Municipal Services

Department of Waste Management & Recycling
Paul Philleo, Director

Nav Gill, County Executive Officer
Rob Leonard, Chief Deputy County Executive

County of Sacramento

MUNICIPAL SERVICES

KIEFER LANDFILL
PHASE 3 FINAL COVER AND STORMWATER IMPROVEMENTS

CONTRACT NO. 4286

ADDENDUM NO. 3

June 23, 2016

RECEIPT OF THIS ADDENDUM MUST BE ACKNOWLEDGED IN THE SPACE PROVIDED IN THE BID FORM

Addendum No. 3 is made part of contract No. 4286

_____
Paul Philleo
Director

ADDENDUM NO. 3

TO THE PROSPECTIVE BIDDERS FOR CONTRACT NO. 4286, KIEFER LANDFILL-PHASE 3 FINAL COVER AND STORMWATER IMPROVEMENTS

RECEIPT OF THIS ADDENDUM MUST BE ACKNOWLEDGED IN THE SPACE PROVIDED IN THE BID FORM

The following addendum has been issued for Contract No. 4286. The addendum includes changes to the Contract Specifications. Additionally, responses to contractor questions are provided in this Addendum.

Reference specification dated May 2016:

Addendum Item	Section, Page Number, or Sheet	Description of Change
3.01	Bid Form	The Bid Form has been corrected to reflect the item numbers listed in Section 1025
3.02	Section 2200	The trench backfill requirements have been revised. The ¾-inch limit on earthfill has been removed.
	Contractor Questions	**County Response**
3.03	Is all concrete generated by demolition to remain on site?	Yes. The contractor shall haul concrete rubble to the site's inerts stockpile.
3.04	Is screening of native material anticipated to meet any soil sizing requirements?	No.
3.05	Spec Section 2200-2.2 (General Earthfill) states that the max particle size for earthfill backfill material in a pipe trench will be ¾". Does this apply to the general earthfill called out in the typical trench sections?	No. Section 2200 has been revised to reflect this change.
3.06	How thick is the concrete lining in the existing SW Channel?	The majority of the existing channel is unreinforced 3-inch concrete. There is a 330-foot section that is 5-inch thick concrete with 4x4 WWF located at the east end of the ditch near the sedimentation basin outfall.
3.07	Please identify the size/spacing of any WWF or reinforcing steel in the existing concrete lining at the SW Channel.	The majority of the existing channel is unreinforced 3-inch concrete. There is a 330-foot section that is 5-inch thick concrete with 4x4 WWF located at the east end of the ditch near the sedimentation basin outfall. Existing inlet and outlet structures are reinforced concrete.

Documents included with this Addendum No. 3 are as follows:

1) Bid Form
2) Specification Section 2200

END OF ADDENDUM

I. BID:

Pursuant to your published NOTICE TO CONTRACTORS for the above-referenced project, and in accordance with the approved Plans and Specifications for that project, the following bid for said entire project is hereby submitted by the firm indicated in Section 1 and Section 7 (Contractor Information) of this Bid Form.

Contractor Name: _____

	Item	Quantity	Unit	Unit Cost	Total
1	Mobilization and Demobilization	1	ls		
2	Layout of Work and Surveys	1	ls		
3	SWPPP Preparation and Implementation	1	ls		
4	Channel Demolition	3,125	lf		
5	LFG Demolition	1	ls		
6	Demolition	1	ls		
7	Stripping	14	ac		
8	E/T Soil Cover	82,000	cy		
9	Access Road Aggregate Base	3,400	cy		
10	Erosion Control Lined Drainage Ditch	3,020	lf		
11	Downdrain 24" Diameter CMP	1,000	lf		
12	Downdrain 30" Diameter CMP	100	lf		

13	Channel 36" Diameter CMP	320	lf		
14	Downdrain Flared Inlet	1	ea		
15	Downdrain Drop Inlets	2	ea		
16	Settlement Monuments	6	ea		
17	LFG Extensions and New Wellheads	6	ea		
18	Salvaged LFG Piping	1	ls		
19	New LFG Piping and Valves	1	ls		
20	Channel Excavation	1,920	cy		
21	Channel Earthfill	3,430	cy		
22	Refuse Excavation	1,000	cy		
23	Shotcrete with Welded Wire Fabric and Fence	3,124	lf		
24	Pipe Headwall & Wingwalls	3	ea		
25	Downdrain Channel Inlet	3	ea		
26	Temporary Fencing	1,250	lf		
27	Rip Rap	200	cy		
28	Front Entrance Landscaping	1	LS		
29	12" Dia. CMP Installation and Materials, Up to 7' deep	80	lf		

30	24" Dia. CPE Drainage Pipe Installation and Materials, Up to 7' deep	600	lf		
31	24" Dia. CPE Drainage Pipe Installation and Materials, 7' to 15' deep	550	lf		
32	36" Dia. CPE Drainage Pipe Installation and Materials, Up to 7' deep	490	lf		
33	Drainage Pipe Manhole	6	ea		
34	Drainage Pipe Drop Inlet	1	ea		
35	Chain Link Fencing	150	lf		
36	Traffic Control Plan and Implementation	1	ls		
37	Final Cover Revegetation	13	ac		
38	Disturbed Area Revegetation	10	ac		
				Bid Total	

Notes: In the event the product of a unit price and an estimated quantity do not equal the extended amount stated, the unit price will govern and the correct product of the unit price and the estimated quantity shall be deemed to be the amount bid.

SECTION 02200
SITE EARTHWORK

PART 1: GENERAL

1.01 SUMMARY

A. Section Includes:

1. Excavation
2. Fill placements
3. Disposal of excess/unsuitable excavated materials
4. Furnishing fill materials from Contractor's sources

B. Related Sections:

1. Section 02110 - Stripping
2. Section 02750 - HDPE Pipe

1.02 DEFINITIONS

A. Backfill: Conform to applicable fill as specified.

B. Borrow Excavation: Borrow excavation shall include excavation of materials from borrow areas identified on the Construction Drawings for the purpose of obtaining soil cover materials. The process will require exclusion of unsuitable materials and minor manipulation of materials.

C. Coefficient of uniformity (Cu): Ratio of grain diameter (in millimeter [mm]) corresponding to 60 percent passing (by dry weight) to the grain diameter (in mm) corresponding to 10 percent passing (by dry weight).

D. Cohesionless Materials: Materials classified by Unified Soil Classification System (USCS) as GW, GP, SW, and SP. Materials classified as GM and SM will be identified as cohesionless only when the fines have a plasticity index of zero.

E. Cohesive Materials: Materials classified by USCS as GC, SC, ML, CL, MH, and CH.

F. Construction Quality Assurance (CQA) Monitor: Also referred to as the "Monitor." The firm or individual hired by the Owner responsible for monitoring that the tasks outlined in the Contract Documents are performed consistent with the Construction Quality Assurance Manual.

G. D15: Grain diameter corresponding to 15 percent passing (by dry weight) in a sieve analysis.

H. D85: Grain diameter corresponding to 85 percent passing (by dry weight) in a sieve analysis.

I. Design Engineer: The individual or firm responsible for the design and preparation of the project Construction Drawings and Technical Specifications. Also referred to as the "Engineer."

J. Earthfill: Fill placed using select excavated materials to the lines and grades indicated on the Construction Drawings.

K. Geosynthetic Materials: HDPE pipe.

L. Gradation: Gradation of materials shall be as determined consistent with ASTM C136, D422, or D1140.

M. Lift: One single continuous placement of soils, usually measured in inches of depth.

N. Oversized Excavated Material: Excavated material not suitable for fill because of particle size.

O. Owner: Sacramento County. Also referred to as the "County."

P. Percent Maximum Density (Relative Compaction): Field dry density expressed as a percentage of the maximum dry density obtained by the test procedure presented in ASTM D698.

Q. Suitable Soil: Soil excavated from the construction limits that meets material property requirements for the soil cover presented in the Technical Specifications.

R. Unsuitable Soil: Soil excavated from the construction limits that do not meet the requirements of suitable soil material property specifications.

S. Third-party Soils Laboratory: A laboratory capable of conducting the tests required by this Specification. This laboratory shall not be affiliated with the Contractor.

T. Unsatisfactory Soils: Soil that when subjected to compactive effort does not provide a firm surface in which to allow for the installation of overlying geosynthetic materials.

1.03 REFERENCES

A. American Society for Testing and Materials:

1. C136 Test Method for Sieve Analysis of Fine and Coarse Aggregate

2. D422 Test Method for Particle size Analysis of Soils

3. D1140 Test Method for Amount of Material in Soils Finer than the No. 200 (75 um) Sieve

4. D1556 Test Method for Density and Unit Weight of Soil in Place by the Sand Cone Method

5. D1557 Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort

6. D2167 Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method

7. D2216 Test Method for Laboratory Determination of Water (Moisture) Content of Soil, Rock, and Soil aggregate Mixtures

8. D2434 Test Method for Permeability of Granular Soils (Constant Head)

9. D2487 Standard Test Method for Classification of Soils for Engineering Purposes

10. D2488 Standard Practice for Description and Identification of Soils (Visual manual Procedure)

11. D2850 Standard Test Method for Unconsolidated, Undrained Compressive Strength of Cohesive Soils in Triaxial Compression (UU)

12. D4318 Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils

13. D4643 Standard Test Method for Determination of Water (Moisture) Content of Soil by the Microwave Oven Method

14. D4767 Standard Test Method for Consolidated Undrained Triaxial Compression Test on Cohesive Soil (CU)

15. D4959 Test Method for Determination of Water (Moisture) Content of Soil by the Direct Heating Method

16. D5084 Standard Test Method of Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter

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

B. County of Sacramento Standard Construction Specifications, January 2016.

1.04 QUALITY ASSURANCE

A. Contractor Qualifications:

1. The earthwork Contractor shall hold a current California, Class A, Contractor's license.

B. The County/Engineer will take soil samples and perform moisture, density, gradation, and other tests to ascertain that the work is being performed in compliance with these Technical Specifications. The County/Engineer will conduct density and other tests on the fill, and related laboratory testing as specified in the Construction Quality Assurance Plan and as outlined in Tables 02200-1, 02200-2, 02200-3 and 02200-4. The Contractor shall remove surface material and render assistance as necessary to enable sampling and testing.

C. Methods of Sampling and Testing:

1. Particle size Analysis: ASTM D422, C136, and D1140

2. In place Density: ASTM D1556, D2167, or D6938

3. Moisture Content: ASTM D2216, D4643, D4959

4. Classification of Soils: ASTM D2487, D2488

5. Liquid Limit, Plastic Limit, and Plasticity Index: ASTM D4318

6. Permeability of Granular Soils: ASTM D2434

D. Suitability of Materials: The suitability of all materials will be determined by the County/Engineer. Soil cover material shall be approved material from borrow areas as shown

on the Construction Plans and as directed by the County/Engineer. Table 02200-4 summarizes the minimum material properties.

E. The County/Engineer may direct that inspection trenches or test pits be cut into fills to determine that the Specifications have been met. Such trenches or pits will be of specified depth and size, and shall be backfilled with the material excavated there from, or other fill material meeting the requirements for the zones cut into. Backfill shall be compacted to the specified density.

F. Tolerances: See Table 02200-4.

1.05 SUBMITTALS

A. The Contractor shall submit certificates of compliance for the Class 2 aggregate base material to the County/Engineer for approval at least 14 calendar days before he intends to place these materials. The certificates of compliance shall include the results of gradation and permeability tests as specified in Table 02200-1 conducted by a third-party soils laboratory.

PART 2: PRODUCTS

2.01 GENERAL

A. Sources: Materials shall be obtained from identified on-site stockpiles, on-site borrow areas, or from Contractor selected (County/Engineer approved) off-site sources.

B. All fill materials shall be free of organic and other deleterious materials as determined by the County/Engineer.

C. Properties and testing procedures for earthwork materials specified in Part 2 - Products are summarized on Table 02200-4.

2.02 GENERAL EARTHFILL

A. Sources: On site stockpiles or borrow excavations as shown on Construction Drawings.

B. Consists of clean, nonexpansive sand, silt, or clay soils or clay mixtures.

C. Maximum particle size of 6 inches.

2.03 SOIL COVER LAYER

A. Sources: On-site stockpiles or borrow excavations of suitable soil as shown on Construction Drawings.

B. Consists of clean, nonexpansive sand, silt, or clay soils or clay mixtures. USCS classification SM, SC, CL, MH or CH.

C. Percent retained on 3/8 inch sieve: less than 15 percent.

D. Percent of material No. 200: greater than 25 percent

E. Plasticity Index: 1 to 35.

F. All soil used for soil cover shall be free of weed seed from the borrow area. The borrow area will be stripped 3 to 6 inches to remove vegetation prior to transporting suitable soil cover to the final cover area.

PART 3: EXECUTION

3.01 PROTECTION OF EXPOSED SURFACES DURING TEMPORARY SUSPENSION OF WORK

A. In accordance with Section 10 of the Standard Construction Specifications, when the Engineer deems it necessary to suspend the work due to unsuitable weather, or any other conditions the Engineer considers unfavorable for the suitable prosecution of the work; the Contractor shall comply with the following provisions:

1. For excavated or filled areas, or stockpiles placed by the Contractor, the Contractor shall provide labor, materials, and equipment to maintain and protect exposed surfaces of cut and fill areas against wind and water erosion. The Contractor shall be responsible for protective method effectiveness.

2. Rainfall surface runoff from the Phase 3 drainage area shall be diverted and pumped out to the perimeter ditches, shown on the plans. Methods used for runoff diversion and infiltration prevention shall be approved by the County/Engineer.

3. Any exposed refuse shall be covered with a 6 inch thick lift of soil at the end of each working day by the Contractor.

3.02 EARTHWORK - GENERAL

A. Required lines, levels, contours, and datum shall be identified by the Contractor before the start of earthwork operations.

B. Earthwork shall conform to lines and grades indicated on the Construction Drawings and as specified in this section.

C. Excavated materials, which conform to Specifications, shall be used as fill. Excavated materials may be stockpiled for later use.

D. Temporary drainage ditches shall be constructed and maintained to provide drainage during construction.

E. Contractor will be responsible for providing siltation control and management during construction.

F. Care shall be taken during earthwork operations to avoid damaging components of the landfill including: Existing LFG collection wells, existing underground piping and HDPE piping. Damage caused by the Contractor shall be repaired at the Contractor's expense consistent with the applicable Technical Specification requirements.

G. The final cover area subgrade shall be disced to a depth of 6 inches prior to soil cover fill placement.

3.03 EXCAVATION

A. General:

1. Excavation shall be conducted in areas and to the grades indicated on the Construction Drawings or specified herein.

2. At all times, the Contractor shall conduct operations in such manner as to prevent free-standing water.

3. The Contractor shall remove all excavated material from the excavation site and dispose of it in fills required at the site or in the designated spoil areas, as specified in Article 3.04B, or use it for other purposes, as approved by the County/Engineer.

4. Unsatisfactory (including concrete rubble and/or refuse) or low-density subgrade material that cannot be compacted in-place to a minimum 90% relative compaction of the ASTM D1557 maximum dry density shall be removed as directed by the County/Engineer and disposed of as specified in Article 3.04. The disposed materials shall be replaced with compacted earthfill meeting the requirements specified in Tables 02200-1, 02200-3, and 02200-4.

5. Adequate working space shall be provided within limits of the excavation for personnel safety.

6. Except as otherwise noted, care shall be exercised to preserve the material below and beyond the lines of all excavation. Where excavation is carried below grade, the Contractor shall backfill with soil cover fill to the required grade and conform to the requirements of Table 02200-4 for placement, lift thickness, placement tolerance, subgrade and lift density, moisture content, and test methods.

7. Any excavation to be carried out for the convenience of the Contractor shall conform to the limits approved by the County/Engineer and shall be at no additional expense to the County/Engineer.

8. Excavated material shall be placed at sufficient distance from the edge of excavations to prevent cave-ins or bank slides. Side slopes of stockpiles shall not be steeper than 2.5:1 (horizontal:vertical). Side slopes of excavations shall be no steeper than 3:1 (horizontal:vertical). Excavation made in the borrow area shall be no steeper than 3:1, no deeper than the grades shown on the Construction Plans, and the borrow area shall be graded to drain at completion of the project.

9. If refuse is encountered during excavation, it shall be removed to a minimum of 2 feet below finish grade and replaced with earthfill and other required materials. The excavated refuse shall be hauled to the active face of the landfill for disposal. No waste shall be left exposed overnight.

B. Channel and Ditch Excavation:

1. General: Channel and Ditches shall be cut accurately to cross sections and grades where indicated. All roots, stumps, rock, and foreign matter in the sides and bottom of ditches shall be trimmed and dressed or removed to conform to the slope, grade, and shape of sections indicated. Care shall be exercised not to overexcavate ditches. Overexcavated ditches shall be backfilled to required grade with satisfactory, thoroughly compacted material. Ditches shall be maintained until final acceptance of the work. Where ditches planned in natural materials are overexcavated and do not include erosion protection such as rip rap or erosion control matting (as shown on the Construction Drawings), the Contractor shall provide erosion protection equivalent to the undisturbed natural material.

2. Ditches shall be excavated at locations shown on the Construction Drawings to collect

and transport storm run-off, wastewater, and water bound material to the retention basins.

3. Ditches shall be excavated true to line and grade. Any erosion which occurs to ditch excavation before County/Engineer's acceptance of project shall be repaired with compacted backfill. All such repairs shall be considered as maintenance costs prior to County/Engineer's acceptance and shall not be considered extra work for payment purposes.

C. Pumping and Drainage

1. The Contractor at all times during construction provide and maintain proper equipment and facilities to remove all water entering excavations, and shall keep such excavations dry so as to obtain a satisfactory undisturbed subgrade foundation condition.

2. Dewatering shall at all times be conducted in such a manner as to preserve the undisturbed bearing capacity of subgrade soils at the bottom of the excavation.

3. Water entering the excavation from surface runoff shall be collected in shallow ditches around the perimeter of the excavation, drained to sumps, and pumped from the excavation to maintain a bottom free from standing water.

4. Conveyance of dewatered liquids in open trenches will not be allowed. Permission to use any storm sewers, or drains, for waste disposal purposes shall be obtained from the authority have jurisdiction. Any requirements and costs for such use shall be the responsibility of the Contractor. The Contractor shall not cause flooding by overloading or blocking flow in the drainage facilities, and shall leave the facilities unrestricted and clean as originally found. Any damage to the facilities shall be repaired or restored as directed by the County or the Authority having jurisdiction.

D. Sheeting and Shoring

1. The Contractor shall furnish, place and maintain sheeting and bracing where required to support the sides of excavation, to prevent movement which could in any way diminish the width of excavation below that necessary for proper construction, to protect adjacent structures, and to protect workers from hazardous conditions or other damage. Such support shall consist of braced steel piling, braced wood lagging and shoulder beams, or other approved methods. Care shall be taken to prevent voids beside the sheeting, but if voids are formed, they shall be immediately filled and compacted. Where soil cannot be properly compacted to fill the void, lean concrete shall be used as backfill at no additional expense to the County.

2. Sheeting shall be plumb and securely braced and tied in position. Sheeting and bracing shall withstand all pressures to which the trench will be subjected. Any deformation shall be corrected at the expense of the Contractor, so as to provide the necessary clearances and dimensions.

3. Where sheeting and bracing are required to support the sides of excavation or trenches, the Contractor shall engage a Professional Structural or Civil Engineer, registered in the State of California, to design sheeting and bracing. Installed sheeting and bracing shall conform to the design, and the Professional Structural or Civil Engineer shall provide certification of this.

4. No wood sheeting is to be withdrawn if driven below mid diameter of any pipe, and under no circumstances shall any wood sheeting be cut off at a level lower than 1 foot above

the top of any pipe.

3.04 DISPOSAL OF EXCAVATED MATERIALS

A. Excavated Materials:

1. Materials excavated from the site shall be used as fill for construction of various features including site grading or stockpiled at locations designated by the County/Engineer for use by the landfill operator.

2. Where used in fills, such material shall be transported directly from the excavation and placed in its final position whenever possible. If required by the Contractor's schedule, the material may be placed temporarily in stockpiles at approved locations. Material in stockpiles shall be protected from contamination of any kind that would render it unsuitable for use in fills.

3. All operations in the stockpile areas throughout the work shall be in strict conformity with the requirements of this section. The Contractor shall ensure that turbid water from the stockpile areas does not enter nearby waterways. Siltation control and management measures shall be constructed by the Contractor.

4. Excavated soil shall be deposited in stockpiles designated on the Construction Drawings or as directed by the County/Engineer.

5. The top surface of all stockpiles shall be graded and wheel-rolled or otherwise provided with a smooth, compacted surface to promote run-off and minimize ponding. The side slopes of stockpiles shall be completely track-walked by a dozer such that the resultant individual track marks are oriented horizontally to resist erosion.

B. Excess/Oversized/Unsuitable Materials:

1. Excess excavated materials, oversized materials, or materials unsuitable for use as fill shall be disposed of at a location designated by the County/Engineer.

2. Concrete rubble, garbage, refuse, and debris, and any waste material which is harmful to the environment shall be disposed of at locations designated by the County/Engineer.

3.05 GENERAL FILL

A. General Requirements:

1. General Earthfill materials shall be placed and compacted to the lines and grades shown on the Construction Drawings or as required by the County/Engineer.

2. If any portion of the materials placed as Earthfill does not meet the specified requirements, the Contractor shall remove such material and replace it with fill materials meeting the Specifications at no additional cost to the County/Engineer.

3. Constructed Earthfills shall be maintained to meet the requirements of this Specification until final completion and acceptance of the work. This shall include all measures to prevent erosion. During seasonal or other extended shutdowns, all exposed surfaces shall be protected with special treatments specified in Article 3.01 above.

B. Placing Requirements:

1. No material shall be placed on any portion of the subgrade or against or upon any structure until consent to place such fill has been obtained from the County/Engineer.

2. Conform to the requirements of Table 02200-3 for placement, lift thickness, placement tolerance, subgrade and lift density, moisture content, and test methods.

3. Prior to placement of materials, the in place density of the underlying material shall be as specified in Table 02200-3.

4. Earthfill materials may require moisture conditioning (wetting or drying) prior to placement and compaction. Some materials may require spreading and extended drying time prior to placement and compaction. Moisture conditioning requirements shall be as specified in Table 02200-3.

5. Earthfill materials shall be placed in continuous and approximately horizontal lifts for their full length and width, unless otherwise specified or specifically permitted by the County/Engineer.

6. Method of dumping and spreading materials shall ensure uniform distribution of the material.

7. Loose thickness of each lift of materials shall be as specified in Table 02200-3.

8. Unless otherwise indicated, Earthfill materials shall be placed to a grade no flatter than 2 percent to facilitate drainage of water. In areas where ponding cannot be prevented or ponding has occurred and fill is required to be placed, placing shall begin only after the area is dewatered and permission is obtained from the County/Engineer.

C. Compaction Requirements:

1. Each lift of soil cover fill material shall be compacted within the applicable minimum and maximum density specified in Table 02200-3.

2. During compaction, the moisture content range of the soil cover fill shall be maintained relative to the ASTM D698 optimum moisture content as specified in Table 02200-3. A uniform moisture distribution shall be obtained by disking, blading, or other methods approved by the County/Engineer prior to compaction of a lift.

3. If the rolled surface of any in place lift is too wet for proper compaction of the next succeeding lift to be placed thereon, then the materials from the in place lift shall be removed and allowed to dry, or worked with harrow, scarifier, or other suitable equipment to reduce the water content, and then recompacted before the next succeeding lift is placed.

4. Earthfill compacted to densities lower or higher than the specified minimum or maximum density or compacted at moisture contents outside the specified acceptable range of moisture content shall be reworked to meet the density and moisture requirements or removed and replaced by acceptable fill compacted to meet these requirements.

5. Compaction equipment shall be approved by the County/Engineer.

3.06 SOIL COVER FILL CONSTRUCTION

A. General Requirements:

1. Soil Cover fill materials shall be placed and compacted to the lines and grades shown on the Construction Drawings or as required by the County/Engineer.

2. If any portion of the materials placed as Soil Cover fill does not meet the specified requirements, the Contractor shall remove such material and replace it with fill materials meeting the Technical Specifications at no additional cost to the County/Engineer.

3. Constructed Soil Cover fills shall be maintained to meet the requirements of this Specification until final completion and acceptance of the work. This shall include all measures to prevent erosion. During seasonal or other extended shutdowns, all exposed surfaces shall be protected with special treatments specified in Article 3.01 above.

4. During construction it is expected that the underlying subgrade will settle. The contractor will provide six points within the cover area that will be used to monitor the amount of settlement during the course of the project. Each point will have a 2' x 2' x ½ inch plywood sheet placed over the point location with a 4 inch diameter PVC pipe placed in the center of the plywood sheet and extended through the soil cover vertically. These points will be surveyed through the pipe weekly as appropriate to determine the average amount of settlement which will be used to adjust the soil cover grades in the field to limit excessive soil usage.

B. Placing Requirements:

1. No Soil Cover fill material shall be placed on any portion of the subgrade or against or upon any structure until consent to place such fill has been obtained from the County/Engineer.

2. Conform to the requirements of Table 02200-3 for placement, lift thickness, placement tolerance, subgrade and lift density, moisture content, and test methods.

3. Prior to placement of materials, the in place density of the underlying material shall be as specified in Table 02200-3.

4. Soil Cover fill materials may require moisture conditioning (wetting or drying) prior to placement and compaction. Some materials may require spreading and extended drying time prior to placement and compaction. Moisture conditioning requirements shall be as specified in Table 02200-3.

5. Soil Cover fill materials shall be placed in continuous and approximately horizontal lifts for their full length and width, unless otherwise specified or specifically permitted by the County/Engineer.

6. Method of dumping and spreading materials shall ensure uniform distribution of the material.

7. Loose thickness of each lift of materials shall be as specified in Table 02200-3.

C. Compaction Requirements:

1. Each lift of Soil Cover fill material shall be compacted within the applicable minimum and maximum density specified in Table 02200-3.

2. During compaction, the moisture content range of the Soil Cover fill shall be maintained relative to the ASTM D698 optimum moisture content as specified in Table 02200-3. A uniform moisture distribution shall be obtained by disking, blading, or other methods

approved by the County/Engineer prior to compaction of a lift.

3. If the rolled surface of any in place lift is too wet for proper compaction of the next succeeding lift to be placed thereon, then the materials from the in place lift shall be removed and allowed to dry, or worked with harrow, scarifier, or other suitable equipment to reduce the water content, and then recompacted before the next succeeding lift is placed.

4. Fill compacted to densities lower than the specified minimum density, higher than the specified maximum density, or fill compacted at moisture contents outside the specified acceptable range of moisture content shall be reworked to meet the density and moisture requirements or removed and replaced by acceptable fill compacted to meet these requirements.

5. Compaction equipment shall be approved by the County/Engineer.

3.07 FIELD QUALITY ASSURANCE

A. The County/Engineer will take samples and perform tests throughout the construction period, and the Contractor shall cooperate in providing access for the County/Engineer to areas where testing is to be performed and shall schedule his earthwork activities to avoid interference with the testing operations.

B. The County/Engineer will perform the tests listed in Table 02200-1 and 2 on a regular basis; these tests are a minimum requirement. Additional tests may be performed at the County's/Engineer's discretion.

C. Placement tolerance shall be as specified in Table 02200-3.

Table 02200-1
Material Evaluation Testing Frequency

ASTM Test Designation[1]	General Earthfill (cy)	Soil Cover (cy)
D2488 (Visual Soil Description)	10,000	10,000
D2487 (Soil Classification)	10,000	10,000
D422 (Soil Gradation)	–	5,000
D1557 (Compaction)	10,000	–
D698 (Compaction)	10,000	10,000
D2216 (Moisture Content)	10,000	10,000
D4318 (Atterberg Limits)	---	10,000

1 Minimum one test per material type.

Note: Minimum testing requirements shown, additional tests to be performed when changes in soil types arise during excavation

Table 02200-2
Soil Construction Testing Frequency

ASTM Test Designation[1]	General Earthfill (cy)	Soil Cover (cy)
D2488 (Visual Soil Description)	10,000	10,000
D2487 (Soil Classification)	10,000	10,000
D422 (Soil Gradation)	–	5,000
D1557 (Compaction)	10,000	–
D698 (Compaction)	–	10,000
D6938 (Nuclear Density)	500	1,000
D2216 (Moisture Content)	500	1,000
D4318 (Atterberg Limits)	---	5,000

1 Minimum one test per material type.

Note: Minimum testing requirements shown, additional tests to be performed when changes in soil types arise during excavation

Table 02200-3
Fill Placement and Compaction

Fill	Loose Lift Thickness (in.)	Moisture Content	Minimum Subgrade and Lift Density	Maximum Subgrade and Lift Density	Finished Grade Tolerance (ft)
Soil Cover Fill	18 - 24	–5% to –2% of Optimum	75%[1]	85%	±0.1
General Earthfill	8	±3% of Optimum	90%	---	±0.1

[1] *No compaction required on the existing subgrade in the final cover placement area*

END OF SECTION 02200