**TXDOT ENGINEERING SOFTWARE
SUPPORT INFORMATION**

TxDOT Bridge Geometry System (BGS)

This document provides end-user support information for the TxDOT Bridge Geometry System (BGS) application. This support information will be updated, as needed, to remain current.

CONTENTS

ABOUT BGS

The TxDOT Bridge Geometry System (BGS) has replaced the TxDOT Roadway Design System (RDS) as the department's primary tool for bridge geometric design.

The initial release of BGS Version 8.1 (June 2007) was developed from the TxDOT Roadway Design System (RDS) Version 8.0 application by removing all non-bridge related RDS commands. In BGS the user could define, and display graphically, geometry points and curves, bridge alignments with templates, superelevations and widenings, and bridge framing, with or without contours, but code supporting the functionality of RDS strictly employed in roadway design was removed from the RDS source code to produce BGS. The result of these changes to RDS was a "scaled down" implementation of TxDOT RDS (Roadway Design System) that focuses on bridge geometric design, and was name Bridge Geometry Systems (BGS).

BGS v8.1.7.2 was deployed in November of 2011 as a technical release to address OS issues with v8.1.7 (i.e. 8.1) released June 2007. By November 2011 work was underway on BGS v9.0 building upon the v8.1.7.2 source code. By January 14, 2014 more than 195 distinct changes had been made by to the BGS v8.1.7.2 FORTRAN-77 source code including bug fixes, functional enhancements and other changes, to yield BGS development version 9.0.3. In addition to these functional changes, the source code for BGS (of the compiled engine component BGS1.EXE), has been migrated from the Intel compiler v10 (integrated with VisualStudio 2008) to v11 (integrated with VisualStudio 2013) and numerous modifications have been made to the interface program component BGS.EXE to yield BGS v9.1.5.

The current draft of the *BGS v9.1 User Guide* is approaching 400 pages in length. Since this user guide is quite large as compared with those of other TxDOT applications it seemed prudent to not deploy it directly to the end user's machine but rather to store it on TxDOT's FTP server and install a link to the file in the Bridge Geometry System (BGS) program group, similar to what is done for the *Support Information* documents of most other TxDOT applications. This decoupling of the BGS User Guide from the deployment packaging of the software allows for updating of the User Guide independently on an as-needed basis between releases.

An estimated 100 TxDOT bridge-design employees and more than 200 consulting bridge-design engineers developing bridge plans for Texas will utilize BGS 9.1. No formal training for BGS 9.1 is anticipated. The *BGS User Guide,* like the old **RDS User Manual**, should provide all the information that the user will need to utilize the software.

An experienced RDS user will be able to begin using BGS immediately as BGS operates in the same manner as RDS. The BGS input data, output computations, reports and CAD plots are the same as produced by RDS when applied to bridge geometric design, notwithstanding the effects on output of bug fixes and enhancements made to BGS since its initial release.

GENERAL SUPPORT INFORMATON

Product Name: **TxDOT Bridge Geometry System (BGS)**

Current Release: VERSION 9.1.6

Technical Support

Non-TxDOT users may request technical support when this software product is used to perform services for department.

Reporting Problems

TxDOT is committed to correcting problems associated with this software product. Users are encouraged to report all problems.

Contact Information

To request technical support or to report problems contact:

Timothy E. Bradberry, P.E.
TxDOT Bridge Division
   E-Mail: tbradber@dot.state.tx.us
   Phone: 512-416-2179

Release History and Support Status

Product Name	Version	Release Date	Support Status
TxDOT Bridge Geometry System (BGS)	9.1.6	January 2016	Supported
TxDOT Bridge Geometry System (BGS)	9.1.5	December 2015	Supported
TxDOT Bridge Geometry System (BGS)	8.1.7.2	November 2011	Supported
TxDOT Bridge Geometry System (BGS)	8.1.7	June 2007	Supported
BGS ("Beta" Release)	1.0.0	N/A	Not Supported

Determining the Product Version

Use the following procedures to determine the specific version of BGS software currently installed:

Use either of the following two methods:

1. **Add or Remove Programs Method** – Start the Windows *Add or Remove Programs* applet, Start→Settings→Control Panel→Add or Remove Programs. Locate the application named *"TxDOT Bridge Geometry System (BGS)."* Click on the product name and then click the support information link to open the Support Info window where the version number is reported.

2. **Command-Line Method –** Open a Command Prompt window by starting the Windows command interpreter (cmd.exe). One way to do this is as follows:

   Start→Run→cmd

   Next, in the Command Prompt window, invoke the BGS program using the following command string:

bgs –V   (you must enter a capital "V" to get version number of all components)

The program will report version information for each program module and for the plotting engine (optional proprietary software) and then exit as shown in the example below:

```
C:\>bgs –V
Texas Department of Transportation (TxDOT)
TxDOT Bridge Geometry System (bgs)
Components:
User Interface (bgs.exe), Version 9.1.5
Main Program (bgs1.exe), Version 9.1.5
```

The plotting engine version that is displayed when Version 8.1.7.2 is installed will be whatever compatible version of MicroStation is installed. Version 9.1.5 does not report the version of MicroStation installed.

The product version will be the same number as that assigned to the bgs1.exe program module. For the above example, the product version is 9.1.5.

Optional Proprietary Software (Bentley Systems MicroStation)

BGS supports plotting features that allow the user to request various plots. For example, the user may request a plot of the plan view of a bridge structure that includes the roadway alignment, bridge frame and contours of the roadway surface.

BGS processes a plot request by running the Bentley Systems MicroStation program to generate a MicroStation two dimensional DGN file that contains the graphic elements that represent the requested plot.

MicroStation is an optional proprietary product and does not need to be installed in order to process bridge geometry calculations. However, this "plotting engine" must be installed in order to process BGS plot commands and create the DGN file. If the user's input file includes a plot request and the MicroStation software is not installed, BGS will perform all bridge geometry calculations and will create the normal output reports. However, the program will issue a warning message reporting that MicroStation is not installed and will not create the DGN file.

MicroStation is a proprietary commercial software product and is not included as part of the BGS software. The BGS user is responsible for purchasing and installing the MicroStation software.

Each release of BGS is developed for use with compatible releases of MicroStation. A compatible version of MicroStation software must be installed. Reference other parts of this support document or reference the product README to determine the specific release of MicroStation software that must be used with this release of BGS.

VERSION 9.1.5 (Recalled)

Status

Version 9.1.5 is a production version that was released in mid-January 2016 and was quickly recalled due to the discovery of an error in the reporting of bearing seat/step elevations in the formal output listing. The bug resulted in no reporting of bearing seat elevations in the formal output for FOPT card framing options 15, 20, 21 and 22 that are typically used for box beams, U-beams and X-beams, but rather placing these reports in a fixed name file, "fort.35", in the BGS Examples folder (C:\Users\Public\Desktop\BGS_Examples). Version 9.1.5 was replaced by

Version 9.1.6. Except for the fix to the bearing seat/step elevations for these framing options, the functionality of v9.1.5 and that of v9.1.6 are identical.

VERSION 8.1.7.2

Status

Version 8.1.7.2 is the past production release replaced by Version 9.1.5. The functionality of Version 8.1.7.2 is identical to that of Version 8.1.7.

MicroStation Compatibility

Version 8.1.7 of BGS was developed and extensively tested using the MicroStation V8 (2004 Edition), Version 8.5 software. In addition to MicroStation V8-2004, BGS Version 8.1.7.2 is compatible with MicroStationV8-XM and MicroStationV8-i. One of these three releases of MicroStation software must be installed in order to process BGS plot commands and generate the MicroStation DGN file.

Installing and Removing the Software

Non-Texas DOT Users
Reference the product distribution README file, included in the software distribution package.

Texas DOT Users
Work with local Information Resources personnel and use LANDesk related procedures to install and uninstall the software.

Known Problems

See summary of the known problems associated with Version 8.1.7 as well as the *Release Notes* of Version 9.1.

VERSION 8.1.7

Status

Version 8.1.7 is a past production release.

MicroStation Compatibility

This release of BGS was developed and tested using the MicroStation V8 (2004 Edition), Version 8.5 software. This specific release of MicroStation software must be installed in order to process BGS plot commands and generate the MicroStation DGN file.

Installing and Removing the Software

Non-Texas DOT Users
Reference the product distribution README file, included in the software distribution package.

Texas DOT Users
Work with local Information Resources personnel and use CA Unicenter Software Delivery related procedures to install and uninstall the software.

Known Problems

The following is a summary of the known problems associated with this release:

Processing Terminates With Erroneous Stationing (Various Bridge Geometry Commands)

Description:
When an erroneous bridge geometry command is defined by inputting beginning and ending station limits that are either both before the beginning station or both after the ending station of the roadway, the system will print an error message and terminate processing. The system should skip the erroneous command, issue an error message and continue processing.

Workaround:
Modify the geometry command so that the station limits are between the beginning and ending stations of the roadway.

Undefined PSLB Number Not Reported (Various Bridge Geometry Commands)

Description:
When a bridge geometry command references a parallel slab line that is not defined, the system prints an error message; however, the error message does not report the number of the undefined PSLB. The user must determine which PSLB was undefined.

Workaround:
None

Frame Plot Not Supported for Box Beams (FOPT Command)

Description:
The system does not compute a frame plot for FOPT option 15 (Box Beams).

Workaround:
None

Undefined Alignment Not Reported Correctly (APLT Command)

Description:
When an APLT command is issued for an undefined alignment, the resulting error message does not report the correct name (letter) for the undefined alignment.

Workaround:
None

Processing Terminates with KEEP = YES (SYSTEM Card)

Description:
The system will print two error messages and terminate processing with no output when the value "YES" in is entered in SYSTEM card columns 31-33 (KEEP field). The two error messages in the ls1 file report "ERROR OPENING FILE 8" and "ERROR OPENING FILE 9."

Workaround:
Leave SYSTEM card columns 28-33 blank.

Processing Terminates with Explicit Decimals (Various RD Commands)
Description:
All stationing data for all RD commands support the use of implicit decimals, with two decimal places for English data and three, for metric. Only the RD05 command (horizontal alignment) also permits station data to be entered with explicit decimals. The system will terminate processing (crash) when station data is entered using explicit decimals for any RD command other than the RD05.

Workaround:
Change the stationing for the RD commands other than RD05 to implicit decimals, with two decimal places for English data and three, for metric.

Diaphragm Lengths File Generated With No Computed Lengths (FOPT Command)

Description:
The system will generate a diaphragm lengths file, with headings and titles, but with no diaphragm lengths. This occurs when defined diaphragms are not present within the FOPT command limits

Workaround:
None

User Must Be Administrator To Create DGN File (Plotting)

Description:
The program cannot automatically locate the MicroStation software unless the user is logged in to the PC as a Windows administrator. This will occur even when the correct release of MicroStation is properly installed. As a result, the program will issue a warning message on the console window reporting that MicroStation is not installed and will not create DGN file.

Workaround:
Run BGS as a Windows administrator. –OR–
Add the following user environment variable to define the exact location of the MicroStation software:

  Variable Name: TXDOT_USTATION
  Variable Value: [full path to MicroStation folder where the ustation.exe file is located]

For example, assume that the MicroStation program file, ustation.exe, resides in the *C:\Program Files\Bentley\Program\MicroStation* directory. Select Control Panel→System. Next, select the *Advanced* tab and click *Environment Variables* button. Add the new user variable environment variable as follows:

  TXDOT_USTATION = C:\Program Files\Bentley\Program\MicroStation\

Note: The value must include the trailing "\" character.

VERSION 1.0.0 ("Beta" Release)

Status

BGS Version 1.0.0, also referred to as the "Beta" release, is no longer supported and should not be used for production work.

Version 1.0.0 was a pre-production test release of the BGS software that was distributed for use to selected TxDOT users and to non-TxDOT organizations requesting RDS or BGS software. If you have installed and used BGS prior to May 2007, then it is very likely that you have been using the Version 1.0.0 software.

REMOVING Version 1.0.0

Use the following procedures to remove the Version 1.0.0 "Beta" release software:

1. VERIFY INSTALLATION – Verify that the following two folders exist:
       D:\engpro\bgs\
       D:\engpro\cadplot\
   These above folders will exist if the BGS Beta release is currently installed.

2. SAVE USER FILES – Navigate to the following directories and locate any user BGS input data files or output files that might exist in any of these folders or subfolders:

D:\engpro\
D:\engpro\bgs
D:\engpro\cadplot

Move all existing input data files and output files that you wish to keep to a new location so that they will not be deleted as part of the uninstall process.

3. RUN BGS UNINSTALL BATCH SCRIPT – Navigate to the D:\engpro\bgs\ folder and execute the uninstall_bgs.bat batch script. This program will remove all files in the D:\engpro\bgs\ directory, including the directory itself.

4. RUN CADPLOT UNINSTALL BATCH SCRIPT – Navigate to the D:\engpro\cadplot\ folder and execute the uninstall_cadplot.bat batch script. This program will remove all files in the D:\engpro\cadplot\ directory, including the directory itself.

5. DELETE ENGPRO FOLDER – Delete the D:\engpro directory.

6. VERIFY SYSTEM ENVIRONMENT VARIABLES – Examine the existing Windows System environment variables and verify that the following two variables do not exist:
   PRO_BGS
   PRO_CADPLOT
Delete these System environment variables if either exists.
Check the existing value of the System PATH variable and verify that the following two directories DO NOT exist in the directory list:
   D:\engpro\cadplot
   D:\engpro\bgs
Delete these directories from the PATH list if either exists.

7. DELETE BGS MEDIA – Delete all media containing the TxDOT Bridge Geometry System Texas Version 1.0.0 installation and executable files.