SECTION 201
CLEARING AND GRUBBING

201.01 DESCRIPTION
This work is the clearing, grubbing, removing, burning, burying, and disposing of vegetation and debris within the right-of-way limits and easement areas without damaging vegetation, adjacent property and other objects designated to remain in place.
Immediately stop work and notify the Engineer if evidence of aboriginal activity or occupation is encountered.

201.01.1 Clearing
Clearing is felling trees, disposing of stumps, brush, windfalls, logs, limbs, sticks, piles of sawdust, rubbish, debris, vegetation, and other matter within the clearing limits or other areas that interfere with the excavation and embankment limits.

201.01.2 Grubbing
Grubbing is removing and disposing of roots, stumps, stubs, duff, matted roots, and debris from the grubbing limits.

201.01.3 Clearing and Grubbing
Is performing both clearing and grubbing meeting Subsections 201.01.1 and 201.01.2.

201.01.4 Disposal
Disposal is removing, burning, and burying material generated from clearing, grubbing, or clearing and grubbing operations meeting all local, state and federal laws and regulations.

201.02 RESERVED

201.03 CONSTRUCTION REQUIREMENTS

201.03.1 General
Limit dragging, piling, disposing of debris, and other work to areas to be excavated or covered by embankment. Do not damage or destroy vegetation not designated to be removed.
Do not injure or damage vegetation adjacent to streams, ponds, or lakes unless designated for removal in the contract. Replace damaged or destroyed vegetation not to be disturbed at Contractor expense.
Coat cut or scarred surfaces of trees or shrubs to be preserved with an asphaltum base paint formulated for tree surgery.
Locate pioneer roads or work trails a minimum 20 feet (6.0 m) inside of the clearing limits. Protect live root systems adjacent to, but outside of, the clearing limits.
Close-cut and remove potential hazards, such as leaning trees (alive or dead), and snags within the right-of-way as directed by the Project Manager.
Coordinate clearing, grubbing, or clearing and grubbing with the grading work to meet the approved erosion control plan in Subsection 208.03.2. Backfill or grade depressions caused by grubbing to drain. Construct temporary settling basins where scour may occur.
The Project Manager will stake the construction limits for cuts, fills, channel changes, ditches, fence lines, utility relocation, roadside development areas, selective thinning for sight distance, grubbing, and similar areas to establish clearing and grubbing limits.
201.03.2 Clearing
  Clear only within the staked construction limits.
  Cut off trees, stumps, brush, shrubs, and other vegetation to within 6 inches (155 mm) of the
  ground. Fell trees without endangering traffic and injuring trees or objects not designated for
  removal.
  Remove dead vegetation, logs, stumps, limbs, sticks, sawdust piles, rubbish, debris, and
  other undesirable matter from areas where live shrubbery, brush, or trees are to remain in place.
  Merchantable timber is the property of the Contractor.

201.03.3 Grubbing
  Grub only within the staked construction limits.
  Remove all stumps, roots, logs, timber exceeding 3 inches (75 mm) in diameter, and all
  brush, matted roots, and other debris within the grubbing limits to at least 12 inches (305 mm)
  below the original ground surface.
  Grubbing items that do not extend more than 6 inches (155 mm) above the ground line that
  are to be covered with at least 4 feet (1.2 m) of subgrade or slope embankment may remain.

201.03.4 Clearing and Grubbing
  Clear and grub meeting Subsections 201.03.2 and 201.03.3 requirements.

201.03.5 Disposal
  Dispose of all brush, stumps, windfalls, slash, timber having no commercial value, and all
  other debris from clearing, grubbing, clearing and grubbing, or other operations to meet all local,
  state and federal requirements at Contractor expense.
  Furnish the Project Manager a written statement detailing where non-salvageable treated
  timber was disposed of.

A. Burning
  Burn materials meeting the State of Montana Open Burning Regulations
  administered by the Air Quality Bureau of the Montana Department of Health and
  Environmental Sciences, and all other applicable local, state and federal rules and
  regulations. The general requirements of the Montana Open Burning Regulations
  regarding burning season and permits are described below.

  1. Permits. Obtain an open burning permit from the Air Quality Bureau during the open
     burning season when burning more than 100 acres (40.5 ha) of forest residue per
     year.
     When burning near public lands during the fire season (May 1 through September
     30, or as extended), obtain a burning permit from the local, state or federal fire
     protection agency having jurisdiction.

  2. Open Burning Season. The open burning season for forestry slash is from March 1
     through November 30. Open burning is not allowed during December, January, or
     February. Burning from September 1 through November 30, on a day-to-day basis is
     subject to ventilation conditions available from the Air Quality Bureau, at 1-800-225-
     6779. Obtain the ventilation conditions daily before burning.

  3. Burning Methods and Instructions. Burning by the Air Curtain Destructor or Forced
     Air methods are encouraged.
     Obtain the Project Manager's approval for burning pits located within the right-of-
     way limits. Dispose of all pits, ashes, and debris meeting Subsection 201.03.5(B).
     Locate burning pits at least 100 feet (30.5 m) from free-flowing water or areas where
     ditches are to be constructed. Locate pits and incinerators to prevent fire damage or
     hazard to surrounding vegetation or structures. Contact local fire protection agencies
     before the start of any burning.
Provide 24 hour monitoring of all burning.

B. Disposal of Other Material. Obtain the Project Manager's approval to incorporate non-hazardous solid material into the work for constructive use.

Dispose of material not incorporated into the work at Contractor expense.

201.04 METHOD OF MEASUREMENT
Measurement for clearing, grubbing, or clearing and grubbing is by either of the following methods.

201.04.1 Lump Sum Basis
Clearing, grubbing, and clearing and grubbing are measured by the lump sum. Disposal of the material is not measured for payment.

201.04.2 Area Basis
Measurement is by the acre (ha) for the area actually cleared, to the nearest 0.1 acre (0.1 ha) to the limits in the contract or as staked by the Project Manager. Disposal is not measured for payment.

201.05 BASIS OF PAYMENT
Payment for the completed and accepted quantities is made under the following:

<table>
<thead>
<tr>
<th>Pay Item</th>
<th>Pay Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clearing</td>
<td>Lump Sum or Acre (hectare)</td>
</tr>
<tr>
<td>Grubbing</td>
<td>Lump Sum or Acre (hectare)</td>
</tr>
<tr>
<td>Clearing and Grubbing</td>
<td>Lump Sum or Acre (hectare)</td>
</tr>
</tbody>
</table>

Payment at the contract unit price is full compensation for all resources necessary to complete the item of work under the contract.

201.05.1 Lump Sum Basis
Payments will be prorated for the percentage of completed work for each item listed as a lump sum item in the contract.

201.05.2 Area Basis
No payment is made or allowed for any areas not actually cleared (i.e. present traveled way, paved surfaces, etc.)

201.05.3 Reserved

201.05.4 Exclusion
When the contract does not contain a pay item for clearing, grubbing, or clearing and grubbing, the work is incidental to and included in payment for other items of work.
SECTION 202
REMOVAL OF STRUCTURES
AND OBSTRUCTIONS

202.01 DESCRIPTION
Remove and dispose of all structures and obstructions not designated to remain or to be
removed and disposed of under other items of the contract.

202.02 RESERVED

202.03 CONSTRUCTION REQUIREMENTS
Raze, remove, and dispose of all buildings, foundations, structures, fences, debris, and other
obstructions on the right-of-way, excluding utilities. Remove and transport specified salvage
material designated to remain property of the Department, without damage, to the specified
locations. Obtain the Project Manager’s written permission to use any salvaged materials.
Dispose of unusable combustible material under Subsection 201.03.5(A). Dispose of
unusable noncombustible material under Subsection 201.03.5(B). Backfill cavities caused by
removing structures and obstructions level with the surrounding ground and compact the backfill
under Subsection 203.03.3.
Install the necessary traffic control devices when removing and transporting structures to
maintain traffic in the work area.

202.03.1 Removal of Bridges and Major Drainage Structures
A. Removal of Superstructures. Repair or replace all damaged or destroyed members,
pins, nuts, and plates from steel or timber structures designated to be salvaged at
Contractor expense.
Match-mark all members to be salvaged with paint before dismantling. Similarly mark
all pins, nuts, and plates to indicate their location in the structure. Paint all pins, pin holes,
and machined surfaces with a zinc-rich paint, and wire all loose parts to adjacent
members or pack in clearly marked boxes showing the contents and index-numbered for
identification.
B. Removal of Substructures. Remove substructures above the ground surface to 3 feet
(915 mm) below the finished ground surface. Remove or cut off piles and substructures
1 foot (305 mm) below the streambed. Shape and contour removal areas to blend with
the surrounding terrain.
Do not damage new work removing existing structures.
C. Disposal of Materials Removed.
1. Structural Steel. Store salvaged structure members and all steel beams above the
ground on skids at the designated sites.
2. Concrete and Masonry. Use concrete and masonry removed from old structures in
backfills or approach embankments under Section 203. Dispose of concrete or
masonry not placed in backfills or embankments at Contractor expense. Remove all
contract related concrete rubble from streams.
3. Timber and Other Materials. Store all salvageable timber or other salvaged
materials above ground on skids at the designated sites.
D. Disposal of Temporary Structures. Remove and dispose of all temporary structures
under 202.03.1(C).
202.03.2 Removal of Pipe Culverts and Minor Drainage Structures

Remove and salvage pipe culverts and minor drainage structures as specified in the contract. Replace lost or damaged salvaged material at Contractor expense.

202.03.3 Removal of Pavement, Sidewalks, Curbs, Etc.

Remove and dispose of all existing bituminous or portland cement concrete pavement, sidewalks, curbs, etc. to be removed unless otherwise specified. Process, handle and transport these materials to utilize them in embankments on the project, or crush, screen, mix and otherwise process for use as base or traffic gravel as approved or dispose of them as solid waste in conformance with applicable laws, rules, regulations and the Montana Solid Waste Management Act.

Existing pavement used for embankment or base gravel must meet the specifications for the particular item. Process the material to be used as embankment to a maximum 6-inch (150 mm) size in its largest dimension. Do not place the removed bituminous pavement in ephemeral drainage’s nor within 100 feet (30 m) of standing water and groundwater wells.

Include all costs of this work in the unit price for the applicable contract item.

202.04 METHOD OF MEASUREMENT

202.04.1 Remove Structures and Obstructions

Remove structures and obstructions is measured by the lump sum or each and includes the removal and disposal of all structures and obstructions encountered within the right-of-way.

202.04.2 Pipe Culvert Removal or Remove and Relay

The pipe length is measured in feet (meter) to the nearest foot (305 mm), in place before removal.

202.05 BASIS OF PAYMENT

Payment for the completed and accepted quantities is made under the following:

<table>
<thead>
<tr>
<th>Pay Item</th>
<th>Pay Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remove Structures and Obstructions</td>
<td>Lump Sum or Each</td>
</tr>
<tr>
<td>Remove Pipe Culvert</td>
<td>Foot (meter)</td>
</tr>
<tr>
<td>Remove and Relay Pipe Culvert</td>
<td>Foot (meter)</td>
</tr>
</tbody>
</table>

Payment at the contract unit price is full compensation for all resources necessary to complete the item of work under the contract.

When the contract does not contain estimated quantities or lump sum items for removal and disposal of structures and obstructions, the work is incidental to and included in payment for other items of work.
SECTION 203
EXCAVATION AND
EMBANKMENT

203.01 DESCRIPTION
This work is the excavation, placing, compacting and disposal of material encountered within the construction limits necessary to construct the project.

203.01.1 Excavation
A. Unclassified Excavation. Unclassified excavation is excavating and disposing, when required, of material from the right-of-way or construction easement areas except borrow excavation and muck excavation as defined in Subsection 203.01.1.

B. Borrow Excavation.
1. Unclassified Borrow. Unclassified borrow for embankment construction is Contractor furnished excavation from outside the right-of-way or construction easement areas.
   Use Department approved sources meeting current environmental and cultural resource preservation regulations.
   Material from a Department-optioned or Department-owned borrow source may be available at no cost. For Contractor-furnished sources, the haul distance is measured for payment under Subsection 206.04.
   The applicable provisions of Subsections 102.06 and 106.02 apply to unclassified borrow.
2. Special Borrow. Special borrow is excavation from designated sources or from other approved sources.
   Subsection 203.01.1(B)(1) and the applicable provisions of Subsection 106.02 apply to special borrow.

C. Unclassified Channel Excavation. Unclassified channel excavation is excavating and disposing of all materials from new watercourses or channels and the widening, deepening, or straightening of existing channels.

D. Street Excavation. Street excavation is excavating all material to the street template.

E. Muck Excavation. Muck excavation is removing and disposing of unstable material below subgrade elevation in cut sections or below the natural ground line in embankment sections.
   Material is considered unstable if:
   1. It contains saturated or unsaturated mixtures of soils and organic matter unsuitable for foundation material, regardless of moisture content; and
   2. If it cannot be excavated using the same equipment and methods as for unclassified excavation.
   If a grade line is adjusted, the difference between the staked or plan lines and adjusted grade lines is not muck excavation unless unstable material is encountered at or below the final grade line. Topsoil removed below the natural ground line in embankment sections is muck excavation if the material is determined unstable and cannot be excavated using the same equipment and methods for unclassified excavation.
   Excavated unstable material areas will be cross-sectioned before they are backfilled.
   Do not place fill over unstable foundation soils without the Project Manager's approval. Materials placed before approval may be ordered removed and replaced at Contractor expense.
F. **Sub-excavation.** Sub-excavation is removing unsuitable material from below the plan subgrade elevation as shown or directed.

203.01.2 Embankment

Place and compact excavation in roadway embankments, dikes, areas where unsuitable material is removed, holes, pits, and other roadway depressions. Prepare embankment foundations, obtain embankment material from the designated roadway, drainage, structure, culvert, or borrow excavation.

203.02 RESERVED

203.03 CONSTRUCTION REQUIREMENTS

203.03.1 Excavation

A. **General.** Do not begin excavation, grading, and embankment operations before the area is cleared of vegetation and obstructions under Sections 201 and 202 and erosion controls are placed as specified in the contract.

   Excavate without disturbing material and vegetation outside of the slope limits.

   Use all suitable material removed from the excavation in embankments, subgrade, shoulders, topsoiling, and other designated locations. Excavated material not used as specified or directed is not paid for.

   Sequence excavation of backfill or road finishing material so it is placed into final position as soon as possible. Stockpile suitable material that is not immediately used.

   Construct temporary fencing to restrict livestock and vehicular traffic from the work under Subsection 607.03.5.

   Replace temporarily removed fence and repair damaged fence to a condition equal to the existing fence at Contractor expense. Confine livestock when fencing is disturbed.

   If excavated material from the roadway prism is used outside the embankments, furnish and place at Contractor expense, an equal quantity of borrow to replace the material.

   Compact the top 8 inches (205 mm) of the subgrade in cut sections under Subsection 203.03.3.

   Place special borrow in layers immediately below the subgrade surface on embankments and through cuts as specified.

B. **Rock Blasting.**

1. **General.** Use and store explosives under Subsection 107.09.

   Use current technology in rock blasting to prevent slides, minimize overbreak, and provide smooth cut slope faces free of loose or fractured rock. Design the ignition sequence and blasting pattern with delays to produce maximum relief to the holes nearest the cut slope face.

   Temporarily suspend blasting operations if the specified slopes are not produced, nearby residences, structures, utilities, or appurtenances are endangered, or the safety and convenience of the traveling public is jeopardized by fly rock, fragmentation, vibration, air blast, or overbreak.

2. **Blasting Plan.** Submit the blasting plan before drilling and blasting operations begin and when there is a change in the proposed drilling and blasting methods. Submit the blasting plan on form CSN-55, available from the Project Manager, with the following information:

   a. Station limits of proposed blast;
b. Plan of proposed drill hole and delay pattern including free face, burden, and spacing; and

c. Report of hole depth, diameter, burden, spacing, stemming, explosive types, powder factor, and delays.

The blasting plan is to reflect a blast design that provides for the proper drilling and blasting procedures to produce the specified results.

Revise the drilling and blasting methods as necessary to produce the specified results.

3. Scaling. Scale all loose or detached rock and soil masses that create a potentially dangerous situation to the work, workers, or the public. Remove the rock by barring, wedging, equipment, or using light explosive charges. Scale during or after each lift is completed. Scaling and disposing of the scaled materials is incidental to unclassified excavation.

4. Pre-splitting Rock Slopes.
   a. General. Pre-split rock cuts to a smooth plane using loaded, timed, and spaced drill holes.

   Produce a continuous or semi-continuous fracture between drill holes and a stable rock cut by eliminating overbreak in the backslope during primary blasting. Detonate pre-split holes before detonating the production holes.

   b. Drilling. Use drills equipped with mechanical devices that accurately determine the angle the drill steel enters the rock. Do not drill if the devices are missing or inoperative.

   Remove overburden soil and loose or decomposed rock along the top of the excavation to produce a smooth rock surface for drilling.

   Use pre-split hole diameters that are between 2 1/2 inches (64 mm) and 3 inches (75 mm). Drill pre-split holes within 3 inches (75 mm) of the staked collar location. Holes drilled outside the 3-inch (75 mm) tolerance will be rejected and not measured for payment. Drill hole intervals may vary between 24 inches (610 mm) and 36 inches (915 mm). A 30-inch (765 mm) interval is used to estimate the measurement of pre-split contract quantities.

   When the cut height exceeds 30 feet (10 m), an offset from the staked slope line, not to exceed 2 feet (610 mm) is allowed at the top of each lift after the top lift. The actual slope cannot deviate from the plan slope by more than 2 feet (610 mm).

   Control the drilling operations to insure that no hole deviates from the slope plane by more than 9 inches (230 mm) parallel or normal to the slope. Pre-split holes exceeding these limits will not be paid for.

   Drilling 2 feet (610 mm) below ditch bottom to aid removing the toe berm is permitted.

   Extend pre-split holes a minimum of 30 feet (9.2 m) beyond the limits of the production holes or to the end of the cut.

   Maintain the length of pre-split holes for any individual lift at no more than 30 feet (9.2 m). The Project Manager may approve a written request to increase the hole length to a maximum of 60 feet (18.3 m) if it is demonstrated that the above pre-split hole tolerances and a uniform slope can be obtained. If over five percent of the pre-split holes are misaligned in any one lift, reduce the lift heights until the 9-inch (230 mm) tolerance is met.
c. **Blasting.** Verify that the drill holes are free of obstructions for their entire depth before placing charges. Take precautions to prevent material from entering the drill holes while placing the charges.

    Drill hole conditions may vary from dry to water filled. Use the type or types of explosives and blasting accessories for the conditions encountered following the manufacturer's recommendations.

    Use explosives with a maximum diameter no more than one-half the diameter of the pre-split hole. Do not use bulk ammonium nitrate and fuel oil in the pre-split holes. Use only standard explosives manufactured specifically for pre-splitting.

    If fractional portions of standard explosive cartridges are used, firmly affix them to the detonating cord to prevent the cartridges from slipping down the cord or bridging across the hole. Space fractional cartridges along the length of the detonating cord at maximum 30-inch (765 mm) centers and adjust spacing to produce the specified results.

    Assemble and affix continuous column cartridge type explosives to the detonating cord following the explosive manufacturer's instructions. Furnish the Project Manager these instructions 24 hours before blasting begins.

    The pre-split hole bottom charge may be larger than the line charges if it does not cause overbreak. Reduce the top charge of the pre-split hole and place it far enough below the collar to avoid overbreak and heaving.

    Stem the upper 3 feet (915 mm) of all pre-split holes below the hole collar with sand or other dry, angular granular material passing a 3/8-inch (9.5 mm) sieve.

    The Contractor may pre-split the slope face before production drilling or pre-split the slope face and production blast at the same time, if the pre-split drill holes are fired simultaneously at least 100 milliseconds before the production blast. Do not delay pre-split holes more than 25 milliseconds, hole to hole, to reduce noise and ground vibration.

    Do not vary the pre-split slope face by more than 1 foot (305 mm), measured perpendicular to the slope, from a plane passing through adjacent drill holes unless otherwise directed.

5. **Production Blasting.** Drill the row of production blast holes adjacent to the pre-split blast line on a plane parallel to and no closer than 6 feet (1.8 m) to the pre-split blast lines. Do not drill the production hole bottoms lower than the pre-split hole bottoms and with a diameter not greater than 6 inches (155 mm).

    Detonate production holes on a delay sequence toward a free face.

    Stem production holes a minimum of 3 feet (915 mm) or 0.7 times the burden distance, whichever is greater, with sand or other dry, angular granular material passing a 3/8-inch (9.5 mm) sieve.

    Perform production blasting to minimize blast damage to the backslope.

    Production blasting is incidental to and included in the measurement and payment for unclassified excavation.

C. **Rock Excavated Below Grade.** Excavate all un-yielding materials that require blasting or the use of rippers to at least 6-inches (155 mm) below subgrade within the roadbed limits. Backfill the excavation with specified or approved material. Remove or drain surface rock pockets that trap or pond water.

    Rock, removed to a maximum depth of 6 inches (155 mm) below subgrade is measured and paid for as unclassified excavation. Rock removed or backfilling due to over excavating in excess of the 6 inches (155 mm) with approved backfill material is at Contractor expense.
D. Removing Excess Moisture. Rework materials from excavation or borrow areas exceeding two percent of optimum moisture to the specified optimum moisture before use in embankments or as backfill. Costs to remove excess moisture from the material is incidental to the embankment.

Remove excess moisture in the finished roadbed soil, introduced or caused by construction operations, for re-use in the work at Contractor expense. Excessively wet material, caused by the construction operations that cannot be properly compacted must be removed and replaced with suitable material at Contractor expense.

E. Borrow Material. Excluding special borrow, borrow material may be used only after the roadway excavation has been placed in the embankment. If excess borrow is placed creating a waste of excavation, the waste quantity will be deducted from the measured volume in the borrow area.

Provide the Project Manager five calendar days notice before excavating material from the borrow area so that cross sections may be taken. Do not excavate beyond the dimensions and elevations established for the borrow areas. Finish and shape all borrow areas to permit accurate measurements. Reclaim borrow areas meeting Subsection 106.02.5 requirements

F. Step or Roughen Slopes. Step or roughen slopes as directed. Horizontally step cutslopes, excluding rock slopes that cannot be excavated by ripping, approximately 1 foot to 2 feet (305 by 610 mm) wide by 1 foot to 2 feet (305 to 610 mm) in height. Extend the steps the continuous length of the slope, even if the slope decreases to less than 2:1.

Start the steps immediately below the backslope rounding. Cut each step opposite in direction of the preceding cut.

Leave loose material deposited on the steps during construction. Stepped slopes are not topsoiled. Seed the completed sections of the stepped slope daily.

203.03.2 Embankment

A. General. Do not place stumps, trees, logs, rubbish, vegetation, muck, frozen material, pockets of rock, or other deleterious materials in embankments.

Spread sod mixed with surface soil and soil containing excessive humus or other organic materials over the embankment slopes or incorporate it into the embankments outside of the shoulder lines.

Compact embankment, backfill, and embankment foundation areas under Subsection 203.03.3.

Leave the surface of completed embankments in a roughened condition.

B. Embankment at Structures. Do not place rocks, broken concrete, or other solid material in areas where piling is to be driven.

Do not place embankment against any backwall or abutment until the concrete has cured for 10 days or has reached 70 percent of the required strength. Furnish a certified laboratory test report showing the field-cured cylinders meet the required strengths.

The Project Manager may approve early embankment work at backwalls or abutments with beams or girders in place, or that are cantilevered from a fixed footing or cap if the strength requirement is met.

Do not place embankment against un-supported backwalls or U-shaped abutments rigidly connected to the deck until the deck is placed and cured meeting the applicable requirements of Section 552.

The Contractor may submit a method of supporting the structure to permit early placement of embankment against the structure. If approved, all costs of the alternate method are at Contractor expense.
Place embankment in 8-inch (205 mm) maximum layers loose thickness and compact adjacent to structures, around columns and similar structural supports, and on both sides of concrete walls, box type structures, and similar structures. Extend embankment material placed above the excavation limits or ground line a minimum 10 feet (3 m) from the structure or structural support.

Restore, repair, or replace structures or structural members moved or distorted by placing and compacting embankment at Contractor expense.

Compact embankment inaccessible to rollers by mechanical tampers to the density specified in Subsection 203.03.3.

Before placing and compacting backfill, compact at least the top 8 inches (205 mm) of the existing ground under Subsection 203.03.3.

C. Preparation of Embankment Foundations. Bench all embankments placed and compacted on hillsides, against existing embankments; built one-half width at a time, or on slopes 6:1 or steeper when measured at right angles to the roadway centerline. Construct benches in minimum 4-foot (1.2 m) width. Maintain the horizontal inclination within 5 percent of horizontal. Backfill and compact each bench in maximum 8-inch (205 mm) layers.

Excavate each bench as close to each other as the slope permits. Use approved material excavated from benches in the embankment.

In excavation to embankment transitions where the natural ground slope exceeds 6:1, construct the excavated benches so the natural ground surface is a minimum 12 inches (305 mm) from the top of the subgrade.

Remove frozen earth, snow and ice from the cut or embankment surface and place it outside the slope stakes at Contractor expense. Remove and dispose of this material at least 300 feet (91.5 m) ahead of the excavation and placing of the embankment.

Remove and waste frozen material, and provide the replacement borrow material at Contractor expense.

Clear the full width of the subgrade of sod and vegetative matter. Scarify the top 8 inches (205 mm) of the subgrade, water, and compact under Subsection 203.03.3 before constructing embankments 4 feet (1.2 m) high or less, or embankments placed on soils having less than 90 percent maximum density, determined by MT-210.

If lightly compacted soils are encountered that exceed 8 inches (205 mm) in depth, remove it to the depth directed. Compact the upper 8 inches (205 mm) of the ground under Subsection 203.03.3. Place the removed material in the embankment or use it for topsoil as directed. Material useable as topsoil may be placed alongside the roadway after compaction is completed.

Whenever a compacted road surface is within 3 feet (915 mm) of the subgrade, scarify the top 8 inches (205 mm) and re-compact under Subsection 203.03.3.

D. Earth Embankment. Place earth roadway embankment in uniform horizontal layers not exceeding 8 inches (205 mm) loose measurement and compact under Subsection 203.03.3. Continuously level, work, and maintain moisture to compact to the specified density. Uniformly work the entire surface of each layer.

Work each layer of earth embankment using a tandem type construction disk with a maximum disk spacing of 14 inches (355 mm) and a minimum worn disk diameter of 25 inches (635 mm). Larger disks may be used if the ratio of disk spacing to disk size is comparable to the above dimensions. Leave the embankment slopes in a roughened condition.

E. Rock Embankment. When the excavated material contains more than 25 percent rock by volume, 6 inches or larger (155 mm) in its greatest dimension, place the embankment
in layers 2 inches (50 mm) thicker than the maximum size rock in the material not to exceed 24 inches (610 mm) loose thickness.

Individual rocks and boulders larger than 24 inches (610 mm) in diameter may be placed in the embankment if the rocks do not exceed 48 inches (1.2 m) vertical height after placement, are evenly distributed, and are spaced to allow placing and compacting of the soil in horizontal layers.

Place and compact the upper 2 feet (610 mm) of the embankment in maximum 8-inch (205 mm) layers loose thickness as specified in Subsection 203.03.2(D).

Dump and work rock from excavations to the stream face when the embankments are adjacent to streams or channels. Prevent the rock from entering the stream. This work is incidental to unclassified excavation.

**F. Embankment Over Swampy Areas.** On low, swampy ground incapable of supporting haul equipment, construct the lower part of the embankment by dumping successive loads of uniformly distributed material in layers thick enough to support the equipment. Place subsequent layers under

**G. Disposal of Unsuitable or Excess Material.** Place excess or unsuitable excavated material, including rock and boulders, not useable in embankments in the side slopes of the nearest fill as directed. Dispose of excess or unsuitable material that cannot be incorporated into side slopes at Contractor expense. Slope and shape all disposal areas to blend into the surrounding terrain and meet the requirements of Subsections 106.02.5 and 107.11.

**203.03.3 Moisture and Density Requirements**

Compact each layer of material to the in-place density requirements of Table 203-1 for the method of moisture and density control used. The moisture and density control is the Proctor method or the Zero Air Voids method, determined by the Project Manager.

If proctors are used for density control, the Contractor may make a written request to the Engineer to compact the soils at a lower moisture content. Identify the soil class in the request. The Engineer may approve the request provided a Department investigation ensures the lower moisture content is not detrimental to compaction of the soil class.

For A-1 material in embankments, MT 218 and MT 230 tests are used.

Compact safety slope embankments to a minimum 90 percent of maximum density with no optimum moisture requirement. The safety slope is the embankment placed from an existing shoulder to a catch point on the original ground not supporting any portion of the surfacing.

Compact rock embankments that cannot be tested by Montana Test Methods MT-212, MT-215, and MT-218 (Proctor Method) or MT-229 (Zero Air Voids Method) with compaction equipment and hauling and spreading equipment. Use grid rollers, pneumatic-tired rollers, vibrating rollers, vibrating compactors, or self-propelled tamping rollers. Do not use sheepfoot rollers unless approved. Use water as required.
TABLE 203-1

COMPACTION REQUIREMENTS

<table>
<thead>
<tr>
<th>Material Compacted</th>
<th>Proctor</th>
<th>Zero Air Voids</th>
</tr>
</thead>
<tbody>
<tr>
<td>Earth Embankment Including All Backfills</td>
<td>Test Methods: MT-210 or AASHTO T99, MT-212, MT-215, MT-218</td>
<td>Test Method: MT-229</td>
</tr>
<tr>
<td>Top 8 Inches (205 mm) of Subgrade in Cut Sections Culvert Foundations</td>
<td>Minimum 95% of Maximum Density at Optimum Moisture ± 2%</td>
<td>Less than 10% Air-filled Voids</td>
</tr>
<tr>
<td>Top 8 Inches (205 mm) of Embankment Foundations and Backfill Foundations</td>
<td>Minimum 90% of Maximum Density at Optimum Moisture ± 2%</td>
<td>Less than 16% Air-filled Voids</td>
</tr>
</tbody>
</table>

203.03.4 Sloping and Finishing

A. Sloping. Finish and shape all cut slopes, ditches, embankments, and structure berms to a uniform, rough textured surface, except for stepped slopes. Scarify smooth slopes.

Conduct slope roughening in accordance with the plans and detailed drawings. Slope roughening is a part of slope construction and is not measured for payment.

Where roadway slopes are not completed to the planned or directed lines and the material from the backslope erodes, sloughs, or slides due to incomplete erosion control measures or the Contractor's operations, the removal of the material and restoration of the slope is at Contractor expense.

Where roadway slopes are completed to the plan or directed lines, all required erosion control devices are in place as specified, and the material from the completed slopes erodes, sloughs, or slides onto the roadway prism before final acceptance of the work, through no fault of the Contractor, the removing of the slide material, potential slide material, and the drainage excavation is paid for at an agreed unit price or on a force account basis under Subsection 109.04.

When directed, widen cuts and flatten slopes to obtain additional excavation for embankments or to increase slope stability. The Project Manager may steepen stable rock slopes. This work is measured and paid for as unclassified excavation unless it requires non-contract construction methods increasing costs that are considered extra work under Subsection 104.03.

B. Finishing. Finish the entire roadbed to the final elevations specified. Do not place organic, or other deleterious material in the top 4 inches (105 mm) of the roadbed surface. Remove and dispose of partly buried oversize material not passing a 4-inch (105 mm) square-mesh screen from the roadbed surface. Finish the grade so it does not deviate more than 0.1 foot (30 mm) at any point from the staked elevation, and so the sum of the deviations from the true grade of any two points not more than 30 feet (9.2 m) apart do not exceed 0.1 foot (30 mm).

203.03.5 Maintenance of Constructed Roadway

Maintain the roadway during construction so it is continuously well drained. Prevent erosion damage to embankments and stream siltation under Section 208. Keep all drainage ditches and structures open and free from debris until final acceptance.
If grading work is suspended, blade smooth and grade the entire roadway area to prevent water from collecting or ponding on the roadway. Maintain the roadway during suspension periods to the specified grade and cross section at Contractor expense.

Maintain erosion and siltation control devices meeting the contract requirements at all times.

203.03.6 Topsoil - Salvaging and Placing

Remove sufficient amounts of topsoil from the excavation and embankment foundations to ensure replacement quantities are available to cover all disturbed areas with four inches (100 mm) of topsoil.

Place topsoil on the completed graded roadway to the lines, grades, and elevations specified.

Unless directed by the Project Manager, place topsoil on all slopes, excluding slopes 2:1 or steeper. Place topsoil to an average 4-inch (100 mm) loose depth on the base course surfacing inslope. Uniformly spread what is available over the remainder of the disturbed areas.

Stockpile topsoil at acceptable selected locations within the right-of-way. When construction operations do not permit stockpiling within the right-of-way, make arrangements for stockpile sites outside the right-of-way at no additional cost to the Department.

Construct stockpiles so drainage is maintained and topsoil is easily reclaimed. Provide erosion controls following best management practice.

In the event that construction sequencing prevents replacement of topsoil over all disturbed areas prior to final paving, reserve adequate quantities to cover the exposed base course surfacing inslope as shown in the Detailed Drawings.

203.04 METHOD OF MEASUREMENT

203.04.1 Excavation

The quantities of unclassified excavation, unclassified borrow excavation, special borrow, unclassified channel excavation, street excavation, subexcavation, and muck excavation for payment is the staked quantities calculated in cubic yards (cubic meters) under Subsection 109.01.

The Department will provide the initial measurement at no charge for the following specific work areas:

1. In slide areas determined by the Department not to be the fault of the Contractor;
2. In excavated areas authorized by the Project Manager, outside the staked lines and grades; and
3. In un-staked areas such as borrow areas, muck excavations, sub-excavations, and un-staked excavations authorized by the Project Manager.

These areas of excavation and borrow are measured in their original position under Subsection 109.01.

Either the Department or the Prime Contractor may request re-measurement of specific work areas, or the entire project, if there is disagreement over the accuracy of quantities computed from the staked lines and grades. The party requesting the re-measurement is responsible for all costs associated with the re-measurement. Department staff may perform the re-measurement, in which case, the rate for determining the costs for performing the work are based upon the original contract amount, and the daily charge established in Subsection 108.08, Table 108-1. An independent third party acceptable to the District Construction Engineer, and under the direction of a professional land surveyor registered in Montana, may also be used to perform the re-measurement.
Excavation requiring more than one handling before placement may be eligible for additional payment if approved by the Project Manager in advance of the second handling. The second handling of the material will be measured and paid for under the appropriate item of work.

Authorized excavation of rock, shale, muck, or unsuitable material below grade necessary to provide the designed thickness of backfill is measured for payment. If the designated bottom plane of the excavation falls within a layer of rock, the below-grade excavation to the bottom of the layer, not exceeding 6 inches (150 mm) below grade, is considered authorized and is measured for payment.

Rock excavation exceeding 6 inches (150 mm) below grade is not measured for payment. If the nature of the material, the thickness of the layers or strata, and method of operations make it practical to excavate only to the plan depth, any material removed below plan depth is not measured.

Measurements are made for unusable materials excavated and removed.

Useable material temporarily removed and replaced for Contractor convenience is not measured for payment.

Removal and disposal of unusable materials from borrow areas is not measured for payment. Special borrow removed from areas before staking is not measured for payment.

The actual quantities of plan and approved sub-excavation are measured and added to the quantities of unclassified excavation for payment.

Material authorized for removal that cannot be excavated by the methods used for the unclassified excavation is measured and paid for as muck excavation.

Muck excavation reworked under Subsection 203.03.1(D) is measured and paid for as unclassified excavation for the second handling.

Hauling muck excavation to the disposal areas is measured and paid for as haul under Section 206.

When the contract does not contain a bid item for muck excavation and an area is determined unstable under Subsection 203.01.1(E), the muck excavation quantity is measured and paid for at an agreed price or force account basis under Subsection 109.04. Measurement and payment for muck excavation at the agreed price includes all excavating and hauling, disposing of all stumps, logs, and other debris encountered in the excavation, all pumping and de-watering required, and finishing of the planned disposal areas.

Unclassified excavation allowed for pre-split drill equipment clearance is calculated from the area bounded by the plan slope and lines parallel to plan slope, offset 2 feet (610 mm) for each 50-foot (15.2 m) increment in vertical cut height. The quantity for drill equipment clearance where the cut slope height is less than 50 feet (15.2 m) is not measured for payment.

Excavation used as select or stockpiled select material is measured by the cubic meter in its original position.

Removed and placed stockpile material is measured using the volume in its original excavated position.

Where it is impractical to measure material by the cross-section method, alternate methods involving three-dimensional measurements may be used.

Channel excavation is measured and paid for as unclassified excavation.

Street excavation is measured and paid for as unclassified excavation unless the contract has street excavation as a bid item.
203.04.2 Drill Pre-splitting Holes
Drill pre-splitting holes are measured by the foot (meter). The measurement is made from the rock surface to the roadway grade or to a predetermined bench elevation. The quantity of drill pre-splitting holes shown in the contract is not guaranteed, and the Department reserves the right to increase or decrease this item with no adjustment in the contract unit price.

203.04.3 Embankment in Place
When the contract contains a bid item for Embankment in Place, all roadway excavation and construction of embankments is measured and paid for as embankment in place. The quantities measured in cubic yards (cubic meters) for payment as embankment in place include the following:
1. The actual quantities of roadway embankment measured, above the original ground line under Subsection 109.01, with no volume adjustments made for shrinkage, compaction, or subsidence.
2. The quantities of unsuitable or excess material used to flatten slopes, or otherwise disposed of, measured in its final position.
3. The topsoil replacement quantity, measured in the topsoil stockpiles.
4. Minor excavation and sub-excavation directed by the Project Manager in its original position.

203.04.4 Compaction
A. Volume Measurement Method. When roadbed compaction is specified in the contract, the quantity measured for payment is the quantity of excavation incorporated in the roadway, measured under Subsection 203.04.1, excluding wasted material.
   Road approaches, turnouts, wyes, and other similar facilities are included as part of the roadway. Measurement includes compaction of the natural ground cut sections under Subsection 203.03.3.
   Water to reach the specified moisture content and compactive effort is not measured for payment and is incidental to roadbed compaction.
   Compactive effort to obtain the specified densities includes scarifying, watering, aeration, and any other work to produce the finished roadbed and embankments.
B. No Bid Item for Compaction. When the contract does not contain an item covering compaction, all work and materials to compact embankment material to the specified density is not measured for payment.
C. Structure Backfill. When there is no item for mechanical tamping, the compaction is not measured and paid for but is incidental to other items in this Section. Compaction of structure backfill and at the ends of major structures is measured for payment if mechanical tamping is specified. Mechanical tamping is measured by the cubic yard (cubic meter) of backfill material and includes compaction of the ground below the backfill to a depth of 8 inches (205 mm).

203.04.5 Topsoil
Excavation of topsoil material from its original position, loading, hauling, stockpiling, and removal from the stockpile and spreading on the designated areas is measured for payment by the cubic yard (cubic meter) in the stockpile before final placement.
Before measurement, shape and smooth each stockpile into the smallest practical area. Haul is not measured for payment.
Topsoil removed from cut areas is not deducted from the unclassified excavation, roadbed compaction, or haul quantities.
Measurement is made as if the topsoil had not been removed.
Topsoil removed from embankment areas and from borrow areas, excluding Contractor-optioned under Section 106, is measured under the bid item Topsoil - Salvaging and Placing.

**203.05 BASIS OF PAYMENT**

Payment for the completed and accepted quantities is made under the following:

<table>
<thead>
<tr>
<th>Pay Item</th>
<th>Pay Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unclassified Excavation</td>
<td>Cubic Yard (cubic meter)</td>
</tr>
<tr>
<td>Unclassified Borrow Excavation</td>
<td>Cubic Yard (cubic meter)</td>
</tr>
<tr>
<td>Special Borrow</td>
<td>Cubic Yard (cubic meter)</td>
</tr>
<tr>
<td>Unclassified Channel Excavation</td>
<td>Cubic Yard (cubic meter)</td>
</tr>
<tr>
<td>Sub-excavation</td>
<td>Cubic Yard (cubic meter)</td>
</tr>
<tr>
<td>Muck Excavation</td>
<td>Cubic Yard (cubic meter)</td>
</tr>
<tr>
<td>Drill Pre-splitting Holes</td>
<td>Foot (meter)</td>
</tr>
<tr>
<td>Embankment in Place</td>
<td>Cubic Yard (cubic meter)</td>
</tr>
<tr>
<td>Roadbed Compaction</td>
<td>Cubic Yard (cubic meter)</td>
</tr>
<tr>
<td>Mechanical Backfill Compaction</td>
<td>Cubic Yard (cubic meter)</td>
</tr>
<tr>
<td>Topsoil - Salvaging and Placement</td>
<td>Cubic Yard (cubic meter)</td>
</tr>
<tr>
<td>Street Excavation</td>
<td>Cubic Yard (cubic meter)</td>
</tr>
</tbody>
</table>

Payment at the contract unit prices is full compensation for all resources necessary to complete these items of work under the contract.
SECTION 204
EXISTING SURFACE PREPARATION

204.01 DESCRIPTION
Existing surface preparation is reshaping the typical section and truing the grade line of a previously completed earth subgrade or gravel or bituminous-surfaced roadbed for new surfacing construction.

204.02 RESERVED

204.03 CONSTRUCTION REQUIREMENTS

204.03.1 Subgrade
Excavate and remove all areas in the roadway subgrade not meeting moisture and density requirements. Backfill the excavations with approved material.
Grade the entire subgrade surface to the specified lines and grades and compact under Subsection 203.03.3.
Grade the roadway ditches to drain. True shoulder lines and shape and slope roadway inslopes uniformly.
Maintain the subgrade surface until the surfacing is placed.

204.03.2 Aggregate Surfaces
Excavate, backfill, and re-compact all existing aggregate surfaces not meeting moisture and density requirements to the typical cross section and profile grade.
Complete compaction and surface smoothness using equipment meeting Section 210 requirements and meeting compaction and smoothness requirements in Subsection 301.03.5.

204.03.3 Bituminous Surfaces
Dispose of existing bituminous surface, designated to be removed, under Subsection 202.03.3.
Re-work all existing bituminous surfaces designated to remain in place as specified.
Before placing the leveling course, clean the existing surface of dirt and loose, extraneous material. Apply a prime or tack coat of bituminous material to the cleaned surface as specified.
Correct dips, depressions, sags, excessive or nonexistent crown, and other surface irregularities using a premixed bituminous mixture. Spread the mixture in 2 inch (50 mm) compacted layers.
Correct surface irregularities exceeding 6 inches (155 mm) deep using untreated aggregate material before leveling with a bituminous mixture.

204.04 METHOD OF MEASUREMENT
Existing surface preparation is measured under the respective contract items used in the work.
The materials and equipment required for existing surface preparation include, but are not limited to, aggregates for the subgrade and aggregate surfacing courses, bituminous material for prime and tack coats, bituminous-mixed surfacing for the leveling material, and watering and rolling.
Materials and equipment used to complete existing surface preparation, not incidental to, or included with other bid items in the contract, are measured and paid for on a force account basis under Subsection 109.04.
204.05 BASIS OF PAYMENT

Existing surface preparation is paid for at the contract unit prices for the material and equipment required to complete the work and on a force account basis for those items required but not having bid items.

The contract unit price paid for plant mix bituminous material spread for leveling includes the spreading, leveling, and compaction of the material.
SECTION 206
HAUL

206.01 DESCRIPTION
Haul is transporting excavation or aggregate surfacing material from its original location to its final location in the work.

206.02 RESERVED

206.03 RESERVED

206.04 METHOD OF MEASUREMENT

206.04.1 Excavation Haul
The haul distance for excavation material moved from:
A. Outside the roadway is measured along the shortest route determined by the Project Manager.
B. Within the roadway and placed inside the roadway is measured along the centerline of the roadway.

Haul is computed by multiplying the number of cubic yards (cubic meters) of excavation removed from its original position by the mean distance it is hauled. The distance between the center of volume of the excavation and the center of volume of the embankment is the haul distance.

Excavation and embankment volumes for ramps, frontage roads, road approaches, driveways, and connections on either side of the roadway is considered concentrated at the centerline or at a line parallel with the main roadway under construction for computing haul quantities for payment.

The number of cubic yards (cubic meters) hauled is determined by measuring the materials in their original position with no allowances for swell occurring when the materials are excavated and loaded into the haul units.

206.04.2 Aggregate Haul
Aggregate haul is measured by the ton-mile (metric ton-kilometer) or mile-cubic yard (kilometer-cubic meter) for haul of aggregate over an approved route. The number of ton-miles (metric ton-kilometer) or mile-cubic yards (kilometer-cubic meter) is the product of miles (kilometer) times tons (metric ton) or cubic yards (cubic meters) of material hauled. The haul distance is measured to the nearest 0.1 mile (10 m) along the shortest practical route from the loading point to the point where placed.

206.05 BASIS OF PAYMENT
Payment for the completed and accepted quantities is made under the following:

<table>
<thead>
<tr>
<th>Pay Item</th>
<th>Pay Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excavation Haul</td>
<td>Mile-Cubic Yard (kilometer-cubic meter)</td>
</tr>
<tr>
<td>Aggregate Haul</td>
<td>Ton-Mile (metric ton-kilometer) or Mile-Cubic Yard (kilometer-cubic meter)</td>
</tr>
</tbody>
</table>

Payment at the contract unit price is full compensation for all resources necessary to complete the item of work under the contract.

When not specified as contract pay item, haul is not measured or paid for but is incidental to and included in the payment for other items of work.
SECTION 207
CULVERT EXCAVATION AND TRENCH EXCAVATION

207.01 DESCRIPTION
This work is the excavation for placing or removing drainage and other appurtenant structures. It includes foundation preparation, backfilling, disposal of excavation material, bailing, drainage, sheeting, shoring and cribbing. Excavation classes are described below.

207.01.1. Culvert Excavation
Culvert excavation is all work under Subsection 207.01, where vertical walls are not required and the excavation width is not specified.

207.01.2. Trench Excavation
Trench excavation is the excavation for placing or removing storm drains, sanitary sewers, water lines, and other installations in the contract. Vertical trench walls, when required, must be shored or supported to meet the U.S. Department of Labor, OSHA, Safety and Health Regulations for Construction. Trench widths are specified in Subsection 207.03.3.

207.02 RESERVED

207.03 CONSTRUCTION REQUIREMENTS

207.03.1 General
Excavate to permit removal, jointing, and backfilling of pipe. Construct and maintain the excavations to prevent personal injuries, damage to foundations, structures, pole lines, or other facilities.

Pile and maintain all excavated material to meet OSHA requirements and with a minimum of inconvenience to the public. Do not obstruct fire hydrants, water valves, meters, and the free flow of storm water in gutters, other conduits, and natural water courses.

Do not excavate below the specified depth, except as permitted in Subsection 207.03.6. Remove all obstructions in the excavation at Contractor expense.

Backfill excavated areas to meet Subsection 603.03.4. Do not place backfill against newly constructed masonry or concrete structures for at least 14 days. Remove all sheeting and bracing before backfilling.

207.03.2 Culvert Excavation
When special foundation stabilization is specified, excavate the bedding trench walls vertically and the trench width to provide room for the bedding material.

207.03.3 Trench Excavation
Keep trench lengths to a minimum in paved roadways, sidewalks, or other improved areas, in advance of the pipe laying and not to exceed 200 feet (61 m). Keep trench backfilling and compaction to within 300 feet (91.5 m) of the installed pipe.

Cut the pavement full depth vertically along regular neat lines in paved roadways that require patching. Excavate the minimum trench width possible.

When vertical trench walls are specified, the maximum trench width is the external width of the pipe barrel plus 3 feet (915 mm). When a special foundation is specified, excavate the bedding trench walls vertically and the trench width as specified.

Do not exceed the specified trench width without the Project Manager's approval when vertical trench walls are specified.
Furnish any additional select backfill material and additional surface and subsurface improvements if the maximum trench width is exceeded at Contractor expense.

207.03.4 Excavation for Appurtenant Structures

Excavate for riprap, rubble masonry, retaining walls, headwalls, manholes, drop inlets, catch basins, headgates, division boxes, and other structures appurtenant to culverts, sewers, drains, pipes, or tubing to meet the applicable requirements of Subsection 207.03.1.

207.03.5 Shoring

Provide and remove shoring or supports for the excavation walls that protect the work, existing property, utilities, pavement, and other existing facilities. Provide safe working conditions meeting OSHA, local and state safety codes.

Repair damage caused from excavation support failure or from failure to provide support at Contractor expense.

207.03.6 Foundation Preparation

Compact foundations for culverts, sewers, drains, pipes, tubing, and appurtenant structures to the moisture and density requirements of Subsection 203.03.3.

Remove unstable or unsuitable material encountered below the excavation floor elevation and replace with material meeting Subsection 701.04.2. Cover with bedding material meeting Subsection 701.04.1 as directed. The Project Manager will investigate unstable pipe installations requiring 4 feet (1.2 m) or more of foundation material.

Remove unyielding material below the staked elevation to at least 12 inches (305 mm) and replace with bedding material meeting Subsection 701.04.

Bed culverts larger than 12 inches (305 mm) as shown in the Detailed Drawings. Place bedding for 12-inch (305 mm) diameter and smaller culverts to uniformly support the culvert throughout its length. The bedding does not need to conform to the outside of the culvert.

Do not lay pipe until the foundations are approved by the Project Manager. Remove and relay pipe laid on unapproved foundations at Contractor expense.

207.04 METHOD OF MEASUREMENT

Culvert excavation, trench excavation and excavation for bedding and foundation material are not measured for payment.

207.05 BASIS OF PAYMENT

Payment for all costs associated with culvert and trench excavation, furnishing and installing culverts is included in the contract unit price per foot (meter) of pipe (type and size).

When bedding or foundation material is specified in the plans, payment for all costs associated with excavation required to place bedding and foundation material is included in the contract unit price per cubic yard (cubic meter) of bedding or foundation material.
SECTION 208
WATER POLLUTION CONTROL AND STREAM PRESERVATION

208.01 DESCRIPTION
Water pollution control is the planning, scheduling, installation, maintaining and removal of measures and devices to prevent pollution, and control sediment transport and soil erosion.

208.02 MATERIALS
Use materials meeting commercial grade standards approved by the Project Manager if permanent and temporary materials are not specified.

208.03 CONSTRUCTION REQUIREMENTS

208.03.1 General
Comply with the Department of Fish, Wildlife and Parks, Department of Environmental Quality, and all other state or federal laws or regulations for preventing or abatement of erosion, water pollution, and siltation.
Prevent pollution and sedimentation of adjacent property, lakes, streams, rivers, ponds, wetlands, or other surface water according to Montana Department of Environmental Quality’s authorization to discharge under the Montana Pollutant Discharge Elimination System (MPDES) or the Environmental Protection Agency’s authorization to discharge under the National Pollutant Discharge Elimination System (NPDES) and associated Water Quality Discharge Permits.
Use temporary and permanent water pollution controls to provide economical, effective, continuous erosion and sediment control, and prevent pollution during and after completion of construction activities.
Plan and install BMP’s to preserve existing streambeds and stream banks.
Install temporary erosion and sediment control BMP’s prior to disturbing soil associated with fill placement. Install temporary erosion and sediment control BMP’s prior to, or concurrently with, other soil disturbance activities. When BMP installation is concurrent with the soil disturbance activity, limit the work to an area that can be protected by BMP’s no later than the same day the work is performed. Failure to install BMP’s within the same day will result in suspension of all work relating to those BMP’s.

208.03.2 Water Pollution Control
Submit to the Department of Environmental Quality an erosion control plan covering all construction areas to be disturbed outside the highway right of way 30 working days before starting work. During construction, follow the plan to prevent polluting and silting of state waters. Prevent chemicals, fuels, lubricants, bitumens, raw sewage, and other wastes from entering state waters. Dispose of all wastes, refuse, and discarded materials meeting Subsection 107.11.
Control erosion, siltation, and water pollution during all work suspensions.
Contractor failure to provide erosion and water pollution controls is cause for the Project Manager to provide the work and deduct those costs from monies due or that may become due the Contractor.
A. Water Pollution Control Plan. Submit a water pollution control plan at the pre-construction conference or 30 working days before work starts. The Department has 30
days to review the plan. Incomplete or illegible plans will be returned for correction and the 30-day review time begins upon receipt of the corrected plan.

Include the schedule for incorporating the permanent erosion control work and all temporary controls proposed for use during the work in the plan. Do not begin work that disturbs the natural ground until the plan is approved. Revise and update the water pollution control plan whenever the required controls differ from the approved plan. Submit all changes for review and approval.

Meet the contract requirements and follow the approved pollution control plan.

B. Temporary Pollution Control Measures. Install temporary erosion control before each construction stage.

Maintain all temporary erosion control until it is no longer needed or conflicts with the work. If devices that conflict with the work are removed, replace these devices at the end of each shift.

Re-grade temporary sites to match the surrounding terrain after the devices are removed.

Repair or replace damaged, inadequate, or non-functioning devices.

Temporary pollution control measures required due to the Contractor's negligence, carelessness, or failure to install permanent controls are at Contractor expense.

C. Permanent Pollution Control Measures. Install permanent pollution controls concurrently or immediately following work that disturbs natural ground.

208.03.3 Limitations on Grading Operations

The maximum area allowed to be disturbed at one time within the highway right-of-way is 750,000 square feet (69,750 square meters) of clearing and grubbing and 750,000 square feet (69,750 square meter) of borrow, excavation and embankment.

The Engineer may modify the 750,000 square feet (69,750 square meter) restriction when soil characteristics, Contractor operations or both, indicate that a smaller or larger area is acceptable. For long or complex projects, the Contractor may have several separate grading operations working, where the Engineer may apply the limit to each individual operation, provided finishing, mulching, and seeding closely follow the rough grading operations at each location. Use the specified pollution controls at each individual location.

208.03.4 Stream Protection

A. General. Meet the following general provisions unless the plan approved by the Department of Fish, Wildlife, and Parks under Subsection 208.03.4(B) is more restrictive:

1. Clear and grub adjacent to streams or associated wetlands meeting Subsections 201.03.2 and 201.03.3.
2. Do not operate mechanized equipment in any stream.
3. Do not spill or dump material from equipment into streams or associated wetlands.
4. Do not permit wash water from cleaning concrete related equipment or wet concrete to enter streams, riparian areas, or wetlands.
5. Do not place fill or embankment material in streams, streambeds, wetlands, or riparian areas.
6. Locate staging or storage areas at least 50 feet (15.2 m) horizontally from the highest anticipated water level during the construction period.
7. Store and handle petroleum products, chemicals, cement and other deleterious materials to prevent their entering streams and associated wetlands.
8. Provide sediment controls for drainage from topsoil stockpiles, staging areas, access roads, channels changes, and instream excavations.
9. Reclaim streambeds and streambanks as close as possible to their pre-disturbed condition.

B. Temporary Construction Facilities. Plan temporary construction facilities to:
   1. Minimize disturbance to streambank, streambank vegetation, streambed, and state waters;
   2. Not restrict or impede fish passage in streams; and
   3. Not restrict any water flow anticipated during use.

   Install, maintain, operate, and remove temporary construction facilities meeting the approved work plans within or adjacent to streambeds and for crossing streams, streambeds or state waters.

   Maintain constant progress once installation or removal work begins. Shape and contour areas disturbed by installation and removal to match adjacent undisturbed ground.

   Furnish plans meeting the Department of Fish, Wildlife, and Parks requirements for approval for work bridges, haul bridges, bridge removal, detours, and other temporary construction facilities. Include the following in the plans:
   a. Details of stream and streambank features before installing temporary construction features and after they are removed;
   b. Location of facilities relative to permanent work and streambanks;
   c. Plan and elevation views of facilities showing stream section;
   d. Anticipated high water elevation during use of the facilities;
   e. Waterway openings and clearances;
   f. Type of bridge bent, pier, and superstructure construction (wood, steel, concrete, etc.);
   g. Written description for installing, operating, and removing facilities; and
   h. Estimated time facilities are to be in place.

   Submit the plan to the Project Manager, who will forward two copies to the Department of Fish, Wildlife, and Parks for approval. Submit revised plans or modifications to approved plans. The Departments have 30 working days to review both the original and all plan modifications. Do not begin work on temporary construction facilities or modifications to approved plans until receiving written approval from the Department of Fish, Wildlife, and Parks.

   Defend, indemnify, and hold harmless the Department from legal actions or fines resulting from violations of the Stream Protection Act, Section 87-5-501 to Section 87-5-509 MCA, because of any act, omission, neglect, or Contractor misconduct.

C. Existing Bridge Removal. Furnish a plan and written description detailing how the existing bridge(s) are to be removed. Include in the description what methods and equipment are to be used to remove the bridge deck, superstructure, piers, footings, and end bents.

   Provide the anticipated start date of removal work and estimated time to complete the work.

   Include details of erosion control measures used during end bent removal.

   Remove all work debris from the waterway within 48 hours of completing the removal work.

   Maintain constant progress on all in-stream work until completed.

208.03.5 Temporary Seeding

Temporarily seed all disturbed soil areas not to be re-disturbed for 21 days or more by the 14th day after the last disturbance. Areas not requiring further disturbance may be permanently
seeded. Re-seed permanently seeded areas that fail to establish a sustainable growth at Contractor expense.

208.03.6 Inspections
Conduct inspections of BMP’s according to the MPDES/NPDES and the associated General Permit for Storm Water Discharges Associated with Construction Activity. Provide one copy of the signed inspection report to the Project Manager within three calendar days of the inspection. Failure to conduct BMP inspections and submit timely inspection reports renders the BMP’s unacceptable and no payment will be made on the monthly progress estimate for BMP’s installed until the inspection reports are completed and approved by the Project Manager.

208.04 METHOD OF MEASUREMENT
Erosion and sediment control devices are measured per each for the type installed. The contract quantities for erosion and sediment control devices are estimated and may vary from the actual quantities used or required for a specific project. Only those quantities approved for placement will be paid for.

The following items are not measured for payment:
1. Maintenance of BMP’s; including BMP maintenance until the completion of the final work inspection;
2. Removal of BMP’s no longer required;
3. Mobilization for maintenance and inspections required by the MPDES/NPDES and the contract;
4. Inspections, documentation and submittal costs required to comply with the MPDES/NPDES and the contract; and
5. Disturbance areas outside the State R/W associated with Contractor activities that are not included in the project specific NOI and SWPPP.

MPDES/NPDES authorization, fees, and BMP’s outside the State R/W are the Contractor’s responsibility and will not be paid for.

208.04.1 Temporary Erosion and Sediment Controls
Temporary Erosion and Sediment Control (TESC) devices are measured by the unit. A unit is the base value used for establishing the relative value of each type of TESC device. The relative value of each TESC device in units is shown in the “Erosion and Sediment Control Rate Schedule” included in the contract.

208.04.2 Temporary and Erosion Seeding
Temporary and erosion seeding is measured parallel to the ground line, and includes seedbed preparation, fertilizing and seeding.

208.04.3 Permanent Water Pollution, and Erosion and Sediment Control
Permanent water pollution, and erosion and sediment control items are measured and paid for under the respective bid items.

208.05 BASIS OF PAYMENT
Payment for the completed and accepted quantities are made under the following:

<table>
<thead>
<tr>
<th>Pay Item</th>
<th>Pay Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temporary Erosion Control</td>
<td>Unit</td>
</tr>
</tbody>
</table>

Temporary erosion and sediment controls are paid for at the contract unit price per temporary erosion control. The units of each type of temporary erosion control paid for will be
calculated by multiplying the measured quantity of each device by the assigned value per units shown in the “Erosion & Sediment Control Rate Schedule” included in the contract.

Normal maintenance of BMP’s in accordance with the MPDES/NPDES and the contract is not paid for separately and is to be included in the contract unit price for temporary erosion control devices.

Maintenance includes:

• Removal of siltation and debris in front of and around BMP’s;
• Repair and replacement of incorrectly installed devices;
• Mobilization and travel for inspections; and
• Maintenance until the completion of the final work inspection.

The replacement or addition of BMP’s ordered by the Project Manager due to a precipitation occurrence that causes damage is paid for under the temporary erosion control item in the contract.

No additional compensation is made for the removal of BMP’s no longer required.

Payment at the contract unit price is full compensation for all necessary resources to complete this item of work under the contract.
SECTION 209
STRUCTURE EXCAVATION

209.01 DESCRIPTION
Structure excavation is excavating bridge foundations and all other structure foundations. The item includes disposing of excess or unsuitable material from the excavations, backfilling to the original ground level, bailing, pumping, draining, sheeting, shoring and cribs.

209.01.1. Structure Excavation Type I
Structure excavation Type I is excavating, de-watering, shoring and cribbing, backfill and compaction for the excavation.

209.01.2 Structure Excavation Type II
Structure excavation Type II is excavating, de-watering, backfill, and compaction for the excavation, excluding shoring and cribbing.

209.01.3 Shoring and Cribs
This is constructing and removing all shoring and cribs, cofferdams or caissons, and for all material, labor, equipment, tools, and incidentals to complete the work.

209.02 RESERVED

209.03 CONSTRUCTION REQUIREMENTS

209.03.1 General
The plan excavation lines in the contract are estimated. Excavate all foundations to the plan elevations and dimensions.
Removing boulders, logs, and other obstructions found in the excavation is incidental to this work.
Remove timber, sheeting, and other material used in the excavation before backfilling.
Remove and stockpile all excavated material that is suitable for backfill.

209.03.2 Treatment of Foundation Materials
When the excavation reaches the designated depth, de-water, clean, and maintain the excavation until the foundation bed is inspected.
Clean and fill rock seams and crevices with concrete mortar.
Obtain the Project Manager's approval of the foundation before placing concrete on the foundation.
Place concrete without disturbing the bottom of the excavation.
Minimize disturbance of the natural ground outside the excavation pay limits except as required for constructing cofferdams.

209.03.3 Cofferdams
Submit drawings and calculations prepared by a registered engineer showing the proposed method of cofferdam construction and de-watering procedures before starting the work. The cofferdam must meet OSHA requirements.
Assure cofferdams or cribs for foundation construction are watertight to permit de-watering.
Provide clearance within the cofferdam for constructing forms, inspection of the form exteriors, and for pumping.
Re-align or enlarge the cofferdams or cribs that are tilted or moved laterally during the work to provide work clearance at Contractor expense.
Timber bracing may be left in cofferdams or cribs extending into the substructure masonry with the Engineer's written approval.

When weighted cribs are used to resist the hydrostatic pressure acting against the bottom of the foundation seal, use an anchorage to transfer the entire weight of the crib to the foundation seal.

When the foundation seal is placed, vent or port the cofferdam at the cofferdam design low-water level.

The foundation seal depths in the contract are based on the estimated, normal water-surface elevations or are consistent with those satisfactorily used on past projects.

The specified seal thickness is a minimum. The Contractor may request an increased seal depth. Submit the request in writing to the Engineer for approval. Any approved increase in seal depth and associated costs are at Contractor expense.

Repair or replace failed cofferdams, foundation seals or both at Contractor expense.

Pump out the cofferdam and place the remaining masonry or concrete in the dry after meeting the time limit in Subsection 209.03.4.

Remove all cofferdam or crib material after the substructure is complete without disturbing or marring the finished work.

209.03.4 Pumping Water from Cofferdams

Pump interior foundation enclosures without disturbing the in-place concrete. Do not pump for at least 24 hours after placing concrete unless pumping from a sump separated from the concrete work by a watertight wall.

209.03.5 Inspection

Place the footings as soon as practical after the excavation depth and the foundation material are approved.

Drill holes or drive rods in the excavation bottom to determine the materials quality when requested by the Project Manager.

Excavate the spread footings and take rod soundings at each individual substructure unit and submit rod soundings simultaneously for the footing elevation approval.

209.03.6 Backfilling

Once approved, backfill and compact all excavated areas without damaging adjacent structures, to match the existing ground line.

Place backfill to be covered by roadway embankment in maximum 8-inch (205 mm) loose thickness, continuous horizontal layers.

Compact each layer meeting Subsection 203.03.3.

Remove and dispose of backfill containing large or frozen lumps, wood, or other deleterious materials. Do not jet or pond the backfill.

Serrate or step the slope bounding the excavation for abutments and wingwalls.

Place coarse gravel or broken stone around drain holes in wingwalls or abutments as shown on the plans.

Backfill around piers and in front of abutments and wingwalls with material large enough to resist erosion. If acceptable material is not available, the Project Manager may order stone or lean concrete backfill, paid for as extra work.

Place backfill against masonry abutments, and wingwalls meeting Subsection 203.03.2(B). Allow culvert related concrete work to cure 14 days before backfilling.

Dispose of excess material.
209.04 METHOD OF MEASUREMENT

209.04.1 Structure Excavation Type I and Type II

Measurement in cubic yards (cubic meters) is based on the volume bounded on the sides by vertical planes 18 inches (460 mm) outside of the footing neat lines; on the top by the original undisturbed ground surface at the time excavation begins or by the lines in the contract; and on the bottom to the specified footing elevation or the elevation directed by the Engineer.

Calculations for tie beams, overhangs, or similar volumes extending beyond the footing lines are computed from lines 18 inches (460 mm) outside of and below neat lines. The computed structure excavation includes only those portions not contained in the volume of footing excavation.

209.04.2 Shoring and Cribs

Shoring and cribs used with structure excavation Type I are not measured for payment.

Shoring and cribs used with structure excavation Type II are measured by the lump sum.

209.05 BASIS OF PAYMENT

Payment for the completed and accepted quantities is made under the following:

<table>
<thead>
<tr>
<th>Pay Item</th>
<th>Pay Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Structure Excavation Type I</td>
<td>Cubic Yard (cubic meter)</td>
</tr>
<tr>
<td>Structure Excavation Type II</td>
<td>Cubic Yard (cubic meter)</td>
</tr>
<tr>
<td>Shoring and Cribs</td>
<td>Lump Sum</td>
</tr>
</tbody>
</table>

Additional approved material for backfill provided from other sources is paid for as extra work. Payment includes the costs of obtaining the material, processing, handling, and transporting to the project. The cost of placing and compacting the additional material and disposing of unsuitable material is included in the contract unit price for structure excavation.

No payment is made for additional material placed outside structure excavation pay limits and slope lines to comply with safety regulations.

No payment is made for additional material to replace material removed from the excavation, rendered unsuitable by improper excavation, handling, or stockpiling methods.

Partial payments for structure excavation Type I or II will be made based on the total quantity as follows:
1. 85 percent when removed to plan elevation.
2. 95 percent when backfilled and compacted.
3. 100 percent when the area is cleaned up to the Project Manager’s satisfaction.

Partial payments for shoring and cribs will be made based on the lump sum contract unit price as follows:
1. 65 percent when shoring and crib is in position.
2. 90 percent when driven to final elevation.
3. 100 percent when shoring and crib is removed and the area is cleaned up to the Project Manager’s satisfaction.

Payment at the contract unit price is full compensation for all resources necessary to complete the item of work under the contract.
SECTION 210
EQUIPMENT USE

210.01 DESCRIPTION
This describes the equipment to be used for the contract work.

210.02 RESERVED

210.03 CONSTRUCTION REQUIREMENTS

210.03.1 General Requirements
Provide equipment in good mechanical condition having sufficient power to perform the work. Repair or replace equipment not meeting these requirements.

210.03.2 Motor Graders
Use self-propelled motor graders either tandem or all-wheel drive equipped with pneumatic tires.

Equip the graders with a moldboard at least 12 feet (3.7 m) long with a cutting edge, a scarifier with nine or more teeth having minimum dimensions of 3 inch x 1 inch x 16 inch (75 mm x 25 mm x 405 mm), and power-operated controls.

The motor grader manufacturer's power rating must be at least 100 horsepower (75 kW).

210.03.3 Dozers
Use dozers of any standard type attached to a crawler tractor of at least 75 horsepower (56 kW) having power-operated controls.

Furnish dozers a minimum 90 inches wide (2.3 m). The dozer and tractor is considered a single unit.

210.03.4 Rollers
A. General. Provide rollers and compaction equipment of standard manufacture bearing the manufacturers identification label. Roller weight is the manufacturer's rating.

Use self-propelled rollers capable of reversing direction without backlash.

Keep rollers in good mechanical condition with positive, accurate steering control.

Use adequately powered trucks or tractors for pull-type rollers.

Other than traction units, operate rollers separate and distinct from other equipment.

Equip all rollers with self-cleaning devices that prevent material from adhering to the wheels or tamping surfaces.

B. Smooth-wheeled Rollers. Use smooth-wheeled, self-propelled rollers meeting one of the following:
1. Tandem-type weighing up to 10 tons (9 mt); or
2. Three-wheeled type weighing a minimum 10 tons (9 mt); or
3. Towed steel-drum rollers weighing a minimum 4 tons (3.6 mt).

C. Tamping Rollers. Use tamping rollers with grids, drums, or shells surrounded by metal studs, pads, or similar elements that compress small areas of material.

D. Pneumatic-tired Rollers. Use pneumatic-tired rollers meeting the following:
1. Two-axle type, straight or oscillating;
2. Rigid framed providing a platform or body for ballast loading;
3. Having an effective rolling width of at least 4 feet (1.2 m);
4. Having a minimum working weight capacity of 250 pounds (113.5 kg) per inch width of tire tread;
5. Smooth tires (no tread) equal in size and diameter;
6. Rear axle tires spaced to overlap the tread gap of the preceding two tires;
7. Uniform tire pressure not varying from each other by more than five psi (34.5 kPa);
and
8. Self-propelled or tractor or truck drawn (tractive power).
Operate the rollers, while turning, to prevent tearing or loosening of the material being rolled or the adjacent material.
Do not use wobble-wheeled pneumatic-tired rollers for bituminous surfacing work.

E. Vibratory Rollers. Use vibratory rollers capable of obtaining the required compaction.

210.03.5 Watering Equipment
Furnish and operate pneumatic-tired water equipment having spray bars capable of uniformly distributing water over the surface area. The control valves must be positive closing to prevent leakage.

210.03.6 Test Trailer, Transport, and Setup
Transport to the project site or provide electrical power service or both for State-owned test trailers. Supply electrical power 24 hours a day, 7 days a week. Transport, set up, and make the trailer operational at least two days before starting plant mix paving.
Paving operations will be suspended if power level requirements are not maintained.
Use a licensed carrier that complies with 49 CFR to transport the test trailer from a designated location to the project site and return it to a designated location as directed.
Transporting includes blocking, leveling, re-blocking, re-leveling and unblocking the trailer.
Contact the Engineer for details concerning the transport of the trailer at least 30 days before plant mix operations.
Purchase a minimum $85,000.00 insurance for the trailer and its contents. Provide written proof of insurance to the Engineer before the trailer is moved. Verify that the Department has prepared the trailer and contents for transport.
Repair or replace all contents and trailer damage occurring in transport at Contractor expense. Do not move the trailer without the Engineer's permission.
Furnish and install a continuous 200-ampere, 220 to 230 volt, single phase, 60-hertz power supply to the trailer. Have the source connected by a Montana licensed electrician using a 4-wire conductor.

210.03.7 Test Trailer, Power, and Blocking
Provide a level parking area, the required blocking, and electrical power service for the test trailer. Locate and construct the parking area a minimum 200 feet (61 m) from the plant mix dryer drum, mixing plant, and storage silo unless otherwise directed, to accommodate the 12 foot x 32 foot (3.6 m x 9.8 m) trailer. Park, block, and level the trailer as directed.
Do not begin plant mix paving operations until the trailer is operational. Suspend paving work during power interruptions or periods of insufficient power to the trailer.
Furnish, install, and connect a commercial or generated power meeting Subsection 210.03.06 requirements.
Unblock the trailer and disconnect the power as directed. The Department will prepare the trailer for transport.

210.04 METHOD OF MEASUREMENT

210.04.1 Equipment Use
Equipment use, when specified as a bid item, is measured by the hour for the hours performing the work and includes furnishing the equipment, including operator, servicing, repairs.
Time in moving equipment from point to point on the project and for repair and servicing is not measured. Equipment used in the work but not specified as a bid item is incidental to the work.

210.04.2 Test Trailer, Transport, and Setup
Test trailer, transport, and setup is measured by the mile (kilometer) for the actual miles (kilometers) moved. It includes insurance, transporting, blocking, unblocking, leveling, furnishing and installing electrical power and associated wiring, and all other necessary resources to complete the item of work. The mileage shown in the contract is an estimate only and may be adjusted by the Engineer.

210.04.3 Test Trailer, Power, and Blocking
Test trailer, power, and blocking is measured by the lump sum and includes constructing a level parking area, blocking, leveling trailer, furnish power and wiring, unblocking, and removing power and wiring.
Maintenance re-blocking and re-leveling is incidental to the work and not measured or paid for separately.
Additional blocking and leveling of the trailer for trailer moves directed by the Engineer are measured and paid for.

210.05 BASIS OF PAYMENT
Payment for the completed and accepted quantities is made under the following:

<table>
<thead>
<tr>
<th>Pay Item</th>
<th>Pay Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motor Grader</td>
<td>Hour</td>
</tr>
<tr>
<td>Dozer</td>
<td>Hour</td>
</tr>
<tr>
<td>Test Trailer Transport/Setup</td>
<td>Mile (kilometer)</td>
</tr>
<tr>
<td>Test Trailer Power/Blocking</td>
<td>Lump Sum</td>
</tr>
</tbody>
</table>

Partial payments for test trailer power/blocking will be made based on the lump sum contract unit price as follows:
1. 50 percent when the trailer is blocked, leveled, and power is supplied.
2. 100 percent when the trailer is unblocked and the power is disconnected.
Payment at the contract unit price is full compensation for all resources necessary to complete the item of work under the contract.
SECTION 211
ROAD LEVELER OPERATIONS

211.01 DESCRIPTION
Road leveling is using a road leveler to final shape the top surfacing course.

211.02 RESERVED

211.03 CONSTRUCTION REQUIREMENTS

211.03.1 Equipment
Use either a self-propelled or tractor-powered unit designed for road leveling work.

A. Leveler Unit. Furnish a leveler unit:
   1. Approximately 40 feet long (12.2 m);
   2. With a minimum cutting blade width of 10 feet (3.0 m);
   3. With pivot points, both in front and behind the center point of the machine;
   4. Mounted on pneumatic tires or crawler-type treads; and
   5. With hydraulic power fittings to control the cutting blade from the power traction unit.

   Machines less than 40 feet (12.2 m) in length may be used if operated off an approved string line using electronic controls.

B. Tractor Power Unit. Use tractor-power units capable of operating the leveler up to 4 miles per hour (6.4 km/h).

   Equip the unit with a two-way hydraulic system having controls for operating the leveler cutting blade.

211.03.2 Operation
Once the final surface course material is finished, bring the surface to the specified tolerance.

   Apply water to the surface as required for leveling.
   Operate the leveler longitudinally, starting from the crown of the roadway working toward the shoulder on successive passes with each pass overlapping.

   Do not straddle the roadway crown with the leveler.

211.04 METHOD OF MEASUREMENT
Road leveler operation is measured by the hour for the actual hours used in the work.

211.05 BASIS OF PAYMENT
Payment for the completed and accepted quantities is made under the following:

<table>
<thead>
<tr>
<th>Pay Item</th>
<th>Pay Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Road Leveler</td>
<td>Hour</td>
</tr>
</tbody>
</table>

Payment at the contract unit price is full compensation for all resources necessary to complete the item of work under the contract.
SECTION 212
OBLITERATE ROADWAY

212.01 DESCRIPTION
Obliterate roadway is the blading, scarifying, dozing, shaping, seeding, and disposing of structures and guardrail not included for removal under other items of the contract on existing portions of abandoned roadways designated for obliteration.

212.02 RESERVED

212.03 CONSTRUCTION REQUIREMENTS
Grade and contour abandoned roadways to blend with the new roadway and existing terrain. After the old roadway surfacing is removed, salvage the topsoil from areas to be graded and perform the rough grading. Grade and contour the obliterated roadway to blend with the new roadway and adjacent terrain. Spread the salvaged topsoil and seed the obliterated roadway area.

Work construction scars, sharp breaks, and steep slopes or cuts to blend with the terrain. Existing surface material may be used in the new work or to construct fills over old roadways when covered with 12 inches (305 mm) of soil capable of supporting plant growth.

Remove and dispose of old structures, guardrail, and other non-salvageable items not included in other contract items for removal at Contractor expense. Remove and neatly store all material designated as salvageable to prevent damage.

The species of seed, seed bed preparation, fertilizing, mulching, and application rate is specified in the contract or will be determined by the Department Agronomist.

212.04 METHOD OF MEASUREMENT
Roadway obliteration is measured in stations to the nearest whole station along the centerline of the roadway obliterated or by the cubic yard (cubic meter), as specified.

When not included in the contract as a pay item, roadway obliteration is measured by the cubic yard (cubic meter) under Subsection 203.04.

Topsoil is measured under Subsection 203.04.

Seeding is measured under Subsection 208.04

212.05 BASIS OF PAYMENT
Payment for the completed and accepted quantities is made under the following:

<table>
<thead>
<tr>
<th>Pay Item</th>
<th>Pay Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roadway Obliteration</td>
<td>Station or Cubic Yard (cubic meter)</td>
</tr>
<tr>
<td>Topsoil</td>
<td>Cubic Yard (cubic meter)</td>
</tr>
<tr>
<td>Seeding</td>
<td>Acre (hectare)</td>
</tr>
</tbody>
</table>

Material obtained from the obliterated roadway and used in the construction of the new roadway is measured and paid for as unclassified excavation and haul under Sections 203 and 206 respectively.

Payment at the contract unit price is full compensation for all resources necessary to complete the item of work under the contract.