

## **Section 203**

### **Excavation and Embankment**

**203.01 DESCRIPTION.** This work consists of excavation, disposal, placement and compaction of materials for which provisions have not been made under other sections of these specifications. This work shall include excavation and embankment construction for roadways and other structures, excavation for ditches and channels, and other grading operations necessary for the work in accordance with these specifications and in conformity with the lines, grades, thicknesses and typical sections shown on the plans or established. When contaminated soils or underground tanks are encountered, handling shall be in accordance with Section 202.

Disposal of material shall be in accordance with Subsection 202.02.

The plans may include data regarding the boring and classification of existing materials. The Department does not guarantee that individual samples are representative of the entire project, and bidders are required to study, make interpretations and additional investigations, as necessary, at no direct pay.

The contractor shall comply with Subsection 107.09 for work in, over or adjacent to navigable waters and wetlands, and shall comply with Subsection 107.27 when cultural artifacts, historical sites or archaeological sites are encountered.

Quality assurance requirements shall be as specified in the latest edition of the Department's publication entitled "Application of Quality Assurance Specifications for Embankment and Base Course."

Excavated material may be used in accordance with Subsection 203.06.

Erosion control shall be in accordance with Section 204.

**203.02 GENERAL EXCAVATION.** General excavation consists of the excavation of materials, as required by the plans, except drainage excavation and structural excavation. General excavation also includes unsuitable material in accordance with Subsection 203.04.

**203.03 DRAINAGE EXCAVATION.** Drainage excavation includes the excavation for drainage beyond the limits of the roadway section. Drainage excavation also includes inlet and outlet ditches to structures or roadways; changes in or deepening of channels of streams, berm ditches,

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ditches parallel or adjacent to the roadway beyond the limits of the roadway section; and material excavated from areas under bridges.

**203.04 UNSUITABLE MATERIAL.** Unsuitable materials are soils containing significant amounts of debris or organic matter including stumps, roots, logs, and humus, or other materials which will decay or produce subsidence, including highly saturated soils, which the engineer determines are not satisfactory for use in the embankment or other construction purposes. Unsuitable materials shall be removed and disposed of as general excavation. Unsuitable materials determined to be environmentally sensitive shall be removed and disposed of in accordance with Subsection 202.05.

**203.05 BORROW.** Borrow is defined as soils required for construction of embankments or other portions of the work in excess of soils obtained from excavation. Borrow shall be obtained from an approved source and shall be used in accordance with Subsection 203.06. The contractor shall make arrangements for obtaining borrow at no direct pay.

Securing of an exclusive option by a contractor on borrow areas or materials for the work will be considered a violation of Louisiana law and will be a basis for rejection of bids or such other action the Department deems advisable.

The contractor shall notify the engineer in writing a minimum of 30 calendar days in advance of borrow operations so that samples may be taken and soil tests completed prior to beginning borrow operations.

Prior to requesting the borrow pit to be bored, the contractor shall furnish the Department a written agreement with the property owner to allow the Department access to the property. The written agreement shall also state that the contractor has agreed to purchase the borrow material from the property owner for this particular site if the material meets contract specifications. A separate agreement shall be obtained from each property owner through which access will be necessary.

Sites from which material has been removed shall, upon completion of the work, be left in an acceptable condition.

Unless otherwise authorized in writing, borrow pits, gravel pits and quarry sites shall be located at least 300 feet (90 m) from the right-of-way.

When sources of borrow are located adjacent to a stream or river listed on the National System of Wild and Scenic Rivers or the Louisiana Natural and Scenic Rivers System, borrow pits, and any stockpiled materials shall be located at least 300 feet (90 m) from the natural stream or river bank.

The borrow pit and access shall be cleared to allow access for DOTD boring equipment. The borrow area shall be surveyed with a base line staked. Both the engineer and laboratory shall be furnished with a location plat and borrow pit plat. The contractor will not be permitted to begin borrow operations until materials are approved for use.

Sampling of soils from open excavations made by the contractor in lieu of borings will be allowed provided the open excavations display and allow sampling of each soil strata and the excavation is at no cost to the Department.

**203.06 SOIL USAGE.** The laboratory will test and classify soil in accordance with DOTD TR 423 from samples taken in the original location or from designated stockpiles. Soil shall be classified and approved prior to its being placed in embankments or other final positions on the project. Blending in the pit by approved methods to adjust percent silt or sand will be permitted. Soils which do not meet Liquid Limit or PI requirements shall not be blended to reduce Liquid Limit or PI. Soils may be treated with lime to reduce PI in accordance with Subsection 203.06(e).

Soil properties will be determined by the test methods shown in Table 203-1.

**Table 203-1  
Soil Properties**

Property	Test Method
Plasticity Index (PI)	DOTD TR 428
Liquid Limit (LL)	DOTD TR 428
% Organic	DOTD TR 413
% Silt	DOTD TR 407
pH	DOTD TR 430

**(a) Usable Soils:** Usable soils shall have a maximum PI of 25 and a maximum organic content of 5 percent. Soils with a silt content of 50 percent or greater and also a PI of 10 or less will not be allowed.

**(b) Selected Soils:** Selected soils are natural soils with a maximum PI of 20, maximum Liquid Limit of 35, and a maximum organic content of 5 percent. Soils with a silt content of 50 percent or greater and also a PI of 10 or less will not be allowed. Soils to be used for in-place cement stabilization shall be in accordance with Subsection 302.02(a).

**(c) Nonplastic Embankment:** Nonplastic embankment shall be as specified in Subsection 203.09.

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**(d) Headers:** Headers are that portion of the embankment within 500 feet (150 m) of a bridge end. Headers shall be constructed for their full height with usable soils having a minimum PI of 11, a maximum PI of 25, and a maximum silt content of 65 percent. No lime treatment to the soil to meet the PI requirements will be permitted. Headers shall be compacted to 98 percent of maximum dry density in accordance with Subsection 203.07.

### **(e) Embankments other than Headers:**

**(1)** Embankments shall be constructed with usable soils, except soil with a PI greater than 25 and less than 35 will be permitted when treated with a minimum of 6 percent lime, by volume, provided the organic content and silt requirements given in Heading (a) are met. If the contractor uses lime treatment, it will be at no direct pay. Lime treatment shall be Type E Treatment conforming to Section 304.

**(2)** The contractor may request in writing that usable soils for temporary detour roads have a PI not to exceed 45 and a maximum silt content of 75 percent provided:

**a.** This material will be removed and not become part of the permanent embankment.

**b.** The contractor agrees to take responsibility for any additional maintenance required.

### **(f) Plastic Soil for Slopes:**

**(1) Embankment Material:** The outside layer of embankment (fill sections) will consist of a plastic soil blanket in accordance with Subsection 203.10. Sampling in the pit may be allowed if an identifiable strata can be isolated. Otherwise, sampling will be from dedicated stockpiles.

**(2) Cut Slopes, PI Less than 10:** When soils having a PI less than 10 exists on cut slopes, the contractor shall undercut 12 inches (300 mm) and place a plastic soil blanket conforming to Subsection 203.10.

**(3) Cut Slopes, PI 10 or Greater:** When soils having a PI of 10 or greater but with a pH less than 5.5, or greater than 8.5, exist on cut slopes, the contractor shall undercut and place a plastic soil blanket complying with Subsection 203.10. In lieu of furnishing a plastic soil blanket, the soil may be modified in place so that the pH of the soil complies with the requirements of Subsection 203.10, at the option of the engineer and concurrence of the contractor. In such case payment will be in accordance with existing items or Subsection 109.04, as applicable, not to exceed the cost of undercut and replacement.

**(g) Usable Soils for Slope Adjustments and Shoulder Widening:** When the thickness of embankment material used for slope adjustment is less than 12 inches (300 mm), a plastic soil complying with Subsection 203.10 will be required. If the thickness is greater than 12 inches (300 mm), the contractor will be allowed to substitute plastic soil for usable soil, provided the widening is not directly below a paved shoulder.

**203.07 GENERAL REQUIREMENTS.** Excavation and embankment construction consists of constructing roadway embankments, including preparation of areas on which they are to be placed; constructing drainage excavation; backslope construction; constructing dikes, when required; placing and compacting approved material in areas where unusable material has been removed; placing and compacting embankment material in holes, pits and other depressions; and placing and compacting embankment materials for backfilling structures. Prior to beginning excavation, grading or embankment operations in an area, all necessary clearing and grubbing in that area shall have been completed. Prior to any embankment operations in an area, all corresponding roadside ditches shall be cut to facilitate drainage in that area. Embankment materials shall not be placed or spread on portland cement concrete or asphaltic concrete pavements. Pavement surfaces, edges and joints shall not be damaged during embankment operations.

Final excavation and embankment slope lines shall be uniform in appearance. Measurements shall be made as necessary to assure that the elevations at the top, bottom, and intermediate breaks in the slope are such that a minimum acceptable slope is achieved. The slopes shall be straight without valleys or humps, as determined by visual inspection. If an apparent discrepancy is discovered upon visual inspection, measurements shall be taken a minimum of every 10 feet (3.0 m) measured along the slope between theoretical break points in the embankment. When these measurements reveal slope variances by more than 0.03 ft/ft (0.03 m/m), too steep, or 0.15 ft/ft (0.15 m/m), too flat, the slopes shall be reworked by the contractor until these criteria have been met. The top of embankment shall not vary from the established grade by more than  $\pm 0.1$  foot (0.030 m).

Embankment material shall be in accordance with Subsection 203.06 and shall be placed in uniform layers not exceeding 12 inches (300 mm) of uncompacted thickness. Each layer shall be placed for the full width of embankment, blended as necessary to obtain a uniform material, brought to a uniform moisture content, and compacted by approved methods to a minimum of 95.0 percent of maximum dry density before the next layer is