

## MEMORANDUM OF AGREEMENT

THIS AGREEMENT dated for reference the 31 day of MARCH, 2005

BETWEEN:

The Association of British Columbia Forest Professionals (ABCFP)

AND:

The Association of Professional Engineers and Geoscientists of the Province of British Columbia (APEGBC)

WHEREAS the ABCFP and the APEGBC each recognizes the other as an honoured and learned profession of equal merit whose close cooperation is essential in the forest sector for the benefit of the public and the environment and in order to ensure that the special knowledge, skills and training of members of each profession are properly available to the public.

AND WHEREAS the *Engineers and Geoscientists Act*, R.S.B.C. 1996 c. 116 as amended provides that the practice of professional engineering "includes reporting on, designing or directing the construction of public utilities, industrial works, railways, bridges, ...".

AND WHEREAS the *Foresters Act*, S.B.C. 2003 c. 19 provides that the practice of professional forestry includes "planning, locating and approving forest transportation systems including forest roads,".

THEREFORE the Councils of ABCFP and APEGBC have agreed to the following terms:

### Principles Governing the Practice of Engineering and Forestry

1. (a) Except as provided herein, Professional Engineers shall confine their practice to the practice of professional engineering as defined in the *Engineers and Geoscientists Act* and Forest Professionals shall confine their practice to the practice of professional forestry as defined in the *Foresters Act*.
- (b) Professional Engineers and Forest Professionals are obliged to practice, in accordance with their respective Code of Ethics, within their areas of competence in the design and construction of forest road bridges and major culverts (crossings) and to the prevailing standard of care.

### Definitions

2. In this Memorandum of Agreement:

**Coordinating Registered Professional:** The Coordinating Registered Professional is a Registered Professional Forester or a Professional Engineer who is a member in good standing of the ABCFP or APEGBC. For simple crossings the Coordinating Registered Professional may be either a Registered Professional Forester or a Professional Engineer. For all other crossings the Coordinating Registered Professional must be a Professional Engineer. The Coordinating Registered Professional either completes the necessary tasks for coordination, planning/design, conducting field reviews and preparing as-built drawings for a crossing directly, or directs those activities with sufficient oversight and supervision such that they can take overall responsibility and

## MEMORANDUM OF AGREEMENT

### ABCFP & APEGBC

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accountability for the project. In the case of a simple crossing the majority, if not all, of the necessary tasks can be undertaken by the Coordinating Registered Professional.

**Crossing:** A forest service road bridge or culvert.

**Culvert:** A pipe, arch, box or log structure six metres or less centre-to-centre of bearing, covered with soil and lying below the road surface used to carry streamflow in an ephemeral or perennial stream channel from one side of a road to the other.

**Design Bearing Pressure:** The pressure applied to the soil or bedrock by the foundation unit.

**Field Splice:** Refers to girders where webs or flanges require a field splice connection during installation.

**Forest Professional:** Is a person admitted under Section 14 of the *Foresters Act*, as either a Registered Professional Forester, holder of a special permit entitled to practice as a Registered Professional Forester within this field of practice or a Registered Forest Technologist.

**Foundation:** A system or arrangement of structural members, which may include concrete strip or spread footings or piles, through which a load from a structure are transferred to supporting soil or rock.

**Major Culvert:** is a crossing where the Coordinating Registered Professional must be a Professional Engineer and is a culvert used to carry ephemeral or perennial stream flow in a stream channel from one side of the road to the other, and has a maximum design discharge of 6 cubic meters per second or greater, and is one of the following:

- .1 a pipe having a diameter of 2000mm or greater;
- .2 a pipe arch having a span of 2130mm or greater;
- .3 an open bottom arch having a span of 2130mm or greater.

**Member:** A registered member in good standing with the ABCFP or the APEGBC.

**Non-composite:** A superstructure system that does not require its sub components (such as girders and concrete deck) to be structurally connected on site to deliver its primary design capacity.

**Non-skewed:** Is a superstructure that is rectangular or square in plan.

**Professional Engineer:** A person who is registered or licensed as a Professional Engineer under the *Engineers and Geoscientists Act*.

**Registered Professional Forester:** A person admitted under Section 14 of the *Foresters Act* as a registered Professional Forester or a holder of a special permit entitled to practice as a Registered Professional Forester within this field of practice.



## MEMORANDUM OF AGREEMENT

### ABCFP & APEGBC

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**Registered Forest Technologist:** A person admitted under Section 14 of the *Foresters Act* as a Registered Forest Technologist.

**Simple Crossing:** Is as defined in paragraph 3 of this Memorandum of Agreement, and means a crossing where the Coordinating Registered Professional may be either a Registered Professional Forester or a Professional Engineer.

**Single Span Simply Supported:** Means crossings with no pier, middle support or needle beams so that substructure components will only be found at the ends of the superstructure.

**Specialist:** A specialist is responsible for providing one or more services required for a crossing project at the request of and under the supervision of the Coordinating Registered Professional. Examples of persons who may be specialists include: professional geoscientists, registered forest technologists, registered professional biologists, professional engineers, registered professional foresters.

**Substructure:** The substructure is that portion of the crossing that rests on the foundation and below the superstructure and generally consists of log cribs, interlocking concrete blocks, or steel towers with footings. In some instances, such as interlocking concrete blocks without footings the substructure and foundation are synonymous.

**Superstructure:** The superstructure is that portion of the crossing that rests on the substructure and provides the traveling surface for the crossing. It generally consists of stringers, decking and guardrails.

### Simple Crossings

3. A Registered Professional Forester may be the Coordinating Registered Professional for simple crossings where all of the following conditions are met for the duration of the crossing project:

#### General requirements:

- .1 plans must be prepared using structural details provided in drawings, tables, charts and other design aids that have been prepared by a Professional Engineer. The crossing components (superstructure, substructure, connections) must all have been designed to be used in the general combination and configuration shown on the plans by the design aids. All design aids must be referenced on the plans and supporting documents;
- .2 limitations on the design aids, if any, must be referenced on the plans and their affect, if any, on the plans documented;
- .3 Factored dead loads and live loads, must impose less than 200 kPa design bearing pressure on the foundation soils or bedrock unless a higher design bearing pressure is authorized by a design aid prepared by a Professional Engineer specifically for that crossing.

#### Hydrology and Hydraulics:

- .1 the channel must be historically stable with erosion resistant banks; or

## MEMORANDUM OF AGREEMENT

### ABCFP & APEGBC

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- .2 the channel may be historically unstable where the Coordinating Registered Professional has determined that it is acceptable for the crossing and/or the approaches to be damaged or destroyed during design flow events and this has been referenced on the plans.

#### **Approaches, alignment and gradient:**

- .1 the native ground at the approaches must be determined to be stable based on field reviews;
- .2 excluding log structures, the road approach shall be aligned to assure that the design vehicle tracks straight on to and off of the crossing with no side tracking; and
- .3 the maximum crossing grade shall be four percent, excluding log structures with gravel decks.

#### **Foundation soils or rock:**

- .1 It is assumed that the foundation soils or bedrock can safely support a design bearing pressure of 200 kPa or more if it is composed of unweathered bedrock free of adverse jointing and discontinuities, dense glacial till, or dense sandy gravel. These ground conditions should be adequate to support the anticipated loads with acceptable settlement (less than 25mm total and differential) provided that the subsection below, Substructures, sub-paragraphs .2 through .6 are met and the following conditions also apply:
  - .1 the normal groundwater table is a minimum of 1m below the base of the footings if on soil;
  - .2 the bearing surface has less than a 5 percent slope in any direction;
  - .3 there is no evidence of instability in the vicinity of the crossing that could impact the proposed structure;
  - .4 the footing bears on undisturbed soil, bedrock or a modest thickness of granular fill as described below; and
  - .5 a modest thickness of granular fill can be utilized to level the footing area provided that the fill is compacted to a minimum of 95% of the Standard Proctor maximum dry density, the total thickness of the fill does not exceed 0.3m and the surface meets all of the above criteria.
- .2 It is recognized that soil and bedrock types and conditions vary from place to place in British Columbia. In some areas the soil or bedrock on which the foundations sit may not be able to support a design bearing pressure of 200 kPa due to local or temporary conditions. In these cases it may be possible to develop geotechnical design aids for local or temporary use in order for the crossing to qualify as a simple crossing. These design aids must:
  - .1 be developed by a Professional Engineer and define the design and construction circumstances to which the design aids are to be used;
  - .2 clearly define the specific soil and bedrock types and conditions and the design bearing pressure which is allowable in terms of what the soil or bedrock can safely support;
  - .3 delineate the geographic area within which the design aids are to be used;
  - .4 explain any limitations in the application of the design aids such as restrictions on site preparation techniques, foundation configurations or construction methods; and
  - .5 indicate any field checks to be made by the Professional Engineer to check the validity of the design aids and application.



## **MEMORANDUM OF AGREEMENT**

### **ABCFP & APEGBC**

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#### **Substructures:**

- .1 If constructed of log sills or log cribs, substructures must be four metres or less in height or if constructed of interlocking concrete blocks (with or without concrete footings) must be two metres or less in height (including sills and caps). Plans for substructures must be prepared using design aids prepared by a Professional Engineer.
  - .1 The four-meter height limitation for log cribs is measured from the lowest point of the substructure where it bears on the foundation soils or rock to the top of the bearing sill or bridge soffit. Sills and caps are transitions to connect the superstructure to the substructure and are included as part of the maximum allowable substructure height.
  - .2 Increasing the substructure height greater than the values above (four metre high log cribs and sills or two metre high interlocking concrete blocks) by combining different substructures together is not permitted. For example a 3 m log crib with 1.5 m concrete lock blocks on top does not qualify as a simple crossing.
- .2 If using concrete footings they are to be no less than .75 meters wide in the smallest dimension.
- .3 If using log or timber sills they are to be no smaller than 0.4 meters width at its narrowest.
- .4 The footing and sills may vary from the widths described above so long as they follow design aids prepared by a Professional Engineer.
- .5 The footings or sills must span the entire width of the foundation.
- .6 The base of the footings is setback at least 1.5 m horizontally from a two horizontal to one vertical plane extrapolated upwards from the toe of soil slopes or 1.5 m back from the crest of the slope, whichever is greater.

#### **Superstructures must:**

- .1 be non-composite;
- .2 be single span simply supported;
- .3 incorporate structural designs that have been prepared by a Professional Engineer for the loading configuration required;
- .4 have plans developed with the aid of tables prepared by a Professional Engineer if consisting of log stringers;
- .5 not require engineered installation procedures (for example specialized lifts or specialized launches);
- .6 not require field splices;
- .7 not require structural field welding or structural concrete grouting; and
- .8 be non-skewed (excluding log structures).

A Professional Engineer may be the Coordinating Registered Professional for a simple crossing and must be the Coordinating Registered Professional all other crossings.

#### **Signing and Sealing of Plans**

4. Plans and supporting documents for a simple crossing or other crossing must be signed and sealed by the Coordinating Registered Professional. The Coordinating Registered Professional shall also sign and seal a Crossing Assurance Statement for each crossing.

## MEMORANDUM OF AGREEMENT ABCFP & APEGBC

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### Disciplinary Provisions

5. A Registered Professional Forester or a Professional Engineer shall be subject to disciplinary action, respectively by, the ABCFP or the APEGBC, if they undertake services for which they are not competent by reason of training or experience and a Registered Professional Forester shall be subject to disciplinary action by the ABCFP for acting as the Coordinating Registered Professional for a crossing that is not a simple crossing as defined in this Agreement.

### Joint Practice Board

6. There is a Joint Practice Board established by the ABCFP and the APEGBC and it is authorized to address matters of common concern and jurisdiction and to make recommendations to the Councils of the ABCFP and APEGBC.
7. The terms of reference of the Joint Practice Board include:
- (a) working on matters of inter-professional relations, including but not limited to, the coordination and publication of guidelines, standards, design aids for crossings, and performance standards for professional services in the forest sector, formulated either jointly or severally by ABCFP and APEGBC;
  - (b) reviewing the terms of this Agreement and, from time to time as necessary, recommending changes to this Agreement for the consideration of the Councils of the ABCFP and APEGBC; and
  - (c) such other matters as may be decided from time to time by the Councils of the ABCFP and APEGBC.

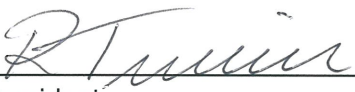
### Modification of this Memorandum of Agreement

8. It is agreed that this Memorandum of Agreement may be modified at any time by mutual consent of the Councils of ABCFP and APEGBC.

### Terms of this Memorandum of Agreement

9. This Memorandum of Agreement shall remain in force by the mutual consent of the Councils of ABCFP and APEGBC.

On behalf of the Council of the  
Association of British Columbia  
Forest Professionals

  
\_\_\_\_\_, RPF  
President

On behalf of the Council of the  
Association of Professional Engineers  
and Geoscientists of British Columbia

  
\_\_\_\_\_, P.Eng.  
President