

To: All HQ Directors, Highways, Transportation Planning & Policy, Partnerships
All Regional Directors
All District Managers Transportation
All Regional Managers, Directors, Project Delivery
All Project Managers
All Regional Managers, Engineering
All Regional Design Managers
All Regional Paving Managers

SUBJECT: RECORD DRAWINGS

PURPOSE:

This Technical Circular clarifies the policy regarding "Record" drawings, outlines the drafting requirements, the deliverables, and assigns the responsibility for delivery of the drawings. This Technical Circular should be read in conjunction with Technical Circular T-06/09 "Engineer of Record, Field Review Guidelines, and Record Drawings" (or any subsequent update/replacement).

BACKGROUND:

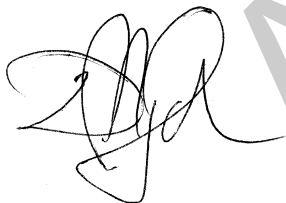
Past practice used the term "As-built" to identify the drawings that showed as-constructed information. The Construction Project Supervisor (now known as the Ministry Representative) was responsible for "As-built" drawings. Until recently this was a Ministry employee. As we move more into the realm of managing the work done by others as well as the use of contracted Construction Supervision, it necessitates an expanded documentation and clarification of roles and responsibilities as well as expected deliverables. In keeping with current industry standards, the term "Record" instead of "As-built" will now be used for these drawings.

POLICY:

Grading and Paving, Bridge Construction, and Electrical Design projects shall have "Record" drawings produced in accordance with the documentation described herein. Responsibility for the delivery shall reside with the person identified under the appropriate type of project.

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GRADING AND PAVING PROJECTS

DECISION CRITERIA

“Record” drawings shall be completed for construction projects in accordance with the following criteria:

Grading Projects:

“Record” drawings will be required on grading projects having a value greater than \$250,000 construction cost and on projects that include intersection improvements, utility relocations or electrical revisions.

Paving Projects:

“Record” drawings will be required if the work involves changing the existing condition of roadway geometry, lane configuration, accesses or intersections.

Overlay Projects:

A Key Plan showing the limits of the work and Typical Section drawings of the overlay work as completed are all that is required.

Curb & Gutter Projects:

“Record” drawings will be required as defined previously under Grading Projects.

District Day Labour or Contract Grade Construction:

For contracts that are too small to warrant the use of CAiCE (or any future Ministry mandated earthwork modeling software), there is no requirement for electronic (AutoCAD) versions of the “Record” drawings. A marked up copy of the original drawings will be adequate. There must be sufficient information provided on the drawings to clearly identify the extent of the work as constructed on the site.

DRAFTING INSTRUCTIONS FOR “RECORD” DRAWINGS

For designs that were drafted using AutoCAD and/or CAiCE, **copies of the original** AutoCAD design drawings are to be used and amended as required to reflect the actual constructed roadway template and amenities at project completion. The Original Design Drawing Files Must Not Be Amended In Any Way. The drawing numbers must remain the same as the originals for storage and retrieval purposes. “Record” drawings must be stand alone documents and contain as much of the original information as possible plus all of the information concerning changes due to construction revisions. This shall include the removal and abandonment of underground utilities. All works removed during construction shall be deleted from the drawings. All works abandoned shall be marked as such. The original design information that has been revised should be erased and replaced by the information that represents the as-constructed works. The Construction Revisions block, as discussed further below, must describe in adequate detail what was removed or changed. If the R/W has been surveyed by a BCLS and a plan registered in the Land Registry Office, change the R/W line style to reflect “existing” R/W and add the legal plan number.

The drawings shall be prepared using the same format and drafting standards as the original design drawings. Drafting Standards are as specified in the Ministry's current version of the *BC Supplement to TAC Geometric Design Guide*. The drawings shall indicate "RECORD" on each sheet. Where AutoCAD was not used to produce the drawings, it will be necessary to make photocopies of the original drawings and manually revise them to reflect the actual constructed product. Insert "RECORD" in the title blocks before PLAN, PROFILE, etc. (e.g. "RECORD PLAN").

Each item or area on the drawing that has been changed from the original design shall have an eight millimetre triangle drawn adjacent to the area of the change with the number of the change inscribed within the triangle. The same number will be shown cross referenced in a Construction Revisions block with a description of the change beside it. The triangle shall be drawn with the apex of the triangle pointing towards the change.

Record drawings shall be signed off in accordance with Technical Circular T-06/09 "Engineer of Record, Field Review Guidelines, and Record Drawings" (or any subsequent update/replacement). The language to be used on the drawings varies depending on who is signing off and who does the drafting, and is discussed in T-06/09 under the heading "Record Drawings".

For electronic drawings, Engineers of Record shall use the digital signature and electronic sealing technology approved by the Association of Professional Engineers and Geoscientists of the Province of BC. Information on this can be found at: <http://www.apeg.bc.ca/ppractice/digitalsignature.html>. Use of the digital signature and electronic sealing is expected to be made mandatory for "Record" drawings at a future date (pending further consultation with the Consulting Engineers of BC). Until digital signatures become mandatory, it will still be acceptable to submit drawings that are hand stamped and signed.

DELIVERABLES

Deliverables shall include a plotted set of "Record" drawings and electronic copies of the drawing files in each of the following formats: AutoCAD (DWG) and Design Web Format (DWFx). Prior to submittal, Consultants must confirm with the Ministry what version the DWG file is to be saved as to ensure compatibility with the current Ministry software. It is recommended that the "e-transmit" feature in AutoCAD be used for preparing the DWG submittal. This will ensure that all files associated with the drawing are included (such as fonts, shape files, plot style tables, x-references, etc).

RESPONSIBILITY FOR DELIVERY

The Project Manager shall determine whether the Ministry Representative (MoT or Consultant) or the Contractor will be responsible for delivering the “Record” drawings.

This process is not intended to preclude continuous liaison between the Ministry Representative and the designer during construction regarding design and construction problems. Changes to the original design contract drawings for the production of “Record” drawings will mostly be the result of field fits (e.g. exact culvert locations); however, if a major design change is required during construction then the Engineer of Record must provide signed and sealed revised contract drawings.

All of the Contract drawings shall be included as separate “Record” drawings except Spot Elevations, Mass Haul Diagrams, Gravel Haul Charts and Staging Drawings.

After a final review by the Ministry Representative and the Contractor, and when no further changes are to be made to the drawings, the signed drawings (or signed marked up copies of originals for small projects) shall be forwarded to the Ministry’s Project Manager. This may be someone in a District, Regional, or Headquarters office. The signed drawings shall be accompanied by the electronic drawing files. The Project Manager shall be responsible for filing the “Record” drawings as follows:

- i) Plotted full size signed original “Record” drawings – send to HQ, attention: Chief Engineer.
 - If plotted drawings are received that are hand stamped and signed, the HQ Engineering Branch Drawing Coordinator will arrange for them to be scanned into PDF format. The original drawings will be archived by the HQ Information and Records Services office. The electronic PDF document will be filed as described below.
- ii) Electronic copies (DWG, DWFx) – send to HQ, attention: Chief Engineer.
 - These files will be copied to the appropriate sub-directory on the Public LAN drive and/or into TRIM by the HQ Information and Records Services office. If you require assistance to locate any stored files, contact HighwaysInformation.RecordsServices@gov.bc.ca
 - Files will be stored on the LAN under “P:\HQ”.
 - Files may be located in TRIM by searching by classification: TRAN-49000-70, and Owner Location: TR Hwy Engineering Branch. Further search parameters can be used to find a specific set of drawings. Drawings will have all the information from the title block entered as part of the file metadata (e.g. project number, contract number, location, bridge number, drawing negative numbers, etc).

The filing of the drawings as noted above does not preclude the Project Manager from requesting that photocopies of the full size or half size drawings be provided to Regional or District offices if desired. Providing electronic copies is not necessary since they will be available from a central location (i.e. LAN and/or TRIM).

BRIDGE CONSTRUCTION PROJECTS

The *Bridge Standards and Procedures Manual, Volume 2 - Procedures and Directions* documents the requirements for the submission of Record Drawings. The manual can be found at the following web site:

http://www.th.gov.bc.ca/publications/eng_publications/bridge/bridge_standards.htm#manual

Signing and sealing will be in accordance with “Grading and Paving Projects” above.

ELECTRICAL DESIGN PROJECTS

Section 200 of the latest edition of the *Electrical and Traffic Engineering Manual* documents the process for production of Record Drawings for Ministry Internal Work, Municipal or Developer Work and Design/Build Projects. Section 710 outlines the methodology for making drawing revisions and record drawings. The manual can be found at the following web site:

http://www.th.gov.bc.ca/publications/eng_publications/electrical/electrical_and_traffic_eng/2004-Electrical_Signing_Design_Manual/tableofcontents.htm

Signing and sealing will be in accordance with “Grading and Paving Projects” above.