

**DIVISION 2**  
**EARTHWORK**  
**SECTION 200**  
**CLEARING AND GRUBBING**

**200-1 DESCRIPTION**

Perform the work of clearing and grubbing in all wooded areas between the construction limits. Perform the work of clearing and grubbing in all non-wooded areas between the construction limits and the limits of the project right of way or in easements shown on the project plans where seeding and mulching, sprigging, sodding, or other work indicated in the plans is to be performed.

- (A) **Clearing** is defined as the cutting, removal, and satisfactory disposal of all wooded vegetation and debris.
- (B) **Grubbing** is defined as the complete removal and satisfactory disposal of all grassy vegetative matter, root mat, ball and root, topsoil material high in organic content, and surface debris.

Perform the following as part of the work of clearing and grubbing:

- (1) Remove and dispose of crops, weeds, and other annual growth.
- (2) Remove and dispose of surface debris such as fences, steps, walls, chimneys, column footings, other footings, foundation slabs, basements, other foundation components, signs, junked vehicles, and other rubble and debris.
- (3) Fill holes and depressions.
- (4) Cut off and plug at the right of way or construction limits any private water or sewer line intercepted during the construction of the project.
- (5) Cut off and remove from the right of way or construction area any septic tank or portion thereof encountered within the right of way or construction area during the construction of the project.
- (6) Remove materials in wetland areas to a depth of 0.3 m below existing ground to be measured in accordance with Section 225.

Perform clearing and grubbing operations sufficiently in advance of grading operations to prevent any debris from interfering with the excavation or embankment operations.

In environmentally sensitive areas shown on the original plans, or permit drawings, perform grubbing operations no more than 7 calendar days prior to beginning continuous grading operations. Perform all work under this section in a manner that will cause a minimum of soil erosion and will meet the requirements of Article 107-13. Coordinate the work with other operations such that no more than 7 hectares of exposed, erodible surface area will be accumulated at any one given time by the clearing and grubbing operation until erosion control measures are provided, unless otherwise increased or decreased by the Engineer. Install temporary or permanent erosion control measures as soon as clearing and grubbing or land disturbing activities begin. Perform such erosion control work, temporary or permanent, as may be necessary to satisfactorily minimize erosion resulting from clearing and grubbing operations.

The Contractor may request an increase in the number of accumulated acres exposed by clearing and grubbing. If approved, establish and maintain such erosion control measures as may be necessary. No payment will be made for the temporary seeding and mulching required by the increase in accumulated exposed acres.

Failure on the part of the Contractor to perform the required erosion control measures will be just cause for the Engineer to direct the suspension of clearing and grubbing operations in accordance with Article 108-7. The suspension will be in effect until such

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time as the Contractor has satisfactorily performed the required erosion control work. In the event the Contractor fails to perform the directed work within a reasonable length of time, the Engineer may have the work performed in accordance with Article 105-16.

### **200-2 MATERIALS**

Refer to Division 10.

### **200-3 CLEARING**

Perform clearing within the limits established by the clearing method required by the plans and as directed.

The Engineer will designate all areas of growth or individual trees that shall be preserved due to their desirability for landscape or erosion control purposes. When the trees to be preserved are located within the construction limits, they will be so shown on the plans or designated by the Engineer.

Trim or cut branches of trees that overhang the roadbed or obstruct sight distances and that are less than 4.9 m above the elevation of the finished grade in a manner that will not endanger the health of the tree.

In embankment areas where the depth of the embankment measured under the roadbed exceeds 1.8 m in height, cut sound trees at a height of not more than 150 mm above natural ground. When trees are to be cut outside the construction limits and the Engineer has designated that the area is not to be grubbed, cut the trees reasonably close to the natural ground surface. Cut trees to approximately 150 mm above low water level in swamp areas.

Prevent limb, bark, or root injuries to trees, shrubs, or other types of vegetation that are to remain growing and also prevent damage to adjacent property. Repair scarred areas in accordance with generally accepted horticultural practice. Where plants are damaged by any construction operations to such an extent as to destroy their value for shade or other landscape purposes, cut and dispose of them without extra compensation.

### **200-4 GRUBBING**

Perform grubbing on all areas cleared, with the following exceptions:

- (A) In embankment areas, when the depth of embankment measured under the roadbed exceeds 1.8 m in height, cut off sound stumps not more than 150 mm above the existing ground level and do not grub. Remove unsound or decayed stumps to a depth of approximately 0.6 m below the natural ground surface.
- (B) When authorized, leave stumps in place that are outside of construction limits. Cut such stumps off reasonably close to the natural ground surface.
- (C) Cut off stumps in swamp areas to approximately 150 mm above low water level and do not grub.
- (D) Do not grub in areas where waste or unsuitable material is to be deposited unless such areas are to become a part of a future roadway.
- (E) Grub all areas where piles are to be driven regardless of fill height.
- (F) Fill all holes and other depressions within the areas between the construction limits and the limits of clearing and grubbing. Bring all areas to a uniform contour where later mowing operations will take place.

### **200-5 DISPOSITION OF TIMBER, STUMPS, AND DEBRIS**

The property owner will have no right to use or reserve for their use any timber on the project. All timber cut during the clearing operations shall become the property of the Contractor, and shall be removed from the project or shall be satisfactorily disposed of as provided hereinafter.

Do not cut any trees and vegetation beyond the clearing limits established. Do not cut any trees and vegetation that is to be preserved for landscape or erosion control purposes as shown on the plans and permit drawings.

Remove from the project and properly dispose of all vegetation, roots, stumps, tree laps, limbs, and timber remaining on the project by a satisfactory method.

When vegetation is disposed of by burning, burn in such a manner as to prevent injury to property within or outside of the right of way. Comply with all local, State, and Federal laws, ordinances, and regulations when burning. Secure all necessary burning permits. Perform all burning under the constant care of a competent watchman. Do not allow smoldering or dense smoke to occur during burning.

Before trees and/or vegetation are disposed of in locations off the right of way and out of sight of the project, furnish the Engineer with verification that the site is permitted. If required, file an approved reclamation plan and furnish a written release from the property owner, or his authorized agent, granting the servitude of his lands.

If it is not burned, dispose of all debris including vegetation in accordance with Section 802.

#### **200-6 SELECT TREE REMOVAL**

When the contract includes the item of *Select Tree Removal* and the work of clearing and grubbing has been completed to the original clearing limits, the Engineer may elect to have select trees removed from the project. Trees removed in this manner shall have an average cross section diameter of at least 100 mm at a point 0.6 m above the ground level.

Completely remove the select trees including the root ball and properly backfill unless otherwise directed.

#### **200-7 MEASUREMENT AND PAYMENT**

*Clearing and grubbing – lump sum* will be paid on a lump-sum basis and no measurement will be made of any clearing and grubbing performed within the limits originally staked and within the right of way or easements shown on the original plans.

*Supplementary clearing and grubbing* that is directed by the Engineer shall be performed on areas outside the limits originally staked or beyond the limits of the right of way or easements or within environmentally sensitive areas shown on the original plans and will be measured and paid for at the contract unit price per hectare. All measurement of clearing and grubbing will be made horizontally.

Once the rootmat is removed, material that consists predominately of soils will be measured and paid in accordance with Section 225.

Materials used to fill depressions in accordance with Subarticle 200-4(F) will be measured and paid for in accordance with Section 225, or Section 230, depending on the source of the material.

When the Contractor is required to furnish borrow sources, material sources, or waste areas, or when the Engineer permits the Contractor to obtain borrow or deposit waste on any area within the right of way in lieu of borrow and waste areas which were to have been furnished by the Contractor, no measurement of clearing and grubbing will be made for such areas.

*Select tree removal* will be measured and paid for as the actual number of select trees satisfactorily removed from the project.

Work performed in cleaning up non-wooded areas between the construction limits and the limits of the project right of way or easements shown on the plans, work performed in the dressing up of areas between the construction limits and the clearing limits, and the removal of weeds, vines, plant stalks, loose rock, and small scattered trees, will be considered as a minor and incidental part of the work of clearing and grubbing.

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Payment will be made under:

<b>Pay Item</b>	<b>Pay Unit</b>
Clearing and Grubbing	Lump Sum
Supplementary Clearing and Grubbing	Hectare
Select Tree Removal	Each

## SECTION 205 SEALING ABANDONED WELLS

### 205-1 DESCRIPTION

Seal abandoned wells at locations shown in the contract or as directed. Perform all work in accordance with the current requirements of the North Carolina Department of Environment and Natural Resources.

### 205-2 CONSTRUCTION METHODS

Abandonment shall be performed by a certified well contractor.

Seal each well prior to clearing and grubbing the well site.

Check the well from land surface to the entire depth of the well before it is sealed to ensure freedom from obstructions that may interfere with sealing operations.

Prior to sealing, place chlorine in the well in sufficient quantities to produce a chlorine residual of at least 100 milligrams per liter in the well.

All casing and screen materials may be salvaged except casing that is cemented in place. In the case of gravel-packed wells in which the casing and screens have not been removed, perforate the casing opposite the gravel pack at intervals not exceeding 3.0 meters.

Completely fill *bored wells* with cement grout or dry clay compacted in place.

Completely fill wells constructed in unconsolidated formations with cement grout by introducing it through a pipe extending to the bottom and raising it as the well is filled.

Fill wells constructed in consolidated rock formations or that penetrate zones of consolidated rock to at least 1.5 m below the top of the consolidated rock with sand, gravel, or grout opposite the zones of consolidated rock. Fill the remainder of the well with cement grout.

Complete a certified well abandonment record (Form GW 30) and submit to the Engineer.

### 205-3 MEASUREMENT AND PAYMENT

*Sealing abandoned wells* will be measured and paid for in units of each for the actual number of wells that have been acceptably sealed. Work includes but is not limited to chlorinating the well prior to sealing, perforating the well casing, filling the well with cement grout, dry clay, sand, or gravel and furnishing all necessary records.

Payment will be made under:

<b>Pay Item</b>	<b>Pay Unit</b>
Sealing Abandoned Wells	Each

## SECTION 210 DEMOLITION OF BUILDINGS AND APPURTENANCES

### 210-1 DESCRIPTION

Demolish, remove, and dispose of all buildings, building components, and appurtenances indicated in the contract.

Do not remove any building or portion of a building intact for any use or purpose.

All material resulting from the demolition work becomes the property of the Contractor. Dispose of or use all materials resulting from the demolition work, except materials that are the property of utility companies providing service to the building. Provide all permits and dispose of all contaminated material encountered in connection with the work.

#### **210-2 GENERAL REQUIREMENTS**

Comply with all Federal, State, and local asbestos regulations.

Demolish and clear from the right of way all buildings, including sheds, outbuildings, or other obstructions indicated in the contract. All shelters, porches, roofed areas, and other appurtenances that are attached to the building are considered a part of the building. Steps, chimneys, column footings, other footings, foundation slabs, basements, or other foundation components shall be removed as part of the work of clearing and grubbing.

Do not disturb any fencing, outbuilding, or other obstruction that are entirely clear of the right of way unless otherwise indicated on the plans or in the contract.

Conform to all applicable safety codes pertaining to the work, and secure all permits that may be required, and pay all fees in connection therewith.

#### **210-3 UTILITIES**

Make all necessary arrangements with utility companies for the disconnecting of all services and the removal of and recovery by them of all meters, telephones, and any other utility facilities or equipment owned by them. Arrange for and actually effect the disconnecting and closing of water and sewer connections to buildings, including but not limited to any work that shall be done in addition to that normally done by the utility company, in conformity with all applicable codes and regulations of the local Boards of Health. Pay for all costs incurred in connection with the above work. All refunds or deposits that may become due as a result of the disconnection of service and the returning of equipment or facilities to any utility company become the property of the Department.

#### **210-4 DISPOSAL**

Unless otherwise indicated in the contract, all materials recovered during demolition become the property of the Contractor to remove from the project. Disposal by burning is permitted, subject to all other applicable sections of these Specifications and all State or local ordinances.

Dispose of materials and debris out of sight of the project as required by Section 802.

#### **210-5 MEASUREMENT AND PAYMENT**

There will be no direct payment for demolishing the buildings listed in the contract. Payment for this work will be included in the contract lump sum price for *Clearing and Grubbing*.

As an exception to the above, when the description of the work covered by a particular building demolition item does not contain information concerning the presence of asbestos material and asbestos material is discovered after the opening of bids for the project, the Engineer may have the work performed by others, or the cost of removal and disposal of such asbestos material will be paid for in accordance with the requirements of Article 104-7.

### **SECTION 215 REMOVAL OF EXISTING BUILDINGS**

#### **215-1 DESCRIPTION**

Remove and dispose of all buildings, building components, and appurtenances indicated in the contract.

Buildings may be removed intact, removed in sections, or demolished. Dispose of resulting material and debris. All materials resulting from the removal of buildings, except such materials as may be the property of utility companies providing service to the

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building, become the property of the Contractor to dispose of or use, or sell by him as his own property.

Provide all permits and dispose of all contaminated material encountered in connection with the work.

### **215-2 GENERAL REQUIREMENTS**

Comply with all Federal, State, and local asbestos regulations.

Completely clear from the right of way all buildings, including sheds, outbuildings, or other obstructions as indicated in the contract. Remove all shelters, porches, roofed areas, and other appurtenances, that are attached to the building. Steps, chimneys, column footings, other footings, foundation slabs, basements, or other foundation components shall be removed as part of the work of clearing and grubbing.

Do not disturb any fencing, outbuildings, or other obstruction, that is entirely clear of the right of way unless otherwise indicated on the plans or in the contract.

Conform to all applicable safety codes pertaining to the work, and secure all permits that may be required and pay all fees in connection therewith.

### **215-3 UTILITIES**

Make all necessary arrangements with utility companies for the disconnecting of service and the removal of and recovery by them of all meters, telephones, or any other utility facilities or equipment owned by them. Arrange for and actually effect the disconnecting and closing of water and sewer connections to the buildings, including but not limited to any work that shall be done in addition to that normally done by the utility company, in conformity with all applicable codes and regulations of the local Boards of Health. Pay for all costs incurred in connection with the above work. All refunds or deposits that may become due as a result of the disconnection of service and the returning of equipment or facilities to any utility company becomes the property of the Department.

### **215-4 DISPOSAL**

Unless otherwise indicated in the contract, all materials recovered during demolition become the property of the Contractor to remove from the project. Disposal by burning is permitted, subject to all other applicable sections of these Specifications and all State or local ordinances.

Dispose of materials and debris out of sight of the project as required by Section 802.

### **215-5 MEASUREMENT AND PAYMENT**

There will be no direct payment for removing the buildings listed in the contract. Payment for this work will be included in the contract lump sum price for *Clearing and Grubbing*.

As an exception to the above, when the description of the work covered by a particular building removal item does not contain information concerning the presence of asbestos material and asbestos material is discovered after the opening of bids, the Engineer may have the work performed by others, or the cost of removal and disposal of such asbestos material will be paid for in accordance with the requirements of Article 104-7.

## **SECTION 225 ROADWAY EXCAVATION**

### **225-1 DESCRIPTION**

#### **(A) General**

Excavate, place, and compact or satisfactorily dispose of all materials encountered within the limits of the work necessary for the construction of the roadway that are not to be removed under another contract item.

Perform all excavation in conformity with the lines, grades, and cross sections shown on the plans or established by the Engineer.

Use care not to cause instability or displacement of the underlying or adjacent materials during construction. The Engineer reserves the right to effect the removal from the grading operation of any equipment that is causing instability or displacement of underlying or adjacent materials to the detriment of the section being constructed.

**(B) Unclassified Excavation**

All material excavated under this section, regardless of its nature or composition, is considered Unclassified Excavation, except for the following:

- (1) Undercut Excavation, as provided in Subarticle 225-1(C).
- (2) Material directed to be removed beyond the limits of the original slope stakes.

**(C) Undercut Excavation**

Undercut Excavation consists of the excavation, placement, and compaction and/or satisfactory disposal of materials removed from a location below the finished grade roadway cross section, except for the following:

- (1) Rock in the bottom of roadway cuts that has been excavated 0.3 m or less below the roadbed and ditches.
- (2) In cut areas, excavation removed below the outside slopes of roadway ditches.

**225-2 EROSION CONTROL REQUIREMENTS**

Install erosion control measures as required by the plans prior to any kind of land-disturbing activity.

- (A)** Unless otherwise required by the plans, conduct operations in such a manner that cut and fill slopes are completely graded to final slopes in a continuous operation, and permanently seeded and mulched in accordance with the requirements of Article 107 - 13.
- (B)** Should the Contractor fail to comply with the requirements specified in (A) above within the time frames established by the Sedimentation and Pollution Control Act, the Contractor shall perform temporary seeding and mulching on any exposed areas at his own expense.
- (C)** When the Contractor fails or neglects to coordinate grading with the permanent seeding and mulching operation, the Engineer may suspend the Contractor's grading operation in accordance with the requirements of Article 108-7 until the work is coordinated in a manner acceptable to the Engineer. Failure to perform the directed work may result in the Engineer having the work performed in accordance with Article 105-16.

**225-3 UNCLASSIFIED EXCAVATION**

Use all suitable material removed from the excavation as far as practicable in the formation of embankments, subgrades, and shoulders and at such other places as may be indicated on the plans or directed.

The wasting of suitable material removed as part of unclassified excavation prior to the completion of embankments is permitted where the Contractor executes a supplemental agreement documenting that he agrees to the following:

- (A)** Provide and incorporate into the project any material required to complete the project up to the volume wasted. Bear all additional costs for providing and incorporating this material into the work, including engineering costs, and

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- (B) Provide suitable replacement material either wasted from the project or approved borrow material, at the Contractor's option, and
- (C) Present no claim for any time arising from the wasting of excess unclassified excavation or for having to replace material wasted from the project that the Department may require to complete the work, and
- (D) Waive rights to request additional compensation with regard to wasting unclassified excavation under the compensation requirements of Section 104 as a result of wasting suitable unclassified excavation and providing replacement material required to complete the work except when unclassified excavation is a major contract item, as defined in Section 101, and when unclassified excavation underruns by more than 25%.

Where the work required to complete the project is so phased by the plans to preclude utilizing suitable unclassified excavation, the Contractor will be permitted to waste suitable unclassified excavation without having to execute the above required supplemental agreement.

Furnish disposal areas for the unsuitable material except where the Engineer permits or directs the use of such material in the widening or flattening of fill slopes. The Engineer will designate materials that are unsuitable.

Where suitable materials containing excessive moisture are encountered above grade in cuts, construct above grade ditch drains prior to the excavation of the cut material when such measures are necessary to provide proper drainage.

Upon execution of a supplemental agreement containing conditions listed below, the Contractor may waste suitable unclassified excavation and replace it with approved borrow material.

- (A) Replace with approved borrow material all suitable unclassified excavation that was wasted.
- (B) Bear all additional costs associated with the wasting of the unsuitable unclassified excavation and the replacing of it with borrow material, including any additional engineering costs to the Department.
- (C) The execution of a supplemental agreement allowing the Contractor to waste suitable unclassified excavation and replace it with approved borrow material bars the Contractor from any claim for any time extensions related to the wasting and replacement operation described in the agreement.
- (D) The Contractor specifically waives his rights to request additional compensation with regard to wasting unclassified excavation under the compensation requirements of Section 104 as result of substituting suitable borrow material and wasting suitable unclassified excavation.

Where the contract includes earth shoulder construction, stockpile suitable surplus material for use in the shoulders. To the extent possible, salvage topsoil from within the limits of the slope stake lines and store in stockpiles. Before the topsoil is removed, clear the areas of all weeds, brush, stumps, stones and other debris. Remove the topsoil from only such areas and to only such depths as required by the contract or as directed. Exercise care to avoid mixing subsoil or other unsuitable material with the topsoil. Stockpile an adequate quantity of material to construct the proposed shoulder before wasting any suitable surplus material. Locate the stockpiles along the project at approved locations. Neatly dress each stockpile, when completed. Perform temporary or permanent seeding on the stockpiles where directed or when necessary to prevent erosion. Remove and dispose of any surplus material remaining in the stockpile after the shoulders are completed as provided below for waste matter.

Dispose of waste material in accordance with Section 802.

Uniformly round the intersection of slopes with natural ground surfaces, including the beginning and ending of cut slopes, as shown on the plans. Concurrent with the



excavation of cuts, construct intercepting berm ditches or earth berms along and on top of the cut slopes at locations shown on the plans or as designated. Finish all slopes to reasonably uniform surfaces acceptable for seeding and mulching operations. Leave no rock or boulders in place that protrude more than 0.3 m within the typical section cut slope lines. Clean all rock cuts of loose and overhanging material. Remove all protruding roots and other objectionable vegetation from the slopes.

Where a cut has been finished and the slopes dressed in accordance with the plans and slope stakes, the Contractor will not be required to flatten or widen the slopes of a completed cut unless otherwise directed prior to beginning the work. When rock is unexpectedly encountered, transition any widening or flattening already begun to leave the cut with a pleasing appearance.

If required, investigate the top 300 mm of the subgrade in cut sections to determine the necessity for rock undercut. This investigative work will be paid for in accordance with Article 104-7.

Unless otherwise directed, excavate rock in the bottom of roadway cuts to a depth of 0.3 m below the roadbed and ditches. Lower ditches if necessary so that water will drain from the rock surface to the ditches. Upon completion of the rock excavation below the level of the roadbed and ditches, backfill the areas where such rock has been removed with suitable material, compact, and shape to the required grade and cross section.

Prior to any work beginning on the structure, excavate all rock under and adjacent to structure sites as directed.

Bring all cuts to the grade and cross section shown on the plans, prior to final inspection and acceptance.

Remove and dispose of slides and overbreaks that occur prior to final acceptance of the project. Where slides and overbreaks occur due to negligence or carelessness on the part of the Contractor, the removal and disposal of said slides and overbreaks will be at no cost to the Department.

All excavation done in the shaping of old roadways to produce a pleasing appearance in accordance with the requirements of Section 808 is paid for as Unclassified Excavation.

Conduct earthwork operations in a manner that will not disturb staking, utility poles or guy wires required to remain in their original location.

Cut off and plug all private utility lines, remove existing shoulder drain and subdrain pipe and remove all underground tanks intercepted within the typical section or in conflict with construction.

Where it is necessary to remove existing sidewalks or driveways, furnish a neat edge along the pavement retained by sawing a neat line approximately 50 mm deep with a concrete saw before breaking the adjacent pavement away.

When excavation operations encounter graves, temporarily discontinue operations in the vicinity of the graves and do not resume until directed.

When excavation operations encounter contaminated soils, temporarily discontinue operations in the vicinity of the contamination and do not resume until directed.

When excavation operations encounter artifacts of historical or archeological significance, temporarily discontinue operations in the vicinity of the artifacts and do not resume until directed. Disposition of the artifacts shall be in accordance with the requirements of the Division of Archives and History.

#### **225-4 UNDERCUT EXCAVATION**

When the Engineer determines that the natural soil materials in areas where fills are to be placed are undesirable in their location or condition, the Engineer may require the Contractor to remove the undesirable material and backfill with approved, properly compacted material.

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When the Engineer determines that the finished graded roadway cross section contains materials that are undesirable in their location or condition, the Engineer may require the Contractor to remove the materials and backfill with approved, properly compacted material to the finished graded section.

Where undercutting is required adjacent to or beneath the location of the proposed drainage structure, perform undercut and backfill a sufficient distance adjacent to the installation to prevent future operations from disturbing the completed drainage structure.

Utilize equipment in undercutting and backfilling operations of such weight, size, and capability to efficiently remove and replace the material within the limits established. Use equipment of a size and weight that will not displace the underlying or adjacent material.

All material removed in the work of undercut excavation will be classified by the Engineer as either suitable for other use without excessive manipulation and utilized elsewhere in the work, or unsuitable for further use and disposed of by the Contractor.

Conduct undercut operations in such a way that the Engineer can take the necessary measurements before any backfill is placed.

Place backfill in undercut areas in a continuous operation concurrent with the undercutting operation. Do not place backfill material in water unless otherwise permitted by the Engineer.

### **225-5 TOLERANCES**

A tolerance of plus or minus 30 mm from the established grade will be permitted in the roadbed after it has been graded to a uniform surface.

### **225-6 MAINTENANCE**

Maintain all work covered by this section during construction until final acceptance.

Provide the drainage of surface runoff along and throughout the length of the cut, construct temporary ditches, and use any other methods necessary to control excessive soil erosion during construction and until final acceptance of the project.

### **225-7 MEASUREMENT AND PAYMENT**

*Excavation* will be measured and paid for in cubic meters of materials, measured in their original position and computed by the average end area method, that have been acceptably excavated in accordance with the contract. The Engineer may also elect to use Digital Terrain Modeling (DTMs) for determining the earthwork quantities, or other new technology that has been proven accurate. Original cross sections for the determination of excavation quantities will be taken before any grading begins. Final cross sections will be taken after the excavation has been completed. Final plan cross sections can be used for the final cross sections where, in the opinion of the Engineer, the work has been constructed in reasonably close conformity to the plan typical section.

Original and final cross sections will be taken by either ground or aerial survey methods, as determined by the Engineer.

All materials excavated from a location below the graded roadway cross section are classified as *Undercut Excavation* and will be measured separately except for the following:

- (A) Rock in the bottom of roadway cuts excavated 0.3 m or less below the roadbed and ditches.
- (B) In cut areas, undercut excavation is limited to excavation removed below the roadbed sub-grade, removed below the inside slopes of roadway ditches, and removed below the bottom of flat bottom roadway ditches.
- (C) Rootmat removed as a part of clearing and grubbing.

When the contract does not include item of *Drainage Ditch Excavation*, measurement will be made in accordance with the requirements of Article 240-4 and payment for this

class of excavation will be made at the contract unit price per cubic meter for *Unclassified Excavation*.

Measurement of materials excavated from overbreaks or slides will be made except where the overbreaks or slides were due to the negligence or carelessness of the Contractor.

No measurement will be made of any materials excavated outside of authorized excavation limits established by the Engineer, or any materials excavated before slope stakes were set.

Article 104-5 will not be applicable for any underruns in the quantity of Unclassified Excavation resulting from the permitted use of such material as Select Granular material.

*Berm Ditch Construction* will be measured and paid for in accordance with the requirements of Article 240-4.

Materials excavated from stockpiles and used to construct earth shoulders will be paid for as *Shoulder Borrow* in accordance with the requirements of Article 560-4. No payment will be made for the removal and disposal of any surplus material remaining in the stockpile after the shoulders have been completed.

Payment for material that the Engineer directs to be removed beyond the limits of the original slope stakes will be made in accordance with Article 104-3.

Payment includes but is not limited to excavation, blasting, hauling anywhere along the project both within and across balance points shown on the plans, removal of undesirable material, removal of sidewalk, driveways, curb and gutter, endwalls, traffic islands and drainage structures, disposal of materials, formation and compaction of embankments, subgrades and shoulders, the cutting off, plugging, and removal of private utility lines and underground tanks and any backfilling required, removing any existing shoulder drain or subdrain pipe and maintaining the work.

Payment will be made under:

<b>Pay Item</b>	<b>Pay Unit</b>
Unclassified Excavation	Cubic Meter
Undercut Excavation	Cubic Meter

## **SECTION 226 COMPREHENSIVE GRADING**

### **226-1 DESCRIPTION**

The work covered by this section consists of all elements of work covered by Section 200 Clearing and Grubbing, Section 225 Roadway Excavation, Section 230 Borrow Excavation, Section 235 Embankments, Section 250 Removal of Existing Pavement, Section 500 Fine Grading Subgrade, Shoulders, and Ditches, and Section 560 Shoulder Construction, except that the requirements of the above-referenced sections pertaining to measurement and payment will not apply unless specific reference is made to such Specifications.

### **226-2 CONSTRUCTION METHODS**

Perform the work in accordance with the requirements of Sections 200, 225, 230, 235, 250, 500, and 560.

### **226-3 MEASUREMENT AND PAYMENT**

*Seeding and mulching* all borrow sources will be measured and paid for at the contract unit prices for such items established in the contract.

Payment for material that the Engineer directs the Contractor to obtain from borrow sources to backfill pipe culverts, box culverts, drainage structures, or structure bents will be made in accordance with Article 104-7.

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Payment for material that the Engineer directs to be removed beyond the limits of the original slope stakes will be made in accordance with Article 104-3.

*Grading* will be paid for at the contract lump sum price. Partial payments will be equal to the percentage of such item that is complete as estimated by the Engineer. No separate payment will be made for clearing and grubbing or draining borrow sources as such work will be considered incidental to the work covered by this section.

Clearing and grubbing work that is directed to be performed on areas outside the limits originally staked or beyond the limits of the right of way or easements shown on the original plans will be measured and paid for at the contract unit price per hectare for *Supplementary Clearing and Grubbing*. All measurements will be made horizontally. Where the contract does not include this item, a unit price per hectare will be established by supplemental agreement.

*Undercut Excavation* will be measured and paid for at the contract unit price per cubic meter. No separate payment will be made for materials used in backfilling the undercut areas as payment at the contract unit price per cubic meter for *Undercut Excavation* will be full compensation for furnishing such material. Where the contract does not include a pay item for *Undercut Excavation*, payment for such excavation will be made in accordance with Article 104-7.

Payment will be made under:

<b>Pay Item</b>	<b>Pay Unit</b>
Grading	Lump Sum
Supplementary Clearing and Grubbing	Hectare
Undercut Excavation	Cubic Meter

## SECTION 230 BORROW EXCAVATION

### 230-1 DESCRIPTION

Excavate approved material from borrow sources. Haul and utilize such material as required on the plans or as directed. Do not use borrow excavation until all available suitable unclassified excavation has been incorporated into the embankments, subgrades, and shoulders except by execution of a supplemental agreement documenting the conditions prescribed below.

- (A) All suitable unclassified excavation wasted as a result of the previous utilization of borrow material will be deducted from the total volume of borrow excavation paid under the contract.
- (B) Reimburse the Department for all additional costs, including additional engineering cost, associated with the wasting of suitable unclassified excavation.
- (C) Any claim for contract time extensions related to the early utilization of borrow is waived should the Contractor use borrow material prior to all suitable unclassified excavation being incorporated into the project pursuant to a supplemental agreement.
- (D) Rights to request additional compensation with regard to the early utilization of borrow under the compensation requirements of Section 104 except when unclassified excavation is a major contract item, as defined in Section 101, and that unclassified excavation overruns by more than 25%.

Where the work required to complete the project is so phased by the plans to preclude utilizing suitable unclassified excavation, the Contractor will be permitted to construct the required embankments, subgrades, or shoulders so controlled by the phasing from approved borrow materials without having to execute the above required supplemental agreement.

**230-2 COORDINATION WITH SEEDING OPERATIONS**

Coordinate the work in this section with the construction of embankments so that the requirements of Article 225-2 are met.

**230-3 MATERIALS**

Refer to Division 10.

<b>Item</b>	<b>Section</b>
Borrow Material	1018

**230-4 CONSTRUCTION METHODS****(A) General**

Thoroughly clear and grub and clean the surface of the borrow area of all unsuitable material before beginning the excavation and, where applicable, before cross-sections are taken. Dispose of material resulting from clearing and grubbing in accordance with Article 200-5. Remove and dispose of overburden in accordance with Section 802.

Do not accumulate exposed, erodible slope area in each borrow operation in excess of 0.4 hectare at any one given time without beginning permanent seeding and mulching of the borrow source or installing other erosion control measures as may be approved.

Remove and stockpile topsoil at locations that will not interfere with the borrow operations and that meet the approval of the Engineer. Install temporary erosion control measures as may be necessary to prevent the erosion of the stockpile material. Once all borrow has been removed from the source or portion thereof, uniformly spread the stockpiled topsoil over the area and permanently seed and mulch the area.

Where payment is made by cross section, notify the Engineer sufficiently in advance of beginning excavation of the borrow material so that the area may be staked and cross sectioned. No payment will be made for any material excavated prior to cross sections being taken. Excavate the material to the lines and slopes as staked in an orderly manner to facilitate measurement at any time.

Where payment is to be made by truck measurement, furnish trucks with bodies suitable for accurate measurement. Load trucks uniformly and in such a manner as to prevent spillage.

When necessary to haul borrow material over existing roads or streets, the requirements of Article 105-15 apply. Use all necessary precautions to prevent damage to the existing structures or pavement. Conduct hauling operations in such a manner as to not interfere with the normal flow of traffic and keep the traffic lanes free from spillage at all times.

Furnish borrow sources except where otherwise indicated in the contract.

**(B) Contractor Furnished Sources**

Prior to the approval of any borrow source(s) developed for use on any project, obtain certification from the State Historic Preservation Officer of the State Department of Cultural Resources certifying that the removal of the borrow material from the borrow source(s) will have no effect on any known district, site building, structure, or object that is included or eligible for inclusion in the National Register of Historic Places. Furnish a copy of this certification to the Engineer prior to performing any work on the proposed borrow source.

Borrow sources will not be allowed in any area under the Corps of Engineers regulatory jurisdiction until the Contractor has obtained a permit for such borrow sources from the Corps District Engineer having jurisdiction and has furnished a copy of this permit to the Engineer. Requests for additional contract time,

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additional compensation, or for work stoppage due to permit violations will not be considered.

The approval of borrow sources furnished by the Contractor is subject to the following conditions:

- (1) Provide written proof of the right to take the material and any rights of access that may be necessary, for locating and developing the source, and any clearing and grubbing and drainage ditches necessary. The proof shall include an agreement with the owner that the borrow source be dressed, shaped, seeded, mulched, and drained as required by these Specifications after all borrow has been removed.
- (2) Sampling and testing of contractor furnished borrow material will be in accordance with procedures set forth in *the Procedures for Sampling and Approving Contractor Furnished Borrow Sources* in effect on the date of advertisement for the project. Copies of this document are available from the Materials and Tests Unit. The criteria for acceptance of the proposed contractor furnished borrow material is shown in Section 1018.
- (3) Except where borrow is to be obtained from a commercial source, jointly submit with the property owner a borrow source development, use, and reclamation plan to the Engineer for his approval prior to engaging in any land disturbing activity on the proposed source other than material sampling that may be necessary. The Department's borrow and waste site reclamation procedures for contracted projects is available on the NCDOT website and shall be utilized for all borrow and waste sites on this project. Address the following in the plan:
  - (a) Topography  
Detail the existing topography and locations of the proposed access and egress haul roads. Detail the proposed final topography of the waste or disposal area showing any proposed drainage systems. Excavate the source according to the plan and dress and shape it in a continuous manner to contours that are comparable to and blend in with the adjacent topography. Grade the source to drain such that no water will collect or stand. Provide a functioning drainage system for the source. If drainage is not practical, and the source is to serve as a pond, the minimum depth shall be a least 1.2 m as determined from the water table at the time the reclamation plan is executed. The slope of the soil below the water shall be between 5:1 and 2:1. The slope of the sides above the water line shall be 2:1 or flatter.
  - (b) Erosion Control  
Detail the temporary and permanent erosion control measures, along with design calculations, that are intended during use of the site and as part of the reclamation. Unless considered impractical due to special circumstances, provide in the plan for the use of staged permanent seeding and mulching and appropriate fertilizer topdressing on a continual basis during site use and the immediate total reclamation of the site when the site is no longer needed. Define the seed mixture proposed for establishing temporary and/or permanent vegetation. Establish permanent stand of vegetation prior to acceptance of the project.
  - (c) Buffer Zones  
Allocate sufficient area between the nearest property line and the tie-in of the slope to natural ground to allow for the operation of excavation, hauling, and seeding equipment and for the installation of any and all erosion control devices required. Leave additional

undisturbed area between the source and any water course or body to prevent siltation of the water course or body and the movement of the shore line either into the water course or body or into the waste areas. Determine if the adjoining property owners or other government agencies require any additional buffer zones and comply with those requirements. Suggested minimum distances are 3.0 m from property lines and 15.2 m from water bodies or water courses. Where it is necessary to drain the borrow source, perform this work in accordance with Section 240.

(d) Evaluation for Potential Wetlands and Endangered Species

Hire an experienced environmental consultant from the approved list to perform an assessment of the borrow site for potential conflicts with wetlands, Areas of Environmental Concern designated by CAMA, and federally protected species. This evaluation will not be required for permitted commercial sites.

Delineate the boundaries of any wetlands or jurisdictional surface waters (streams) encountered. Follow the standard practice for documenting the wetland delineation including completion of the Army Corps of Engineer's approved *wetland data form*. Document information including data regarding soil, vegetation and hydrology. Maintain a minimum 7.6 m buffer adjacent to all sides of the wetland boundary and a minimum 15.2 m buffer adjacent to any stream. Depict the limits of the delineated wetland and surrounding buffer on the Reclamation Plan. Do not remove borrow material in any area under the Corps of Engineers' or any other environmental agencies' regulatory jurisdiction unless and until the NCDOT permit has been modified to allow such disposal activity in the jurisdictional area.

Perform a site assessment for federally listed threatened or endangered species to include habitats that may support these species. Provide a detailed technical report on the assessment findings. If federally listed threatened or endangered species or habitat that may support such species exist on the proposed borrow site, notify the Engineer prior to continued pursuit of such site.

(e) Approval

Obtain written approval from the Engineer prior to excavating any material within the proposed borrow source area.

Submit a revised or additional reclamation plan if the non-permitted waste or disposal area is expanded by more than 0.4 hectare or is significantly changed from the previously approved submittal.

If the Contractor proposes a borrow source, the environmental assessment shall include wetland and stream delineation extending 122 m beyond the proposed borrow source limits.

(i) If wetlands or streams are present within 122 m of the borrow source:

Submit a hydrologic analysis (Skaggs Method) or equivalent to determine if lateral effects will permanently impact or cause degradation to wetlands or streams. The analysis shall be performed by an environmental or hydraulics engineer with expertise in this discipline and shall consist of, but not be limited to:

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Hydric soil type

Average profile depth to restrictive soil layer

Effective hydraulic conductivity or permeability

Average drainable porosity or available water capacity

Required buffer width, including safety factor

(ii) If wetlands or streams are present within 122 m and the contractor does not propose to excavate below the seasonal high water table or the water level in the adjacent stream, no documentation will be required.

(iii) If wetlands or streams are not present within 122 m, no additional documentation will be required

During Department review of the proposed borrow area, the hydrologic analysis will be submitted to the U. S. Army Corps of Engineers for evaluation.

Obtain copy of Skaggs Method for Determining Lateral Effects of a Borrow Pit on Adjacent Wetlands from the Department's website.

### (C) Maintenance

During construction and until final acceptance, use any methods approved by the Engineer that are necessary to maintain the work covered by this section so that the work will not contribute to excessive soil erosion.

### 230-5 MEASUREMENT AND PAYMENT

*Borrow Excavation* will be measured and paid for in cubic meters. Borrow excavation will be measured in place in its original position except that truck measurement will be made where called for in the contract.

If the quantity of borrow excavation used is excessive as evidenced by the presence of surplus suitable material from the roadway excavation, the measured quantity of borrow excavation will be reduced by the quantity of such surplus suitable material.

**In Place Measurement:** *Borrow Excavation* to be paid for will be the actual number of cubic meters of approved material, measured in its original position by cross sectioning and computed by the average end area method, that has been excavated from the borrow source and incorporated into the completed and accepted work. No measurement will be made of any overburden or unsuitable material removed from the source, or of any material excavated prior to cross sections being taken.

**Truck Measurement:** *Borrow Excavation* to be paid for will be the actual number of cubic meters of approved material, measured in trucks, that has been excavated from the borrow source and incorporated into the completed and accepted work. Each truck will be measured and shall have a legible identification mark indicating its capacity. Load each truck to at least its measured capacity at the time it arrives at the point of delivery. The recorded capacity will be adjusted by making a 25 percent deduction to allow for shrinkage, and the adjusted capacity will be the quantity to be paid for.

Topsoil that is stockpiled and placed back on the source as a part of the reclamation effort will be measured in the stockpile by cross sectioning and computed by the average end area method and paid for per cubic meter for *Borrow Excavation*. No in place measurement will be made of the topsoil.

*Seeding And Mulching* and establishment of temporary erosion control for all borrow sources will be made at the contract unit prices for the items established in the contract as payment for seeding and mulching.

Payment includes but is not limited to: furnishing the source of the borrow; providing and implementing a development, use, and reclamation plan, evaluation of potential wetlands and endangered species, building, maintaining, and obliterating haul roads,



clearing and grubbing or draining the borrow source; removing, stockpiling, and replacing topsoil, removing and disposing of overburden and other unsuitable material, excavation, hauling, formation of roadway embankments, subgrades, and shoulders, restoration of the source and haul roads to an acceptable condition, obtaining permits and/or certifications, and maintaining the work.

Payment will be made under:

<b>Pay Item</b>	<b>Pay Unit</b>
Borrow Excavation	Cubic Meter

## **SECTION 235 EMBANKMENTS**

### **235-1 DESCRIPTION**

Place suitable material excavated under Sections 225, 226, 230, and 240 in embankments, backfills, and earth berms, to conform with the lines, grades, and typical cross sections shown on the plans. Fill and compact holes, pits, and other depressions when unsuitable material has been removed. Work includes preparation, formation, compaction, and maintenance of the embankment area as well as the formation of benches in the existing ground with rises less than 1500 mm.

### **235-2 COORDINATION WITH SEEDING OPERATIONS**

Coordinate work with excavation operations to meet the requirements of Article 107-13 and Article 225-2.

### **235-3 MATERIALS**

Use soil consisting of loose, friable, sandy material free of subsoil admixtures, refuse, stumps, rocks, roots, root mats, or other unsatisfactory material.

Wet, dry, or frozen material may be suitable when dried, wetted, or thawed, respectively. Waste suitable material only with written authorization.

Use Select Material in accordance with Section 1016 when required by the contract.

### **235-4 CONSTRUCTION METHODS**

#### **(A) Preparation for Embankment**

- (1) Finish clearing and grubbing within an area before starting embankment in accordance with Section 200.
- (2) Remove and waste organic or other unsuitable material unless otherwise directed.
- (3) Plow mowed sod and leave in place where the height of embankment to be constructed is greater than 1.8 m measured under the roadbed.
- (4) Plow or scarify and break up cleavage planes of all underlying road surfaces.
- (5) Remove or break up existing pavement in accordance with Section 250.
- (6) Bench existing slopes steeper than 4:1 measured at right angles to the roadway.
  - (a) Provide rises of not less than 300 mm nor greater than 1500 mm as embankment is brought up in layers.
  - (b) Provide sufficient width for the operation of placing and compaction equipment.
  - (c) Begin bench cut at the intersection of the original ground and the vertical side of the previous cut.

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- (d) Construct benches greater than 1500 mm in height only when shown on the plans. Such benches will be paid for in accordance with the contract.

### **(B) Embankment Formation**

- (1) Uniformly spread material in successive, approximately horizontal layers of not more than 250 mm in depth, loose measurement, for the full width of the cross section.
- (2) Compact each layer in accordance with Subarticle 235-4(C).
- (3) Shape embankment surface to properly drain at all times.
- (4) Route construction equipment uniformly over the full width of the embankment and prevent deep rutting.
- (5) May construct the first layer of embankments across saturated or unstable material, that does not support the weight of hauling equipment, by successively dumping a uniformly distributed layer of a thickness not greater than necessary to support hauling equipment while placing subsequent layers.
- (6) When placing material in swamp or in water, keep unsuitable surge material in a fluid state or remove to prevent trapping in or under embankment.
- (7) When shown on the plans or allowed by the contract, form a satisfactory base by end or side dumping in valleys, ravines, and at the foot of slopes on side hills.
- (8) Where embankments are being constructed principally of rock or broken pavement, place in uniform layers with a maximum depth of 900 mm.  
Place rock or broken pavement so larger pieces are evenly distributed and are no larger than 900 mm in any dimension.  
Fill all voids.  
Place rock or broken pavement lifts a minimum of 0.6 m below finished subgrade or finished grade whichever is lower.
- (9) Do not place rock or broken pavement greater than 50 mm in diameter within 300 mm of the subgrade or finished grade whichever is lower.
- (10) Do not place rock or broken pavement in areas where foundations are to be placed.
- (11) Place Select Material where indicated in the contract.
- (12) Construct stabilized embankment when required by the contract.
- (13) Install pipe culverts as specified in Section 300.
- (14) Construct subsurface drains adjacent to structures as required by Article 414-8 for box culverts and Article 410-9 for other structures, except for that portion of the drain located below the elevation of the original ground.
- (15) Do not disturb existing utilities within the project construction limits until released by the Engineer.

### **(C) Embankment Compaction**

- (1) Compact each layer for its full width to a density equal to at least 95 percent of that obtained by compacting a sample of the material in accordance AASHTO T99 as modified by the Department. Copies of these modified procedures are available upon request from the Department's Materials and Tests Unit.
- (2) Uniformly bond all layers to preceding layers.

- (3) Compact all surfaces on embankment slopes, principally constructed of soil, that are flatter than 1 1/2:1 using tracked equipment or other approved methods.
- (4) Increase or decrease moisture content of the material before compacting to produce the maximum density that will provide a stable grade.
- (5) Exempt portions of rock embankments, that cannot be tested by approved methods, from density requirements.

**(D) Maintenance**

- (1) Maintain all embankments made under the contract until final acceptance.
- (2) Construct and maintain adequate drainage of surface runoff to prevent soil erosion.
- (3) Replace damaged or displaced embankment caused by Contractor carelessness or negligence at no cost to the Department.
- (4) Replace damaged or displaced embankment as a result of natural causes. Payment for this repair work will be at the contract unit price for the excavated material required to make the necessary repairs.
- (5) Bring all embankments to the grade and cross section shown on the plans prior to final inspection and acceptance.

**235-5 TOLERANCES**

Finish subgrade surface within plus or minus 30 mm from the established grade after it has been graded to a uniform surface.

**235-6 MEASUREMENT AND PAYMENT**

Payment will not be made for embankment construction. Payment at the contract unit prices for the various items covered by Section 225, 226, 230, and 240 will be full compensation for all work covered by this section.

**SECTION 240  
DITCH EXCAVATION**

**240-1 DESCRIPTION**

**(A) General**

Excavate and satisfactorily dispose of all materials excavated in the construction of ditches except silt ditches.

**(B) Drainage Ditches**

*Drainage ditches* are defined as inlet and outlet ditches for pipe culverts and structures, changes in channels of streams, ditches draining borrow and material sources, and parallel or lateral ditches when such ditches are separated from the roadway slope by an area of natural ground or berm.

Unless otherwise classified on the plans, parallel or lateral ditches constructed as an integral part of the graded roadbed, having a continuous slope from the outer limit of the shoulder to the bottom of the ditch, will be considered to be within the roadway grading limits and will be part of the work covered by Section 225.

**(C) Berm Ditches**

*Berm ditches* are defined as ditches constructed by either excavation or the construction of earth berms along the top of the cut slopes. The location of berm ditches will be as shown on the plans or as directed.

**240-2 GENERAL**

Excavate to the lines, grades, typical sections, and details shown on the plans or established. Coordinate all work covered by this section with the grading, construction of drainage structures, excavation of borrow and material sources, and other work along the

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project, and maintain in a satisfactory condition so that adequate drainage is provided at all times. Maintain the ditches until the final acceptance of the project. Trim flush with the sides of the ditch any roots that protrude into the ditch. Complete inlet and outlet ditches for pipelines before the pipe is installed unless otherwise permitted.

### 240-3 DISPOSAL OF MATERIALS

Utilize all excavated materials in the construction of roadway embankments except where otherwise directed. Deposit materials that are excess to the needs of the project alongside the ditch, and spread to form a low, flat, inconspicuous spoil bank of sufficient regular contour to permit seeding and mowing, provided no drainage into the ditch is blocked.

### 240-4 MEASUREMENT AND PAYMENT

*Drainage Ditch Excavation* will be measured and paid for in cubic meters, measured in the original position by the average end area method of all materials excavated within the limits established by the plans or directed. Work includes but is not limited to excavation, shaping of the ditches, disposal of all materials, construction of earth berms, and the maintenance of the work in an acceptable condition until final acceptance.

No measurement and payment will be made where excavation has been performed beyond the above limits; made solely for the convenience of the Contractor; for temporary drainage of the project; or for any excavation to provide drainage of borrow or material sources furnished by the Contractor.

Where the contract does not include a pay item for *drainage ditch excavation*, all work of drainage ditch excavation will be treated as unclassified excavation and will be paid in accordance with Section 225.

*Berm Ditch Construction* will be measured and paid for in linear meters, measured along the flow line of the ditch within the pay limits shown on the plans, completed and accepted. Work includes but is not limited to excavation, shaping of the ditches, disposal of all materials, construction of earth berms, and the maintenance of the work in an acceptable condition until final acceptance.

Payment will be made under:

<b>Pay Item</b>	<b>Pay Unit</b>
Drainage Ditch Excavation	Cubic Meter
Berm Ditch Construction	Linear Meter

## SECTION 250 REMOVAL OF EXISTING PAVEMENT

### 250-1 DESCRIPTION

Break up, remove and satisfactorily dispose of the portland cement concrete or asphalt components of an existing roadway pavement structure, including paved shoulders, within the limits shown on the plans or as directed. This work includes the removal of any temporary roadway pavement structure placed during construction to serve as a detour.

### 250-2 PAVEMENT REMOVAL AND DISPOSAL

Break up and remove the pavement for its entire depth. Where concrete or asphalt pavement is to be removed, provide a neat edge along the pavement being retained by sawing the pavement approximately 50 mm deep before breaking the adjacent pavement away. Properly dispose of all materials resulting from the pavement removal as provided herein.

When existing pavement is located where embankment is to be constructed, and the depth of the embankment is greater than 0.3 m exclusive of base and pavement, do not remove existing pavement, but break up the existing pavement into pieces with the

longest dimension no larger than 0.9 m. Fill all voids. All voids must be filled when building an embankment out of rock or broken pavement.

Use all materials in the construction of embankments, unless otherwise directed. Stockpile materials, that the Department desires to use, as indicated on the plans at approved locations.

Where the Contractor requests permission to use salvageable material in other parts of the work and such material has been intended for use in the construction of embankments, the Engineer may permit such use provided the Contractor furnishes at no cost to the Department an adequate quantity of material for embankment construction to replace the material used in all other parts of the work.

Dispose of all materials that cannot be used in the work in accordance with Section 802.

### **250-3 MEASUREMENT AND PAYMENT**

*Removal of Existing Asphalt Pavement* will be measured and paid for in square meters of existing asphalt pavement actually removed and disposed of properly. Removal of existing asphalt pavement will be measured by actual surface measurement of the asphalt pavement prior to its removal.

*Removal of Existing Concrete Pavement* will be measured and paid for in square meters of existing concrete pavement actually removed and disposed of properly. Removal of existing concrete pavement will be measured by actual surface measurement of the concrete pavement prior to its removal.

*Breaking of Existing Concrete Pavement* will be measured and paid for in square meters of existing concrete pavement actually broken up and left in place. The quantity will be determined by actual surface measurement of the pavement prior to breaking it up.

*Breaking of Existing Asphalt Pavement* will be measured and paid for in square meters of existing asphalt pavement actually broken up and left in place. The quantity will be determined by actual surface measurement of the pavement prior to breaking it up.

Where the pavement removed or broken up is a combination of layers of both asphalt and concrete pavement, payment will be made at the contract unit price per square meter for *Removal of Existing Concrete Pavement* or at the contract unit price for *Breaking of Existing Concrete Pavement*.

Where the pavement removed is a combination of layers of both asphalt and concrete pavement and an item is not established for concrete pavement removal, the cost of removing the combination of layers of asphalt and concrete will be made in accordance with Article 104-7.

Payment includes but is not limited to breaking up, removing and disposing of existing concrete or asphalt pavement, including paved shoulders and removing any temporary roadway pavement structure placed during construction to serve as a detour.

This work does not include removing and disposing of sidewalks, driveways, curb and gutter, traffic islands, and parking areas, or any other incidental paved structures that are not part of a roadway pavement structure.

Payment will be made under:

<b>Pay Item</b>	<b>Pay Unit</b>
Removal of Existing Asphalt Pavement	Square Meter
Removal of Existing Concrete Pavement	Square Meter
Breaking of Existing Concrete Pavement	Square Meter
Breaking of Existing Asphalt Pavement	Square Meter

## SECTION 260 PROOF ROLLING

### 260-1 DESCRIPTION

Furnish and operate at the direction of the Engineer, heavy pneumatic tired compaction equipment for compacting the roadbed and testing the roadbed for stability and uniformity of compaction.

### 260-2 EQUIPMENT

Provide equipment with the following features:

- (A) Four rubber tired wheels mounted on a rigid steel frame.
- (B) Wheels evenly spaced in one line across the width of the roller and arranged so that all wheels will carry approximately equal loads when operated over an uneven surface.
- (C) Maximum center to center spacing between adjacent wheels is 812.8 mm.
- (D) Load capacity from 43.6 to 45.5 metric tons unless otherwise permitted in writing.
- (E) The loaded roller shall be covered or constructed so that it will not trap water that will add weight to the ballast.
- (F) Other equipment of equal or better effectiveness may be substituted with written permission.
- (G) Tire pressures shall be between 468.8 and 496.4 kPa unless otherwise permitted in writing. Inflate tires with air only; use no liquid.

Provide ballasts consisting of bulk sand, bulk stone, bags of sand, stone, or other materials of known unit weight such that the total weight of the ballast used can be readily determined at all times. Provide a sufficient amount of ballast to load the equipment to a maximum gross weight of 45.5 metric tons.

Use rubber tired or other types of tractive equipment for operation of this equipment on the roadbed. The entire assembly including motivating equipment shall be capable of executing a 180 degree turn on a 8.2 m wide area.

### 260-3 CONSTRUCTION METHODS

After the roadbed has been completed within 0.15 m of final grade, compact and test the roadbed with one coverage, unless otherwise directed, with a heavy pneumatic tired roller meeting the requirements of Article 260-2. Coverage is considered that stage in the rolling procedure when the entire width of the area being proof rolled has been in contact with the pneumatic tires of the roller. Operate the roller in a systematic manner so that the number of coverages over all areas to be proof rolled can be readily determined and recorded.

Operate the equipment at a speed between 68.6 and 91.4 m per minute.

Perform proof rolling only in the presence of the Engineer.

Proof roll areas again following the completion of the necessary corrections. Perform proof rolling at no cost to the Department if the corrections are necessary due to the negligence of the Contractor or weather.

Protect all structural facilities on the project, such as but not limited to bridges, box culverts, pipe culverts, and utilities, from damage by the proof rolling equipment. Protection may include unloading and reloading of the roller, detouring, protective earth pads, or other suitable measure to avoid damage.

### 260-4 MEASUREMENT AND PAYMENT

*Proof Rolling* will be measured and paid for as the actual number of hours, measured to the nearest 0.1 hour, during which the heavy pneumatic tired roller has been engaged in proof rolling in the presence of the Engineer, exclusive of hours of proof rolling

performed following corrective action made necessary by the negligence of the Contractor or by weather.

Corrective work necessary, as determined by proof rolling, and not due to negligence of the Contractor or to weather, will be paid for at the applicable contract unit prices or as extra work, whichever may be applicable.

Payment includes furnishing all labor, equipment, fuel, and ballast for loading, loading and unloading ballast as directed, and increasing and decreasing tire pressure as directed.

Payment will be made under:

<b>Pay Item</b>	<b>Pay Unit</b>
Proof Rolling	Hour

**SECTION 265  
SELECT GRANULAR MATERIAL**

**265-1 DESCRIPTION**

Furnish and place select granular material over the previously placed fabric for soil stabilization and/or backfill in water as shown in the plans and as directed.

**265-2 MATERIALS**

Refer to Division 10.

<b>Item</b>	<b>Section</b>
Class II Select Material	1016-3
Class III Select Material	1016-3

**265-3 CONSTRUCTION METHODS**

Select granular material used over the soil stabilization fabric and/or backfill in water shall be either Class II or Class III Select Material.

Place Select Granular Material 0.9 m above the fabric and/or backfill in water.

**265-4 MEASUREMENT AND PAYMENT**

*Select Granular Material* will be measured and paid in cubic meters of select granular material that has been incorporated into the completed and accepted work.

Work includes but is not limited to furnishing, hauling, placing and all incidentals necessary to satisfactorily complete the work. When the Engineer permits select granular material being obtained from either unclassified excavation or from an approved borrow source, payment will be provided for select material under this pay item and not under the pay items contained in Articles 225, 226 or 230.

Payment will be made under:

<b>Pay Item</b>	<b>Pay Unit</b>
Select Granular Material	Cubic Meter

**SECTION 270  
FABRIC FOR SOIL STABILIZATION**

**270-1 DESCRIPTION**

Furnish and install synthetic fabric for soil stabilization in accordance with the contract or as directed.

**Section 270**

**270-2 MATERIALS**

Refer to Division 10.

<b>Item</b>	<b>Section</b>
Fabric for Soil Stabilization, Type 4	1056

**270-3 CONSTRUCTION METHODS**

Grubbing may not be required in areas where fabric for soil stabilization will be used. Minimize the use of heavy equipment in these areas in order to limit rutting. Cut trees flush with the ground surface and place fabric on relatively undisturbed ground as directed.

Do not leave fabric uncovered for more than 7 days. Provide a surface free of obstructions, debris and soft pockets. Place the fabric at locations as directed. Place the fabric with the long dimension parallel to the centerline of the roadway and lay it smooth and free from tension, stress, folds, wrinkles or creases. Overlap all transverse and longitudinal joints at least 457.2 mm unless otherwise directed to sew or bond seams together. Use wire staples as needed to hold the fabric in place until it is covered. Unless otherwise stipulated, provide backfill material meeting the requirements of the contract. Do not operate equipment on the fabric until it is covered with material as directed. Do not use vibratory compaction equipment on the initial lift of backfill.

**270-4 MEASUREMENT AND PAYMENT**

*Fabric for Soil Stabilization* will be measured and paid for as square meters of fabric, measured along the surface of the ground that has been acceptably placed. No separate measurement will be made for overlapping fabric, sewing seams or bonding. Work includes but is not limited to furnishing, hauling, placing, and sewing the fabric and furnishing and placing wire staples.

Payment will be made under:

<b>Pay Item</b>	<b>Pay Unit</b>
Fabric for Soil Stabilization	Square Meter