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GUIDELINES FOR PROFESSIONAL PRACTICE BUILDING ENVELOPE PROFESSIONAL ENGINEER (Approved by APEGBC Council September 9, 1999)

1. Basic Building Envelope Professional Services

The role of the Building Envelope Professional Engineer (BEPE) is to provide review of the building envelope design to the project architect or coordinating registered professional with respect to environmental separation and the performance of materials, components and assemblies of the building envelope. The responsibility for the design and field review of the construction of new buildings rest with the project Architect, except when a professional engineer is providing architectural services under the AIBC/APEGBC Memorandum of Agreement.

The usual phases of the *Basic Services*, as discussed below, are generally organized in a consulting agreement according to the sequential stages of a typical project. They are intended to assist the *Building Envelope Professional* (BEP) in addressing the *Building Envelope* performance issues around control of Heat, Air and Moisture as defined in Part 5 of the Building Code.

For the purposes of this document, element means an assembly, component or material forming part of the *Building Envelope*, and performance means performance with respect to Part 5 of the Building Code.

1.1 Conceptual or “Schematic” Design Phase

In the conceptual or schematic design phase, the *BEP* shall:

- 1.1.1 Attend as required, meetings with the Consultant and design team to obtain information regarding the functional, aesthetic, cost and scheduling requirements. The *BEP* review should focus on the *Building Envelope* elements and performance requirements defined in Part 5 of the Building Code.
- 1.1.2 If required, assist the *Coordinating Registered Professional (CRP)* in identifying the need for any specialist envelope consultants who may be required for the project.
- 1.1.3 Review the design criteria and environmental loads for the *Building Envelope* assemblies in consultation with the CRP.

- 1.1.4 Review applicable codes, standards, regulations, restrictions, insurance requirements and other factors affecting the performance of the building envelope.
- 1.1.5 Review compatibility and interaction with other building systems.
- 1.1.6 Review the preliminary design concept, together with alternate design concepts where appropriate.
- 1.1.7 Consider the requirements of other design professionals and provide information relating to the *Building Envelope* design, as they require.

1.2 Design Development Phase

In the design development phase, wherein the accepted conceptual design is developed in sufficient detail to enable commencement of the *Contract Documents* by all participants in the design team, the *BEP* shall:

- 1.2.1 Review preliminary drawing of such *Building Envelope* elements as: walls, windows (and glazed elements), roofs, balconies, decks, and typical interface details between elements of the *Building Envelope*.
- 1.2.2 Review durability of *Building Envelope* elements, and consider maintenance, renewals and service life requirements. Specific consideration should be given to the following items:
 - (a) Expected service life of the *Building Envelope* elements;
 - (b) Consideration of the layering of *Building Envelope* elements, so that repair and replacement of elements with shorter services lives does not require the removal or replacement of items with longer service lives; and
 - (c) Materials compatibilities and resistance to various mechanisms of deterioration, given the nature, function and exposure of the materials.

1.3 Contract Development Phase

In the contract documents phase the *BEP* shall:

- 1.3.1 Review the construction documents to verify that they describe *Building Envelope* elements that achieve the performance criteria that were established during the Schematic Design Phase and further developed during the Design Development Phase.
- 1.3.2 Provide technical input into the specifications.
- 1.3.3 Assist in establishing testing and inspection requirements.

- 1.3.4 Assist the client in obtaining the required approvals, licenses and permits, including preparation of the relevant documentation required by the authority having jurisdiction.

1.4 Bidding and Negotiation Phase

In the bidding and negotiation phase the *BEP* shall:

- 1.4.1 Provide assistance to the CRP in preparing addenda to the design, and clarification of the construction documents as required.

1.5 Construction Phase

In the construction phase, the *BEP* shall provide services for all *Building Envelope* elements which the *BEP* has reviewed in earlier project phases.

Some items reviewed by the *BEP* may also require review by other members of the design team or by testing or inspection agencies. Such work may include waterproof membranes, glazing, pre-cast concrete elements, welding, proprietary products, and primary and secondary structural elements.

Construction phase services shall include, but not necessarily be limited to the following, and may vary depending upon the complexity of the job and the experience of the contractor.

- 1.5.1 Attend construction meetings, if required.
- 1.5.2 Assist in confirming, reporting and scheduling procedures for testing and field reviews.
- 1.5.3 Assist in confirming that the qualifications of fabricators meet the specifications.
- 1.5.4 Assist in review of submittals for general compliance with the contract documents.
- 1.5.5 Assist with the review of *Building Envelope* related shop drawings and other submittals for general conformance with the contract documents and the intent of the design.
- 1.5.6 Provide enhanced field review, visiting the site at sufficiently frequent intervals, appropriate to the stage of construction, and review a substantial number of the details (rather than just a representative sampling) to observe the quality and the progress of the construction of those elements reviewed by the *BEP*. The term “enhanced field review” is used to differentiate the level of review which a *BEP* shall provide, which supplements the level of field review and assurances which shall be provided by the architect and other registered professionals.

- 1.5.7 Review reports provided by material and component manufacturers, as well as other reports prepared by professionals reviewing *Building Envelope* elements.
- 1.5.8 Prepare site visit reports outlining observations and deficiencies in the work and bring them to the attention of the CRP.
- 1.5.9 Make site visit reports available to the authority having jurisdiction upon request.
- 1.5.10 Assist in arranging for and observing the mock-up and/or testing of key envelope elements such as wall assemblies or window installations, where required.
- 1.5.11 Review the continuity of thermal insulation, moisture, air and vapour barriers.
- 1.5.12 Review drainage paths.
- 1.5.13 Review the acceptability of the moisture content of wood products.
- 1.5.14 Review that components and materials used are those specified in the contract documents.

2. **Additional *Building Envelope Professional* Services**

In addition to the *Basic Services*, the *BEP* may be required to provide the following *Additional Services* if they become necessary during the course of the project. They are generally not considered part of the basic services, as discussed in the preceding sections, and may require a review of the service agreement between the *BEP* and their client.

Examples of Additional Services are:

- 2.1 Work resulting from changes to the project as originally described and agreed to under the contract between the *BEP* and client, such as changes in scope, schedule, cost, complexity, diversity or magnitude of the project;
- 2.2 Review of alternate designs and related documentation after selection of the *Building Envelope* designs are made during the conceptual design and design development phases;
- 2.3 Review of alternate or substitute assemblies if requested by the *BEP*'s client for tendering to obtain competitive bids for such items such as propriety products;
- 2.4 Work connected with the review of documents for tendering segregated contracts, pre-tendered contracts, phased or fast-track construction;
- 2.5 Assistance in preparing or reviewing construction cost estimates;

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- 2.6 Review of alternate designs or products after completion of the contract documents;
- 2.7 Special physical model analysis such as wind-tunnel;
- 2.8 Full-time inspections of construction;
- 2.9 Review of additional submittals when occasioned by improper or incomplete submittals;
- 2.10 Work resulting from corrections or revisions required because of errors or omissions by others; and
- 2.11 Work resulting from damage during construction as the result of fires, man-made disasters, or natural disasters.