
Section 02315**EXCAVATION AND BACKFILL FOR DETENTION PONDS****1.0 GENERAL****1.01 SECTION INCLUDES**

- A. Excavation of materials for detention ponds.
- B. Placement of fill within the project limit.
- C. References to Technical Specifications:
 - 1. Section 01200 – Measurement and Payment Procedures
 - 2. Section 01350 – Submittals
 - 3. Section 01760 – Project Record Documents
 - 4. Section 01450 – Testing Laboratory Services
 - 5. Section 01500 – Temporary Facilities and Controls
 - 6. Section 01532 – Waste Material Disposal
 - 7. Section 02255 – Bedding, Backfill and Embankment Material
 - 8. Section 01570 – Trench Safety Systems
 - 9. Section 01564 – Control of Ground Water and Surface Water
 - 10. Section 01720 – Field Surveying
 - 11. Section 02220 – Site Demolition
 - 12. Section 02200 – Site Preparation
 - 13. Section 02330 – Embankment
 - 14. Section 01140 – Contractor’s Use of Premises
- D. Referenced Standards:
 - 1. American Society for Testing and Materials (ASTM)
 - a. ASTM D 698, “Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort”
 - b. ASTM D 4318, “Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils”
 - c. ASTM 1556, “Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method”
 - d. ASTM 2922, “Standard Test Method for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)”
 - e. ASTM 2922, “Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth)”
 - 2. Occupation Safety and Health Administration (OSHA)
 - 3. Texas Department of Transportation (TxDOT)

- a. Tex-101-E, Preparing Soil and Flexible Base Materials for Testing.
 - b. Tex-110-E, Particle Size Analysis of Soils.
- E. Definitions:
1. Final Survey – the survey completed after the detention pond excavation is complete, all on site fill material has been placed, all excess fill material has been hauled off site, final grades have been completed. This survey shall be completed prior to the placement of any concrete, topsoil or installation of Bio-swales.
 2. Initial Survey – the survey completed after site preparation has been completed and prior to any excavation.
 3. Over-Excavation – excavation of unsatisfactory soils in the bottom and or side slopes of the detention pond as identified by the material testing lab during excavation.

1.02 MEASUREMENT AND PAYMENT

- A. Measurement and payment for detention pond excavation fill placement and excess material disposal shall be on a cubic yard basis and paid for in a single pay item.
1. Payment will be made monthly based on estimated quantities up to 90% of the total bid quantity included in section 00300 – Bid Proposal. No additional payment will be made until submittal and approval of the final survey. Survey shall be in accordance with Section 01720 Field Surveying.
 2. The Engineer shall calculate the final pay item quantity using the Initial and Final Surveys. Payment will be based on the calculated volume of material excavated from the pond. No separate payment is made for fill material placed either inside or outside the project boundaries. Contractor shall not be paid for excavation quantities below the grades or outside of the limits of established bank as shown on the plans. The Engineers calculated quantities shall be final.
- B. Measurement and Payment for Over-Excavation and Backfill of Unsuitable Materials shall be on a cubic yard basis. All Over-Excavation must be approved by the Engineer prior to work being done, in order to be paid. Quantities to be over excavated shall be agreed to by the Contractor and Owners Representative on a daily basis.
- C. Refer to Section 01200 – Measurement and Payment Procedures.

1.03 SUBMITTALS

- A. Make Submittals required by this Section under the provisions of Section 01350 – Submittals.

- B. Initial Survey, Signed and Sealed by a Texas Licensed Land Surveyor on a maximum grid of 25'. A hard copy and electronic file capable of creating a digital terrain model shall be submitted.
- C. Final Survey, Signed and Sealed by a Texas Licensed Land Surveyor on a maximum grid of 25'. A hard copy and electronic file capable of creating a digital terrain model shall be submitted.
- D. Submit record drawings documenting locations of grade breaks and swales, referenced to survey Control Points, under the provisions of Section 01760 – Project Record Documents, 1.04C. Include location of approved Over- Excavation and back fill. Give horizontal dimensions, elevations, inverts and gradients.

1.04 TESTING

- A. Testing and analysis of product quality, material sources, or field quality shall be performed by an independent testing laboratory provided by the Owner under the provisions of Section 01450 – Testing Laboratory Services and as specified in this Section.

1.05 PROTECTION OF PEOPLE AND PROPERTY

- A. Contractor shall conduct all construction operations under this Contract in conformance with the practices described in Section 01500 – Temporary Facilities and Controls.

2.0 PRODUCTS

2.01 MATERIALS

- A. Contractor shall use on-site materials for backfill that conforms to the requirements in Section 02255 – Bedding, Backfill and Embankment Material.

2.02 EQUIPMENT

- A. Perform excavation with equipment suitable for achieving the requirements of this section.
- B. Use equipment which will produce the degree of compaction specified.

3.0 EXECUTION

3.01 PREPARATION

- A. Construction surveying shall be performed by qualified personnel under the direction of the contractor. Contractor shall be responsible for the accuracy and correctness of this work. In the event that the work consists of significant alteration of the

topographic features of natural grade, contractor shall perform enough topographic survey to substantiate existing pre-construction elevations. No claim shall be made for additional excavation or grade adjustment in excess of quantities contained in the contract documents without demonstrable evidence that such conditions existed prior to start of the work

- B. Employ a Trench Safety Plan as specified in Section 01570 – Trench Safety Systems.
- C. Install and operate necessary dewatering and surface water control measures in accordance with requirements of Section 01564 – Control of Ground Water and Surface Water.
- D. Identify required lines, levels, and datum. Coordinate with Section 01720 – Field Surveying.
- E. Perform the Initial Survey in accordance with this Specification and Section 01720-Field Surveying.
- F. Identify existing structures and utilities above and below grade. Stake and flag their location.
- G. Remove existing pavements and structures, including sidewalks and driveways, in conformance with requirements of Section 02220 – Site Demolition, as applicable.
- H. Area shall be cleared and grubbed under the provisions of Section 02200 – Site Preparation prior to excavation.
- I. Strip and stockpile topsoil under the provisions of Section 02200 – Site Preparation. Ensure strip material to be used a topsoil meets criteria in Section 02910- Topsoil and is kept separated from unsuitable material.
- J. Upon discovery of unknown or badly deteriorated utilities not designed for removal, or concealed conditions, discontinue work. Notify Engineer and obtain instructions before proceeding in such areas.

3.02 EXCAVATION

- A. Perform excavation work to an elevation that shall allow the finished grades as shown on the plans. Some areas shown on the plans include 3” of top soils and some the finished grade areas do not include the placement of top soil. If the top soil is not included in the finished grade, the top soil is part of a separate contract and shall be done by others.
- B. Excavated soil shall be classified as suitable or unsuitable backfill. Any soils deemed unsuitable for backfill shall be hauled off site. Material suitable for backfill shall be stockpiled until no longer needed and then disposed of.

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- C. If when the Contractor reaches the required elevation and finds the subgrade soil to be of questionable quality, the Contractor shall notify the Engineer and request the Owner's laboratory to test the soil. If the laboratory finds the soil to be unsuitable, the Contractor shall Over-Excavate the unsuitable soil and replace with on-site material that meets the Clay-Liner material requirements. The Contractor shall coordinate the Over-Excavation with the Owner's Representative and Laboratory to ensure all unsuitable material is removed and the quantity of unsuitable material is properly recorded for payment.
 - D. While waiting for lab results for unsuitable soil, Contractor may continue excavation in other parts of the Detention Pond, after the area of concern has been staked out.
 - E. Prior to Final Grading the Contractor shall install any underground utilities to ensure the subgrade material is suitable. The excavation of the underground utilities shall be in accordance with Section 02318 – Excavation and Backfill for Utilities.
 - F. After Final Grading the Contractor shall perform and submit the Final Survey in accordance with Section 01720 – Field Surveying.

3.03 DEWATERING

- A. Maintain ground water control as directed by Section 01564 – Control of Ground Water and Surface Water. No separate payment shall be made for dewatering associated with work.

3.04 FIELD QUALITY CONTROL

- A. Tests will be performed initially on a minimum of three different samples of each material type for plasticity characteristics, in accordance with ASTM D 4318, and for gradation characteristics, in accordance with TxDOT Tex 101-E and Tex-110-E. Additional classification tests will be performed whenever there is a noticeable change in material gradation or plasticity.
- B. In-place density tests of compacted subgrade will be performed according to ASTM D 1556, or ASTM D 2922 and ASTM D 3017, and at the following frequencies and conditions.
 - 1. A minimum of three density tests for each full work shift when compaction is being performed.
 - 2. Density tests will be performed in all placement areas.
 - 3. The number of tests will be increased in inspection determines that soils types or moisture contents are not uniform or if compacting effort is variable and not considered sufficient to attain uniform density
- C. At least three tests for moisture-density relationships will be initially performed for each type of backfill material in accordance with ASTM D 698. Additional

moisture-density relationship tests will be performed whenever there is a noticeable change in material gradation or plasticity.

- D. If tests indicate work does not meet specified compaction requirements, recondition, re-compact, and retest at Contractor's expense.

3.05 CLEAN-UP AND RESTORATION

- A. Perform clean-up and restoration in and around construction zone in accordance with Section 01140 - Contractor's Use of Premises.

3.06 PROTECTION OF THE WORK

- A. Maintain excavation and embankment areas until start of subsequent work. Repair and re-compact slides, washouts, settlements, or areas with loss of density at no cost to the Owner.
- B. Prevent erosion at all times and maintain slopes until vegetation has been established.

END OF SECTION