

RISP

MINISTRY OF TRANSPORTATION AND INFRASTRUCTURE
(BCMOT)

CATEGORY GLOSSARY

Professional and Technical

Changed
→

**New Professional Planning category on
ADVANCED BUSINESS CASE DEVELOPMENT**

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Important Notices **About Category Types**

PROFESSIONAL vs TECHNICAL CATEGORIES:

Only members of the Association of Professional Engineers and Geoscientists of British Columbia (APEGBC) can apply for Professional Categories (these are categories that have an even number after the dash, such as 01-32 and marked with P in column 2 on the Glossary). The only exceptions are the design categories that start with 05 before the dash (such as 05-66). For the design categories, experienced design technicians and design EITs may enter their design experiences for the appropriate design categories (Technical or Professional) in part 2 of the application. These experiences may be approved if they meet the adjudication criteria. The technical employee and EIT will not be approved for these Professional categories but their approved Professional category experiences will count in approving the office's requested maximum preferred contract amount.

GEOGRAPHICAL CATEGORY TYPES:

The rule described here is applied only for consulting work estimated at or below \$75,000. RISP categories are classed as Provincial, Regional or Local. Local categories (marked with L in column 1) and Regional categories (marked with R in column 1) cover services which by their nature require either a rapid response, familiarity with local conditions, or other reasons for having these consulting services to be available close to the site or the Ministry's office where the contract is managed. A Local search starts with one of the 28 Ministry of Transportation and Infrastructure (BCMOT) Maintenance Service Contract Areas, expanding if necessary to the surrounding Contract Areas if no matches are found. A Regional search starts with one of the five RISP regions, expanding if necessary to the surrounding Contract Areas if no matches are found within the first region. Provincial categories (marked with Pr in column 1) cover services which can be provided by any qualified RISP registered firm in or out of the Province, hence the search criteria are Province wide then out-of-Province. For more information, refer to the document on the "RISP Business Rules" and the RISP Local and Region Areas map. For more information, refer to the document on the "RISP Business Rules" and the map of RISP Geographic Areas in Appendices 3.6 and 3.7 of the RISP User Manual

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Notes:


- In column 1: *L* indicates a local category – *R* indicates a regional category – *Pr* indicates a provincial category.
- In column two: **P** indicates Professional categories which have even second numbers in column 3 – **T** indicates Technical categories which have odd second numbers in column 3.
- New Ministry name: Ministry of Transportation and Infrastructure or BCMOT in short.

01-series			BRIDGE & STRUCTURAL CONSULTING & INSPECTION
			Bridge Design: Additional to the development of conceptual and design, the scope of work generally includes the production of detailed engineering drawings, contract specifications and cost estimates.
<i>Pr</i>	P	01-10	Provide conceptual/detailed design for complex long span structures (suspension, cable-stayed, hinged arch). Must have P.Eng. membership in APEGBC.
<i>Pr</i>	P	01-12	Provide conceptual and detailed design for intermediate to long span structures. Must have P.Eng. membership in APEGBC.
<i>L</i>	P	01-14	Provide conceptual and detailed design for short-span structures Must have P.Eng. membership in APEGBC..
<i>L</i>	P	01-16	Provide conceptual and detailed design for culverts, retaining walls and miscellaneous structures. Must have P.Eng. membership in APEGBC.
<i>Pr</i>	T	01-17	Structural Drafting Services: The scope of the work would include the development of bridge contract drawings from engineering sketches with dimensions, details and quantities.
			Seismic Retrofit Engineering: The scope of work generally includes the seismic assessment and strategy, development of conceptual and detailed designs, engineering drawings, and contract specifications and cost estimates.
<i>Pr</i>	P	01-18	For long-span structures (suspension, cable stayed and hinged arch structures, etc.). Must have P.Eng. membership in APEGBC.
<i>Pr</i>	P	01-20	For intermediate to long span structures. Must have P.Eng. membership in APEGBC.
<i>Pr</i>	P	01-22	For short-span structures. Must have P.Eng. membership in APEGBC.
<i>Pr</i>	P	01-26	Bridge Deck Rehabilitation: Includes condition surveys for the structure, the preparation of tender documents for bridge deck overlay, cathodic protection, or full deck replacement. The scope will also include the design for removal and replacement of deck joints and deck railings where required. Must have P.Eng. membership in APEGBC.
<i>Pr</i>	T	01-27	Deck Condition Inspection: The work includes inspection of the deck surface utilizing methods such as visual inspection, chain drag, half-cell survey, concrete coring with chloride and petrography analysis. Provide an inspection report that can be utilized in developing designs and tender documents for bridge deck re-surfacing.
<i>Pr</i>	T	01-29	Wood Truss Structure Inspection: The work is limited to inspection of the truss members using visual inspection and wood boring and probing techniques to record section loss.
<i>Pr</i>	T	01-31	Steel Structure Coating Inspections: The work consists of inspection of all types of coatings using visual, non-destructive and destructive techniques to evaluate both new and old coating systems. Minimum qualifications are NACE Level 1.
			Bridge Rehabilitation Design: Perform condition inspections on structures, develop detailed designs and prepare tender documents for repair or replacement of components.
<i>Pr</i>	P	01-32	For long-span structures (suspension, cable stayed and hinged arch structures, etc.) Must have P.Eng. membership in APEGBC..
<i>Pr</i>	P	01-34	For intermediate to long span structures. Must have P.Eng. membership in APEGBC.
<i>L</i>	P	01-36	For short-span structures. Must have P.Eng. membership in APEGBC.
<i>Pr</i>	T	01-39	Underwater Bridge Inspection: Projects consist of inspecting underwater components of all types of substructure elements, utilizing visual and non-destructive testing. Minimum qualifications are certification as a bridge inspector or a Professional Engineer with bridge experience. Inspectors must also be certified divers.
<i>Pr</i>	P	01-40	Forensic Analysis: Review structures subject to either damage or failure due to vehicular impact, prepare recommendations on the cause for insurance claims purposes, and provide expert testimony as required. Must have P.Eng. membership in APEGBC.
<i>Pr</i>	P	01-42	Structural Instrumentation – Analysis and Design: The scope of work would include ambient vibration tests on the structure and provision of a Finite Element Model of the structure, development of seismic mode shapes, a condition assessment that identifies critical changes in the structure and potential compromises to the structural integrity, determination of the appropriate sensors and data delivery mechanisms to integrate with the Ministry’s Smart

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			Infrastructure Monitoring System. Must have P.Eng. membership in APEGBC.
<i>Pr</i>		01-43	Structural Instrumentation – Testing and Calibration: The work includes ensuring the synchronized working of the seismic or structural health monitoring system under simulated conditions and the integration of the system with the Ministry’s Smart Infrastructure Monitoring System.
<i>Pr</i>	P	01-50	Marine Structures Design and Rehabilitation: to provide conceptual and detailed design complete with drawings, specifications and cost estimates for tender for dock (for marine vessels) and marine structures, including debris and impact protection systems. Must have P.Eng. membership in APEGBC.
<i>L</i>	T	01-61	Project Supervision (Bridge / Structural)...small to medium projects fee value \leq \$300,000 and capital cost \leq \$3 M.
<i>L</i>	T	01-63	Project Supervision (Bridge / Structural)...medium to large projects fee value $>$ \$300,000 and capital cost $>$ \$3 M.
<i>L</i>	T	01-65	Project Supervision (Concrete Bridge Deck Re-Surfacing).

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05-series			HIGHWAY DESIGN & SURVEY ENGINEERING
<div style="border: 2px solid red; padding: 5px; display: inline-block;"> READ  </div>			<p><i>Note: Most of these categories are listed in the Professional Category Glossary (starting with 05-XX with XX being an even number.) Only RISP Offices with qualified Professional Engineers registered in British Columbia can be approved for these categories. Technician, EITs and Engineers not registered in BC may list these categories to indicate their work experience in design and survey work in Part 2 of their application. However; RISP Offices can only apply for the highway design and survey engineering categories in Part 3 when there is at least one experienced Design Engineer that is listed their RISP application.</i></p>
<i>L</i>	<i>T</i>	05-13	<p>Design Survey: Provide all cadastral, planimetric detail, ground surface, topographical features and underground utility ties using electronic gather equipment for processing with CAiCE software program. Produce all ground surface models and base plans (in AutoCad), including site plans for water, railway or utility crossings. Provide field staking of proposed alignments, R/W, cut/fill toes, setting hubs and benchmarks in the field, etc. Survey to meet the latest version of the Ministry's General Survey Requirements Manual.</p>
<i>Pr</i>	<i>T</i>	05-15	<p>Topographic Mapping from <u>Aerial LiDAR Scanning Sources</u>: Provide digital and hard copy 10 to 15 cm resolution colour orthophotography with horizontal positional accuracy of 30 cm RMSE at the 95% confidence level. Provide digital point cloud data, in LAS format, compiled to meet 15 cm relative vertical accuracy at the 95% confidence level on hard open surfaces. Provide filtered LiDAR data to meet point density, spacing and feature code identification for points and chains; data to be delivered in BCMOT Survey File Format for import into CAiCE Visual Transportation software (refer to Sections 900, 1000 and 1200 of the General Survey Guide) http://www.th.gov.bc.ca/publications/eng_publications/survey/General_Survey_Guide.pdf Provide data in the projection and datum required to meet project deliverable. Dependent on the terms of the assignment, provide ground control and quality control audits using GPS (Refer to section 300 of the General Survey Guide).</p>
<i>Pr</i>	<i>T</i>	05-17	<p>Topographic Mapping from <u>Aerial Data Collection Sources</u>: Provide hard copies and/or digital topographic mapping for highway design and engineering through the use of approved / recognized aerial methods of data capture such as photogrammetry. Provide hard copies and/or digital un-rectified and rectified photo mosaics. Provide or coordinate, if necessary, the acquisition of ground control, aerial data, air photos, etc. for producing controlled digital topographic mapping. Digital Data including point density, spacing and feature code identification for points and chains shall be delivered in BCMOT Survey File Format for import into CAiCE Visual Transportation software (refer to Section 900, 1000 and 1200 of the General Survey Guide at the following Internet address: http://www.th.gov.bc.ca/publications/eng_publications/survey/General_Survey_Guide.pdf). Provide data in the projection and datum required to meet project deliverables.</p>
<i>L</i>	<i>T</i>	05-19	<p>Highway Design Drafting Services: The scope of work generally includes the drafting of detail roadway design drawings in accordance with Ministry standard layout.</p>
			<p>Highway Design – Less Complex Preliminary, functional, and/or detailed design assignments for less complex highway engineering projects. Projects are typically in rural flat or rolling terrain with minimal stakeholder, geotechnical, environmental, R/W, or access mgmt risks.</p>
<i>L</i>	<i>P</i>	05-66	Small assignments under \$100,000
<i>R</i>	<i>P</i>	05-68	Medium assignments between \$100,000 and \$300,000.
<i>Pr</i>	<i>P</i>	05-70	Large assignments greater than \$300,000.
			<p>Highway Design – Complex Preliminary, functional, and/or detailed design assignments for complex highway engineering projects. Projects typically have significant stakeholder, geotechnical, environmental, R/W, or access mgmt risks. Typical projects include work in: mountainous terrain; urban areas; major intersection improvements; interchange designs.</p>
<i>L</i>	<i>P</i>	05-72	Small assignments under \$100,000.
<i>R</i>	<i>P</i>	05-74	Medium assignments between \$100,000 and \$300,000.
<i>Pr</i>	<i>P</i>	05-76	Large assignments greater than \$300,000.
<i>Pr</i>	<i>P</i>	05-90	<p>Water Supply and Drainage Systems: analysis of existing water supply systems, design of new water supply and distribution systems. For the design of highway drainage systems, use either this category or any of the categories 05-72, 05-74 and 05-76.</p>

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06-series			FIELD SERVICES		
			<p>Usual procedure for Multiple Category RISP Selections in the following category series:</p> <p>RISP selections using multiple 06-xx categories (such as 60% 06-45 and 40% 06-73, for a single project with both large grading and paving components) should not normally be done. Typically the RISP selection should be based on the 06-xx category that represents the largest portion of the work. This will allow firms to sub-contract services that they cannot provide internally. For exceptions to this procedure, contact the Lead Adjudicator.</p> <p>The primary exceptions to this multiple selection guideline will be:</p> <ul style="list-style-type: none"> • The Senior Project Supervisor and Construction Management categories (06-8x and 06-9x), where these categories give individuals of greater experience to oversee others from the normal 06-xx project supervision categories, and • for Day Labour Supervision with significant construction survey, when 06-6x may be used in conjunction with 06-11. <p>Where multiple categories are used with a single RISP selection, the aggregate fee cap is still \$1 million.</p>		
<i>L</i>	<i>T</i>	06-11	<p>Construction Survey – Provide construction surveys including: QA and quantity surveys; pick up of existing and As-built ground and details; material horizons; slope, off-set and shoulder stakes; setting/checking location of culverts, retaining walls, fencing, spot elevations, etc.; providing electronic survey data compatible with CAiCE software in accordance with Ministry standards. <\$1.0 M fees.</p>		
			<p>Project Supervision Categories (Non-structural): 06-4x, 06-5x, 06-6x and 06-7x</p> <p>These categories are to provide project supervision services for highway grading and/or paving projects, including quality management, record documentation, survey and volume determination, cost control and reporting, and inspection services for compliance with drawings, standards and specifications. It will involve administration of the construction contract, liaison with other individuals and agencies, and will require provision of all equipment, vehicles and tools necessary to complete the work.</p> <p>On projects requiring a structural Project Supervisor, categories 01-61 or 01-63 are to be used.</p> <p>06-4x: Project Supervision – Roadway: This category is to provide project supervision services for roadway grading projects, including CAiCE volume determination. The work will include paving and small structural elements (such as retaining walls and multiplate culverts) to a lesser extent.</p> <p>For supervision of projects with a high degree of complexity or risk, add a Senior Project Supervisor or Construction Manager by selecting 06-4x plus 06-8x or 06-9x. For projects valued at over \$10 million, select category 06-45 plus 06-84 or 06-93.</p> <p>06-5x: Project Supervision – Seal Coat/Micro-surfacing: This category is to provide project supervision services for seal coat, chip sealing, graded aggregates seal, and micro-surfacing projects. The work will include grading elements to a lesser extent.</p>		
<i>L</i>	<i>T</i>	06-41	Project Supervision (Roadwork)...Small	<\$0.5 M CAP. COST	<\$0.1 M FEES
<i>R</i>	<i>T</i>	06-43	Project Supervision (Roadwork)...Medium	<\$3 M Cap. cost	<\$0.5 M fees
<i>Pr</i>	<i>T</i>	06-45	Project Supervision (Roadwork)...Large	≥\$3 M Cap. cost	<\$1 M fees
<i>L</i>	<i>T</i>	06-51	Project Supervision (Sealcoating)	< \$0.2 M cap. Cost	<\$0.1 M fees
<i>Pr</i>	<i>T</i>	06-53	Project Supervision (Sealcoating)	≥ \$0.2 M cap. Cost	<\$1M fees
			<p>...typically a team providing services, including supervisor, lab people and inspectors</p>		
			<p>06-6x: Project Supervision – Day Labour: This category is for staff to provide project supervision and equipment selection, direction and monitoring on Day Labour construction. Must demonstrate the ability to plan and analyze work; select appropriate equipment; balance fleets; set and achieve challenging productivity targets; administer hired equipment; prepare and administer labour, equipment and materials supply contracts; maintain a safe and environmentally compliant site.</p> <p>Where survey and layout of the work is a substantial component of the work, category 06-11</p>		

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			may also be selected.
		06-61 (local):	Generally a single person required. Equipment fleet would typically be 1-2 excavators, a loader, compactor, grader, and 6-10 trucks; Staff of 6-10, including labourers, flaggers and first aid.
		06-63 (regional):	Generally a small team will be required – a project supervisor, with one or two assistants for inspection, surveying and QC, overseeing a larger fleet operating on multiple fronts.
		06-65 (provincial):	A team of a project supervisor, assistants, surveyors, QC and administrative personnel are required, with foremen potentially required. Extensive fleet, much of it provided under supply contracts which would include foremen, including all types of construction equipment (excavators, scrapers, dozers, compactors, graders, on- and off-road trucks, cranes, etc.)
<i>L</i>	T	06-61	Day Labour Supervision ...Small - <\$0.5 M Capital cost - <\$0.1 M fees...typically one person providing service
<i>R</i>	T	06-63	Day Labour Supervision ...Medium - <\$2 M Capital cost - <\$0.5 M fees...typically a team providing services
<i>Pr</i>	T	06-65	Day Labour Supervision ...Large - <\$5 M Capital cost - <\$1 M fees...typically a team providing services
			06-7x: Project Supervision – Surfacing: This category is to provide project supervision services for asphalt concrete paving projects (includes conventional, EPS, HIP, etc.). The work will include grading and structural elements to a lesser extent.
<i>L</i>	T	06-71	Project Supervision (Surfacing)...Small <\$0.5 M Cap. cost <\$0.1 M fees ...typically one person providing service
<i>Pr</i>	T	06-73	Project Supervision (Surfacing)...Medium ≥\$0.5 M Cap. cost <\$1 M fees ...typically a team providing services, including supervisor, lab people, profilers and inspectors
			Construction Management (P.Eng.)
			This category series is for a single professional Construction Manager to simultaneously oversee the work of multiple Project Supervisors (Professional or Technical; normally employed by other firms) on multi-discipline (grading, surfacing and/or structural) projects. Where professional quality management or certification is required on a single project or the project value exceeds \$7 - 10 million, the category may also be used to retain a Construction Manager plus a Project Supervision team from the same firm, in which case the RISP selection shall be for both this category and 06-4x or other suitable supervision category. Duties include record documentation, cost control and reporting, management of the construction project schedule and budget, administration of the construction contract, second-stage dispute resolution with the Contractor, arranging / facilitating and documentation of construction project team meetings, liaison with other Ministries, individuals and outside agencies, and provision of all equipment, vehicles and tools necessary to complete the work. Must have P.Eng. membership in APEGBC.
<i>R</i>	P	06-80	Construction Management Services <u>by a P.Eng.</u> <\$3 M Capital cost <\$0.1 M fees
<i>Pr</i>	P	06-82	Construction Management Services <u>by a P.Eng.</u> <\$10 M Capital cost <\$0.5 M fees
<i>Pr</i>	P	06-84	Construction Management Services <u>by a P.Eng.</u> ≥\$10 M Capital cost <\$1 M fees
			Construction/project Supervision
			Senior Project Supervisor - This category is for a single, non-professional, highly experienced Project Supervisor to oversee the work on one high-value or complex project, or simultaneously oversee multiple Project Supervisors (Professional or Technical; normally employed by other firms) on multidisciplinary (grading, surfacing, and/or structural) projects. [On structural projects requiring a Senior Project Supervisor, category 01-63 is to be used.] Duties include managing the project supervision services, ensuring consistency; providing construction quality assurance on the project supervision services; managing the inter-relationship of multiple individual construction project schedules and budgets; liaising with

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			<p>other consultants, other Ministries, individuals and outside agencies; arranging, facilitating and documenting construction project team meetings; ensuring BCMOT is fully informed on all project issues, including regular status reporting.</p> <p>Where the work is on a single project of higher complexity or with value in excess of \$7 – 10 million, this category may be used in conjunction with 06-45 to obtain a project supervision support team as well as the Senior Project Supervisor.</p>
R	T	06-91	Senior Project Supervisor’s Services ...Less complex project <\$100K in fees
Pr	T	06-93	Senior Project Supervisor’s Services ...Project of medium complexity \$ 100K to <\$500K in fees
Pr	T	06-95	Senior Project Supervisor’s Services ...Complex project \$ 500K to <\$1 M in fees
10-series			GEOTECHNICAL / GEOLOGICAL/SOIL TESTING
L	T	10-07	Soil Mechanics - Field Investigations: To supervise subsurface sampling operations involving soils and rock. This may also include arranging equipment access, preparation of logs and other records, installation of instrumentation, establishing exact site locations and elevations. For contracts less than \$100,000.
R	T	10-09	Same as 10-07. For contracts between \$100,000 and \$300,000.
Pr	P	10-10	Soil Mechanics / Investigation and Design: Assignments may include field investigation, laboratory testing, design, reporting, recommending and construction monitoring or supervision of earthwork projects. Must be Qualified Professional member of APEGBC.
Pr	T	10-11	Same as 10-07. For contracts greater than \$300,000.
L	T	10-13	Soil Mechanics - Laboratory Testing: To conduct sophisticated soil testing to establish standards and reporting criteria. Testing and procedures may include Shelby tube extraction and sample logging, unconfined compression, consolidation shear box, tri-axial testing, etc. For contracts less than \$100,000.
R	T	10-15	Same as 10-13. For contracts between \$100,000 and \$300,000.
Pr	T	10-17	Same as 10-13. For contracts greater than \$300,000.
Pr	T	10-19	Project Supervision, Rock Slope Stabilization: To provide project supervision services, including quality management, record documentation, cost control and reporting, inspection services for compliance with drawings, standard specifications, traffic management plans and compliance with WCB regulations. It will involve administration of the construction contract, liaison with BCMOT staff and or its delegates, liaison with utilities and agencies and project stakeholders. Project supervision will also include services for Day Labour slope stabilization construction including quality management, record documentation, inspection, work direction involving labourers and Hired Equipment and traffic management, and compliance with WCB regulation. Project Supervision will include the provision of all equipment, vehicles and tools, necessary to perform the above tasks.
R	P	10-20	Terrain and Natural Hazard Evaluation: Assignments may include interpretation of air photos or other “remote” resources; field investigation to classify soils and rock for route selection; assessment of debris flow and other natural hazards; risk assessment and recommendations for mitigation; aggregate potential assessments; etc. - and designs of mitigation for hazard control or prevention. Must be Qualified Professional member of APEGBC.
Pr	P	10-30	Rock Slope Design and Stabilization: Rock slope design / stabilization assessments for new rock cut construction and remedial stabilization of existing rock slopes; preparation of blast plans in support of new construction or remedial stabilization of rock slopes. The work may involve structural and geologic mapping; statistical analysis of structural data; assessment of local rock conditions, rockfall behaviour including accessing steep and difficult terrain possibly including the use of ropes to characterize site conditions and identify potential rockfall hazards; other field investigation necessary to properly characterize rock conditions and develop mitigation measures specifically for rockfall control along transportation corridors; any laboratory test/analysis to determine rock properties, global and local stability analysis, rockfall modeling, ditch configuration design preparing blast plans to minimize back-break and fly-rock, control vibration, and optimize fragmentation; assessment of ground vibration and air noise; and preparation of design reports describing work performed and recommendations developed. Must be Qualified Professional member of APEGBC.
Pr	P	10-32	Rock fall Hazard Assessment and Slope Hazard Rating: To perform rockfall hazard ratings along highway corridors through the application of specific procedures combined with solid engineering experience in a manner that will produce consistent and repeatable results. Work involves assessment and scoring of site factors related to slope rockfall hazard potential, geometric data, other data describing site conditions, conceptual remedial stabilization costs and entry of data in a database. Must be Qualified

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			Professional member of APEGBC.
<i>Pr</i>	P	10-40	Pavement Evaluation and Design: Assignments may include field investigation, laboratory testing, design, reporting, recommending and construction monitoring or supervision of projects relating to pavement structure including base courses and surface. Must be Qualified Professional member of APEGBC.
<i>Pr</i>	P	10-50	Groundwater Studies: Assignments may include field investigation; laboratory testing, design, reporting, recommending and monitoring of groundwater related projects. Must be Qualified Professional member of APEGBC.
<i>R</i>	T	10-41	Pavement Evaluation, Testing and Data Collection: Conducting routine field testing and data collection using established standards and testing frequencies.
<i>L</i>	T	10-55	Geotechnical Drafting Services: Scope of work generally includes preparation of drawings for bridge foundations, construction details, surveys/mapping and related data in accordance with Ministry standards.
<i>L</i>	T	10-61	Aggregate Prospecting and Supply Evaluation: Scope of work generally includes field investigations, sample collection, evaluation of laboratory test results and preparation of gravel pit reports. For contracts less than \$100,000.
<i>R</i>	T	10-63	Same as 10-61. For contracts between \$100,000 and \$300,000.
<i>Pr</i>	T	10-65	Same as 10-61. For contracts greater than \$300,000.
<i>Pr</i>	P	10-70	Earthquake Engineering Studies. Must be Qualified Professional member of APEGBC.
<i>Pr</i>	P	10-80	Geophysical Investigations: Includes seismic refraction and reflection; electrical and electromagnetic; ground penetrating radar or other geophysical field investigations; interpretation of results, recommendations. Must be Qualified Professional member of APEGBC.
<i>Pr</i>	P	10-90	Contamination and Remediation Provide soil, water and air contaminant investigation and evaluate, recommend and design solutions to achieve compliance with current Waste Management Act, MWLAP standards. Develop environmental solutions that will reduce concentrations of pollutants in highway runoff or leachate from fills before entering receiving waters. May include field investigation, laboratory testing, design, preparation of contract documents and monitoring. Must be Qualified Professional member of APEGBC.
<i>Pr</i>	T	10-91	Rock slope Survey and Modeling: Provide detailed survey of rock slopes, including topographic detail, identification of major geological structural features in UTM coordinates, pickup of geologic boundaries, utility pole, fences posts, property boundaries; produce a DTM model and conduct 3-D modeling of rock slopes, structural features (including overhangs) to determine area/volume estimates, overlay mesh area estimates, locational positioning of other remedial measures and extrapolation of geologic features; preparation of front view plans, 3-D views, cross sections generally conforming to Ministry AutoCAD standards. Provide surveys for slope movement monitoring, establish back sights, establish new or rehabilitate existing optical prism targets, plot target positioning information on DTM model, develop time based cumulative vector displacement plots.
15-series			MATERIALS TESTING & ENGINEERING
<i>L</i>	P	15-10	Soils: Assignments may include laboratory and field testing using standard specification test methods, interpretation of results and recommendations on appropriate action. For contracts less than \$100,000. Must be Qualified Professional member of APEGBC.
<i>L</i>	T	15-11	Soils and Aggregates: Assignments may include laboratory and field testing using standard specification test methods, in-situ compaction measurement using nuclear methods. This also includes interpretation of results, recommendations on appropriate actions and preparation of pit development plans. For contracts less than \$100,000.
<i>R</i>	P	15-12	Same as 15-10. For contracts between \$100,000 and \$300,000. Must be Qualified Professional member of APEGBC.
<i>R</i>	T	15-13	Same as 15-11. For contracts between \$100,000 and \$300,000.
<i>Pr</i>	P	15-14	Same as 15-10. For contracts greater than \$300,000. Must be Qualified Professional member of APEGBC.
<i>Pr</i>	T	15-15	Same as 15-11. For contracts greater than \$300,000.
<i>L</i>	T	15-17	Sieve Analysis and Crusher Control: To provide quality control and/or assurance on projects such as crushing operations where strict control of gradation is required. Testing shall conform to established standards. For contracts less than \$100,000.
<i>R</i>	T	15-19	Same as 15-17. For contracts between \$100,000 and \$300,000.

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<i>L</i>	<i>P</i>	15-20	Asphaltic Concrete Mix Design, Testing and Evaluation: Assignments may include design of asphalt concrete mixes; laboratory and field test using standard specification test methods; interpretation of results, recommendations. For contracts less than \$100,000. Must be Qualified Professional member of APEGBC.
<i>Pr</i>	<i>T</i>	15-21	Same as 15-17. For contracts greater than \$300,000.
<i>R</i>	<i>P</i>	15-22	Same as 15-20. For contracts between \$100,000 and \$300,000 Must be Qualified Professional member of APEGBC..
<i>Pr</i>	<i>P</i>	15-24	Same as 15-20. For contracts greater than \$300,000. Must be Qualified Professional member of APEGBC.
<i>L</i>	<i>T</i>	15-27	Asphalt Concrete Field-Testing: Conducting routine field tests according to established standards and testing frequencies. For contracts less than \$100,000.
<i>R</i>	<i>T</i>	15-29	Same as 15-27. For contracts between \$100,000 and \$300,000.
<i>L</i>	<i>P</i>	15-30	Portland Cement Mix Design, Concrete Testing and Evaluation: Assignments may include concrete mix design, laboratory and field test using standard specification test methods, interpretation of results, recommendations. For contracts less than \$100,000. Must be Qualified Professional member of APEGBC.
<i>Pr</i>	<i>T</i>	15-31	Same as 15-27. For contracts greater than \$300,000.
<i>R</i>	<i>P</i>	15-32	Same as 15-30. For contracts between \$100,000 and \$300,000. Must be Qualified Professional member of APEGBC.
<i>Pr</i>	<i>P</i>	15-34	Same as 15-30. For contracts greater than \$300,000. Must be Qualified Professional member of APEGBC.
<i>L</i>	<i>T</i>	15-37	Portland Cement Concrete Field Testing: To provide on-site quality control services on plastic Portland Cement concrete such as slump measurement, temperature monitoring, air content and the sampling and preparation of laboratory test samples. For contracts less than \$100,000.
<i>R</i>	<i>T</i>	15-39	Same as 15-37. For contracts between \$100,000 and \$300,000.
<i>Pr</i>	<i>T</i>	15-41	Same as 15-37. For contracts greater than \$300,000.
<i>L</i>	<i>T</i>	15-45	Chemical Testing - Specification Compliance: Scope is limited to the provision of non-interpretative chemical test data required for specification compliance. For contracts less than \$100,000.
<i>R</i>	<i>T</i>	15-47	Same as 15-45. For contracts between \$100,000 and \$300,000
<i>Pr</i>	<i>T</i>	15-49	Same as 15-45. For contracts greater than \$300,000.
<i>L</i>	<i>P</i>	15-50	Other Materials: Laboratory and field tests on materials other than specified above using standard specification and modified test methods, interpretation of results, and recommendations on appropriate action. For contracts less than \$100,000. Must be Qualified Professional member of APEGBC.
<i>R</i>	<i>P</i>	15-52	Same as 15-50. For contracts between \$100,000 and \$300,000. Must be Qualified Professional member of APEGBC.
<i>Pr</i>	<i>P</i>	15-54	Same as 15-50. For contracts greater than \$300,000. Must be Qualified Professional member of APEGBC.
<i>L</i>	<i>T</i>	15-55	General Materials Testing - Specification Compliance: Scope is limited to the provision of non-interpretative physical test data required for specification compliance. For contracts less than \$100,000.
<i>R</i>	<i>T</i>	15-57	Same as 15-55. For contracts between \$100,000 and \$300,000.
<i>Pr</i>	<i>T</i>	15-59	Same as 15-55. For contracts greater than \$300,000.
<i>Pr</i>	<i>T</i>	15-65	Paint and Coating Systems Evaluation: Assignments may include field and laboratory testing and assessment of paint and coating systems including bridge coatings and centerline paints; recommendations for inclusion of paints and coating systems in the Ministry's Recognized Products List; project specific recommendations for coating systems for application to bridge structures; quality audit of contracts for application of coatings; advice and recommendations on long-term and project specific strategies for maintaining and rehabilitation bridge coatings.
<i>Pr</i>	<i>T</i>	15-71	Non-Destructive Weld Testing.

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20-series			TRANSPORTATION & HIGHWAY PLANNING
<i>Pr</i>	P	20-10	Transportation Study: Work done in this category may be quite diverse, and can pertain to any aspects of transportation planning not captured in other specific planning categories. Applications may be rural or urban and may include multi-modal considerations. Must have P.Eng. membership in APEGBC.
<i>Pr</i>	P	20-16	Project and Corridor Planning: A sequence of activities involving problem identification and definition including constraints, development of alternatives and recommendation of highway improvement actions using appropriate justification. This is performed in advance of design, but may require cooperation in a multi-discipline team including designers, various specialists, and external stakeholders. Outputs include project business cases and corridor management plans Must have P.Eng. membership in APEGBC..
<i>Pr</i>	P	20-18	Advanced Business Case Development: Although preparation of project business cases is also an expected output of category 20-16, category 20-18 requires a high degree of demonstrated expertise in: 1) performance analysis to identify performance problems and justify further analysis, 2) problem definition to show that the causes of the problem are well understood, 3) development of a number of relevant options (including phasing options where appropriate) based on good problem definition work, 4) option evaluation: B/C analysis and MAE presentation, and 5) risk analysis to identify the key sources of uncertain and assess their impact on the evaluation results. Must have P.Eng. membership in APEGBC.
<i>Pr</i>	P	20-20	EMME2 Transportation Modeling: Urban transportation demand modeling of current and future conditions using the EMME2 regional land use model, and comprised of trip generation, trip distribution, modal split and trips assignment. This involves developing new network scenarios or modifying existing, calibrating to available data, running the model and interpreting the results. Must have P.Eng. membership in APEGBC.
25-series			TRAFFIC ENGINEERING
<i>Pr</i>	P	25-10	Traffic Studies: To provide an operational analysis of a highway corridor or highway segment with or without traffic. Recommendations will be the result of on-site observations, safety reviews, conflict analyses and capacity analyses, etc. These recommendations will center on revisions to: guide, regulatory, or warning signing; signal phasing; pavement markings; or minor geometric improvements including laning, curb radii or turn bay storage lengths, etc. Also included here are studies for pedestrian and cycling facilities. This category includes the performance of warrant analysis for different traffic control devices, including traffic signals and pedestrian crossings. Must have P.Eng. membership in APEGBC.
<i>Pr</i>	P	25-20	Traffic Signal Analysis and Optimization These studies will involve detailed capacity and accident analyses. The results will be recommendations and design of efficient signal phasing; optimal timing plans and progression strategies based on sound engineering principles. Must have P.Eng. membership in APEGBC.
<i>Pr</i>	P	25-30	Traffic Signs and Pavement Marking: To provide the evaluation, design and recommendation for the installation of appropriate signing including warning, regulatory and guide signs, and pavement markings Must have P.Eng. membership in APEGBC.
<i>Pr</i>	P	25-40	Traffic Micro-simulation Modeling: This will involve the use of Synchro / Sim Traffic and TSIS micro-simulation software and other Ministry approved micro-simulation tools to model the traffic flow of roadway networks including signalized and non-signalized intersections in a corridor or network; and freeway operations (merge, diverge, weaving). Must have P.Eng. membership in APEGBC.
30-series			ROAD MAINTENANCE / REHABILITATION PROGRAM SERVICES
<i>Pr</i>	P	30-10	Snow Avalanche Slope Assessment and Mitigation Design. Must have P.Eng. membership in APEGBC.
<i>Pr</i>	P	30-12	Road Maintenance Systems: Development of reporting processes and systems / procedures, maintenance performance/materials standards and road infrastructure analysis management for quality assurance on maintenance contracts. Must have P.Eng. membership in APEGBC.
			Pavement Rehabilitation
<i>Pr</i>	T	35-15	Preliminary Condition Analysis: Pavement surface analysis.
<i>Pr</i>	T	35-17	Pavement Condition - Data Gathering: Pavement surface conditions data gathering by manual and automated means. Excludes analysis and recommendations.
<i>Pr</i>	T	35-21	Detailed Surface / Roadway Studies: Conditions of pavements, road structure and bridge decks.
<i>Pr</i>	T	35-23	Surface / Roadway Status Data Gathering: The collection and collating of data on pavement, structures and bridge decks, excluding analysis and recommendations.

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			Road & Bridge Rehabilitation
<i>Pr</i>	T	35-51	Infrastructure Analysis and Recommendations: Condition inspection and assessment of existing infrastructure systems/corridors (including roads, bridges and other structures) and preparation of status reports and/or development of long term rehabilitation and maintenance strategies for infrastructure corridors and systems.
			Maintenance Auditing Services
<i>Pr</i>	T	35-53	<p>Highway Maintenance Quality Auditing Services...to provide quality auditing services on the road and bridge maintenance contractor’s Quality Management Systems (QMS). The assignments will require acting as Lead Auditor when performing Regional Audits as part of the Ministry Quality Plan and Contractor Assessment Program (CAP) and will include:</p> <ul style="list-style-type: none"> - Reviewing the most recent version of the Ministry Quality Plan and CAP Manual to ensure understanding of the provincial criteria for audits, as the criteria may be amended from time to time; - Coordinating schedule of audits with the audit team (at least one BCMOT staff must be on the team and a maximum of 2) and the contractors; - Reviewing the most recent version of the contractors’ QMS; - Reviewing the Maintenance agreement between the Ministry and the contractor; - Meeting with Ministry personnel as required (pre/post audit meetings); - Giving notice to the contractor of the audit; - Performing the audit; - Completing the Audit Report; - Completing the Assessment; - Debriefing to District Management; - Providing all relevant documentation to the Regional Operations Technician.
45-series			ELECTRICAL ENGINEERING
			ELECTRICAL DESIGN - Traffic Systems
<i>Pr</i>	P	45-10	Street Lighting Design: Design street lighting installations using the latest lighting analysis software packages, complying with the latest IES lighting Guidelines, and applying appropriate lighting engineering judgment.. Must have P.Eng. membership in APEGBC.
<i>Pr</i>	P	45-12	Traffic Signal Design: Design multi-traffic signal installations including performing site assessments, identifying deficiencies / requirements and ensuring compliance with MUTCD and Ministry standards. This will include designing, evaluating and recommending appropriate interconnection media for closed loop and multi-jurisdictional coordinated systems Must have P.Eng. membership in APEGBC..
<i>Pr</i>	P	45-14	Lane Control Systems Design: This category is no longer in use. Must have P.Eng. membership in APEGBC.
<i>Pr</i>	P	45-16	Traffic Management Systems: Evaluate, design and make recommendations on various Traffic Management System components such as dynamic message signs, CCTV / video systems, traffic monitoring systems (computerized and electronic systems to monitor queues, speed, flow and occupancy of vehicles on the roadway) and other components related to Intelligent Transportation systems. Must have P.Eng. membership in APEGBC.
			ELECTRICAL DESIGN – Electrical / Electronic Systems
<i>Pr</i>	P	45-20	Equipment Design and Specification Evaluate, design and provide recommendations in report or technical specification form for miscellaneous electrical equipment such as light fixtures, traffic controllers, service, equipment, steel poles, etc.... Must have P.Eng. membership in APEGBC.
<i>Pr</i>	P	45-22	Power Distribution and Emergency Backup Systems Evaluate, design and recommend appropriate service and emergency generation/backup equipment; size and specify feeders, transformers, protection devices, transfer switches, etc... Must have P.Eng. membership in APEGBC.
<i>Pr</i>	P	45-24	Specialized Electrical / Electronic Systems Evaluate, design and provide recommendations for telemetry, instrumentation and other specialized electrical and electronic systems such as communication for remote electronic equipment (open/closed signs, traffic counters, changeable message signs, etc.); control systems for pump systems, over height detection systems, fog sensors and other similar devices; prototype equipment used for traffic signal controller enhancements, fire signal controllers, special crosswalk controllers, preemption systems, etc... Must have P.Eng. membership in APEGBC.

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<i>Pr</i>	P	45-26	Bridge and Tunnel Electrical and Electronic Systems Evaluate, design and make recommendations for electrical and electronic systems for bridges such as deck heating, cathodic protection, swing bridge mechanisms and control, bridge signals, pier lighting, aircraft and navigational warning lights / signs, tunnel ventilation systems, fire suppression systems, and other related work. Must have P.Eng. membership in APEGBC.
<i>Pr</i>	P	45-28	System Integration Evaluate, design, specify, develop, integrate, test and commission hardware and software systems (including communications). This includes the capability to modify commercially available software and hardware and develop new hardware and software as well as provide long term support, training and systems documentation. Must have P.Eng. membership in APEGBC.
			General Electrical Services
<i>Pr</i>	T	45-31	Electrical Drafting: The scope of work generally includes the drafting of electrical drawings for traffic signals, street lighting, etc., in accordance with Ministry standard layout.
<i>Pr</i>	T	45-33	Electrical Inspection: To conduct inspection of new and rehabilitation electrical and signing installations in accordance with Ministry standards and practice.
<i>Pr</i>	T	45-35	Electrical Technical Services: management of drawings, inventory confirmation and data management, BC Hydro calculation / cost sharing agreements and other related technical services.
<i>Pr</i>	T	45-37	Electrical Standards Development: includes research, development, enhancement and documentation of electrical, traffic and sign design, construction, material, inspection and maintenance standards.
<i>L</i>	T	45-51	Project Supervision (Electrical) - up to \$ 250,000 cap. cost
<i>L</i>	T	45-53	Project Supervision (Electrical) - over \$ 250,000 cap. cost
47-series			ACOUSTICS ENGINEERING
<i>Pr</i>	P	47-20	Vibration Monitoring and Control: vibration exposure of heavy equipment operators or assessment of vibration due to traffic passage. Must have P.Eng. membership in APEGBC.
<i>Pr</i>	P	47-22	Community Noise Assessment Assess the community noise effects (applicability of the Ministry’s noise policy) of highway development proposals with the objective of avoiding traffic and construction noise impacts where feasible. Provide mitigation and compensation recommendations and design alternatives for unavoidable impacts. Typically involves working within a multi-disciplinary project team May require design and administration of public surveys and development and implementation of a citizen involvement program. Service contract may be requested to be on an “as-and-when-required” basis for a specified period of time (generally 1-2 years). Must have P.Eng. membership in APEGBC.
50-series			ENVIRONMENTAL SERVICES
<i>L</i>	T	50-31	Roadside Facility Design Develop conceptual design for safety rest area sites which identifies design parameters based on anticipated traffic volumes and site preservation measures and determine feasibility of securing a potable water supply and acceptable sewage disposal system. Provide contract documents including drawings, special provisions and cost estimates for parking, electrical, or solar power, a water delivery system, sewage system, grading and drainage details, building design, site furniture, planting, irrigation and maintenance.
<i>L</i>	T	50-35	Erosion and Sediment Control Develop and implement operations and procedures (may include contract drawings, special provisions and cost estimates) to mitigate erosion and sediment control problems associated with highway construction. These should utilize best management practices, combining the use of native plant material and physical structures.
<i>L</i>	T	50-45	Environmental Impact Assessment Assess the environmental effects of highway development proposals at the corridor evaluation level, route selection level, during refinement of the alignment and detailed design with the objective of avoiding impacts where feasible and providing mitigation and compensation recommendations for unavoidable impacts. Typically involves working cooperatively with a multi-disciplinary project team. Liaison and pursuing project approvals from environmental agencies will be required. May require development and implementation of a post-construction monitoring program. Service contract may be requested to be on an “as-and-when-required” basis for a specified period of time (generally 1-2 years).
<i>L</i>	T	50-47	Archaeological Resources Assess the effects of highway development proposals on archaeological resources with the objective of avoiding impacts where feasible and providing mitigation and compensation recommendations for

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			unavoidable impacts. Typically involves working cooperatively with a multi-disciplinary project team. Requires liaison with First Nations, and may require the hiring of First Nation assistants to assist in the assessment. Obtain all permits and approvals to undertake work. May require development and implementation of a three-year post-construction monitoring program. May include construction monitoring. Service contract may be requested to be on an “as-and-when-required” basis for a specified period of time (generally 1-2 years).
L	T	50-49	<p>Fish and Aquatic Resources</p> <p>Assess the effects of highway development proposals on fish and aquatic resources with the objective of avoiding impacts where feasible and providing mitigation and compensation recommendations for unavoidable impacts. Typically involves working cooperatively with a multi-disciplinary project team. Requires liaison with environmental agencies, and the acquisition and compliance with permits. May include the design of mitigation works to protect (sediment and erosion control), replace, rehabilitate, or restore disturbed aquatic habitats; including the preparation of contract documents (drawings, special provisions and cost estimates). May require the development and implementation of a post-construction monitoring program. Service contract may be requested to be on an “as-and-when-required” basis for a specified period of time (generally 1-2 years).</p>
L	T	50-51	<p>Terrestrial Wildlife Resources</p> <p>Assess the effects of highway development proposals on terrestrial wildlife resources with the objective of avoiding impacts where feasible and providing mitigation and compensation recommendations for unavoidable impacts. Typically involves working cooperatively with a multi-disciplinary project team. Requires liaison with environmental agencies, and the acquisition and compliance with permits. May include the design of mitigation works to replace, rehabilitate, or restore disturbed terrestrial habitats; including the preparation of contract documents (drawings, special provisions and cost estimates). May require the development and implementation of a post-construction monitoring program. Service contract may be requested to be on an “as-and-when-required” basis for a specified period of time (generally 1-2 years).</p>
L	T	50-53	<p>Rare and Endangered Flora / Fauna</p> <p>Assess the effects of highway development proposals on rare and endangered flora / fauna with the objective of avoiding impacts where feasible and providing mitigation and compensation recommendations for unavoidable impacts. Typically involves working cooperatively with a multi-disciplinary project team. Requires liaison with environmental agencies, and the acquisition and compliance with permits. May include the design of mitigation works to replace, rehabilitate, or restore habitats; including the preparation of contract documents (drawings, special provisions and cost estimates). May require the development and implementation of a post-construction monitoring program. Service contract may be requested to be on an “as-and-when-required” basis for a specified period of time (generally 1-2 years).</p>
L	T	50-55	<p>Environmental Monitoring</p> <p>Supervise and inspect operations and procedures at environmentally sensitive sites during construction period and ensure compliance with environmental designs, specifications, special provisions and all Federal and provincial regulations and standards. Represent the Ministry on environmentally related matters and liaise with environmental agencies, Project Supervisors and Contractors. May include the development and implementation of a quality management system for project environmental components. May require the development and implementation of a post-construction monitoring program, and the preparation of environmental monitoring completion reports or other project-related reporting. May include the acquisition of environmental approvals. May include the design and implementation of mitigation works to protect (sediment and erosion control) replace, rehabilitate, or restore disturbed habitats. May require the development and implementation of a multi-year post-construction monitoring program. Service contract may be requested to be on an “as-and-when-required” basis for a specified period of time (generally 1-2 years).</p>

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L	T	50-57	<p>Vegetation Management Develop strategic plans for integrated vegetation management employing chemical, mechanical, cultural, and biological control methods for undesirable vegetation such as noxious weeds. Prepare and obtain approvals of pest management plans for herbicide applications. Administer contracts for vegetation management operations. Monitor contractor operations for compliance with contract and statutory requirements. Conduct field investigations to assess public noxious weed control requests and to collect information required for compliance with environmental approvals. Requires liaison with ministry staff, other agencies, non-governmental organizations, contractors and the public.</p>
L	T	50-59	<p>Noxious Weed Control Undertake the implementation of, and potentially the day-to-day operation for, mechanical, cultural, and/or biological control (in accordance with the ministry’s integrated Pest Management Plan) of noxious weed species on Ministry right-of-way. Service contract may be requested to be on an “as-and-when-required” basis for a specified period of time (generally 1-2 years).</p>
L	T	50-61	<p>Landscape Design and Management Typically involves working cooperatively within a multi-disciplinary team on projects to satisfy rural, sub-urban and/or urban landscape design standards. Produce a written report and preliminary level landscape design which indicates general planting layout, irrigation requirements, landscape grading and contouring, erosion control, slope stabilization measures and general maintenance requirements. Deliver landscape contract documents including drawings, special provisions, cost estimates and maintenance procedures document. May include the preparation or maintenance plans and construction or post-construction landscape inspection services. Service contract may be requested to be on an “as-and-when-required” basis for a specified period of time (generally 1-2 years).</p>
L	T	50-65	<p>Socio-Community Impact Assessment Assess the socio-community effects of highway development proposals with the objective of avoiding impacts where feasible and providing mitigation and compensation recommendations for unavoidable impacts. Typically involves working cooperatively within a multi-disciplinary team on projects of a multi-modal nature within either a rural or urban setting. May require design and administration of public surveys and development and implementation of a citizen involvement program.</p>
L	T	50-69	<p>Air Quality Undertake air quality impact assessments and modeling to describe the potential effects of a highway project on a regional and local (community) airshed, and recommend measures and practices to mitigate concerns. Major concerns usually relate to vehicular traffic and highway construction related pollutants, such as ozone, particulate matter, and green house gases. Identification of potential effects must consider the highway construction itself as well as any ancillary construction activities such as gravel production or use of detours during construction. Also may include issues related to operation and maintenance of the highway or a structure such as a tunnel. Must take into consideration traffic volumes as well as traffic idling and delays.</p>
L	T	50-71	<p>Environmental Project Coordination Provide a single environmental coordinator (or range of environmental specialists where required) to manage the environmental components of a multi-disciplinary project from inception to completion. Requires input into the planning, design, construction, and post-construction stages of the project. Requires liaison and communication with ministry representatives, external government agencies, external engineering and environmental consultants, and the public. Responsible for developing terms of reference for environmental studies, coordinating or undertaking environmental studies, obtaining environmental project approvals, coordinating or undertaking post-construction environmental monitoring programs. Service contract may be requested to be on an “as-and-when-required” basis for a specified period of time (generally 1-2 years).</p>
L	T	50-73	<p>Agricultural Land Assessment Manage the acquisition of approvals required for project activities affecting Agricultural Land Reserve property. May include preparation of agricultural land reclamation plans or designs. Specific cases may require a qualified Agronomist and/or Agrologist. Requires liaison with other Ministries, government agencies, consultants, and the public.</p>

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70-series			HYDRAULICS
<i>Pr</i>	P	70-06	Culvert Hydraulics: Hydrologic analysis of small drainage basins with estimated design flows of less than 10 cubic metres per second (for required return periods), using the Rational Equation or SCS Method. The hydraulic design of culverts shall be based on inlet control. Must have P.Eng. membership in APEGBC.
<i>Pr</i>	P	70-10	River Engineering: analysis of river hydraulics problems, estimate scour depths, design river training works, bank protection, erosion protection and flood control systems, and hydraulic design constraints for bridges and structures. Must have P.Eng. membership in APEGBC.
<i>Pr</i>	P	70-16	Mathematical Hydraulic Modeling: development, testing and analysis using mathematical hydraulic models of rivers, creeks and reservoirs. Must have P.Eng. membership in APEGBC.
<i>Pr</i>	P	70-20	Physical Hydraulic Modeling: construction, testing, and analysis of physical hydraulic models of rivers, creeks, and reservoirs. Must have P.Eng. membership in APEGBC.
<i>Pr</i>	P	70-60	Coastal Engineering: Analysis and design of bridges, wharfs or other engineering works subject to waves, tides and coastal processes. Must have P.Eng. membership in APEGBC.
85-series			TUNNEL ENGINEERING
<i>Pr</i>	P	85-10	Cut and cover tunnel design. Must have P.Eng. membership in APEGBC.
<i>Pr</i>	P	85-20	Tunnel ventilation design. Must have P.Eng. membership in APEGBC.
<i>Pr</i>	P	85-30	Tunnel design in soft ground. Must have P.Eng. membership in APEGBC.
<i>Pr</i>	P	85-40	Tunnel design in rock. Must have P.Eng. membership in APEGBC.
87-series			COST ESTIMATING
			<p>Cost Estimating Services...to provide a Lead Cost Estimator and the technical support to produce cost estimates for an assigned project in accordance with the Ministry's cost estimating guidelines and good cost estimating practice.</p> <p>The Lead Cost Estimator must have training in cost estimating or quantity surveying and considerable experience in:</p> <ul style="list-style-type: none"> ◇ project and program level cost estimating and control budget development ◇ cost risk analysis and contingency management ◇ developing cost estimates for a variety of technical and professional disciplines ◇ alternate project delivery models.
<i>Pr</i>	T	87-51	Cost Estimating Services ...Small projects, uni-disciplinary and somewhat complex
<i>Pr</i>	T	87-53	Cost Estimating Services ...Medium projects, multi-disciplinary and somewhat complex.
<i>Pr</i>	T	87-55	Cost Estimating Services ...Large projects, multi-disciplinary and highly complex.
			<p>Cost Estimate Audit Services...to provide a Cost Estimate Audit Leader and the requisite Team Members to conduct an audit of the cost estimate(s) for an assigned project. The Cost Estimate Audit Leader will design and conduct the audit to ascertain the quality of the estimate and supporting documentation in accordance with the assigned project's requirements, the ministry's cost estimating guidelines and good estimating practice.</p> <p>The Lead Cost Estimator must have training in planning and conducting audits, cost estimating or quantity surveying and considerable experience in:</p> <ul style="list-style-type: none"> ◇ engineering quality systems ◇ project and program level cost estimating and control budget development ◇ cost risk analysis and contingency management ◇ developing cost estimates for a variety of technical and professional disciplines ◇ alternate project delivery models. <p>The Team members shall be selected in accordance with requirements for the project in relation to the size, complexity and project delivery model. The Team Members must have training in cost estimating or quantity surveying and have experience in developing cost estimates in the discipline they represent.</p>
<i>Pr</i>	T	87-61	Cost Estimate Audit Services ...Small projects, uni-disciplinary and somewhat complex.
<i>Pr</i>	T	87-63	Cost Estimate Audit Services ...Medium projects, multi-disciplinary and somewhat complex.
<i>Pr</i>	T	87-65	Cost Estimate Audit Services ...Large projects, multi-disciplinary and highly complex.

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90-series			MARINE ENGINEERING
<i>Pr</i>	P	90-10	Marine Architecture and Survey: to survey vessels within the existing inland ferry fleet, make recommendations regarding repair or modification, and provide contract drawings and specifications Must have P.Eng. membership in APEGBC..
95-series			PROJECT MANAGEMENT SERVICES
			<p>Project Management Services...to provide project management services for highly technical projects with significant external partnerships with other agencies or levels of government, comprised of a professional engineering Project Manager as well as the technical support necessary to assist with:</p> <ul style="list-style-type: none"> ◇ creation / execution of a project plan in consultation with the BCMOT Project Manager, project team and stakeholders, ◇ leading a multi-disciplinary project team comprising both BCMOT and consultant representatives to deliver the project within approved scope, schedule and budget, ◇ liaising with other Ministries, individuals and outside agencies, ◇ arranging, facilitating and documenting project team meetings, ◇ monitoring project schedule and costs, ◇ ensuring the BCMOT Project Manager is fully informed on all project issues, including regular status reporting, ◇ management of project documentation, including printing and distribution of meeting minutes, reports, etc, ◇ management of public presentation processes, including preparation of presentation materials, and ◇ project cost management using the Ministry’s Capital Programming System (CPS).
<i>L</i>	P	95-10	Project Management Services ...Small Projects - technically complex, low project cost. Must have P.Eng. membership in APEGBC.
<i>L</i>	T	95-11	Project Management Services...Small Projects low complexity, low project cost
<i>R</i>	P	95-12	Project Management Services ...Medium Projects - more technically complex, higher project cost Must have P.Eng. membership in APEGBC..
<i>R</i>	T	95-13	Project Management Services...Medium Projects more complex, higher project cost
<i>Pr</i>	P	95-14	Project Management Services ...Large Projects - high technical complexity, higher project cost. Must have P.Eng. membership in APEGBC.
<i>Pr</i>	T	95-15	Project Management Services...Large Projects high complexity, &/or high project cost
<i>Pr</i>	T	95-51	Value Analysis / Value Engineering (VA / VE): to provide value analysis / value engineering team leadership, coordination of services, assemble the appropriate specialist VA/VE team members and prepare reports and recommendations.
<i>Pr</i>	P	95-60	Project Quality Audit Services
97-series			ROAD SAFETY AUDIT
			Road Safety Audit Services... conducted in accordance with the Ministry’s RSA policy, and TAC Guidelines. Must have P.Eng. membership in APEGBC.
<i>Pr</i>	P	97-70	Safety Audit Team Leader... to provide a single person to lead a team to conduct a road safety audit of an assigned project. The Team Leader will be required to advise the Ministry on the make-up of the team, to organize and carry out the audit, and to complete all necessary documentation. The Ministry will augment the balance of the team with internal staff or other contracted resource.
<i>Pr</i>	P	97-80	Road Safety Team... to provide a Safety Audit Team Leader and the requisite Team Members to conduct a road safety audit of an assigned project. The Team Members shall be selected in accordance with requirements of the project in relation to size, complexity and staging. Team Members must have training in conducting road safety audits and have considerable experience in the discipline they represent. Must have P.Eng. membership in APEGBC.

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99-series		OWNER’S ENGINEER	
		<p>Owner’s Engineer Services: provision of senior multi-disciplinary engineering and technical advice to the Project Team, senior Ministry management and/or Executive, including provision of support to project procurement, public consultation and financial planning. These services include quality management advice and leadership to the Project Director, assistance with project scope and objective development, and representation of the Ministry on large partnership projects where another agency is delivering the work, as well as options analysis and alternative delivery strategy, preparation of engineering assignment terms of reference and proposal evaluation, preparation of construction contract specifications and project scheduling. These services will assist the Project Director with identification, analysis, coordination and implementation of the engineering and technical tasks and components of the project, including those related to design, construction and operation of the assets. The assignment may also include management of independent engineering contracts for the Ministry as well as sub-consulting support services, management of project engineering documentation, provision of project management services, provision of construction management services (both roadwork and structures), etc. Experience in putting together and leading multi-disciplinary engineering project teams is essential.</p>	
<i>Pr</i>	P	99-10	Owner’s Engineer Services...Small, less complex projects, or as BCMOT / Provincial representative. Must have P.Eng. membership in APEGBC.
<i>Pr</i>	P	99-12	Owner’s Engineer Services...Medium, more complex projects, including full engineering support services. Must have P.Eng. membership in APEGBC.
<i>Pr</i>	P	99-14	Owner’s Engineer Services...Large, highly complex projects, including full engineering support services and management of engineering design and other consultant assignments Must have P.Eng. membership in APEGBC..