

State of Georgia
Department of Transportation

Bridge Pile Bent



Bridge Pile Bent

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Atlanta, Georgia 30308

This document was developed as part of the continuing effort to provide guidance within the Georgia Department of Transportation in fulfilling its mission to provide a safe, efficient, and sustainable transportation system through dedicated teamwork and responsible leadership supporting economic development, environmental sensitivity and improved quality of life. This document is not intended to establish policy within the Department, but to provide guidance in adhering to the policies of the Department.

Your comments, suggestions, and ideas for improvements are welcomed.

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Chapter 1 Pile Bent

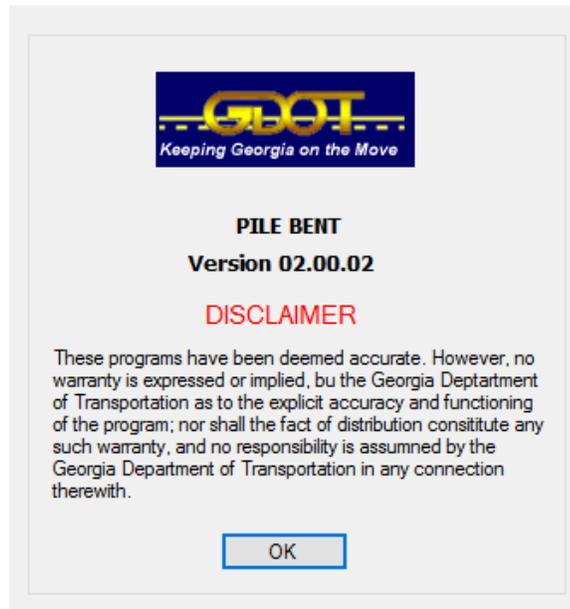
1.1 Purpose

The purpose of this program is to allow GDOT MicroStation users to create and revise Pile Bent input files. This chapter covers the Pile Bent application for Bridge Design.

NOTE:

- This program is for MicroStation V8 and newer data; does not support V7 input data.
- An example project is used for program data throughout the document.

1.2 Application Overview



1.3 Pile Bent Components

The GDOT - Pile Bent window contains the following components:

- Title bar
- Menu bar
- Toolbar
- Project tab
- General details tab
- Bent dimensions tab
- Bent elevation tab
- Beam and bearings tab
- Pile data tab

1.4 Types of pile bent information

Use the fields in the tabs of the GDOT - Pile Bent window to set the following types of information about pile bents:

- Project description information
- General information
- Bent dimension information
 - Cap dimension information
 - Fillet dimension information
 - Cap step dimension information
 - Wingwall dimension information
 - Wingwall angle information
 - Pile box dimension information
 - Backwall dimension information
 - End post dimension information
- Elevation information
 - Cap step elevation information
 - Bottom cap elevation information
 - Wingwall elevation information
 - Backwall elevation information
 - End post elevation information

- Beam and bearing information
 - Bearing information
 - Beam angle information
 - Beam dimension information
- Pile information
 - Pile information

1.5 Menu Bar Options

The Pile Bent menu bar is one of the components in the GDOT - Pile Bent window. The Pile Bent menu bar contains the following menu items:

File: Select this menu item to display the File menu. Use this menu to perform any of the following tasks:

- Open a new Concrete Bent input file
- Open an existing Concrete Bent input file
- Save a Concrete Bent input file
- Save a Concrete Bent input file with another file name
- Print a concrete quantity file
- Preview a concrete quantity file
- Preview a graphics design file
- Exit the Concrete Bent application

Help: Select this menu item to display the Help menu. Use this menu to perform any of the following tasks:

- Search for specific Help topics about the Pile Bent application
- View version information about the Pile Bent application

1.6 Toolbar Options

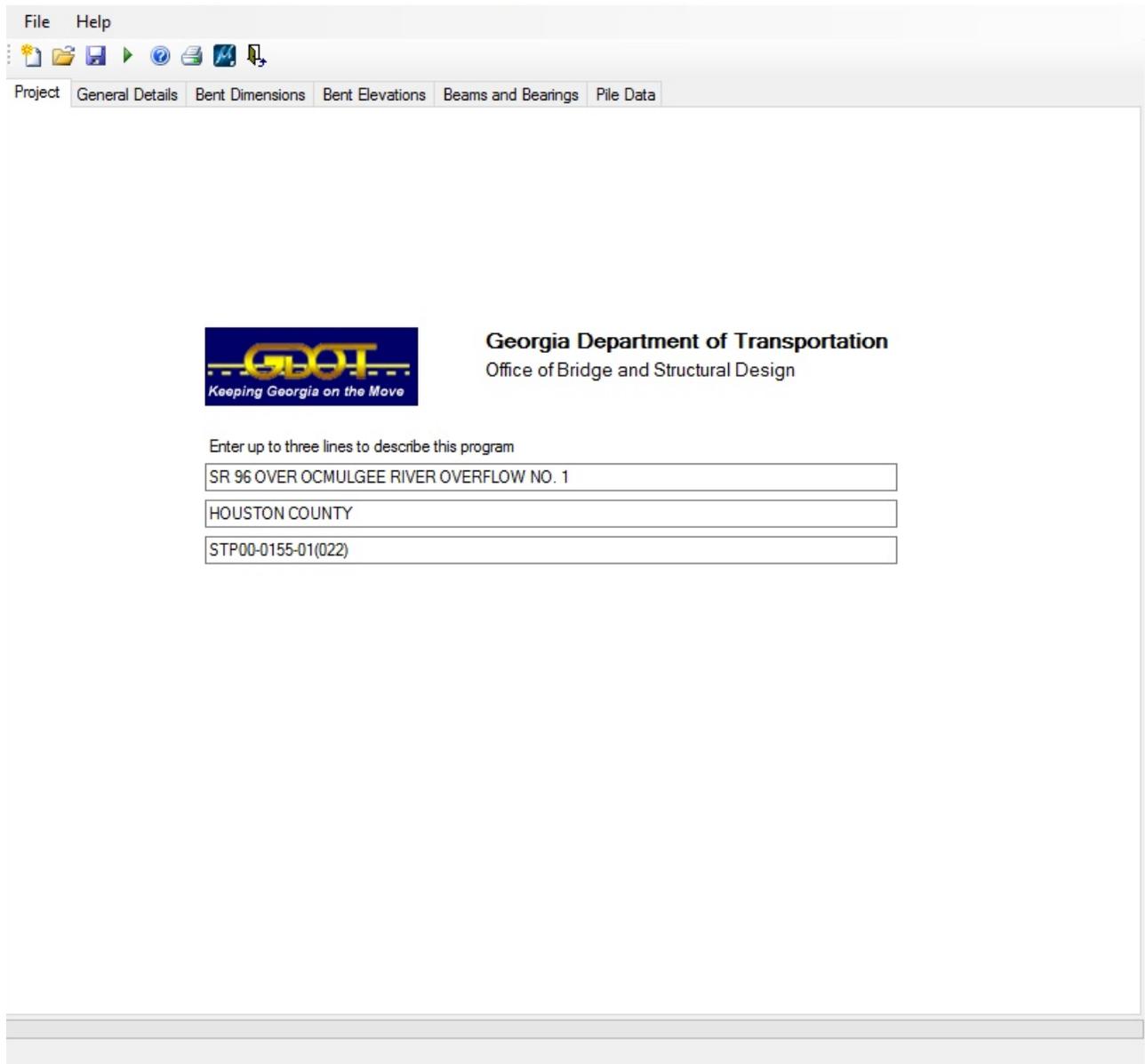
The Concrete Bent toolbar is one of the components in the GDOT - Concrete Bent window. The Concrete Bent toolbar contains the following toolbar buttons:

- New
- Open
- Save

- Run
- Help
- Print
- Open Drawing
- Exit

Field	Descriptions
	New: Select this toolbar button to display the Confirm Reset confirmation window. Use this window to verify that you want to open a new Concrete Bent input file.
	Open: Select this toolbar button to display the Open window. Use this window to open an existing Concrete Bent input file.
	Save: Select this toolbar button to display the Save As window. Use this window to save the Concrete Bent input file.
	Run: Select this toolbar button to run the input file and create a MicroStation DGN File.
	Help: Select this toolbar button to display the Help contents window. Use this window to search for specific Help topics about the Concrete Bent application.
	Print: Select this toolbar button to display the Printer window. Use this window to perform any of the following tasks: <ul style="list-style-type: none"> • Preview a graphics design file • Print a concrete quantity file
	Open Drawing: Opens MicroStation from Concrete Bent using the current input file.
	Exit: Select this toolbar button to display the Confirm Exit confirmation window. Use this window to verify that you want to exit the Concrete Bent application.

Chapter 2 Project Tab



The screenshot shows a software application window titled "Project" with a menu bar containing "File" and "Help". Below the menu bar is a toolbar with icons for file operations. The main area of the window contains a tabbed interface with the following tabs: "Project", "General Details", "Bent Dimensions", "Bent Elevations", "Beams and Bearings", and "Pile Data". The "Project" tab is active and displays the Georgia Department of Transportation logo and the text "Georgia Department of Transportation Office of Bridge and Structural Design". Below this, there is a prompt "Enter up to three lines to describe this program" followed by three text input fields containing the text: "SR 96 OVER OCMULGEE RIVER OVERFLOW NO. 1", "HOUSTON COUNTY", and "STP00-0155-01(022)".

Introduction: Use the fields in the GDOT - Pile Bent Project tab to enter the project description information in a Pile Bent input file.

Enter Up To Three Lines To Describe This Program

Intentionally Left Blank

Chapter 3 General Details

File Help



Project General Details Bent Dimensions Bent Elevations Beams and Bearings Pile Data

General

Select the drawing scale:

Select the type of bent: Click to View Centerlines Sketch

Select the number of beams:

Select the bent skew:

Are all the angles between the centerline of the beam and the centerline of the bearing the same?

Is the first bent drawn "Looking back"?

Enter the length of the cap: feet

Introduction: Use the fields in the GDOT - Pile Bent General Details tab set the general information about the project in a Pile Bent input file.

3.1 General Details List Of Window Fields

The GDOT - Pile Bent window, General Details tab contains the following fields:

- General group box
- Select The Drawing Scale
- Select The Type Of Bent
- Select The Number Of Beams
- Select The Bent Skew
- Are All The Angles Between The Centerline Of The Beam And The Centerline Of The Bearing The Same?
- Is The First Bent Drawn Looking Back?
- Is The Top Left Wingwall Level?
- Is The Top Right Wingwall Level?
- Enter The Length Of The Cap
- Enter The Length Of The Cap Measured Along The Front Face Of The Cap
- Are The Wingwalls Parallel To Each Other?
- Select The Number Of Wingwall Pile Boxes
- Are Battered Piles To Be Drawn?

3.2 General Details List Of Window Buttons

The GDOT - Pile Bent window, General Details tab contains the following buttons:

- General group box
 - Click To View Centerline Sketch

3.3 General Details Options

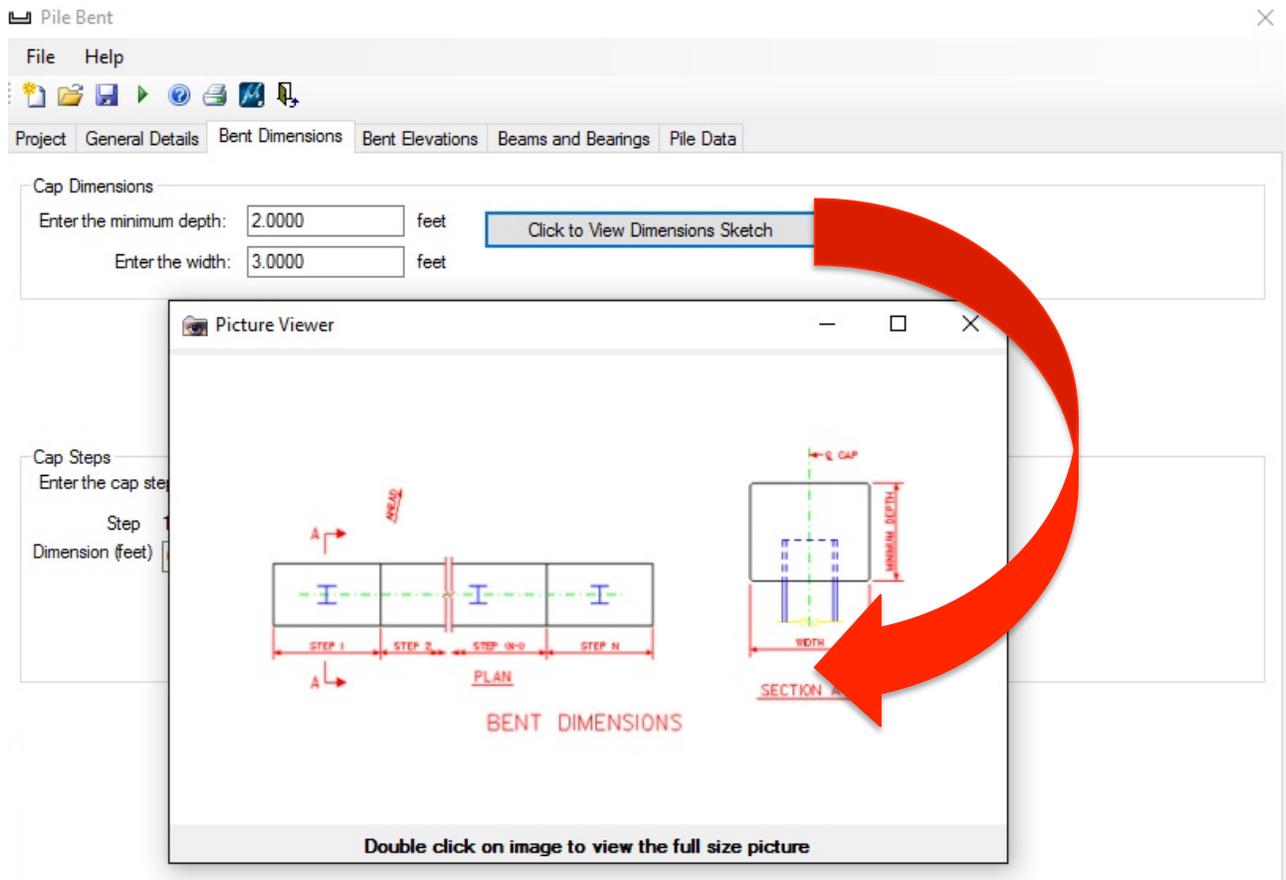
Field	Descriptions
Select The Drawing Scale	Use this field in the General group box to set the text size, arrowhead size, and detailing measurements for the drawing. <ul style="list-style-type: none"> • 1/2 in/ft (default value)
Select The Type Of Bent	Use this field in the General group box to set the type of bents used in the project. <ul style="list-style-type: none"> • Pile Intermediate Bent (default value)
Select The Number Of Beams	Use this field in the General group box to set the number of beams used in the project <ul style="list-style-type: none"> • Default value: 4 beams
Select The Bent Skew	Use this field in the General group box to set the type of bent skew. <ul style="list-style-type: none"> • None (default value)
Are All The Angles Between The Centerline Of The Beam And The Centerline Of The Bearing The Same?	Use this field in the General group box to set whether or not the angles between the centerline of the beam and the centerline of the bearing are equal. <ul style="list-style-type: none"> • Yes (default value) • No
Is The First Bent Drawn Looking Back?	Use this field in the General group box to set whether or not you want the first bent drawn "Looking Back." Select one of the following values: <ul style="list-style-type: none"> • Yes (default value if you selected "Pile End Bent Without Backwall" or "Pile End Bent With Backwall" in the Select The Type Of Bent field in this tab) • No (default value if you selected "Pile Intermediate Bent" in the Select The Type Of Bent field in this tab)

Field	Descriptions
Is The Top Left Wingwall Level?	<p>Use this field in the General group box to set whether or not the top left wingwall is level. Select one of the following values:</p> <ul style="list-style-type: none"> • Yes (default value) • No <p>Note: This field is not displayed if you selected "Pile End Bent Without Backwall" or "Pile End Bent With Backwall" in the Select The Type Of Bent field in this tab.</p>
Is The Top Right Wingwall Level?	<p>Use this field in the General group box to set whether or not the top right wingwall is level. Select one of the following values:</p> <ul style="list-style-type: none"> • Yes (default value) • No <p>Note: This field is not displayed if you selected "Pile End Bent Without Backwall" or "Pile End Bent With Backwall" in the Select The Type Of Bent field in this tab.</p>
Enter The Length Of The Cap	<p>Use this field in the General group box to set the length of the cap, in feet.</p> <ul style="list-style-type: none"> • 24 (default value) <p>Note: This field is not displayed if you selected "Pile End Bent Without Backwall" or "Pile End Bent With Backwall" in the Select The Type Of Bent field in this tab.</p>
Enter The Length Of The Cap Along The Front Face Of The Cap	<p>Use this field in the General group box to set the length of the cap, in feet.</p> <p>Note: This field is not displayed if you selected "Pile Intermediate Bent" in the Select The Type Of Bent field in this tab.</p>
Are The Wingwalls Parallel To Each Other?	<p>Use this field in the General group box to set whether or not the wingwalls are parallel to each other. Select one of the following values:</p> <ul style="list-style-type: none"> • Yes (default value) • No <p>Note: This field is not displayed if you selected "Pile End Bent Without Backwall" or "Pile End Bent With Backwall" in the Select The Type Of Bent field in this tab.</p>

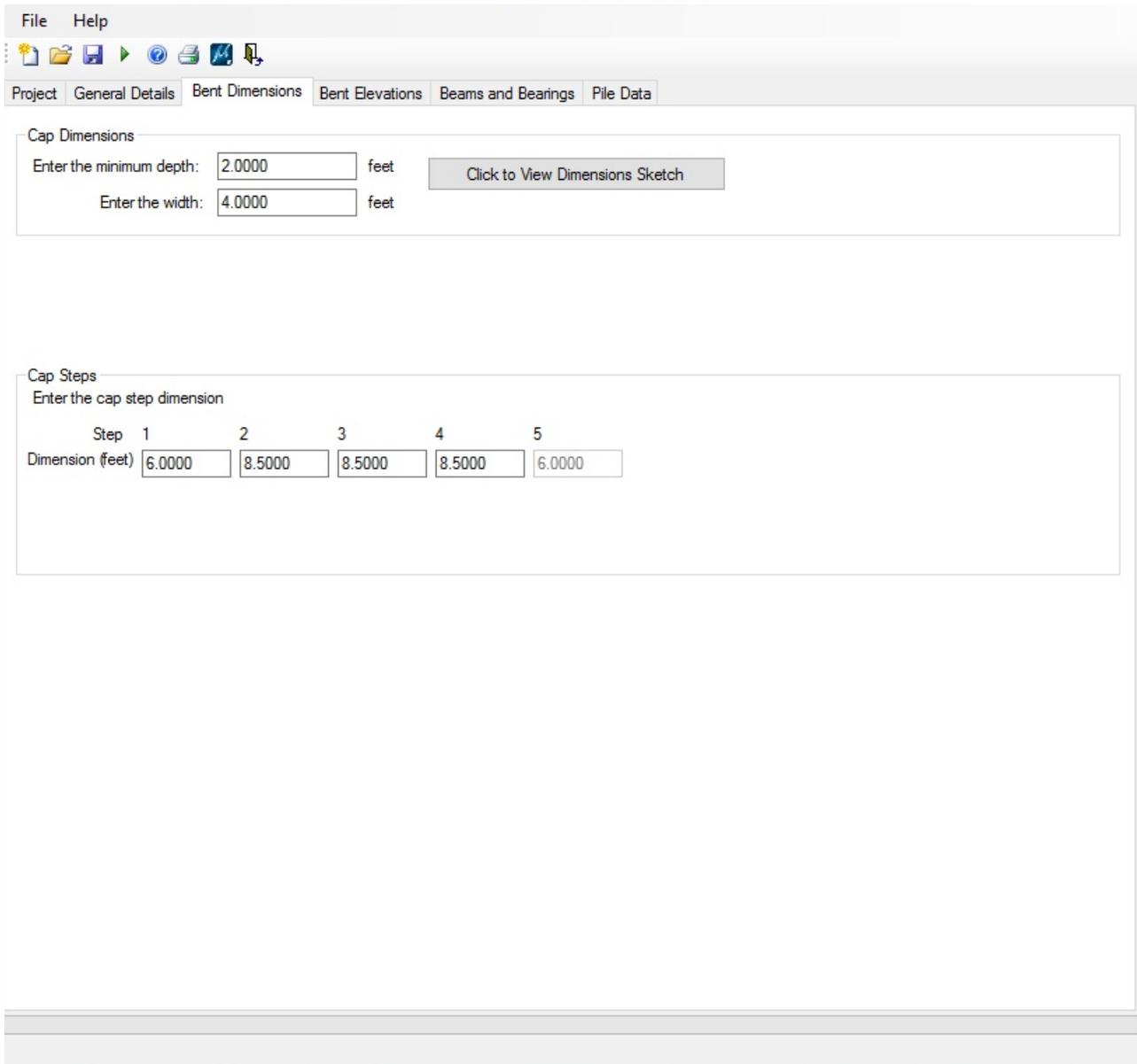
Field	Descriptions
<p>Select The Number Of Wingwall Pile Boxes</p>	<p>Use this field in the General group box to set the number of pile boxes in each wingwall.</p> <ul style="list-style-type: none"> • Default value: 0 pile boxes <p>Note: This field is not displayed if you selected "Pile End Bent Without Backwall" or "Pile End Bent With Backwall" in the Select The Type Of Bent field in this tab.</p>
<p>Are Battered Piles To Be Drawn?</p>	<p>Use this field in the General group box to set whether or not you want battered piles to be drawn. Select one of the following values:</p> <ul style="list-style-type: none"> • No (default value) • Yes <p>Note: This field is not displayed if you selected "Pile End Bent Without Backwall" or "Pile End Bent With Backwall" in the Select The Type Of Bent field in this tab.</p>

3.4 Dimension Sketch

Field	Descriptions
<p>Click To View Centerline Sketch</p>	<p>Choose this button in the General group box to display one of the following windows:</p> <ul style="list-style-type: none"> • Pile End Bent Without Backwall Centerlines Sketch window • Pile End Bent With Backwall Centerlines Sketch window • Pile Intermediate Bent Centerlines Sketch window <p>Use this window to view an example sketch.</p> <p>Note: The window displayed is dependent on the value that you selected in the “<i>Select The Type Of Bent</i>” field in this tab.</p>



Chapter 4 Bent Dimensions



Step	1	2	3	4	5
Dimension (feet)	6.0000	8.5000	8.5000	8.5000	6.0000

Introduction: Use the fields in the GDOT - Pile Bent Bent Dimensions tab to set the bent dimension information in a Pile Bent input file. The bent dimension information includes the following information: Cap dimension information, Fillet dimension information, Cap step dimension information, Wingwall dimension information, Wingwall angle information, Pile box dimension information, Backwall dimension information, End post dimension information

Note: Scroll the text in the Cap Steps group box to view all of the fields in this group box.

4.1 Bent Dimensions List Of Window Fields

The GDOT - Pile Bent window, Bent Dimensions tab contains the following fields:

- Cap Dimensions group box
 - Enter The Minimum Depth
 - Enter The Width
- Fillet Dimensions group box
 - Enter The Longitudinal Width
 - Enter The Transverse Width
- Cap Steps group box
 - Enter The Cap Step Dimension
- Wingwall Dimensions And Angles group box
 - Enter The Length Of The Wingwall
 - Enter The Wingwall Angle
 - Enter The Left Wingwall Angle
 - Enter The Right Wingwall Angle
- Pile Box Dimension group box
 - Enter The Dimension From The Front Face Of Cap To The Centerline Of The First Pile Box
 - Enter The Dimension From The Front Face Of Cap To The Centerline Of The Second Pile Box
- Backwall And End Post Dimension group box
 - Enter The Length Of The End Post
 - Enter The Width Of The Backwall

4.2 Bent Dimensions List Of Window Buttons

The GDOT - Pile Bent window, Bent Dimensions tab contains the following buttons:

- Cap Dimensions group box
 - Click To View Dimensions Sketch

4.3 Bent Dimensions Options

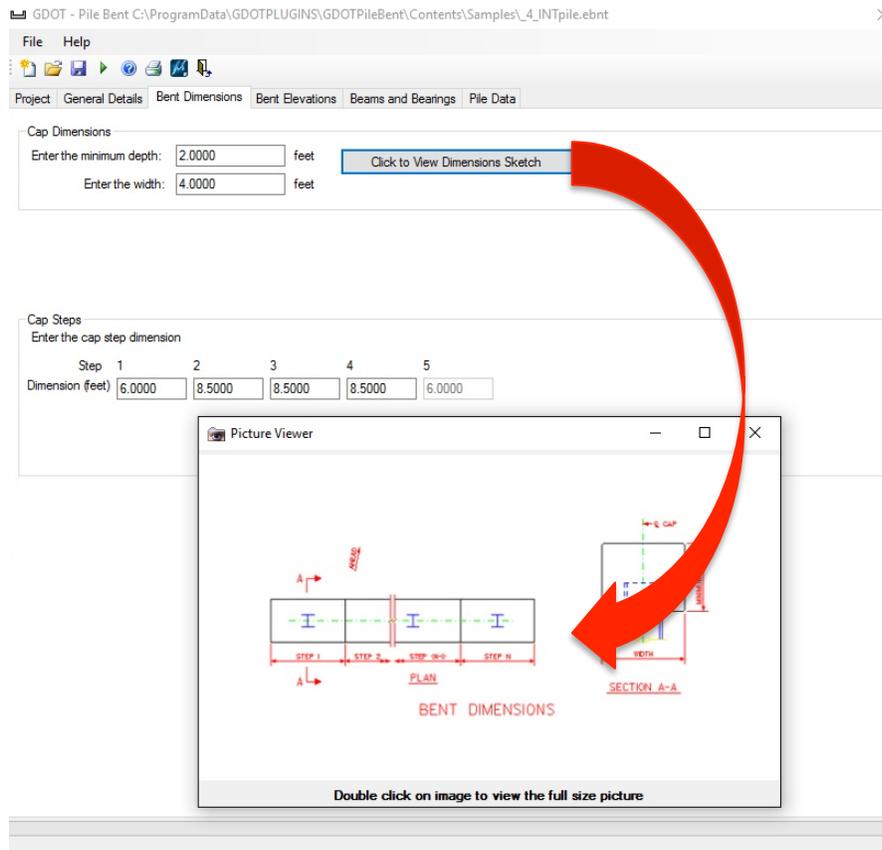
Field	Descriptions
Enter The Minimum Depth	Use this field in the Cap Dimensions group box to set the minimum depth of the cap, in feet. <ul style="list-style-type: none"> • Default value: 2.0000 feet
Enter The Width	Use this field in the Cap Dimensions group box to set the width of the cap, in feet. <ul style="list-style-type: none"> • Default value: 3.0000 feet
Enter The Longitudinal Width	Use this field in the Fillet Dimensions group box to set the longitudinal width of the fillet, in feet. The longitudinal width of the fillet is measured perpendicular to the back face of the paving rest. <ul style="list-style-type: none"> • Default value: 2.0000 feet Note: This field is not displayed if you selected "Pile Intermediate Bent" in the "Select The Type Of Bent" field in the GDOT - Pile Bent General Details tab.
Enter The Transverse Width	Use this field in the Fillet Dimensions group box to set the transverse width of the fillet, in feet. The transverse width of the fillet is measured parallel to the back face of the paving rest. <ul style="list-style-type: none"> • Default value: 2.0000 feet Note: This field is not displayed if you selected "Pile Intermediate Bent" in the "Select The Type Of Bent" field in the GDOT - Pile Bent General Details tab.
Enter The Cap Step Dimension	Use this field in the Cap Steps group box to set the dimension of each of the cap steps, in feet. The cap step dimension is measured along the front face of the cap <p>Note:</p> <ul style="list-style-type: none"> • The last cap step dimension is calculated by the Pile Bent application. • Scroll the text in the Cap Steps group box to view all of the fields in this group box.

Field	Descriptions
Enter The Length Of The Wingwall	<p>Use this field in the Wingwall Dimensions And Angles group box to set the length of the wingwall, in feet.</p> <p>Minimum value: 10.0000 feet</p> <p>Note: This field is not displayed if you selected "Pile Intermediate Bent" in the "Select The Type Of Bent" field in the GDOT - Pile Bent General Details tab.</p>
Enter The Wingwall Angle	<p>Use this field in the Wingwall Dimensions And Angles group box to set the angle of the wingwall, in degrees, minutes, and seconds.</p> <p>Note:</p> <ul style="list-style-type: none"> • This field is not displayed if you selected "Pile Intermediate Bent" in the "Select The Type Of Bent" field in the GDOT - Pile Bent General Details tab. • This field is not displayed if you selected "No" in the "Are The Wingwalls Parallel To Each Other?" field in the GDOT - Pile Bent General Details tab.
Enter The Left Wingwall Angle	<p>Use this field in the Wingwall Dimensions And Angles group box to set the angle of the left wingwall, in degrees, minutes, and seconds. A right skew wingwall angle is an acute angle measured counterclockwise from a line running parallel to the front face of the cap to the left wingwall. A left skew beam angle is an acute angle measured clockwise from a line running parallel to the front face of the cap to the left wingwall.</p> <p>Note:</p> <ul style="list-style-type: none"> • This field is not displayed if you selected "Pile Intermediate Bent" in the "Select The Type Of Bent" field in the GDOT - Pile Bent General Details tab. • This field is not displayed if you selected "Yes" in the "Are The Wingwalls Parallel To Each Other?" field in the GDOT - Pile Bent General Details tab.

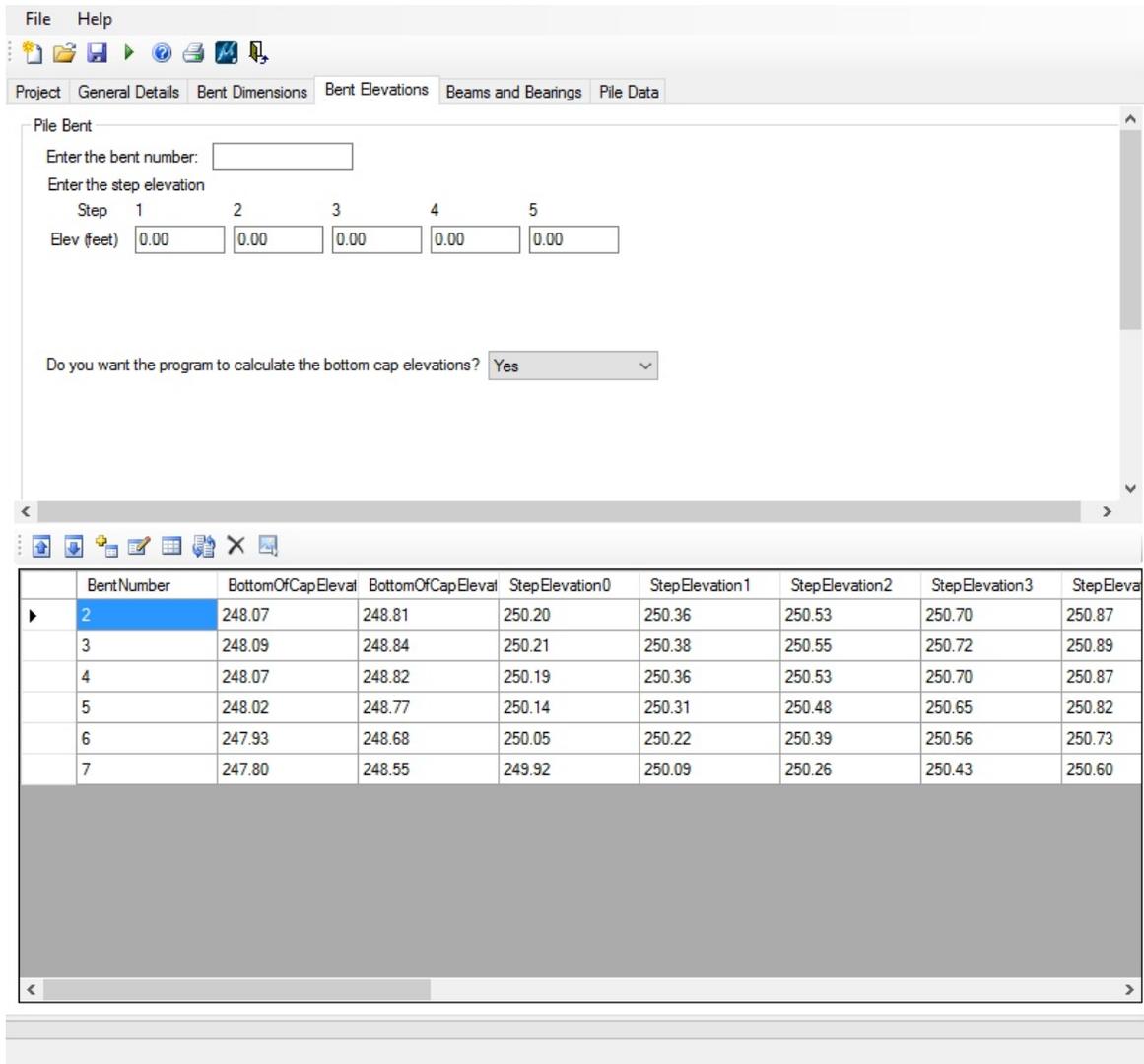
Field	Descriptions
<p>Enter The Right Wingwall Angle</p>	<p>Use this field in the Wingwall Dimensions And Angles group box to set the angle of the right wingwall, in degrees, minutes, and seconds. A right skew wingwall angle is an acute angle measured counterclockwise from a line running parallel to the front face of the cap to the right wingwall. A left skew beam angle is an acute angle measured clockwise from a line running parallel to the front face of the cap to the right wingwall.</p> <p>Note:</p> <ul style="list-style-type: none"> • This field is not displayed if you selected "Pile Intermediate Bent" in the Select The Type Of Bent field in the GDOT - Pile Bent window, General Details tab. • This field is not displayed if you selected "Yes" in the Are The Wingwalls Parallel To Each Other? field in the GDOT - Pile Bent window, General Details tab.
<p>Enter The Dimension From The Front Face Of Cap To The Centerline Of The Second Pile Box</p>	<p>Use this field in the Pile Box Dimension group box to set the dimension from the front face of the cap to the centerline of the second pile box, in feet.</p> <p>Note:</p> <ul style="list-style-type: none"> • This field is not displayed if you selected "Pile Intermediate Bent" in the "Select The Type Of Bent" field in the GDOT - Pile Bent General Details tab. • This field is not displayed if you selected "0" in the "Select The Number Of Wingwall Pile Boxes" field in the GDOT - Pile Bent General Details tab.
<p>Enter The Length Of The End Post</p>	<p>Use this field in the Backwall And End Post Dimension group box to set the length of the end post, in feet.</p> <p>Note: This field is not displayed if you selected "Pile Intermediate Bent" in the Select The Type Of Bent field in the GDOT - Pile Bent General Details tab.</p>
<p>Enter The Width Of The Backwall</p>	<p>Use this field in the Backwall And End Post Dimension group box to set the width of the backwall, in feet.</p> <p>Note: This field is not displayed if you selected "Pile Intermediate Bent" in the "Select The Type Of Bent" field in the GDOT - Pile Bent General Details tab.</p>

4.4 Dimension Sketch

Field	Descriptions
<p>Click To View Dimensions Sketch</p>	<p>Choose this button in the Cap Dimensions group box to display one of the following windows:</p> <ul style="list-style-type: none"> • Pile End Bent Without Backwall Dimension Sketch window • Pile End Bent With Backwall Dimension Sketch window • Pile Intermediate Bent Dimension Sketch window <p>Use this window to view an example sketch.</p> <p>Note: The window displayed is dependent on the value that you selected in the Select The Type Of Bent field in the GDOT - Pile Bent General Details tab.</p>



Chapter 5 Bent Elevations



The screenshot shows the 'Bent Elevations' tab in the software. It features a 'Pile Bent' section with an input field for 'Enter the bent number:' and a section for 'Enter the step elevation' with five input boxes labeled 'Step 1' through 'Step 5', each containing '0.00'. Below this is a dropdown menu for 'Do you want the program to calculate the bottom cap elevations?' set to 'Yes'. At the bottom, a table displays calculated values for bent numbers 2 through 7.

	BentNumber	BottomOfCapEleva	BottomOfCapEleva	StepElevation0	StepElevation1	StepElevation2	StepElevation3	StepEleva
▶	2	248.07	248.81	250.20	250.36	250.53	250.70	250.87
	3	248.09	248.84	250.21	250.38	250.55	250.72	250.89
	4	248.07	248.82	250.19	250.36	250.53	250.70	250.87
	5	248.02	248.77	250.14	250.31	250.48	250.65	250.82
	6	247.93	248.68	250.05	250.22	250.39	250.56	250.73
	7	247.80	248.55	249.92	250.09	250.26	250.43	250.60

Introduction: Use the fields in the GDOT - Pile Bent Bent Elevation tab to set the elevation information in a Pile Bent input file. The elevation information includes the following information: Cap step elevation information, Bottom cap elevation information, Wingwall elevation information, Backwall elevation information, and End post elevation information

Note:

- Scroll the text in the Enter The Step Elevation field to view all the field entries.
- Scroll the text in the Top Left Wingwall group box to view all of the fields in the group box.
- Scroll the text in the Top Right Wingwall group box to view all of the fields in the group box.
- Refer to "Viewing Example Elevation Sketches" for details about measuring elevations.

5.1 Bent Elevations List Of Window Fields

The GDOT - Pile Bent window, Bent Elevation tab contains the following fields:

- Pile Bent group box.
 - Enter The Bent Number
 - Enter The Step Elevation
 - Do You Want The Program To Calculate The Bottom Cap Elevations?
 - Enter The Bottom Left Cap Elevation
 - Enter The Bottom Right Cap Elevation
- Top Left Wingwall group box.
 - Enter The Elevation At The Top Of The Left Wingwall
 - Enter The Elevation At The Top Of The Left Wingwall At The Front Face Of The Cap
 - Enter The Elevation At The Top Of The Left Wingwall At The End Of The Wingwall
- Top Right Wingwall group box
 - Enter The Elevation At The Top Of The Right Wingwall
 - Enter The Elevation At The Top Of The Right Wingwall At The Front Face Of The Cap
 - Enter The Elevation At The Top Of The Right Wingwall At The End Of The Wingwall
- Top Of Backwall Elevations And End Post group box
 - Enter The Elevation For The Top Of The Left End Post
 - Enter The Elevation For The Top Of The Right End Post
 - Enter The Elevation At The Top Of The Backwall At The Inside Face Of The Left End Post
 - Enter The Elevation At The Top Of The Backwall At The Centerline Of The Bent
 - Enter The Elevation At The Top Of The Backwall At The Inside Face Of The Right End Post
- Bent Number/Bottom Left Cap/Bottom Right Cap/Step x/Top Left Wingwall (Front Face)/Top Right Wingwall (Front Face)/Top Left Wingwall (End)/Top Right Wingwall (End)/Top Left End Post/Top Right End Post/Inside Face Left End Post/Centerline Of Bent/Inside Face Right End Post table

5.2 Bent Elevations List Of Window Buttons

The GDOT - Pile Bent window, Bent Elevation tab contains the following buttons:

- Click To View Elevations Sketch
 - Up arrow
 - Down arrow
 - Add
 - Edit
 - Insert
 - Replace
 - Delete
 - Click To View Elevation Sketch

5.3 Bent Elevations Options

Field	Descriptions
Enter The Bent Number	Use this field in the Pile Bent group box to set the bent number.
Enter The Step Elevation	Use this field in the Pile Bent group box to set the elevation of each cap step, in feet. Note: Scroll the text in this field to view all the field entries.
Do You Want The Program To Calculate The Bottom Cap Elevations?	Use this field in the Pile Bent group box to set whether or not you want the Pile Bent application to calculate the elevations of the bottom caps. Select one of the following values: <ul style="list-style-type: none"> • Yes (default value) • No

Field	Descriptions
Enter the Bottom Left Cap Elevation	Use this field in the Pile Bent group box to set the elevation of the bottom left cap, in feet Note: This field is not displayed if you selected "Yes" in the "Do You Want The Program To Calculate The Bottom Cap Elevations?" field in this tab.
Enter the Bottom Right Cap Elevation	Use this field in the Pile Bent group box to set the elevation of the bottom right cap, in feet. Note: This field is not displayed if you selected "Yes" in the "Do You Want The Program To Calculate The Bottom Cap Elevations?" field in this tab.
Enter The Elevation At The Top Of The Left Wingwall	Use this field in the Top Left Wingwall group box to set the elevation at the top of the left wingwall, in feet Note: <ul style="list-style-type: none"> • This field is not displayed if you selected "Pile Intermediate Bent" in the Select The Type Of Bent field in the GDOT - Pile Bent window, General Details tab. • This field is not displayed if you selected "No" in the Is The Top Left Wingwall Level? field in the GDOT - Pile Bent window, General Details tab. Scroll the text in this field to view all the field entries.

Field	Descriptions
<p>Enter The Elevation At The Top Of The Left Wingwall At The Front Face Of The Cap</p>	<p>Use this field in the Top Left Wingwall group box to set the elevation at the top of the left wingwall at the front face of the cap, in feet.</p> <p>Note:</p> <ul style="list-style-type: none"> • This field is not displayed if you selected "Pile Intermediate Bent" in the "Select The Type Of Bent" field in the GDOT - Pile Bent General Details tab. • This field is not displayed if you selected "Yes" in the "Is The Top Left Wingwall Level?" field in the GDOT - Pile Bent General Details tab. <p>Scroll the text in this field to view all the field entries.</p>
<p>Enter The Elevation At The Top Of The Left Wingwall At The End Of The Wingwall</p>	<p>Use this field in the Top Left Wingwall group box to set the elevation at the top of the left wingwall at the end of the wingwall, in feet</p> <p>Note:</p> <ul style="list-style-type: none"> • This field is not displayed if you selected "Pile Intermediate Bent" in the "Select The Type Of Bent" field in the GDOT - Pile Bent General Details tab. • This field is not displayed if you selected "Yes" in the "Is The Top Left Wingwall Level?" field in the GDOT - Pile Bent General Details tab. <p>Scroll the text in this field to view all the field entries.</p>
<p>Enter The Elevation At The Top Of The Right Wingwall</p>	<p>Use this field in the Top Right Wingwall group box to set the elevation at the top of the right wingwall, in feet.</p> <p>Note:</p> <ul style="list-style-type: none"> • This field is not displayed if you selected "Pile Intermediate Bent" in the "Select The Type Of Bent" field in the GDOT - Pile Bent General Details tab. • This field is not displayed if you selected "No" in the "Is The Top Right Wingwall Level?" field in the GDOT - Pile Bent General Details tab. <p>Scroll the text in this field to view all the field entries.</p>

Field	Descriptions
<p>Enter The Elevation At The Top Of The Right Wingwall At The Front Face Of The Cap</p>	<p>Use this field in the Top Right Wingwall group box to set the elevation at the top of the right wingwall at the front face of the cap, in feet.</p> <p>Note:</p> <ul style="list-style-type: none"> • This field is not displayed if you selected "Pile Intermediate Bent" in the "Select The Type Of Bent" field in the GDOT - Pile Bent General Details tab. • This field is not displayed if you selected "Yes" in the "Is The Top Right Wingwall Level?" field in the GDOT - Pile Bent General Details tab. <p>Scroll the text in this field to view all the field entries.</p>
<p>Enter The Elevation At The Top Of The Right Wingwall At The End Of The Wingwall</p>	<p>Use this field in the Top Right Wingwall group box to set the elevation at the top of the right wingwall at the end of the wingwall, in feet.</p> <p>Note:</p> <ul style="list-style-type: none"> • This field is not displayed if you selected "Pile Intermediate Bent" in the "Select The Type Of Bent" field in the GDOT - Pile Bent General Details tab. • This field is not displayed if you selected "Yes" in the "Is The Top Right Wingwall Level?" field in the GDOT - Pile Bent General Details tab. <p>Scroll the text in this field to view all the field entries.</p>

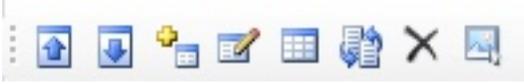
Field	Descriptions
Enter The Elevation For The Top Of The Left End Post	Use this field in the Top Of Backwall Elevations And End Post group box to set the elevation at the top of the left end post, in feet Note: This field is not displayed if you selected "Pile Intermediate Bent" or "Pile End Without Backwall" in the "Select The Type Of Bent" field in the GDOT - Pile Bent General Details tab.
Enter The Elevation For The Top Of The Right End Post	Use this field in the Top Of Backwall Elevations And End Post group box to set the elevation at the top of the right end post, in feet. Note: This field is not displayed if you selected "Pile Intermediate Bent" or "Pile End Without Backwall" in the "Select The Type Of Bent" field in the GDOT - Pile Bent General Details tab.
Enter The Elevation At The Top Of The Backwall At The Inside Face Of The Left End Post	Use this field in the Top Of Backwall Elevations And End Post group box to set the elevation at the top of the backwall at the inside face of the left end post, in feet. Note: This field is not displayed if you selected "Pile Intermediate Bent" or "Pile End Without Backwall" in the "Select The Type Of Bent" field in the GDOT - Pile Bent General Details tab.
Enter The Elevation At The Top Of The Backwall At The Centerline Of The Bent	Use this field in the Top Of Backwall Elevations And End Post group box to set the elevation at the top of the backwall at the centerline of the bent, in feet. Note: This field is not displayed if you selected "Pile Intermediate Bent" or "Pile End Without Backwall" in the "Select The Type Of Bent" field in the GDOT - Pile Bent General Details tab.
Enter The Elevation At The Top Of The Backwall At The Inside Face Of The Right End Post	Use this field in the Top Of Backwall Elevations And End Post group box to set the elevation at the top of the backwall at the inside face of the right end post, in feet. Note: This field is not displayed if you selected "Pile Intermediate Bent" or "Pile End Without Backwall" in the "Select The Type Of Bent" field in the GDOT - Pile Bent General Details tab.

Bent Number/Bottom Left Cap/Bottom Right Cap/Step x/Top Left Wingwall (Front Face)/Top Right Wingwall (Front Face)/Top Left Wingwall (End)/Top Right Wingwall (End)/Top Left End Post/Top Right End Post/Inside Face Left End Post/Centerline Of Bent/Inside Face Right End Post table

This table contains the following fields:

Field	Descriptions
Bent Number	The bent number.
Bottom Left Cap	The elevation of the bottom left cap, in feet.
Bottom Right Cap	The elevation of the bottom right cap, in feet.
Step x	The elevation of each cap step, in feet.
Top Left Wingwall (Front Face)	The elevation at the top of the left wingwall at the front face of the cap, in feet.
Top Right Wingwall (Front Face)	The elevation at the top of the right wingwall at the front face of the cap, in feet.
Top Left Wingwall (End)	The elevation at the top of the left wingwall at the end of the wingwall, in feet.
Top Right Wingwall (End)	The elevation at the top of the right wingwall at the end of the wingwall, in feet.
Top Left End Post	The elevation at the top of the left end post, in feet.
Top Right End Post	The elevation at the top of the right end post, in feet.
Inside Face Left End Post	The elevation at the top of the backwall at the inside face of the left end post, in feet.
Centerline Of Bent	The elevation at the top of the backwall at the centerline of the bent, in feet.
Inside Face Right End Post	The elevation at the top of the backwall at the inside face of the right end post, in feet.

5.4 Button Options

	
Field	Descriptions
	<p>Up Arrow: Do the following:</p> <ol style="list-style-type: none"> 1. Select an entry row in the Bent Number/View/Bottom Left Cap/Bottom Right Cap/Step x/Footing x table. 2. Choose this button to move the selected entry up one table row.
	<p>Down Arrow: Do the following:</p> <ol style="list-style-type: none"> 1. Select an entry row in the Bent Number/View/Bottom Left Cap/Bottom Right Cap/Step x/Footing x table. 2. Choose this button to move the selected entry down one table row.
	<p>Add to data grid: Do the following:</p> <ol style="list-style-type: none"> 1. Type or select values in the fields in the Cap and Footing Elevations group box. 2. Choose this button to add this information to the Bent Number/View/Bottom Left Cap/Bottom Right Cap/Step x/Footing x table, in the row after the last table row.
	<p>Edit data grid: Do the following:</p> <ol style="list-style-type: none"> 1. Select an entry row in the Bent Number/View/Bottom Left Cap/Bottom Right Cap/Step x/Footing x table. 2. Choose this button to display the values in the fields in the Cap and Footing Elevations group box.

Field	Descriptions
	<p>Insert above selected data grid row: Do the following:</p> <ol style="list-style-type: none"> 1. Type or select values in the fields in the Cap and Footing Elevations group box. 2. Select an entry row in the Bent Number/View/Bottom Left Cap/Bottom Right Cap/Step x/Footing x table. 3. Choose this button to insert this information in the table row above the selected entry row.
	<p>Replace selected record in data grid: Do the following:</p> <ol style="list-style-type: none"> 1. Type or select values in the fields in the Cap and Footing Elevations group box. 2. Select an entry row in the Bent Number/View/Bottom Left Cap/Bottom Right Cap/Step x/Footing x table. 3. Choose this button to replace the existing values in the entry row with the new values in the fields in the Cap and Footing Elevations group box.
	<p>Delete selected row in data grid: Do the following:</p> <ol style="list-style-type: none"> 1. Select an entry row in the Bent Number/View/Bottom Left Cap/Bottom Right Cap/Step x/Footing x table. 2. Choose this button to display the values in the fields in the Cap and Footing Elevations group box.
	<p>Click to view elevation sketch: Choose this button in the Cap and Footing Elevations group box to display the Elevation Sketch window. Use this window to view an example sketch. This sketch includes the following information:</p> <ul style="list-style-type: none"> • The location of the footings • The location of the bottom left cap • The location of the bottom right cap • The location of the measurements of the cap steps

File Help

Project General Details Bent Dimensions Bent Elevations Beams and Bearings Pile Data

Pile Bent

Enter the bent number:

Enter the step elevation

Step	1	2
Elev (feet)	<input type="text" value="0.00"/>	<input type="text" value="0.00"/>

Do you want the program to calculate the

Top Left Wingwall Level
Enter the elevation at the top of the

Top Right Wingwall Level
Enter the elevation at the top of the

Double click on image to view the full size picture

BentNumber	BottomOfCapElevat	BottomOfCapElevat	StepElevation0	StepElevation1	StepElevation2	StepElevation3	StepEleva
1	254.68	255.30	256.80	256.99	257.12	257.24	257.31
9	253.19	254.36	255.41	255.71	255.95	256.18	256.36

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Chapter 6 Beams and Bearings

File Help

Project General Details Bent Dimensions Bent Elevations Beams and Bearings Pile Data

Bearing Data

Select type of bearing hole: Dowel Bar v

Enter the dimension from the centerline of the bent to the centerline of the bearing: 1.0000 feet

Click to View Bearing Dimension and Beam Angle Sketch

Beam Angle

Enter the beam angle

Beam 1

Angle 90° 0' 0.0"

Centerline Locations

Enter the left dimension 1.7500 Right dimension. The right dimension is calculated by the program 1.7500

Click to View Centerline Beam Sketch

Bearing Distance	1	2	3	4
Dimension (feet)	8.5000			

Introduction: Use the fields in the GDOT - Pile Bent Beam And Bearings tab to set the beam and bearing information in a Pile Bent input file. The beam and bearing information includes the following information: Bearing information, Beam angle information, and Beam dimension information

Note: Scroll the text in the Beam Angles group box to view all of the fields in this group box.

6.1 Beams And Bearings List Of Window Fields

The GDOT - Pile Bent window, Beam And Bearings tab contains the following fields:

- Bearing Data group box
 - Select The Type Of Bearing Hole
 - Enter The Distance From The Front Face Of The Cap To The Center Of The Bearing
- Beam Angles group box
 - Enter The Beam Angle
- Locations Of The Centerline Of The Beam group box
 - Enter The Left Dimension
 - Right Dimension
 - Step Dimension

6.2 Beams And Bearings List Of Window Buttons

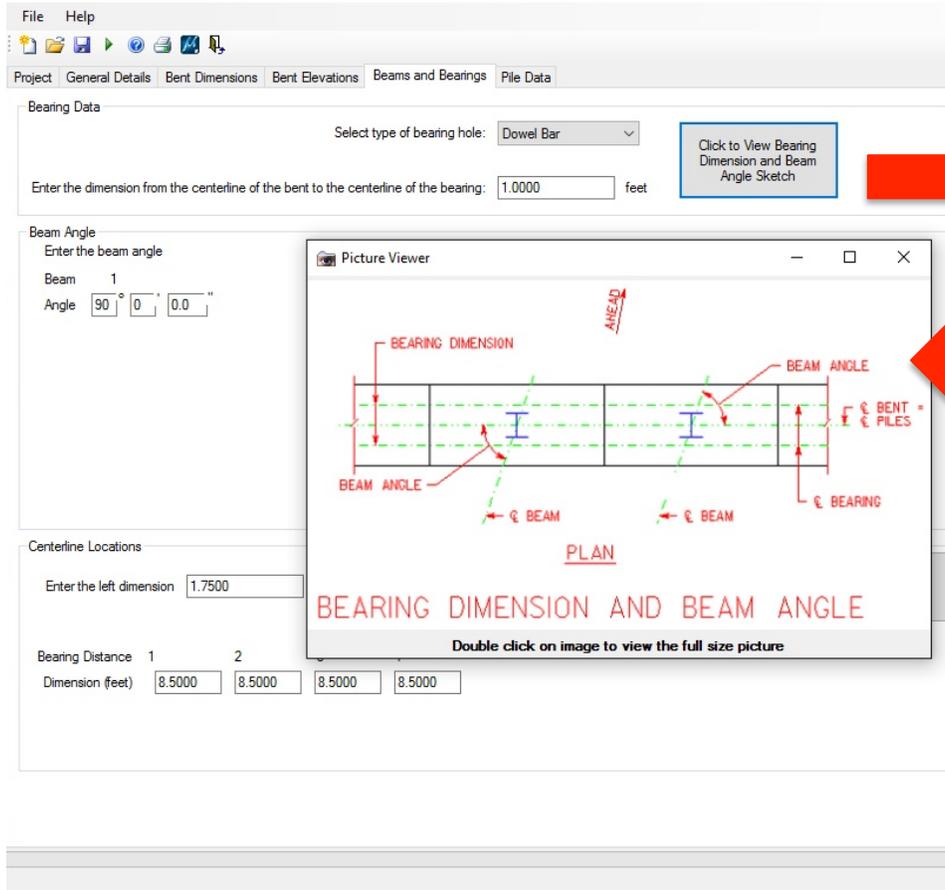
The GDOT - Pile Bent Beam And Bearings tab contains the following buttons:

- Bearing Data group box
 - Click To View Bearing Dimension and Beam Angle Sketch
- Locations Of The Centerline Of The Beam group box
 - Click To View Centerline Beam Sketch

6.3 Beams And Bearings Options

Field	Descriptions
Select The Type Of Bearing Hole	Use this field in the Bearing Data group box to set the type of bearing hole used in the project. Select one of the following values: <ul style="list-style-type: none"> • Dowel Bar (default value) • Two Anchor Bolts • None
Enter The Distance From The Front Face Of The Cap To The Center Of The Bearing	Use this field in the Bearing Data group box to set the dimension from the front face of the cap to the center of the bearing, in feet.
Enter The Beam Angle	Use this field in the Beam Angles group box to set the angle of the beams, in degrees, minutes, and seconds. A right skew beam angle is an acute angle measured counterclockwise from the centerline of the bearing to the centerline of the beam. A left skew beam angle is an acute angle measured clockwise from the centerline of the bearing to the centerline of the beam. Note: Scroll the text in the Beam Angles group box to view all of the fields in this group box.
Enter The Left Dimension	Use this field in the Locations Of The Centerline Of The Beam group box to set the left dimension of the beam, in feet.
Right Dimension	The right dimension of the beam is calculated by the Pile Bent application.
Step Dimension	Use this field in the Locations Of The Centerline Of The Beam group box to set the dimensions of the cap steps, in feet.

6.4 Bearing Dimension & Beam Angle Sketch



Field	Descriptions
<p>Click To View Bearing Dimension And Beam Angle Sketch</p>	<p>Choose this button in the Bearing Data group box to display one of the following windows:</p> <ul style="list-style-type: none"> • Pile End Bent Without Backwall Bearing Dimension and Beam Angle Sketch window • Pile End Bent With Backwall Bearing Dimension and Beam Angle Sketch window • Pile Intermediate Bent Elevation Bearing Dimension and Beam Angle window <p>Use this window to view an example sketch.</p> <p>Note: The window displayed is dependent on the value that you selected in the “<i>Select The Type Of Bent</i>” field in the GDOT - Pile Bent General Details tab.</p>

6.5 Centerline Beam Sketch

The screenshot shows a software interface for designing a pile bent. A 'Picture Viewer' window displays a 'PLAN' view of a centerline beam sketch. The sketch shows a series of beams (BEAM 1, BEAM 2, BEAM (N-1), BEAM N) with their respective spacings (BEAM SPACING 1, BEAM SPACING 2, BEAM SPACING (N-1), BEAM SPACING (N-2)) and dimensions (LEFT DIMENSION, RIGHT DIMENSION). A red arrow points from a button in the 'Centerline Locations' section to the sketch.

Centerline Locations

Enter the left dimension: Right dimension. The right dimension is calculated by the program:

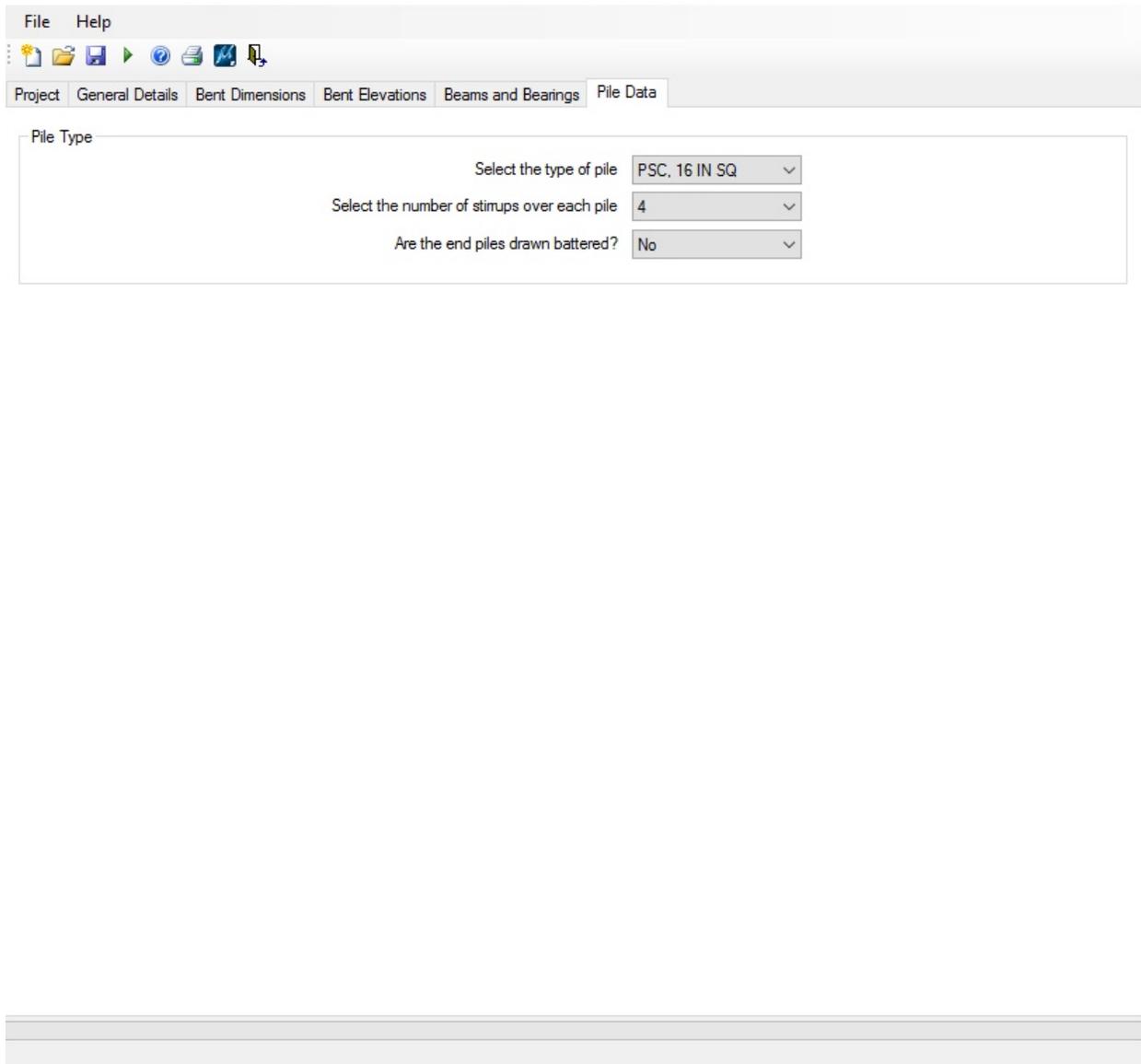
Bearing Distance 1 2 3 4
 Dimension (feet)

Click to View Centerline Beam Sketch

Field	Descriptions
<p>Click To View Centerline Beam Sketch</p>	<p>Choose this button in the Locations Of The Centerline Of The Beam group box to display one of the following windows:</p> <ul style="list-style-type: none"> • Pile End Bent Without Backwall Centerline Beam Sketch window • Pile End Bent With Backwall Centerline Beam Sketch window • Pile Intermediate Bent Centerline Beam Sketch window <p>Use this window to view an example sketch.</p> <p>Note: The window displayed is dependent on the value that you selected in the “<i>Select The Type Of Bent</i>” field in the GDOT - Pile Bent General Details tab.</p>

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Chapter 7 Pile Data



File Help

Project General Details Bent Dimensions Bent Elevations Beams and Bearings Pile Data

Pile Type

Select the type of pile PSC, 16 IN SQ

Select the number of stirups over each pile 4

Are the end piles drawn battered? No

Introduction: Use the fields in the GDOT - Pile Bent Pile Data tab to set the pile information in a Pile Bent input file. The pile information includes the following information: Pile information and Battered pile information

7.1 Pile Data List Of Window Fields

The GDOT - Pile Bent Pile Data tab contains the following fields:

- Pile Type group box
 - Select The Type Of Pile
 - Select The Number Of Stirrups Over Each Pile
- Battered Piles group box
 - Select The Number Of Battered Piles
 - Enter The Left Dimension
 - Right Dimension
 - Battered Pile Spacing

7.2 Pile Data Options

Field	Descriptions
Select The Type Of Pile	Use this field in the Pile Type group box to set the type of piles used in the project. Select one of the following values: <ul style="list-style-type: none"> • 12" Square PSC (default value) • 14" Square PSC • 16" Square PSC • AISC HP10"x42" • AISC HP12"x53" • AISC HP14"x73" • 14" Diameter Metal Shell • 16" Diameter Metal Shell
Select The Number Of Stirrups Over Each Pile	Use this field in the Pile Type group box to set the number of stirrups over each pile.

Field	Descriptions
Select The Number Of Battered Piles	<p>Use this field in the Battered Piles group box to set the number of battered piles used in the project.</p> <p>Note:</p> <ul style="list-style-type: none"> • This field is not displayed if you selected "Pile Intermediate Bent" in the "Select Type of Bent" field in the GDOT - Pile Bent General Details tab. • This field is not displayed if you selected "No" in the "Are Battered Piles To Be Drawn?" field in the GDOT - Pile Bent General Details tab.
Enter The Left Dimension	<p>Use this field in the Battered Piles group box to set the left dimension of the battered piles used in the project, in feet.</p> <p>Note:</p> <ul style="list-style-type: none"> • This field is not displayed if you selected "Pile Intermediate Bent" in the "Select Type of Bent" field in the GDOT - Pile Bent General Details tab. • This field is not displayed if you selected "No" in the "Are Battered Piles To Be Drawn?" field in the GDOT - Pile Bent General Details tab.
Right Dimension	<p>The right dimension of the battered pile is calculated by the Pile Bent application.</p>
Battered Pile Spacing	<p>Use this field in the Battered Piles group box to set the spacing of the battered piles used in the project, in feet.</p> <p>Note:</p> <ul style="list-style-type: none"> • This field is not displayed if you selected "Pile Intermediate Bent" in the "Select Type of Bent" field in the GDOT - Pile Bent General Details tab. • This field is not displayed if you selected "No" in the "Are Battered Piles To Be Drawn?" field in the GDOT - Pile Bent General Details tab.

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