



Professional Engineers  
and Geoscientists of BC

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## **Professional Practice Guidelines Shop Drawings**

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# DEFINITIONS

In these guidelines, the following terms have the following definitions and are italicized in the text:

## **Act**

Means the *Engineers and Geoscientists Act* [RSBC 1996] c. 116, as amended.

## **Erection Drawings**

Drawings or documents produced by the erector or equipment installer to cover temporary loadings, temporary bracing, false work and erection sequence instructions. They are a type of *shop drawings*.

## **Fabrication or Detail Drawings**

Drawings produced to provide all information necessary for shop personnel to fabricate and/or assemble items. They are a type of *shop drawings*.

## **Final Design Drawings**

Design drawings prepared by a *registered professional of record* to reflect design changes made during the construction of a building project. *Final design drawings* are intended to incorporate addenda, change orders and other significant design changes, but not necessarily site instructions.

## **General Arrangement Drawings**

Drawings that specifically describe the location of structural members, connections and components. They are a type of *shop drawings*.

## **Registered Professional of Record**

Means a member or licensee retained for the provision of the major part of the professional services within a particular discipline and who is responsible for the review of the design documents prepared by any supporting registered professionals retained on the project within that discipline. The *registered professional of record* is also responsible for reviewing the *shop drawings* prepared under the direction of any supporting registered professionals within that discipline, and either performing the field review of those components or satisfying himself or herself that the necessary field reviews have been performed by the supporting registered professionals.

## **Seal (synonymous with stamp)**

Noun: APEGBC professional's *seal*; either a rubber *seal* or electronic *seal*.

Verb: Affix an APEGBC professional *seal*, along with signature and date, to a document.

The handwritten date or the digitally-embedded date associated with the digital signature must be the date of *sealing* and signing; this date may differ from the date on the document.

## **Shop Drawings**

Drawings, diagrams, illustrations, schedules, performance charts, brochures and other data intended to illustrate details of a portion of the work which are provided to the *registered professional of record*.

## **Supporting Letters of Assurance**

Where required or requested *shop drawings* may be referenced in, included in, or attached to various letters of assurance. Examples of such letters of assurance include schedules S-B and S-C provided in the joint *AIBC/APEGBC Practice Note 16 - Professional Design and Field Reviews by Supporting Registered Professionals for Building Projects*, assurance statements provided by the Ministry of Forests and assurance statements provided by the Ministry of Transportation and Infrastructure.

The Schedule S-B and S-C *supporting letters of assurance* for building projects may be required in support of the *shop drawings* submitted to architects responsible for items which require the services of a professional engineer under the Architecture items included in the Schedule B letter of assurance in the *City of Vancouver Building Bylaw* or *BC Building Code* (e.g. guard rails, hand rails, exterior glazing, structural capacity of architectural components including anchorage and seismic restraint).

## 1.0 PURPOSE

*Shop drawings* are prepared to provide information which assists in confirmation of the intent of the design and to provide suppliers, fabricators or manufacturers with information which assists them in making the required components.

## 2.0 GUIDANCE

### 2.1 PREPARATION OF *SHOP DRAWINGS*

A contractor may arrange for the preparation of clearly identified *shop drawings* as called for by the contract documents or as the *registered professional of record* may reasonably request.

*Shop drawings* are prepared by fabricators, suppliers, equipment manufacturers, sub-contractors and contractors or by others retained by these parties.

*Shop drawings* are prepared following a review of the drawings, specifications and contract documents supplied by the *registered professional of record* . and other project consultants as may be applicable . and the resolution of any inconsistencies or requested changes.

*Shop drawings* may be required to be submitted at the time of submission of *final design drawings*.

For *shop drawings* related to forest sector crossings, refer to section 4.1.3.3 in the APEGBC/Association of BC Forest Professionals *Guidelines for Professional Services in the Forest Sector – Crossings*.

### 2.2 TREATMENT OF VARIOUS TYPES OF *SHOP DRAWINGS* AND RELATED DOCUMENTS

The following *shop drawings* and related documents require the *seal* of a professional engineer or licensee:

- **Component design drawings:** The drawings for structural elements and individual components, special connections or equipment which have been designed specifically for a particular application by the professional engineer or licensee acting for the fabricator, supplier or equipment manufacturer.
- **Proprietary items:** Drawings of open web steel joists are an example of proprietary items. The *seal* on these drawings confirms that the professional engineer or licensee takes responsibility for the selection of components that are incorporated into the design.
- **Erection drawings:** Where appropriate, *supporting letters of assurance* must accompany *sealed erection drawings*.
- **Reliance statements:** The *registered professional of record* and authorities having jurisdiction may request reliance statements. Some examples of reliance statements include *supporting letters of assurance*, assurance statements provided by the Ministry of Forests, and assurance statements provided by the Ministry of Transportation and Infrastructure.

The following types of *shop drawings* do not require the *seal* of a professional engineer or licensee:

- **General arrangement drawings:** *General arrangement drawings* may be reproducible copies of the drawings provided by the *registered professional of record* on which the information is noted. *General arrangement drawings* are not design drawings and, therefore, need not be *sealed* by the fabricators, suppliers or equipment manufacturers, professional engineer or licensee.

- **Fabrication or detail drawings:** Because *fabrication or detail drawings* normally do not contain design information, the *registered professional of record* should not require that they be *sealed*. In the event, however, that *fabrication or detail drawings* do contain design information, they must be *sealed* by the fabricator's or supplier's or equipment manufacturer's professional engineer or licensee.
- **Standard connections, components or equipment:** The *registered professional of record* may specify that a contractor select standard structural connections and components from industry handbooks. An itemized list of the standard connections and components selected must be clearly included on the latest revision to the *shop drawings* and submitted as an attachment to the *shop drawings* or a letter of certification. This submission is not required to be *sealed*. The *registered professional of record* may also specify that standard equipment be utilized which does not involve design and would, therefore, also not require a *seal*. This practice does not absolve the *registered professional of record* of his or her responsibility for the overall design reflected on the *shop drawings* and other relevant documents.

## 2.3 INFORMATION TO BE INCLUDED ON SHOP DRAWINGS

*Shop drawings* must make reference to the appropriate design drawings produced by the *registered professional of record* by indicating drawing number(s) and revision number(s) and the appropriate section of the specification.

The design loads or quantities specified by the *registered professional of record* must be clearly shown on the *shop drawings*. The *shop drawings* must indicate the codes that have been used in the preparation of the *shop drawings*.

*Shop drawings* must include the following information:

1. The original date of issue;
2. The dates of all applicable revisions;
3. The project title;
4. Where applicable, the project address;
5. The project number;
6. Wherever applicable, the name(s) of the:
  - a. Contractor(s),
  - b. Sub-contractor(s),
  - c. Supplier(s),
  - d. Manufacturer(s), and
  - e. Separate detailer(s);
7. The sequence number for each *shop drawing*;
8. Identifications of all products and materials;
9. Relation to adjacent structures or materials;
10. Clearly-identified field dimensions; and
11. Applicable standards . such as a Canadian Standards Association [CSA] or a Canadian General Standards Board [CGSB] number.

When the manufacturer's standard schematic drawings, catalogue sheets, diagrams, schedules, performance charts, illustrations and other standard descriptive data are submitted as *shop drawings*, the contractor is to, where applicable:

- Delete information which is not applicable to the project;

- Supplement standard information where necessary to provide additional information applicable to the project;
- Show dimensions and clearances required;
- Show performance characteristics and capacities; and
- Show wiring diagrams and controls.

*Shop drawings* provided for equipment must use the abbreviations used in the specifications from the *registered professional of record* and, where applicable, include the following:

- Manufacturer identification;
- Model number;
- Installation arrangement;
- Material sizes;
- Construction details;
- Dimensions;
- Weight;
- Operating characteristics as they relate to the use of application;
- Operating performance;
- Performance curves with clearly-indicated performance range(s);
- Equipment efficiency;
- Duty cycles;
- Motor duty cycles;
- Electrical classification;
- Electrical data and characteristics;
- Approvals;
- Sound levels; and
- Vibration levels.

## 2.4 SUBMITTAL OF SHOP DRAWINGS

While the overall process related to the submission and review of *shop drawings* by contractors and sub-contractors should be dealt with contractually prior to the start of a project, the current practice requires fabricators, suppliers or equipment manufacturers to forward *shop drawings* to the sub-contractors or directly to the contractor.

It is recommended that the *registered professional of record* should only accept *shop drawings* for review that the sub-contractor has reviewed and approved, and then forwarded to the *contractor* for review and approval; moreover, it is recommended that the *registered professional of record* should only review *shop drawings* that the contractor has reviewed and where deemed appropriate the contractor has made the required revisions or returned them to the sub-contractor or fabricator, supplier or equipment manufacturer for revisions as required.

Prior to submission to the *registered professional of record*, it is recommended that the contractor review and approve all *shop drawings*. The intent is that by this review and approval, the contractor represents that it has determined and verified all field measurements, field construction criteria, materials, catalogue numbers and similar data, and that it has checked and coordinated each *shop drawing* with the requirements of the work and the contract documents. It is recommended that the contractor indicate its review and approval by including the date and the signature of a responsible person on each *shop drawing*.

The *registered professional of record* may require that *shop drawings* be accompanied by a transmittal letter showing date, project title, project number, the contractor's or supplier's address, and the sequence number of each *shop drawing* submitted.



*Shop drawings* can be submitted in electronic format, in the form of reproducible transparencies or prints as the *registered professional of record* may direct. The format in which *shop drawings* are to be submitted may be established at the start of the project. Similarly the format in which *shop drawings* can be returned as having been reviewed or marked up may be established at the start of the project. Where *shop drawings* are being conveyed electronically a secure format must be used. At the time of submission, the contractor is to notify the *registered professional of record* in writing of any deviations in the *shop drawings* from the requirements of the contract documents.

The *registered professional of record* will forward the *shop drawings* to the appropriate members of the *registered professional of record's* team for review. In performing his or her review, the *registered professional of record* will only review for conformity to the design concept and for general arrangement. Unless a deviation on the *shop drawings* has been previously approved in writing by the *registered professional of record*, such a review by the *registered professional of record* does not relieve the contractor from its responsibility for any and all errors or omissions in the *shop drawings* or from its responsibility for meeting all the requirements contained in the contract documents. The *registered professional of record* must confirm that he/she has reviewed the *shop drawings* e.g., using a stamp that confirms the *shop drawings* have been reviewed. The shop drawing review stamp should include appropriate wording to indicate the nature of the review, and that the *shop drawings* were reviewed for general conformance only to the design concept and for general arrangement. Where variations from the design intent are identified during the review of *shop drawings* they must be documented and followed up.

Unless otherwise directed by the *registered professional of record*, a contractor is to make all changes to the *shop drawings* which the *registered professional of record* may require to be consistent with the contract documents and resubmit the *shop drawings*. When resubmitting the *shop drawings*, a contractor is to notify the *registered professional of record* in writing of any revisions other than those requested by the *registered professional of record*.

## **2.5 SHOP DRAWINGS DURING CONSTRUCTION**

The supply, fabrication or manufacture of components may not commence until the *registered professional of record* has reviewed the *shop drawings*, returned them to the contractor and the contractor provides authorization to proceed.

A copy of the *shop drawings* must be available at all times at the location where the component is being made, at the site of the work, and at the contractor's office and at the *registered professional of record's* office.

## **2.6 SHOP DRAWINGS AFTER CONSTRUCTION**

Upon completion of construction, a copy of all final approved *shop drawings* must be kept with the *final design drawings* in the files of the *registered professional of record*. As appropriate, copies of the *shop drawings* should also be filed in the operating and maintenance manuals.

### **3.0 REFERENCES AND RELATED DOCUMENTS**

*APEGBC Quality Management Guidelines – Use of the APEGBC Seal*

*Guide to the Letters of Assurance in the B.C. Building Code 2006* (December 2010, Edition 5a) [Building & Safety Standards Branch, Ministry of Public Safety & Solicitor General, Province of British Columbia]

*AIBC/APEGBC Practice Note 16: Professional Design and Field Review by Supporting Registered Professionals* (September 2010, First Edition)

*APEGBC/ABCFFP Guidelines for Professional Services in the Forest Sector – Crossings* (March 2005, Revised September 2008)