

SECTION 02324 - TRENCHING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes excavating trenches for utilities from outside building; compacted fill from top of utility bedding to subgrade elevations; and backfilling and compaction.
- B. Related Sections:
 - 1. Section 01420 - Testing and Inspection.
 - 2. Section 02055 - Soils.
 - 3. Section 02060 - Aggregate Materials
 - 4. Section 02200 - Earthwork.
 - 5. Section 02320 - Backfill: General backfilling.
 - 6. Section 03300 - Cast-in-Place Concrete.
- C. Additional Documents:
 - 1. Geoseismic/Geotechnical Investigation Report for Rosemead High School, prepared by Baca Associates, Inc. and dated April 27, 2005.

1.2 REFERENCES

- A. ASTM D1557 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10 lb Rammer and 18 inch Drop.
- B. Public Contract Code, Section 7104 - Contracts for Digging Trenches or Excavations; Notice on Discovery of Hazardous Waste or Other Unusual Conditions; Investigations; Change Orders; Effect on Contracts.
- C. Conform to the requirements of the California Occupational Safety and Health Regulations (CAL/OSHA).

1.3 DEFINITIONS

- A. Utility: Any buried pipe, duct, conduit, or cable.

1.4 FIELD MEASUREMENTS

- A. Verify that survey bench mark, control point, and intended elevations for the Work are as shown on drawings.

1.5 WORK COORDINATION

- A. The Contractor shall fully coordinate the work operations of this Section with that of other trades involved and with the Construction Manager.
- B. Coordinate the Work in the public right-of-way with the City of Rosemead and coordinate the Work within the site with the California Code of Regulations, Title 24 - Building Standards, Part 5, 2001 Basic Plumbing Regulations with State Amendments.

1.6 PROTECTIONS

- A. Comply with provisions of DIVISION 1 - GENERAL REQUIREMENTS. Protect and guard all excavations against damage to life, limb and property.
- B. Provide and install signs, lights and barricades at danger points on and off the job-site to guard against accidents, etc.
- C. Protect against damage resulting from Contractor's operations. Repair or replace damaged items to the full satisfactions of the Construction Manager at no added cost to the District.
- D. Divert or pump out of all excavations until concrete and other items are placed therein, forms removed and backfilling is completed.

1.7 INSPECTION

- A. All trenches will be inspected by the Inspector of Record before filling, backfilling and/or other subsequent work is placed therein.

1.8 DISPOSAL OF EXCESS MATERIALS

- A. Remove from the job-site all excess excavated and imported materials not used for fill or backfill and all waste and debris.

1.9 COORDINATION

- A. Coordinate work under provisions of Section 01400 - Quality Control.
- B. Verify work associated with lower elevation utilities is complete before placing higher elevation utilities.

1.10 PRE-INSTALLATION CONFERENCE

- A. Conduct conference at project site in compliance with requirements in Division 1 Section "Project Coordination."
- B. Review product requirements and installation methods.
- C. Review field and substrate conditions, and coordinate sequencing with adjacent work.

PART 2 - PRODUCTS

2.1 FILL MATERIALS

- A. Fill Type S2: As specified in Section 02055 - Soils.
- B. Structural Fill Type A1: As specified in Section 02060 - Aggregate Materials.
- C. Concrete: Structural concrete conforming to Section 03300 - Cast-In-Place Concrete with a compressive strength of 3500 psi.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Identify required lines, levels, contours, and datum locations.
- B. Protect plant life, lawns, and other features remaining as a portion of final landscaping.
- C. Protect bench marks, existing structures, fences, sidewalks, paving, and curbs from excavating equipment and vehicular traffic.
- D. Maintain and protect above and below grade utilities which are to remain.
- E. Cut out soft areas of subgrade not capable of compaction in place. Backfill with Fill and compact to density equal to or greater than requirements for subsequent backfill material.
- F. Trenches, ditches, pits, and similar items which are outside the barricaded working area shall be barricaded to conform to Cal OSHA standards.
- G. Trenches over 5'-0" in depth shall conform to the Construction Safety Orders of the California Division of Industrial Safety.

3.2 EXCAVATING

- A. Excavate trenches for utilities, pipes, and concrete encased electrical conduits, to required depth, as indicated on Drawings. Grade bottom of trenches to a uniform surface to prevent pockets. Remove all loose soil from the excavation before placing 6" layer of sand bedding, compacted to 90% of the maximum density. Use clean, fine-grained sand of such size that not less than 90 % shall pass through a 1/4" screen and not more than 25 % through a number 50 screen. Sand, meeting the Specifications for fine aggregate for concrete work, may be used. Place pipes, encased conduits and other utilities on a uniformly bearing sand bed.
- B. Cut trenches sufficiently wide to enable installation and allow inspection. Remove water or materials that interfere with Work.
- C. Do not interfere with 45 degree bearing splay of foundations.
- D. Keep excavations free of water during installation work. Dispose of water in such a manner as not to endanger public or private property or public health. Remove accumulated water in excavations by pumping, or other approved means. Any contaminated water shall be stockpiled on site per direction by the Construction Manager. The District shall be responsible for any offsite disposal of contaminated water.
- E. Remove lumped subsoil, boulders, and rock up to 1/3 cu yd, measured by volume.
- F. Where portions of existing structures, walks, paving, etc. must be removed or cut for pipe or conduit installation, replace the material with equal quality, finished to match adjacent work.

- G. Stockpile excavated material in area designated on site and remove excess material not being used, from site. Any contaminated soils shall be stockpiled on site per direction of the Construction Manager. The District shall be responsible for any offsite disposal of contaminated soil.

3.3 BACKFILLING

- A. Do not place backfill until the work installed has been inspected, tested and approved by the Inspector of Record/Soils Engineer. Remove excavated rocky material unsuitable for backfill from the site.
- B. Backfill trenches to contours and elevations with unfrozen fill materials.
- C. Systematically backfill to allow maximum time for natural settlement. Do not backfill over porous, wet, or spongy subgrade surfaces.
- D. Trenches for electrical installation outside of the barricaded working area, shall be backfilled within 72 hours after approval of electrical installation by the Construction Manager.
- E. Backfill shall be placed in layers not exceeding 4" in thickness and compacted to 90% of the maximum density.
- F. Employ a placement method that does not disturb or damage foundation perimeter drainage and utilities in trench.
- G. Maintain optimum moisture content of fill materials to attain required compaction density.
- H. Remove surplus fill materials from site.
- I. Leave fill material stockpile areas completely free of excess fill materials.

3.4 TOLERANCES

- A. Top Surface of Backfilling Under Paved Areas: Plus or minus 1 inch from required elevations.
- B. Top Surface of General Backfilling: Plus or minus 1 inch from required elevations.

3.5 FIELD QUALITY CONTROL

- A. Section 01455 - Testing Laboratory Services:Quality Control.
- B. Inspector of Record/Soils Engineer will inspect all subgrades and excavations prior to placing backfill materials.
- C. Compaction testing will be performed in accordance with ASTM D1557, method "C".
- D. If tests indicate Work does not meet specified requirements, remove Work, replace, compact, and retest.

3.6 PROTECTION OF FINISHED WORK

- A. Protect finished Work under provisions of Section 01600 - Materials and Equipment.

B. Reshape and re-compact fills subjected to vehicular traffic during construction.

3.7 EXCESS MATERIAL DISPOSAL

A. Remove all excess excavated and imported material not used for fill or backfill and all waste and debris from job-site. Grade site surface to prevent free standing surface water.

3.8 INSPECTION REQUEST

A. Comply with Division 1 Section "Testing and Inspection."

B. Submit request for inspection at each stage of trenching prior to proceeding to the next stage. Do not proceed to the next stage unless the previous stage has been approved.

END OF SECTION 02324