Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 33 00 – Submittal Procedures.

.2 Section 01 35 31 – Special Procedures for Traffic Control.

.3 Section 01 74 11 – Cleaning.

.4 Section 31 24 14 – Roadway Excavation, Embankment and Compaction.

.5 Section 32 11 24 – Granular Base and Sub-Base.

.6 Section 33 42 13 – Pipe Culverts.

1.2 REFERENCES

.1 BC MoTI Specifications.

.2 ASTM International

.1 ASTM D698-[07e1], Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft ;) (600kN-m/m ;).

1.3 MEASUREMENT FOR PAYMENT

.1 Earthwork to install pipe culverts shall be incidental to **"Unit Price Item 10 – Supply and Install Pipe Culverts"**.

.2 Excavation shall be in accordance with Drawing D-05.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit in accordance with Section 01 33 00 - Submittal Procedures.

.2 Sustainable Design Submittal:

.1 Erosion and Sedimentation Control: submit erosion and sedimentation control plan in accordance with Section 01 35 43 – Environmental Procedures.

Part 2 Products

2.1 MATERIALS

.1 Excavated material shall be used for backfill.

.2 In the event that the excavated material is unsuitable for backfill and designated by the Departmental Representative as waste, the Contractor shall haul suitable material from outside the Park to be used for backfill. Cost of importing backfill material shall be incidental to **"Unit Price Item 10 – Supply and Install Pipe Culverts"**.

Part 3 Execution

3.1 EXAMINATION

.1 Verification of Conditions:

.1 Before commencing work establish locations of buried services on and adjacent to site.

.2 Evaluation and Assessment:

.1 Testing of materials and compaction of backfill will be carried out by testing laboratory designated by Departmental Representative.

.2 Departmental Representative may verify backfilling compaction.

.3 Before commencing work, conduct condition survey of existing structures, trees and plants, lawns, fencing, service poles, wires, rail tracks and paving, survey bench marks and monuments which may be affected by work.

3.2 PREPARATION

.1 Use temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways per the approved Sediment Control Plan and requirements of authorities having jurisdiction.

.2 Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.

.3 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

.4 Protection of in-place conditions:

.1 Protect excavations from freezing.

.2 Keep excavations clean, free of standing water, and loose soil.

.3 Where soil is subject to significant volume change due to change in moisture content, cover and protect to Departmental Representative's approval.

.4 Protect natural and man-made features required to remain undisturbed. Unless otherwise indicated or located in an area to be occupied by new construction, protect existing trees from damage.

.5 Protect buried services that are to remain undisturbed.

.6 Removal:

.1 Remove obsolete buried services within 2 m of foundations. Cap cut-offs.

.2 Remove obstructions, ice and snow, from surfaces to be excavated within limits indicated.

.3 Cut asphalt pavement or sidewalk neatly along limits of proposed excavation in order that surface may break evenly and cleanly.

.4 Remove trees, stumps, logs, brush, shrubs, bushes, vines, undergrowth, rotten wood, dead plant material, exposed boulders and debris within excavation area and from excavated material.

3.3 EXCAVATION

.1 Shore and brace excavations, protect slopes and banks and perform work in accordance with Provincial and Municipal regulations whichever is more stringent.

.2 Do blasting, if required, in accordance with Provincial and Municipal regulations. Blasting is not allowed within Parks Limits. Repair damage to approval of Departmental Representative.

.3 Topsoil stripping:

.1 Do not handle topsoil while in wet or frozen condition or in any manner in which soil structure is adversely affected.

.2 Strip topsoil to depths as directed by Departmental Representative. Avoid mixing topsoil with subsoil.

.3 Strip topsoil over areas to be covered by new construction, over areas where grade changes are required, and so that excavated material may be stockpiled without covering topsoil.

.4 Stockpile in locations as directed by Departmental Representative.

.5 Dispose of topsoil outside the Pacific Rim National Park or as directed by the Departmental Representative.

.4 Excavate as required to carry out work, in all materials met.

.1 Do not disturb soil or rock below bearing surfaces. Notify Departmental Representative when excavations are complete.

.5 Excavate trenches to provide uniform continuous bearing and support for 200 mm thickness of pipe bedding material on solid and undisturbed ground.

3.4 SITE QUALITY CONTROL

.1 Fill material and spaces to be filled to be inspected and approved by Departmental Representative.

3.5 BACKFILLING

.1 Start backfilling only after inspection and receipt of approval of fill material and spaces to be filled from Departmental Representative.

.2 Remove snow, ice, construction debris, organic soil and standing water from spaces to be filled.

.3 Lateral support: maintain even levels of backfill around structures as work progresses, to equalize earth pressures.

.4 Placing:

.1 Place backfill, material in 150 mm lifts. Add water as required to achieve specified density.

.5 Compaction: compact each layer of material to following densities for material to ASTM D698:

.1 To underside of basecourses: 95%.

.2 Basecourses: 100%.

.3 Elsewhere: 90%.

.6 Blown rock material, not capable of fine grading, is not acceptable, imported material must be placed on this type of material.

3.6 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.

.1 Dispose of cleared and grubbed material off site daily.

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section - 01 45 00 - Quality Management

.2 Section 01 35 31 - Special Procedures for Traffic Control.

.3 Section 31 00 99 - Earthworks for Minor Works

.4 Section 31 24 14 - Roadway Excavation, Embankment and Compaction

.5 Section 33 42 13 - Supply and Install Pipe Culverts

1.2 SUMMARY

.1 This Section defines correction to maximum dry density to take into account aggregate particles larger than 19 mm.

1.3 REFERENCES

.1 American Society for Testing and Materials (ASTM)

.1 ASTM C127-88 (2001), Standard Test Method for Specific Gravity and Absorption of Coarse Aggregate.

.2 ASTM D698-00a, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft^3 (600 kN-m/m^3)).

.3 ASTM D 1557-00, Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft^3 (2,700 kN-m/m^3)).

.4 ASTM D4253-00, Standard Test Methods for Maximum Index Density and Unit Weight of Soils Using a Vibratory Table.

1.4 DEFINITIONS

.1 Corrected maximum dry density is defined as:

.1 D =D1xD2/(F1 x D2) + (F2 x D1).

.2 D = (F1 x D1) + (0.9 x D2 x F2).

.3 Where: D = corrected maximum dry density kg/m^3.

.1 F1 = fraction (decimal) of total field sample passing 19 mm sieve

.2 F2 = fraction (decimal) of total field sample retained on 19 mm sieve (equal to 1.00 - F1)

.3 D1 = maximum dry density, kg/m^3 of material passing 19 mm sieve determined in accordance with Method A of ASTM D1557.

.4 D2 = bulk density, kg/m^3, of material retained on 19 mm sieve, equal to 1000G where G is bulk specific gravity (dry basis) of material when tested to ASTM C127.

.4 For free draining aggregates, determine D1 (maximum dry density) to ASTM D4253 wet method when directed by Departmental Representative.

Part 2 Products

.1 Not Used.

Part 3 Execution

.1 Not Used.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 02 41 13.14 – Use of Reclaimed Asphalt Pavement (RAP).

.2 Section 32 12 16 – Supply, Haul, Place and Compact Hot Mix Asphalt. (EPS).

.3 Section 01 35 31 – Special Procedures for Traffic Control.

.4 Section 10 35 43 – Environmental Procedures.

1.2 REFERENCES

.1 Asphalt Mix Aggregate shall be produced in accordance with BC MoTI Specifications, Section 502.

1.3 WORK DESCRIPTION

.1 The Contractor shall supply all asphalt mix aggregates for work from source of his choice meeting all requirements as listed under Section 502 of the BC MoTI Specifications and acceptable to the Departmental Representative. Any cost incurred by Contractor in developing a source of asphalt mix aggregate will be incidental to the Unit Price of aggregate measurement.

.2 Course asphalt mix aggregates shall meet the requirements of Table 502-B for Class 1.

.3 Hot Mix Asphalt Aggregate Gradation Limits shall meet the requirements of Section 502, Table 502-C-1 for Class 1, 16 mm medium hot mix asphalt.

.4 Contractor to obtain written approval from Departmental Representative of its proposed aggregate source(s) prior to providing asphalt mix aggregate for this Contract.

.5 RAP incorporated into hot mix asphalt shall be considered as asphalt mix aggregate.

1.4 MEASUREMENT PROCEDURES

.1 Measurement of asphalt mix aggregate for which payment will be made shall be equal to the corresponding tonnes of hot mix actually laid without any adjustment for asphalt mix or moisture content, and shall include and will be full compensation for everything furnished and done to complete the Work. Payment will be made under **"Unit Price Item 5 – Supply of Asphalt Mix Aggregate".**

.2 Loading and hauling will be incidental to the Work. No overhaul will be paid for this Work.

.3 Supply, installation and maintenance and calibration of weight scales and a scale house by the Contractor shall be considered incidental to the contract and no additional payment will be measured for payment.

.4 Traffic Control required for this Work shall be incidental to **"Lump Sum Price Item 2 - General Traffic Accommodation"** and no separate payment will be made to the Contractor.

.5 Mobilization and demobilization required for this work shall be incidental to **"Lump Sum Price Item 1 - Mobilization/Demobilization"** and no additional payment will be made.

.6 All Quality Control required for this Work shall be incidental to **"Unit Price Item 5 – Supply of Asphalt Mix Aggregate".**

.7 Environmental mitigations required in accordance with Section 01 35 43 – Environmental Procedures, for the work in this Section shall be incidental to the contract and no separate payment shall be made to the Contractor.

.8 Cost of processing aggregates will be incidental to the unit price of measurement.

.9 Clearing, grubbing, stripping and stockpiling of overburden at any gravel source will be incidental to the unit price of measurement.

.10 Crushed material supplied to construct a base for stockpiles will be incidental to the unit price of measurement.

.11 All costs associated with repairing and maintaining haul roads will be the responsibility of the Contractor and all costs will be incidental to the unit price of measurement.

1.5 QUALITY CONTROL

.1 All Quality Control testing by the Contractor.

1.6 QUALITY ASSUARENCE

.1 Provide water, electric power, and propane to Departmental Representative laboratory trailer at production site.

.2 Allow continual sampling for Quality Assurance by Departmental Representative during production.

.3 Provide Departmental Representative with access to source and processed material for sampling.

.4 Install sampling facilities at discharge end of production conveyor, to allow Departmental Representative to obtain representative samples of items being produced. Stop conveyor belt when directed by Departmental Representative to permit full cross section sampling.

.5 Pay cost of sampling and testing of aggregates which fail to meet specified requirements.

.6 Asphalt Mix Aggregates that do not meet specified tolerances for intended use are subject to rejection by Departmental Representative.

1.7 WASTE MANAGEMENT AND DISPOSAL

.1 Separate and recycle waste materials in accordance with Section 01 35 43 –Environmental Procedures.

Part 2 Products

2.1 MATERIAL

.1 Asphalt Mix Aggregates material as per the BC MoTI Specifications, Section 502.

2.2 ACID ROCK DRAINAGE OR METAL LEACHING POTENTIAL

.1 The Contractor shall engage a Qualified Professional (QP) who shall be responsible for evaluating the acid rock drainage (ARD) and metal leaching (ML) potential of the material. The QP is required to be registered as a professional engineer or geoscientist with the Association of Professional Engineers and Geoscientists of British Columbia (APEGBC) and have experience with ML/ARD evaluation and geological field mapping.

.2 The evaluation will fulfill the British Columbia Ministry of Transportation and Infrastructure's Technical Circular T-04/13 Evaluating the Potential for Acid Rock Drainage and Metal Leaching at Quarries, Rock Cut Sites and from Stockpiled Rock or Talus Materials Used by the MOTI, available on-line at: http://www.th.gov.bc.ca/publications/Circulars/Current/T_Circ/2013/t04-13.pdf

.3 The QP is responsible for ensuring that their evaluation is representative of the material within the proposed quarry development areas and/or other material sources (i.e. rock cuts, stockpiled rock, and/or talus materials). All QP reports shall include data to support their conclusion that the material is acceptable for use, it shall be signed and sealed by the QP, and it shall be provided to the Departmental Representative fourteen (14) days before any material is placed on the construction site. No material shall be sourced or placed until the report is received and accepted by the Departmental Representative. Only materials that are evaluated as having low potential for ML/ARD shall be accepted by the Department.

.4 In the event that the Contractor's off-site source of rock is found to be adversely impacting the environment (proven by an ML/ARD evaluation and a contaminated sites investigation carried out by the Department), the Contractor will remedy the situation and impacts entirely on their own account including reimbursing the Department for the investigation costs. The Contractor shall engage a QP for a Stage 1 & 2 Preliminary Site Investigation, a Detailed Site Investigation (both as per the BC Environmental Management Act (EMA)) and have a remediation plan prepared by a QP to ensure that all potential environmental impacts are addressed as per the EMA (e.g. groundwater and soil contamination,

etc.). The Contractor's investigation and remediation plans, as prepared by the QP, shall be submitted and accepted by the Department (at the onset of discovery of the unsuitable material) and shall include but not be limited to: removal of all ML/ARD material brought onto the site, disposal of all material to an environmentally accepted location (as per the EMA), the requisite contaminated site investigations as mentioned above, removal of any impacted material at the site, all environmental and contaminated sites remedial works, as well as the location and provision of an alternative source of rock to replace the unsuitable material. There will be no additional cost to the Department that may include but not be limited to: testing costs, source development costs and additional hauling and placement costs.

.5 Payment: There will be no separate payment for ML/ARD evaluation, testing, and remediation in accordance with the above noted T- Circular. Payment will be incidental to **"Item 5 – Supply of Asphalt Mix Aggregate"** for the project.

Part 3 Execution

3.1 PROCESSING

.1 Process asphalt mix aggregate uniformly using methods that prevent contamination, segregation, and degradation.

.2 Blend aggregates, if required, to obtain gradation requirements, percentage of crushed particles, or particle shapes, as specified. Use methods and equipment approved by Departmental Representative.

.3 Wash aggregates, if required to meet specifications. Use only equipment approved by Departmental Representative.

.4 When operating in stratified deposits use excavation equipment and methods that produce uniform, homogeneous aggregate.

3.2 HANDLING AND TRANSPORTING

.1 Avoid segregation, contamination, and degradation of aggregate during handling and transporting.

.2 Load limit restrictions will be in accordance with British Columbia Highway Traffic Act pertaining to registered weight limits and vehicle size.

3.3 STOCKPILING

.1 Stockpile aggregates in locations approved by Departmental Representative. Do not stockpile on a completed asphalt pavement surfaces.

.2 Stockpile aggregates in sufficient quantities to meet project schedules.

.3 Stockpile sites to be level, well drained, and of adequate bearing capacity and stability to support stockpiled materials and handling equipment.

.4 Except where stockpiled on acceptably stabilized areas, provide compacted crushed gravel base not less than 300 mm in depth to prevent contamination of aggregate. Do not incorporate compacted base of pile into work.

.5 Separate different aggregates by strong, full depth bulkheads, or stockpile far enough apart to prevent intermixing.

.6 Do not use intermixed or contaminated materials. Remove and dispose of rejected materials as directed by Departmental Representative.

.7 Stockpile aggregates in uniform layers one metre thick.

.8 Uniformly spot-dump aggregates delivered to stockpile in trucks and build up stockpile as specified.

.9 Do not cone piles or spill material over edges of piles.

.10 Do not use conveying stackers.

.11 During winter operations, prevent ice and snow from becoming mixed into stockpile or in material being removed from stockpile.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 35 43 – Environmental Procedures.

.2 Section 01 45 00 – Quality Management.

.3 Section 01 35 31 – Special Procedure for Traffic Control.

.4 Section 01 74 11 – Cleaning.

.5 Section 31 00 99 – Earthwork for Minor Works.

.6 Section 31 05 17 – Supply and Place Crushed Granular Base.

.7 Section 33 42 13 – Supply and Install Pipe Culverts.

1.2 MEASUREMENT PROCEDURES

.1 Foundation excavation to install pipe culverts shall be incidental to "**Unit Price Item 10 – Supply and Install Pipe Culverts"**, and shall include excavation, stockpiling, loading, unloading, hauling and backfilling materials for embankment construction.

.2 No overhaul will be paid for this Work.

.3 Mobilization and demobilization required for this Work shall be incidental to **"Lump Sum Price Item 1 - Mobilization/Demobilization"**, and no additional payment will be made.

.4 Traffic Control required for this Work shall be incidental to **"Lump Sum Price Item 2 - General Traffic Accommodation"** and no separate payment will be made to the Contractor.

.5 Environmental mitigations required in accordance with Section 01 35 43 - Environmental Procedures, for the Work in this Section shall be incidental to the contract and no separate payment will be made to the Contractor.

1.3 REFERENCES

.1 American Society for Testing and Materials International, (ASTM).

.1 ASTM D698-00a, Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,000 ft-lbf/ft^3) (600 kN-m/m^3).

1.4 DEFINITIONS

.1 Rock Excavation:

.1 Solid Rock: excavation of:

.1 Material from solid masses of igneous, sedimentary or metamorphic rock which, prior to removal, was integral with parent mass. Material that cannot be ripped with reasonable effort from Caterpillar D9L or equivalent to be considered integral with parent mass.

.2 Boulder or rock fragments measuring in volume one (1) cubic metre or more.

.2 Rippable Rock: excavation of material for solid masses of igneous, sedimentary or metamorphic rock which prior to removal, was integral with parent mass and that can be ripped with reasonable effort from a Caterpillar D9L or equivalent.

.2 Common Excavation: excavation of materials that are not Rock Excavation or Stripping.

.3 Free Haul: distance that excavated material is hauled without compensation.

.4 Stripping: excavation of organic material covering original ground.

.5 Over Haul: authorized hauling in excess of free haul distance that excavated material is moved. No overhaul will be paid for materials hauled within or outside the Project Limits.

.6 Embankment: material derived from usable excavation and placed above original ground or stripped surface.

.7 Waste Material: material unsuitable for embankment, embankment foundation or material surplus to requirements.

.8 Topsoil: material capable of supporting good vegetative growth and suitable for use in top dressing, landscaping and seeding.

1.5 QUALITY ASSURANCE

.1 Regulatory Requirements:

.1 Adhere to Provincial and National Environmental requirements when potentially toxic materials are involved.

1.6 WASTE MANAGEMENT AND DISPOSAL

.1 Separate and recycle waste materials in accordance with Section 01 35 43 - Environmental Procedures.

.2 Archeological material may be encountered around culvert installation areas. If human remains are found or the site is of archeological significance, work shall be stopped and a detour arranged. An archeologist will be onsite during culvert excavations. The Contractor shall be required to coordinate with the archeologist.

Part 2 Products

2.1 MATERIALS

.1 Embankment materials require approval by Departmental Representative.

.2 Material used for embankment not to contain more than 3% organic matter by mass, frozen lumps, weeds, sod, roots, logs, stumps or other unsuitable material.

Part 3 Execution

3.1 WATER DISTRIBUTORS

.1 Apply water uniformly.

3.2 COMPACTION EQUIPMENT

.1 Compaction equipment must be capable of obtaining required densities in materials on project. Equipment that does not achieve specified densities must be replaced or supplemented.

3.3 STRIPPING OF TOPSOIL

.1 Commence topsoil stripping of areas on approval by the Departmental Representative after clearing and grubbing debris have been removed from these areas.

.2 Do not mix topsoil with subsoil.

.3 Stockpile stripped materials in area approved by Departmental Representative.

3.4 EXCAVATING

.1 General:

.1 Notify the Departmental Representative when unsuitable roadway embankment materials are encountered and remove to depth and extent as directed by the Departmental Representative. This material shall be placed on the sideslope outside the 2:1 slope.

.2 Subcut below subgrade elevation in cut sections only as directed by the Departmental Representative. Compact top 150 mm below subcut to minimum 95% maximum dry density, ASTM D698 (AASHTO T99). Replace with approved embankment material and compact.

.3 Treat ground slopes, where subgrade is on transition from excavation to embankment, at grade points.

.4 The dimensions of the excavations and embankments shall be, in accordance with the typical sections accompanying these specifications, but the dimensions of any or all excavations and embankments may be increased or decreased at any time by the Departmental Representative as conditions and circumstances may determine.

.2 Drainage:

.1 Maintain profiles, crowns and cross slopes to provide good surface drainage at all times.

.2 Provide ditches as work progresses to provide drainage.

.3 Rock excavation:

.1 Notify the Departmental Representative when material appearing to conform to classification for rock is encountered.

.2 Shatter rock to minimum 300 mm below subgrade elevation.

.3 All rock on cut face that is loose, hanging or which creates a potentially dangerous situation shall be removed or stabilized to Departmental Representative's satisfaction, during or upon completion of excavation each lift. Drilling of next lift will not be allowed until this work has been completed. Other methods such as machine scaling, hydraulic splitters may be used in lieu of, or to supplement, hand scaling. Cost of scaling is considered incidental to appropriate contract unit price item and no additional payment will be made for scaling.

.4 Contractor shall be responsible for safety of all excavation operations and ensuring that his methods meet all applicable Federal and Provincial regulations. Particular attention should be paid to control of rock falls from excavated slopes so there is no hazard to Park users and wildlife during construction.

.5 In order to obtain uniform shattering in subgrade, drilling shall be carried out to a plane parallel to and at 0.3 m below subgrade. This material shall be removed and the 0.3 m to subgrade shall be constructed as embankment. All operations shall be so conducted as to affect drainage to ditches and not leave undrained pockets in foundation.

.6 Ditch line and 0.5 m below subgrade or backslope shall represent the bottom pay line in rock excavation. Any additional drilling, or sub-excavation required to construct subgrade to required tolerance shall be considered incidental to work, and no additional payment will be made.

.7 In solid rock, cuts where pockets are formed below subgrade or backslope plane, and which will not drain, Contractor shall, at Contractor's expense, provide drainage by ditching to a free outlet, and shall, at Contractor's expense, backfill both pockets and trench to approved elevation with free draining granular or other approved material.

.8 Excavated rock shall be used within work area in road embankment as directed by the Departmental Representative. Contractor shall ensure all rock fill surfaces are earth tight. No separate payment shall be made for loading, hauling, placing and compacting rock. Such payment shall be incidental to bid price for Excavation Rock.

.9 The maximum size of rock allowed in embankment construction shall not be more than 0.3 cubic m. Rock exceeding 0.3 cubic m

shall be further broken down. Large rock blocks will be placed at or near base of embankment. Upper 0.3 m of embankment shall be comprised of smaller sized rock material not exceeding 0.1 m in any dimension.

3.5 EMBANKMENTS

.1 Scarify or bench existing slopes in side hill or sloping sections to ensure proper bond between new materials and existing surfaces. Method used to be subject to prior approval of the Departmental Representative.

.2 Do not place material which is frozen nor place material on frozen surfaces except in areas authorized.

.3 Maintain crowned surface during construction to ensure ready run-off of surface water.

.4 Drain low areas before placing materials.

.5 Place and compact to full width in layers not exceeding 200 mm loose thickness. The Departmental Representative may authorize thicker lifts if specified compaction can be achieved and if material contains more than 25% by volume stone and rock fragments larger than 100 mm.

.6 Rock Embankments:

.1 Place to full width in layers of sufficient depth to contain maximum sized rocks, but in no case is layer thickness to exceed 0.6 m.

.2 Distribute rock material to fill voids with smaller fragments to form compact mass.

.3 Fill surface voids at design elevation with rock spalls or selected material to form earth-tight surface.

.4 The Contractor may place rock embankments during freezing conditions provided compaction equipment of sufficient size to break large rock particles is used and all snow and ice is removed from fill surface.

.5 Do not place boulders or rock fragments with dimensions exceeding 150 mm within 300 mm of subgrade elevation.

.6 The Departmental Representative has no preference for which embankments are constructed with rock fill.

.7 Complete subgrade construction with Select Granular Subgrade Material as described in Section 32 11 20 and shown on the Drawings.

3.6 SUBGRADE COMPACTION

.1 Break material down to sizes suitable for compaction and mix for uniform moisture to full depth of layer.

.2 Compact each layer to minimum 95% maximum dry density, ASTM D698 (AASHTO T99). Top 300 mm of subgrade to be compacted to 98% maximum dry density, ASTM D698 (AASHTO T99).

.3 Add water or dry as required to bring moisture content of materials to level required to achieve specified compaction.

.4 For rock placed as fill, compact with large steel wheeled or tracked equipment of sufficient size to break larger particles. Compact until rock fill is stable under compaction equipment and all voids are filled.

3.7 FINISHING

.1 Shape entire roadbed to within 15 mm of design elevations.

.2 Finish slopes, ditch bottoms and borrow pits to neat condition, true to lines, grades and drawings where applicable. Scale excavation slopes in bedrock steeper than 1:1 by removing loose fragments.

.3 Remove rocks over 150 mm in any dimension from slopes and ditch bottoms.

.4 Hand finish slopes that cannot be finished satisfactorily by machines.

.5 Trim between constructed slopes and edge of clearing to provide drainage free of humps, sags, ruts and protruding stones.

3.8 PROTECTION

.1 Maintain finished surfaces in condition conforming to this section until acceptance by the Departmental Representative.

END OF SECTION