

- .3 Installation and maintenance of temporary barriers and supply and installation of temporary traffic control and other temporary construction facilities required for completion of the Work of the Project.
- .4 Excavating materials from the right-of-way cuts, hauling and placing this material in embankments or in stockpiles at locations shown on the Drawings and as directed by the Departmental Representative.
- .5 Supply and install Corrugated Steel Pipe (CSP) culverts at locations shown on the Drawings and as directed by the Departmental Representative. AT Designation 2 Class 20 Base Aggregate (considered a suitable replacement for 25 mm Well Graded Base) material is available from stockpiles at Settler's Pit and can be stockpiled at 4-mile/Hector Pit.
- .6 Load, haul and place sub-base course materials. AT Designation 6 80mm Granular Sub-Base (GSB) and Pit-Run Gravel (suitable for use as SGSB) materials are available from stockpiles at Mannix Pit and Settler's Pit, respectively, and can be stockpiled at 4-mile/Hector Pit.
- .7 Load, haul and place base course materials. AT Designation 2 Class 20 Base Aggregate (a suitable replacement for 25 mm Well Graded Base) material is available from stockpiles at Settler's Pit and can be stockpiled at 4-mile/Hector Pit.
- .8 Purchase asphalt binder, mix with supplied aggregate, haul and place BC MoTI Class 1 Medium Mix (19mm) asphalt concrete pavement as directed by the Departmental Representative. Asphalt aggregate materials used shall be in accordance with BC MoTI – Standard Specifications for Highway Construction (Latest Edition) Section 502 – Asphalt Pavement Construction (EPS). Settler's Pit in KNP is available for Contractor's use for aggregate sourcing and crushing, as directed by the Departmental Representative. **RAP mix is not permitted.**
- .9 Produce and Stockpile 12.5 mm Winter Abrasive. Settler's Pit in Kootenay National Park is available for Contractor's use for aggregate sourcing and crushing, as directed by the Departmental Representative.
- .10 Produce and Stockpile mixed RAP material utilizing existing ACP waste, Millings and 20 mm Aggregate in Settlers Pit. Settler's Pit in Kootenay National Park is available for the Contractor's use for aggregate sourcing and crushing, as directed by the Departmental Representative.
- .11 Remove and dispose outside of Park existing CSP culverts as shown on the Drawings and as directed by the Departmental Representative.
- .12 Removal, by milling and/or reclaiming, of existing asphalt and stockpile material at Settler's Pit, as directed by the Departmental Representative.
- .13 Remove, stockpile and reinstall modified British Columbia Ministry of Highways Precast Concrete Median Barriers as shown on the Drawings and as directed by the Departmental Representative.
- .14 Removal and relocation of existing wildlife fencing.
- .15 Supply and paint temporary roadway paint markings during construction as required. Permanent line markings to be installed at the completion of the work.
- .16 Supply and Install regulatory signs.

- .2 Cooperate with Owner in scheduling operations to minimize conflict and to facilitate Owner usage.

1.10 OWNER FURNISHED ITEMS

- .1 The following granular materials will be made available to the Contractor for Works specified the in the Contract Documents:
 - .1 AT Designation 6 80mm Granular Sub-Base material, at Mannix Pit;
 - .2 AT Designation 2 Class 20 base aggregate at Settler's Pit;
 - .3 19mm Class 1 Medium Mix Asphalt Aggregate for H1 mix Asphalt Concrete Pavement used shall be in accordance with BC MoTI – Standard Specifications for Highway Construction (Latest Edition) Section 502 – Asphalt Pavement Construction (EPS). Settler's Pit in KNP is available for Contractor's use for aggregate sourcing and crushing, as directed by the Departmental Representative.
- .2 Crushing of furnished aggregate is scheduled to start in November 2015 and to be completed by the end of March 2016.
- .3 Raw rock material is available from Pit 16 for the Contractor to produce Riprap as specified in this Section 31 37 00.

1.11 CONSTRUCTION SIGNAGE

- .1 No signs or advertisements, other than warning signs, are permitted on site.
- .2 Signs and notices for safety and instruction shall be in both official languages. Signs shall be diamond grade and shall conform to CAN3-Z321.
- .3 Maintain approved signs and notices in good condition for duration of project, and dispose of off-site on completion of project or earlier if directed by the Departmental Representative.
- .4 The Contractor shall supply, install and maintain two (2) portable Changeable Message Signs with a minimum of three (3) lines with eight (8) characters per line, for the duration of the project.
- .5 All temporary traffic control signs that are used for longer than one day shall be mounted on wood posts.
- .6 Signage shall be coordinated with other Contractors.

1.12 SETTING OUT OF WORK

- .1 Departmental Representative will establish control points and provide:
 - .1 Detailed cross-section templates showing design centreline and shoulder grades.
 - .2 Complete set of construction Drawings.
 - .3 Alignment notes showing curve data and control point coordinates.
 - .4 List of control monuments including coordinates and elevations.
 - .5 Measurements for Payment (Quantity Surveys) and volumes by the average end method.
- .2 Contractor to:
 - .1 Set additional control points as necessary.

1.7 DESIGN REVIEW

- .1 Provide Departmental Representative with four (4) sets of complete working Drawings and one copy of detailed design calculations, for review at least four (4) weeks prior to beginning construction. Drawing to show both detour and final roadway design at each stage. **Drawings and design calculations to bear signature and stamp of qualified Professional Engineer registered or licensed in the Province of the work.**
- .2 Verify existing site conditions and ground elevations before preparing working Drawings.

1.8 QUALITY CONTROL – TESTING

- .1 All Quality Control testing by the Contractor.
- .2 Testing as per approved Contractor's Quality Control Plan.

Part 2 Products

2.1 MATERIALS

- .1 All materials used in the construction of detours shall be in accordance with the Contract documents or as directed by the Departmental Representative.
 - .1 Pit-Run Gravel (suitable for use as SGSB) material supplied by the owner is available at Settler's Pit.
 - .2 80 mm Granular Sub-Base material supplied by the Owner is available at Mannix Pit.
 - .3 AT Designation 2 Class 20 base aggregate is available to the Contractor from stockpile at Settler's Pit. The AT Designation 2 Class 20 base aggregate is considered a suitable replacement for the 25 mm WGB specified.
 - .4 19mm Class 1 Medium Mix Asphalt Aggregate supplied by the Owner shall be in accordance with BC MoTI – Standard Specifications for Highway Construction (Latest Edition) Section 502 – Asphalt Pavement Construction (EPS). Settler's Pit in KNP is available for Contractor's use for aggregate sourcing and crushing, as directed by the Departmental Representative.

Part 3 Execution

3.1 CONSTRUCTION AND PARTIAL REMOVAL OF DETOURS

- .1 Construction and Partial Removal in accordance with other relevant sections from this Specification Document.

3.2 MAINTENANCE OF DETOURS

- .1 Maintenance as per Contractor's Drawings and in accordance with BC MoTI Maintenance Specifications – Latest edition.

END OF SECTION

- .7 Fisheries protection windows shall be observed for any other watercourse in this contract and will guide the timing of the work so that stream disturbance is prevented. See "Specific Concerns".
- .8 If a pump-out sump to dewater excavation sites will be required, the Contractor is to prepare an EPP that details how the dewatering shall be undertaken, to the satisfaction of the Departmental Representative and the E.S.O. Special attention is to be given to the environmental sensitivity of the discharge area, freezing conditions operation, overflow avoidance, decanting and settlement pond reclamation. Water containing suspended materials shall not be pumped into watercourses, drainage systems or on to land, except with the permission of the Departmental Representative and the E.S.O.

3.5 CULVERT INSTALLATION

- .1 All culverts shall be installed using best management practices for working in or near water that will result in a minimum amount of sedimentation and damage to the riparian area of the watercourse. The Contractor shall prepare a plan for the installation of each culvert, a minimum one (1) week prior to doing the work for approval by the Departmental Representative and ESO.
- .2 The culverts shall be installed using best management practices for placement, including consideration of aquatic ecology.
- .3 It is preferable to install the culvert during periods of low discharge (e.g. during the fall). The use of sediment control measures may be necessary to ensure that excessive amounts of sediments do not enter watercourses.
- .4 It may be necessary to exclude fish from the immediate construction site while the culvert is being installed. If this practice is necessary, fish shall be salvaged from within the exclusion area, and construction should be carried out expediently to minimize the time spent working in the drainage.

3.6 ASPHALT PLANT OPERATION AND PAVING

- .1 Execution of the Work shall be in accordance with BC MoTI Standard Specifications Manual for Highway Construction (Latest Edition) – Specification 502 – End Product specification for Asphalt Concrete Pavement.
- .2 The contractor will be permitted to setup a Mobile Asphalt Plant or use a Stationary Asphalt Plant for this Project. The asphalt plant may be set up in Settler's Pit for the Contractor's use.
- .3 The asphalt plant used on this project, regardless of location, shall be a minimum of 100 tonne per hour production plant, equipped with a dry bag system for pollution control, in addition to, or in replacement of standard cyclone dust collectors, to effectively eliminate emissions of dust and smoke pollutants into the atmosphere. Use of secondary dust collection systems, requiring discharge of dust polluted water into settling ponds or drainage system will not be permitted. In addition the Asphalt plant must comply with all environmental pollution control regulations applicable in the asphalt plant area. The plant operator must make daily inspections of the emission control.
- .4 Trucks for hauling asphalt mixture shall have tight, clean, smooth metal beds that have been sprayed with a minimum amount of thin fuel oil to prevent the mixture from adhering and causing waste asphalt. The vehicle covers shall be securely

- .3 Concrete bases: Excavate one hole for the concrete base at the location and depth provided by the Departmental Representative. Using some of the excavated material, level and compact bottom of hole. Place base with one side parallel to the edge of asphalt and level. The top of the base is to be flush or 1" above finished grade.
- .4 Adjust the post height by using a pipe cutter or cut off saw. All post cuts will be determined in the field by the Contractor. The Contractor will measure existing elevations at each site and calculate the cuts needed.
- .5 Assemble the signs on the forks on the ground. Slide forks onto posts and place the cap.
- .6 Drill 1 hole in base sleeves and posts for ½ " bolts, as shown in the detail sheet and as verified by the Departmental Representative, and shim to plumb if necessary.
- .7 Bases must be perfectly plumbed. Vertical and horizontal tolerances for the base are 0.075m. Tolerance for the plumb of the posts is 0.01 m per 1.0 m or 1/4" on a two foot carpenters level. Tolerances for the signs are 0.075 m for distance from asphalt and 0.075 m for height above white line.
- .8 The Contractor is responsible for hauling all materials to and from each work site.
- .9 Landscape so the top of the base is flush or 25 mm above finished grade.
- .10 Remove all excess material from site, including boulders larger than 100 mm.
- .11 All signs are to be covered until the Departmental Representative advises to uncover.
- .12 The Contractor is to place NPC/PNC stickers (provided by the Departmental Representative) on all signs as indicated by the Departmental Representative.
- .13 Payment for this item shall be based on the number of signs installed and shall include all material, labour and equipment required to satisfactorily complete this item of work.

3.2 REMOVAL AND SALVAGE

- .1 The Contractor shall carefully dismantle and salvage posts, and aluminum signs where possible.
- .2 Deliver salvaged materials to 4-Mile pit or other locations as directed by Departmental Representative.
- .3 Damaged signs and posts shall be hauled to recycling facility accepted by the Departmental Representative.
- .4 Fill holes with gravel and compact

3.3 CLEANING

- .1 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

Part 1 General

1.1 SUPPLIED PRODUCTS UNDER THIS SECTION

- .1 19mm Class 1 Medium Mix Asphalt Aggregate material supplied by the Owner shall be in accordance with BC MoTI – Standard Specifications for Highway Construction (Latest Edition) Section 502 – Asphalt Pavement Construction (EPS). Settler's Pit in KNP is available for Contractor's use for aggregate sourcing and crushing, as directed by the Departmental Representative.

1.2 WORK DESCRIPTION

- .1 Work shall consist of supplying, loading, hauling and placing BC MoTI Medium Mix Class 1 Asphalt Concrete Pavement at widening locations identified along Highway 93S in Kootenay NP, or as directed by the Departmental Representative
- .2 For the Class 1 mix, asphalt aggregate used shall consist of a 19mm Medium Mix Asphalt Aggregate in accordance with BC MoTI – Standard Specifications for Highway Construction (Latest Edition) Section 502 – Asphalt Pavement Construction (EPS). Asphalt Cement used shall be 150-200A penetration grade in accordance with BC MoTI – Standard Specifications for Highway Construction (Latest Edition) Section 502 – Asphalt Pavement Construction (EPS).
- .3 **The use of Recycled Asphalt Pavement (RAP) in the asphalt mix designs is not permitted.**
- .4 Perform mix designs for BC MoTI Class 1 Asphalt Concrete Pavement using Asphalt Cement 150-200A penetration grade and 19mm Asphalt Aggregate. Mix design is subject to acceptance by the Departmental Representative.
- .5 The asphalt plant used on this project, regardless of location, shall be a minimum of 100 tonne per hour production plant, equipped with a dry bag system for pollution control, in addition to, or in replacement of standard cyclone dust collectors, to effectively eliminate emissions of dust and smoke pollutants into the atmosphere. Use of secondary dust collection systems, requiring discharge of dust polluted water into settling ponds or drainage system will not be permitted. In addition the Asphalt plant must comply with all environmental pollution control regulations applicable in the asphalt plant area. The plant operator must make daily inspections of the emission control.

1.3 MEASUREMENT PROCEDURES AND UNIT PRICE ADJUSTMENTS

- .1 Accepted asphalt concrete pavement will be measured in metric tonnes. Payment shall be made under **“Unit Price Item 9a – Asphalt Concrete Pavement - EPS - BC MoTI Class 1 Medium Mix (19mm)”** and shall be considered full compensation for supply of asphalt concrete mix including all materials, supply and application of tack coat, processing, plant mixing, loading, hauling, paver laying, compacting, finishing surface, raking, interim and final lane marking, quality control testing, safety, and maintenance.
- .2 Applicable payment adjustments (additions or subtractions as applicable) shall not be applied for paving Works completed under this project.

- .4 19mm Class 1 Medium Mix Asphalt Aggregate material is available to the contractor in stockpiles at Settler's Pit.

Part 3 Execution

3.1 METHODOLOGY

- .1 ACP placement:
- .1 Asphalt concrete mix shall not be placed when the air temperature is below 4°C, or when the weather is rainy.
 - .2 Asphalt concrete mix shall be placed only on clean, dry, and unfrozen surfaces.
 - .3 Unless otherwise shown on the plans, the asphalt concrete mix shall be placed in the following lift thicknesses:
 - .1 in a single lift when the design compacted total thickness is 75 mm or less.
 - .2 in two or more lifts when the design compacted total thickness is greater than 70 mm. The lift thickness selection shall be determined by the Contractor except that:
 - .1 the maximum thickness of any lift shall be 75 mm machine laid.
 - .2 the minimum thickness of a final lift shall be 50 mm.
 - .3 On widenings, the thickness of asphalt concrete mix up to 75 mm may be placed in one lift. Over 75 mm thickness, the asphalt concrete shall be placed in two lifts.
- .2 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.

3.2 EQUIPMENT, PLANT AND MIXING REQUIREMENTS

- .1 Execution of the Work shall be in accordance with BC MoTI - Standard Specifications for Highway Construction (Latest Edition) Section 502 – Asphalt Pavement Construction and Section 504 – Pavement Drainage
- .2 The contractor will be permitted to setup a Mobile Asphalt Plant or use a Stationary Asphalt Plant for this Project. The asphalt plant may be set up in Settler's Pit for the Contractor's use.
- .3 The asphalt plant used on this project, regardless of location, shall be a minimum of 100 tonne per hour production plant, equipped with a dry bag system for pollution control, in addition to, or in replacement of standard cyclone dust collectors, to effectively eliminate emissions of dust and smoke pollutants into the atmosphere. Use of secondary dust collection systems, requiring discharge of dust polluted water into settling ponds or drainage system will not be permitted. In addition the Asphalt plant must comply with all environmental pollution control regulations applicable in the asphalt plant area. The plant operator must make daily inspections of the emission control.

- .4 Repair spots where damage has occurred to coating in the field by applying two coats of zinc rich paint approved by the CSP supplier. Allow each coat to dry before placing second coat, bedding or backfill.

3.5 BACKFILLING

- .1 Backfill around and over culverts as indicated or as directed by Departmental Representative.
- .2 Place granular backfill material, in 150 mm layers to full width, alternately on each side of culvert, so as not to displace it laterally or vertically.
- .3 Compact each layer to 98% maximum density to ASTM D698 taking special care to obtain required density under haunches. Hand tamp where necessary to obtain compaction.
- .4 Protect installed culvert with minimum 900 mm cover of compacted fill before heavy equipment is permitted to cross. During construction, width of fill, at its top, to be at least twice diameter or span of pipe and with slopes not steeper than 2H:1V.
- .5 Place backfill in unfrozen condition.
- .6 Place Riprap.

3.6 TRENCHING EXISTING PAVEMENT STRUCTURES

- .1 Where trenches are cut into existing pavement structures, backfill will match the existing materials and thickness, payment for backfill and paving will be made at the unit price for the type of material used.

3.7 CULVERT EXTENSIONS

- .1 Extensions to existing culverts shall be as noted on drawings. Payment for installation shall include all hardware and necessary features to attach new sections. Backfill and bedding shall be as per drawings and paid as per the appropriate unit price item.

3.8 CULVERT / STRUCTURE REMOVAL

- .1 Culvert removal shall be as indicated on drawings and shall include disposal of sections to a site outside of the National Parks.
- .2 Bedding and backfill for culvert removal shall be paid as per the appropriate unit price item.

END OF SECTION

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.
- .2 Deliver, store and handle materials in accordance with manufacturer's written instructions.
- .2 Storage and Protection:
 - .1 Store materials in accordance with manufacturer's recommendations
 - .2 Replace defective or damaged materials with new.
- .3 Waste Management and Disposal:
 - .1 Separate waste materials in accordance with Section 01 35 43 – Environmental Procedures.

Part 2 Products

2.1 MATERIAL:

- .1 Supply of barrier drain pipe shall be in accordance with Section 33 42 13 – Pipe Culverts and shall include anchor plates and anchors.
- .2 Supply Precast Concrete barrier as per BC MoTI Standard Specifications for Highway Construction (Latest Edition) Section 941 - Concrete Barriers.

2.2 PRECAST CONCRETE BARRIER

- .1 Concrete Quality:
 - .1 To CAN/CSA-A23.1 except where amended below:
 - .1 Compressive Strength: Compressive strength test result is equal to or exceeds 30 MPa.
 - .2 No individual cylinder strength is less than 27 MPa.
 - .3 Calcium chloride or admixtures containing calcium chloride are not to be used in concrete.
 - .4 Cement Content: minimum of 320 kg/m³.
 - .5 Water/Cement Ratio: maximum of 0.45.
 - .6 Coarse Aggregate: nominal maximum size not exceeding 28 mm.
 - .7 Slump: 50 mm plus or minus 20 mm.
 - .8 Entrained Air: 5 to 8%.
 - .9 Reinforcement: 50 mm fibrillated polypropylene fibres to be added at the rate of 0.9 kg/m³
- .2 Concrete Placing and Consolidation:
 - .1 To CAN/CSA-A23.4, Clause 19.
- .3 Concrete Curing and Protection:
 - .1 Strictly to CAN/CSA-A23.4, Clause 21.
 - .2 During curing period temperature differential between concrete surface and ambient air not to exceed 20°C.
- .4 Exposed Concrete Surfaces: