

DATE: September 19, 1995
TO: Staff Bridge Engineers and Technicians

FROM: P. K. Padhiar

SUBJECT: Metric Details

Currently the Staff Bridge Branch has several metric projects designed and in the final stages of plan preparation. A meeting was held in the Bridge conference room on Monday September 10 to discuss the status of metric plan preparation and to resolve some confusion over metric plans. In attendance were Keith Heater, Mark Leonard, Ron Dickey, Sham Chowdhury, Joe Viridi, Sharon Wilson, and P. K. Padhiar. In order to assure consistency in the plans we produce and to provide guidance for upcoming projects, the following recommended practices have been agreed upon.

General Policy:

All elevations and stations shall be in meters. Dimensions provided by the Regions, i.e., lane widths, shoulders, shall be in the units shown on the roadway drawings (either mm or m). When hydraulics information is shown, dimensions shall be in millimeters, except that elevations and stations shall be in meters. All other information shall be in the units shown by Hydraulics.

Dimensions in a string shall all be the same unit. For example, then the lane and shoulder widths are shown in meters, the width of the rail or curb shown in the same string shall be shown in meters. The overall width of the structure which is on a different dimension line or in a different string, should be in millimeters. See the attached General Layout for an example.

Zero Sheet:

The general notes shall include the following statements which has also been added to the working drawings:

Elevations and stations are in meters. All other dimensions are in millimeters unless otherwise noted.

General Layout:

Station tick marks shall be at 20 m intervals and shall be shown on the horizontal control line in the plan view and below the section view. If details become cluttered, the stations may be shown only for the even 1000 meter stations, otherwise, stations should be shown for each tick mark. At least two stations must be shown to serve as a reference for the direction of stationing.

For extremely large or complex layouts, the above policy may require modification.

Dimensions:

Dimensions shall be shown to the nearest whole millimeter; fractional millimeters should not be used. A dimension that is to be divided by a center line should be rounded to an even number, ie. do not use 305 mm, half of which is 152.5 mm.

Plate Sizes:

Suppliers indicate that plate can be rolled for any metric dimension. The mills will actually make a soft conversion of metric dimension and roll plate to the next largest size rounded to the nearest one thousandth of an inch (0.025 mm).

The Staff Bridge policy shall be to design with plate dimensions in whole millimeters as shown in the CDOT Metric Conversion Manual. Therefore, plate sizes shall be shown in whole millimeters.

Reinforcing Bar:

Bar lengths should be rounded to the nearest millimeter. Calculations should be to the nearest whole millimeter.

To facilitate reading bar numbers on the bar list, put bar size first, letter designation, and then the bar designation. For example: 10A401, 25RW003

It is not necessary to put an M in the bar list number designation for metric bars. Where not included in a bar list, all other bar call-outs should still be shown per CRSI, ie. #10M, #15M, etc.

Page 3
September 19, 1995
Metric Details

Bridge Geometry:

Bridge Geometry output, Roadway Approach elevation sheets, and Bridge Deck Elevation sheets are noticeable exceptions to the general metric policy. All Stations, Elevations, and Distances shown in these documents will be in meters. The note at the bottom of the elevation sheets will require a millimeter dimension from finished grade to top of concrete.

Keith Heater will coordinate revisions to the working drawings and the Picasso program to include an explanation of the units used on the Roadway Approach and Bridge Deck Elevation sheets.

Reference:

The primary reference for metric conversion will be the CDOT Metric conversion Manual, the Standard Specifications Using International System of Units, and metric versions of our working drawings and the M & S Standards. Other references may be used where appropriate.

Attachment

PKP/SLW/ld

cc: P. K. Padhiar
S. W. Horton
M. A. Leonard
S. Chowdhury
S. Wilson