

SECTION 203—CLASS 1, CLASS 1A, AND CLASS 1B EXCAVATION

203.1 DESCRIPTION—This work is excavation for roadways, roadway appurtenances, and structures. The three classes of excavation include the following:

(a) Class 1 Excavation.

- Excavation as shown on the [Standard Drawings](#), for roadways, shoulders, ditches, drainage structures, stream channels, grade separation structures, retaining walls, and wingwalls.
- Excavation, as indicated or directed, for benches and for the removal of existing pavements not being rehabilitated.
- Excavation, as indicated or directed, for the removal of unsuitable material having a bottom width of 2.5 m (8 feet) or more.
- Excavation, as indicated or directed, to allow for the placement of topsoil.
- Excavation and stockpiling, as indicated or directed, for the removal of topsoil other than the first 200 mm (8 inches), which are incidental to the clearing and grubbing operations specified in [Section 201](#).
- Removal of unforeseen slides and rock ledges.
- Removal of stone fences, piles of dirt or stones, individual boulders, and any portions of structures above the natural ground, when in excess of 0.5 m³ (1/2 cubic yard) volume.

(b) Class 1A Excavation. Excavation for the removal of unsuitable material below subgrade having a bottom width of less than 2.5 m (8 feet), as indicated or directed. Saw cut as necessary. Includes backfilling as specified in [Section 206](#).

(c) Class 1B Excavation. For roadway rehabilitation, sawcutting and removal of existing pavement to neat lines, as indicated or directed.

203.3 CONSTRUCTION—

(a) General. During construction, keep the excavation graded to drain seal with smooth-wheeled compaction equipment to prevent subgrade from becoming saturated. Seal the surface at the end of the workday in order to prevent conditions from deteriorating before work can proceed. Temporary drainage structures or channels may be required.

(b) Blasting. Drill and blast rock, not removable by other excavating methods, in a manner that completes the excavation to the lines indicated, with the least disturbance to adjacent material to provide a safe and stable slope face. Remove loose, unstable material during excavation. Limit drilling and blasting to a maximum of 1 m (3 feet) below the subgrade elevation to limit the disturbance of the subgrade. Perform deeper drilling and blasting only with the written approval of the Geotechnical Engineer. Compact loose, residual material below the subgrade after the blasting operations. Replace material removed below subgrade with suitable material.

Provide information describing pertinent blasting procedures, dimensions, and notes before starting any phase of the operation.

1. Presplit Blasting Method. Excavate material overlying rock or hard shale to the elevation directed before start of presplit blasting. Excavate those areas not designated for presplit blasting at ends of the excavation section.

Presplit according to the following criteria:

- Drilling depth increments—not to exceed 9 m (30 feet).
- Maximum diameter of holes—90 mm (3 1/2 inches).
- Spacing of holes—450 mm (18 inches) minimum, 900 mm (36 inches) maximum.
- Explosives—manufactured for presplit blasting: cartridge-type less than or equal to one-half the diameter of presplit hole up to a maximum of 40 mm (1 1/2 inches).

Arrange a meeting with the Representative to discuss presplit blasting operation at least 2 weeks before anticipated start of operation. Submit a presplit blasting plan to the Representative 1 week before the meeting, with a copy for the Project Geotechnical Engineer, for review. Arrange a meeting with the Representative when a change in drilling or presplit blasting method is proposed.

The presplit test blasting plan will contain complete details on drilling, blasting patterns, and include the following information as a minimum:

- Approved DEP blasting activity permit.
- Manufacturer data sheets for all explosives, primers, and initiators to be employed.
- Station limits of test area and presplit blast section.

Construct test sections approximately 7.5 m (25 feet) in length to determine optimum spacing, size, and loading of holes for presplitting at the beginning of the operation, and when material of different characteristics is encountered. Test sections may have varied loading and hole spacing, depths, and sizes. Use an overall test area up to 30 m (100 feet) in length.

Presplit blast the first test area using 9 m (30-foot) maximum lifts and four 7.5 m (25-foot) sections with holes spaced at 450 mm (18 inches), 600 mm (24 inches), 750 mm (30 inches), and 900 mm (36 inches).

Expose test area for the Representative and Project Geotechnical Engineer to examine and evaluate upon completion of the presplit blasting test. Prepare presplit blasting plan for full-scale operations based on evaluation of loads and hole spacing in presplit blasting test. Adjust presplit blasting lift based on presplit blasting test evaluation.

Drill presplit holes within one bit diameter of the staked collar location. A hole outside the tolerance of one bit diameter of the size drill bit used to drill the hole is not acceptable.

Control drilling operations by the use of proper equipment and technique. Ensure that no drill hole deviates from the indicated slope by more than 300 mm (12 inches) either parallel or normal to slope after blasting.

Holes out of 300 mm (12-inch) alignment tolerance or one drill bit diameter of the staked collar location will be deducted from the payment. If parallel deviation results in an acceptable presplit face, those holes may be accepted for payment.

Submit a plan for correction when more than 5% of presplit holes in any lift are misaligned.

An offset bench 600 mm (2 feet) in width will be allowed when excavation is deeper than drilling depth increment, to accommodate drill head to slope for each lift. Stake offset benches for toe of completed slope to coincide with indicated toe of slope.

Complete presplit slopes before blasting interior portions of excavation by separate operations or use time delay initiators, which will fracture slope before charges detonate in interior portion. Always extend presplitting holes to end of excavation, or not less than 15 m (50 feet) beyond limits of interior portion.

Submit copies of seismic data showing generated frequencies and particle velocities to the Representative after each blast. Submit shot reports and seismic records to the Representative within 14 days of blasting.

(c) Removal of Existing Pavements.

1. Under Embankments. Remove existing pavements within 1 m (3 feet) of the finished grade, scarify the underlying base to a depth of 150 mm (6 inches) and recompact.

2. Outside Embankment Limits. Remove existing pavements outside the limit of embankments, as indicated, to neat lines, and backfill with suitable material compacted as specified in [Section 206.3\(b\)](#).

3. Roadway Rehabilitation. Outline area, cut, and remove existing pavement structure as indicated or directed.

(d) Slopes. Vary the slopes, if directed, depending on the type of material encountered, in order to obtain satisfactory stability. Remove the material by a method that allows the revised slope lines to be neatly and acceptably trimmed to meet existing conditions.

If a slide occurs, notify the Inspector-in-Charge immediately and cease operations in the slide area until directed to resume.

Remove slide material and bench or flatten slopes, as directed, to obtain the planned width of roadway.

(e) Excavation Beyond Established Slope Lines. Do not remove or excavate any material beyond the slope lines indicated, without written authorization.

(f) Stream Channels. Do not excavate stream channels until directed.

(g) Topsoil. Stockpile topsoil removed from within the excavation or under embankment areas as specified in [Section 801](#), unless otherwise directed. Replace topsoil that is required on the project and wasted during clearing and grubbing operations at no expense to the Department.

(h) Bracing and Shoring. Brace and shore sides of the excavation, as necessary. Remove bracing and shoring when no longer required, unless otherwise indicated or directed.

(i) Cofferdams. Drive timber or metal sheeting to form a cofferdam. Brace the sheeting in all directions. Pump or bail to remove water as necessary. Remove sheeting or bracing when no longer required, unless otherwise indicated or directed.

(j) Suitable Material Required for Embankment and Backfill. Haul suitable excavated material for placement in embankment and for backfill. Replace suitable material ([Section 206.2\(a\)2](#)) that is required on the project and wasted during clearing and grubbing operations at no expense to the Department.

(k) Unsuitable and Surplus Material. Dispose of unsuitable and surplus material in suitable waste areas obtained as specified in [Section 105.14](#).

203.4 MEASUREMENT AND PAYMENT—Cubic Meter (Cubic Yard)

For the class of excavation indicated and as follows:

(a) Excavation Within Established Slope Lines. Excavation quantities will be determined for payment as follows:

1. Plan Quantities. Indicated quantities may be used if the Representative agrees, in writing, that the project has been constructed as indicated and that the indicated quantities may only be used if the borrow section can be isolated.

2. Measured Quantities. If the plans have been altered by construction changes, or if the project involves Borrow Excavation that cannot be isolated, excavation will be measured. Measurement may also be requested, or the Representative may require measurement, if there is disagreement as to the accuracy of the indicated quantities. Cross-sectional measurements will be obtained by field survey or by photogrammetric methods. The original cross-sections will be used as the base cross-sections and the final cross-sections plotted thereon. Additional cross-sections may be interpolated at intermediate points, where necessary to more accurately determine the quantities. The average end-area method, based on horizontal measurement, will be used to compute quantities. If this method produces considerable error, the Representative will use any other three-dimensional method that will keep the error to a minimum.

Stone fences, piles of stone, and individual surface boulders, in excess of 0.5 m³ (1/2 cubic yard) and not shown on the cross-sections, will be measured by a three-dimensional volume method.

Measure the excavation by acceptable methods involving three-dimensional measurements where it is otherwise impractical to measure material by the cross-sectional method due to the erratic type or location of work.

(b) Excavation Beyond Established Slope Lines. The Department will make payment as specified in [Section 205.4\(a\)](#) when widened excavation is used in place of borrow excavation, as shown on the [Standard Drawings](#) and accepted in writing. Excavating offsets for the convenience of drilling is incidental to the Class 1 Excavation.

(c) Stream Channels. Request an inspection of the excavation when excavation of a channel is completed as indicated. Cross-sections will be obtained, and the quantities computed, using the method specified in [Section 203.4\(a\)2](#) when the excavation is satisfactory. These quantities will be used as the basis for current and final payments.

Clearing and grubbing required to make such measurements is incidental to stream channel excavation.

(d) Presplit Blasting. Lineal Meter (Lineal Foot)

Measured on lineal meter (lineal foot) of acceptable presplit blast hole depth with appropriate deductions for holes not drilled within tolerance as specified in [Section 203.3\(b\)](#).

(e) Slope Changes. The Department will pay for work required to change slopes from the indicated template, when directed, as specified in [Section 110.03](#).

(f) Saw Cutting. Saw cutting is incidental to Class 1A excavation.