DIVISION 200 - EARTHWORK

SECTION 201 - CLEARING RIGHT-OF-WAY

201.01 Description This work shall consist of clear cutting, selective clearing and thinning, tree trimming, removing single trees, including dead, blown down or uprooted trees, removing and disposing of all stumps and debris within the limits of the right-of-way and easement areas except such objects as are designated to remain or are to be removed in accordance with other sections of these specifications. This work shall also include the preservation from injury to or defacement of all vegetation and objects designated to remain and the treatment of stumps with herbicides.

a. Clearing shall consist of cutting and disposing of all trees, down timber, brush, bushes, and debris within designated limits.

b. Tree trimming shall consist of removing any designated branches and other tree portions for preservation purposes.

c. Selective Clearing and Thinning shall consist of cutting and disposing of designated trees, down timber, stubs, brush, bushes, and debris within designated limits. This work also includes application of approved herbicides on hardwood stumps.

d. Removing trees shall consist of cutting and disposing of single trees, stumps and roots, located outside the limits of clearing or selective clearing and thinning limits, as indicated on the plans or as authorized.

1. A single tree is defined as any tree or remains of a tree, still standing, 12 inches or more in its average diameter measured, as specified in Subsection 201.09 - Method of Measurement, and taller than 5 feet measured from the ground at the base of the tree.

2. A stump is defined as the remains of a single tree 12 inches or more at its average diameter from which the toppings have been removed and which is less than 5 feet in height measured from the ground at the base of the stump.

201.02 Materials Materials shall conform to the requirements specified in the following Subsection of Section 717.07 - Herbicide.

201.03 General The Resident will verify clearing and selective clearing limit lines and designated items that are to be preserved and to remain.

Unsound or unsightly branches of trees and shrubs, designated to remain and not specified to be removed under another item, shall be removed as directed. Branches of trees extending over the roadbed shall be trimmed to provide a clear height of 20 feet above the road and shoulder surface. Trimming shall be done by skilled workers and in accordance with good tree surgery practices.

Alignment stakes, grade stakes, witness stakes, boundary markers, bench marks and tie points shall be preserved until permission is given for their destruction.

201.04 Clearing In areas indicated on the plans, all trees, down timber, brush, bushes, shrubs, plants and debris not designated to remain shall be removed and disposed of.

In areas where the proposed embankment is not designated to be grubbed, as provided in Subsection 203.09 - Preparation of the Embankment Area, all stumps shall be cut off as close to the ground as is practicable. When stumps are to remain in the backslope rounding of cut sections, they shall be cut flush with the final slope line.

All wood in the clearing area, except trees designated to remain, shall become the property of the Contractor, unless otherwise provided.

The Contractor shall take special care to completely dispose of all elm trees removed, by burning or by burying under soil in approved areas.

All live hardwood stumps, 1 inch or more in diameter located between the lines of improvement and the outermost clearing or selective clearing lines shall be treated with an approved herbicides, unless specifically exempted.

In areas where stumps and shrubs are to remain, the surface of the ground shall not be unduly disturbed or compacted. Existing ground cover shall be preserved insofar as possible and the area shall be left neat and clean and in a condition that is reasonably consistent with the surroundings.

201.05 Selective Clearing and Thinning In order that trees may be properly marked, the Contractor shall give the Resident at least 2 weeks notice before starting work. Only those trees or bushes designated to be removed shall be cut. In no event shall selective clearing and thinning operations begin until approval is given.

All dead or diseased trees or shrubs, junk, trash, litter or foreign matter of any kind shall be removed from the areas to be enhanced. This shall include uprooted stumps and all branches, tops, trunks and dead wood, resulting from woodcutting operations or from any other causes.

Trees and shrubs to be preserved shall be carefully pruned to remove all dead, diseased and injured wood. In addition, in certain areas, the Resident may require the branches of designated trees to be removed to a height above ground as directed. Complete clearing may be required in certain areas. Such clearing shall be included under this Subsection. Storing logs and pulpwood in thinned areas shall be avoided.

The Contractor shall avoid disturbing or compacting the existing ground surfaces as well as avoiding damage to plant growth. The use of heavy equipment, operating anywhere within the area to be selectively thinned, will not be allowed unless authorized.

Any injury to trees and shrubs that are to be preserved shall be carefully repaired. Disturbed ground surface shall be restored as nearly as possible to natural conditions.

Pruning and repairs to live trees and shrubs shall be done by skilled workers or tree surgeons according to approved arboricultural practice. All stumps, new or old, shall be cut off as close to the ground as is practicable.

Trees falling outside the specified limits of the thinning areas shall be removed and disposed of in a satisfactory manner. Undesirable trees leaning or falling over the highway right-of-way from outside shall be cut at the property line.

201.06 Herbicides All herbicides shall be approved by the Department of Transportation Landscape Architect. The herbicides shall be applied by Certified Pesticide Applicators in accordance with State Pesticides Control Board Regulations. With the exception of coniferous (softwood) trees, stumps over 1 inch in diameter resulting from cutting live hardwood trees and shrubs shall be treated with approved herbicide spray mixture. The spray mixture may be applied at any time until regrowth from the stumps has reached a height of approximately 24 inches except that it shall not be applied when the stumps are wet or frozen. The herbicide spray mixture shall be sprayed on all exposed surfaces of stumps and the stems of regrowth, until there is complete saturation and run-off. Particular attention to coverage shall be given to the bark and all exposed roots.

All stumps shall receive at least one treatment with the herbicide spray mixture. At the time of final acceptance, live regrowth of hardwood tree seedlings shall have been substantially eliminated. Any remaining regrowth will require another treatment before final acceptance.

Particular care must be taken that the herbicide mix does not come in contact with or too near live trees and shrubs that are to be preserved. Unless otherwise directed the spray mixture shall not be applied closer than 2 feet from the trunk of a tree that is to remain.

When directed, live stumps in specified areas shall be exempted from spraying with herbicides.

The Contractor shall be responsible for maintaining the treated area until final acceptance of the work. All damage or dieback shall be repaired at the Contractor's expense as directed. At the time of final acceptance the area shall be free of all dead, dying or damaged trees and shrubs and litter of any kind as well as free from regrowth.

201.07 Disposal All brush, timber, logs and other woody debris shall be disposed of by approved methods. The Contractor shall make every effort to provide useful disposition of woody material that may be marketable. If the Contractor can demonstrate that a reasonably suitable market for the material is not available, other disposal methods may be approved.

Acceptable methods of disposal may include chipping, grinding, and burying. Burning may be allowed when so provided by Special Provision.

a. Chipping Wood chippers shall reduce woody material to chips, not over ¼ inch thick by not over 8 inches long, and the chips shall be spread uniformly over the ground or as directed. ~~For a related provision, see Code of Maine Regulations 401 Section 7.~~

b. Burying Brush and logs may be disposed of by burying in approved waste dumps or by placing in the portion of the embankments outside a slope 1 horizontal to 1 vertical extending from the edge of the shoulder to the existing ground and covering with a minimum of 2 feet of earth. Excavation or borrow used to cover the brush and logs in the slopes may be placed in layers at least 2 feet thick and compacted only to the extent that the stability of the slope is assured. For a related provision, see **Department of Environmental Protection** Code of Maine Regulations **401**~~102~~102 Section **7**~~33~~.

c. Burning Burning is not allowed

~~c. Burning A Special Provision will state when burning is allowed. Logs, brush and other refuse produced as a result of clearing, may be disposed of by burning, provided pollutant type material is not used to start or maintain the fire. All fires shall be started with natural material and the fire maintained in such a manner that minimum of visible smoke is produced.~~

Special attention shall be given to wind direction to assure no nuisance results from smoke. Burning shall be done in accordance with applicable laws and ordinances and under the direction of competent workers. Extreme care shall be taken to control the fires. Fires will not be allowed where there is any possibility of burning, scorching, overheating or otherwise jeopardizing trees, shrubs, surrounding forest cover, adjacent property or buildings nor where there is a possibility of damaging overhead wires and cables. Fires will not be allowed where undisturbed ground is to remain exposed nor on areas which have been seeded to grass or other plants.

The Contractor will be held responsible for any damage caused by fires built in the construction of the project. Such responsibilities shall include removing and disposing of burned material, replacing trees, shrubs, fences or any other material or object which has been designated to remain and seeding, fertilizing and mulching the burned areas. At the option of the Resident, a cash settlement or a combination of replacement and cash settlement may be assessed in lieu of replacing all damaged trees and plants. When directed, the Contractor may be required to perform such work beyond the Right-of-Way lines.

201.08 Removing Single Trees and Stumps~~–~~ When called for on the plans or otherwise designated, complete removal and disposal of single trees and stumps shall be required and shall include the backfilling of stump holes.

Trees, which have been uprooted, shall be removed by cutting the tree and removing the stump from the ground or, where approved, the stumps may be placed back in the hole to present a natural appearance. The area shall be graded to conform to the surrounding terrain.

201.09 Method of Measurement Clearing, and selective clearing and thinning will be measured by the acre, determined from horizontal dimensions, acceptably and actually cleared or thinned within the limits shown on the plans or additional areas flagged by the Resident. Areas not shown on the plans or not flagged for clearing or thinning will not be measured for payment.

As an alternative to field measurements, the Contractor and the Resident may agree in writing that the acreage acceptably cleared for payment will be that shown in the Schedule of Items. If such an agreement is reached, no further measuring and computing of quantities will be required and the quantity referred to herein will be final.

Single trees and stumps will be measured by each unit. The size of the tree shall be the average diameter determined by circumferential measurement at a height of 4½ feet above the ground. When trees are removed under this contract and the removal of the stump is required, the stump size shall be the same size as that determined for the tree. The size of all other stumps shall be the greatest horizontal cross sectional dimension determined at the top of the stump. Trees or stumps, which have multiple trunks protruding from a single base trunk, shall be measured for payment as a single tree or stump.

Individual trunks of multiple trunk trees or stumps having a diameter of less than 12 inches will not be included to determine the size of a tree or stump.

201.10 Basis of Payment The accepted quantities of clearing, selective clearing and thinning will be paid for at the contract unit price per acre.

The accepted quantity of single trees and stumps removed will be paid for at the contract unit price each. Payment for trees shall include removal and disposal of the entire tree except stumps.

All stumps, as defined in Subsection 201.01 d.2 and designated to be removed, will be paid for at the contract unit price each. Payment shall include removal and disposal of the stumps and roots.

When the Schedule of Items does not contain an estimated quantity for clearing, and it is not noted on the plans as incidental, the work, when authorized, will be paid for under the provisions of Section 109.3 - Extra Work.

When the use of herbicide or tree paint is required to complete the work included under this section, it will not be paid for directly, but will be considered as included in the other contract pay items.

Grubbing, when required, will be measured and paid for as provided in Section 203 - Excavation and Embankment.

Payment for removal of trees and stumps, not defined as contract pay items under Section 201.01d, shall be considered incidental to the contract and no separate payment will be made.

Removal of unsound and unsightly branches and trimming branches of trees, as specified in Subsection 201.03 - General, will be paid for under the provisions of Sections 109.03 - Extra Work or 631 - Equipment Rental.

Payment will be made under:

Pay Item		Pay Unit
201.11	Clearing	Acre
201.12	Selective Clearing and Thinning	Acre
201.23	Removing Single Tree Top Only	Each
201.24	Removing Stump	Each

SECTION 202 - REMOVING STRUCTURES AND OBSTRUCTIONS

202.01 Description This work shall consist of removing wholly or in part, and satisfactory disposing of all designated buildings, structures, bituminous pavement, portland cement concrete pavement, manholes, catch basins, and other obstructions which are required to be removed, except for the obstructions to be removed and disposed of under other contract items. It shall also include salvaging designated materials.

202.02 Removing Buildings The Contractor shall remove and dispose of all buildings and foundations indicated **on plans or bid documents**.

Cavities remaining as a result of foundation or structure removal shall be filled to the level of the surrounding ground and, if within the limits of embankment or below the subgrade in excavation areas, shall be compacted in accordance with applicable embankment construction requirements.

Details of the ownership of the buildings and all the equipment, fixtures and materials therein, except equipment belonging to a Utility or equipment or fixtures specifically excepted and details relative to the date of availability of the property, will be stated in the Special Provision.

Written notice will be given the Contractor when any building becomes available before the date specified **in the special provision.** On the above-specified date, or upon notice of availability, ownership of the buildings shall transfer from the State to the Contractor who then shall proceed with the work required under this section. The buildings shall not be used or occupied for any purpose while in the right-of-way and the buildings shall be removed as soon as possible after the date available, unless otherwise authorized.

If, during the negotiations between the Department and the owners of the building specified under this section, agreements are made with the owners to move, remove or raze the buildings, the Department reserves the right to remove any or all items from the contract upon written

notice to the Contractor and no payment will be made for the items. Removal of debris, when necessary under such conditions, will be accomplished under Section 629 - Hand Labor and Section 631 - Equipment Rental.

All debris and unusable materials shall be removed to an approved dump or waste area and buried. No material shall be disposed of by burning. For a related provision, **see** Department of Environmental Protection Maine Solid Waste Management Rules, 06-096 CMR Ch. 401, Landfill Siting, Design and Operation.

202.03 Removing Existing Superstructure, Structural Concrete, Railings, Curbs, Sidewalks and Bridges Removing existing superstructures shall consist of removing and disposing of existing superstructure including fill, pavement, railing, and all other material on or over the superstructure unless otherwise specified. Removing existing structural concrete shall be to the limits designated on the plans and shall be accomplished without damage to the portion of the structure to remain.

Removing existing bridge shall be to the limits shown on the plans.

Existing concrete curbs, granite curbs, and concrete sidewalks shall be removed to the limits shown on the plans using a chipping hammer or pavement breaker of a size approved by the Resident or any other method approved by the Resident which will not damage the structural integrity of the concrete deck to remain.

Before removal of existing concrete curbs or sidewalks, the fascia removal line, as indicated on the plans, shall be saw cut to a depth of 1 inch minimum. Care shall be taken not to damage any reinforcing steel that is to remain in the bridge.

When the material from an existing structure is to be retained by the Department, the Contractor shall carefully dismantle it, and all materials, except those that may be specified to be reused in the new structure, shall be loaded on trucks supplied by the Department or carefully stored by the Contractor within the right-of-way. The use of any portion of the salvaged material in connection with new or temporary construction shall not be anticipated by the Contractor. The dismantling of metal structures or railings shall, when especially provided, include the removal of all bolts and rivets necessary to disconnect the members and the matchmarking of these members for future reassembling.

When the material from an existing structure is designated to become the property of the Contractor, it shall be entirely removed and disposed of out of sight of the highway and beyond the limits of the right-of-way. Such material shall not be deposited in rivers, streams, or other bodies of water. If the material is to be wasted then it shall be disposed of at an approved ~~dump or other approved~~ location.

When practical, any suitable material removed shall be used in backfilling or for the formation of embankments and no additional allowances for payment will be made. Unsuitable or surplus material shall be disposed of in an approved waste area.

Blasting or other operations necessary for the removal of an existing structure or obstruction, which might damage new construction, shall be completed before placing the new work. If this is not feasible, the work shall be done only when approved and entirely at the Contractor's risk.

202.031 Removing Existing Bituminous Pavement and Concrete Wearing Surface from Bridges and Scarifying the Top of Deck The full depth of existing bituminous pavement, or concrete wearing surface shall be removed from curb to curb for the entire length of the bridge. Membrane waterproofing, if present, shall also be removed in a manner approved by the Resident.

Extreme care shall be taken to avoid damaging the top of the concrete deck to remain. All existing deck concrete damaged by the Contractor, which is not specified to be scarified or rehabilitated, shall be repaired. Such repair shall be at the expense of the Contractor.

When rehabilitation of the top of the deck is called for on the plans, the work will be done in accordance with Section 518 - Rehabilitation of Structural Concrete Bridge Decks.

When scarifying the top of the deck is called for, the specified depth of material shall be removed from curb to curb for the entire length of the bridge. Removal shall be accomplished by an approved scarifying machine. Areas that cannot be removed by a scarifying machine, such as adjacent to curbs, drains, and armored joints, shall be removed by using a maximum 35 pound chipping hammer or pavement breaker.

202.04 Removing Portland Cement Concrete Pavement All Portland cement concrete pavement and Portland cement concrete base course designated for removal shall be broken into pieces suitable for use in construction or embankment or disposed of as directed by the Resident. When used in construction of embankments, the maximum size of any fragment shall not exceed the thickness of the layer being placed. The Contractor may, at their option and with approval, dispose of material in approved waste areas and replace with an equivalent volume of granular borrow at no cost to the State.

202.05 Removing Manholes or Catch Basins Where the manhole or catch basin is under a roadway of embankment, the sides shall be removed to a depth of at least 2 feet below subgrade. When the plans do not provide for the complete removal of pipe(s) connecting to the catch basin or manhole, said pipe: (1) if to be connected to new pipe, shall not be disturbed, or (2) if no connection is called for, the pipe shall be tightly plugged with mortared masonry. Floors of the structures shall be broken up or removed to permit drainage. The open cavity shall be filled with earth and thoroughly compacted.

202.06 Removing Bituminous Concrete Pavement The equipment for removing the bituminous pavement shall be capable of scarifying and loading the bituminous pavement without including any gravel, except that adhering to the pavement. The remaining gravel shall be graded to drain as approved by the Resident.

202.061 Removing Pavement Surface The equipment for removing the bituminous surface shall be a power operated **milling**~~planingplaning~~ machine or grinder capable of removing bituminous concrete pavement to the required depth**, transverse cross slope, and profile grade by the use of an automated grade and slope control system. The controls shall automatically increase or decrease the pavement removal depth as required, and readily maintain desired cross slope, to compensate for surface irregularities in the existing pavement course.**~~..~~ The equipment shall be capable of accurately establishing profile grades by referencing ~~either~~ from **a fixed reference such as a grade wire,**~~the existing pavement~~ or from **the existing pavement surface using a 30 foot minimum contact ski (floating beam), or 24 foot non-contact grade control beam.** ~~an independent grade control and shall have a positive means for controlling cross slope elevations.~~

The Contractor shall locate and remove all objects in the pavement through the work area that would be detrimental to the planing or grinding machine.

The finished milled surface will be inspected before being accepted, and any deviations in the profile exceeding ½ inch under a 16 foot string line or straightedge placed parallel to the centerline will be corrected. Any deviations in the cross-slope that exceed ⅜ inch under a 10 foot string line or straightedge placed transversely to centerline will be corrected. All corrections will be made with approved methods and materials. Any areas that require corrective measures will be subject to the same acceptance tolerances. Excess material that becomes bonded to the milled surface will be removed to the Resident's satisfaction before the area is accepted.

202.062 Pavement Butt Joints The equipment for removing the bituminous surface shall be a cold milling machine or a power operated planer capable of removing the existing pavement to the required depth, width, grade, and slope.

The milled surface shall have a uniform texture and provide acceptable rideability for vehicles. Should resurfacing be delayed, or the resulting milled surface is unsatisfactory for any reason, bituminous leveling course or temporary pavement may be required. The Contractor shall clean the milled surface and surrounding area of all loose material prior to use by traffic.

202.07 Method of Measurement Removing buildings, removing existing superstructures, and removing existing bridges will each be measured by the lump sum. Removing Portland cement concrete pavement, removing bituminous concrete pavement, pavement butt joints, and removing pavement surface will be measured by the square yard with no deductions made for areas occupied by existing catch basins and manholes. Removing existing structural concrete will be measured either by the cubic yard in place before work starts on the particular portion of the structure to be removed or by the lump sum as specified. Remove existing railings will be measured by the foot in place along the grade and line of the railing from outside to outside of end posts or rail projections, whichever is greater.

The removing of existing bituminous pavement, removing existing concrete wearing surface, removing of existing concrete curbs and sidewalks from bridges, and scarifying of the

concrete deck will each be measured for payment as one lump sum unit, complete, and accepted.

The removing of existing manholes and catch basins will be measured by the unit.

202.08 Basis of Payment The accepted quantity of removing building, removing existing superstructure, and removing existing bridge will be paid for at the contract lump sum price, which price shall be full compensation for removing and disposing of the obstructions and building foundations down to an elevation matching the surrounding ground as directed by the Resident. Removing Portland cement concrete pavement will be paid for at the contract unit price per square yard which price will be full compensation for removing and disposing of pavement and pavement reinforcement. Material for backfilling holes resulting from removal of obstructions will be measured and paid for as provided in Section 203 - Excavation and Embankments. The quantity of structural concrete removed will be paid for, either at the contract unit price per cubic yard or at the contract lump sum price which price shall include disposal of the concrete. The quantity of railing removed will be paid for at the respective contract unit price per foot of railing removed and disposed of.

Removing and scarifying existing concrete, removing existing concrete wearing surface, and removing existing bituminous pavement from bridges will be paid for at the contract lump sum price for the respective contract pay item involved. Removing membrane waterproofing, if present on the existing deck, shall be incidental to the removing of bituminous pavement.

The containment and disposal of pollutants during the removal of materials from an existing bridge will not be paid for directly but shall be incidental to the related contract Pay Item. These payment provisions shall prevail over those of Section 656 - Temporary Soil Erosion and Water Pollution Control, for this work only. The payment for each contract pay item will be full compensation for furnishing all materials, labor, equipment for all formwork, and for all other incidentals necessary to complete the work.

Removing existing manholes and catch basins will be paid for at the contract unit bid price each, which price shall include all work, materials, labor, and equipment. New pipe as required by the plans will be paid for separately under the appropriate pay item. Where new pipe is to be connected to existing pipe, the Contractor shall furnish and install, at their expense, pipe necessary to replace any existing pipe damaged beyond the limits of pipe removal shown on the plans.

Removing bituminous concrete pavement will be paid for at the contract unit price for the number of square yards removed as required by the plans or as ordered by the Resident, which price will be full compensation for removing and disposing of the bituminous pavement and re-grading of the remaining material.

The accepted quantity of pavement butt joints will be paid for at the contract unit price per square yard which price will be full compensation for removing and salvaging the bituminous material. Any bituminous leveling material or temporary pavement required will not be measured for payment directly, but will be incidental to the related contract Pay Items.

The accepted quantity of removing pavement surface will be paid for at the contract unit price per square yard. This price will be full compensation for removing the material to the required depth, profile and cross slope, complete cleaning of the milled surface suitable for paving, and for salvaging, hauling, and stockpiling excess material to an approved designated area. Locating and removing objects, and additional milling and paving required to correct deviations will not be paid for separately but will be included in the contract unit price per square yard.

When the pay item calls for material to be retained by the Department, payment shall include the salvage of these materials, custody, preservation, and storage on the right-of-way and disposal as provided herein. When the proposal does not include pay items for removal of structures and obstructions as provided in this Section, such work shall be incidental to the various contract pay items and no direct payment will be made except that removal of foundations and Portland cement concrete pavement will be paid as provided in Section 203 - Excavation and Embankment.

Payment will be made under:

Pay Item		Pay Unit
202.08	Removing Building No. ___	Lump Sum
202.09	Removing Existing Superstructure - Retained by Department	Lump Sum
202.10	Removing Existing Superstructure - Property of Contractor	Lump Sum
202.11	Removing Portland Cement Concrete **Pavement**	——— Square Yard
202.12	Removing Existing Structural Concrete	Cubic Yard
202.121	Removing Existing Concrete	Lump Sum
202.123	Scarifying Concrete Deck - Top xx inch	Lump Sum
202.127	Removing of Existing Bituminous Pavement	Lump Sum
202.128	Removing of Existing Concrete Curbs & Sidewalks	Lump Sum
202.13	Removing Existing Railings - Retained by Department	Foot
202.14	Removed Existing Railings - Property of Contractor	Foot
202.15	Removing Existing Manhole or Catch Basin	Each
202.17	Removing Existing Structural Concrete	Lump Sum
202.19	Removing Existing Bridge	Lump Sum
202.20	Removing Bituminous Concrete Pavement	Square Yard
202.202	Removing Pavement Surface	Square Yard
202.203	Pavement Butt Joints	Square Yard
202.30	Removing Existing Concrete Wearing Surface	Lump Sum

203.01 Description This work shall consist of removing, hauling, disposing and compacting, if required, of all material not being removed under some other item, encountered for the construction of the project in accordance with the specifications and in reasonably close conformity with the lines, grades, thickness and typical cross sections shown on the plans or established. Excavation, except structural excavation, will be classified as common excavation, rock excavation, unclassified excavation, as hereafter defined. Material not classified as excavation that is required to construct embankments, backfill trenches and holes shall be classified as borrow.

a. Common Excavation shall consist of removing all material encountered in grading the project within the limits of construction and in driveways, which is not otherwise classified and paid for. Common excavation shall include the removing and disposing of boulders, solid mortared stone masonry, and concrete masonry when each is less than 2 yd^3 in volume and all soft and disintegrated rock which can be removed with ordinary excavating machinery. It shall include grubbing, which consists of the removing and disposing of all stumps, roots, bushes, grass, turf or other objectionable material and it shall include berm ditches and cut slope downspouts.

Common Excavation shall include muck removal, which shall consist of excavating and disposing of saturated or unsaturated mixtures of soils and organic matter not suitable for embankment foundation material regardless of moisture content.

Common Excavation shall also include removing and disposing of all earth material encountered in excavating for permanent stream channel diversion, channel widening or straightening, when designated on the Plans, outside the limits of structural excavation or other classifications.

b. Rock Excavation shall consist of removing hard igneous, metamorphic and sedimentary rock which cannot be excavated without drilling and blasting or drilling and splitting and all boulders, solid mortared stone masonry, concrete masonry, each having a volume of 2 **yd^3 or more. The use of perchlorate is not allowed in blasting operations**~~m^3 [2 yd^3] or more~~.

c. Unclassified Excavation shall consist of common excavation and rock excavation as classified above and not measured separately.

When identical unit prices are bid for Common Excavation and for Rock Excavation, such bids shall be considered as a bid for Unclassified Excavation of the combined items and shall be so classified.

203.02 Materials Borrow shall consist of approved material required for the construction of embankments or for other portions of the work as designated and shall be obtained from beyond the limits of the required cut slopes. Unless otherwise designated in the contract, the Contractor

shall make their own arrangements for obtaining borrow and shall pay all costs involved. No material shall be removed from an approved borrow pit except for use under this contract.

Material shall meet the requirements of the following Subsections of Division 700 - Materials:

Common Borrow	703.18
Granular Borrow	703.19
Gravel Borrow	703.20
Rock Borrow	703.21

Slope blanket backfill material shall meet the requirements of aggregate for base or aggregate for subbase, Type D specified in Subsection 703.06 - Aggregate for Base and Subbase, as directed.

203.03 Unauthorized Use of Materials No common excavation, rock excavation, unclassified excavation or borrow which is designated for use in embankments or backfill may be diverted for the Contractor's own use. Any unauthorized use of such material will be adjusted by deducting quantities, measured by the most appropriate method, as determined, and 115% of the quantity deducted from the total amount.

203.04 General Prior to beginning excavating, grading, and embankment operations in any area, all necessary clearing in that area shall have been performed in accordance with Section 201 - Clearing Right-of-Way.

Unsuitable material shall be disposed of as directed and no material shall be wasted without permission. Excavating operations shall be conducted so that material outside of the limits of slopes will not be disturbed.

The Resident may designate as unsuitable those soils which cannot be properly compacted in embankments and all such unsuitable material shall be disposed of in approved waste storage areas or waste areas as directed.

Suitable material taken from excavation shall be used in the construction of embankment, subgrade, and for backfilling as indicated on the plans, or as directed, except that if the volume of suitable excavated material exceeds that required to construct the embankments to the grades indicated, the excess shall be used as directed or wasted.

The Contractor shall give the Resident sufficient time before beginning excavation to take necessary cross section elevations and measurements. The Contractor shall not excavate beyond the dimensions, slopes and elevations established, and no material shall be removed prior to the staking out and cross sectioning the site. Unless otherwise authorized, borrow material shall not be placed until after all suitable excavation has been placed in the embankment unless the use of granular borrow is called for on the plans or required for use under embankments or in conjunction with the use of excavated material or for the maintenance of traffic. If the Contractor places more borrow than is required and thereby causes a waste of suitable

excavation material, the amount of such waste will be measured by the method deemed most appropriate and 115% of the amount deducted from the borrow volume.

When different unit prices are bid for Common Excavation and Rock Excavation, the Contractor will be required to strip earth from the ledge to provide an opportunity for the Resident to take the necessary measurements. When identical prices are bid for Common Excavation and Rock Excavation, the Contractor will not be required to strip the earth from the ledge.

When it is necessary to temporarily remove fencing designated to remain, the fencing shall be replaced by the Contractor at their expense in as good a condition as it was originally. The Contractor shall be responsible for the confinement of livestock when a portion of the fence is removed. When new fencing for confinement of livestock is required, it shall be erected before existing fencing is disturbed. Where new fencing cannot be erected in its final location, temporary fencing shall be at the Contractor's expense.

Excavating for obliterating old roadways or salvaging material from old roadways shall include all grading operations necessary to incorporate the old roadway into the new roadway and surroundings or placing salvaged material in a stockpile as directed.

The degree of finish for grading ditches and slopes, both fill slopes and cut slopes, shall be that obtainable from machine operations. Ditches shall be constructed to within 6 inches above or below the grade called for on the cross sections or as otherwise modified but in no case shall the ditch be finished in a condition that will not allow the flow of water. Ditches shall be graded to the extent that puddles will not form. All provisions for measurement and payment limits shall remain in force and no payment will be made for unauthorized work done beyond authorized pay limits.

Unstable slopes subject to sliding and slumping shall be excavated to the lines and grades shown or as directed. Immediately after each location is excavated approved stone or granular slope blanket backfill material shall be placed and shaped to match the adjacent slopes.

Ledge slopes shall be scaled (cleaned of all loose material) immediately as the excavation proceeds. The ledge slope shall then be examined by the Contractor to determine if the slope is stable. If the slope is not deemed stable upon this examination, then immediate steps shall be taken by the Contractor to insure the stability of the slope during construction. There will be no additional pay for any temporary protection required for the construction of the project.

203.041 Salvage of Existing **Hot Mix Asphalt**~~Bituminous~~~~Bituminous~~ Pavement

All existing hot mix asphalt pavement designated to be removed under this contract must be salvaged for utilization. Existing hot mix asphalt pavement material shall not be deposited in any waste area or be placed below subgrade in any embankment.

Methods of utilization may be any of the following:

1. Used as a replacement for untreated aggregate surface course on entrances provided the material contains no particles greater than 50 mm [2 inchin] in any dimension. Payment will be made under Pay Item 411.09, Untreated Aggregate Surface Course or 411.10, Untreated Aggregate Surface Course, Truck Measure. Material shall be placed, shaped, compacted and stabilized as directed by the Resident.

2. Used as the top 3" of gravel. Recycled Asphalt Pavement (RAP) shall be process to
1½" minus and blending will not be allowed. When this method is utilized, a surcharge will not be required

3. Stockpiled at commercial or approved sites for commercial or MaineDOT use.

4. Other approved methods proposed by the Contractor, and approved by the ~~Resident~~ Resident which will assure proper use of the existing hot mix asphalt pavement.

The cost of salvaging hot mix asphalt material will be included for payment under the applicable pay item, with no additional allowances made, which will be full compensation for removing, temporarily stockpiling, and rehandling, if necessary, and utilizing the material in entrances or other approved uses, or stockpiling at an approved site as described above. The material will also be measured and paid for under the applicable Pay Item if it is reused for aggregate in entrances, or other approved uses.~~.~~"~~All existing bituminous pavement designated to be removed under this contract must be salvaged for utilization. Existing bituminous pavement material shall not be deposited in any waste area or be placed below subgrade in any embankment.~~."

203.042 Rock Excavation and Blasting

1. **All blasting operations including the storage and handling of explosives and blasting agents shall be performed in accordance with the applicable provisions of the standard Specifications and all other pertinent Federal, State and local regulations.**
2. **The Contractor shall observe the entire blast area to guard against potential hazards before commencing work in the cut.**
3. **In case of conflict between regulations or between regulations and this Specification, the Contractor shall comply with the strictest applicable codes, regulations, or Specifications.**
4. **General Requirements**
    a. **The Resident will, at all times, have the authority to prohibit or halt the Contractor's blasting operations if it is apparent that through the methods being employed, the required slopes are not being obtained in a stable condition, or the safety and convenience of the public is being jeopardized.**
    b. **Explosives shall be stored, handled and employed in accordance with Federal, State and Local regulations. No explosives, caps, detonators or fuses shall be stored on the project site during non-working hours.**

c. The overburden shall be removed or trenches shall be excavated through the overburden at the intervals directed by the Resident, normally 25 ft. but in no case closer than 10 ft. apart to permit cross sectioning of the rock in its original position. Rock removed prior to sectioning will be considered as Common Excavation.

5. SUBMITTALS

a. Advance submittal – Not less than two weeks prior to commencing drilling and blasting operations, or at any time the Contractor proposes to change drilling and blasting methods, the Contractor shall submit a Blasting Plan to the Resident for review. The Blasting Plan shall contain full details of the drilling and blasting patterns and controls the Contractor proposes to use for both the controlled and production blasting. Review of the Blasting Plan by the Department shall not relieve the Contractor of his responsibility for the safety, accuracy and adequacy of the Plan when implemented in the field. The Blasting Plan shall contain the following information.

i. Station limits of proposed shots.

ii. Plan and section views of the proposed drill pattern, including free face, burden, blasthole spacing, blasthole diameters, blasthole angles, lift height, and subdrill depth.

iii. Loading diagram showing type and amount of explosives, primers, initiators, and location and depth of stemming.

iv. Initiators sequence of blastholes including delay times and delay system.

v. Manufacturers' data sheets for all explosives, primers and initiators to be used.

1. The delay elements in blasting caps are known to deteriorate with age. For this reason, it is required that all blasting caps used on the project be less than one year of age. No blasting product will be brought to the job site if the date codes are missing.

2. When in the opinion of the Resident any blasting product is either of excessive age or in what appears to be a deteriorated condition, all work will cease until the product's age or quality can be determined.

3. Explosives containing Perchlorate compounds shall not be used on Department projects.

vi. Details of the audible advance signal system to be employed at the job site.

vii. Precautions to protect nearby structures and cultural features.

b. Daily Blasting Logs – The Contractor shall provide the Resident with a daily log of blasting operations, submitted on a weekly basis. The log shall be updated at the close of each working day. The log shall include the number of blasts, times, and dates of blasts, the blasting locations and patterns, and all information shown below:

i. Station limits of the shot.

ii. Plan and section views of drill pattern, including free face, burden blasthole spacing, blasthole diameters, lift height, and subdrill depth.
iii. Loading diagram showing type and amount of explosive, primers, initiators, and location and depth of stemming.
iv. Initiators sequence of blastholes including delay times and delay system in each blasthole.
v. Mats or other protection used.
vi. Signature of the Blaster in charge.

c. The Contractor shall report to the Resident in writing all blasting complaints received by the Contractor within 24 hours of receipt. Each blast complaint report shall include the name and address of the complainant, time received, date and time of blast complained about, and a description of the circumstances which led to the complaint.

6. BLAST VIBRATION CONTROL AND MONITORING
   a. The Contractor shall be required to monitor blasting vibrations (both ground and air concussions) and shall provide a Pre-Blast Condition survey of all structures and cultural features that may be affected.
   b. When nearby structures, utilities, or adjacent slopes may be subject to damage from blast-induced ground vibrations, the ground vibrations shall be controlled by the use of properly designed delay sequences and appropriate charge weights per delay.
   c. When vibration damage to adjacent structures or cultural features is possible, the Contractor shall monitor each blast with an approved seismograph located, as approved, between the blast area and the closest structure subject to blast damage. The seismograph used shall be capable of recording particle velocity for three mutually perpendicular components of vibration in the range generally found with controlled blasting.
7. FLYROCK CONTROL Before the firing of any blast in areas where flying rock or debris may result in personal injury or damage to property, the rock to be blasted shall be covered with approved blasting mats, soil, or other equally serviceable material to prevent flyrock. The method of flyrock control shall be subject to approval by the Resident.
8. CONTROLLED BLASTING METHODS Controlled blasting is defined as a blasting method which utilizes a line of closely spaced, lightly loaded blastholes that are fired either before or after the main production blast to define a break line on the perimeter of the excavation.

The purpose of the Controlled blasting is to create a stable rock face with a fall zone to protect the traveling public from rockfall hazard, and to protect existing structures, adjacent and nearby properties, and the public from damage or injury. Controlled blasting shall be required on all rock critical slopes.

a. Production blasting refers to the main fragmentation blasting resulting from widely spaced production holes drilled throughout the main excavation area

adjacent to the presplit line. Production holes shall be detonated in a controlled delay sequence.

b. Presplitting is defined as the establishment of a free surface of a shear plane in rock by the controlled usage of explosives and blasting accessories in appropriately aligned and spaced drill holes so that the resulting split rock is not affected by subsequent blasting and excavation operations. The purpose of presplitting is to minimize damage to the rock backslope and to help ensure long term stability. When presplitting, the detonation of the presplit line shall be before the detonation of any production holes.

i. Prior to drilling, all overburden and all loose and disintegrated rock shall be removed down to solid rock in the vicinity of the presplit lines. Potentially dangerous boulders beyond the excavation limits shall also be removed as directed by the Resident.

ii. Presplitting shall extend a minimum of 30 feet ahead of the limits of production blasting within the section or to the end of the cut as applicable.

iii. All drilling equipment used to drill the presplit holes shall have electromechanical or electronic devices affixed to that equipment to accurately determine the angle at which the drill steel enters the rock. Presplit hole drilling will not be permitted if these devices are missing or inoperative.

iv. The length of the presplit holes shall not exceed 30 feet in depth unless approved by the Resident. Rock deeper than 30 feet shall usually be presplit in lifts, but no lift shall be less than 10 feet in depth. When the cut height will require more than one lift, a maximum 2-foot offset between lifts shall be permitted to allow for equipment clearance. No payment will be made for additional excavated quantity caused by offsetting of presplit lines for less than 20 foot lifts. Drilling 2 feet below ditch bottom will be allowed to facilitate removal of the toe berm.

v. Before placing charges, the contractor shall determine that the hole is free of obstructions for its entire depth. All necessary precautions shall be exercised so that placing the charges will not cause caving of material from the walls of the holes.

vi. The diameter of the explosives used in presplit holes shall not be greater than ½ the diameter of the hole.

vii. Continuous column cartridge explosives manufactured especially for presplitting shall be used for all presplitting. The bottom charge of a presplit hole may be larger than the line charges, but shall not be large enough to cause overbreak. The top charge of the presplitting hole shall be placed far enough below the collar, and reduced sufficiently, to avoid overbreaking and heaving. The upper portion of all presplit holes, from the top charge to the hole collar, shall be stemmed.

viii. The presplit slope face shall not deviate more than one foot from a plane passing though adjacent drillholes, except where the character

of the rock is such that, as determined by the Resident, irregularities are unavoidable. The one-foot plane shall be measured perpendicular to the plane of the slope. In no case shall any portion of the slope encroach on the roadbed.

c. Cushion blasting. Where the horizontal distance from the existing rock face to the cut face is less than 15 feet, or if rock conditions warrant this approach, the contractor may use cushion blast in lieu of presplitting. Cushion blasting is similar to presplitting except that the detonation along the cut face occurs after the detonation of all production holes. With the exception of the above criteria, requirements previously given for presplitting shall also apply to cushion blasting.

Sliver Cuts – For sliver cuts, pioneering the top of cuts and preparing a working platform to begin the controlled blasting may require unusual work methods and use of equipment. The contractor may use angle drilled holes during the initial pioneering operations to obtain the desired rock face. Hole spacing shall not exceed 30 inches.~~Methods of utilization may be any of the following:~~

~~1. Used in the upper 150mm [6 in] of travelways and full depth in driveways as aggregate base or subbase provided the material contains no particles greater than 75 mm [3 inch] in any dimension.~~

~~(a) Placing, shaping, compacting, stabilizing, and surface tolerance shall be in accordance with applicable provisions of Section 304 – Aggregate Base and Subbase Course, except that the material shall be placed in a layer of uniform thickness not to exceed 150 mm [6 in] and compacted to the extent that the material is stabilized and keyed together. No more than one layer may be used.~~

~~(b) If the material is blended, it must be blended with an aggregate that meets the gradation and quality requirements for Aggregate Subbase Course, Gravel – Type D noted in Subsection 703.06.~~

~~2. Used as a replacement for untreated aggregate surface course on entrances provided the material contains no particles greater than 50 mm [2 in] in any dimension. Payment will be made under Pay Item 411.09 Untreated Aggregate Surface Course. Paragraphs 1(a) and 1(b) of this provision will apply or as directed by the Resident.~~

~~3. Recycled as stabilized base or plant mix pavement if so designated in the contract.~~

~~4. Stockpiled at commercial or approved sites for commercial or MDOT use.~~

~~5. Other approved methods proposed by the Contractor, which will assure proper use of the existing bituminous pavement.~~

~~The cost of salvaging bituminous material will be included for payment under the applicable pay item, with no additional allowances made, which will be full compensation for removing, temporarily stockpiling, and rehandling, if necessary, and utilizing the material in the roadway~~

~~or stockpiling at an approved site as described above. The material will also be measured and paid for under the applicable Pay Item for which it is reused.~~

203.05 Roadway Excavation Roadway excavation shall be maintained in such condition that the excavation surface will be well drained. Temporary drains, drainage ditches and culverts shall be constructed to intercept and divert water that may adversely affect the condition of the excavation and the prosecution of the work.

Excavation in general, shall proceed in an upgrade direction. Subgrades shall be promptly graded and rolled to minimize absorption of water. Adjacent ditches shall be graded to the extent that puddles will not form. Grubbing areas which cannot be drained shall be promptly filled with approved excavation or borrow to such an elevation that surface drainage will be effective. If, due to unusual circumstances, drainage by gravity cannot be accomplished, the Resident may require the Contractor to provide adequate means of pumping the area. Pumping may be required on a 24 hour a day continuous basis and no direct compensation for cost of pumping will be made.

Muck shall be removed in such a manner to insure its complete removal with no areas remaining or trapped below the embankment. Excavated muck shall be deposited in designated waste storage areas as shown on the plans or as otherwise directed. When muck is encountered that was not contemplated on the plans, it shall be disposed of as indicated above.

Excavation adjacent to roots of trees or shrubs, which are to remain, shall be removed by hand.

When excavating results in a subgrade of unsuitable soil, the Resident may require the Contractor to remove the unsuitable material and backfill the area with approved material. The Contractor shall conduct their operations in such a way that the Resident can take the necessary measurements before the backfill is placed.

Material classified as rock, whether paid for as rock excavation or unclassified excavation, shall be excavated to the required depth. Care shall be taken that undrained pockets will not be left in the surface of the rock remaining.

The space between the rock remaining and the normal subgrade shown on the plans shall be backfilled with the designated aggregate subbase or aggregate base, pulverized rock or other approved material. The Contractor shall conduct their excavating and hauling work in a manner that will cause as little contamination as possible. Fine grading at the normal subgrade line will be required unless aggregate subbase or aggregate base material is used.

Ditches in rock cuts shall be constructed with no protrusions of rock above the designated rock cut pay lines. The space between the rock remaining and the finished surface of the ditch shall be backfilled with broken rock.

For earth and rock backslopes designated to be constructed on a 2 horizontal to 1 vertical slope or flatter, the slope shall be uniformly finished to within 6 inches above or 6 inches below

the lines designated, but in no case shall projections of rock extend over 6 inches above the actual finished surface of the slope as constructed. Rock backslopes designated to be constructed on a ¼ horizontal to 1 vertical slope shall be excavated at least to a vertical plane.

Buried structures and obstructions, as specified in Section 104.3.13 - Materials and Items Found on the Project, located within the designated limits of the work, shall be removed as part of the applicable excavation item for type of work being performed. Buried structures and obstructions located below or outside the required excavation, whose removal is ordered, shall be removed and such removal paid for as Common Excavation, Rock Excavation or Unclassified Excavation, whichever is applicable.

203.051 Drilling and Blasting of Solid Rock Subgrade. Subgrade areas shall be shattered to the dimensions shown on the Plans or as directed by the Resident.

The area of blasted rock subgrade shall extend sufficiently beyond the beginning and end of cut areas to ensure the shattering of all rock to a depth of 4 feet below subgrade elevation to eliminate water pockets.

After detonation, any rock that protrudes above the subgrade elevation shall be removed. When directed by the Resident, the Contractor shall excavate a trench across the blasted rock to determine if the rock is broken and rearranged to a depth of 4 feet below subgrade. Afterwards, the trench shall be backfilled with the rock removed.

203.06 Waste Areas It shall be the responsibility of the Contractor to obtain necessary permits and approvals from all pertinent State and Federal agencies and from the local municipality before the establishment of waste areas off the project. In addition, written permission of the property owners shall be obtained by the Contractor, including permission to dispose of waste in the area. Copies of all required permits shall be given to the Resident.

Provisions shall be made for temporary and permanent erosion controls at waste areas, which shall include, but not necessarily be limited to, grading the surface to drain, covering the surface with loam or other earthy material that will support growth and seeding and mulching. Seed and mulch shall be applied in accordance with Section 618 - Seeding.

Entrances to waste areas located within wooded areas shall be in accordance with Subsection 203.07 - Haul Roads.

When waste areas are located within wooded areas, a screen of trees at least 100 feet wide shall be maintained between the nearest edge of the waste area and the right-of-way line or the construction limit line.

The entrances to waste areas shall be treated in the same manner as the waste area except that if entrances in wooded areas exceed 16 feet in width the ground shall also be replanted with trees compatible with the type growth in adjacent area. These plantings shall extend for a length of 100 feet along the entrance road or as otherwise directed.

All trees that are damaged, uprooted or otherwise moved as a result of the waste material, and trees that have had waste material placed around them to the extent that they may die, shall be cut and removed at the expense of the Contractor.

Designated waste areas may be established by the Department. When such waste areas are established, the location and other conditions relating to them will be described in the Special Provisions or on the plans.

Waste material shall not be disposed of in wetlands without prior approval and the acquisition by the Contractor of all necessary Federal, State and local permits.

"Wetlands" are those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas. The Contractor shall be solely responsible for delays and costs resulting from or associated with the proposed disposal of waste material in wetlands.

203.07 Haul Roads In wooded areas, haul roads shall be kept to a minimum width and placed at approximately right angles to the road or angled away from view of oncoming traffic.

203.08 Borrow The location of all borrow pits and rock borrow quarries shall be approved in accordance with Section 105.8.6 - Pit Requirements and Section 657 - Rehabilitation of Pits.

The Contractor shall notify the Resident sufficiently in advance of opening any borrow areas so that cross section elevations and measurements of the ground surface after stripping may be taken and the borrow material can be tested before being used. Existing pits shall, when directed, be graded and shaped by the Contractor before being cross-sectioned for original measurements.

Borrow pits shall be excavated to neat lines and all slopes shall be dressed uniformly and left in a neat condition. Before the completion of the project, all borrow pits and haul roads shall be graded to blend with adjacent ground, loamed if necessary, seeded and mulched. When practicable, the bottom of all pits shall be graded to drain the pit.

203.09 Preparation of the Embankment Area When the depth of the embankment, measured vertically below subgrade, does not exceed 5 feet the area on which the embankment is to be placed shall be grubbed as defined in Subsection 203.01 a. When the embankment is more than 5 feet, as measured above, all vegetation in the embankment area shall be cut as specified in Section 201 - Clearing Right-of-Way.

When embankment is to be placed and compacted on hillsides or where new embankment is to be compacted against existing embankment, slopes steeper than 1 vertical to 2 horizontal

shall be continuously benched by excavating steps into the existing material of sufficient width to permit operations of placing and compacting the additional material. Material removed shall be placed and compacted along with the new embankment material. When such benching is required, it will be as indicated on the plans, called for in the special provisions or as directed.

203.10 Embankment Construction - General Layers of material for embankments shall start at the deepest portion of the fill and as placement progresses, layers shall be constructed approximately horizontal. Except for the first layer over swampy ground and cleared areas, roadway embankment of earth material shall be placed in layers not exceeding 8 inches, loose measure, unless otherwise approved and the material compacted as specified before the next layer is placed.

When it is impractical to construct layers over the full width of the cross section, partial width layers may be authorized.

Effective spreading equipment shall be used on each layer to obtain uniform thickness. Each layer shall be crowned and maintained free of ruts and ridges to provide direct drainage of water from the embankment. As the compaction of each layer progresses, grading and manipulating will be required to assure uniform density. Construction equipment shall be routed uniformly over the entire surface of each layer.

Embankments within 50 feet of a bridge abutment, structural plate or box culvert type structure shall be compacted by the moisture and density control method as specified in Section 203.12 - Construction of Earth Embankment with Moisture and Density Control, except that rock embankments may be constructed over culverts as specified in Section 203.15 - Construction of Rock Embankments.

Water shall be added or removed, if necessary, in order to obtain required compaction. Aeration of excavated roadway materials to reduce the moisture content to within specified limits shall be as specified under Section 631.04 - Aerating.

When placing layers of specified thickness is not feasible, such as filling in water or over swampy ground, the initial layer of embankment may be constructed in one layer to an elevation where bridging will be accomplished. In embankment areas where no grubbing is required, the material placed in the first layer shall be of sufficient depth to cover all stumps.

When the excavation or borrow consists predominantly of fragments of such size that the material cannot be placed in embankments in layers of specified thickness without breaking down the pieces, such material may be placed in layers in thickness not exceeding the approximate average size of the larger rocks but in no case shall layers exceed 2 feet. Rocks exceeding this thickness shall be separated and collectively placed in accordance with the requirements for rock embankments. Each layer shall be leveled and smoothed with suitable leveling equipment and by even distribution of rock spalls and finer rock fragments or earth. The Resident may test any or all layers by moisture and density control as specified in Section 203.12 - Construction of Earth Embankment with Moisture and Density Control, which are constructed in depths exceeding 8 inches. The layers so constructed shall not be placed above

an elevation 2 feet below the finish subgrade. The remainder of the embankment shall be composed of suitable material smoothed and placed in layers not exceeding 8 inches, loose thickness, and compacted as specified for earth embankments.

Where guardrail is to be installed, rock shall not be placed in the embankment under the location of the guardrail to an elevation 4 feet below the finished grade of the shoulder. Rocks, broken concrete and other solid materials shall not be placed in any portions of embankments where piling is to be placed or driven or where Utility facilities are to be placed.

Excess or unsuitable excavated material, including rock and boulders, which cannot be used in embankments shall be placed in the nearest available waste areas. When it is impossible to dispose of all material in the manner described, the remainder shall be disposed of in approved waste areas.

When material obtained from roadway excavation is unsatisfactory for use in the formation of embankments due to excessive moisture content, can be rendered satisfactory for such use by combining it with granular material, the unsatisfactory material shall be combined with granular borrow or granular excavation when and as directed by the Resident.

If the embankment is required to be deposited on only one side of abutments, wing walls, piers or culvert headwalls, care shall be taken that the area immediately adjacent to the structure is not compacted excessively to the extent that it will cause overturning of or excessive pressure against the structure. When embankment is to be placed on both sides of a concrete wall, structural plate or box type structure, operations shall be so conducted that the embankment is always at approximately the same elevation on both sides of the structure.

At the close of each day's work, the embankment surface shall be graded, crowned, smoothed, rolled and sealed against infiltration of water.

The portion of the embankment and subbase outside a 1 vertical to 1½ horizontal slope extending from the edge of the finished shoulder to the existing ground, as shown on the Standard Detail entitled "Disposal of Waste Materials", will be required to be compacted only to the extent that stability of the slope is assured. As construction of the embankment progresses, material placed in the portion of the embankment outside the 1 vertical to 1½ horizontal slope shall not be placed above the elevation of the surface of the main embankment unless provisions are made to allow drainage of surface water from the embankment. The surface of the slopes shall be finished to present a uniform neat appearance.

The portion of the embankment inside the aforementioned 1 vertical to 1½ horizontal slope lines shall be compacted in accordance with the designated embankment compaction requirements specified for the project.

203.11 Construction of Earth Embankment-Layer Method The layer method will be required unless otherwise specified. Unless otherwise approved the material shall be deposited and

spread upon compacted material in full width layers not more than 8 inches in depth, loose measure. Clay or loam soils shall be compacted by use of sheepsfoot or tamping type roller having a minimum weight on each tamper, under working conditions, of 250 psi of cross sectional bearing area. Sand or gravel soils shall be compacted by vibratory type compaction equipment or by pneumatic tired equipment and, if necessary, by the addition of water. A combination of the above or other methods capable of producing equivalent results may be used. The compacting operations shall be continued until each layer is compacted to its full depth and width.

With approval, the Contractor may place layers in excess of 8 inches and less than 24 inches, loose measure, providing the specified compaction requirements are obtained and the Contractor agrees to make necessary test excavation for the Resident to determine density.

The Contractor will be required to demonstrate that the compaction equipment and methods are obtaining satisfactory compaction.

Satisfactory compaction for the purpose of the demonstration is defined as not less than 90% of the maximum density. The maximum density shall be determined in accordance with AASHTO T180, Method C or D, **correcting for oversize particles according to AASHTO T 224 except mixtures may have 40 percent or less retained on the ¾ inch sieve. (An** ~~corrected by the Soils Laboratory~~ Adjustment Chart**/Spreadsheet for this correction is**~~,~~ available at the **MaineDOT**~~MDOTMDOT~~ Central Laboratory **in**~~,~~ Bangor, Maine**).** ~~.~~ – Field density tests will be **performed by the Department**~~mademade~~ in accordance with AASHTO **T 310**~~T191T191,~~ ~~adjusted to include only the material passing a 19 mm [¾ inch] sieve or by an approved method using a calibrated nuclear device~~.

Compaction of each layer of base or subbase material that exceeds 40 percent retained on the ¾ inch sieve shall continue until a density of not less than 98% of the maximum density has been achieved for the full width and depth of the layer. Density tests and the maximum density determined by a control section shall be performed by the Department.

A 300 foot section at the start of the operation will be designated as the control section. The contractor shall add water to the control section as directed until the Department determines that optimum moisture has been obtained. The control section shall then be rolled as directed using the specified compaction equipment until the Department determines that four consecutive passes do not increase the dry density by more than 1 lb/ft^3. The compaction process shall be repeated for each roller. Once the compaction process is complete, the Department will perform several additional density tests. The average of these tests shall be used to determine the maximum density of the control section.

~~—~~203.12 Construction of Earth Embankment with Moisture and Density Control ~~–~~ The contract or Section 203.10 will designate the areas to be constructed with moisture and density control and the distance below subgrade to which such methods shall be applied. ~~-~~ The moisture content at the time of compaction shall be suitable to obtain the required density. ~~–~~ The maximum density shall be determined in accordance with AASHTO T180, Method C or D,

correcting for oversize particles according to AASHTO T 224 except mixtures may have 40 percent or less retained on the ¾ inch sieve. (An ~~corrected by the Soils Laboratory~~ Adjustment Chart/**Spreadsheet for this correction is** available at the **MaineDOT**~~MDOTMDOT~~ Central Laboratory **in**~~,~~ Bangor, Maine**).** ~~.~~ Field density tests will be **performed by the Department.** ~~made in accordance with AASHTO T191, adjusted to include only the material passing a 19 mm [¾ inch] sieve or by an approved method using a calibrated nuclear device.~~

~~—~~All material in embankments above the elevation designated on the plans for moisture density control shall be placed at a moisture content suitable to obtain the required density. ~~-~~ Each layer placed with controlled moisture shall be compacted to not less than 90% of the maximum density.

Compaction of each layer of base or subbase material that exceeds 40 percent retained on the ¾ inch sieve shall continue until a density of not less than 98% of the maximum density has been achieved for the full width and depth of the layer. Density tests and the maximum density determined by a control section shall be performed by the Department.

A 300 foot section at the start of the operation will be designated as the control section. The contractor shall add water to the control section as directed until the Department determines that optimum moisture has been obtained. The control section shall then be rolled as directed using the specified compaction equipment until the Department determines that four consecutive passes do not increase the dry density by more than 1 lb/ft^3. The compaction process shall be repeated for each roller. Once the compaction process is complete, the Department will perform several additional density tests. The average of these tests shall be used to determine the maximum density of the control section.

~~Density requirements will not apply to the portions of embankments constructed of material which cannot be tested in accordance with AASHTO T191 or when the material contains more than 30% material retained on a 50 mm [2 in] square mesh sieve.~~

203.15 Construction of Rock Embankments The material for rock embankment shall be placed in compacted layers not exceeding 3 feet in depth. Depositing the rock directly over the end of the fill from the hauling equipment will not be permitted; it shall be deposited on the fill and pushed into place. The top of the rock embankment shall be so choked that there will be no infiltration of the earth embankment placed on the top of the rock embankment.

This method shall be used only in fills in excess of 4 feet in depth. In no case shall the rock embankment be placed within 1 foot of subgrade **(3 feet in guardrail areas).**~~unless authorized.~~

When structures are located under rock embankment, they shall be covered with not less than 2 feet of earth excavation or borrow before the rock embankment is placed over the structures.

203.16 Winter Construction of Embankments Frozen material shall not be placed in the core embankment. The construction of embankments may continue during cold weather only when all frozen material in the top of the core embankment or the existing ground is moved to the waste area before placing additional material. When this procedure results in additional borrow quantity the additional borrow will not be paid for directly.

Compaction shall be in accordance with the specified method of embankment construction. When the prevailing temperatures are below 30°F all material used in embankment construction shall have a moisture content, at the time of compaction, equal to or less than the optimum moisture content.

The embankment shall not be constructed upon frozen material except that such construction of embankments may be allowed providing the total depth of the added fill, including bases, plus the depth of the frozen material beneath does not exceed 5 feet. Frozen material may be left in the embankment only if it has been compacted as specified before freezing. The Contractor shall not resume construction of any embankments built in this manner until all frozen material has thawed. If test holes are required to make this determination they shall be dug and backfilled with satisfactory compaction at the Contractor's expense. Before additional material is added, uncompacted material on the surface of such embankments shall be either recompacted in accordance with the specified method of embankment construction or removed.

203.17 Preparation and Protection of the Subgrade Unless otherwise provided, the subgrade shall be brought to a condition of uniform stability and compacted for the full width of the roadway by grading and rolling operation and shall be maintained to no tolerance above or 3 inches below the required grade and cross section. The surface shall be compacted to uniform density and stability and graded to the extent that puddles of water will not form. Additional material required as a result of low subgrade shall be furnished and placed at the expense of the Contractor.

The required compaction shall be the same as specified for embankments. When the subgrade occurs in cuts, the required compaction shall apply to a depth of 6 inches below subgrade unless otherwise specified.

The Contractor shall protect the subgrade from damage. Ditches and drains along the roadway shall be maintained to effectively drain the subgrade. In no case shall vehicles be allowed to travel in a single track and form ruts. No material shall be deposited on a subgrade until the subgrade has been approved.

203.18 Method of Measurement Except as otherwise provided, excavation and borrow will be measured by the number of cubic yards measured in **place**~~itsits original position~~ by cross sectional elevations~~ of the area excavated~~. Measurements will include slides in common excavation and unclassified excavation, not attributable to carelessness of the Contractor, and authorized excavation of earth, rock, shale, muck or other unsuitable material. Volumes will be computed by the average end area method or by other methods generally recognized as conforming to good engineering practice.

When granular borrow or gravel borrow is placed for backfill behind bridge abutments and around structural plate pipes, pipe arches, and plate arches to the lines, grades, and dimensions shown on the plans, the quantity measured for payment will be that portion of the number of cubic yards shown in the Schedule of Items that is estimated for the structure.

This quantity is considered final, and no adjustments will be made except under the following conditions:

a. When the structure is founded on ledge, the quantity measured will be what is actually placed to maximum allowable horizontal dimensions shown on the plans.

b. When changes to the plans are made by the Resident.

Muck excavation, to be measured for payment as common excavation, will be the number of cubic yards of material acceptably excavated from areas shown on the plans or other authorized areas not shown on the plans or placed in waste storage areas or hauled to an approved waste area. Muck excavation shall be measured in its original position by cross sectional elevations and the volume computed by the average end area method. If muck is stored in excess of the maximum slope requirements of any waste storage area, the amount requiring reloading, hauling and disposing of in other waste storage areas or approved waste areas will not again be measured for payment.

When it is impractical to measure excavation by the cross sectional method due to the erratic location of isolated deposits, acceptable methods involving three-dimensional measurements may be used. When small quantities of borrow are involved and it is impractical to measure in **place,**~~its original position~~ a quantity not exceeding 2,500 cubic yards per item for a single project may be measured in vehicles at the point of delivery**. If** ~~and~~ a **dedicated borrow pit is available**~~quantity quantity not exceeding 5,000 m³ [6,500 cubic yards] per item~~ for **the**~~aa single~~ project**, the entire quantity** ~~–~~may be measured **pit quantity**~~inin place~~. When measured in vehicles the quantity for payment shall be **80**~~9090~~% of the quantity determined for earth and **100**~~7575~~% of the quantity determined for rock as shown on delivery slips. When **pit** measured**,** ~~in place~~ the amount for payment shall be **90**~~115115~~% of the quantity so measured for earth material and **130**~~7575~~% of the quantity so measured for rock.

Unless otherwise authorized, measurement for excavation in earth cuts will be made to the designated slopes. Field changes made by the Resident will be measured by cross sections or by other acceptable methods. Elevations for final cross sections shall be determined at the surface of the finished ground with no additional allowance for thickness of loam, sod, riprap, hay mulch, or other type of ground cover except that excavation for slope gravel blanket will be measured by the cubic yard.

Unless otherwise authorized, measurement for excavation in rock slopes designated to be constructed on a 1 vertical to 2 horizontal slope or flatter will be made to the designated slope line providing the finished slope is within tolerances described in Subsection 203.05 - Roadway Excavation. If the finished slope line is not within the tolerances described, payment will be

made to the designated cut slope line or to the finished slope line, whichever yields the lesser quantity.

Unless otherwise authorized, measurement for excavation in rock slopes designated to be constructed on a 1 vertical to ¼ horizontal slope will be made to the designated slope providing the rock is excavated beyond a vertical plane. There will be no payment for material removed beyond the designated slope line.

Unless authorized, material placed in embankments outside a surface parallel to and 6 inches beyond the neat line of embankment slope or 12 inches beyond the neat line of the waste storage area in which waste has been placed will not be included in the quantity for payment and will be deducted from the borrow at 100% of the material so measured in place.

The elevations for final cross sections for excavation shall be determined at the surface of the finished ground with no additional allowance for thickness of loam, sod, riprap, temporary erosion control blanket, hay mulch or other type ground surface except that excavation for slope gravel blanket will be measured by the cubic yard.

Measurements will be made for unsuitable materials actually excavated and removed to obtain proper compaction in cut sections and in foundations for fill sections.

Aeration of excavated materials to reduce moisture content to specified limits will be measured as specified under Section 631 - Equipment Rental.

The quantity of Drilling and Blasting of Solid Rock Subgrade to be measured for payment will be the number of square yards of subgrade plan area drilled and detonated in accordance with this Section, measured at subgrade level. The number of cubic yards of excavation required by the Resident to inspect the depth of shattered and rearranged rock, computed at a maximum width of 30 inches will be measured for payment as Structural Earth Excavation – Drainage and Minor Structures Below Grade.

When Structural Rock Excavation – Drainage and Minor Structures, and Drilling and Blasting of Solid Rock Subgrade occur at the same location, measurement and payment for Structural Rock Excavation - Drainage and Minor Structures will be made for the required trench. This area will not be included in the measurement and payment for Drilling and Blasting of Solid Rock Subgrade.

Controlled Blasting shall be paid by the linear foot of presplitting holes and extra drilled holes without explosives, measured from the top of the drill hole at the rock surface to the bottom of the hole or to the elevation of the required subgrade (whichever is higher) or to an established bench elevation. Portions of holes not meeting the requirements of Subsection 8 will not be measured. Production holes will not be measured. Presplitting holes and extra drilled holes without explosives drilled where presplitting is not required by this specification will not be measured. Where presplitting is required, excavated rock will be paid only to the slope and depth lines shown on the plans or as ordered by the Resident. Where the Resident determines that the removal of additional rock is necessary due to conditions clearly not attributable to the

Contractor's methods of operations, the payment lines will be adjusted to the limits ordered, to include only rock actually removed within such limits.

203.19 Basis of Payment The accepted quantity of excavation and borrow will be paid for at the contract unit price per cubic yard for each of the pay items included in the Schedule of Items. Payment shall be full compensation for obtaining borrow when required and for excavating, loading, hauling, placing, grading and compacting all material necessary for the formation of embankments. It shall also include full compensation for disposing of unsuitable and surplus material when necessary. It shall also include excavation in embankments for determining compaction density.

Haul, connected with the disposal of waste or surplus material or both, shall be limited to a maximum distance of 2,000 feet beyond the limits of the project for disposal in flattening slopes or other roadway work. If no disposal areas are designated the haul shall be made to an approved waste area supplied by the Contractor.

Payment for removal of unstable material below subgrade in cuts will be paid at the contract unit price per cubic yard for Common Excavation or Unclassified Excavation whichever is appropriate.

Payment for placing and compacting any backfill, except Special Backfill, placed in accordance with Section 206 - Structural Excavation, will not be paid for separately but will be included in the payment for any one of the related excavation items, provided however, there is suitable excavation material available in its original position at the time of backfilling. When there is no suitable material available for backfilling, the material authorized will be paid for under the contract item for the class of material used.

When rock is encountered and no item is included in the contract for its removal, the excavation of the rock will be paid for at 6 times the contract unit price for common excavation.

The furnishing and placing of backfill material between the rock remaining and the normal subgrade line of rock cuts will not be paid for directly, but shall be considered incidental to the work. The quantity of Aggregate Subbase or Aggregate Base for payment in rock cuts shall include only the material placed above the normal subgrade lines.

Earth material from beyond the designated slope lines on earth cut slopes as specified in Section 203.18 - Method of Measurement, and when authorized, may be paid for, when used to construct embankments, at the contract unit bid price for excavation or borrow, whichever is less. Costs for furnishing and placing material necessary to backfill and to grade rock cut slopes designated to be constructed on a slope of 1 vertical to 2 horizontal or flatter, will be considered to be included under the payment for the material used, either excavation or borrow.

When muck is encountered, the excavation of the muck will be paid for at the contract unit price bid for Common Excavation or Unclassified Excavation.

Excavation which requires more than one handling prior to final placement in the embankments including material placed as backfill and loamy top soil to be stockpiled and reserved for later use on the slopes, will be paid for at the contract unit price for Common Excavation, Unclassified Excavation or Rock Excavation, as the case may be, for each handling approved **by the Department.** ~~:~~ It may be paid for under another contract item for the second handling when so authorized. Each handling shall be considered to include the operations of excavating, loading, transporting, unloading and disposing of earth or rock material.

Excavation for unstable slopes for slope blanket backfill, as specified in Subsection 203.04 - General, will be paid for at twice the contract unit price bid for common excavation. Backfill material will be paid for as specified in Subsection 304.11 - Basis of Payment.

Excavation for benching to receive embankments will not be paid for directly but shall be incidental to the other contract items.

Water added to embankment material to aid in compaction will not be paid for directly but shall be considered included in the contract items.

Payment for compacting the soils in the abutment and pier areas, after the topsoil has been removed will not be made directly but shall be considered included in the other contract items.

Removing portland cement concrete pavement and portland cement concrete base course, when not included in the contract as a separate pay item, will be paid for under Pay Item 203.21 - Rock Excavation.

Payment for excavating or filling and compacting material in building or other foundation holes, whether existing or created by the removal of structures and obstructions, will be made under the appropriate pay item for excavation or borrow and no additional allowances will be made.

All work and materials required to grade, loam, seed and hay mulch waste areas and haul roads to and from waste areas to eliminate unsightly conditions and to control erosion will not be paid for directly but will be considered included in the work of the various classifications of excavation all as specified in Section 203.06 - Waste Areas.

Stripping pits to obtain necessary borrow will not be paid for separately but will be considered included in the other contract items.

When common excavation and rock excavation are reclassified as unclassified excavation, payment will be made for the reclassified items under Pay Item 203.22 - Unclassified Excavation, at the identical unit bid price.

Unless otherwise provided in contracts with common excavation, rock excavation or unclassified excavation items, grading, furnishing and placing loam, seed and mulch in waste areas shall be considered incidental to the contract and no separate payment will be made.

\The accepted quantities of Drilled and Blasted Solid Rock Subgrade as measured will be paid for at the Contract unit price per square yard for the specified Contract items. Payment will be full compensation for performing the work specified including the removal of blasted rock that may swell above subgrade and its disposition on the project as directed by the Resident. Excavation and backfill required to inspect the depth of broken rock below subgrade will be paid for at the Contract unit price per cubic yard for Structural Rock Excavation – Drainage and Minor Structures.

The accepted quantity of presplitting rock will be paid for at the contract unit price per linear foot under Pay Item 203.211 – Presplitting Rock. All costs incurred by the Contractor in preparing an approved blasting plan, in maintaining a blasting log, and in adopting revised blasting methods necessary to produce an acceptable test shot shall be considered incidental to the contract unit prices for rock excavation and presplitting rock

~~In Contracts that do not contain Common Excavation or Unclassified Excavation items, grading, furnishing and placing loam, seed and mulch in waste areas will be paid for under applicable pay items of the contract.~~

Payment will be made under:

Pay Item		Pay Unit
203.20	Common Excavation	Cubic Yard
203.2001	Common Excavation - Plan Quantity	Cubic Yard
203.21	Rock Excavation	Cubic Yard
203.211	**Presplitting Rock**	**Linear Foot**
203.213	**Drilling and Blasting of Solid Rock Subgrade**	**Square yard**
203.22	Unclassified Excavation	Cubic Yard
203.221	Unclassified Excavation - Plan Quantity	Cubic Yard
203.24	Common Borrow	Cubic Yard
203.25	Granular Borrow	Cubic Yard
203.26	Gravel Borrow	Cubic Yard
203.27	Rock Borrow	Cubic Yard
203.35	**Crushed Stone 3/4-inch**	**Cubic Yard**

SECTION 204 - SHOULDER REHABILITATION

204.01 Description This work shall consist of rehabilitating existing shoulders by grading and compacting shoulders, and furnishing, placing, grading and compacting new shoulder aggregate to required grade.

204.02 Aggregates New shoulder aggregate for shoulder rehabilitation shall be material meeting the requirements of Section 703.10 - Aggregate for Untreated Surface Course and Leveling Course or Section 703.06 b. - Aggregate for Subbase, Type D.

New shoulder aggregate for add shoulder aggregate shall be material meeting the requirements of Section 703.11 - Aggregate for Shoulders or Section 703.06 b. - Aggregate for Subbase, Type D.

New shoulder aggregate used for shoulder rehabilitation or add shoulder aggregate will not be required to pass the Washington State Degradation Test.

204.03 Existing Shoulder The existing shoulder for rehabilitate shoulder shall be prepared by grading with power equipment to provide a surface on which to place an aggregate course. All sod, tar-penetrated strips and other unsuitable material shall be removed to the extent required by the Resident. Suitable excavated granular material may be used to fill low areas and to widen out to provide a uniform shoulder width as required. Where required by the Resident the edge of the existing traveled lane shall be cut to provide a uniform edge.

For proposed paved shoulders the surface of the existing shoulder shall be graded and compacted approximately parallel to the proposed finished paved shoulder surface.

Surplus material shall be incorporated into embankments or disposed of in an approved waste area.

Add new shoulder aggregate to existing shoulders shall be to the widths and grades that are required by the typical sections.

204.04 New Aggregate After preparation of the existing shoulder and where the thickness of new shoulder aggregate for rehabilitated shoulders to be placed exceeds 4 inches, material meeting the requirements of Aggregate for Subbase, Type D or Aggregate for Untreated Surface Course shall be placed to the required grade. Where the thickness of new shoulder aggregate to be placed is 4 inches or less, material meeting the requirements of Aggregate for Untreated Surface Course shall be used. The Contractor may, at their option, grade the existing shoulders to an elevation of 4 inches or more below the proposed finished gravel surface and place material meeting the requirements of Aggregate for Subbase, Type D, full depth.

Where the thickness of new shoulder aggregate for add shoulder aggregate shoulders to be placed exceeds 4 inches, material meeting the requirements of Section 703.06(b) Aggregate for Subbase, Type D, or Section 703.11 - Aggregate for Shoulders shall be placed to the required grade. Where the thickness of new shoulder aggregate to be placed is 4 inches or less, material meeting the requirements of this provision shall be used. The Contractor may, at their option, grade the existing shoulders to an elevation of 4 inches or more below the proposed finished gravel surface and place material meeting the requirements of Section 703.06 Aggregate for Subbase, Type D full depth

204.05 Surface Tolerance The completed surface of the rehabilitated shoulder shall be shaped and maintained to a tolerance, above or below the required cross sectional shape of ⅜ inch.

The completed surface of the add shoulder aggregate shoulder shall be shaped and maintained to a uniform machine finish.

204.10 Method of Measurement The quantity of rehabilitation of existing shoulders and add shoulder aggregate measured for payment will be the number of square yards shown in the Schedule of Items in the contract.

This quantity will be considered final, and no adjustments will be made, except when the quantity shown in the Schedule of Items is added to or deducted from, when changes to the plans are made by the Resident.

204.11 Basis of Payment The accepted quantity of rehabilitation of existing shoulder will be paid for at the contract unit price per square yard. No adjustment will be made to the quantity for payment, except as described under Method of Measurement above. Payment will be full compensation for cutting the edge joint, removing pavement, curb and other unsuitable material, grading and compacting the existing shoulder, disposing of surplus and unsuitable material, and for furnishing, placing, grading, and compacting new aggregate to the required depth, suitable for paving at the time of paving.

The accepted quantity of Add Shoulder Aggregate to existing shoulder will be paid for at the contract unit price per square yard. No adjustment will be made to the quantity for payment, except as described under Method of Measurement above. Payment will be full compensation for furnishing, placing, grading, and compacting new aggregate to the required depth.

Additional material required as a result of cross-slope variance of the pavement surface will not be paid for directly, but will be considered incidental to the contract unit price per square yard of rehabilitation of existing shoulder.

Grading, furnishing and placing loam, seed and mulch in required waste areas will be considered incidental to the contract and no separate payment will be made.

Payment will be made under:

Pay Item		Pay Unit
204.20	Add Shoulder Aggregate to Existing Shoulder, Plan Quantity	Square Yard
204.41	Rehabilitation of Existing Shoulder, Plan Quantity	Square Yard

SECTION 205 - SHOULDER RECONSTRUCTION

205.01 Description This work shall consist of reconstructing or widening existing shoulders by excavating, grading, furnishing, and compacting new shoulder aggregate and fill material if necessary, in accordance with the thickness and typical sections shown on the plans.

205.02 Aggregates New shoulder aggregate shall be material meeting the requirements of Section 703.06 a. - Aggregate for Base, Type B.

Fill material shall be existing excavation or common borrow from an outside source.

205.03 Existing Shoulder The area shall be excavated to the depth shown on the typical section and graded to a tolerance, above or below the required cross sectional shape, of ¾ inch. Where required by the Resident, the edge of the existing travel lane pavement shall be cut to provide a uniform edge.

Excavated material shall be incorporated into embankments, used to flatten existing slopes as directed or disposed of in an approved waste area.

205.04 New Aggregate After excavation, new shoulder aggregate shall be placed and compacted to the required grade.

205.05 Surface Tolerance The completed surface of the shoulder shall be shaped and maintained to a tolerance, above or below the required cross section shape of ⅜ inch.

205.051 Compaction The aggregate shall be compacted to the requirements of Section 304.04.

205.06 Method of Measurement The quantity of reconstruction of existing shoulders and widening of existing shoulders measured for payment will be the number of square yards shown in the Schedule of Items in the Contract.

This quantity will be considered final, and no adjustments will be made, except when the quantity shown in the Schedule of Items is added to or deducted from, when changes to the plans are made by the Resident.

205.11 Basis of Payment The accepted quantity of reconstruct existing shoulder will be paid for at the contract unit price per square yard. No adjustment will be made to the quantity for payment, except as described under Method of Measurement above. Payment will be full compensation for cutting the edge joint, removing pavement, curb and other unsuitable material, excavating, grading and compacting the existing shoulder, disposing of surplus and unsuitable material, and for furnishing, placing, grading, and compacting new aggregate to the required depth.

The accepted quantity of widening of existing shoulder will be paid for at the contract unit price per square yard. Payment will be full compensation for excavating, removal of pavement, and other unsuitable material, and for the cutting of edge joints. Payment will also be full

compensation for furnishing, grading, and compacting fill material; disposing of surplus and unsuitable material; and for furnishing, placing, grading, and compacting new aggregate.

Grading, furnishing and placing loam, seed and mulch in required waste areas will be considered incidental to the contract and no separate payment will be made.

Payment will be made under:

Pay Item		Pay Unit
205.41	Reconstruction of Existing Shoulder, Plan Quantity	Square Yard
205.51	Widening of Existing Shoulder, Plan Quantity	Square Yard

SECTION 206 - STRUCTURAL EXCAVATION

206.01 Description This work shall consist of excavating, hauling and backfilling or disposing of all material encountered for the installation and construction of drainage and minor structures and for major structures in accordance with these specifications and in reasonably close conformity with the lines, grade and typical cross sections shown on the plans or established. Excavating for structures below designated excavation limits as specified or shown on the plans will be included under this Section. Material, which is required to be excavated under another item, shall not be included under this item.

Ditches at inlets and outlets of culverts, special ditches and outlet ditches, all as shown on the plans, shall be constructed and paid for under Section 203 - Excavation and Embankment.

a. Drainage and Minor Structures shall include pipe culverts, pipe arches, underdrains, catch basins, manholes, structural plate units, box culverts, culvert end walls, concrete steps and other minor structures.

b. Major Structures shall include abutments and piers for bridges, rigid frame structures, and masonry retaining walls.

c. Special backfill shall consist of obtaining, hauling, and placing selected material suitable for the location where it is to be used. Structural backfill as a contract item will be called for on the plans or in the proposal.

d. Structural Rock Excavation shall consist of removing hard igneous, metamorphic and sedimentary rock which cannot be excavated without drilling and blasting or drilling and splitting and all boulders, solid mortared stone masonry, concrete masonry, each having a volume of 2 cubic yards or more.

206.02 Construction Methods The Contractor shall notify the Resident a sufficient length of time in advance of the beginning of structural excavation so that necessary elevations and

measurements may be taken of the undisturbed ground. When solid rock is encountered which is to be removed, the Contractor shall uncover the rock and provide ample opportunity for the Resident to take the necessary measurements of the undisturbed rock. Soil erosion control devices shall be in place at this time.

When the foundation material is soft or otherwise unsatisfactory the excavation shall be carried to a depth designated and the material removed below the elevation shown on the plan and shall be replaced with approved granular material, thoroughly compacted, or a lower elevation for the bottom of the structure shall be established.

Suitable material removed from the excavation area including that material removed from beyond the specified excavation pay limits shall be used for backfilling or for the formation of embankments and no additional allowances for payment will be made. Unsuitable or surplus material shall be disposed of as directed.

When the foundation is to be placed on solid rock, the rock shall be excavated to a firm surface, either level stepped or serrated. When solid or disintegrated rock or boulders are encountered, the rock shall be excavated to a designated depth below the bottom of the proposed structures. Except for installations of underdrain, the material so removed shall be replaced with selected fine compressible material such as sand and uniformly compacted and shaped in accordance with Section 603.04 - Bedding.

When the structure is to rest on an excavated surface other than rock, special care shall be taken not to disturb the bottom of the excavation. If the surface upon which the structure is to rest is disturbed, it shall be regraded and recompacted to the extent directed by the Resident.

After each excavation is completed, the Contractor shall notify the Resident and no culverts or masonry shall be placed, foundation piles driven or other installations made, until the depth of the excavation and the character of the foundation material has been approved.

Before drainage or underdrain pipe is installed in cut areas where common excavation, unclassified excavation or muck excavation is removed below the subgrade elevation shown on the plans, the undercut roadbed shall be filled with approved granular material to a depth sufficient to support construction equipment. All fill material shall be compacted as required.

206.03 Backfilling Backfilling shall consist of placing suitable material in all spaces excavated and not occupied by drainage structures, bridge structures and other permanent structures up to the elevation of the existing ground or other elevations shown on the plans or designated. Except for underdrain backfill and for structural plate pipe units, backfill material for drainage and minor structures shall be fine readily compressible soil or granular material, at or near optimum moisture content, and shall not contain stones larger than 3 inches, frozen lumps, chunks of clay, mineral matter or any other objectionable material. Backfill material for major structures shall be granular borrow or other material designated on the plans and shall be at or near optimum moisture content and shall not contain stones larger than 3 inches, frozen lumps, chunks of clay, mineral matter or any other objectionable matter.

~~Backfill shall not be placed against gravity sections of masonry abutments, wing walls, box culverts or other structures requiring forms, until the masonry has been in place at least 7 days or until concrete cylinders cured with the structure establish that design strength has been reached. For reinforced sections, no backfill shall be placed until the masonry has been in place at least 14 days or until concrete cylinders cured with the structure establish that design strength has been reached~~. **Backfill shall not be placed against gravity sections of any structure, including those comprised of masonry and/or concrete, until the structure has been in place for at least 7 days or until mortar and/or concrete cubes/cylinders cured with the structure establish that design strength has been reached. For structures other than gravity structures that require reinforcing steel designed to resist applied dead and live loads, no backfill shall be placed against the structure until the concrete has been in place for at least 14 days or until concrete cylinders cured with the structure establish that the design strength has been reached.** Backfilling around pipes, catch basins and manholes, the joints of which are made with portland cement mortar, shall not be done until the mortar has been in place at least 12 hours unless methods approved by the Resident are used to protect the mortar from being disturbed.

Except for structural plate units, backfill material shall be uniformly distributed in layers of not more than 8 inches in depth, loose measure, and each layer thoroughly compacted by use of approved compactors before successive layers are placed. When backfill is being placed around a pipe or structure, operations shall be so conducted that the fill is always at approximately the same elevation on both sides. Water shall be added when necessary to increase the moisture content of the backfill material to obtain compaction. Puddling or jetting of backfill will not be allowed unless specifically provided in the contract. Structural plate units shall be backfilled in accordance with Section 509 - Structural Plate Pipes, Pipe Arches, Arches, and Metal Box Culverts.

Unless otherwise indicated on the plans or directed, all sheeting and bracing used during structural excavation shall be removed by the Contractor following the completion of the work, and all voids resulting from use of the sheeting and bracing backfilled where necessary.

206.04 Method of Measurement Structural excavation will be measured by the number of cubic yards of material removed, measured in its original position acceptably excavated in conformity with the plans or as directed.

When structures are to be installed where roadway excavation is to be removed, only the excavation beyond and below the roadway excavation limits will be classified as structural excavation.

a. Drainage and Minor Structures For these structures there will be no measurement for structural earth excavation except excavation required below a plane parallel with and 12 inches below the bottom of the aforementioned structures, as shown on the plans, hereafter called Structural Earth Excavation, Below Grade. When measured for payment, the quantity of Structural Earth Excavation, Below Grade, will be the amount actually excavated, provided the maximum allowable horizontal dimensions do not exceed those bounded by vertical surfaces 15 inches from the structure, except 18 inches out-side the lines of the base

of catch basins, manholes, structural plate units, and box culverts, and to the vertical neat lines of underdrain trenches, as shown on the plans.

When rock is required to be excavated for installation of these structures, the depth for measurement will be the actual depth required in accordance with the construction specifications or as otherwise designated for a maximum vertical dimension of 1 foot below the bottom of the invert of the pipe for culvert pipe and for underdrain and 1 foot below the bottom of the base for catch basins and manholes. The quantity of rock will be the number of cubic yards actually removed provided the maximum allowable horizontal dimensions do not exceed those bounded by vertical surfaces specified in the preceding paragraph. Any removal of solid rock for leveling, stepping or serrating, as shown on the plans, Standard Details, or determined, shall be measured within the aforementioned limits.

b. Major Structures For major structures, the quantity measured for payment will be the number of cubic yards shown on the Schedule of Items in the contract.

This quantity is considered final, and no adjustments will be made except under the following conditions:

1. When the structure is founded on ledge, the quantity measured will be what is actually excavated to the top of the ledge and to maximum allowable horizontal dimensions bounded by vertical surfaces 18 inches outside the neat lines of the base as shown on the plans.

2. When changes to the plans are made by the Resident.

When the outermost limit of french drains exceeds the vertical planes stated above, the limit to be measured for payment will be extended upward from the bottom of the french drain on a vertical plane bounded by the outermost limit of the french drains.

When rock is required to be excavated for the construction of major structures to definite elevations as shown on the plans, or elevations designated by the Resident after the rock has been exposed, the maximum depth of measurement for payment will be to a horizontal plane or planes located 12 inches below the elevation shown or designated.

Removal of solid rock, for leveling, stepping or serrating, as shown on the plans or determined, shall be measured within the aforementioned limits and paid for as structural rock excavation. When earth is required to be removed to uncover existing rock, it will mean to excavate to undisturbed solid rock and will be so measured for payment.

c. Special Backfill The quantity of Special Backfill to be measured for payment as a contract item will be the number of cubic yards of material acceptably placed and measured in place, but will not include replacement of material excavated beyond the specified pay limits for structural excavation.

206.05 Basis of Payment The accepted quantities of structural excavation, when specified to be paid for separately, will be paid for at the contract unit price per cubic yard. The work, whether paid for separately or incidental to the structure, shall include the placing and compacting of backfill, the formation of any embankments made with material from structural excavation and the disposal of all surplus or unsuitable material, unless otherwise specified.

Earth excavation for installation of drainage and minor structures, except that which is defined as "Below Grade" will not be paid for and all costs for such excavation and disposal of materials will be considered incidental to the contract unit price per item for the structure being installed or constructed. Rock excavation for the installation of these structures will be paid for at the contract unit price for Pay Item 206.07 - Structural Rock Excavation - Drainage and Minor Structures.

The accepted quantity of Structural Earth Excavation - Drainage and Minor Structures, Below Grade and of Structural Rock Excavation - Drainage and Minor Structures, will be paid for at the contract unit price per cubic yard.

When rock is encountered and no Structural Rock Excavation - Drainage and Minor Structures item is included in the contract, the excavation of the rock will be paid for at 16 times the contract unit price per cubic yard for Common Excavation.

When rock is encountered and no Structural Rock Excavation - Major Structures or Structural Rock Excavation - Piers is included in the contract, the excavation of the rock will be paid for at 6 times the contract unit price for structural earth excavation of the corresponding classification.

When it is necessary to excavate below the elevation shown on the plans for abutments, masonry retaining walls, piers or rigid frame structures, payment for such excavation will be made at 1½ times the contract unit price for the item classification applying where the extra depth is required.

Protective systems and/or additional excavation for backsloping required for structural excavation will not be measured for payment, but will be considered included in the payment for the related contract item(s).

When no bid item appears in the contract for clearing drainage ways, maintenance of traffic, special detours or cofferdams, any necessary work of this type will not be paid for directly but will be considered incidental to the work. Unless otherwise specified, payment under the pertinent contract items shall include costs of all pumping, bailing, drainage, sheeting, bracing and incidentals required for proper execution of the work.

Backfill or bedding materials, except for material used to backfill underdrain, whose source is other than structural excavation, will be paid for under the class of material used. Material used to backfill underdrain will not be paid for but shall be considered incidental to the cost of the underdrain.

Excavation for channels, berm ditches and cut slope downspouts will be paid for under Section 203 - Excavation and Embankment.

Special backfill will be paid for at the contract unit price per cubic yard.

Payment will be made under:

Pay Item		Pay Unit
206.061	Structural Earth Excavation - Drainage Minor Structures Below Grade	Cubic Yard
206.07	Structural Rock Excavation - Drainage & Minor Structures	Cubic Yard
206.082	Structural Earth Excavation - Major Structures, Plan Quantity	Cubic Yard
206.092	Structural Rock Excavation - Major Structures	Cubic Yard
206.10	Structural Earth Excavation - Piers	Cubic Yard
206.11	Structural Rock Excavation - Piers	Cubic Yard
206.14	Special Backfill	Cubic Yard

SECTION 207 - BRUSH MATTING

Reserved

SECTION 208 - SAND DRAINS

Reserved

SECTION 209 - WICK DRAINS

Reserved

~~SECTION 210 - CRUSHED STONE WINDROWS~~

~~Reserved~~

SECTION 211 - DITCH AND INSLOPE EXCAVATION

211.01 Description This work shall consist of removing winter sand build-up and other earth material from existing inslopes and ditches. New ditch areas consist of removing all material encountered including backslopes as needed.

211.02 Inslope Excavation From the edge of shoulder to the subgrade break, the inslope will be graded to the original template, or as directed by the typicals or construction notes. From the subgrade break to a location on the slope that does not create a hinge point, the inslope

shall be machine graded and finished to a smooth condition so that the flow of water is unimpeded.

211.03 Inslope Excavation - Guardrail– Winter sand and other earth materials shall be removed from all paved areas. From the edge of shoulder to the subgrade break, the inslope will be graded to the original template, or as directed by the typicals or construction notes. From the subgrade break to a location on the slope that does not create a hinge point, the inslope shall be machine graded and finished to a smooth condition so that the flow of water is unimpeded.

211.04 Inslope Rehabilitation– Material shall be excavated from or placed on inslopes. All inslopes shall be built, from the edge of shoulder to the toe of slope, to provide a 3 horizontal to 1 vertical minimum slope (1¾ horizontal to 1 vertical in guardrail sections), or as directed by the typicals or construction notes. Added material shall be capable of attaining a growth of grass and shall be approved by the Resident

211.05 Ditch Excavation Ditches and adjacent slopes will be graded to the original template from the edge of shoulder to the top of the backslope, or as directed by the typicals or construction notes.

211.06 New Ditch Excavation Ditches and adjacent slopes will be graded from the edge of shoulder to the top of the backslope as directed by the typicals or construction notes.

211.07 Method of Measurement The quantity of work done will be measured by the linear foot. Measurements will be made along the ground parallel to the roadway centerline. Payment for inslope rehabilitation will include excavation and fill areas.

211.08 Basis of Payment Payment will be full compensation for excavating, removing brush, trees and stumps, placing waste material in designated areas, disposing excess materials, rehabilitating waste areas including seed and mulch, and for grading and finishing the work.

In inslope rehabilitation areas, any borrow material needed to complete the rehabilitation of the inslopes will not be paid for separately, but will be considered incidental to this item.

When rock is encountered in new ditch excavation areas and new ditch excavation rock is not included in the contract, the excavation of the rock will be paid for at 6 times the contract unit price for new ditch excavation.

The work will not be accepted for payment until inspected and approved by the Resident or authorized personnel. Conditions of approval will include, but are not limited to, grade and smoothness, flow of runoff, proper functioning of the drainage system, and cleanup of all disturbed areas including waste disposal areas. Seed, mulch, and erosion control blanket applied on the project will be paid for under appropriate contract items.

Payment will be made under:

Pay Item	Pay Unit

211.20	Inslope Excavation	Linear Foot
211.21	Inslope Rehabilitation	Linear Foot
211.22	Inslope Excavation - Guardrail	Linear Foot
211.221	Inslope Excavation - Guardrail Plan Quantity	Linear Foot
211.30	Ditch Excavation	Linear Foot
211.40	New Ditch Excavation	Linear Foot
211.41	New Ditch Excavation - Ledge	Linear Foot