

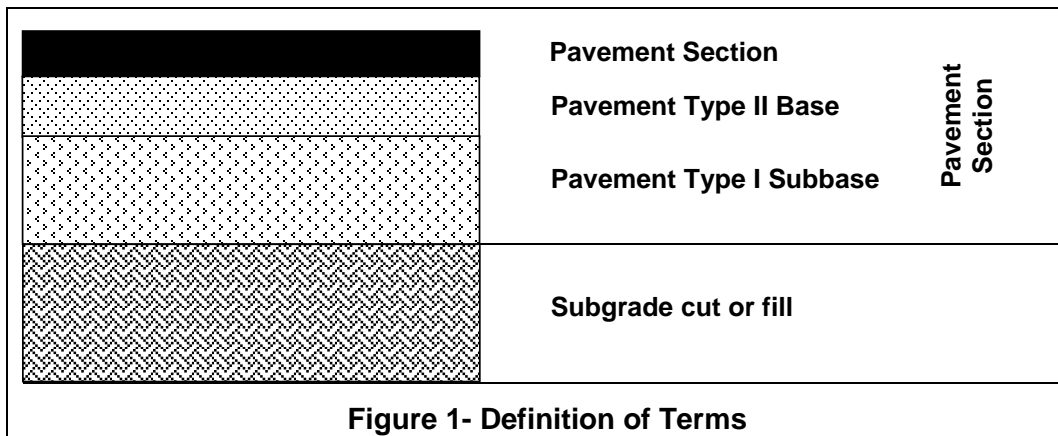
SECTION 203

EXCAVATION AND EMBANKMENT

DESCRIPTION

203.01.01 GENERAL

- A. This work shall consist of grading and excavating the roadway, excavating borrow pits, removing slide material, and excavating ditches and stream channels and satisfactorily disposing of all excavated material and all work necessary for the construction and completion of cuts, embankments, slopes, ditches, dikes, stream channels, approaches, parking areas, intersecting driveways and highways, and subsidiary work. Exceptions are slope rounding, structure excavation, or other separately designated pay items of work, which are made a part of the contract. All work shall be in conformity with the alignment, grades, and cross sections shown on the plans or established by the Engineer.



MATERIALS

203.02.01 ROADWAY EXCAVATION

- A. Roadway excavation shall consist of all excavation involved in grading and constructing the roadway and appurtenances, irrespective of the nature or type of material encountered; except excavation designated as structure excavation, drainage excavation, channel excavation, and borrow excavation when these items are provided as items of work under the contract. Dividing the project into construction stages shall not be construed as separate material classifications.
- B. When cementitious material is encountered within the excavation limits, the treatment, removal, trimming, and working of that material shall be considered as incidental to the excavation work.

203.02.02 DRAINAGE EXCAVATION

- A. Drainage excavation shall include all excavation in the construction of open ditches less than 12 feet in bottom width, excepting ditches that are part of the roadway prism as shown in the plans. The nature or type of material encountered shall have no bearing on the classification of material.

- B. When cementitious material is encountered within the excavation limits, the treatment, removal, trimming, and working of that material shall be considered as incidental to the excavation work.

203.02.03 CHANNEL EXCAVATION

- A. Channel excavation shall include all excavation in the construction of open ditches or stream channels with a bottom width of 12 feet or more with the exception of ditches that are part of the roadway prism as shown in the plans. The nature or type of material encountered shall have no bearing on the classification of material.
- B. When cementitious material is encountered within the excavation limits, the treatment, removal, trimming, and working of that material shall be considered as incidental to the excavation work.

203.02.04 BORROW

- A. Borrow shall consist of approved material excavated and used in the construction of fills, or for other construction purposes. Borrow shall be material that is excavated from sources specified in the Special Provisions or designated by the Engineer. The source of material to be excavated shall be approved in advance by the Engineer. Borrow shall be excavated to the lines and grades established by the Engineer.
- B. The Contractor shall notify the Engineer, sufficiently in advance, of opening any borrow site so that adequate time will be allowed for testing the material and establishing cross section elevations and measurements of the ground surface. The widening of roadway cuts shall be considered as roadway excavation and not as borrow, unless otherwise specified. Borrow excavation will not be classified according to type or character of material encountered in the borrow area unless otherwise required in the Special Provisions.

203.02.05 SELECTED BORROW

- A. Selected borrow shall consist of approved material required for the construction of embankments within the required limits shown on the plans or directed by the Engineer, and shall be obtained from approved sources.
- B. Selected borrow shall conform to the requirements set forth in the Special Provisions.

CONSTRUCTION

203.03.01 ROADWAY

- A. All excavation shall be made true to lines and grades staked by parties under the supervision of a Nevada licensed professional land surveyor working for the Engineer or Contractor and shall be so conducted as to avoid removing or loosening any material outside the required slopes. If any material is so disturbed, it shall be replaced and thoroughly compacted to the required cross section, unless such replacement is impractical as determined by the Engineer.
- B. The work done under this section shall begin at some definite point or points on the project subject to the approval of the Engineer, and the work shall progress toward completion in an orderly manner. The roadway shall be graded to full cross section width before placing base or surfacing of any type, unless otherwise specified.

- C. Intersecting roads, service highways, ramps, approaches, and driveways shall be graded as shown on the plans or established by the Engineer.
- D. All suitable material removed from the excavation shall be used as far as practicable in the formation of embankments, subgrade, shoulders, slopes, dikes, and backfill for structures, unless otherwise indicated on the plans or specifications herein or disposed of in a manner satisfactory to the Engineer. Excavated material shall not be wasted without permission.

203.03.02 GRADE TOLERANCE

- A. Immediately prior to placing subsequent layers of material thereon, the grading layer shall conform to one of the following:
 - 1. The subgrade shall not vary more than 0.10 foot above or below the grade established by the Engineer or Contractor.
 - 2. The final subgrade layer prior to application of the structural base shall not vary more than zero foot above or 0.10 foot below the grade.

203.03.03 UNSUITABLE MATERIAL

- A. Unsuitable material as defined in Section 101 "Definitions", and that is unsuitable for planned use, including material below the natural ground surface in embankment areas, shall be excavated and disposed of in a manner approved by the Engineer or as specified in the contract documents.
- B. 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 specified below under embankment.
- C. Disposal of material outside the right-of-way shall be in accordance with ***Subsection [107.14](#), "Disposal of Material Outside Project Right-of-Way."***

203.03.04 BLASTING

- A. Any material outside the authorized cross section on the backslopes which may be shattered or loosened because of blasting shall be removed by the Contractor at no additional cost to the Contracting Agency. Shattered or loosened material below the bottom limits of required excavation shall be uniformly distributed and compacted or otherwise disposed of in a manner satisfactory to the Engineer. The Contractor shall discontinue any method of blasting which leads to overshooting or is dangerous to the public or destructive to property or to natural features.
- B. The use of coyote holes in blasting is prohibited. Attention is directed to ***Subsection [107.10](#), "Explosives."***

203.03.05 ROCK CUTS

- A. In excavating side hill rock cuts and rock cliffs, the Contractor shall exercise care and use precautionary methods so as not to break down, loosen, or otherwise damage supporting rock below the bottom limits of required excavation. In general, such cuts shall be worked from the top of lifts of such height that will not damage the bench of rock below the bottom limits of required excavation. The Contractor shall be responsible for the methods used and for any damage to the roadbed resulting from Contractor's operations.

- B. The slope of all rock cuts shall be scaled and dressed to a safe, stable condition by removing all loose spalls and rock not firmly keyed to the rock slope. Overhanging rock shall be removed when, in the opinion of the Engineer, it may be a hazard to public use of the roadway.
- C. In solid rock excavation, slopes shall be constructed to the approximate neat lines staked by the Engineer. No rock shall project or overhang more than 12 inches from the true slope.

203.03.06 OVERBREAK

- A. Overbreak is that portion of material excavated, displaced or loosened outside and beyond the slopes or grade as staked or re-established, regardless of whether any such overbreak is due to blasting, the inherent character of any formation encountered, or to any other cause. Slides and slipouts as defined in **Subsection 203.03.11, "Slides and Slipouts,"** and that portion of rock subgrade as set forth below shall not be considered overbreak. All side slope overbreak as so defined shall be removed by the Contractor and shall be disposed of in the same manner as provided for the surplus under the heading of "Surplus Material," but at no additional cost to the Contracting Agency and without any allowance for overhaul.
- B. Rock removed to a maximum depth of 6 inches below subgrade will be measured for payment as described in **Subsection 203.04.01.C.2, "Overbreak."**

203.03.07 SLOPES

- A. All excavation and embankment slopes, except in solid rock, shall be trimmed to the lines staked by the Engineer. The degree of smoothness shall be that normally obtained by hand shovel operations or blade grader operations.

203.03.08 WIDENING CUTS

- A. If the Engineer directs the Contractor to excavate beyond the limits of the typical cross section originally proposed and within the limits of the right-of-way, the Contractor shall do so and compensation therefor will be as set forth in **Subsection 203.04.01.C.3, "Widening Cuts."**

203.03.09 SURPLUS MATERIAL

- A. Unless otherwise specified in the contract documents, surplus excavated material shall be used to widen embankments uniformly, or to flatten slopes, or at other locations, all in a manner satisfactory to the Engineer. No surplus material shall be disposed of above the grade of the adjacent roadbed nor shall the Contractor waste any material unless approved in writing by the Engineer.
- B. If the quantity of surplus material is specified in the contract documents, such quantity shall be considered approximate only. The Contractor shall verify that there is sufficient material available for the completion of the embankments within the areas involved before disposing of any indicated surplus material inside or outside the right-of-way. Any shortage of material caused by premature disposal of the indicated surplus material by the Contractor shall be replaced by the Contractor and no compensation will be allowed the Contractor for such replacement.

203.03.10 SELECTED MATERIAL

- A. When specified in the contract documents, or when selected by the Engineer, suitable selected material encountered in excavating or widening the roadway prism or any other excavation within the right-of-way, or in the excavation or borrow, shall be used for finishing the top portion of the subgrade. The top portion of the subgrade shall be 2 feet in depth, or as determined by the Engineer.
- B. Selected material shall be defined as material that is excavated from one or more of the above sources and is used for selective purposes.
- C. When practical, selected material shall be hauled directly from excavation to its final position and compacted in place and such work shall be paid for at the contract unit price for the excavation item involved. Attention is directed to ***Subsection 104.05, "Rights In and Use of Materials Found on the Project."***
- D. When the transporting of selected material directly from excavation to its final position is impractical, the selected material shall be left in place until it can be placed in final position and no additional compensation will be made because of the delayed excavation. If, however, the conditions are such that the undisturbed selected material will hamper ordinary grading operations or cause unnecessary movements of equipment, the Engineer may order, in writing, the removal of sufficient selected materials and the stockpiling thereof to enable practical hauling operations. If the excavation and stockpiling of selected material is specified in the contract documents or is ordered by the Engineer, the excavation and stockpiling locations shall be designated by the Engineer. The selected material shall be removed from the stockpile and placed in final position when approved by the Engineer.
- E. Measurement for payment of selected material will be in accordance with ***Subsection 203.04.01.C.4, "Selected Material."***

203.03.11 SLIDES AND SLIPOUTS

- A. Material outside the planned roadway or ditch slopes that is unstable and constitutes potential slides in the opinion of the Engineer, material from slides that has come into the roadway or ditch, and material that 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 a manner approved by the Engineer. Such material shall be used in the construction of the embankments or disposed of as approved by the Engineer.
- B. The above provisions shall not be so construed as to relieve the Contractor from the duty of maintaining all slopes true and smooth. Erosion, regardless of amount or extent, caused by the action of the elements which results in damage to work or materials, shall in no case be considered a slide or slipout. Measurement for payment will be in accordance with ***Subsection 203.04.01.C.6, "Slides and Slipouts."***

203.03.12 DRAINAGE

- A. During construction of the roadway, the roadbed shall be maintained in such condition that it will be well drained at all times.
- B. V-type ditches shall be formed to the cross section and dimensions on the plans by means of suitable equipment, which will deposit all loose material on the downhill side. The bottom of the finished ditches shall not be less than 2 feet 6 inches below the crest of the loose material piled on the downhill side.

- C. In going from cut-to-fill, the roadway ditches shall be so cut as to avoid damage to embankments by erosion.
- D. The flat-bottom ditches indicated on the plans, or staked by the Engineer, shall be excavated to the required cross section and grade. Materials so obtained shall be used to construct roadway embankments or dikes or both, to form a continuous diversion channel as staked by the Engineer.

203.03.13 CHANNELS

- A. To avoid destruction of natural growth during construction of ditches, channels, or dikes, travel of equipment shall be confined to the construction limits. Where ditches, channels, and dikes are nearly parallel to the roadway, turn-around shall not be located closer than 200 feet apart. Attention is directed to **Subsection [107.12](#), "Protection and Restoration of Property and Landscape."**
- B. Fine grading of channel bottoms will not be required unless paving is specified.

203.03.14 BORROW

- A. A possible source of borrow material may be indicated in the contract documents. If the Contractor desires to use borrow materials from sources other than those described in the contract documents, the Contractor shall, at no additional cost to the Contracting Agency, acquire the necessary right to take materials and pay all costs involved. All costs of exploring such alternate sources shall be borne by the Contractor. Use of material from these sources will not be permitted until approved in writing by the Engineer.
- B. The Contractor shall, at the time of execution of the contract, execute an "Agreement" for all borrow deposits obtained under an "Option and Agreement for Sale of Materials" when said "Option" is contained in the Special Provisions. This agreement shall be executed whether the material is to be used or not.
- C. In case designated borrow deposits fail to contain the necessary quantity of acceptable material, the Contractor shall immediately notify the Engineer in writing. The Engineer shall thereupon investigate, and if the Engineer's investigation shows that there is not sufficient quantity of acceptable material, the Engineer shall designate an alternate deposit from which to obtain the deficit.
- D. In all borrow pits having undesirable material, including overburden, refuse, organic and deleterious substances, the material shall be removed and wasted or redistributed, in a manner satisfactory to the Engineer. All costs incurred therefor shall be considered as incidental and subsidiary to the borrow material.
- E. Borrow shall not be obtained until all other excavation items are complete to the extent necessary to determine the need for borrow.
- F. The Contractor shall notify the Engineer 30 days in advance of opening any borrow areas so that cross section elevations and measurements of the ground surface after stripping may be taken, and the borrow materials can be tested before being used. Sufficient time for testing of the borrow material shall be allowed.
- G. Borrow deposits shall be excavated to regular lines as staked to permit accurate measurement. The dimensions of the borrow deposit will be designated and the Contractor shall not excavate below the depth or outside limits given, except with prior approval. The depth of excavation throughout the area of the borrow pits shall be as uniform as practicable and the side slopes shall conform to the requirements of

Section 626, "Final Cleanup." Unless otherwise permitted, borrow pits shall be excavated so that the pits will drain to the nearest natural outlet.

- H. All materials that are not satisfactory for use for the purposes intended shall be rejected at the pit and disposed of in a manner satisfactory to the Engineer.
- I. If the Contractor excavates more material than is required, the excess will not be measured for payment.
- J. All work and materials required to build and maintain borrow haul roads and obliteration of haul roads in accordance with **Section 626, "Final Cleanup"** shall be considered subsidiary to the "borrow" item and no further compensation will be allowed.

203.03.15 FOUNDATION

- A. When embankment is to be placed and compacted on hillsides, or when new embankment is to be compacted against existing embankments, or when embankment is to be built one half width at a time, the slopes that are steeper than 4:1, when measured at right angles to the roadway, shall be continuously benched as the work is brought up in layers. Benching shall be of sufficient width to permit operations of placing and compacting equipment. Each horizontal cut shall begin at the intersection of the original ground and the vertical sides of the previous cuts. Material thus cut out shall be recompacted along with the new embankment material at no additional cost to the Contracting Agency, unless the width of excavation required by the Engineer exceeds 6 feet, in which case the excavated material in excess of 6 feet will be measured and paid for as roadway excavation.
- B. All foundations for embankment shall be cleared and grubbed in accordance with **Section 201, "Clearing and Grubbing."**
- C. In designated areas, unsuitable material shall be removed and disposed of as prescribed in **Subsection 203.03.03, "Unsuitable Material."**
- D. Where 12 inches or less of embankment is placed over existing bituminous surface, such surface shall be removed and incorporated in the embankment or otherwise disposed of as approved by the Engineer. Where more than 12 inches of embankment is placed over existing bituminous surface, such surface shall be left undisturbed. Measurement for removal of existing bituminous material will be measured and paid for as roadway excavation unless the contract documents specifically call for payment under **Section 202, "Removal of Structures and Obstructions."**

203.03.16 EMBANKMENT MATERIALS

- A. Embankments shall be constructed with suitable materials, excavated as prescribed and with any excess materials from other operations which are acceptable and suitable for use.
- B. All materials used in embankment shall be free from objectionable material such as leaves, grass, roots, logs, stumps, brush, or other perishable material.
- C. When there is a choice of material, the excavation shall be made so the best material will be placed on top of the embankment for at least 1 foot in depth. This paragraph shall not be interpreted as to require the Contractor to stockpile and subsequently rehandle embankment materials except as provided in **Subsection 203.03.10, "Selected Material."**

- D. Material shall not be placed in the embankment when either the material, foundation, or the embankment on which it would be placed is frozen.
- E. Where embankments are to be made of material from rock cuts or other material that is unsuitable for finishing the roadbed, the upper 6 inches of the roadbed shall be formed of approved material.

203.03.17 PLACING EMBANKMENT

- A. For embankment or backfill deposited against structures, attention is directed to ***Subsection 207.03.02, "Placing and Compacting at Abutments, Piers, Wingwalls and Retaining Walls."***
- B. Where structure abutments are placed on embankment, the embankment shall be constructed to subgrade elevation prior to excavating for the construction of the abutment. Where the abutment is supported on piles, the embankment shall be constructed to the elevation of the bottom of the footing.
- C. Where a structure is to be covered by a rockfill, it shall be covered with not less than 2 feet of satisfactory soil or granular materials before the rock embankment is placed over the structure.
- D. Embankments shall, except as specified herein, be constructed in layers. The construction of embankments shall begin at the lowest point of the fill below the grade or the bottom of ravines. Individual layers shall be spread evenly to uniform thickness throughout and parallel with the finished grade for the full width of the embankment, unless otherwise permitted. The thickness of the layer shall be as necessary to secure the required compaction with 12 inch maximum thickness after compaction. Excepted provisions for placing in marsh and placement of rock are outlined below. Hauling equipment shall be routed to obtain uniform compaction and channelization of haul routes and rutting of the fill shall be avoided.
- E. When embankments are constructed across wet or swampy ground that will not support the weight of heavy hauling and spreading equipment, the Contractor will be expected to choose such methods of embankment construction and to use such hauling and spreading equipment as will least disturb the soft foundation. When soft foundations are encountered, and when approved by the Engineer, the lower part of the fill may be constructed by dumping and spreading successive vehicle loads. This shall be in a uniformly distributed layer of a thickness not greater than that necessary to support the vehicle while placing subsequent layers, after which the remainder of the embankment shall be constructed in layers and compacted as specified.
- F. It is not the policy of the Contracting Agency to allow an increase in the planned depth of embankment material over soft, wet, or swampy ground for the sole purpose of providing support for heavy hauling and spreading equipment, unless the Contractor proves to the satisfaction of the Engineer that the planned depth is inadequate to support light hauling vehicles. If it proves necessary for the Contractor to use smaller hauling vehicles or different methods of embankment construction than the Contractor had originally contemplated in order to comply with the foregoing, such shall not be the basis for a claim for extra compensation against the Contracting Agency. The unit contract price for the various pay items involved shall be full compensation for all labor, materials, and equipment necessary to perform the work as outlined herein.
- G. Embankment which, in the opinion of the Engineer, contains enough rock larger than 4 inches to make it impractical to place and compact in 1-inch lifts shall be considered as

"Rock Embankment." The materials shall be spread in a uniform horizontal layer over the full width of the embankment. The layer thickness shall not exceed 1-1/3 times the vertical dimension of maximum size material larger than 8 inches. The largest size rock allowed in the embankment will be 3 feet measured in vertical direction and rocks larger than this shall be broken up before being placed in the embankment. Rock to be wasted may exceed 3 feet and be disposed of in an inconspicuous manner approved by the Engineer.

- H. In rock fills where end dumping is employed, direct end dumping upon the previously constructed layer of embankment will not be permitted. Rock shall be dumped on the layer of embankment being constructed and dozed ahead into place. Care shall be exercised to work the fines and smaller rock into the spaces between the larger rock. Compaction will be required as provided in **Subsection 203.03.19, "Compaction, Rock Embankment."**
- I. To the extent of project requirements for embankments, all rock from excavation shall be used for embankment. The Contractor shall plan the grading operation to use rock that may be encountered in excavation in accordance with the following provisions:
- J. Rock, in general, shall be placed to form the base of embankment for the full width of the cross section under the following condition:
 - 1. on the side slope or slopes of a new embankment being placed; or
 - 2. on the side slope or slopes of an embankment already in place requiring widening; or where excess rock may be wasted; or
 - 3. on the side slopes and top of rolled embankment made of embankment materials other than rock.
- K. The Contractor shall not place large rock in embankments where piles will be driven. The Contractor shall be responsible for penetrating the embankment with specified piles.
- L. When rock and other embankment materials are excavated at approximately the same time, the rock shall be distributed throughout the fill and not nested in one location.
- M. When there is insufficient material other than rock in the excavation to permit properly compacted layers, the rock shall be placed for the full cross section width with the larger rocks well distributed and the void spaces filled with the smaller rocks and fragments.
- N. When shown on the plans or considered necessary by the Engineer, embankments shall be built to such elevation above required grade to allow for settlement, or sufficient surcharge shall be placed above the required elevation of earth grade over deposits of unstable material to secure displacement or settlement. Surcharge shall be removed only after the fill has reached stability or the required settlement time has been reached.

203.03.18 COMPACTION, DIRT EMBANKMENT

- A. Optimum moisture content and material density of the various soils will be determined by a Geotechnical Engineer and acceptable ranges for optimum moisture and material density shall be approved by the Engineer. At the time of compaction, the moisture content of the various soils shall be within the approved ranges.
- B. The compacted subgrade shall be maintained at a minimum of optimum moisture content until placement of an aggregate base course or cement treated base.
- C. When necessary, each layer before being compacted shall be processed as required in order to bring its moisture content within the prescribed limits. The material shall be

wetted by the application of water or dried as necessary and either process may be carried out either on the embankment or at the source of the material or otherwise as approved by the Engineer. Full compensation of any work involved in wetting or drying embankment material to obtain the required moisture content shall be considered as included in the contract unit price bid for excavating or furnishing the material and no additional compensation will be allowed therefor.

- D. Hauling and leveling equipment shall be routed over each layer of the fill in such a manner as to uniformly distribute the compaction afforded by the wheel load. In addition to hauling and leveling equipment, the Contractor shall provide compaction equipment that is specifically designed and manufactured for compacting dirt embankments. The compaction equipment shall work continuously with the grading equipment.
- E. The top 8 inches of the base of cuts and natural ground having less than 5 feet of embankment, measured from the subgrade, and all embankment material, shall be compacted to not less than 90 percent relative compaction unless otherwise specified. When natural ground material is encountered that cannot be compacted to the required density, compaction requirements shall be determined by the Engineer.
- F. All selected borrow and structure backfill placed within the limits of embankment shown on the plans for approaches to bridges shall be compacted to not less than 95 percent relative compaction unless otherwise specified.
- G. It is to be expected that a loss of density in the upper portion of earth subgrade may occur due to the elements, or for lapse of time, or for other reasons. Recomposition to the specified density will be required prior to placement of any subsequent course and no additional compensation will be allowed.

203.03.19 COMPACTION, ROCK EMBANKMENT

- A. Field density tests will not be required on rock embankments. In lieu thereof, the required compaction shall be tested by proof rolling. Unless otherwise specified, compaction shall be attained and tested by using construction methods and equipment as follows:
 - 1. Methods:
 - a. The material for the embankment shall be deposited, spread, and leveled the full width of the embankment, and the layer of thickness may be 1-1/3 times the vertical dimension of maximum size material. The maximum size rock shall not exceed 3 feet.
 - b. Hauling and leveling equipment shall be routed and distributed over each layer of the fill in such a manner as to make use of the compaction afforded thereby. Rollers, vibrators, or compactors shall compact the embankment full width with a minimum of 3 complete passes for each layer of embankment. The compacting equipment shall not exceed a speed of 5 miles per hour and shall work continuously with the grading equipment.
 - c. Rolling shall be done in a longitudinal direction along the embankment and shall begin at the outer edges and progress toward the center. The travel paths of traffic and construction equipment shall be kept dispersed over the entire width of the embankment to aid in obtaining uniform compaction. Weights of equipment used in making embankments over soil having an excessive moisture content may be limited, if, in the judgment of the Engineer, such limitations are necessary in order to maintain the fill in a satisfactory condition.

- d. Water shall be applied to the embankment in the amount necessary to obtain the required compaction.
2. Equipment:
 - a. Compaction equipment shall be adequately designed to obtain compaction requirements without adverse shoving, rutting, displacement, or loosening and shall meet the requirements specified herein. Rollers shall have displayed thereon in permanent legible characters, the manufacturer's guaranteed net operating weights as distributed on each axle.
 - b. The proof roller shall be a pneumatic-tired roller or pneumatic-tired compactor weighing not less than 50 tons, and capable of applying to the ground loads of not less than 25,000 pounds per wheel. All tires shall be of equal size and diameter and shall be capable of operating at an air pressure of at least 90 psi. The tires shall be kept uniformly inflated so that the difference in pressure in any 2 tires shall never exceed 5 psi and means shall be provided by the Contractor for checking the tire pressure on the job at any time.
 3. Tests:
 - a. Subsequent layers shall not be placed until the previous layer of the embankment is compacted to the degree that no further appreciable deflection is evidenced under the action of proof rolling equipment, as determined by the Contractor with approval of the Engineer.
 - b. Rolling and proof rolling may be deleted on any layer or portion thereof when, in the judgment of the Engineer, accomplishment is physically impractical.
 - c. Payment for rolling and proof rolling or for the correction of any subgrade weakness or deficiencies disclosed by the proof rolling operation shall be considered subsidiary to the price bid for the "Excavation" item.
 4. The Contractor shall submit an inspection report to the Engineer that has been reviewed and stamped by a Nevada professional engineer.

203.03.20 MAINTENANCE

- A. Embankment material that may be lost or displaced as a result of natural settlement of the ground or foundation upon which the embankment is constructed shall be replaced by the Contractor with acceptable material from excavation or borrow, etc. The quantity of material required will be paid for at the regular contract price for the type of material used.
- B. The Contractor shall, at no additional cost to the Contracting Agency, remove and replace with acceptable material any embankment or portion thereof which has been constructed with unapproved material as well as remove and replace portions of the embankment which may become unstable or displaced as the result of carelessness or negligence on the Contractor's part.

203.03.21 SUBGRADE TOLERANCE

- A. Subgrade shall comply with **Subsection [203.03.02](#), "Grade Tolerance."**

METHOD OF MEASUREMENT

203.04.01 MEASUREMENT

- A. Unless otherwise specified, excavation will be measured on a volume basis by cross sectioning the area to be excavated and computing neat lines for an end area. The average end area method will be used with no allowance made for curvature. If for any reason it is impossible or impractical to measure quantities by average end areas, the Engineer will compute the quantities by a method which, in the Engineer's opinion, is best suited to obtain an accurate determination.
- B. The quantity of excavation to be measured for payment shall be the number of cubic yards excavated and placed as shown on the plans and as directed by the Engineer. The estimated quantities shown on the plans, plus or minus authorized changes will be the quantity used for payment. Additional measurement of excavation quantities will not be made for methods or equipment chosen by the Contractor for the Contractor's convenience. The Contracting Agency or the Contractor may request a final measurement in which case final cross sections will be taken. When final cross sections are taken the determination of quantities derived therefrom will be the quantities used for payment. Furthermore, when the Contractor requests final measurement and the quantities thus determined are less than the planned quantities plus authorized changes, the Contractor shall reimburse the Contracting Agency for the Agency's expenses incurred by such final measurement and calculation.
- C. When changes are made during construction such as widening cuts, changing grades, disposing of unsuitable material, stockpiling selected material, and other changes resulting in increases or decreases in quantities, then additional measurements for payment will be made by the Engineer as outlined below:
1. **Unsuitable Material:**
 - a. When the removal and disposal of unsuitable material is shown in the contract documents, such material will be measured for payment as excavation for the related item. Removal and disposal of unsuitable material not shown on the plans will be measured and paid for as "Roadway Excavation." However, if removal and disposal of unsuitable material not shown on the plans required special equipment or unusual operations, it may be paid for as extra work according to the provisions of ***Subsection 104.03, "Extra Work."***
 - b. No measurement will be made of suitable material temporarily removed and replaced to facilitate compaction of material.
 2. **Overbreak:**
 - a. All sideslope overbreaks as defined in ***Subsection 203.03.06, "Overbreak,"*** shall not be paid for. Rock removed to a maximum depth of 6 inches below subgrade will be measured for payment provided the rock has been removed sufficiently to permit accurate cross sectioning. Replacement to this depth shall be with material designated on the plans and approved by the Engineer and will be measured and paid for at the contract unit price for the material used.
 - b. Rock loosened or removed in excess of 6 inches below subgrade will not be measured nor paid for. When ordered by the Engineer, the loosened material will be removed and the resultant space refilled with approved material at the expense of the Contractor.

3. **Widening Cuts:** If the Engineer directs the Contractor to excavate beyond the limits of the typical cross section and before the excavation is substantially completed, the material shall be classified as "Roadway Excavation" and shall be paid for at the contract bid price. However, if widening cuts requires special equipment, or unusual and extra expense, it may be paid for as extra work according to the provisions of **Subsection 104.03, "Extra Work."**
 4. **Selected Material:** Selected material stockpiled as provided in **Subsection 203.03.10, "Selected Material"** will be measured for payment as roadway excavation both in its original position and also from the stockpile. Measurement of the material taken from stockpile will be made of the volume actually removed.
 5. **Surplus Material:** Surplus excavated material will be measured for payment as roadway excavation and no further compensation will be allowed by virtue of the method of disposing, placing, or widening embankments caused from such surplus material.
 6. **Slides and Slipouts:** In the event of slides and slipouts, the Engineer and Contractor shall negotiate in each case and decide the relative difficulty of performing the work, and payment will be made either as "Roadway Excavation" or as "Extra Work" as provided in **Subsection 104.03, "Extra Work."**
- D. Where slopes have been previously completed by the Contractor, the cost of resloping required in areas where unstable material is removed will be paid for as extra work as provided in **Subsection 104.03, "Extra Work."**
- E. The cost of pioneering work necessary to make slide or slipout areas accessible to normal excavation equipment and the cost of necessary clearing and grubbing will be paid for as extra work as provided in **Subsection 104.03, "Extra Work."**
- F. Only those quantities of slide or slipout material that are authorized and actually removed will be measured for payment.
- G. Excavation in excess of the staked or authorized cross section will not be measured for payment, except as outlined above.
- H. Material used for surcharge, whether shown on the plans or called for by the Engineer, will be measured for payment as roadway excavation both in its original position and when removed from the surcharge position.
- I. Earthwork quantities within the limits of "Slope Rounding" will not be measured for payment.
- J. V-type ditches will be measured parallel to the ground and each 100 linear feet shall constitute a unit of measure. The volume of excavation for such ditches will not be measured for payment.
- K. The quantity of "Selected Borrow" or "Selected Borrow Excavation" to be measured for payment will be the number of cubic yards or tons measured as set forth in the Special Provisions.
- L. All measurements will be made in accordance with **Subsection 109.01, "Measurement of Quantities."**

BASIS OF PAYMENT

203.05.01 PAYMENT

- A. The accepted quantities of excavation measured as specified in **Subsection 203.04.01, "Measurement,"** will be paid for at the contract unit price bid for each of the pay items listed in the bid schedule. Compensation for roadway excavation shall include excavating, loading, hauling, depositing, spreading, compacting, and maintaining the material complete and in place which includes all labor, tools, equipment for removal of existing asphalt paving, saw cutting of existing paving, scarifying the existing subgrade or subbase, all miscellaneous grading of shoulders, ditches, and transitions, and incidentals as necessary, as shown on the drawings, as specified herein, and as required by the Engineer.
- B. All costs for disposal of surplus materials is considered to be included in the contract price paid per cubic yard of roadway excavation and no additional payment will be made therefor.
- C. The accepted quantities of selected borrow or selected borrow excavation will be paid for at the contract unit price bid per cubic yard or ton for "Selected Borrow" or "Selected Borrow Excavation," which shall be full compensation for furnishing all materials, loading, hauling, depositing, spreading, watering, compacting, and maintaining the material complete and in place.
- D. The contract unit price bid per cubic yard for roadway excavation, borrow excavation, and channel excavation shall be considered as including payment for all haul.
- E. All payments will be made in accordance with **Subsection 109.02, "Scope of Payment."**
- F. Payment will be made under:

PAY ITEM	PAY UNIT
Roadway Excavation	Cubic Yard
Drainage Excavation.....	Cubic Yard
Channel Excavation.....	Cubic Yard
Borrow Excavation.....	Cubic Yard
V-type Ditches	Stations
Selected Borrow	Cubic Yard, Ton
Selected Borrow Excavation.....	Cubic Yard, Ton

TESTING

203.05.02 TESTING

SECTION	DESCRIPTION	TEST	REFERENCE SPECIFICATION AND/OR TEST PROCEDURE	RECOMMENDED FREQUENCY
203.02.01	Roadway Excavation (Subgrade)	Field Density	AASHTO T 310	1/5000 SF
203.02.02	Drainage Excavation (Subgrade)	Field Density	AASHTO T 310	1/5000 SF
203.02.03	Channel Excavation (Subgrade)	Field Density	AASHTO T 310	1/5000 SF
203.02.04	Borrow	Sieve Analysis	AASHTO T 11 & T 27	1/Type
		Plasticity Index	AASHTO T 89 & T 90	1/Type ¹
203.02.05	Selected Borrow	R-Value	AASHTO T 190	1/Type
		Proctor	AASHTO T 180	1/Project or Change
203.03.01	Roadway At Grade or Fill (Subgrade)	Field Density	AASHTO T 310	Residential = 1/5000 SF/Lift/Day Arterial and Collector = 1/5000 SF/Lift/Day
203.03.10	Selected Material	Sieve Analysis	AASHTO T 11 & T 27	1/1000 LF
		Plasticity Index	AASHTO T 89 & T 90	1/1000 LF
		R-Value	AASHTO T 190	1/Type
		Field Density	AASHTO T 310	1/5000 SF/Lift/Day
		Proctor	AASHTO T 180	1/Project or Change
203.03.15	Foundation ² (Subgrade)	Field Density	AASHTO T 310	1/500 SF/Lift/Day
		Proctor	AASHTO T 180	1/Project or Change
203.03.18	Embankment	Field Density Fill	AASHTO T 310	1/5000 SF/Lift/Day
		Field Density Native Below Embankment Fill Operations	AASHTO T 310	1/5000 SF/Lift/Day
		Proctor	AASHTO T 180	1/Project or Change
203.03.19	Rock Embankment	Visual	Issue Inspection Report	Full Time

¹ A maximum testable lift is defined as a 12-inch layer of compacted material.

² This is in reference to benched slope construction of embankment only.