

# CITY OF ALBANY

## Standard Specifications Technical Provisions

### Section 3

### Earthwork

#### 3-1 Earthwork

**3-1.1 General** — Earthwork shall consist of all excavation grading and construction, except structure excavation of pipelines, any excavation separately designated and paid for as a separate item. Work under this section shall consist of performing all operations necessary to excavate earth and rock, regardless of character and subsurface conditions, from the roadway prism or adjacent thereto; to excavate all materials, of whatever nature, necessary for the construction of foundations for structures and other facilities; to excavate drainage and irrigation ditches; to excavate drainage channels; to excavate selected material and borrow material for use as specified; to construct embankments including the placing of selected material in connection therewith as specified; to place backfill for structures, and other facilities; to backfill trenches and depressions; to remove and replace unsuitable material; to excavate and grade road approaches, driveways, and connections; to construct protection dikes; to remove unstable material, slide material which has come into the graded area, and material which has slipped from embankments; all as shown on the plans and as specified in these Specifications and the Special Provisions and as directed by the Director of Public Works; and furnishing all labor, materials, tools, equipment and incidentals, and for doing all the work that may be required for earthwork, except excavation, trenching and backfilling for pipe, culverts, underground utilities system, and other subsurface pipes. Excavation trenching and backfilling for sewer and storm drain pipes, underground utilities, and other subsurface pipes is as specified in other sections of these Technical Provisions.

Whenever reference to finished grade is made, it shall be considered to be the finished surface of the completed facility. When the work covered by the Contract is stage construction, the relation between finished grade and the work covered by the Contract will be as shown on the plans.

Unless otherwise specified, quantities of all type of existing subbase, base, surfacing, or pavement removed will be included in the quantities of the type of

excavation in which they are located, and no separated payment will be made therefor.

When hauling is done over highways or City streets, and when directed by the Director of Public Works, the loads shall be trimmed and all material removed from shelf areas of vehicles in order to eliminate spilling of material. If directed by the Director of Public Works, the loads shall be watered after trimming to eliminate dust and/or covered.

**3-1.2 Protection of Construction/Erosion Control** — The Contractor shall provide and maintain slopes, crowns, and ditches on all excavations, fills and embankments to ensure satisfactory drainage at all times during the construction period. He shall be responsible for the construction of temporary dams, silting basins, and other facilities as required to prevent damage to the work, and eroded earth and silt from being deposited in streams or on adjacent properties. The finished subgrade shall not be disturbed by traffic or other operations and shall be protected and maintained by the Contractor in a satisfactory condition until subbase, base or pavement is placed. No separate payment will be made for this work, but it shall be considered as being included in the unit bid price for the earthwork involved. The storage or stockpiling of materials on the finished subgrade will not be permitted. No subbase, base or pavement shall be laid until the subgrade has been checked and approved. Attention is directed to Chapter 15 of the City Code, the provisions of this section shall apply to all work.

**3-1.3 Control of Ground & Surface Waters** — The Contractor shall take such measures as may be required, and shall furnish, install and operate such pumps or other devices as may be necessary to remove any seepage, storm water or sewage that may be found or may accumulate in the excavations during the progress of the work. The Contractor shall keep all excavations entirely free from water at all times during the construction of the work and until the Director of Public Works gives permission to cease pumping.

**3-2 Selected Materials** — Shall be defined as materials which are excavated from the project site and which are satisfactory for use in fills, embankments, as backfill or other uses as specified or directed, insofar as such material is suitable for compaction, contains no cemented lumps or rocks larger than 3 inches in greatest dimension, is free of topsoil, organic and other deleterious materials, and is approved by the Director of Public Works.

**3-3 Local Borrow Materials** — Shall be defined as materials excavated and used in the construction of fills and embankments, or for use as selected material, or for other construction purposes obtained from sources within the project site as directed by the Director of Public Works or as specified in the Special Provisions. The Contractor will have no choice or selection of the source.

**Imported Borrow Materials** — Shall be defined as materials which are obtained from sources outside the project site. Such materials shall be subject to the approval of the Director of Public Works. Unless otherwise stipulated in the Specific Provisions, the Contractor shall make his own arrangements for obtaining imported material and shall pay all costs involved.

**3-5 Topsoil** — When so specified in the Special Provisions or directed by the Director of Public Works, topsoil shall be stripped to a depth of 4 to 6 inches and shall be either spread on areas indicated or shall be transported and deposited in stockpiles convenient to areas that are to receive application of the topsoil later. Topsoil shall be kept separate from other excavated materials and stockpiled free of roots, stones, and other undesirable materials.

**3-6 Classification of Excavation** — Unless otherwise specified in the Special Provisions, all excavation shall be unclassified. When excavation is classified in the Special Provisions as rock or common excavation and separate payment items have been established for same, then all excavation shall be done on a classified basis.

No consideration will be given to the nature of the materials under the designation of unclassified excavation. Earth and rock, regardless of character and subsurface conditions, shall be excavated to the lines and grades as established by the plans.

**3-7 Selection of Borrow Materials** — Borrow materials shall be selected to meeting the requirements and conditions of the particular fill or embankment for which it is to be used. Local borrow material shall be obtained from the borrow areas shown on the plans or specified in the Special Provisions. Imported borrow material shall be obtained from sources selected by the Contractor and approved by the Director of Public Works. Unless otherwise specified, the Contractor shall obtain from the owners the right to procure material, pay all royalties and other charges involved, and bear all expense of developing the sources, including rights of way for hauling.

No imported borrow material shall be delivered to the site until approved by the Designated Authority. Approval of borrow material shall be based on the Designated Authority's inspection of the borrow source and the testing of representative samples submitted by the Contractor. Such representative samples shall be submitted to the Director of Public Works not less than 15 days prior to commencing the work.

Imported borrow, delivered to the site, that significantly differs from the submitted samples shall be subject to rejection. Rejected materials shall be removed from the site at the Contractor's expense. Approval of a particular borrow material shall constitute approval of only that portion of the proposed borrow source represented by the submitted sample.

Unless specifically provided, no local borrow shall be obtained within the limits of the project site without prior written approval. Necessary clearing, grubbing, and satisfactory drainage of local borrow pits and the disposal of debris thereon shall be considered incidental operations to the borrow excavation and shall be performed by the Contractor at no additional cost to the City.

**3-8 Unsuitable Material** — Material below the natural ground surface in embankment areas and basement material in excavation areas below the limits specified in Article “Compaction” herein, that is unsuitable for the planned use, shall be excavated and disposed of as directed by the Director of Public Works.

The removal and disposal for such unsuitable material will be paid for as roadway excavation for the quantities involved if the removal for such material is shown on the plans or specified in the Special Provisions.

If removal of such unsuitable material is not shown on the plans or specified in the Special Provisions, the removal and disposal of such unsuitable material will be paid for at the contract prices for roadway excavation for the quantities involved unless either the Director of Public Works, prior to removal of any such material, orders the unsuitable material to be removed and disposed of and paid for as extra work as provided in Part I - General Provisions, or the Contractor, prior to performing any such work, requests in writing that the removal and disposal of such unsuitable material be paid for as extra work as provided in Part I - General Provisions of the Standard Specifications.

When unsuitable material is removed and disposed of, the resulting space shall be filled with material suitable for the planned use. Such suitable material shall be placed and compacted in layers as hereinafter specified for constructing embankments.

**3-9 Slides and Slipouts** — Material outside the planned roadway or ditch slope which is unstable and constitutes a potential slide in the opinion of the Designated Authority, material which has come into the roadway or ditch, and material which has slipped out of new or old embankments shall be excavated and removed. The material shall be excavated to designated lines or slopes either by benching or in such manner as directed by the Soils Engineer and approved by the Director of Public Works. Such material may be used in the construction of the embankments when approved by the Soils Engineer.

The removal and disposal of slide and slipout material as above specified, and not resulting from any act or failure to act on the part of the Contractor, will be paid for at the contract prices of roadway excavation for the quantities involved.

However, if in the opinion of the Director of Public Works the character of the work, the removal and disposal of such material is not properly compensable at the contract prices for roadway excavation, the work may be paid for as “Extra Work” as

provided in Part I - General Provisions provided the Contractor requests in writing such payment prior to performing any such work.

Only those quantities of slide or slipout material will be paid for which are actually removed as ordered by the Director of Public Works.

**3-10 Slopes** — Excavation slopes shall be finished in conformance with the lines and grades shown on the plans. All debris and loose material shall be removed. When completed, the average plane of the slopes shall conform to the slopes indicated on the plans and no point on the completed slopes shall vary from the designated plane by more than 6 inches measured at right angles to the slope. Where excavation is in rock no point shall vary more than 2 feet from the designated plane of the slope. In no case shall any portion of the slope encroach on the roadbed.

Embankment slopes shall be finished in conformance with the lines and grades shown on the plans. When completed, the average plane of the slopes shall conform to the slopes indicated on the plans and no point on the completed slopes shall vary from the designated plane by more than 6 inches measured at right angles to the slope.

**3-11 Surplus Materials** — Unless otherwise shown on the plans or specified in the Special Provisions, no surplus excavated material may be disposed of within the right-of-way or on adjacent property within the project area. Unless otherwise specified in the Special Provisions, surplus excavated material to be disposed of shall become the property in responsibility of the Contractor and shall be disposed outside the City at the Contractor's expense, unless otherwise provided for in the Specific Provisions.

Quantities of surplus material, if any shown on the plans or in the Special Provisions, are approximate only. The Contractor shall satisfy himself that there is sufficient material available for the completion of the embankments before disposing of any indicated surplus material. Any shortage of material, caused by premature disposal of the indicated surplus material by the Contractor, shall be replaced by him and no compensation will be allowed for such replacement.

**3-12 Deficiency in Materials** — If the quantity of acceptable material from excavation is not sufficient to construct the fills or embankments required by the work, the quantity of material needed to complete the fills or embankments shall consist of imported borrow, as determined by the Director of Public Works.

The Contractor shall obtain imported borrow in accordance with the provisions of Section 3-3 and 3-4 herein. If the contract does not include an item for imported borrow, payment of the required imported borrow will be made by "Extra Work" as provided in Part I - General Provisions.

**3-13 Selected Material** — Selected material encountered in the excavation

within the right-of-way shall be used for finishing the top portion of the roadbed, constructing shoulders, structure backfill; as shown on the plans; as specified in the Special Provisions, or as directed by the Director of Public Works. Topsoil excavated within the limits of the project may be considered as a selected material only for the purpose of backfilling areas to be planted.

When practicable, selected material shall be hauled directly from excavation to its final position in the roadway prism and compacted in place and such work will be paid for at the contract prices for roadway excavation.

Selected material shall remain in place until it can be placed in final position as provided above. No additional compensation will be allowed for any delay in excavation operations, except that if ordered in writing by the Director of Public Works, selected material may be excavated and stockpiled at locations designated by him and later placed in final position in the roadway prism.

Excavating selected material and stockpiling, if required, will be paid for at the contract prices for roadway excavation. Removing the selected material from stockpiles and placing it in final position in the roadway prism will again be paid for at the contract prices for roadway excavation, except that the quantities to be paid for will be determined from measurements of the material in the stockpiles prior to removal.

No payment for stockpiling of selected material will be made, unless such stockpiling is ordered by the Director of Public Works.

When determining quantities of earthwork to be paid for, topsoil placed along the tops of slopes in connection with erosion control work will not be considered as stockpiled material.

### **3-14 Measurement**

**3-14.1 Roadway Excavation** to be paid for will be the number of cubic yards of material excavated as classified or unclassified excavation, as defined in the Technical Provisions, measured in the original position and computed by the average end area method. The following earthwork operations will be measured as roadway excavation for the quantities of material involved; excavating the roadway prism including public and private road approaches; connections and driveways; excavating unsuitable slides and slipouts not resulting from overshooting; excavating surplus material; excavating selected material and topsoil from within the limits of project and removing such materials from stockpiles when stockpiling is ordered; excavating channels; and excavating local borrow.

Excavating in excess of the planned or authorized cross section will not be paid for. The Contractor shall backfill and compact unauthorized excavated areas to

the original ground elevation or authorized section at no expense to the City.

The measurement will not include the yardage of subgrade material or other material that is scarified or plowed and reused in place by road mixing or other similar in place method of operation.

Where due to changed conditions or the nature of a particular operation or for any other reason, it is impossible or impractical to measure quantities of common excavation by means of average areas, the Director of Public Works will compute the quantities of material excavated by a method which in his opinion is best suited to obtain an accurate determination.

When quantities of roadway excavation are computed by means of average end areas and centerline distances, a correction for curvature will not be applied to quantities within the roadway prism.

The final estimate of roadway excavation quantities shall be the quantities included within the planned or authorized cross section, excluding the rounding of the tops of excavation slopes and ends of excavations, and the quantities involved in the removal of slides and slipouts.

**3-14.2 Imported Borrow** — The quantity of imported borrow material will be measured either by the ton (2,000 lbs.), or by the cubic yard of truck measure, as indicated in the bid schedule. When measured by the ton, the Contractor shall furnish certified weight slips to the Director of Public Works for each load delivered. A weight deduction will be made for any moisture content in excess of 6 percent of the dry weight of the material. When truck measure is used, each type of truck shall be accurately marked for its cubic yard, "water level," capacity, and said yardage figures shall be mutually agreed upon before hauling commences. All such vehicles shall be loaded to at least their "water level" capacity, and the Contractor shall furnish certified yardage slips to the Director of Public Works for each load delivered.

### **3-15 Payment**

**3-15.1 Roadway Excavation** — Quantities of classified or unclassified roadway excavation will be paid for at the contract unit price per cubic yard for the respective classification. Such price shall include excavating, sloping, rounding tops and ends of excavations, loading, depositing, conditioning, spreading, watering, and compacting the material complete in place and disposal of surplus material and no additional compensation shall be made therefor. If there is no bid item for Roadway Excavation, full payment shall be considered as included in the other contract items of work.

**3-15.2 Imported Borrow** — Imported borrow and classified or unclassified local borrow, measured as stated above and accepted, will be paid for at the contract unit prices per cubic yard or ton for borrow, which prices and payment shall constitute full compensation for furnishing all labor, materials, equipment, tools, supplies, and incidentals necessary to clear and strip the borrow sites, excavating, loading, hauling, depositing, spreading, watering and compacting the material complete in place, and disposing of cleared and stripped material, and no additional compensation shall be made therefor.

If there is no bid item for Import Borrow, full compensation shall be considered as included in the other contract items of work.

### **3-16 Structure Excavation and Backfill**

**3-16.1 General** — Shall consist of the removal of material for the construction of foundations for bridges, box culverts, retaining walls, headwalls and endwalls for culverts, reservoirs, buildings, and other structures, and other excavation designated on the plans or in these Specifications, or in the Special Provisions as structure excavation.

Structure backfill shall consist of furnishing, placing and compacting backfill material around structures to the lines designated on the plans or specified or directed by the Director of Public Works.

Structure excavation and structure backfill shall include the furnishing of all materials and equipment and the construction or installation of all shoring, cofferdam and sheeting and/or other facilities which may be necessary to perform the excavations and place and compact the backfill, and the subsequent removal of such facilities, except where they are required or permitted by the plans or Specifications to remain in place.

When shown on the plans or directed by the Director of Public Works, recesses of culvert inlets shall be excavated in excavation slopes to the dimensions designated and the resulting material disposed of in embankments as directed, and such work will be paid for as structure excavation for the quantities involved.

Surplus material from structure excavation shall be deposited in embankments as provided in Article "Embankment Construction," or disposed of as provided for in "Surplus Material," all as directed by the Director of Public Works, and no additional compensation will be allowed for such work.

**3-16.2 Foundation Subgrade Treatment** — When footing concrete or masonry is to rest upon rock, the rock shall be fully uncovered and the surface thereof shall be removed to a depth sufficient to expose sound rock. The rock shall be roughly



leveled off or cut to approximate horizontal and vertical steps, and shall be roughened. Seams in the rock shall be grouted under pressure or treated as the Director of Public Works may direct and the cost thereof will be paid for as extra work.

When no piles are used and footing concrete or masonry is to rest on an excavated surface other than rock, care shall be taken not to disturb the bottom of the excavation and final removal of the foundation material to grade shall not be made until just before the concrete or masonry is placed. Except when over-excavation is directed by the Director of Public Works, excavation below grade shall be replaced at the Contractor's expense with the same class of concrete specified for the structure and at the time the concrete for the structure is being placed.

The excavation for piers and abutments shall be completed to the bottom of the footings before any piles are driven therein, and excess material remaining in the excavation after pile driving shall be removed to the elevation of the bottom of the footings.

When piles are used and ground displacement results from pile driving operations, the Contractor shall at his expense excavate or backfill the footing areas to the grade of the bottom of the footing as shown on the plans with structure backfill material.

**3-16.3 Construction Review** — Whenever any structure excavation is completed, the Contractor shall notify the Director of Public Works who will conduct a construction review of the foundation. No concrete or masonry shall be placed until the foundation has been approved by the Director of Public Works.

**3-16.4 Structure Backfill** — Shall not be placed until the structure footings or other portions of the structure or facility have been reviewed by the Director of Public Works and approved for backfilling. No backfill material shall be deposited against the back of concrete abutments, concrete retaining walls, foundation walls, or the outside walls of cast-in-place concrete culverts until the concrete has developed a strength of not less than 2,500 psi in compression as determined by test cylinders cured under conditions similar to those prevailing at the site.

Unless otherwise specified in the Special Provisions, structure backfill shall consist of approved selected material from excavation, free from stones or lumps exceeding 3 inches in greatest dimension, vegetable matter, or other unsatisfactory material. When the material from excavation is unsuitable for use as backfill, it shall be disposed of as directed by the Director of Public Works and suitable material approved by the Director of Public Works shall be furnished by the Contractor for the backfill.

Consolidation of structure backfill by pounding and jetting will be permitted when, as determined by the Director of Public Works, the backfill material is of such character that it will be self-draining when compacted and that foundation materials will not soften or be otherwise damaged by the applied water, and no damage to the structure from hydrostatic pressure will result. Pounding and jetting of the upper 2 feet below finish subgrade will not be permitted in roadway areas. When pounding and jetting is permitted, material for use as structure backfill shall be placed and compacted in layers not exceeding 4 feet in thickness. The work shall be performed without damage to the structure or softening of the embankment, and in such a manner that excess water will not be impounded. Pounding and jetting methods shall be supplemented by the use of vibratory or other consolidation equipment when necessary to obtain the required consolidation.

**3-16.5 Measurement** — There shall be no separate measurement for Structure Excavation and Backfill.

**3-16.6 Payment** — Unless otherwise provided in the Special Provisions, no payment will be made for structure excavation or backfill as such; the cost thereof shall be considered as included in the price bid for the construction or installation of the items to which such excavation or backfill is incidental or appurtenant. Separate payment for such excavation or backfill will be made only when the Special Provisions provide, and then, only for the volume included within vertical faces one foot beyond and parallel with the outermost horizontal dimensions of that portion of the structure to be constructed within the limits of the excavated space.

### **3-17 Embankment Construction**

**3-17.1 General** — Shall consist of constructing embankments and fills, including the preparation of the areas upon which they are to be placed; buttress fills; dikes; the placing and compacting of approved material within areas where unsuitable material has been removed; and the placing and compacting of material in holes, pits and hole depressions.

Areas over which fills are to be placed shall be cleared and scarified to provide a bond between the existing ground and the material to be deposited thereon. When fills are to be placed over existing surface improvements which are to remain in place, such clearing and scarifying will not be required. Whenever a fill is constructed upon an existing structure or pavement, 4 inch drainage holes shall be drilled through the structure on 5 foot centers each way or the pavement shall be broken by stomping in a grid pattern of 5 feet each way.

Rocks, broken concrete, or other solid materials which are larger than 4 inches

in greatest dimension, shall not be placed in fill areas where piles are to be placed or driven, or that would interfere with the construction for other structures.

When fill is to be made and compacted on hillsides or where new fill is to be compacted against existing fill or where embankment is built one-half width at a time, the slopes of original hillsides and old or new fills shall be benched a minimum of 4 feet horizontally as the fill is placed. A new bench shall be started where the vertical cut for the next lower bench intersects the existing ground.

Materials thus cut out shall be recompacted along with the new embankment material at the Contractor's expense unless the width of the bench required by the Director of Public Works exceeds 4 feet, in which case the excavated material in excess of 4 feet will be measured and paid for as excavation.

Clods or hard lumps of earth of 6 inches in greatest dimensions shall be broken up before compacting the materials in embankment, with the following exception:

When the fill materials contain large rocks, boulders, or hard lumps such as hardpan or cemented gravel which cannot be broken readily over 12 inches in greatest dimension, such materials may be incorporated in the fill only when authorized by the Director of Public Works with respect to the acceptability of the material, the location and depth of its placement in the fill, and the method to be used. When the embankment material consists of large rocky materials, or hard lumps such as hardpan or cemented gravel, 12 inches and less in greatest dimension, which cannot be broken readily, such material shall be well distributed throughout the embankment. Sufficient earth or other fine material shall be placed around the large material as it is deposited so as to fill the interstices and produce a dense, compact embankment.

When bridge footings are to be constructed in embankment, the embankment shall be constructed to the elevation of the grading plane before excavating for the footing, or when foundation piling is shown on the plans, before driving the piles or excavating for the footing.

**3-17.2 Compacting** — Embankment shall be constructed in compacted layers of uniform thickness and each layer shall be compacted in accordance with the requirements herein specified with the following exception: where embankments are to be constructed across low, swampy ground which will not support the weight of hauling equipment, the lower part of the embankment may be constructed by dumping excessive loads in a uniformly distributed layer of a thickness not greater than that necessary to support the equipment while placing subsequent layers. The remainder of the embankment shall be constructed in layers and compacted as specified.

The construction of dikes, the placing and compacting of approved material where

unsuitable material has been removed, and the filling of holes, pits and other depressions shall conform to all of the requirements specified herein for compacting embankments. Trenches, holes, depressions and pits outside of areas where embankments are to be constructed shall be graded to provide a presentable and well-drained area.

Embankments shall be constructed so that each layer shall have a cross fall of at least 2% but not more than 5%.

The loose thickness of each lift of embankment material shall not exceed that which will provide the specified relative compaction through the full depth of the lift by the specific compaction equipment being utilized. Each lift shall be compacted in accordance with the requirements of Article "Compaction" herein.

When embankment material contains by volume over 25% of rock larger than 6 inches in greatest dimension, the embankment below a place 3 feet from finished grade may be constructed in layers of a loose thickness before compaction not exceeding the maximum size of rock in the material but not exceeding 3 feet in thickness.

The interstices around the rock in each layer shall be filled with earth or the fine material and compacted. Broken Portland cement concrete and bituminous type pavement obtained from the project excavations will be permitted in the embankment with the following limitations:

1. The maximum dimension of any piece used shall be six inches.
2. Pieces larger than 4 inches shall not be placed within 12 inches of any structure.
3. Pieces larger than 3 inches shall not be placed within 12 inches of the subgrade for paving.
4. "Nesting" of pieces will not be permitted.

At locations where it would be impracticable to use mobile power compacting equipment, embankment layers shall be compacted to the specified requirements by any approved method that will obtain the specified relative compaction.

At the time of compaction, the moisture content of embankment material shall be such that the specified relative compaction will be obtained and the embankment will be firm, hard and unyielding. Embankment material which contains excessive moisture shall not be compacted until the material is dry enough to obtain the required relative compaction. Full compensation for any additional work involved in drying embankment material to the required moisture

content shall be considered as included in the contract unit prices and no additional compensation will be allowed therefor.

**3-17.3 Measurement** — There shall be no separate measurement for embankment.

**3-17.4 Payment** — Full compensation for constructing embankments, preparing subgrade at the grading plane, doing necessary plowing or benching, constructing all dikes, placing and compacting approved material where unsuitable and unstable embankment foundation material has been removed, filling and compacting holes, pits, and other depressions, backfilling excavations resulting from the removal of structures and other facilities, placing selected material where required, placing topsoil excavated from within the project limits on slopes, placing selected material and topsoil in stockpiles, all as shown on the plan and as specified in these Specifications and the Special Provisions, shall be considered as included in the contract price paid per cubic yard for excavating the material or the contract price paid for furnishing and placing the material, as the case may be, and no additional compensation will be allowed for such work.

Where embankment is specified in the bid schedule or in the Special Provisions full compensation for constructing such embankments shall include the cost of all the necessary excavation in connection therewith, both within the limits of the project or otherwise, together with the cost of all grading, shaping, and other work that is required under this Article "Embankment Construction." The quantities used in determining payment for embankment bid items shall be those of the completed embankments in place within the limit of dimensions shown on the plans.

### **3-18 Compaction**

**3-18.1 General** — Earthwork compaction consists of obtaining the required compaction in all earthwork described in these Specifications or the Special Provisions, except structure backfill.

Embankments shall be constructed in layers. The loose thickness of each layer of embankment material before compaction shall not exceed 0.67 foot, except as provided for rocky material.

**3-18.2 Relative Compaction (95 Percent)** — Unless otherwise specified in the Special Provisions, whether in excavation or embankment, when subbase, base, pavement, or curb and gutter is to be placed directly on subgrade material, the top 6 inches of subgrade material shall be compacted to a relative compaction of 95 percent. After compaction and trimming, the subgrade shall be firm, hard, and unyielding. When expansive soils are encountered, the Director of Public Works may require that 6 inches of expansive soils be removed and replaced with either

aggregate base or subbase, this will be in lieu of the 95 percent compaction requirement. This provision does not waive the requirement in regard to "Unsuitable Material."

In addition, relative compaction for not less than 95 percent shall be obtained under subbase, base, pavement, and curbs and gutters for a minimum depth of 2.5 feet below finished grade in embankment areas.

Relative compaction for not less than 95 percent shall be obtained for embankment under wall footings without pile foundations within the limits established by inclined planes sloping 1½:1 out and down from lines one foot outside the bottom edges of the footing.

**3-18.3 Relative Compaction (90 Percent)** — Relative compaction of not less than 90 percent shall be obtained in all layers of material in embankment, except as specified herein to be 95 percent; and under driveways and sidewalks for a minimum depth of 2.5 feet below finished grade.

**3-18.4 Measurement** — There shall be no separate payment for compacting earthwork.

**3-18.5 Payment** — For earthwork compaction will be considered as included in the various contract items of work requiring compaction of earthwork and no separate payment will be made therefor. If the Contractor elects to excavate and replace basement material to facilitate compaction, the cost of such work will be considered as included in the contract items of work requiring compaction of earthwork and no separate payment will be made therefor.

**3-19 Finish and Tolerance** — The surface of all excavations, fills, embankments, and subgrade shall be finished to a reasonably smooth and compact surface, substantially within 0.10 foot above or below the planned elevation, the lines, grades, and cross sections or elevations, except for roadways, parking areas, sidewalks, and other paved areas, the finished subgrades of such areas shall not vary more than 0.03 foot above nor 0.05 foot below the planned elevation.

When the subbase, base or pavement for roadways, parking areas, sidewalks, and other paved areas are not being constructed under this Contract, the subgrades of such areas shall be finished within a tolerance of plus or minus 0.2 foot.

All other site areas that have been excavated, or that have received fill or embankments (excluding roadways and other paved areas), shall be finished within a tolerance of plus or minus 0.2 foot.