

Updated: June 29, 2012



## **TXDOT ENGINEERING SOFTWARE SUPPORT INFORMATION**

### ***TxDOT Concrete Box Culvert Analysis Program (CULV5)***

This document provides end-user support information for the TxDOT Concrete Box Culvert Analysis (CULV5) application. This support information will be updated, as needed, to remain current.

## **CONTENTS**

### **ABOUT CULV5**

- End User Support
- Reporting Problems
- Contact Information
- Release History and Support Status
- Determining Program Version Number

### **VERSION 2.2**

- Status
- Known Problems

### **VERSION 2.1**

- Status
- Known Problems

### **VERSION 2.0.4**

- Status
- Known Problems

### **VERSION 1.71**

- Status
- Known Problems

## **ABOUT CULV5**

CULV5 is an analysis tool for concrete box culverts. The program determines the forces acting on each of the different members of the culvert using the direct stiffness method. The user provides input data for loading conditions, structure geometry, and member sizes. The program outputs the member forces for use in either a working stress design or a load factor design in accordance with the AASHTO Standard Specifications for Highway Bridges, 17th Ed. for highway loadings, and AREMA 2006 in the case of E72 and E80 loadings.

## GENERAL SUPPORT INFORMATION

**Product Name:** TxDOT Concrete Box Culvert Analysis Program (CULV5)  
**Current Release:** Version 2.2

### End User Support

The TxDOT Bridge Division provides end user support for this application. See Contact Information section below. Non-TxDOT users may request technical support when this product is used to perform services for department.

### Reporting Problems

Users are encouraged to report problems that they experience using this product.

### Contact Information

To request technical support or to report problems contact:

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

### Release History and Support Status

Version	Release Date	Support Status
2.2	June 2012	Supported
2.1	May 2010	Unsupported
2.0.4	December 2008	Unsupported
1.71	August 2003	Unsupported

### Determining Program Version Number

#### Version 1.71

The CULV5 program file for the Version 1.71 release is named *CULV5.EXE*. Run the program to determine the program's version number. When the program starts a console window will open and display the program banner as show in Figure 1. The banner reports the version number 1.71.

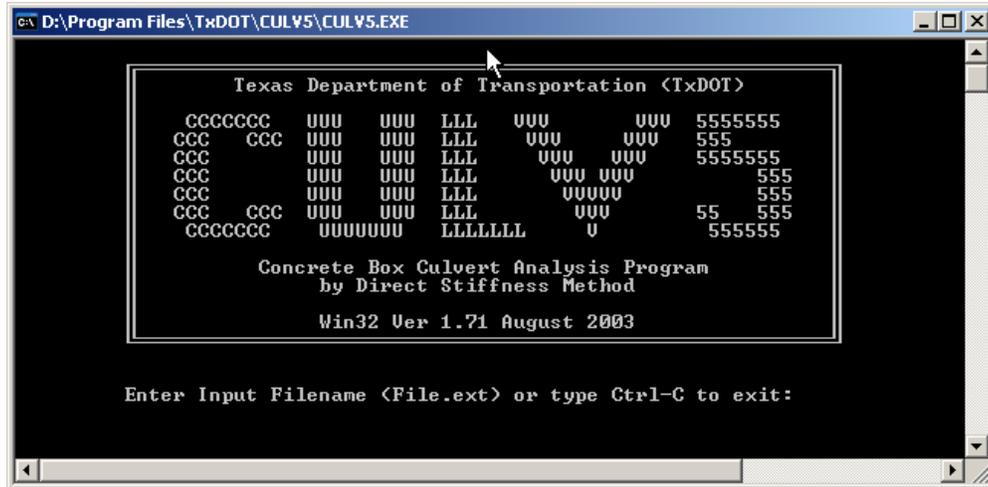


Figure 1 - Version 1.71 Program Banner

### Version 2.x

The following two methods may be used to determine the program version number for Release 2.x:

#### Method 1 – Command Line

1. Open a command window. One way to do this is to select *Start>Programs>Accessories>Command Prompt*.
2. In the command window, issue the `culv5` command and include either the `/v` (lowercase "v") or `/V` (uppercase "V") switch as shown in Figure 2 to instruct the program to report version information:

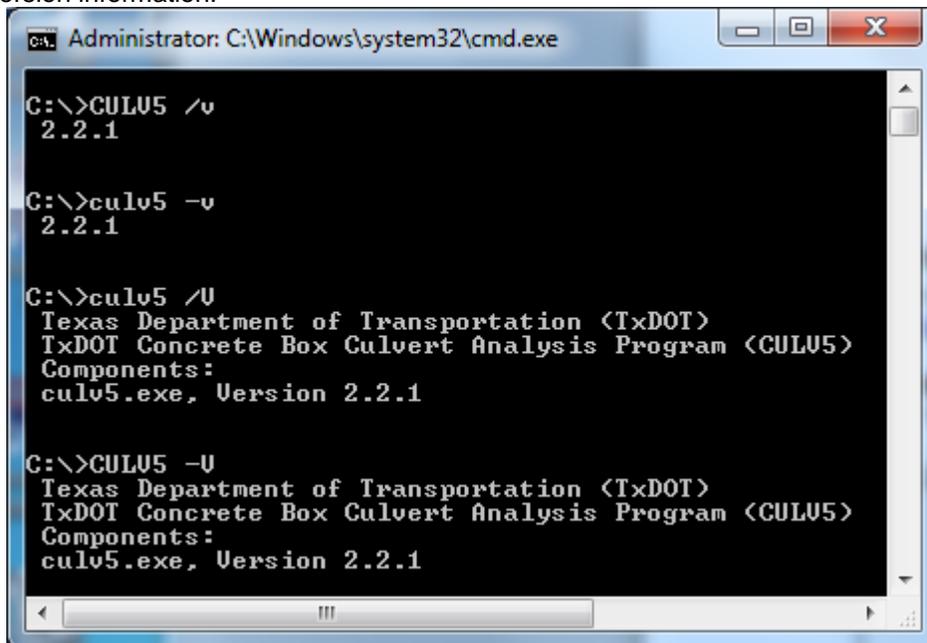


Figure 2 – Determining Program Version Number (Command-Line Method)

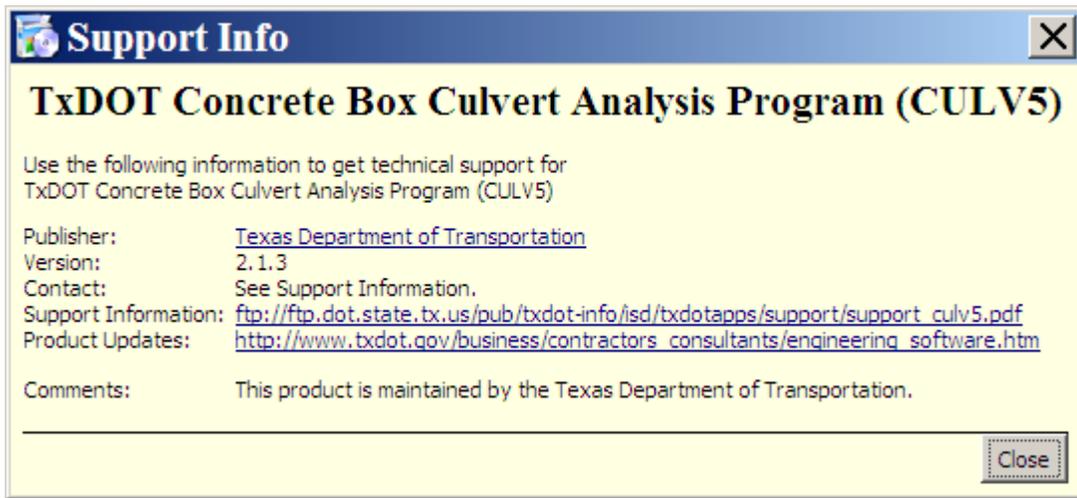
#### Method 2 – Add or Remove Programs Applet (in Windows XP)

1. Start the Windows Control Panel *Add or Remove Programs* applet.

## SUPPORT INFORMATION

### TxDOT Concrete Box Culvert Analysis Program (CULV5)

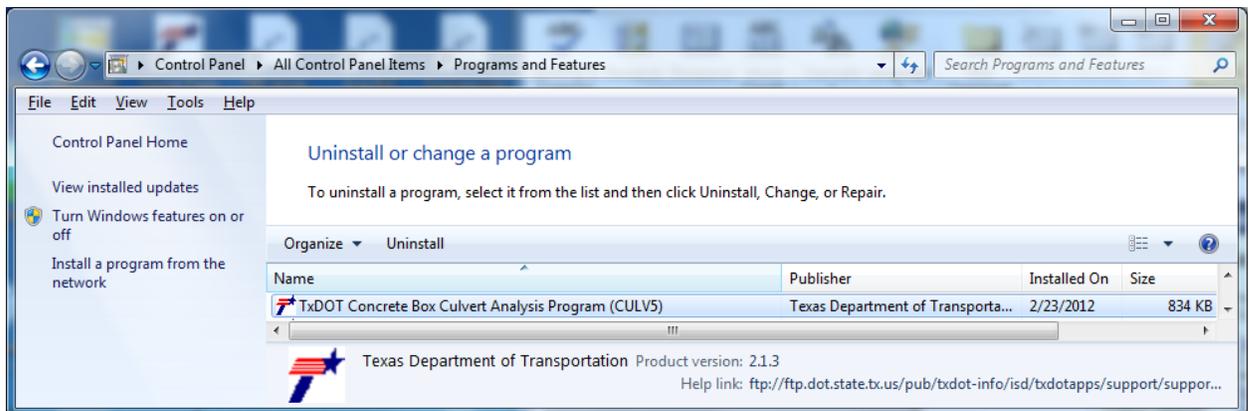
2. Select the *TxDOT Concrete Box Culvert Analysis Program (CULV5)* product.
3. Select the *Click here for support information* link to display support information as shown in Figure 3 to display the program version number.



**Figure 3 – Determining Program Version Number (Add or Remove Programs Method)**

#### Method 2 – Programs and Features applet (in Windows 7)

1. Start the Windows Control Panel *Programs and Feature* applet.
2. Scroll down to the *TxDOT Concrete Box Culvert Analysis Program (CULV5)* program listing and click on it.
3. The details of the program installation will be displayed at the bottom of the window below the list of programs. Click on the URL link displayed after the words 'Help link:' to display support information (see as shown in Figure 4 to display the program version number. If the words 'Help link' are not displayed widen the window until you see these words and are able to click on the URL link.



**Figure 4 – Determining Program Version Number (Programs and Features Method)**

## **VERSION 2.2**

### **Status**

CULV5 Version 2.2 is the current production release.

### **Known Problems**

There are no known problems with this release.

## VERSION 2.1

### Status

CULV5 Version 2.1 was superseded by Release 2.2 in June 2012. **Version 2.1 is no longer supported.**

### Known Problems

#### Water Weight Value Not Being Properly Used

In the case of a culvert having haunches, this release of the program erroneously fails to consider the effects of water on the inside of the culvert when the user specifies water density on the CULV card (in columns 61-64).

#### The Railroad Live Load Impact Factor Was Outdated

The railroad design specifications provisions for railroad live load impact have evolved since CULV5 was originally written. The impact factor for E80 and E72 loadings in AREMA 2000 was 40% at 18 inches and zero at 10 ft, while the 2006 Edition of the AREMA manual changed this impact factor to 60% at 18 inches and 0% at 10 ft. CULV5, Version 2.2 used the old provisions for impact factor.

## VERSION 2.0.4

### Status

CULV5 Version 2.0.4 was superseded by Release 2.1 in May 2010. **Version 2.0.4 is no longer supported.**

### Known Problems

#### ***NaN Output***

For some input data files specifying haunches, tables of repeated text "NaN" (Not a Number) are output. The presence of the haunch data is necessary but not sufficient for this to occur.

#### ***Stop Gap Measure***

There is no known stop-gap measure to remedy or work around the NaN output problem, other than to eliminate the haunch data from the input file.

#### ***Apparent Lateral Live-load Bug***

The program was modified to correct calculations resulting in output moments being greater than normal for some combinations of input data due an error in the formulae for applied lateral load.

#### ***Erratic Results***

The program was modified to correct calculations resulting in output moments which were occasionally erratic for some combinations of input data.

## VERSION 1.71

### Status

CULV5 Version 1.71 was superseded by Release 2.0 in November 2008. **Version 1.71 is no longer supported.**

### Known Problems

The program will not produce Service Load Analysis for AREMA Loadings when the input is flagged by the user to do so.

The program has an apparent bug in the distribution of moving live load on the top slab of the culvert.

The program has an apparent bug in analysis relating to vertical reactions at wall joints.

The program has an apparent bug in the support conditions / live load reactions.

A runtime error causes array index overflow when assigning the moment reaction to bottom slab.