



MINNESOTA DEPARTMENT OF TRANSPORTATION  

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Bridge Office

# Summary of Drafting Standards

MnDOT BRIDGE OFFICE

# Summary of Drafting Standards

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# INTRODUCTION

The MnDOT CADD Standards contain the CADD standards for all MnDOT plans (found at <https://www.dot.state.mn.us/caes/>).

The MnDOT Bridge Office has adopted additional drafting standards, found in this document, for use when creating MnDOT bridge plans. The *MnDOT Bridge Office Summary of Drafting Standards* is meant to be used only when drafting bridge plan sheets and does not apply to other types of MnDOT plans.

Use of these drafting standards is recommended when drafting plans for bridges on the state trunk highway system. Use of these standards is also encouraged for bridges on the local system.

## Open Bridge Modeler (OBM) CADD Workspace and Configuration

The Bridge Office has created a CADD environment for Open Bridge Modeler which defines the configuration and necessary files for preparing bridge plans.

MnDOT Bridge Office users can ensure they are using this environment by launching OBM from ProjectWise. If working outside of ProjectWise, use the desktop shortcut that was created with the OBM installation, then browse to open the file.

Consultants may download the MnDOT workspace environment from the MnDOT web site (<https://www.dot.state.mn.us/caes/>). Consultants should confirm they are using the current workspace prior to starting a new project.

Double-clicking and opening a file from Windows Explorer is discouraged as this may open OBM with an incorrect workspace.

# DRAFTING REQUIREMENTS

## General

Use sheets efficiently; make use of open spaces for special details. Balance the number of details on plan sheets to avoid having one crowded and another empty. Do not overcrowd sheets. Use additional sheets instead.

Provide final hard copy sheets (11" x 17") that are readable. Review the sheet PDF or physical hard copy for line weights, patterning, text sizes, and legibility, not the view in OBM.

Show the initials of the individuals responsible for the design, drafting, design check, and drafting check on all plan sheets except the survey sheets, boring sheets, any unrevised information sheets (such as those showing alignment tabulations, superelevation transitions, or aesthetics) taken from the preliminary bridge plan, and the as-built sheet. On the boring sheets, show the initials of the individuals responsible for the drafting and drafting check. Do not include periods between initials.

Also, insert the initials of the design checker only after the design has been checked and the drafting checker only after the sheet has been checked.

Include an engineer certification block on all sheets, except the survey sheets, boring sheets, any unrevised information sheets (if provided), and the as-built sheet.

Include a blank plan sheet revision block on all sheets, except bridge survey sheets, boring sheets, any unrevised information sheets (if included), and the as-built sheet.

When copying details from other plans, make sure details are applicable and to the correct scale.

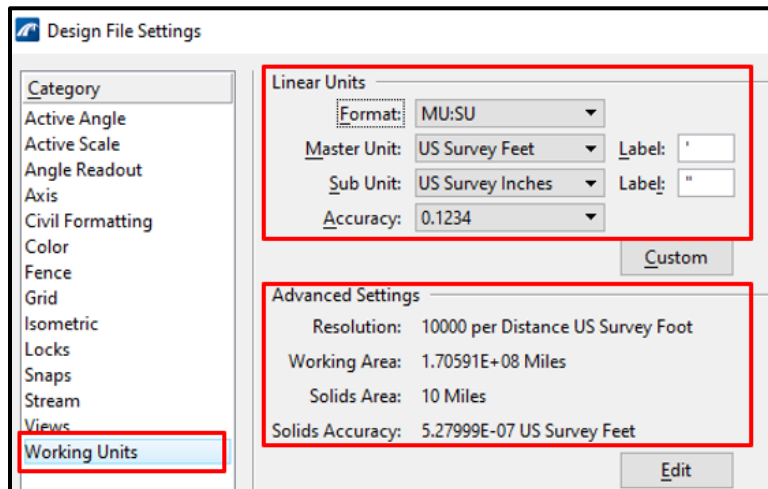
Never copy bridge standard details from other plans. Always use the most current standard downloaded from the Bridge Office web site (<https://www.dot.state.mn.us/bridge/standards.html>).

Make sure details, data, and other information, which may be given on more than one plan sheet, agree between plan sheets.

Refer to the *Guidelines for Checking Final Design Bridge Plans* as well as other drafting aids on the MnDOT web site (<https://dot.state.mn.us/bridge/drafting-aids.html>).

## Working Units

The seed files delivered in the MnDOT Bridge Office OBM workspace define Survey Feet as the master units and Survey Inches as the sub-units. These working units are consistently defined in all MnDOT Bridge Office OBM seed files. The resolution is set at 10000 units per Survey Foot, enabling precise measurement and design accuracy up to 0.0001 Survey Feet. See Figure 1.



**Figure 1 – MnDOT Bridge Office Working Units**

## Seed File

The seed files contain the appropriate models for starting new DGN files for a bridge structure project. Multiple drawings (models) can exist (and usually will) within a single DGN file. Each model can be thought of as its own design space, complete with its own settings and configuration. See Table 1 for seed file options.

There are three types of models available.

- Design
- Drawing
- Sheet

Design and Sheet models can be two or three-dimensional, while the drawing models are limited to two dimensions. The MnDOT Bridge Office uses the following seed files.

**Table 1 – MnDOT Bridge Office Seed Files**

Seed File Name	Description
E2Dseed_Design_Brg.dgn	Imperial units (English) 2D seed file for design. Used for generating the 2D models of structures.
E2Dseed_Drawing_Brg.dgn	Imperial units (English) 2D seed file for drawing. Used for generating the 2D models of structures.
E2Dseed_Sheet_Brg.dgn	Imperial units (English) 2D seed file for Sheet. Contains sheets and planning sheet models in which ANSI B (11"x17") sized borders have been placed.
E3Dseed_Design_Brg.dgn	Imperial unit (English) 3D seed file for design. Used for generating the 3D models of structures.

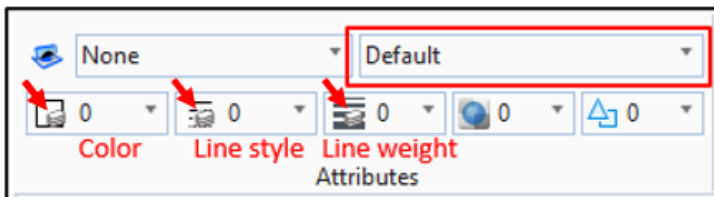
These seed files are available at the following ProjectWise location:

pw:\\Documents\CADDStandards\Workspaces\MnDOT\_CE\Standards\Seed\

## Level Structure

The MnDOT workspace defines levels and level filters which form the foundation of the plan production and modeling workspace. These are defined within the MnDOT DGN Library. This DGN Library contains level definitions for each Department discipline, including bridge, roadway, construction, surveys, etc. All level symbology definitions are present within this DGN Library, and the defined attributes include the name, color, line style, and weight for each level.

Before placing elements into a design file, first select the desired level. This ensures that elements are created on the correct level and the associated symbology will be automatically set correctly. Note that the Attributes toolbar buttons for color, line style, and weight should all be set to "By Level" in order for the level symbology settings to be applied. When an attribute is set to "By Level", the OBM level symbol can be seen in the drop-down menu. See Figure 2.



**Figure 2 – Element Attributes**

The Bridge Office standard design level libraries define standard Level names. Drafters should use these standard Levels for Bridge Office plan production in all CADD standard design files. The

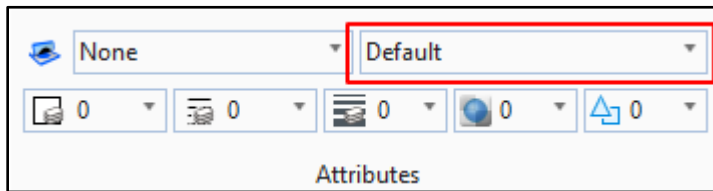
following describes the Bridge Office’s basic level naming convention. The naming format of the level convention is based on the “AIA & NCS” standard.

There are four defined layer name data fields: Discipline Designator, Major Group, and two Minor Groups. Each data field is separated from adjacent fields by a dash ("-") for clarity. In the example layer name “SB-ABUT-PILE-CONC”, SB denotes STRUCTURAL BRIDGE, ABUT denotes ABUTMENT, PILE denotes PILING, and CONC denotes CONCRETE.

For a comprehensive list of standard Bridge Office Levels, see Table A in Appendix A at the end of this document.

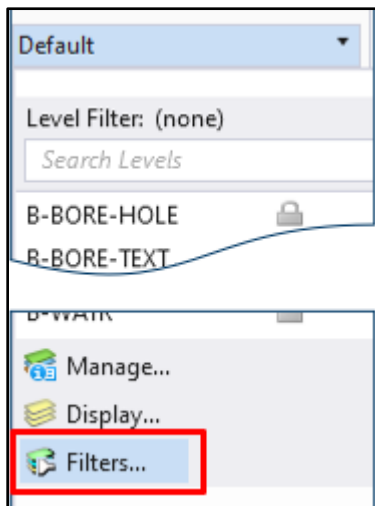
Level Filters have been set up to make it easier to locate a particular discipline’s group of levels. The Active Level Filter dialog, located on the Level drop down, allows users to select the set of levels viewed within the Level Manager or Level Display dialogs. Use the following three step process, as seen in Figures 3a, 3b, and 3c, to find the Bridge Office level filter (MnDOT\_Mstn\_StruBridge-LevelElemTpl).

**Step 1:** Select the Level drop-down menu in Attributes.



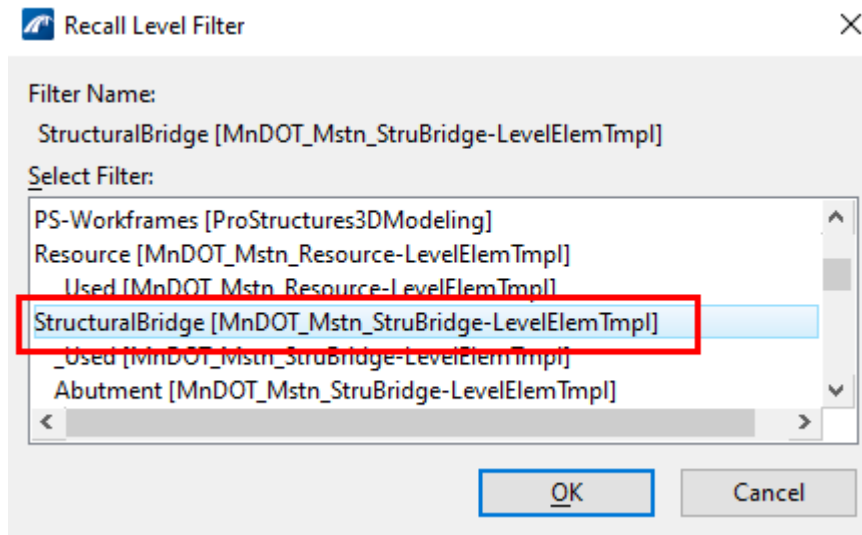
**Figure 3a – Attributes Menu**

**Step 2:** Select Filters.



**Figure 3b – Level Drop-down Menu**

**Step 3:** Select "MnDOT\_Mstn\_StruBridge-LevelElemTpl" and click "OK".



**Figure 3c – Recall Level Filter**

## Symbology

Element line symbology standards. See Table 2.

**Table 2 – Standard Line Symbology**

Line Description	Line Weight (WT)	Line Code (LC)
Centerlines	2	4 (CL)
In-place Structure *	1	2
Drawings – Object lines	3*	0
Drawings - Reinforcement	2*	0
Utilities	1	0
Hidden lines *	2	2
Dimensioning witness line	2	0
Dimensioning Text	3	0
Text – Normal	3	0
Text – Headings, etc.	5	0

\* Symbology may be adjusted for clarity.

## Scales

As part of implementing an OBM workflow, the Bridge Office has introduced the use of annotation scales for bridge drafting. Annotation scales enable the utilization of a single set of text styles, dimension styles, and scalable symbols, which can be displayed at any scale required for screen display or printing.

The Bridge Office CADD environment defines the scales shown in Table 3a and Table 3b below, which are used for development of bridge plans and models.

The ratios shown below are utilized automatically. The drafter does not need to make any size calculations since the various cell, text, and dimension libraries have been constructed to accommodate these scale definitions.

These annotation scales are used for multiple purposes, including the automation of cell sizing for point features and automated text sizing when using text and dimension styles. Prior to using text or dimension styles within a design file, the annotation scale for the DGN model should be set, and the annotation scale toggle must be turned on. See Figure 4.

**Table 3a – Engineering Scale**

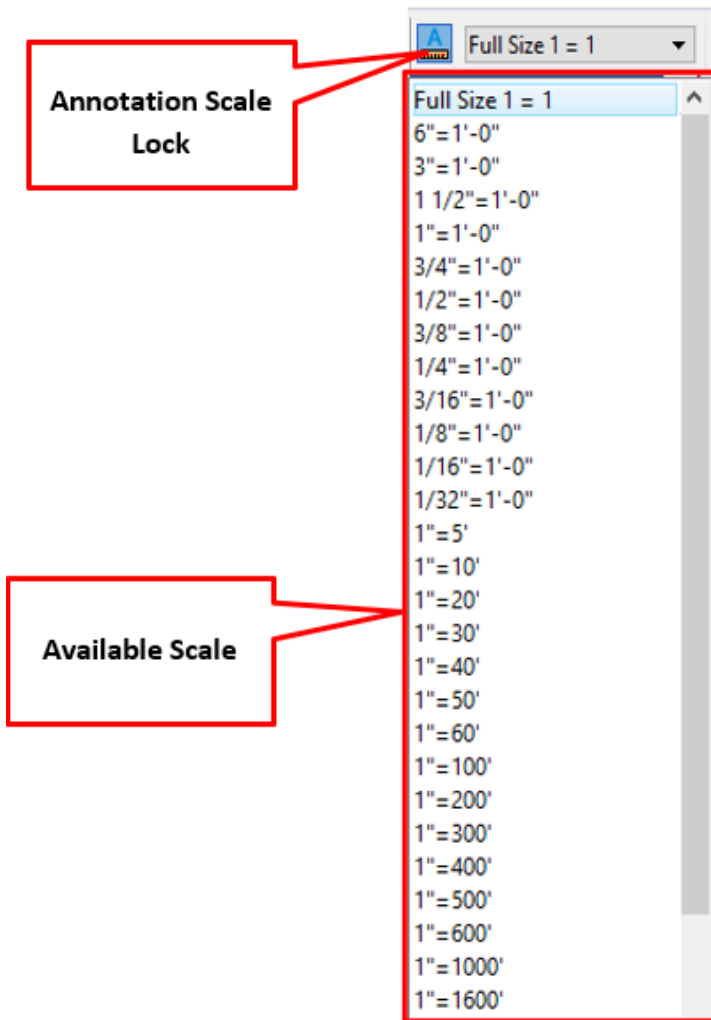
Scale	Ratio
1" = 500'	1:6000
1" = 200'	1:2400
1" = 100'	1:1200
1" = 60'	1:720
1" = 50'	1:600
1" = 40'	1:480
1" = 30'	1:360
1" = 25'	1:300
1" = 20'	1:240
1" = 10'	1:120
1" = 5'	1:60
1" = 2.5'	1:30
1" = 2'	1:24

**Table 3b – Architectural Scale**

Scale	Ratio
1/32" = 1'-0"	1:384
1/16" = 1'-0"	1:192
1/8" = 1'-0"	1:96
3/16" = 1'-0"	1:64
1/4" = 1'-0"	1:48
3/8" = 1'-0"	1:32
1/2" = 1'-0"	1:24
3/4" = 1'-0"	1:16
1" = 1'-0"	1:12
1 1/2" = 1'-0"	1:8
3" = 1'-0"	1:4
6" = 1'-0"	1:2

There are several ways to set the annotation scale in OBM. One way is to use the "Drawing Scale" ribbon group located at the top of the screen while in the "Utilities" tab. In this ribbon group, the user can toggle the annotation scale on/off and select the active annotation scale from the drop-down list. See Figure 4.





**Figure 4 – Annotation Scale**

## Hatch Area

Elements used to define a hatched area can be in the active model or in references. Where associative patterning is used, any modification to elements defining the hatched area results in an equivalent update to the hatching.

Set level to = SB-HTCH

Use a 45° (-45°) angle for hatching and cross-hatching.

## Reinforcement

Use appropriate level name (see Table A in Appendix A for a list of levels).

All level symbology definitions are present within this DGN Library, which automatically defines attributes such as name, color, line style, and weight for each level.

Detail reinforcement with one line, not two lines. For crowded drawings, do not show every rebar. Label representative rebars.

When showing rebar sections, provide a circle that measures  $\frac{1}{16}$ " in diameter on the final print (11" x 17") (Use cell "Br0" or set the radius of the circle to  $\frac{1}{4}$  the normal text size. For example, TX=0.0052, set radius=0.0013").

Label and dimension rebar splices.

When detailing bars in a plan view or cross-section that lap with in-place dowels, show the new bars as filled circles and the in-place dowels as unfilled circles.

New bars →●○← In-place dowels

When detailing deck longitudinal bars in a cross-section, show the continuous bars as filled circles and the additional bars over the piers as unfilled circles.

Continuous longitudinal bars →●○← Additional bars over piers

Do not use the *ACI Detailing Manual* or *CRSI Manual of Standard Practice* method of referencing bar bend details by letter to generic shapes. Use the MnDOT method for showing bar bend details:






- Show each bar bend detail, with the bar marks it applies to listed below the detail.
- For each bar mark, provide out-to-out length dimensions at each bend, except one.
- Only show a radius dimension on nonstandard bends.
- For slopes in bar bend details, show the angle using a fractional ratio relative to 12. For example, for a 27 degree slope, show 6 1/8 : 12.

Provide a Bill of Reinforcement for all reinforced concrete work. See Figure 5.

In the Bill of Reinforcement, provide columns containing the following for each bar:

- Bar mark (See LRFD Bridge Design Manual, Article 5.2.2 for details)
- Number of bars
- Total length of bar
- Small schematic of actual bar shape
- Bar location
- Leave extra rows at the bottom of the Bill of Reinforcement for possible additions

With staged construction, use separate columns for each stage in the Bill of Reinforcement and Summary of Quantities.

BILL OF REINFORCEMENT FOR XXXXXXXX				
BAR	NO.	LENGTH	SHAPE	LOCATION
AX01	..	---		-----
				
				
				
				

**Figure 5 – Bill of Reinforcement**

## Dimensioning

The MnDOT Bridge Office CADD environment also defines dimension styles. Dimension styles simplify the placement of dimensions and promotes uniformity. Dimension style settings are pre-defined inside a DGN library. The fonts defined in text styles are utilized in these dimension styles. The annotation scale also applies to dimension styles. When placing dimensions, set the drawing scale as appropriate and turn on the annotation scale lock. Then, the sizes of text and dimensions will be appropriate scale.

- Do not use curved leader lines.
- Be consistent throughout the plan with the distance between dimension lines.
- Round dimensions to the nearest 1/8 of an inch.

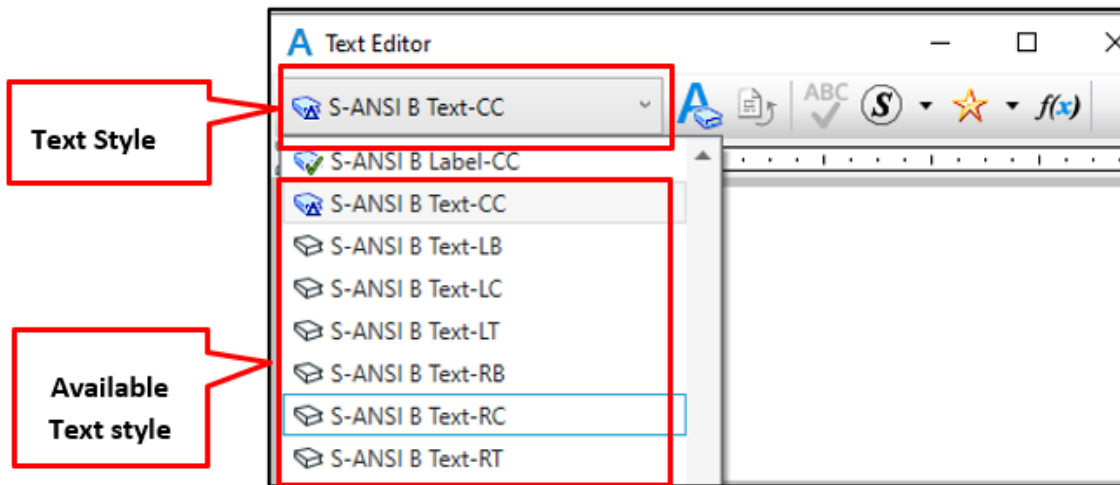
Table 4 shows the dimension styles which are configured in the workspace for the Bridge Office. Make every effort to use automatic dimensioning with the element association enabled.

**Table 4 – Dimension Style**

Dimension Style	Description
S-ANSI B Angle D.DDDD	Placing Dimension Angle (decimal)
S-ANSI B Angle D.MM.SS	Placing Dimension Angle (degree minute & second)
S-ANSI B Auto	Placing Dimension (terminator inside or outside)
S-ANSI B Curve-length	Placing Dimension curve (linear length)
S-ANSI B Curve-length-dec	Placing Dimension curve (decimal)
S-ANSI B Curve-length'-"	Placing Dimension curve (feet, inches)
S-ANSI B INLINE	Placing Dimension (text placed in-line)
S-ANSI B Inside	Placing Dimension (terminator placed inside)
S-ANSI B Note	Placing Note with leader
S-ANSI B Outside	Placing Dimension (terminator placed outside)
S-ANSI B OutsideExt	Placing Dimension (extension line extended outside)

## Text

Use true type font "Calibri" as the standard text font style for all MnDOT drawings. When placing text, choose a text style. Selecting a text style will automatically adjust the text settings. When text styles are utilized, there is no need to manually adjust the font, text height, text width, line spacing, or other properties independently. It is only necessary to identify the drawing scale and activate the annotation scale lock when placing text. See Figure 6.



**Figure 6 – Text Style**

Various text styles have been configured in the workspace for use in the preparation of bridge plans. These text styles are configured as appropriate in many different tools used for drafting. See Table 5.

**Table 5 – Text Styles Configured in the Workspace**

Text Style	Description
S-ANSI B Text CC	Placing Text (center justification)
S-ANSI B Text LB	Placing Text (left bottom justification)
S-ANSI B Text LC	Placing Text (left center justification)
S-ANSI B Text LT	Placing Text (left top justification)
S-ANSI B Text RB	Placing Text (right bottom justification)
S-ANSI B Text RC	Placing Text (right center justification)
S-ANSI B Text RT	Placing Text (right top justification)
S-ANSI B Label CC	Placing Heading, Titles, View, etc.

Text style settings generally should not be overridden, with two exceptions: the text background and underline. Changing other settings defeats the purpose of using text styles. Furthermore, if text styles have been modified and the 'dgnlib update' key-in command is executed, the changes will be reset to the default values of the associated text styles.

Calibri font files do not include certain special symbols commonly used by drafters, such as center lines, degree symbols, and other engineering symbols. In order to access these unique characters not typically available in standard Calibri fonts, the department utilizes Lucida Unicode font files. Some examples of the available characters include fractions, mathematical symbols, survey symbols, Greek letters, and super/subscripts. Additionally, Lucida Unicode font files expand upon the Unicode definition by introducing additional engineering symbols like  $\text{⌚}$ ,  $\pm$ ,  $^\circ$ , and various fraction combinations. Access to these characters is provided through the "Insert Symbol" tool within the OBM Text Editor/Word Processor dialog.

## Cell Libraries

Cell libraries are standard DGN files with a “.cel” filename extension. Cell libraries utilize the design model concept with each cell definition occupying its own model. The cell libraries are used in a variety of drafting tools as well as used by feature definitions.

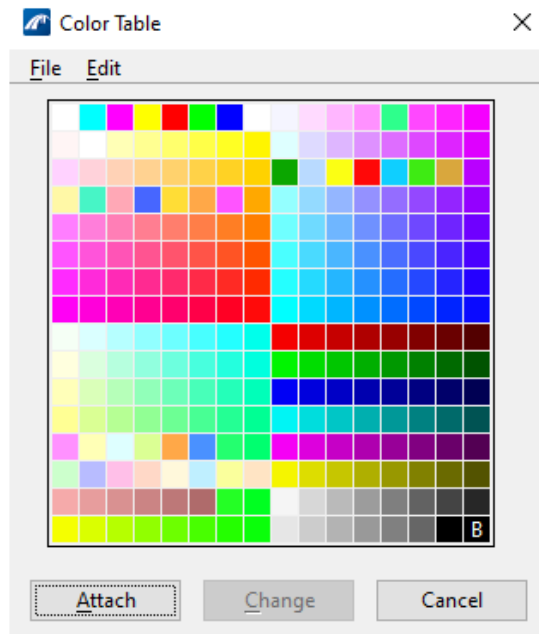
The cell libraries in the workspace have been adjusted for size to accommodate annotation scale changes. The MnDOT cell libraries are automatically built into the OBM workspace when accessed from ProjectWise or downloaded from MnDOT’s web site. The following cell libraries, as seen in Table 6, are available for Bridge Office use.

**Table 6 – MnDOT Bridge Office Cell Libraries**

Cell Library Name	Description
MnDOT_BRG_PLAN_BRDR.cel	Bridge Office plan borders cells
MnDOT_BRG_PD.cel	Bridge Office Preliminary Design cells
MnDOT_BRG_FD.cel	Bridge Office Final Design cells

## Color Table

The MnDOT Bridge Office OBM workspace contains standard color definitions for use in bridge plan preparation. The standard colors are defined in the file named “MnDOT color.tbl” as preset by the MnDOT OBM workspace variable. See Figure 7 for the standard MnDOT color table.



**Figure 7 – Standard MnDOT Color Table**

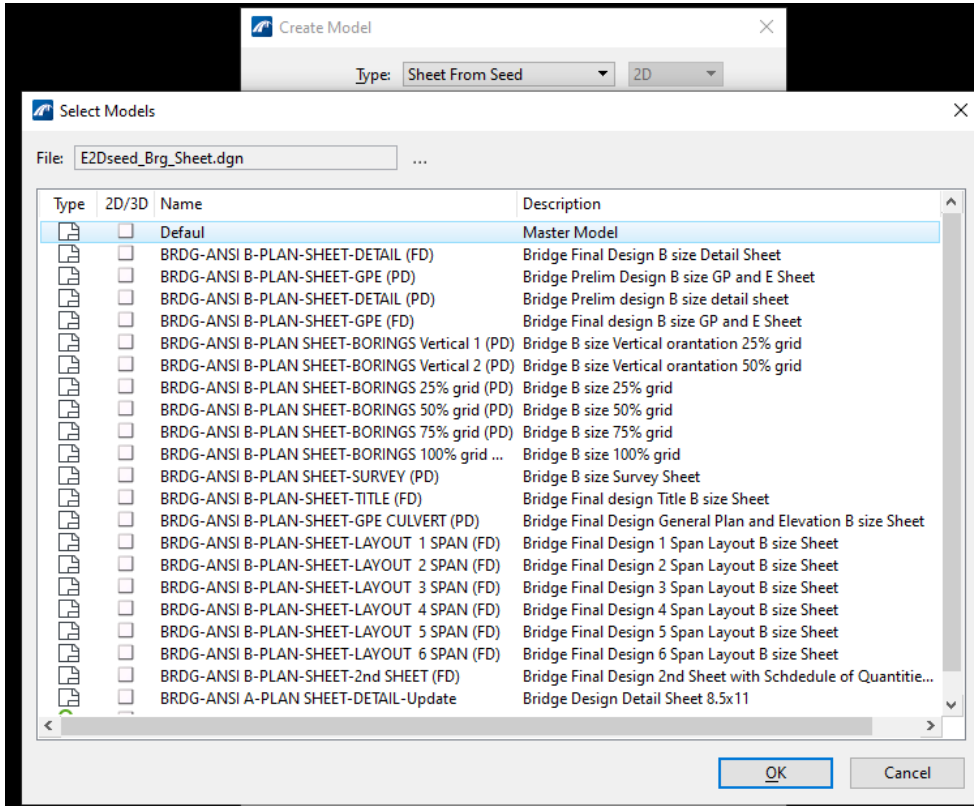
## Plan Production

All drawings will be drawn at true scale in design models.

All Final Design plots will be made from Sheet Models. Preliminary Design plots will be made from coordinate correct Design Models, which aids in the passing of information to other functional groups.

Sheet size: 11"x17" (ANSI B size).

The following Sheet Models, as seen in Figure 8, are available in the MnDOT workspace for bridge plan production.



**Figure 8 – Sheet Models**

## Plan Sheet Order

Table 7 shows the order of sheets for the final bridge plan of a typical new structure. Plan sheet placement can vary when project size and complexity are factors. In general, plan sheets are placed in the order a bridge is constructed, from the foundation up.

**Table 7 – Order of Sheets for Typical Final Bridge Plans**

Sheet Title	Notes
Title Sheet	Use when a bridge is let separately from grading, or when work is being completed at different locations.
General Plan and Elevation	General Plan and Elevation, Construction Notes, and other Miscellaneous Notes.
Schedule of Quantities and Transverse Section	Schedule of Quantities, Transverse Section, and Construction Notes (if not on GPE sheet), and other Miscellaneous Notes.
Staging Plan	Show staging for removals and construction.
Bridge Layout	Show Working Point Layout, stool and beam heights, simple superelevation charts, etc.
Removal Details	Complex removal details may be shown on a separate plan sheet. Otherwise, removal details should be included with the structure details.
Abutment 1 Details	For abutment geometrics, tie corners and piles to Working Points.
Abutment 1 Reinforcement	Abutment reinforcement follows abutment details.
Abutment 2 Details	<i>Similar to Abutment 1 Details.</i>
Abutment 2 Reinforcement	<i>Similar to Abutment 1 Reinforcement.</i>
Pier 1 Details	For pier geometrics, tie corners and piles to Working Points.
Pier 1 Reinforcement	Pier reinforcement follows pier details.
Pier 2 Details	<i>Similar to Pier 1 Details.</i>
Pier 2 Reinforcement	<i>Similar to Pier 1 Reinforcement.</i>
Framing Plan	Include any drafting aids as needed.
Beam Details	Steel Beams and/or Prestressed Concrete Beams.
Superstructure Details	Include deck plan and any drafting aids as needed.
Corner Details	Corner details should be included with the superstructure details, or deck plan. Complex corner details may be shown on a separate plan sheet.
Superstructure Reinforcement	Include Bill of Reinforcement and Summary of Quantities.
Barrier, Parapet, Railing, and/or Fencing Details	
Expansion Joint Details	
Utilities/Conduit Systems	
Slope Paving Details	
B-Details	
As-Built Bridge Data	
Superelevation	For complex superelevations, include grading plan layout or line diagram, if provided on Preliminary Plan.
Bridge Survey	Obtain from Preliminary Bridge Plan.
Borings	Show test piles and footing locations on boring sheets, obtained from Preliminary Bridge Plan.

## File Naming Convention

Set the file name in accordance with the following:

"BR" + "bridge number" + "designator"

(designator = "\_" + "file extension" + ".dgn")

Example:

BR12345\_abt.dgn

On Consultant created files, include a "C" prefix in the filename.

Example:

CBR12345\_abt.dgn

## Designator

### NEW BRIDGE PLANS:

_abt.dgn	Abutment Details and Reinforcement
_det.dgn	B-Details, Standard Sheets, and As-Built Bridge Data Sheet
_exp.dgn	Expansion Device Details **
_pcb.dgn	Concrete Beam Details **
_pir.dgn	Pier Details and Reinforcement
_ral.dgn	Railing and Median Details **
_s12.dgn	General Plan and Elevation, Bridge Layout, Variable Super Charts, and Quantities
_stl.dgn	Steel: Beams, Framing Details, etc.**
_sup.dgn	Superstructure: Deck Plan, Framing Plan, Integral Diaphragm, Deck Transverse and Longitudinal Sections, and Sidewalk and Median Sheets.
_sur.dgn	Survey: Plan and Profile
_sys.dgn	Conduit Systems: Power, Lighting, Phone, Signals, etc.

\*\* These plan sheets may be included in the "sup" file extension.

### BRIDGE REPAIR PLANS:

_app.dgn	Approach Panels
_rem.dgn	Removals
_rep.dgn	Repair
_stg.dgn	Staging Plans

### ES/ESS CHECKING FILE:

_chk.dgn	Bridge plan checking file
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## DRAFTING RESOURCES

The *MnDOT CADD Standards* can be found at:

<https://www.dot.state.mn.us/caes/>



Other bridge specific drafting resources can be found at:

<http://www.dot.state.mn.us/bridge/drafting-aids.html>

or (MnDOT internal access only):

pw:\\pw8i.ad.dot.state.mn.us:cadp\Documents\Bridge\Final\_Design\ -Resources

The *MnDOT LRFD Bridge Design Manual* can be found at:

<http://www.dot.state.mn.us/bridge/lrfd.html>

Bridge Details and Standard plans can be found at:

<https://www.dot.state.mn.us/bridge/standards.html>

# APPENDIX A

**Table A – Bridge Office Standard Levels**

Name	Description
SB-ABUT-CNTR	Structural Bridge Abutment Centerline
SB-ABUT-CNTR-BRNG	Structural Bridge Abutment Centerline Bearing
SB-ABUT-COLS-CONC	Structural Bridge Abutment Columns Concrete
SB-ABUT-CONC	Structural Bridge Abutment Concrete
SB-ABUT-CONC-HIDD	Structural Bridge Abutment Concrete Hidden
SB-ABUT-DOWE-RBAR	Structural Bridge Abutment Dowel Bar
SB-ABUT-END~-CONC	Structural Bridge Abutment End Block Concrete
SB-ABUT-END~-RBAR	Structural Bridge Abutment End Block Reinforcement
SB-ABUT-FTNG-CONC	Structural Bridge Abutment Footing Concrete
SB-ABUT-FTNG-INPL	Structural Bridge In-place Abutment Footing
SB-ABUT-FTNG-RBAR	Structural Bridge Abutment Footing Reinforcement
SB-ABUT-FTNG-RBAR-1	Structural Bridge Abutment Footing Reinforcement Top Mat Bottom Bar
SB-ABUT-FTNG-RBAR-2	Structural Bridge Abutment Footing Reinforcement Top Mat Top Bar
SB-ABUT-FTNG-RBAR-3	Structural Bridge Abutment Footing Reinforcement Bottom Mat Bottom Bar
SB-ABUT-FTNG-RBAR-4	Structural Bridge Abutment Footing Reinforcement Bottom Mat Top Bar
SB-ABUT-FTNG-RBAR-5	Structural Bridge Abutment Footing Reinforcement Tie Bar
SB-ABUT-INPL	Structural Bridge In-place Abutment
SB-ABUT-OTLN	Structural Bridge Abutment Outline
SB-ABUT-PARA-CONC	Structural Bridge Abutment Parapet Concrete
SB-ABUT-PARA-RBAR	Structural Bridge Abutment Parapet Reinforcement
SB-ABUT-PARA-RBAR-1	Structural Bridge Abutment Parapet Reinforcement Vertical Bar
SB-ABUT-PARA-RBAR-2	Structural Bridge Abutment Parapet Reinforcement Horizontal Bar
SB-ABUT-PARA-RBAR-3	Structural Bridge Abutment Parapet Reinforcement Tie Bar
SB-ABUT-PEDE-CONC	Structural Bridge Abutment Pedestal Concrete
SB-ABUT-PEDE-RBAR	Structural Bridge Abutment Parapet Reinforcement Bar
SB-ABUT-PILA-CONC	Structural Bridge Abutment Pilaster Concrete
SB-ABUT-PILE	Structural Bridge Abutment Piles
SB-ABUT-PILE-CONC	Structural Bridge Pile Concrete CIP
SB-ABUT-PILE-INPL	Structural Bridge In-place Abutment Piling
SB-ABUT-PILE-RBAR	Structural Bridge Abutment Pile Ties
SB-ABUT-PILE-STEL	Structural Bridge Piles Steel H
SB-ABUT-STEM-ARCH	Structural Bridge Abutment Stem Architectural Treatment
SB-ABUT-STEM-CONC	Structural Bridge Abutment Stem Concrete
SB-ABUT-STEM-RBAR	Structural Bridge Abutment Stem Reinforcement
SB-ABUT-STEM-RBAR-1	Structural Bridge Abutment Stem Reinforcement Front Vertical Bar
SB-ABUT-STEM-RBAR-2	Structural Bridge Abutment Stem Reinforcement Front Horizontal Bar
SB-ABUT-STEM-RBAR-3	Structural Bridge Abutment Stem Reinforcement Back Vertical Bar
SB-ABUT-STEM-RBAR-4	Structural Bridge Abutment Stem Reinforcement Back Horizontal Bar
SB-ABUT-STEM-RBAR-5	Structural Bridge Abutment Stem Reinforcement Stirrup
SB-ABUT-STEM-RBAR-6	Structural Bridge Abutment Stem Reinforcement Tie Bar
SB-ABUT-WATR	Structural Bridge Abutment Waterproofing
SB-ABUT-WWAL-ARCH	Structural Bridge Abutment Wingwall Architectural Treatment
SB-ABUT-WWAL-CONC	Structural Bridge Wingwall Concrete
SB-ABUT-WWAL-DOWE	Structural Bridge Wingwall Dowels
SB-ABUT-WWAL-PILE	Structural Bridge Wingwall Pile
SB-ABUT-WWAL-RBAR	Structural Bridge Wingwall Reinforcement
SB-ABUT-WWAL-RBAR-1	Structural Bridge Wingwall Reinforcement Front Vertical Bar
SB-ABUT-WWAL-RBAR-2	Structural Bridge Wingwall Reinforcement Front Horizontal Bar
SB-ABUT-WWAL-RBAR-3	Structural Bridge Wingwall Reinforcement Back Vertical Bar

**Table A (Cont.) – Bridge Office Standard Levels**

Name	Description
SB-ABUT-WWAL-RBAR-4	Structural Bridge Wingwall Reinforcement Back Horizontal Bar
SB-ABUT-WWAL-RBAR-5	Structural Bridge Wingwall Reinforcement Stirrup
SB-ABUT-WWAL-RBAR-6	Structural Bridge Wingwall Reinforcement Tie Bar
SB-ABUT-WWFG-CONC	Structural Bridge Wingwall Footing Concrete
SB-ABUT-WWFG-RBAR-1	Structural Bridge Wingwall Reinforcement Top Mat Bottom Bar
SB-ABUT-WWFG-RBAR-2	Structural Bridge Wingwall Reinforcement Top Mat Top Bar
SB-ABUT-WWFG-RBAR-3	Structural Bridge Wingwall Reinforcement Bottom Mat Bottom Bar
SB-ABUT-WWFG-RBAR-4	Structural Bridge Wingwall Reinforcement Bottom Mat Top Bar
SB-ABUT-WWFG-RBAR-5	Structural Bridge Wingwall Reinforcement Stirrup
SB-ABUT-WWFG-RBAR-6	Structural Bridge Wingwall Reinforcement Tie Bar
SB-ALGN	Structural Bridge Alignment
SB-ANCH-BAR	Structural Bridge Anchor bar
SB-ANNO	Structural Bridge Annotation
SB-ARCH	Structural Bridge Architectural Treatment
SB-BARR-CONC	Structural Bridge Barrier Concrete
SB-BARR-COND	Structural Bridge Barrier Conduit
SB-BARR-MDBR-CONC	Structural Bridge Barrier Median Concrete
SB-BARR-ORNA	Structural Bridge Barrier Ornamental
SB-BARR-OTLN	Structural Bridge Barrier Outline
SB-BARR-RBAR	Structural Bridge Barrier Reinforcement
SB-BARR-RBAR-1	Structural Bridge Barrier Reinforcement Ties 1
SB-BARR-RBAR-2	Structural Bridge Barrier Reinforcement Ties 2
SB-BARR-RBAR-3	Structural Bridge Barrier Reinforcement Ties 3
SB-BARR-RBAR-4	Structural Bridge Barrier Reinforcement Horizontal
SB-BARR-RBAR-HORZ	Structural Bridge Barrier Reinforcement Horizontal
SB-BARR-RLG~CONC	Structural Bridge Barrier Railing Concrete
SB-BARR-STEL	Structural Bridge Barrier Steel
SB-BEAM-BOX~	Structural Bridge Beam Box
SB-BEAM-CNTR-DIAP	Structural Bridge Centerline Diaphragms
SB-BEAM-CNTR-FASC	Structural Bridge Centerline Fascia Beams
SB-BEAM-CNTR-INT~	Structural Bridge Centerline Interior Beams
SB-BEAM-CONC	Structural Bridge Beam Concrete
SB-BEAM-CONC-HIDD	Structural Bridge Beam Concrete Hidden
SB-BEAM-DIAP-CONC	Structural Bridge Beam Diaphragm Concrete
SB-BEAM-DIAP-LABL	Structural Bridge Beam Diaphragm Cross Frame Labels
SB-BEAM-DIAP-RBAR	Structural Bridge Beam Diaphragm Reinforcement
SB-BEAM-DIAP-STEL	Structural Bridge Beam Cross Framing
SB-BEAM-INVNT	Structural Bridge Beam Inverted Tee
SB-BEAM-LABL	Structural Bridge Beam Label
SB-BEAM-LINE	Structural Bridge Beam outline
SB-BEAM-OTLN	Structural Bridge Beam Outline
SB-BEAM-STEL	Structural Bridge Beam Steel
SB-BEAM-STEL-SPLI	Structural Bridge Beam Steel Splice Plates
SB-BEAM-STIF-LABL	Structural Bridge Beam Stiffeners Label
SB-BEAM-STIF-STEL	Structural Bridge Beam Stiffeners Steel
SB-BEAM-WJNT	Structural Bridge Beam Wet Joint
SB-BRKL	Structural Bridge Break Line
SB-BRNG-CONC	Structural Bridge Bearing Concrete
SB-BRNG-EXPA	Structural Bridge Bearing Expansion
SB-BRNG-FIXE	Structural Bridge Bearing Fixed

**Table A (Cont.) – Bridge Office Standard Levels**

Name	Description
SB-BRNG-LABL	Structural Bridge Bearings Label
SB-BRNG-LINE	Structural Bridge Bearing Line
SB-CELL	Structural Bridge Cell
SB-CNTR-LINE	Structural Bridge Center line
SB-CULV-CONC	Structural Bridge Culvert Concrete
SB-CULV-RBAR	Structural Bridge Culvert Steel
SB-DECK-BEAM-INPL	Structural Bridge In-place Deck Beams
SB-DECK-CONC-HIDD	Structural Bridge Deck Concrete Hidden
SB-DECK-DIAP-CNTR	Structural Bridge Deck Diaphragm Centerline
SB-DECK-DIAP-CONC	Structural Bridge Deck Diaphragm Concrete
SB-DECK-DIAP-RBAR	Structural Bridge Deck Diaphragm Reinforcement
SB-DECK-DIAP-RBAR-1	Structural Bridge Deck Diaphragm Reinforcement Vertical
SB-DECK-DIAP-RBAR-2	Structural Bridge Deck Diaphragm Reinforcement Horizontal
SB-DECK-EXPA	Structural Bridge Expansion Device
SB-DECK-INPL	Structural Bridge In-place Deck
SB-DECK-OVLY	Structural Bridge Deck Overlay
SB-DECK-RBAR	Structural Bridge Deck Reinforcement
SB-DECK-RBAR-1	Structural Bridge Deck Top Mat Longitudinal Bar
SB-DECK-RBAR-2	Structural Bridge Deck Top Mat Transverse Bar
SB-DECK-RBAR-3	Structural Bridge Deck Top Mat Skew Reinforcement Bar
SB-DECK-RBAR-4	Structural Bridge Deck Bottom Mat Longitudinal Reinforcement Bar
SB-DECK-RBAR-5	Structural Bridge Deck Bottom Mat Transverse Reinforcement Bar
SB-DECK-RBAR-6	Structural Bridge Deck Bottom Mat Skew Reinforcement Bar
SB-DECK-RBAR-LONG-2	Structural Bridge Deck Longitudinal Reinforcement
SB-DECK-RBAR-TRAN-1	Structural Bridge Deck Transvers Reinforcement Bottom Bar
SB-DECK-RBAR-TRAN-3	Structural Bridge Deck Transvers Reinforcement Top Bar
SB-DECK-SIDE-CONC	Structural Bridge Deck Sidewalk Concrete
SB-DECK-SLAB-CONC	Structural Bridge Deck Slab
SB-DECK-SLAB-OTLN	Structural Bridge Deck Slab Outline
SB-DECK-STOL-CONC	Structural Bridge Deck Stool
SB-DECK-SWLK-CONC	Structural Bridge Deck Sidewalk Concrete
SB-DECK-SWLK-RBAR	Structural Bridge Deck Sidewalk Reinforcement
SB-DECK-WATR	Structural Bridge Waterproofing
SB-DIAP-CONC	Structural Bridge Diaphragms Concrete
SB-DIAP-CROS	Structural Bridge Diaphragms Cross Frames
SB-DIAP-RBAR	Structural Bridge Diaphragms Reinforcement
SB-DIMS	Structural Bridge Dimension
SB-DUCT	Structural Bridge Duct Conduit
SB-ENDB-CONC	Structural Bridge End Block Concrete
SB-EXCS-ERTH	Structural Bridge Excavations Structures Earth
SB-EXCS-ROCK	Structural Excavations Structures Rock
SB-EXCS-UNID	Structural Bridge Excavations Structures Unidentified
SB-EXCS-WATR	Structural Bridge Excavations Structures Water
SB-EXCV	Structural Bridge Excavations
SB-EXPA	Structural Bridge Expansion Device
SB-GRND-INPL	Structural Bridge In-place Groundline
SB-GRND-INPL-CNTR	Structural Bridge In-place Groundline Center
SB-GRND-INPL-RIGHT	Structural Bridge In-place Groundline Right
SB-HTCH	Structural Bridge Hatching
SB-INPL-BRDG	Structural Bridge In-place Bridge

**Table A (Cont.) – Bridge Office Standard Levels**

Name	Description
SB-INPL-GRND-LEFT	Structural Bridge In-place Groundline Left
SB-LINE	Structural Bridge Linear Element
SB-PIER-CAPS-ARCH	Structural Bridge Pier Caps Architectural Treatment
SB-PIER-CAPS-CONC	Structural Bridge Pier Caps Concrete
SB-PIER-CAPS-RBAR	Structural Bridge Pier Cap Reinforcement
SB-PIER-CAPS-RBAR-1	Structural Bridge Pier Cap Reinforcement Front Vertical Bar
SB-PIER-CAPS-RBAR-2	Structural Bridge Pier Cap Reinforcement Front Horizontal Bar
SB-PIER-CAPS-RBAR-3	Structural Bridge Pier Cap Reinforcement Back Vertical Bar
SB-PIER-CAPS-RBAR-4	Structural Bridge Pier Cap Reinforcement Back Horizontal Bar
SB-PIER-CAPS-RBAR-5	Structural Bridge Pier Cap Reinforcement Stirrups
SB-PIER-CAPS-RBAR-6	Structural Bridge Pier Cap Reinforcement Ties
SB-PIER-CAPS-STIR-1	Structural Bridge Pier Cap Reinforcement Stirrups
SB-PIER-CAPS-STIR-2	Structural Bridge Pier Cap Reinforcement Stirrups
SB-PIER-CNTR	Structural Bridge Pier Centerline
SB-PIER-CNTR-BRNG	Structural Bridge Pier Centerline Bearing
SB-PIER-COLS-ARCH	Structural Bridge Pier Column Architectural Treatment
SB-PIER-COLS-CONC	Structural Bridge Pier Column Concrete
SB-PIER-COLS-RBAR	Structural Bridge Pier Column Reinforcement
SB-PIER-COLS-RBAR-1	Structural Bridge Pier Column Reinforcement Vertical
SB-PIER-COLS-RBAR-2	Structural Bridge Pier Column Reinforcement Horizontal
SB-PIER-COLS-RBAR-3	Structural Bridge Pier Column Reinforcement Ties
SB-PIER-COLS-RBAR-4	Structural Bridge Pier Column Reinforcement Ties
SB-PIER-COLS-RBAR-5	Structural Bridge Pier Column Reinforcement Spiral
SB-PIER-CONC	Structural Bridge Pier Concrete
SB-PIER-CONC-HIDD	Structural Bridge Pier Concrete Hidden
SB-PIER-DOWE-RBAR	Structural Bridge Pier Dowel Bar
SB-PIER-FTNG-CONC	Structural Bridge Pier Footing Concrete
SB-PIER-FTNG-INPL	Structural Bridge In-place Pier Footing
SB-PIER-FTNG-RBAR	Structural Bridge Pier Footing Reinforcement
SB-PIER-FTNG-RBAR-1	Structural Bridge Pier Footing Reinforcement Top Mat Longitudinal Bar
SB-PIER-FTNG-RBAR-2	Structural Bridge Pier Footing Reinforcement Top Mat Transverse Bar
SB-PIER-FTNG-RBAR-3	Structural Bridge Pier Footing Reinforcement Bottom Mat Longitudinal Bar
SB-PIER-FTNG-RBAR-4	Structural Bridge Pier Footing Reinforcement Bottom Mat Transverse Bar
SB-PIER-FTNG-RBAR-5	Structural Bridge Pier Footing Reinforcement Tie Bar
SB-PIER-INPL	Structural Bridge In-place Pier
SB-PIER-OTLN	Structural Bridge Pier Outline
SB-PIER-PEDE-CONC	Structural Bridge Pier Pedestal Concrete
SB-PIER-PILE	Structural Bridge Pier Pile
SB-PIER-PILE-CONC	Structural Bridge Pile Concrete CIP
SB-PIER-PILE-INPL	Structural Bridge In-place Pier Piling
SB-PIER-PILE-STEL	Structural Bridge Piles Steel H
SB-PIER-STRU-CONC	Structural Bridge Pier Strut Concrete
SB-PIER-STRU-RBAR-1	Structural Bridge Pier Strut Reinforcement Vertical Bar
SB-PIER-STRU-RBAR-2	Structural Bridge Pier Strut Reinforcement Horizontal Bar
SB-PIER-STRU-RBAR-3	Structural Bridge Pier Strut Reinforcement Ties
SB-PLAN-BRDR	Structural Bridge Plan Border
SB-PLAN-LABL	Structural Bridge Plan Label
SB-PLAN-PNTS	Structural Bridge Plan Points
SB-PLAN-POI~	Structural Bridge Plan Points Auxiliary
SB-PLAN-SLIN	Structural Bridge Support Lines

**Table A (Cont.) – Bridge Office Standard Levels**

Name	Description
SB-PLAN-SLIN-LABL	Structural Bridge Support Lines Label
SB-PLOT-AIDS	Structural Bridge Border Iplot
SB-PLOT-BRDR	Structural Bridge Sheet Border
SB-PNTS	Structural Bridge Points
SB-ROAD-CNTR	Structural Bridge Center Line Roadway
SB-ROAD-CONC	Structural Bridge Roadway Concrete
SB-ROAD-GUTR	Structural Bridge Gutter Line
SB-ROAD-LANE	Structural Bridge Lane Lines
SB-ROAD-OTLN	Structural Bridge Roadway Outline
SB-ROAD-OVLY	Structural Bridge Roadway Overlay
SB-RPAR-CUTL	Structural Bridge Repair Cut Line
SB-SEGM-CONC	Structural Bridge Segments
SB-SLOP-AGGR	Structural Bridge Stabilized Aggregate Slope Paving
SB-SLOP-PAVE	Structural Bridge Slope Paving
SB-SLOP-RRAP	Structural Bridge Slope Riprap
SB-STAN	Structural Bridge Standard
SB-STAN-RBAR	Structural Bridge Standards Reinforcement
SB-STEL-STIF	Structural Bridge Steel Stiffeners
SB-STRU-CONC	Structural Bridge Strut Concrete
SB-STRU-RBAR-1	Structural Bridge Strut Reinforcement Horizontal Bar
SB-STRU-RBAR-2	Structural Bridge Strut Reinforcement Vertical Bar
SB-STRU-RBAR-3	Structural Bridge Strut Reinforcement Ties
SB-TEND-CNTR	Structural Bridge Tendon Centerlines
SB-TEND-STEL	Structural Bridge Tendon Steel
SB-TEXT	Structural Bridge Text Anno
SB-TEXT-TITL	Structural Bridge Titles
SB-UTIL	Structural Bridge Utilities
SB-WORK	Structural Bridge Working Point
SB-WORK-LINE	Structural Bridge Working Line
SB-WWAL-ABUT-CONC	Structural Bridge Wingwall
SB-WWAL-CONC	Structural Bridge Wingwall Concrete
SB-WWAL-DOWE-RBAR	Structural Bridge Wingwall Dowels
SB-WWAL-FTNG-CONC	Structural Bridge Wingwall Footing Concrete
SB-WWAL-FTNG-RBAR-1	Structural Bridge Wingwall Reinforcement Bottom Mat Bottom Bar
SB-WWAL-FTNG-RBAR-2	Structural Bridge Wingwall Reinforcement Bottom Mat Top Bar
SB-WWAL-FTNG-RBAR-3	Structural Bridge Wingwall Reinforcement Top Mat Bottom Bar
SB-WWAL-FTNG-RBAR-4	Structural Bridge Wingwall Reinforcement Top Mat Top Bar
SB-WWAL-PILE-CONC	Structural Bridge Wingwall Pile Concrete
SB-WWAL-PILE-STEL	Structural Bridge Wingwall Pile Steel
SB-WWAL-STEM-CONC	Structural Bridge Wingwall Stem Concrete