SECTION 9 - SURFACING DESIGN

9.1 GENERAL

Surfacing Design includes:

- First course gravel for grading projects
- Base and Paving
- Final Paving
- Pavement Rehabilitation
- Seal Coats

9.2 SURFACING DESIGN PACKAGE

The Consultant shall complete a surfacing design package (using the Department’s standard format as per Appendix F) that will include but is not limited to:

- basic surfacing strategy
- detailed structural design
- aggregate requirements
- binder material
- Special Provisions if needed
- supplemental specifications and specification amendments if required
- bid items description
- quantity and cost estimates

**NOTE:** A surfacing estimate for each project (combined projects) and a surfacing estimate summary are essential requirements for every job submitted to Program Management Branch (Tel No. 415-1081).

- plans
- pavement markings(see Section 8.11).

The Surfacing Design and Tender Package (refer to Section 11.1) shall consist of all information needed for tendering purposes. Detailed surfacing design information does not have to be submitted with the Surfacing Design and Tender Package; however, it shall be retained as outlined in Appendix “K” (Records Management by Consultants).
9.2.1 SURFACING STRATEGY AND BASIC STRUCTURAL DESIGN

The Consultant shall adhere to the surfacing strategy and basic structural design, as prepared by the Regional Consultant (refer to Section 5.3) and included as part of the Information Package in the Terms of Reference for the project. The Consultant shall perform a site inspection of the roadway at the time detailed design is being undertaken to pinpoint and finalize the project limits. The roadway condition shall be assessed to identify and rationalize the need for preliminary leveling, repair of failed areas, additional ACP quantities for crossfall/superelevation corrections and special treatment of cracks.

If for any reason, it is deemed necessary to revisit the surfacing strategy and basic structural design, the work shall be referred to the Project Sponsor and the Surfacing Standards Specialist at Technical Standards Branch.

9.2.1.1 Laboratory Testing

The Consultant shall carry out all necessary laboratory testing and evaluation which may have been identified in the Terms of Reference or which were deemed necessary at the detailed engineering stage. The results of this testing and evaluation shall be documented and appended to the design package.

9.2.2 GRAVEL SURFACING AND SEAL COAT

Department guidelines for gravel surfacing design and seal coat type are included in Appendix “F”.

9.2.3 GEOMETRICS AND CLEARANCES

Where the project is primarily a “surfacing” job, the Consultant shall confirm the appropriate roadway geometrics including minimum vertical clearances allowed under overpass structures and shall include in the design package all works such as interchanges (including ramps and loops), intersection treatments, sideslope improvements, superelevation corrections, horizontal and vertical alignment improvements, railway crossings, guardrail design, culverts, treatment on bridge decks and on approaches to bridge decks. Where the project involves a significant grading component, the review and analysis of geometric elements is normally undertaken as part of the Geometric Design. Liaison with the Project Sponsor is essential.
9.2.4 AGGREGATE REQUIREMENTS

The Consultant shall quantify all aggregate requirements and coordinate aggregate supply conditions for the project.

The volume of aggregate required needs only to be an estimate based on the major components of the project. Co-ordination of the aggregate supply conditions shall be in accordance with Section 9.3 - “Supply of Aggregate”.

9.2.5 BINDER MATERIAL

Where applicable, the Consultant shall select, specify and quantify all surfacing binder materials. Binder material for asphalt concrete pavement shall be in accordance with the asphalt concrete mix type and characteristics currently in use by the Department.

9.2.6 SPECIAL PROVISIONS

The Consultant shall assemble all necessary standard Special Provisions and develop such project specific Special Provisions as may be required. Refer to Section 11.1.4 for details on accessing up-to-date versions of the standard Special Provisions.

9.2.7 SUPPLEMENTAL SPECIFICATIONS & SPECIFICATION AMENDMENTS

The Consultant shall identify all supplemental specifications and specification amendments applicable to the project.

9.2.8 BID ITEMS QUANTITY AND COST ESTIMATES

The Consultant shall provide detailed bid item descriptions, bid item codes, quantity and cost estimates and summaries for the required surfacing work in the Department standard format. Examples of this format are included in Appendix “F”.

If multiple projects are to be included in the contract works, a materials distribution chart must be included in the tender document. A sample of this chart is included in Appendix “F”.

Where applicable, the Consultant shall also include bid item descriptions and cost estimates for roadway and intersection line painting, “grooved” or “milled” rumble strips on shoulders
or at stop locations, side sloping, guardrail (removals and installations) signing, plus any sidewalk, raised median, or curb and gutter requirements.

9.2.9 PLANS

The Consultant shall provide a key plan showing the project location and limits, plus the location of all major intersections, bridge structures, vehicle turnouts and climbing lanes included within the project limits or scope of works. Detailed customized plans of intersections need only be provided where new construction or changes in layout are involved. An example of the necessary key plan is included in Appendix “F”.

In addition, the Consultant shall produce all necessary drawings to provide clear delineation of the work required.

The Consultant shall attach aggregate plans as part of the design tender package.

9.2.10 REPORTING REQUIREMENTS

The Consultant shall deliver the complete Surfacing Design Package to the Project Sponsor for review no later than two weeks before the date scheduled for delivery of the final tender package. Refer to Section 11.1.7 for information on timing and details for submission of the finalized tender package.

9.3 SUPPLY OF AGGREGATE

9.3.1 AGGREGATE SOURCES

9.3.1.1 General

In general, the Contractor is responsible for the supply of aggregate materials. To assure an economical supply of aggregates and to obtain competitive bids, a Department controlled aggregate source will normally be offered as an option. The Department’s policy regarding aggregate management is identified in Engineering Consultant Guidelines for Highway and Bridge Projects – Volume 2 – Construction Contract Administration.

9.3.1.2 Aggregate Data Summary Request

The Consultant shall request an aggregate source from the Regional Aggregate Coordinator as soon as a reasonable estimate of the gravel component is available. An electronic copy of the Aggregate Data Request Summary form shall be obtained from the Regional Aggregate
Coordinator. The “Aggregate Data Summary Request” shall be used to identify the project, project limits, type of work, type of material, and the approximate quantity of aggregate that is required. The request shall be submitted a minimum of six weeks prior to the tender submission date (unless the Department advances the project on short notice). The Department will issue to the Consultant the finalized “Aggregate Data Summary Request” for all projects, including those with no optional aggregate source. The Consultant shall use this information in the design. The consultant is responsible to review the Special Provisions, Plans and the Aggregate Summary Request, and convert the data for inclusion into the tender documents.

An amended summary shall be submitted at any time that the aggregate quantity increases because this may necessitate a change to the pit-operating plan or require a change to a different aggregate source.

9.3.1.3 Payment for Aggregate

Payment for the supply of aggregate will be made to the Contractor through a separate bid item. This value will be predetermined by the Department as stated in the form “Aggregate Data Summary Request” in Appendix “G” and included in the tender documents when the specification amendments indicate that the contractor may use a Department controlled source. No aggregate value will be assigned if the specification amendment indicates that the contractor may NOT use an aggregate source controlled by the Department. Eligibility for payment is identified in the Standard Specifications for Highway Construction manual.

9.3.1.4 Pit Reclamation

Progressive reclamation of pits in conjunction with construction or crushing contracts is a normal practice followed by the Department. It is reasonable and desirable to follow this practice to minimize double handling of overburden and reduce the Department’s outstanding liability for reclamation.

The Consultant shall assess the need for pit reclamation on each project, as well as whether a Department controlled source is offered as an option, and recommend, to the Regional Aggregates co-ordinator, changes to the Special Provisions of the contract tender accordingly.

9.3.1.5 Aggregate Source Controlled by the Department

Where a Department source is made available for a project, the Department will provide the relevant pit information including Aggregate Source Summary Request, Aggregate Testing Plan, Approvals, operating plan and conditions, Summary of Aggregate Sieve
Analysis, and the aggregate value (which is to be used for the “Supply of Aggregate” bid item). The Consultant shall use this information to form the Special Provisions. If the plans or approvals require updating or are not available, the Consultant is responsible for obtaining them and providing them to the Department. This includes surveying the source in an approved manner, and redrafting the plans using the Department standards. The plans and approvals include, but are not limited to:

- Legislated Environmental Approvals
- Water Resource Permits
- Aggregates Testing Plans and Pit Plans
- Detailed Operating plans

The Consultant shall specify in the Tender Special Provisions any special operating conditions that are not included in the Department’s “Standard Specifications for Highway Construction”.

9.3.1.6 Plan Quality in Tender Package

The consultant shall include legible testing plans and operating plans for any optional source made available for the contract.

If available, the Aggregate Co-ordinator will provide digital Testing Plans and operating plans in DGN or CGM formats. The Consultant shall convert the images into an electronic format for inclusion into the tender document.

In the absence of a digital plan, a blueprint of the original plan will be provided. The consultant shall be responsible for the drafting of a digital plan that meets Department standards, for inclusion in the tender document. Scanned plans are not acceptable.

Along with the full testing plan, the portion of the testing plan to be operated shall be enlarged and included in the tender document. Examples of testing plans are shown in Appendix G. More than one enlarged plan may be required to show the area clearly. Alternately, full size plans in PDF (portable document format) shall be included with the other engineering plans as described in Section 11.1.2 – Design and Tender Package Submission Requirements.

The Consultant shall verify the quality of the plans by printing out the image from the PDF or word perfect file, prior to submission of the tender document.
SECTION 9 – SURFACING DESIGN

Current References for Section 9:


Pavement Surface Summary (Primary Highways), Current, Alberta Transportation.

Pavement Surface Summary (Secondary Highways), Current, Alberta Transportation.

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