a manner acceptable to the Engineer.

H. At the end of each day's work, the CONTRACTOR shall re-establish sewer flows in the gravity sewer system. Work undertaken each day shall only include work that can be completed during that working day.

I. See the standard specifications for requirements of property owner notification due to bypassing operations.

END OF SECTION