CITY OF EL PASO, TEXAS
AGENDA ITEM
DEPARTMENT HEAD'S SUMMARY FORM

DEPARTMENT: **Engineering and Construction Management**

AGENDA DATE: **April 12, 2011**

CONTACT PERSON NAME AND PHONE NUMBER: **R. Alan Shubert, P.E., City Engineer X4423**

DISTRICT(S) AFFECTED: **All**

SUBJECT:

That the City Council approves the expenditure of additional available funding in the amount of Two Hundred Two Thousand and 00/100 dollars ($202,000.00) to J.A.R. Concrete, Inc. dba J.A.R. Construction, Inc. for additional construction costs for EPIA Runway 8R-26L & Taxiway L Extension & Reconstruction of Taxiway W. The change order provides for additional processing of 101,000 cubic yards of soil required for the embankment to meet Federal Aviation Administration specifications, adding Thirty Three days of contract time for Contract Number 2010-268. The new contract sum, including this change order, is Seven Million One Hundred Ninety Eight Thousand Two Hundred Thirty Six and 10/100 dollars ($7,198,236.10).

BACKGROUND / DISCUSSION:

The soils at the airport required for the embankment were different than the specifications in the contract. Due to unforeseen conditions the contractor had to spend extra effort to excavate, prepare and condition the material before it could be used as embankment fill. The final negotiated amount for the extra effort is $2 per cubic yard on the remaining 101,000 cubic yards of material. The cost is being paid for by EPIA Passenger Facility Charges.

PRIOR COUNCIL ACTION:

City Council approved the construction award of EPIA Runway 8R-26L & Taxiway L Extension & Reconstruction of Taxiway W on September 28, 2010 and a change order March 15, 2011.

AMOUNT AND SOURCE OF FUNDING:

$202,000.00 Passenger Facility Charges

BOARD / COMMISSION ACTION:

N/A

**********REQUIRED AUTHORIZATION**********

DEPARTMENT HEAD: _____

(If Department Head Summary Form is initiated by Purchasing, client department should sign also)

Information copy to appropriate Deputy City Manager

RESOLUTION

BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF EL PASO

That the City Council approves the expenditure of additional available funding in the amount of Two Hundred Two Thousand and 00/100 Dollars ($202,000.00) to J.A.R. Concrete, Inc. dba J.A.R. Construction, Inc. for additional construction costs for EPIA Runway 8R-26L & Taxiway L Extension & Reconstruction of Taxiway W. The change order provides for additional processing of 101,000 cubic yards of soil required for the embankment to meet Federal Aviation Administration specifications, adding Thirty Three (33) days of contract time for Contract Number 2010-268. The new contract sum, including this change order, is Seven Million One Hundred Ninety Eight Thousand Two Hundred Thirty Six and 10/100 dollars ($7,198,236.10).

ADOPTED THIS _____ DAY OF _____, 2011.

THE CITY OF EL PASO:

_____
John F. Cook, Mayor

ATTEST:

_____
Richarda Duffy Momsen, City Clerk

APPROVED AS TO FORM:

_____
Cynthia Osborn
Assistant City Attorney

APPROVED AS TO CONTENT:

_____
R. Alan Shubert, P.E.
City Engineer

CITY OF EL PASO CONSTRUCTION CHANGE ORDER

CONSTRUCTION CHANGE ORDER NO.: 2 DATE: April 4, 2011 [ ] SCOPE CHANGE

PROJECT: PIA Runway 8R-26L & Taxiway L Extension & Reconstruction of Taxiway \ SOLICITATION NO. 2010-268 [X] CONSTRUCTION CHANGE

Original Contract Amount:	$ 6,752,736.10	Contract Time to Subtantial Completion	180
Net Change by previous Change Orders:	$ 93,500.00	Total days added due to Change Orders and CQN's	0
Net Change by previous Construction Quantity Notices:	$ 150,000.00	Total days added for this Change Order	33
Amount of this Construction Change Order:	$ 202,000.00	New Contract Time to Substantial Completion:	213
New Amended Contract Amount:	$7,198,236.10	Current Substantial Completion Due Date	8/4/2011
Change Order Percentage:	6.60%		

CONTRACTOR NAME: J.A.R. Construction

Please provide a detailed scope of work of the change order (see back for reason/justification):

The soil at the airport required for the embankment was different than the specifications in the contract. The Contractor is required to excavate and prepare the soil in order to meet the revised specifications. The additional work includes excavation, breaking up the caliche and moisture condition. 101,000 cubic yards at $2.00 per cubic yard = $202,000.

CONSECUTIVE CALENDAR DAYS ADDED TO COMPLETION TIME: 33 TOTAL CHANGE ORDER AMOUNT: $ 202,000.00

CONTRACTOR

I, David Rodriguez, of J.A.R. Construction, Inc. agree and accept the terms and conditions of this change order.

Signature: David Rodriguez Date: April 4, 2011

CITY OF EL PASO (OWNER)

I, R. Alan Shubert, P.E., of the City of El Paso hereby authorize and direct the Contractor to proceed with additional work as described in this form.

Signature: _____ Date: _____

R. Alan Shubert, P.E., City Engineer

CITY OF EL PASO CONSTRUCTION CHANGE ORDER- Pg. 2

CONSTRUCTION CHANGE ORDER NO.: 2 **DATE:** April 4, 2011 [ ] SCOPE CHANGE

PROJECT: PIA Runway 8R-26L & Taxiway L Extension & Reconstruction of Taxiway **SOLICITATION NO.** 2010-268 [X] CONSTRUCTION CHANGE

Project Number	G620AIP0026	Project Number	0	**PURCAHSE ORDER #** 1100000062
Class	0	Class	0	
Department	62620031	Department	0	
Fund	11516	Fund	0	
Account	508027	Account	0	

CONTRACTOR NAME: J.A.R. Construction

PROVIDE REASON/JUSTIFICATION FOR CHANGE ORDER:

As part of the project, the Contractor was required to excavate and construct the embankment for the runway extension. The specification did not meet the existing material. As a result, the Contractor has to spend extra effort to mine, prep and condition the material to be used as embankment fill. Attached are the revised specifications. The extra cost accounts for any and all future costs for delays associated with this and other actvities resulting from the extra work to prep the embankment fill

CONSECUTIVE CALENDAR DAYS ADDED TO COMPLETION TIME: 33 **TOTAL CHANGE ORDER AMOUNT:** $ 202,000.00

Project Manager recommends approval: _____

Engineering Division Manager recommends approval: _____

Financing Department approval: _____
(If Required)

CONSTRUCTION, INC.

9609 CARNEGIE AVENUE
EL PASO, TEXAS 79925
(915) 591-3389
(915) 591-8253 Fax

April 4, 2011

City of El Paso
Engineering Department
2 Civic Center Plaza
El Paso TX 79901

Attn: Mr. Sam Rodríguez, P.E.

RE: **Request for Change Order #2**
EPIA Runway 8R-26L and Taxiway L Extension & Reconstruction of Taxiway W
Project No. 2010-268

Dear Mr. Rodríguez,

JAR is requesting a change order to the above referenced project for Item #10, P-152, Embankment in Place. We encountered unforeseen and concealed conditions in the on-site soil material. This existing on-site material did not meet contract specifications. Thus, the Owner issued an adjustment to the specifications. Consequently, the Contractor has required extra work in order to excavate the on-site material, prep that same existing material, and make it suitable to meet the revised specifications.

The extra work has resulted in one and a half time the effort (labor, equipment, etc.) required to complete the work involved in pay item #10. Therefore, JAR is requesting a change order to increase the cost of 101,000 CY of P-152 from four dollars per cubic yard to six dollar per cubic yard. The total value of this change amounts to $202,000.00

If you should have any questions, please do not hesitate to contact me.

Sincerely,

David Rodríguez
J.A.R. Project Engineer
Cell (914) 241-2367

cc. Alan Shubert, P.E., City of El Paso, City Engineer
Joe A. Rosales, Jr, JAR President

ITEM P-152

EXCAVATION AND EMBANKMENT

DESCRIPTION

152-1.1 This item covers excavation, disposal, placement, and compaction of all materials within the limits of the work required to construct safety areas, runways, taxiways, aprons, and intermediate as well as other areas for drainage, building construction, parking, or other purposes in accordance with these specifications and in conformity to the dimensions and typical section(s) shown on the plans.

152-1.2 CLASSIFICATION. All material excavated shall be classified as defined below:

a. **Unclassified Excavation.** Unclassified excavation shall consist of the excavation and disposal of all material, regardless of its nature, which is not otherwise classified and paid for under the following items.

b. **Over-Excavation of Unsuitable Material.** Over-excavation of unsuitable material shall consist of material found during construction that will be removed to provide a more stable platform from which to begin construction.

c. **Rock Excavation.** Not Used.

d. **Muck Excavation.** Not Used.

a. **Drainage Excavation.** Not Used.

b. **Borrow Excavation.** Borrow excavation shall consist of approved material required for the construction of embankment or for other portions of the work in excess of the quantity of usable material available from required excavations. Borrow material shall be obtained from areas within the limits of the airport property but outside the normal limits of necessary grading, or from areas outside the airport.

g. **Contaminated Soil Removal and Backfill.** If contamination is encountered that may be dangerous to human health during construction operations, the Contractor shall suspend that portion of work and notify the Engineer immediately. Within seven (7) calendar days, the City will determine if the material poses a threat to human health and is hazardous. There shall be no claims made for delay as a result of the determination period of the ensuing contamination soil excavation. If the material is not deemed hazardous or poses a danger, the City will direct the Contractor to proceed without change. If the material is deemed hazardous and special handling of the material is necessary to accomplish the work, the City will employ an on-call Contractor to handle disposal of the contaminated soil.

*h. **Over-excavation and embankment of exiting material.** Over-excavation and embankment of existing material shall consist of the soil directly under the proposed pavement locations that will need to be over-excavated and re-compacted to the depths shown on the plans and within the P-152 specification.*

152-1.3 Unsuitable Excavation. Any material containing vegetable or organic matter, such as muck, peat, organic silt, or sod shall be considered unsuitable for use in embankment construction. Material, when approved by the Engineer as suitable to support vegetation, may be used on the embankment slope.

a. **Select Backfill Material.** This item shall consist of approved material required for the construction of sub-grade stabilization as indicated under Subsection 152-2.1, Select Backfill Material.

MATERIALS

152-2.1 Select Backfill Material. To replace areas that are over-excavated due to unsuitable material, the area shall be backfilled with select backfill material. Material designated for select backfill shall have a plasticity index not exceeding eight (8) and shall meet the gradation requirements of Table 1, as follows:

TABLE 1 – GRADATION FOR SELECT BACKFILL MATERIAL.

Sieve Size	Percent Passing by Weight
3-inch	*100*
No. 4	*75-100*
No. 200	*0-25*

CONSTRUCTION METHODS

152-3.1 General. Before beginning excavation, grading, and embankment operations in any area, the area shall be completely cleared and grubbed in accordance with Item P-151, "Clearing and Grubbing".

The suitability of material to be placed in embankments shall be subject to approval by the Engineer. All unsuitable material shall be disposed of off-site in a City approved waste site.

When the Contractor's excavating operations encounter artifacts of historical or archaeological significance, the operations shall be temporarily discontinued. At the direction of the Engineer, the Contractor shall excavate the site in such a manner as to preserve the artifacts encountered and allow for their removal. Such excavation will be paid for as extra work.

Those areas outside of the pavement areas in which the top layer of soil material has become compacted, by hauling or other activities of the Contractor shall be scarified and disked to a depth of 4 inches, in order to loosen and pulverize the soil.

If it is necessary to interrupt existing surface drainage, sewers or under-drainage, conduits, utilities, or similar underground structures, the Contractor shall be responsible for and shall take all necessary precautions to preserve them or provide temporary services. When such facilities are encountered, the Contractor shall notify the Engineer, who shall arrange for their removal if necessary. The Contractor shall, at his/her own expense, satisfactorily repair or pay the cost of all damage to such facilities or structures that may result from any of the Contractor's operations during the period of the contract.

152-3.2 EXCAVATION. No excavation shall be started until the work has been staked out by the Contractor and the Engineer has obtained elevations and measurements of the ground surface. All suitable excavated material shall be used in the formation of embankment, subgrade, or for other purposes shown on the plans. All unsuitable material shall be disposed of off airport property.

When the volume of the excavation exceeds that required to construct the embankments to the grades

indicated, the excess shall be used to grade the areas of ultimate development or disposed of as directed. When the volume of excavation is not sufficient for constructing the fill to the grades indicated, the deficiency shall be obtained from borrow areas.

The grade shall be maintained so that the surface is well drained at all times. When necessary, temporary drains and drainage ditches shall be installed to intercept or divert surface water that may affect the work.

a. **Selective Grading.** When selective grading is indicated on the plans, the more suitable material as designated by the Engineer shall be used in constructing the embankment or in capping the pavement subgrade. If, at the time of excavation, it is not possible to place this material in its final location, it shall be stockpiled in approved areas so that it can be measured for payment for rehandling as specified in paragraph 3.3.

b. **Undercutting.** Rock, shale, hardpan, loose rock, boulders, or other material unsatisfactory for safety areas, subgrades, roads, shoulders, or any areas intended for turfing shall be excavated to a minimum depth of 12 inches or to the depth specified by the Engineer, below the subgrade. Muck, peat, matted roots, or other yielding material, unsatisfactory for subgrade foundation, shall be removed to the depth specified. Unsuitable materials shall be disposed of at locations shown on the plans. This excavated material shall be paid for at the contract unit price per cubic yard for unclassified excavation. The excavated area shall be refilled with suitable material obtained from the grading operations or borrow areas and compacted to specified densities. The necessary refilling will constitute a part of the embankment. Where rock cuts are made and refilled with selected material, any pockets created in the rock surface shall be drained in accordance with the details shown on the plans.

c. **Removal of Utilities.** The removal of existing structures and utilities required to permit the orderly progress of work will be accomplished by someone other than the Contractor, e.g., the utility unless otherwise shown on the plans. All existing foundations shall be excavated for at least 2 feet below the top of subgrade or as indicated on the plans, and the material disposed of as directed. All foundations thus excavated shall be backfilled with suitable material and compacted as specified herein.

d. **Compaction Requirements.** The subgrade under areas to be paved shall be compacted to a depth of six inches and to *a density as shown on the plans page C4.2. Densities for soils under Concrete Pavement shall be 90% for cohesive soils and 100% for non-cohesive soils in the first 18 inches of the structural section as determined by ASTM D-698. Any depth below this the densities shall be 90% for cohesive soils and 95% for non-cohesive soils* ~~not less than 95 percent for cohesive soils or 100 percent for noncohesive soils of the maximum density~~ as determined by ASTM D 1557. The material to be compacted shall be within +/- 2 percent of optimum moisture content before rolled to obtain the prescribed compaction (except for expansive soils).

   If nuclear density machines are to be used for density determination, the machines shall be calibrated in accordance with ASTM D 2922. The nuclear equipment shall be calibrated using blocks of materials with densities that extend through a range representative of the density of the proposed embankment material. (See attached Section 120 of the General Provisions for additional guidance with nuclear density testing).

The in-place field density shall be determined in accordance with ASTM D 1556 or ASTM D 2167. Stones or rock fragments larger than 4 inches in their greatest dimension will not be permitted in the top 6 inches of the subgrade. The finished grading operations, conforming to the typical cross section, shall be

completed and maintained at least 1,000 feet ahead of the paving operations or as directed by the Engineer.

In cuts, all loose or protruding rocks on the back slopes shall be barred loose or otherwise removed to line of finished grade of slope. All cut-and-fill slopes shall be uniformly dressed to the slope, cross section, and alignment shown on the plans or as directed by the Engineer.

Blasting will not be permitted on this project.

152-3.3 BORROW EXCAVATION. Borrow area(s) are within the airport property but are not indicated on the plans. Coordination with EPIA will be required for these locations.

When borrow sources are outside the boundaries of the airport property, it shall be the Contractor's responsibility to locate and obtain the supply, subject to the approval of the Engineer. The Contractor shall notify the Engineer, at least 15 days prior to beginning the excavation, so necessary measurements and tests can be made. All unsuitable material shall be disposed of by the Contractor. All borrow pits shall be opened up to expose the vertical face of various strata of acceptable material to enable obtaining a uniform product. Borrow pits shall be excavated to regular lines to permit accurate measurements, and they shall be drained and left in a neat, presentable condition with all slopes dressed uniformly.

Borrow materials necessary to supplement the fill materials derived from usable excavated materials shall be placed in accordance with Item P-152. No borrow materials shall be imported until the Contractor can demonstrate that materials from the project excavations are exhausted and authorization from the Engineer is issued. Quality Control testing of borrow materials for conformance of gradation, plastic index and environmental clearance (including total petroleum hydrocarbons, volatile organic compounds and metals) will be the responsibility of the Contractor. Samples of borrow material for preliminary testing and during intervals of production shall be furnished by the Contractor prior to the start of importing the borrow material. Prior to transporting borrow materials to the project site, the Engineer's approval shall be required for the quality of the material. Import materials may be obtained from multiple borrow sources providing that the Contractor pre-approves the borrow sources with the Engineer at least ten (10) calendar days prior to its use and that only one (1) dedicated borrow site is used at a time. All borrow sites used by the Contractor shall be dedicated for this project only. All costs associated with approval and pre-approvals of borrow material and borrow sites shall be considered by the Contractor and included in the unit prices bid for borrow material. No additional or direct payment will be made for borrow material or borrow sites.

152-3.4 DRAINAGE EXCAVATION. Not Used.

152-3.5 PREPARATION OF EMBANKMENT AREA. Where an embankment is to be constructed to a height of 4 feet or less, all sod and vegetable matter shall be removed from the surface upon which the embankment is to be placed, and the cleared surface shall be completely broken up by plowing or scarifying to a minimum depth of 6 inches. This area shall then be compacted as indicated in paragraph ~~2-6.152-3.6.~~ When the height of fill is greater than 4 feet, sod not required to be removed shall be thoroughly disked and recompacted to the density of the surrounding ground before construction of embankment.

In areas where the runway and taxiway are excavated to a depth shown on the typical cross sections, the cleared surface shall be completely broken up by plowing and scarifying to a minimum depth of six (6) inches. This area shall then be compacted as indicated in Paragraph ~~2-6.152-3.6.~~

No direct payment shall be made for the work performed under this section. The necessary clearing and

grubbing and the quantity of excavation removed will be paid for under the respective items of work.

152-3.6 FORMATION OF EMBANKMENTS. Embankments shall be formed in successive horizontal layers of not more than 8 inches in loose depth for the full width of the cross section, unless otherwise approved by the Engineer.

The grading operations shall be conducted, and the various soil strata shall be placed, to produce a soil structure as shown on the typical cross section or as directed. Materials such as brush, hedge, roots, stumps, grass and other organic matter, shall not be incorporated or buried in the embankment.

Operations on earthwork shall be suspended at any time when satisfactory results cannot be obtained because of rain, freezing, or other unsatisfactory conditions of the field. The Contractor shall drag, blade, or slope the embankment to provide proper surface drainage.

The material in the layer shall be within +/-2 percent of optimum moisture content before rolling to obtain the prescribed compaction. In order to achieve a uniform moisture content throughout the layer, wetting or drying of the material and manipulation shall be required when necessary. Should the material be too wet to permit proper compaction or rolling, all work on all of the affected portions of the embankment shall be delayed until the material has dried to the required moisture content. Sprinkling of dry material to obtain the proper moisture content shall be done with approved equipment that will sufficiently distribute the water. Sufficient equipment to furnish the required water shall be available at all times. Samples of all embankment materials for testing, both before and after placement and compaction, will be taken for each 1000 cubic yards. Based on these tests, the Contractor shall make the necessary corrections and adjustments in methods, materials or moisture content in order to achieve the correct embankment density.

If nuclear density machines are to be used for density determination, the machines shall be calibrated in accordance with ASTM D 2922. The nuclear equipment shall be calibrated using blocks of materials with densities that extend through a range representative of the density of the proposed embankment material. (See attached Section 120 of the Special Provisions (FAA General Provisions) for additional guidance with nuclear density testing.

Rolling operations shall be continued until the embankment is compacted to *a density as shown on the plans page C4-2. Densities for soils under Concrete Pavement shall be 90% for cohesive soils and 100% for non-cohesive soils in the first 18 inches of the structural section as determined by ASTM D-698. Any depth below this the densities shall be 90% for cohesive soils and 95% for non-cohesive soils* ~~not less than 95 percent of maximum density for noncohesive soils, and 90 percent of maximum density for cohesive soils~~ as determined by ASTM D 1557. Under all areas to be paved, the embankments shall be compacted to the depths and to densities shown on the plans.

On all areas outside of the pavement areas, no compaction will be required on the top 4 inches.

The in-place field density shall be determined in accordance with ~~ASTM D 1556 or ASTM D 2167~~.

Compaction areas shall be kept separate, and no layer shall be covered by another until the proper density is obtained.

During construction of the embankment, the Contractor shall route his/her equipment at all times, both when loaded and when empty, over the layers as they are placed and shall distribute the travel evenly over the entire width of the embankment. The equipment shall be operated in such a manner that hardpan,

cemented gravel, clay, or other chunky soil material will be broken up into small particles and become incorporated with the other material in the layer.

In the construction of embankments, layer placement shall begin in the deepest portion of the fill; as placement progresses, layers shall be constructed approximately parallel to the finished pavement grade line.

When rock and other embankment material are excavated at approximately the same time, the rock shall be incorporated into the outer portion of the embankment and the other material shall be incorporated under the future paved areas. Stones or fragmentary rock larger than 4 inches in their greatest dimensions will not be allowed in the top 6 inches of the subgrade. Rockfill shall be brought up in layers as specified or as directed and every effort shall be exerted to fill the voids with the finer material forming a dense, compact mass. Rock or boulders shall not be disposed of outside the excavation or embankment areas, except at places and in the manner designated by the Engineer.

When the excavated material consists predominantly of rock fragments of such size that the material cannot be placed in layers of the prescribed thickness without crushing, pulverizing or further breaking down the pieces, such material may be placed in the embankment as directed in layers not exceeding 2 feet in thickness. Each layer shall be leveled and smoothed with suitable leveling equipment and by distribution of spalls and finer fragments of rock. These type lifts shall not be constructed above an elevation 4 feet below the finished subgrade.

Frozen material shall not be placed in the embankment nor shall embankment be placed upon frozen material.

~~There will be no separate measurement of payment for compacted embankment, and all costs incidental to placing in layers, compacting, disking, watering, mixing, sloping, and other necessary operations for construction of embankments will be included in the contract price for excavation, borrow, or other items.~~

152-3.7 FINISHING AND PROTECTION OF SUBGRADE. After the subgrade has been substantially completed the full width shall be conditioned by removing any soft or other unstable material that will not compact properly. The resulting areas and all other low areas, holes or depressions shall be brought to grade with suitable select material. Scarifying, blading, rolling and other methods shall be performed to provide a thoroughly compacted subgrade shaped to the lines and grades shown on the plans.

Grading of the subgrade shall be performed so that it will drain readily. The Contractor shall take all precautions necessary to protect the subgrade from damage. He/she shall limit hauling over the finished subgrade to that which is essential for construction purposes.

All ruts or rough places that develop in a completed subgrade shall be smoothed and recompacted.

No subbase, base, or surface course shall be placed on the subgrade until the subgrade has been approved by the Engineer.

152-3.8 HAUL. All hauling will be considered a necessary and incidental part of the work. Its cost shall be considered by the Contractor and included in the contract unit price for the pay of items of work involved. No payment will be made separately or directly for hauling on any part of the work.

152-3.9 TOLERANCES. In those areas upon which a subbase or base course is to be placed, the top of

the subgrade shall be of such smoothness that, when tested with a 16-foot straightedge applied parallel and at right angles to the centerline, it shall not show any deviation in excess of 1/2-inch, or shall not be more than 0.05-foot from true grade as established by grade hubs or pins. Any deviation in excess of these amounts shall be corrected by loosening, adding, or removing materials; reshaping; and recompacting by sprinkling and rolling.

On safety areas, intermediate and other designated areas, the surface shall be of such smoothness that it will not vary more than 0.10 foot from true grade as established by grade hubs. Any deviation in excess of this amount shall be corrected by loosening, adding or removing materials, and reshaping.

152-3.10 TOPSOIL. Not Used.

MATERIAL ACCEPTANCE

152-4.1 ACCEPTANCE SAMPLING AND TESTING. The acceptance sampling and testing necessary to determine conformance with the requirements specified in this section will be performed by the Materials Laboratory hired by the City of El Paso. Embankment materials shall be accepted on a lot basis. One (1) lot shall consist of 1,000 cubic yards or one (1) day's production, whichever is less.

CONTRACTOR QUALITY CONTROL

152-5.1 QUALITY CONTROL PROGRAM. The Contractor shall develop a Quality Control Program in accordance with Section 100 of the Special Provision Specifications. The program shall address all elements that affect the quality of the embankment(s) being formed. A P-152 Quality Control Testing Plan shall be developed as part of the Quality Control Program.

152-5.2 TESTING FREQUENCY. The Contractor shall establish a minimum testing frequency of one (1) density and moisture test for each of the following conditions:

a. For each 500 cubic yards of embankment formed, and;

b. For each eight (8) inch loose lift, and;

c. For sub-grade compaction, the Contractor shall provide at least one (1) density and moisture test for each 2,000 square yards. For isolated areas or confined areas that are less than 2,000 square yards, there shall be at least one (1) density and moisture test.

152-5.3 QUALITY CONTROL TESTING. The Contractor shall perform all quality control tests necessary to control the production and construction processes applicable to this specification and as set forth in the Quality Control Program. The testing program shall include, but not necessarily be limited to tests for material density, material moisture content, rolling patterns, and embankment lift thickness.

a. Material Density. The in-place field density shall be determined in accordance with ASTM D 1556 or ASTM D 2167. Nuclear moisture and density methods meeting ASTM D 2922 and D 3017 may be used, provided that at least one (1) out of ten (10) tests are conducted using the ASTM D 1556 method to correlate test results.

b. Material Moisture Content. The material in each layer shall be within plus or minus two (2) percent of optimum moisture content before rolling to obtain the prescribed compaction.

c. **Embankment Lift Thickness.** Embankments and backfill constructed shall be formed in successive horizontal layers of not more than eight (8) inches in loose depth for the full width of the cross section. Samples of embankment materials for quality control testing, both before and after placement and compaction, will be taken for each 500 cubic yards.

d. **Borrow Materials.** For borrow materials imported, the Contractor shall submit the name and address of the supplier; approximate amount of material to be imported; location from which the material was excavated or recovered; the gradation and plastic index of the material and a written certification from the material supplier that the borrow material(s) are free of hazardous materials and or substances as defined by local, state and federal environmental regulations. When written certification is not available from the materials supplier that states that the material is free of hazardous materials and/or substances, the Contractor shall arrange for the materials to be tested in accordance with the latest edition of EPA SW846 "Test Methods for Evaluation Solid Waste". Material testing shall include, but not be limited to EPA test methods 8240 (VOCs), 8270 (SVOCs) 8080 (pesticides/PCBs), and 6010/7000 Series (priority pollutant metals). All sample collections and analysis shall be performed by a state certified laboratory. The Contractor shall submit the material supplier(s) certifications and/or the certified laboratory results in the Quality Control Report for approval prior to importing any borrow materials onto El Paso International Airport.

METHOD OF MEASUREMENT

152-6.1 The quantity of embankment to be paid for shall be the number of cubic yards (cubic meters) measured in its original position.

Measurement shall not include the quantity of materials excavated without authorization beyond normal slope lines, or the quantity of material used for purposes other than those directed.

~~**152-6.2** Borrow material shall be paid for on the basis of the number of cubic yards (cubic meters) measured in its original position at the borrow pit.~~

152-6.3 For payment specified by the cubic yard (cubic meter), measurement for all embankment shall be computed by the average end area method. The end area is that bound by the original ground line established by field cross sections and the final theoretical pay line established by embankment cross sections shown on the plans, subject to verification by the Engineer. After completion of all embankment operations and prior to the placing of base or sub base material, the final embankment shall be verified by the Engineer by means of field cross sections taken randomly at intervals not exceeding 500 linear feet.

Final field cross sections shall be employed if the following changes have been made:

a. Plan width of embankments or excavations are changed by more than plus or minus 1.0 foot; or

b. Plan elevations of embankments or excavations are changed by more than plus or minus 0.5 foot.

152-6.4 The quantity of work to be paid for shall be the number of Cubic Yards (CY) measured in its original position. This volume shall include the area required to construct the pavement section as demonstrated by the limits shown in the plans.

BASIS OF PAYMENT

152-7.7 For ``Embankment in Place" payment shall be made at the contract unit price per cubic yard. This price shall be full compensation for furnishing all materials, labor, equipment, tools, and incidentals necessary to complete the item. This item includes the men and equipment necessary for all excavation of the plan quantities, excavation necessary for the required borrow material, men and equipment necessary to transfer the material to the project sight and for all of the men and equipment necessary for all embankments to be placed to the final grades per plans.

152-7.8 For "Over-excavation and embankment of existing material " payment shall be made at the contract unit price per cubic yard. This price shall be full compensation for furnishing all materials, labor, equipment, tools, and incidentals necessary to complete the item.

Payment will be made under:

Item P-152-7.1	Unclassified Excavation	Not Used.
Item P-152-7.2	Rock Excavation	Not Used.
Item P-152-7.3	Muck Excavation	Not Used.
Item P-152-7.4	Drainage Excavation	Not Used.
Item P-152-7.5	Borrow Excavation	Not Used.
Item P-152-7.6	Stockpiled material	Not Used.

Item P-152-7.7 Embankment in Place - per cubic yard

Item P-152-7.8 Over Excavation and Embankment of existing material in Place - per cubic yard

TESTING REQUIREMENTS

ASTM D 698 Test for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 5.5-pound (2.49 kg) Rammer and 12-inch (305 mm) Drop

ASTM D 1556 Test for Density of Soil In Place by the Sand-Cone Method

ASTM D 1557 Test for Laboratory Compaction Characteristics of Soil Using Modified Effort

ASTM D 2167 Test for Density and Unit Weight of Soil In Place by the Rubber Balloon Method.

ASTM D 2922 Density of Soil and Soil Aggregate in Place by Nuclear Methods.

ASTM D 3017 Water Content of Soil and Rock in Place by Nuclear Methods.

EAP SW 846 Test Methods for Evaluating Solid Waste

EPA 8240/8270 Volatile Organic Compounds

EPA 8080 Pesticides and PCBs

END OF ITEM P-152