

SECTION 02200 - EARTHWORK

PART 1 - GENERAL

1.1 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.

1.2 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.

1.3 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 - Record Drawings and Submittals
 - 2. Section 01060 - Permits and Other Regulatory Requirements
 - 3. Section 02140 - Dewatering
 - 4. Section 02222 - Protecting Existing Underground Utilities
 - 5. Section 02223 - Trenching, Backfilling, and Compacting

1.4 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 City of Oceanside Engineers Design and Processing Manual and the Water Utilities Department Water, Sewer, and Reclaimed Water Design and Construction Manual.
- 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.

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3. California Department of Transportation Traffic Manual.

1.5 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 AGENCY 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 AGENCY'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 AGENCY may require.
 6. An agricultural soil evaluation about the suitability of proposed topsoil.

PART 2 - PRODUCTS

2.1 FILL AND BACKFILL MATERIALS

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- 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 AGENCY.
- 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 AGENCY before transporting imported material.
- D. Unclassified Material: Unclassified material shall conform to SSPWC Subsection 300-4.

2.2 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.

2.3 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.

2.4 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

3.1 GENERAL

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- 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.

3.2 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.

3.3 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.

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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 AGENCY. Trees shall be supported during excavation by means previously reviewed and accepted by the AGENCY.
- 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.
- ### 3.4 FILL AND BACKFILL
- A. General:
1. Backfill shall be placed in accordance with City of Oceanside Engineers Design and Processing Manual and the Water Utilities Department Water, Sewer, and Recycled Water Design and Construction Manual.

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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: 95%
 - b. Fill beneath structures, including water-containing structures: 95%
 - c. All trench backfill: 95%
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 AGENCY.

3.5 PREPARATION OF SUBGRADE

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- A. The preparation of subgrade for pavement, curbs and gutters, driveways, sidewalks and other roadway structures shall be in accordance with SSPWC Subsection 301-1.

3.6 UNTREATED BASE

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

3.7 TEMPORARY STOCKPILES

- A. Locations of temporary stockpiles shall be approved by the AGENCY.
- B. Temporary stockpiles shall not be allowed to surcharge buried pipe, conduits, or other structures.

**** END OF SECTION ****