

205 - EXCAVATION AND EMBANKMENT FOR HIGHWAYS

SECTION 205

EXCAVATION AND EMBANKMENT FOR HIGHWAYS

205.1 DESCRIPTION

Excavate, haul, place, remove and dispose of the specified materials. Construct the embankments as specified in the Contract Documents. Compact the earthwork according to the requirements for the type of compaction and moisture range specified in the Contract Documents.

BID ITEMS

Common Excavation
Common Excavation (Contractor-Furnished)
Rock Excavation
Rock Excavation (Non-Durable Shale)
Unclassified Excavation
Common Excavation (Unstable)
Common Excavation (Unsuitable)
Compaction of Earthwork (Type *) (MR-**)
Embankment
Embankment (Contractor-Furnished)
Eradication of Traveled Way
Water (Grading) (Set Price)
*Type of Compaction
**Moisture Range

UNITS

Cubic Yard
Cubic Yard
Cubic Yard
Cubic Yard
Cubic Yard
Cubic Yard
Cubic Yard
Cubic Yard
Cubic Yard
Cubic Yard
Station
M Gallon

205.2 MATERIALS

Provide water for earthwork compaction that complies with **DIVISION 2400**.

If "Common Excavation (Contractor-Furnished)" is specified, provide soil or a mixture of soil and gravel, stone or other acceptable material. Provide material that is similar to the material shown in the Contract Documents or found in the Report of Soil Survey. Provide material with a quality satisfactory for the purpose intended. Do not use material that has sod, roots, stumps and other perishable and deleterious matter. Provide soil that complies with the requirements shown in the Contract Documents for the material used in the top 18 inches of the embankment.

The Engineer will accept the material based on compliance with these requirements and visual inspection of the material placed on the project.

Provide crushed stone for backfill that complies with **DIVISION 1100**.

205.3 CLASSIFICATION OF EXCAVATION

The geological information shown in the Contract Documents is based on studies made in the field, and represents the best information available to KDOT. The classification of embankment and drainage excavation as "Common Excavation", "Rock Excavation" or "Rock Excavation (Non-Durable Shale)", which classifications shall include all materials of whatever nature encountered, is shown in the Contract Documents. As the work is performed, the Engineer in conjunction with the Regional Geologist will determine if the classification of embankment and drainage excavation requires adjustment. The Engineer has the authority to identify and define the physical characteristics that determine the classification. The classification of materials for excavation is based on the materials in an unfrozen condition.

a. Common Excavation. Common excavation is all excavation not included as rock excavation or excavation otherwise classified. The following are included in common excavation: hot mix asphalt or concrete sidewalk, concrete ditch lining, concrete or stone wash checks and hot mix asphalt pavement 6 inches or less in thickness.

Depending on the makeup and characteristics of the common excavation, some material may or may not be used for embankment. The Engineer will identify which materials may not be used for embankment.

205 - EXCAVATION AND EMBANKMENT FOR HIGHWAYS

b. Common Excavation (Contractor-Furnished). Common excavation (Contractor-Furnished) is material provided by the Contractor that complies with the material requirements of this specification.

Non-durable shale provided as common excavation (Contractor-Furnished) shall be manipulated (sized) with equipment and water as required for non-durable shale excavation.

c. Rock Excavation. Rock excavation includes firm, rigid and unweathered sedimentary, igneous and metamorphic rock that is naturally in-place. Boulders or detached stones with a volume of 2 cubic yards or more are classified as rock excavation.

Portland cement concrete pavement, portland cement concrete base, cement treated base, hot mix asphalt pavement greater than 6 inches in thickness, concrete curb and gutter and any hot mix asphalt placed upon these structures is classified as rock excavation.

When common excavation is interlayered with the rock excavation, and the common excavation makes up 25% or less of the volume, the entire volume is classified as rock excavation.

d. Rock Excavation (Non-Durable Shale). Rock excavation (Non-Durable Shale) is non-durable rock shale that if used in embankments is required to be manipulated with construction equipment and water added until it is broken down to particle sizes shown in **subsection 205.4c**.

e. Unclassified Excavation. Unclassified excavation includes all excavation, regardless of type, nature or condition of materials encountered. When excavation is unclassified, the Contractor assumes full responsibility to estimate the kind and extent of the various materials to be encountered in order to accomplish the work. Unclassified excavation includes materials which, if classified, would be included in **subsections 205.3a., b., c. and d.**

f. Common Excavation (Unstable). Common excavation (Unstable) is considered to be material in the subgrade or embankment with any of the following characteristics:

- When the material encountered has a moisture content above the plastic limit of the soil.
- When the plastic limit of the soil is at or less than the optimum moisture content, the soil is not capable of being compacted at the optimum moisture content.

Suitable material with excess moisture caused by the Contractor's negligent operations is not classified as unstable excavation.

g. Common Excavation (Unsuitable). Common excavation (Unsuitable) is material encountered in the subgrade or embankment that contains a high organic content (such as peat or A-horizon soils).

205.4 CONSTRUCTION REQUIREMENTS

a. General Excavation Requirements. Before beginning the excavation, clear and grub all vegetation according to the Contract Documents. Remove existing structures as shown in the Contract Documents.

Strip and stockpile the existing topsoil from within the construction limits. To the extent practical use this material to cap the finished embankment and cut slopes. This work is subsidiary to grading items in the contract.

Where practical, do not store equipment or materials (including soil stockpiles) within 50 feet of rivers, streams or other surface waters. Where such storage is necessary, obtain the Engineer's written approval and include in the project SWPPP appropriate best management practices for the storage area.

Unless requested in writing from the Contractor, and approved in writing by the Engineer, or specified otherwise in the Contract Documents, do not exceed 750,000 square feet of surface area of erodible earth material per equipment spread at one time. The Engineer will limit the surface area of erodible earth material exposed by clearing and grubbing, excavation, borrow (within right-of-way) and embankment operations. Limit the exposed erodible earth material according to the capability and progress, and in keeping with the approved schedule.

Areas will not count toward the 750,000 square feet limit, when the following conditions are met:

For areas that will not be disturbed again due to project phasing:

- Finish grade the completed area;
- Stabilize and maintain stabilization according to **SECTION 902**; and

205 - EXCAVATION AND EMBANKMENT FOR HIGHWAYS

- Do not disturb the area again without a written request from the Contractor and written approval from the Engineer;

For areas that will be disturbed again due to project phasing:

- Rough grade; and
- Stabilize and maintain stabilization according to **SECTION 902**.

DO NOT clear and grub areas unless work will actively be performed in the exposed area (or portions of the exposed area) within 7 calendar days on exposed steep slope areas (40% or greater) or within 14 calendar days for all other exposed areas. If areas are cleared and grubbed and not finish graded, not part of project phasing and no meaningful work toward the completion of the bid item is performed within the exposed area (or portions of the exposed area) for 7 calendar days on exposed steep slope areas (40% or greater) or 14 calendar days for all other exposed areas, stabilize and maintain stabilization at these exposed areas according to **SECTION 902** at no cost to KDOT.

Before beginning excavation or depositing waste at the Contractor-Furnished site, obtain all permits and clearances required for compliance as shown in **SECTION 107**, (which most commonly includes wildlife and archaeological clearances). See **SECTION 106** for requirements for use of private property.

Before incorporating any material from these areas into the project, the Engineer shall require a copy of the KDWP clearance and the KSHS clearance. Before depositing any project waste onto these waste sites, the Engineer shall require a copy of the KDWP clearance, the KSHS clearance, and when required, the KDHE waste disposal permit.

If the Contractor's excavation operations expose potentially historical or archaeological significant sites, discontinue the excavation of such sites until the Engineer determines the disposition of the discovery. The Engineer will contact the ESS to determine the proper course of action, according to **SECTION 107**.

Obtain the Engineer's approval before wasting surplus excavation material. Use approved surplus excavated material to widen embankments, flatten slopes, or as directed by the Engineer. If surplus excavation material is wasted on the project, place the material to provide a neat appearance. Do not place waste materials in a manner that is detrimental to the abutting property.

If the Contract Documents designate certain materials to be excavated and stockpiled for future use, do not contaminate these materials in the process. Stockpile the materials neatly and compactly at locations approved by the Engineer.

Before beginning excavation, allow the Engineer to define the limits and cross-section the borrow areas shown in the Contract Documents. The Contractor shall define the limits and cross-section Contractor-Furnished sites before beginning excavation. Do not remove any material beyond the dimensions and elevations established. When borrow excavation is complete, grade the site uniformly to drain. Comply with any permit requirements.

The Engineer may allow the use of borrow pits or waste areas other than those shown in the Contract Documents, provided the change does not increase the cost for KDOT.

If rock, shale or unsuitable material is encountered in cuts, excavate this material to the cross-section or limits shown in the Contract Documents.

Do not overbreak rock excavation below the cross-section shown in the Contract Documents. If overbreakage occurs, backfill the overbreakage with material designated in the Contract Documents. If the designated backfill is material obtained through normal excavation, compact the backfill to the density requirements shown in the Contract Documents. If the designated backfill is crushed aggregate or other special aggregate, make sure that there are no layers of earth or shale between the backfill material and the surface of the rock. Before backfilling overbreakage areas with crushed stone for backfill or other specified material, shape the rock overbreakage area to drain.

Trim all slopes to the lines shown on the cross-sections. When warranted, the Engineer may approve a modified slope in rock or other material. Remove rock so that the resulting rock slope has a uniform face. Do not disturb any materials beyond the limits of the excavation.

Excavate all side ditches as shown in the Contract Documents.

Provide temporary erosion and pollution control according to **DIVISION 900**.

b. Presplit Rock Excavation. If designated in the Contract Documents, use a presplitting technique to split the face of the rock along the designated backslope. Presplit along the backslope before blasting the interior portion of the rock cut.

205 - EXCAVATION AND EMBANKMENT FOR HIGHWAYS

Devise a plan for the diameter, spacing and loading of the presplit holes. Drill the presplit holes the full depth of the rock ledge. Demonstrate to the Engineer with a 100-foot test section that the presplitting plan will produce an acceptable backslope. If the backslope of the test section is unacceptable, establish additional test sections until satisfactory results are obtained.

c. Shale Excavation. Shale will be classified as durable or non-durable in the Contract Documents. Durable and non-durable shale is prohibited in the top 18 inches of the embankment, unless specified in the Contract Documents.

- Durable Shale. Durable shale may be used as any other rock in a fill.
- Non-Durable Shale. Manipulate non-durable shale with equipment and water until 100% of the material is smaller than 6 inches in all dimensions, and until a minimum of 90% of the material is smaller than 3 inches in all dimensions. The Engineer will verify manipulation requirements with a visual inspection (e.g. have the Contractor scarify a known area to a known depth, calculate theoretical volume scarified, calculate an average volume for the stones between 3 and 6 inches and if the volume for the stones exceeds 10%, the test fails). Continue manipulation and retest until the above requirements are met. Compact and adjust the moisture content of this material as specified in the Contract Documents.

The Contractor will determine whether to manipulate and use the non-durable shale on the project, or waste the non-durable shale and replace it with other suitable material.

d. Common Excavation (Unstable). Excavate unstable material encountered during construction to the limits designated by the Engineer. Allow the Engineer to measure the area before the backfill is placed. Backfill the area where the unstable material was removed with suitable material from the project.

Aerate the unstable material until the moisture content is acceptable. Use this material in the construction of the project.

Remove and dry unstable material caused by the Contractor's negligence to an acceptable moisture content and use in the project.

e. Common Excavation (Unsuitable). If excavation to the finished graded section results in subgrade or slopes of unsuitable material, excavate the unsuitable material to the limits designated by the Engineer. Remove the unsuitable material from the project. Allow the Engineer to measure the area before placing the backfill. Backfill with suitable material from the project.

f. Eradication of Traveled Way. Remove the surfacing, if any, excavate the embankment and fill the ditches. Grade the traveled way to approximately the original ground contour, or as shown in the Contract Documents. Stockpile any materials designated for salvage at the locations shown in the Contract Documents. Do not contaminate the salvaged material. Dispose of excess excavation, base materials and surfacing not designated for salvage.

g. Compaction Requirements. Requirements for the various types of compaction are shown in **TABLE 205-1.**

205 - EXCAVATION AND EMBANKMENT FOR HIGHWAYS

TABLE 205-1: SOIL COMPACTION REQUIREMENTS	
Type	Minimum Compacted Soil Density
Type AAA	100% of Standard Density
Type AA	95% of Standard Density
Type A	90% of Standard Density
Type B	<p>Such that no further consolidation is gained by additional rolling. The Engineer will visually determine acceptable Type B compaction based on the following:</p> <ul style="list-style-type: none"> • Acceptable Type B compaction is demonstrated if the tamping feet of a tamping (sheepsfoot) roller “walks out” of the soil and rides on top of the lift being compacted. • In soil with low plasticity or nonplastic fine-grained materials, the tamping feet may not “walk out” of the material being compacted. With these materials, acceptable Type B compaction is demonstrated if the tamping feet support the weight of the roller (without the drum of the roller contacting the lift being compacted). • In sand and gravel, where the use of a tamping roller produces unacceptable results, use other types of rollers (such as a pneumatic-tired) to compact this type of material. With these materials, acceptable Type B compaction is demonstrated if no further consolidation is evident after additional passes of the roller. • In small irregular areas where the use of conventional compaction equipment is impracticable, use other equipment and methods to obtain compaction. The Engineer will determine by visual inspection if Type B compaction is obtained. • If the Engineer is unable to visually determine that Type B compaction is obtained, the Engineer may conduct density tests on the compacted soil. If tested, the compacted soil density shall be at least 90% of the standard density.

h. Moisture Control Requirements. At the time of compaction, use soil with uniform moisture content within the moisture range designated in the Contract Documents.

Adjust the moisture content of the soil by adding water to or aerating the material to bring soil within the required moisture content.

If the soil is unstable within the designated moisture range, the DME will adjust the moisture range.

Water may be added to the soil in borrow and cut areas (before hauling) or on the embankment (after hauling). Use methods and equipment that will prevent undue loss of moisture. Add only the quantity of water necessary to provide a moisture content within the required moisture range plus a reasonable quantity to compensate for evaporation and other unavoidable losses.

Excavation areas may be pre-watered to provide uniform moisture content. Submit sketches of the areas with details of the proposed methods and equipment for the pre-watering for approval by the Engineer. Provide drilling equipment to obtain samples for moisture determination before, during and after the pre-watering. Using the results of the moisture samples, the Contractor and Engineer will jointly determine the quantities of water necessary to bring the soils to optimum moisture. The Engineer will allow sufficient water to bring the full depth and width of the excavation to optimum moisture plus up to 20% for evaporation.

In areas to be pre-watered, leave the vegetation in place until the watering is completed. If runoff is observed during the pre-watering, rip the area on the contour to a depth of approximately 2 feet at 4-foot intervals. To permit penetration to the full depth of the excavation (for uniform moisture content), allow a curing period after the pre-watering is completed. The Contractor and Engineer will use the moisture samples obtained by the Contractor (at locations and depth agreed to by the Contractor and Engineer) to determine moisture content and uniformity for the pre-watered areas. Strip the vegetation from the areas after the water has penetrated the soils.

Requirements for the various moisture ranges are shown in **TABLE 205-2**.

205 - EXCAVATION AND EMBANKMENT FOR HIGHWAYS

TABLE 205-2: SOIL MOISTURE CONTENT REQUIREMENTS	
Moisture Range	Moisture Content
0-5 (MR-0-5)	A maximum of 5 percentage points above optimum, nor less than optimum.
3-3 (MR-3-3)	A maximum of 3 percentage points above optimum, and a maximum of 3 percentage points below optimum.
5-5 (MR-5-5)	A maximum of 5 percentage points above optimum, and a maximum of 5 percentage points below optimum.
90 (MR-90)	Sufficient to allow the type of compaction specified in the Contract Documents. If Type B compaction is specified, the Engineer will determine by visual inspection if satisfactory moisture control and compaction are obtained.

i. Foundation Treatment. If an embankment is started less than 4 feet below the finished subgrade, remove all vegetation from the surface where the embankment will be placed. Plow, scarify or break up the cleared surface to a minimum depth of 6 inches (foundation area). Adjust the foundation area to a moisture content within the specified moisture range. Compact the foundation area as specified in the Contract Documents for the embankment.

If an embankment is placed over an existing surface (PCCP, HMA, gravel), plow, scarify or break up the full depth of the existing surface regardless of the height of the embankment.

j. Embankment Requirements. Construct the embankment from material classified as Soil, Rock/Soil or Rock, as defined in **TABLE 205-3**.

TABLE 205-3: EMBANKMENT GRADATION CLASSIFICATION	
Classification	Gradation Criteria
Soil	≤ 20% retained on the ¾ inch sieve
Rock/Soil	> 20%, but < 80% retained on the ¾ inch sieve
Rock*	≥80% retained on the ¾ inch sieve

*Could include concrete pavement.

If frozen soil is encountered in the surface of the original ground or in the surface of a partially constructed embankment, remove the frozen material or allow the frozen material to thaw before continuing construction of the embankment.

Unless shown otherwise in the Contract Documents, if shale (all shale classified as non-durable or common excavation) is used as embankment material, manipulate the shale with equipment and water until it complies with **subsection 205.4c**. Adjust the moisture content and compact the shale as specified in the Contract Documents.

Construct and backfill culverts and other structures below the embankment surface before the embankment is constructed.

When the embankment is placed against a hillside or an existing embankment with slopes steeper than 4:1, bench the existing slope with each lift of the embankment. Cut the benches wide enough to accommodate the hauling and compacting equipment. Begin cutting (horizontally) each new bench at the intersection of the original ground and the vertical side of the previous bench. Use the material excavated from the benches in the embankment.

Exercise care placing and compacting the embankment, when placed on only one side of a structure (such as abutments, piers and wingwalls). Do not put excessive pressure against the structure.

Place soil embankment material in horizontal lifts approximately 8 inches thick (loose measurement). Compact the earthen material as specified in the Contract Documents before placing the next lift. Compact manipulated (sized) non-durable shale to the compaction requirement in the Contract Documents and adjust the moisture content of the manipulated non-durable shale to MR-5-5. Use compaction equipment as specified in **DIVISION 150**. Provide sufficient motorgraders and tamping rollers to adequately blade and compact the material delivered to the embankment. Route the construction equipment uniformly over the entire surface of each lift. Continuously use a motorgrader to level and manipulate the material during the placing and compacting of each lift of the embankment. If the material delivered to the embankment is not properly placed and compacted, suspend delivery of materials to the embankment until the problem is corrected.

205 - EXCAVATION AND EMBANKMENT FOR HIGHWAYS

Where it is impracticable to use a roller, use a mechanical tamper. Place the embankment material in horizontal lifts not to exceed 8 inches (loose measurement) capable of being compacted by the mechanical tampers. Compact the earthen material as specified in the Contract Documents before placing the next lift.

If the Contract Documents do not specify a compaction requirement for the earthwork, place the embankment in uniform lifts not to exceed approximately 8 inches thick (loose measurement). Compact the earthen material to the requirements of Type B, MR-90.

Place rock/soil embankment material in horizontal lifts approximately 10 inches thick (loose measurement). Compact the embankment by making consecutive passes of a vibratory roller, with a minimum weight of 16 tons, until no further increase in density is achieved by successive passes. The Engineer shall verify the density by using the nuclear moisture/density gauge.

Place rock embankment material in horizontal lifts approximately the average size of the larger rocks, a maximum of 2 feet thick (loose measurement). Make no more than 10% of the rock embankment material larger than 7 feet in circumference measured in any direction and no more than 10% passing the 1-inch sieve as determined by visual inspection. The maximum size of rock placed will be limited by the thickness of rock to be placed, as shown on the plans.

An embankment made up largely of rock consists of rock in interparticle contact with itself, with no intervening layers of soil. Distribute the large stones uniformly and fill the voids with smaller stones, earth, sand or gravel. Level and manipulate each lift with a motorgrader, bulldozer or similar equipment capable of shifting and shaping the material. Compact each lift by routing construction traffic over the lift until no further consolidation under the traffic is visible. When shown in the Contract Documents to construct the top 12 inches with rock excavation, finish the grade with crushed stone for backfill compacted to Type B, MR-90, **SECTION 204**. No shale is allowed in the top 12 inches.

If the embankment is constructed of rock mixed with enough compactable material to make rolling feasible, and if the Contract Documents specify compaction, compact the embankment to meet Type B compaction requirements (regardless of the type of compaction specified).

If possible, use rock embankment material to form the base (full width) of the embankment. If rock and other embankment material are delivered to the embankment at the same time, place the rock in the outer portions of the embankment and the other material in the center of the embankment. Adjust the hauling and compacting operations (for both materials) as necessary to construct the embankment in level lifts.

Before rock embankment material is placed on compacted embankment constructed of other material, shape the top of the compacted embankment to slope from centerline to the outside. Do not build undrained pockets of rocks into the embankment.

Do not place rocks, broken concrete or other solid materials in embankment areas where piling will be driven or where culverts will be installed. Do not place rocks larger than 3 inches (in any dimension) in the top 12 inches of the embankment.

Where a grass median is constructed, do not place any rock excavation material or shale in the top 18 inches of the median area. Construct the top 18 inches of medians with earthen material suitable for growth of vegetation.

Dispose of all loose rocks within the right-of-way that will interfere with mechanical mowing.
Apply water as needed to control dust on the project.

k. Compaction in Cuts. Plow, scarify or break up the soil 6 inches below the grade line in cut sections. If necessary to obtain compaction, adjust the soil to a moisture content within the specified moisture range. Compact the soil as specified in the Contract Documents.

If the depth of compaction in cut sections is greater than 6 inches, excavate all material to within 6 inches of the lower limit of compaction. Plow, scarify or break up the material left in place. If necessary to obtain compaction, adjust the soil to a moisture content within the specified moisture range. Compact the soil as specified in the Contract Documents. Replace and compact (as embankment) the excavated material until the cut is compacted to the grade line shown in the Contract Documents.

205.5 MEASUREMENT AND PAYMENT

a. Contract Quantities. Provided the project is constructed essentially to the lines and grades shown in the Contract Documents, the quantities shown in the Contract Documents for the various balances will be the quantities for which payment is made.

205 - EXCAVATION AND EMBANKMENT FOR HIGHWAYS

If the Contract Documents are altered, or if the Engineer or Contractor questions the accuracy of the contract quantities in any balance, either party may request the quantities involved be measured by the cross-section method. Unless errors are noted or the original ground was disturbed before the work started, the cross-sections shown in the Contract Documents will be used as the original field cross-sections. Additional original cross-sections may be interpolated, or determined by other approved methods, at points necessary to accurately determine the quantities.

If the Contractor elects to waste the non-durable shale, or fraction thereof, and provide Common Excavation (Contractor-Furnished) in lieu of manipulating the non-durable shale, payment will be made for "Rock Excavation (Non-Durable Shale)," as though it was not wasted, not "Common Excavation (Contractor-Furnished)" actually used.

b. Measured Quantities. The Engineer will measure excavation and borrow (including rock, shale, unstable and unsuitable) by the cubic yard. The Engineer will measure quantities for the various types of excavation by cross-sectioning the area. The Engineer will compute the quantities (volume) by the average end area method. Where it is not possible to measure material by the cross-section method, the Engineer may use 3-dimensional measurements. If the depth of compaction through cut areas is greater than 6 inches, the material excavated to gain access to the lower 6-inch layer will be measured for payment. The excavation of unstable and unsuitable material necessary to obtain compaction in cut sections and in foundations for fill sections will be measured for payment. The Engineer will not measure rock overbreakage (below the depth shown in the Contract Documents) for payment. Excavation required for benching into an existing slope will not be measured for payment. The excavation required to remove unstable material caused by the Contractor's negligent operations will not be measured for payment.

If either the Contractor or Engineer questions the accuracy of the plan quantity for non-durable shale excavation, contact the Regional Geologist for guidance.

The Engineer will measure compaction of earthwork (in place after the rolling or tamping is complete) by the cubic yard. The Engineer will measure compaction of earthwork by cross-sectioning the area. The Engineer will compute the quantities (volume) by the average end area method. Where it is impractical to measure material by the cross-section method, the Engineer may use 3-dimensional measurements. The Engineer will not measure for payment the compaction of foundation area under a fill or the bottom 6-inch layer in a cut section.

The Engineer will measure water used for earthwork compaction and non-durable shale manipulation and compaction by the M Gallon by means of calibrated tanks or water meters.

If the Contractor uses non-durable shale for "Common Excavation (Contractor-Furnished)", the Engineer will not measure the manipulation water for payment. However, the Engineer will measure the water required to meet moisture requirements for compaction.

The Engineer will not measure water used for dust control, water wasted through the Contractor's negligence or water in excess of the quantity required to obtain the proper moisture content.

If the Contract Documents include the bid items "Embankment" or "Embankment (Contractor-Furnished)", the Engineer will not measure excavation, compaction and water separately for payment. The Engineer will measure the embankment in place by the cubic yard. The Engineer will measure quantities for the embankment by cross-sectioning the area. The Engineer will compute the quantities (volume) by the average end area method. Where it is impractical to measure material by the cross-section method, the Engineer may use 3-dimensional measurements. No payment will be made for quantities beyond the limits of the Contract Documents.

If the Contract Documents include the bid item "Eradication of Traveled Way", the Engineer will measure this item by the station along the centerline of the traveled way being eradicated. If the Contract Documents do not include the bid item "Eradication of Traveled Way", excavation required for this activity is measured for payment.

c. Payment.

(1) General. Payment for "Common Excavation", "Common Excavation (Contractor-Furnished)", "Rock Excavation", "Rock Excavation (Non-Durable Shale)", "Unclassified Excavation", "Compaction of Earthwork", "Embankment", "Embankment (Contractor-Furnished)" and "Eradication of Traveled Way" at the contract unit prices is full compensation for the specified work. Deduct any measured quantities placed beyond the limits of the Contract Documents, unless the placement was authorized by the Engineer.

Payment for "Water (Grading) (Set Price)" at the contract set unit price is full compensation for the specified work. Payment for water used for pre-watering excavation areas at 75% of the contract set unit price for

205 - EXCAVATION AND EMBANKMENT FOR HIGHWAYS

Water (Grading) (Set Price) is full compensation for the specified work. The contract set unit price will govern regardless of the accepted quantity provided.

(2) Common Excavation (Unstable). Payment for "Common Excavation (Unstable)", as provided below, is full compensation for the specified work to remove, manipulate and replace material, including any additional material needed to fill the created void.

Compaction for backfill of areas removed as Common Excavation (Unstable) will be paid for at the appropriate contract unit prices.

- Rural Projects (outside incorporated city limits): 1½ times the contract unit price for "Common Excavation", up to a maximum of \$6.00 per cubic yard. If the contract unit price for "Common Excavation" is greater than \$6.00 per cubic yard, the contract unit price is the maximum paid per cubic yard for this item.

If the Contract Documents have the bid item of "Embankment" instead of "Common Excavation" the Engineer will pay for Common Excavation (Unstable) at 1½ times the contract unit price for "Embankment", up to a maximum of \$6.00 per cubic yard.

- Urban Projects (inside incorporated city limits): 1½ times the contract unit price for "Common Excavation", up to a maximum of \$10.00 per cubic yard. If the contract unit price for "Common Excavation" is greater than \$10.00 per cubic yard, the contract unit price is the maximum paid per cubic yard for this item.

If the Contract Documents have the bid item of "Embankment" instead of "Common Excavation," the Engineer will pay for Common Excavation (Unstable) at 1½ times the contract unit price for "Embankment", up to a maximum of \$10.00 per cubic yard.

(3) Common Excavation (Unsuitable). Payment for the "Common Excavation (Unsuitable)", as provided below, is full compensation for the specified work.

Compaction for backfill of areas removed as Common Excavation (Unsuitable) will be paid for at the appropriate contract unit prices.

Excavation to replace unsuitable material removed from the project will be paid for at the appropriate contract unit price.

- Common Excavation (Unsuitable) not designated in the Contract Documents and encountered during construction is paid for at 3 times the contract unit price for "Common Excavation", up to a maximum of \$12.00 per cubic yard, which price shall include the disposal of materials. If the contract unit price for "Common Excavation" is greater than \$12.00 per cubic yard, the contract unit price will be the maximum paid per cubic yard for this item, which price shall include the disposal of materials.

If the Contract Documents have the bid item of "Embankment" instead of "Common Excavation", the Engineer will pay for Common Excavation (Unsuitable) at \$12.00 per cubic yard.