

SECTION 02011

SUBSURFACE INVESTIGATION

02011.01 GENERAL

A. Description

Subsurface investigation shall include, but not necessarily be limited to, drilling test holes, augering holes, digging test pits or driving rods (where drilling or augering is impractical) as a means of verifying the character and suitability of existing material for foundation purposes, for use as embankment or backfill material, and/or for determining the means and methods for grading operations.

B. Related Work Included Elsewhere

1. Protection of the environment; Section 01500.
2. Clearing and grubbing; Section 02110.
3. General Excavation; Section 02210

C. Quality Assurance

The County Engineer will inspect the work to ensure compliance with the Contract Documents.

D. Submittals

1. Submit finished reproducible reports with copies in triplicate indicating neatly and clearly the information for each boring including the depths of stratum by elevations, classification of materials, driving records, and any other pertinent information and construction recommendations.
2. Submit log of all rods driven including number, size, length, and location of all rods.
3. Submit a report recommending construction methods, foundation preparation requirements, quantities and types of borrow and/or selected fill required, optimum moisture contents, gradation, permeability, binders in the soil, reasonable compaction limits using native soils, and any recommendations on further tests needed.
4. Submit soil samples to the County Engineer for retention for future reference.

02011.02 MATERIALS

A. Materials Furnished by the County

SUBSURFACE INVESTIGATION

02011-2

The County will not furnish any materials for subsurface investigation.

B. Contractor's Options

Not applicable.

C. Detailed Material Requirements

Not applicable.

02011.03 EXECUTION

A. General

Test holes shall be drilled or augered as indicated on the Plans or in the "Special Provisions," or as directed by the County Engineer.

B. Site

1. When the County Engineer considers the conditions at the site unsuitable for the prosecution of the work, the County Engineer may order the Contractor, in writing, to suspend work until suitable conditions exist. In accordance with Section GP-8.07, no additional compensation shall be paid the Contractor on account of such suspension.
2. It is the Contractor's responsibility to satisfy himself as to the location of underground utilities in the immediate vicinity of the subsurface investigation so as to prevent damage to them. Should any damage to such utilities occur, the Contractor shall be required to bear the full cost of repairs and/or replacement of the utilities in accordance with State law.
3. The Contractor shall be required to do all necessary clearing and any other work necessary to move the Contractor's equipment to, around and from the site. Each test hole drilled by the Contractor shall be suitably backfilled and leveled upon its completion and acceptance by the County Engineer. At the completion of the work, the Contractor shall remove the Contractor's equipment and leave the site in a clean condition acceptable to the County Engineer.

C. Soil Sampling

1. The soil sampling shall be performed in accordance with ASTM D 1586 which shall be consulted for description of equipment required, preparation for and method of boring, care of samples, logging and data required, and groundwater determination. Soil sampling shall be carried to the proposed depths shown on the Plans unless otherwise directed by the County Engineer. Augering between samples will be

permitted if, in the opinion of the County Engineer, subsurface conditions allow.

2. Samples recovered from wash water commonly called "wash samples" will be unacceptable.
3. In general, the use of water for cleaning out the casing will be permitted; however, if the moisture content of the material below the casing might be altered by water in the casing, such water shall be removed by an approved method.
4. Test holes drilled through overburden shall be suitably cased to permit obtaining "dry samples" of the sizes specified or directed by the County Engineer.
5. Blasting with small charges to remove small boulders or other obstructions which cannot be conveniently removed will not be permitted unless otherwise authorized by the County Engineer.
6. A continuous record shall be kept of the number of hammer blow per foot of penetration on a comparative basis. The same weight and fall of casing hammer shall be used for drilling casings of the same size by all drilling rigs used by the Contractor on this work.
7. During the sinking of the casing, observations shall be made to determine the elevation of the water surface in the hole. On any day in which a boring is not completed, the hole shall be pumped as nearly dry as practicable and permitted to stand overnight. Before resuming work the next day the elevation of the water surface in the hole shall be determined.

02011.04 METHOD OF MEASUREMENT

RESERVED FOR FUTURE USE

02011.05 BASIS OF PAYMENT

RESERVED FOR FUTURE USE

SECTION 02012

TEST PITS

02012.01 GENERAL

A. Description

1. Test pits shall include, but not necessarily be limited to, excavation to determine the exact location and/or elevation of underground structures, utilities, and other obstructions; the backfill and compaction of the excavation; and the stabilization of the surface in accordance with the Contract Documents.
2. It is the County's policy to test pit existing underground utilities at their point of crossing with proposed utilities for design purposes. When this is done, the information obtained is shown on the Plans. However, should there be a location(s) where crossings of existing and proposed utilities occur and a test pit(s) was not performed, it shall be the Contractor's responsibility to establish the location and/or elevation of the existing utility.

B. Related Work Included Elsewhere

1. Maintenance of traffic; Sections 01410 through 01470.
2. Protection of the environment; Section 01500.
3. Adjusting and replacing fences, shrubs, hedges, etc.; Section 02130.
4. Adjusting existing utilities and underground structures; Section 02140.
5. Removal of existing pavement, sidewalk, curb, and combination curb and gutter; Section 02160.
6. Tamped fill; Section 02265.
7. Excavation support; Section 02400.
8. Dewatering; Section 02512.
9. Patching paving; Section 02680.

C. Quality Assurance

1. Materials

It is intended that all materials removed from the test pit excavation, exclusive of paving materials, be used for backfill. The County Engineer will inspect all material

prior to its use as backfill to determine the material's suitability for use as backfill.

2. **Field Tests**

The County Engineer may, at the County Engineer's discretion, arrange for in-place moisture/density testing of the backfilled excavation. The Contractor shall be governed by the requirements of Section 02250.01, Article C.

D. Submittals

None.

02012.02 MATERIALS

A. Materials furnished by the County

None.

B. Contractor's Options

Not applicable.

C. Detailed Material Requirements

1. **Use of Excavated Material**

All suitable material excavated from test pits shall be used, as far as practicable, for backfill. The Contractor shall properly store or stockpile and protect all materials that are to be reused in the work. The Contractor shall replace, at the Contractor's own expense, material that was suitable when excavated, which has subsequently become unsuitable because of careless, neglectful, wasteful, or unprotected storage. The Contractor shall have no property right in any material taken from any excavation and no excavated material shall be wasted or otherwise removed from the project site without permission of the County Engineer. All unsuitable material shall be removed from the excavation and disposed of off-site by and at the expense of the Contractor.

2. **Borrow**

Borrow material for test pit backfill shall meet the requirements of Section 02240.02.

3. **Graded Aggregate Subbase**

Graded aggregate subbase for test pit backfill shall meet the gradation requirements specified in Section 02621.02.

02012.03 EXECUTION

A. General

It shall be the Contractor's responsibility to determine the location and/or elevation of underground structures and utilities by the use of test pit excavation prior to initiating

TEST PITS

02012-3

excavation operations for the installation of the proposed facility. Test pits shall be of the size, depth and location as approved by the County Engineer. Should the location and/or elevation thus determined be different from that shown on the Plans, the Contractor shall promptly furnish the correct information to the County Engineer so that the impact on the Project may be determined.

B. Test Pits

1. Surface preparation, excavation, backfill, compaction, and maintenance of the backfilled excavation shall be as specified in Section 02250.03 for trenches except that the limits of the work shall be as approved by the County Engineer.
2. Restoration shall be as specified in Section 02250.03 unless otherwise specified or directed by the County Engineer.

02012.04 METHOD OF MEASUREMENT

RESERVED FOR FUTURE USE

02012.05 BASIS OF PAYMENT

RESERVED FOR FUTURE USE