

DESIGN BULLETIN #19/2004 (Updated June 2015)

Engineering Consultant Guidelines for Highway and Bridge Projects, Volume 1 Design and Tender 2002 Design Cross-Sections on Major Grading Projects

June 2015 Update: Superseded in 2011 by Engineering Consultant Guidelines for Highway and Bridge Projects, Volume 1 – Design and Tender: <http://www.transportation.alberta.ca/915.htm>

Summary: This design bulletin is being issued as an amendment to Alberta Transportation's Engineering Consultant Guidelines for Highway and Bridge Projects, Volume 1 Design and Tender 2002.

For all major grading projects, Consultants shall now submit as part of their tender document submission, an electronic file containing all design cross-sections for use by Bidders during the tendering process.

Background

In the Winter of 2002, the Alberta Roadbuilders and Heavy Construction Association (ARHCA) asked the Operations Committee if it would be possible to provide bidders with design cross-sections on grading tenders during the tender period.

In the Spring of 2003, a working committee comprised of Alberta Transportation, Consulting Engineers of Alberta (CEA) and ARHCA was formed to investigate the format and the requirements of the cross-section information.

In the Summer of 2003, design-cross sections were provided on several grading projects on a trial basis. The results of these trials form the basis of this Design Bulletin.

Implementation

Effective immediately, for all Alberta Transportation grading or grade-widening tenders with more than 100 000 cubic metres of excavation, the tender package shall include an electronic Adobe Acrobat file containing all available design cross-sections for the project.

The design cross-sections shall be submitted to Professional Services Section with the Design and Tender package submission.

Alberta Transportation will post the electronic file on COOLNet, and will print hard-copies for resale through the tender distribution offices.

Submission Format

The design cross-sections shall be provided to Professional Services in electronic format (Adobe Acrobat Version 4x) as one electronic file. On large grading projects, where there are more than 750 design cross-sections, or where the electronic file exceeds 3MB in size, the Consultant may split the project into 2 or more separate electronic files.

The design cross-section electronic file shall have the following requirements:

- Each page shall be formatted to fit 8.5" x 11" size paper;
- Design cross-sections shall be printed one cross-section per page;
- Each cross-section shall be printed with "landscape" orientation;
- Each page shall be provided with a minimum ½ inch border on the long edge to facilitate binding;
- All available design cross-sections shall be included in the electronic file(s);
- Each cross-section shall show the station number, horizontal and vertical scale, and both horizontal and vertical gridlines;
- Changes to horizontal and vertical scale should be minimized (or avoided). Whenever possible, the Consultant should attempt to maintain constant horizontal and vertical scales for all cross-sections. In the event that project requirements dictate a scale change(s), the revised scale should be maintained for a length of at least 200 metres;
- The recommended horizontal and vertical scales are:
 - Horizontal: 1:250 or 1:500 (depending on width of cross-section)
 - Vertical: 1:50, 1:75, or 1:100 (dependent on the terrain – i.e. flat or rolling). In areas of extreme grade heights (stream crossings, large cuts or fills) 1:200 vertical scale may be used.
- Each cross-section shall show all design surfaces, (original ground, design, undercut, finished surface, etc...);
- All cross-sections shall be created in black and white. To facilitate printing, all lines and text shall be black. The Consultant may use different line-types to designate different surfaces, however, the Consultant shall ensure different line-types can be reproduced by a standard photocopier.

Methodology for Creating Design Cross-Sections

The methodology used by the Consultant to create the Design Cross-Sections will be at the discretion of the Consultant. Because different Consultants may use different software packages for the creation of the cross-sections, there is no "one-size-fits-all" methodology that can be used by all Consultants.

For informational purposes, the following two methodologies have been used by Consultants for the creation of an electronic design cross-section file using cross-sections created using the EMXS software:

Method 1

1. From the designed earthworks database, .DXF (Digital Exchange File) files are created within the design software for each cross-section.
2. A software product "PLOT2PDF" (www.softcover.com) is used to create a PDF file for each DXF cross-section.
3. Adobe Acrobat is then used to combine all of the separate PDF files into one large PDF file.

Method 2

1. Use EMXS panel 5.2.P to generate .PLT files as you would normally do to print x-sections on a printer. (Note: to keep the EMXS x-section .PLT files in numerical sequence, do up to 99 x-sections at one time.)
2. Use Plot2PDF option Export > Export PDF Booklet to convert the EMXS .PLT files to a PDF format booklet. The EMXS PLT files will be in your current EMXS project directory. Highlight the PLT files starting with the highest number (e.g. Plot99.PLT).
3. Repeat steps 1 and 2 as required, making sure you delete the previously created PLT files from your EMXS project directory each time.

Note: It should be noted that both methodologies have utilized 3rd party software "PLOT2PDF". Alberta Transportation does not recommend or endorse the use of any 3rd party software package. The use of "PLOT2PDF", or any other 3rd party software for the creation of design cross-section books is solely at the discretion of the Consultant.

Contacts

Any questions with regard to this Design Bulletin should be directed to Alberta Transportation's Professional Services Section (Attention: Greg Plewis, Tender Preparation Specialist (780) 427-7393.

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