

**ENGINEERING CONSULTING
GUIDELINES FOR HIGHWAY, BRIDGE,
AND WATER PROJECTS**

**Government
of Alberta ■**
Transportation

**VOLUME 1 – DESIGN AND TENDER
2011**

ENGINEERING CONSULTANT GUIDELINES FOR HIGHWAY, BRIDGE, AND WATER PROJECTS – VOLUME 1 – DESIGN AND TENDER

The purpose of this manual is as follows:

- To outline the Department's expectations for the provision of engineering services for the design and tendering of all provincial highway, bridge, and water management projects where a consultant is hired directly by the Department.
- To ensure uniformity and consistency in the provisions of these services to the Department.
- To outline specific responsibilities and authorities of the consultant when providing these services.

The consultant's obligations are detailed in the consulting services contract and construction contract documents. This manual outlines the deliverables established by the Department which will typically fulfil the consultant's obligations and ensure that Department requirements are met in the desired manner.

This manual does not provide a complete record of all the processes, responsibilities and authorities of the consultant and the Department in managing the delivery of a Department construction contract. Other documents or manuals which must be considered include but are not limited to the following:

1. Engineering Consultant Guidelines for Highway and Bridge Projects – Volume 2 – Construction Contract Administration
 - This document provides guidelines covering the post-tender period.
2. Project Administration Manual
 - This document outlines the Department's internal methods of administering engineering contracts and construction contracts as well as selecting, monitoring and evaluating consultants.
3. Traffic Accommodation in Work Zones Manual
 - This document provides information and minimum standards for the provision of traffic accommodation through work zones on highways and bridges in Alberta.

The authorities, responsibilities and processes contained in all these manuals are based on the Department's policy statements, authority's matrix, contract specifications, and contracts for engineering consultant services. Updates or revisions to existing contract specifications, the terms of the contract, policy statements or the authority's matrix may affect these processes, responsibilities and authorities. In the event of any such changes which significantly affect

the contents of these manuals, users will be advised accordingly. Please refer to the Department website for a listing of additional Department publications.

This manual is not intended to replace or modify the contents of the Department's construction contracts or engineering consultant contracts. If a conflict or ambiguity exists between this manual and the Consulting Services Contract, the user shall contact the Director, Professional Services Section, of the Department's Program Management Branch for clarification.

Any omissions, obvious errors, or recommendations for future updates should be forwarded to the Director, Professional Services Section, of the Department's Program Management Branch.

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SECTION 1 - GENERAL

1.1 INTRODUCTION

These guidelines, appendices and references shall be used for the provision of engineering services on all Provincial highway, bridge and water management projects where a Consultant is hired directly by the Department. These guidelines may also be used when stipulated for projects not undertaken directly by the Department but where the funding agency (whole or partial funding) is Alberta Transportation.

Where a discrepancy exists between this document and the documents prepared specifically for a project, for example the Terms of Reference for a project, the latter shall take precedence. Because of the evolving nature of standards, guidelines, legislation, regulations, specifications and engineering practices, it is impractical to expect all the contents of this document and the documents referenced to be up-to-date. The Consultant is responsible for using current standards, design codes and guidelines and for ensuring that all current legislation and regulations are being followed. A list of current Federal and Alberta Provincial legislation and regulations that are relevant to highway planning, design, construction and operations is contained on the Department website. This list is not all-inclusive.

In the event of discrepancies, the hierarchy of documents shall be as follows, in descending order:

- Legislation and Regulations
- Consulting Services Contract¹
- Terms of Reference¹
- Engineering Technical Standards¹, Warrants¹ and Processes
- “Engineering Consultant Guidelines for Highway, Bridge, and Water Projects”

In keeping with a spirit of innovation, the Department is interested in hearing innovative proposals from Consultants at the ‘Request for Proposal’ stage, if it is apparent that projects can be undertaken more efficiently or effectively using an alternative approach rather than that outlined in the Terms of Reference. This spirit of innovation will be encouraged by Department staff when developing Terms of Reference for a project, and when evaluating proposals that have been submitted.

The Prime Consultant retained by the Department is responsible for the engineering integrity and professional liability of all work performed under their Contract, including work by any Sub-Consultant. The checking of the Consultant’s or Sub-Consultant’s work by the Department or the signing of drawings by Department staff does not relieve the Consultant from any responsibility for the work. Therefore these

¹ See Section 1.1.1 - Definitions

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guidelines will generally use the terminology of “acceptance” rather than “approval” when referring to engineering issues submitted to the Department by the Consultant.

1.1.1 DEFINITIONS

The following words, when used in this document, shall have the meaning as defined below:

Acceptance	Work is accepted by the Department without detailed checking of the engineering principles and calculations.
Alberta Land Surveyor	A person registered to perform land surveys in the Province of Alberta.
Approval	The subject work shall be “approved” by the Department for matters relating to things such as Department policy, funding, contract extensions or over-runs, right-of-way purchase, or Contract Design Change Proposals. The Department will also review and approve Design Exceptions as required (see Section 1.6.1).
Bridge Assessment	A formal review of bridge condition, functionality controlling issues and technical parameters with respect to the crossing and roadway approaches. A key objective is to identify optimum strategies for preservation, rehabilitation or potential reconstruction of the crossing over the life cycle of the structure. See Appendix J1 for more details.
Bridge Planning	An engineering process for bridges undertaken prior to the structural design phase including but not limited to bridge assessment, functional planning, geometric design, hydrotechnical design, site location and survey, environmental determinations, preliminary geotechnical investigation and development of optimized concepts for advancement to structural design.
Bridge Structures	Consist of: <ul style="list-style-type: none">▪ Bridge Size Culverts - structures that are completely surrounded by soil and located below the surface of the roadway parallel to the general direction of the stream flow. All bridge size culverts are defined as having an equivalent flow area of 1500 mm or more.

- Standard Bridges - bridge structures built using standard plans. Typically standard bridge construction comprises standard precast girders and steel or concrete abutments (and piers when applicable) supported on steel piles, but excludes new precast girder bridges with a composite cast-in-place concrete deck (e.g. standard SLC bridges).
- Major Bridges - all other bridge structures including large or complex culverts. Major bridges are typically built from site-specific drawings, but can also be built from standard drawings (e.g. standard SLC bridges). Typically major bridges are river crossings, highway interchanges or railway crossings.

Checker	The Professional Engineer who conducts an independent check of the Design Drawings.
Consultant	The person or company that has entered a consulting services contract with the Department.
Consulting Services Contract	The contract between the Department and the Consultant for the provision of services on Department projects.
Construction Contract	The contract between the Department and the Contractor covering the performance of the work.
Contract Design Change Proposal	An alternate design or a design modification to the Department's tendered design or a component thereof. If required, the Contractor shall submit this proposal (through the Department's Project Sponsor) after the tender is awarded.
Contractor	The person or company that has entered into a construction contract with the Department.
Department	Alberta Transportation.
Designer	The Professional Engineer who takes professional responsibility for the Design Drawings.
Design Data (DD) Drawings	Design Data Drawings are bridge engineering drawings that provide all significant pre-design information for use in structural design or associated river engineering, as well as recording and illustrating all relevant bridge planning information.

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Design Drawings	Drawings that encompass any original designs or design changes. These drawings shall be authenticated by both the Designer and Checker indicating that the design has been prepared in accordance with all appropriate engineering and Departmental Standards.
Design Exception	An instance where a designer has chosen to use a parameter or product which is different from the prevailing practice. Documentation of the rationale used for the design exception must be filed as part of the design tender package for future reference.
Design Package	Includes grading, surfacing, and bridge design packages which are used as the basis for preparation of the contract tender. It generally includes the detailed design calculations, notes to the Project Manager, Utility Agreements, environmental permits, etc. The completed and independently checked package is normally submitted to the Project Sponsor. A sign-off letter is prepared by the Consultant for the Project Sponsor's signature for submission to Professional Services Section prior to tendering.
ECO plan	The Environmental Construction Operations plan consists of plans and written procedures that address environmental protection issues relevant to the specific activity being performed during construction of a project.
Engineering Assessment	<p>A formal assessment of various technical and safety parameters and/or performance data generally using a predefined methodology or warrant system. An engineering assessment is generally undertaken early in the construction programming cycle to allow the scope-of-work to be accurately estimated.</p> <p>Examples of engineering assessments are Geometric Assessment, Safety Assessment, Surfacing Strategy, etc. See Section 5 for more details.</p>
Estimates	
“A” Estimate	A “Program/Planning Estimate”, which is a “Ball Park” estimate, to be prepared before any design calculations are completed.

For roadway grading, base, and paving projects the “A” Estimate may be based on a typical cost per kilometre all inclusive cost (including engineering, materials costs, right-of-way, utilities, mobilization, contract costs, etc.) from past experience of average cost in the vicinity. The “A” Estimate may be refined after an Engineering Assessment has been completed.

For bridge structures, this estimate is usually produced at the Functional Planning stage and is usually based on the typical square metre cost for the overall deck area.

See [Appendix I](#) for an example.

“B” Estimate

A “Preliminary “B” Grading Design Estimate” is prepared when preliminary earthwork quantities have been established after 1 or 2 computer runs have been made. A Preliminary “B” Surfacing Estimate is prepared when the surfacing strategy has been established. These estimates may be updated one or more times before the “C” estimate is prepared.

Each subsequent “B” Estimate submission for either roads or bridges needs to be identified as “B1”, “B2”, “B3”, etc. estimate when a greater accuracy is identified at a later stage of design. The number will designate generation or occurrence.

For bridge structures, the “B” Estimate is usually produced at the Choose Design stage for each alternative structure type after overall dimensions are established (out to out, width, etc.). The “B” Estimate should be based on itemized quantities and unit prices resulting from preliminary sizing of the structural elements and be sufficiently accurate to allow a reasonable comparison of viable options.

See [Appendix I](#) for an example.

“C” Estimate

A Final Design Estimate which is to be prepared when the Grading Estimate Summary” and the Surfacing Estimate Summary have been completed for roadway grading, base and paving projects. Typically this estimate is produced after the final design is completed. For Bridge structures, the “C” Estimate is produced when the tender drawings and estimated quantities are

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available. Refer to [Section 11](#) for more details.

See [Appendix I](#) for an example.

“D” Summary An estimate produced when the actual tender prices are known.

See [Appendix I](#) for an example.

Field Review Engineer The Professional Engineer who takes responsibility for assuring that the finished construction substantially complies with the Design Drawings and the contract specifications.

Final Details Describes the package of information that must be compiled and submitted at the completion of construction work. A detailed description of the requirements of Final Details for roads and bridges is provided in the “Engineering Consultant Guidelines for Highway and Bridge Projects – Volume 2 – Construction Contract Administration”. Record drawings for each roadway and bridge project are to be included as part of the Final Details.

A Final Details Report is required for each bridge file where construction or rehabilitation work is undertaken as stipulated in Volume 2.

FOIP Government of Alberta legislation entitled “Freedom of Information and Protection of Privacy Act”.

Preliminary Engineering An engineering exercise undertaken early in the detailed design process, the purpose of which is to gather preliminary site surveys, geotechnical and other information used and reaffirm the key design parameters that should be used on the project.

In cases where a Planning Study and/or Engineering Assessment has been undertaken for the project the Preliminary Engineering process will involve “revisiting” the previously made recommendations. On projects where there is no Planning or Engineering Assessment available, the Preliminary Engineering exercise will involve establishing the key design parameters based on normal Department practices.

See [Section 6](#) for more details.

Professional Engineer	A person registered to practice engineering in the Province of Alberta under the APEGGA Act.
Project Administrator	A Department employee who has been designated by the Project Sponsor to administer the Project on a day to day basis.
Project Co-Sponsor	A Department employee primarily responsible for a particular component of work, such as highway or bridge work.
Project Design Brief	A document that is completed by the Consultant for major bridge projects. The document lists salient points and design assumptions prior to any detailed design work. The purpose of the document is to ensure that the Consultant and the Department agree on the main design assumptions before the design progresses to detailed work. An example of a brief is included in Appendix J1 . A blank brief will be made available to the Consultant at the project initialization meeting.
Project Sponsor	The Department employee appointed by the Department to be responsible for the delivery of the project. The Project Sponsor is the Department's Senior Manager responsible for the Project/Assignment.
Record Drawings	Drawings that represent the completed constructed project (previously referred to as As-Constructed Drawings/Details). Record drawings shall be authenticated by the Field Review Engineer indicating that the constructed product substantially complies with the Design Drawings and all appropriate Contract Plans and Specifications.
Request for Proposal	<p>A formal document that includes a cover letter defining the preparation of the proposal, the basic insurance requirements expected of the Consultant and has the Terms of Reference attached to it.</p> <p>A Request for Proposal system seeks the best value through open competition or the competition of short-listed proponents, and, most importantly, it is a system which provides for both objective and justifiable reasons for its choices.</p>

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Road Drainage Culverts	Culverts with an equivalent diameter of less than 1.5 m and which are included with the road design package.
Sub-Consultant	A person or company that enters into an agreement with the Consultant to carry out part or all of the work covered in the consulting services contract.
Technical Standards, Guidelines and Warrants	Technical References and other Department documents listed on the Department website.
Tender Package	The end product of the design phase of the project. This package normally includes tender documents, plans, design summaries, cost estimates and covering memos.
Terms of Reference	A document outlining the description of the assignment, the scope of the work, schedules and expected deliverables.

1.2 WORKERS COMPENSATION BOARD AND OCCUPATIONAL HEALTH AND SAFETY

1.2.1 GENERAL

The Consultant's responsibilities under the Occupation Health and Safety Act are defined in the Consulting Services Contract as follows:

The Consultant shall familiarize themselves, their staff and their sub-consultants with the terms of the "Occupational Health and Safety Act" and Regulations to ensure complete understanding of the responsibilities given and compliance required. The Consultant acknowledges and accepts all of the responsibilities and duties of the Prime Contractor as defined in the "Occupational Health and Safety Act".

The Prime Contractor shall, to the extent required by the "Occupational Health and Safety Act", establish and maintain a Health and Safety system or process to ensure compliance to the Act and Regulations by sub-consultants. The Consultant shall also, to his satisfaction, ensure that any sub-consultants are able to comply with all health and safety regulations before commencing work.

As the Department representative on site, the Consultant will communicate with Contractors and Utilities Companies and may have to arbitrate disputes between them when they are working in the vicinity of each other.

1.2.2 WORKSITE HAZARD

The Consultant has the responsibility to identify worksite hazards and shall develop operational occupational safety policies, procedures and plans which are specific to the work being performed to ensure the safety of workers, whether employed by the Consultant or Sub-Consultant(s). The impact of the public traveling through the site must be considered when developing these plans (if applicable). When requested by the Department, the Consultant shall provide copies of these safety policies, procedures and plans to the Department prior to the commencement of the work, along with verification that they have been submitted to Workplace Health and Safety.

If Workplace Health and Safety conducts a worksite inspection which results in “orders” being issued to the Consultant, the Consultant shall immediately supply copies of these orders to the Project Sponsor or the Department Safety Officer.

In cases of recognized imminent danger or when the Consultant fails to comply with safety orders issued or fails to rectify previously identified worksite hazards, the Project Sponsor, a Department Safety Officer or any other authorized Department representative will order the cessation of the work until it is safe for the work to resume. Their interpretation of a worksite hazard will be considered as final in all cases.

1.2.3 ACCIDENT INVESTIGATION AT THE WORKSITE

In the event of an injury or accident involving workers of the Consultant, or his/her Sub-Consultant, at the worksite as defined by the “Occupational Health and Safety Act”, the Consultant shall conduct an accident investigation where required by Section 18 of the “Occupational Health and Safety Act”. In addition, the Consultant shall supply a copy of this investigation report and obtain copies of the Contractors accident reports to the Project Sponsor within 72 hours of knowledge of the occurrence.

Where there is a worksite accident involving the Contractor’s personnel, the Contractor shall conduct the investigation and the Consultant shall submit a copy of the investigation report to the Project Sponsor within 72 hours of knowledge of the occurrence.

1.2.4 SAFETY CERTIFICATE OF RECOGNITION

The Department will only prequalify and award assignments to Consultants who have achieved accreditation/recognition in a Safety Certification Program which is relevant to their industry and which is recognized by Alberta Employment and Immigration,

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Workplace Health and Safety. Accreditation/recognition will be in the form of a Certificate of Recognition in Health and Safety (COR). A small employer's certificate of recognition (SECOR) is not acceptable.

Consultants shall submit proof of accreditation with their annual pre-qualification. The Department may verify the Consultant's compliance with this requirement through the Alberta Construction Safety Association (ACSA) at any time, and any firm found not to have current accreditation will have their pre-qualification rescinded.

It is the prospective Consultant's responsibility to ensure that their registration in the program is properly documented with the Alberta Construction Safety Association, and the Department will assume no liability for errors or omissions by the Alberta Construction Safety Association in this regard.

For Consultants that have not obtained a Certificate of Recognition in Health and Safety, a valid Temporary Letter of Certification (TLC) issued by Alberta Construction Safety Association will be considered acceptable.

1.3 PUBLIC SAFETY REQUIREMENTS (TRAFFIC ACCOMMODATION THROUGH THE WORK ZONE)

1.3.1 GENERAL

Accommodation of traffic may be required at any time through the planning, preliminary engineering, design, construction, and post construction phases. Refer to "Engineering Consultant Guidelines for Highway and Bridge Projects – Volume 2 – Construction Contract Administration" on procedures for traffic accommodation operations.

Traffic control devices shall be constructed, installed and maintained in accordance with the Department's latest version of the "Traffic Accommodation in Work Zones" manual.

The Consultant shall be responsible for identifying situations that will require special traffic accommodation procedures to be implemented. These situations could involve major utility or pipeline relocations, bridge construction, the need to accommodate high traffic volumes, major grade line changes, lane closures, etc.

If traffic control is found to be inadequate, the Consultant shall take appropriate and timely action to rectify the situation.

- Planning, Preliminary Engineering, and Design Phase

During planning, design, preliminary and legal survey operations, geotechnical work such as test holes/test piles the Consultant shall be responsible for provision of suitable traffic accommodation measures.

Preparation of traffic accommodation plans showing signing, delineation, traffic lanes, etc., for all detours, diversions or partial road closures, shall be undertaken by the Consultant.

The Consultant shall install and maintain any required traffic control devices.

- **Construction Phase**

Please refer to the latest version of “Traffic Accommodation in Work Zones” manual.

1.3.1.1 Flagperson

When the Consultant is undertaking surveying/engineering/inspection/field reconnaissance/field investigation operations that may cause interruption, delay or hazards to the travelling public or anyone on the worksite, qualified flagpersons shall be provided as required for the direction and control of traffic. The Consultant shall ensure that flagpersons are instructed in the use of proper traffic control procedures appropriate for the prevailing conditions. Flagpersons shall have proof of certification from a recognized training program on traffic control procedures through construction zones. The Department currently only recognizes traffic control programs administered by the Alberta Construction Safety Association.

Flagpersons shall be dressed in accordance with the information and minimum standards in the “Traffic Accommodation in Work Zones” manual.

1.3.2 ACCIDENT INVESTIGATION WITHIN THE PROJECT LIMIT

Should any third party accident involving highway users (vehicular or pedestrian) occur within the project limits, the Consultant shall investigate the accident and provide the Project Sponsor with a report on the prescribed forms within 72 hours of knowledge of the occurrence. If a fatal or major accident involving serious personal injury or major property damage occurs, the Consultant shall immediately notify the Project Sponsor or the Department Safety Officer of the incident. The accident report will include a record of conditions at the time of the accident, photos, description of all pertinent signing and other traffic control devices in place at the time. The “Report of Motor Vehicle Traffic Collisions Occurring in Construction Zones” form is available in the “Engineering Consultant Guidelines for Highway and Bridge Projects – Volume 2 – Construction Contract Administration”.

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1.4 OTHER GENERAL REQUIREMENTS

1.4.1 PROFESSIONAL REGISTRATION

All Consultants engaged to provide engineering services for the Department shall be registered with the Association of Professional Engineers, Geologists and Geophysicists of Alberta (APEGGA) and shall abide by the Association's regulations, code of ethics and by-laws.

Land surveyors who are doing legal surveys for the Department must be registered Alberta Land Surveyors.

1.4.2 PROFESSIONAL SEAL

The Consultant shall sign, seal and date all plans, drawings, specifications, designs, data and any other engineering documents they produce, check and/or approve. The seal shall consist of the APEGGA member stamp or seal and the permit stamp.

1.4.3 CONSTRUCTION SPECIFICATIONS AND CONTRACT CONDITIONS

The current edition of the Department's "Standard Specifications for Highway Construction", "Specification Amendments and Supplemental Specifications for Highway Construction", "Standard Drawings for Highway Construction" and "Specifications for Bridge Construction" shall apply to all construction contracts. They may be modified and supplemented by special provisions, plans, specification amendments, or supplemental specifications.

The Consultant shall be the engineering representative engaged to administer construction contracts on behalf of the Department. The Consultant cannot change any condition of the contract between the Department and the Contractor.

1.4.4 FIRST NATION CONSULTATION

1.4.4.1 First Nation Consultation For Projects on Indian Reserves

For those projects where land is required from Indian Reserves the Department has a legal duty to uphold the "honour of the Crown" by consulting with First Nations. The Project Sponsor, with the assistance of the Consultant, shall complete the necessary consultation in order to satisfy federal consultation requirements. During construction, the Department does allow the use of First Nations labour, equipment, and material resource supply (through mutual agreement with the First Nation jurisdiction) when undertaking construction activity through Indian Reserves.

1.4.4.2 First Nation Consultation For Projects Outside Indian Reserves

The department has a legal duty to uphold the "honour of the Crown" by consulting with First Nations as required by the Supreme Court of Canada in consideration of aboriginal and treaty rights that are recognized and affirmed in Section 35 of the "Constitution Act". Although there is no legal obligation to consult with respect to non-treaty uses, Alberta has made a policy commitment to consult when the Crown decision making has the potential to adversely impact these uses. To meet this legal duty and policy commitments made by the Alberta provincial Crown, the Department must consult with First Nations when the Department's decisions have the potential to adversely impact Rights and Traditional Uses. The Project Sponsor, with the assistance of the Consultant, shall complete the necessary consultation procedures as outlined in "Draft Alberta First Nations Consultation Procedures Manual". This document will provide the guidance required on the issue of First Nations consultation for the planning, design, and construction phases.

1.4.4.3 Federal Government First Nation Consulting Requirements

In addition to the First Nation consultation requirements outlined in the "Draft Alberta First Nations Consultation Procedures Manual", the federal government also has First Nation consultation requirements. It is essential that discussions regarding First Nations consultation with the relevant federal departments (e.g. Department of Fisheries and Oceans/Transport Canada) occur early in the process so that any additional consultation requirements that may be required are incorporated into the project as necessary.

The Consultant is required, in the earliest stages of the project, to identify to the Project Sponsor those federal agencies that need to be contacted regarding First Nations consultation requirements and to assist the Project Sponsor in fulfilling any subsequent obligations as a result of those discussions.

1.4.5 RECORDS, FREEDOM OF INFORMATION, AND PROTECTION OF PRIVACY ACT

Any information collected or generated by a Consultant, when providing engineering services, is the sole property of the Department. This information is subject to the Records Management Regulations of the Government and the FOIP Act. Refer to [Appendix K](#) to ensure that records are retained accordingly. When asked to give out information the Consultant must contact the Project Sponsor prior to doing so, in order that the FOIP Act is not violated in regards to privacy and personal information. Refer to [Appendix C](#) for a sample request for Corporate Bridge Information form.

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1.4.6 MANUALS

All guidelines, manuals, or other documents referred to in these standards are the current edition or version unless specifically noted. Refer to the Department website for a listing of documents available for sale at the time of writing.

1.4.7 DUPLICATING

The Executive Director, Program Management Branch, hereby gives permission for the Consultant to copy these guidelines solely for use within the firm.

1.4.8 UPDATES

Updated information related to Design and/or Construction is released by the Department through Design Bulletins and Construction Bulletins respectively. These bulletins are made available to consultants and others through the Department's website. Bulletins are numbered sequentially and dated. The Bulletins will continue to be displayed until the information is superseded either by a more permanent document (e.g. Design Guide, Specification, etc.) or when more current information comes into use.

The Department will update these guidelines on an as required basis. Updates are normally done through the rewrite of the complete document on a regular basis (usually every 3 years). The Consultant shall ensure that the most recent version of the guidelines is used on all projects.

Consultants are required to monitor the Design and Construction Bulletins on a regular basis to ensure that they are following the latest Department practices. At the time of writing the web addresses for the bulletins are as follows:

Design Bulletins:

www.transportation.alberta.ca/649.htm

Construction Bulletins:

www.transportation.alberta.ca/920.htm

1.4.9 WEBSITE

The Department's web address is www.transportation.alberta.ca. A search engine is available on the website to assist in locating information.

1.5 RESPONSIBILITIES

1.5.1 GENERAL

The Consultant shall complete the assignment as described in the Consulting Services Contract. The Consultant shall also monitor all aspects of health and safety on the project. The Department will tender and award all construction contracts, and will administer holdback, contract security, public work act claims, and be involved in settlement of construction contract related claims (in consultation with the Consultant).

The Consultant shall supply all personnel, materials, and equipment required to provide the services in accordance with these guidelines.

The Consultant shall be responsible for all work performed under the Consulting Services Contract, including work done by any Sub-Consultants.

1.5.2 CHANGES TO SCOPE OF WORK FOR ENGINEERING ASSIGNMENT

Any changes in the scope of work or the Terms of Reference of the Consulting Services Contract that impacts upon the time frame or costs of the project shall be brought to the attention of the Project Sponsor by the Consultant. These changes to the scope of work shall be in writing including the estimated costs and shall be submitted as soon as they become apparent, for review and approval. Scope changes having impact on engineering costs of the project will be recorded on the cost control sheet submitted with the invoices.

NOTE: *Except for emergency situations, the Consultant shall not proceed unless an authorization to do the work is given by the Project Sponsor.*

1.5.3 BACKGROUND INFORMATION

The Consultant shall identify and review all historic records, archives and information relating to the project. The Department's files and archives will be available for the Consultant's review and use. A "Request for Corporate Bridge Information" form indicating record types, storage areas, and the contact persons are included in [Appendix C](#).

Electronic reporting is to be used when available and Department programs will be made available to Consultants unless restricted by licensing or other requirements.

1.5.4 LIAISON

For each project, a Project Sponsor will be appointed by the Department to act as the liaison between the Department and the Consultant. The Project Sponsor will have the overall responsibility of ensuring that the work is planned, coordinated, and executed in accordance with the Consulting Services Contract. The Project Sponsor will liaise between the Consultant and the various branches within the Department to resolve any administrative, technical or contractual matters.

1.5.5 PROJECT INITIALIZATION

The Project Sponsor is responsible for ensuring that each activity and phase of the work is completed as scheduled. To do this, prior to any work commencing on a project, the Project Sponsor will normally call a Project Initialization Meeting with the Consultant, the Department Safety Officer, and any appropriate specialist staff from the Department to clarify the assignment, expectations and staff roles, the scope of the work, the safety strategy, the reporting requirements (during planning or design work as identified in the Terms of Reference), the standards to be used, the time frame for the overall project, as well as any significant milestone dates within that time frame for specific activities. Project Administration information such as Consulting Contract number, work activity codes, jobcoster numbers, sample forms, revised procedures, etc. will also be made available to the Consultant at this meeting. The Project Sponsor will advise the Consultant of all issues that may affect the Consultants work plan (e.g. tendering schedule, right-of-way negotiations, borrow purchase). See [Appendix B](#) for Sample Agenda Items and the Project Administration Manual (P.A.M.) for other details.

1.5.6 APPROVAL OR ACCEPTANCE

The following, and other unforeseen matters, shall be referred to the Project Sponsor for approval or acceptance unless authority is delegated elsewhere:

- Approval
 - Change of Project Personnel
 - Public participation programs
 - Planning report
 - Roadway preliminary engineering report
 - Significant changes to project funding requirements
 - Property Agreements
 - Design Exceptions (before or after tender)
 - Design Changes (before or after tender)
 - Changes to scope of work and fee increases

- Specified start and/or completion dates for the contract and any other conditions related to construction schedules
 - Bridge assessments and bridge planning concept meeting
 - Contract Design Change Proposals
 - Unit prices for bid items that were not included in the original tender
 - Contract claims resolution
 - Extra work (as per the Departments Authorities Matrix)
 - Contract Payments
 - Contract over-runs
 - Contract extensions
 - Railway Crossing Agreements
 - Utility Crossing Agreements
 - Public Advertising on behalf of the Department
 - Site occupancy changes
- Acceptance
- Environmental permits, licenses, and investigations
 - Engineering Assessment Report (see [Section 5](#))
 - Bridge and bridge culvert design package
 - Utility plans and adjustment methods
 - Other Contract and Design Changes (prior to tender)
 - Electronic file formats
 - Geotechnical investigation and report
 - Grading design package
 - Surfacing design package
 - Final project design, cost estimates and tender package
 - Progress and Final Payment for Construction Contracts
 - Final Details
 - Final Bridge Planning Summary Report

1.5.7 COST ESTIMATES

Accurate and timely submission of cost estimates including current unit costs is important for the Department's programming function.

The Consultant shall provide the following cost estimates:

- Planning Stage
 - "A" Preliminary cost estimates with all planning studies and bridge assessments
- Design Stage
 - "B" cost estimates on completion of preliminary designs
 - "C" cost estimates on completion of final design with tender packages

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- “D” cost summary after contract award (for bridge structures only)
 - Utility relocation and adjustment estimates
 - Surfacing estimate
 - Grading design estimate
 - Tender package cost summary
- Construction Stage
 - Progress and final estimates
 - Refer to Engineering Consultant Guidelines for Highway and Bridge Projects – Volume 2 – Construction Contract Administration for more details.

1.5.8 INDEPENDENT DESIGN CHECK

The Consultant shall undertake an independent check of all designs, Contract Tender Package, drawings, and final details by a qualified and experienced Professional Engineer, prior to submission of the work to the Department. Tender estimates and progress estimates shall be prepared and independently checked by either a qualified and experienced engineer or technologist. All documents and drawings shall show the names and/or signatures of persons responsible for design and checking. This independent design check shall be carried out by another Consultant when the design Consultant does not have adequate in-house capabilities to provide this check.

For Independent Design Check of bridge planning and bridge structural design, also refer to [Section 10.3](#).

1.5.9 REVIEW OF WORK BY THE DEPARTMENT

Any review of the Consultant’s work, signing of drawings and the acceptance of documents by Department staff does not relieve the Consultant from any responsibility for errors or omissions by the Consultant.

1.5.10 CONSULTANT PERFORMANCE EVALUATION

At the project initialization meeting, the Project Sponsor will advise the Consultant of appropriate form(s) to be used, and as required, also identify the criteria/ weighting/ timing that will be used as the basis in the evaluation process. See the Project Administration Manual for further information on this process.

1.6 DESIGN PHILOSOPHY

1.6.1 GENERAL

While undertaking planning studies, preliminary engineering or detailed design, Consultants are expected to achieve “best value” for the project dollars while still achieving a safe, functional and efficient design for the end-user. The guidelines, warrants, and practices contained in the Department’s Design Guides (Highway Geometric Design Guide, Roadside Design Guide, Pavement Design Manual, Bridge Design manuals, etc.) should be followed. However, where there are significant constraints, especially areas with rough terrain conditions (steep hills, muskegs, sharp river valleys, winding river crossings, widening of narrow roads, existing developed infrastructures etc.), it may not be practical or desirable to maintain normal standards.

In these circumstances, to ensure that designs are “optimized”, the designer may request a Design Exception to adopt a design parameter that is more appropriate for the context while addressing other factors such as safety, cost-effectiveness, consistency, etc.

Occasionally a design exception may involve use of a design parameter, which exceeds normal standards or practices. The use of modified design parameters (lower or higher standards) shall be analyzed by the designer/proponent, documented (to show the rationale used for the exception generally including economic justification, impacts on end-users and risk analysis), reviewed and approved by the Department.

The approval process shall include a written submission of a Design Standards/ Practice Exception Request Form (attached in [Appendix C](#) with the following information:

- Description and details of the project including the project stage, type, location, length, and limits. In addition, highway service class or level, design speed, posted speed, cross-sections, and other improvements being considered should be included.
- Site plans, profiles, sketches, detailed drawings, and/or photographs of the site and the alternatives considered.
- Current and future projected traffic volumes, growth rate, traffic composition, Turning Movement Diagrams (if applicable).
- Summary of the current standards / practices that are not being followed and what alternatives were considered and evaluated.
- Information on implications to future planned improvements to the roadway or corridor that may need to be considered.
- Cost estimate to build to standard versus to the Design Standards / Practice Exception.
- Assessment of the exposure and risk with respect to traffic volume, location, severity (worst case scenario), duration, etc. The evaluation may involve an

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- assessment beyond the project limits. The evaluation may also include a Road Safety Audit.
- Summary of the collision history within the project limits.
 - Description of any proposed mitigations (safety enhancements such as signing, markings, barriers, etc.) to reduce the potential impact and/or risk of not meeting the current standards and practices.

The document should be stamped by the appropriate professional. All requests must be recommended by the Project Sponsor and the Regional Director. The requests are then forwarded to the Executive Director, Technical Standards Branch for approval. Where the Design Exception involves a planning project or a planning aspect of any project, the Executive Director, Planning will be asked to sign in addition to indicate consensus.

1.6.2 CONTRACT DESIGN CHANGE PROPOSALS

The Standard Specifications allow the Contractor (after a tender has been awarded), the option of submitting a Contract Design Change Proposal for an alternative design or change to the Department's design. In the event of a "contract design change" the Department's expectations of the Consultant and Contractor are outlined in the Standard Specifications. Depending on the nature of the proposal, the technical details may be very complex or relatively simple. The Consultant will generally be involved in the review and there is an expectation that deadlines will be met. When a Contractor submits a design change proposal directly to the Consultant, the Consultant shall immediately forward it to the Project Sponsor for direction.

The review/acceptance process may involve several branches of the Department including Technical Standards Branch and Program Management Branch. Consequently, the Consultant is required to have the resources available to facilitate this process in a timely way.

In the event that a proposed Contract Design Change is approved, the Department's Program Management Branch needs to be involved so that the necessary contractual changes can be made. Contract change documentation shall be signed and executed by the Department before the work is undertaken.

If a Contract Design Change Proposal is submitted and the Department asks the Consultant to participate in the assessment of the proposal and subsequent engineering work, a change of scope to the original Consulting Services Contract may be made if required. Refer to Engineering Consultant Guidelines for Highway and Bridge Projects – Volume 2 – Construction Contract Administration for more detail.

1.7 USE OF ALL TERRAIN VEHICLES (ATVs) FOR ENGINEERING ACTIVITIES

The Department, in recognition of the substantial cost savings that can be made through the use of ATVs for engineering activities (e.g. field surveys), has made arrangements for the delegation of authority so that ATVs may be permitted to operate on the highway right-of-way under special permit. Consultants should make their request (see [Appendix C](#) for a Sample Order) to the Project Sponsor who in turn will arrange for Regional Director's approval. The ATV Operator shall carry a copy of the Permit when conducting work. Regional Directors may grant permission subject to certain conditions. The following conditions will generally apply:

1. ATVs cannot work on the highway finished pavement surface (shoulder to shoulder).
2. ATVs can cross highway surfaces, but must follow existing Legislation. (Unnecessary highway crossings must be avoided).
3. The registered owner(s) of the ATVs must ensure that ATV operators are trained and fully qualified to operate ATVs. A valid operator's license of a class higher than a learner's permit shall be obtained by an ATV operator prior to doing work in the highway right-of-way.
4. The use of ATVs must be restricted to daylight hours only.
5. All employees on the ATVs must wear fluorescent red-orange safety vests. The safety vest shall have the word "SURVEY" or "CONSTRUCTION" or "MAINTENANCE" on the back of the vest, or alternatively on the back of the ATV machine. These employees must also wear protective headwear that has been approved by one of the following organizations:
 - Canadian Standards Association (CSA)
 - American National Standards Institute (ANSI)
 - Snell Memorial Foundation
 - British Standards Association
6. ATVs must be licensed, insured, and equipped as defined in the existing legislation.
7. If unique safety hazards are identified, the Department reserves the right to refuse the use of ATVs for survey activities.
8. The Work area where the ATVs are to be used should be limited to 3 kilometres in length. This is particularly important if the work zone is to be "signed". Unless surveyors (not ATVs-see item 1) are actually working on the road surface, the need for warning signs is minimal.
9. The Department will require that the ATV users develop a safe work procedure for this specific operation. If several Consultants will be involved in this type of operation, a joint safe work procedure shall be developed to accomplish the work.

Additional conditions are currently being considered to ensure that survey crews will be easily distinguishable from other ATV users in the highway right-of-way. The use of rotating amber light attached to a pole in the ATV machine is also being considered

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at this time and may also be required. These conditions will be clearly stipulated in the permit.

1.8 REPORTING REQUIREMENTS

All written communication between the Consultant and the Department shall be through the Project Sponsor. If stipulated in the Terms of Reference or at the initialization meeting, there may be a requirement to send copies of correspondence to other persons, for example the Co-Sponsor.

During planning, preliminary engineering, and design activities the Consultant shall advise the Project Sponsor as required of progress on the project and discuss upcoming work, milestones and critical issues. Regular meetings shall be held with the Project Sponsor as required.

Progress Review meetings shall be called by the Consultant at the conclusion of milestone events and when technical or other progress matters need to be reviewed. The Consultant shall review the work of Sub-Consultants before being brought forward to the Progress Review meetings for discussion. These meetings will generally be held at Department offices or on site.

Minutes of all meetings will be taken by the Consultant and circulated within 5 working days. For reporting requirements concerning contract administration refer to Engineering Consultant Guidelines for Highway and Bridge Projects – Volume 2 – Construction Contract Administration.

All submissions to the Department shall be in electronic format unless otherwise stated. Additional hard copy format may also be required, as specified by the Consultant Service Contract and/or the Project Sponsor.

Current References for Section 1:

Below are references identified in this Section. Please see the Department website for a complete list of available documents.

Constitution Act, 1982, Government of Canada

Draft Alberta Transportation First Nations Consulting Procedures Manual, 2009, Alberta Transportation

Engineering Consultant Guidelines for Highway and Bridge Projects – Volume 2 – Construction Contract Administration, 2001, Alberta Transportation

Freedom of Information and Protection of Privacy Regulation (Alberta Regulation 200/95), 2001, Province of Alberta

Highway Geometric Design Guide, 1999, Alberta Transportation

Occupational Health and Safety Act, 1994, Province of Alberta

Specification Amendments and Supplemental Specifications for Highway Construction, 1998, Alberta Transportation

Specifications for Bridge Construction, latest, Alberta Transportation

Standard Drawings for Highway Construction, 2000, Alberta Transportation

Standard Specifications for Highway Construction, 2001, Alberta Transportation

Traffic Accommodation in Work Zones Manual, 2008, Alberta Transportation

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SECTION 2 - PLANNING

2.1 GENERAL

The Consultant shall undertake planning studies that typically consist of the following types of projects with details outlined in the specific project Terms of Reference.

- Corridor study
- Location study
- Interchange study
- Access management studies
- Traffic impact assessments
- Bridge planning study
- Functional planning study

As part of the planning study, the Consultant may be requested to prepare the basic right-of-way plans and right-of-way request for the project (refer to [Section 3.1](#) and [Appendix D](#) Planning Requirements).

The proposed plan will be subject to the Department's final approval. Where planning studies recommend design parameters that are not compatible with current accepted standards/practices, a design exception shall be requested.

2.2 DATA COLLECTION

Before embarking on data collection activities, the Consultant shall review the existing data available in the Department or through other sources/agencies. This data may include:

- Previous planning documentation (reports, plans, files, surveys, etc.)
- Traffic data
- Collision information
- Highway geometrics (profile and alignment)
- Pavement condition
- Bridge inventory, condition inspection data, correspondence file
- Attributes that may influence the study such as utilities, drainage, irrigation systems, railway facilities, structures, or adjacent developments
- Aerial photography
- Contour mapping
- Identification of possible contaminated sites
- Right-of-way owned by the Department
- Geotechnical reports

2.3 TYPICAL STUDY CONSIDERATIONS

Where required, the Consultant shall recommend a roadway standard based on factors such as traffic volumes, roadway service classification, and the Department's long range network plan. A typical study shall consider factors such as, but not limited to:

- Highway safety
- Consistent application of geometric standards
- Geometric Assessments of all existing paved roads
- Highway continuity
- Staging requirements (short and long term)
- Traffic assessments, travel demand forecasts, capacity analyses, laning, auxiliary lanes, and intersection operational analyses
- Bridge and/or river training planning level assessments
- Ultimate bridge plan functionality, optimization, stageability, and site constraints
- Bridge functionality
- Geotechnical investigations
- Major drainage requirements (especially in semi-urban and urban areas) and storm-water management plan to include:
 - Areas tributary to highway ditches;
 - Median ditches and culverts (less than bridge size); and
 - Discharge and outfall quantity and quality considerations
- Impact to adjacent property, irrigation systems, railways, and developments
- Utility impact (location and cost)
- Land use impact
- Environmental issues (Federal and Provincial Requirements)
- Historical Resource Overview
- Estimated construction cost comparison and analysis
- Benefit Cost analysis
- Access and service road requirements
- Public involvement considerations
- First Nations consultation
- Right-of-way requirements
- Provisional Road Reservation plans
- Traffic control devices and illumination
- Pavement conditions
- Traffic noise in urban areas
- Aesthetics
- Truck weight, length, and geometric requirements
- Mass haul diagram
- Safety rest areas and pullouts
- Value Engineering (where specifically required)

As required, several options should be compared and summarized in the form of a formal planning report, outlining the rationale for the recommended option.

2.4 PLAN PREPARATION

Plan and report identification numbers will be supplied to the Consultant in the Terms of Reference or at the initiation of the project. These numbers are to be indicated in all plans or documents and used in the naming of the electronic files. Naming convention shall be obtained from the Planning Branch. All plans are to be submitted in MicroStation format.

2.4.1 MOSAIC PLANS

All planning studies require the preparation of mosaic plans unless otherwise specified. Plans shall show existing and proposed right-of-way dimensions as well as all pertinent geometric data such as curve radii, super-elevation, tapers, etc. Mosaic plans are to be prepared to the Department's standards (refer to [Appendix D](#)).

2.4.2 CONTOUR PLANS

Some planning studies will require the preparation of contour plans. Standards shall be reviewed with the Department prior to undertaking this work.

2.5 STAKEHOLDER INPUT

The Consultant shall submit a written "Communication Plan" to the Project Sponsor and consult with the local authorities, regulatory agencies, First Nations, and general public as required. These discussions may be in the form of general meetings including open houses. All meetings must be documented. Approval of this plan from the Department is required prior to presenting any information to the public. Refer to [Appendix D](#) for the Typical Public Input Process. This process may vary depending on project specifics. The Consultant will be required to prepare a summary of the public input process in the final report. Also, all original questionnaires, sign-in sheets, letters, etc. are to be bound separately and submitted to the Department (this information is to be kept confidential as per FOIP requirements).

2.6 FIELD WORK

The Consultant shall undertake field reviews of proposed alignments, and establish alignments on the ground (particularly at river crossings or in areas of extreme topographical constraints). Refer to Location Survey Requirement in [Appendix D](#).

SECTION 2 – PLANNING

2.7 PRESENTATION OF RECOMMENDATION

The majority of planning studies will require presentation(s) to the Department. A one (1) page briefing with a map (12 copies) must be submitted at least one week prior to the presentation. At this presentation, the Consultant shall outline the project objectives, discuss options, and make recommendations.

2.8 REPORTING REQUIREMENTS

The Consultant shall produce a written, unbound, report for all planning studies that follows the Department's approved sign off guidelines. The reproducible copy shall consist of unbound pages up to 11"x17" size. Any sheets that are larger shall be provided on Mylar for reproduction purposes. In addition to the hard copy of the report and plans, the Consultant is also required to submit an electronic version of the formatted report (PDF) and digital data (MicroStation and document files) for the report and plans. The Consultant shall submit the draft planning study for review by the Department to reach a consensus before finalizing the report. The report must include all details pertinent to the project, including but not limited to background, alternatives, functional plans, estimated costs, and justification for the recommendations made. Deliverables should include all spreadsheet files (travel demand forecast computations, illumination and signal warrants, and/or quantity/cost estimates), as well as simulation and capacity software input/output files (traffic/drainage models and MicroStation). Plan profiles at specified scales are required in MicroStation format. Departmental approval is required for the reports. The planning study shall not be considered complete without this approval.

Additional information on record management is included in [Appendix K](#).

Current References for Section 2:

There were no references identified in this Section. Please see the Department website for a complete list of available documents.

SECTION 2 – PLANNING

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SECTION 3 - RIGHT-OF-WAY

3.1 BASIC RIGHT-OF-WAY REQUEST

3.1.1 GENERAL

For projects requiring the acquisition of right-of-way the Consultant shall prepare a "right-of-way" request document detailing “any” or “all” property requirements for the project.

Generally, the Project Sponsor will identify the need for a right-of-way request by specifying this work in the project Terms of Reference. For projects involving a planning study, the Consultant hired to do the study may be asked to prepare the basic right-of-way request under the Terms of Reference for that project.

Right-of-way requests (see [Appendix D](#)) must include all right-of-way requirements shown relative to existing land parcels as follows:

1. Highway basic right-of-way width
2. Proposed service road right-of-way (if required)
3. Proposed intersection improvement right-of-way (if required)
4. Optional purchase of isolated cut-off-areas
5. Area calculations from each certificate of title
6. Safety Rest Area (SRA) sites (if required)
7. Storm Water Management Facilities (if required)

Prior to issuing the right-of-way request, the Consultant shall review the following items:

1. Land titles and registered survey plans are checked to ensure that the existing property boundaries are shown correctly on the mosaics.
2. The planning report is reviewed for access requirements, intersection improvements, cut-off areas, creek diversions, existing developments, replacement of service road dedications, etc.
3. Land ownership as shown on the mosaics is updated as per current land titles. The date of title search shall be shown on mosaics under the title block. Subdivisions are plotted on mosaics.

3.1.2 REQUEST DOCUMENTS

The right-of-way request document must address access closures, access consolidations, new access construction requirements, and any special measures for

SECTION 3 – RIGHT-OF-WAY

interim access. All right-of-way requests must be color coded (as to the type of request) in accordance with the Department's established format. See [Appendix D](#).

3.1.3 LEAD-TIME

A lead-time of 18 months is desirable (12 months minimum) for all right-of-way requests to allow sufficient time, should expropriation be necessary. Longer lead-time may be required for projects through Federal jurisdiction (e.g. Indian Reserves, Military Installations, etc.) and urban centres.

3.1.4 RIGHT-OF-WAY FOR PROJECTS ON UNTITLED CROWN LAND

Upon approval by the Department, the Consultant shall prepare the provisional reservation affecting Crown Land and submit the reservation to the appropriate authority with a copy to the Project Sponsor. This work shall be done as early in the process as possible.

3.2 SUPPLEMENTARY AND FINAL RIGHT-OF-WAY REQUESTS

3.2.1 GENERAL

The Consultant shall prepare the supplementary (if required) and final right-of-way requests during the detailed design to address unforeseen factors such as:

1. Change in project limits
2. Additional scope of work
3. Expropriation proceedings which necessitate an increase or decrease from basic right-of-way (and which require finalization of right-of-way needs)
4. Excessive cuts and fills along the main alignment and for road allowances that require grade-line improvement
5. Sight distance or grade-line restrictions that might necessitate changes in intersection location
6. Intersection modification requirements
7. Proposed borrow locations
8. Projects located near major urban centres (land parcels are smaller, higher in price, and contain numerous owners to deal with)

To facilitate land negotiations with property owners, an early indication of earth borrow requirements is desirable. Coordination between the Consultant, Project Sponsor, and Property Agent can expedite this procedure. The Consultant is generally required to arrange for borrow agreements.

3.2.2 RIGHT-OF-WAY FOR PROJECTS ON UNTITLED CROWN LAND

A final right-of-way request is not required in the case of a new alignment, since provisional reservations will cover any extra taking. A final right-of-way request may be required along an existing facility if a provisional reservation is not in place. The provisional reservation will be issued listing all conditions the Department is obligated to meet. This will include identification of all third-party interest requiring consents or agreements. Negotiations shall be based on the land acquisition Terms of Reference noted in [Section 3.3.1](#).

For conditions and application requirements for obtaining borrow on crown land, please refer to [Section 4.7](#).

3.2.3 REQUEST DOCUMENTS

The right-of-way request document must also address earth borrow requirements, easements, back-slope agreements, and general release of all demands. All right-of-way requests must be color coded in accordance with the Department's established format. See [Appendix D](#).

3.3 ACQUISITION OF RIGHT-OF-WAY

3.3.1 GENERAL

Land required for the project may be acquired by either the Department or the Consultant on a project specific basis as described in the project Terms of Reference. When being handled by the Consultant Land Agent (CLA), the Department may assist in negotiations with landowners.

A CLA must have a valid Alberta Land Agent's license, be a Commissioner for Oaths, and must have an Alberta Drivers License. CLAs must hold a membership in either of the International Right-of-way Association (IRWA), the Appraisal Institute of Canada (AIC), or other appraisal organization recognized by the department.

As part of the duties of the Consulting Land Agent, the CLA shall:

1. Meet with the landowners (and those who hold a third party interest) or their agents to assess their concerns, and to negotiate the terms of land agreements. The "Principles of Compensation" as set forth under the Expropriations Act, Revised Statutes for Alberta 1980, Chapter 16, shall form the basis of compensation packages.
2. Establish priorities and set up schedules to ensure the landowners most affected are addressed first.

SECTION 3 –RIGHT-OF-WAY

3. Start negotiations in a timely manner to ensure possession dates for land do not delay or compromise established departmental construction schedules.
4. Perform all title searches; locate all existing documents pertaining to that title, including crown land dispositions, legal survey, and other plans.
5. Review the sketches and/or preliminary plans showing the land to be acquired or the interests affected; and advise the department of additional information which may be required for negotiations.
6. Review any appraisal requirements with the department. The department will arrange for the reports required. These plans or reports shall be available for negotiation purposes; however, they remain the property of the department.
7. Prepare recommendations for compensation for each landowner affected. The department will provide comments, and/or review and approve the CLA's recommendation prior to presenting the proposal to the landowner or the landowner's agent.
8. Prepare all draft agreements with associated documentation necessary for negotiations and a final agreement. The associated documentation may include, but is not limited to:
 - Offer to Sell Agreements
 - Section 30 Agreements
 - Moving Agreements
 - Agreements for Survey
 - General Release of all Demands
 - Fencing Agreements
 - Preliminary Agreements For Temporary Rental of Haul Roads, Camp, Plant, or Stockpile
 - Agreements of Easement for Construction and Maintenance of a Public Work
 - Consent to Withdrawals
 - Permission to Enter, Test, and Survey
 - Earth Borrow – Letter of Understanding
 - Approach/Access Relocation
9. For all grading projects, the issue of earth borrow shall be discussed during negotiations with the landowner. In cases where the landowner is receptive to providing a borrow source, the CLA shall complete an "Earth Borrow – Letter of Understanding" with the landowner.
10. Provide a summary of the services performed pertaining to the project upon completion of the land acquisition process.
11. Maintain frequent communication with the Department's representative during negotiations with landowners and provide:
 - Photographs of all land and improvements affected by the project
 - Detailed notes to file documenting all conversations, meetings, and discussions pertaining to the project
 - Monthly status reports to track progress of the right-of-way acquisition process as defined in [Appendix D](#) in the Right-of-way Progress Acquisition Summary
12. Submit monthly invoices and Contract Summary Reports in a timely fashion.

13. Prepare briefing notes and draft letters for ministerial responses and reports when required by the department.
14. Sign an agreement addressing confidentiality requirements and conflict of interest disclaimer if required.
15. Attend monthly team meetings in the Regional Office when invited to do so.
16. Provide a history of negotiations upon completion of the negotiations or as requested by the department.
17. Direct all contact from the media to the Department's contact person listed in the agreement.

To improve the line of communication, a process has been designed to encourage the landowners to contact the regional property managers rather than the MLA's. At an open house, the Department may distribute a pamphlet outlining the land acquisition process and answer questions about property related issues. In advance of the CLA's first visit, a letter of introduction from the regional property manager as well as the pamphlet will be distributed to the landowner. The landowner is encouraged to contact the land consultant, and then the regional property manager, should a dispute arise. The land consultant also needs to be aware of what flexibility he has in the engineering plans when negotiating with landowners.

Private land is acquired by one of the following methods:

1. Offer to Sell
2. Section 30 Agreement
3. Full Expropriation

The most desirable method is the Offer to Sell. This is where the landowner voluntarily agrees to sell the required land at the price offered by the Property Agent. After construction, the right-of-way boundary is surveyed and if the area is greater than what is in the Offer to Sell, an adjustment payment is forwarded to the landowner.

If unable to obtain an Offer to Sell, and if compensation is the only outstanding issue, the Property Agent may request the landowner to sign a Section 30 Agreement. By executing such an agreement under the Expropriation Act, the landowner gives up possession of the required right-of-way at a mutually agreed date, but reserves the right to have final compensation determined by the Land Compensation Board.

The last resort in acquiring right-of-way is Full Expropriation. In this situation the landowner refuses to sell the required land (for example, objection to the proposed alignment). The issue may go before an inquiry, at which time the Department must present sufficient evidence to justify the expropriation (financial compensation is dealt with at a later stage). In some cases, it can take up to a year from the date of the notice of intention to expropriate to the date when possession of the land is obtained.

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For both Section 30 Agreements and Full Expropriation, the Consultant is responsible for supplying plans showing the final right-of-way requirements from the subject properties. Special care must be taken in confirming the final right-of-way requirements since it can be difficult and sometimes impossible to obtain additional right-of-way at a later date. This is especially true in the case of Full Expropriation.

The Consultant shall refer to the Expropriation Act and the Department’s “The Expropriation Process” documentation (available from the Manager, Expropriations, Land Services, Infrastructure) for details of the process to be followed for expropriation.

3.3.2 TIMING

Consulting Services Contracts shall include land acquisition services for all outstanding right-of-way for all projects to be delivered within a five year window from activation of the contract. For projects beyond the 5 year window, land acquisition will be considered in those cases where the landowner makes a request, the negotiations are based on fair market value, and the purchase has been pre-approved by the Assistant Deputy Minister, Transportation and Civil Engineering. These acquisitions will be negotiated by in-house land agents in most cases. The procedures are defined in the Land Agents Handbook and Property Services Manual.

Any change to the functional plan or design considered during right-of-way negotiations (such as changing the median spacing to minimize the required right-of-way to appease a landowner so that construction can proceed) shall be referred to the Project Sponsor.

3.3.3 SPECIAL CONSIDERATIONS FOR FEDERAL LANDS

Additional time may be required for right-of-way acquisition on Federal Lands because of the greater complexity of the process. Each project should be assessed on its own merit and dealt with accordingly.

3.3.4 APPROVALS REQUIRED

All land purchases and borrow agreements shall be referred to the Property Manager for approval, prior to presenting a proposal to the landowner and after the agreements are signed by the landowners. All right-of-way shall be obtained prior to proceeding with tender, unless otherwise approved by the Project Sponsor.

3.4 LEGAL SURVEY

3.4.1 GENERAL

Except for expropriation surveys, and subject to any special instructions issues by Alberta Transportation, the Consultant shall be responsible for the Legal Survey of the right-of-way acquired as related to the project and shall supply and install associated materials to complete the work. Legal Survey shall be done by a registered Alberta Land Surveyor.

The Consultant shall ensure that the Legal Survey is carried out in accordance with the provisions of the Surveys Act, the Land Titles Act, the Public Works Act, the “Land Surveyor’s Manual of Standard Practice”, and any other applicable legislation.

The Consultant shall also be responsible for:

- Registration of the plan of survey at the appropriate Alberta Land Titles Office
- Discharge of the caveats protecting the acquired right-of-way
- Provision of two (2) copies of the registered legal survey where Crown Lands are involved to:
 - Sustainable Resource Development
 - Public lands Division,
 - 5th Floor, Petroleum Plaza South Tower
 - 9915-108 Street
 - Edmonton, Alberta T5K 2G8
 - Attention: Supervisor, Senior Land Administrator
 - Applications / Approvals - Oil and Gas, Roadways, Reservations
 - Re: RDS #
- Provision of one (1) copy of the registered legal survey to the Property Manager

3.4.2 PERMISSION TO SURVEY

When doing any surveys for the Department, the Consultant shall consider the following: permission is normally obtained from the owner/lessee as a courtesy prior to entering or passing over private lands or public lands that are leased in order to undertake a survey.

If cutting or clearing of trees or other vegetation is required for survey purposes, permission to do this work must be obtained from the landowner/lessee.

When surveying on Crown lands in the green zones, the Consultant must adhere to the requirements of the local forestry officials. When surveying on crown lands in the white zones, the surveyor shall obtain approval in writing from Public Land officials.

SECTION 3 – RIGHT-OF-WAY

3.4.3 REFERENCING EXISTING SURVEY MONUMENTS

Key statutory monuments are to be identified and referenced prior to construction where there is a chance of monuments being destroyed during construction.

3.4.4 ALIGNMENT

In determining the final alignment and extent of the project, the Land Surveyor shall take into account the following:

1. Area purchased
2. Designed alignment and boundaries, including curve and deflection information
3. Area used for construction
4. Centre-line of the final grade
5. Area fenced

The Consultant shall advise the Project Sponsor of any significant deviations before completing the survey.

3.4.5 POSTING BOUNDARIES (INSTALLING IRON POSTS)

When an Alberta Land Surveyor is doing road surveys for the Department, all service roads within a primary highway will be posted and labelled as “service roads”. In addition, where practical, efforts are to be made to consolidate existing road plans into the new survey.

3.4.6 PLAN PREPARATION

A Legal Survey plan, if required, shall be in a registerable format and comply with all of the requirements as stated in the Land Titles “Policy and Procedures Manual for the Submission of Digital Plans of Survey for Registration”. A copy of this manual is located on the following website:

www.servicealberta.ca/1075.cfm

Headings for plans prepared for the Department are to include:

- The nature of the plan, e.g. “Plan showing Survey of Public Work (Road), Stockpile Site” etc., as delivered by the Public Works Act
- The file number of the Department, preferably at the bottom right-hand corner of the plan (e.g. “AT File No. _____”)

- Affidavit for the plan prepared for the Department along with a copy of the plan of the unregistered plan of survey shall be submitted to the Department for review, approval, and execution

3.4.7 AT AFFIDAVIT FOR ACQUIRING LANDS

One of the following affidavits will apply, depending on whether the lands were acquired by agreement or expropriation.

3.4.7.1 Normal Affidavit

I hereby certify that this plan represents a survey of land required for public work pursuant to the Public Works Act and the lands covered by this plan were acquired by agreement with the owner(s) thereof.

Dated _____ 20 ____ _____ (seal)
Property Manager

3.4.7.2 Affidavit When Lands Are Being Expropriated

I hereby certify that this plan represents a survey of land required for public work pursuant to the Public Works Act and the lands covered by this plan were acquired by expropriation pursuant to the Expropriation Act.

Dated _____ 20 ____ _____ (seal)
Property Manager

3.4.8 EXPROPRIATION SURVEYS

The Consultant shall contact the landowner to explain the purpose of the survey and obtain permission to proceed with the survey. If permission is not obtained, please advise the Project Sponsor for further direction.

Marker posts and lathe shall not be used unless permission to place has been obtained. If statutory iron posts are placed without marker posts, the iron posts should be countersunk and the excavation should be filled to its original state.

Any damage done such as line clearing, disturbing crops, etc., shall be recorded showing the date and extent of the damage. This will be a part of the Survey Report.

SECTION 3 – RIGHT-OF-WAY

3.5 EXPROPRIATION PROCESS

When negotiations are not progressing, a review under the “Pre-Expropriation Process” will be lead by the Property Manager and will include the Project Sponsor; Infrastructure Manager; Property Agent; Director, Highway Planning & Design, Technical Standards Branch; Manager, Expropriation and Regional Services, Properties Division; Consulting Design Engineer; Consulting Planning Engineer; and Alberta Justice Solicitor. The review will document Landowner issues, compensation proposed, and a comparison of positions including:

- Appraisal reports and alternatives considered;
- The history of negotiations and file chronology; and
- The design and planning alternatives including technical standards.

The decision to proceed with expropriation shall be supported by the Assistant Deputy Minister, Transportation and Civil Engineering, and the recommendation will be forwarded to the Properties Division of Infrastructure to manage the formal Section 8 process.

Following the Notice of Intention to Expropriate, the landowner may exercise their right to object to the expropriations. At this point, an Inquiry Officer will be appointed, and the Consulting Engineer, on behalf of the Department, will be responsible for defending the alignment at the hearing.

3.6 REPORTING REQUIREMENTS

Upon completion of the project, all titles, plans, survey control searches shall accompany a blue print or Mylar copy of the plan of survey submitted to the Department along with appropriate affidavits. The electronic file in MicroStation format shall also be submitted in accordance with the Department’s Drafting Guidelines.

Any information that might affect the cost of the survey or incur liability to the Department shall also be included.

Current References for Section 3:

Below are references identified in this Section. Please see the Department website for a complete list of available documents.

Expropriation Act, 1996, Province of Alberta

Historical Resources Act, 1997, Province of Alberta

Land Agents Handbook and Property Services Manual, 2010, Alberta Transportation

Land Surveyor's Manual of Standard Practice, April 1996, (includes amendments to April 26, 2003), Alberta Land Surveyor Association

Land Titles Act, 1999, Province of Alberta

Policy and Procedures Manual for the Submission of Digital Plans of Survey for Registration, 2000, Province of Alberta

Pre-Expropriation Process; 2006, Alberta Transportation

Public Lands Act, 1998, Province of Alberta

Public Works Act, 1996, Province of Alberta

Surveys Act; Survey Regulation (Alberta Regulation 94/2000), 1999, Province of Alberta

Summary of Expropriation Process, 2000, Alberta Transportation

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SECTION 4 - ENVIRONMENTAL CONSIDERATIONS

4.1 ENVIRONMENTAL MANAGEMENT SYSTEM

The Department's Environmental Management System (EMS) outlines environmental measures that apply to Department Projects. The EMS applies to Department staff and all Consultants contracted by the Department. The Consultant is responsible for understanding their EMS roles and responsibilities.

4.2 ENVIRONMENTAL ASSESSMENT

On the Department's website there are two Terms of Reference (TOR) for Environmental Assessment (EA). These are the "Alberta Transportation – Terms of Reference for Environmental Assessment (CEAA)" and the "Alberta Transportation – Terms of Reference for Environmental Evaluation" which contain the specific requirements that must be followed in order to complete an EA.

The Environmental Evaluation TOR is to be utilized for projects that are not on the five year construction program and/or do not have any federal CEAA triggers associated with them. The Environmental Assessment TOR (CEAA) is to be used for those projects on the five year program and have federal triggers under CEAA.

These TORs are updated as required to ensure that they meet current regulatory standards.

4.3 REGULATORY CONTACT/APPROVALS/AUTHORIZATIONS

Federal and provincial departments have mandates for ensuring that projects they are responsible for are handled appropriately. Contact with appropriate federal and provincial government departments (e.g. Fisheries & Oceans Canada, Alberta Environment) shall be initiated as soon as the project is awarded and shall be maintained to ensure that all environmental considerations and requirements (e.g. authorizations, decisions and advisory letters) are adequately addressed throughout the design and construction phases. The Consultant must obtain permission from the Department prior to each contact with regulatory authorities.

The Consultant shall ensure that the project complies with all current environmental legislation. The Consultant is responsible for identifying and facilitating the process to secure all applicable permits, approvals, and authorizations. The Consultant shall complete the following Alberta Transportation EMS Environmental Approvals Framework appendices:

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- Appendix 2: Environmental Approvals and Consultation Checklist;
- Appendix 3: Environmental Reports and Considerations Checklist; and
- Appendix 4: Necessary Environmental Approvals Checklist.

It is mandatory that the Consultant provide a signed copy of the appendices to the Project Sponsor prior to the start of construction.

4.3.1 PROJECT SPONSOR SIGN-OFF ON ENVIRONMENTAL AND REGULATORY APPLICATIONS

The following procedures shall be followed by the Consultant when facilitating the process to secure regulatory approvals, authorizations, and permits for the project:

- The Consultant will collect and assess environmental information for a project and will make recommendations for mitigation and/or compensation for environmental impacts to the Project Sponsor prior to contacting the regulatory agency
- The Project Sponsor will determine which mitigation and/or compensation measures may be discussed with the regulatory agency and direct the Consultant's next actions accordingly
- The Consultant prepares a draft application, complete with all the necessary documents and supporting information, for submission to the Project Sponsor for review and signature
- The Project Sponsor will forward a signed copy of the application to the regulatory agency with a copy of same to the Consultant
- Any amendments to a regulatory approval will follow the above protocol

The Consultant shall keep copies of all permits, approvals and authorizations for their records.

4.4 SPECIAL PROVISIONS

Copies of all Environmental Approvals, Permits, Authorizations and other associated documents shall be included in the Plans Section of the tender document. Where the environmental documents indicate specialized work to be performed by the Contractor, the Special Provisions shall describe the work required, and shall describe the method of payment. Where the environmental documents indicate conditions that are beyond the scope of the Contractor's Work, the excluded conditions shall be clearly indicated in the Special Provisions.

4.5 ENVIRONMENTAL RISK ASSESSMENT

The Consultant shall complete a project Environmental Risk Assessment as part of the detailed design work for all projects. These assessments shall identify any permanent and temporary measures required to protect the environment. Assessments shall be discussed with the Project Sponsor and incorporated into the tender package, contract bid items, and special provisions as required. This is a minimum review and is expected to be brief.

Items include:

- A list of permits/authorizations that have been issued for the project
- Identification of the environmental sensitivities by the Consultant, or as discussed in the Environmental Assessment documents (where they exist) that must be addressed in the Contractor's ECO Plan
- A summary of the borrow pre-disturbance assessment
- A summary of the soil stripping plan
- A summary of the weed survey
- Identification of Clubroot infected areas
- Environmental Protection Plan
- Alignment Sheets (where they exist)

4.6 CONSERVATION AND RECLAMATION OF TOPSOIL AND SUBSOIL

The Environmental Protection and Enhancement Act requires an operator to conserve and reclaim specified land, and unless exempted by the regulations, to obtain a Reclamation Certificate. Environmental Protection Guidelines (Information Letters) that address Roadways, Pits, Borrow Excavation, Disposal of Excess Soil Materials from Roadways, and Conservation and Reclamation Guidelines for Alberta have been developed by Alberta Environment. The "Alberta Transportation Guide to Reclaiming Borrow Excavations Used for Road Construction" provides field level experiences for proper reclamation to be achieved. This document can be found on Alberta Transportation's website.

4.6.1 SOIL STRIPPING PLAN

During the project design stage the following procedures shall be followed on Department projects that contain a grading component.

The Consultant shall employ a soils specialist to perform a complete assessment of the soil within the highway right-of-way and borrow excavation.

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The assessment must identify soil depths, textures, colour changes, and any areas with potential soil handling concerns (such as areas where colour change between topsoil and subsoil cannot be used as an accurate guide to topsoil stripping, poorly drained areas, and areas of saline or Solonchic subsoil) on the existing side slopes, ditches, and back slopes and any additional widening of the right-of-way.

The assessment will include a description of how the topsoil and subsoil layers are to be handled, including details of temporary and permanent stockpile locations. Topsoil and subsoil shall be salvaged and stockpiled separately, within a minimum 3 m distance separating the different stockpiles.

The “Alberta Transportation Pre-Disturbance Assessment Procedures for Borrow Excavations for Road Construction” and the “Alberta Transportation Post-Disturbance Reclamation Criteria and Assessment Procedures for Borrow Excavations for Roadway Construction” outlines the techniques to be followed in developing the soils assessment. These documents can be found on the Department’s website. Soils shall be described according to the terminology outlined in the “Canadian System of Soil Classification”.

The Consultant shall design the project such that all topsoil in the right-of-way is salvaged and redistributed in the right-of-way. All subsoil (if suitable) in the right-of-way shall be used in the construction of embankments. Prior to drafting the contract special provisions, the Consultant shall liaise with the Department’s Project Sponsor and the local Reclamation Inspector for Alberta Environment to confirm actual requirements.

If the quantity of soil is such that additional areas are required for either interim stockpiling or final placement, the Consultant shall make the necessary arrangements for the additional areas. Other alternative Department owned sites (gravel pits) may be considered. In these cases, the Consultant shall consult with the Project Sponsor to determine the availability of such sites and provide a cost estimate for hauling the soil material. The Consultant shall incorporate the soil survey data into the tender documents. Soil quantities shall be calculated and a plan developed for the interim stockpiling of soil during construction.

4.7 BORROW EXCAVATIONS

The Consultant must obtain permission from the appropriate Provincial Government agency before entering on, testing, or operating a borrow excavation on Crown land. A pre- and post-disturbance assessment shall be conducted on all borrow areas that pertain to the project.

Conservation of topsoil and subsoil material from a borrow excavation is mandatory. The haul road utilized to access the borrow excavation is considered an integral part

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of the borrow and must have the topsoil and subsoil treated in the same manner as the borrow.

4.7.1 DEPARTMENT SUPPLY OF BORROW

The Consultant shall prepare a pre-disturbance assessment of the proposed borrow as detailed in the “Alberta Transportation Pre-Disturbance Assessments Procedures for Borrow Excavations for Road Construction” document.

The Consultant shall prepare a post-disturbance assessment report for the area disturbed by operation of the borrow excavation as detailed in the “Alberta Transportation Post-Disturbance Reclamation Criteria and Assessment Procedures for Borrow Excavations for Roadway Construction” document.

4.7.2 CONTRACTOR SUPPLY OF BORROW

The Consultant shall ensure that pre-disturbance and post-disturbance assessments are completed by the Contractor for borrow that is supplied by the Contractor and ensure that reclamation criteria are met before accepting the borrow.

Copies of pre-disturbance and post-disturbance assessments prepared for borrow excavations are to be submitted to the Project Sponsor or delegate. The timing of submission is to be as follows: pre-disturbance assessment to be submitted within one (1) month of undertaking the assessment. The post-disturbance assessment is to be submitted within one (1) month of the completion of the reclamation of the borrow excavation. Additional follow-up post-disturbance assessments may be required subject to the conditions detected during the initial post-disturbance assessment.

4.8 WEED SURVEY

A weed survey must be completed along the right-of-way and for all borrow excavations prior to the commencement of activities to establish a bench mark for post-activity assessment. The land owner or land manager should be advised of the presence of Prohibited Noxious and Noxious weeds that are listed in Schedule 1 and 2 in the “Weed Control Act”.

The location of restricted and noxious weeds should be clearly delineated and appropriate control measures put in place to destroy all restricted weeds, control noxious weeds, and prevent the scattering of nuisance weeds throughout the life of the project.

The “Weed Control Act” also states that the movement of a machine or vehicle is prohibited if the movement is likely to cause the spread of a noxious or prohibited

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noxious weed. Equipment, materials, and vehicles exposed to weeds should be cleaned prior to leaving an infested site.

4.9 CONTAMINATED SITES

If, during the course of any investigations or work the Consultant believes, or has a reason to believe, that any property may be contaminated, the Consultant must immediately report the contamination to the Project Sponsor. Further direction will be given to the Consultant at that time.

4.10 MONITORING AND INSPECTION REPORTING

The Consultant shall conduct monitoring during the construction phase to ensure compliance with regulatory requirements. The Consultant will develop appropriate monitoring procedures consistent with the terms and conditions, site characteristics, work activities, and potential environmental risks associated with the work to be performed. Project specific items outlined in the monitoring procedures shall include locations and items to be inspected, monitoring frequency, monitoring during shut-downs, and reporting requirements related to environmental permits. Any actual or perceived non-compliance with environmental requirements must be reported to the Contractor and the Department immediately, and corrective/preventative measures implemented.

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Current References for Section 4:

Below are references identified in this Section. Please see the Department website for a complete list of available documents.

Alberta Transportation Guide to Reclaiming Borrow Excavations Used for Road Construction, 2002, Alberta Transportation

Alberta Transportation Post-Disturbance Criteria and Assessment Procedures for Borrow Excavations for Road Construction, 2002, Alberta Transportation

Alberta Transportation Pre-Disturbance Procedures for Borrow Excavations for Road Construction, 2002, Alberta Transportation

Canadian System of Soil Classification, 1987, Agriculture Canada

Environmental Protection and Enhancement Act, 1998, Province of Alberta

Weed Control Act, 2008, Province of Alberta

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SECTION 5 - ENGINEERING ASSESSMENT

5.1 GENERAL

NOTE: Engineering Assessments are not normally included as part of a Design/Construction Supervision engineering assignment, however, if they are, this will be stated in the Terms of Reference for the assignment.

The purpose of an Engineering Assessment is to determine the scope of work of a detailed design and construction project at the conceptual level in advance of preparing a Terms of Reference for the project. An Engineering Assessment typically includes a review of the roadway geometric and operational characteristics using safety, traffic, and roadway engineering principles with the purpose of identifying measures which could improve road operations and safety for all road users.

For projects involving planning, design, and construction of new segments of highways, the Department conducts safety audits to ensure that all road components meet road safety requirements. Engineering Assessments on projects involving existing segments of highways are normally undertaken at the Engineering Assessment stage of a design project approximately 3 to 5 years in advance of a planned highway construction or rehabilitation. Engineering Assessment may also be required as part of an operational or safety review of an existing in-service highway or its component.

Ideally Engineering Assessments of roadways and bridges are completed prior to issuing a Terms of Reference for the detailed design/construction supervision of a project. Roadway Engineering Assessments involve some or all of the following tasks (which are described in greater detail later in this section): Geometric Assessment, Road Safety Audit, In-Service Safety Review, At-grade Railway Crossing Assessment and Applications, Assessment of the need for Illumination, Traffic Signals and Pedestrian Crossing Signals, Traffic Studies, Surfacing Strategy, Basic Pavement Structure Design, and Seal Coat Assessment.

The fundamental parameters that are normally established at the planning/Engineering Assessment stage are as follows:

- Design speed, posted speed
- Design designation (surface width, overlay acceptable or widening required)
- Geometric improvements needed
- Lighting (warranted or not)
- Traffic signals (required or not)
- Safety improvements
- Bridge requirements and assessments
- Railway at-grade crossings (improvements warranted or not)

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- Surfacing strategy and basic pavement structural design

A more comprehensive description of engineering assessment information is provided in the following pages.

The purpose of an Engineering Assessment is to ensure that an appropriate amount of engineering is undertaken to identify, prioritize, and determine the scope of projects before detailed engineering work is undertaken. This is also an opportunity to build consensus on safety, engineering and programming strategies.

5.2 ROADWAY ENGINEERING ASSESSMENTS

5.2.1 GEOMETRIC ASSESSMENT

Geometric Assessments are primarily undertaken on existing highway segments identified for pavement rehabilitation and/or geometric improvements. Usually, the Region identifies the need to conduct a Geometric Assessment and initiates a project under a separate engineering agreement. Alternatively, Geometric Assessments may be done as a first step with Preliminary Engineering of a detailed design project.

The scope of a Geometric Assessment and type of analysis required will depend on the nature and cost of the work being considered. The requirements for a project will be described in detail in the Terms of Reference. Additional information is contained in Chapter G “3R/4R Geometric Design Guidelines” of the “Highway Geometric Design Guide”.

Geometric assessments required on unpaved roads shall use “new construction standards”. Exceptions to the above require approval of a Design Exception through the formal process described in [Section 1.6.1](#).

The 3R/4R Geometric Design Guidelines (Chapter G of the Department “Highway Geometric Design Guide”) are used for geometric analysis on existing paved roadways. The assessment shall result in identification of geometric elements of existing infrastructure that warrant improvement based on consideration of total societal costs and benefits and 3R/4R Guidelines. The Consultant shall investigate and makes recommendations on the need for upgrading or on the suitability of existing geometrics, particularly roadway width, horizontal and vertical alignment, intersections, auxiliary lanes, roadside slopes, turnouts, climbing lanes, etc.

The Geometric Assessment is generally used to prepare the Terms of Reference for detailed design.

A Geometric Assessment is a review of existing geometric, traffic and operational conditions, including but not limited to the following:

1. Geometric information
 - Design designation
 - Horizontal alignment
 - Vertical alignment
 - Intersection geometry
 - Cross-section elements
 - Sight distances
 - Super-elevation
 - Climbing/passing lanes
 - Railway crossings
 - Guardrail
 - Roadside hazards in clear zone
 - Horizontal and vertical clearances to structures
 - Roadside auxiliary developments (historical turn-outs, SRA sites, view points, litter box turn-outs, etc.)
 - Passing opportunity (based on pavement marking and traffic)
 - Functional classification system
 - Access management and service roads
 - Rumble strips
 - Highway illumination
 - Traffic control devices, signals, and roundabouts
 - Pedestrian traffic control
 - Culverts, storm water drainage, and management facilities
 - Noise attenuation devices

2. Traffic information
 - Traffic volume, hourly and daily
 - Traffic composition (vehicle types)
 - Turning volumes at major intersection
 - Level of service and capacity analysis
 - Pavement markings
 - Posted speed, general and advisory
 - Running speed (85th percentile and average)

3. Collision experience
 - Collision records for previous 5 years
 - Records of special monitoring locations
 - Breakdown of non-animal and animal collisions
 - Collision types
 - Collision severity

4. Other information (catalogue of locations)
 - Utilities (catalogue the existence of all buried and above ground utilities)
 - Culvert conditions
 - Signing and traffic signals (catalogue)
 - Illumination (catalogue)

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- Geotechnical information (landslides)
- Noise attenuation devices (catalogue of existing devices)

Much of the above information is available through the Department's Transportation Infrastructure Management System (TIMS). The TIMS interactive web map contains information on roadway geometric conditions, appurtenances, operational and traffic characteristics, and collision information. More detailed information on collisions within a particular roadway segment can be obtained from the Transportation Safety Services Branch.

Information on the existing roadway elements and appurtenances can also be gathered from existing records, which are available from the Department in the Twin Atria building. Some information, for example super-elevation rates on existing curves and intersection sight distances available at intersections, can only be measured accurately from an on-site survey. A full survey (e.g. preliminary survey) is not required at the Engineering Assessment stage, however, a limited amount of survey work may be needed to check existing cross section elements (e.g. side slopes), guardrail, existing intersection configuration, sight distances, culvert condition, existing pavement width, roadside hazards, utility and illumination.

5.2.2 ROAD SAFETY AUDIT

Road Safety Audits are conducted to identify potential road safety issues and make suggestions within a function plan, design, or prior to opening of a highway transportation project for all road users, under all operating conditions. The Road Safety Audit provides an independent assessment of the safety performance of a road transportation project, carried out at predetermined intervals by road safety specialists.

The objective of a Road Safety Audit is to:

- Minimize the frequency and severity of preventable collisions;
- Consider the safety of all road users, including vulnerable road users;
- Ensure that collision mitigation measures that may eliminate or reduce potential safety problems are considered fully; and
- Minimize potentially negative safety impacts both within and outside the project limits (i.e. to avoid introducing collisions elsewhere along the route or on the network).

The intervals at which the Road Safety Audit shall be conducted include at the planning, preliminary design, detailed design, and pre-opening stages.

The "Road Safety Audit Guidelines" shall be followed for all preliminary engineering assessments associated with changes to roadways or interchanges.

5.2.3 IN-SERVICE SAFETY REVIEW

In-Service Safety Reviews are engineering studies of an existing highway segment or its component with the purpose of identifying cost-effective countermeasures that would improve safety and operations for all road users. An In-Service Safety Review is generally done as a stand-alone assignment under a separate engineering contract. The scope of an In-Service Safety Review is defined in detail in the Terms of Reference for that project.

An In-Service Safety Review is focused on a particular safety or operational problem occurring at a defined location such as an intersection, interchange, curve, or bridge. Typically, a problematic location is identified through the process of network screening. Safety or operational problems at a candidate location may also be identified by members of the public, municipal officials, or elected representatives.

An In-Service Safety Review involves a structured review and analysis of the collision history, in particular, a breakdown of collision types and rates in conjunction with a review of the existing geometric parameters and analysis of traffic operational efficiency. An In-Service Safety Review could also include traffic conflict observations and a human factors assessment. The study usually results in the identification of geometric or operational deficiencies and the development of countermeasures to address these problems.

In-Service Safety Reviews make use of the following types of information:

Core Data Requirements:

1. Site physical characteristics
 - Surrounding land use
 - Road classification
 - Design and posted speed
 - Vertical and horizontal alignments features
 - Cross-section elements including lane configuration and width, shoulders and super-elevation
 - Geometry of auxiliary lanes at an intersection and sight distances
 - Transit facilities including bus stop locations
 - Roadside elements such as embankments, boulevards, ditches, barrier (type, location and condition) and fixed object hazards
 - Pedestrian facilities and control
 - Roadway lighting
2. Traffic information and operational characteristics
 - Traffic volume, hourly and daily
 - Traffic composition (vehicle types)
 - Bicycle traffic volumes
 - Turning movement diagram at an intersection

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- Pedestrian volumes (vulnerable road user volumes such as schoolchildren, and elderly)
 - Level of service
 - Pavement markings
 - Posted speed, general and advisory, running speed (85th percentile and average)
 - Parking regulations
 - Traffic control devices and their locations
 - Traffic signal characteristics
3. Collision Information
- A five year collision history
 - Breakdown of non-animal and animal collisions
 - Collision types and severity
 - Collision diagram (showing direction of travel of vehicles involved in a collision)

The Department has compiled a five-year historical record of the safety performance of all single and double digit Provincial highways to identify operational problems at both spot locations and along segments of highways. Summaries of collision data for primary highways are available from the Department.

Supplementary Data Requirements:

- Traffic conflicts (near misses) observations
- Additional traffic measurements (e.g., speed measurements, gap analysis)
- Stakeholder input
- Human factors review
- Technical information reported by the police including date, time weather, light condition, pavement condition, collision severity, and travel direction

In some situations, it may be important to analyze traffic operational efficiency to determine if any of the operational factors contribute to safety problems. The efficiency of traffic operations shall be evaluated using a capacity analysis in accordance with the procedures of the “Highway Capacity Manual” or the “Canadian Capacity Guide for Signalized Intersections”.

Depending on the nature of the problem and socio-economic needs, an In-Service Safety Review may also require stakeholder input or consultation. The scope of the stakeholder consultation will be described in details in the Terms of Reference for that project.

An In-Service Safety Review will identify appropriate types of countermeasures and improvements to mitigate the existing safety problems to best meet the needs of all road users and the Department.

The countermeasures should be grouped into workable improvement strategies based on the time frame for their implementation (i.e., short, medium, and long term strategies).

Short term, inexpensive strategies provide opportunity to improve safety at locations where the cost of major upgrading is not justified or warranted. Examples of short-term, low cost measures are signing, chevrons, pavement markings, rumble strips, animal reflector posts, etc.

Medium and long term improvement strategies are typically more expensive and may require planning and design work, possibly the acquisition of right-of-way and public consultation. Examples include the addition of a left-turn lane, installing a new signal and even grade-separation or roadway re-aligning.

In many instances, an improved safety performance can be achieved with the implementation of the immediate countermeasures, which often reduce the need for more expensive long-term improvements. Therefore it is preferred that an In-Service Review identify countermeasures that could be effectively applied in the short term.

Where major improvements are warranted, the extent of these improvements together with the estimated capital cost and internal rate of return for the improvement shall be provided. The internal rate of return shall be calculated according to the Department's "Benefit Cost Analysis" guide considering total societal costs and benefits over the life of the project.

Although the main focus of an In-Service Safety Review is to determine engineering countermeasures, an analysis may also reveal the need for education and enforcement strategies to counter specific driver or pedestrian behaviours. Recommendations for enforcement and education should be supplementary to through road-engineering based recommendations.

5.2.4 AT-GRADE RAILWAY CROSSING APPLICATIONS

Where an existing public at-grade railway crossing is under consideration for safety improvements, an Engineering Assessment is undertaken to establish the need for improvements and to decide on the appropriate type of treatment. The At-grade Railway Crossing Assessment is normally done as a stand-alone safety assessment under a separate engineering contract.

The assessment includes preliminary assessment of need and preparation and submission of applications for safety improvements at new or existing crossings. The assessment involves consultation with all parties involved, especially those who may be cost sharing on the improvement. The initial assessment may include an on-site joint inspection.

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Where there is general agreement that safety improvements should be made at an existing public at-grade crossing, a formal application must be prepared and submitted to Transport Canada, the Railway Company, and any other party involved as per current federal regulations. Transport Canada Railway Safety Directorate should be contacted during the preliminary engineering stage. Public at-grade railway crossings on national railways (such as CPR and CNR) are under federal jurisdiction. Improvements to existing crossings or construction of new ones require not only agreement from affected railway companies but also adherence to federal guidelines and standards.

If the proposed road work will significantly affect a railway crossing, the railway company shall be consulted in a timely manner for their review of potential impacts to their operations, review of engineering requirements, and cost estimate. Railway input on drainage treatment, planking material, utilities and signal hardware placement is also needed to avoid potential conflicts, costly re-construction, or delays in waiting for an agreement.

Since certain railway safety improvements (signals, sight line improvements, etc.) are partially funded by Transport Canada and the Railway Company, application for improvements shall be submitted well in advance as the approval process can take up to 18 months. If Transport Canada is not cost-sharing, there is no need to submit an application to them. If a cost-apportionment dispute develops and a submission to the Canadian Transportation Agency (CTA) for resolution is made, a turn-around time of 90 days should be expected.

A general review of traffic, train volumes, and the safety record of the crossing will also help determine the need for signals and other protection works.

The “Road/Railway Grade Crossing Guidelines” for at-grade crossings and grade separations should be followed for the preliminary engineering assessment and application.

5.2.5 ROADWAY APPURTENANCES: (HIGHWAY LIGHTING, TRAFFIC SIGNALS, PEDESTRIAN CROSSING CONTROL)

The assessment of the need for installation or upgrade of existing highway appurtenances is frequently required at the engineering assessment stage of a design project, and may also be required as part of an operational review on an existing in-service highway. For this reason, the analysis of the need for Highway Lighting, Traffic Signals and Pedestrian Traffic Control may be undertaken under a separate engineering contract.

5.2.5.1 General

The Department receives requests from municipalities and the general public regarding the installation of traffic control devices such as highway lighting, traffic signals, roundabouts, and pedestrian crossings control at selected locations throughout the province. These requests usually require an investigation of existing traffic data, a warrant analysis, and good traffic engineering judgment to access the required need. A warrant analysis is used to compare the operation, safety and uniform application of highway lighting, traffic signals, and pedestrian crossing control with other locations in the province. However, the warrant calculation (number of priority points obtained) is not absolute and requires sound engineering judgment on the safety and operational implication of installing the traffic device. The use of warrants for street lighting, traffic signals, roundabouts, and pedestrian crossing control is necessary to develop consistency in prioritizing of installation/upgrading/maintenance of these traffic devices. A warranted application also promotes drivers' compliance with traffic control devices that could help solve operational safety problems.

5.2.5.2 Scope Outline

The following general steps are required to assess whether highway lighting, traffic signals, or pedestrian crossing protection devices are warranted.

1. Review background information relating to the candidate location. This information can be requested through the Project Sponsor and Central Records.
2. Review current operations with the Regional Operations Manager, Operations Engineer, Maintenance Contract Inspector, or other Department staff.
3. Review with appropriate stakeholders involved (e.g. discuss with school administration if the request is a pedestrian crossing in the vicinity of a school).
4. Public consultation is not normally required as part of the assessment.
5. Obtain the most recently available collision summary from Transportation Safety Services. Review collision types to ascertain whether the requested traffic control would address the collision type.
6. The Department will provide access to traffic information for the analysis. If traffic information is unavailable, or if a manual count has not been undertaken within the previous three years, an up-to-date traffic count would be desirable. A traffic count, if required, is generally done through existing contractors (under contract to the Department), however in some cases a special count may be done by the consultant using Departmental procedures if specifically requested by the Project Sponsor.

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7. Obtain aerial photos, maps, plans, drawings, etc. to determine the geometry and development in the area. Note other sources of signals and lighting in the area.
8. Undertake a site reconnaissance to observe the overall operations at the location at an appropriate time. Note that an examination of the site may be required during darkness (e.g. for illumination).
9. Undertake warrant calculation using appropriate warrant procedure.
10. Assess other various options including lower cost alternatives such as other intersection improvements possibly relating to other traffic control devices, roundabouts, lane markings, delineation, minor geometric adjustments, etc., to address the problem and possibly postpone the need for traffic signals and/or lighting.
11. Provide an estimate of costs, need year, and staging for the suggested traffic control scheme, including other possible low-cost alternatives for better operations.
12. The Department specifications for materials used in lighting should also be compatible with the standards set by the industry. This will ensure that service equipment used will serve both old and new lighting systems and that the replacement material is readily available.
13. Report the results of the engineering assessment in a draft document for review by the Project Sponsor and others.
14. Modify draft report to include Project Sponsor's and others comments.

Turning Movement Diagram or speed data collection may be required at selected sites based on a request from the Project Sponsor.

5.2.5.3 Warrant Analysis

The following publications are generally used in calculating the warrant for each type of traffic control:

1. "Canadian Traffic Signal Warrant Matrix Procedure"
 - Traffic signals are considered at a threshold value of 100 points.
2. "Pedestrian Crossing Control Manual"

- The Department generally follows the hierarchy of pedestrian crossings outlined in the TAC guide.
3. “Illumination of Isolated Rural Intersections”, “Guide for the Design of Roadway Lighting”
- The guide for “Illumination of Isolated Rural Intersections” shall be used to determine the requirement for lighting at rural or semi-urban intersections. The guide outlines three types of highway lighting: full, partial, and delineation lighting, which is recommended based on the warrant calculations. When selecting the type and the extent of the lighting, several factors needs to be considered including presence of lighting at adjacent roadway sections, presence of lit roadside development, presence of vulnerable road users during reduced visibility conditions. The consultant shall also use engineering judgment in recommending the appropriate type of lighting treatment.
 - The “Guide for the Design of Roadway Lighting” shall be used to determine the type and extent of roadway lighting along highway segments and their elements (e.g., curves, bridges). Lighting is usually justified when the warrant calculations reach given threshold values.

5.2.6 TRAFFIC DATA: (TURNING MOVEMENT STUDIES, TRAFFIC SPEED DATA COLLECTION)

The Department frequently requires traffic data for planning, engineering assessment and detailed design purposes. The Department maintains an extensive database of current information and retains the services of a consulting engineering company to collect new information as required. In the event that normal processes cannot be used to obtain/compile the required data, an appropriate traffic study (i.e., speed data collection or turning movement count) may be undertaken either in conjunction with a preliminary Engineering Assessment or as a stand-alone assignment under a separate engineering contract

5.2.6.1 General

The Department is the authority responsible for setting speed limits on provincial highways. Often to assist with the setting of speed limits on various highway sections, special traffic speed data collection is required at selected sites to determine speed and turning movements. The following section provides details of turning movement and speed data requirements.

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5.2.6.2 Turning Movement Studies

The following steps are to be followed to acquire data on Turning Movements Studies for engineering assessment and other purposes.

1. The number of and location of intersections on the highway segment being assessed should be determined.

The Department website below should be accessed to determine if current traffic volume data is available for the intersections. There is information available for over 1900 intersections in Alberta.

www.transportation.alberta.ca/3459.htm

2. If an intersection is not available on the website, the consultant should check with the local municipality to see if the local road intersecting with the provincial highway has been counted.
3. If an intersection has no traffic information, the consultant should determine if a turning movement study is warranted. The rough guidelines for this are that the Average Annual Daily Traffic (AADT) on the provincial highway should exceed 1000 and the AADT on the intersecting road should exceed 200. Reference “Highway Geometric Design Guide” Figure D-7.4.
4. The Department provides AADT volume data for all primary highways which can be found on the web page above.
5. The volume on the intersecting road can be estimated by knowing the local land use, recreational activity, and industrial activity. Trip generation rates for various land uses are available in the “ITE Trip Generation Manual”.
6. Once it has been determined that an intersection traffic study is required, the consultant shall request authorization from the Project Sponsor to undertake the study. If authorized, the consultant shall do the study following the procedures outlined in the “Turning Movement Training Manual”.
7. At the completion of the study, the data collected must be transferred from field sheets to a spread sheet in Microsoft Excel.
8. This spreadsheet shall be sent to the Department’s approved consultant for factoring to annual statistics. For information on the Department’s current traffic factoring consultant, please contact the Traffic Data and Forecasting Engineer in Strategic and Network Planning Section, Planning Branch.

9. The consultant shall pay for factoring the traffic data to annual statistics and bill it back to the Department under the assessment contract.
10. The Turning Movement Study is not completed until the factored data is presented back to the Project Sponsor in the required format.

5.2.6.3 Speed Data Requirements

The consultant may choose to collect spot speed data by a reliable method as they see fit. This may be done through manual observations using a radar device, or through the placement of portable equipment to automatically record vehicle speeds.

For automatic speed data sampling, a minimum of 24 hours of data are required for each travel direction. The consultant shall adhere to the Department's traffic accommodation guidelines when installing or removing devices from the highway lane.

For manual speed data sampling, a minimum of 4 hours of observation is required with a minimum number of representative speed samples taken within this period to be statistically viable. For low volume roads, it may be necessary to extend the 4 hours of observation to attain a minimum sample requirement. Periods of inclement weather, poor driving conditions, and congested periods, which may alter the speed results, should be avoided.

The following information is required for speed data:

1. Highway number, control section, and kilometre
2. Date and day of week
3. Location description
4. Start and end times
5. Sampling scheme (as indicated on the request)
6. General weather and wind conditions
7. Posted speed and limit of speed zone
8. Direction of traffic being monitored
9. Lane observed
10. Vehicle number (number of sampled observations with recorded speed)
11. Road surface type and condition

The Consultant is responsible for performing a statistical analysis of the raw spot speed data, including mean speed, 85th percentile speed, median, mode, and 15 km/h pace (15 km/h interval having the most occurrences). The results must be included in a graphical format.

SECTION 5 –ENGINEERING ASSESSMENT

5.2.7 REPORTING REQUIREMENTS

A written report is required for all Engineering Assessments for each roadway project, unless this is specifically excluded in the Terms of Reference. The report will include a copy of the completed Geometric Assessment or other relevant checklist, supporting documents such as reproduced existing Department drawings (if available) or new drawings. The drawings shall show the geometric and other pertinent information, and recommendation for improvement.

As a minimum, these drawings shall show horizontal alignment, vertical alignment, cross-section elements, details of all major intersections, and any other pertinent information. The information on geometric improvement needs shall be provided in electronic (MicroStation) and hardcopy format that can be used for a Terms of Reference for detailed design and construction supervision components of the work.

A relatively detailed construction estimate shall also be provided in the report. This estimate shall be more precise than an “A” Estimate since adjustments would have been made for all of the identified geometric improvements.

Draft reports should be sent to the Project Sponsor for review. Comments from the Department should be taken into consideration before finalizing the reports. Departmental acceptance is required for all Engineering Assessment reports due to the cost implications to the construction program. Refer to [Section 2.8](#) for details of reporting requirements.

The Consultant may be required to participate in an Engineering Assessment completion meeting if issues arising from their submission cannot be satisfactorily resolved.

5.3 SURFACING ENGINEERING ASSESSMENT

5.3.1 SURFACING STRATEGY AND BASIC PAVEMENT STRUCTURAL DESIGN

The Department develops a Multi-Year Construction and Rehabilitation program on an ongoing basis. This program identifies the projects which are proposed for construction on the provincial highway network. Construction programming is a continuous process and is subject to revisions due to changing circumstances in terms of projected expenditures, current budget levels, and technical needs.

Since surfacing strategy has major cost implication for construction projects, it is important that an appropriate Engineering Assessment is undertaken to identify the scope of work prior to detailed engineering. Generally, this is done by the Department’s Regional Consultant as an assignment under the Preliminary Engineering Regional Assignment and included in the Terms of Reference for detailed design.

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The current Roadway Preliminary Engineering Regional Assignment agreements include Surfacing Strategy and Basic Structural Design for new construction (base and paving), final paving, and rehabilitation projects which are scheduled for detailed design and subsequent construction. The work shall be done in general accordance with the Department's "Pavement Design Manual", "Pavement Preservation Manual", and subsequent Design Bulletins.

The project tasks shall consist of the following:

1. Obtain design inputs such as project description and limits, traffic, planning report, mosaic plans, soil logs, as-built pavement structures, pavement evaluation data (Falling Weight Deflectometer (FWD), International Roughness Index (IRI), and rut measurements) from the Department, as applicable.
2. The Consultant's designer shall conduct and document a detailed field reconnaissance for all projects. The field reconnaissance shall be carried out in accordance with Section 2.5 of the "Pavement Design Manual".

For existing grades (base and paving projects) it may be necessary for the consultant to undertake a field reconnaissance to confirm the existing subgrade width and subgrade condition if this information cannot be obtained from Department records.

3. Carry out the analysis and interpretation of FWD testing data in accordance with the "Pavement Design Manual" for the 10 and 20 year design life.
4. Carry out design to establish basic pavement thickness, material types, alternate treatments such as Cold In-Place Recycling (CIR), cold mill and inlay, etc.
5. For establishing that a project may be a suitable candidate for CIR, a review of past construction records and pavement condition data shall be carried out. Detailed field coring and laboratory evaluation program for evaluating CIR may be required.
6. For rehabilitation projects, the consultant shall include surfacing strategy(ies) for any geometric improvement elements as identified by a geometric assessment provided by the Department. These elements may include widening, intersections, climbing lanes, access roads, and reconstruction.

In cases where a geometric assessment has not been carried out for a rehabilitation project the consultant shall confirm that finished widths meet the requirements of the Department's 3R/4R guidelines in the "Highway Geometric Design Guide". If widths will not meet the 3R/4R guidelines, direction shall be sought from the Project Sponsor. A design exception may be required.

SECTION 5 –ENGINEERING ASSESSMENT

A detailed report shall be prepared which shall include, as a minimum:

- All pertinent design inputs (i.e. existing structure, traffic, soils characteristics, etc.)
- Typical cross section drawings for the recommended pavement design strategy
- Site photos to illustrate general roadway condition and typical condition of distresses such as cracking
- Graphical presentation of calculated moduli, overlay needs, rut and roughness data, and existing cross sections
- Site plan showing project limits
- Recommended surfacing strategy(ies) and basic structural design including any special requirements such as pre-treatment of existing cracks
- Detailed field reconnaissance notes identifying specific distress areas and other observations supporting design recommendations
- A “B” type construction estimate based on the recommended surfacing strategy and current construction costs. Multiple estimates may be requested to satisfy programming needs
- Discussion of the inputs used to arrive at the design recommendations and the rationale used in selecting the recommended design strategy

5.3.2 SEAL COAT PRIORITIZATION

There is a need to select those pavements which have the greatest need for seal-coat in order to optimize the effectiveness of the Department’s annual seal coat program. This Engineering Assessment is generally done on a Regional basis under the terms of a Regional Preliminary Engineering Agreement. The Department will provide the Consultant a list of potential seal coat projects in a Region. The Consultant shall prioritize the projects on the list in accordance with the Department’s “Guidelines for Assessment, Rating and Prioritization of Seal Coat”. The procedure to be followed involves assessing potential seal coat projects from on-site inspection of the pavement condition, gathering input from the Region (i.e. Construction and/or Operations Managers), and application of a set of criteria to evaluate the needs of particular pavements.

5.3.3 REPORTING REQUIREMENTS

For Surfacing Strategy, the Consultant shall provide a design report (including methods of addressing rehabilitation requirements and cross-section drawing) in a similar format as contained in the “Pavement Design Manual”. The report shall also include a type “B” Estimate for the construction cost based on the recommended surfacing strategy.

For Seal Coat, the Consultant shall submit to the Project Sponsor a priority list for the construction year (arranged in order of highest to lowest priority) and all the scoring

SECTION 5 –ENGINEERING ASSESSMENT

sheets used in the evaluation of the potential projects. The Consultant shall provide a unit cost estimate for each of the projects in the list.

5.4 BRIDGE ASSESSMENTS AND/OR BRIDGE PLANNING

The procedure to be followed for Bridge Assessments is covered in [Section 10.10.1](#).

SECTION 5 –ENGINEERING ASSESSMENT

Current References for Section 5:

Below are references identified in this Section. Please see the Department website for a complete list of available documents.

Benefit Cost Analysis (Summary Guide and User Guide and Manual), 1991, Alberta Transportation

Canadian Capacity Guide for Signalized Intersections, Current, ITE

Canadian Traffic Signal Warrant Matrix Procedure, 2005, TAC

Guide for the Design of Roadway Lighting, 2006, TAC

Guidelines for Assessing Pavement Preservation Treatments and Strategies, 2006, Alberta Transportation

Guidelines for Assessment, Rating and Prioritization of Seal Coat, 1997, Alberta Transportation

Highway Capacity Manual (Transportation Research Board), 2000, TRB, FHWA, USA

Highway Geometric Design Guide, 1999, Alberta Transportation

Illumination of Isolated Rural Intersections, 2001, TAC

ITE Trip Generation Manual (5th Edition), 1991, ITE

Pavement Design Manual, 1997, Alberta Transportation

Pedestrian Crossing Control Manual, 1998, TAC

Road/Railway Grade Crossing Guidelines, 1997, Alberta Transportation

Road Safety Audit Guidelines, 2004, Alberta Transportation

Turning Movement Training Manual, 1994, Alberta Transportation

SECTION 6 - PRELIMINARY ENGINEERING

6.1 GENERAL

Before undertaking any preliminary engineering, Designers are to revisit any pertinent planning and Terms of Reference (TOR) documents to examine basic assumptions, current design practices, concepts, staging plans, cost-effectiveness (based on life cycle costing methods), safety, preservation of design flexibility for the future, and other considerations. The Designer shall ensure that all decisions related to the above are fully explored, discussed and agreed with the Project Sponsor before proceeding with preliminary engineering.

The Consultant shall revise/update and/or undertake any of the following preliminary engineering tasks as stipulated in the Terms of Reference for the project.

6.1.1 BRIDGE PLANNING

Bridge Planning for bridges is a distinct and different process compared to roadway preliminary engineering. This function is described in Bridge Planning [Section 10.10](#). The bridge planning process combines planning, hydrotechnical design, relevant roadway preliminary engineering, and detailed geometric design to provide pre-design parameters for structural design for bridge structures. The timing and complexity of bridge planning is dependent on the type of bridge and crossing under consideration. It is normally undertaken well in advance of detailed structural design of the structure. Early advancement of roadway preliminary engineering components such as survey and finalization of geometric design parameters at the structure and approaches, along with constant coordination between the roadway designer and the bridge planner, are generally required for successful bridge planning.

6.1.2 PROJECT SET-UP AND REVIEW EXISTING INFORMATION

The Consultant shall assemble and review all relevant information (i.e. existing design and project data) available from Alberta Transportation and shall plan a Preliminary Engineering Strategy based on this information. All acquired data from sources at Alberta Transportation and for this Preliminary Engineering phase shall be assessed with respect to its impact on the design.

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6.1.3 INITIALIZATION MEETING

Prior to commencement of the work, the Consultant will attend a meeting with the Project Sponsor to discuss with him/her their work plan, scheduling, evaluation criteria, and project file review.

6.1.4 PRELIMINARY SURVEY

6.1.4.1 General Requirements

The Consultant shall complete a preliminary survey that will include:

- Title search
- Horizontal and vertical survey
- Survey control points
- DTM modeling
- Survey transit notes

All surveys are to be tied to the Alberta Survey System NAD83 3TM Coordinates and survey closure accuracy shall be as follows:

- For general roadway work, the following survey closure accuracy shall apply:
 - Vertical level circuit closure accuracy
allowable error (mm) = 12 x square root (distant of circuit (km))
 - Horizontal linear closure to within 1 in 5000
- For sensitive (critical) locations with very high accuracy requirements (e.g. bridge structures, curb & gutter, etc.), survey closure accuracy shall be suitably precise to comply with construction tolerances

All surveys shall be carried out according to the Department's current procedures as shown in the latest "Survey Manual" and "Guide to Electronic Survey and Data Management". These manuals provide specific information on work methods, procedures, and practices that are to be followed for electronic survey activities required for highway work. In particular, the modules on Establishing a Control Network, Stake-Out, Data Pickup, Data Processing, Data Management and Final Quantities shall be followed by all Consultants unless an alternative method has been proposed by the Consultant and accepted by the Project Sponsor in advance of commencement of the survey.

6.1.4.2 Chainages

Chainages will begin on the south end of projects running in a general south-north direction and on the west end of projects running in a west-east direction. The chainage at the beginning of a project shall match the control section kilometre value at the same location. For example, if the km value is 10, the initial chainage is 10+000.

Twinning projects may require special chainage e.g. along centre-line or independently along each roadway if they are independent alignments, however the same general convention should be followed where feasible.

NOTE: The 'km' is defined as the length along centre-line from the beginning of the control section, with the south end of each control section being '0' on north-south alignments and the west end being '0' on east-west alignments. Alberta Transportation Control Section Numbering System and Kilometre Datum Measurement must be used.

6.1.4.3 Construction Control Points

Control points, as references for future stages of construction, shall (as required) be established at locations that will provide protection from damage or loss. The construction, location, and marking of these control points shall be appropriate to ensure their integrity for the duration of the project. Steel Pins (min 45cm) are considered sufficient as control points. Brass caps shall not be used for construction control points due to possible confusion with legal survey markers.

The Consultant shall follow the procedure of establishing a three dimensional control network as described in the “Guide to Electronic Surveying and Data Management”. The Consultant shall also use standardized descriptor codes for all data pickup, and the guidelines related to naming conventions and data handling, to ensure the integrity, validity, and security of all data.

6.1.4.4 Elevations

Elevations during bench mark levelling are to be recorded to the nearest 0.001m (the third decimal figure is usually estimated).

6.1.4.5 Bridge Surveys

Bridge Surveys shall be conducted in accordance with the following:

SECTION 6 – PRELIMINARY ENGINEERING

- Appendix J – Example of a Bridge Report in “Guide to Electronic Surveying and Data Management”
- Section 1.3.3 Site Survey Requirements in “Bridge Size Culverts – Design and Drafting Guidelines”

6.1.5 DRAINAGE REVIEW (SIDE DITCHES, MEDIANS DITCHES, NON-BRIDGE SIZED CULVERTS, AND STORM WATER MANAGEMENT FACILITIES)

The condition of all existing culverts shall be checked and inventoried. The sizing of the ditches, culverts, and storm-water management facilities, existing and proposed, should be checked to ensure it is appropriate and adequate to allow safe passage of a design major event, along or across the highway without:

- Inundating the highway surface
- Causing overflow of side or median ditches
- Saturating the base course
- Causing erosion
- Causing pounding for excessive periods
- Allowing the passage of spills or wastes from the highway onto private lands or sensitive water courses, or
- Exceeding safe discharge rates into natural drainage runs, permitted discharge rates into outfalls, irrigation systems or watercourses.

If any culverts are deteriorated, they shall be checked for excessive deformation to see if condition is suitable for installation of a plastic liner. If the culvert is deformed too much to install a liner, then the Consultant shall recommend an alternative to rehabilitate/replace existing culverts. Best practice guidelines are available on the department web-site for the selection of both new culverts and culvert liners.

All drainage patterns along and adjacent to the roadway alignment shall be determined and surveyed (if necessary). The Functional Planning Report and Geometric Assessment Report (when available) will be reviewed, and additional verification of condition of various drainage structures will be completed as needed.

6.1.6 RIGHT-OF-WAY COORDINATION/ PERMISSION TO ENTER & TEST

Prior to the commencement of roads, bridges, utility, or soil preliminary surveys on private or crown land, written permission shall be obtained to survey and test from the property owners or renters, land management agency and/or utility company where required. Permission must be obtained for cutting down of any trees, brushing or clearing.

SECTION 6 – PRELIMINARY ENGINEERING

Land acquisition has occasionally created problems for the Department and Utility Companies. The Consultant should advise Utility Companies as early as possible even in the functional planning design stage. Once the right-of-way plans and the design detail work are done, the Consultant should forward them to the Utility Companies immediately to allow the Utility to begin negotiating with the land owners for utility easements.

6.1.7 SOIL SURVEY

Soil survey requirements are outlined in [Section 7](#) – Geotechnical Considerations.

6.1.8 UTILITY SURVEY

6.1.8.1 Utility Search

The Consultant shall search and locate all utilities during the Utility Survey stage. The Consultant shall contact all affected utility companies to gather detailed information and inform them of the proposed design and construction schedules. This shall include, but is not limited to, the following:

- “Alberta One-Call” at 1-800-242-3447 (for buried utility locations). Consent from the utility companies shall be obtained prior to surveying over the utility easements. A minimum of two (2) full working days are required for the lines to be located.

NOTE: *Consultants should be aware that not all utility companies subscribe to “Alberta One-Call” and therefore additional searching may be required. Please note that Alberta Transportation is currently not a member of Alberta One-Call.*

- Energy Resources Conservation Board (ERCB). The ERCB can provide high and low pressure location plans in township format (“Township Platf’s”) in the area of the project
- Planning mosaic plans
- Land Titles (ownership, easements, caveats, etc.)
- Registered Pipeline Utility Plans are available at the Land Titles office. The plan numbers are usually shown on the roadway legal plans.
- Preliminary field survey
- Alberta Transportation Edmonton office
- Alberta Transportation Pipeline Crossing Plan archives (microfiche and electronic; contact the Planning Standards Technologist, Planning Branch)
- Land Agents (when right-of-way is required)
- Landowner contact (i.e. private water lines). Contact with the landowners can best be done through the land agent during right-of-way and/or borrow negotiations.

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- Obtaining “Permission to Enter and Test” approvals are also opportunities to inquire about utilities.
- Local Municipality

The Consultant shall complete a thorough search for all utilities. Searching all sources available as shown above as well as searching the site for signs of the utilities will demonstrate due diligence on the part of the Consultant.

The results of any initial contact made by the Department will be made available to the Consultant.

6.1.8.2 Notification Letter

The Consultant’s first contact with each utility company should be done at the preliminary survey stage, in writing, and indicating:

- The Consultant name and contact personnel
- The Consultant is representing the Department for this project
- The project description, scope, and type of work
- The tentative design completion and tender advertising dates

A set of preliminary mosaic plans or township plans should accompany the letter, with each of the applicable utilities highlighted. The letter should request that all Utility Companies provide:

- All of its utilities within the project limits
- The name, e-mail address, telephone and fax number of their contact personnel for field and design coordination
- Tentative commencement and completion dates

The Consultant should provide the names of all utility field contact, e-mail addresses, and telephone and fax numbers in the contract document.

As soon as the need to relocate a utility has been identified, the Consultant shall communicate the requirement to the utility company reiterating the schedule for the proposed roadwork and obtain a preliminary relocation schedule from the utility company. The Consultant shall remain in contact with the utility company on a regular basis until the relocation has been completed.

6.1.8.3 Pipelines

The Consultant shall make arrangements with the field representative of each affected company to locate and flag the alignment of each pipeline for the purpose of obtaining survey data.

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The Consultant shall obtain exact locations of all buried pipelines in the highway right-of-way. This shall include the horizontal alignment and vertical depth of the utilities (by hand exposing or hydrovac) and then recording the elevations (generally at the proposed ditch locations and right-of-way boundaries). This requirement is normally used for major pipelines (high pressure), and may not be necessary for low pressure gas lines. It is advised to arrange the Pipeline Companies to do the hydrovac, and the Consultant shall ensure the cost charged by the Pipeline Company is reasonable.

Because adjustment to buried pipelines is required in most cases when the highway horizontal/vertical alignment and/or cross-section elements are improved, it may be more cost effective for Consultants to simply arrange for utility adjustments on low pressure gas lines based on highway design information rather than undertaking a full (hand-exposure) survey. This practice is acceptable, provided that the low pressure gas line depth information is not needed at the design stage, and provided that utility adjustments can be scheduled so that they do not adversely affect construction operations and safety. When a low pressure pipeline's adjustment/relocation is perceived to be expensive (e.g. pipeline parallel to the highway), a full exposure at the preliminary survey stage is generally required.

Where it has been determined by the Consultant that a full survey of a pipeline is required, the exposure of the pipeline shall be undertaken by the Pipeline Company or a Contractor hired by the Consultant for the Department. With the presence of field representatives of the Pipeline Company, the pipeline shall be hand exposed, and elevations taken both left and right in the proposed ditch areas and right-of-way boundaries. These four elevations are critical to the roadway design and assessment of any potential pipeline alterations. The company field representative shall be present during backfilling operations. Backfilling with acceptable materials and appropriate compaction shall be done as per the applicable utility agreement. The Consultant shall monitor the backfill operation to ensure that the disturbed area is left in a neat and tidy condition.

Due to the fragile nature of plastic pipelines, extra care and attention is required during their exposure.

The Consultant shall make allowance for the cost of hand exposing the pipeline or other means of locating utilities in their engineering proposal. The Consultant shall also be responsible for preparing utility crossing plans and agreements as required.

When a major relocation of pipeline is necessary, the Consultant shall contact the affected Pipeline Company as soon as possible. Pipeline relocation work could take up as much as eight (8) months lead time from design to completion.

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6.1.8.4 Power Lines

It is critical to relocate power poles in a timely manner to facilitate the highway grading work. The Consultant shall contact the power company as soon as possible so the power poles can be relocated/removed prior to the commencement of the grading work.

During the survey of power lines, the exact location of poles and/or structures shall be noted by chainage and offset from the proposed centerline (it is important at this stage to determine whether the poles and lines are within the existing right-of-way due to relocation cost implications). The number of wires, height of conductors in the field, voltage, and ownership shall be noted. Information concerning voltage shall be obtained from the local power company representative. Detailed plans are required for any location where power lines cross the highway or other roadways which will be constructed, improved, or obliterated.

Detailed plans shall be prepared at all major intersections (for only the intersections that will be impacted by construction) that contain power poles, power lines, traffic signals, and street lighting.

In the case of buried power facilities, the power company representative will locate and flag their cable alignment and provide all relevant data. The exact location of the buried lines shall be noted by offset from the proposed centerline and crossings by the chainage.

The location of Department owned street lighting buried cable is not available through the Alberta One-Call system. The Consultant needs to arrange a qualified locator to locate and flag their cable alignment and provide all relevant data.

6.1.8.5 Telephone Facilities

Owners of telephone lines will establish the location and flag the horizontal alignment of buried cables. The exact location of telephone cables, fibre optic lines, manholes, and pedestals shall be noted. The size and type of cables shall be recorded and any special features shall be noted.

Overhead telephone lines running parallel to the highway right-of-way are to be noted giving exact locations of poles, chainage and offset from proposed centerline, and number of wires. Lines crossing the right-of-way shall be noted by chainage. The exact location of poles and anchors located beyond right-of-way boundaries, which may be affected by construction, shall be noted.

6.1.8.6 Railway Crossings

At those locations where the proposed roadway alignment crosses a railway, or where it is proposed to widen an existing railway crossing, a special survey shall be completed to provide details of any railway crossing signals, control boxes or power sources present. The complete details of survey requirements and typical plans for railway crossings are shown in Section 1 of the “Drafting Guidelines (CB4)”. All railway coordination shall be in accordance with the “Road / Railway Grade Crossing Guidelines” and “Procedural Guidelines for Railway Grade Separations”– manuals.

6.1.8.7 Other Cables

Other cables include television, telecommunication, pipeline company instrumentation, telegraph, railway operating cables, traffic counters, traffic light sensors, cathodic protection, and high impact fibre optics. Television cables shall be referenced in detail in the survey field books. Overhead telegraph and railway operating cables shall be referenced with exact location of poles and number of wires.

Traffic counter locations shall be coordinated with the Department through Strategic and Network Planning. Strategic and Network Planning shall be advised of the type of work to be done and the tentative scheduling.

Traffic lights (including sensor loops), pedestrian crosswalk lights, and all warning beacons (amber and red) are owned by the Department and shall be coordinated through the Project Sponsor.

Cathodic protection cables are usually associated with bridge-sized culverts and shall be coordinated through the Department’s Regional bridge section.

6.1.8.8 Illumination Assessment

The assessment of the need for illumination and/or determining the extent of illumination that is warranted (i.e. partial or full, etc.) will normally be done in advance of detailed design under an Engineering Assessment. Where this is the case, the Consultant will discuss the recommendations with the Project Sponsor to obtain additional direction as required. See [Section 5.2.5](#) for details.

6.1.8.9 Reporting Requirements

The Consultant shall provide Mylar and digital copies of the completed drawings showing detailed information on utilities. For pipelines, “Pipeline Crossing Plans” must be completed. For all other utilities, the mosaic and/or intersection drawings can

SECTION 6 – PRELIMINARY ENGINEERING

be used to show survey details. Utility survey information shall be recorded in the Survey Field Books and shall be submitted to the Department at the completion of the project. See [Appendix K](#).

6.1.9 REVIEW ACCESS MANAGEMENT

The Consultant shall review the access management for the project as outlined in the “Highway Geometric Design Guide”. Proper access management on highways enhances safety for all road users.

6.1.10 SIGN INVENTORY

Existing signage on the project and signs adjacent to the project which may be affected by the proposed improvements shall be inventoried. The information collected shall include size, number, location and type of all signs (public and private). The condition of existing sign mounts, structures, and sign faces shall be noted. Faces that are damaged or non-reflective shall be identified. See [Section 8.9](#) for information on sign design.

6.1.11 GEOMETRIC AND SAFETY ASSESSMENT, AND SURFACING STRATEGY

In the event that these activities have not been done in the planning or Engineering Assessment stages, these activities may be included as part of the preliminary engineering tasks at the discretion of the Project Sponsor. See [Section 5](#) – Engineering Assessment for details.

Where this work has been completed previously, the Consultant responsible for preliminary engineering is required to review the previously compiled data, engineering guidelines/warrants used, and the recommendations made.

Repetition of the original analysis and assessment undertaken at the planning or engineering assessment stages is not required unless new information has become available or some design guidelines or technical needs have changed.

Consultants shall strive to achieve highly cost-effective designs while providing the standards which are appropriate for the highway according to the “Highway Geometric Design Guide”.

When pavement rehabilitation and/or geometric improvements are considered on existing paved roadways, designers shall use the information contained in Chapter G - 3R/4R Geometric Design Guidelines of the “Highway Geometric Design Guide”. Where various options are being considered, for example for horizontal or vertical alignments, the guidelines contained in the “Benefit-Cost Analysis” shall be followed

to ensure that total societal cost and benefits are considered in a uniform way. Through the use of a consistent set of guidelines it will be possible to compare the merits of various alternatives on a particular project and to rank various projects according to economic indicators.

- Any changes proposed to the original reports will be documented and verified by the Project Sponsor and Technical Standards Branch.
- Where a Geometric Assessment, Safety Assessment, Surfacing Strategy or other Engineering Assessment task must be completed at the Preliminary Engineering Stage, the reporting requirements are as shown in [Section 5](#). In the event that an Engineering Assessment was completed in advance of Preliminary Engineering, the Consultant is required to document any changes that are proposed to the previously accepted recommendations. These changes should be supported by a suitably detailed rationale / analysis which may include a life-cycle economic analysis.

6.2 REPORTING REQUIREMENTS

- An ASCII geographic coordinate file (xyz values such as latitude, longitude, elevation) is required for roads and bridge site surveys to be submitted to the Project Sponsor upon completion of the preliminary survey. In cases where horizontal alignments are being improved or new alignments constructed and there is no planning study, an ASCII file of the alignment shall be submitted by the Consultant to the Project Sponsor as soon as the horizontal alignment has been finalized in the field. The purpose of this submission is to facilitate the Project Sponsor sending the information to the Highway Geomatics Section, Divisional Services Branch to keep the inventory up to date. This digital ASCII file shall also include raw and processed data of survey, including geodetic datum, and any other survey specific information.
- All titles, survey data (hard copy and electronic data), copies of all pertinent correspondence and the original or all permits and approvals (e.g. permission from landowner to survey and/or enter land, and/or clear vegetation for survey purposes), shall be submitted to the Project Sponsor as part of the project documentation at the completion of the project.

A written report and an appropriate construction cost estimate are required for the Geometric Assessment, Safety Assessment, and Surfacing Strategy of each construction project. See [Section 5](#) for details.

The estimate for Surfacing Strategy should be a type “B” Estimate. The estimate for Geometric/Safety improvements should be a “B” Estimate if grading quantities have been calculated. If grading quantities have not been run, an estimate that is in the format of an “A” Estimate but with more accuracy (due to knowledge of the geometric improvement requirements) is required.

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See [Appendix K](#) for more information on records management. The Consultant shall keep copies of all permits and approvals for their records. Any information that might affect the cost of the survey or incur liability to the Department shall be included.

Current References for Section 6:

Below are references identified in this Section. Please see the Department website for a complete list of available documents.

A Guide to Electronic Surveying and Data Management, 1996, Alberta Transportation

Benefit Cost Analysis (Summary Guide and User Manual), 1991, Alberta Transportation

Drafting Guidelines (CB4), 1990, Alberta Transportation

Highway Geometric Design Guide, 1999, Alberta Transportation

Procedural Guidelines for Railway Grade Separations, 2nd edition - 2004

Road/Railway Grade Crossing Guidelines, May 1997, Alberta Transportation

Survey Manual, 1988, Alberta Transportation

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SECTION 7 - GEOTECHNICAL CONSIDERATIONS

7.1 GENERAL

Geotechnical investigations are required for highway, geotechnical, and bridge projects. This Section presents basic principles and requirements with which to guide the Consultant in the preparation of proposals and completion of their investigations. Irrespective of the requirements listed in this document, it is important that the Consultant clearly outlines in their proposal what assumptions were made in estimating the effort and resources necessary to complete the scope of work.

A project may consist of new road construction, grade widening, bridge and culvert design, and specific geotechnical projects such as landslide repair. Within any of these types of projects there may be numerous major areas of investigations, including roadway; borrow; bridge and culvert; soft ground or muskeg; landslide; erosion; and rock. General requirements for these types of investigations are outlined in the following sections. Requirements for culvert corrosion surveys are provided in this section. It should be noted that there are specific qualifications for personnel responsible for gathering field data and testing related to corrosion surveys. Requirements for topsoil survey related to topsoil conservation within the highway right-of-way, and for pre- and post-borrow assessments are provided in [Section 4](#).

This section provides minimum requirements for test hole spacing. Sound engineering and application of ‘common sense’ principles should govern the project requirements for test hole spacing and locating. Minimum drilling requirements through problematic areas should be supplemented as required to provide a reasoned basis on which to proceed with the design, using a balance of risk acceptance and avoidance in harmony with project costs and objectives. For the purposes of this Section, ‘test hole’ and ‘bore hole’ are interchangeable terms. Minimum requirements for field investigations, laboratory tests, and reports are summarized in each subsection.

The Consultant’s Geotechnical Engineer assigned to the project shall make at least one (1) site visit, preferably prior to start of the field investigation. This trip will help the engineer to familiarize himself with the site conditions and aid in the positioning of test holes. Several site visits may be required for complex sites such as major landslide or bridge projects.

SECTION 7 – GEOTECHNICAL CONSIDERATIONS

TABLE A provides a summary of field, laboratory and reporting requirements for each type of project listed below. Refer to the legend for numeric codes.

TABLE A - INVESTIGATION AND REPORT CONTENT REQUIREMENTS							
Type of Investigation		Office review	Minimum Field Investigation			Minimum Laboratory Testing	Reporting Requirements
			Location	Depth	Instrumentation		
Roadway (Section 7.2)	New construction	1, 2, 6	7, 8	21, 22, 23, 25	28, 30	32, 33, 34	37-43
	Grade widening	1, 2, 3, 4, 5, 6	7, 9	21, 22, 24, 25	28, 30	31, 33, 34	
Borrow (Section 7.3)		1, 2, 6	7, 10	21, 23	29	32, 33	
Bridges (Section 7.4)	Abutments	1, 2, 3, 4, 5, 6	7, 11	23, 24, 25	29, 30	32, 33, 34, 35	
	Piers		7, 12	22, 24, 25	28, 30	32, 33, 34, 35	
	Culvert		7, 13	23, 24, 25	29, 30	32, 33, 34, 35	
	MSE/retaining walls		7, 14	23, 24, 25	29, 30	32, 33, 34, 35	
	Wingwalls		7, 15	23, 24, 25	29, 30	32, 33, 34, 35	
	Approach fills		7, 16	22, 23, 25	29, 30	31, 33, 34	
Culvert – Corrosion Survey (Section 7.4)		3, 4, 5, 6	17	26	26	36	
Soft ground/ muskeg (Section 7.5)		1, 2, 3, 4, 5, 6	7, 18	23, 25, 27	28, 30	31, 33, 34	
Landslides (Section 7.6)		1, 2, 3, 4, 5, 6	7, 19, 22	23, 25	28, 30	32, 33, 34	
Expansive Soils (Section 7.7)		1, 2, 3, 4, 5, 6	7, 19	22, 23	29, 30	32, 33, 34	
Erosion (Section 7.8)		1, 2, 3, 5, 6	7, 19	21, 23		32, 33, 34	
Rock (Section 7.9)		1, 2, 3, 4, 6	7, 20	21, 23, 24	28	31, 33, 34	

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Legend:

Office Review

1. Surface geology, bedrock geology maps and reports
2. Air photo review
3. Consultant and Department geotechnical, bridge and design reports and file records
4. Construction records
5. Maintenance records, local peoples perspective
6. Site visit by Project Engineer

Field Investigation

7. Test hole or test pit
8. Drill at 200 m maximum spacing (for topsoil survey assessment requirements refer to [Section 4](#)). Offset test holes as appropriate to provide coverage across the full width of the proposed construction. As a suggested guideline, alternate drilling of centerline holes with test holes advanced along the right and left ditch lines.
9. Drill at 300 m maximum spacing if it can be determined that previous soils information is available and relevant; otherwise use 200 m maximum spacing. For topsoil survey assessment requirements refer to [Section 4](#). Offset test holes as appropriate to provide coverage across the full width of the proposed construction. Drill along shoulder of the road to assess the existing road structure, along the existing embankment slope to determine the presence of waste materials for benching requirements, and along existing ditch which will form the foundation for the new fill.
10. Minimum of two (2) test holes per borrow, for pre- and post-borrow disturbance assessment requirements refer to [Section 4](#).
11. Minimum of one (1) test hole per abutment. Siting of abutment and pier test holes should be done in conjunction with bridge planning objectives and existing site constraints.
12. Minimum of one (1) test hole per land based pier. Drilling at all river based piers is preferred, however the use of Ground Penetrating Radar (GPR) tied into land based test holes, or approved technique to determine soil conditions at river based pier locations may be acceptable. Limitations of the technique used should be discussed in the report. Siting of abutment and pier test holes should be done in conjunction with bridge planning objectives and existing site constraints.
13. Minimum of one (1) test hole per 25 m culvert length at new culvert sites. Use judgement at culvert replacement sites.
14. Minimum of two (2) test holes along each wall base, otherwise at 50 m spacing along Mechanically Stabilized Earth (MSE) structure.
15. Wing wall drilling is left to the discretion of the Consultant. The Consultant will be required to document reasons for not doing an investigation.
16. Typically drill one (1) test hole per approach fill, about 50 m from abutment seat.

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17. See Section 7.4.
18. Where feasible use an auger truck to probe; alternatively use a muskeg probe or vane testing. Some test hole sampling of muskeg and underlying mineral soils is required. Probe muskeg at 20 m spacing along alignment, and alternate left and right offset probes.
19. The actual number of test holes required is typically site specific. The number, location, and depth of test holes to be determined by the Consultant after the site visit. For proposal purposes, the Consultant should use engineering judgement and provide documentation of reasoning. Instrumentation requirements are also to be determined by the Consultant on a site-specific basis.
20. Probe to rock surface at 50 m intervals and core rock at 100 m intervals.
21. Drill a minimum 2 m below ditch level or below bottom of borrow.
22. Drill to a depth equal to the fill height, or to a minimum of 2 m below existing natural grade in fill sections, whichever is greater. The depth of drilling should be consistent with the data requirements for stability analysis, etc.
23. Samples are to be taken of each major soil type encountered and where moisture conditions show abrupt change. Block samples of muskeg may be required. Undisturbed (pushed thin wall tube) samples and/or cores to be retrieved for advanced laboratory testing as appropriate.
24. Drill a minimum 3 m below pile foundation depth or a minimum 3 m below footing depth. Core a minimum 3 m into competent bedrock where encountered.
25. Standard Penetration Test (SPT), Cone Penetration Test (CPT), Dynamic Cone Penetration Test (DCPT), vane testing, pressure meter, dilatometer and/or muskeg probe as appropriate.
26. Corrosion survey. For requirements see [Section 7.4](#).
27. Probe to firm ground at least 1 m below bottom of organic layer where organic terrain is encountered. Where buried valleys are infilled with loose or soft compressible materials, probe to at least three (3) times the embankment height or 10 m, whichever is greater.
28. The Consultant may elect to install slotted standpipe piezometers and slope indicators at deep cut locations.
29. Slotted standpipe piezometers should be installed in at least one (1) test hole per borrow, and may be appropriate for installation at culvert and MSE excavations and along approach cuts into bridge or culvert sites.
30. Recommendations for instrumentation during construction should be included in the report. Such instrumentation may include standpipe and pneumatic piezometers, horizontal and vertical slope indicators, settlement monitoring devices, pile dynamic analyzer (PDA), etc.

Laboratory Test Program

31. The frequency of testing shall be a minimum of one (1) ‘suite’ of tests per borehole. A ‘suite’ of tests consists of a moisture content test, an Atterberg limit test and/or a grain size analysis (whichever is appropriate), and estimates of optimum moisture content and maximum dry density for each tested sample.

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32. The frequency of testing shall be a minimum of two (2) ‘suites’ of tests per borehole. A ‘suite’ of tests consists of a moisture content test, an Atterberg limit test and/or a grain size analysis (whichever is appropriate), and estimates of optimum moisture content and maximum dry density for each tested sample.
33. Moisture content profile shall be completed for each test hole, meaning that all samples will be tested for moisture content.
34. Advanced testing as determined by the Consultant. This may include direct shear, triaxial, unconfined compressive, permeability, consolidation, point load, slaking, pinhole dispersion, or other tests as deemed appropriate and justified by the Consultant.
35. Soluble sulphate testing for determination of cement type for locations where concrete will come into contact with soil.
36. Corrosion survey: soil resistivity and pH testing, sulphide, sulphate, and chloride testing.

Report Content

The project report shall be a complete and comprehensive document. The report format is left to the discretion of the Consultant. The report shall provide the following information and any additional information as indicated in the project Terms of Reference

37. Executive summary
38. Office information review
 - Surface geology, terrain, and drainage description
 - Bedrock geology if appropriate
 - Air photo review comments
 - Existing geotechnical reports and file review
 - Discussions with locals, maintenance personnel, etc.
39. Field investigation
 - Field observations: terrain description, ground cover, drainage pattern, scarps, cracks, distressed ground, seeps, heaves, pavement distress, weather at time of inspection, etc.
 - Description of drilling program, including test hole locations and depths summary
 - Adverse conditions encountered during drilling, caving or sloughing, loss of drill fluid circulation, refusal conditions, etc.
 - Discussion of groundwater conditions encountered during drilling, immediately after drilling, and after stabilization
 - Generalized soil condition descriptions, with exceptions noted as appropriate
 - Description of field tests and results, SPT, CPT, etc.
 - Details of instrumentation and monitoring program
 - Field corrosion test results, as applicable

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40. Laboratory testing

- Table of results indicating sample data, soil description, Unified Soils Classification System (USCS) description as modified by Prairie Farm Rehabilitation Association (PFRA), and all test results
- Description of advanced test results, indicating limitations of test and test conditions, type of sample
- Chemical test results, soluble sulphates, etc.

41. Engineering Assessment

- Discussion of type of analysis undertaken
- Discussion of material parameters used
- Presentation of analysis findings and limitations if any
- Discussion of risk, including uncertainty, associated with findings
- Discussion of various hazard mitigative options, pros and cons, cost - benefit

42. Recommendations

- Requirements for mitigation of geotechnical risk at the site including but not limited to:
 - Requirements for contract special provisions
 - Staged construction, rate of fill placement
 - Surcharge or overbuild
 - Cut and fill slope angles
 - Stabilization measures for natural slopes, embankment, or cut slopes and cost estimates for it.
 - Site dewatering, soil moisture conditioning
 - Swelling soil and frost heave mitigation
 - Soft ground construction
 - Fill and foundation settlement estimates
 - Volume modification factors for various fill materials to be encountered
 - Erosion control requirements
 - Foundation options and design parameters, bearing and skin friction values, negative or down-drag consideration, and cement type related to soluble sulphate concentrations
 - Consolidation design, wick drains, and drainage designs
 - Lateral earth pressure
 - Other construction related issues – requirements for monitoring and instrumentation, PDA or test pile requirements
 - Other geotechnical related recommendations as appropriate

43. Appendix

- List of references
- Test hole logs, including electronic copy
- Muskeg probe logs
- Instrumentation records and readings
- Stratigraphic cross-section and plan drawings
- Photographs, site sketches
- Advanced test result sheets

7.2 ROADWAY

The selection of the most desirable grade-line and alignment for highway grading projects are normally conducted through shallow test hole drilling methods inside and immediately outside of the proposed roadway prism. The reporting requirements for grade widening investigations are considered to be the same as for new construction. However there may be room for a relaxation in the frequency of test hole and laboratory testing requirements for grade widening projects, depending on the availability and quality of existing soil information.

Requirement for the depth and distribution of test holes/test pits should be determined based on findings of the office review and site visit by the Project Engineer. It is expected that additional test holes beyond those stated in Table A will be undertaken if adverse soil conditions are expected or encountered during the course of the field drilling. Consideration should be given to augment the roadway investigation at deep cuts and high fills with offset test holes in order to provide sufficient stratigraphic data for a stability analysis to be undertaken. The possible presence of ‘snake pits’, narrow pits excavated to dispose of wet or otherwise deleterious soils along the toe of existing embankments should be evaluated through the file review, air photo assessment, field inspection, and drilling program.

Soil samples shall be taken of each change in soil type within a test hole. The size of samples shall be sufficient to meet the laboratory testing requirements.

Requirements for topsoil survey are provided in [Section 4](#).

7.3 BORROW

The selection of suitable borrow material can have a significant impact on the success of a project during construction and in the long-term. Consultants are directed to avoid the use of frost susceptible materials as a road building material unless it can be demonstrated that no economically viable alternative exists and the design is optimized to limit the influence of the silt. Most borrow investigations are completed using auger drilling techniques or test pits. Typically borrow reports form a subsection of a geotechnical report, although project requirements may occasionally dictate that a stand-alone report be prepared.

Requirement for the depth and distribution of test holes/test pits should be determined based on findings of the office review and site visit. It is expected that additional test holes, beyond those stated in Table A will be undertaken if adverse soil conditions are expected or encountered during the course of the field drilling. Long term monitoring of groundwater conditions is a requirement of borrow investigations. This typically requires the installation of standpipe piezometers, and the consultant should be prepared to revisit the site several weeks or months after drilling to monitor groundwater levels.

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Groundwater tables can change seasonally, and as such, a single standpipe reading is generally not sufficient to predict the range of water table level possible.

Soil samples shall be taken of each change in soil type within a test hole. The size of samples shall be sufficient to meet laboratory testing requirements.

7.4 BRIDGE AND MAJOR CULVERTS

It is recommended that senior personnel with relevant experience be assigned to these projects. A field visit by the Project Engineer is a prerequisite that must be completed prior to field drilling. Site conditions may be adverse at the proposed site, but favourable a short distance away. Although a bridge site may be feasible, the approach cuts into a particular valley may traverse unstable terrain, requiring costly mitigative work. The Project Engineer must have sufficient experience to identify such conditions and to bring field issues forward to the design team at an early stage.

Similar equipment and methods of sampling used for grading design are commonly used for investigating bridge approach fills and foundations. The use of rotary drilling or wire-line coring may be required to retrieve intact rock samples. In-situ vane shear, pressure meter, cone penetration, and dilatometer tests are also undertaken where results from these tests would allow better interpretation of ground conditions for design.

Predicted foundation depths shall not exceed the known soil stratigraphic profile. It is not acceptable to design foundation elements to be placed in unknown soil or bedrock conditions or to choose foundation types that are in conflict with the known soil and bedrock conditions. If the depth of the proposed bridge foundations is below the probed depth at borehole locations, a satisfactory rationale is required to support the design. Re-drilling of the site may be required to meet these design criteria.

The potential geotechnical issues at a bridge or culvert site may also involve consideration of the construction sequence and methods required to complete the project. If a culvert bore or push is to be undertaken, comments on tunnelling aspects of the project are required. If a deep fill is to be excavated to replace a culvert, consideration of where the excavated fill can be temporarily placed and the excavation cut-slopes is required. Stockpiling of excavated material on metastable valley slopes can be an issue and should be addressed in the geotechnical report.

Recommendations for quality assurance measures consistent with the scale of the project and requirements of the design methodology (limit states design geotechnical factor selection) should be provided. Various confirmatory and quality assurance tests are becoming practical and may be appropriate for the bridge foundations under study. Recommendations for Pile Driving Analysis (PDA), Osterberg, Statnamic, conventional pile load test and other methods should be provided in the geotechnical report.

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It is expected that the structural engineer will dialog with the geotechnical engineer on foundation and other geotechnical issues. The foundation design drawings should be reviewed by the geotechnical engineer to ensure that all geotechnical recommendations are being followed. Any deviations from the geotechnical recommendations should be documented, and rationale provided to support the deviation.

7.4.1 CORROSION SURVEY

Corrosion surveys may be required as stand-alone projects or as a component of a larger study. The following steps provide a recommended procedure for determination of the corrosive potential of the soil and water at a culvert site. Procedures for determination of time to first penetration for water-side and soil-side corrosion, and design of cathodic protection systems are not included in this section.

Procedures for field determination of pH and resistivity:

- a) Take the pH and resistivity values of the soil on the road side-slope on both sides of the road, and in the upstream and downstream banks.
- b) Take the pH and resistivity values of the water at the upstream and downstream ends.
- c) Check for the presence of sulphide, sulphates, and chlorides.

Sufficient testing to accurately establish the corrosive nature of the soil and water in which the culvert is to be located must be carried out, and the location and numbers of the readings (or samples) is to be at the discretion of the Consultant.

- d) If the existing structure is a metal culvert, take static potential readings between the soil and culvert at 3, 6, 9, and 12 o'clock positions at the upstream and downstream ends. Readings shall be taken using a copper - copper sulphate half cell or approved equivalent.

The Consultant may be required to undertake all the above tasks (a to d), or partial tasks. The site-specific requirements will be as directed by the Project Sponsor with input from the Consultant.

7.4.1.1 Reporting Requirements

- Provide a summary of all pH, resistivity, sulphide, sulphate, and chloride values obtained, together with the average values used for calculation purposes.
- Provide brief details of the testing methods used to obtain the values, and the significance of the results.

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7.4.1.2 Qualifications

A Corrosion Technologist with at least 3 years related experience is the minimum qualifications required for personnel responsible for gathering field data, testing, adjusting, and servicing cathodic protection systems etc.

A Professional Engineer who has specialized in corrosion engineering is the minimum qualification required for personnel responsible for preparing reports, interpreting data, providing recommendations, and designing cathodic protection systems, etc.

7.5 SOFT GROUND/MUSKEG

Muskeg investigations are usually undertaken as part of a grading project. Test pits using backhoe's, track mounted auger drilling, probing using muskeg probes, or other acceptable methods of investigating the depth and characteristics of soft soils and muskegs provide supplementary means of acquiring relevant subsurface information to assist in site evaluation and assessment.

On occasion, the Consultant may consider block sampling peat deposits and subsequent laboratory strength or consolidation testing. Owing to the difficulty and cost of this procedure, the Consultant should be prepared to justify the expenditure. In-situ vane shear testing can also be used for strength estimation.

The Consultant should identify any specific construction techniques required to build on muskeg or soft ground. In addition, the risk factors associated with construction and long term maintenance of the roadway over muskeg terrain should be identified. An engineering and cost/benefit analysis should justify recommendations for inclusion or removal of the muskeg or soft ground. Muskeg probe logs should be maintained and included in the report Appendix.

7.6 LANDSLIDE

Landslide investigations are typically a stand-alone project, however these types of investigations may also be undertaken as part of a grading design. The scope of the investigation can range from a site visit to more elaborate, costly drilling and monitoring programs. The project scope for landslide projects can be complex and time-critical. Consultants who work on these types of projects must be experienced geotechnical or geological engineers. It is recommended that senior personnel with relevant experience be assigned to oversee these projects.

A detailed air photo interpretation shall be included in all landslide projects, in addition to a thorough review of past site information and nearby sites located in similar geologic settings.

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A field visit by the Project Engineer is a prerequisite that must be completed prior to field drilling. Site observations should be well documented through photographs and plan view sketches annotated with field observations. The site may be actively failing such that several visits may be required for the Project Engineer to fully comprehend and appreciate the failure mode and scale of the project. A multi-staged investigation may be required, spanning several weeks or months, depending on the level of activity at the site and the consequences of failure of the slide. The landslide geotechnical assessment is to be completed in two phases: a preliminary assessment, and a detailed design.

At least two (2) feasible mitigative options shall be presented in the form of a preliminary landslide assessment. The preliminary assessment should include documentation of the investigation completed to date, the various soil parameters used, appropriate reference sources, relevant slope stability analysis results, and current instrumentation monitoring results. The preliminary reports should identify the risk factors at the landslide site, and the associated probability of occurrence and consequence of occurrence. Relative terms such as low, medium, or high may be used provided that these subjective terms are well defined. Lack of site information is considered to be a risk factor, and this should be identified in the preliminary report. Large true-scale (same scale on both axes) stratigraphic cross-sections shall be included with the preliminary assessment.

The Department will undertake a review of the preliminary options and direct the Consultant to continue to detailed design of one (1) approved option. Additional investigative, monitoring, and analysis requirements may be added after the Department reviews the preliminary assessment. Any changes to the original scope of work will be negotiated.

7.7 EXPANSIVE SOILS

Roadway embankments built on or with expansive soils are known to exhibit volumetric expansion (heave) or contraction (shrinkage) depending on the moisture content of the soil and confining stresses acting on the soil. Within embankments, heaves are often expressed at ground surface as wave-like irregularities, longitudinal cracking, localized deformations, and/or generalized (alligator) cracking. Localized heave of a subgrade at transverse crack locations has occurred in Alberta in areas of expansive soil and is a major concern to the Department. Repair or remedial options for these issues are generally expensive and disruptive to traffic. It is preferred to address the presence of these problematic soils during the investigation and design phase rather than during the operation phase of a road life-cycle.

At the investigation phase, the Consultant should determine the prevalence of soils with moderate to very high swelling potential within the construction area, including borrow locations. Lake bed clay deposits and other high plastic clay soils often possess significant swell and shrinkage potential and are common throughout Alberta.

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Several published correlations are available to predict swell potential; many are based on Atterberg limit parameters or soil activity. If required, the swelling potential of high plastic clays should be quantified through the use of advanced laboratory testing (e.g. one dimensional swell or settlement potential tests). Where a swelling potential is identified, consultants are directed to avoid the use of these soils as a road building material unless it can be demonstrated that no economically viable alternative exists, and the design and construction procedures are optimized to reduce the influence of soil expansion. Inclusion of swelling soils in embankment may be done with the inclusion of capillary breaks or with sufficient overburden confinement. Treatment with chemicals, such as lime, may reduce swelling potential. Strict compaction moisture content control (optimum to two percent wet of optimum) would be expected to be a minimum construction consideration. Compaction of moderate to very high swell potential soils at conditions dry of optimum shall not be permitted.

7.8 EROSION

The Department has developed two manuals (“Design Guidelines for Erosion and Sediment Control Guidelines for Highways” and “Field Guide for Erosion and Sediment Control for Highways”) to assist in the assessment and design of erosion control measures. The first manual addresses issues related to long-term or permanent erosion control. Primarily consultants use this manual. The second manual addresses issues related to short-term or construction related erosion and sediment control. This field manual is intended for use by contractors and consultant field personnel. It provides guidance for contractors in the development of ECO Plans and erosion control installation techniques.

The consultant should determine what types of erosion and sediment control measures are suited to each particular site. The most effective means of sediment control is erosion prevention; hence the design should be directed to prevention techniques, where these techniques can be shown to offer practical and economically competitive solutions. Innovative solutions are encouraged.

Typically there may be several alternative designs appropriate for a given erosion condition. The permanent erosion control requirements shall be designed using an engineering approach based on acceptable principles of open channel flow hydraulics and soil mechanics. At least two (2) feasible options should be prepared identifying pros and cons, relative costs, and associated risk factors for each option. The designs shall be supported by documentation of any design assumptions, soil and hydraulic parameters used in the analysis, method of analysis, and philosophy for selection of a given erosion control method. Erosion plans and sediment control related to wetlands and sensitive water bodies may require special design treatment stipulated by other agencies. Referrals to the appropriate agencies (e.g. Alberta Environmental Protection) shall be done at an early stage of the design.

7.9 ROCK

For projects where bedrock or boulders are encountered (e.g., shale, sandstone, rock boulders of size 0.5 cubic metres and greater, or a combination of these materials), a “rock investigation” shall be undertaken as part of the geotechnical investigation. This rock investigation is to be conducted through rock core drilling and/or test pitting. The percent recovery and Rock Quality Designation (RQD) of cored materials is to be reported. Strength tests are to be conducted to determine classification of rock in terms of the rock classification outlined in the “Canadian Foundation Engineering Manual”. Seismic or GPR techniques may be useful in determine the bedrock horizon and in estimating the shear velocity of the rock. Shear velocity can be correlated to rip-ability, as noted in various equipment supplier handbooks. At this time the Department recognizes the compressive strength and point load index tests to determine classification of rock materials for pay item purposes.

For grading projects, a rock investigation report is required as a separate document. This report shall contain a detailed description of the investigation, test results, photographs of cores, photographs of test pits, logs of stratigraphy, and quantity and classification of rock materials. In Section 2.3 of the “Standard Specification for Highway Construction”, rock materials are classified as either Rippable or Solid depending upon whether they can be ripped by a D9 size dozer. For payment purposes, the rock excavation is paid as common excavation (or borrow, etc.) plus an extra amount for “Rippable Rock Excavation – Premium” or “Solid Rock Excavation – Premium” as applicable. The rock investigation report shall provide quantity estimates to support design and tender documents.

7.10 BACKFILLING OF TEST HOLES AND RESTORATION OF TEST PITS

Test pits are considered to be large excavations. Test pits that are not properly restored may cause premature road distress. Deep excavations along the highway side slope or ditch may destabilize the embankment. For these reasons where test pits are to be advanced in an existing roadbed or along the embankment side-slope or along the ditch at the base of the highway embankment slope; a test pit plan containing the method of excavation and backfilling test pits is required for approval by the Project Sponsor.

Test holes are to be properly backfilled in accordance with the established practices of backfilling test holes. In areas with environmental sensitivity, holes may have to be backfilled with cement grout, or other approved materials, to avoid cross contamination of aquifer zones and migration of surface waters or run-off to lower aquifers. This is especially significant at bridge sites. Each site should be treated separately and the Consultant shall provide proposed methods for backfilling the test holes for approval by the Project Sponsor.

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If test holes are left open for a period of time, for the purposes of monitoring groundwater or sloughing conditions, provisions shall be made to temporarily cover and restrict access to the test hole and for permanent backfilling after the monitoring period is complete. The pavement or gravel surface is to be restored to its original condition after backfilling. Test holes that are not properly backfilled can cause injury to humans and livestock that can be a cause for litigation against the Consultant.

7.11 INSTRUMENTATION INSTALLATION AND MONITORING

Whenever instrumentation is required to monitor ground and groundwater conditions, an instrumentation installation and monitoring report must be prepared and submitted. A copy of the reduced monitoring data and analysis report must also be submitted to the Project Sponsor.

Instrumentation shall be protected from environmental hazards such as wildlife, recreational vehicles, construction traffic, maintenance vehicles, vandalism, etc. All installations should be well marked with adjacent tall lathe or sturdy posts, and labelled with permanent markings to identify the installation number, consultant and drill date. Provisions should be made to provide protective housings for instrument cables. In developed areas where vandalism is a concern, the use of locked metal protectors is recommended, especially in highly visible and well trafficked areas. Excess materials from the field program should be removed from the site and disposed of at approved dumpsites. It is unacceptable to dispose of any excess materials on site.

7.12 LABORATORY TESTING

Methods of undertaking laboratory testing and reporting for geotechnical purposes are outlined in ASTM and AASHTO standards with modifications for special non-standard requirements.

For grading projects, the standard laboratory testing 'suite' shall include:

- i) Visual description and classification according to Unified Soils Classification System as modified by the PFRA (ASTM D2487-98)
- ii) Field moisture content (ATT-15, Part I or IV as appropriate, or ASTM D2216)
- iii) Atterberg limits (AASHTO Designation T89 or T90 or ASTM D4318 Method A)
- iv) Washed sieve analysis, including the 5000, 1250, 315, 160, and 80 metric sieves (AASHTO Designation T88)

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The following information shall also be included in these tests and form part of the summary of test:

- i) Estimates of Standard Proctor maximum dry density and optimum moisture content based on the Department's tables (refer to the Department's Transportation Laboratory Test Procedures)
- ii) Plasticity Index and Liquidity Index

Field visual description and classification, and laboratory moisture content tests shall be conducted on all soils samples.

Additional testing may be required depending on the project requirements. Test methods for: triaxial; direct shear; consolidation; swell; dispersion; hydraulic conductivity; rock quality, durability and strength; and other advanced geotechnical testing shall follow applicable ASTM test methodologies.

7.13 GEOSYNTHETIC AND EROSION CONTROL MATERIALS

The need for geosynthetics and erosion control materials must be supported by an analysis and design. Specifications for geosynthetic materials shall reference material properties that are appropriate for the design use intended. The use of 'generic' or 'all-purpose' specifications is considered appropriate only when these specifications address the analysis and design requirements of the project. Where judgment is used in selecting materials, reasons must be provided to show the practical, as well as economic, benefits of such material usage.

7.14 BOREHOLE DATA REPORTING

Reporting of test hole logs shall be done through a geotechnical borehole database system, such as GCA gINT software (Geotechnical Computer Application), or an acceptable end product equivalent. A Department customized template for gINT is available (free of charge) on the gINT website. An electronic copy of all borehole logs shall be submitted to the Director, Geotechnical and Materials Section.

7.15 PRESENTATION OF SOILS AND ROCK INFORMATION ON MOSAICS

Soil descriptions on the mosaics are to consist of the principal soil types. Where rock or rock type materials are encountered, only the field visual descriptions must be shown on the mosaic logs with the corresponding graphic symbol. The results of the identified rock test will normally be made available to bidders.

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7.16 REPORTING REQUIREMENTS

Where applicable, geotechnical conceptual requirements for planning, design, construction, and maintenance shall be submitted for discussion and evaluation at an early stage of the project life cycle. Content requirements for geotechnical reports are outlined in Table A and preceding subsection.

The methods for field work, laboratory work, and preparation and submission of reports must be well defined and compatible with the overall design and synchronize with the project schedule. The geotechnical report must accompany the design when submitted for review. The grading or bridge design shall have the soils logs and the proposed erosion and sediment control schemes included. Refer to [Section 7.8](#) for reporting requirements for permanent erosion control measures. Depending on the nature of the project, some of this information may be needed at the concept engineering stage, if acceptance of concepts is required.

The Consultant shall provide two (2) copies of the report to the Project Sponsor, unless otherwise directed.

The final project report must include a section or sections on the geotechnical issues identified in the earlier design stages, and how these were treated during construction. Record drawings (in MicroStation format) must be provided and any variations of methods, etc., outlined. Comments, notes, and recommendation provided to the Project Sponsor should be included in the construction completion report.

7.16.1 DIFFERING SITE CONDITIONS (DSC) CLAUSES

Subsurface conditions are a result of natural geologic processes modified over time by natural events or the actions of man. Geotechnical investigations are undertaken to provide subsurface information to the designer and contractor. However, unanticipated ground conditions can and do occur. Contractors will be paid based on the terms of their contract. This may involve changes in compensation where unforeseen conditions are encountered. Nothing can completely remove the risk of encountering a differing site condition; however, the potential for costly disputes over what constitutes differing site conditions is greatly reduced through a well-defined geotechnical baseline. To this end, full disclosure of the geotechnical investigation report will be available to contractors at the tender stage and at the construction stage should the Contractor request it. The Consultant is therefore responsible for setting the geotechnical baseline through the accuracy and factual representations of their work and to the contract conditions and specifications developed through the recommendations contained in the report.

Geotechnical reports are composed of factual, interpreted, and qualified information. It is preferable to include all geotechnical information in the contract documents; however a stand alone geotechnical report can be referenced in the contract

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documents and made available at a prescribed time and location for inspection by the bidders. Factual information includes test hole logs, field and lab test results, and the like. Interpreted information represents the opinions of a qualified geotechnical engineer based on the factual information. This should describe the thought process that led to the design, specifications, and special provisions included on the plans and in the contract documents. Qualified information is factual information where the source of the data was not under direct control of the geotechnical design staff. Historical construction records, previous geotechnical reports, and the like are examples of qualified information.

There are two principle types of DSC claims. A Type I DSC refers to subsurface or latent physical conditions at the site, including surface conditions that differ materially from those indicated in the contract. Type I DSC is usually related to the factual information presented in the contract. A Type II DSC refers to unknown physical conditions at the site of an unusual nature differing from those ordinarily encountered and generally recognized as to be inherent in work of the character provided for in the contract. Type II DSC is usually related to the interpreted information presented in the contract. Both types of DSC can be greatly reduced through the establishment of a well defined geotechnical baseline with which to compare the encountered site conditions and the predicted or interpreted site conditions. To this end, the Consultant should be neither overly optimistic about site conditions nor overly pessimistic, but should rely on a rational and objective approach to interpretation of the site conditions.

Specific disclaimer clauses can be used as plan notes to define factual and interpreted information, particularly in the case of bridge and culvert projects. This is preferred to the inclusion of blanket or general disclaimer. An example of a specific clause might be: “The test hole logs for TH100 to TH110 are representative of the condition at the location where each boring was made but conditions may vary between test holes.” This note indicates that the Consultant has used proper drilling techniques to locate, drill and log the test holes shown on the plans and documents. Soil conditions encountered at the location of the test holes that differ materially from those stated on the logs form the basis of a Type I DSC. Soil conditions between boreholes that differ substantially from those noted at the test hole locations, or that could not have been reasonably interpreted from the drilling logs, or that are unknown in the region would form the basis of a Type II DSC.

SECTION 7 – GEOTECHNICAL CONSIDERATIONS

Current References for Section 7:

Below are references identified in this Section. Please see the Department website for a complete list of available documents.

American Association for State Highway and Transportation Officials (AASHTO) – Provisional Standards and Volume II Test, 1995, AASHTO

American Society for Testing Materials (ASTM) Specifications, 1996, ASTM

Canadian Foundation Engineering Manual, 4th Edition, 2006, Canadian Geotechnical Society

Canadian System of Soil Classification, 1987, Agriculture Canada

Design Guidelines for Erosion and Sediment Control for Highways, 2003, Alberta Transportation.

Field Guide for Erosion and Sediment Control for Highways, 2003, Alberta Transportation

Guidelines for Consulting Geotechnical Engineers and Technologists Assignments, May 1998, Alberta Transportation

Standard Specifications for Highway Construction, Current, Alberta Transportation

SECTION 8 - GEOMETRIC DESIGN

8.1 GENERAL

Before undertaking any geometric design, designers are to revisit any pertinent planning and Terms of Reference documents to examine basic assumptions, current design practices, concepts, staging plans, cost-effectiveness (based on life cycle costing methods), safety, preservation of design flexibility for the future, and other considerations. The designer shall ensure that all decisions related to the above are fully explored, discussed and agreed with the Project Sponsor before proceeding with geometric design.

The Consultant shall use the Department’s “Highway Geometric Design Guide” and Design Bulletins for all geometric design. The Consultant is responsible for all highway design activities including but not limited to:

- Grading and geometric design including horizontal and vertical alignment grade lines, passing lanes, climbing lanes, intersection geometric layout, interchange and roadside turnouts
- Establishment of cross-section elements, drainage design (including culverts, curb and gutter, storm sewers), fencing design, retaining walls, etc.
- Roadside facilities (refer to Chapter “F” of the “Highway Geometric Design Guide”)
- Access management (refer to Chapter “I” of the “Highway Geometric Design Guide”)
- Roadside design (refer to the Department’s “Roadside Design Guide”)
- Railway crossings (at-grade and grade separated)
- Coordination of utility relocations and preparation of crossing agreements
- Seeding
- Signing
- Guide posts (delineators)
- Pavement markings
- Preparation of the Grading Design Package (see [Section 8.1.1](#))
- Special First Nations Agreements (Special Provisions for contract, etc.) if required (see [Section 1.4.4](#))
- Optimization of stream and grade separation bridge crossings including geometrics, grading, bridge planning, and structural design considerations
- Pedestrian, cyclist, and pathway accommodation and geometrics in accordance with the “Roadside Design Guide” and TAC standards

A “Consultant Highway Grading/Surfacing Design Coordination Flow Diagram” is provided for guidance in [Appendix E](#).

SECTION 8 – GEOMETRIC DESIGN

The Consultant shall prepare a detailed computer aided design package for contract tendering. The Consultant shall use an appropriate and proven roadway design software package for geometric design, earthwork and quantity calculations, cross sectioning, and mass-haul diagrams. All work shall be done in accordance with applicable guidelines, standards, and specifications. Standard drawings shall be used wherever possible. For relatively simple projects, especially if the grading work will be tendered as a lump sum contract, a design produced manually (without the aid of computers) may be acceptable. Information submitted for tendering purposes must be in electronic format.

8.1.1 GRADING DESIGN PACKAGE

The Consultant shall prepare a grading design package which will provide all the necessary details for the grading component of the Tender Package (see [Section 11.1](#)). The grading design package includes the following detailed design work:

- Design Exceptions (documents, economic analysis, etc.)
- Grading Estimate Summary
NOTE: A grading estimate summary for each project is required for multiple project submission
- Summary of Estimated Grading Quantities
- Unit Price Analysis
- Intersection Analysis
- Bridge documentation (written instructions, sketch) with Estimate Sheet
- Design Review (Minutes of Review Meetings)
- Pavement Design cross-section
- Utility Crossing Agreements and Adjustment Estimate (including all applicable Approvals, licenses, permits)
- Geotechnical requirements
- Illumination requirements
- Signing requirements
- Fencing requirements
- Drainage and culvert requirements and drainage notes
- Notes to Consultant's Representative
- Applicable Special Provisions, Specification Amendments, and Supplemental Specifications
- Lists of Standard Drawings and Special Drawings
- One set of full size and one (1) set of reduced (11"x17") mosaic* plan-profile drawings, plans for intersection geometric layout, utility plans, overhaul diagram, and other special drawings (signed as required for tendering) in MicroStation format.
- Contract Location Map (Key Plan)

* Air photo mosaics as stipulated in [Appendix D](#) are required in PDF format for the full size (22"x34") drawings unless otherwise specified in the Terms of

Reference. The 11”x17” drawings (reduced sized mosaic plans) shall be submitted without the photo mosaic image.

8.2 ROADSIDE FACILITIES

The Consultant shall assess the need for roadside facilities such as roadside turnouts, vehicle inspection stations, historical turnouts, etc. Consultants should review the latest information in Design Bulletins as well as the design content in this regard. The work required may involve upgrading of existing facilities or construction of new facilities. The Consultant should first review the Terms of Reference and any relevant design or planning documents (Geometric Assessments, files, and reports) for direction on this subject. Planning Reports are available which identify the suggested spacing and approximate location of roadside turnouts on all divided highways and some undivided highways in the Province. Contact the Highway and Roadside Planning Section of Technical Standards Branch for more information. If there is no clear direction contained in these documents, the Consultant shall ask for direction from the Project Sponsor on the adequacy of existing facilities as well as the need and feasibility of constructing additional roadside facilities on the project and on adjacent segments of highway. The general guidelines regarding spacing of roadside facilities contained in Chapter F of the “Highway Geometric Design Guide”, together with a review of on-site conditions, may be used to gauge the need for new or improved roadside facilities. Any additional roadside facilities that are considered desirable or necessary should be brought to the attention of the Project Sponsor for concurrence before proceeding with right-of-way purchases, survey or detailed design.

8.3 INTERSECTION DESIGN

The Consultant shall prepare intersectional analysis using traffic volumes, turning movement diagrams, and collision history which can be obtained from the Department. The Consultant shall also review with the Department Project Sponsor prior to finalizing the intersection design. Guidelines regarding intersection design can be found in the Chapter D of the “Highway Geometric Design Guide”.

8.4 RIGHT-OF-WAY AND BORROW

The Consultant shall assess the need for right-of-way or borrow based on design information and basic right-of-way requirements. The Consultant shall, as required, prepare plans for right-of-way purchase, and Borrow Agreements to obtain final agreements between the Department and landowners. See [Section 3](#) for more detail.

SECTION 8 – GEOMETRIC DESIGN

8.5 ROADSIDE DESIGN (Clear Zone, Mitigation of Hazards, Barrier Protection, etc.)

On new construction projects the Consultant shall evaluate the traffic volume, traffic speed, highway function, terrain type, and typical hazards and develop an appropriate strategy for clear zone, mitigation of hazards, and barrier protection for the project. The design of guardrail at the edge of the finished road surface shall be minimized through the use of flatter side slopes and berms to either eliminate or offset the guardrail. Recommended fill heights and side-slopes shall be used to reduce the extent of guardrail installation. On existing highways, the Consultant shall carry out all necessary survey, inspection, and evaluation of existing traffic barriers. Efforts shall be made to eliminate the need for traffic barriers wherever possible by reducing the severity of hazards, relocating fixed objects outside of the clear zone and side-slope improvement. When assessing the need for traffic barriers, all scenarios shall be examined to achieve the best possible engineering solution to minimize risks and cost to road users, the Department, etc. In some cases, the preferred solution may involve no protection being used. Where it has been decided that existing barrier shall be retained/replaced, the condition of the various components should be assessed for possible replacement. Wood components will generally need replacement when they have rotted, cracked, or become weakened due to age or weathering.

Where necessary, barrier installations shall be designed with locations shown on the roadway design plans. The “Roadside Design Guide” shall be used as a guide for the choice of barrier system type. Where more than one barrier system is suitable for a project, the Department normally prefers the more forgiving type (i.e. the one expected to produce less severe collisions). Therefore flexible systems (such as high tension cable barrier) are preferred over semi-rigid systems (such as the strong post W-beam) which are in turn preferred over rigid systems (such as concrete barriers). The choice shall be suitable for the highway type and AADT. Similarly, the types of end treatments to be used shall be in accordance with the “Roadside Design Guide”. Bridge rails and approach guardrail transitions shall meet requirements of the “Bridge Structures Design Criteria”.

8.6 RAILWAY CROSSINGS

The Consultant shall produce design plans for each railway crossing that is created or modified as a result of the highway improvement project.

The design submission package for each crossing shall include, in addition to the crossing design plan, the required Environmental Screening Report, a road and railway traffic estimate, and all other documentation required for an application for approval to carry out the proposed work. In some cases, commitments related to cost sharing and maintenance distribution will be involved. As the approval process may take up to 18 months to complete, the Consultant shall complete this phase of the project as early as possible.

Consultants doing this work shall make themselves familiar with Railway Crossing Cost-Sharing arrangements and historical agreements. Refer to the “Road/Railway Grade Crossing Guidelines” for more information.

8.6.1 AT-GRADE CROSSINGS

The Consultant shall refer to the engineering assessment that is normally completed prior to design. Refer to [Section 5.2.4](#) in conjunction with the “Road/Railway Grade Crossing Guidelines” for more details on the at-grade crossing agreement procedures and engineering and safety standards.

8.6.2 GRADE SEPARATED CROSSINGS

In addition to the review of the assessment and recommendation mentioned in Section 8.6.1 the Consultant shall undertake the following tasks:

- Bridge assessment
- Bridge planning and DD Drawings
- Evaluation of repair options
- Advisement of adjacent landowners with respect to safety issues
- EARP (Environmental Assessment Review Process) when applicable
- Completion of the structural design, construction drawings, contract documents, and construction inspections in accordance with [Section 10](#).

8.7 UTILITIES

8.7.1 GENERAL

“Utilities” shall mean all power, telecommunications, pipelines, and/or other cables or lines facilitating a utility system, including Department owned utilities (street lighting system).

Wherever possible and available, the Consultant shall contact the Department to obtain the as-built drawings of Department owned utilities. These drawings shall be included as part of the tender document.

The Consultant shall locate all utilities and prepare plans showing the relocation or adjustments required and shall begin making arrangements to have the work performed whenever possible.

The Consultant shall determine the impact to all utilities (including anchoring) affected by the proposed work. This shall include utility protection, relocations, and soil stability (stability of the soil beneath existing pipelines and back-slope cut

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stability should all be considered). These impacts shall be conveyed to and coordinated with the Utility Companies.

The Consultant shall determine, in conjunction with Utility Companies, the most economical and practical method of utility relocation and/or adjustment by investigating all possible options such as:

- i) Revision of alignment
- ii) Highway grade-line adjustment
- iii) Concrete slab pipeline protection
- iv) Installation of pipe casing
- v) Lowering and replacing of pipeline with thick walled pipe
- vi) Relocation of the pipeline, power, and telecommunication lines
- vii) Thermal protection (water pipelines)
- viii) Providing sufficient earth cover (i.e. ditch blocks)
- ix) Other recommendations

The Consultant shall search for utilities in proposed borrow locations and avoid locating such borrows where there is a big impact on buried pipelines, if possible.

In general, borrows shall be located to avoid an impact on buried utilities. Borrow pit haul roads may need to cross such buried lines. If this is the case, reference must be made for such a crossing in the contract special provisions and a temporary crossing agreement must be obtained from the utility companies by the Contractor.

Projects involving utilities relocation or adjustment work require ‘As-Constructed’ drawings upon completion of the work. These drawings shall be prepared by the Consultant and submitted to the Department as part of the Final Details.

It is the Department’s desire to have all utility relocations completed prior to commencement of the road Contractor’s work. In some cases, the relocation of utility work can be done a year ahead. The Consultant should contact the Project Sponsor to ensure funding is available. The approval for such construction is required from the Department.

When a pipeline relocation or adjustment work is completed prior to the construction of the roadway or bridge, the Consultant shall prepare and provide an ‘As-Constructed’ pipeline crossing plan to the Contractor. This plan shall indicate the exact horizontal location of the pipeline in relation to the station and offset and the vertical elevation of the pipeline in relation to the roadway centerline pavement elevation.

When utilities adjustment/construction work is considered along the highway in the vicinity where the road construction will be undertaken at the same time, the Utility Company shall be advised to contact and liaise with the Department’s Consultant to avoid potential problems with the road construction work. The Consultant shall obtain

information such as detailed plans/drawings, traffic accommodation, and construction schedule from the Utility Company and coordinate all the information with the highway Contractor.

The Consultant shall monitor Utility Companies' operations for compliance with the Department's latest version of the "Traffic Accommodation in Work Zones" manual.

The Consultant shall include Utility Companies contact names and emergency telephone numbers in the special provisions and forward the final drawing(s) to the respective Utility Companies.

8.7.2 COORDINATION

The Consultant shall coordinate with all Utility Companies at the following milestone dates of the design, tender, and construction process:

- i) Detailed Design (mid-design stage): The Consultant shall provide updated mosaic plans, utility crossing plans with the existing utilities shown on them, and a letter of confirmation from the Consultant to authorize Utility Companies to proceed with the work. For simpler projects, such as intersectional improvements, intersection plans with hand-sketched locations of the utilities will be sufficient. All plans at this stage should be marked "Preliminary". This shall be completed as early as possible, to provide the Utility Companies enough lead time for preparing adjustments to the design. It is recommended that the Consultant hold interim coordination meetings as required to discuss the on-going design with the Utility Companies. The Consultant should request the Utility Companies to commence their adjustment design and their preparation of estimated costs at this time.
- ii) Final Design: The Consultant shall submit design drawings, utility crossing plans, and copies of the agreements for final design review to all affected Utility Companies. At this stage, the Consultant shall finalize the utility adjustment costs by requesting the final costs in writing from the Utility Companies. This shall be done a minimum of two (2) weeks prior to the Final Design Review Meeting. (See [Appendix H](#) for sample agreements and letters)
- iii) Final Design Review Meeting: The Consultant may invite all Utility Companies to the Final Design Review Meeting. All design concerns and costs associated with the utilities shall be finalized at this stage. A letter of confirmation is requested by the Consultant and provided by Utility Companies indicating the final costs, the cost sharing arrangement with the Department, and the starting and completion dates.

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- iv) **Signing of Crossing Agreements:** The Consultant shall get all agreements signed, with agreed costs, within the Department's right-of-way, the Department standard crossing agreement shall be used (See [Appendix H](#)). As-built/Record drawings from the Department are available prior to tendering (one month in advance of tendering). The as-built drawings shall be included in the contract documents.
- v) The Consultant should provide a table listing all the utilities within the limits of the project. This table will be provided in the Special Provision as part of the tender document. An example is given as below:

Station to Station	Angle to Centerline	Offset	Utility Name	Product or Voltage	Comments
10+000	45 degrees LH fwd		ATCO Pipelines	High Pressure Natural Gas	Xing Agreement # APL 31313
5+000 to 15+750	Parallel - Eastside	23.0 Rt	Fortis	500 KV power line	
7+500	30 degrees RH fwd		Star Gas	Sour Gas	
1+000 to 21+000	Parallel - Westside	11.3 Lt	TELUS	400 pair phone line	To be Abandoned

- vi) **Tender Advertising:** The Consultant shall inform all Utility Companies affected by the work about the tender advertising date and the tender opening date. This shall be done in writing.
- vii) **Pre-Tender Meeting (Optional):** If a pre-tender meeting is held, the Consultant may consider inviting the Utility Companies depending on the nature of the meeting and the level of impact the utilities are to the project.
- viii) **Construction Schedule:** Once the successful Contractor's schedule is provided to the Consultant he shall provide this schedule to all Utility Companies affected by the work. At this stage, a letter should be sent by the Consultant to the Contractor with a copy to the Utility Company indicating that the Contractor is responsible for all utility coordination henceforth.
- ix) **Pre-Construction Meeting:** The Consultant may invite all Utility Companies to the main Pre-Construction meeting to coordinate the Contractor's interaction with the Utility Companies. The meeting chaired by the Consultant with the Utility Companies and the Contractor can be held separately from the main Pre-Construction meeting.

8.7.3 UTILITY EASEMENTS AND CLEARING

The Consultant shall review the need for Utility easements along the project with the Utility Companies and provide this information to the Department's Land Agent (internal or external). The Consultant shall also advise Utility Companies that additional easements are required. The Department Land Agent will not negotiate for

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any easements on behalf of Utility Companies, but may advise the land owners so the land owners clearly understand the impact to their land.

The Consultant shall provide the name and telephone number of the Department's Land Agent to all Utility Companies. It is recommended that the Utility Companies should negotiate easements with the land owners at the same time as Department.

Utility Company can contact the land owner separately to obtain their own easements.

The Consultant shall coordinate with the Utility Companies to determine the need and timing for clearing within the right-of-way and easements (existing and/or proposed). The Consultant shall consider the following options:

- Clearing to be completed as per the Department's construction contract (standard practice). If timing is a concern, the Consultant may, if permitted by the Project Sponsor, specify an earlier completion date for the clearing in the Tender document
- The Utility Company provides their own clearing for their utility relocation unless otherwise specified
- A separate Department contract is prepared for clearing the right-of-way and easements
- The Utility Company clears the highway right-of-way and their easements under their own contract. The Utility Company's contract must contain the same level of clearing and timber salvage specifications as in a Department contract

When applicable, the Consultant shall discuss these options with the Project Sponsor, and the Project Sponsor shall make the decision on which option is to be used.

The cost for the highway right-of-way clearing typically will be paid by the Department. The cost for the utility easement clearing will normally be paid by the Utility Company except as specified below.

When utility easements from land owners are obtained and registered by the Utility Company before arrival of the Department's clearing Contractor, the Department will clear any proposed easements by the Utility Company at the Department's cost. The Utility Companies must notify this to the Consultant in writing. Failure to do so will result in the cost of clearing the proposed utility easements remaining with the responsibility of the Utility Companies.

When there is no existing easement, or the existing easement is not cleared, the Department will not pay for clearing in any old or new easements.

8.7.4 CROSSING ADJUSTMENT AGREEMENTS

The Consultant shall first check with the Project Sponsor to see if any historical agreements and permits for utility work exist and to review the approval condition(s) of a particular utility installation. Older “Utility Construction” agreements (which may only be useful for new alignments) are stored in the Semi-Active Records Centre at the Twin Atria Building. Utility crossing agreements stored in the Semi-Active Records Centre may be accessed by reference to the legal land description at the crossing location. Request for Corporate Bridge Information form and Historical Agreements/Permits District Contact Persons list may be obtained from the Senior Utilities Engineer, Technical Standards Branch.

The following are the current general practices which apply to cost responsibility for utility relocations/adjustments:

- Power lines - Those within the right-of-way are adjusted/ relocated at the Utility Company’s cost. Distribution lines (less than 69kv) anywhere outside the right-of-way are relocated at the Department’s cost. Transmission lines (greater than 69kv) within 30 metres of the right-of-way (particularly paralleling lines) may have a condition requiring the Department’s approval but the Utility Company is responsible for the relocation costs. The Department has a master agreement with ATCO Electric and Fortis for the placement of their lines within primary highway rights-of-way.
- Existing lighting located along three digit provincial highways – While working with three digit provincial highways which were previously under the Municipalities’ jurisdiction, Consultants should check with Municipalities for copies of permits and agreements. The Department will honour these agreements signed by the Municipalities until they expire.
- Telecommunication lines - Those within the right-of-way (ROW) are adjusted/ relocated at Utilities Companies’ cost. Those outside the right-of-way are adjusted/ relocated at the Department’s expense. The Department has a master agreement with TELUS and AltaLink dealing with their lines within primary highway right-of-way. There are and will likely be more agreements with other telecommunication companies such as Shaw Cable, Total Telecom, etc.
- Pipelines governed by the Pipeline Act (major oil and gas lines) - For these types of crossings, generally the Department pays for adjustments and relocations outside the Department right-of-way. Those within the Department’s right-of-way are adjusted/relocated at the Pipeline Company’s cost.
- Lines which run parallel highways are normally positioned (by practice) at a minimum offset of 30 metres outside of the right-of-way boundary (any line offset at 30 metres or greater from the right-of-way boundary does not require the

Department's approval). Where there are cases of these pipelines paralleling a highway within 30 metres outside the right-of-way, the Department's approval may have included a condition that the company pays for future adjustments or relocations. It is very rare that these lines will be found paralleling the highway within the right-of-way. If this is the case, it is very likely that an agreement or condition of approval exists, making the Utility Company responsible for any adjustments/relocations.

- Pipelines governed by the Public Highways Development Act (water, sewer, low-pressure gas) - Any of these lines located within 30 metres outside the highway right-of-way require the Department's approval. Generally, lines within the highway right-of-way paralleling the roadway are adjusted or relocated at the cost of the Utility Company. There may be permit/approval condition(s) applied to a paralleling line within 30 metres outside the right-of-way requiring the owner to adjust/relocate the line at his own cost. For many gas cooperatives, if not all, there are agreements in place which deal with relocation/adjustment costs.

If, prior to the construction of a new pipeline crossing, the Department issues a permit and specifies that the crossing be at a particular depth and/or location, the Company must meet these specifications. If the Utility Company chooses not to meet these specifications and elects to construct the new pipeline crossing, to current minimum standards, as set out in the Energy Resources Conservation Board Act and subsequent relocation is required by the Department, the relocation will be at the sole cost of the Utility Company.

In the case where the road right-of-way within the crossing area, is widened as requested by the Department, beyond the width defined in the permit as required for the improvement of the road, the cost to adjust or lower, or relocate that portion of the pipeline within the added right-of-way will be borne by the Department. The portion of the pipeline within the Department's original (the existing) right-of-way will be borne by the Pipeline Company unless there is a governing cost sharing agreement.

Prior to submitting for Department's approval, the Consultant shall finalize and sign utility plans/drawings based on negotiations and crossing agreements with the Utility Companies.

The Consultant shall use standard Department crossing agreements. Examples of typical agreements to be used for adjustments to telecommunications, power, pipeline utilities, and railway crossing material cost are shown in [Appendix H](#) or the "Alberta Transportation Utility Guidance Manual". Any cost implications are to be attached to the agreements. The Project Sponsor will be a signatory in all crossing agreements and cost apportionment as per the Department policy.

All agreements shall be in place prior to tendering (one month in advance of tendering).

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8.7.5 UTILITY AGREEMENTS

Within the Department’s right-of-way, a Standard Crossing Agreement shall be used. The Utility Agreement shall also include the following:

- The Utility Company must implement traffic accommodation procedures in accordance with the Department’s typical standards outlined in the latest version of “Traffic Accommodation in Work Zones” manual when working inside the highway right-of-way
- The Consultant’s role and responsibility to deal with utility construction is outlined in the latest version of “Traffic Accommodation in Work Zones” manual

8.7.6 UTILITY SPECIAL PROVISIONS

The Consultant shall prepare utility special provisions based on the above negotiations and agreements. See [Section 11.1.4](#) for more information on accessing an up-to-date version of the standard Special Provisions.

8.8 SEEDING

The Consultant shall prepare seeding and fertilizer requirements for disturbed areas. See [Section 11.1.4](#) for more information on accessing an up-to-date version of the standard Special Provisions.

8.9 SIGNING

The Consultant is responsible for preparing an inventory of existing permanent signs (which will identify signs, posts, etc. that may be reused) and produce a plan of all permanent signs required for the project. The tender documents for a project will need to show the number of “remove and re-install” as well as the number of “supply and install” signs. Standard signing plans may be used in some cases, for example for standard intersection treatments or for climbing/passing lanes (see the “Traffic Control Standards Manual”). Customized plans shall be prepared whenever the standard plans do not show the necessary detail. The plan shall include any signing off the site which is required as a consequence of the project. Approval of the Project Sponsor is required for customized signing plans.

A best practice guideline for the selection of sign materials is available on the Department’s website.

If identified by the Project Sponsor in the Terms of Reference, the above plans may be used for bidding purposes on a lump sum basis (rather than the conventional payment per sign method).

A detailed schedule of all signing requirements must be prepared and made available at the tendering stage if a lump sum bid is used. A Special Provision may be used to modify the payment method.

8.9.1 PRIVATELY OWNED SIGNS

The Consultant shall be aware that the Department has several sign programs available to private facilities and businesses along highways. The Department leases or assigns space in the highway right-of-way for placement of these signs, and the private sign owners are responsible for the installation and maintenance of their own signs. Any adjustment to these private signs, such as removal and reinstallation during construction, are the private sign owners' responsibility. Examples of privately owned signs include Community Business Signs, Sponsorship Signs, Brown Facility Signs, etc.

The Consultant shall prepare a list of existing private signs requiring adjustment along the highway, including the sign owners' contact information. The Consultant shall obtain the ownership information and existing lease agreements for the privately owned signs from the appropriate Department Regional Offices. The Consultant shall include Special Provisions in the tender document outlining the Contractor's responsibility for arranging sign adjustments with sign owners prior to construction activities. These privately owned signs are excluded from the bid item schedule, as the Department will not compensate the Contractor for removal and installation of private signs.

8.10 GUIDEPOSTS (DELINEATORS)

Delineators shall be designed as per the design guidelines contained in Section C7 of the "Highway Pavement Marking Guide" and "Traffic Accommodation in Work Zones" manual. These guides provide warrants, recommended spacing, and installation details for delineators.

8.11 PAVEMENT MARKINGS (COMBINED GRADING/ SURFACING PROJECTS AND SURFACING PROJECTS)

The pavement marking requirements for all intersections, interchanges, passing lanes, rest areas, vehicle inspection stations, auxiliary lanes, and similar highway features shall be shown. This may be done through the use of standard plans where applicable

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(see the “Alberta Highway Pavement Marking Guide”) or through the use of customized plans for the project.

The Consultant shall identify pavement markings (including pavement messages) required for school zones, railway crossings, R.C.M.P. aircraft patrol zones, stop lines, etc., where these are required on the project.

If identified by the Project Sponsor in the project Terms of Reference, the above plans may be used for tendering purposes on a lump sum basis (rather than the conventional payment by quantity method).

8.11.1 LANE WIDTHS (PAINTING)

Because lane width standards have changed over the years, there is a need to follow a consistent practice to implement the current standards. The current practice for painting lane widths on rural and urban roadways is as follows:

1. Normal maintenance involves repainting lines in the same location as the existing lines. This avoids the problem of having two lines visible.
2. When projects come up for construction or pavement rehabilitation, lane widths are painted as per the current geometric design standards. This includes all types of construction contracts (e.g. new construction, grade widening, overlay, seal-coat, etc.). After the roadway has been built to the current metric standards, periodic repainting will preserve the standard lane width.

8.12 RUMBLE STRIPS

Rumble strips will normally be installed in regular highway projects whenever a new paved surface is constructed.

Guidelines for placement (utilization) of rumble strips on shoulders, centerlines, and at stop conditions are available from the Technical Standards Branch. These guidelines/practices have been developed based on experience and take into consideration accommodation of cyclists, mitigation of noise near residences, collision experience at intersections and on curves, and other factors. These guidelines/practices are shown on the relevant standard drawings.

8.13 HIGHWAY ILLUMINATION (LIGHTING)

The Consultant shall prepare plans identifying all existing highway illumination systems which will require modification, expansion, or replacement on the project,

and recommend new lighting installations which may be required as a result of the highway construction or improvement.

Consultants shall be aware that:

- Lighting design shall be the Consultant’s responsibility (the electrical utility company may provide design input and advice) and shall be included in the Tender Package
- Each lighting installation is the subject of an agreement with the Department
- Where additions or alterations to existing lighting arrangements are proposed, the Consultant shall research the ownership and operating conditions pertaining to the existing installation
- Because of time requirements, it is necessary that lighting needs be identified early in the project design to allow for discussion/concurrence with the Project Sponsor, detailed design, review, and co-ordination with electrical utility companies
- The Consultant shall prepare a draft agreement to be signed by the electrical utility company and the Department, detailing the capital and operating costs and any proposed cost sharing arrangement

Warrants and Operating Guidelines for Highway Lighting should be referenced from the “Guide for Design of Roadway Lighting”.

8.14 TRAFFIC CONTROL SIGNALS

The Consultant shall produce a plan for each traffic control signal and/or pedestrian crosswalk signal that may be required on the project. The plan shall include all details of the signals, signs, markings, roadway geometrics, and ancillary features.

The warrant for traffic control signals will normally be 80 percent of the traffic and safety warrant contained in the “Manual of Uniform Traffic Control Devices for Canada”. As signal installations are normally subject to internal Departmental review and approval, the Consultant shall identify potential signal requirements prior to undertaking the actual design.

8.15 INDEPENDENT DESIGN CHECK

The Consultant shall carry out a complete check of the design and drawings (stamped and signed) using an engineer other than the individual responsible for the design.

SECTION 8 – GEOMETRIC DESIGN

8.16 FINAL DESIGN REVIEW

If required, a final design review meeting will be organized and attended by the Consultant, Project Sponsor, and representatives of other concerned branches of the Department. The Consultant will select the time and place for the meeting (after consultation with the Project Sponsor), will establish an agenda and shall act as chairperson at the meeting.

Assuming that all significant design decisions have been made at this point, this meeting should concentrate on reviewing the final design, confirming that all necessary changes have been made, finalizing, and packaging the design (including the drawings) for submission. Specification shells, Special Provision requirements, etc., should be checked and tender schedule and design submission date confirmed.

8.17 COST SUMMARY

Where the “C” estimate for the project exceeds the approved funding (“B” Estimate) by more than 20 percent, the Consultant shall provide written reasons for the increase in estimated cost.

8.18 REPORTING REQUIREMENTS

The Consultant shall deliver the final roadway design to the Project Sponsor for review no later than two (2) weeks before the date scheduled for delivery of the final tender package. See [Section 11.1.7](#) for information on timing for submission of the finalized Contract Tender Package.

The **final roadway design package** shall include both electronic and hard copy of the tender documents, and an electronic copy and set of blueprints of the plans. Documents and plans required for record purposes are listed under Roadway Design in [Appendix K](#). The Roadway Tender Package requirements are included in [Section 11.1](#).

Current References for Section 8:

Below are references identified in this Section. Please see the Department website for a complete list of available documents.

Alberta Transportation Utility Guidance Manual, 2001, Alberta Transportation

Bridge Structures Design Criteria, Current, Alberta Transportation

Guide for Design of Roadway Lighting, 1983, TAC

Highway Geometric Design Guide, 1999, Alberta Transportation

Highway Pavement Marking Guide, 2003, Alberta Transportation

Manual of Uniform Traffic Control Devices for Canada, 1996, TAC

Road/Railway Grade Crossing Guidelines, 1997, Alberta Transportation

Roadside Design Guide, 2007, Alberta Transportation

Traffic Accommodation in Work Zones, 2008, Alberta Transportation

Traffic Control Standards Manual, 1995, Alberta Transportation

SECTION 8 – GEOMETRIC DESIGN

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SECTION 9 - SURFACING DESIGN

9.1 GENERAL

This section deals with the detailed design, quantity estimates, and related requirements for all projects with a surfacing component. Other items identified under Section 5 through 8 must also be addressed, as required, to provide a complete design/tender package.

Surfacing includes:

- First course gravel for grading projects
- Base and paving (either first or full stage placement)
- Final paving
- Portland cement concrete pavement
- Pavement rehabilitation
- Surface treatments (seal coats or micro-surfacing)
- In-place recycling (CIR, HIR, FDR)

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.

- Plans
- Pavement markings (see [Section 8.11](#))

The Surfacing Design and Tender Package (see [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).

SECTION 9 – SURFACING DESIGN

9.2.1 SURFACING STRATEGY AND BASIC STRUCTURAL DESIGN

The Department's design practices and philosophies for pavement design are outlined in the following:

- “Pavement Design Manual”
- “Guidelines for Assessing Pavement Preservation Treatments and Strategies”
- “Alberta Infrastructure Guidelines for Assessment, Rating and Prioritization of Pavements for Seal Coat”
- Various Design Bulletins

The Consultant shall adhere to the Preliminary Surfacing Strategy as prepared by the Regional Consultant (see [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 levelling, repair of failed areas, additional ACP quantities for cross-fall/ super-elevation 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, Technical Standards Branch. Examples where the original assessment or surfacing strategy should be revisited include:

- Stale or outdated designs (i.e. 5 years or older)
- Changed traffic patterns resulting in increased or decreased traffic volumes or loadings
- Revised mix types or material selection criteria
- Significant deterioration of roadway since completion of the original assessment or surfacing strategy
- New elements added that were not included in the original assessment such as climbing lanes, intersection improvements, park/approach roads, etc.

Prior to undertaking new assessments or surfacing strategies the Consultant should seek guidance from the project sponsor and applicable Department specialist.

For projects where a Preliminary Surfacing Strategy is not available and is not to be completed by the Regional Consultant, the Consultant shall undertake the necessary structural design following the above design procedures and practices or procedures as directed in the Terms of Reference. A draft surfacing strategy shall be submitted to the Project Sponsor and the Surfacing Standards Specialist for acceptance. After revisions, if required, the final copy shall also be submitted.

9.2.1.1 Pavement and 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.

For projects involving in-place recycling of pavement materials (Hot or Cold-In-Place Recycling or Full Depth Reclamation) the following information is typically collected and included within the tender submission:

- Pavement cross-section diagrams indicating the material types, thicknesses, widths, and year of construction. These are usually contained within the Preliminary Surfacing Strategy.
- Where available, historical quality assurance test results for the asphalt concrete pavement materials can be obtained from the Surface Engineering and Aggregate section. This information is to be summarized in regards to average lift thickness, asphalt content, aggregate gradation, and percentage of RAP additives (where applicable).
- The use of ground penetrating radar (GPR), or other methods, may be required for Full Depth Reclamation projects where the depths of the surfacing materials may be variable or are in doubt.

If historical quality assurance test results and/or layer thickness data are not available, or there is doubt in the type or quality of the granular base materials, additional pavement sampling and laboratory testing may be required. Test data to be collected includes:

- Pavement material types and layer thicknesses
- Aggregate gradation analysis of asphalt and granular layers
- Two face fracture count of aggregate materials
- Atterberg limits for the fines component of granular base or subbase materials
- Asphalt content of asphalt bound layers
- Rheology testing of recovered asphalt cement (hot in-place recycling only)
- GPR (possible procedure to provide plots on layer thickness)

General sampling frequencies should be in accordance with Transportation Laboratory test procedure TLT 300 Recycling Asphalt Concrete Pavement.

Test data is to be tabulated and included within the tender documents. Mix designs for in-place recycling is the Contractor's responsibility and not normally performed by the Consultant.

SECTION 9 – SURFACING DESIGN

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, side-slope improvements, super-elevation corrections, horizontal and vertical alignment improvements, railway crossings, guardrail design, culverts, and treatment on bridge decks and 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. Coordination of the aggregate supply conditions shall be in accordance with [Section 9.3](#).

9.2.5 ASPHALT MIX TYPE AND BINDER SELECTION

Asphalt mix type and binder selection shall be as described in the Pavement Design Manual and associated Design Bulletins. Asphalt binders and mix types are generally provided as part of the Preliminary Surfacing Strategy; however, when not provided, the Consultant shall select, specify, and quantify all ACP mix types and binder materials.

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](#). Note that for estimating purposes, a factor of 2.33 t/m³ is used for converting compacted granular and asphalt material quantities to tonnes.

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](#).

The Consultant shall discuss with the local Maintenance Contract Inspector or Project Sponsor if there is a need to include the bid item “Asphalt Mix for Others”.

Where applicable, the Consultant shall also include bid item descriptions and cost estimates for:

- Roadway and intersection line painting
- “Milled” rumble strips on shoulders, at centre-lines, or at stop locations
- Side sloping
- Guardrail (removals and installations) signing
- 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.

SECTION 9 – SURFACING DESIGN

9.2.10 REPORTING REQUIREMENTS

The Consultant shall deliver the complete Surfacing Design Package to the Project Sponsor for review no later than two (2) weeks before the date scheduled for delivery of the final tender package. See [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

These guidelines cover the consultant responsibilities related to Specification 5.2 Supply of Aggregate and to a lesser extent, Specification 3.2 Aggregate Production and Stockpiling in the “Standard Specifications for Highway Construction”. A description of the various categories of aggregate sources is provided in Section 5.2.2 of Specification 5.2. The two main categories are:

- Aggregate sources controlled by the Department
- Aggregate sources not controlled by the Department

Each category is further sub-divided based upon “legal status” (Department owned or controlled source, crown source, or private source). The Consultant must be familiar with the specifications and tendering/payment practices regarding Supply of Aggregate including the legal status of any sources being offered to, or that has been selected, by the Contractor.

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. In some cases the Contractor is required to use a specified source controlled by the Department (Designated Source) for all or a portion of the project.

The Department’s policy regarding aggregate management at the construction and post-construction stage 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 Summary Request form shall be obtained from the Regional Aggregate Coordinator.

The Aggregate Data Summary Request ([Appendix G](#)) 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 (6) 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 Data Summary Request, and convert the data for inclusion into the tender documents.

For projects where the tender date is unknown, or the pit is currently unavailable, the Department may advise that the plans and special provisions will be provided closer to the tender date.

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.

Additionally, any time the Consultant is required to update the “C” Estimate prior to the tender, the Regional Aggregates Coordinator shall be contacted to ensure the aggregates information is still relevant.

9.3.1.3 Payment for Supply of Aggregate

Payment for the supply of aggregate will be made to the Contractor through a separate Supply of Aggregate bid item which is only paid for aggregate obtained from sources not controlled by the Department. The Supply of Aggregate bid items are:

- Supply of Aggregate – With Option. The Contractor is allowed to use one or more specified sources controlled by the Department, or may use his own source(s). The Supply of Aggregate value is expressed in \$/tonne and its unit rate value is determined by the Department and reported to the Consultant on completed Aggregate Data Summary Request.
- Designated Source. No Supply of Aggregate bid item is required.
- Supply of Aggregate – No Option. The Department does not offer a source and the Contractor selects the unit rate value to be used.

During construction, an adjustment to the Supply of Aggregate unit rate is made for material obtained from crown sources not controlled by the Department as outlined in Specification 5.2 of the “Standard Specifications for Highway Construction”.

At the conclusion of the project, the Contractor may request a letter confirming the quantity of aggregate incorporated into the work in order to apply for a royalty exemption from Sustainable Resource Development.

SECTION 9 – SURFACING DESIGN

The request shall be processed when there is a bid item in the contract. For lump sum bid items where quantities are not available or tracked by the consultant, the Contractor must provide additional information to justify their request. A letter may not be provided if the Department is not satisfied with how quantities were tracked.

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 Regional Aggregates Coordinator shall assess the need for pit reclamation on each project, as well as whether a Department controlled source is offered as an option. The Special Provisions of the tender shall be revised 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 Special Provisions, 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 to ensure all issues listed on the Aggregate Source Summary Request have been addressed. 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 "Standard Specifications for Highway Construction". The Code of Practice for pit or Reservation conditions is not included in the tender.

9.3.1.6 Tender Package Requirements for Aggregates

Based on the information provided in the Aggregate Data Summary Request form, the Consultant shall check the appropriate box, AMC_S9.4, AMC_S9.5 or AMC_S9.6, on the Specification Amendment table. When provided, the aggregate value shall be inserted in the Unit Price Schedule.

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

If available, the Aggregate Coordinator will provide digital Testing Plans and operating plans in MicroStation or PDF formats. The Consultant shall convert the images into an electronic format for inclusion into 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 (1) enlarged plan may be required to show the area clearly. Alternately, full size plans in PDF 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 word perfect file prior to submission of the tender document.

SECTION 9 – SURFACING DESIGN

Current References for Section 9:

Below are references identified in this Section. Please see the Department website for a complete list of available documents.

Alberta Infrastructure Guidelines for Assessment, Rating and Prioritization of Pavements for Seal Coat, 1997, Alberta Transportation

Engineering Consultant Guidelines for Highway and Bridge Projects – Volume 2 – Construction Contract Administration, Current, Alberta Transportation

Guidelines for Assessing Pavement Preservations Treatments and Strategies, Edition 2, July 2006, Alberta Transportation

Pavement Design Manual, 1997, Alberta Transportation and Utilities

Standard Specifications for Highway Construction, Current, Alberta Transportation

SECTION 10- BRIDGE PLANNING, DESIGN AND INSPECTION

10.1 DESIGN STANDARDS

All design work shall be done in accordance with relevant codes, current Department standards, specifications, and recognized engineering practices.

10.2 ENGINEERING DRAWINGS

The current version of the Department's standard title block shall be used for all drawings. The Department will assign drawing numbers (DD, P, N, S, etc.) for all engineering drawings required to complete projects. These numbers and the standard title block template are issued by the Bridge Standards Technologist, Technical Standards Branch.

Whenever possible, the Department's standard drawings shall be referenced for the construction of bridges and culverts. The drawings are now available at the Department's website (see [Section 10.9](#)).

See [Appendix J1](#) for schedule of milestone dates of submission of drawings and reports.

10.3 INDEPENDENT DESIGN CHECK

A complete check of the bridge planning, structural design, and drawings shall be carried out by a Checker. The Checker shall provide design check notes and shall also stamp, sign, and seal the drawings. This independent design check shall be carried out by another Consultant when the design Consultant does not have adequate in-house capabilities to provide this check or if so directed by the Department.

Typically, an Independent Design Check involves the following activities:

- Complete review of bridge planning and assessments
- Complete re-analysis of all aspects of the original structural design, preferably (but not essentially) by a methodology or computer program other than that used in the original design
- Ensuring that the engineering drawings accurately convey the design philosophies of the original design and the checkers design
- Ensuring the completeness, integrity, and accuracy of all aspects of the Engineering Drawings

SECTION 10 – BRIDGE PLANNING, DESIGN AND INSPECTION

To resolve issues of concern, an independent check of a specific component of the structure may be requested by the Department at any time.

10.4 BRIDGE SURVEYS

Refer to [Section 6.1.4.5](#).

10.4.1 BENCH MARKS

The Department will assign reference numbers for the bench mark tablets when applicable (major bridge only). These numbers are issued by the Survey/Imagery Coordinator, Divisional Services Branch. When available, the final geodetic elevation for the bench marks shall be incorporated into the Record drawings and reported back to the Coordinator.

10.5 RIGHT-OF-WAY REQUESTS FOR STAND ALONE BRIDGE PROJECTS

Refer to [Section 3](#).

10.6 STAKEHOLDER INPUT

The Consultant shall discuss the proposed alternatives with municipalities and regulatory agencies as required to facilitate stakeholder input and feedback. The Consultant shall formulate a public participation strategy where required. Any strategy not detailed in the project Terms of Reference requires prior approval of the Department.

10.7 APPROVALS, LICENSES, AND PERMITS

The Consultant shall follow the process laid out in [Section 4.3](#).

10.8 SUBMISSIONS OF DRAWINGS AND REPORTS

Stages of the project that have been identified (in [Appendix J1](#) or the Terms of Reference) as requiring a review by the Department shall be submitted in a timely manner. The submission shall take into account the ‘milestone dates’ that have been specified in the Consulting Services Contract (or [Appendix J1](#) in the absence of

SECTION 10 – BRIDGE PLANNING, DESIGN AND INSPECTION

detailed dates in the Agreement), and allow sufficient time to enable a level of review appropriate to the work involved to be undertaken.

All bridge drawings and reports submitted to the Department must contain a reference to the unique bridge file number (BF#) that has been assigned to the project.

Two (2) hard copies of all reports are to be submitted, accompanied by an electronic format version in either MS Word or PDF format. Electronic files are to be identified with bridge file number and date of document.

10.9 BRIDGE ENGINEERING WEBSITE

Additional Information on bridge planning, design, construction, and standard engineering drawings etc. can be found at the ‘Bridges’ section of the Alberta Transportation website.

<http://www.transportation.alberta.ca/565.htm>

10.10 BRIDGE PLANNING AND ASSESSMENTS

Unless otherwise noted, the provisions of CAN/CSA-S6-06 shall NOT apply to this phase of the work. All bridge planning and assessments shall be done in accordance with current Department guidelines, standards, best practices, specifications, and recognized engineering practices.

Unless advised otherwise by the Department, all major bridge or culvert structures and/or associated river engineering works shall require preparation of Design Data (DD) Drawings in accordance with [Appendix J1](#). DD drawings confirm feasibility of the proposed bridge plan, communicate site geometric requirements to the detailed design phase, and document planning data and decisions that may not be part of the tender package for future reference. For sites where DD drawings are not required, sketches detailing bridge planning elements superimposed on the site survey shall be provided within the Bridge Planning Summary Report. At a minimum, these sketches shall include a Site Plan, Elevation View, and Roadway Profile with similar features to those described in [Appendix J1](#) for DD drawings.

10.10.1 ASSESSMENTS

Bridge assessments should follow bridge best practice guideline No. 5, which is available from the Bridge web page.

SECTION 10 – BRIDGE PLANNING, DESIGN AND INSPECTION

10.10.2 INPUT TO FUNCTIONAL PLANNING STUDIES

- Identify all relevant site constraints based on available data and site inspection for each existing or proposed structure.
- Review functionality and current strategies of existing bridges for consistency with any proposed highway improvements.
- Participate in the identification, optimization, and assessment of highway alignment options that involve bridges, considering structure geometric requirements and feasibility, crossing location impacts, river engineering/hyrotechnical issues, future flexibility, and stageability.
- For grade separation bridges, provide sketches of cross-sections including staging for the bridge opening and the bridge deck showing laning and required clearances. Pier location/span limitations within planning level tolerance shall also be provided on a plan.
- For stream crossing bridges, provide sketches of site plan, elevation view, and roadway grade-line. Estimated bridge fills location and river protection works extents (if any) should be shown.
- Provide cost estimates and approximate configuration for any proposed bridges or modifications to existing bridges.
- Describe proposed life cycle strategy for each structure, including impacts of future highway modifications.

10.10.3 BRIDGE PLANNING

The Consultant shall:

- Collect all relevant data including file history, site survey, site inspection observations, geotechnical investigation, right-of-way and land ownership information, required environmental assessments, and corrosion survey (culvert).
- Establish hydrotechnical design parameters based on the “Hydrotechnical Design Guidelines for Stream Crossings in Alberta”. Review any published hydrotechnical design parameters for consistency with site observations survey and any additional knowledge gained.
- Identify appropriate location, alignment, grade-line, bridge fills, and structure type alternatives (consideration shall be given to right-of-way requirements, utilities, geotechnical and hydrotechnical information, traffic accommodation detour, and staging requirements).
- Prepare Draft Bridge Planning Summary Report including a summary of all constraints and parameters, description of all conceptual alternatives identified including cost estimates, sketches, and description of pros and cons.

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- Complete hydrotechnical, river engineering, and geometric design for selected option.
- Prepare draft DD drawings or detailed sketches superimposed on the survey as detailed in [Appendix J1](#).
- Finalize the Bridge Planning Summary Report and DD Drawings (if necessary) with modifications as discussed with the Department. The final report will include a description of the selected option and justification for its selection.

10.10.4 SUMMARY OF REPORTING AND SUBMISSION REQUIREMENTS

The final Bridge Planning Summary Report and Design Data (DD) drawings (stamped and signed) are to be received by the Department the date identified in the Consulting Services Contract.

Any materials procured in the bridge planning phase that may be of value to the Department in future analysis, such as air photos and DEM files, shall be submitted at the completion of the bridge planning phase.

All reports and sketches are to be submitted in hard copy and electronic format (MS Word or PDF). Electronic files are to be identified with bridge file number and date of document.

10.11 BRIDGE STRUCTURAL ENGINEERING

The Consultant shall complete the bridge designs for the project as detailed in the following sections:

10.11.1 STRUCTURAL ALTERNATIVES ANALYSIS

The Consultant shall prepare a Structure Alternatives and Choose Design Report for structure options considered suitable for the site (including rehabilitation when appropriate), illustrative drawings, and “B” Estimate and life cycle cost, etc., for each alternative. See [Section 1.1.1](#) for definitions of various types of cost estimates and to [Appendix I](#) for examples.

The report should include considerations for suitable types of foundation, abutment, pier, girders, deck, and bridge rails; structure articulation system to handle temperature, shrinkage and creep deformations; and scheduling and constructability issues.

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10.11.2 DETAILED STRUCTURAL DESIGN

The Consultant shall prepare a Project Design Brief (See [Appendix J1](#)) for the chosen structure (major bridges and overhead sign structures only) at the beginning of detailed design, to confirm the department’s agreement on the basic bridge features. The consultant shall have expended sufficient engineering effort on the chosen design alternative to affirm appropriateness of the information submitted in the Project Design Brief. The submission shall also record any major outstanding issues to be resolved later, if necessary.

The Consultant shall complete the detailed design and construction drawings for the selected structure, including special provisions, “C” Estimate, bid items, contract quantities, reinforcing steel bar lists, material lists, etc.

10.11.3 SUMMARY OF REPORTING AND SUBMISSION REQUIREMENTS

At the conclusion of the project, the Consultant shall submit (or already have submitted) the following documentation:

- Structures Alternatives and Choose Design Report, including “B” Estimates for alternatives considered
- Choose Design form
- Any outstanding work as per [Section 4.3](#) concerning environmental and regulatory permits must be completed at this stage
- Corrosion survey report (culverts only), and life expectancy calculations
- Project Design Brief (major bridges and overhead sign structures only)
- Tender Drawings (stamped and signed Mylars and MicroStation files) to Bridge Standards Technologist, Technical Standards Branch
- Special Provisions and “C” Estimate for final detailed design, in addition to the requirements for plans and drawings prior to tendering as specified in [Section 11.1.2.4](#)
- After the contract is awarded, a “D” Estimate will be prepared and submitted to the Project Sponsor
- Design Completion form
- Three (3) sets of the approved shop or fabrication drawings, erection drawings, stressing, calculations, etc. (two (2) sets to Fabrication Standards Specialist, Technical Standards Branch, one (1) set to Project Sponsor)
- Design notes including title page and table of contents, summary of design assumptions, summary of superstructure shear and moment tables or plots, support reactions, and all supporting structural and geometric calculations
- Independent design check notes including all calculations performed by the checker to verify accuracy and soundness of the design
- Record Drawings (stamped and signed Mylars and MicroStation files), after all design changes during construction have been incorporated, to Bridge Standards Technologist, Technical Standards Branch. This data is required at the conclusion

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of the contract (see Engineering Consultant Guidelines for Highway and Bridge Projects – Volume 2 – Construction Contract Administration and applicable Design Bulletins).

For further details of “Reporting and Submission Requirements” see [Appendix J1](#).

All reports and sketches to be submitted in hard copy and electronic format (MS Word or PDF). Electronic file to be identified with bridge file number and date of document.

10.12 MATERIAL FABRICATION AND BRIDGE CONSTRUCTION INSPECTION

The Consultant shall perform quality assurance checks, inspections, and acceptance of plant fabricated materials in accordance with Department standards and guidelines. See [Appendix J2](#) for qualifications of materials inspectors.

The Consultant shall inspect the Contractor’s work and ensure that all construction work fully complies with the contract. See [Appendix J3](#) for qualifications of bridge construction inspectors.

For Requirements of Inspection, refer to “Engineering Consultant Guidelines for Highway and Bridge Projects – Volume 2 – Construction Contract Administration”.

10.12.1 SHOP DRAWINGS

Refer to “Engineering Consultant Guidelines for Highway and Bridge Projects – Volume 2 – Construction Contract Administration”.

10.12.2 RECORD DRAWINGS

As part of the Final Details Submission, the Consultant shall submit Record Drawings (C-Drawings) to the Department electronically and on 3 mil Mylar film sheets as per “Engineering Consultant Guidelines for Highway and Bridge Projects – Volume 2 – Construction Contract Administration”. The Record Drawings shall provide an accurate representation of the completed construction project, and shall be authenticated by the Field Review Engineer indicating that the construction substantially complies with the Design Drawings and all appropriate Contract Plans and Specifications.

SECTION 10 – BRIDGE PLANNING, DESIGN AND INSPECTION

Current References for Section 10:

Below are references identified in this Section. Please see the Department website for a complete list of available documents.

Engineering Consultant Guidelines for Highway and Bridge Projects – Volume 2 – Construction Contract Administration, 2001, Alberta Transportation

Hydrotechnical Design Guidelines for Stream Crossings in Alberta, current, Alberta Transportation

SECTION 11- CONTRACT TENDERING

11.1 DESIGN AND TENDER PACKAGE

11.1.1 GENERAL

The contract tender submission is the end product of the design phase. The accuracy and relevance of the information provided is critical to the bidding process, and provides the framework for the construction supervision and contract administration phase.

The Consultant shall undertake an independent check of all submissions in accordance with [Section 1.5.8](#) of these guidelines. A design and tender package shall be submitted by the Consultant to the Project Sponsor. This formal submission shall be accompanied by a signed covering letter from the Consultant; and shall include a tender document, all associated plans, drawings, data sheets, design quantities, cost summaries, and associated information documents as detailed below.

Once the Regional submission has been reviewed, revised as required, and approved by the Project Sponsor; the package shall be submitted to Professional Services Section. This submission shall be complete, and shall include all documents in electronic format on CD unless otherwise noted below. Partial and/or e-mail submissions are not acceptable.

11.1.2 DESIGN AND TENDER PACKAGE SUBMISSION REQUIREMENTS

Generally, there are five main components to the design and tender package submission: the covering letter, design submission (including Project Sponsor sign-off), tender document, associated separate contract plans and drawings, and Environmental Risk Assessment (ERA).

Depending on the type of work involved, additional documentation may be required. These may include, but are not limited to: reference drawings, design cross-sections, geotechnical and/or environmental reports, etc. These documents will be made available to prospective bidders for information purposes only.

11.1.2.1 Covering Letter

The covering letter may be submitted in electronic or printed form. The letter shall contain the following information:

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- The name, address, telephone number, and signature of the Consultant
- The name, title, telephone number, and email address of the designer/contact person responsible for the preparation of the design and tender submission
- The consulting services contract number, tender number, highway/control section number, and the Work Activity number(s)
- A list of all enclosures
- The status of all right-of-way/borrow pit negotiations, if applicable
- The status of all utility crossing agreements, if applicable
- The status of all environmental permits, Fisheries and Navigable Waters Authorizations, if applicable
- The memo shall identify the individual/company that performed the independent check
- If the “C” Estimate varies from the most recent estimate shown in the Department’s construction program by more than 20% (either greater or less than), the Consultant shall provide a rationale for the variance
- A list of all Design Exceptions with the Technical Standards Branch approvals
- Indication that the tender package has been reviewed and accepted by the Project Sponsor, and that all revisions requested by the Project Sponsor have been incorporated or otherwise addressed.

11.1.2.2 Design Submission

The design shall include:

- Two (2) separate cost estimates: one shall be an Average Unit Price Estimate based on the Department’s most recent average unit price report, and the second (the “C” Estimate), which is the estimated cost of the project at the time of tendering, shall be the Consultant’s best estimate of the project’s actual cost if it were to be tendered on the date the “C” Estimate was prepared. The “C” Estimate shall not include any estimate of inflation to account for any potential or expected delay in the actual tendering of the project. For bridge construction and/or rehabilitation work using lump sum bid items, or other projects incorporating specialized types of work where the average unit price information is unavailable, only the “C” Estimate will be required.

The Consultant shall take into consideration project specific local conditions when preparing the “C” Estimate. These include, but are not limited to: project location, contractor availability, aggregate availability and/or haul distances, current asphalt binder prices, quality and/or availability of common and/or borrow excavation material, delivery time for materials relative to contract completion date(s), timelines available for construction completion, etc.

The Consultant shall include a memo explaining the rationale used to determine the estimated prices. This information shall concentrate on the major bid items only, and shall include sufficient information to allow the Project Sponsor and

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Program Management Branch staff to assess the validity of assumptions being made. The memo shall include a sign-off area for the Project Sponsor to indicate that he has assessed the validity of the rationale used, and has accepted the design as complete.

- “C” Estimates shall include separate cost breakdowns summaries for the project based on major work categories (i.e. grading, surfacing, bridge, etc.), as well as an overall combined summary
- For tenders with multiple projects, the “C” Estimate shall also include overall quantity and cost breakdown summaries for each individual project
- Each cost estimate shall include Contract Items, 10 Percent Contingencies, Engineering Costs, Right-of-Way Costs, Utility Costs, and any other relevant Project Costs
- All cost estimates shall be provided in electronic form (MS Excel) and in printed format
- The Unit Price Schedule database created by the Consultant Bid Item System (CBIS) program shall be provided in electronic format
- The Consultant shall provide updated “C” Estimates, including breakdowns by project, whenever revisions are made to tender quantities via addendum

The Consultant is advised that in cases where tendering takes place more than 2 months subsequent to the design submission, the Department may request that the Consultant provide updated Average Unit Price and “C” Estimates to be based on the most recent information available. Resubmission of the memo explaining the rationale used to determine the estimated prices will not be required except in cases where the rationale has changed from that used in developing the original “C” Estimate.

If, during tender review, Professional Services Section identifies changes to the project schedule that are substantially different from that used by the Consultant in preparation of the “C” Estimate, the Project Sponsor and Consultant will be advised. The Consultant shall review the potential impact of the changes and shall make any necessary revisions to the “C” Estimate.

11.1.2.3 Tender Documents

- The tender document shall be prepared in WordPerfect Version 8 or newer (must be WordPerfect 8 compatible) format. Electronic conversion from other programs into WordPerfect Version 8 is not acceptable
- All tender documents shall be created using the most recent version of the tender document shell located on the Department’s website
- Whenever practicable, the tender document shall utilize either standard specifications or the special provisions posted on the Department’s website
- Any non-typical special provisions, specification amendments, or supplemental specifications shall be created in a format consistent with the Department’s

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- standard specifications, and shall be in accordance with current Department policies
- Any permits or authorizations, contract drawings, pit plans or other images which are scanned for incorporation in the tender document shall be scanned using the following settings:
 - Save image in PCX, JPG, or TIF format
 - Resolution: 300 dpi
 - Image type: line art or black and white drawing, as applicable. Do not use photo, colour, or grey scale settings
 - All scanned images shall be easily legible when printed in the proper size format
 - Plans and drawings which are converted directly from MicroStation format shall be in black and white format only. Do not use colour or grey scale settings
 - As a minimum, all tender documents shall include a Location Plan

11.1.2.4 Separate Plans and Drawings; Reference Drawings (if applicable)

Some tenders may require oversize drawings that are intended to form part of the tender documents. Oversize plans are described as plans larger than 22”x34”. These plans may be required due to the size or detail of a project and are occasionally needed for interchanges, complex intersections, major utilities, etc. Whenever possible the Consultant shall attempt to use standard size plans in lieu of oversized plans.

Generally, separate plans are required on grading projects, bridge projects, and some surfacing projects. These plans are typically considered essential to bidders for the preparation of their bids and include project specific drawings and some reference drawings. Drawings are typically made available in 11”x17” and 22”x34” formats. One (1) set of 11”x17” plans is included with each tender document issued by the Department. Full size (22”x34”) plans for roadway construction are made available by the Department for viewing purposes and for separate purchase by interested bidders. Full size (22”x34”) bridge plans are not made available during the tendering period.

In addition, some tenders may reference drawings that are provided for information purposes only and are not considered essential for the preparation of bids. These reference drawings may include, but are not limited to, utility plans and as-built/Record drawings. These drawings are made available to bidders for viewing and/or separate purchase during the tendering period. Reference drawings may be oversized depending on the size of the original drawing.

Submission requirements for plans and drawings include:

- The Consultant shall submit one (1) set of Design Drawings (P-Drawings) on 3 mil Mylar sheets at the time of tender submission to the Project Sponsor. Each drawing shall be signed and stamped by both the Designer and the Checker. Each drawing shall be clearly marked with the appropriate date and/or revision number.
- The Consultant shall provide a CD containing the electronic copies of signed Mylars in MicroStation format (as per the latest version of the “Engineering Drafting Guidelines for Highway and Bridge Projects”).
- Except for stand-alone bridge projects, the Consultant shall submit two (2) electronic versions of the drawings in PDF format. One version shall include photo mosaics, and the other version shall have photo mosaics turned off. File sizes shall be limited to a maximum of 2 MB per page. For stand-alone bridge projects, an electronic version of the drawings, including associated reference and standard bridge drawings, shall be submitted in PDF format.
- If the tender includes reference drawings, the Consultant shall supply the reference drawings in PDF format.
- For bridge projects, full size drawings are not required unless the plan detail is insufficient for bidders to prepare their bids.
- To facilitate printing, all drawings shall be converted to PDF format using black and white settings. Do not use colour or grey scale settings. Notwithstanding the preceding requirement, Consultant logos may be left in colour if desired.

11.1.2.5 Design Cross-Sections (if applicable)

For all Department grading or grade widening projects with more than 100,000 m³ of excavation, the tender package shall include an electronic set of all available design cross-sections for the project, submitted in PDF format.

Electronic design cross-section files shall meet the following requirements:

- Design cross-sections shall be provided for each 20 m distance
- Each cross-section shall show the station, horizontal and vertical scale, and both horizontal and vertical gridlines
- Whenever practicable, the Consultant shall maintain constant horizontal and vertical scales for all cross-sections. Changes to horizontal and vertical scale should be avoided or minimized. In the event that project requirements dictate scale changes, revised scales should be maintained for a length of at least 200 m.
- The recommended horizontal and vertical scales are as follows:
 - Horizontal: 1:250 or 1:500 (Depending on width of cross-section)
 - Vertical: 1:50, 1:75, Or 1:100 (Dependent on terrain – i.e. flat or rolling)
- Each cross-section shall show all design surfaces (i.e. original ground, design, undercut, finished surface, etc.)
- To facilitate printing, cross-sections shall be created or converted to black and white. Different line types may be used to indicate different surfaces, however, the Consultant shall ensure that the line types used can be reproduced using a standard photocopier.

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- Each page shall be formatted to fit 8.5”x11” paper size (landscape orientation)
- Design cross-sections shall be printed one (1) cross-section per page
- Each page shall have ½” margins at the left hand, right hand and bottom of the page, and shall have a top margin of 1” to facilitate binding

For projects with 750 or fewer individual cross-section pages, the information shall be submitted in a single electronic file. For projects with more than 750 cross-section pages, the information shall be split into two or more electronic files.

11.1.2.6 Additional Information Documents (if applicable)

Additional information documents include, but are not limited to geotechnical reports, environmental reports and assessments, and/or other information that may be considered relevant to the work.

Generally, the Consultant shall submit electronic copies of these documents in PDF format. The Department will print hard copies of these documents, and provide them to its tender distribution points where they will be made available for viewing by potential bidders.

In instances where the information documents contain mixed page sizes due to fold out content (i.e. plans, tables, spreadsheets, etc.), photographs and/or colour content, the Consultant shall provide five (5) copies of each document in hard copy format in addition to electronic format version.

11.1.3 TENDER DOCUMENT PACKAGE

The format of the tender document is provided in the Tender Document Template located on the Department’s internet web page. The format of the tender document is as follows:

- Title page
- Table of contents (generated by WordPerfect)
- Instructions to Bidders
- Tender forms
- Unit Price Schedule (created by merging the CBIS database)
- Tender Amendment form
- Special Provisions
- Specification Amendments, where applicable
- Supplemental Specifications, where applicable
- Plans and Permits:
 - Table listing separate and/or reference plans, where applicable
 - Standard plans and drawings, where applicable
 - Pit plan(s), where applicable

- Aggregates testing plan(s) and data sheets, where applicable
- Environmental permits, licenses, approvals, and authorizations, where applicable
- Engineering Plans and drawings
- Contract Plan(s) (location plan minimum) and typical sections where applicable
- Addenda

11.1.4 STANDARD SPECIFICATIONS, SPECIAL PROVISIONS, SPECIFICATION AMENDMENTS AND SUPPLEMENTAL SPECIFICATIONS

The Department’s website contains the most up-to-date versions of the tender document templates, bid items, typical Special Provisions, Specification Amendments, and Supplemental Specifications.

The Department maintains several specification manuals including the “General Specifications, Specification Amendments and Supplemental Specifications for Highway and Bridge Construction”, the “Standard Specification for Highway Construction”, and the “Specifications for Bridge Construction” manuals. Whenever possible, Consultants shall utilize the Standard Specifications rather than creating new Special Provisions.

In the event that a special provision is required, the Consultant shall first review the typical Special Provisions posted on the Department’s website. If it is necessary for the Consultant to develop a new Special Provision, the Consultant shall ensure the Special Provision is created in a format that is consistent with the Standard Specifications and the existing Special Provisions posted on the website. It is important that any new special provision be reviewed and accepted by the Project Sponsor to ensure that there are no conflicts with other existing specifications (the Project Sponsor may refer this to the Technical Standards Branch or Professional Services Section).

11.1.5 ADDENDA

Addenda are revisions to the tender documents that are issued to all known prospective bidders during the tender period. Although any number of sources may identify the need for an addendum; the Consultant is responsible for providing the addendum information to Professional Services Section prior to the tender closing date.

Typically, the Consultant shall notify the Project Sponsor as soon it becomes apparent that changes to the tender documents are required. Where feasible, the Addendum shall be submitted to the Project Sponsor and Professional Services Section on the

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same working day that the need is identified. If an addendum is submitted to Professional Services less than two (2) working days prior to the scheduled close of tenders, the closing date may be extended by the Professional Services Section to allow all bidders the opportunity to properly evaluate the addendum content.

The addendum submission to Professional Services Section shall be in WordPerfect Version 8.0 electronic or newer (must be WordPerfect 8 compatible) format. If the addendum includes revised plans, the plans shall be provided in accordance with [Section 11.1.2.4](#).

If the addendum will result in a change to the estimated cost of the project, the Consultant shall provide a revised “C” Estimate with the addendum submission.

11.1.6 MATERIALS

Typically, the supply of materials will be the responsibility of the Contractor as part of the construction contract. In the rare instance where material supply is not included in the construction contract, the Consultant shall be responsible for the preparation of material orders for the Department.

11.1.7 REPORTING REQUIREMENTS

Unless otherwise agreed by the Department, the Consultant shall submit the draft design and tender package to the Project Sponsor a minimum of 4 weeks prior to the Tender Package Submission Date, or as otherwise stated in the Terms of Reference.

Following the detailed design review and acceptance of the tender documents by the Project Sponsor, the Consultant shall submit the final design and tender package to Professional Services Section on or before the scheduled Tender Package Submission Date.

Within two (2) weeks after the Contract has been awarded, the Consultant shall submit six (6) sets of full size drawings (four (4) to the Contractor, two (2) to the Project Sponsor). These drawings shall be accompanied by a letter to the Contractor and Project Sponsor indicating the revision number and/or date of the appropriate set Design Drawings for use at the commencement of construction. Where significant changes have not been made during the tender period through addenda, the Consultant may refer to the set previously submitted as part of the Tender Package.

11.1.8 CONSULTANT SERVICES DURING THE TENDER PERIOD

Inquires during the tender period are directed to the Consultant. The Consultant shall not provide information to individual bidders that is contrary or supplemental to that

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contained within the tender documents. In instances where supplemental information needs to be disseminated to all plan holders, Professional Services Section will issue an addendum.

For many projects, it may be determined that a pre-tender meeting should be held between the Consultant and interested bidders. In such cases, once the Consultant has been advised that a tender has been scheduled for advertising he shall schedule a pre-tender meeting to take place during the tendering period. The Consultant shall provide this information to Professional Services Section prior to advertising so it may be included in the tender document.

SECTION 11 – CONTRACT TENDERING

Current References for Section 11:

Below are references identified in this Section. Please see the Department website for a complete list of available documents.

Engineering Drafting Guidelines for Highway and Bridge Projects, Current, Alberta Transportation

Specifications for Bridge Construction, 2001, Alberta Transportation

Standard Specifications for Highway Construction, Current, Alberta Transportation

SECTION 12- WATER CONTROL STRUCTURES PLANNING AND DESIGN

12.1 GENERAL

This section outlines responsibility and authority of the Consultant that is specific to the planning and design of water management projects. Those projects include:

- Dams, diversion weirs, lake stabilization structures
- Canals
- Erosion control work
- Flood control structures and dykes
- Pump houses
- Water pipelines
- Reservoirs

Any bridges or bridge-sized culverts on public roadways that are combined or integrated into water management projects shall be designed to the requirements of [Section 10](#).

Even though the Consultant may need to liaise with other staff members of the Department for various phases of water management projects, all discussions with Department staff need to go through the Project Sponsor/Administrator.

12.2 DESIGN STANDARDS AND GUIDELINES

All work shall be done in accordance with relevant codes, current Department standards, specifications, and recognized engineering practices.

Design standards and guidelines are available on the Department’s website. See Section 2.0 of “Water Control Structures – Selected Design Guidelines” for a thorough listing of codes, standards, and references for water control structures.

12.3 INDEPENDENT DESIGN CHECK

A complete check of water management design, specifications, and drawings shall be carried out by a Checker. The Checker shall prepare and retain design check notes and shall also sign and stamp or seal the drawings. This design check shall be carried out by another consultant if the design Consultant does not have adequate in-house capabilities to provide this check or if so directed by the Department. See [Section 1.5.8](#) for more details.

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12.4 SURVEYS

Where required by the Terms of Reference to establish a project specific datum for horizontal and vertical control, such a survey shall be tied into the Alberta Survey Control Monument System as outlined in [Section 6.1.4](#). All benchmarks for rehabilitation projects must be tied into the same system.

Alberta Environment benchmarks are located on the Alberta Environment website at:

www.environment.alberta.ca/01533.html

12.5 LAND ACQUISITION REQUIREMENTS

Refer to [Section 3](#) for general Departmental land acquisition guidelines and to “Reservoir Lands Guideline” for land assembly requirements for Water Control Structures.

12.6 APPROVALS, LICENSES AND PERMITS

The Consultant shall, in consultation with the Department and Regulatory agencies, determine which regulatory approvals, licenses, authorizations, and permits are required for the project.

Alberta Environment is the owner of all water management projects. Alberta Transportation, however, will apply for all regulatory approvals, licenses, authorizations and permits that are required to deliver the project on behalf of the owner. The Contractor shall be required to apply for any temporary approvals or permits that are required based on the methodology adopted by the contractor during construction.

The Consultant shall assemble and prepare the information needed for regulatory approvals, licenses, authorizations, and permits. This may include but is not limited to:

- Drawings and specifications
- Assessment reports
- Impact statements
- Proposed mitigation efforts
- Application forms

The Consultant shall incorporate conditions of any approvals, licenses, authorizations, or permits that affect the construction work into the Special Provisions of the Contract documents and shall include copies of approvals, licenses, etc. in the Contract document.

12.7 CONSTRUCTION CONTRACT SPECIFICATIONS

Unless noted in the Terms of Reference, the Contract Specifications for water control structures shall be based upon the latest version of the Civil Works Master Specification (CWMS). The Consultant shall edit the CWMS as necessary to produce the Contract Specifications.

For some water control structures the “Specifications for Bridge Construction” or the “Standard Specifications for Highway Construction” may be used.

12.8 ENGINEERING DRAWING STANDARDS

Refer to the “Development of Project Drawings” guide, [Section 10.2](#), [Section 10.12.2](#), and all applicable Design Bulletins.

12.9 CONCEPTUAL STUDY

The Conceptual Study is a review of available information to determine the proposed design criteria and identify any information gaps. The Consultant shall identify available options to solve problems identified in the Terms of Reference. The Conceptual Study will not generally require the acquisition of field data.

12.9.1 STUDIES

The Consultant shall:

- Inspect the site and inventory project components
- Review existing surveys, investigations, data, drawings, aerial photographs, and reports
- Review issues and potential options with stakeholders of the project. See [Section 2.5](#).
- Undertake studies that are necessary to complete the Conceptual Study
- Determine utility locations and project restrictions due to those utilities. See [Section 6.1.8](#)
- For a rehabilitation project, evaluate the current design criteria for the existing project and propose design criteria for the project. For a new project, propose design criteria for the project
- Complete an environmental and historical resources overview as necessary
- Determine land ownership and preliminary land assembly requirements for the project
- Prepare conceptual level drawings for the project
- Prepare an “A” Estimate for the project and a life-cycle cost analysis for the various options

SECTION 12 – WATER CONTROL STRUCTURES AND DESIGN

12.9.2 REPORTING REQUIREMENTS

The Consultant shall prepare a Conceptual Study report that includes the following components:

- A summary of the investigations, surveys, and reviews
- A review of existing design criteria for rehabilitation projects
- Inventory of project components and utilities
- Relevant existing drawings
- Proposed design criteria
- Proposed alternatives that would meet the Terms of Reference
- Conceptual drawings of each alternative
- “A” Estimate (project cost) and life cycle cost for each option
- Right-of-way requirements
- Potential environmental, social, and historical impacts and mitigative measures
- A ranking of alternatives
- A listing of recommended investigations that would improve the decision making process, refine the design, reduce the life cycle cost of the project, or reduce the risk of the proposed alternatives.

12.10 PRELIMINARY ENGINEERING

Preliminary Engineering is a detailed review of available alternatives that results in a recommended alternative that provides the best solution. The Consultant shall undertake required field studies and laboratory testing, consider all external factors, and prepare preliminary design and costing to develop all the viable alternatives to a level that one can be chosen for implementation. If a Conceptual Study is not required by the Terms of Reference, the study requirements of that design phase must be included in the Preliminary Design phase.

12.10.1 STUDIES

The consultant shall:

- Inspect the site
- Review surveys, investigations, data, drawings, aerial photographs, and reports. Recommend any additional investigations that are required to assist in the evaluation of options
- Undertake any required investigations
- Undertake required environmental and historical reviews or assessments
- Complete final hydrologic, hydraulic, and geometric design and preliminary geotechnical and structural design of each alternative
- Review options with stakeholders of the project. See [Section 2.5](#)
- Determine utility relocation requirements

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- Determine final land assembly requirements of each alternative for the project
- Prepare preliminary level drawings for the project. These drawings would include detailed site plans; plans and various sections of each structure with enough detail to cost the components; borrow, lay-down and waste disposal areas; and care of water options for each alternative.
- Specify materials for major project components: rip rap, concrete, impervious fill, etc.
- Determine material sources for each alternative
- Prepare a “B” Estimate and life cycle cost for each alternative

12.10.2 REPORTING REQUIREMENTS

The consultant shall prepare a Preliminary Engineering report that includes the following components:

- A summary of the studies and investigations carried out
- Comparison of viable alternatives that would meet the Terms of Reference
- Final Design Criteria
- Preliminary Drawings
- “B” Estimate for each alternative and life cycle cost
- Final Land Assembly requirements for each alternative
- Utility relocations for each alternative
- Environmental impact overview or assessment and probable mitigation requirements
- Historical resources overview
- The recommended alternative

12.11 FINAL DESIGN

The Final Design is the phase where the chosen alternative is advanced to detailed design stage and tender drawings and specifications are produced. The Department will select the one (1) alternative from the Preliminary Engineering report for construction and provide direction to the Consultant. Land Assembly often precedes independent of Final Design by another consultant.

12.11.1 DESIGN ACTIVITIES

The Consultant shall:

- Complete final geotechnical and structural design of the selected alternative
- Prepare and obtain utility relocation or crossing agreements
- Identify right-of-way requirements
- Review the final design with stakeholders of the project. See [Section 2.5](#).

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- Prepare Tender Drawings for the project. These drawings would include but may not be limited to: detailed site plans; contractor site limits including environmentally and historically sensitive sites; plans and various sections of each structure with enough detail to cost the components and determine material requirements; borrow, lay-down and waste disposal areas; and care of water plans where appropriate.
- Prepare Contract Specifications for the Contract
- Prepare a “C” Estimate for the project

12.11.2 REPORTING REQUIREMENTS

During the Final Design phase, unless otherwise noted in the Terms of Reference, the consultant shall provide electronic copies of the tender drawings in PDF format to the department at the 50 percent and 95 percent complete stages. Unless otherwise noted in the Terms of Reference, the consultant shall provide electronic specifications for review at the 75 percent and 95 percent complete stage.

The consultant shall prepare a Final Design Report that summarizes the:

- Final studies
- Final drawings
- Final right-of-way requirements
- Utility relocation agreements
- “C” Estimate.

12.12 CONTRACT TENDERING

Refer to [Section 11](#) with the following exceptions:

- The Tender Documents shall be prepared on the CWMS Contract
- Drawings for water management projects shall be prepared in AutoCAD format

12.12.1 SITE MEETING

Where required by the Tender Documents, the Consultant will attend and guide a site meeting with prospective bidders, as well as prepare notes from this site meeting.

12.12.2 TENDER INQUIRIES

The Consultant shall respond to tender inquiries by potential bidders. Any questions that cannot be addressed by referring to the Tender Documents shall be forwarded to

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the Project Sponsor. When required, the Consultant shall prepare addendums for issuance by the Department.

SECTION 12 – WATER CONTROL STRUCTURES AND DESIGN

Current References for Section 12:

Below are references identified in this Section. Please see the Department website for a complete list of available documents.

Civil Works Master Specification for Construction of Provincial Water Management Projects, Current, Alberta Transportation

Development of Project Drawings, 2004, Alberta Transportation

Reservoir Lands Guideline, 2005, Alberta Environment

Specifications for Bridge Construction, 2001, Alberta Transportation

Standard Specifications for Highway Construction, Current, Alberta Transportation

Water Control Structures – Selected Design Guidelines, 2004, Alberta Transportation and Alberta Environment

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APPENDIX A

GENERAL ENGINEERING PROCESSES

FOR MANAGEMENT OF ALBERTA'S HIGHWAYS AND BRIDGES

APPENDIX A

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GENERAL OUTLINE OF THE ENGINEERING PROCESS FROM LONG RANGE PLANNING TO CONSTRUCTION COMPLETION FOR PROVINCIAL HIGHWAYS

A. Long Range Planning

1. Alberta Transportation's Mission is to contribute to Alberta's economic prosperity and quality of life through the provision of a safe and efficient transportation network. The Department's Core Business in this regard is to ensure continuous improvement of the provincial highway infrastructure through efficient planning, design, construction, rehabilitation, operation, and maintenance.
2. To begin, the Department monitors all Provincial Highways for traffic volume, collision experience, operations, pavement/bridge condition, level-of-service, etc. on a regular basis.

An inventory of existing highways including details of features and appurtenances together with various information regarding condition, age, serviceability, etc. is also maintained and stored in the Transportation Infrastructure Management System (TIMS –an important tool in establishing future highway programs).

3. Using this information, the Department develops and refines its Long Range Plan which identifies overall transportation needs and priorities for various time horizons (e.g. 5, 10, 15, and 20 year) for the entire highway system.
4. At any given time there is a three-year program in place. The three-year program is a "rolling program" which is generally approved in the spring session of the legislature each year and is freely available public information. Projects that are included in the three-year program are subjected to planning, engineering assessment, detailed design, etc. as required to deliver the construction work.

Program Management Branch (PMB) coordinates input from the Regions, Transportation Safety Services Division, Technical Standards Branch (TSB), and other stakeholders to identify projects for inclusion in the construction/rehabilitation programs. Projects are approved based on demand, needs, and available budgets.

A Flow Diagram is attached to show the various stages followed in the Highway Engineering Process for projects in the 3 to 10 year programs. The "Process of Notification of Provincial Highway Construction Projects to Municipalities" is also attached.

An initial "Scope Review" is undertaken by the Department on all projects or highway segments that are under consideration for the 3 to 10 year program. This initial scope review is generally undertaken by the Infrastructure Manager with input from other staff and using the most current technical information. The information available may include planning studies, engineering assessments, pavement management systems information, video log, etc. At this time, the Department will make an initial determination of whether the project requires planning, engineering assessment, or if it can be advanced directly to the preliminary engineering stage.

B. Consultant Selection

5. The Department employs competent consulting engineering firms registered with the Association of Professional Engineers, Geologists and Geophysicists of Alberta (APEGGA). All consultants must be pre-qualified for engineering work required on provincial highway projects.

Sub-consultants and other firms providing specialized services are not necessarily pre-qualified by the Department.

6. Professional Services Section (PSS) of PMB administers the consultant procurement process. PSS compiles preliminary information for several projects into a Ranking List, and sends out a Request for Expression of Interest to all consultants pre-qualified in that category. Based on the relative rankings and submissions received, a short list of typically three Consultants is created for each project.
7. A Project Sponsor is designated by the Department to act as liaison between the Department and Consultant. The Project Sponsor is assigned the management duties for the consultant assignment. The Project Sponsor also ensures that funding is in place for the engineering and construction work, that upset fees are not exceeded, and requests increases in upset fees if required are justified. The Project Sponsor takes responsibility for delivery of the project as per the program or other defined schedules.
8. A Terms of Reference (TOR) for a project is prepared by the Project Sponsor based on the project requirements and through consultation with technical specialists or others as required. The TOR defines the scope of work, deliverables and schedules expected by the Department.
9. PSS sends out a Request for Proposal (RFP) to the consultants on the approved short list. PSS receives proposals from interested/short listed consultants and arranges for the selection meeting with the Region and TSB to determine the preferred Consultant.

The proposals are evaluated based on specified criteria and a selection of the preferred Consultant is made. PMB obtains approvals for the selection and the final terms of agreement are negotiated between the preferred Consultant and the Department. An agreement is prepared by PSS.

10. In specific instances, sole sourcing may be utilized by the Department for obtaining consultant services if it is in the best interests of the Department based on value and schedule. Sole source assignments may require special knowledge or experience, and the scope of work will be clearly defined. For sole source assignments, the Department expects the Consultant to have good knowledge and capabilities in the area concerned as well as a thorough understanding of the effort required to perform the work.
11. In some situations, the Department hires consulting firms to undertake Regional planning or engineering assessments as required to assess the need to reconstruct/rehabilitate existing roads and bridges (These assessments follow the 3R/4R guidelines or other established engineering practices for assessment of roads and bridges. An "A" Estimate is submitted as part of the final report on planning work.).

For engineering assessments, the type of engineering information provided by these firms consists of geometric assessment, surfacing strategy, safety assessment, railway crossing improvement requirements, lighting assessment, traffic signal assessment, seal coat requirements, etc. The production of construction cost estimates that are more detailed and reliable than the programming estimate is part of an engineering assessment. (For surfacing work a “B” Estimate is produced at the preliminary stage. Because the need for geometric improvements is defined at this stage, the original ballpark “A” Estimate for roadway grading/base/paving may be fine-tuned accordingly.).

12. Generally, the engineering work required for preliminary engineering, detailed design, tender preparation, construction supervision, and contract administration are bundled together in one assignment. In instances where the project schedule is of particular importance to the Department, the award of construction supervision and contract supervision may be contingent upon satisfactorily meeting the timelines for other phases of the project. The conditions for these projects are clearly outlined in the project TOR.

C. Consultant Roles

13. Following the assignment of a project to a Consultant, the Project Sponsor calls a Project Initialization Meeting with the Department’s Project Administrator, Consultant, and the Department Safety Officer to review and clarify project scope, roles, schedule, and requirements.
14. The Consultant performs the detailed engineering work using all relevant manuals, guidelines, and practices that apply to highways in Alberta.

The Consultant submits all deliverables as noted in the TOR including right-of-way plans, right-of-way agreements, utility agreements, environmental permits, licenses, and approvals.

The Consultant submits a “B” Estimate to the Project Sponsor on completion of preliminary designs.

The Consultant prepares grading, surfacing, and bridge design packages which are used as the basis for preparation of the contract tender.

The Consultant delivers a completed and independently checked design, mosaics, drawings, and electronic copies which include summaries of all estimates including a “C” Estimate for project expenditure.

The Consultant submits the tender package to the Project Sponsor as per the schedule specified in the RFP/TOR and as may be adjusted by the Department.

As required, the Consultant calls for a Design Review Meeting(s), a Pre-Tender Meeting, and a Pre-Construction Meeting.

D. Tendering Process

15. The Project Administrator carries out a complete detailed design and tender package review; and updates the Programming Estimate in PMA with the Consultant provided “C” Estimate.

Once all revisions requested by the Project Administrator have been incorporated, the Project Sponsor forwards the complete approved tender package and Project Sponsor sign-off letter to Professional Services Section. Professional Services Section schedules advertising of the project; and carries out final stage review, editing, and tendering of the project.

Hard copies of the tender documents are distributed to the Department tender sales centres.

16. All projects over \$100,000 are advertised and tendered by Program Management Branch. Program Management Branch obtains approval to tender and advertises the tender on the Alberta Purchasing Connection (APC) website, in the Construction Alberta News, and on the Edmonton and Alberta Construction COOLNet electronic tendering system websites.

Hard copies of the contract tender documents are distributed to the Department tender sales centres.

17. Generally, the Regions advertise and tender contracts where the estimated contract cost is less than \$100,000.

Where regional tenders are based on either lump sum or unit price quotation, the Department obtains quotes from at least three sources. The Consultant evaluates the quotes and submits the recommendations to the Department for approval.

E. Construction Administration (Volume 2 of this document)

18. Throughout the project, the Consultant provides project management and submits weekly reports complete with relevant comments on material testing to the Project Sponsor.

The Consultant submits monthly invoices for engineering fees as well as project expenditure reports for construction activities on a timely basis to the Project Sponsor. In addition, the Consultant certifies and submits contractor invoices to the Department for payment.

The Project Sponsor monitors construction activities and progress of individual construction projects, liaises with consultants and contractors, and provides monthly progress reports in the Program Management Application (PMA).

As required, site visits are conducted by representatives from the Region, TSB, and PMB to monitor various aspects of the project such as construction supervision, adherence to specs/standards, compliance to terms of agreements, and public/worker safety.

19. The Consultant initiates contract changes (i.e. changes in scope of work, estimated cost) within certain defined limits.

-
20. The Consultant performs segregation inspection and rating of finished pavement surfaces within the time limits required in the contract specifications. A segregation rating sheet is filled out to calculate bonuses and penalties.
 21. The Consultant calls for a Final Inspection tour when the Contractor advises the Consultant that the project is complete.
 22. Upon completion of the project, the Consultant indicates to the Project Sponsor that the work is complete. A conditional Construction Completion Certificate is issued advising the Contractor of all outstanding work (i.e. seasonal deficiencies), the date by which this work is to be completed and the amounts to be retained in holdbacks for the work (at least twice the estimated cost of the remaining work).

Unless otherwise notified, the Consultant Project Manager holds back 10% of progress payments.

In general, the holdback is retained until:

1. Contract has been accepted as complete.
 2. Contractor's Statutory Declaration has been received.
 3. W.C.B. clearance has been received.
23. When the construction contract has been completed, the Consultant submits the complete "Final Details" and Project Records file to the Projects Sponsor. Selected road and bridge information (i.e. As-Constructed Details, Record Drawings, design calculations and checker notes for bridges, etc.) is forwarded by the Project Sponsor to the appropriate Section(s) for processing and subsequent record retention. Consultants must follow TSB standards for file identification.

The department does not pay for any post-construction engineering work until the complete "Final Details" and Project Records file has been received.

Rationale for collection of Record information is as follows:

- i) Information on bridge structures is needed for load ratings.
- ii) Pavement width and thickness information is needed for pavement management purposes.
- iii) Information on geometry/traffic control is needed for future assessment of improvement needs, investigation of need for additional traffic control devices and lighting, for on-going monitoring of safety performance, and to record drainage information.
- iv) To generate year-end summary reports on construction quality.

All of the above information will be stored as part of TIMS and will be available for future programming, design, and management purposes.

The Consultant retains a complete duplicate copy of the "Project Records Package" which is described in [Appendix K](#) of this document. The "Project Records Package" includes the Final Details as well as design information, correspondence, and other pertinent records.

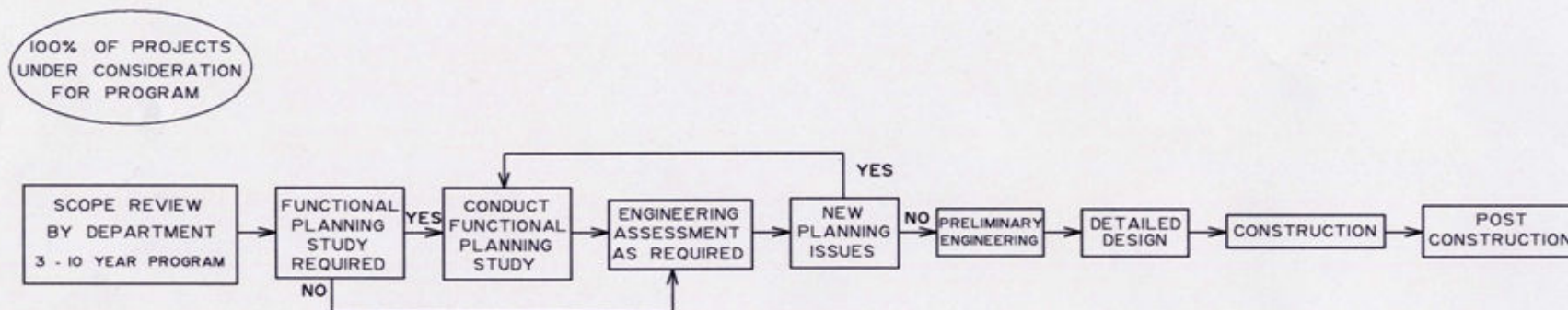
24. Upon request from the Contractor, the Consultant releases electronic files for earthwork quantities to the Contractor once the files have been edited and verified.
25. The Project Sponsor completes an evaluation of the Consultant. The evaluation form is signed by the Consultant and Project Sponsor.

F. Warranty Inspection

26. As required, a Warranty Inspection is done 30 to 60 days before the expiration of the warranty period. The warranty period is generally 12 months for roads and 24 months for major bridges. Some aspects of the workmanship or materials require longer warranties (e.g. bridge joints and bridge bearings – typically a 5 year warranty period is specified.) The warranty inspection is undertaken by a Regional Warranty Inspection Consultant if required.

If deficiencies are found, the Consultant informs the Contractor in writing prior to the expiry of the warranty period advising him of the defects and specifying a completion date for the repairs. A copy of the letter is sent to the Project Sponsor, PMB, and the bonding company.

FLOW DIAGRAM HIGHWAY ENGINEERING PROCESS



NOTE: PLANNING STUDY TRIGGERS

- ACCESS MANAGEMENT
- MAJOR R/W IMPACTS
- PUBLIC CONSULTATION
- REALIGNMENTS
- MAJOR INTERSECTION OR INTERCHANGE REQUIREMENTS
- TWINNING

**PROCESS OF NOTIFICATION OF PROVINCIAL HIGHWAY
CONSTRUCTION PROJECTS TO MUNICIPALITIES**

Recommended Steps to Follow	Responsible Party
1. As part of the TOR development, contact the municipality to advise them of the upcoming work and that the Consultants may be requesting information from the municipality as part of RFP development.	Project Sponsor
2. Include in the RFP a statement to the effect that the successful consultant will contact the municipality after they are awarded the project engineering work and gather input from them.	Project Sponsor
3. Invite municipality representative to the project initialization meeting and conceptual design meeting (as required)	Project Sponsor
4. Include municipality representative in the value engineering sessions. Invitation is at the discretion of the Department.	Project Sponsor/Consultant
5. Provide notice of the project tender to the municipality. PSS will forward a copy of the "Approval for Advertising" sheet to the project sponsor to forward to the municipality	Project Sponsor
6. Advise the municipality which contractor is awarded the construction contract and anticipated start date.	Consultant
7. Invite municipality to the Pre-Construction meeting (if warranted). Copy the municipality on the notes of meeting.	Consultant
8. Involve municipality representative in the interim inspection if there is an anticipated significant impact to their network or local issues identified	Consultant
9. Elevate recommended changes to this process to the Divisional Executive Managers	CPMG Executive Sponsor

APPENDIX B

TYPICAL AGENDA FOR CONSULTANT INITIALIZATION MEETING

APPENDIX B

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Consultant Initialization Meeting - Provincial Highway Project's Agenda

- 1) Safety (separate meeting for Pre-Engineering activities) _____

- 2) Details of Aggregate Source
 - Status of Pit Update _____
 - Pit Operations Plan and Conditions _____
 - Pit Reclamation if necessary _____
 - Contract and Design Packages _____
 - Status of reporting to Department _____

- 3) Description and Scope of Work _____

- 4) Review of Consultant Proposal/Terms of Agreement
 - Items to clarify _____

- 5) Review Administrative Items
 - Consultant Personnel _____
 - Project Communications _____
 - Project Schedule (Milestone dates) _____
 - Project Reporting _____
 - i) Review Department Reporting, Structure, i.e., Weeklies, etc. _____
 - ii) Control Cost Sheet for Invoices (sample) _____
 - iii) Forms, i.e., Expenditure Reports, Change of Scope _____
 - Outline Consultant Performance Evaluation Criteria, i.e., Milestone Dates, Quality, Safety Administration, Weighting Factors, Expectations, Timeliness of Reporting, etc. _____
 - "B" Estimate at conceptual design stage. Provide explanation for differences.
 - "C" Estimate at design completion (One based on previous year Provincial average cost, and one based on site specific conditions). _____

- 6) Details supplied to the Consultant
 - Contract Number _____
 - Program "A" Estimates for review. Provide PR's, Scope of Work, Cost Breakdown _____
 - Unit Price Schedule (if necessary) _____
 - Any pertinent Background _____

- 7) Other Items
 - Add-ons _____
 - Bridge Files, Bridge Permit Information _____
 - Special Provisions in Tender package (i.e. Liquidated Damages, Site Occupancy) _____
 - Coordination of Utility Agreements _____

8) Finals

- Copies of Finals Documents Package to be included as follows:

- i) Summary Report (2 copies) _____
- ii) Final Estimate (1 copy) _____
- iii) Grand Summary (3 copies) _____
- iv) Final Details Checklist (3 copies) _____
- v) Widths and Thickness Diagram (3 copies) _____
- vi) E.P.S. Bonus payment Backup (3 copies) _____
- vii) Aggregate Removal Report (Dept. Source only) (3 copies) _____

APPENDIX C

SUMMARY TABLES OF COMMONLY USED FORMS

APPENDIX C

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Government of Alberta |
Transportation

ACCIDENT NOTIFICATION
INCIDENT REPORT INVOLVING
THIRD PARTY AND/OR CONTRACTOR'S EQUIPMENT

DATE OF ACCIDENT: _____ TIME: _____ am pm

HWY. NO. _____ LOCATION _____

CONSTRUCTION ZONE YES NO MAINTENANCE ZONE YES NO OTHER: _____

IS HIGHWAY CLOSED YES NO TRAFFIC RESTRICTED YES NO OTHER: _____

WEATHER CONDITIONS: _____ ROAD CONDITIONS _____

ACCIDENT CAUSE: REAREND YES NO SIDESWIPE YES NO HEAD-ON YES NO OTHER _____

POLICE CONTACTED YES NO DETACHMENT _____ FILE # _____

CONTRACTOR'S NAME: _____ CONTRACT # _____

THIRD PARTY: _____

INJURIES (PLEASE CIRCLE ONE):
CONTRACTOR: NONE - MINOR - SERIOUS - FATAL THIRD PARTY: NONE - MINOR - SERIOUS - FATAL

BRIEF DESCRIPTION: _____

INFORMATION REPORTED BY: _____ DATE: _____
FORM COMPLETED BY: _____ PHONE NO. _____

IS FOLLOW UP REQUIRED BY THE DEPARTMENT? YES NO IF SO BY WHOM:
CONTACT NAME _____ PHONE NO. _____

EMAIL TO: Regional Safety Officer

REGIONAL SAFETY OFFICER EMAIL TO:

ADM Office

Government of Alberta ■ Transportation	<h2 style="margin: 0;">UTILITY ACCIDENT REPORT</h2>													
To: Project Sponsor, Region: _____ From: Consultant: _____ Telephone No: _____ Fax No: _____ Contract No: _____														
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th colspan="3" style="text-align: center;">Date of Accident</th> <th rowspan="2" style="text-align: center;">Time (Use 24:00 Hr)</th> <th rowspan="2" style="vertical-align: top;"> <input type="checkbox"/> For your information and records <input type="checkbox"/> For claims investigation <input type="checkbox"/> Others (Explain) _____ </th> </tr> <tr> <th style="width: 33%;">D</th> <th style="width: 33%;">M</th> <th style="width: 33%;">Y</th> </tr> <tr> <td style="height: 20px;"></td> <td></td> <td></td> <td style="text-align: center;">_____</td> <td></td> </tr> </table>	Date of Accident			Time (Use 24:00 Hr)	<input type="checkbox"/> For your information and records <input type="checkbox"/> For claims investigation <input type="checkbox"/> Others (Explain) _____	D	M	Y				_____		
Date of Accident			Time (Use 24:00 Hr)			<input type="checkbox"/> For your information and records <input type="checkbox"/> For claims investigation <input type="checkbox"/> Others (Explain) _____								
D	M	Y												

Project: _____ Description: _____ Station: _____ Offset: _____ Legal Description: 1/4 Sec. _____ TWP. _____ RGE. _____ W. _____ M.														
Contractor Name: _____ Phone No: _____ Equipment Used During Accident: _____ Government or Hired Equipment: _____ Unit No: _____ Operator Name: _____ Phone No: _____														
Utility Company: _____ Contact: _____ Type of Utility: <input type="checkbox"/> Pipeline Size: _____ Commodity: _____ <input type="checkbox"/> Powerline <input type="checkbox"/> Tel. Cable <input type="checkbox"/> TV Cable <input type="checkbox"/> Others (Explain) _____														
Was utility locate requested? <input type="checkbox"/> Yes <input type="checkbox"/> No If "Yes" <input type="checkbox"/> Requested through Alberta 1st. call Reg. No: _____ <input type="checkbox"/> Requested through utility owner Date (d,m,y): _____ If "No" (Explain) _____														
Severity of Accident: <input type="checkbox"/> Fatal <input type="checkbox"/> Injury <input type="checkbox"/> Property Damage														
<table style="width: 100%;"> <tr> <th colspan="2" style="text-align: center;">Brief Description of Injury</th> </tr> <tr> <td style="width: 50%;">Name: _____</td> <td style="width: 50%;">Name: _____</td> </tr> <tr> <td>Employer: _____</td> <td>Employer: _____</td> </tr> <tr> <td>Injury: _____</td> <td>Injury: _____</td> </tr> </table>		Brief Description of Injury		Name: _____	Name: _____	Employer: _____	Employer: _____	Injury: _____	Injury: _____					
Brief Description of Injury														
Name: _____	Name: _____													
Employer: _____	Employer: _____													
Injury: _____	Injury: _____													

Description of Accident: _____ _____ _____ _____ _____ _____ _____ _____			
Remarks: _____ _____ _____ _____			
	Witness 1:	Witness 2:	Witness 3:
Name: _____ Address: _____ Phone: _____ Position: _____ Employer: _____	_____ _____ _____ _____ _____	_____ _____ _____ _____ _____	_____ _____ _____ _____ _____
Sketch area if required			
NOTE: For all pipeline hits & major cable cuts, photographs to accompany report within 48 hours.			
c.c. _____ Insurance Services, General Services Branch (Address)	_____ Signature	_____ Title	_____ Date

APPENDIX C

Office of the Regional Director

_____, 20__

NAME OF FIRM

RE: ATVS USE FOR FIELD SURVEYS

Thank you for your letter dated _____, 20__, requesting approval for your firm to use ATVs to conduct Field Surveys for Engineering purposes.

Enclosed is the Order authorizing your firm to use the highway right-of-way (off highway surface) during the daylight hours only.

Please contact the appropriate RCMP Detachments along the route regarding your activities.

While permission is granted, it must be understood that neither this department nor the government will accept any responsibility or liability for anything that may occur as a result. Please be sure to remind the firm employees to obey all applicable traffic laws and urge them to use the utmost caution at all times. As well, the ATV operator must have a valid Operator's License.

Sincerely,

Regional Director

Attachment (Order and Guidelines)

**GOVERNMENT OF ALBERTA
DEPARTMENT OF TRANSPORTATION
ALL - TERRAIN VEHICLES ORDER**

I, _____, Regional Director of Transportation, pursuant to Section 18(2) of the Off-Highway Vehicle Act, make the following Order, being the _____ Order.

_____ are authorized to permit ATVs between _____ within the highway right-of-way, but not on the travelled portion of Highway during the period from _____ to _____. This use is restricted to undertake engineering work and the attached Guidelines form a condition of this permit.

DATED at _____, Alberta this _____ day of _____, 20__

Regional Director of
Transportation

Request for Corporate Bridge Information Instructions

Viewing Location

4999 – 98th Avenue SE side of Twin Atria
Main Floor
Corporate Records Centre
Phone: (780) 427-0039

Hours of Operation:

8:30 – 4:15 (Closed during lunch hour 12:00 – 1:00 daily)

Minimum of 72 hours of notice must be given prior to viewing

The following steps must be completed before access is permitted:

Consultant/Contractor Complete the Following:

- Name of representative and phone number
- Company name (indicate if you are the prime consultant or a sub; if you are a sub consultant/contractor indicate who is the prime consultant)
- Who engaged by
- Date requested and date required
- Bridge site numbers, bridge site description, date range (eg: bridge site 74458 from 1945 to 1998)
- Select the file types being requested
- Project description
- Obtain project sponsor signature
- Email completed form to Corporate Records Centre (CRC) at records@gov.ab.ca

Department Project Sponsor Complete the Following:

Name, signature and phone number

For Municipality Projects:

Include a signed and dated letter of authorization from the municipality project sponsor including a phone number.

Note: the request will not be processed without a signature)

Please Note the Following Guidelines:

- Minimum of 72 hours of notice must be given prior to viewing
- Bookings will be done at a first come first serve basis
- Maximum of four (4) individuals in the room at the same time
- One consultant firm only in the room when doing a Request for Proposal (RFP)
- No drop in requests will be accepted
- Requestor must sign for records at CRC prior to viewing
- Upon completion of review leave all records in the room so CRC staff can verify that all files have been returned

Request For Corporate Bridge Information

Representative Information Name _____ Phone Number _____ Email Address _____	Company Name, Phone Number, Email Address) Prime Consultant: _____ Sub Consultant: _____ Email Address: _____
-----------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------

_____ RFP for Transportation _____ Engaged by MD/County _____ Other (Explain)	Date Requested: _____ Date Required AM/PM: _____ Date Reviewed _____
----------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------

Bridge Site Number (Date Range Required) _____ _____ _____ _____ _____ _____ _____ _____	Project Description _____ _____ _____ _____ _____ _____ _____ _____
---------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------

AP – Agreement Plans	FD - Final Details	RA - Rating Design
BI - Bearing Inspection / Repair	FL - Flood	SFR - Steel Fabrication Report
BO – Board Orders	General Correspondence	SGL - Steel Girder Inspection
CN – Construction	GT - Geotechnical	TI - Truss Inspection
DK – Deck	IR - Inspection Report	
DN – Design Notes	MIR - Misc Inspection Reports	
Drawings (Design) <i>Obtain from Project Sponsor</i>	PCG - Precast Concrete Girders	
Drawings (Shop) <i>Obtain from Project Sponsor</i>	PI - Paint Inspection	

Project Sponsor (Print Name) _____	Signature _____	Phone Number _____
----------------------------------------------	---------------------------	------------------------------

Email completed form to Corporate Records Centre (CRC) at records@gov.ab.ca

You will be contacted only if the request cannot be filled by the requested time period.

Municipality Request For Corporate Bridge Information

Authorization to Proceed and View Alberta Transportation Bridge Files

We authorize _____ (*Consultant Name*) to view Alberta Transportation Bridge Files for these bridge sites as well as any sites upstream, downstream or on adjacent roadways or watercourse's which would be required to obtain local site history for the completion of the current assignment.

Signed: _____ (*Municipality Project Sponsor*)

Date: _____

Phone: _____

The information provided by Alberta Transportation is provided in confidence and shall not be used or disclosed either directly or indirectly except for

- purposes necessary for the performance of services under contract
- the preparation of proposals to Alberta Transportation
- The following information is being collected under the authority of the Government Organization Act and will be used to track the access of corporate information. It is protected by the privacy provisions of the Freedom of Information and Protection of Privacy Act.

PAYMENT VOUCHERS - DIRECTIONS ON USE

The Payment Voucher has been prepared in such a manner that certain fields remain the same, or constant. These fields have been identified in red.

The Payment Voucher is a Word document that is utilized by the Department to identify various types of coding and provides our accounting department a means to enter information into an electronic format.

The Payment Voucher identifies the “vendor” or “payee” by using a 10-digit number, which represents the vendor’s address and other payment criteria.

The consultant will be required to fill in the following fields (using the “tab” key to move to the next available space):

Prepared By – please enter the person’s name that is filling in the form.

Date – enter date the form is being prepared.

Amount Payable – enter total amount payable, less GST (see GST Exemption Clause).

Invoice Date – enter date in MMDDYY format

Invoice ID – enter invoice number

Line 01 Amount – enter amount that will be charged to Engineering Fees¹.

Line 02 Amount – enter amount that will be charged to Engineering Disbursements².

Note – Lines 01 and 02 will add up to total Amount Payable.

Please forward the completed Payment Voucher along with your invoice and other supporting documents to Attn: Project Sponsor or, should you choose, the completed form can be forwarded by e-mail to *projectsponsor’sfirstname.projectsponsor’slastname@gov.ab.ca*.

For any questions regarding the completion of this form and account status please contact the Project Sponsor’s Administrative Assistant.

¹ Engineering Fees – Includes payments to architects, engineers, draftsmen, testing, and related costs.

² Engineering Disbursements – Includes payments for services that involve a combination of people, materials, and business services not identified in Engineering Fees.

Payment Voucher Completion Guide for Consultants

1) Complete the “**Payment Voucher**” as follows:

- **(A) Business Unit:** Hard Coded 169A
- **(B) Voucher ID:** Leave Blank
- **(C) Prepared by:** Name of the person who prepared payment voucher
- **(D) Date:** the date you prepared the voucher

2) Complete the “**Invoice Header Information**” as follows:

- **(E) Vendor #:** Department Supplied
- **(F) Terms:** as directed
- **(G) Amount Payable:** Actual Amount Payable
- **(H) Accounting Rule:** N/A
- **(I) Invoice Date:** Enter the invoice date in the standard format of “mm-dd-yy”.
- **(J) Factor to Vendor Number:** N/A
- **(K) Invoice ID:** Enter the invoice number (Please Note: for “Contracts” use contract number and estimate number) example: 1234/00Est1
- **(L) Expenditure Officer Approval:** Department Use
- **(M) Date:** Date Expenditure Officers signs
- **(N) Payment Message:** Enter additional information that will be printed on the remittance advice (limited to 30 characters). example: Hwy No. and CON No

3) Chart Fields

- **(O) Amount:** Dollar amount
- **(P) Account** – Defines the expenditure – will be supplied by Project Sponsor
example: 543060 (for CON agreements)
535030 (for construction contract payments)
215031 (for holdback)
- **(Q) Fund** – Defines operating or capital – will be supplied by Project Sponsor
example: 01 or 02
- **(R) Org** – Defines the departmental office where request was originated.
- **(S) Program** – Defines the program(s) where the payment is to be charged– will be supplied by Project Sponsor
- **(T) Project** – Refer to the Job Number for which the expenditure is to be applied – will be supplied by Project Sponsor
- **(U) Task** – Defines the task performed – will be supplied by Project Sponsor as well as additional Task and Activity Coding Information
- **(V) Activity** – Defines the action performed – will be supplied by Project Sponsor as well as additional Task and Activity Coding
- **(W) KMs** – N/A
- **(X) KM Code** – Department use
- **(Y) Tax Code** – Department use
- **(Z) 1099 Code** – N/A
- **(AA) Contract** – Enter the CON number example: CON00100101
- **(BB) Employee No.** – Department use

Government of Alberta ■

Transportation

PAYMENT VOUCHER

Page 1 of

BUSINESS UNIT 169A (A)		VOUCHER ID (B)		PREPARED BY: (C)		DATE: (D)	
VENDOR # (E)							
TERMS (F)		AMOUNT PAYABLE (G)					ACCOUNTING RULE (H)
INVOICE DATE (M M - D D - Y Y) (I)			FACTOR TO VENDOR NUMBER (J)		EXPENDITURE OFFICER APPROVAL:		DATE:
INVOICE ID (K)				(L)		(M)	
PAYMENT MESSAGE (N)						DUE DATE	
HANDLING CODE							
Line	Amount	Account		Fund	Org	Program	
01	(O)	(P)		(Q)	(R)	(S)	
		Project (T)		More...	Task (U)	Activity (V)	
KMs (W)		KM Code (X)	Tax Code (Y)	1099 Code (Z)	Contract (AA)	Employee 00E(BB)	
Line	Amount	Account		Fund	Org	Program	
02							
		Project (T)		More...	Task (U)	Activity (V)	
KMs		KM Code	Tax Code	1099 Code	Contract	Employee 00E	
Line	Amount	Account		Fund	Org	Program	
03							
		Project (T)		More...	Task (U)	Activity (V)	
KMs		KM Code	Tax Code	1099 Code	Contract	Employee 00E	
Line	Amount	Account		Fund	Org	Program	
04							
		Project (T)		More...	Task (U)	Activity (V)	
KMs		KM Code	Tax Code	1099 Code	Contract	Employee 00E	

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DESIGN STANDARDS/ PRACTICE EXCEPTION
REQUEST FORM

Date:

Project:

Region:

Project Sponsor:

Consultant:

NOTE: complete, modify and/or provide additional information as required.

Project Stage

- () Functional Planning () Preliminary Design () Detailed Design
- () Construction () Traffic Impact Assessment (development)
- () Access Management () Other _____ Please specify

Project Type

- () Functional Planning () New Construction () Reconstruction
- () Paving/Surfacing () Bridge () Operations () Geotechnical () Environmental
- () Other _____ Please specify

Project Data (typically required for all projects)

Project Description			
Highway No.		Control Section	
Km Posts	From:	To:	
Length of Project			
Chainage (if applicable)	From:	To:	
Chain Direction	<input type="checkbox"/> South to North	<input type="checkbox"/> West to East	
Design Designation			
Service Classification			
Basic or Existing Right-of-Way			
Existing Traffic Vol.	AADT		ASDT
Projected Traffic Vol. (___ years)	AADT		ASDT
Design Vehicles			Vehicle Distribution
Design Speed			Posted Speed

Example of information required for geometric design:

Cross-Section:	Existing Width		Width after Overlay	
	3R/4R (Suggested Min. Width)		Current Standards	
	Back slope		Side slope	
	Ditch Width			
Level of Service:	Existing		Projected	
Horz. Alignment	Min. Radii		Proposed Radii	
Vert. Alignment	Min. K Crest Curve		Proposed K Crest Curve	
	Min. K Sag Curve		Proposed K Sag Curve	
	Max Grade:		Proposed Grade:	
Existing Passing/Climbing Lanes				

Collision History (if applicable): (Period Year to Year)

() Segment () Interchange () Intersection () Bridge () Other _____ Please specify

Collision Data	Non Animal	Animal	Total
Collision Rate			
Collision Frequency			
Collision Severity Breakdown	# Fatal	# Injury	# PDO
Other (Type): Please specify			

Other Criteria - Please Specify

Details and Supporting Documentation of Design Exception

Provide drawings, analysis, evaluations, cost estimates, rationale, justification, etc. and supporting documentation as required.

Recommended:

Project Sponsor/Date

Recommended:

Regional Director/Date

Recommended:

Technical Standards Branch/Date

Recommended (if applicable):

Executive Director of Planning/Date

Approved:

Executive Director of Technical Standards Branch/Date

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APPENDIX D

PLANNING REQUIREMENTS

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PLANNING STUDY TYPES

1. CORRIDOR STUDY

A corridor is defined as a strip of land approximately 1 to 3 kilometres wide. This type of study is used to identify and analyze general routings for new alignments over a wide area usually through undeveloped lands. It is generally completed with the use of large scale mapping, air photo interpretation, and a field reconnaissance.

A corridor study can be considered as rough work or approximations where one would consider the constructability of a roadway corridor in general terms such as acceptable grades; construction material constraints (e.g. muskeg crossings); general location of bridge crossings; and general cultural impacts such as communities, utilities, other roads, or any other man made things.

A corridor study leads to a more detailed location study along the selected corridor.

2. LOCATION STUDY

A Location Study is a detailed study that:

- Determines the precise location for a roadway in a rural setting
- Defines the future roadway standards and considers improvements to the horizontal and vertical alignment
- Defines approximate earthwork quantities based on a tentative grade line
- Reviews environmental concerns
- Reviews historical resources
- Reviews wildlife issues
- Involves a detailed bridge planning component
- Looks at geotechnical concerns
- Looks at avoiding or mitigating utility conflicts
- Looks at access control/considerations
- Defines right-of-way requirements and property impacts
- Considers First Nations issues
- Provides an approximate cost estimate for construction
- Defines future traffic projections and identifies possible future traffic generators, as well as existing and future traffic patterns
- May identify possible construction staging/timing
- Considers local community development plans and needs

3. INTERCHANGE STUDY

An Interchange Study reviews alternate configurations of interchanges, recommends the most appropriate and cost effective configuration, and looks at staging the construction of the interchanges

4. ACCESS MANAGEMENT STUDIES

Access Management Studies are conducted to:

- Review existing access locations along a roadway
- Review need for interchanges
- Reviews need to upgrade intersections to higher standards
- Review need for service roads
- Looks at access consolidation
- Looks at access spacing consistent with the highway service classification

There are many factors involved for choosing an intersection type, including:

- Highway traffic volumes
- Intersecting road traffic volumes
- Intersection road classification
- Traffic type
- Turning movements
- Sight distance
- Gradient on highway and intersecting road
- Vehicle turning radii (large trucks)
- Acceleration rates for large trucks

5. TRAFFIC IMPACT ASSESSMENTS

A Traffic Impact Assessment defines the standards that an intersection should be designed and constructed to base upon developments occurring on lands outside the highway right-of-way. It takes into consideration existing, background, and/or projected traffic based upon specific development types or ITE traffic generation numbers for specific land uses. In addition, it determines proposed development traffic, intersection needs, and a future (15 to 20 years) projection of intersection improvements required.

Traffic Impact Assessments may include items such as signals, illumination and pedestrian crossing warrants, and will typically review the geometric requirements for the intersection based upon traffic type and volumes (note that the traffic type and volumes will depend on the type of development being proposed).

6. BRIDGE PLANNING STUDY

Bridge Planning Studies focus mainly on the bridge crossing site: the objective is to find the most cost effective method for bridge replacement either at the existing location or at a new location. These studies also deal with investigating the need for upgrading the bridge approaches, and in some instances, an alignment study may dictate that a particular crossing be made to work.

7. FUNCTIONAL PLANNING STUDY

A Functional Planning Study is similar to a location study as far as data collection and considerations are concerned. They differ only in complexity and usually deal with multi-lane highways, upgrading (twinning) highways, intersections and interchanges. These studies are usually in and near urban areas and can involve traffic modeling and complex traffic movements.

MOSAIC PRODUCTION

The Department has moved towards the use of ortho-rectified mosaics. This is the Departments preference unless otherwise indicated that scale-corrected mosaics are acceptable.

Mosaics are to be produced digitally using the appropriate software. For ortho-mosaics, the raster is to be corrected to a base map consisting of parcel mapping and the Provincial Digital Elevation Model (DEM). For improved accuracy, particularly projects that have a lot of terrain relief, contour mapping may also be supplied or requested to aid in scale correction of the raster.

If only scale-corrected mosaics are requested, then the raster is corrected to a base map consisting of parcel mapping. In either case the base map is to be based on the 3-TM, NAD 83 coordinate system and the appropriate base longitude. Phone Highway Geomatics to confirm the base longitude for the project. The scale and date of the aerial photography used is to be determined by the Department.

The aerial photography that is used for scanning can be in either print or diapositive format. The photography is to be scanned at a minimum resolution of 600 dpi. Tone matching between aerial photographs is required when more than one aerial photograph is needed for a mosaic sheet. The flight line number, aerial print number, and the date of the aerial photography is to be recorded on each mosaic sheet.

The typical standard mosaic sheet format to be used will be supplied by the Department. The mosaic sheets are to be positioned on the base map so that the highway alignment is approximately centred within the sheet. Additionally, the mosaic sheets are to be positioned to allow for approximately 300 metres of overlap on each side of each sheet for adjacent sheets. Extra overlap between sheets may be required to compensate for additional length in the profile as the result of horizontal curves.

The design files are to be rotated about the origin point to an angle of 0 degrees. The design files supplied to the Department are to be compatible to MicroStation.

The scale corrected rasters are to be rotated to an angle of 0 degrees and clipped to fit within the reference points on the mosaic sheet. The raster files supplied to the Department are to be in a format that is compatible with 'Intergraph I/RAS C'.

The design files and clipped rasters are to be plotted at an angle of 0 degrees and at a minimum resolution of 400 dpi. Plotting is to be done on a dimensionally stable Mylar that is between 0.03mm and 0.04mm in thickness. The plotting device is to be able to produce a permanent non-smearable plot. The maximum allowable scale error of the plotted mosaic sheet measuring between the corner origin points is 2mm.

The maximum allowable error in the accuracy of the raster to base map within the clipped area is 1mm. The maximum allowable error between adjacent mosaic sheets in the overlapping areas is 1mm.

The mosaic/raster files are to be supplied to the Department at the completion of the project. The Departments preference is to receive this information on CD-ROM.

APPENDIX D

Following is a list of file extension naming conventions that are to be used:

- .OS1, .OS2 for mosaic sheets from number one to nine
- .010, .011 for mosaic sheets from number ten and greater
- i.e. HWY2.OS1, HWY2.010

- .EXT for raster files (i.e. H2SHTO1.EXT)
- .DET for mapping detail design files
- .LGL for base map design files
- .PRO for profile design files
- .CON for contour design files
- .ALI for alignment design files

BASIC RIGHT-OF-WAY REQUEST

For the purpose of purchasing the basic highway right-of-way, the Engineering Consultant will provide right-of-way information on 1:5000 scale digital photo mosaics. These mosaics are in addition to the mosaics prepared for the functional planning study and are to be constructed to the standards as outlined in Mosaic Production on the previous pages. The mosaics should show clearly and concisely all right-of-way requirements. Prior to submission of the final Right-of-Way Request package, two (2) coloured copies marked "DRAFT" are to be provided to the Property Manager for review and approval.

Once the Right-of-Way Request has been approved by the Property Manager and the Project Sponsor, the Consultant is to provide:

- Seven (7) sets of colour paper mosaic prints
- One (1) transparent version with no colour
- Three (3) coloured mosaics schematic plan showing an overview of the entire project on one sheet. It may be necessary to use two sheets for larger projects. The size of these project overview plans shall not exceed 11"x 17" in size.
- Individual Ownership Plan's (IOP's) showing the proposed right-of-way information for each titled property affected by the project (excepting thereout titled crown land). The IOP shall not exceed 8.5"x14" in size. The contents of the IOP's shall be consistent with the requirements for the mosaic information required except that only the required right-of-way is to be shaded in red.
- Plans required by Sustainable Resource Development for the submission of the Provisional Roadway Application on untitled crown lands
- One (1) electronic copy in .PDF format of all required plans listed above

A thorough and current title search is required on all lands affected by the project. All encumbrances must be reviewed. All encumbrances in the name of Her Majesty the Queen (Minister of Transportation) must be reviewed through the Regional Property Manager for clarification of the nature and extent of the encumbrances/caveats. The date of the title search should be clearly labelled on the mosaics under the title block. In addition, the following information is to be shown clearly on the mosaics:

- Land ownership, which is to include the landowner's name and current address, the amount of right-of-way required from each parcel or land affected in both acres and hectares (right-of-way area calculations to be indicated to the nearest 0.1 acres / 0.01 hectares), land title certificate number, legal description, and/or plan number all labelled within the owner's property. In the case where the parcel of land is too small to record the information within the property boundaries, the information may be shown outside the property with an indicator arrow.
- Show all Certificate of Title boundaries, surveyed rights-of-way, easements, service road dedications, etc.
- Any changes or relocation of existing accesses must be shown including alternate means of access (e.g. service road, local road, private drive).
- Indicate the area of all cut-off parcels or severed land that should be considered for optional purchase by the Department or consolidation with adjacent properties.

APPENDIX D

- Show all dimensions of the proposed and existing right-of-way as well as the additional right-of-way requirements, showing the difference between the two.
- In areas such as subdivisions, towns, etc. where there are properties too numerous to show the required information clearly at the 1:5000 scale, a more detailed plan at a suitable scale may be required. Details on these plans will follow the same requirements as stated in Mosaic Production on the previous pages and this document.
- In areas through untitled crown lands, the Consultant is to conduct a Land Status Automated System (LSAS) search for all existing land use interests (i.e. Leases, license of occupation, pipelines, etc.) affected by the required right-of-way. The consultant is to obtain any and all plans or sketches that are within the proposed highway right-of-way including ownership of the interests (if available) and record this information on the mosaics to the aforementioned standards.
- In areas through Special Areas Board land, a Special Areas Board search must be conducted to identify occupants.
- Identify potential contaminated sites.
- All mosaic updates and revisions must be consecutively numbered, beginning with Right-of-way request #1.
- It is required that all right-of-way requirements are to be shown on the mosaic prints highlighted with shading in the appropriate colour to the following format. A colour legend indicating the following must be shown adjacent to the title block, on each mosaic sheet.
 - Right-of-way required.....RED
 - Previously requested right-of-wayGREEN
 - Cancellation of previously requested right-of-way YELLOW
 - Requested easementsORANGE
 - Optional purchasesCROSSHATCHED (RED)
 - Possible borrow locations.....10cm diam. RED CIRCLE
- Each mosaic sheet title block must indicate “Preliminary Design”, the date of mosaic preparation, and “Right-of-Way Request Number”.

Required information	Sample of preferred format
<p>Legal Description C. of T. number Landowner name/s Landowners address</p> <p>R/W required (Provide separate areas for highway r/w and Service road r/w) (Red) Previously requested r/w (Green) Cancellation of previously requested r/w (Yellow) Requested Easement (Orange) Optional purchase (Cross Hatched Red)</p> <p>Possible borrow locations (Red Circle 10 cm dia.)</p> <ul style="list-style-type: none"> - Information to be indicated in the upper right corner (Title Block) - A Right-of-Way request form is required for each revision to the r/w requirements 	<p>NE 27-73-4-W6M or Plan /Block/Lot 962 305 963 Bob Smith and Cathy Smith Box 1234, Worsley, AB T0H 3P0</p> <p>Required Highway R/W - 5.9 ac (2.38 ha) Required Service Road R/W - ac (ha) Previously requested R/W – 5.2 ac (2.10 ha) Cancelled R/W – 2.5 ac (1.01 ha) Easement – 1.3 ac (0.5 ha) Optional purchase / cut-off –29.6ac (11.98 ha) Total R/W required - ac (ha)</p> <p>Possible borrow location – 10 cm diam. Red circle</p> <p>Note: Use only the headings that are applicable.</p> <p>Right-of-way Request # 3 - June 21, 1999 Preliminary Design, For Discussion Purposes Only</p>

Sample format

Insert Consultants Logo

RIGHT-OF-WAY REQUEST

To: Insert name of Property Manager	Project Description: Insert description of project and bridge file number if applicable	FILE:
		DATE:
		R/W REQUEST NO.:

INDICATE (X) IF APPLICABLE	TYPE OF REQUEST	COLOUR ON PLAN
	RIGHT-OF-WAY REQUESTED	RED
	PREVIOUSLY REQUESTED RIGHT-OF-WAY	GREEN
	CANCELLATION OF PREVIOUSLY REQUESTED RIGHT-OF-WAY	YELLOW
	EASEMENT BEING REQUESTED	ORANGE
	OPTIONAL PURCHASED	CROSS-HATCHED (RED)
	POSSIBLE BORROW LOCATIONS	10 CM DIAM. RED CIRCLE

JUSTIFICATION:			
ADDITIONAL REMARKS:			
REQUESTED BY:	NAME	DATE	SIGNATURE
APPROVED AS TO FORM & CONTENT BY PROPERTY MANAGER:			
APPROVED FOR ACQUISITION BY PROJECT SPONSOR:			

HISTORICAL RESOURCES OVERVIEW SCOPE OF WORK

The Historical Resources Overview shall be designed to review current historical resources location data, topography, disturbances, and sedimentary regimes to develop a model of historical resources potential of the proposed development area. The objective of this study is to identify those areas, if any, for which a Historical Resources Impact Assessment is needed. The Overview shall include:

- Examination of site data files maintained by Alberta Community Development for archaeological and historic sites and sensitivity maps for paleontological concerns;
- Summary description and evaluation of known sites within the development zone with a particular focus on site location and function variables;
- Making full use of ancillary data such as ethno graphic, ethno historic, environmental and paleo-environmental studies;
- Developing a model of historical resources potential for the impact area based on known data, topographical potential, models of land use and site distribution;
- Ground truthing to consist of evaluating terrain potential for historical resources, assessing the degree of previous disturbance and evaluating sedimentation and its effect on field methods such as the need for deep testing. The discovery of historical resources *per se* is not the objective of the ground truthing stage; and
- Formulating detailed recommendations regarding the need for a Historical Resources Impact Assessment, and the locations, scope, and methods necessary.

ENVIRONMENTAL ASSESSMENT REQUIREMENTS

Information on the following Valued Ecosystem Components (VEC) must be collected in order to ensure that the effect(s) of the proposed roadway alignment or improvements on the environment can be determined. The significance of the impact of the roadway on the environment shall be determined and the mitigation measures recommended to decrease the roadway impact on the VEC.

I. **Surface/Groundwater**

A review of surface water patterns throughout the study area shall be conducted. Areas suspected to have groundwater concerns should be identified. Any unusual areas where surface/groundwater problems may occur should also be identified. Proximity to water wells, dugouts?

II. **Vegetation**

An inventory of vegetation communities in the study area or along the alignment(s) shall be conducted. Rare, threatened, or endangered species and communities should be identified.

III. **Wildlife**

The study area or alignment(s) shall be reviewed for the presence of any wildlife. Rare, threatened, or endangered species should be identified along with any habitat utilized for any portion of their life stage.

IV. **Fisheries**

The study area or alignment(s) shall be reviewed for the presence of fish and fish habitat in all watercourses. Where no information is available, then a fisheries inventory and a fish habitat assessment shall be undertaken. Rare, threatened, or endangered fish species or habitat should be identified.

V. **Historical Resources**

Refer to Historical Resources Overview Scope of Work on previous page.

VI. **Soil/Landforms**

Soils shall be classified according to the Canadian System of Soil Classification or other common systems recognized in Alberta. Representative topsoil depths should be identified and any special concerns with soil handling procedures should also be identified. Landforms within the study area or along the alignment(s) should be identified and any special properties regarding the landforms should also be identified.

LOCATION SURVEY REQUIREMENTS

Location surveys may be required on zone planning project, in which case this need will be identified in the project Terms of Reference. The purpose of the Location Survey is to accurately establish the recommended alignment on the ground to ensure that it fits to the surrounding terrain and to confirm that there are no additional impacts that will affect the highway location. The alignment as established on the ground will be used to establish the alignment for a preliminary survey at a later date. Note that a Locations Survey is not a preliminary survey and may require that the horizontal alignment be revised and resurveyed a number of times to achieve optimum placement.

Required Tasks

- The recommended alignment is to be tied to the Alberta Survey Network (3TM, NAD 83 coordinate system) and based on the appropriate base longitude so the alignment can be plotted graphically and accuracy of the survey can be confirmed.
- Obtain written permission of landowners/leaseholders for access to land where applicable.
- Establish tangents and points of intersection (PI's), points on tangent (POT's), and ends of curves along the recommended alignment. The POT's and ends of curve's are to be referenced with offsets at 90 degrees to the centre line tangents a distance that is outside the proposed right-of-way width so that the alignment can be easily re-established at a later date for a preliminary survey. A metal rod approximately 30 centimetres in length should be used, where appropriate, and countersunk a minimum of 30 centimetres below the ground especially in cultivated areas.
- All centre-line points, offset points and ends of curves are to be clearly marked with 1"x2" marker stakes and a marker lathe bearing the appropriate centre-line chainage. For offsets the offset distance and direction from centre-line should be clearly marked on the reverse side of the marker stakes.
- Where applicable the recommended alignment is to be tied to all legal survey pins in the immediate vicinity.
- All curves and tangents are to be staked at 20 metre intervals.
- A centre-line profile is required using geodetic datum. All natural breaks in the terrain that do not fall within the 20 metre staking are to be recorded.
- Spot cross-sections in critical areas along the alignment are required to ensure the alignment fits to the surrounding terrain.
- Additional profiling to geodetic datum is required along all public access roads to a minimum distance of 300 metres. Some access roads may require longer profiles depending on the terrain.
- Chainages are to increase from south to north and from west to east.

- Transit notes are required detailing all existing features in the vicinity of the recommended alignment. In forested areas the type and general size of the trees are to be recorded.
- All original curve/transit notes, centre-line profile notes and bench mark level notes are to be recorded in appropriate note books and supplied to the Department upon completion of the survey.
- The recommended alignment is to be plotted on the mosaics using the field co-ordinates and chainages obtained from the survey. All PI coordinates are to be recorded on the mosaics in table form on their respective sheets.
- At the request of the Technical Standards Branch, a standard bridge survey may be required for selected water course crossings. If required this issue will be covered in a separate Schedule included with the Terms of Reference.
- Safety procedures for survey crews are to be adhered to at all times (adequate warning signs and flag people if necessary, etc.)

TYPICAL PLANNING STUDY PROCESS FOR MAJOR FUNCTIONAL PLANNING STUDIES

PUBLIC PARTICIPATION AND PROJECT APPROVAL

(Under the direction of the Technical Review Committee)

(NOTE: This process may vary depending on the type of project)

Send letter from Minister to MLA informing of upcoming study.

Send letter from Consultant to Local Authority informing of study initiation

Notify, by letter, all adjacent landowners of project initiation (Consultant) **

Meet with Local Authorities and/or major stakeholders to identify issues (Consultant and the Department if meeting with council members)

Develop conceptual plans for presentation at first public open house meeting

Meet with MLA's (if required), Consultant and the Department.

First open house (complete the following tasks as part of "open house procedure")

- Review the consultants advertisement, coverage, and strategy (Department)
- Notify by letter, the MLA's local authorities, adjacent landowners and stakeholders of public meeting data (Consultant) **
- Advertise in local media of upcoming open house (Consultant)**
- Hold first open house to present broad concepts for discussion purposes (Consultant, right-of-way agent, and the Department)

Hold individual discussion with concerned landowners (Consultant and right-of-way agent, or other Department representative)

Develop more detailed plans based on input from first open house and discussion with landowners and stakeholders (Consultant)

Hold second open house and repeat all tasks in "open house procedure" to present findings from first open house and revised plans (Consultant, right-of-way agent, and the Department).

Prepare draft report for review by technical review committee (consultant)

Present recommendation and obtain acceptance from the Department Divisional Executive Committee (Consultant)

Prepare necessary documentation for briefing outlining recommendations and public feedback for the Deputy Minister and the Minister (Consultant)

Send letter from the Minister to the MLA's advising the results of the study and the date of the third open house (Consultant to prepare draft letter)

Hold third (final) open house to present final recommended plan and repeat all tasks required in "open house procedure" (Consultant right-of-way agent, and the Department)

Send letter to MLA's informing of completion of study and future actions

Prepare a letter for the signature of the Regional Director (Consultant). Send this letter and plan to landowners indicating:

- Status of recommended plan
- General data of construction
- Right-of-way requirements
- Timing of right-of-way purchase (Department right-of-way Contact Person)
- Department's contact person and telephone number (Regional Director)

** A statement is provided in all letters to the public, newspaper advertisements, and an open house questionnaire's indicating a specific contact person and collect telephone number for the consultant.

Indicates enhancements to the public participation process

Note: There could still be some stakeholders who may not be satisfied with the recommended plan. Every effort will be made to mitigate the individual's concerns/issues through on going discussions.

COMMUNICATIONS PROCEDURES FOR OPEN HOUSES

Advertising

It is the Consultant's responsibility to ensure that all stakeholders are aware of any open house or public meeting(s). The Consultant will work within newspaper(s) deadlines to ensure ads are placed in the appropriate newspaper(s).

The Consultant will:

- Develop ad copy using the template provided by the Department (Consultant's and Department's logos to appear on the bottom of the ad – Department logo to appear on the right hand side)
- Provide a list of newspapers where the ad will be inserted and list insertion dates, and book space in newspaper(s) for insertion at least one week before the event
- Submit draft copy for approval to Communications **at least two weeks in advance**
- Provide Transportation's approved ad copy to newspaper(s)
- Provide Communications with a tear sheet (or photocopy of ad) from newspaper(s)

Correspondence to Landowners

Using the template provided, the Consultant will draft correspondence to the land-owner and stakeholders in plain language.

Correspondence to include:

- an explanation that the consultant was hired by the Department to manage the project
- a plain language description of the project
- mention that the open house(s) will take place and list the location, date, and time
- mention that their participation is important and valued
- a request to landowners to advise anyone else who has an interest in this project about the open house
- a contact name and telephone number

Approval: Draft correspondence must be submitted to Communications for approval at least two weeks in advance.

Fact Sheet

The Consultant will develop a fact sheet for distribution at the open house.

Information should:

- be in plain language
- provide background details
- provide current status
- state proposed plans
- provide a contact name for further information
- have both the Consultant's and the Department's logo on bottom right hand side of fact sheet

Approval: Submit draft fact sheet to Communications for approval at least two weeks in advance of open house

Display

The Consultant will develop a display with maps and alternate plans or proposals if applicable.

Information should:

- be in plain language
- be point form
- be in large type
- use lots of white space
- include maps if applicable
- include charts if applicable
- have the Consultant's and the Department's (bottom right hand side) logos on display panel

Approval: Submit **draft display copy** to Communications for approval at least two weeks in advance

Survey

If the Consultant and the Department decide that a survey should be developed for an open house or public meeting, the Consultant will:

- develop one using plain language
- encourage participation by having a statement of how important stakeholders' comments are
- at a table near the exit, provide a cardboard box or other container so that participants can return completed surveys anonymously
- give a fax number and mailing addresses where questionnaires can be returned
- state a deadline for receipt of the questionnaires
- follow up with Communications on survey results/analysis

If the stakeholder can be identified by any information on the completed questionnaire, the following statement must be added to the survey:

Personal information that you provide on this form is protected under the Freedom of Information and Protection of Privacy Act of Alberta. The personal information that is collected on this form relates directly to programs being undertaken by Alberta Transportation and will be used to reply to your questions and concerns supplied on this form. No other use will be made of this information and it will not be released without your written consent.

Approval: Submit draft survey to Communications for approval at least two weeks in advance.

Communications for those with Special Needs

Consultants should be aware of any special needs of their stakeholders and anticipate the need for alternative formats for communications such as larger print handouts and interpreters. Where practical, meeting venues should be accessible to persons with disabilities. This would include wheelchair access, washroom access, and adequate lighting.

Issues Management

The Consultant is to identify any potential issues and must advise the Department project manager and Communications of these. The Consultant and Communications will work together to manage all issues.

Media Relations

The Consultant will deal with the media on general project questions.

The Consultant will:

- always respond in a timely manner
- stick to the facts
- not give their own opinion
- not comment on policy decisions
- speak only on behalf of the Department
- not speculate if they do not know the answer to a question (advise the reporter you will get the information and call them back)
- telephone Communications and discuss media questions and responses if known ahead of time
- complete a media request form and fax immediately to Communications

OPEN HOUSE

HIGHWAY XXX
Planning Study

Alberta Transportation has retained ZZZ
Engineering Ltd. to complete a --- etc.

**You are invited to view
plans and provide input
on the planning study at
an open house on:**

**September 23, 2011
6 p.m.
XXX Community Centre**

ZZZ Engineering Ltd. representatives will
be in attendance to outline the project
and answer questions.

For more information on the planning
study, please contact _____ collect at
(xxx) xxx-xxxx or e-mail _____.

ZZZ Engineering Ltd.

Sample Correspondence to Stakeholder

Date

Dear Property Owner:

Alberta Transportation has retained the XYZ Company, an engineering firm, to determine (description of what company XYZ is doing).

Please plan to attend the scheduled open house/public information session as your participation in this process is important.

Location:

Date:

Time:

We have attempted to contact all landowners who may be affected by this project. Should you be aware of other individuals or groups, who may have an interest in this subject, please advise them of the open house/public information session, or contact us directly.

If you have any questions, or would like more information, please call my office at (area code) xxx-xxxx. (Please include a toll-free number if you have one.) We look forward to seeing you at the open house/public information session.

Sincerely,

John Smith
Consultant

Sample Survey

Topic: Highway 14X Access Relocation

In order to understand your transportation requirements, concerns, and community-related issues, your assistance, by completing this survey, is appreciated.

Please take this time to review and discuss the plans with staff before completing the survey.

1. *How did you hear about this session?*

2. Were the information displays helpful? Yes No

3. Were the hosts helpful in explaining the xx? Yes No

4. *Did the open house help you to better understand the requirements for xxxxxxxxxx?*
 Yes No

5. *Do you have any comments or suggestions that you feel may be useful in the xxxxx?*

Thank-you for your participation.

Please deposit your questionnaire in the box at the door when leaving. You may also fax or mail the completed survey to: consultant's name, address, etc., fax number.

DEADLINE date (one week from time of open house)

Note: If you ask for the following information as part of the survey you must include the statement pertaining to Freedom of Information and Protection of Privacy Act.

APPENDIX D

Contact Information:

Name

Street/Avenue/RR#/Box #

Town/City

Province

Postal Code

Personal information that you provide on this form is protected under the Freedom of Information and Protection of Privacy Act of Alberta. The personal information that is collected on this form relates directly to programs being undertaken by Alberta Transportation and will be used to reply to your questions and concerns supplied on this form. No other use will be made of this information and it will not be released without your written consent.

Consultant Logo

Transportation Logo

APPENDIX E

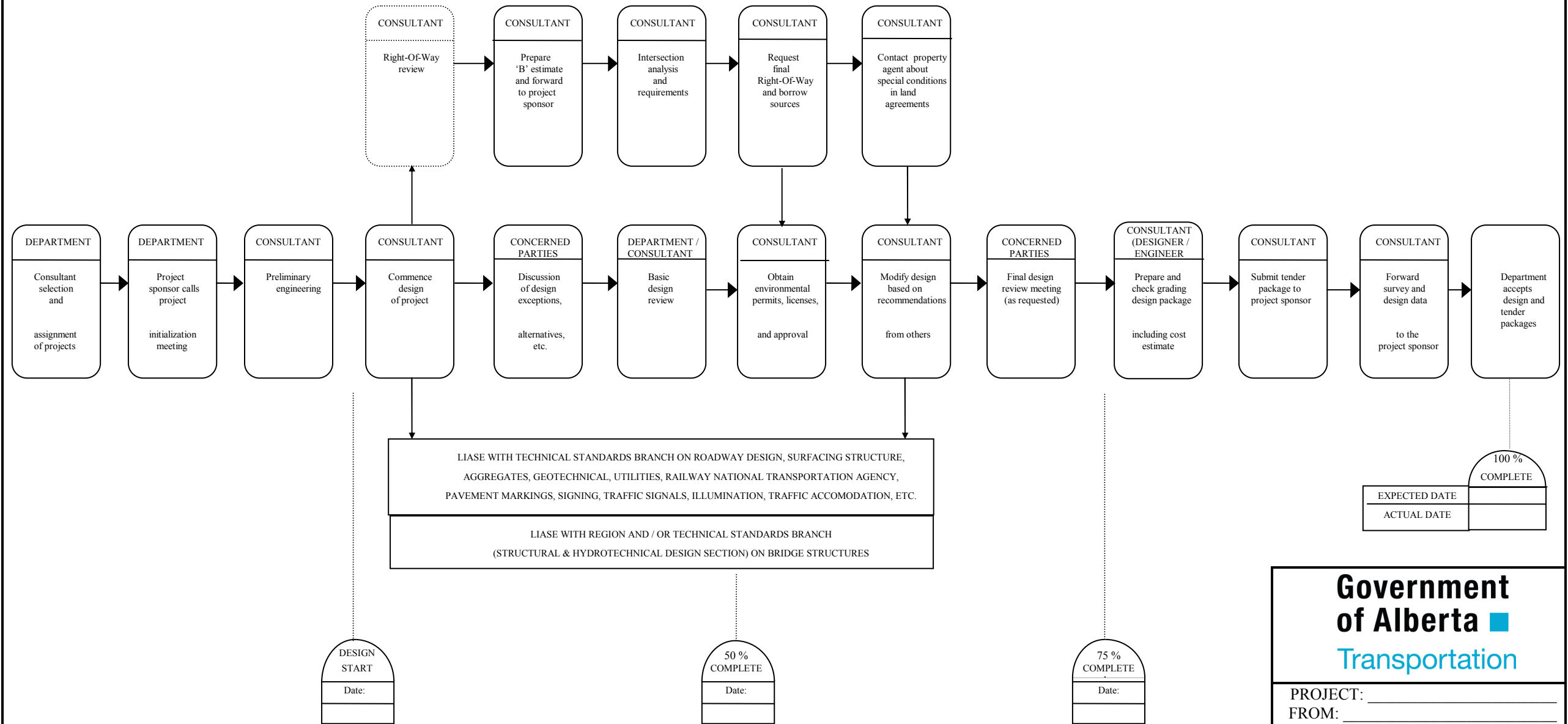
HIGHWAY GRADING/SURFACING DESIGN COORDINATION FLOW CHART

APPENDIX E

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CONSULTANT HIGHWAY GRADING / SURFACING DESIGN COORDINATION FLOW DIAGRAM

THIS CHART IS ONLY A GENERAL GUIDE AS PROJECTS WILL HAVE UNIQUE DIFFERENCES THAT THE DESIGNER SHOULD ADJUST FOR



Government of Alberta ■
Transportation

PROJECT: _____
FROM: _____
TO: _____
CONSULTANT: _____

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APPENDIX F

SURFACING CRITERIA

APPENDIX F

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SURFACING DESIGN ESTIMATE

PREAMBLE

A. WORK SHEET

The work sheet shall contain complete project descriptions and limits for all of the work proposed, and a work-up of the spread rates and application rates per km for each typical section, for each type and layer of material. Extra material required for levelling and minor intersections or approaches are indicated here. These rates are used in the calculation of quantities in the project estimates. This is also a valuable aid to the Consultant's Representative in terms of material distribution management. Major intersection and roadside turnout quantities shall be calculated separately.

B. SCHEMATIC DIAGRAM

Prepare a graphic logistic layout of all of the major contract work components. It shows the limits of work segments and project limits for each project, expressed in kilometres. Show locations of all of the typical sections and respective limits where they occur. Special notes and details or conditions regarding bridges, curb and gutter, railway crossings, intersections, climbing lanes, and other special peculiarities are also shown here.

C. TYPICAL SECTIONS AND DETAILS

Show all of the typical sections. Each typical section shows the layers and thicknesses expressed in mm, widths expressed in m, as well as the ACP mix type, and asphalt binder grade to be used in the construction of each material layer. It also indicates the requirements of tack coat and/or spray coats where required. Cross-fall and side-slope gradients should be shown when necessary.

D. PROJECT ESTIMATES

Each project in the contract requires a separate complete comprehensive estimate of quantities and costs. Each estimate shall include the contract costs, contingency, and engineering.

E. BID ITEM SUMMARY

Prepare a summary of the total quantities from all of the project estimates for all of the bid items in the contract.

F. COST SUMMARY

Prepare a summary of all of the total costs from all of the projects for all of the bid items as well as the total estimated costs including contract costs, contingencies, and engineering.

G. SURFACING ESTIMATE SUMMARY

Compile a combined summary of quantities and costs used in the preparation of the "Unit Price Schedule" for the final tender documents.

H. CONTRACT LOCATION MAP (KEY PLAN)

Prepare a map showing the geographic location, limits, townships, and ranges, plus the locations of all major intersections, bridge structures, vehicle turnouts, and passing/climbing lanes within the contract.

I. MATERIALS DISTRIBUTION SUMMARY

Prepare a distribution chart for the major haul related materials.

SPREAD RATE GUIDELINES FOR FIRST COURSE GRAVEL SURFACING DESIGN

The following chart has been developed to assist in the design of first course gravel surfacing quantities:

SUBGRADE WIDTH (m)	SPREAD RATE (m³/km)
7.0	300
8.0	350
9.0	400
10.0	450
11.0	500
12.0	550
13.0	600
14.0	650
15.0	700
16.0	750
17.0	800
18.0	850

The spread rates provided apply to general application only. The condition of the subgrade may affect the actual gravel requirements.

Alberta Transportation
Technical Standards Branch
Surface Engineering and Aggregates Section

GUIDELINES FOR SELECTING TYPE OF SEAL COAT ON A PAVED SURFACE

Once a project has been selected and approved for seal coat application on a paved surface the traffic volume determines the seal coat type and aggregate materials as shown in the following table:

Traffic Volume A.A.D.T.	Seal Coat Type	Specification for Aggregate (see Specification 3.2 Table 3.2.3.1)	
		Designation	Class
> 10,000	Chip Seal	3	12.5 AW
800 – 10,000	Chip Seal	3	12.5 BW
< 800	Graded Aggregate Seal	3	12.5 C
< 500	Double Seal Coat ¹	3	16 (both applications)

Note ¹: Not regularly used by the Department. Double Seal Coat is applied on a granular base in lieu of an asphalt pavement. Applications to be determined after consultation with Technical Standards Branch

<p>ALBERTA Transportation Technical Standards Branch</p> <p>SURFACING ESTIMATE WORKSHEET</p> <p>Designed by: D.C. Reviewed by: M.J.</p>	<p>Date: Aug 31, 2011</p> <p>File: Hwy. 41:08 Hwy. 545:02 A.R. 154</p>																												
<p>ASPHALT CONCRETE PAVEMENT - EPS</p> <hr/> <p>“Contractor’s Supply With Option”</p>																													
<table style="width: 100%; border: none;"> <tr> <td style="width: 33%;">Hwy. 41:08</td> <td style="width: 33%;">From N. of Hilda Access to N. of Hwy 545</td> <td style="width: 33%;">km 21.850 - km 39.229 = 17.379 km</td> </tr> <tr> <td>Hwy. 545:02</td> <td>From Jct. Hwy 41:08 to Saskatchewan Border</td> <td>km 0.000 - km 6.511 = 6.511 km</td> </tr> <tr> <td>A.R. 154</td> <td>From Jct. Hwy 41:08 to E. of Hilda</td> <td>km 0.000 - km 5.124 = 5.124 km</td> </tr> </table>		Hwy. 41:08	From N. of Hilda Access to N. of Hwy 545	km 21.850 - km 39.229 = 17.379 km	Hwy. 545:02	From Jct. Hwy 41:08 to Saskatchewan Border	km 0.000 - km 6.511 = 6.511 km	A.R. 154	From Jct. Hwy 41:08 to E. of Hilda	km 0.000 - km 5.124 = 5.124 km																			
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<p>SUBGRADE EXCAVATION</p> <p>GRANULAR FILL</p> <p style="padding-left: 20px;">Backfill: Pit - Run Des. 6 - 125</p> <p style="padding-left: 20px;">Backfill: Crushed Des. 2 - 25</p> <p>ASPHALT CONCRETE PAVEMENT - EPS</p> <p style="padding-left: 20px;">Mix type M1/200-300A</p> <p style="padding-left: 40px;">Roadway</p> <p style="padding-left: 40px;">Minor Ints.</p> <p style="padding-left: 40px;">Extras</p> <p style="padding-left: 20px;">Total (t/km)</p> <p>ASPHALT CONCRETE PAVEMENT - EPS</p> <p style="padding-left: 20px;">Mix Type L1/200-300A</p> <p style="padding-left: 40px;">Roadway</p> <p style="padding-left: 40px;">Minor Ints.</p> <p style="padding-left: 40px;">Extras</p> <p style="padding-left: 20px;">Total (t/km)</p> <p>ASPHALT CONCRETE PAVEMENT - EPS</p> <p style="padding-left: 20px;">Mix Type S1/200-300A</p> <p style="padding-left: 40px;">Roadway</p> <p style="padding-left: 40px;">Preliminary levelling</p> <p style="padding-left: 20px;">Total (t/km)</p> <p>SCHEDULE, NOTE OR SPECIAL PROVISIONS (See Attached)</p>	<p style="text-align: right;">500 m³ Total</p> <p style="text-align: right;">650 t Total</p> <p style="text-align: right;">650 t Total</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%;"><u>Typ. 'A'</u></td> <td style="width: 50%;"></td> </tr> <tr> <td style="text-align: right;">1,300</td> <td></td> </tr> <tr> <td style="text-align: right;">50</td> <td></td> </tr> <tr> <td style="text-align: right;"><u>50</u></td> <td></td> </tr> <tr> <td style="text-align: right;">1,400</td> <td></td> </tr> <tr> <td><u>Typ. 'B'</u></td> <td><u>Typ. 'C'</u></td> </tr> <tr> <td style="text-align: right;">1,650</td> <td style="text-align: right;">850</td> </tr> <tr> <td style="text-align: right;">100</td> <td style="text-align: right;">50</td> </tr> <tr> <td style="text-align: right;"><u>200</u></td> <td style="text-align: right;"><u>150</u></td> </tr> <tr> <td style="text-align: right;">1,950</td> <td style="text-align: right;">1,050</td> </tr> <tr> <td><u>Typ. 'A'</u></td> <td></td> </tr> <tr> <td style="text-align: right;">550</td> <td></td> </tr> <tr> <td style="text-align: right;"><u>200</u></td> <td></td> </tr> <tr> <td style="text-align: right;">750</td> <td></td> </tr> </table>	<u>Typ. 'A'</u>		1,300		50		<u>50</u>		1,400		<u>Typ. 'B'</u>	<u>Typ. 'C'</u>	1,650	850	100	50	<u>200</u>	<u>150</u>	1,950	1,050	<u>Typ. 'A'</u>		550		<u>200</u>		750	
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ALBERTA
Transportation
Technical Standards Branch

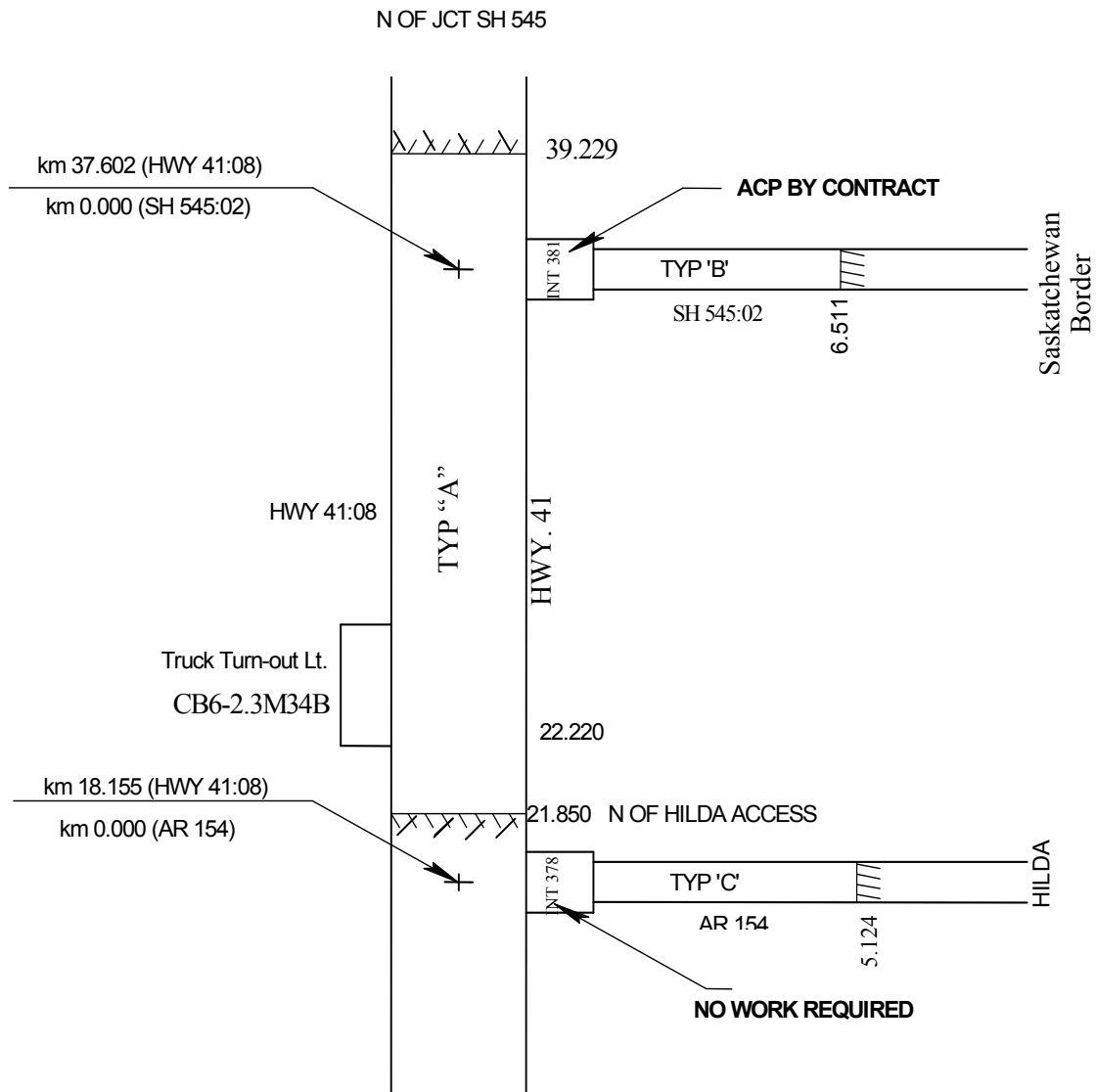
Date: Aug 31, 2011

SURFACING ESTIMATE WORKSHEET

Designed by: D.C.
 Reviewed by: M.J.

File: Hwy. 41:08
 Hwy. 545:02
 A.R. 154

SCHEMATIC



ALBERTA
Transportation
Technical Standards Branch

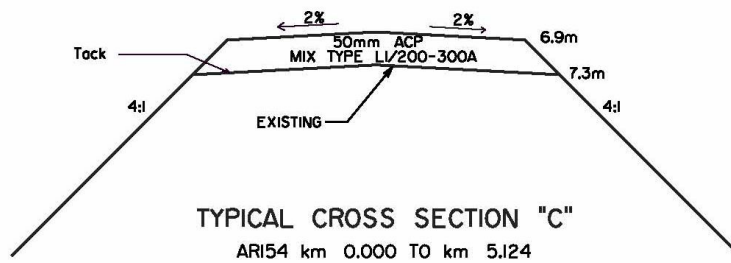
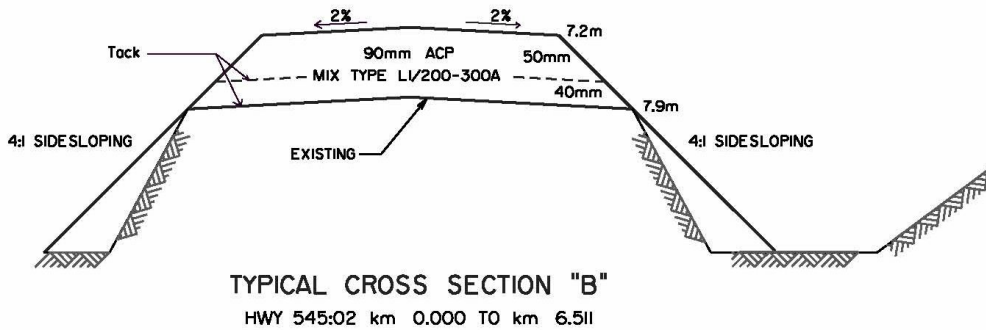
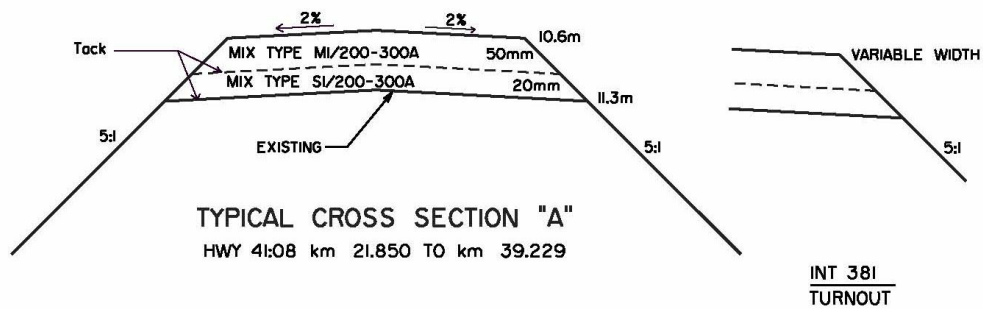
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SURFACING ESTIMATE WORKSHEET

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 A.R. 154

TYPICALS



ALBERTA Transportation Technical Standards Branch	Date: Aug 31, 2011
SURFACING ESTIMATE WORKSHEET Designed by: D.C. Reviewed by: M.J.	File: Hwy. 41:08 Hwy. 545:02 A.R. 154

ASPHALT CONCRETE PAVEMENT - EPS

"Contractor's Supply With Option"

PROJECT: Hwy. 41:08
 LOCATION N. of Hilda Access - N. of Jct Hwy. 545
 km 21.850 - km 39.229 = 17.379 km

SUBGRADE EXCAVATION	allow 400 m ³ Subgrade Excavation : 400 m ³ X 16.80 \$/m ³ =		\$6,720
GRANULAR FILL (Pit- Run) Des. 6 - 125	Backfill : 200 m ³ X 2.33 t/m ³ =	<u>470 t</u>	
	Granular Fill Des. 6: 500 t X 20.00 \$/t =	470 t	\$10,000
GRANULAR FILL Des. 2-25	Backfill : 200 m ³ X 2.33 t/m ³ =	<u>470 t</u>	
	Granular Fill Des. 2 : 500 t X 33.00 \$/t =	470 t	\$16,500

ASPHALT CONCRETE PAVEMENT End Product Spec. Mix Type M1/200-300A

'A' km 21.850 to km 39.229 = 17.379 km X 1,400 t/km =	24,330 t
CB6-2.3M34B :	
[1600 m ² + (350 m X 0.125 m)] X 0.050 m X 2.33 t/m ³ + 10% =	210 t
Int. 381 :	
[2200 m ² + (500 m X 0.125 m)] X 0.050 m X 2.33 t/m ³ + 10% =	<u>290 t</u>
	24,830 t

Asphalt Concrete Pavement - E.P.S. Mix Type M1/200-300A: 24,900 t X 65.00 \$/t = \$1,618,500

ASPHALT CONCRETE PAVEMENT End Product Spec. Mix Type S1/200-300A

'A' km 21.850 to km 39.229 = 17.379 km X 750 t/km =	13,040 t
CB6-2.3M34B :	
[1600 m ² + (350 m X 0.300 m)] X 0.020 m X 2.33 t/m ³ + 10% =	90 t
Int. 381 :	
[2200 m ² + (500 m X 0.300 m)] X 0.020 m X 2.33 t/m ³ + 10% =	<u>120 t</u>
	13,250 t

Asphalt Concrete Pavement - E.P.S. Mix Type S1/200-300A: 13,300 t X 70.00 \$/t = \$931,000

ROADWAY LINES - Supplying Paint & Painting Directional Dividing + 2 Edge

'A' km 21.850 to km 39.229 =	<u>17.379 km</u>
	17.379 km
Roadway Lines - Supplying Paint & Painting Directional Dividing + 2 Edge : 17.38 km X 715.00 \$/km =	\$12,427

ROADWAY LINES - Supplying Paint & Painting Lane Dividing Lines – Turnout

km 22.060 to km 22.380 =	<u>0.320 km</u>
	0.320 km
Roadway Lines - Supplying Paint & Painting Lane Dividing Lines - Turnout : 0.32 km X 501.00 \$/km =	\$161

INTERSECTION LINES - Supplying Paint & Painting All Lines

Int # 381

Intersection Lines – Supplying Paint & Painting All Lines : 1 unit X 251.00 \$/unit = \$251

SUPPLY OF AGGREGATE - WITH OPTION

Granular Fill : 1,000 t

ACP : 38,200 t

TOTAL : 39,200 t

Supply of Aggregate - With Option : 39,200 t X 2.50 \$/t = \$98,000

MOBILIZATION (10 %)	<u>\$269,356</u>
SUB-TOTAL	\$2,962,915
CONSTRUCTION COST	\$2,963,000
CONTINGENCY (5 %)	\$148,150
ENGINEERING (10%)	<u>\$311,115</u>
TOTAL ESTIMATED COST (to nearest \$1000)	\$3,422,000

ALBERTA	Date: Aug 31, 2011
Transportation	
Technical Standards Branch	
SURFACING ESTIMATE WORKSHEET	File: Hwy. 41:08
Designed by: D.C.	Hwy. 545:02
Reviewed by: M.J.	A.R. 154

ASPHALT CONCRETE PAVEMENT – EPS

“Contractor’s Supply With Option”

PROJECT: Hwy. 545:02
LOCATION: From Jct. Hwy. 41:08 to Saskatchewan Border
 km 0.000 - km 6.511 = 6.511

SUBGRADE EXCAVATION	allow 100 m ³	
	Subgrade Excavation : 100 m ³ X 16.80 \$/m ³ =	-----\$1,680
GRANULAR FILL (Pit-Run) Des. 6 - 125	Backfill : 50 m ³ X 2.33 t/m ³ =	<u>120 t</u>
		120 t
	Gran. Fill Des. 6: 150 t X 20.00 \$/t =	-----\$3,000
GRANULAR FILL Des. 2 - 25	Backfill : 50 m ³ X 2.33 t/m ³ =	<u>120 t</u>
		120 t
	Gran. Fill Des. 2: 150 t X 33.00 \$/t =	-----\$4,950

ASPHALT CONCRETE PAVEMENT End Product Spec. Mix Type L1/200-300A
 ‘B’ km 0.000 to km 6.511 = 6.511 X 1,950 t/km = 12,700 t
 12,700 t
 Asphalt Concrete Pavement - E.P.S. Mix Type L1/200-300A : 12,700 t X 68.00 \$/t = ----- \$863,600

ROADWAY LINES - Supplying Paint & Painting Directional Dividing + 2 Edge
 ‘B’ km 0.000 to km 6.511 = 6.511 km
 6.511 km
 Roadway Lines - Supplying Paint & Painting Directional Dividing + 2 Edge 6.51 km X 715.00 \$/km = \$4,655

SUPPLY OF AGGREGATE - WITH OPTION
 Granular Fill : 300 t
 ACP : 12,700 t
 TOTAL : 13,000 t
 Supply of Aggregate - With Option : 13,000 t X 2.50 \$/t = ----- \$32,500

MOBILIZATION (10 %)	<u>\$91,039</u>
SUB-TOTAL	\$1,001,424
CONSTRUCTION COST	\$1,002,000
CONTINGENCY (5 %)	\$50,100
ENGINEERING (10 %)	<u>\$105,210</u>
TOTAL ESTIMATED COST (to nearest \$1000)	\$1,157,000

ALBERTA
Transportation
Technical Standards Branch

Date: Aug 31, 2011

SURFACING ESTIMATE WORKSHEET

File: Hwy. 41:08

Designed by: D.C.

Hwy. 545:02

Reviewed by: M.J.

A.R. 154

ASPHALT CONCRETE PAVEMENT – EPS

“Contractor’s Supply With Option”

PROJECT: A.R. 154
LOCATION: From Jct. Hwy. 41:08 to E. of Hilda
 km 0.000 - km 5.124 = 5.124 km

ASPHALT CONCRETE PAVEMENT End Product Spec. Mix Type L1/200-300A

‘C’ km 0.000 to km 5.124 = 5.124 km X 1,050 t/km = $\frac{5,380 \text{ t}}{5,380 \text{ t}}$

Asphalt Concrete Pavement - E.P.S. Mix Type L1/200-300A: 5,400 t X 68.00 \$/t = ----- \$367,200

ROADWAY LINES - Supplying Paint & Painting Directional Dividing + 2 Edge

‘C’ km 0.030 to km 5.124 = $\frac{5.09 \text{ km}}{5.09 \text{ km}}$

Roadway Lines – Supplying Paint & Painting Directional Dividing + 2 Edge:

5.09 km X 715.00 \$/km = ----- \$3,640

SUPPLY OF AGGREGATE - WITH OPTION

ACP : $\frac{5,400 \text{ t}}{5,400 \text{ t}}$

TOTAL : $\frac{5,400 \text{ t}}{5,400 \text{ t}}$

Supply of Aggregate - With Option : 5,400 t X 2.50 \$/t = ----- \$13,500

MOBILIZATION (10%)	<u>\$38,434</u>
SUB-TOTAL	\$422,774
CONSTRUCTION COST	\$423,000
CONTINGENCY (5%)	\$21,150
ENGINEERING (10%)	<u>\$44,415</u>
TOTAL ESTIMATED COST (to nearest \$1000)	\$489,000

APPENDIX F

ALBERTA	Date: Aug 31, 2011
Transportation	
Technical Standards Branch	
SURFACING ESTIMATE WORKSHEET	File: Hwy. 41:08
Designed by: D.C.	Hwy. 545:02
Reviewed by: M.J.	A.R. 154

BID ITEM SUMMARY

DESCRIPTION	Hwy. 41:08	Hwy. 545:02	A.R. 154	TOTAL	UNITS
Mobilization	\$269,356	\$91,039	\$38,434	\$398,829	Lump Sum \$
Supply of Aggregate - With Option	39,200	13,000	5,400	57,600	t
Subgrade Excavation	400	100		500	m ³
Granular Fill (Pit-Run) Des. 6 - 125	500	150		650	t
Granular Fill Des. 2 - 25	500	150		650	t
Asphalt Concrete Pavement - E.P.S. Mix Type L1/200-300A		12,700	5,400	18,100	t
Asphalt Concrete Pavement - E.P.S. Mix Type M1/200-300A	24,900			24,900	t
Asphalt Concrete Pavement - E.P.S. Mix Type S1/200-300A	13,300			13,300	t
Roadway Lines - Supplying Paint & Painting Directional Dividing + 2 Edge	17.38	6.51	5.09	28.98	km
Roadway Lines - Supplying Paint & Painting Lane Dividing Lines - Turnout	0.32			0.32	km
Intersection Lines - Supplying Paint & Painting All Lines	1			1	unit

MATERIAL SUMMARY

DESCRIPTION	Hwy. 41:08	Hwy. 545:02	A.R. 154	TOTAL	UNITS
-------------	------------	-------------	----------	-------	-------

UNIT PRICE TO BE PROVIDED BY THE REGIONAL AGGREGATE COORDINATOR FOR ALL OPTION SOURCES AND TO BE INSERTED INTO THE UNIT PRICE SCHEDULE BY THE PRIME CONSULTANT
i.e. 57,600t @ \$2.50/t = \$144,000

ALBERTA
Transportation
Technical Standards Branch

Date: Aug 31, 2011

SURFACING ESTIMATE WORKSHEET

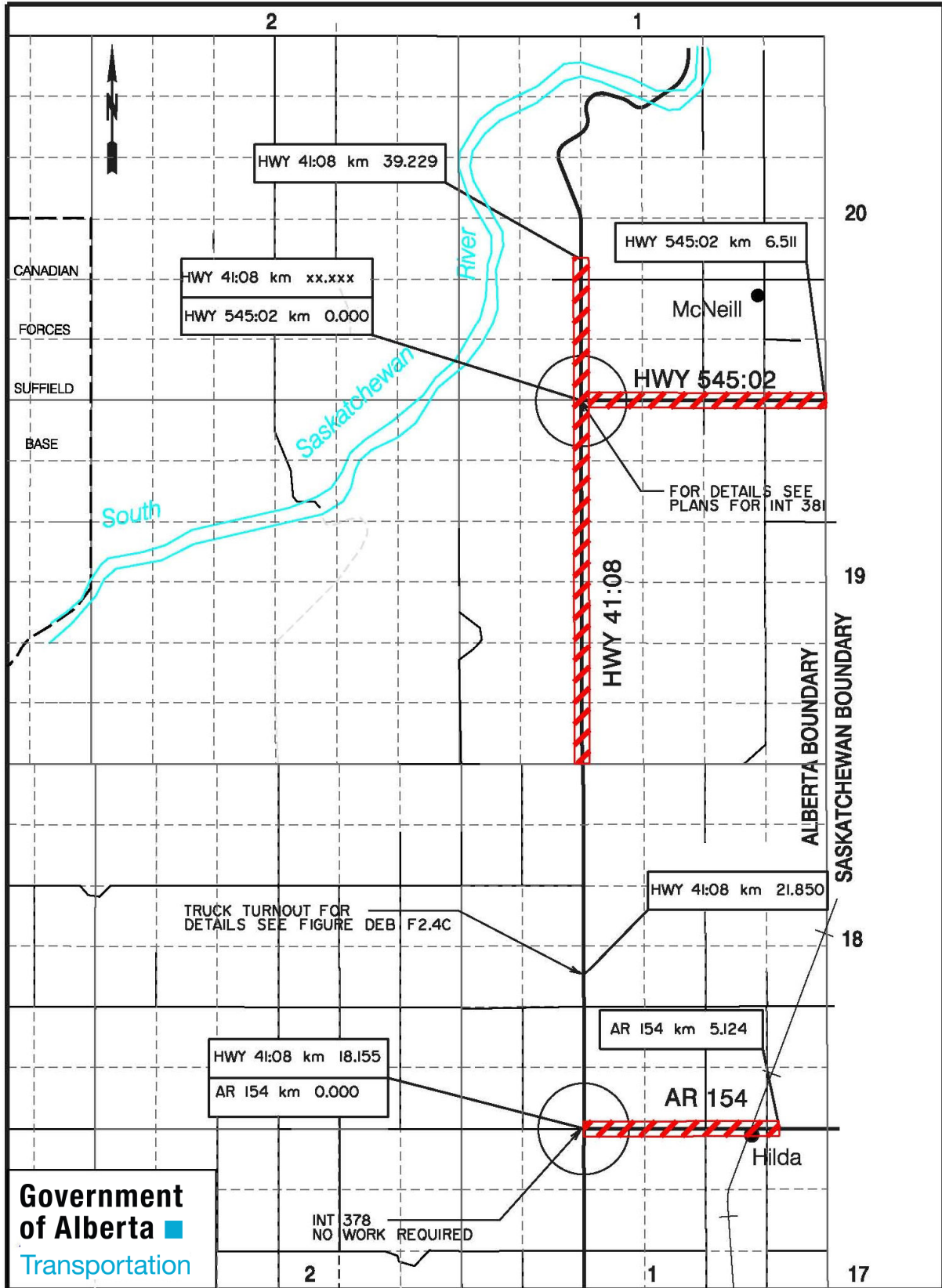
Designed by: D.C.
 Reviewed by: M.J.

File: Hwy. 41:08
 Hwy. 545:02
 A.R. 154

COST SUMMARY

DESCRIPTION	Hwy. 41:08	Hwy. 545:02	A.R. 154	TOTAL
Mobilization	\$269,356	\$91,039	\$38,434	\$398,829
Supply of Aggregate - With Option	\$98,000	\$32,500	\$13,500	\$144,000
Subgrade Excavation	\$6,720	\$1,680		\$8,400
Granular Fill (Pit-Run) Des. 6 - 125	\$10,000	\$3,000		\$13,000
Granular Fill Des. 2 - 25	\$16,500	\$4,950		\$21,450
Asphalt Concrete Pavement - E.P.S. Mix Type L1/200-300A		\$863,600	\$367,200	\$1,230,800
Asphalt Concrete Pavement - E.P.S. Mix Type M1/200-300A	\$1,618,500			\$1,618,500
Asphalt Concrete Pavement - E.P.S. Mix Type S1/200-300A	\$931,000			\$931,000
Roadway Lines - Supplying Paint & Painting Directional Dividing + 2 Edge	\$12,427	\$4,655	\$3,640	\$20,722
Roadway Lines - Supplying Paint & Painting Lane Dividing Lines - Turnout	\$161			\$161
Intersection Lines - Supplying Paint & Painting All Lines	\$251			\$251
SUB-TOTAL	\$2,962,915	\$1,001,424	\$422,774	\$4,387,113
CONSTRUCTION COST (rounded)	\$2,963,000	\$1,002,000	\$423,000	\$4,388,000
CONTINGENCY (5%)	\$148,150	\$50,100	\$21,150	\$219,400
ENGINEERING (10%)	\$311,115	\$105,210	\$44,415	\$460,740
TOTAL ESTIMATED COST (rounded)	\$3,422,000	\$1,157,000	\$489,000	\$5,068,000

ALBERTA Transportation Technical Standards Branch		SURFACING ESTIMATE SUMMARY															
Project: <u>Hwy. 41:08</u>		From km: <u>21.850</u>	To km: <u>39.229</u>														
Project: <u>Hwy. 545:02</u>		From km: <u>0.000</u>	To km: <u>6.511</u>														
Project: <u>A.R. 154</u>		From km: <u>0.000</u>	To km: <u>5.124</u>														
PMB Code #	Bid Item Description	Unit	Estimated Quantity	Unit Price	Estimated Cost	Spec Nos.	Remarks (Plan No.)										
X100	Mobilization	Lump	1	Lump	\$398,829	1.2											
A800	Supply of Aggregate – With Option	t	57,600	\$2.50	\$144,000	3.2 & S.P.											
B100	Subgrade Excavation	m ³	500	\$16.80	\$8,400	3.1											
B152	Granular Fill (Pit-Run) Des. 6 - 125	t	650	\$20.00	\$13,000	3.8											
B153	Granular Fill Des. 2 - 25	t	650	\$33.00	\$21,450	3.8											
Q992	Asphalt Concrete Pavement - EPS (Mix Type M1/200-300A)	t	24,900	\$65.00	\$1,618,500	3.50											
Q993	Asphalt Concrete Pavement - EPS (Mix Type L1/200-300A)	t	18,100	\$68.00	\$1,230,800	3.50											
Q994	Asphalt Concrete Pavement - EPS (Mix Type S1/200-300A)	t	13,300	\$70.00	\$931,000	3.50											
S350	Roadway Lines – Directional and 2 Edge Lines	km	28.98	\$715.00	\$20,722	7.2											
S355	Roadway Lines - Lane Dividing Line - Turnout	km	0.32	\$501.00	\$161	7.2											
S360	Roadway Lines – Intersection Lines	Unit	1	\$251.00	\$251	7.2	Int. 381										
Total					\$4,387,113												
<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td style="padding: 5px;">Total Estimated Contract Cost (rounded)</td> <td style="text-align: right; padding: 5px;">\$4,388,000</td> </tr> <tr> <td style="padding: 5px;">Contingencies @ 5%</td> <td style="text-align: right; padding: 5px;">\$219,400</td> </tr> <tr> <td style="padding: 5px;">Total Estimated Contract Cost + Contingencies</td> <td style="text-align: right; padding: 5px;">\$4,607,400</td> </tr> <tr> <td style="padding: 5px;">Engineering @ 10%</td> <td style="text-align: right; padding: 5px;">\$460,740</td> </tr> <tr> <td style="padding: 5px;">Total Estimated Cost (rounded)</td> <td style="text-align: right; padding: 5px;">\$5,068,000</td> </tr> </table>					Total Estimated Contract Cost (rounded)	\$4,388,000	Contingencies @ 5%	\$219,400	Total Estimated Contract Cost + Contingencies	\$4,607,400	Engineering @ 10%	\$460,740	Total Estimated Cost (rounded)	\$5,068,000			
Total Estimated Contract Cost (rounded)	\$4,388,000																
Contingencies @ 5%	\$219,400																
Total Estimated Contract Cost + Contingencies	\$4,607,400																
Engineering @ 10%	\$460,740																
Total Estimated Cost (rounded)	\$5,068,000																
Prepared By: <u>R.G.</u>		Date: <u>Aug/31/11</u>															
Checked By: <u>M.J.</u>		Date: <u>Aug/31/11</u>															



Materials Distribution Summary

PROJECT	DESCRIPTION	ACP Type M1/200-300A (tonnes)	ACP Type L1/150-200A (tonnes)	ACP Type S1/200-300A (tonnes)	
HWY. 41:08	N. of Hilda Access to N. of Jct Hwy 545	24,900		13,300	
HWY. 545:02	Jct Hwy. 41 to Saskatchewan Border		12,700		
A.R. 154	Jct Hwy. 41 to Hilda		5,400		
	TOTALS	24,900	18,100	13,300	

ALBERTA Transportation Technical Standards Branch Surface Engineering & Aggregates Section	Region		Dwn. By:	Checked By:	Contract Plan for Contract No. xxxx/xx
	Southern				MATERIALS DISTRIBUTION SUMMARY
			x		Plan No. xxx:xx-xx (x of x)

APPENDIX G

SUPPLY OF AGGREGATE

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The following is a brief description of the forms and their purpose. Examples follow in the same order as listed.

AGGREGATE DATA SUMMARY REQUEST

Use this form to formally request an aggregate source for all projects. It will be returned with the information necessary to complete the special provisions for the contract. This new form replaces both the Aggregate Data Summary (MT-2-12/90) and Aggregate Source Data Sheet (MAT2-11/90).

PIT PLAN

Use this plan to show the proposed pit operations such as areas to be cleared and mined, stockpile and plant sites, areas to be backfilled or reclaimed. It may not be necessary to repeat in the special provisions what is clearly shown on the plan. The plan may require a draft update prior to including it in the tender document.

AGGREGATE TESTING PLAN

This plan shows the test holes, open pit and other surface features. The proposed pit operations should not be shown here. An additional plan, sufficiently enlarged to ensure the text is legible, shall be included for the portion of the plan where mining is to occur.

The plan may require updating before it can be included in the tender document.

SIEVE ANALYSIS

These correspond to the test holes on the Aggregate Testing Plan. These sheets will be included in the tender documents.

Government of Alberta ■ Transportation		AGGREGATE DATA SUMMARY REQUEST (form version: Mar 8, 2011)				
TENDER# _____		REQUEST DATE: _____	REQUIRED DATE: _____	AD DATE: _____		
Project: (to be completed by the Consultant)		(Nominal Length <u>0.00</u> km)				
1	_____ km	_____ to km	_____	(_____ - _____)		
2	_____ km	_____ to km	_____	(_____ - _____)		
3	_____ km	_____ to km	_____	(_____ - _____)		
4	_____ km	_____ to km	_____	(_____ - _____)		
Materials Required:						
		HWY#	0	0	0	0
Type of Work	Des	Class	<u>Quantity (t)</u>	<u>Quantity (t)</u>	<u>Quantity (t)</u>	<u>Quantity (t)</u>
H1	ACP	1 -				
H2	ACP	1 -				
S1	ACP	1 -				
L1	ACP	1 -				
M1	ACP	1 -				
	GBC	2 -				
	Pit Run	6 -				
	Surf Gr.	4 -				
TOTALS:			-	-	-	-
Name: _____						
Company: _____						
Address: _____						
Ph # : _____		Fax# : _____		E-mail: _____		
AGG. SOURCES AVAILABLE. (Data below is completed by the Department and returned to the Consultant. Copy to Surface Engineering and Aggregates Section)						
<input type="checkbox"/> CONTRACTOR SUPPLY (WITH OPTION) <input type="checkbox"/> CONTRACTOR SUPPLY (NO OPTION) <input type="checkbox"/> DESIGNATED SOURCE						
	<u>TYPE</u>	<u>NAME</u>	<u>LOCATION</u>	<u>OWNERSHIP</u>	<u>QUANTITY AVAILABLE</u>	<u>AGG BID VALUE</u>
1.	_____	_____	_____	_____	_____ m ³	_____
2.	_____	_____	_____	_____	_____ m ³	_____
3.	_____	_____	_____	_____	_____ m ³	_____
SPECIAL PROVISION CONSIDERATIONS:			INFO ATTACHED FOR TENDER:		INFO FOR PROJECT MANAGER:	
<input type="checkbox"/> Mining below water <input type="checkbox"/> Cattle guard <input type="checkbox"/> Haul road construction <input type="checkbox"/> Clear/Mulch ha <input type="checkbox"/> Fencing m <input type="checkbox"/> Clear/Salvage ha <input type="checkbox"/> Reclamation ha			<input type="checkbox"/> Special Provisions <input type="checkbox"/> Pit plans <input type="checkbox"/> Test plan <input type="checkbox"/> Lab results		<input type="checkbox"/> Reservation <input type="checkbox"/> Agreement <input type="checkbox"/> Environmental approval	
COMMENTS: _____						
APPROVAL BY: _____			REGIONAL AGGREGATES COORDINATOR		DATE: _____	

Government of Alberta
 Transportation

AGGREGATES TESTING PLAN

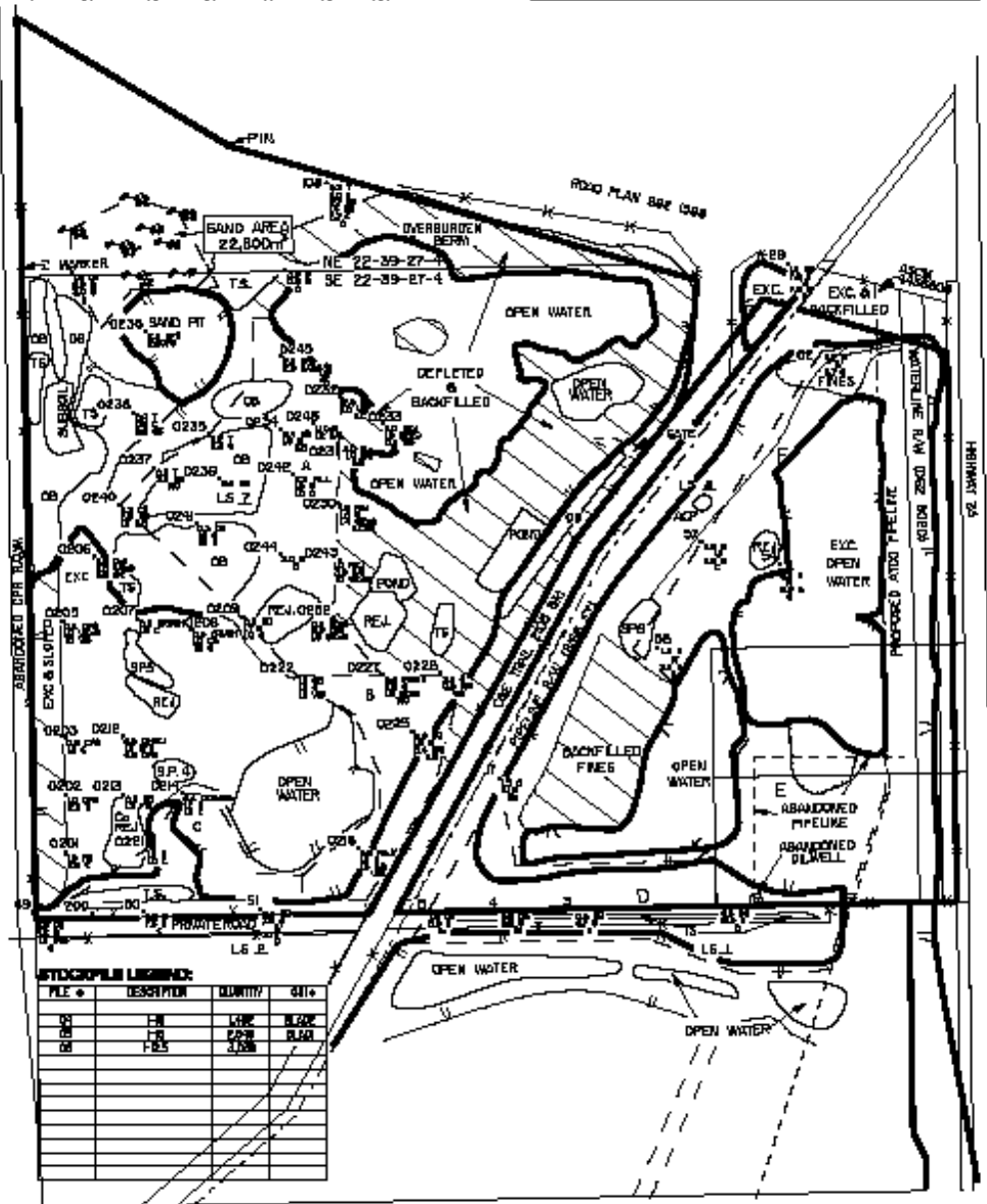
LEGEND:

1. FILL	2. SAND	3. GRAVEL	4. AT THE TOP	5. EXCAVATED
6. CLAY	7. SILT	8. SAND	9. AT THE TOP	10. EXCAVATED
11. SAND	12. SILT	13. GRAVEL	14. AT THE TOP	15. EXCAVATED
16. SAND	17. SILT	18. GRAVEL	19. AT THE TOP	20. EXCAVATED
21. SAND	22. SILT	23. GRAVEL	24. AT THE TOP	25. EXCAVATED
26. SAND	27. SILT	28. GRAVEL	29. AT THE TOP	30. EXCAVATED
31. SAND	32. SILT	33. GRAVEL	34. AT THE TOP	35. EXCAVATED
36. SAND	37. SILT	38. GRAVEL	39. AT THE TOP	40. EXCAVATED
41. SAND	42. SILT	43. GRAVEL	44. AT THE TOP	45. EXCAVATED
46. SAND	47. SILT	48. GRAVEL	49. AT THE TOP	50. EXCAVATED

SE 1/4 SEC. 22 TP. 39 R. 27 W. 4 M.
BLACKFALDS _____ PT.
 TESTED BY **POSCHNER** DATE: **08. 20. 08**

AMENDMENTS:

NO.	DATE	DESCRIPTION
1	08. 20. 08	INITIAL



STOCKPILE LEGEND:

FILE #	DESCRIPTION	QUANTITY	QTY
01	F-1	1000	BLACK
02	F-2	1000	BLACK

ACCESS FROM
 G.P. BLACKFALDS PT

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APPENDIX H

UTILITY ADJUSTMENT AGREEMENTS (SAMPLES)

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This appendix contains sample agreements that have been used by Alberta Transportation (AT) to arrange for adjustments to utilities which are generally required due to highway upgrading or new construction.

A letter format is normally used for agreements with utility companies. All agreements should be sent under AT letterhead except letter of Notification, Requesting for Cost Estimate and Confirmation of Commencement of Construction which can be sent out under the Consultant's company letterhead.

For pipeline, one of three standard "pipeline crossing agreements" is used. The first type (sample 5 or sample 6) is used for upgrading of existing roadways or twinning. The second type (sample 7) is used for "new construction" projects.

Samples of each type of agreement follow:

Sample 1	Letter of Notification
Sample 2	Letter Requesting for Cost Estimate
Sample 3	Letter of Confirmation of Cost Estimate and Signing Agreements (Telecommunication and Power company)
Sample 4	Letter of Confirmation of Cost Estimate and Signing Agreements (Pipeline Company)
Sample 5	Roadway Upgrading Pipeline Crossing Agreement (Pipeline Adjustment is required)
Sample 6	Roadway Upgrading Pipeline Crossing Agreement (Pipeline Adjustment is not required)
Sample 7	New Roadway over Existing Pipeline Crossing Agreement
Sample 8	Letter of Confirmation of Cost Estimate (New Railway Crossing)
Sample 9	Letter of Confirmation of Cost Estimate (Existing Railway Crossing Upgrading)
Sample 10	Letter of Confirmation of Commencement of Construction
Sample 11	Utility agreement with ATCO Electric Ltd.
Sample 12	Roadway Upgrading Pipeline Crossing Agreement with ATCO Pipeline Ltd. or ATCO Gas Ltd. (with or without Pipeline Adjustment is required)

Note:

1. Agreements for payment of utility adjustment costs are sometimes documented separately from the "Utility Adjustment Agreement".
2. In the case of sample 5 is used, sample 4 should also be used and included to form part of the agreement to address the issue of pipeline adjustment costs.
3. In the case of sample 11 is used, the copy of the letter for the Master Agreement in regarding prime contractor obligations signed by ATCO Electric and AT on May 11, 2006 should be appended to form as part of the agreement document.
4. In the case of Sample 12 is used, sample 4 should be used and included as part of the agreement to address the issue of pipeline adjustment costs.

In addition, the copy of the letter for the Master Agreement regarding prime contractor obligations signed by ATCO Pipeline Ltd or ATCO Gas Ltd and AT signed on June 8, 2006 and May 23, 2006 respectively should be appended to form as part of the agreement document.

5. Sample letters 3 and 11 must not be used as they stand to accept utility proposals for the installation of power supply services. These services must be quoted by the utility as fixed price contributions. The noted sample letters may be used if they are re-formatted to exclude all references to cost adjustments and adjustment mechanisms and if approved fixed-cost is stated as such in the first paragraph.
6. The Operations Manager needs to be informed or provided a written notice when there are implications on the operating/maintenance costs.

SAMPLE 1

Our File: Hwy. XX:XX
Utility Agreement No. XXXX

Phone: (403) XXX-XXXX
Fax: (403) XXX-XXXX

Month XX, 20XX

Attention: Mr. Name
Utility Company Ltd.
Address
City, Alberta
X2X 3X5

Dear:

**RE: Hwy. XX:XX, Jct. Hwy. XX to South of Town
Grade Widening, Selective Gradeline Revision, Granular
Base Course Asphalt Concrete Pavement & Other Work**

We are working as Engineering Consultants on behalf of Alberta Transportation for the above noted project. The project involves highway widening for 16.7 kilometres, commencing at the Junction of Hwy. XX to South of Town. The existing right-of-way width is presently xx metres and it is proposed to widen by an additional xx metres on each side. We have identified five (5) pipeline crossings by your company within the limits of this project, as highlighted on the enclosed plans. Your facilities may be impacted by the proposed construction.

Please confirm the location of all facilities owned by your company that are within the project limits and provide us with a copy of your as-built records.

We request that you forward the names of the contact persons from your company for utility exposures and design coordination at this time.

Alberta Transportation has tentatively scheduled a September xxxx tender for this project. Construction is anticipated to commence in the spring of xxxx.

If you require any further information or have any questions or concerns, please contact this office directly.

Yours truly,

Name, Consultant's Title
Company Name

Encl.
cc: Alberta Transportation - Project Sponsor

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SAMPLE 2

Our File: X:XX
Utility Agreement No. XXXX

Phone: (403) XXX-XXXX
Fax: (403) XXX-XXXX

Month XX, 20XX

Canadian Western Natural Gas Company Ltd.
c/o Mr. John Jones
Supervisor Pipelines
909 - 11th Avenue N.E.
Calgary, Alberta
T5R 1L8

Dear:

RE: HWY. X:XX; W. OF JCT. S.H. XXX - JCT. HWY. X
Pipeline Plans; 1:02-61 & 1:02-62

The enclosed four prints each of the above noted plans showing the affect our construction will have on your Company's pipelines. The impacted locations and suggestions are listed below:

Station 306+554.969 S.E. Ramp	Plan No. 1:02-62	No adjustments proposed
Station 201+113.867	Plan No. 1:02-61	Lower pipeline to provide 1.4 minimum earth cover at the lowest design ditch elevation
Benchlands Connectors &	Install pipeline warning signs as required	
Station 300+393.008 on Ramp		

Your concurrence or alternate suggestion will be appreciated. Please submit a **detailed** estimate and breakdown of all costs (labour, materials, equipment, administration, etc.) for alternate suggestions, to the Consultant's office for approval.

Should you require any information please contact the Consultant's Representative, **Mr. John Smith of ABC Engineering Ltd.** at (403) XXX-XXXX in **Calgary**.

Please acknowledge receipt of the above information by signing both letters and also returning one for our file.

APPENDIX H

Sincerely,

**Name, Consultant's Title
Company Name**

Authorized Representative of CWNG

Date

cc: Signed Copy to: Alberta Transportation – Project Sponsor

SAMPLE 3

**Our File: Hwy. XX:X
Utility Agreement No. XXXX**

Phone: (403) XXX-XXXX
Fax: (403) XXX-XXXX

Month XX, 20XX

Fortis Alberta Ltd.
Deerfoot Atrium, Box 1900
Calgary, Alberta
T6B 2X3

**ATTENTION: Mr. John Jones
X & X Projects - Calgary Region**

Dear:

**RE: HWY. XX:XX, W. OF JCT. S.H. XXX - JCT. HWY X
UTILITY ADJUSTMENT COST ESTIMATE (\$11,111.00)**

Please be advised that Alberta Transportation (AT) acknowledges receipt of your cost estimate of \$11,111.00 for the above noted project. AT agrees to reimburse Fortis Alberta Ltd. based on actual close-out costs. This letter constitutes AT approval for Fortis Alberta Ltd. to proceed with the proposed powerline adjustments. If there is a variation of more than 5% or \$10,000 whichever is greater from the original cost estimate, Fortis Alberta Ltd. must contact the Consultant immediately and obtain Department approval for the additional cost BEFORE proceeding with the work.

OCCUPATIONAL HEALTH AND SAFETY ACT

Alberta Transportation (the Department) assigns prime contractor responsibilities, as specified in the Occupational Health and Safety Act, to all parties with which it enters into contracts and agreements. On highway and bridge construction or maintenance projects this would typically include a Contractor, a Consultant (the Department employs an engineering consultant on construction projects only) and various Utility Companies.

During the course of the project, the work sites of the Contractor, Consultant and Utility Company may be separated by time and/or space or, may be in the same general vicinity or may be adjacent, depending on the circumstances on the project at any given point in time. It is a requirement of all Department contracts and agreements that the Contractor, Consultant and Utility Companies working within the project limits, coordinate their respective activities, as outlined herein, to ensure a safe project. However, it is not the Department's intent that any of these parties be responsible to ensure that the other parties, or the other parties' subcontractors, have adequate health and safety process for their respective activities.

Designation of Prime Contractor

The Utility Company shall familiarize itself, its staff and its subcontractors with the terms of the Occupational Health and Safety Act and Regulations there under to ensure complete understanding respecting the responsibilities given and compliance required. The Utility Company acknowledges that it is and assumes all of the responsibilities and duties of the Prime Contractor, as defined by the Occupational Health and Safety Act, and that it shall as a condition of this Agreement, comply with the Occupational Health and Safety Act and the regulations there under.

Coordinating Activities

The Utility Company shall coordinate its activities on the project with those of the Consultant and the Contractor. When the Consultant and/or Contractor are conducting activities within the project limits the Utility Company shall liaise with Consultant and/or Contractor as the case may be, and jointly develop a health and safety system or process for the affected worksites. The health and safety system or process agreed to by the parties must be in writing. Any changes required to the health and safety system must be agreed to by all affected parties and must also be in writing. Documenting the written health and safety system or process, including any required changes shall be the responsibility of the Contractor.

(i) Coordinating activities on Highway and Bridge Construction Projects

For the purposes of coordinating activities on highway/bridge construction projects, the contact persons for the Contractor, Consultant and Utility Company shall be identified at the pre-construction meeting for the project. The responsibility to initiate "contact" for coordinating activities shall reside with the party entering a project or site on which work has commenced. This responsibility to initiate contact shall apply regardless of whether or not the worksites are separated by time and/or space, are in the same general vicinity or are adjacent.

(ii) Coordinating activities not associated with a Highway or Bridge Construction Project

When the activities of the Utility Company are not being performed on a highway/bridge construction project, the Utility Company shall contact the local Albertan Transportation office prior to commencing work, to obtain the name of the contact person for the Department's highway maintenance contractor. The responsibility to initiate "contact" for coordinating activities shall reside with the party entering a project or site on which work has commenced. This responsibility to initiate contact shall apply regardless of whether or not the worksites are separated by time and/or space, are in the same general vicinity or are adjacent.

Resolving Disputes Related to Coordination of Activities

If the parties cannot agree on a process or system that addresses the safety concerns of all parties, work at the affected worksites shall cease and this matter shall be referred to the Consultant. However, if the Consultant is one of the parties involved in the dispute, or the Department has not employed a Consultant for the project, the matter shall be referred to the Department.

The Consultant or Department as applicable, after review, will decide which party shall be responsible for resolving the disputed safety issue. Such decision shall be final and binding upon all parties.

Responsibility for Subcontractors/Owner operators

The Prime Contractor shall, to the extent required by the Occupational Health and Safety Act, establish and maintain a Health and Safety system or process to ensure compliance to the Act by his subcontractors/owner operators.

Fortis Alberta Ltd (or their Contractor) shall comply with the following:

- Contact John Smith of ABC Engineering Corp., Consultant's Representative, at telephone number (403) XXX-XXXX in Calgary to co-ordinate work within the project limits.
- Provide the Consultant's representative with the name and contact information of the utility person responsible for the work.
- Submit a traffic control plan and a written Traffic Accommodation Strategy to address for the safe accommodation of traffic as outlined in the current Traffic Accommodation in Work Zones Manual for Alberta Transportation's review and comment.
- Desist from starting work until the TAS has been reviewed.
- Notify the Consultant and Contractor(s) a minimum of 72 hours in advance of the proposed commencement or cessation of utility construction work.
- Maintain a copy of the TAS on site for the inspection by Alberta Transportation or their designated representative(s).

The final invoice for your work must be accompanied by back-up documentation and detailed cost breakdown sufficient and reasonable to support the actual close-out costs claimed. The breakdown of the estimate for the project should include the following:

- Direct labour costs
- Contractor chargers
- Materials
- Salvage costs / credits
- Subsidiary costs if any (e.g. easements, etc.)
- Direct engineering
- Overheads

Please forward the invoice and associated documentation to the Consultant's office for reimbursement.

Please sign all three letters; return one copy for our file and forward one copy to the Consultant.

Sincerely,

Name, Construction Manager
Region
Telephone Number

Fortis Alberta Ltd. Authorized Representative

Witness

APPENDIX H

Date

Date

cc: Signed Copy to: Consultant
Company's Name
Company's Address

SAMPLE 4

**Our File: Hwy. XX:XX
Utility Agreement No. XXXX**

Phone: (403) XXX-XXXX
Fax: (403) XXX-XXXX

Month XX, 20XX

XX Pipeline Ltd.
Address
Calgary, Alberta
T6B 2X3

**ATTENTION: Mr. Bob Jones
X & X Projects – Calgary Region**

Dear:

**RE: HWY. XX:XX, W. OF JCT. S.H. XXX – JCT. HWY X
CONFIRMATION OF PIPELINE ADJUSTMENT COST ESTIMATE (\$300,000) AND SIGNING
PIPELINE CROSSING AGREEMENT**

Please be advised that Alberta Transportation (AT) acknowledges receipt of your cost estimate of \$300,000 for the above noted project. AT agrees to reimburse XX Pipeline Ltd. based on actual close-out costs. This letter constitutes AT approval for XX Pipeline Ltd. to proceed with the proposed pipeline adjustments. However, if there is a variation of more than 5% or \$10,000 whichever is greater from the original cost estimate, XX Pipeline Ltd. must contact the Consultant immediately and obtain Department approval for additional costs before proceeding with the work.

Three copies of our standard Pipeline Crossing Agreement are enclosed. Please indicate your acceptance by signing and returning one copy for our file and one to the Consultant's office.

You should forward your final invoice to the Consultant's office with the necessary back-up documentation and detailed breakdown for reimbursement. Contact with John Smith of ABC Engineering Corp., Consultant's Representative, at telephone number (403) XXX-XXXX in Calgary is recommended in order to co-ordinate work within the project limits.

Sincerely,

Name, Construction Manager
Region
Telephone Number

Encl. Three
cc: Signed Copy to: Consultant
Company's Name
Company's Address

Our File: Hwy. X:XX
Utility Agreement No. XXXX

ROADWAY UPGRADING PIPELINE CROSSING AGREEMENT
PIPELINE ADJUSTMENT IS REQUIRED

This agreement is made as of the **XXth** day of **Month**, A.D. 20**XX**

BETWEEN

Her Majesty the Queen in right of the Province of Alberta
as represented by the Minister of Alberta Transportation
(hereinafter called the "Minister")

- and -

a body corporate registered and existing under the laws of
the Province of Alberta
(hereinafter called the "Operator")

WHEREAS the Minister intends to make improvements to a roadway known as **Hwy. XXX:XX** which may result in a ground disturbance within the controlled area (**Alberta Pipeline Act**) or Safety Zone (**National Energy Board Act**) of the Operator's pipelines in the land legally described as:

as shown on the attached Plan No.: _____, and adjustment costs as negotiated in a letter dated (sample 4) _____ which form as part of this agreement.

AND WHEREAS the Operator obtained a permit from the Minister for placement of a pipeline under **Hwy.**_____.

NOW THEREFORE, pursuant to the applicable section of the **Alberta Public Highways Development Act**, the **National Energy Board Act**, **Alberta Pipeline Act and Regulation** the **Water Gas and Electrical Companies Act**, and the **Gas Distribution Act** (hereinafter called the "Acts"), the Minister and the Operator agree as follows:

1) The Operator's representative shall be:

(Name): _____

Telephone Number): _____

(Address): _____

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- 2) The Minister's representative shall be:
- (Name): _____, Construction Manager
- (Telephone Number): () - _____
- (Address): Alberta Transportation, _____ Region
- 3) The Minister (or his delegate) shall contact the Operator at least seventy-two (72) hours (excluding Saturdays, Sundays and Statutory Holidays) prior to undertaking any excavation or construction within the controlled area as defined in the Pipeline Act, or Safety Zone as defined in the National Energy Board Act, as the case may be. The Operator, upon receiving such notice, shall make arrangements to have a representative present during the period machinery is to be used within the controlled area or safety zone, as the case may be, and to witness the exposure of the Operator's pipeline(s). No excavation or construction of any sort shall be carried out within the controlled area or safety zone, as the case may be, until the Operator's representative is present at the site and has authorized same, unless the Operator has advised otherwise by written notice to the Minister.
- 4) The Operator shall locate and mark the Operator's pipeline(s), perform inspections and supervise a ground disturbance as required under Part 67 (Alberta Pipeline Regulation 91/2005) without charging any fee to the Minister undertaking the ground disturbances.
- 5) The Operator's pipeline shall be exposed under the direction of the Operator by hand digging or other acceptable method such as excavation by water or air jets to determine the exact location and depth of cover (for the purpose of highway design) before construction is undertaken. The cost of this exposure shall be borne by the Minister.
- 6) In the event pipeline work is required and the Operator is authorized by the Minister to carry out the work, the Operator shall carry out all necessary and permanent protection, adjustment or relocation of their pipeline(s) as required to accommodate the roadway construction.

OCCUPATIONAL HEALTH AND SAFETY ACT

Alberta Transportation (the Department) assigns prime contractor responsibilities, as specified in the Occupational Health and Safety Act, to all parties with which it enters into contracts and agreements. On highway and bridge construction or maintenance projects this would typically include a Contractor, a Consultant (the Department employs an engineering consultant on construction projects only), various Utility Companies and the Operator (Pipeline Company).

During the course of the project, the work sites of the Contractor, Consultant, Utility Companies and the Operator may be separated by time and/or space or, may be in the same general vicinity or may be adjacent, depending on the circumstances on the project at any given point in time.

It is a requirement of all Department contracts and agreements that the Contractor, Consultant, Utility Companies and the Operator working within the project limits, coordinate their respective activities, as outlined herein, to ensure a safe project. However, it is not the Department's intent that any of these parties be responsible to ensure that the other parties, or the other parties' subcontractors, have adequate health and safety process for their respective activities.

Designation of Prime Contractor

The Operator shall familiarize itself, its staff and its subcontractors with the terms of the Occupational Health and Safety Act and Regulations there under to ensure complete understanding respecting the responsibilities given and compliance required. The Operator acknowledges that it is and assumes all of the responsibilities and duties of the Prime Contractor, as defined by the Occupational Health and Safety Act, and that it shall as a condition of this Agreement, comply with the Occupational Health and Safety Act and the regulations there under.

Coordinating Activities

The Operator shall coordinate its activities on the project with those of the Consultant and the Contractor. When the Consultant and/or Contractor and/or Utility Companies are conducting activities within the project limits the Operator shall liaise with the Consultant and/or Contractor and/or Utility Companies as the case may be, and jointly develop a health and safety system or process for the affected worksites. The health and safety system or process agreed to by the parties must be in writing. Any changes required to the health and safety system must be agreed to by all affected parties and must also be in writing. Documenting the written health and safety system or process, including any required changes shall be the responsibility of the Contractor.

(i) Coordinating activities on Highway and Bridge Construction Projects

For the purposes of coordinating activities on highway/bridge construction projects, the contact persons for the Contractor, Consultant, Utility Companies and the Operator shall be identified at the pre-construction meeting for the project. The responsibility to initiate "contact" for coordinating activities shall reside with the party entering a project or site on which work has commenced. This responsibility to initiate contact shall apply regardless of whether or not the worksites are separated by time and/or space, are in the same general vicinity or are adjacent.

(ii) Coordinating activities not associated with a Highway or Bridge Construction Project

When the activities of the Operator are not being performed on a highway/bridge construction project, the Operator shall contact the local Alberta Transportation office prior to commencing work, to obtain the name of the contact person for the Department's highway maintenance contractor. The responsibility to initiate "contact" for coordinating activities shall reside with the party entering a project or site on which work has commenced.

This responsibility to initiate contact shall apply regardless of whether or not the worksites are separated by time and/or space, are in the same general vicinity or are adjacent.

Resolving Disputes Related to Coordination of Activities

If the parties cannot agree on a process or system that addresses the safety concerns of all parties, work at the affected worksites shall cease and this matter shall be referred to the Consultant. However, if the Consultant is one of the parties involved in the dispute, or the Department has not employed a Consultant for the project, the matter shall be referred to the Department.

The Consultant or Department as applicable, after review, will decide which party shall be responsible for resolving the disputed safety issue. Such decision shall be final and binding upon all parties.

Responsibility for Subcontractors/Owner operators

The Prime Contractor shall, to the extent required by the Occupational Health and Safety Act, establish and maintain a Health and Safety system or process to ensure compliance to the Act by his subcontractors/owner operators.

- 7) If the pipeline work is of such a kind as to fall within the purview of the National Energy Board Act and National Energy Board Pipeline Crossing Regulations, the Operator agrees to carry out the work in accord with the Canada Labour Code R.S.C. (as amended) and the Oil and Gas Occupational Safety and Health Regulations SOR/86-304 (as amended).
- 8) In the event that the Minister authorizes the pipeline work to be done by a person, either legal or natural, other than the Operator, the Minister agrees to require that person to fulfill the responsibilities and duties of the Prime Contractor as that term is used in the Occupational Health and Safety Act, R.S.A 2000, as amended, and any regulations made pursuant to that Act. However, if the pipeline work is of such a kind as to fall within the purview of the National Energy Board Act, and the National Energy Board Pipeline Crossing Regulations, the Minister agrees to require the person to carry out the work in accordance with the Canada Labour Code R.S.C. (as amended) and the Oil and Gas Occupational Safety and Health Regulations SOR/86-304 (as amended).
- 9) The Minister shall carry out all work within the controlled area or safety zone, as the case may be, in accordance with good engineering and construction practices, and in accordance with the relevant Acts.
- 10) The Minister shall ensure that no equipment, material or vehicles will be stored, parked or driven over or along the controlled area or safety zone, as the case may be, except as reasonably necessary in the actual construction of the roadway.
- 11) If any excavation or construction equipment is to be moved across the controlled area or safety zone, as the case may be, prior to excavation or construction, and as a temporary protective measure, the Operator may require direct protective measures in accordance with good engineering and construction practices, and in accordance with the relevant Acts, to be placed across the Operator's pipeline(s) at the point of crossing, the cost of which shall be borne by the Minister.
- 12) The Minister shall be liable for and shall indemnify and save harmless the Operator from all manner of actions, causes of action, proceedings, claims, demands, costs, damages and expenses whatsoever including damage to the Operator's pipeline(s), which the Operator may sustain, pay or incur as a result of or in connection with any breach of the obligations assumed under this document by, or the negligence of, the Minister, his employees, servants or agents.

- 13) The Operator shall be liable for and shall indemnify and save harmless the Minister from all manner of actions, causes of action, proceedings, claims, demands, costs, damages and expenses whatsoever including damage to the Minister's facilities which the Minister may sustain, pay or incur as a result of or in connection with any breach of the obligations assumed under this document by, or the negligence of, the Operator or any person for whom the Operator is responsible at law or in equity.
- 14) In the event the Operator is performing any work on its pipeline, the Operator (or their Contractor) shall comply with the following:
- Contact John Smith of ABC Engineering Corp., Consultant's Representative, at telephone number (403) XXX-XXXX in Calgary to co-ordinate work within the project limits.
 - Provide the Consultant's representative with the name and contact information of the person responsible for the work.
 - Submit a traffic control plan and a written Traffic Accommodation Strategy to address for the safe accommodation of traffic for Alberta Transportation's review and comment.
 - Desist from starting work until the TAS has been reviewed.
 - Notify the Consultant and Contractor(s) a minimum of 72 hours in advance of the proposed commencement or cessation of utility construction work.
 - Maintain a copy of the TAS on site for inspection by Alberta Transportation or their designated representative(s).

- 15) In the event the Minister is responsible for the whole/portion of the relocation/upgrade cost, the Operator shall provide the following:

The final invoice for your work must be accompanied by back-up documentation and detailed cost breakdown sufficient and reasonable to support the actual close-out costs claimed. The breakdown of the estimate for the project should include the followings:

- Direct labour costs
- Contractor charges
- Materials
- Salvage costs / credits
- Subsidiary costs if any (e.g. easements, etc.)
- Direct engineering
- Overheads

Please forward the invoice and associated documentation to the Consultant's office for reimbursement.

Please sign all three copies; return one copy for our file and forward one copy to the Consultant.

- 16) Any written notice required or permitted hereunder shall be directed to the party to whom it will be given (hand delivered, sent by prepaid mail, or sent by telecommunication), addressed as follows:

(a) **To the Minister:**
Alberta Transportation
_____ **Region**

ATTENTION: Name
Construction Manager
Region

(b) **To the Operator:**

ATTENTION:

And in the event of mail service disruption, such notice shall be delivered by hand.

- 17) Where the terms and conditions in this document contradict any portion of the Acts, the latter shall prevail.
- 18) The terms and conditions of this agreement shall be effective from the date shown at the beginning of this agreement.

**Executed on behalf of the
Operator by:**

**Executed on behalf of the
Minister by:**

Name
Title

Name
Construction Manager
Region

ROADWAY UPGRADING PIPELINE CROSSING AGREEMENT
NO PIPELINE ADJUSTMENT IS REQUIRED

This agreement is made as of the **XXth** day of **Month**, A.D. 20**XX**

BETWEEN

Her Majesty the Queen in right of the Province of Alberta
as represented by the Minister of Alberta Transportation
(hereinafter called the "**Minister**")

- and -

a body corporate registered and existing under the laws of
the Province of Alberta
(hereinafter called the "**Operator**")

WHEREAS the Minister intends to make improvements to a roadway known as **Hwy. XXX:XX** which may result in a ground disturbance within the controlled area (**Alberta Pipeline Act**) or Safety Zone (**National Energy Board Act**) of the Operator's pipelines in the land legally described as:

as shown on the attached Plan shown in schedule A. There is no pipeline adjustment is required.

AND WHEREAS the Operator obtained a permit from the Minister for placement of a pipeline under **Hwy. _____**.

NOW THEREFORE, pursuant to the applicable section of the **Alberta Public Highways Development Act**, the **National Energy Board Act**, **Alberta Pipeline Act and Regulation** the **Water Gas and Electrical Companies Act**, and the **Gas Distribution Act** (hereinafter called the "**Acts**"), the Minister and the Operator agree as follows:

1) The Operator's representative shall be:

(Name): _____

Telephone Number): _____

(Address): _____

-
- 2) The Minister's representative shall be:
- (Name): _____, Construction Manager
- (Telephone Number): () - _____
- (Address): Alberta Transportation, _____ Region
- 3) The Minister (or his delegate) shall contact the Operator at least seventy-two (72) hours (excluding Saturdays, Sundays and Statutory Holidays) prior to undertaking any excavation or construction within the controlled area as defined in the Pipeline Act, or Safety Zone as defined in the National Energy Board Act, as the case may be. The Operator, upon receiving such notice, shall make arrangements to have a representative present during the period machinery is to be used within the controlled area or safety zone, as the case may be, and to witness the exposure of the Operator's pipeline(s). No excavation or construction of any sort shall be carried out within the controlled area or safety zone, as the case may be, until the Operator's representative is present at the site and has authorized same, unless the Operator has advised otherwise by written notice to the Minister.
- 4) The Operator shall locate and mark the Operator's pipeline(s), perform inspections and supervise a ground disturbance as required under Part 67 (Alberta Pipeline Regulation 91/2005) without charging any fee to the Minister undertaking the ground disturbances.
- 5) The Operator's pipeline shall be exposed under the direction of the Operator by hand digging or other acceptable method such as excavation by water or air jets to determine the exact location and depth of cover (for the purpose of highway design) before construction is undertaken. The cost of this exposure shall be borne by the Minister.
- 6) In the event that the Minister authorizes the pipeline exposure work to be done by a person, either legal or natural, other than the Operator, the Minister agrees to require that person to fulfill the responsibilities and duties of the Prime Contractor as that term is used in the Occupational Health and Safety Act, R.S.A 2000, as amended, and any regulations made pursuant to that Act. However, if the pipeline work is of such a kind as to fall within the purview of the National Energy Board Act, and the National Energy Board Pipeline Crossing Regulations, the Minister agrees to require the person to carry out the work in accordance with the Canada Labour Code R.S.C. (as amended) and the Oil and Gas Occupational Safety and Health Regulations SOR/86-304 (as amended).
- 7) The Minister shall carry out all work within the controlled area or safety zone, as the case may be, in accordance with good engineering and construction practices, and in accordance with the relevant Acts.
- 8) The Minister shall ensure that no equipment, material or vehicles will be stored, parked or driven over or along the controlled area or safety zone, as the case may be, except as reasonably necessary in the actual construction of the roadway.
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APPENDIX H

- 9) If any excavation or construction equipment is to be moved across the controlled area or safety zone, as the case may be, prior to excavation or construction, and as a temporary protective measure, the Operator may require direct protective measures in accordance with good engineering and construction practices, and in accordance with the relevant Acts, to be placed across the Operator's pipeline(s) at the point of crossing, the cost of which shall be borne by the Minister.
- 10) The Minister shall be liable for and shall indemnify and save harmless the Operator from all manner of actions, causes of action, proceedings, claims, demands, costs, damages and expenses whatsoever including damage to the Operator's pipeline(s), which the Operator may sustain, pay or incur as a result of or in connection with any breach of the obligations assumed under this document by, or the negligence of, the Minister, his employees, servants or agents.
- 11) The Operator shall be liable for and shall indemnify and save harmless the Minister from all manner of actions, causes of action, proceedings, claims, demands, costs, damages and expenses whatsoever including damage to the Minister's facilities which the Minister may sustain, pay or incur as a result of or in connection with any breach of the obligations assumed under this document by, or the negligence of, the Operator or any person for whom the Operator is responsible at law or in equity.
- 12) Any written notice required or permitted hereunder shall be directed to the party to whom it will be given (hand delivered, sent by prepaid mail, or sent by telecommunication), addressed as follows:

(a)

To the Minister:

Alberta Transportation
_____ **Region**

ATTENTION: Name
Construction Manager
Region

(b)

To the Operator:

ATTENTION:

And in the event of mail service disruption, such notice shall be delivered by hand.

- 13) Where the terms and conditions in this document contradict any portion of the Acts, the latter shall prevail.
- 14) The terms and conditions of this agreement shall be effective from the date shown at the beginning of this agreement.

**Executed on behalf of the
Operator by:**

**Executed on behalf of the
Minister by:**

**Name
Title**

**Name
Construction Manager
Region**

New Roadway Over Existing Pipeline Crossing Agreement

THIS AGREEMENT is made and effective as of the ____ day of, 20 ____.

BETWEEN _____ ("**Grantor**")
(*hereinafter and in Schedules A, B & C referred to as the Grantor*)

and *Her Majesty the Queen in right of the Province of Alberta as represented by the
Minister of Alberta Transportation* ("**the Minister**")
(*hereinafter and in Schedules A, B & C referred to as the Minister*)

WHEREAS Grantor operates under the jurisdiction of the National Energy Board, Alberta Energy and Utilities Board, or Alberta Energy, and holds *permits, approvals, or authorizations* for a pipeline across the said lands and has constructed a pipeline therein, hereinafter referred to as "**Grantor's Facility**"; and

WHEREAS the Minister desires to construct *the Minister's Facility* across the "**Grantor's Facility**" and has acquired *an interest in* the said lands and proposes to install therein a roadway (Hwy. _____) hereinafter referred to as "**the Minister's Facility**"; and

WHEREAS the *lands* and/or Facilities of the respective parties intersect in the Crossing Area;
and

WHEREAS the parties wish to define their respective rights and liabilities with respect to the Crossing Area under certain terms and conditions defined in Schedule "A".

NOW THEREFORE THIS AGREEMENT WITNESSES that in consideration of the premises, mutual covenants and agreements herein contained, the parties agree that their respective Work in the Crossing Area shall be governed by this Agreement together with the Schedules as herein described.

1. Terms and Conditions

This Agreement including the recitals and the following Schedules, which are attached hereto and made part hereof, shall be the terms and conditions as agreed to by Grantor and the Minister:

Schedule "A" - Mutually Agreed to Terms and Conditions.

Schedule "B" - Location Plan and Profile.

Schedule "C" - Specific Terms and Conditions.
(the "Schedules")

2. LOCATION AND NOTICES

(a) Location of Crossing Area (Legal Description):

(b) Notices:

	<u>Grantor's Corporate Office</u>	<u>Minister's Office</u>
Name:	_____	_____
Address:	_____	_____
	_____	_____
Dept.:	_____	_____
Phone	_____	_____
fax	_____	_____
email	_____	_____

(c) Field Representative:

	<u>Grantor's</u>	<u>Minister's Representative</u>
Name:	_____	_____
Position::	_____	_____
Address:	_____	_____
	_____	_____
Phone:	_____	_____
Fax:	_____	_____
email:	_____	_____
	_____	_____
Alternate:	_____	_____
Phone	_____	_____
Fax:	_____	_____
email:	_____	_____

APPENDIX H

IN WITNESS WHEREOF the parties hereto have caused this Agreement to be duly executed.

"Grantor"

Executed on behalf of the Minister

Per: _____

Name:

Per: _____

Title:

Schedule "A"**Mutually Agreed to Terms and Conditions**

This Schedule "A" to Form Part of the New Roadway Over Existing Pipeline Crossing Agreement.

Between _____ **(Grantor)**

and Her Majesty the Queen in right of the Province of Alberta as represented by the Minister of Alberta Transportation **(the Minister)**

and dated the _____ **day of** _____, **20**_____.

1. Interpretation

- 1.01 In this Agreement, including the recitals, the words and terms used shall have the following meanings:
- (a) "Crossing Area" means the area of intersection of Grantor's *rights of way* and the Minister's *interest in the said lands* and/or Facilities as outlined in Schedule "B";
 - (b) "*Minister*" means the Minister of Alberta Transportation or his delegate;
 - (c) "Minister's Facility" means the facility or facilities to be constructed by the Minister and to be located within, across, along, upon, over or under the Crossing Area;
 - (d) "Grantor's Facility" means the facility or facilities of Grantor located within, across, along, upon or under the Crossing Area;
 - (e) "Facility" means:
 - i) any structure that is constructed or placed on or in the right-of-way within the Crossing Area (*including but not limited to* concrete slab, concrete conduit, retaining wall, and special fences such as chain link); and
 - ii) any highway, public or private road, railway, irrigation ditch, drain, drainage system, sewer, dike, cable line, telecommunication line, telephone line or line for the transmission of hydrocarbons, power or any other substance that is or is to be carried across, along, upon, over or under the Crossing Area;
 - (f) "said lands" means the lands described in Schedule "B";
 - (g) "the Body of this Agreement" means the Agreement to which this Schedule is attached and which has been executed by the parties;
 - (h) "this Agreement" means the Body of this Agreement and the Schedules attached to it; and

(i) "Work" means, with respect to a Facility, the carrying, laying, installing, constructing, maintaining, operating, repairing, inspecting, replacing, altering, removing, abandoning and such other operations as may be required from time to time.

1.02 Unless a term or provision contained in the Body of this Agreement, if acted upon, would result in violation of any code, statute, law, regulation, permit, license, or governmental order, the following shall apply:

(a) If any term or provision conflicts with a term or provision contained in any Schedule, the term or provision in the Schedule shall prevail.

(b) If any terms or provisions of the Schedules conflict, the following shall apply: Schedule "C", if present, shall prevail over Schedules "A" and "B", Schedule "B" shall prevail over Schedule "A".

2. Consent

Grantor hereby agrees, insofar as it has the right to do so, that the Minister may perform the Work on the Minister's Facility in the Crossing Area in accordance with the terms and conditions of this Agreement.

3. Compliance with Statutes and Regulations

(a) The Minister shall at all times comply with any and all applicable codes, statutes, laws, regulations, permits, licenses, orders and directions of any *Federal or Provincial* governmental authority from time to time in force. The minimum applicable technical standards therein shall apply to both parties unless more stringent standards are provided for in this Agreement. If compliance with any provision of this Agreement would result in violation of any applicable codes, statutes, laws, regulations, permits, licenses, orders and directions of any *Federal or Provincial* governmental authority, such code, statute, law, regulation, permit, license, order and direction of any *Federal or Provincial* governmental authority shall prevail and this Agreement shall be deemed to be amended accordingly.

The Minister agrees to require any agent or contractor who performs work, as defined by this agreement, on behalf of the Minister to comply with the applicable provincial or federal legislation and regulations governing occupational health and safety.

(b) During the course of the project, the work sites of the Contractor, Consultant (the Department employs an engineering consultant on construction projects only), Utility Companies and the Grantor may be separated by time and/or space or, may be in the same general vicinity or may be adjacent, depending on the circumstances on the project at any given point in time. It is a requirement of all Department contracts and agreements that the Contractor, Consultant and Utility Companies working within the project limits, coordinate their respective activities, as outlined herein, to ensure a safe project. However, it is not the Department's intent that any of these parties be responsible to ensure that the other parties, or the other parties' subcontractors, have adequate health and safety process for their respective activities.

Designation of Prime Contractor

The Grantor shall familiarize itself, its staff and its subcontractors with the terms of the Occupational Health and Safety Act and Regulations there under to ensure complete understanding respecting the responsibilities given and compliance required. The Grantor acknowledges that it is and assumes all of the responsibilities and duties of the Prime Contractor, as defined by the Occupational Health and Safety Act, and that it shall as a condition of this Agreement, comply with the Occupational Health and Safety Act and the regulations there under.

Coordinating Activities

The Grantor shall coordinate its activities on the project with those of the Consultant and the Contractor. When the Consultant and/or Contractor and/or Utility Companies are conducting activities within the project limits the Grantor shall liaise with the Consultant and/or Contractor and/or Utility Companies as the case may be, and jointly develop a health and safety system or process for the affected worksites. The health and safety system or process agreed to by the parties must be in writing. Any changes required to the health and safety system must be agreed to by all affected parties and must also be in writing. Documenting the written health and safety system or process, including any required changes shall be the responsibility of the Contractor.

For the purposes of coordinating activities on highway/bridge construction projects, the contact persons for the Contractor, Consultant, Utilities Companies and the Grantor shall be identified at the pre-construction meeting for the project. The responsibility to initiate "contact" for coordinating activities shall reside with the party entering a project or site on which work has commenced. This responsibility to initiate contact shall apply regardless of whether or not the worksites are separated by time and/or space, are in the same general vicinity or are adjacent.

Resolving Disputes Related to Coordination of Activities

If the parties cannot agree on a process or system that addresses the safety concerns of all parties, work at the affected worksites shall cease and this matter shall be resolved by all parties at the site.

Responsibility for Subcontractors/Owner operators

The Prime Contractor shall, to the extent required by the Occupational Health and Safety Act, establish and maintain a Health and Safety system or process to ensure compliance to the Act by his subcontractors/owner operators.

4. Position of Facility

Unless otherwise indicated in any of the Schedules, or ordered by a *Federal or Provincial* governmental authority or regulations *the Grantor's Facility shall have the lower physical position in the Crossing Area;*

5. Conditions

When the Minister performs work on the Minister's Facility in the Crossing Area, the following terms and conditions shall apply:

- (a) The Minister's Field Representative shall contact Grantor's Field Representative directly, either in person or by telephone, a minimum of 72 hours (excluding Saturdays, Sundays and Statutory Holidays) before commencement of the Minister's Work within 30 meters of the Crossing Area and, if unable to contact that person, the Minister shall serve a minimum of 72 hours written notice pursuant to Clause 8 hereof before commencement of the Minister's Work.
- (b) Grantor has the right to have a representative present to inspect the Work of the Minister in the Crossing Area.
- (c) During installation pursuant to this Agreement, the Minister's Representative shall have available at the Crossing Area a copy of this Agreement.
- (d)
 - (i) Before proceeding to excavate within 5 metres of the Crossing Area, the Minister shall require the Grantor to expose its Facility by hand digging or other acceptable method such as excavation by water or air jets. The Minister shall not use or permit the use of an excavating machine within 1.5 metres of either side of any existing Grantor's Facility, or 3.0 metres of either side of any existing Grantor's Facility as required under the National Energy Board Act and Regulation, as the case may be, unless otherwise agreed to in Schedule "C".
 - (ii) *The cost of the exposure referred to in (d)(i) above shall be borne by the Minister.*
- (e) *Notwithstanding clause 5(d) above, the Grantor shall carry out any necessary and permanent protection, adjustment, or relocation of the Grantor's facility that is made necessary by the construction of the Minister's Facility.*
- (f) The Minister shall, where applicable, install and maintain during performance of the Work suitable markers indicating the location of Grantor's Facility in the Crossing Area.
- (g) The Minister shall lay down and construct its Facility in accordance with the Schedules to this Agreement.
- (h) The Minister shall carry out all Work in the Crossing Area in a proper and diligent manner and in accordance with good engineering and construction practices.
- (i) The *Minister* shall ensure no damage occurs to existing Facilities while the Work is being performed in the Crossing Area including damage which may result from the use of heavy work equipment outside the Crossing Area while performing the Work in the Crossing Area.

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- (j) In the event that Grantor's Facility suffers contact damage or other damage as a result of the Minister's Work, Grantor shall be notified forthwith and its repair shall be carried out as directed by Grantor at the Minister's cost.
- (k) Where cathodic protection is required *to be modified* by Grantor as a result of the Minister's installation, the *Grantor at its cost shall, at the time of the construction of the Minister's Facility, modify and thereafter maintain a cathodic protection system for Grantor's Facility at the crossing. The Grantor shall provide a cost estimate of the installation of the cathodic protection system prior to construction of the Minister's Facility, and upon approval of all or a part of the costs of the installation of the cathodic protection system by the Minister, the Minister shall reimburse the Grantor in accordance with the attached Schedule "C"*.
- (l) At least 24 hours (excluding Saturdays, Sundays and Statutory Holidays) prior to covering Grantor's exposed Facility, the Minister's Field Representative shall contact Grantor's Field Representative directly, either in person or by telephone for inspection.
- (m) (i) *Where backfilling the excavation in the Crossing Area is required as a result of the Minister's installation, the Grantor may elect to backfill in accordance with Standard Specifications for Highway Construction (Alberta Transportation, current edition). Upon such election, the Grantor at its cost shall, at the time of the construction of the Minister's Facility, backfill the Crossing Area. The Grantor shall provide a cost estimate to backfill the Crossing Area, and upon approval of all or a part of the costs to backfill the Crossing Area by the Minister, the Minister shall reimburse the Grantor in accordance with the attached Schedule "C"*.
- (ii) *In the event the Grantor elects not to backfill the Crossing Area, and unless otherwise directed by the Grantor, the Minister shall cover Grantor's Facility with at least 30 centimetres of select backfill material as specified in Schedule "C" prior to commencing backfilling operations. The Minister shall, in backfilling the excavation in the Crossing Area, compact the fill material in 15 centimetre layers, or such greater depth specified by Grantor's Field Representative.*
- (n) The Minister shall, as soon as it is reasonably practical after the completion of the Minister's Work in the Crossing Area, restore the surface of the Crossing Area as closely as is practical to the condition in which it existed immediately prior to the Work being commenced.
- (o) The Minister shall maintain the Crossing Area in good order and condition and carry out expeditiously all Work hereunder.
- (p) The cost associated with the location, identification or supervision of the Grantor's facility shall not be charged to or borne by the Minister unless specified in Schedule "C".

6. Remedy on Default

In the case of default by the Minister in carrying out any of the provisions of this Agreement, Grantor may give notice thereof to the Minister. If the Minister fails to commence to remedy such default within 15 days after receipt of such notice and diligently complete such remedy thereafter, Grantor may take such steps as are appropriate to remedy such default and the Minister shall be liable for and shall pay all reasonable costs and expenses incurred by Grantor in remedying the default.

7. Further Work

- (a) If, subsequent to the initial Work undertaken by the Minister for its Facility, *the Minister* desires to undertake any Work in the Crossing Area in respect of its Facility, this Agreement shall be deemed to grant consent to *the Minister*, and the provisions of this Agreement shall apply *as the context requires* to all subsequent Work undertaken by *the Minister* under this Clause 7.
- (b) Notwithstanding the foregoing, installation of any Facility by the Minister other than those shown on attached Schedule "B" shall require a separate New Roadway Over Existing Pipeline Crossing Agreement.
- (c) Notwithstanding the foregoing, if emergency Work in the Crossing Area is required with respect to a party's Facility, that party shall commence the necessary Work and shall forthwith give the other party's Field Representative verbal notice of the emergency and necessary Work, and shall forthwith give notice pursuant to Clause 8 hereof.

8. Notices

Notices shall be in writing and shall be sent to the parties at the addresses for notice shown in the Body of this Agreement. The following shall govern notices:

- (a) Either party may from time to time change its address for service by giving notice to the other party.
- (b) All notices required to be given hereunder may be delivered by hand, mailed by registered or prepaid mail, or sent by telecommunication. If mailed, the notice shall be deemed to have been received seven days (Saturdays Sundays and Statutory Holidays excluded) after the mailing thereof. If delivered by hand, the notice shall be deemed to have been received on the day on which it was delivered, or if delivered after regular business hours, it shall be deemed to have been received on the following business day. If sent by telecommunication, the notice shall be deemed to have been received on the first business day following the day it was dispatched.
- (c) No notice shall be effective if mailed during any period in which Canadian postal workers are on strike or if a strike of postal workers is imminent and may be anticipated to affect normal delivery thereof.

-
- (d) Notwithstanding the foregoing, to the extent described in this Agreement, Grantor's and the Minister's Field Representatives or designated alternates shall have the right and authority to make, give, receive any notice, information, direction or decision required in conducting Work hereunder.

9. Liability and Indemnity

(a) Liability:

- (i) The Minister shall be liable to Grantor for all loss, damages and expenses which Grantor may suffer, sustain, pay or incur by reason of any matter or thing arising out of or attributable to any act or omission of the Minister, his servants, agents or employees in respect of the Minister's use of the Crossing Area or by reason of this Agreement.
- (ii) Grantor shall be liable to the Minister for all loss, damages, and expenses which the Minister may suffer, sustain, pay or incur by reason of any matter or thing arising out of or attributable to any act or omission by Grantor, its servants, agents or employees in respect of Grantor's use of the Crossing Area or by reason of this Agreement.

(b) Indemnity:

- (i) The Minister shall indemnify and save harmless the Grantor against all actions, proceedings, claims, demands, and costs which may be brought against or suffered by Grantor or which it may sustain, pay or incur, by reason of any matter or thing arising out of or attributable to any act or omission of the Minister, its servants, agents or employees in respect of the Minister's use of the Crossing Area or by reason of this Agreement.
- (ii) Grantor shall indemnify and save harmless the Minister against all actions, proceedings, claims, demands, and costs which may be brought against or suffered by the Minister or which it may sustain, pay or incur, by reason of any matter or thing arising out of or attributable to any act or omission of Grantor, its servants, agents or employees in respect of Grantor's use of the Crossing Area or by reason of this Agreement.

10. Insurance

- (a) Without in any way limiting the liability of either party under this Agreement, each party shall obtain and keep in force during the term of this Agreement comprehensive general liability insurance covering liability for bodily injury and property damage arising from Work contemplated by this Agreement. The limit of this insurance shall not be less than five million dollars, inclusive, for any one occurrence unless otherwise agreed by the parties in writing. This policy shall provide coverage for liability assumed under this Agreement.
- (b) A party, upon request of the other party, shall furnish written documentation, satisfactory to the requesting party, evidencing the required coverage.

- (c) As an alternative to the five million dollar policy of comprehensive general liability insurance referred to in Sub-clause 10 (a), if acceptable to the other party, a party may self-insure against the risks normally covered by such a policy.

11. Changes to Agreement

No change, modification or alteration of this Agreement shall be valid unless it be in writing and signed by the parties hereto, and no course of dealing between the parties shall be construed to alter the terms hereof.

12. Assignment

- (a) Neither party to this Agreement shall assign or transfer this Agreement or the rights and privileges hereby granted without the written consent of the other party, and such consent shall not be unreasonably withheld. The party intending to assign or transfer this Agreement shall give to the non- assigning party to this Agreement notice of its intent by registered mail.
- (b) The non-assigning party to this Agreement may require the assignor and assignee to execute a novation agreement in a form acceptable to the non-assigning party.

This Agreement shall endure to the benefit of and be binding upon the parties, their successors and assigns.

13. Governing Law

This Agreement and the rights and obligations of the parties herein shall be governed and construed according to the laws of the province of *Alberta*.

14. Term

The rights and obligations of the parties under this Agreement shall terminate:

- (a) two years from the date hereof if construction of the Minister's Facility has not commenced, or
- (b) upon proper abandonment or removal of all of Grantor's or the Minister's Facilities from the Crossing Area and the completion of any reclamation Work required by applicable laws, except for those rights acquired and obligations incurred prior to such events.

15. Miscellaneous

- (a) In this Agreement, words importing the singular include the plural and vice versa; words importing the masculine gender include the feminine and vice versa; and words importing persons include firms or corporations and vice versa.
- (b) Words such as "hereto", "thereto", "hereof", and "herein", when used in this Agreement, shall be construed to refer to provisions of this Agreement.

- (c) The headings of all clauses of this Agreement, and the Schedules, are inserted for convenience of reference only and shall not affect the meaning or construction thereof.
- (d) Time is of the essence of this Agreement.
- (e) No waiver of any breach of a covenant or provision of this Agreement shall take effect or be binding upon a party unless it is expressed in writing. A waiver by a party of any breach shall not limit or affect that party's rights with respect to any other or future breach.

16. Entire Agreement

This Agreement, including the recitals and schedules, sets forth the entire agreement between the parties hereto and shall be deemed to have superseded any and all previous agreements and understandings, whether written or oral, between the parties dealing with the Facilities and the Crossing Area, and all rights and obligations as herein described.

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Schedule "B"

Location Plan and Profile

This Schedule "B" to Form Part of the New Roadway Over Existing Pipeline Crossing Agreement.

Between _____(Grantor)

and _____(the Minister)

and dated the _____ day of _____, 20_____.

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Schedule "C"
Specific Terms and Conditions

This Schedule "C" to Form Part of the New Roadway Over Existing Pipeline Crossing Agreement.

Between _____(Grantor)

and _____(the Minister)

and dated the ____ day of _____, 20____.

NOTE: All invoices for the items listed below (if applicable) shall be directed to the Minister's Representative.

NOTE: Attach a copy of any existing permit, approval or authorization held by the Grantor as part of Schedule "C" here ((as per clause 1.02(b)).

NOTE: Permission to use an excavating machine within 1.5 metres of either side of any existing Grantor's Facility as required under the Pipeline Act and Regulation, or 3.0 metres of either side of any existing Grantor's Facility as required under the National Energy Board Act and Regulation, as the case may (if applicable) here ((as per clause 5(d)(i)).

NOTE: Attach a copy of the Grantor's cost estimate of the installation of the cathodic protection system (if any) here ((as per clause 5(k)).

NOTE: Attach a copy of the Grantor's cost estimate for backfilling the excavation in the Crossing Area (if any) here ((as per clause 5(m)(i)).

NOTE: Attach a copy of the Grantor's specification for backfill (if any) here ((as per clause 5(m)(ii)).

NOTE: Attach a copy of the cost associated with the location, identification or supervision of the Grantor's facility to be borne by the Minister (if applicable) here ((as per clause 5(p)).

This page left blank intentionally.

SAMPLE 8

**Our File: Hwy. XX:XX
Utility Agreement No. XXXX**

Phone: (403)XXX-XXXX
Fax: (403)XXX-XXXX

Month XX , 20XX

Central Western Railway
1407 Scotland Street SW
Calgary, Alberta
T3C 3W3

ATTENTION: Technical Support Engineer

Dear:

**RE: INTERSECTION HWY XX:XX
NEW RAILWAY CROSSING AGREEMENT**

Please be advised that Alberta Transportation (AT) acknowledges receipt of your cost estimate of \$163,400.00 for the above noted project. AT agrees to reimburse Central Western Railway based on actual close-out costs. This letter constitutes AT approval for Central Western Railway to proceed with the construction of the proposed new railway crossing. If there is a variation of more than 5% or \$10,000 whichever is greater from the original cost estimate, Central Western Railway must contact the Consultant immediately and obtain approval for the additional cost before proceeding with the work.

OCCUPATIONAL HEALTH AND SAFETY ACT

Alberta Transportation (the Department) assigns prime contractor responsibilities, as specified in the Occupational Health and Safety Act, to all parties with which it enters into contracts and agreements. On highway and bridge construction or maintenance projects this would typically include a Contractor, a Consultant (the Department employs an engineering consultant on construction projects only), various Utility Companies and the Railway Company.

During the course of the project, the work sites of the Contractor, Consultant, the Utility Companies and Railway Company may be separated by time and/or space or, may be in the same general vicinity or may be adjacent, depending on the circumstances on the project at any given point in time. It is a requirement of all Department contracts and agreements that the Contractor, Consultant, Utility Companies and Railway Company working within the project limits, coordinate their respective activities, as outlined herein, to ensure a safe project. However, it is not the Department's intent that any of these parties be responsible to ensure that the other parties, or the other parties' subcontractors, have adequate health and safety process for their respective activities.

Designation of Prime Contractor

The Railway Company shall familiarize itself, its staff and its subcontractors with the terms of the Occupational Health and Safety Act and Regulations there under to ensure complete understanding respecting the responsibilities given and compliance required. The Railway Company acknowledges that it is and assumes all of the responsibilities and duties of the Prime Contractor, as defined by the Occupational Health and Safety Act, and that it shall as a condition of this Agreement, comply with the Occupational Health and Safety Act and the regulations there under.

Coordinating Activities

The Railway Company shall coordinate its activities on the project with those of the Consultant, the Contractor and the Utility Companies. When the Consultant and/or Contractor and/or Utility Companies are conducting activities within the project limits the Railway Company shall liaise with the Consultant and/or Contractor as the case may be, and jointly develop a health and safety system or process for the affected worksites. The health and safety system or process agreed to by the parties must be in writing. Any changes required to the health and safety system must be agreed to by all affected parties and must also be in writing. Documenting the written health and safety system or process, including any required changes shall be the responsibility of the Contractor.

(I) Coordinating activities on Highway and Bridge Construction Projects

For the purposes of coordinating activities on highway/bridge construction projects, the contact persons for the Contractor, Consultant, the Utility Companies and the Railway Company shall be identified at the pre-construction meeting for the project. The responsibility to initiate "contact" for coordinating activities shall reside with the party entering a project or site on which work has commenced. This responsibility to initiate contact shall apply regardless of whether or not the worksites are separated by time and/or space, are in the same general vicinity or are adjacent.

(ii) Coordinating activities not associated with a Highway or Bridge Construction Project

When the activities of the Railway Company are not being performed on a highway/bridge construction project, the Railway Company shall contact the local Alberta Transportation office prior to commencing work, to obtain the name of the contact person for the Department's highway maintenance contractor. The responsibility to initiate "contact" for coordinating activities shall reside with the party entering a project or site on which work has commenced. This responsibility to initiate contact shall apply regardless of whether or not the worksites are separated by time and/or space, are in the same general vicinity or are adjacent.

Resolving Disputes Related to Coordination of Activities

If the parties cannot agree on a process or system that addresses the safety concerns of all parties, work at the affected worksites shall cease and this matter shall be referred to the Consultant. However, if the Consultant is one of the parties involved in the dispute, or the Department has not employed a Consultant for the project, the matter shall be referred to the Department. The Consultant or Department as applicable, after review, will decide which party shall be responsible for resolving the disputed safety issue. Such decision shall be final and binding upon all parties.

Responsibility for Subcontractors/Owner operators

The Prime Contractor shall, to the extent required by the Occupational Health and Safety Act, establish and maintain a Health and Safety system or process to ensure compliance to the Act by his subcontractors/owner operators.

A transfer of ownership of land from the existing road allowance will be made from the Crown to the Central Western Railway in exchange for a transfer of ownership of land required for the new crossing (as shown on the attached plan). All survey and associated land registration costs would be to the account of Alberta Transportation.

The cost of maintenance and operation of the signal protection shall be paid according to the current agreement which states that fifty percent of the above mentioned cost is paid by Alberta Transportation and fifty percent by the Central Western Railway Company.

Other maintenance costs shall be apportioned based on seniority. According to current guidelines the road authority being the junior party at the new location shall be wholly responsible for the maintenance or the rubber planking.

The final invoice for your work must be accompanied by back-up documentation and detailed breakdown sufficient and reasonable to support the actual close-out costs claimed. The breakdown of the estimate for the project should include the following:

- Direct labour costs
- Contractor charges
- Materials
- Salvage costs / credits
- Subsidiary costs if any (e.g. easements, etc.)
- Direct engineering
- Overheads

Please forward the invoice and associated documentation to the Consultant's office for reimbursement.

Please sign all three copies; return one copy for our file and forward one copy to the Consultant.

Sincerely,

Name, Construction Manager
Region
Telephone Number

SAMPLE 9

**Our File: Hwy. XX:XX
Utility Agreement No. XXXX**

Phone: (403) XXX-XXXX
Fax: (403) XXX-XXXX

Month XX, 20XX

Canadian National, Great Plains District
Floor 26, CN Building
10004 - 104 Avenue
Edmonton, Alberta
T5J 0K2

**ATTENTION: Technical Support Engineer
Great Plains District**

Dear:

**RE: HWY. XX:XX, CN RAILWAY CROSSING (NORTH OF XXXXX)
FULL DEPTH RUBBER MATERIAL
COST ESTIMATE (\$17,490.00)**

Please be advised that Alberta Transportation (AT) acknowledges receipt of your cost estimate of \$17,490.00 for the above noted project. AT agrees to reimburse Canadian National (CN) based on actual close-out costs. This letter constitutes AT approval for CN to proceed with the proposed Highway XX:XX Railway Crossing adjustments. If there is a variation of more than 5% or \$10,000 whichever is greater from the original cost estimate, CN must contact the Consultant immediately and obtain approval for the additional cost before proceeding with the work.

OCCUPATIONAL HEALTH AND SAFETY ACT

Alberta Transportation (the Department) assigns prime contractor responsibilities, as specified in the Occupational Health and Safety Act, to all parties with which it enters into contracts and agreements. On highway and bridge construction or maintenance projects this would typically include a Contractor, a Consultant (the Department employs an engineering consultant on construction projects only), various Utility Companies and the Railway Company.

During the course of the project, the work sites of the Contractor, Consultant, the Utility Companies and Railway Company may be separated by time and/or space or, may be in the same general vicinity or may be adjacent, depending on the circumstances on the project at any given point in time. It is a requirement of all Department contracts and agreements that the Contractor, Consultant, Utility Companies and Railway Company working within the project limits, coordinate their respective activities, as outlined herein, to ensure a safe project. However, it is not the Department's intent that any of these parties be responsible to ensure that the other parties, or the other parties' subcontractors, have adequate health and safety process for their respective activities.

Designation of Prime Contractor

The Railway Company shall familiarize itself, its staff and its subcontractors with the terms of the Occupational Health and Safety Act and Regulations there under to ensure complete understanding respecting the responsibilities given and compliance required. The Railway Company acknowledges that it is and assumes all of the responsibilities and duties of the Prime Contractor, as defined by the Occupational Health and Safety Act, and that it shall as a condition of this Agreement, comply with the Occupational Health and Safety Act and the regulations there under.

Coordinating Activities

The Railway Company shall coordinate its activities on the project with those of the Consultant, the Contractor and the Utility Companies. When the Consultant and/or Contractor and/or Utility Companies are conducting activities within the project limits the Railway Company shall liaise with the Consultant and/or Contractor as the case may be, and jointly develop a health and safety system or process for the affected worksites. The health and safety system or process agreed to by the parties must be in writing. Any changes required to the health and safety system must be agreed to by all affected parties and must also be in writing. Documenting the written health and safety system or process, including any required changes shall be the responsibility of the Contractor.

(i) Coordinating activities on Highway and Bridge Construction Projects

For the purposes of coordinating activities on highway/bridge construction projects, the contact persons for the Contractor, Consultant, the Utility Companies and the Railway Company shall be identified at the pre-construction meeting for the project. The responsibility to initiate "contact" for coordinating activities shall reside with the party entering a project or site on which work has commenced. This responsibility to initiate contact shall apply regardless of whether or not the worksites are separated by time and/or space, are in the same general vicinity or are adjacent.

(ii) Coordinating activities not associated with a Highway or Bridge Construction Project

When the activities of the Railway Company are not being performed on a highway/bridge construction project, the Railway Company shall contact the local Alberta Transportation office prior to commencing work, to obtain the name of the contact person for the Department's highway maintenance contractor. The responsibility to initiate "contact" for coordinating activities shall reside with the party entering a project or site on which work has commenced. This responsibility to initiate contact shall apply regardless of whether or not the worksites are separated by time and/or space, are in the same general vicinity or are adjacent.

Resolving Disputes Related to Coordination of Activities

If the parties cannot agree on a process or system that addresses the safety concerns of all parties, work at the affected worksites shall cease and this matter shall be referred to the Consultant. However, if the Consultant is one of the parties involved in the dispute, or the Department has not employed a Consultant for the project, the matter shall be referred to the Department.

The Consultant or Department as applicable, after review, will decide which party shall be responsible for resolving the disputed safety issue. Such decision shall be final and binding upon all parties.

Responsibility for Subcontractors/Owner operators

The Prime Contractor shall, to the extent required by the Occupational Health and Safety Act, establish and maintain a Health and Safety system or process to ensure compliance to the Act by his subcontractors/owner operators.

CN Railway (or their Contractor) shall comply with the following:

- Contact John Smith of ABC Engineering Corp., Consultant's Representative, at telephone number (403) XXX-XXXX in Calgary to co-ordinate work within the project limits.
- Provide the Consultant's representative with the name and contact information of the utility person responsible for the work.
- Submit a traffic control plan and a written Traffic Accommodation Strategy to address for the safe accommodation of traffic as outlined in the current Traffic Accommodation in Work Zones Manual for Alberta Transportation's review and comment.
- Desist from starting work until the TAS has been reviewed.
- Notify the Consultant and Contractor(s) a minimum of 72 hours in advance of the proposed commencement or cessation of utility construction work.
- Maintain a copy of the TAS on site for the inspection by Alberta Transportation or their designated representative(s).

The final invoice for your work must be accompanied by back-up documentation and detailed breakdown sufficient and reasonable to support the actual close-out costs claimed. The breakdown of the estimate for the project should include the following:

- Direct labour costs
- Contractor charges
- Materials
- Salvage costs / credits
- Subsidiary costs if any (e.g. easements, etc.)
- Direct engineering
- Overheads

Please forward the invoice and associated documentation to the Consultant's office for reimbursement.

Please sign all three copies; return one copy for our file and forward one copy to the Consultant.

Sincerely,

Name, Construction Manager
Region
Telephone Number

SAMPLE 10

Our File: Hwy. XX:XX
Utility Agreement No. XXXX

Phone: (780) XXX-XXXX
Fax: (780) XXX-XXXX

Month XX, 20XX

Attention: Mr. Name
Utility Company Ltd.
Address
City, Alberta
X2X 3X5

Dear:

RE: Hwy. XX:XX, Jct. Hwy. X to South of Town
Date for Commencement of Construction

By way of this letter and on behalf of Alberta Transportation, **Consultant's Name** is informing you that the tentative date for commencement of construction for the above noted project is April 01, 2002.

The Prime Contractor is:

Name:	ATTN: Name:
Address:	Phone:
	Fax:

The grading sub-contractor is:

Name:	ATTN: Name:
Address:	Phone:
	Fax:

According to the contract specifications between Alberta Transportation and the Prime Contractor, the Prime Contractor is required to coordinate and schedule their field operations with the applicable utilities companies.

If you have any questions please contact the undersigned at **phone no.**

Yours truly,

Name, Consultant's Title
Company Name

cc: Signed Copy to: Prime Contractor
Alberta Transportation – Project Sponsor

(To be used for ATCO Electric Ltd. only)

SAMPLE 11

**Our File: Hwy. XX:XX
Utility Agreement No. XXXX**

Phone: (780) XXX-XXXX
Fax: (780) XXX-XXXX

Month XX, 20XX

ATCO Electric Ltd.
10035 – 105 Street, Box 2426
Edmonton, Alberta
T5J 2V6

**ATTENTION: X X X
X & X Projects**

Dear X:

**RE: HWY. XX:XX, W. OF JCT. S.H. XXX - JCT. HWY X
UTILITY ADJUSTMENT COST ESTIMATE (\$XXX)**

Please be advised that Alberta Transportation (AT) acknowledges receipt of your cost estimate of \$XXX for the above noted project. AT agrees to reimburse ATCO Electric Ltd. based on actual close-out costs. This letter constitutes Department's approval for ATCO Electric Ltd. to proceed with the proposed powerline adjustments. However, if there is a variation of more than 5% or \$10,000 whichever is greater from the original cost estimate, ATCO Electric Ltd. must contact the Consultant immediately and obtain approval for additional cost before proceeding with the work.

AT would assign Prime Contractor responsibilities, as specified on the Occupational Health and Safety Act, to ATCO Electric Ltd. as per the Master Agreement regarding prime contractor obligations with the Department dated on May 4, 2006. This Master Agreement regarding Prime Contractor shall be appended herewith to form as part of the agreement document.

ATCO Electric Ltd. (or their Contractor) shall comply with the following:

- Contact John Smith of ABC Engineering Corp., Consultant's Representative, at telephone number (403) XXX-XXXX in Calgary to co-ordinate work within the project limits.
- Provide the Consultant's representative with the name and contact information of the utility person responsible for the work.
- Submit a traffic control plan and a written Traffic Accommodation Strategy to address for the safe accommodation of traffic as outlined in the current Traffic Accommodation in Work Zones Manual for Alberta Transportation's review and comment.
- Desist from starting work until the TAS has been reviewed.
- Notify the Consultant and Contractor(s) a minimum of 72 hours in advance of the proposed commencement or cessation of utility construction work.
- Maintain a copy of the TAS on site for the inspection by Alberta Transportation or their designated representative(s).

(To be used for ATCO Gas Ltd. and ATCO Pipeline Ltd. only)

SAMPLE 12

**Our File: Hwy. X:XX
Utility Agreement No. XXXX**

ROADWAY UPGRADING PIPELINE CROSSING AGREEMENT
PIPELINE ADJUSTMENT IS REQUIRED

This agreement is made as of the **XXth** day of **Month**, A.D. 20**XX**

BETWEEN

Her Majesty the Queen in right of the Province of Alberta
as represented by the Minister of Alberta Transportation
(hereinafter called the "Minister")

- and -

a body corporate registered and existing under the laws of
the Province of Alberta
(hereinafter called the "Operator")

WHEREAS the Minister intends to make improvements to a roadway known as **Hwy. XXX:XX** which may result in a ground disturbance within the controlled area (**Alberta Pipeline Act**) or Safety Zone (**National Energy Board Act**) of the Operator's pipelines in the land legally described as:

as shown on the attached Plan No.: _____, and adjustment costs as negotiated in a letter dated (sample 4) _____ which form as part of this agreement.

AND WHEREAS the Operator obtained a permit from the Minister for placement of a pipeline under **Hwy. _____**.

NOW THEREFORE, pursuant to the applicable section of the **Alberta Public Highways Development Act**, the **National Energy Board Act**, **Alberta Pipeline Act and Regulation** the **Water Gas and Electrical Companies Act**, and the **Gas Distribution Act** (hereinafter called the "**Acts**"), the Minister and the Operator agree as follows:

1) The Operator's representative shall be:

(Name): _____

Telephone Number): _____

(Address): _____

-
- 2) The Minister's representative shall be:
- (Name): _____, Construction Manager
- (Telephone Number): () - _____
- (Address): Alberta Transportation, _____ Region
- 3) The Minister (or his delegate) shall contact the Operator at least seventy-two (72) hours (excluding Saturdays, Sundays and Statutory Holidays) prior to undertaking any excavation or construction within the controlled area as defined in the Pipeline Act, or Safety Zone as defined in the National Energy Board Act, as the case may be. The Operator, upon receiving such notice, shall make arrangements to have a representative present during the period machinery is to be used within the controlled area or safety zone, as the case may be, and to witness the exposure of the Operator's pipeline(s). No excavation or construction of any sort shall be carried out within the controlled area or safety zone, as the case may be, until the Operator's representative is present at the site and has authorized same, unless the Operator has advised otherwise by written notice to the Minister.
- 4) The Operator shall locate and mark the Operator's pipeline(s), perform inspections and supervise a ground disturbance as required under Part 67 (Alberta Pipeline Regulation 91/2005) without charging any fee to the Minister undertaking the ground disturbances.
- 5) The Operator's pipeline shall be exposed under the direction of the Operator by hand digging or other acceptable method such as excavation by water or air jets to determine the exact location and depth of cover (for the purpose of highway design) before construction is undertaken. The cost of this exposure shall be borne by the Minister.
- 6) If the pipeline work is of such a kind as to fall within the purview of the National Energy Board Act and National Energy Board Pipeline Crossing Regulations, the Operator agrees to carry out the work in accord with the Canada Labour Code R.S.C. (as amended) and the Oil and Gas Occupational Safety and Health Regulations SOR/86-304 (as amended).
- 7) In the event that the Minister authorizes the pipeline work to be done by a person, either legal or natural, other than the Operator, the Minister agrees to require that person to fulfill the responsibilities and duties of the Prime Contractor as that term is used in the Occupational Health and Safety Act, R.S.A 2000, as amended, and any regulations made pursuant to that Act. However, if the pipeline work is of such a kind as to fall within the purview of the National Energy Board Act, and the National Energy Board Pipeline Crossing Regulations, the Minister agrees to require the person to carry out the work in accordance with the Canada Labour Code R.S.C. (as amended) and the Oil and Gas Occupational Safety and Health Regulations SOR/86-304 (as amended).
- 8) The Minister shall carry out all work within the controlled area or safety zone, as the case may be, in accordance with good engineering and construction practices, and in accordance with the relevant Acts.
- 9) The Minister shall ensure that no equipment, material or vehicles will be stored, parked or driven over or along the controlled area or safety zone, as the case may be, except as reasonably necessary in the actual construction of the roadway.
-

- 10) If any excavation or construction equipment is to be moved across the controlled area or safety zone, as the case may be, prior to excavation or construction, and as a temporary protective measure, the Operator may require direct protective measures in accordance with good engineering and construction practices, and in accordance with the relevant Acts, to be placed across the Operator's pipeline(s) at the point of crossing, the cost of which shall be borne by the Minister.
- 11) The Minister shall be liable for and shall indemnify and save harmless the Operator from all manner of actions, causes of action, proceedings, claims, demands, costs, damages and expenses whatsoever including damage to the Operator's pipeline(s), which the Operator may sustain, pay or incur as a result of or in connection with any breach of the obligations assumed under this document by, or the negligence of, the Minister, his employees, servants or agents.
- 12) The Operator shall be liable for and shall indemnify and save harmless the Minister from all manner of actions, causes of action, proceedings, claims, demands, costs, damages and expenses whatsoever including damage to the Minister's facilities which the Minister may sustain, pay or incur as a result of or in connection with any breach of the obligations assumed under this document by, or the negligence of, the Operator or any person for whom the Operator is responsible at law or in equity.
- 13) In the event the Operator is performing any work on its pipeline, the Operator (or their Contractor) shall comply with the following:
 - Contact John Smith of ABC Engineering Corp., Consultant's Representative, at telephone number (403) XXX-XXXX in Calgary to co-ordinate work within the project limits.
 - Provide the Consultant's representative with the name and contact information of the person responsible for the work.
 - Submit a traffic control plan and a written Traffic Accommodation Strategy to address for the safe accommodation of traffic for Alberta Transportation's review and comment.
 - Desist from starting work until the TAS has been reviewed.
 - Notify the Consultant and Contractor(s) a minimum of 72 hours in advance of the proposed commencement or cessation of utility construction work.
 - Maintain a copy of the TAS on site for inspection by Alberta Transportation or their designated representative(s).
- 14) In the event the Minister is responsible for the whole/portion of the relocation/upgrade cost, the Operator shall provide the following:

The final invoice for your work must be accompanied by back-up documentation and detailed cost breakdown sufficient and reasonable to support the actual close-out costs claimed. The breakdown of the estimate for the project should include the followings:

- Direct labour costs
- Contractor charges
- Materials
- Salvage costs / credits
- Subsidiary costs if any (e.g. easements, etc.)

- Direct engineering
- Overheads

Please forward the invoice and associated documentation to the Consultant's office for reimbursement.

Please sign all three copies; return one copy for our file and forward one copy to the Consultant.

- 15) Any written notice required or permitted hereunder shall be directed to the party to whom it will be given (hand delivered, sent by prepaid mail, or sent by telecommunication), addressed as follows:

(a) To the Minister:

Alberta Transportation
_____ **Region**

ATTENTION: Name
Construction Manager
Region

(b) To the Operator:

ATTENTION:

And in the event of mail service disruption, such notice shall be delivered by hand.

- 16) Where the terms and conditions in this document contradict any portion of the Acts, the latter shall prevail.
- 17) The terms and conditions of this agreement shall be effective from the date shown at the beginning of this agreement.

APPENDIX H

**Executed on behalf of the
Operator by:**

**Executed on behalf of the
Minister by:**

Name
Title

Name
Construction Manager
Region

Alberta Transportation – Project Sponsor

APPENDIX I

SAMPLE COST ESTIMATES AND SUMMARY

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Preliminary Cost Estimate Summary

ESTIMATE TYPE "A"

ABC
Consulting

Hwy 99:06

ABC Project No. 1234-01-56789

North/South Limits Sta 0+123 to Sta 14+123

Total Length N/S (km): 14.000

Design Designation: RAU-211.8 std Ultimate

Grading, Base Paving and Bridge Construction

	GRADING	ILLUM.	BASE/PAVE	BRIDGES	TOTAL
(ref Engr)	(remaining)	(\$10k)	(7%)	(12%)	(12%)
CONTRACT COST	\$4,900,000 <small>(14km x \$329,000/km)</small>	\$90,000	\$3,300,000 <small>(14km x \$242,000/km)</small>	\$4,880,000* <small>* based on bridge planning</small>	\$13,170,000
Contingencies (10%)	\$490,000	\$9,000	\$330,000	\$488,000	\$1,317,000
ENGINEERING (ass. 12% total)	\$753,400	\$10,000	\$231,000	\$585,600	\$1,580,000
RIGHT OF WAY	\$0				\$0
TOTALS	\$6,143,400	\$109,000	\$3,861,000	\$5,953,600	\$16,067,000

TOTAL \$ 16,067,000

* based on bridge planning

REMARKS:

1. Engineering Costs are assumed at 12%
2. Estimate based on 2002 Dollars.
3. R/W for project is presently in place. R/W estimate \$s awaiting Regional input.
4. No detailed information available for Utilities estimate.
5. Proposed Hwy 99 Access Management improvements are not included at this time but could greatly impact the wetland Replacement costs (frontage service roads). Work in Wetlands may also have timing constraints (migratory birds).

Prepared by:

Date: October 5, 2011

Copy to:

GRADING DESIGN ESTIMATE FORM

ESTIMATE TYPE: “ B ”
 FROM: West of
 Km 12.345 To Km 28.345
 DESIGN DESIGNATION: RAU 209-110
 INITIATED BY: _____
 DATE: _____

PROJECT: SH 999:00
 TO: East of
 LENGTH: 16.000 Km
 SUBGRADE WIDTH: 12.6 m
 NATURE OF PRIORITY: _____

ITEM	UNIT	QUANTITY	UNIT PRICE	ESTIMATED COST
Common Exc.	m ³	113,000	\$1.90/m ³	\$214,700.00
Borrow Exc.	m ³	390,000	\$2.00/m ³	\$780,000.00
B.T.S. Exc.	m ³	40,000	\$1.00/m ³	\$40,000.00
Channel Exc.	m ³	40,000	\$3.00/m ³	\$120,000.00
Rock Exc.	m ³			
Com/Bor Truck Haul	m ³			

Total Excavation: 583,000

Clearing	ha	38	\$2500.00/ha	\$95,000.00
Fencing	km			
Overhaul	m ³ km	150,000	\$0.75/m ³ km	\$112,500.00
Water	m ³			

TOTAL ESTIMATED COST:

\$1,362,200.00

x 1.25 factor =

\$1,702,750.00

Right-of-Way	
R/W: _____ ha @ _____ \$/ha = _____	
R/W: _____ ha @ _____ \$/ha = _____	
Damages = _____	
Total = _____	

10 % Contingencies

\$170,275.00

18 % Engineering

\$306,495.00

4 % Materials

\$68,110.00

Right-of-Way

Borrow Agreements

Utilities

\$30,000.00

TOTAL FOR "GRADING ESTIMATE":

\$2,277,630.00

Borrow Agreements	
Borrow Pits: _____ ha @ _____ \$/ha = _____	
Backslopes: _____ ha @ _____ \$/ha = _____	
Damages = _____	
Total = _____	

- Subtract Right-of-Way

+ Gravel Surfacing (Grading Only)

\$40,800.00

TOTAL FOR "PROGRAM ESTIMATE"

\$2,318,430.00

(Total CPMS Grading "B" Est.)

Estimate based on 20 Dollars.

Prepared by: _____ Date: _____

REMARKS: No work on bridge structures. R/W and borrow costs already in place.

Length of project may be changed.

COPY SUBMITTED TO PROGRAM ENGINEER: _____

20

Copy to: _____

PRIMARY HIGHWAY 99:00**SURFACING STRATEGY AND BASIC STRUCTURAL DESIGN**

Type "B" Surfacing Estimate (Based on AT 2011 Regional unit prices)

		Existing Width (m)				Final Width (m)				
Rehabilitation Overlay										
km 16.20 – km 25.135		9.0				11.8				
km 25.135 – km 33.000		9.7				14.1				
km 33.000 – km 34.20		9.4				14.1				
Item	From km	To km	Width (m)	Thickness (m)	tonnes/km	Est. Tonnes/km	Length (km)	Est. tonnes	Unit Price (\$/t)	Estimated Cost
Grade Widening										
Granular Base Course (Des. 2 Class 25)										
km 16.20 – km 19.260	16.20	19.26	5.5	0.330	4191	4200	3.06	12852		
km 19.260 – km 25.135	19.26	25.14	5.5	0.330	4191	4200	5.88	24675		
km 25.135 – km 33.000	25.14	33.00	4.7	0.280	3066	3100	7.86	24366		
km 33.00 – km 34.20	33.00	34.20	5.0	0.280	3262	3300	1.20	3960		
Inter., ent., crossovers, etc								6585		
Total tonnage (GBC – Des. 2 Cl. 25)								72438	\$11.75	\$851,150
Rehabilitation Overlay										
Asphalt Concrete Pavement (Mix Type 2 – EPS)										
km 16.20 – km 19.260	16.20	19.26	13.0	0.050	1515	1550	3.06	4743		
km 19.260 – km 25.135	19.26	25.14	13.0	0.100	3029	3050	5.88	17919		
km 25.135 – km 33.000	25.14	33.00	4.7	0.050	548	550	7.86	4323		
km 33.00 – km 34.20	33.00	34.20	5.0	0.050	583	600	1.20	720		
Inter., ent., crossovers, etc								2770		
Total tonnage (ACP – Type 2)								30475	\$35.50	\$1,081,870
Asphalt Concrete Pavement (Mix Type 8 – EPS)										
km 16.20 – km 19.260	16.20	19.26	13.0	0.020	606	650	3.06	1989		
Inter., ent., crossovers, etc								199		
Total tonnage (ACP – Type 8)								2188	\$39.00	\$85,328
Mobilization (8%)										\$161,468
Sub-Total – Construction (contract) Costs										\$2,179,817
Contingency (5%)										\$108,991
Engineering (10%)										\$228,881
Estimated Total										\$2,517,688

"B" Estimate Total
(to nearest \$1000)

\$2,518,000

Consultant : DEF Engineering Ltd	Estimate Type : B	File No : 82400NE
Project : Stoney Trail over Nose Creek in the City of Calgary	CE No : CE808.06	No of Structures : 1
Stream : Nose Creek	Date Submitted : 03/15/07	Length (m) : 56.4
Span & Type : 1-46.5m WG1800x3 Girder Bridge	Tender Date : TBD	Width (m) : 10.2
Region/Sponsor : Edmonton Calgary Highways/Garry Lamb	Completion Date : TBD	Area (m ²) : 575.28

Item No	AIT Code	Bid Item Description	Estimated Quantity	Unit	Estimated Unit Price	Estimated Cost
1	X100	Mobilization	1.00	lump sum	200,000.00	200,000.00
2	X004	Site Occupancy - Bridge Structures	500.00	\$ per day	300.00	150,000.00
3	F186	Excavation - Structural	1.00	lump sum	5,000.00	5,000.00
4	F190	Backfill	1.00	lump sum	20,000.00	20,000.00
5	F824	Drill Rig Set-up	6.00	per pile	5,000.00	30,000.00
6	F826	Pile Installation	91.00	per metre	235.50	21,430.50
7	F822	Concrete - Pile	103.00	per m3	750.00	77,250.00
8	F835	Concrete - Class C	39.00	per m3	775.00	30,225.00
9	F841	Concrete - Class HPC	180.00	per m3	1,250.00	225,000.00
10	F850	Plain Reinforcing Steel - Supply	13,784.00	per m3	1.80	24,811.20
11	F852	Epoxy-coated Reinforcing Steel - Supply	19,678.00	per kg	2.35	46,243.30
12	F854	Reinforcing Steel - Place	33,462.00	per kg	1.45	48,519.90
13	F905	Supply and Delivery of Bearings	1.00	lump sum	10,000.00	10,000.00
14	F910	Installation of Bearings	1.00	lump sum	3,000.00	3,000.00
15	F900	Supply of Structural Steel Girders and Associated Materials	80.00	per tonne	4,375.00	350,000.00
16	F925	Delivery of Girders	80.00	per tonne	250.00	20,000.00
17	F930	Erection of Girders	80.00	per tonne	937.50	75,000.00
18	F965	Ducts	1.00	lump sum	5,000.00	5,000.00
19	F970	Miscellaneous Iron	1.00	lump sum	3,000.00	3,000.00
20	F842	Sealer	1.00	lump sum	9,000.00	9,000.00
21	F974	Deck Waterproofing	520.00	per m2	28.00	14,560.00
22	F980	Asphalt Concrete Pavement - Mix Type H2 (150-200A)	100.00	per tonne	200.00	20,000.00
23	F780	Bridgerail	94.00	per lm	744.68	70,000.00
24						
25						
26						
27						
28						
29						
30						
Remarks :					Estimated Tender Cost Total :	1,458,039.90
					Estimated Unit Cost (\$/m ²) :	2,534.49
					10.00 % Contingencies :	145,803.99
					18.00 % Engineering :	262,447.18
					Estimated Project Cost Total :	1,866,291.07

**Cost Estimate "C"
For
Hwy 99:06**

TENDER 9999/07

**Prepared for
Alberta Transportation
Southern Region**

**Prepared By
ABC Consulting
Somewhere, Alberta
June 4, 2011
REVISION 3**

HIGHWAY 99:06 - Grading Estimate Summary
 Highway 90 to S. of Access

Item No.	Code (CEB)	Item Description	Unit	Estimated Quantity	2011 Weighted Average	Estimated Unit Price "C"	Estimated Cost "C"	2011 AVE Cost
1	X100	Mobilization (10 %) GRADING work	lump sum	1.0			\$535,298.40	\$542,172.66
2	X004	Site Occupancy	per day		\$1,500.00	\$1,500.00	\$0	\$0
3	G100	Clearing	ha	1.00	\$1,750.00	\$4,000.00	\$4,000	\$1,750
4	G225	Common Excavation	m3	560000.00	\$2.10	\$2.13	\$1,192,800	\$1,176,000
5	G220	Channel Excavation	m3	3500.00	\$4.21	\$4.50	\$15,750	\$14,735
6	G230	Borrow Topsoil Excavation	m3	360000.00	\$1.58	\$1.40	\$504,000	\$568,800
7	G235	Borrow Excavation	m3	1020000.00	\$1.87	\$1.75	\$1,785,000	\$1,907,400
8	G239	Overhaul	m3.km	1720000.00	\$0.56	\$0.60	\$1,032,000	\$963,200
9	D100	Culverts - Remove and Dispose (C.S.P.) (up to 700 mm dia.)	m	183.00	\$30.00	\$28.00	\$5,124	\$5,490
10	D105	Culverts - Remove and Dispose (C.S.P.) (over 700 mm dia.)	m	44.00	\$23.00	\$35.00	\$1,540	\$1,012
11	D200	Granular Backfill - Culverts	m3	500.00	\$40.00	\$14.00	\$7,000	\$20,000
12	D410	Culverts - Supply and Install (600 mm dia. C.S.P.)	m	316.00	\$100.00	\$110.00	\$34,760	\$31,600
13	D425	Culverts - Supply and Install (800 mm dia. C.S.P.)	m	656.00	\$163.00	\$135.00	\$88,560	\$106,928
14	D540	Grouting of Abandoned Culverts	m3	37.00	\$208.00	\$250.00	\$9,250	\$7,696
15	E018	Plugging Abandoned Water Well	lump sum	1.00	\$1,000.00	\$1,500.00	\$1,500	\$1,000
16	G452	Remove and Dispose of Existing Fence	km	10.00	\$772.86	\$800.00	\$8,000	\$7,729
17	G453	Remove and Salvage of Existing Fence	km	2.50	\$965.00	\$1,000.00	\$2,500	\$2,413
18	G475	New Fence - Supply and Install - Class B	km	10.00	\$3,646.61	\$3,700.00	\$37,000	\$36,466
19	G480	New Fence - Supply and Install - Class C	km	1.00	\$5,783.33	\$7,000.00	\$7,000	\$5,783
20	G014	New Fence - Modified Class B -(Five Strand Barbwire)	km	0.20	\$5,000.00	\$5,000.00	\$1,000	\$1,000
21	G014	New Fence - Modified Class B (2.4m Post Spacing)	km	2.00	\$4,500.00	\$5,500.00	\$11,000	\$9,000
22	G018	Relocate Ranch Gate	lump sum	1.00	\$1,500.00	\$1,500.00	\$1,500	\$1,500
23	G300	Topsoil Placement	m2	750000.00	\$0.10	\$0.14	\$105,000	\$75,000
24	E600	Seeding, Fertilizing and Harrowing	ha	145.00	\$416.00	\$455.00	\$65,975	\$60,320
25	E605	Seeding, Fertilizing and Mulching	ha	12.00	\$2,700.00	\$3,500.00	\$42,000	\$32,400

26	E500	Soil Covering (Low Flow)	m2	12000.00	\$5.00	\$5.00	\$60,000	\$60,000
27	A800	Supply of Aggregate - With Option	t	800.0	\$0.95	\$0.95	\$760	\$760
36	S830	Flexible Guide Post/Delineators - Round - Supply and Install	posts	180.00	\$30.16	\$30.00	\$5,400	\$5,429
37	S825	Remove and Dispose of Existing Guardrail	m	200.00	\$6.07	\$7.00	\$1,400	\$1,214
38	S820	Remove, Salvage and Reinstall Existing Guardrail	m	840.00	\$15.45	\$17.50	\$14,700	\$12,978
39	S800	W-Beam Guardrail - Supply and Install	m	2040.00	\$40.25	\$41.00	\$83,640	\$82,110
40	S257	Supply and Install Post - 100 mm x 150 mm	posts	105.00	\$32.45	\$35.00	\$3,675	\$3,407
41	S258	Supply and Install Post - 150 mm x 200 mm	posts	12.00	\$50.00	\$60.00	\$720	\$600
42	S272	Supply of Signs, Aluminum	m2	40.00	\$188.55	\$200.00	\$8,000	\$7,542
43	S270	Supply of Signs, 3/4" Plywood	m2	14.00	\$213.35	\$220.00	\$3,080	\$2,987
44	S275	Removal and Reinstallation or Disposal of Existing Signs - One Post	signs	55.00	\$31.80	\$30.00	\$1,650	\$1,749
45	S277	Removal and Reinstallation Disposal of Existing Signs - Two Posts	signs	15.00	\$44.40	\$100.00	\$1,500	\$666
46	S283	Concrete Base - Remove and Reinstall	units	4.00	\$179.00	\$200.00	\$800	\$716
47	S291	Remove and Reinstall Breakaway Steel Posts	posts	4.00	\$97.33	\$150.00	\$600	\$389
48	S288	Install Sign - Less than 1 m2	signs	100.00	\$26.27	\$30.00	\$3,000	\$2,627
49	S289	Install Sign - 1 m2 to 3 m2	signs	15.00	\$88.72	\$120.00	\$1,800	\$1,331
58	F750	Traffic Accommodation	lump sum	1.00	\$200,000.00	\$200,000.00	\$200,000	\$200,000
				TOTAL			\$5,888,282	\$5,963,899

TOTAL ESTIMATED EXPENDITURE	\$5,888,282	\$5,963,899
CONTRACT ESTIMATE (rounded to nearest 1000 dollars)*	\$5,888,000	\$5,964,000
CONTINGENCIES @ 10%*	\$588,800	\$596,400
ENGINEERING (Total)	7.2% \$467,100	\$467,100
UTILITIES	\$25,000	\$25,000
RIGHT-OF-WAY	\$0	\$0
GRADING ESTIMATE SUMMARY	\$6,968,900	\$7,052,500

HIGHWAY 99:06 ACP ESTIMATE SUMMARY
Highway 90 to S. of Access

Bid No.	Code (CEB)		Unit	Estimated Quantity	2011 AVE	Estimated Unit Price "C"	Estimated Cost "C"	2011 AVE Cost
1	X100	Mobilization (10 %) ACP	lump sum	1.0			\$212,562.50	\$203,328.45
2	X004	Site Occupancy	per day		\$1,500.00	\$1,500.00	\$0.00	\$0
27	A800	Supply of Aggregate - With Option	t	78000.0	\$0.95	\$0.95	\$74,100.00	\$74,100
28	Q185	Gravel Surfacing	t	10000.0	\$3.80	\$5.00	\$50,000.00	\$38,000
33	Q487	Asphalt Concrete Pavement - EPS Mix Type 1	t	67000.0	\$27.20	\$28.25	\$1,892,750.00	\$1,822,400
34	Q510	Asphalt Mix For Others	t	1000.0	\$23.40	\$24.00	\$24,000.00	\$23,400
50	S310	Pavement Message Markings - Turn Arrow (Single or Double)	units	17.0	\$41.24	\$50.00	\$850.00	\$701
51	S315	Pavement Message Markings - Stop Bar	units	4.0	\$51.55	\$75.00	\$300.00	\$206
53	S350	Roadway Lines - Supplying Paint and Painting (Directional Dividing and 2 Edge Lines)	km	23.5	\$452.11	\$500.00	\$11,750.00	\$10,625
54	S355	Roadway Lines - Supplying Paint and Painting (Lane Dividing Lines)	km	7.5	\$202.11	\$250.00	\$1,875.00	\$1,516
55	S360	Intersection Lines - Supplying Paint and Painting	intersections	2.0	\$168.39	\$250.00	\$500.00	\$337
56	X510	Cutting of Pavement Edge	m	10000.0	\$5.00	\$5.75	\$57,500.00	\$50,000
57	S052	Remove and Dispose Advance Warning Signs	units	2.0	\$6,000.00	\$6,000.00	\$12,000.00	\$12,000
					TOTAL		\$2,338,188	\$2,236,613

TOTAL ESTIMATED EXPENDITURE	\$2,338,188	\$2,236,613
CONTRACT ESTIMATE (rounded to nearest 1000 dollars)*	\$2,338,000	\$2,237,000
CONTINGENCIES @ 10%*	\$233,800	\$223,700
ENGINEERING (Total)	\$67,431	\$67,431
UTILITIES	\$0	\$0
RIGHT-OF-WAY	\$0	\$0
TOTAL ESTIMATE HIGHWAY 99:06 - ACP	\$2,639,231	\$2,528,131

HIGHWAY 99:06 - GBC ESTIMATE SUMMARY
Highway 90 to S. of Access

Item No.	Code (CEB)	Item Description	Unit	Estimated Quantity	2011 AVE	Estimated Unit Price "C"	Estimated Cost "C"	2011 AVE Cost
1	X100	Mobilization (10 %) GBC	lump sum	1.0			\$138,795	112,312.96
2	X004	Site Occupancy	per day		\$1,500.00	\$1,500.00	\$0	\$0
27	A800	Supply of Aggregate - With Option	t	173000.0	\$0.95	\$0.95	\$164,350	\$164,350
29	B100	Subgrade Excavation	m3	500.0	\$3.92	\$4.00	\$2,000	\$1,960
30	B172	Granular Fill (Pit-run) 6 - 80	t	1000.0	\$13.33	\$14.00	\$14,000	\$13,330
31	B282	Granular Base Course 2-25	t	172000.0	\$5.30	\$6.80	\$1,169,600	\$911,600
				TOTAL			\$1,450,745	\$1,171,663

TOTAL ESTIMATED EXPENDITURE	\$1,450,745	\$1,171,663
CONTRACT ESTIMATE (rounded to nearest 1000 dollars)*	\$1,451,000	\$1,172,000
CONTINGENCIES @ 10%*	\$145,100	\$117,200
ENGINEERING (Total)	5.2% \$84,944	\$84,944
UTILITIES	\$0	\$0
RIGHT-OF-WAY	\$0	\$0
GBC ESTIMATE	\$1,684,844	\$1,377,454

HIGHWAY 99:06 CPR OVERPASS BF 99999 N and BF 99999 S ESTIMATE SUMMARY

Bid No.	Code (CEB)	Item Description	Unit	Estimated Quantity	2011 AVE	Estimated Unit Price "C"	Estimated Cost "C"	2011 AVE Cost
59	X100	Mobilization (10 %) Bridge Structures	lump sum	1.0			253,468.25	250,708.37
60	X004	Site Occupancy	per day		\$600.00	\$600.00	\$0	\$0
61	F186	Excavation - Structural	lump sum	1	\$40,000.00	\$40,000.00	\$40,000	\$40,000
62	F190	Backfill	lump sum	1	\$400,000.00	\$400,000.00	\$400,000	\$400,000
63	F812	Supply of Piling - H-Pile	m	466	\$62.89	\$65.00	\$30,290	\$29,307
64	F816	Pile Set-up	piles	28	\$1,191.24	\$1,200.00	\$33,600	\$33,355
65	F818	Pile Driving	m	466	\$4.00	\$4.00	\$1,864	\$1,864
66	F018	Mechanically Stabilized Earth Wall	lump sum	1	\$640,000.00	\$640,000.00	\$640,000	\$640,000
67	F963	Supply of Girders - Precast Long Span - DBC Type (Exterior)	girders	4	\$25,000.00	\$25,000.00	\$100,000	\$100,000
68	F963	Supply of Girders - Precast Long Span - DBC Type (Interior)	girders	18	\$25,000.00	\$25,000.00	\$450,000	\$450,000
69	F940	Delivery of Girders	lump sum	1	\$25,000.00	\$25,000.00	\$25,000	\$25,000
70	F945	Erection of Girders	lump sum	1	\$130,000.00	\$130,000.00	\$130,000	\$130,000
71	F834	Concrete - Class C	m3	191	\$619.00	\$675.00	\$128,925	\$118,229
72	F840	Concrete - Modified Class SF	m3	382	\$819.64	\$850.00	\$324,700	\$313,102
73	F850	Plain Reinforcing Steel - Supply	kg	29227	\$0.83	\$0.85	\$24,843	\$24,258
74	F852	Epoxy-coated Reinforcing Steel - Supply	kg	33188	\$1.32	\$1.35	\$44,804	\$43,808
75	F854	Reinforcing Steel - Place	kg	62415	\$0.41	\$0.45	\$28,087	\$25,590
76	F905	Supply of Bearings	lump sum	1	\$10,000.00	\$10,000.00	\$10,000	\$10,000
77	F780	Bridge rail	lump sum	1	\$79,700.00	\$79,700.00	\$79,700	\$79,700
78	F020	Tube Rail Fence	m	215	\$40.00	\$40.00	\$8,600	\$8,600
79	F965	Ducts	lump sum	1	\$5,200.00	\$5,200.00	\$5,200	\$5,200
80	F970	Miscellaneous Iron	lump sum	1	\$10,000.00	\$10,000.00	\$10,000	\$10,000
81	F842	Sealer	lump sum	1	\$10,000.00	\$10,000.00	\$10,000	\$10,000
81	F022	Ditch Lining	m2	800	\$2.00	\$2.00	\$1,600	\$1,600
82	F022	Sacked Concrete Drain Troughs	m	166	\$45.00	\$45.00	\$7,470	\$7,470
					TOTAL		\$2,788,151	\$2,757,792

TOTAL ESTIMATED EXPENDITURE	\$2,788,151	\$2,757,792
CONTRACT ESTIMATE (rounded to nearest 1000 dollars)*	\$2,788,000	\$2,758,000
CONTINGENCIES @ 10%*	\$278,800	\$275,800
ENGINEERING	\$166,276	\$166,276
UTILITIES	\$0	\$0
RIGHT-OF-WAY	\$0	\$0
TOTAL ESTIMATE HIGHWAY 99:06 CPR OVERPASS	\$3,233,076	\$3,200,076

HWY 99:06 ACP (FINAL STAGE) ESTIMATE SUMMARY
S. of Access - N. of Anytown

Bid No.	Code (CEB)	Item Description	Unit	Estimated Quantity	2011 AVE	Estimated Unit Price "C"	Estimated Cost "C"	2011 AVE Cost
1	X100	Mobilization (10 %) ACP	lump sum	1.00			\$54,169	\$52,203
2	X004	Site Occupancy	per day		\$1,500.00	\$1,500.00	\$0	\$0
29	B100	Subgrade Excavation	m3	250.00	\$3.92	\$4.00	\$1,000	\$980
30	B172	Granular Fill (Des 6-80)	t	500.00	\$13.33	\$14.00	\$7,000	\$6,665
27	A800	Aggregate Supply With Option	t	17500.00	\$0.95	\$0.95	\$16,625	\$16,625
33	Q487	Asphalt Concrete Pavement - EPS Mix Type H1	t	17000.00	\$27.20	\$28.25	\$480,250	\$462,400
38	S820	Remove, Salvage and Reinstall Existing Guardrail	m	138.00	\$15.45	\$17.50	\$2,415	\$2,132
35	G270	Side slope Improvement	km	3.00	\$9,186.15	\$9,200.00	\$27,600	\$27,558
50	S310	Pavement Message Markings - Turn Arrow (Single or Double)	units	18.0	\$41.24	\$50.00	\$900.00	\$742
52	S315	Pavement Message Markings - Stop Bar	units	6.00	\$51.55	\$75.00	\$450	\$309
52	S321	Pavement Messages - STOP	units	6.00	\$383.21	\$450.00	\$2,700	\$2,299
53	S350	Roadway Lines - Supplying Paint and Painting (Directional Driving and 2 Edge Lines)	km	4.00	\$452.11	\$500.00	\$2,000	\$1,808
55	S360	Intersection Lines - Supplying Paint and Painting	intersections	3.00	\$168.39	\$250.00	\$750.00	\$505
				TOTAL			\$595,859	\$574,228

TOTAL ESTIMATED EXPENDITURE	\$595,859	\$574,228
CONTRACT ESTIMATE (rounded to nearest 1000 dollars)*	\$596,000	\$574,000
CONTINGENCIES @ 10%*	\$59,600	\$57,400
ENGINEERING (Total)	\$33,311	\$33,311
UTILITIES	\$0	\$0
RIGHT-OF-WAY	\$0	\$0
TOTAL ESTIMATE HIGHWAY 99:06 - ACP - Final Stage Paving	\$688,911	\$664,711

TOTAL HIGHWAY 99:06 Cost Estimate "C" Summary

	Estimated Cost "C"	2011 AVE Cost
TOTAL ESTIMATED EXPENDITURE*	\$13,099,225	\$12,736,085
CONTRACT ESTIMATE (rounded to nearest 1000 dollars)*	\$13,099,000	\$12,737,000
CONTINGENCIES @ 10%*	\$1,309,900	\$1,273,700
ENGINEERING (Total) 6.3%	\$819,062	\$819,062
UTILITIES	\$25,000	\$25,000
RIGHT-OF-WAY	\$0	\$0
TOTAL CONTRACT ESTIMATE - ALL PHASES COMBINED	\$15,252,962	\$14,854,762

*Note: Total Estimated Expenditure values vary from individual estimate summaries due to rounding.

Prepared By: Person 1, Transportation Engineer
 Checked By: Person 2, Sr. Project Manager
 Checked By: Person 3, RET Project Manager

Date October 11, 2011

Revision 3 - Final Check Revised Costs for Engineering and Combining Quantities.

**CONTRACT ESTIMATED SUMMARY "C"
FOR TENDER 9999/00 HWY 99:06**

2012 Estimated Construction	Contract (Nearest \$1,000)	10% Contingencies	Engineering	Right of Way	Utilities	Totals
Grading	\$5,888,000	\$588,800	\$467,100	\$0	\$25,000	\$6,968,900
GBC Surfacing	\$1,489,000	\$148,900	\$84,944	\$0	\$0	\$1,722,844
ACP Surfacing	\$2,338,000	\$233,800	\$67,431	\$0	\$0	\$2,639,231
CPR Overpass	\$2,788,000	\$278,800	\$166,276	\$0	\$0	\$3,233,076
ACP - Final Stage - S. of Access	\$596,000	\$59,600	\$33,311	\$0	\$0	\$688,911
Totals	\$13,099,000	\$1,309,900	\$819,062	\$0	\$25,000	\$15,252,962
2011 Average Unit Prices Costs	Contract (Nearest \$1,000)	10% Contingencies	Engineering	Right of Way	Utilities	Totals
Grading	\$5,964,000	\$596,400	\$467,100	\$0	\$25,000	\$7,052,500
GBC Surfacing	\$1,204,000	\$120,400	\$84,944	\$0	\$0	\$1,409,344
ACP Surfacing	\$2,237,000	\$223,700	\$67,431	\$0	\$0	\$2,528,131
CPR Overpass	\$2,758,000	\$275,800	\$166,276	\$0	\$0	\$3,200,076
ACP - Final Stage - S. of Access	\$574,000	\$57,400	\$33,311	\$0	\$0	\$664,711
Totals	\$12,737,000	\$1,273,700	\$819,062	\$0	\$25,000	\$14,854,762

Notes:

2011 Average Unit Prices obtained from UNIT PRICE REPORT DATED April 12 2011

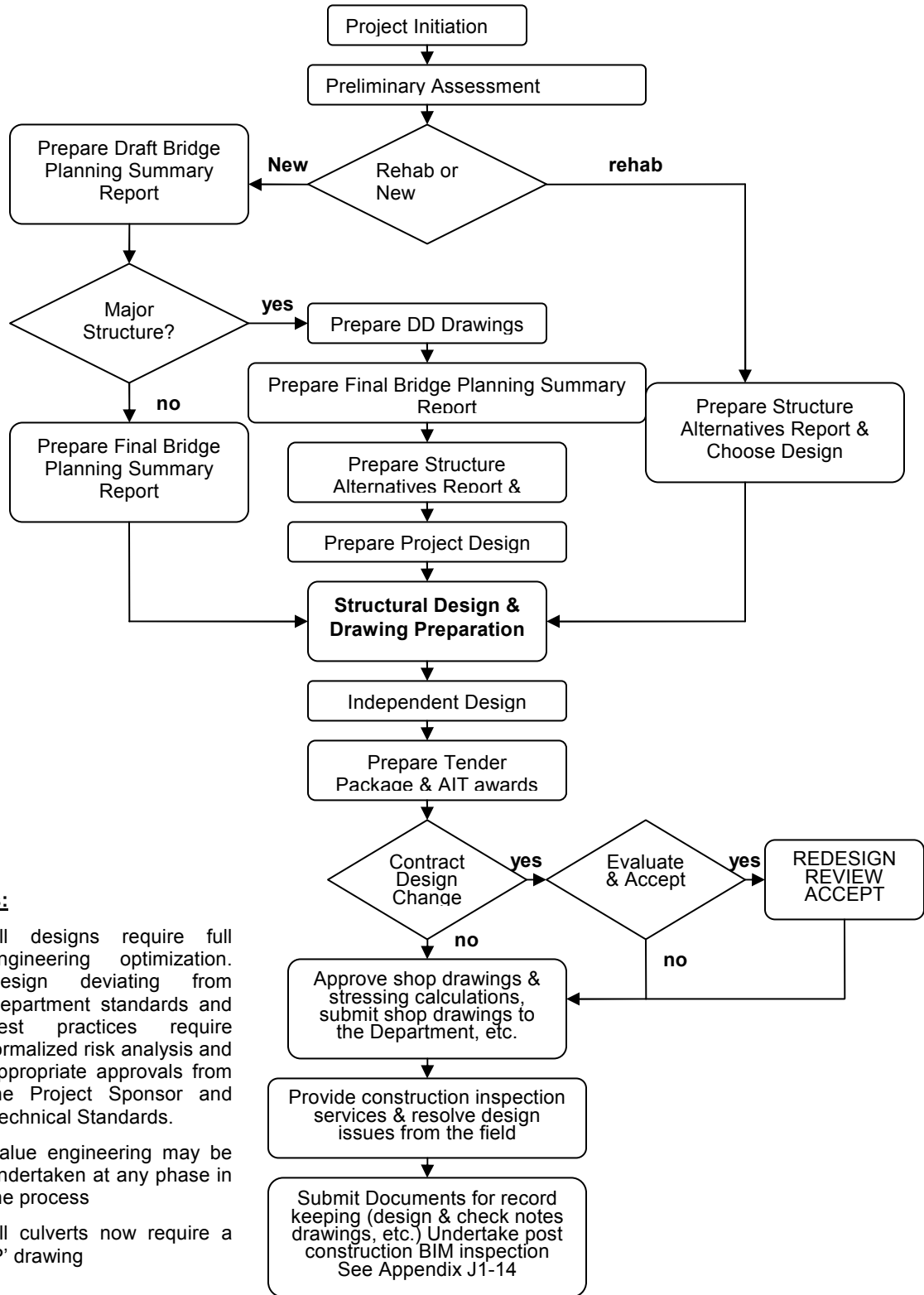
Southern Region Prices were used when available and Provincial Average Prices were used when no price for Southern Region was available.

APPENDIX J1

BRIDGE DESIGN PROCESSES AND DATA REQUIREMENTS

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BRIDGE DESIGN PROCESS CHART



Notes:

- All designs require full engineering optimization. Design deviating from Department standards and best practices require formalized risk analysis and appropriate approvals from the Project Sponsor and Technical Standards.
- Value engineering may be undertaken at any phase in the process
- All culverts now require a 'P' drawing

BRIDGE PROJECT PROCESS

No.	Activity of Design Process	Participants	Approximate Time Frame
1	Preliminary Assessment and Site History <ul style="list-style-type: none"> - Collect available information and supplement as required - Determine hydrotechnical and geometric requirements - Review project with stakeholders (road authority, railway, environment, navigable waters, canal authority, etc.) 	Consultant	2 – 4 weeks
2	Submit Draft Bridge Planning Report for review and Department concurrence to proceed with recommended option	Region/ Technical Standards	Milestone Date (given in agreement) Allow 2 weeks for AIT review
3	Finalize bridge plan for selected option (submit draft Design Data Drawings for review*)	Consultant	2 to 4 weeks
4	Submit Final Bridge Planning Summary Report (and finalized Design Data Drawings*)	Region/ Technical Standards	Milestone Date (given in TOR) DD drawings to be submitted 2 weeks prior to this date
5	Prepare Structure Alternatives Report	Consultant	Provide 1 week prior to (6)
6	Review Structure Alternatives Report and Select Alternative <ul style="list-style-type: none"> - Region and Technical Standards review options and recommendation - Region completes “Choose Design Completion” form and communicates decision to consultant 	Region/ Technical Standards	Milestone Date (given in TOR)
7	Obtain Required Approvals <ul style="list-style-type: none"> - Consultant prepares all documents and submits to Region - Region or consultant makes formal submissions to NTA, NWPA, Environment, etc. for approval 	Consultant/ Region	As required to meet construction tender contract dates
*8	Prepare Project Design Brief	Consultant	1 week and submit 1 week prior to (10)
*9	Review and Accept Project Design Brief and Communicate decision to consultant	Region/ Technical Standards	Milestone Date (given in TOR)
10	Detailed Structural Design Package <ul style="list-style-type: none"> - Prepare contract drawings ** - Independent check of design and drawings - Prepare special provisions - Assemble tender documents ** All culverts now require a ‘P’ drawing	Consultant	4 to 15 weeks Package to be submitted 2 weeks prior to (11)
11	Review and Accept Tender Package <ul style="list-style-type: none"> - Region, Technical Standards, and Contracts review tender package - Region accepts tender package, completes “Design Completion” form, and communicates decision to consultant 	Region/ Technical Stds./Program Management Branch	Milestone Date (given in TOR)

No.	Activity of Design Process	Participants	Approximate Time Frame
12	Provide Design Services during Construction <ul style="list-style-type: none"> - Approve shop or fabrication drawings, erection drawings, and stressing calculations - Respond to queries from field related to design 	Consultant	As specified in Terms of Reference
13	Prepare As-Constructed Drawings <ul style="list-style-type: none"> - Undertake post construction BIM inspection 	Consultant Consultant/ Region	4 weeks after open to traffic date
14	File Documents <ul style="list-style-type: none"> - Record drawings, shop drawings, special provisions, designers' notes, checkers notes, etc. - Submit completed "Corporate Data Requirements" forms 	Technical Standards Region	8 weeks maximum after open to traffic date
15	Evaluate Consultant <ul style="list-style-type: none"> - Communicate Results to Technical Standards 	Region/ Consultant	4 weeks after completion date

*** Major Bridges Only**

REQUIREMENTS FOR DESIGN DATA DRAWINGS

WORK TASKS

- ◆ Undertake an initial site assessment in order to highlight significant issues. Conduct a cost benefit or life cycle cost analysis involving any components can be reused during reconstruction. If necessary, co-ordinate preliminary design with concurrent geometric design and/or location study, and local road authority. Submit Decision for Navigability request.
- ◆ Undertake site survey and geotechnical investigation as necessary. Complete location optimization, geometric design, and hydraulic analysis. Provide consideration of alternative structure types to allow development of alternative and ultimate finalization of optimum planning design to be shown on Design Data drawings and structural design. Complete draft Bridge Planning Summary Report and facilitate choose concept meeting.
- ◆ Prepare Design Data drawings containing sufficient detail and information to allow the construction of the bridge head slopes and fills, any river training works and/or protection works, and temporary traffic accommodation during construction. Design Data drawings are to include but are not necessarily restricted to the items detailed in the following sections. Sample drawings will be provided upon request to the Edmonton office.
- ◆ Detailed site plan showing:
 - location of the as-built bridge relative to the stream
 - all existing or proposed river training and/or bank protection works
 - all utilities, existing and required right-of-way, and any existing developments
 - detour alignment which meets or exceeds minimum standards
- ◆ Elevation view showing:
 - existing bridge including abutments, piers, and foundation
 - location of the bridge head slopes
 - any protection works relative to the river banks
 - design hydraulic conditions including:
 - design high water elevation
 - high water elevations with date of measurement
 - minimum freeboard (as per SAD guidelines)
 - design ice conditions
 - anticipated scour
 - proposed deck elevation
 - geotechnical information including test holes or test piles
- ◆ Bridge cross-section showing minimum proposed clear deck width, lane configurations, and crown or super-elevation
- ◆ Cross section of roadway approach fills at bridge ends.

-
- ◆ Site mosaic showing:
 - proposed bridge
 - stream
 - extent of fills
 - river training and/or protection works
 - existing roadway system including horizontal curve data and how the replacement bridge will tie in
 - land ownership

 - ◆ Stream bed and water or ice surface profile.
 - Highway profile showing station and elevation of:
 - vertical curves (with associated “K” values and slope)
 - proposed abutments

 - ◆ General Summary notes including:
 - survey acquisition information
 - hydrotechnical summary giving:
 - drainage area
 - design discharge and return frequency
 - historical high flood
 - mean flow velocity for design discharge through the proposed bridge opening
 - flowing ice condition with situation and elevation
 - stream bed slope
 - anticipated backwater due to proposed bridge
 - type, specification, and quantities of any bridge and/or bank protection material
 - all other relevant notes required to structurally design, construct, and operate the bridge
 - highway geometric design standards

 - ◆ Prepare Navigable Waters sketches (if required).

 - ◆ Fish Compensation plans when required

 - ◆ Obtain all necessary permits, licenses, or approvals and prepare special provisions and submissions for Water Resources Permit, Federal Fisheries, and/or Navigable Waters Protection Act approval.

 - ◆ Submit Bridge Planning Summary Report.

PROCESS MILESTONES

- ◆ At an agreed upon time after proposal acceptance, attend initial meeting with Municipality to identify alignment, location, and structure type alternatives and discuss site-specific issues.

- ◆ Prepare alternatives for advancement to Design Data drawing stage.

APPENDIX J1

- ◆ Submit concept alternatives and draft Bridge Planning Summary Report.
- ◆ Attend meeting to review initial design including hydrotechnical and geometric aspects.
- ◆ Prepare final Design Data drawings in preparation for formal Design Data drawing review with Municipality. A complete check of the design and drawings by an engineer other than that responsible for the design is required. Copies of these drawings are to be supplied to Municipality two weeks prior to the Design Data Drawing meeting.
- ◆ Attend meeting for final review and acceptance of Design Data drawings.

Obtain permits and approvals to satisfy requirements.

Bridge File: _____
 Region: _____
 Project Description: _____ Highway: _____ Road Authority: _____
 Dept. Sponsor: _____ Dept. Admin: _____ TSB Liaison: _____
 Consultant: _____ Project Manager: _____ CE Agreement: _____

CLEAR ROADWAY WIDTH:	_____	AREA (O.T.O. fills and total bridge width) :	_____
----------------------	-------	----------------------------------------------	-------

STRUCTURE ALTERNATIVES				
	Description	Selected	Cost Estimate	NPV (50 Years, 4%)

SPECIAL CONSIDERATIONS:	
Notes:	

SELECTED ALTERNATIVE:			
Girder Type, Size and No. of Lines:			
Culvert Size (span x rise x length) and Shape:			
Abutment Type:		Pier Type:	
Deck and Wearing Surface Type:			
Deck Joints:			
Curbs:		Bridge Rail:	
Approach Slabs:		Guardrail:	
Notes:			
DD Drawing No.'s:			

Draft Submission: _____ Review Meeting Date: _____ Final Submission: _____

Cost Estimate	Type	Date	Milestone Schedule	Date
Current: _____			Project Design Brief:	_____
Previous: _____			Complete detailed design:	_____
Includes: <u>Engineering, Construction, Contingencies, R/W, Detour</u>			Tender ready for advertising:	_____
			Tender advertize date:	_____

Consultant Project Manager's Signature _____	Dept. Administrator's Signature _____	Dept. Sponsor's Signature _____

Copies to: Consultant, TSB, Bridge File

Bridge File: _____

Region: _____

Project Description: _____ Highway: _____ Road Authority: _____

Dept. Sponsor: _____ Dept. Admin: _____ TSB Liaison: _____

Consultant: _____ Project Manager: _____ CE Agreement: _____

DESIGN INFORMATION:			
Clear Roadway:		Total Width:	
Deck Length:		Net Deck Area:	
Design Loading:			
Girder Type, Size and No. of Lines:			
Culvert Size (span x rise x length) and shape:			
Abutment Type:		Pier Type:	
Bearing Types:			
Deck and Wearing Surface Type:			
Deck Joints:			
Curbs:		Bridge Rail:	
Approach Slabs:		Deck Drainage:	
Approach Surface:		Guardrail:	
Utility Accommodations:		Traffic:	
Disposal of Salvage:			
NOTES:			
DD Drawing No.'s:			
P Drawing Numbers:		Sign Date:	

APPROVALS/PERMITS:				
	REQUIRED	APPLICATION DATE	DATE ISSUED	NUMBER
Alberta Environment Protection (Water Act)				
Coast Guard Canada (NWPA)				
Fisheries and Oceans Canada				
Canadian Transportation Agency				

RIGHT OF WAY/EASEMENTS:	
--------------------------------	--

Draft Submission: _____ Review Meeting Date: _____ Final Submission: _____

	Cost Estimate	Type	Date
Current:	_____	_____	_____
Previous:	_____	_____	_____
Includes:	Engineering, Construction, Contingencies, R/W, Detour		

Milestone Schedule	Date
Tender ready for advertising:	_____
Tender advertise date:	_____
Completion construction:	_____

Consultant Project Manager's Signature _____	Dept. Administrator's Signature _____	Dept. Sponsor's Signature _____
----------------------------------------------	---------------------------------------	---------------------------------

Copies to: Consultant, TSB, Bridge File

File No.: _____
 Page No.: _____
 Date: _____

Engineer/Company: _____

DESIGN PROJECT BRIEF

PROPOSED TITLE BLOCK

Design Codes: : _____
 Other References: _____
 DD No. _____
 Choose Design Record: _____
 Latest Cost Estimate: _____

Project Scope & Short Description of Structure:

ITEM	REV	DESCRIPTION
General		Superstructure type, spans & o/o width: AADT/year: Roadway classification: Approach roadway design speed: Design speed at structure: Clear zone: Horizontal alignment (curve radius): Crown or super-elevation: Grade-line: Skew (LHF/RHF): Curbs, shoulder, lane, median, and sidewalk widths: Median type: Clear roadway:

File No.: _____
 Page No.: _____
 Date: _____

Engineer/Company: _____

ITEM	REV	DESCRIPTION
		Clearance box under structure: Future widening requirements: Approach guardrail type: Bridge-rail type: Identify any obstacles behind bridge-rails: Set-back requirement for obstacles: Approach guardrail transition type: Approach pavement type: Additional comments:
Design Parameters		Live Load: Highway class for fatigue design: Pier collision load: Wind load: Effective structure temperature range: Earth pressures: Ice loads: Earthquake: Test piles: Soil borehole data: Geotechnical features: General scour elevation: Design local scour:

Engineer/Company: _____

ITEM	REV	DESCRIPTION
		Additional comments:
Structural Materials		As per standard drawings: Concrete: Class B: 25 MPa Class C: 35 MPa Class HPC: 45 MPa Class D: 30 MPa Class S: 20 MPa Pipe Pile: 25 MPa Reinforcing steel grade and type: Pre-stressing steel: Post-tensioning steel: Structural steel: Other materials:
Abutments		Abutment Type: Piles/orientation: Casing for integral piles (Y/N, type): Abutment face height: Inspection access: Back wall: Wing walls/orientation: Wing wall and treatment: Curtain Wall: Roof Slab:

File No.: _____
 Page No.: _____
 Date: _____

Engineer/Company: _____

ITEM	REV	DESCRIPTION
		Grade beam: Approach Slab: Sleeper slab: Sidewalk slab: Median: Finishes and Sealing: Slope protection: Plumbing for finger joints: Drain troughs at wing wall ends: Sub-drainage system: Estimated settlement after construction: Additional comments:
Piers		Pier type: Shaft and nose shape: Pier protection: Foundation: Footing elevations: Footing shape: Bracing: Nose plates: Finishes: Additional comments:

Engineer/Company: _____

ITEM	REV	DESCRIPTION
Bearings		Expansion bearings: Fixed bearings: Orientation w.r.t. skew: Additional comments:
Girders		Method of analysis: Wheel line/girder (Tabulate for critical moment & sheer locations): Girder type: Number and spacing: Continuity: Transverse connectivity: Abutment diaphragm Pier diaphragms: Intermediate diaphragms: Girder finishing: Additional comments:
Deck		Deck thickness: Nominal girder haunch height: Waterproofing system: Wearing surface: Allowance for future removal by milling: Allowance for future w.s. after milling: Barrier type:

File No.: _____
 Page No.: _____
 Date: _____

Engineer/Company: _____

ITEM	REV	DESCRIPTION
		Curbs width and height: Roadway deck drains: Sidewalks width and height: Median/curb type: ACP weep drains: Utilities provisions:
Bridge End Deck or Pavement Joints		Location and joint types: Additional comments:
Retaining Walls		Location and wall type: Component features and specifications: Traffic or other safety barriers:
Construction Features:		Construction loads: Remarks on how the major project elements will be built (contract; crew; etc.) Other factors to consider: detours; channel/road work; staging; field vs. plant work; drainage; lighting; other agency involvements. Generally, only unusual situations or non-standard procedures need be listed.

File No.: _____
 Page No.: _____
 Date: _____

Engineer/Company: _____

ITEM	REV	DESCRIPTION	
Preliminary List of Drawings:		Drawing No.	Drawing Title

File No.: _____
Page No.: _____
Date: _____

Engineer/Company: _____

ITEM	REV	DESCRIPTION
Scheduling:		Provide realistic estimates of completion of design and drafting work considering current knowledge of drafting support level.
Unresolved Major Items:		List items for further review, investigation decision, missing data, etc.

CORPORATE DATA REQUIREMENTS FOR BRIDGE PROJECTS
PROJECT SUMMARY

Municipality:		
Bridge File:	Agreement #	Department Liaison
Project Description:		
Region:	Location:	
Consultant:		
Project start date:	Project completion date:	

STRUCTURAL AND HYDROTECHNICAL DELIVERABLES

PRELIMINARY ENGINEERING	date required**	date delivered	forwarded to Edmonton?
• Bridge Assessment Report			
• Cost Estimates (B1)			
• Environment Permit			
• Federal Fisheries Approval			
•			
• NWPA Approval			
• Preliminary Engineering Meeting Form			
• CTA Approval (Railways)			
• Geotechnical Report			
• Corrosion Survey Report			
• Complete Design Notes & Checkers Notes			
• DD Drawings: signed & stamped Mylar and CAD Files			
• Drawing Numbers	DD		

DETAILED DESIGN	date required	date delivered	forwarded to Edmonton?
• Preliminary Structures Report			
• Choose Design Form			
• Project Design Brief			
• Culvert or Bridge Authorization Form			
• Design Completion Form			
• Cost Estimate ("C")			
• Approved Shop/fabrication Drawings and CAD Files			
• Approved Stressing Calculations			
• Const. Drawings: signed and stamped Mylar and CAD Files			
• Design Notes and Checkers Notes			
• Drawing Number Range	P		

for additional information see clause of the "Engineering Consultant Guidelines for Highway, Bridge, and Water Projects"

****Project Sponsor to indicate N/A in box when "not applicable"**

cc: Director, Bridge Engineering Section, Technical Standards Branch

Note: All reports, forms, approvals and notes to be submitted in hard copy and electronic format (MS Word or PDF). Electronic files to be modified with bridge file number and date.

APPENDIX J2

QUALIFICATIONS FOR BRIDGE MATERIALS FABRICATION INSPECTION

**PRE-STRESSED PRE-CAST CONCRETE
GIRDER/UNITS**

**MISCELLANEOUS MATERIAL (INCLUDING
CULVERTS)**

MAJOR STEEL COMPONENTS

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BRIDGE MATERIALS FABRICATION INSPECTION

PRE-STRESSED PRECAST CONCRETE GIRDERS/UNITS

QUALIFICATIONS

- **Inspector**
ACI grade 1 certified concrete testing technician and must have extensive precast pre-stressed concrete fabrication experience. He shall be fully cognizant of all requirements of the Contract, Specifications, and Drawings.
- **Testing Lab**
Certified to CSA standards.

CULVERTS

Culverts include metal CSP (Corrugated Steel Pipe) and SPCSP (Structural Plate Corrugated Steel Pipe)

QUALIFICATION OF VISUAL INSPECTOR

- Level 1 certified and must have experience in fabrication inspection of CSP and SPCSP.

MISCELLANEOUS MATERIAL

Miscellaneous material includes deck joints, bearings, bridge-rail, strengthening/replacement members, miscellaneous iron, and culverts.

QUALIFICATIONS OF VISUAL INSPECTOR

- The visual inspector shall be a Level II certified welding inspector as per CSA 178.2 accredited with W47.1/W59 or must have bridge related fabrication inspection experience. He shall be fully cognizant of all requirements of the Contract, Specifications, and Drawings.

QUALIFICATIONS OF NDT INSPECTORS

- **Radiographic Inspection:** The lead technician shall be certified to Level II of C.G.S.B. and his assistant shall be a Qualified Operator (Q.O.).
- **Ultrasonic Inspection:** The technician shall be certified to Level II of C.G.S.B.
- **Magnetic Particle Inspection:** The technician shall be certified to Level II of C.G.S.B.

MAJOR STEEL COMPONENTS

Major steel components include steel girders, sign structures, and ferries.

QUALIFICATIONS OF VISUAL INSPECTOR/S

- The day shift visual inspector shall be a Level III certified welding inspector as per CSA 178.2 accredited with W47.1/W59 or must have an extensive bridge related fabrication inspection experience. He must also be experienced in operating telebrinell hardness testing apparatus. He shall be fully cognizant of all requirements of the Contract, Specifications, and Drawings.
- The second shift visual inspector shall be a Level II certified welding inspector as per CSA 178.2 accredited with W47.1/W59 or must have bridge related fabrication inspection experience. He shall be experienced in interpreting Engineering Drawings.

QUALIFICATIONS OF NDT INSPECTORS

- Radiographic Inspection: The lead technician shall be certified to Level II of C.G.S.B. and his assistant shall be a Qualified Operator (Q.O.).
- Magnetic Particle Inspection: The technician shall be certified to Level II of C.G.S.B.
- Ultrasonic Inspection: The technician shall be certified to Level II of C.G.S.B.

APPENDIX J3

**QUALIFICATIONS FOR
BRIDGE CONSTRUCTION INSPECTION
AND
BRIDGE PAINTING INSPECTION**

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BRIDGE CONSTRUCTION INSPECTION

GENERAL

- Bridge Construction Inspection shall include inspection for major bridge structures, bridge rehabilitation work, and bridge size culverts.

QUALIFICATIONS OF BRIDGE CONSTRUCTION INSPECTOR

- Preference for either a Civil Engineer (P. Eng.) or (E.I.T.) or Certified Civil Engineering Technologist (C.E.T.).
- Extensive field experience in supervision and inspection of bridge construction/bridge rehab work by contract.
- Trained and experienced in interpreting engineering drawings and applicable specifications.
- Effective written and oral communication skills.
- Previous field experience in construction surveying, concrete quality control, rebar installations and concrete placement and installation and assembly of culverts.
- Thorough knowledge of contract administration and contract law.
- Competent and knowledgeable of the Occupational Health and Safety Act and Regulations.

BRIDGE PAINTING INSPECTION

GENERAL

- Bridge Painting Inspection shall be inspection of bridge structures requiring the application of an approved coating system.

QUALIFICATIONS OF PAINT INSPECTOR

- The Paint Inspector shall have N.A.C.E. (National Association of Corrosion Engineers) Level III certification.

QUALIFICATIONS OF FIELD WELDING INSPECTOR

The visual inspector shall be a Level II certified welding inspector as per CSA 178.2 accredited with W47.1/W59 and must have experience in field welding.

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APPENDIX K

RECORDS MANAGEMENT BY CONSULTANTS ON PROJECTS

APPENDIX K

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RECORDS MANAGEMENT BY CONSULTANTS ON PROJECTS

To ensure that sufficiently detailed records are kept to comply with the requirements of the Freedom of Information and Protection of Privacy (FOIP) Act, and to serve the future needs of the Department, the following records must be prepared, submitted, and a copy retained by the Consultant. The records are listed in categories as follows:

- 1) Planning
- 2) Roadway Design
 - 2a) Preliminary Survey
 - 2b) Grading Design
 - 2c) Environment
 - 2d) Utilities
 - 2e) Lands and Aggregates
 - 2f) Geotechnical
 - 2g) Surfacing
 - 2h) Traffic
- 3) Bridges
 - 3a) Bridge Preliminary Engineering
 - 3b) Bridge Design

The bridge related information (listed as items 3a and 3b above) shall be submitted based on bridge file number to facilitate record retention under those file numbers. The rest of the information shall be submitted as one Project Records file with the information categorized according to the headings shown. The Project Records file will be stored in the Corporate Records Centre under the following identifiers: Highway Number, Control Section Number, and Kilometre "from and to" information (project limits). Supplemental information that will also be shown on the file identifier are dates, project description "from and to", and Contract Number. The Department will store the graphics information separately from the Project Records file e.g. mosaic-profile plans, bridge plans, etc. will be stored in the appropriate graphics files.

Electronic files for all text and graphics shall be included. **The Project Records file shall be submitted prior to final invoice submission for engineering services on a project.**

Consultants are required to prepare a complete duplicate copy of the Project Records file and retain the information for ten (10) years. After this time, the documents should be returned to the Department for destruction. The Department's practice is documented in Schedule number 2002/046 which is available from Records Management Section, Alberta Transportation, 4999 98 avenue, Edmonton.

Note: *An asterisk (*) beside a plan or record indicates that a Record Drawing is to be submitted following completion of construction. All Record Drawings shall be submitted in MicroStation format and on 3 mil Mylar, stamped, signed, and sealed, along with a CD containing the Record Drawing electronic drawings as part of the Final Details for a project. Final details shall be submitted prior to final invoice submission for engineering services on a project.*

1. PLANNING

- A written reproducible (unbound, camera ready, 8"x11" or on Mylar film) report (complete with plans) is required. All electronic data, for example survey data, digital files for photo image, digital file for interchange or intersection plans, etc. shall also be submitted for department use.
- Public participation documents (i.e. questionnaires) shall be bound separately to enable the Department to protect the privacy of the individual as per FOIP.

2. ROADWAY DESIGN

A CD containing all electronic files of the design categories below (from 2a to 2h), clearly labelled, shall be submitted to the Project Sponsor prior to final invoice submission for engineering services on a project.

2a) PRELIMINARY SURVEY

- An ASCII geographic coordinate file (xyz values such as latitude, longitude, elevation) for roads and bridges site surveys including raw and processed data of survey, geodetic datum and other survey specifics.
- Utilities Survey
 - Exact location and depth of installation of telephone cable (size and type) and pedestals, overhead telephone lines, power lines, television, telecommunication, pipeline company instrumentation, pipelines, telegraph, railway operating cables, etc. shall be noted in the survey field book.
- Railway Crossings
 - The complete details of survey and all plans prepared for railway crossings

2b) GRADING DESIGN

- Geometric, Safety, and Surfacing Assessment Reports (when prepared by the Roadway Design Consultant)
- Final Grading Design Package (as noted in [Section 8.1.1](#)) including Design Drawing mosaic profile plans, intersection plans, utility plans, overhaul diagram, and other special drawings
- A zipped file of computer aided Detailed Design of the entire project including road allowances, roadside turnouts, accesses, and service roads

NOTE: The database should be ready for loading in the program software to print design information as well as to view the Design Cross Sections, Earthwork Quantities, and Overhaul Diagrams

- Design Element Files
 - horizontal and vertical alignments
 - typical cross-sections
 - super-elevation

-
- climbing/passing lanes
 - soil survey information (i.e. borings file)
 - area/surface parameters
 - borrow files
 - volume files
- Record Drawing mosaic profile plans
 - Record Drawing plans for intersection geometric layout, passing lanes, climbing lanes, interchange, roadside turnouts, etc.

2c) ENVIRONMENT

- Approvals issued by Alberta Environmental Protection need to be retained until a reclamation certificate is obtained for borrow pits and gravel pits
- Permits and licenses issued by Environmental Protection may need periodic re-authorization
- Letters of clearance issued by Alberta Community Development for archaeological sites, etc.
- Terms and conditions from referrals

2d) UTILITIES

- Utility crossing plans and associated crossing agreements (plan to be retained with Finals)
- Utility alteration estimates, where applicable
- Correspondence with utilities companies

2e) LAND AND AGGREGATES

- Aggregate data summary requests
- Spec. shell (supply and payment for aggregate - contractor's supply with option)
- Pit operations
- Pit plan
- Aggregates testing plan
- Area map showing project and aggregate site
- Mosaic of right-of-way request

2f) GEOTECHNICAL

- Geotechnical engineering report (complete with investigation report, borehole logs, plans, drawings, recommendations)
- Computer diskettes containing instrumentation monitoring readings and files of plots
- Computer printout of instrumentation monitoring plots

2g) SURFACING DESIGN

- Detailed Design (Final) Surfacing strategy and basic structural design report
- Contract document
- Bid items description
- Quantity, cost estimates, and summaries
- Record Drawing Cross sections and plans
- Design notes and correspondence
- Summary of Pavement Testing Program Materials (where required)

2h) TRAFFIC

- Traffic and Pedestrian Control Signals
 - Traffic data (if these are provided by the consultant)
 - Signal design (phasing, timing, etc.)
 - Intersection layout (signal design)
 - Signal equipment (electrical prints, operation manuals, brochures, etc.)
- Railway Crossing Signals
 - Crossing plan
 - Application documents with Transport Canada, etc.
 - Board Orders and cost sharing agreements
- Traffic Studies
 - Proposals
 - Study Report
- Signing, Pavement Markings, and Guardrail Design
 - Project plans where necessary
- Illumination
 - Lighting design (plans, etc.)
 - Agreements with power company (operation and maintenance responsibility)

3. BRIDGES

3a) BRIDGE PRELIMINARY ENGINEERING

- Bridge assessment report
- Plans and cost estimate for alternatives considered
- Navigable Water Protection Act (NWPA) drawings and permit applications/approvals
- Railway grade separation design plan including Canada Transportation Act (CTA) submission
- Drawings
- Environmental Impact Assessment and all documentation required for CTA approval
- Environmental permit documents

- Estimated life expectancy of culvert and corrosion survey results
- Design notes
- Stamped, signed and sealed original Design Data (DD) drawings (hard copy & electronic data)
- CTA order, and approval drawing(s)

3b) BRIDGE DESIGN

- Original drawing (with stamps and signatures)(hard copy & electronic data)
- Design notes
- Shop drawings
- Project summary report
- Copy project related photographs

Note: An electronic form (MS Word or PDF) of all records, notes, etc. need to be submitted with two hard copies.

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