

Pipe Supports User Guide and Menu Reference

CADD5® 5i Release 11

DOC40078-007

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3 January 2000

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Preface

Pipe Supports User Guide and Menu Reference gives you a quick reference for designing and manipulating pipe support models, using the CADDSS Pipe Supports Package. It provides a reference to the menus and property sheets on the Graphical User Interface.

Related Documents

The following documents may be helpful as you use *Pipe Supports User Guide and Menu Reference*.

- *Equipment and Cabletray Support User Guide and Menu Reference*
- *Piping Specification User Guide*
- *Visualization/Preparation Reference*
- *Advance Structural Modeling User Guide and Menu Reference*
- *Explicit Modeling User Guide and Menu Reference*.

Book Conventions

The following table illustrates and explains conventions used in writing about CADDs applications.

Convention	Example	Explanation
Menu selections and options	List Section option, Specify Layer field	Indicates a selection you must make from a menu or property sheet or a text field that you must fill in.
User-selected graphic location	X, d ₁ or P1	Marks a location or entity selection in graphic examples.
User input in CADDs text fields and on any command line	<code>cvaec.hd.data.param</code> <code>tar -xvf /dev/rst0</code>	Enter the text in a CADDs text field or on any command line.
System output	<code>Binary transfer complete.</code>	Indicates system responses in the CADDs text window or on any command line.
Variable in user input	<code>tar -cvf /dev/rst0 filename</code>	Replace the variable with an appropriate substitute; for example, replace filename with an actual file name.
Variable in text	tagname	Indicates a variable that requires an appropriate substitute when used in a real operation; for example, replace tagname with an actual tag name.
CADDs commands and modifiers	INSERT LINE TANTO	Shows CADDs commands and modifiers as they appear in the command line interface.
Text string	"SRFGROUPA" or 'SRFGROUPA'	Shows text strings. You must enclose text string with single or double quotation marks.
Integer	<i>n</i>	Supply an integer for the <i>n</i> .
Real number	<i>x</i>	Supply a real number for the <i>x</i> .
#	<code># mkdir /cdrom</code>	Indicates the root (superuser) prompt on command lines.
%	<code>% rlogin remote_system_name</code> <code>-l root</code>	Indicates the C shell prompt on command lines.
\$	<code>\$ rlogin remote_system_name</code> <code>-l root</code>	Indicates the Bourne shell prompt on command lines.

Window Managers and the User Interface

According to the window manager that you use, the look and feel of the user interface in CADDSS can change. Refer to the following table:

Look and Feel of User Interface Elements

User Interface Element	Common Desktop Environment (CDE) on Solaris, HP, DEC, and IBM	Window Manager Other Than CDE on Solaris, HP, DEC, IBM, SGI, and NT
Option button	ON — Round, filled in the center OFF — Round, empty	ON — Diamond, filled OFF — Diamond, empty
Toggle key	ON — Square with a check mark OFF — Square, empty	ON — Square, filled OFF — Square, empty

Online User Documentation

Online documentation for each book is provided in HTML if the documentation CD-ROM is installed. You can view the online documentation in the following ways:

- From an HTML browser
- From the Information Access button on the CADDSS desktop or the Local Data Manager (LDM)

Please note: The LDM is valid only for standalone CADDSS.

You can also view the online documentation directly from the CD-ROM without installing it.

From an HTML Browser:

1. Navigate to the directory where the documents are installed. For example,
 - `/usr/apl/caddss/data/html/htmldoc/` (UNIX)
 - `Drive:\usr\apl\caddss\data\html\htmldoc\` (Windows NT)
2. Click `mainmenu.html`. A list of available CADDSS documentation appears.
3. Click the book title you want to view.

From the Information Access Button on the CADDSS Desktop or LDM:

1. Start CADDSS.
2. Choose Information Access, the *i* button, in the top-left corner of the CADDSS desktop or the LDM.
3. Choose DOCUMENTATION. A list of available CADDSS documentation appears.
4. Click the book title you want to view.

From the Documentation CD-ROM:

1. Mount the documentation CD-ROM.

2. Point your browser to:

CDROM_mount_point/html/doc/mainmenu.html (UNIX)

CDROM_Drive:\html\doc\mainmenu.html (Windows NT)

Online Command Help

You can view the online command help directly from the CADDSS desktop in the following ways:

- From the Information Access button on the CADDSS desktop or the LDM
- From the command line

From the Information Access Button on the CADDSS Desktop or LDM:

- 1. Start CADDSS.**
- 2. Choose Information Access, the *i* button, in the top-left corner of the CADDSS desktop or the LDM.**
- 3. Choose COMMAND HELP. The Command Help property sheet opens displaying a list of verb-noun combinations of commands.**

From the Command Line: Type the exclamation mark (!) to display online documentation before typing the verb-noun combination as follows:

```
#01#!INSERT LINE
```

Printing Documentation

A PDF (Portable Document Format) file is included on the CD-ROM for each online book. See the first page of each online book for the document number referenced in the PDF file name. Check with your system administrator if you need more information.

You must have Acrobat Reader installed to view and print PDF files.

The default documentation directories are:

- /usr/apl/caddss/data/html/pdf/doc_number.pdf (UNIX)
- CDROM_Drive:\usr\apl\caddss\data\html\pdf\doc_number.pdf (Windows NT)

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PTC welcomes your suggestions and comments. You can send feedback in the following ways:

- Send comments electronically to `doc-webhelp@ptc.com`.
- Fill out and mail the PTC Documentation Survey located in the *PTC Customer Service Guide*.

Overview of Pipe Supports

This chapter describes how you can access the Graphical User Interface (GUI) for Pipe Supports Package. Pipe Supports is available from the CADDs Explicit environment.

- Introduction
- Definitions
- Accessing Pipe Support Options
- Setup Options
- Task Set Options
- Reporting Options
- Pipe Support Property Sheets

Introduction

A pipe support is a device or assembly or structural component that is used to support a set of pipe lines or duct lines. It transmits environmental loads from the piping systems to the attached building or structure. CADD5 Pipe Supports allows you to create, modify, manipulate, report and draw pipe supports, ship and plant design projects.

Pipe Supports can be classified into two categories.

- Standard catalog supports
- Fabricated supports

Standard Catalog Supports

Standard catalog supports consists of the following:

- Hangers
- Guides
- Anchors
- Sliding supports
- Constant and variable load spring supports and hangers
- Sway struts (two way restraints)
- Snubbers (used to dampen vibration)

Fabricated Supports

Fabricated pipe supports are made up of one or more structural members assembled together to support a set of pipe lines. A pipe support member can be made from various cross sections such as angles, flat bar, channels and I-beams. Fabricated pipe supports can contain various ready made peripheral items such as clamps, u-bolts, sliding pads and attachment pads. Pipe supports also include information such as weight, material type, paint code, label and cross section dimensions.

CADD5 Pipe Supports deals only with fabricated pipe supports. It allows you to create, modify, manipulate, report and draw two basic types of objects.

- Pipe support members
- Pipe support units

For these objects you can

- Establish pipe support environment parameters
- List pipe support environment parameters
- Create pipe support models
- Modify pipe support models
- Manipulate pipe support models
- Generate pipe support labels
- Report pipe support attributes
- Generate pipe support database
- Produce installation drawings

CADDS Pipe Supports automatically calculates and checks the required dimensional parameters, such as cross section size, pipe support width and height, clamp type, tolerance and clearance distances.

Pipe supports can be modeled in stand-alone mode or related to the pipe lines they support. Though, ultimately all the pipe supports should be related to pipe lines, a pipe support in stand alone mode is easier to manipulate while modeling.

Definitions

The various terms used in this book are defined below.

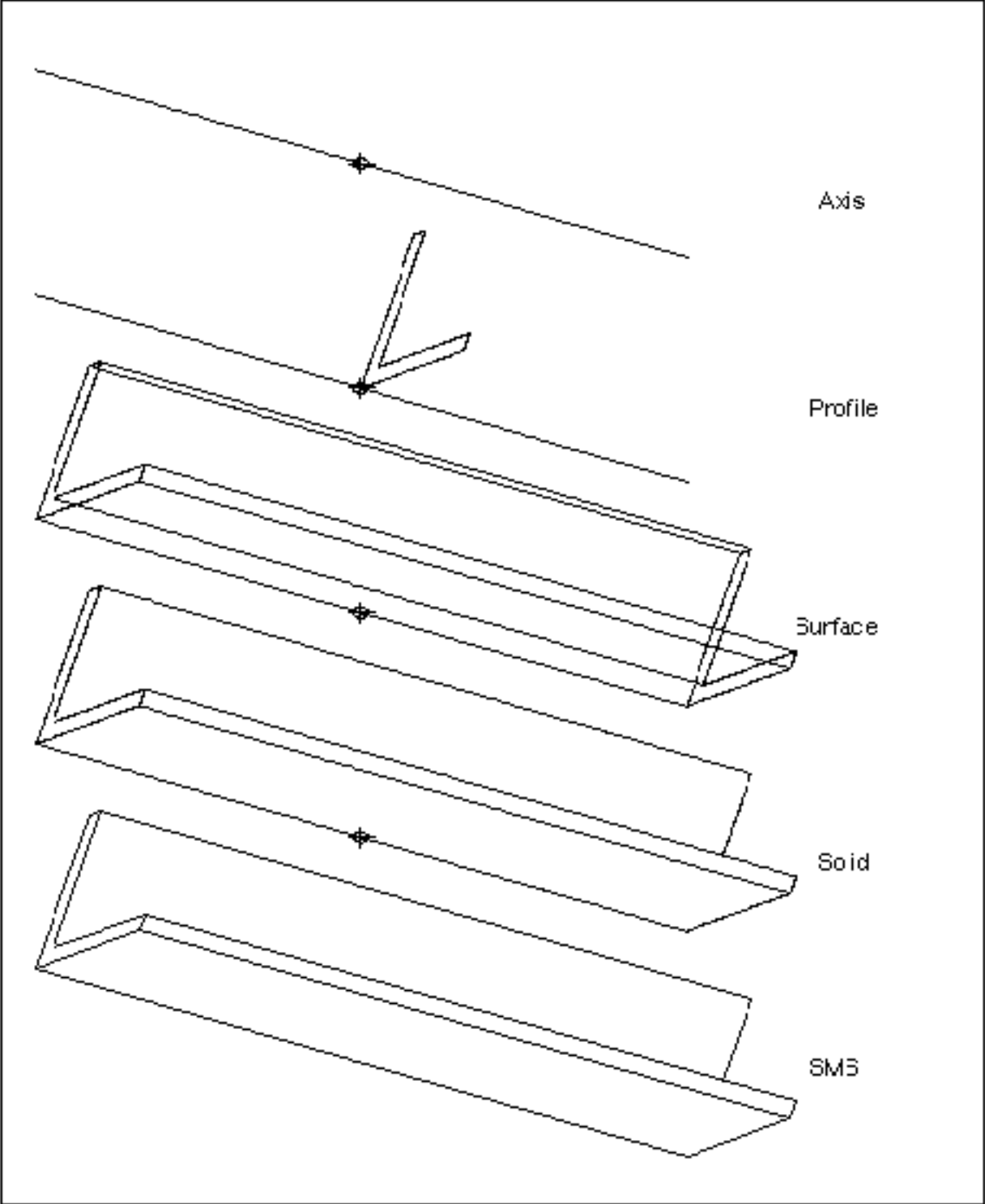
Pipe Support Member

A member or pipe support member, is a structural element. It is represented by a local nodal figure associated with related model graphics and non-graphical attributes. The model graphics representation can be any one of the following:

- Nspline projection axis
- Nspline projection axis with related cross section profile
- Set of NURB surfaces
- Solid
- Set of closed co-planar strings representing the member surfaces (SMS display mode)

The various model graphics representations of a pipe support member are illustrated.

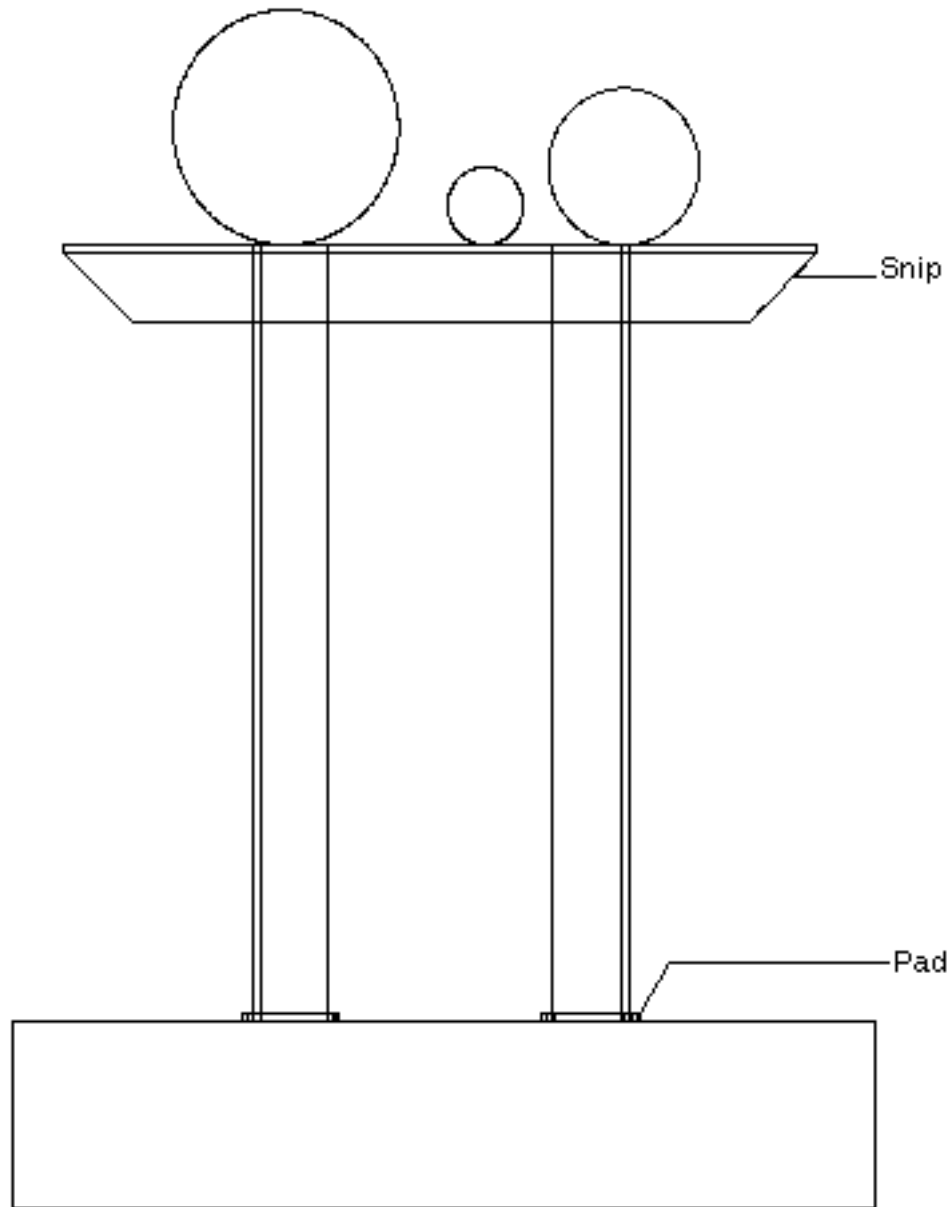
Figure 1-1 Different Model Graphics Representations of Pipe support member



Pipe Support Unit

A pipe support or a pipe support unit is a collection of one or more pipe support members that are related to each other, and comprise a single logical unit. A pipe support unit denotes all the members and attached components such as pads, snips, clamps, sliding pads, cable trays and tubestraps. A pipe support unit with pad and snip is illustrated.

Figure 1-2 Pipe Support Unit with Pad and Snip



Pad

A pad is a small planar plate that lies between the attachment member of a pipe support and the structural object on which the pipe support is erected.

Snip

A snip is a 45 degree cut at the end of a pipe support member.

Sliding Pad

A sliding pad is a small plate which lies between a pipe support member and the pipe line it supports. Optionally there should be only one sliding pad for each pipe line. A sliding pad is stored as a non-graphic property on the related pipe line.

Clamp

A clamp is a device used to fasten a pipe line onto a pipe support member. A clamp is stored as a non-graphic property on the related pipe line.

Cable Tray

A cable tray is a device that takes the weight of electrical or control cables which are routed in groups, from one connection point to another. A cable tray is created as a local nodal entity.

Tube Strap

A tube strap is a device used to fasten a tube onto a pipe support member. Tube strap is stored as a non-graphic property on the supporting member.

Attachment Points

An attachment point is the location at which a pipe support is attached to an existing structural object.

Accessing Pipe Support Options

Access the Supports options from the Explicit environment of CADD5. Enter the Supports environment either from the Local Data Manager (LDM) menu or directly from the command prompt without entering CADD5.

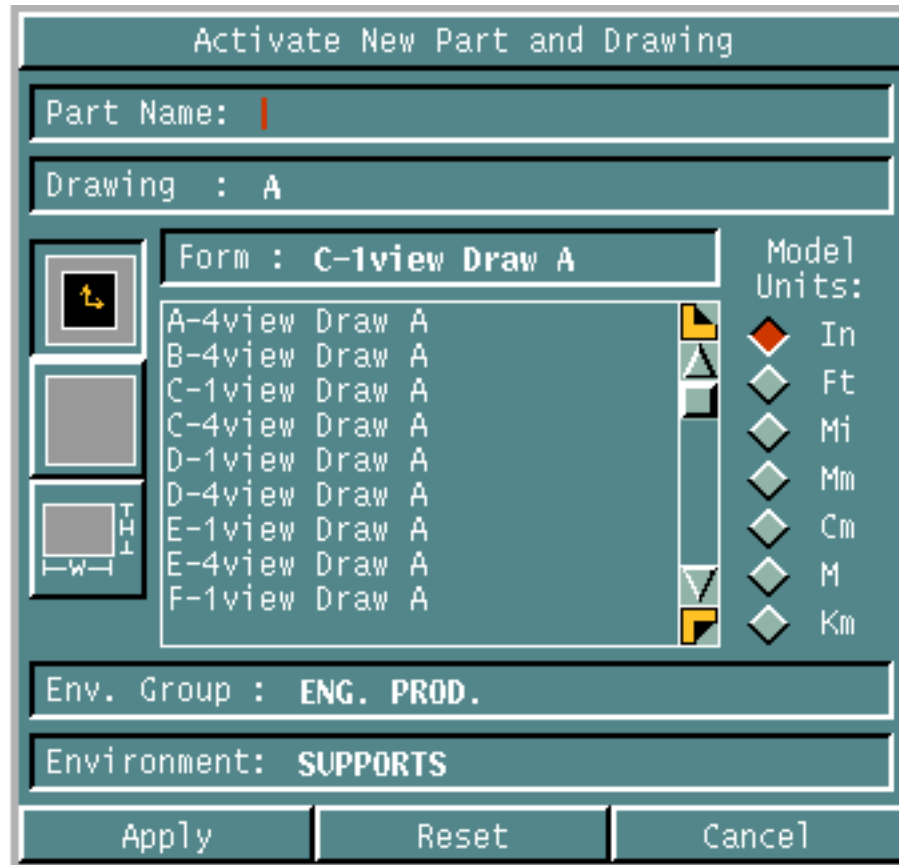
Using the Local Data Manager Menu

You can enter the Supports environment from the Local Data Manager in the following ways:

- Issue the command ENTER SUPPORTS on the command line,
or
- Click in the Env. Group field in the Activate New Part and Drawing property sheet. Choose SUPPORTS as the environment group from the pull down menu that appears.



The Env.Group field changes automatically to ENG.PROD and the environment changes to SUPPORTS.



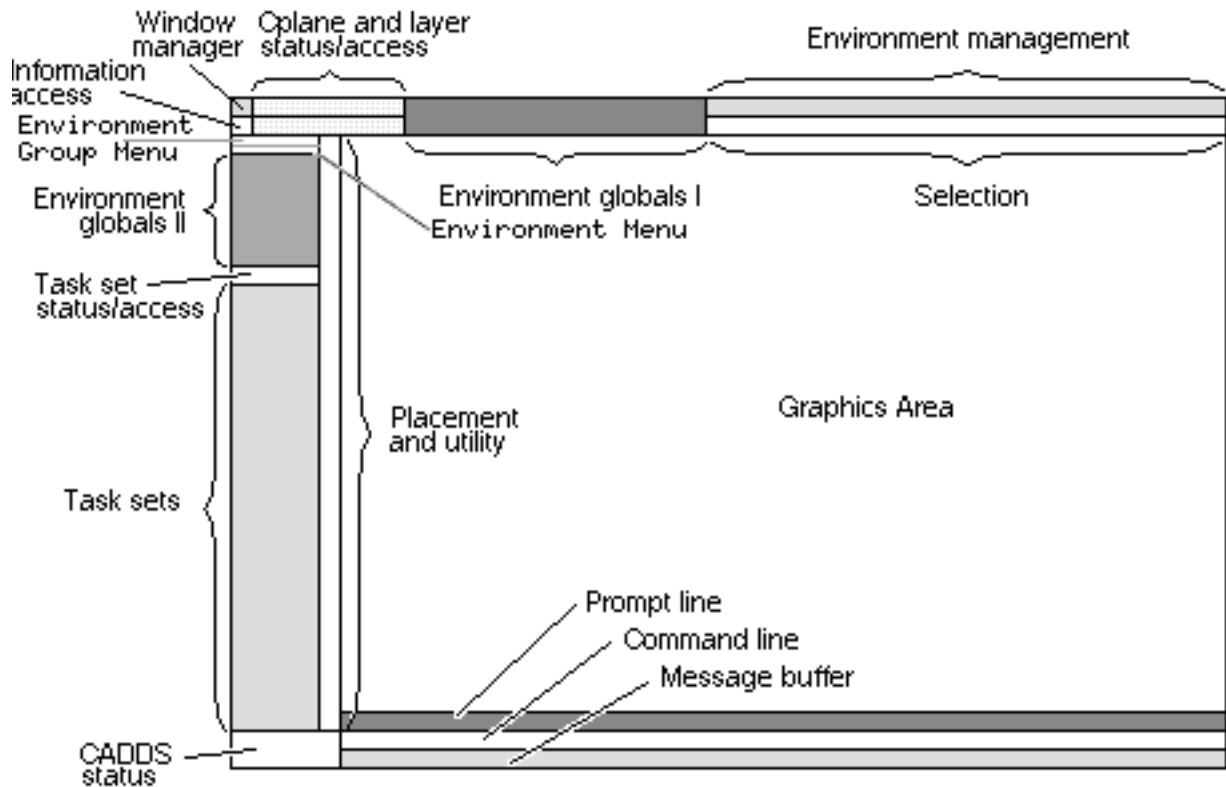
If the part already exists, click on the part and choose SUPPORTS as the environment group. The Env.Group changes automatically to ENG.PROD and the environment changes to SUPPORTS.

Accessing Supports Options Without the LDM

Access the various Supports options without using the Local Data Manager (LDM) in the following way:

1. Invoke CADD5 directly without the LDM by issuing the following command:
`CADD5 -EXPLICIT`
2. Activate a new or an existing Supports model.
3. Access the various Supports options using the following menu areas:
 - The Environment Management menu area on the top bar
 - The Environment Access menu area on the side bar

- The Environment Globals I menu area on the top bar
- The Task Set Access menu area on the side bar



There are three types of Pipe Support options.

- Setup options
- Task Set options
- Report options

The sections that follow briefly explain each of these options and show you how to access them.

Setup Options

Pipe Support Setup options are available from the Environment Management menu on the top bar. The support setup options include:



SELECT SUPPORT PARAMETERS

Choose this option to set up various pipe supports modeling parameters.



SELECT EQUIPMENT AND CABLETRAY SUPPORT PARAMETERS

Choose this option to set up various equipment supports modeling parameters.

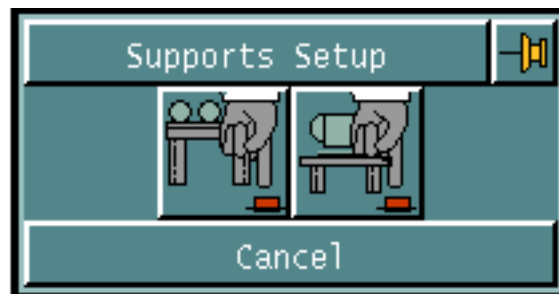
These options are discussed in detail in Chapter 2, “Setting Up Pipe Support Parameters”.

Accessing Pipe Support Setup Options

To access Pipe Support Setup options

4. Choose Setup from the Environment Management menu. The Setup menu appears.
5. Choose Supports from the Setup menu to display the Supports Setup palette.

Figure 1-3 Supports Setup Palette



Task Set Options

Pipe Support task set is available from the Task Set access panel on the side bar.

Pipe Support Task Set Options

The Pipe Supt option displays the Pipe Support task set options. Each task set option allows you to perform specific tasks.

Modeling Tasks

The following Pipe Support task set options allows you to create, delete, modify and manipulate pipe support units, members and components. They also allow you to generate support labels, write model information into an external database and generate support fabrication drawings. The use of these options is described in detail in Chapter 3, “Modeling Pipe Supports”.

- Create Pipe Support Units
- Create Pipe Support Members
- Edit Pipe Support Units
- Edit Pipe Support Members
- Edit Support Related Pipe
- Delete Pipe Supports
- Relate Pipe Supports
- Unrelate Pipe Supports
- Connect Pipe Supports
- Disconnect Pipe Supports
- Trim Pipe Support Members
- Move Pipe Supports
- Mirror Pipe Supports
- Rotate Pipe Supports
- Insert Pad
- Delete Pad
- Insert Snip
- Delete Snip
- Create Pipe Support Label
- Create Pipe Support External Database

- Create Pipe Support Drawing

Accessing the Pipe Support Task Set

To access the Pipe Support task set.

- 1.** Choose Supports from the Environment Access menu.
- 2.** The Pipe Supt option is displayed on the Task Set panel.

The Pipe Support task set with modeling options appears.

Figure 1-4 Options on Pipe Support Task Set

	PIPE SUPT		
INSERT SUPPORT			INSERT SUPPORTMEMBER
INSERTPAD			INSERT SNIP
MODIFY SUPPORT			EDIT SUPPORTMEMBER
EDIT SUPPORT			DELETE SUPPORT
DELETE PAD			DELETE SNIP
RELATE SUPPORT			UNRELATE SUPPORT
CONNECTSUPPORT			DISCONNECT SUPPORT
TRIMSUPPORT			TRANSLATE SUPPORT
MIRROR SUPPORT			ROTATE SUPPORT
GENERATE SULABEL			GENERATE SUPPODBA
DRAWSUPPORT			

Reporting Options

The Pipe Support Reporting options include



VERIFY SUPPORTS

Choose this option to list the data and properties of pipe supports.



VERIFY ESUPPORTS

Choose this option to verify selected equipment support parameters.



SELECT SUPPORT LIST

Choose this option to list the currently selected pipe support parameter values.



SELECT SUPARAMETER LIST

Choose this option to list the currently selected equipment support parameter values

These options are discussed in detail in Chapter 4, “Reporting Pipe Supports”.

Accessing Pipe Support Reporting Options

To access the Reporting Options

1. Choose the ? option on the CADD5 Environment Globals I menu to display the Report menu.
2. Choose Supports on the Report menu to display the Supports Verification palette.

Figure 1-5 Supports Verification Palette



Pipe Support Property Sheets

This section describes how to use the special buttons provided on the property sheets. These buttons are used to display a scrolling list of valid selections for a field or to display a property sheet with additional options.

Please note: Basic information about using CADD5i property sheets is in the *Explicit Modeling User Guide and Menu Reference*.

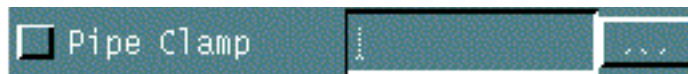
List Button

Pipe Support property sheets have a feature called the List button.

Some fields on the property sheet display a scrolling list of valid selections for that field. To access such a list, a List button is provided next to the field.

For example, the following is a field on a property sheet:

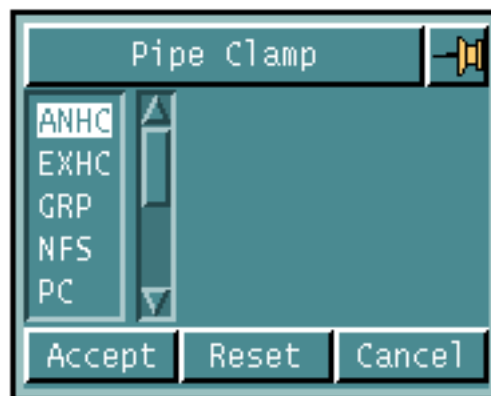
Figure 1-6 List Button



Click the List button to display a scrolling list of valid clamp types. When you choose a Pipe Clamp name on the list, and click the Accept button, that Pipe Clamp name is automatically displayed in the field to the left of the List button.

For example, the following Pipe Clamp scroll list is displayed when you click the List button next to the Pipe Clamp field.

Figure 1-7 Pipe Clamp Scroll List



Option List Button

Pipe Support Property Sheets have a feature called the Option List button.

Some fields on the property sheet display a list of valid values for that field. To access such a list, an option list button is provided next to the option.

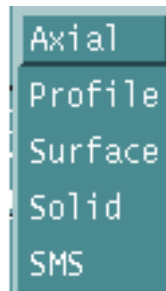
For example the following is an illustration of an option list button in a property sheet.

Figure 1-8 Option List Button



Clicking on the option list button labeled Profile displays the following list. Choose the desired option from the list.

Figure 1-9 Related Pipe Option List



Additional Options Button

Pipe Support property sheets have a feature called the Options button.

Some fields on the property sheet display another property sheet with additional options for that field. To access such a property sheet, an options button is provided next to the option.

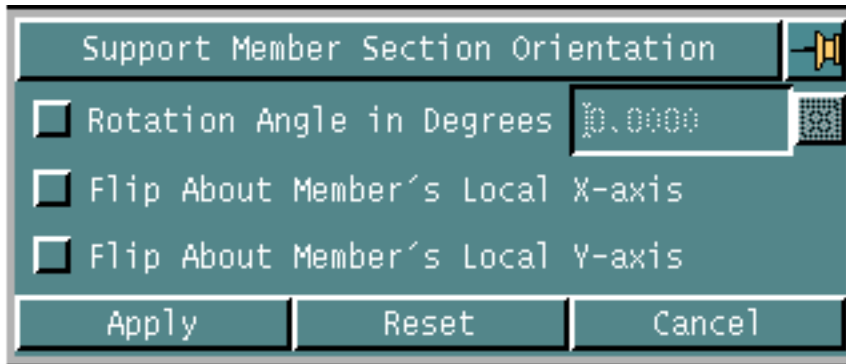
For example, the following is an illustration of an options button in a property sheet:

Figure 1-10 Options Button



Clicking the Options button, displays the following property sheet with additional options. Choose the desired options and click Apply.

Figure 1-11 Support Member Section Orientation Property sheet



Setting Up Pipe Support Parameters

Before you start a work session in Pipe Supports, you must establish default values for Pipe Support Parameters. These default parameter values are used for creating the pipe support units. The Pipe Support Setup tasks and the corresponding options are described in this chapter.

- Overview of Support Setup Options
- Selecting Pipe Support Parameters

Overview of Support Setup Options

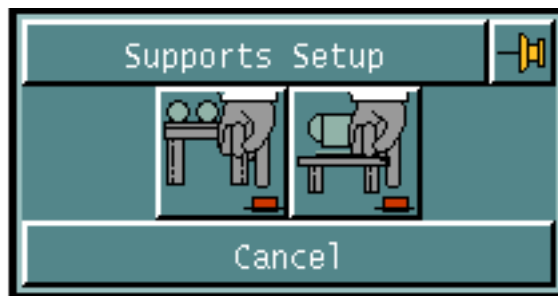
Choosing the Supports option on the Setup menu displays the Supports Setup palette enabling you to perform the following tasks.

- Select Pipe Support Parameters.
- Select Equipment and Cabletray Support Parameters.

Accessing Support Setup Options

1. Choose Supports from the Environment Access Menu.
2. Choose Setup from the Environment Management menu on the top bar. The Setup menu appears.
3. Choose Supports... from the Setup menu. The Supports Setup command palette appears.

Figure 2-1 Supports Setup palette



Options on the Supports Setup Command Palette



SELECT PIPE SUPPORT PARAMETERS

Choose this option to set up various pipe supports modeling parameters. For details, see “Selecting Pipe Support Parameters” on page 2-3.



SELECT EQUIPMENT AND CABLETRAY SUPPORT PARAMETERS

Choose this option to set up various equipment and cabletray supports modeling parameters. The Equipment and Cabletray support parameters are described in the *Equipment and Cabletray Support User Guide and Menu Reference*. For details, see Chapter 2, Support Setup Options.

Selecting Pipe Support Parameters



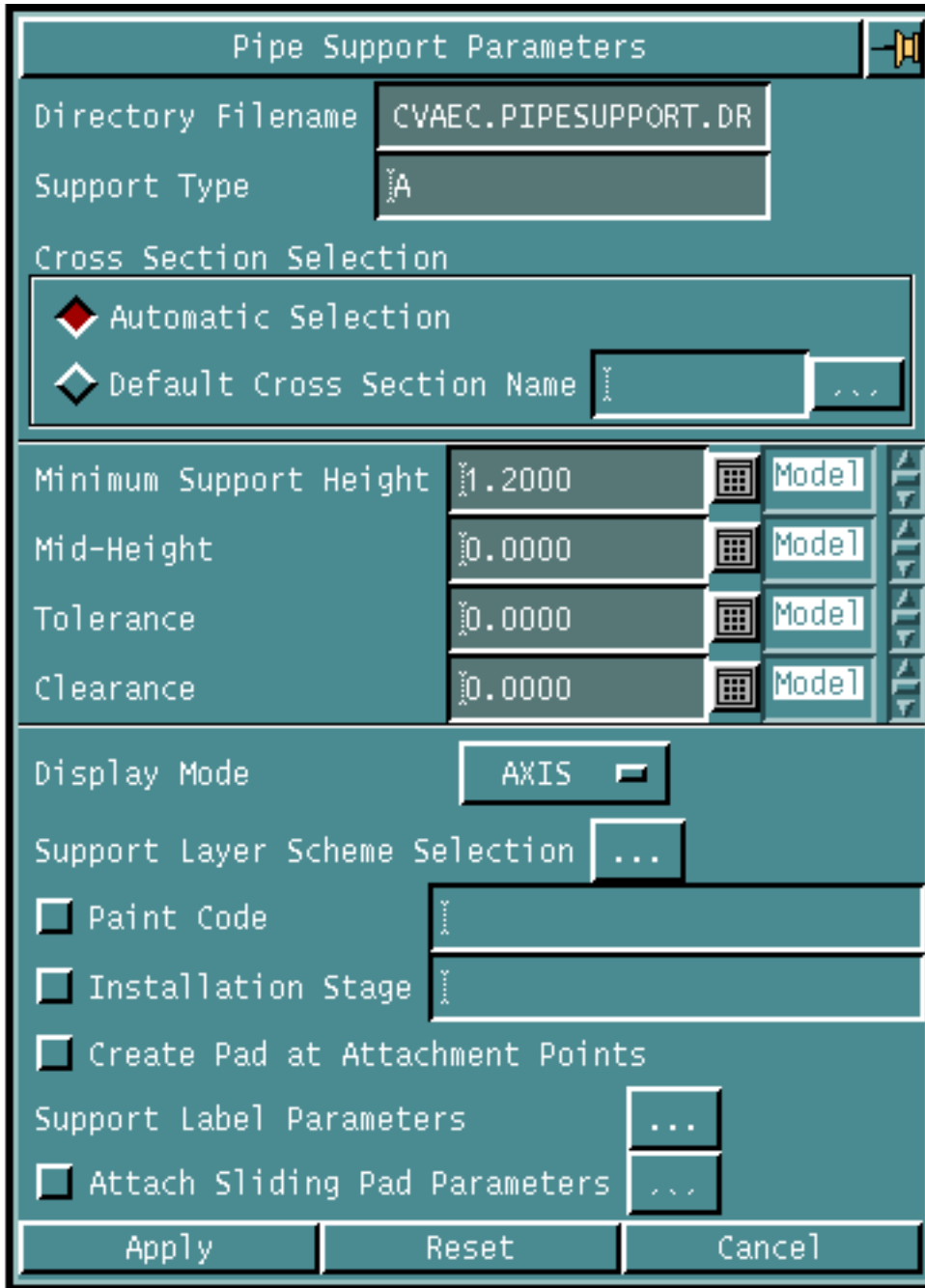
Choose the Select Pipe Support Parameters option to set various default pipe support parameters, before beginning a work session with Pipe Supports. These default parameter values are used when you create pipe support units.

Using This Option

1. Choose Supports from the Environment Access Menu.
2. Choose Setup from the Environment Management menu on the top bar. The Setup menu appears.
3. Choose Supports... from the Setup menu.
4. Choose the Select Pipe Support Parameters option from the Setup menu.

The Pipe Support Parameters property sheet appears.

Figure 2-2 Pipe Support Parameters Property Sheet



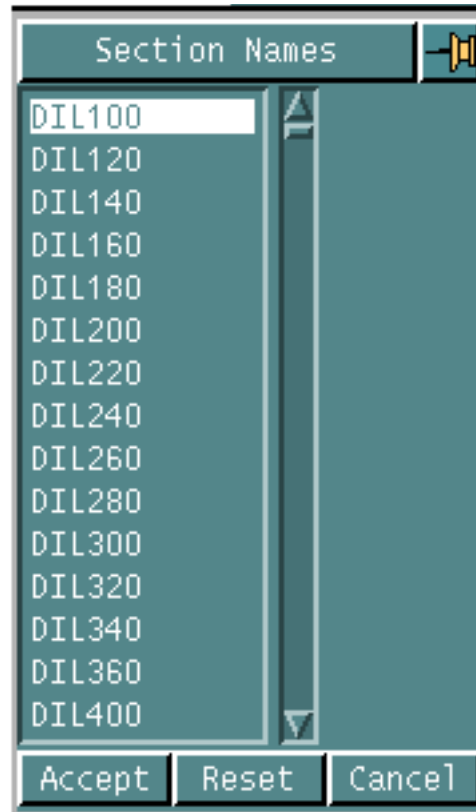
Procedure

Follow these steps to set the various Pipe Support parameter defaults.

- 1.** Enter the directory file name, to be used for pipe support modeling in the Directory Filename field. The directory file contains the names of automatic selection files. The default directory file is `CVAEC.PIPESUPPORT.DRFILE`.
- 2.** Enter a default support type in the Support Type field. You can specify one of the predefined support types as default for this field. Refer to Figure 3-6 on page 3-18 for a list of available types. Unless a new support type is specified while creating pipe support units, the default support type set here, is automatically selected.
- 3.** Choose one of the following Cross Section selection options.
 - a.** Click Automatic Selection to select the cross section of pipe support member automatically, based on support configuration during insertion.

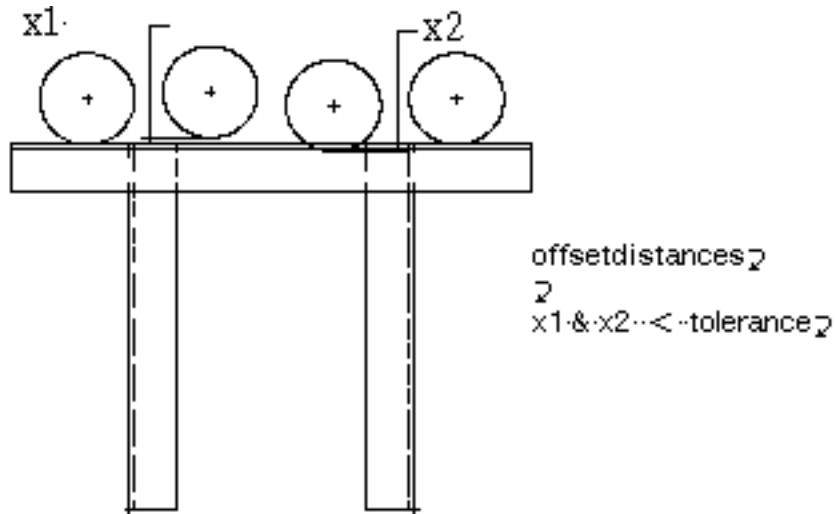
OR
 - b.** Click Default Cross Section Name and enter a cross section name in the field. Or click the List button to display the Section Names Scroll List. Choosing this option overrides the cross section auto-selection mode. You can also choose a section name from the Section Names Scroll List displayed.

Figure 2-3 Section Names Scroll List



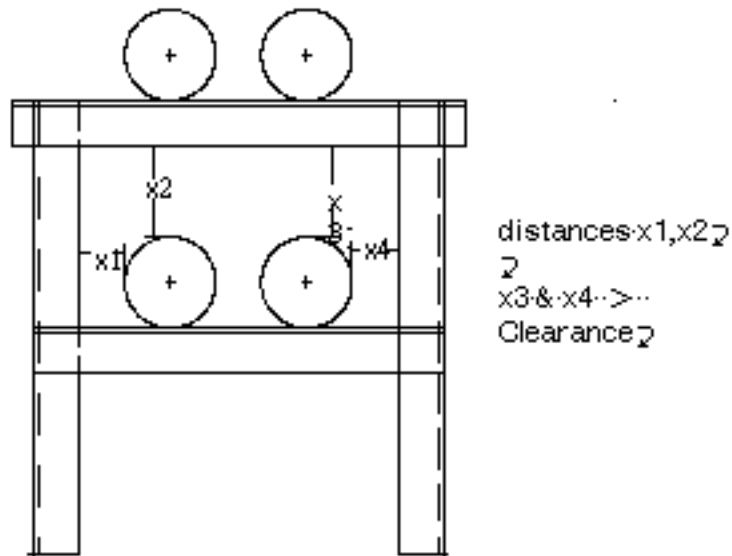
- a. Choose the required cross section on the Section Names Scroll List.
 - b. Click Accept.
4. Enter the minimum height of the support unit, to qualify for automatic mid height member insertion in Minimum Support Height field and choose the unit from the scroll list. If a pipe support unit's height is greater than the value set here, then a mid-height member is automatically inserted, for applicable support types.
 5. Enter the height at which the mid member has to be inserted in the Mid-Height field and choose the unit from the scroll list. By default the mid height member is created exactly at the middle of the anchor member.
 6. Enter the default tolerance value in the Tolerance field and choose the unit from the scroll list. This option specifies the maximum allowed offset distance, between the bottom of the pipe and the supporting plane of the member, that supports the pipe. This offset distance is checked while creating related pipe support units or while relating pipe support members. If the actual offset distance exceeds the value set, an error message is issued.

Figure 2-4 Tolerance between Related Pipe and its Supporting Member



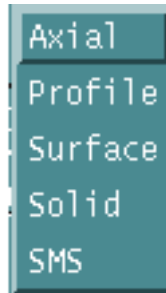
7. Enter the default clearance value in the Clearance field and choose the unit from the scroll list. This option specifies the minimum required distance, between the pipe's outer surface and the members, that are not supporting the pipe. This distance is checked during pipe support unit or member creation. If the actual distance is less than the clearance set, an error message is displayed.

Figure 2-5 Clearance between Pipe and Non-Supporting Member



8. Click the Display Mode Option List button and choose the required option from the Option List displayed. Choosing this option enables you to specify the display mode selected for the model graphics representation.

Figure 2-6 Display Mode Option List



9. Click the Support Layer Scheme Selection Options button to display the Support Layer Scheme property sheet. For details, see “Support Layer Scheme Property Sheet” on page 2-9.
10. Choose Paint Code and enter a code in the field to attach a paint code to the support unit as a property. If paint code is not required, deselect this option.
11. Choose Installation Stage and enter a stage number in the field to attach an installation stage to the support unit as a property. If installation stage is not required, deselect this option.
12. Click Create Pad at Attachment Points to insert support pads automatically for the attachment members. The pipe support member length is automatically adjusted for the pad thickness. Support pads are automatically selected and sized based on an external table which correlates the support member cross section size with pad types and sizes.
13. Click the Support Label Parameters Options button to display the Support Label Parameters property sheet. For details, see “Support Label Parameters Property Sheet” on page 2-10.
14. Choose Attach Sliding Pad Parameters to automatically insert Sliding pads for the pipe lines. Click the Attach Sliding Pad Parameters Options button to display the Sliding Pad Parameters property sheet. For details, see “Sliding Pad Parameters Property Sheet” on page 2-12.
15. Click Apply.

Options on the Pipe Support Parameters Property Sheet

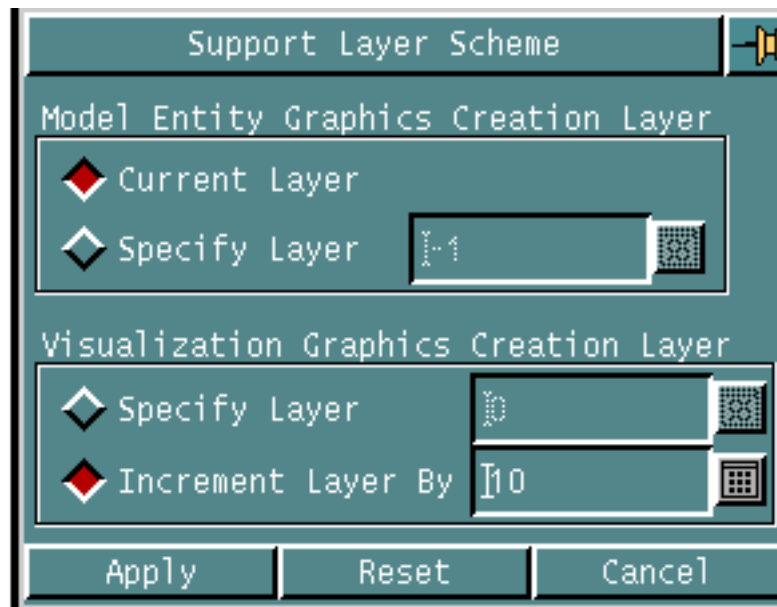
Given below are details of the options on the Pipe Support Parameters property sheet.

Specifying Support Layer Scheme Selection

Pipe support layering scheme offers you the option to create nodal figure and axis in one layer and 3-D visualization graphics on another layer.

1. Click the Support Layer Scheme Selection Options button on the Pipe Supports Parameters property sheet. The Support Layer Scheme property sheet appears.

Figure 2-7 Support Layer Scheme Property Sheet



2. Choose one of the following Model Entity Graphics Creation Layer options. You can specify the layer for creating a nodal figure and member projection axis by using one of the following two options.
 - a. Click Current Layer to create the nodal figure and projection axis of the pipe supports in the currently active layer.
 - OR
 - b. Click Specify Layer and enter the layer number, to create the nodal figure and projection axis of the pipe supports on a layer, other than the currently active layer.
3. Choose one of the following Visualization Graphics Creation Layer options.
 - a. Click Specify Layer and enter the layer number, to create the pipe support visualization graphics on a layer, other than the default layer.
 - OR
 - b. Click Increment Layer By and enter a value to increment the layer on which the pipe support visualization graphics are created. By default they

are created 10 layers away from the nodal figure and projection axis layer in the positive direction.

Specifying Support Label Parameters

This option enables you to set up default parameters of the support label, before generating pipe support labels. The format for the pipe support label is MNEMONIC1 - NUMBER - MNEMONIC2. You can set defaults for each of these fields.

1. Click the Support Label Parameters Options button on the Pipe Support Parameters property sheet. The Support Label Parameters property sheet appears.

Figure 2-8 Support Label Parameters Property Sheet

Support Label Parameters

Label <Mnemonic1-Number-Mnemonic2>

Label Mnemonic1 Field PS

Mnemonic 2 Field Parameters

Use Installation stage

Label Mnemonic2 Field 1

Number Field Parameters

Field Width	3	
Starting Value	1	
Increment Value	1	

Apply Reset Cancel

2. Enter a string in the Label Mnemonic1 Field to be used as MNEMONIC1. The default string is PS.
3. MNEMONIC2 is also a string field. Set the default string for MNEMONIC2, by choosing one of the following two options.

- a. Click Use Installation Stage to use the installation stage name of the pipe support as MNEMONIC2. This is the default.
- OR
- b. If you do not want to use installation stage name for MNEMONIC2, click Label Mnemonic 2 Field and enter a string for MNEMONIC2 field.
4. Set the field width, starting number and increment for each successive support using the following Number Field Parameter options.
 - a. Enter the Field Width to specify the field width of the NUMBER field of the support label. The default width is 3 digits.
 - b. Enter the Starting Value to specify the starting serial number for the NUMBER field of the support label. The default is 1.
 - c. Enter the Increment Value to specify the increment value for the NUMBER field of the support label. While generating support labels, supports in a selected direction (X, Y or Z), are sequentially numbered in ascending or descending order, using this increment value.
 5. Click Apply.

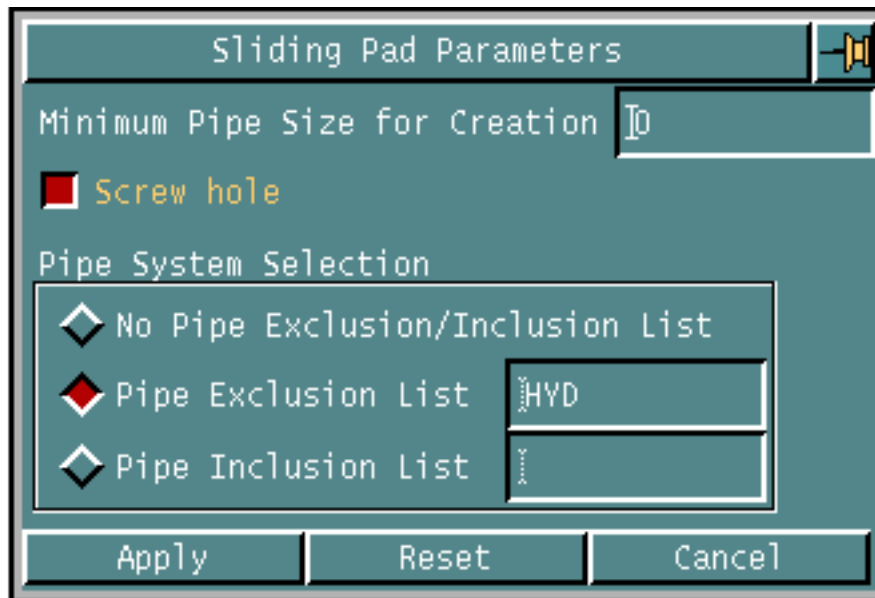
Specifying Attach Sliding Pad Parameters

Choosing this option enables automatic insertion of sliding pad for a pipe line, supported by a support member. This automatic insertion is based on certain criteria, which you can set or modify.

Please note: The sliding pad is inserted only as property, not as graphic entity.

1. Choose Attach Sliding Pad Parameters on the Pipe Support Parameters property sheet and click the Options button. The Sliding Pad Parameters property sheet appears.

Figure 2-9 Sliding Pad Parameters Property Sheet



2. Enter the Minimum Pipe Size for Creation in the text field to specify the minimum pipe size, for automatic insertion of sliding pads. The format must be the same as used in the pipe label.
3. By default screw there is a screw hole on the sliding pad. If you do not want the screw holes, deselect the Screw Hole option. When there is no screw-hole, sliding pad is known as sliding shoe.
4. Choose one of the following options to include or exclude a set of pipe lines from sliding pad creation criteria.
 - a. Click No Pipe Exclusion/Inclusion List if you do not want to set exclusion or inclusion list for sliding pad creation.
OR
 - b. Click Pipe Exclusion List to set the exclusion list for pipe support sliding pad creation. Enter the MNEMONIC field in the label of the pipe lines, separated by a comma, to exclude them from automatic sliding pad insertion. The default is HYD.
OR

- c. Click Pipe Inclusion List to set the inclusion list for pipe support sliding pad creation. Enter the MNEMONIC field in the label of the pipe lines, separated by a comma, to include them for automatic sliding pad creation.

Please note: The format of the pipe label MNEMONIC field specified, should be as per the CADD5 Piping Package.

- 5. Click Apply.

Modeling Pipe Supports

This chapter describes Pipe Support Modeling tasks. These tasks include creating, editing, modifying and deleting pipe support units. The Pipe Support task set contains these options.

- Overview of Pipe Support Modeling
- Creating Pipe Support Units
- Creating Pipe Support Members
- Editing Pipe Support Units
- Editing Pipe Support Members
- Editing Support Related Pipe
- Deleting Pipe Supports
- Relating Pipe Supports
- Unrelating Pipe Supports
- Connecting Pipe Supports
- Disconnecting Pipe Supports
- Trimming Pipe Support Members
- Translating Pipe Supports
- Mirroring Pipe Supports
- Rotating Pipe Supports
- Inserting Pad
- Deleting Pad
- Inserting Snip
- Deleting Snip
- Creating Pipe Support Labels

- **Creating Pipe Support External Database**
- **Creating Pipe Support Drawing**

Overview of Pipe Support Modeling

Choose the Supports option from Environment Access menu and the Pipe Support task set appears. Each task set option is either a direct action option or it displays a command palette, a property sheet or opens a menu.

If you are in the Supports environment, click the Task Set access panel and the menu appears. Choose Pipe Supt and the Pipe Support task set appears.

Use the Pipe Support task set to produce a Pipe Support model. The Task Set options allow you to create, edit and display Pipe Support models.

To create Pipe Support models, the default pipe support parameters and properties set in the Setup options are used. Refer to Chapter 2, “Setting Up Pipe Support Parameters” for details on the Setup options.

Use the Pipe Support task set options for

- Creating Support Units
- Creating Support Members
- Editing Support Units
- Editing Support Members
- Editing Support Related Pipes
- Deleting Supports
- Relating Supports
- Unrelating Supports
- Connecting Supports
- Disconnecting Supports
- Trimming Support Member
- Translating Supports
- Mirroring Supports
- Rotating Supports
- Inserting Pad
- Deleting Pad
- Inserting Snip
- Deleting Snip
- Creating Support Label

- Creating Support External Database
- Creating Support Drawing

Accessing the Pipe Support Task Set

To access the Pipe Support Task Set options

1. Choose Supports on the Environment Access menu.

OR

If you are in the Supports environment, choose the Pipe Supt option from the Task Set access panel.

2. The Pipe Supt option appears on the Task Set access panel. The Pipe Support task set appears.

Figure 3-1 Pipe Support Task Set

	PIPE SUPT		
INSERT SUPPORT			INSERT SUPPORTMEMBER
INSERTPAD			INSERT SNIP
MODIFY SUPPORT			EDIT SUPPORTMEMBER
EDIT SUPPORT			DELETE SUPPORT
DELETE PAD			DELETE SNIP
RELATESUPPORT			UNRELATE SUPPORT
CONNECTSUPPORT			DISCONNECT SUPPORT
TRIMSUPPORT			TRANSLATE SUPPORT
MIRROR SUPPORT			ROTATE SUPPORT
GENERATE SULABEL			GENERATE SUPPDBA
DRAWSUPPORT			

Options on the Pipe Support Task Set

The various options on the Pipe Support task set are:



INSERT SUPPORT

Displays the Create Support Unit property sheet that enables you to create a pipe support unit. For details, see “Creating Pipe Support Units” on page 3-10.



INSERT SUPPORT MEMBER

Displays the Create Support Member property sheet that enables you to create a pipe support member. For details, see “Creating Pipe Support Members” on page 3-24.



INSERT PAD

Displays the Support Pad Insertion property sheet that enables you to insert a pipe support pad at the end of a pipe support member. For details, see “Inserting Pad” on page 3-69.



INSERT SNIP

This direct action option enables you to create a snip at the end of a pipe support member. For details, see “Inserting Snip” on page 3-76.



MODIFY SUPPORT

Displays the Edit Support Unit property sheet that enables you to edit a support unit. For details, see “Editing Pipe Support Units” on page 3-36.



EDIT SUPPORT MEMBER

Displays the Edit Support Member property sheet that enables you to edit a support member. For details, see “Editing Pipe Support Members” on page 3-41.



EDIT SUPPORT

Displays the Edit Support Related Pipe property sheet that enables you to edit a support related pipe. For details, see “Editing Support Related Pipe” on page 3-44.



DELETE SUPPORT

Displays the Support Deletion property sheet that enables you to delete either a pipe support unit or a pipe support member. For details, see “Deleting Pipe Supports” on page 3-46.



DELETE PAD

This option displays the Support Pad Deletion property sheet that enables you to delete a pad. For details, see “Deleting Pad” on page 3-74.



DELETE SNIP

This direct action option enables you to delete a snip. For details, see “Deleting Snip” on page 3-79.



RELATE SUPPORT

This direct action option enables you to relate a pipe line or a set of pipe lines to a pipe support member. For details, see “Relating Pipe Supports” on page 3-48



UNRELATE SUPPORT

Displays the Unrelating Supports From Objects property sheet that enables you to unrelate either an entire pipe support unit or a single pipe support member from the pipe line supported by it. For details, see “Unrelating Pipe Supports” on page 3-50.



CONNECT SUPPORT

Displays the Connecting Supports property sheet that enables you to connect one support unit to another to form one single unit. For details, see “Connecting Pipe Supports” on page 3-52



DISCONNECT SUPPORT

Displays the Disconnecting Supports property sheet that enables you to disconnect a single support member from the unit or to disassemble the entire support unit. For details, see “Disconnecting Pipe Supports” on page 3-54



TRIM SUPPORT

Displays the Trimming Support Member property sheet that enables you to either trim or stretch a pipe support member. For details, see “Trimming Pipe Support Members” on page 3-56.



TRANSLATE SUPPORT

Displays the Move/Copy Support property sheet that enables you to move and/or copy pipe support units. For details, see “Translating Pipe Supports” on page 3-59.



MIRROR SUPPORT

Displays the Mirror/Copy Support property Sheet that enables you to mirror a pipe support unit about a mirror plane. You can also create a copy of the pipe support unit at the mirrored location. For details, see “Mirroring Pipe Supports” on page 3-62.



ROTATE SUPPORT

Displays the Rotate/Copy Support property sheet that enables you to rotate a pipe support unit about a rotation axis. You can also create a copy of the pipe support unit at the resultant location. For details, see “Rotating Pipe Supports” on page 3-65.



GENERATE SULABEL

Displays the Create Support Label property sheet enables you to create a pipe support label for a selected pipe support unit. For details, see “Creating Pipe Support Labels” on page 3-80.



GENERATE SUPPDBA

Displays the Create Support External Database property sheet that enables you to write the graphic and non-graphic information of all the selected pipe support units into an external RDBMS database. For details, see “Creating Pipe Support External Database” on page 3-85.



DRAW SUPPORT

Displays the Support Drawing Generation property sheet that enables you to create the fabrication drawing of pipe support units in the active part. For details, see “Creating Pipe Support Drawing” on page 3-88.

Creating Pipe Support Units



Choosing this option displays the Create Support Unit property sheet enabling you to create a pipe support unit.

Use INSERT SUPPORT to insert a pipe support unit into a CADDSS 3-D Piping model. A pipe support unit is created based on pre-defined pipe support types and the cross section library. Refer to Appendix B, “Directory Files” for a list of the pre-defined pipe support types and cross section library.

You can create the pipe support unit in two modes.

- Related Mode
- Stand-Alone Mode

In the Related Mode, the pipe support unit is related to the pipes it supports, at the time of creation. Whereas in the Stand-Alone Mode, the pipe support unit is not related to any pipe lines and the automatic calculation features are disabled, at the time of creation. It can later be related to the pipe it supports.

Automatic Calculations

The following parameters are automatically calculated when a pipe support unit is created in the Related Mode. These calculations are based on the pipe lines, the anchor points selected and the pre-defined auto-selection files.

- Cross Section of Support Member
The cross section of the support member is selected from the auto-selection file, unless a cross section is specified in the current property sheet or a default cross section is set, as in the Setup options.
- Height of Support Unit
The height of the pipe support unit is calculated based on the selected pipe and anchor point locations. This height is automatically adjusted if a sliding pad is inserted.
- Optimum Width
Optimum Width of the support unit or the length of the horizontal pipe supporting member is the distance between the selected pipe lines plus the minimum clamp space at both the ends of the member. If the width calculated based on the digitized anchor locations is greater than the optimum width, then the calculated width is used.

- **Clamp Type and Parameters**

The Clamp Type and Parameters are selected from the clamp auto-selection file.

- **Sliding Pad Name and Parameters**

The Sliding Pad Name and Parameters are chosen from the sliding pad auto-selection file. Note that the sliding pads are inserted as a property and do not have any related graphics.

Please note: In the Stand-Alone Mode, these parameters are not calculated automatically. If you do not specify all these parameters, the system displays an error message.

Dimension Checking

When a pipe support is inserted in the Related Mode, its dimensions are checked for the given Tolerance and Clearance values. The system displays an error message if the required conditions are not met.

- **Tolerance**

Tolerance is the distance between the bottom of the pipe and the support member's supporting plane. This distance should not exceed the default Tolerance value as set in the Setup options.

- **Pipe Clearance**

Pipe Clearance is the minimum distance between the outer surface of a pipe line and support members which are not supporting it. This clearance distance should be greater than the default Clearance value as set in the Setup options.

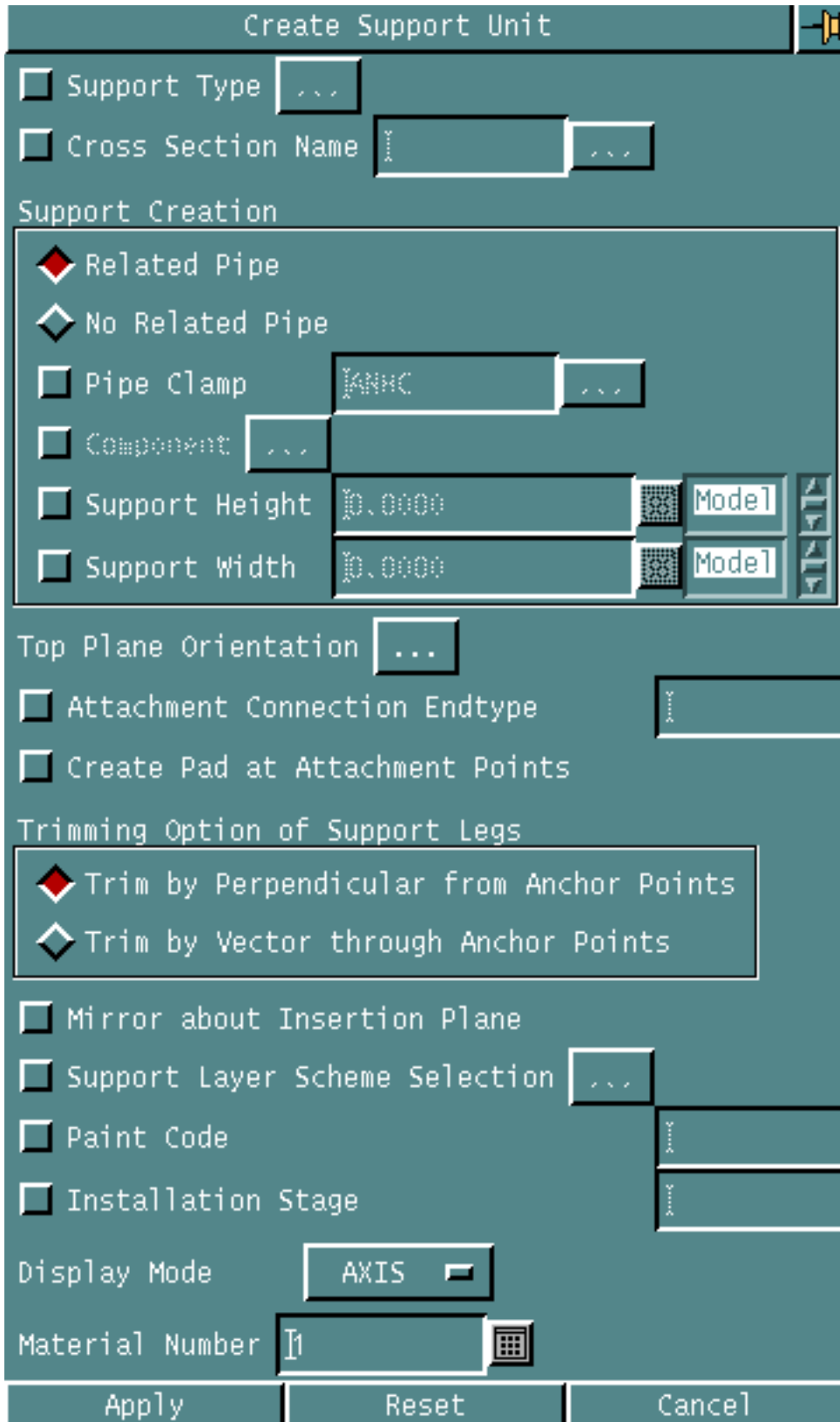
- **Member Clearance**

Member Clearance is the minimum distance between two pipe support members that are not directly connected to each other. This clearance distance should be greater than the default Clearance value as set in the Setup options. The Member Clearance is checked in both the Related and Stand-Alone mode of support insertion.

Using This Option

1. Choose Supports from the Environment Access menu. Or choose the Pipe Supt option from the Task Set access panel inside the Supports environment. The Pipe Support task set appears.
2. Choose the Create Support Unit option from the Pipe Support task set. The Create Support Unit property sheet appears.

Figure 3-2 Create Support Unit Property Sheet

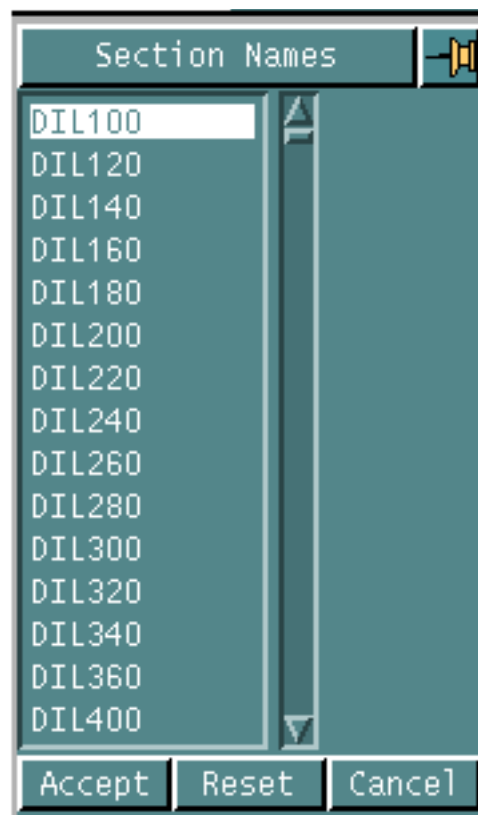


Procedure

1. Choose Support Type to enter a pipe support type and click the Options button to display the Support Type Selection property sheet. For details, see “Support Type Selection Property Sheet” on page 3-18.
2. Choose Cross Section Name and enter a cross section name in the field. Choosing this option overrides the cross section auto-selection mode. You can also choose a cross section name from the Section Names Scroll List by clicking the List button. The Section Names Scroll List appears.

Please note: If the cross section auto-selection is not set, this option should be specified, otherwise the system displays an error message. Also the selected section must exist in the internal or external section library.

Figure 3-3 Section Names Scroll List



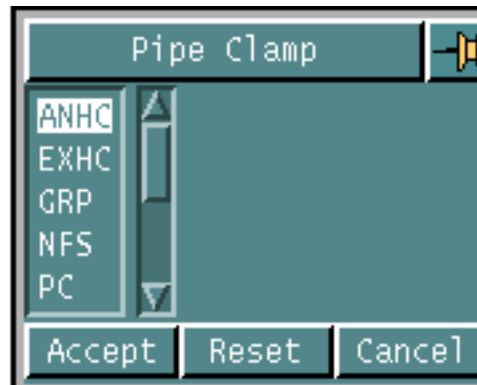
- a. Choose the required cross section on the Section Names Scroll List.
 - b. Click Accept.
3. Choose one of the following Support Creation options.

- a. Click Related Pipe to create the pipe support unit in the Related mode. By default the pipe support is created in the Related Mode. The support member length, cross section, clamp type and parameters and sliding pad parameters are calculated automatically in this mode of pipe support creation.

OR

- b. Click No Related Pipe to create the pipe support unit in the Stand-Alone mode. In this mode the pipe support is not related to any pipe line during its creation, but it can be related to one afterwards. The automatic calculations for the support member length, cross section, clamp type and sliding pad parameters are not done in this mode. The height of the support unit also has to be specified in this mode of pipe support creation.
4. Choose Pipe Clamp and enter a clamp type in the Pipe Clamp field. Or click the List button to display the Pipe Clamp Scroll List in case of the Related Mode. This option is active only in the Related Mode.

Figure 3-4 Pipe Clamp Scroll List



- a. Choose the required clamp type on the Pipe Clamp Scroll List.
 - b. Click Accept.
5. Choose Component and click the Options button to display the Support Component property sheet. For details, see “Support Component Property Sheet” on page 3-19.
 6. Choose Support Height and enter the overall height of the pipe support unit in the field in case of the Stand-Alone Mode. You can select the unit of measurement from the scroll list. This option is active only in the Stand-Alone mode.
 7. Choose Support Width and enter the width of the pipe support unit in the field to specify the width of the support unit. You can specify the overall width of the support unit and select the unit of measurement from the scroll list. This option is active both in the Stand-Alone mode and in the Related mode.

Please note: In the Related mode the optimum width of the Pipe support unit is calculated automatically. Choose the Support width option only if the width to be specified is greater than the optimum width, otherwise the system displays an error message.

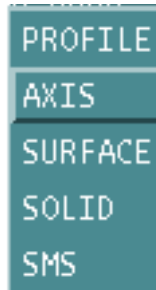
8. Click the Top Plane Orientation Options button to display the Support Top Plane Orientation property sheet. For details, see “Support Top Plane Orientation Property Sheet” on page 3-21.
9. Choose Attachment Connection Endtype to erect the supports on the existing structural objects. Based on the type of end connection, the actual attachment location of the support member on the structural object is calculated. Enter the endtype selection names in the field. Multiple endtype names can be specified and each endtype name must be separated by comma and they must be entered in same order as the target attachment points, in the pipe support.
10. Choose Create Pad at Attachment Points to create pads at the anchor member ends. Deselect this option to disable the pad insertion. This option inserts pads at the support attachment points. Support pad parameters are automatically calculated and pads are inserted at all attachments points. The shape of the pad corresponds to the cross section of the attachment member. Refer to the Figure 3-38, “Pipe Support Pad Definitions,” on page 3-71 for various shapes of the pads.
11. Choose one of the following Trimming options.
 - a. Click Trim by Perpendicular from Anchor points to trim the support leg members by dropping perpendicular from the digitized anchor locations. This is the default.

OR

 - b. Click Trim by Vector through Anchor points to trim the support leg members by the vector passing through the digitized anchor locations. This option is applicable for support type B, C, D, E, F, G, I and Y only.
12. Choose Mirror About Insertion Plane to mirror the support unit about its insertion plane. Individual member orientations are changed accordingly.
13. Choose Support Layer Scheme Selection to set layering scheme for support insertion and click the Options button to display the Support Layer Scheme property sheet. For details, see “Support Layer Scheme Property Sheet” on page 3-22.
14. Choose Paint Code and enter the desired paint code name in the paint field to attach a paint code to the support unit as a property. The specified paint code name is stored in the PAINTCODE property. Deselect this option, if the paint code name is not required to be attached to the pipe support, during insertion. The default is as set in the Setup options.
15. Choose Installation Stage and enter a stage number in the field to attach an installation stage to the support unit as a property.

16. Click the Display Mode Option List button and choose the required 3-D graphics display mode for the creation of pipe support units from the Option list.

Figure 3-5 Display Mode Option List



- a. Choose Profile to display the support member as a local Nfigure with profile wire frame graphical entities. The projection axis and cross section profile curve are generated for the support member.
OR
 - b. Choose Axis to display the support member as a local Nfigure with simple wire frame graphical entities. The projection axis is generated for the support member.
OR
 - c. Choose Surface to display the support member as a local Nfigure with 3-D representation with minimum number of NURB surfaces.
OR
 - d. Choose Solid to display the support member as a local Nfigure with 3-D representation like solids.
OR
 - e. Choose SMS to display the support member as a local Nfigure with SMS style 3-D representation (SMS display mode 4, AUTOMODEL mode 2). That is, the 3-D graphics is displayed as a set of closed coplanar strings for the surface outline.
17. Enter the Material Number in the field to specify the material number to be used for pipe support members.
 18. Click Apply.
 19. If the Related Pipe option is chosen, select the pipe lines to be supported by the support being inserted.
 20. Select the support anchor locations.

Options on the Create Support Unit Property Sheet

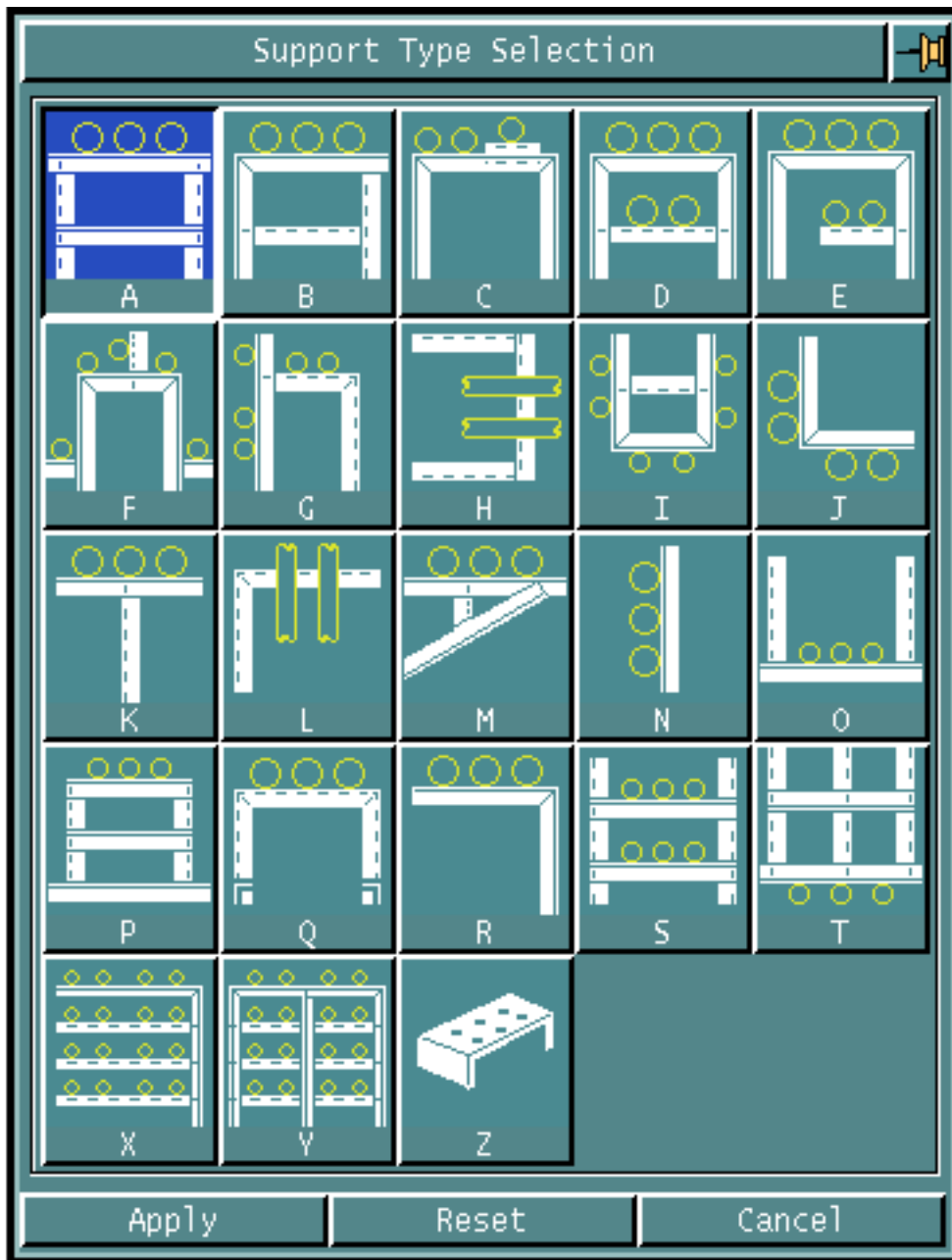
Given below are the details of the options on the Create Support Unit property sheet.

Specifying Support Type

Use this option to choose a support type. The Support Type Selection property sheet has 23 options, representing different types of pre-defined pipe support.

1. Choose Support Type on the Create Support Unit property sheet and click the Options button. The Support Type Selection property sheet appears.

Figure 3-6 Support Type Selection Property Sheet



2. Select the desired Support Type on the Support Type Selection property sheet.
3. Click Accept.

The default pipe support type is A. Refer to Appendix A, “Pipe Support Type Definitions” for more details on each support type.

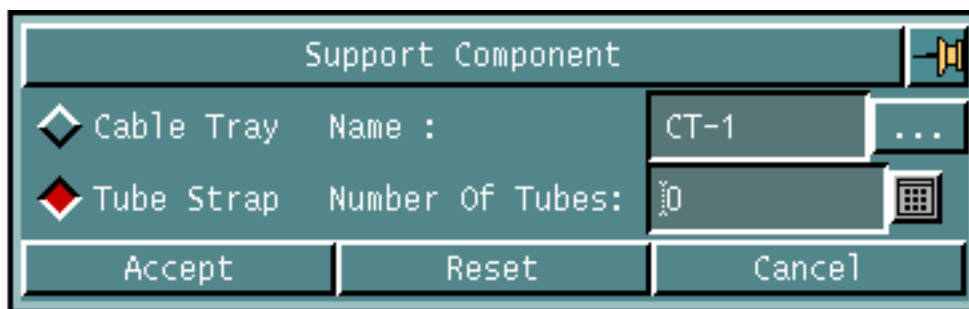
Specifying Component

This option is active only in the Stand-Alone mode. It enables you to attach components like Cable Tray or Tube Strap to the pipe support unit.

Please note: Note that either the Cable Tray or Tube Strap is to be stored in the support unit as property, with no graphics representation.

1. Choose Component on the Create Support Unit property sheet and click the Options button. The Support Component property sheet appears.

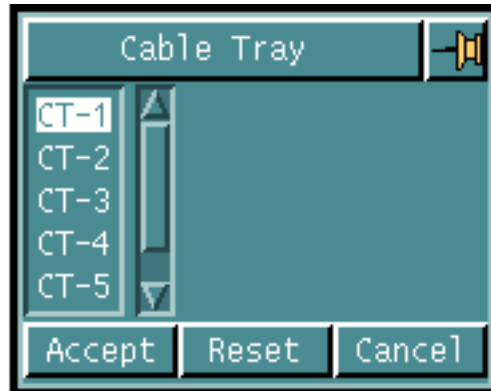
Figure 3-7 Support Component Property Sheet



2. Click Cable Tray to indicate that a cable tray property is to be attached to the pipe support. Enter the Cable Tray name in the Name field or click the List button. The Cable Tray Scroll List appears.

Please note: The cable tray can be attached only to the Pipe Support types K, N and R.

Figure 3-8 Cable Tray Selection Scroll List



- a. Choose the Cable Tray type from the scroll list.
 - b. Click Accept.
3. Click Tube Strap to indicate the that the tube strap property is to be attached to the pipe support. Enter the number of tubes in the Number Of Tubes field. Tube strap is inserted as a property to the pipe support unit.

Please note: The tube strap can be attached only to a Type Z pipe support which, in turn can be created only in the Stand-Alone mode.

4. Click Accept.

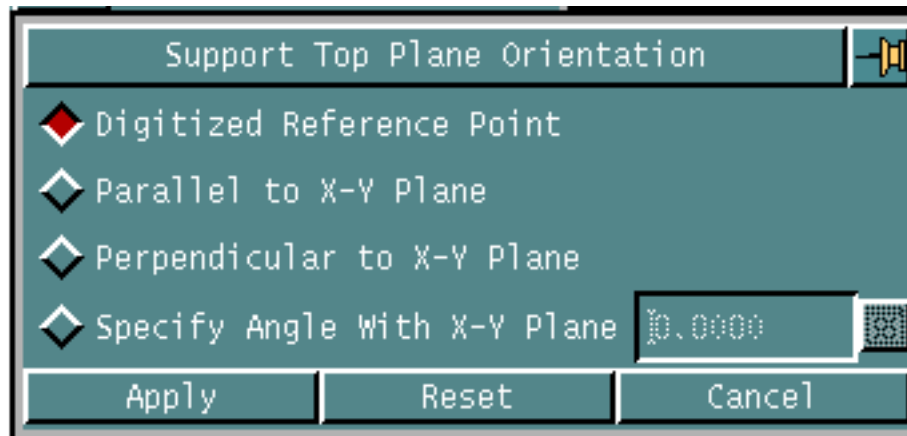
Specifying Top Plane Orientation

Normally, in Related mode, the support top plane orientation is determined automatically from the orientations of the first two pipe lines selected. You can use this option

- To override the automatic top plane orientation.
- To determine the top plane orientation, when there is only one pipe to be supported.

- To specify the top plane orientation of your choice in Stand-Alone mode.
1. Click the Top Plane Orientation Options button on the Create Support Unit property sheet. The Support Top Plane Orientation property sheet appears.

Figure 3-9 Support Top Plane Orientation Property Sheet



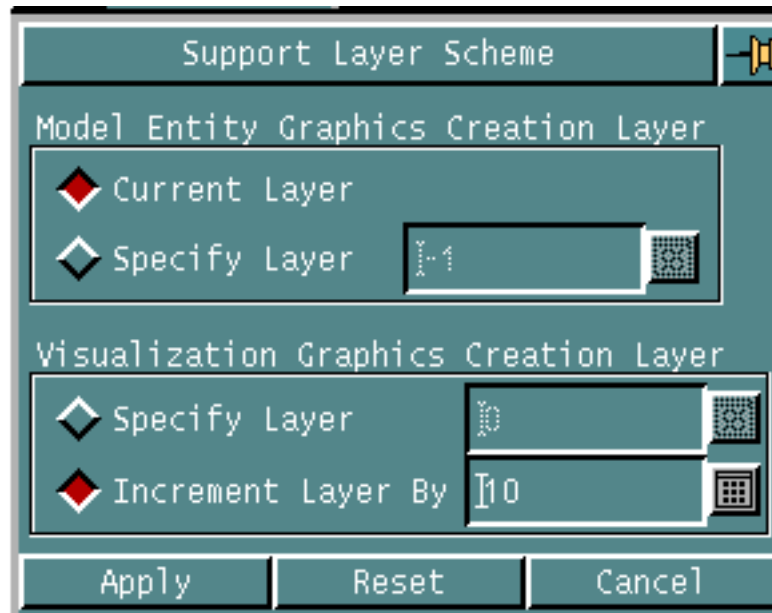
2. Choose one of the following methods to set the top plane orientation.
 - a. Click Digitized Reference Point to determine the top plane orientation of a pipe support member. This is the default method. In this method, the top plane is determined by the reference points selected.
 OR
 - b. Click Parallel to X-Y Plane to set the top plane orientation parallel to the X-Y plane of the currently active CPL.
 OR
 - c. Click Perpendicular to X-Y Plane to set the top plane orientation perpendicular to the X-Y plane of the currently active CPL
 OR
 - d. Click Specify Angle with X-Y Plane to set the top plane orientation at a given angle with the X-Y plane of the currently active CPL. Choose this option and specify the angle required in the field.
3. Click Apply.

Specifying Support Layer Scheme Selection

Pipe Support Layer Scheme Selection offers you the option to create a nodal figure and axis on one layer and a 3-D visualization graphics on another.

1. Click the Support Layer Scheme Options button on the Create Support Unit property sheet. The Support Layer Scheme property sheet appears.

Figure 3-10 Support Layer Scheme Property Sheet



2. Choose one of the following Model Entity Graphics Creation Layer options. You can specify the layer for creating a nodal figure and member projection axis by using one of the following two options.
 - a. Click Current Layer to create the nodal figure and projection axis of pipe supports in the currently active layer.
OR
 - b. Click Specify Layer and enter the layer number to create the nodal figure and projection axis of the pipe supports on a layer other than the currently active layer.
3. Choose one of the following Visualization Graphics Creation Layer options.
 - a. Click Specify Layer and enter the layer number to create the pipe support visualization graphics on a layer other than the default layer.
OR

- b.** Click **Increment Layer By** to increment the layer on which the pipe support visualization graphics are created. By default they are created ten layers away from the nodal figure and projection axis layer, in the positive direction.
- 4.** Click **Apply**.

Creating Pipe Support Members



Choosing this task set option displays the Create Support Member property sheet enabling you to create a pipe support member.

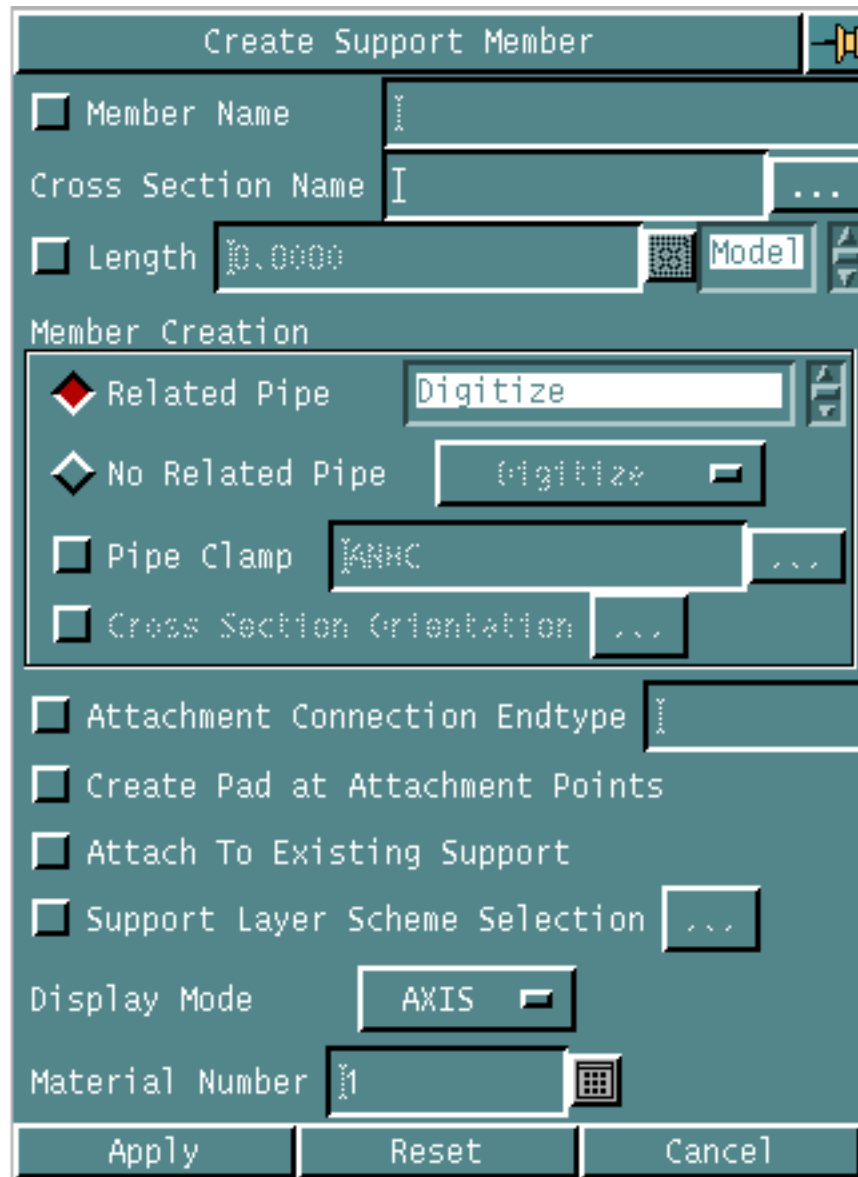
Use **INSERT SUPPORT MEMBER** to insert a pipe support member into a CADD3 3-D model. Pipe Support members are created based on the cross section defined in the internal or external cross section library.

You can create pipe support members, similar to pipe support units, in two modes, Related Mode and Stand-Alone Mode. For a detailed description of these two modes refer to “Creating Pipe Support Units” on page 3-10.

Using This Option

1. Choose Supports on the Task Set access panel to display Pipe Support task set.
2. Choose the Create Support Member option from the Pipe Support task set. The Create Support Member property sheet appears.

Figure 3-11 Create Support Member Property Sheet

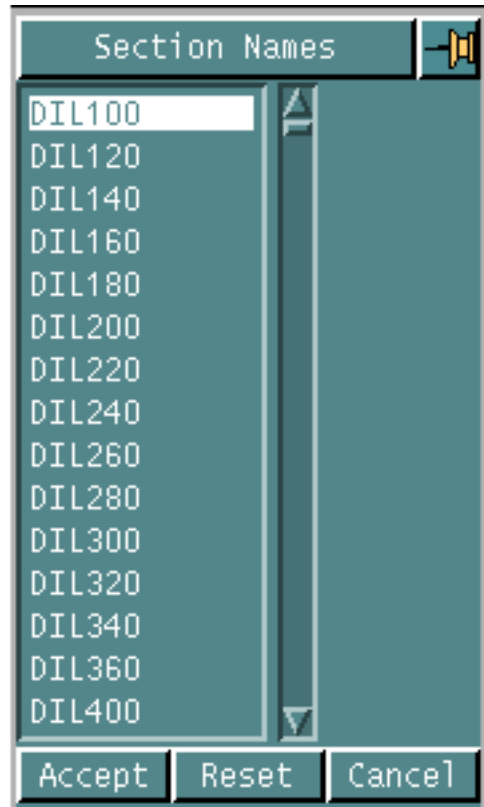


Procedure

1. Choose the Member Name option and enter a name for the support member in the field. If the member is to be attached to an existing pipe support unit using Attach To Existing Support option, the name need not be specified.
2. Enter the required cross section of the support member in the Cross Section Name field. Choosing this option overrides the default cross section as set in the Setup options and enables you to specify the required cross section name in the Cross Section Name field. As an alternative, click the List button and choose a section name from the Scroll List displayed.

Please note: The cross section specified here is applicable only to the current support member to be inserted.

Figure 3-12 Section Names Scroll List

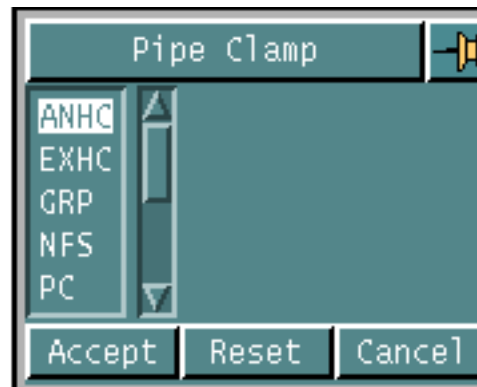


- a. Choose the required Section Name.
- b. Click Accept.
3. Choose Length and enter the length in the field to determine the length of the support member. You can choose an appropriate unit from the scroll list. If you do not choose this option, the selected locations determine the length of the support member.
4. Choose one of the following options.
 - a. Click Related Pipe to create support members in the Related mode and choose the supporting top plane orientation of the member from the option list. The selectable options in the list are Digitize, East, West, North, South, Down, Up. For details, see “Specifying Related Pipe” on page 3-29.

OR

- b. Click No Related Pipe to create the support member in the Stand-Alone mode and click the Option List button to display an Option List. Choose a method to determine the projection axis orientation of the member from the option list. The selectable options in the list are Digitize, Entity, Parallel, Perpendicular. For details, see “Specifying No Related Pipe” on page 3-32.
5. Choose the Pipe Clamp option and enter the clamp type. Or click the List button to display the Pipe Clamp scroll list to specify the clamp type. This option is active only in the Related Mode.

Figure 3-13 Pipe Clamp Scroll List



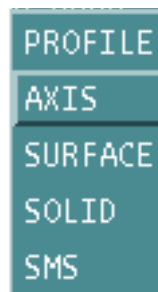
- a. Choose the required Clamp Type.
- b. Click Accept

Please note: Deselect this option to enable the pipe clamp auto-selection. That is, for each selected pipe line, read the default clamp type and parameters from the clamp auto-selection file.

6. Choose Cross section Orientation to specify the cross section orientation of the support member in the Stand-Alone mode. Click the Options button to display the Support Member Section Orientation property sheet. For details, see “Support Member Section Orientation Property Sheet” on page 3-33.
7. Choose Attachment Connection Endtype to erect the support members on the existing structural objects. Multiple endtype names can be specified, each endtype name must be separated by comma, and the endtype names must be entered in the same order as the attachment points of the support members. Based on the endtype connection, the accurate location on the structural object is calculated.
8. Choose Create Pad at Attachment Points to create pads at both ends of the support member. Support pad parameters are automatically calculated and pads are inserted at all attachments points. The shape of the pad corresponds to the cross section of the member.

9. Choose Attach To Existing Support to attach the support member to an existing support unit. By default the pipe support member inserted, is not attached to an existing pipe support unit.
10. Choose Support Layer Scheme Selection to set layering scheme for support member insertion and click the Options button to display the Support Layer Scheme property sheet. For details, see “Support Layer Scheme Property Sheet” on page 3-34.
11. Click the Display Mode Option List button and display the option list. Choose the required 3-D graphics display mode option from the Option list. The selectable options are PROFILE, AXIS, SURFACE, SOLID, SMS. For details, see “Display Mode Option List” on page 3-16.

Figure 3-14 Display Mode Option List



12. Enter the material number for the pipe support members in the Material Number field.
13. Click Apply.
14. If the option Related Pipe is chosen, select the pipe lines to be supported.
15. If the option Attach To Existing Support is chosen, selected the support unit to be connected to.
16. If any one of the option Entity, Parallel, Perpendicular is chosen from the No Related Pipe Option List, select the line like entity to be used as reference entity to define the projection axis for the support member insertion.
17. Select the locations to be used to define the projection axis for the support member insertion.

Options on the Create Support Member Property Sheet

Given below are the details of the options on the Create Support Member property sheet.

Specifying Related Pipe

In this mode the pipe support member is related to the pipe line it supports. By default the pipe support member is created in the Related Mode. The support member length, cross section size, clamp type and parameters and sliding pad parameters are calculated automatically in this mode of pipe support creation.

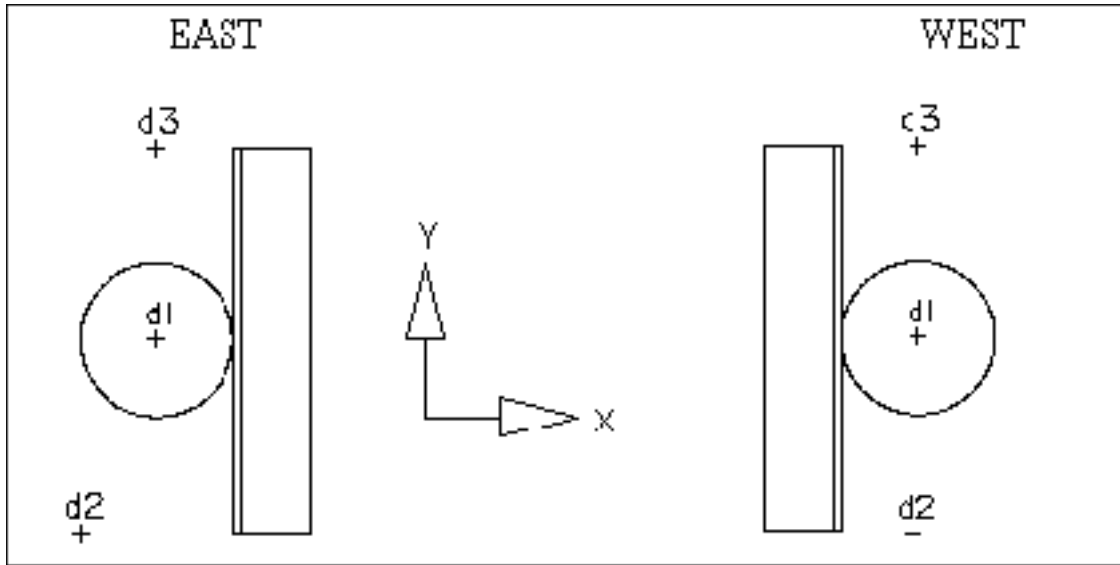
1. Click Related Pipe on the Create Support Member property sheet and choose one of the options from the Option List to determine the supporting top plane of the pipe support member. Normally, the supporting top plane is automatically determined if at least two pipe lines are selected.

Figure 3-15 Related Pipe Option List

Digitize
East
West
North
South
Down
Up

2. Choose one of the following options.
 - a. Choose the Digitize option to determine the insertion plane and supporting plane from the pipe lines selected. Insertion plane is perpendicular to the first pipe selected and the supporting plane is perpendicular to the insertion plane. If only one pipe is selected, the supporting plane is parallel to the line defined by the two digitized locations and fitted to the bottom of pipe (bop). If two or more pipe lines are selected, the supporting plane is fitted to the bottom of the first two pipes and parallel to the line connecting the bottom (bop) of the first two pipes. This is the default option.
 OR
 - b. Choose the East option to insert the pipe support member in such a way that its supporting plane is in the positive X direction of the current CPL from the center of the pipe.
 OR
 - c. Choose the West option to insert the pipe support member in such a way that its supporting plane is in the negative X direction of the current CPL from the center of the pipe.
 OR

Figure 3-16 East West Options



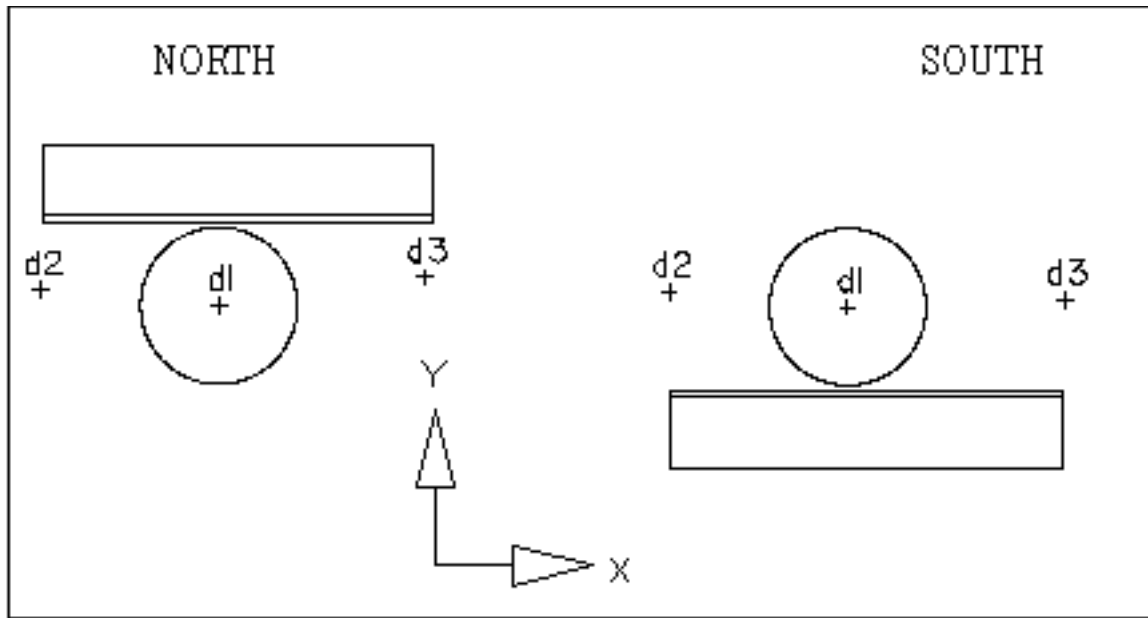
- d. Choose the North option to insert the pipe support member in such a way that its supporting plane is in the positive Y direction of the current CPL from the center of the pipe.

OR

- e. Choose the South option to insert the pipe support member in such a way that its supporting plane is in the negative Z direction of the current CPL from the center of the pipe.

OR

Figure 3-17 North South Options



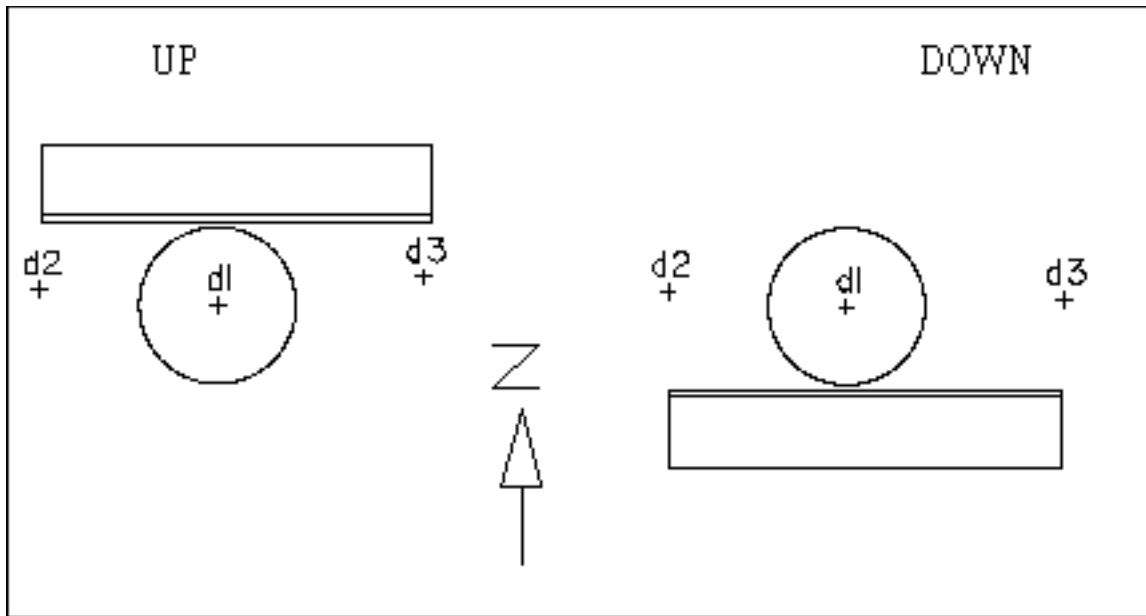
- f. Choose the Up option to insert the pipe support member in such a way that its supporting plane is in the positive Y direction of the current CPL from the center of the pipe.

OR

- g. Choose the Down option to insert the pipe support member in such a way that its supporting plane is in the negative Y direction of the current CPL from the center of the pipe.

OR

Figure 3-18 Up Down options



Specifying No Related Pipe

Choosing this option creates the pipe support in the Stand-Alone mode. In this mode, the pipe support is not related to any pipe line during its creation, however it can be related to one afterwards. The automatic calculations for the support member length, cross section, clamp type and parameters and sliding pad parameters are not done in this mode. The height of the support unit also has to be specified in this mode of pipe support creation.

1. Click No Related Pipe on the Create Support Member property sheet and click the Option List button. The No Related Pipe Option list appears. Choose the required option from the option list to determine the orientation of the member projection axis.

Figure 3-19 No Related Pipe Option List

Digitize
Entity
Parallel
Perpendicular

2. Choose one of the following options.
 - a. Choose the Digitize option, and the direction of Support member's projections is determined by the locations selected. This is the default.

OR

- b. Choose the Entity option and select an entity, to use that entity as the projection axis of the support member. Valid entities are lines, strings, arcs and nsplines and other pipe support members.

OR

- c. Choose the Parallel option and select an entity to create the support member parallel to that entity.

Please note: Only linear entities can be selected.

OR

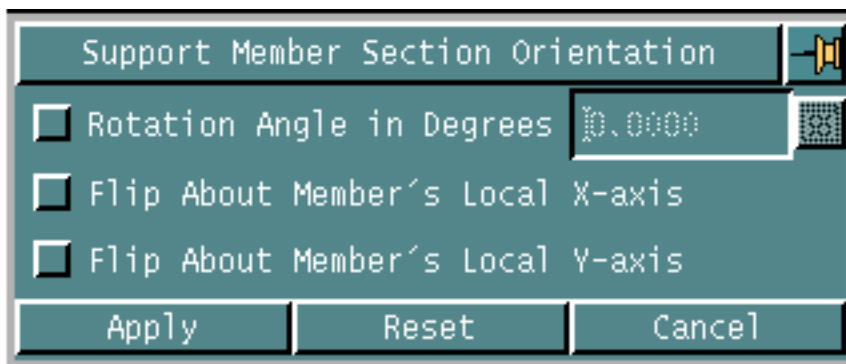
- d. Choose the Perpendicular option and select an entity to create the support member perpendicular to that entity. Note that only linear entities can be selected.

Specifying Cross Section Orientation

This option enables you to determine the orientation of the pipe support member. This option is active only in the Stand-Alone mode.

1. Choose Cross Section Orientation on the Create Support Member property sheet and click the Options button. The Support Member Section Orientation property sheet appears.

Figure 3-20 Support Member Section Orientation Property Sheet



2. Choose Rotation Angle in Degrees to specify the rotation of the pipe support member about the local Z-axis of the cross section's local coordinate system. Local Z axis is the same as the projection axis of the member. Choose this option and enter the value of the rotation angle in degrees in the field.
3. Choose Flip About Member's Local X-axis to mirror the pipe support member about the local X axis of the cross section's local coordinate system. In effect the local Y axis direction is reversed.

4. Choose Flip About Member's Local X-axis to mirror pipe support member cross section about the local Y axis of the cross section's local coordinate system. In effect the local X axis direction is reversed.
5. Click Apply.

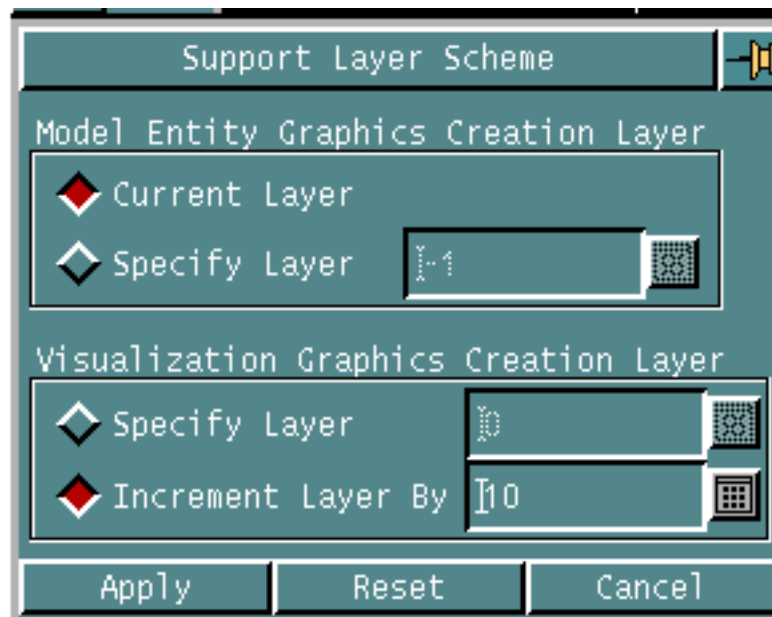
Specifying Support Layer Scheme Selection

Choosing this option enables you to specify the creation layer for the model entities, like nodal figure and projection axis, on one and the 3-D visualization graphics entities on another.

Procedure

1. Choose Support Layer Scheme Selection on the Create Support Member property sheet and click the Options button. The Support Layer Scheme property sheet appears.

Figure 3-21 Support Layer Scheme Property Sheet



2. You can specify the layer for creating Model Entity Graphics by using one of the following two options.
 - a. Click Current Layer to create the Model Entity Graphics of the pipe support members in the currently active layer.

OR

- b.** Click Specify Layer and enter the layer number to create the Model Entity Graphics of the pipe support members on a layer other than the currently active layer.
- 3.** You can specify the layer for creating Visualization Graphics by using one of the two following options.
 - a.** Click Specify Layer and enter the absolute layer number to create the pipe support visualization graphics on a layer other than the default layer as specified by the next option.

OR
 - b.** Click Increment Layer By and specify an incremental value to specify the layer for creating 3-D Visualization graphics. By default, the pipe support member visualization graphics are created ten layers away from the nodal figure and projection axis layer, in the positive direction.
- 4.** Click Apply.

Editing Pipe Support Units



Choosing this option displays the Edit Support Unit property sheet enabling you to edit a pipe support unit.

Pipe supports are inserted with graphic representation and other non-graphical data and properties. Use **MODIFY SUPPORT** to edit the following data and properties of selected pipe support units:

- Pipe Support Type Name
- Member Cross Section Type
- 3-D Graphical Display Representation
- Support Layer and Visualization Graphics Layer
- Mirroring status
- Material of Construction

Using This Option

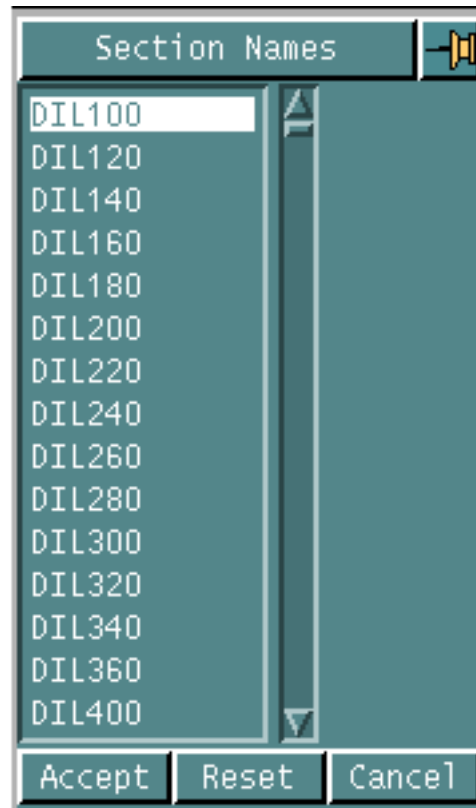
1. Choose Supports on the Task Set access panel to display the Pipe Support task set.
2. Choose the Edit Support Unit option from the pipe support task set. The Edit Support Unit property sheet appears.

Figure 3-22 Edit Support Unit Property Sheet

Procedure

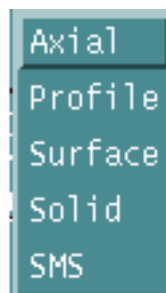
1. Choose Support Type and enter the new support type in the field to change the support type. Changing the support type using this option does not change the configuration of the support unit to the configuration of the new type specified. It just changes the value of the property SUPTTYPE being stored in the support unit. Any type name containing up to a maximum of 72 characters is valid.
2. Choose Cross Section Name and enter the new cross section name in the field, to change the cross section of support members. Or Click the List button to display the Section Names Scroll List. Choosing this option also revises the graphics according to the new cross section.

Figure 3-23 Section Names Scroll List



- a. Choose the required cross section name.
- b. Click Accept
3. Choose Display Mode and choose the required display mode from the scroll list to change the display representation of support member projection axis. This option enables you to change the 3-D visualization graphics representation of the support unit. Choose this option and choose the required display mode from the option list which appears.

Figure 3-24 Display Mode Option List



4. Choose Change Layer Number To and enter a new layer number to change the layer on which the support unit's projection axis and nodal figure appear. Choosing this option enables you to change the layer of the selected support unit model entities, like nodal figure and projection axis. Choose this option and specify the new layer number in the field.
5. Choose one of the following options to change the layer of the 3-D graphics visualization entities of the selected support units. Choose one of the following options to update the selected support units.
 - a. Click No Change if no change is required. By default, there is no change in the 3-D graphics visualization layer.
OR
 - b. Click Change Visualization Graphics Layer To and specify the new layer number for the 3-D graphics visualization.
OR
 - c. Click Increment Layer By and enter the increment layer value from the axis-nfig layer. Choosing this option enables you to specify the incremental value such that the 3-D graphics visualization entities of the selected support units, are to be changed to layer $L+n$, where L is the layer on which the support model entities reside and n is the specified incremental value.
6. Choose Paint Code to change or delete the paint code name of the selected support units. Choose one of the following options.
 - a. Click New Code and enter the paint code name in the field to update the support unit. If such an attribute exists in the selected support unit, it is to be updated with the specified paint code name. If the property does not exist in the selected support unit, it is to be attached to the support unit.
OR
 - b. Click Delete Code to delete the paint code name from the selected support units.
7. Choose Installation Stage to change or delete the installation stage name of the selected support units. Choose one of the following options.
 - a. Click New Stage and enter the installation stage name in the field to update the support unit. If such an attribute exists in the selected support unit, it is to be updated with the specified stage name. If the property does not exist in the selected support unit, it is to be attached to the support unit.
OR
 - b. Click Delete Stage to delete the installation stage name from the selected support units.
8. Choose Mirror about Insertion Plane to mirror all the support members of the selected support units about their insertion planes. This option also revises the graphics to show the change.

- 9.** Choose Material Number and enter the new material in the field to change the construction material of the support unit to the specified material.
- 10.** Click Apply.
- 11.** Select the support units to be updated.

Editing Pipe Support Members



Choosing this task set option displays the Edit Support Member property sheet enabling you to edit a pipe support member.

Use EDIT SUPPORT MEMBER to edit the following properties specific to pipe support members:

- Cross Section Type
- Cross Section Orientation

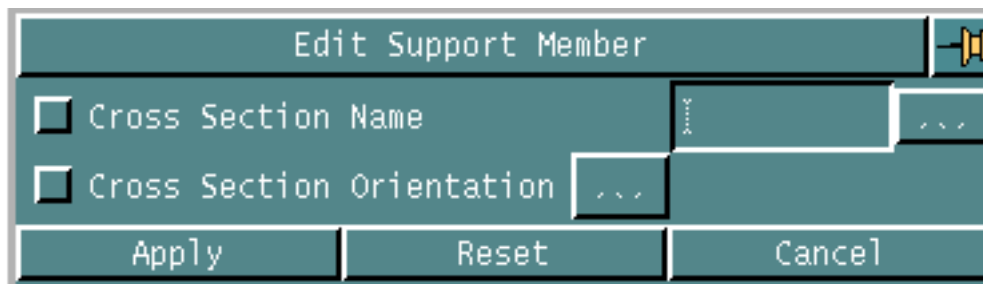
The cross section orientation options are as follows:

- Rotation Angle About Member's Axis
- Flip About Section's Local X-Axis
- Flip About Section's Local Y-Axis

Using This Option

1. Choose Supports on the Task Set access panel to display the Pipe Support task set.
2. Choose the Edit Support Member option from the Pipe Support task set. The Edit Support Member property sheet appears.

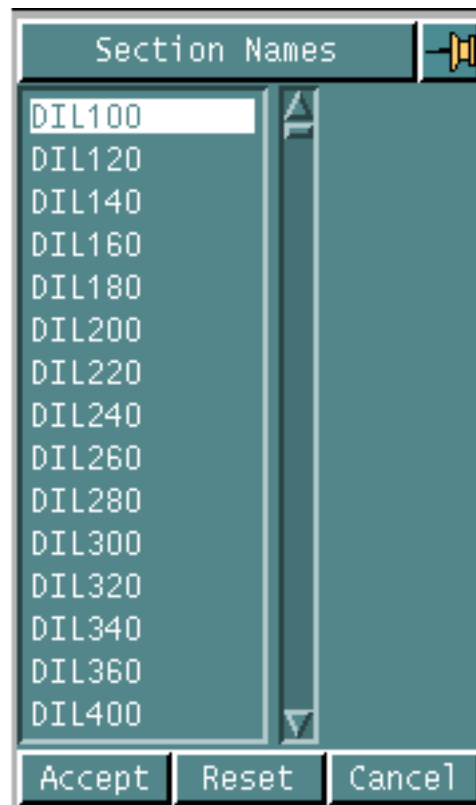
Figure 3-25 Edit Support Member Property Sheet



Procedure

1. Choose Cross Section Name and enter the new cross section name in the field to change the cross section of the selected support member. Or click the List button to display the Section Names Scroll List. Choosing this option also revises the graphics according to the new cross section. The specified cross section name must exist in the internal or external section library. An error message is displayed if the cross section name specified is not valid.

Figure 3-26 Section Names Scroll List



- a. Choose the required cross section name.
 - b. Click Accept.
2. Choose Cross Section Orientation to change the cross section orientation properties of the support member. Click the Options button to display the Support Member Section Orientation property sheet. For details, see "Support Member Section Orientation Property Sheet" on page 3-43.
 3. Click Apply.
 4. Select the support members to be updated.

Options on the Edit Support Member Property Sheet

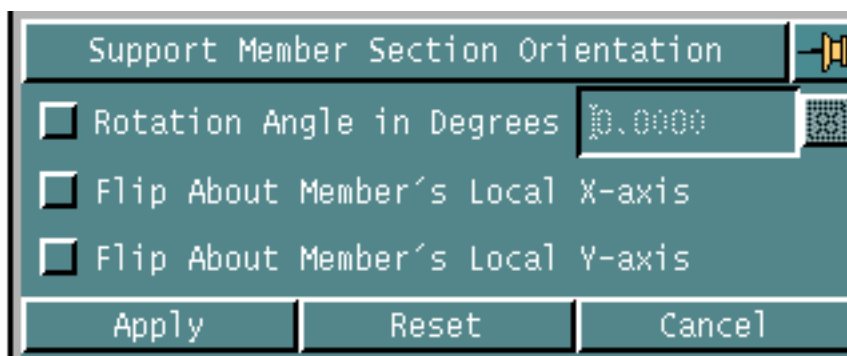
Given below are the details of the options on the Edit Support Member property sheet.

Cross Section Orientation

Choosing this option enables you to change the cross section orientation properties of the support members.

1. Choose the Cross Section Orientation and click the Options button to display the Support Member Section Orientation property sheet. The options on this property sheet enables you to change the cross section orientation of the selected members.

Figure 3-27 Support Member Section Orientation Property Sheet



2. Choose Rotation Angle in Degrees to rotate the member's cross section about its local Z-axis in clockwise direction. The local Z axis is same as the projection axis of the member. Choose this option and specify the rotation angle in degrees in the field.
3. Choose Flip About Member's Local X-axis to mirror the pipe support member about the X axis of the cross section's local coordinate system. In effect the local Y axis direction is reversed.
4. Choose Flip About Member's Local Y-axis to mirror the pipe support member's cross section about the Y axis of the cross section's local coordinate system. In effect the local X axis direction is reversed.
5. Click Apply.

Editing Support Related Pipe



Choosing this task set option displays the Edit Support Related Pipe property sheet enabling you to edit the data and properties of pipes being supported by a support unit.

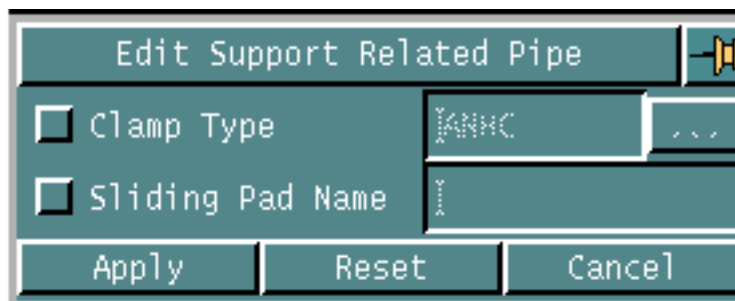
Use EDIT SUPPORT to edit the data and properties of the pipes related to a support unit. The properties of the related pipes that can be edited are:

- Clamp Type
- Sliding Pad Name

Using This Option

1. Choose Supports on the Task Set access panel to display the Pipe Support task set.
2. Choose the Edit Support Related Pipe option from the Pipe Support task set. The Edit Support Related Pipe property sheet appears.

Figure 3-28 Edit Support Related Pipe Property Sheet



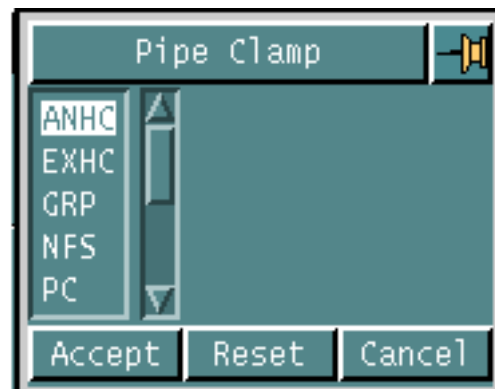
Procedure

1. Choose the Clamp Type option to modify the clamp type for the selected pipe lines. The clamp type is stored as property PIPECLAMP on the anchor Cnode entity of the supported pipe lines. There is no graphics display for clamp. If such a property exists on the Cnode entity, its value is to be updated with the specified clamp type. If the property does not exist, it is to be attached to the anchor Cnode entity. Enter the new clamp type in the field or click the List

button to display the Pipe Clamp scroll list. Choose the required clamp type from the Pipe Clamp scroll list.

Please note: An error message is displayed if the clamp type specified in the Pipe Clamp field does not exist in the clamp auto-selection table.

Figure 3-29 Pipe Clamp Scroll List



- a. Choose the required clamp type from the Pipe Clamp scroll list.
 - b. Click Accept.
2. Choose the Sliding Pad Name option to modify the support sliding pad for the selected pipe lines, which are supported by an existing pipe support and enter the new sliding pad name in the field. If a sliding pad does not already exist, a new sliding pad is inserted. The sliding pad is stored as property PIPESPAD on the anchor Cnode entity of the supported pipe lines. There is no graphics display for sliding pad. Choose the option and enter the name of the new sliding pad in the field. An error message is displayed if the specified sliding pad does not exist in sliding pad auto-selection file.

Please note: With the specified sliding name, the selected pipe line must continue to rest properly on the supporting member. That is, the gap between the pipe and its supporting member minus the sliding pad thickness must be within the tolerance value as set in the Setup options. Otherwise, it is an error.

3. Click Apply.
4. Select the Connect Node(Cnode) entity of the supported pipe lines to be modified.

Deleting Pipe Supports



Choosing this option displays the Support Deletion property sheet enabling you to delete existing pipe support units and members.

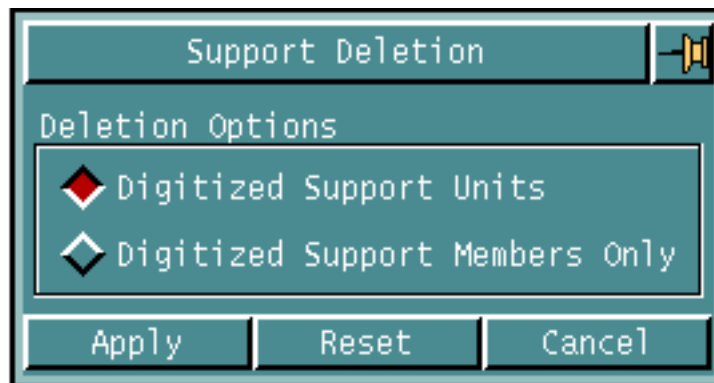
Use **DELETE SUPPORT** to delete the existing pipe support unit or member.

This option unrelates the pipe support unit or member from the pipe before deleting it. Also, if the support has a label, the label is not deleted until the last member of the support unit is deleted.

Using This Option

1. Choose Supports option on the Task Set access panel to display the Pipe Support task set.
2. Choose the Delete Support option from the Pipe Support task set to display the Support Deletion property sheet.

Figure 3-30 Support Deletion Property Sheet



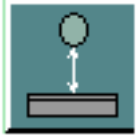
Procedure

1. Choose one of the following Deletion options.
 - a. Click Digitized Support Units to delete the entire pipe support units. All pipes related to the support units are unrelated. If pipe support labels exist for selected support units, they are also deleted.

OR

- b.** Click Digitized Support Members Only to delete only the selected pipe support members. This option unrelates the support member from the pipe before deleting it. Also if the support has a label, the label is not deleted until the last member of the support unit is deleted.
- 2.** Click Apply.
- 3.** Select the support units or members to be deleted.

Relating Pipe Supports



Choosing this option enables you to relate a pipe line or set of pipe lines to existing support member(s). The support members are stretched or trimmed as required to support the selected pipe lines.

As discussed in the section “Creating Pipe Support Units” on page 3-10, you can create pipe support units either in Related Mode or in Stand-Alone Mode. In Related Mode, the pipe support is related to the pipe lines supported by it. In Stand-Alone Mode, the pipe supports are created without any related pipe lines.

Use RELATE SUPPORT to relate the supports created in both the modes to a pipe line.

- Stand-Alone mode pipe supports can be related to selected pipes lines and thus turned into Related mode.
- Related mode pipe supports can be related to additional pipe lines without affecting the already existing relations.

While relating pipe supports to pipe lines, the basic geometry of the pipe support units is preserved. Insertion plane and pipe supporting plane orientations of the support units are also preserved. If the selected pipe lines affect these basic geometric features, error messages are displayed.

The individual support members are stretched or trimmed so that the pipe supporting member has at least the minimum length required to support the pipes and to accommodate the pipe clamps at both ends.

If the selected support unit’s member is already related, automatic dimension calculations are performed to retain it. The gap between the selected pipe lines and the supporting member must be within the tolerance value, as set in the Setup options. Otherwise, it is an error.

Using This Option

- 1.** Choose Supports on the Task Set access panel to display the Pipe Supports task set.
- 2.** Choose the Relate Support option from the Pipe Support task set. This is a direct action option.
- 3.** Select the pipe lines to be supported and type semicolon.
- 4.** Select the support member to be related to the pipe lines.

Unrelating Pipe Supports



Choosing this task set option displays the Unrelating Supports From Objects property sheet. It enables you to unrelate the selected or all the support members of an support unit from all its related pipelines.

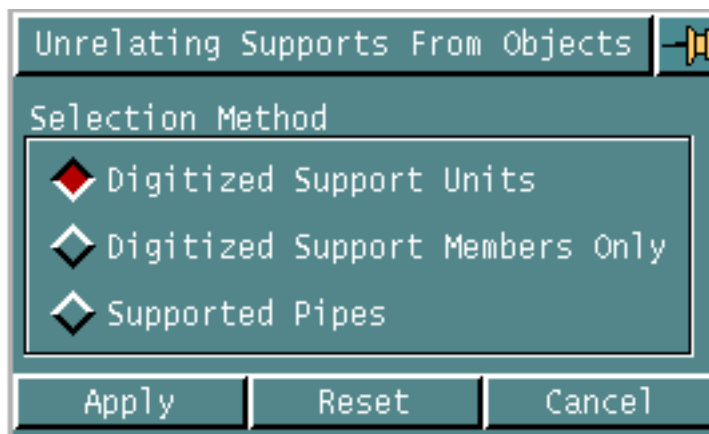
Use UNRELATE SUPPORT to unrelate pipe support units or members from the pipelines they support. The pipe support unit or member becomes a Stand-Alone support unit or member after unrelating it from the pipe lines it supports.

Unrelating pipe support does not change its geometry. It removes non graphical relationship between pipe lines and supporting members. It also removes the nobreak anchor Cnode, which graphically relates the pipe line to its supporting member.

Using This Option

1. Choose Supports on the Task Set access panel to display the Pipe Support task set.
2. Choose the Unrelate Support option from the Pipe Support task set to display the Unrelating Supports From Objects property sheet.

Figure 3-31 Unrelating Supports From Objects Property Sheet



Procedure

- 1.** Choose one of the following Selection Method options.
 - a.** Click Digitized Support Units to unrelate entire pipe support units from all the pipe lines supported by them. All members of the selected pipe support units are made free of the related pipe lines and the support unit becomes stand-alone.

OR
 - b.** Click Digitized Support Members Only to unrelate only the selected pipe supports members from pipe lines supported by them. Selected pipe support members are unrelated from the pipe lines supported by them.

OR
 - c.** Click Supported Pipes to unrelate an individual pipe line from its supporting member.
- 2.** Click Apply.
- 3.** If Digitized Support Units is chosen, select the support units to be unrelated from the supported pipe lines.

OR
- 4.** If Digitized Support Members Only is chosen, select the support members to be unrelated from the supported pipe lines.

OR
- 5.** If Supported Pipes is chosen, select the anchor Cnode entities of the pipe lines to be unrelated from the supporting members.

Connecting Pipe Supports



Choosing this task set option displays the Connecting Supports property sheet enabling you to connect a pipe support member or unit to another pipe support member or unit.

Use **CONNECT SUPPORT** to connect an individual support member or support unit to selected support members or support units to make them one single unit.

Using **Create Support Unit** and **Create Support Member** options, you have an option of inserting either a whole support unit or separate support members. If you create a support unit, all the members of the unit are connected non graphically so that they remain together as a unit. This concept of support unit helps in easy manipulation of entire unit.

But the **Create Support Unit** option has a limitation of choice. You can create support units from only 23 pre-defined pipe support types. Whereas the **Connect Support** option allows you to merge with existing support units or members to create you own pipe support type. You also have an option to name the new type that you have created.

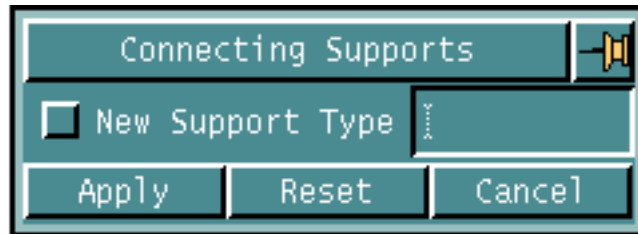
You can connect support unit or members, even if they are related to a set of pipe lines. Their relationship between support member and its supported pipe lines is preserved. But if two members of different support units are connected to form a new unit, the previous relationships among members in the origin unit are lost.

Please note: The **Connect Support** option checks, neither for physical connection nor creates such a connection between the selected members. Connection is only a non-graphical binding between members, facilitating easy manipulation of the connected members as a whole unit.

Using This Option

1. Choose Supports on the task set Access.
2. Choose the Connect Support option from the Pipe Support task set to display the Connecting Supports property sheet.

Figure 3-32 Connecting Supports Property Sheet



Procedure

1. Choose the New Support Type option and enter the name of the new type in the field to create a new pipe support type. Choosing this option enables you to specify the name of the resultant pipe support unit. The type name can have a maximum of 72 alpha-numeric characters.
2. Click Apply.
3. Select the pipe support units or members to be connected.

Disconnecting Pipe Supports



Choosing this option displays the Disconnecting Supports property sheet. This enables you to disconnect a pipe support member from an existing pipe support unit.

Use DISCONNECT SUPPORT to disconnect a pipe support member from an existing pipe support unit. This option breaks the non-graphical relationship between the pipe support member and the parent member that keeps them together. The disconnected member now becomes a new pipe support unit on its own.

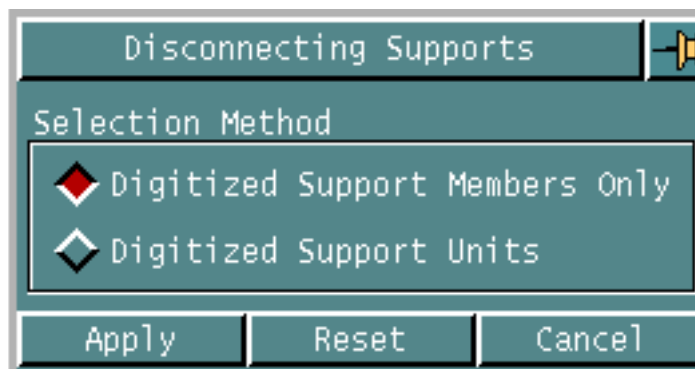
Optionally, you can also disconnect all the members of a selected support unit and have them disassembled into individual support units.

The support unit or members can be disconnected, even if they are related to a set of pipe lines. The relationship between a support member and its supported pipe lines is preserved.

Using This Option

1. Choose Supports on the Task Set access panel to display the Pipe Support task set.
2. Choose the Disconnect Support option from the Pipe Support task set. The Disconnecting Supports property sheet appears.

Figure 3-33 Disconnecting Supports Property Sheet



Procedure

- 1.** Choose one of the following Selection options.
 - a.** Click Digitized Support Members Only to disconnect the selected pipe support member from the support unit it belongs to.

OR

 - b.** Click Digitized Support Units to disassemble all the members of a selected support unit. Each member becomes a separate support unit.
- 2.** Click Apply.
- 3.** Select the support members or units to be disconnected.

Trimming Pipe Support Members



Choosing this task set option displays the Trimming Support Member property sheet enabling you to either trim or stretch a pipe support member.

Use TRIM SUPPORT to trim pipe support members. The member is trimmed from the end nearer to the point of selection. You can either stretch or trim a pipe support member using this option.

If the selected support member is related to a set of pipe lines, automatic dimension calculations are carried out to find out if the resultant member is still valid to support the related pipe lines. An error message is displayed if it becomes invalid to support the related pipe lines.

Similarly, calculations are also carried out to maintain the existing physical connections between the members of the support unit. An error message is displayed if the connectivity is lost as a result of the trimming operation.

The support members can be trimmed in the following ways:

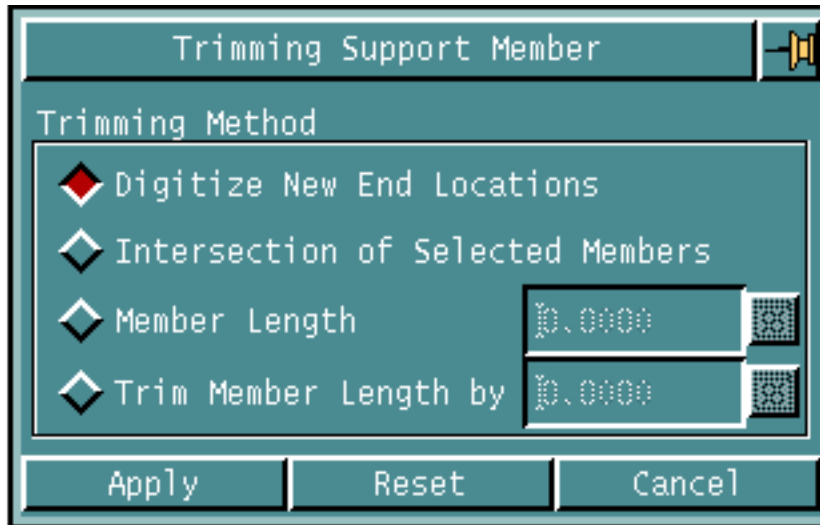
- Trim by choosing new trim end graphically
- Trim till intersection by another member
- Trim member to have specified length
- Trim member by a specified incremental length

All the methods are discussed in detail later in this section.

Using This Option

1. Choose Supports option on the Task Set access panel to display the Pipe Support task set.
2. Choose the Trim Support Member option from the Pipe Support task set. The Trimming Support Member property sheet appears.

Figure 3-34 Trimming Support Member Property Sheet



Procedure

1. Choose one of the following Trimming options.
 - a. Click Digitize New End Locations to trim or stretch the selected support members till the selected new end locations. You can trim both ends of the selected members simultaneously by selecting two locations on the member. If the selected point does not lie on the member then its projection on the member is used as the trimming location.
OR
 - b. Click Intersection of Selected Members to trim or stretch the member till the point of intersection of the selected member. Both ends of the selected members can be trimmed simultaneously, by choosing two intersection members. If an intersection is not found between these members, an error message is displayed.
OR

- c. Click Member Length to trim the member to a specific length and enter the required length in the field. Choose this option and specify the length of the member required after trimming, in model units. If a negative value is entered, an error message is issued.

OR

- d. Click Trim Member Length by to trim the member by a specific value and enter the incremental value in the field. A member is trimmed or stretched based on whether the increment value is positive or negative. Choose this option and specify the increment value by which the member is to be trimmed. The length of member after trimming is shown by the following relation.

$$\text{Length after trimming} = \text{Original Length} - \text{Incremental Length}$$

Please note: A negative increment value stretches the length of the member. If the specified Incremental Length is greater than the original length, an error message is issued.

- 2. Click Apply.
- 3. Select the support member to be trimmed, where the digitized location indicates the end of the member to be trimmed.
- 4. If Intersection of Selected Members is chosen, select the intersecting support member.

Translating Pipe Supports



Choosing this task set option displays the Move/Copy Support property sheet. It enables you to translate a pipe support unit along a translation vector and/or also to create a new support by copying the original.

Use TRANSLATE SUPPORT to translate selected pipe support units, along a translation vector. Optionally, you can also create new support units by copying the original units. In effect this option can be used either to move or copy pipe support units.

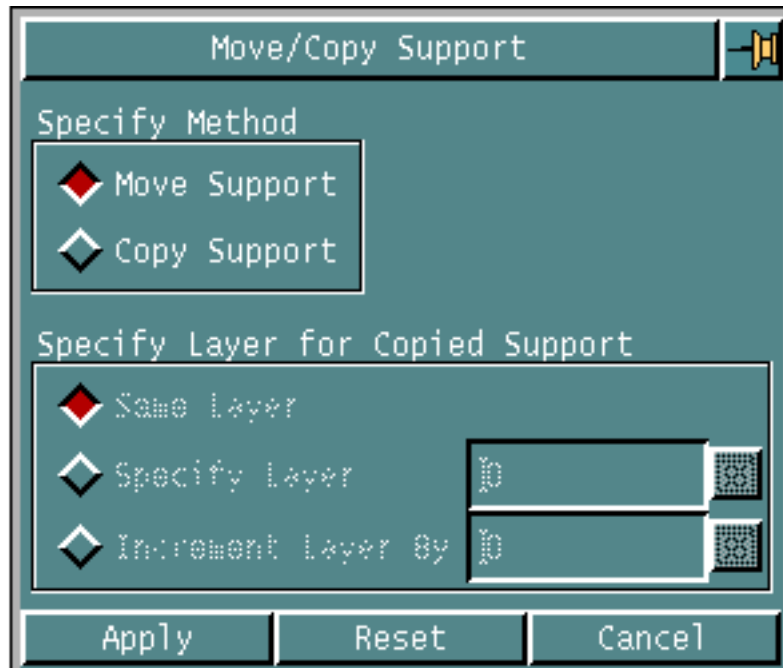
Please note: The pipe support units that are in the Related Mode cannot be translated. Unrelate the pipe support units from the pipe lines they are related to before the translation operation.

Support units with relate pipe lines can be copied. But the created support unit does not have pipe relation information. That is, they are copied as Stand-Alone support units.

Using This Option

1. Choose Supports on the Task Set access panel to display the Pipe Support task set.
2. Choose the Translate Support option from the Pipe Support task set. The Move/Copy Support property sheet appears.

Figure 3-35 Move/Copy Support Property Sheet



Procedure

1. Choose one of the following Specify Method options.
 - a. Click Move Support to move the selected support units to new locations. Choosing this option moves the selected support units along the specified translation vector. Select two locations to define the translation vector.

Please note: A support unit related to a pipe line cannot be moved.

OR

- b. Click Copy Support to move and copy the selected support units and move it along the specified translation vector thus creating new pipe support units. Choose this option and select two locations to define the translation vector. To create more than one copy, select more than two locations. One copy of the selected support unit is created at the second and subsequent selected locations.

Please note: Copies can be made of pipe support units even in the related mode.

2. If you have chosen the Copy Support option, specify the layer for the copied support by choosing one of the following options.
 - a. Click Same Layer to copy the selected support units in same layer as that of the original.

OR

- b.** Click Specify Layer to copy the selected support units on a specified layer and enter the layer number in the field.

OR

- c.** Click Increment Layer By to specify the layer increment value for copying the selected support units, such that the new support units are to be created on layer $L+n$, where L is the layer of the original support unit and n is the specified increment value. Choose this option and specify the increment value in the field.
- 3.** Click Apply.
 - 4.** Select the support units to be translated or copied, and then type semicolon.
 - 5.** Select two locations to define the translation vector. Or select more than two locations if multiple copies of the support units are desired.

Mirroring Pipe Supports



Choosing this task set option displays the Mirror/Copy Support property sheet. It enables you to mirror a pipe support unit about a given mirror plane and also to create a new support, by copying the original.

Use MIRROR SUPPORT to mirror the pipe support units about a specified mirror plane. You also have an option to create a copy of the pipe support units at the mirrored location.

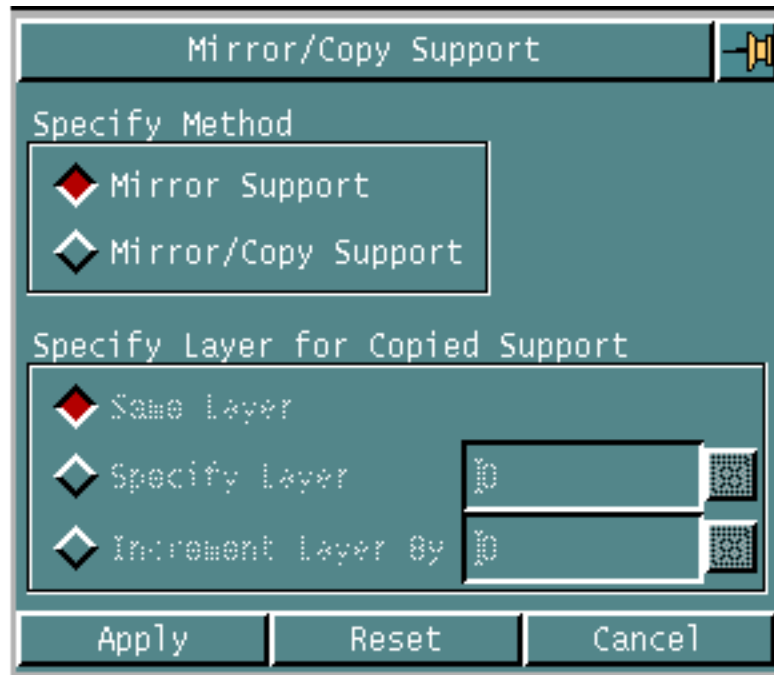
Please note: The pipe support units which are in the Related Mode cannot be mirrored. Unrelate the pipe support units from the pipe lines they are related to before the mirroring operation.

Support units with relate pipe lines can be copied. But the created support unit does not have pipe relation information. That is, they are copied as Stand-Alone support units.

Using This Option

1. Choose Supports on the Task Set access panel to display the Pipe Support task set.
2. Choose the Mirror Support option from the Pipe Support task set to display the Mirror/Copy Support property sheet.

Figure 3-36 Mirror/Copy Support Property Sheet



Procedure

1. Choose one of the following options.
 - a. Click Mirror Support to mirror the selected support units about a given mirror plane. Specify the mirror plane by choosing either two or three locations. Note that a support unit related to a pipe line can not be mirrored.
OR
 - b. Click Mirror/Copy Support to copy the selected support units and then mirror them to create new pipe support units at the mirrored location. Specify the mirror plane by choosing either two or three locations.

Please note: Copies can be made of pipe support units even in the related mode.

2. If you have chosen the Mirror/Copy Support option, specify the layer for the new support by choosing one of the following options.
 - a. Click Same Layer to copy the selected support units in the same layer as that of the original.
OR
 - b. Click Specify Layer to copy the selected support units in a specified layer and enter the layer number in the field.

OR

- c. Click Increment Layer By to specify the layer increment value for copying the selected support units, such that the new support units are to be created on layer $L+n$, where L is the layer of the original support unit and n is the specified increment value. Choose this option and specify the increment value in the field.
3. Click Apply.
 4. Select two locations to define a mirror plane which is perpendicular to the active construction plane and goes through the selected locations.

OR

5. Select three locations to define the mirror plane which goes through the selected locations.

Rotating Pipe Supports



Choosing this option displays the Rotate/Copy Support property sheet that enables you to rotate a pipe support unit about a given rotation axis and also to create a new support by copying the original.

Use ROTATE SUPPORT to rotate pipe support units by the specified angle about a rotation axis in the counterclockwise direction. You also have an option to create a copy of the pipe support units at the resultant location. You can either choose one of the three orthogonal axes (X, Y or Z) as the rotation axis or specify any other axis by selecting two points.

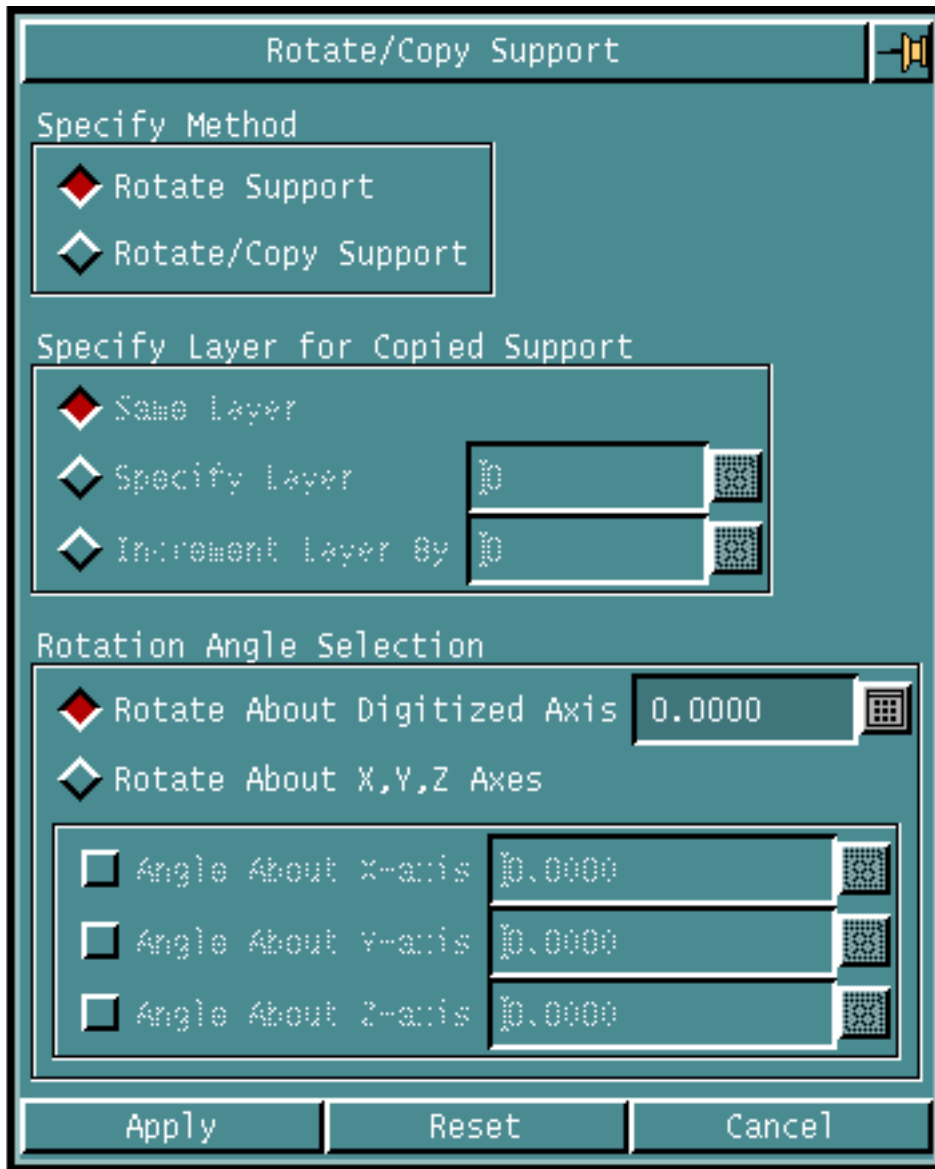
Please note: The pipe support units in the Related Mode cannot be rotated. Unrelate the pipe support units from the pipe lines they are related to before the rotation operation.

Support units with relate pipe lines can be copied. But the created support unit do not have pipe relation information. That is, they are copied as Stand-Alone support units.

Using This Option

1. Choose Supports on the Task Set access panel to display the Pipe Support task set.
2. Choose the Rotate Support option from the Pipe Support task set. The Rotate/Copy Support property sheet appears.

Figure 3-37 Rotate/Copy Support Property Sheet



Procedure

1. Choose one of the following options.
 - a. Click Rotate Support to rotate the selected support units by a given angle about the specified rotation axis. Specify the rotation axis by selecting its location. A Support unit with a related pipe line cannot be rotated. The original pipe support units are deleted and placed in the new resulted location.

OR

- b.** Click Rotate/Copy Support to copy and then rotate them about a specified rotation axis by a specified angle, to create new pipe support units at the resultant location.

Please note: Copies can be made of pipe support units even in the related mode.

- 2.** Choose the Rotate/Copy Support option and specify the layer for the new support by choosing one of the following options.
 - a.** Click Same Layer to copy the selected support units in the same layer as that of the original.
OR
 - b.** Click Specify Layer to copy the selected support units in a specified layer and enter the layer number in the field.
OR
 - c.** Click Increment Layer By to specify the layer increment value for copying the selected support units such that the new support units are to be created on layer $L+n$, where L is the layer of the original support unit and n is the specified increment value. Choose this option and specify the increment value in the field.
- 3.** Choose one of the following options to specify the rotation axis and angle. Default rotation angle value is 0.0 degree in all the cases.
 - a.** Click Rotate About Digitized Axis and specify the angle of rotation to rotate the selected support units about a specified rotation axis other than X-, Y-, or Z- axis of the active construction plane. Specify the rotation axis by selecting three locations. The first location determines the center or origin of the rotation axis, the second and third location determine the direction vector of the rotation axis. Enter the rotation angle in degrees in the field.
OR
 - b.** Click Rotate About X,Y,Z Axis to indicate that the selected support units are to be rotated about the X-, Y-, or Z- axis of the active construction plane.
- 4.** If Rotate About X,Y,Z Axis is chosen, specify the rotation angle in degrees about the corresponding axis.
 - a.** Click Angle About X-axis and enter the angle of rotation in the field to rotate the selected support units about an axis parallel to X- axis of active construction plane (CPL). Choose this option and enter the rotation angle in degrees in the field. Select one location to specify the placement of the rotation axis.
OR

- b.** Click Angle About Y-axis and enter the angle of rotation in the field to rotate the selected support units about an axis parallel to Y-axis of active construction plane (CPL). Choose this option and enter the rotation angle in degrees in the field. Select one location to specify the placement of the rotation axis.

OR

- c.** Click Angle About Z-axis and enter the angle of rotation in the field to rotate the selected support units about an axis parallel to Z-axis of active construction plane (CPL). Choose this option and enter the rotation angle in degrees in the field. Select one location to specify the placement of the rotation axis.
- 5.** Click Apply.
 - 6.** Select the support units to be rotated, and then type semicolon.
 - 7.** If Rotate About Digitized Axis is chosen, select three locations to define the rotation axis. The first location defines the center or origin of the rotation axis, and the next two locations define the direction vector of the rotation axis.
 - 8.** If Rotate About X,Y,Z Axis is chosen, select one location to determine the placement of the rotation axis.

Inserting Pad



Choosing this task set option enables you to insert a pipe support pad at the end of a pipe support member.

Use **INSERT PAD** to insert a pipe support pad at the end of a pipe support member. The various parameters of the pad being inserted is determined by the cross section of the selected member.

A pad is a small planar plate, that is used to separate the axial attachment member of a support unit from the reference structure it stands on. The pad is inserted as a structural membrane stobject with a pre-defined cross section defined in the internal or external section library in the active part. Based on the selected axial member cross section, the pad name, shape (cross section), thickness, and origin is read from the Pad Autoselection file. If no pad is defined for the cross section of the selected support member in the pad auto-selection file, an error message is displayed.

The pad is inserted perpendicularly to the member at the end point which is nearest to the selected location on the axial member. The thickness of the pad trims the axial member automatically, such that the overall length of the member and the thickness of the pad remains the same.

When you insert the pad, you can specify the X-origin and Y-origin values. The **XORIGIN** and **YORIGIN** values in the Pad Autoselection file define the origin of the pad. The **XORIGIN** and **YORIGIN** values represent the offset from the origin of the cross section profile, along the local X- and Y- axis respectively.

XORIGIN and **YORIGIN** are optional fields in the Pad Autoselection file. If these fields are not specified in the Pad Autoselection file, the **XORIGIN** and **YORIGIN** values are set to zero.

Please note: The origin of the cross section of the pad anchors the origin of the cross section of the associated stiffener. The orientation of the cross section of the pad follows the orientation of the cross section of the stiffener.

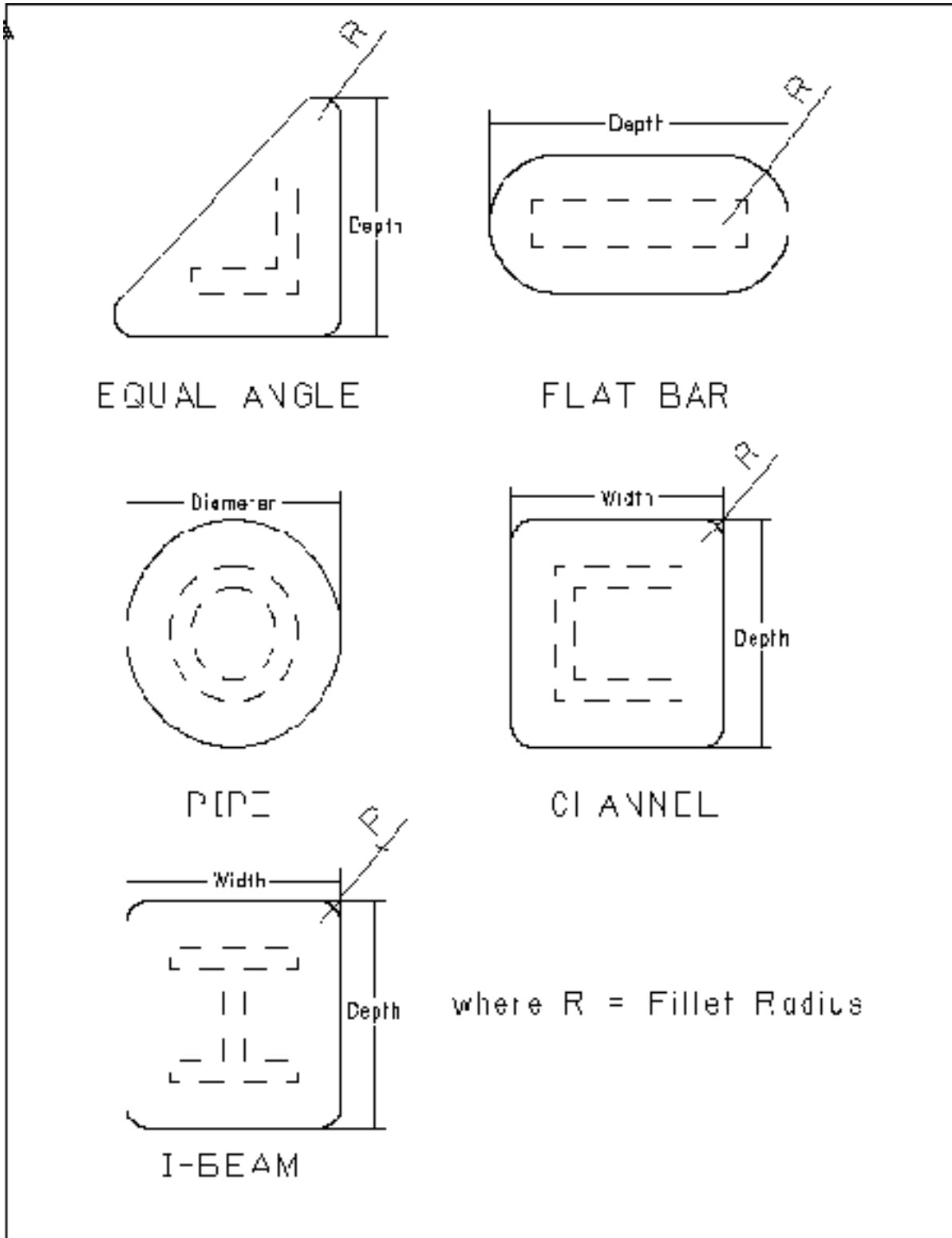
Optionally, you can specify an existing reference structure to orient the pad that is to be inserted. The pad lies on the surface of the reference structure where the member resides now.

This is also a part of the Equipment Support System. Thus, you can read a particular pad specification file while inserting a pad. To do so, run the command **SELECT SUPARAMETRES** in order to select the correct directory file:

```
SELECT SUPARAMETERS DRFILE CVAEC.PIPESUPPORT.DRFILE
```

Refer to the figure shown for samples of the support pad definitions of the various support member cross section.

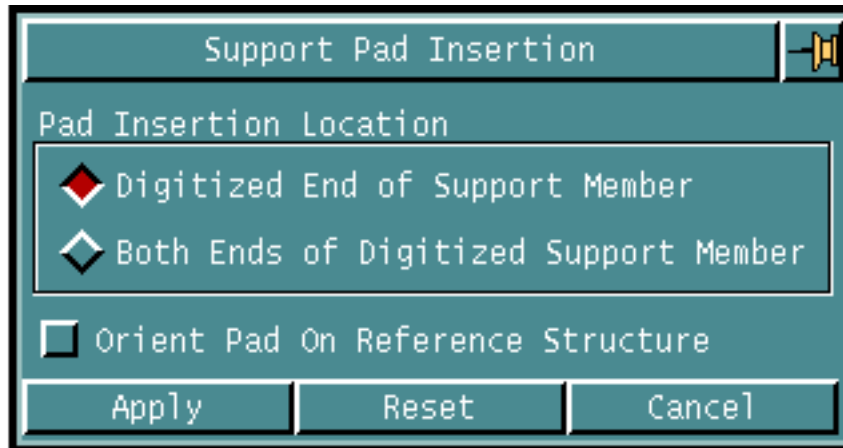
Figure 3-38 Pipe Support Pad Definitions



Using This Option

1. Choose Supports on the Task Set access panel to display the Pipe Support task set.
2. Choose the Insert Pad option from the Pipe Support task set. The Support Pad Insertion property sheet appears.

Figure 3-39 Support Pad Insertion Property Sheet



Procedure

1. Choose one of the following Pad Insertion Location options.
 - a. Click Digitized End of Support Member to insert the pad at the selected end of the support member.OR
 - b. Click Both Ends of Digitized Support Member to insert the pad at both ends of the support member. Default is to insert pad at the end of the support member nearer to the digitize.
2. Choose Orient Pad On Reference Structure to specify that an existing reference structure is used to orient the pad. The pad inserted, lies on the surface of the reference structure on which the support member stands on. The default is to insert the pad perpendicular to the support member.
3. Click Apply.
4. Select the support member on which pad is to be inserted.
5. If Orient Pad On Reference Structure is chosen, select the reference structure on which the support member stands on.

Alternate Methods

Apart from the Insert Pad task set option, pads can also be inserted during support creation by following methods:

- 1.** Choose the Create Pad at Attachment Points option on the Create Support Unit property sheet as shown on Figure 3-2 on page 3-12. This option inserts pads at the attachment points of the anchor members of the pipe supports to be created.
- 2.** Choose the Create Pad at Attachment Points option on the Create Support Member property sheet as shown on Figure 3-11 on page 3-25. This option automatically inserts pads at the attachment points of the support members to be created.
- 3.** Choose Create Pad at Attachment Points option on the Pipe Support Parameters property sheet as shown in Figure 2-2 on page 2-4. This enables subsequent support unit creation which automatically creates pads at the attachment points.

The pads created by the three methods described above are of axial type stobject.

Deleting Pad



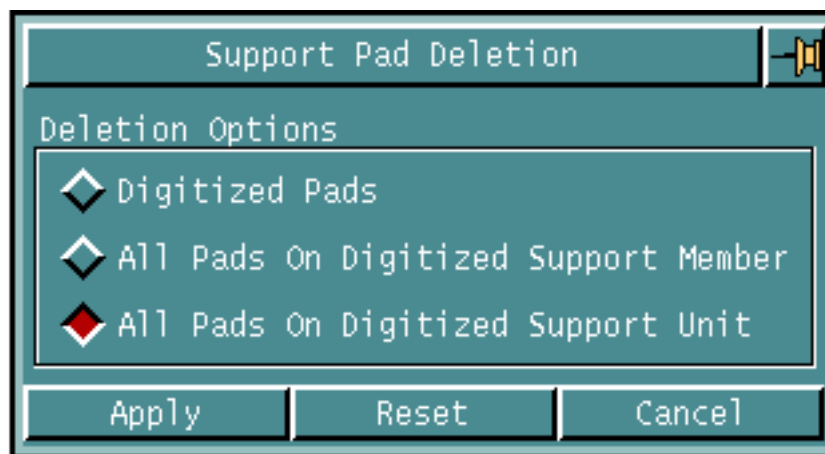
Choosing this option displays the Support Pad Deletion property sheet that enables you to delete a pad from the support member.

Use DELETE PAD to delete an pad from its associated support member. While deleting a pad, the attachment member is stretched by the thickness of the pad such that the overall length of the member plus the thickness of the pad remains the same after deletion of the pad.

Using This Option

1. Choose Supports on the Task Set access panel to display the Pipe Support task set.
2. Choose the Delete Pad option from the Pipe Support task set. The Support Pad Deletion property sheet appears.

Figure 3-40 Support Pad Deletion



Procedure

1. Choose one of the following Deletion Options.
 - a. Click Digitized Pads to delete selected pads only from the pipe support unit.OR
 - b. Click All Pads On Digitized Support Member to delete all pads from the selected pipe support members.

OR

- c.** Click All Pads On Digitized Support Unit to delete all the pads from the selected pipe support units.
 - 2.** Click Apply.
 - 3.** Select the pads to be deleted.
 - a.** If Digitized Pads is chosen, select the pads to be deleted.

OR

- b.** If All Pads On Digitized Support Member is chosen, select the support members whose pads are to be deleted.

OR

- c.** If All Pads On Digitized Support Unit is chosen, select the support units whose pads are to be deleted.

Inserting Snip

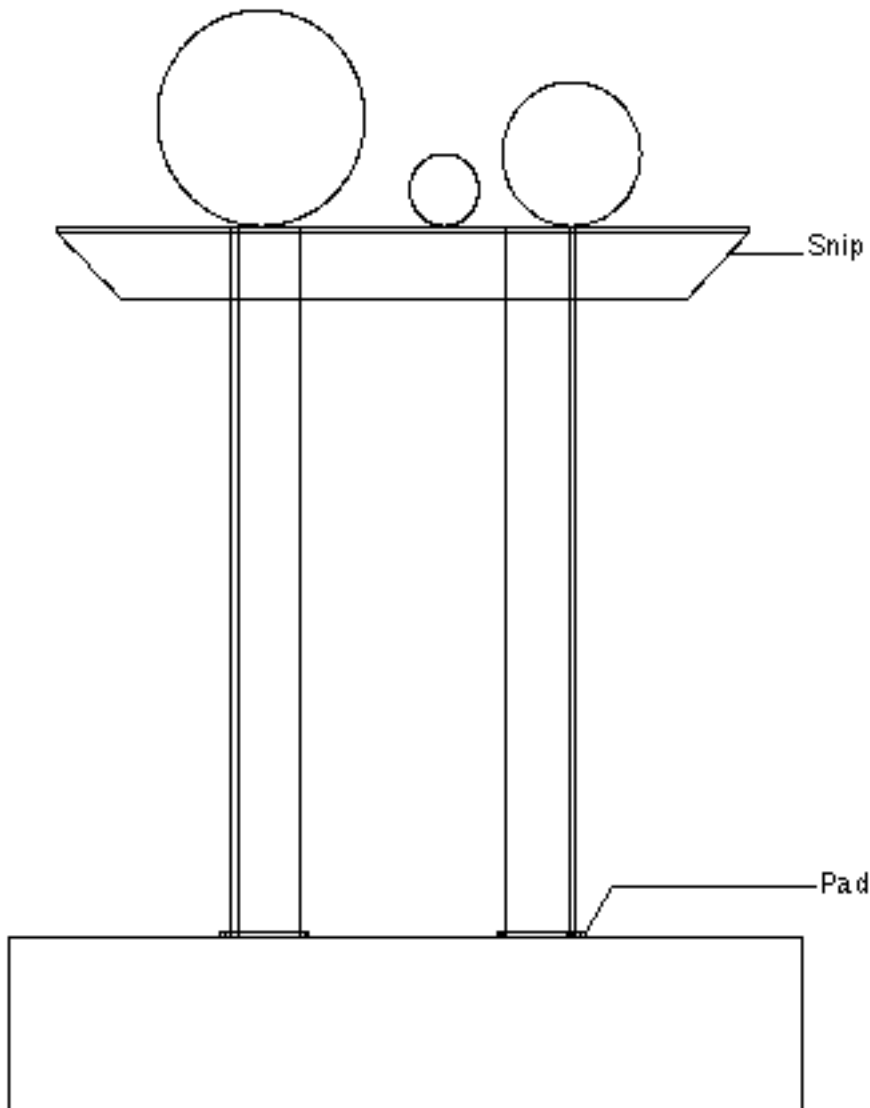


Choosing this task set option enables you to insert snip at the end of pipe support members.

Use **INSERT SNIP** to insert snip at the end of selected pipe support member

A snip is a 45 degree cut at the end of a pipe support member. It is inserted on the web or flange of the cross section. For details see the following figure.

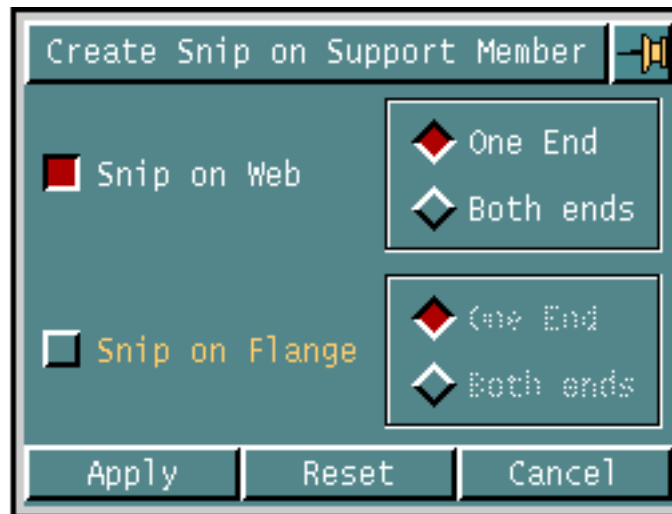
Figure 3-41 Inserting snip



Using This Option

1. Choose Supports on the Task Set access panel to display the Pipe Support task set.
2. Choose the Insert Snip option from the Pipe Support task set. The Create Snip on Support Member property sheet appears.

Figure 3-42 Create Snip on Support Member



Procedure

1. Choose Snip on Web to insert the snip on the web of the support member. This is the default.
 - a. Choose One End to insert the snip at one end (the end nearest to the location specified by the user) of the support member on the web. This is the default.OR
 - b. Choose Both ends to insert two snips at both ends of the support member on the web.
2. Choose Snip on Flange to insert the snip on the flange of the support member.
 - a. Choose One End to insert a snip at one end (the end nearest to the location selected by the user) of the support member on the flange. This is the default.OR
 - b. Choose Both ends to insert two snips at both ends of the support member on the flange.

- 3.** Click Apply.
- 4.** Choose the support member on which the snip is to be inserted.

Deleting Snip



Choosing this option enables you to delete an existing snip on a member.

Use DELETE SNIP to delete an existing snip of a member. All the graphical and non-graphical informations of the selected snip are deleted.

Using This Option

1. Choose Supports on the Task Set access panel to display the Pipe Support task set.
2. Choose the Delete Snip option from the Pipe Support task set. This is a direct action option.

Procedure

1. Select the member on which the snip is to be deleted. The snip which is nearer to the digitized location is to be deleted.

Creating Pipe Support Labels



Choosing this task set option displays the Create Support Label property sheet enabling you to create a pipe support label for a selected pipe support.

Use **GENERATE SULABEL** to create a pipe support label for the selected pipe supports. For a pipe support unit to have a label, it must have the installation stage property, **SUSTAGE**. If such property does not exist on the support units, use **INSERT PROPERTY** to attach the **SUSTAGE** property to the pipe support units, for which you want to create label.

The pipe support label is to be created as a Nodel Text (Ntext) entity, and is to be related to the pipe support. A pipe support label has 3 fields, **MNEMONIC1**, **NUMBER** and **MNEMONIC2**, and it takes on the format described below.

MNEMONIC1 - NUMBER - MNEMONIC2

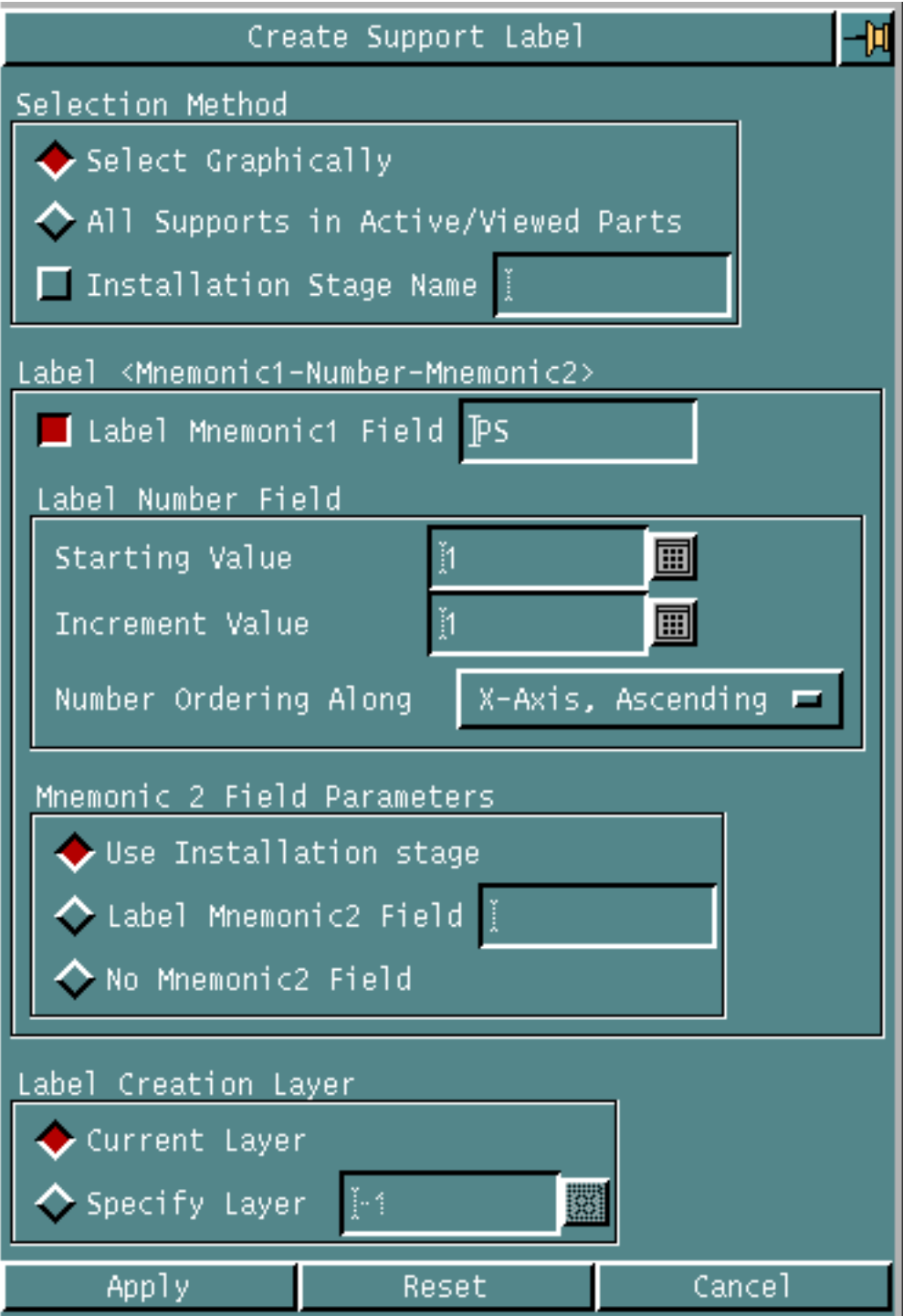
The **MNEMONIC1**, **MNEMONIC2** and **NUMBER** field in the pipe support label are to be generated based on the following priority:

1. If new values are specified in the Create Support Label property sheet, they are used for the current label generation process.
2. Otherwise the default values, if set in the Select Pipe Support Parameters property sheet are used.

Using This Option

1. Choose Supports on the Task Set access panel to display the Pipe Support task set.
2. Choose the Create Support Label option from the Pipe Support task set. The Create Support Label property sheet appears.

Figure 3-43 Create Support Label Property Sheet



Procedure

1. Choose one of the following Selection Method options.
 - a. Click the Select Graphically option to choose the pipe support units graphically. Choosing this option creates pipe support label only for the graphically selected pipe supports. Choose this option and select the pipe support units, for which labels are to be created.

OR

 - b. Click the All Supports in Active/Viewed Part option to create support labels for all the pipe support units in the active part.
2. Choose the Installation Stage Name option and enter the required installation stage name in the field to create support label, only for the pipe support units having the specified installation stage.
3. If the Mnemonic1 field is not required in the support label, deselect the Label Mnemonic 1 Field option. Otherwise, choose Label Mnemonic 1 Field and enter the text string to be used as Mnemonic1 in the field.
4. Enter the starting number to be used to generate the support label in the Starting Value field. The specified starting number is the label number for the first pipe support unit to be processed. The default is as set in the Select Pipe Support Parameters option, in the Setup options.
5. Enter the increment value to be used to generate the support label in the Increment Value field. The label number for the next pipe support unit to be processed is $N+n$, where N is the label number of the most recently processed pipe support unit and n is the specified increment value. The default is as set in the Select Pipe Support Parameters option, in the Setup options.
6. Click the Number Ordering Along Option List button to display the option list. Choose the required option from the option list to determine the method to be used to generate label number. The label number is ordered based on the location of the selected pipe support units, along the X-, Y- or Z-axis of the active CPL, in the ascending or descending order.

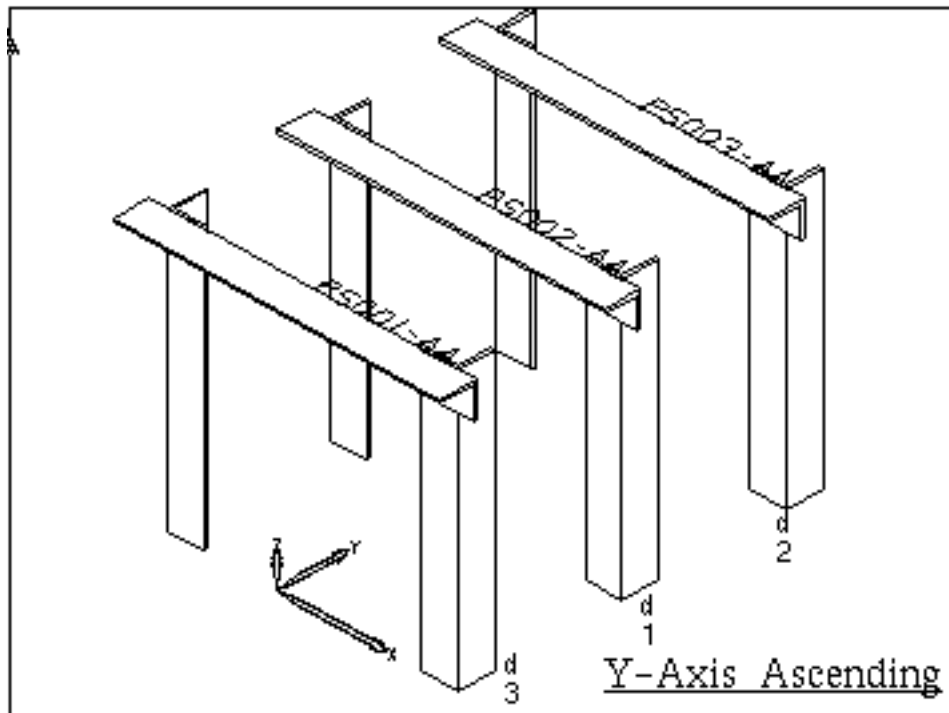
Figure 3-44 Label Number order Option List

X-Axis, Ascending
Y-Axis, Ascending
Z-Axis, Ascending
X-Axis, Descend
Y-Axis, Descend
Z-Axis, Descend

The figure below shows support labels generated using Y-Axis Ascending.

Please note: The support units are selected in a different order but the label number in the support labels are generated in ascending order along Y-axis direction.

Figure 3-45 Support Labels using Y-Axis ascending



7. Choose one of the following options to specify the MNEMONIC2 field.
 - a. Click Use Installation Stage to use the installation name property of the support unit as MNEMONIC2.
OR
 - b. Click Label Mnemonic 2 field and enter the text string to be used as Mnemonic2 in the field.
OR
 - c. Click No Mnemonic 2 Field if the MNEMONIC2 field is not required in the support label.
8. Choose one of the following to specify the Label Creation Layer.
 - a. Click Current Layer to create pipe support label text in the active layer.
OR
 - b. Click Specify Layer to explicitly specify the layer on which the support labels are to be created. Enter the layer number in the field.

9. Click Apply.

10. If Select Graphically is chosen, select the pipe support units to be labeled.

Creating Pipe Support External Database



Choosing this task set option displays the Create Support External Database property sheet. This option enables you to create an external RDBMS database for the pipe support and support member attributes, from the active CADDs part.

Use GENERATE SUPPDBA to extract pipe support and support member attributes from the active CADDs part and store the information in an external RDBMS database.

Once the data is in RDBMS database, the RDBMS query utilities are used to process and format the pipe support data outside CADDs. The RDBMS reporting utilities are used to generate Bill of Materials or to generate various reports required for the pipe support fabrication and installation process.

The pipe support installation drawing generation process reads the information being stored in the external RDBMS database to create the drawing for the selected pipe support units.

Using This Option

1. Choose Supports on the Task Set access panel to display the Pipe Support task set.
2. Choose the Create Support External Database option from the Pipe Support task set. The Create Support External Database property sheet appears.

Figure 3-46 Create Support External Database Property Sheet

The dialog box is titled "Create Support External Database". It contains the following fields and options:

- External Database Login:**
 - User Name: [Redacted]
 - Password: [Redacted]
- Project Name:** [Redacted]
- Selection Method:**
 - Select Graphically
 - All Supports in Active/Viewed Parts
 - Installation Stage Name: [Redacted]
- Overwrite Support External Database
- Buttons: Apply, Reset, Cancel

Procedure

1. Enter the login user name in the User Name field, to be used to establish connection to the external RDBMS in order to access the database.
2. Enter the password in the Password field, to be used to establish connection to the external RDBMS in order to access the database.
3. Enter the pipe support project name in the Project Name field to identify the external RDBMS database files. This option is mandatory. An error message is displayed if a project name is not entered.
4. Choose one of the following Selection Method options.
 - a. Click Select Graphically to specify that the attributes and parameters of only the selected pipe support units are to be written to the external RDBMS database.OR
 - b. Click All Supports in Active/Viewed Part to specify that the attributes and parameters of all the pipe support units in the active part are to be written to the external RDBMS database.

- 5.** Choose the Installation Stage Name option and enter the required installation stage name in the field. The pipe support units having the specified installation stage name are written to the external RDBMS database.
- 6.** Choose the Overwrite Support External Database option to overwrite if a pipe support unit already exists in the external RDBMS database.
- 7.** Click Apply.
- 8.** If Select Graphically is chosen, select the pipe support units whose attributes are to be written to the external RDBMS database.

Creating Pipe Support Drawing



Choosing this Task Set option displays the Support Drawing Generation property sheet enabling you to create the installation drawing of pipe support units in the active part.

Use `DRAW SUPPORT` to automatically create the installation drawing of selected pipe support units in the active part. The selection of the pipe support units is made using the various options available.

The parameter and attributes of the selected pipe support units are read from the external pipe support database and the corresponding installation drawings are created automatically.

You have an option to either plot the current CADDs drawing or save the plotter data in a diskfile in CGM format.

In order to create the support installation drawing, the parameters and attributes of the pipe support unit must be written to the external database using the Create Support External Database task set option. For details, see “Creating Pipe Support External Database” on page 3-85.

There can be more than one support drawing in the active drawing. You can change the form part to change the layout of the drawing and placement of various texts to suite your requirements.

Using This Option

1. Choose Supports on the Task Set Access to display the Pipe Support task set.
2. Choose the Create Support Drawing option from the Pipe Support task set. The Support Drawing Generation property sheet appears.

Figure 3-47 Support Drawing Generation Property Sheet

Support Drawing Generation

External Database Login

User Name

Password

Project Name

Drawing Name

Save with Starting Suffix

Name of Form Part

Drawing Name in Form Part

Selection Method

Installation Stage Name

Starting Serial Number

Ending Serial Number

Support Drawing Parameters (Options...)

Support Drawing Output (Options...)

Process Drawings Continuously Without Break

Apply Reset Cancel

Procedure

1. Enter the login user name in the User Name field to establish connection to the external RDBMS.
2. Enter the password in the Password field to establish connection to the external DBMS.

3. Enter the pipe support project name in the Project Name field to identify the external RDBMS database files. An error message is displayed if a project name is not entered.
4. Enter Drawing Name in the field to specify the name of the drawing to be activated with the specified form part and the drawing for support drawing generation. This option is mandatory and there is no default drawing name.

Once all the forms in the active drawing are filled up and there are more support units to be processed, all the model entities and the active drawing are deleted and a drawing with the same name is activated with the given form part and drawing. This process is repeated until all selected supports are drawn. By default, the drawing is activated with the specified name, therefore no suffix is added to the drawing name. The active part contains only the last processed drawing

5. Choose Save With Starting Suffix and enter the starting suffix number in the field. This option indicates that the drawings created are named with a suffix. The starting suffix number together with the specified drawing name are used to determine the name of the drawings to be activated and kept in the active part. The default starting suffix number is 1.

Once all the forms in the active drawing are filled up and there are more support units to be processed, the current suffix number n is incremented by one and appended to the specified drawing name drawing name to form a new drawing name drawing name $n+1$. The active drawing is kept in the active part and another drawing with the new name is activated with the specified form part and drawing to process the remaining selected support units. This process is repeated until all selected supports are drawn.

For example, if the specified drawing name is “DWG” and the starting suffix number n is 1, then the drawings are created and named as “DWG1”, “DWG2”, “DWG3”,...etc

6. Enter Name of Form Part in the field to specify the name of the form part to be used to activate the drawing for support drawing generation. This option is mandatory and there is no default form part name.
7. Enter Drawing Name in Form Part in the field to specify the associated drawing in the form part as specified in Name of Form Part. The drawing information like drawing size and graphics is to be taken from this specified form part drawing, to activate the drawing for support drawing generation. This option is mandatory and there is no default form part drawing name.
8. Choose Installation Stage Name and enter the installation stage name of the pipe supports to be processed in the field. Choosing this option creates pipe support drawings only for those pipe supports units, which have the specified installation stage. Choose this option and enter the installation stage name of the pipe support units to be processed.

- 9.** Choose the Starting Serial Number option to generate an installation drawing for pipe support units having the specified label number. If Ending Serial Number is also chosen, they together are the starting and ending number of a range, and the installation drawing of the pipe supports whose label number is in this range is to be generated. This option is active only if Installation Stage Name is chosen. Enter the label number in the field.
- 10.** Choose the Ending Serial Number option to generate installation drawing for pipe support units whose label number is in the specified range. This option is active only if the Starting Serial Number option is chosen. Enter the ending number in the field. They together are the starting and ending number of the range. For example, if the value entered for Starting Serial Number option is 10 and the value entered for Ending Serial Number is 20, then only those supports whose label number is between 10 and 20 inclusively are selected for the drawing generation.
- 11.** Choose Support Drawing Parameters to specify the drawing parameter options. Click the Options... button, the Support Drawing Parameters property sheet appears. For details, see “Support Drawing Parameters Property Sheet.” on page 3-92.
- 12.** Choose Support Drawing Output to specify the output destinations and other hardcopy options. Click the Options... button, the Support Drawing Output Options property sheet appears. For details, see “Support Drawing Output Options Property Sheet” on page 3-94.
- 13.** Choose Process Drawings Continuously Without Break to indicate that if there are more selected supports than the number of drawing forms in the active drawing, all the selected supports are processed continuously with no break.

If this option is chosen, then once all the drawing forms in the active drawing are filled up, the graphics data in the active drawing are sent to the printer or plotter device or stored in the specified diskfile as needed, the active drawing is deleted, a new drawing is activated from the same form part drawing and it continues to process the remaining selected supports. Once all the drawing forms in the active drawing are filled up, by default this option prompts you to type ok before activating the next drawing and continue the processing of the remaining selected supports.

- 14.** Click Apply.

Options on the Support Drawing Generation Property Sheet

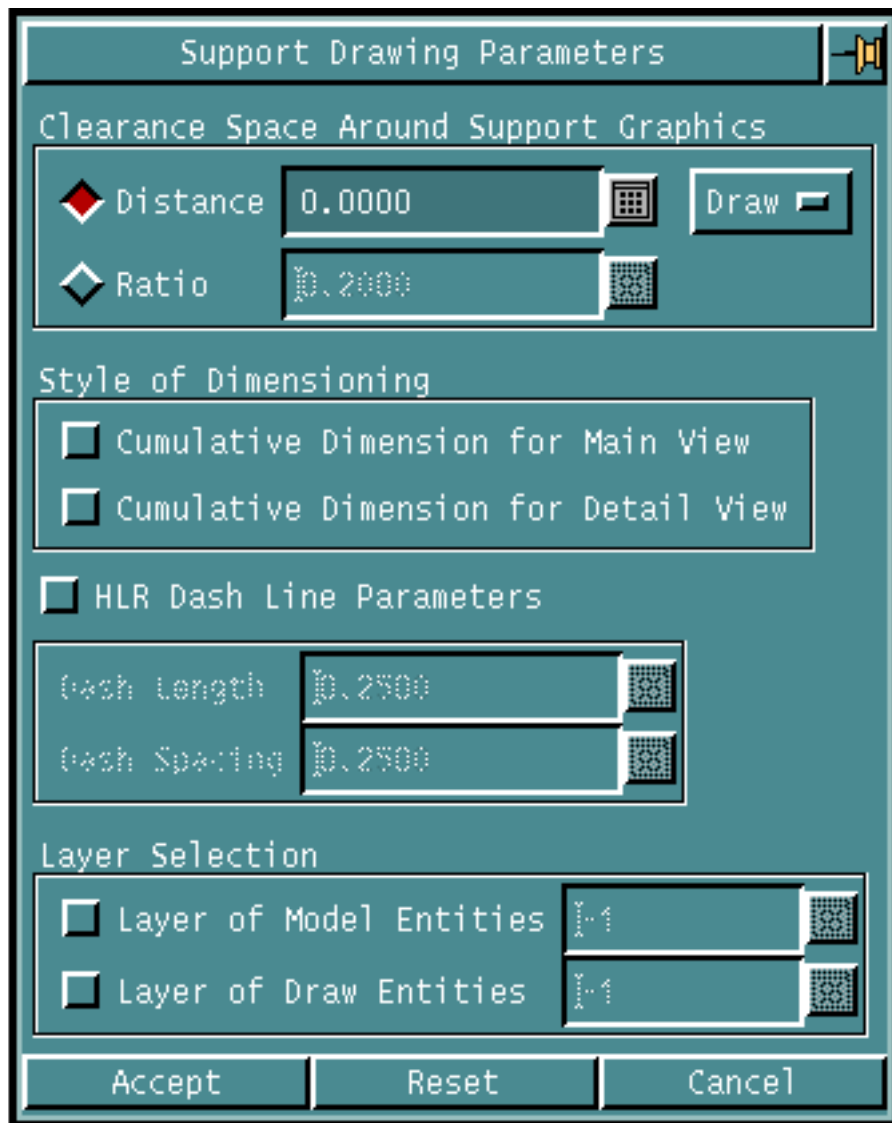
Given below are details of the options on the Support Drawing Generation property sheet.

Specifying Support Drawing Parameters

Use Support Drawing Parameters to specify the support drawing parameter options.

1. Click Support Drawing Parameters on the Support Drawing Generation property sheet. Click the Options... button. The Support Drawing Parameters property sheet appears.

Figure 3-48 Support Drawing Parameters Property Sheet.



2. Choose one of the following Clearance Space Around Support Graphics options.
 - a. Click Distance and enter the absolute minimum clearance distance in the field. Click the Unit Option List button to display the option list. The

selectable options are DRAW, IN, FT, MI, MM, CM, M and KM. Choose the appropriate measurement unit for the specified clearance distance. The specified minimum clearance distance is used to calculate the scaling factor to display the support unit and its related dimension entities in the detail drawings or views.

Figure 3-49 Distance Option List



OR

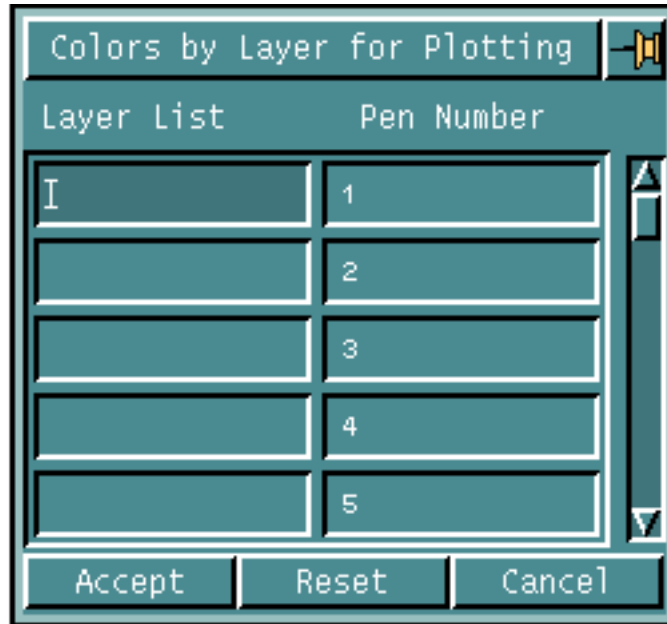
- b.** Click Ratio and enter the minimum clearance space as a percentage of either the horizontal or vertical extent of the support detail drawing whichever is smaller. The default is 0.2 or 20%. That is, the minimum total clearance space between the support objects and the detail drawing boundary is 20% of either the horizontal or vertical extent of the support detail drawing. Or it is 10% of the detail drawing extent from each side of the detail drawing boundary. The specified minimum clearance ratio is used to calculate the scaling factor to display the support unit and its related dimension entities, in the detail drawings or views.
- 3.** Choose Cumulative Dimension for Main View to use the accumulative dimensioning style for the support main detail drawing or view. The default is non-accumulative dimensioning.
- 4.** Choose Cumulative Dimension for Detail View to use the accumulative dimensioning style for the support clamp hole detail drawing or view. The default is accumulative dimensioning.
- 5.** Choose HLR Dash Line Parameters and enter the dash line font parameters, dash length and inter-spacing.
 - a.** Enter the dash length in absolute drawing units in the Dash Length field. The default is 0.25 drawing units. This option is active if the HLR Dash Line Parameters option is chosen.

- 2.** Specify one of the following Output Destination options.
 - a.** Click Screen Only to indicate that the support drawings are to be displayed on the screen only.

OR
 - b.** Click Screen and Diskfile to indicate that the graphics data in active drawing is output in CGM format to a file on disk. Enter the name of the diskfile in the field. This file is created in the user's create directory unless an explicit path name is specified in the file name. If the Process Drawing Continuously Without Break option is chosen, the label of the first support being drawn in the current drawing is appended to the specified diskfile name. That is, the diskfile is named as diskfile support label in order to spool the active drawing to different diskfiles continuously. A maximum limit for a filename is 20 characters. If the diskfile exists, you are prompted for confirmation before overwriting the existing diskfile.

OR
 - c.** Click Screen and Printer to indicate that the graphics data in the active drawing is output to a printer or plotter device. Enter the logical device name of the printer or plotter in the field.
- 3.** Choose Rotate 90 Degrees Before Plotting to rotate the drawing by 90 degrees before plotting.
- 4.** Choose Resolution Quality Level and enter an integer value to specify the relative resolution for stroking arcs and circles. Acceptable integer values are 8-24, with 8 representing the coarsest resolution and 24 the finest. The default value is 12.
- 5.** Choose ColorIndex to specify the layer number and color index assignment to be used for plotting. All entities on the specified layers are plotted in the assigned color whose color number is as defined on the plotter. On pen plotter, the color index number corresponds to the pen number. Click the Options... button to display the Colors by Layer for Plotting property sheet.

Figure 3-51 Colors by Layer for Plotting Property Sheet



- a. Enter the list of layer number in the cell under the Layer List column on the left, and then enter the color number to be used to plot the entities on these layers in the cell on the right under the Pen Number column. Repeat this process on the subsequent rows until the layer-color number assignment is done.
 - b. Click Accept.
6. Click Accept.

Reporting Pipe Supports

This chapter describes the Pipe Support Reporting options. These options generate reports on the selected pipe support parameters and properties, or list the pipe support modeling parameters.

- Overview of Pipe Support Reporting
- Verifying Pipe Supports
- Listing Pipe Support Parameters

Overview of Pipe Support Reporting

Choosing the ? option on the Environment Globals I menu displays the Supports Verification command palette. The Supports Verification palette includes options for the following tasks:

- Verifying Pipe Supports
- Verifying Equipment Supports
- Listing Pipe Support Parameters
- Listing Equipment Support Parameters

Using This Option

1. Choose the ? option on the CADD5 Environment Globals I menu to display the Reporting menu.
2. Choose SUPPORTS on the Reporting menu to display the Supports Verification command palette as shown below.

Figure 4-1 Supports Verification Palette



Options on the Supports Verification Command Palette



VERIFY PIPE SUPPORTS

Choosing this option displays the Pipe Support Verification property sheet. It enables you to list the data and properties of pipe supports. For details, see “Verifying Pipe Supports” on page 4-4.



VERIFY EQUIPMENT/CABLETRAY SUPPORTS

Choosing this option displays the Equipment Supports Verification property sheet. It enables you to verify and list the parameters and properties of the selected equipment and cabletray support. For details, see *Equipment and Cabletray Supports User Guide and Menu Reference*, Chapter 4.



LIST PIPE SUPPORT PARAMETERS

Choosing this option lists the default value of the pipe support modeling parameters. This is a direct action option. For details, see “Listing Pipe Support Parameters” on page 4-6.



LIST EQUIPMENT/CABLETRAY SUPPORT PARAMETERS

Choosing this option lists the default value of the equipment and cabletray support modeling parameters. This is a direct action option. For details, see *Equipment and Cabletray Supports User Guide and Menu Reference*, Chapter 4.

Verifying Pipe Supports



Choosing this option displays the Pipe Support Verification property sheet enabling you to verify and list the parameters and properties of pipe supports.

Use this option to list the graphical and non-graphics data and attributes of the pipe supports. Using this option, you can list either the parameters and properties of all the members of a pipe support unit or only the selected pipe support members.

The list contains the following data and properties:

- Support label
- Support unit type
- Support unit total weight
- Support unit stage name
- Support unit paint code
- Support unit insertion locations (parent Nodal Figure location)
- Cable tray name
- Tube strap
- Support member projection axis definition points
- Support member cross section
- Pad name
- Label of the related pipe lines
- Anchor locations of related pipe lines
- Type of clamp fitted with related pipe lines
- Name of sliding pad fitted with related pipe lines

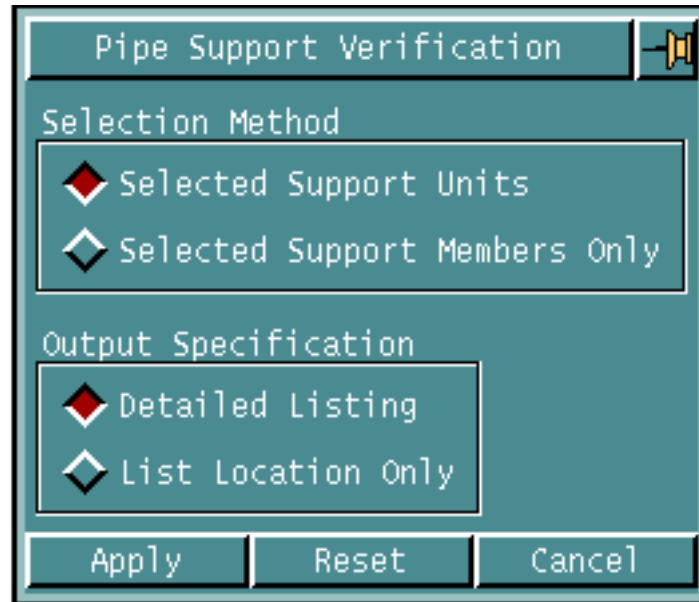
Optionally, you can have the listing of the attachment points only.

Using This Option

1. Choose ? on the CADDs Environment Globals I menu to display the Reporting menu.
2. Choose Supports... on the Reporting menu to display the Supports Verification command palette.

3. Choose Verify Pipe Supports from the Supports Verification command palette. The Pipe Support Verification property sheet appears.

Figure 4-2 Pipe Support Verification Property Sheet



Procedure

1. Choose one of the following Selection Method options.
 - a. Click Selected Support Units to verify all the members of the selected pipe support units.
OR
 - b. Click Selected Support Members Only to verify the selected support members.
2. Choose one of the following Output Specification options.
 - a. Click Detailed Listing to list all parameters and attributes of the pipe support units or members. This is the default.
OR
 - b. Click List Location Only to list only the attachment points of the pipe support units or members.
3. Click Apply.
4. Select the support units to be reported.

Listing Pipe Support Parameters



Choosing this option lists the default value of the pipe support modeling parameters.

Use this option to get the list of pipe support parameter defaults. The default values and data files are listed as following:

- Default directory file name
- Default pipe support unit type
- Default cross section name
- Default support creation layer
- Default visualization entities creation layer
- Default display mode
- Tolerance and clearance value for validity check
- Mid-height member insertion parameters
- Pad insertion parameters
- Sliding Pad insertion parameters
- Support label parameters

You can set or modify these defaults using the Setup options, discussed in the Chapter 2, “Overview of Support Setup Options.”

Using This Option

- 1.** Choose ? on the CADD5 Environment Globals I menu to display the Reporting menu.
- 2.** Choose Supports... on the Reporting menu to display the Supports Verification command palette.
- 3.** Choose List Pipe Support Parameters on the Supports Verification command palette to list the default value of the pipe support modeling parameters.

Example

The following example illustrates the results of the List Support Parameters operation:

```
***** PIPE SUPPORT PARAMETERS *****

Drfile : CVAEC.PIPESUPPORT.DRFILE
Default Support Unit Type : I
Default Cross Section : L90X10
Layer : -1
Visualization Layer : 10 <increment>
Default Display Mode : SURFACE
Tolerance : 0.0001
Clearance : 0.0
Thgt : 1.2
Mhgt : 0.0
No Pad
No Sliding Pad
Label : PS001
  Start : 1
  Increment : 1
  Mnemonic1 : PS
  Mnemonic2 : <nil>
  Number Field Width : 3
```


Pipe Support Type Definitions

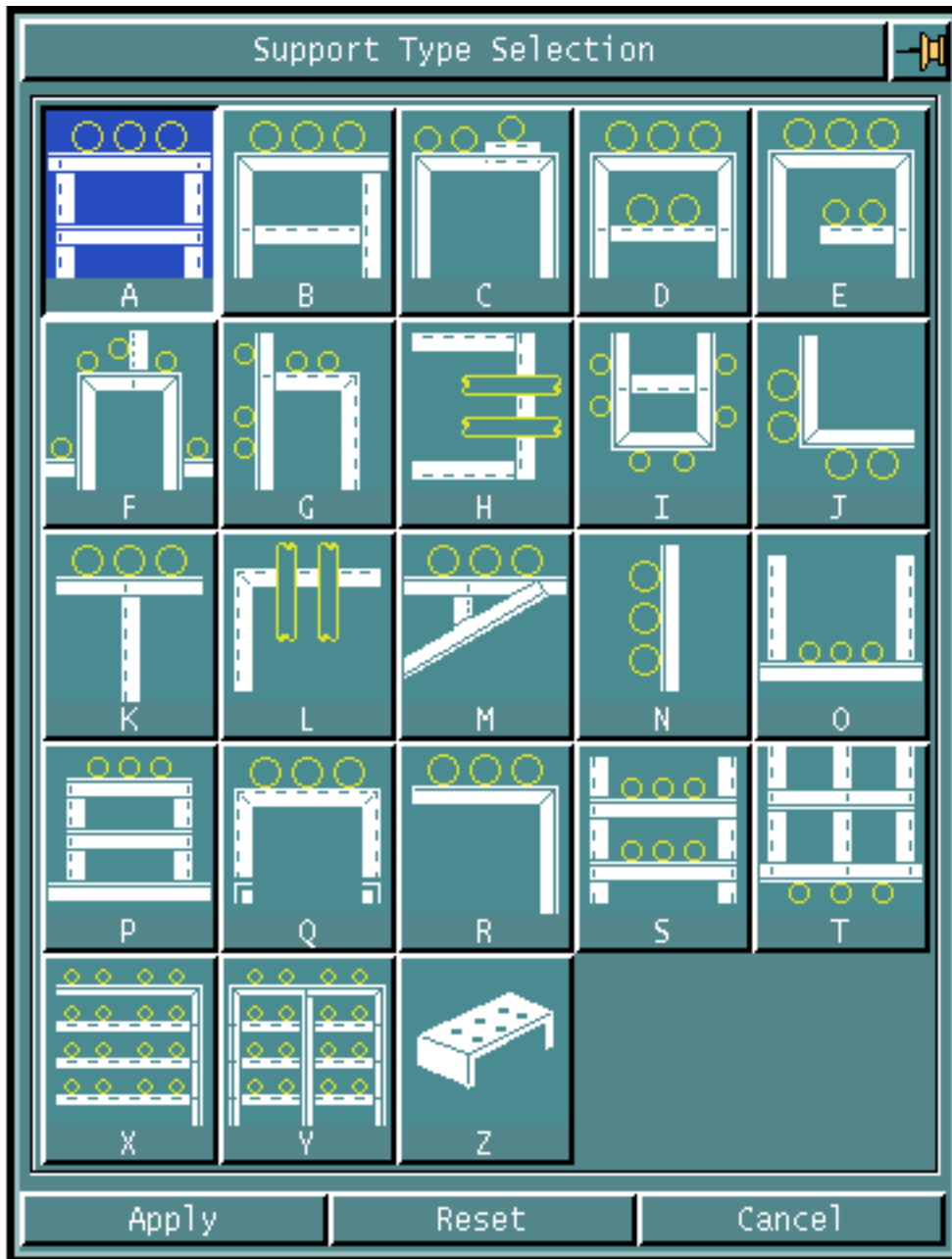
This appendix outlines the parameters used to calculate the dimensions and positions of the pipe support members for each pipe support type.

- Default Pipe Support Types
- Definition Parameter Descriptions

Default Pipe Support Types

There are 23 pipe support types defined in this Pipe Support Package. Each of these pipe support types can be inserted as a feature through the command INSERT SUPPORT.

Figure A-1 Default Pipe Support Types



Definition Parameter Descriptions

A detailed description of the parameters used to calculate the dimensions and positions of the pipe support members for each pipe support type is defined below.

Type - A

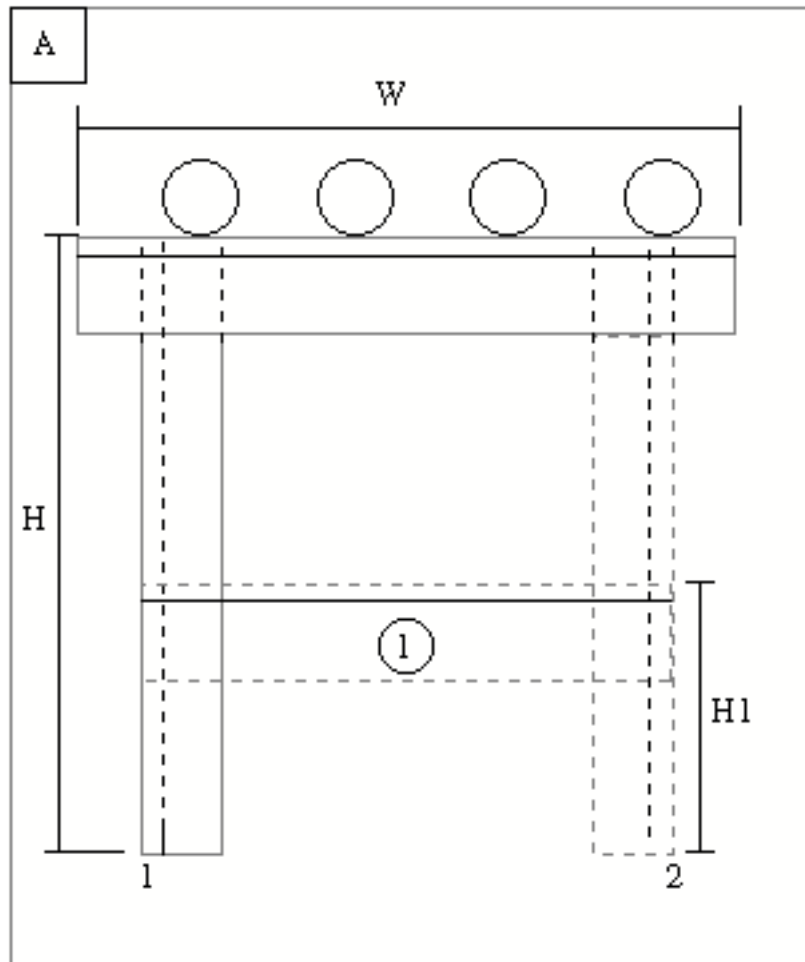
1. Pipe support member “1” is optional.

If H is less than THGT, which is selected by “SELECT SUPPORT THGT” (for example 1200mm), then member “1” is not necessary.

2. If member “1” is required, then $H1 = MHGT$ (if the value selected for MHGT is not 0, see SELECT SUPPORT MHGT)
 $= H / 2$ (if MHGT is equal to 0.0)

3. The number of pipes that can be related to the pipe support unit is variable.
4. The maximum number of pipes to be related to the support unit is 20.

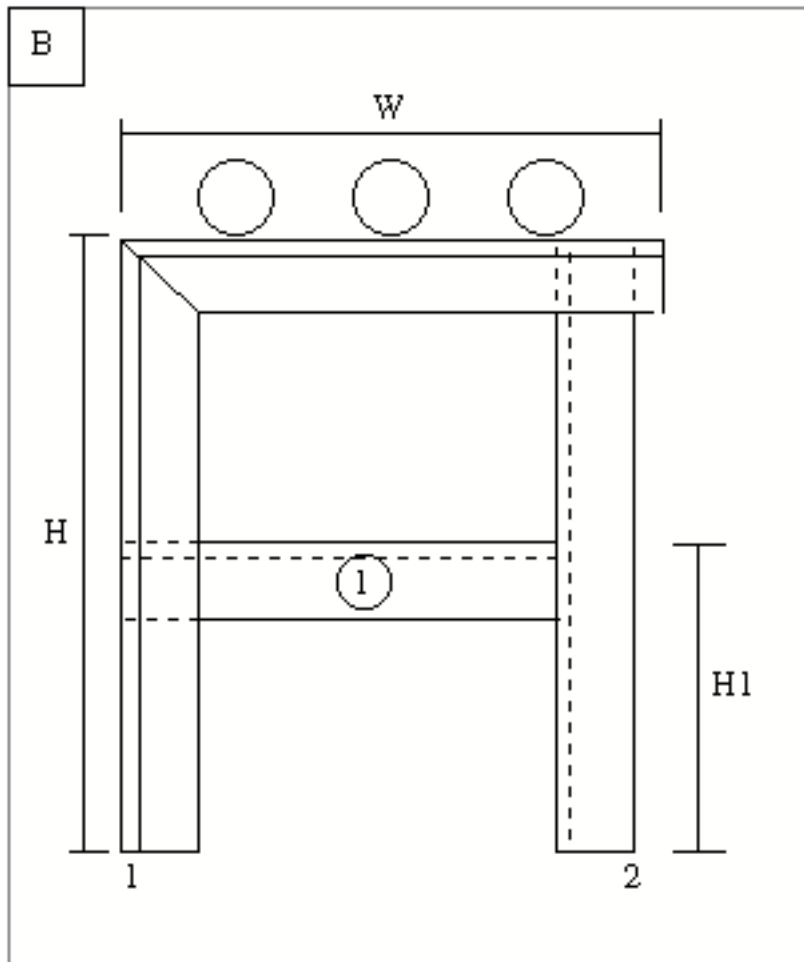
Figure A-2 Support Type - A



Type - B

1. Pipe support member "1", is optional. Rules for location of the member "1" are similar to type "A".
2. The dimension "2", is 10 mm when the OPTIMIZE modifier is used.
3. The maximum number of pipes that can be related to the support unit is 20.

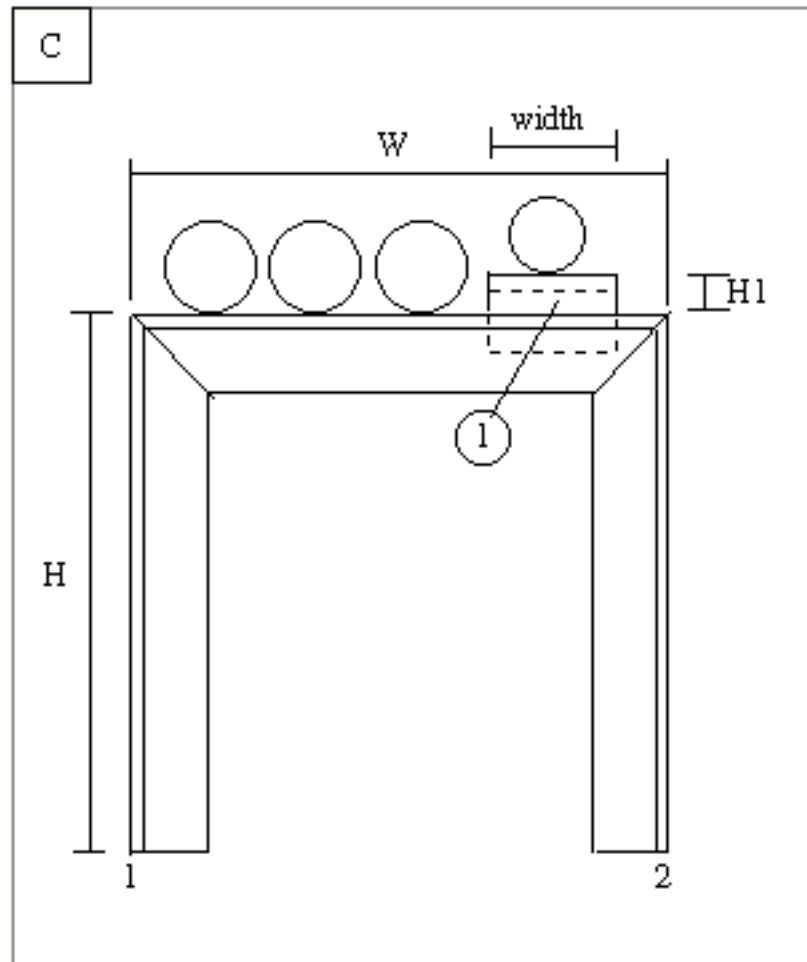
Figure A-3 Support Type - B



Type - C

1. The “1” dimension is equal to the width of the leg of anglesection (L-section).
2. Pipe support member “1”, is optional and can be positioned anywhere along the pipe support top plane.
3. “H1” must be greater than the selected clearance (see SELECT SUPPORT CLEARANCE) and be less than the dimension “1” - 10mm. Otherwise, an error message is issued and the processing terminates.
4. The “width” dimension is equal to the minimum clamp length times two. Refer to Appendix B, “Clamp Selection”.
5. Member “1” may support more than one pipe.

Figure A-4 Support Type - C



Type - D

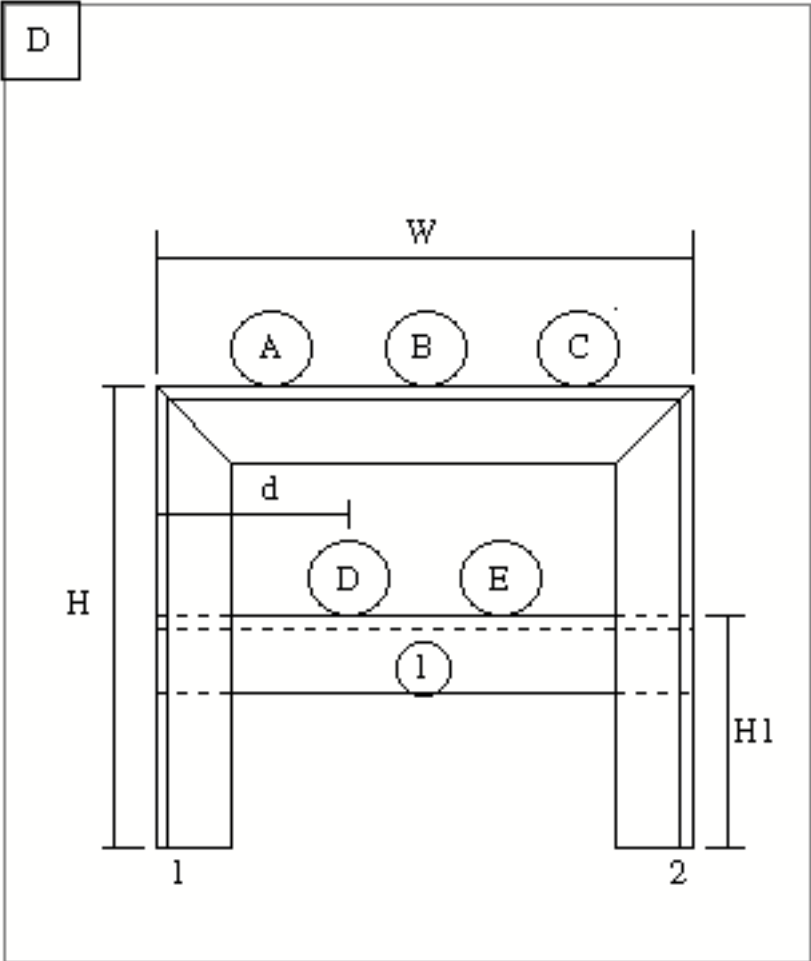
1. Pipe support member “1”, is optional.
2. If there are no D and E pipes, then the member “1” is not necessary.
3. Member “1” is parallel to pipe support top plane.
4. Plane and location of member “1” is defined by the first digitized pipe amongst D and E.
5. The dimension “d” is defined as:
$$d > L + (\text{diameter of pipe}) / 2 + 10\text{mm}$$

Where L = width of the leg of the L- section

Otherwise, an error message is issued and the processing terminates.

- 6. The clearance between pipe E and the top plane of member "1" is checked against the maximum clearance, as defined by SELECT SUPPORT CLEARANCE.

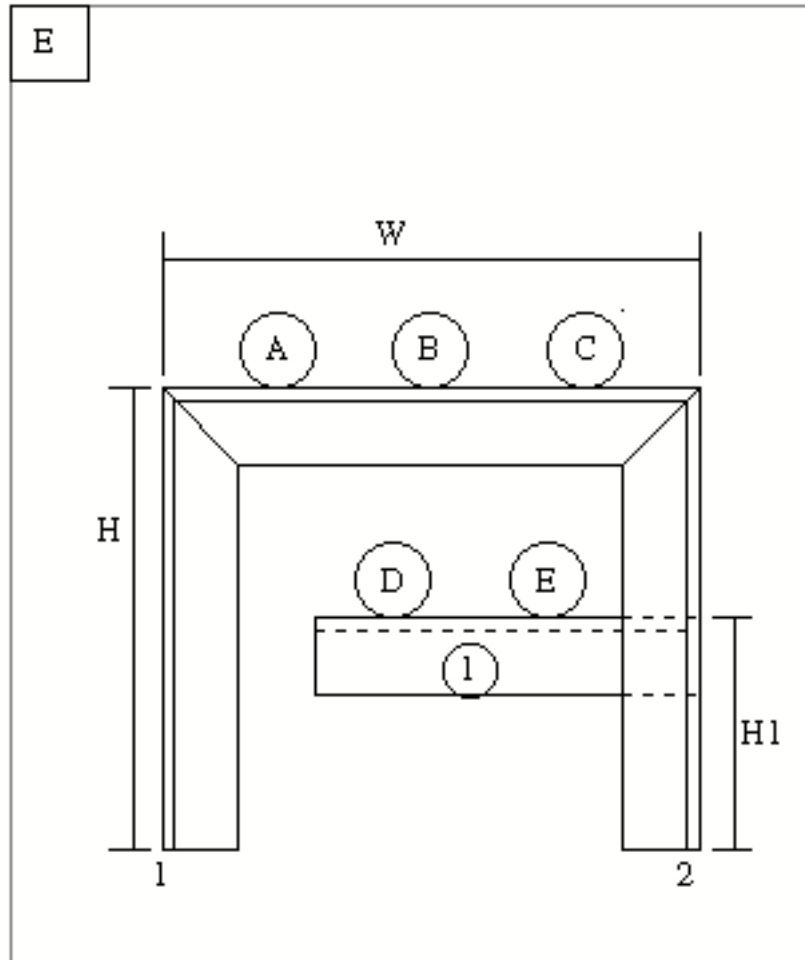
Figure A-5 Support Type - D



Type - E

1. Pipe support member “1” is optional, similar to type “D” defined above.

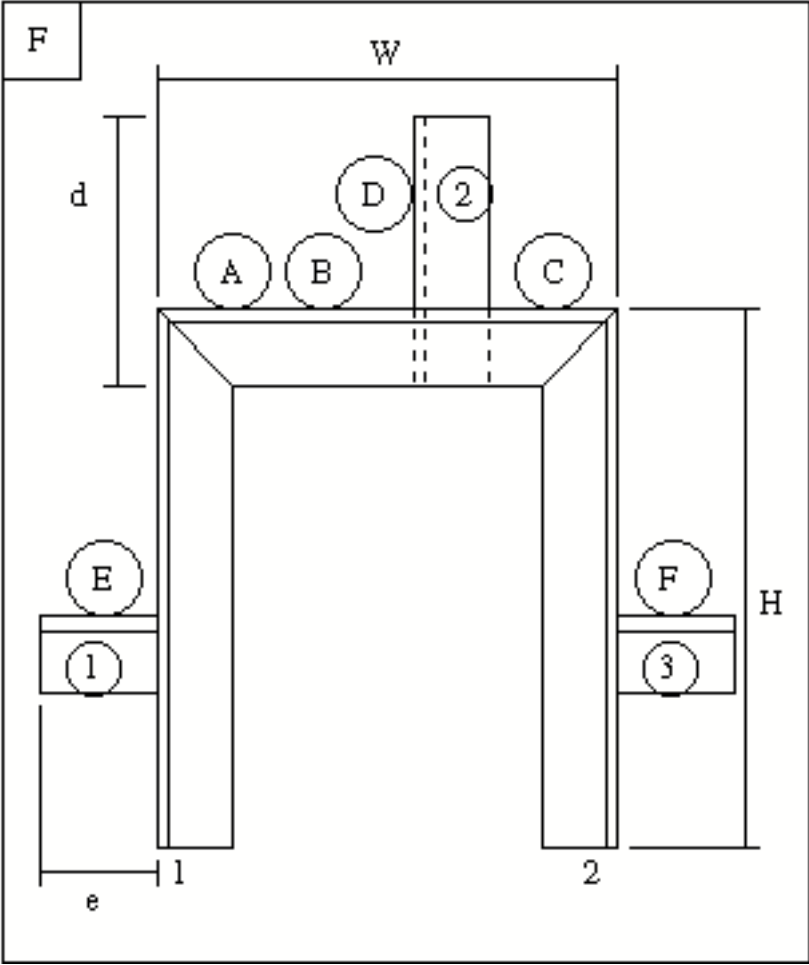
Figure A-6 Support Type - E



Type - F

1. Pipe support members “1”, “2” and “3” are optional.
2. Members “1”, “2” and “3” are defined by locations of the pipelines digitized.
3. Dimensions “d” and “e” must be greater than the minimum clamp length, otherwise an error message is issued and processing terminates. Refer to “Clamp Selection” on page -12.

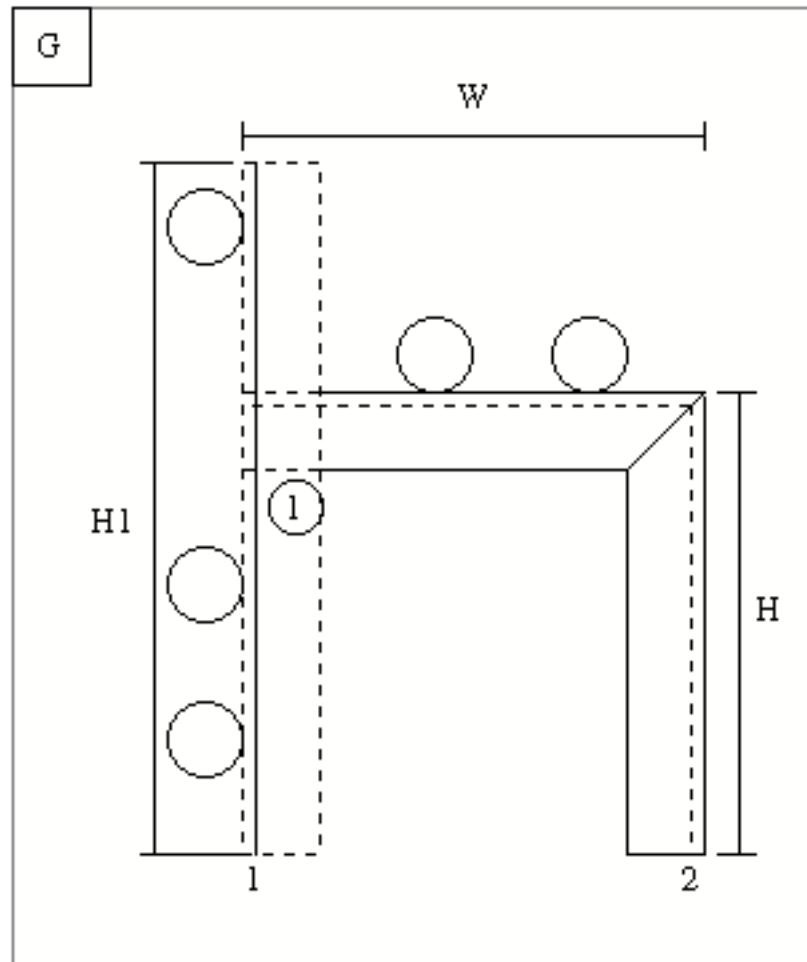
Figure A-7 Support Type - F



Type - G

1. If H1 is less than H, then H1 must be set equal to H.
2. The “POS” point must be automatically located to be in a plane which is tangent to the pipe.
3. If a pipe is to be supported by the member “1”, then an error message is issued and processing terminates.

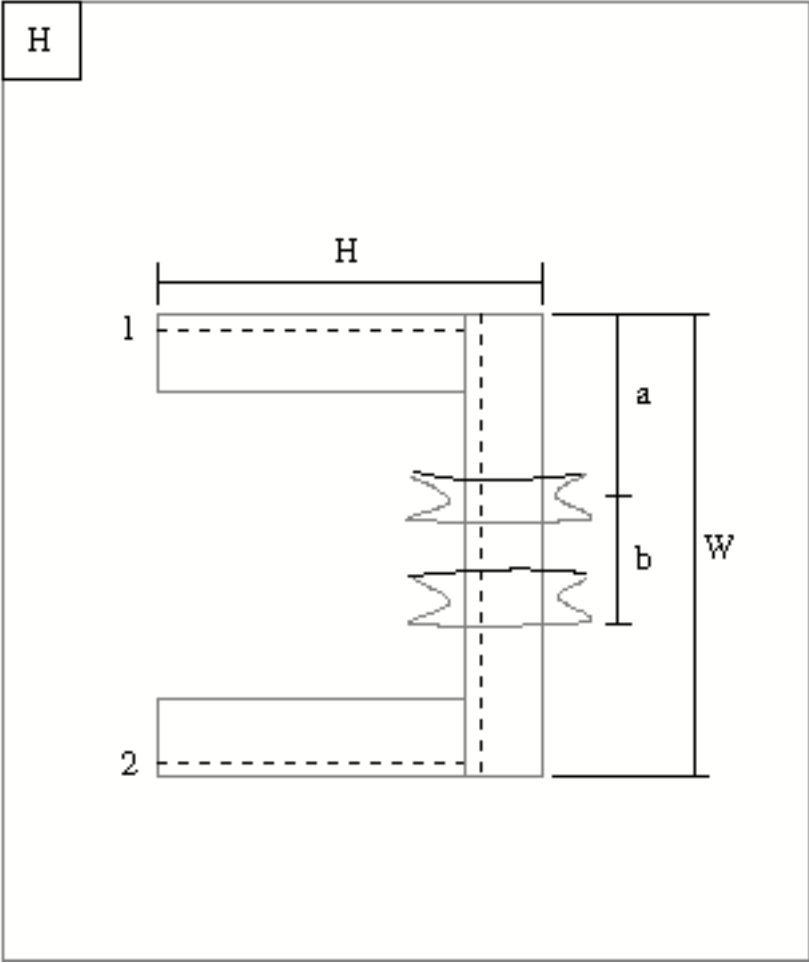
Figure A-8 Support Type - G



Type - H

1. The dimension “a” must be greater than (“l” + pipe diam/2), where “l” is the equal angle size.
2. The dimension “H” is defined by the first digitized pipe line. It is the distance from the digitized location to the attachment point along the pipe line itself.

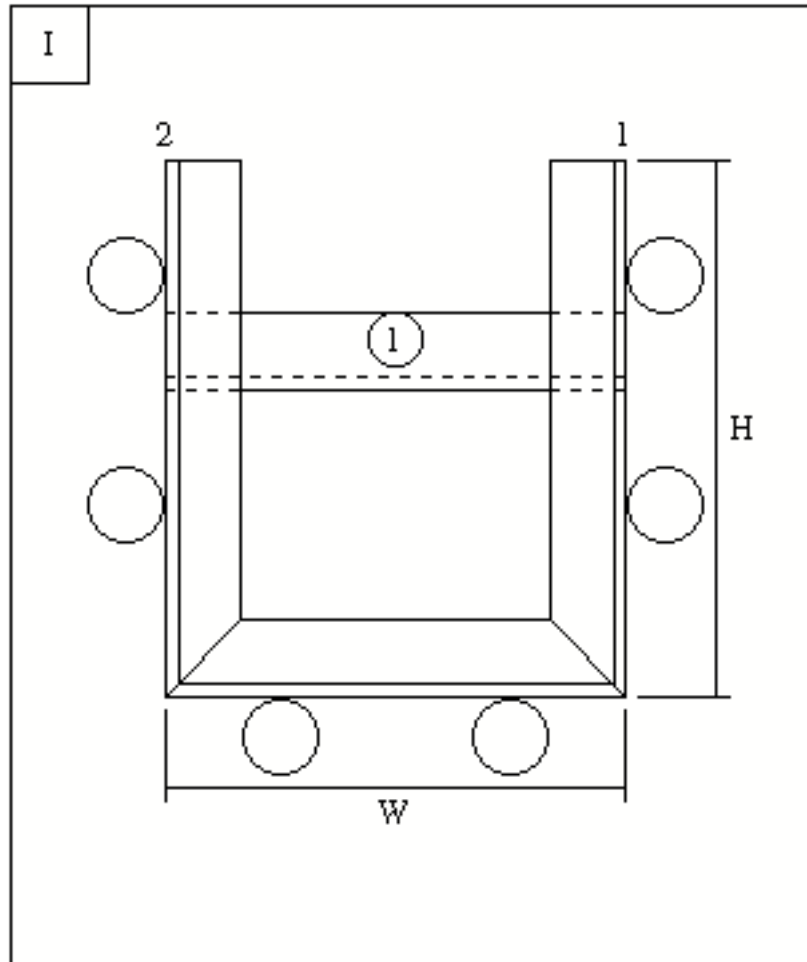
Figure A-9 Support Type - H



Type - I

1. Pipe support member “1” is optional.

Figure A-10 Support Type - I

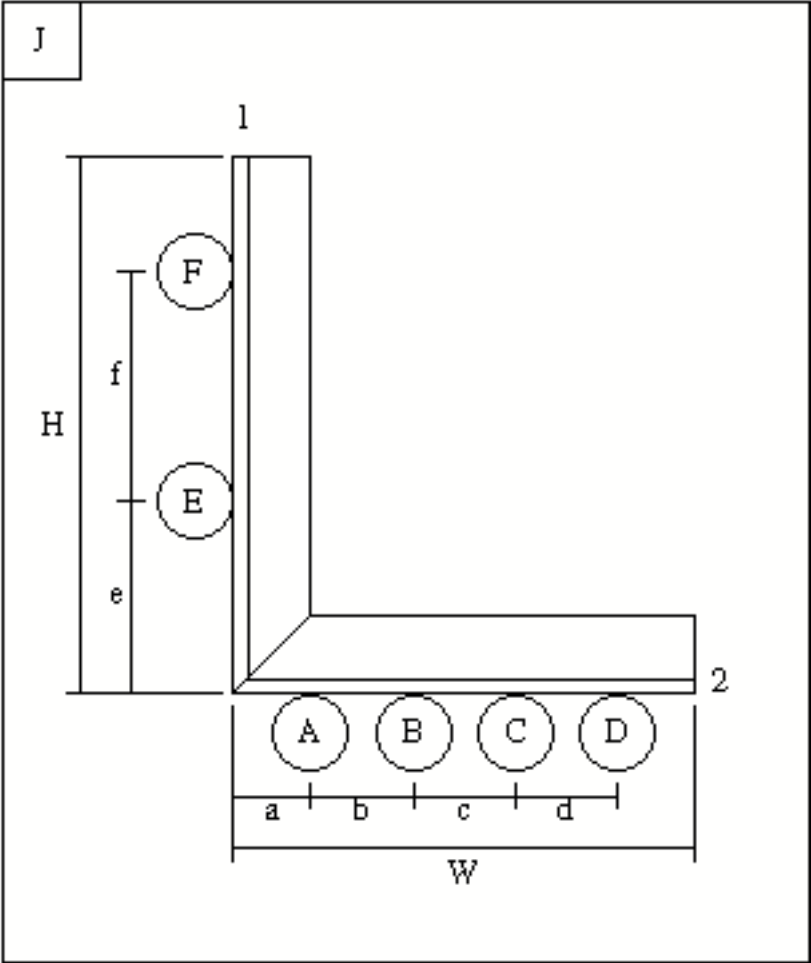


Type - J

1. Each pipe support member must support at least one pipe line.
2. The user must digitize the two anchor points.
3. The dimensions “a”, “e”, “d”, and “f” must be greater than minimum clamp length.

Otherwise, an error message is issued and the processing terminates.

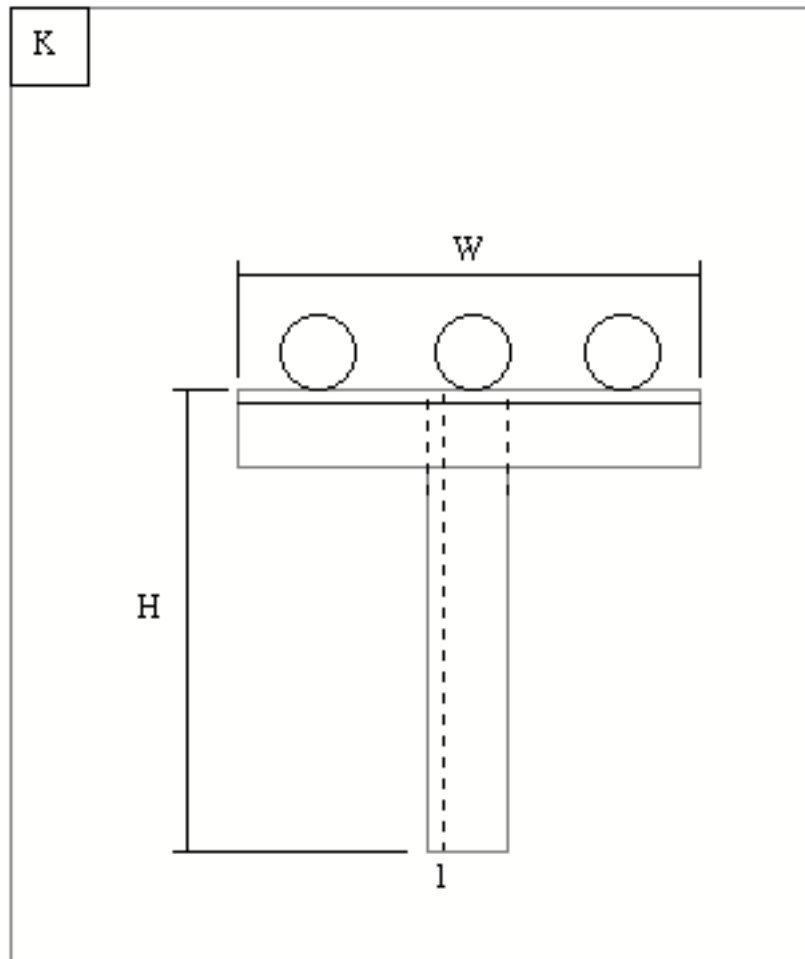
Figure A-11 Support Type - J



Type - K

1. The first digitized point is the anchor point.

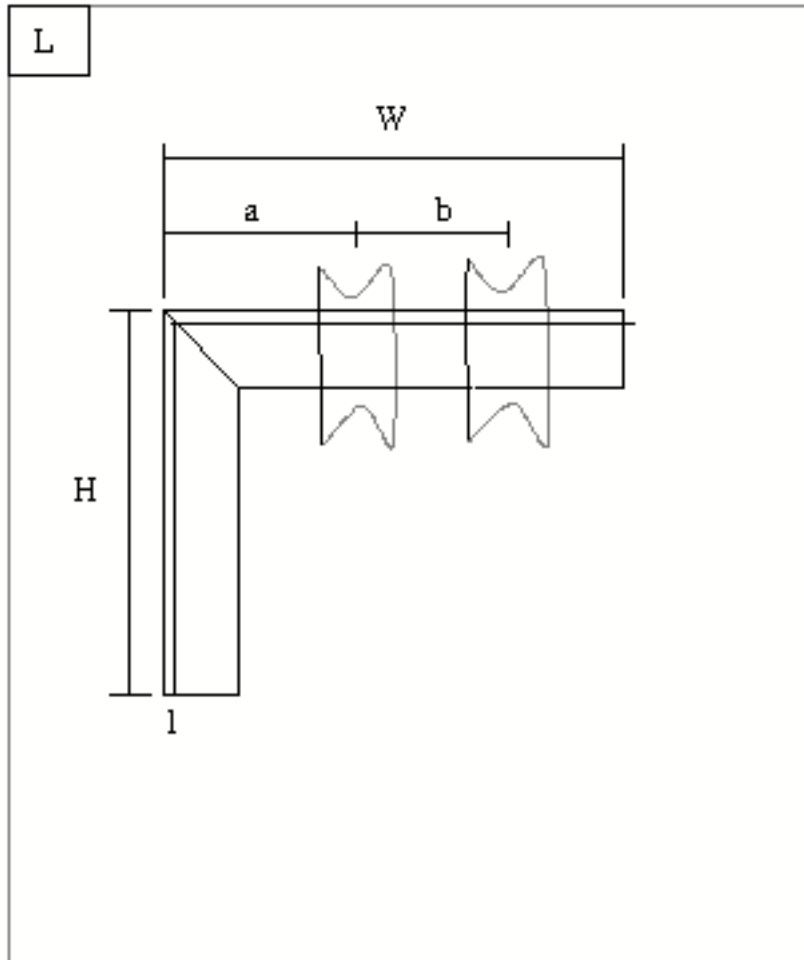
Figure A-12 Support Type - K



Type - L

1. This type is the same as type “H”, except that there is only one anchor member.

Figure A-13 Support Type - L



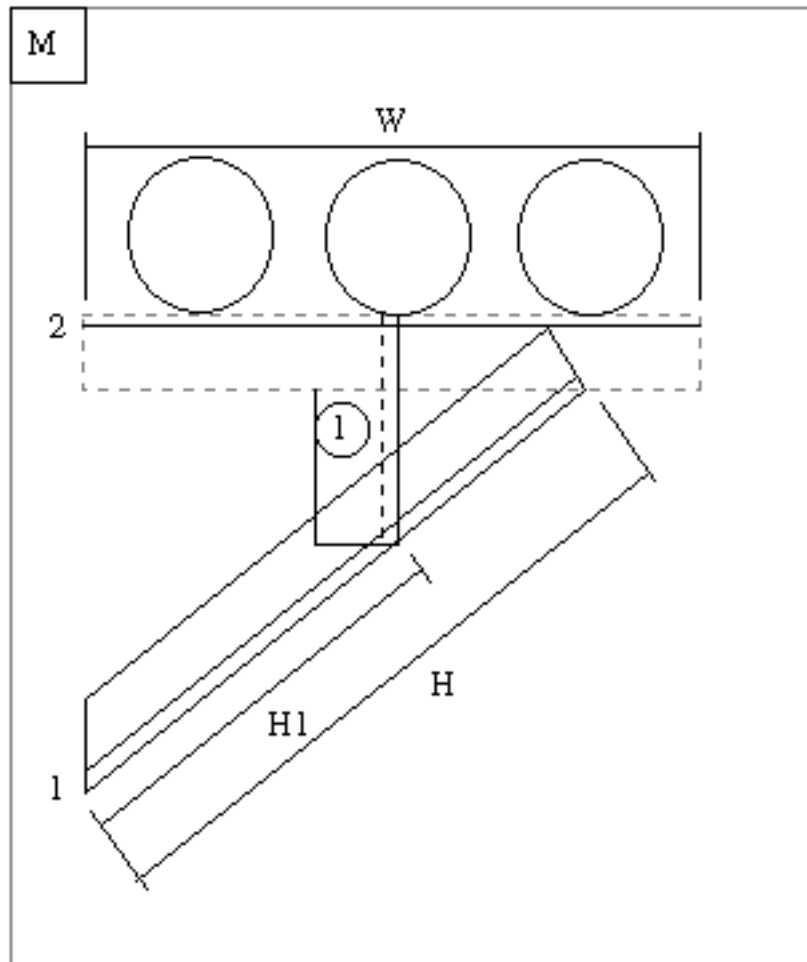
Type - M

1. Pipe support member “1” is optional.
2. Member “1” is required if the dimension “W” is greater than “THGT”.
3. If member “1” is required then the dimension “m” is calculated as follows:

$$m = \text{MHGT}, \text{ if } \text{MHGT} > 0$$

$$m = \text{THGT} / 2, \text{ if } \text{MHGT} = 0$$
4. The dimension “1” is equal to the width of the L cross section.

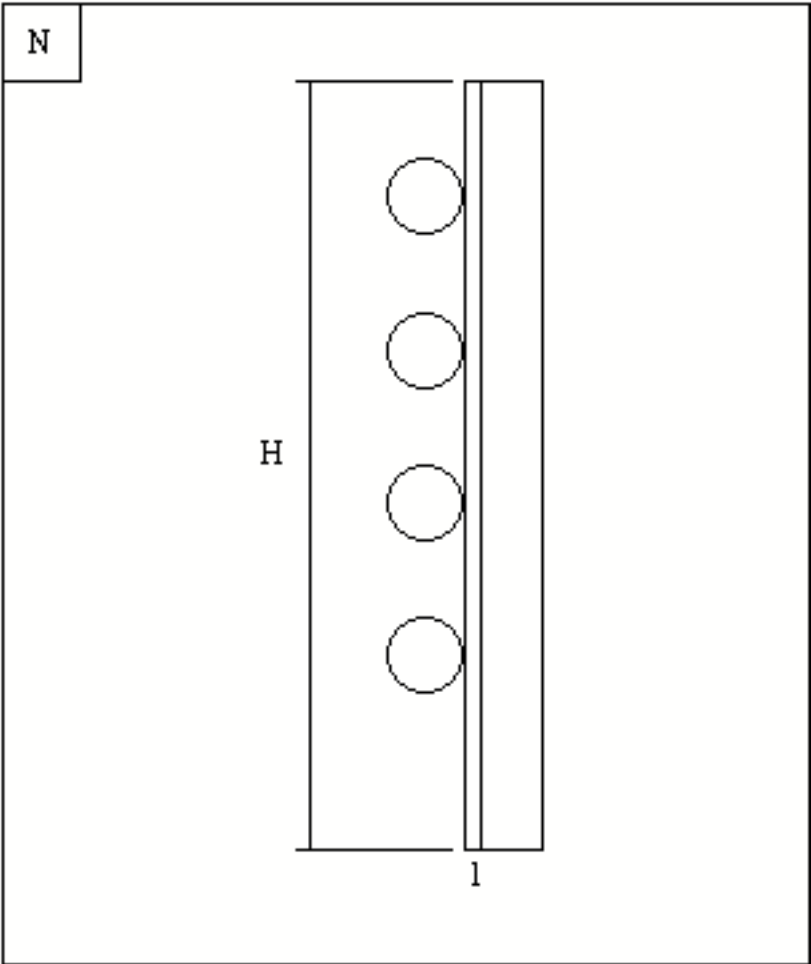
Figure A-14 Support Type - M



Type - N

1. No comment.

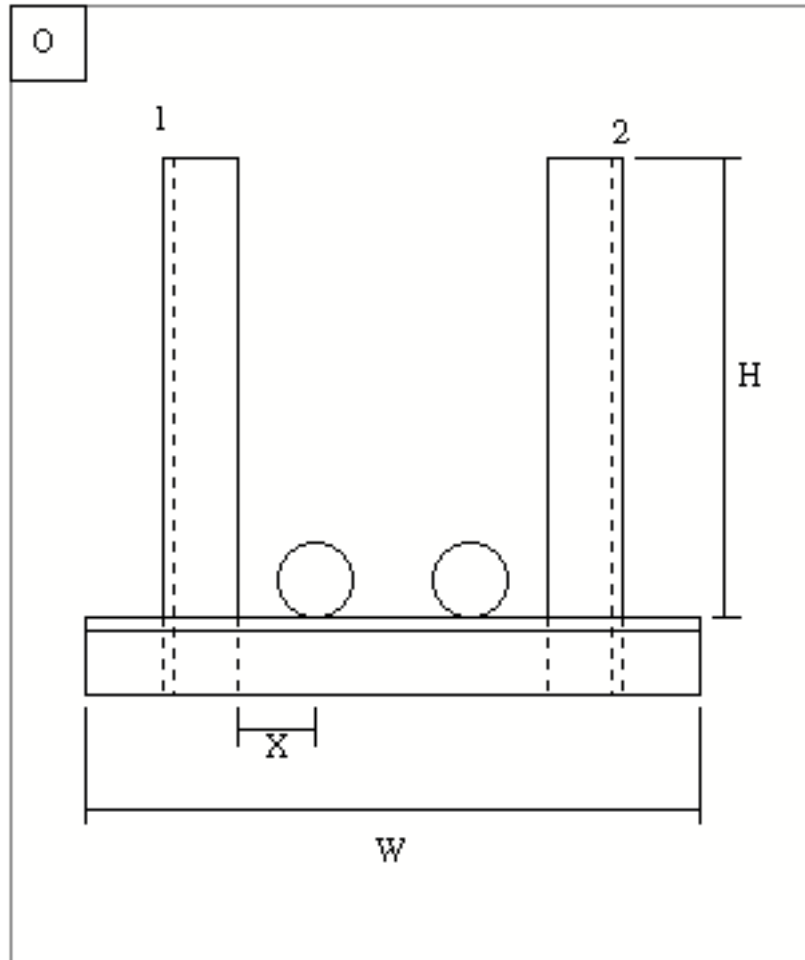
Figure A-15 Support Type - N



Type - O

1. The dimension “X” must be greater than (pipe diam/ 2 + 10 mm)

Figure A-16 Support Type - O

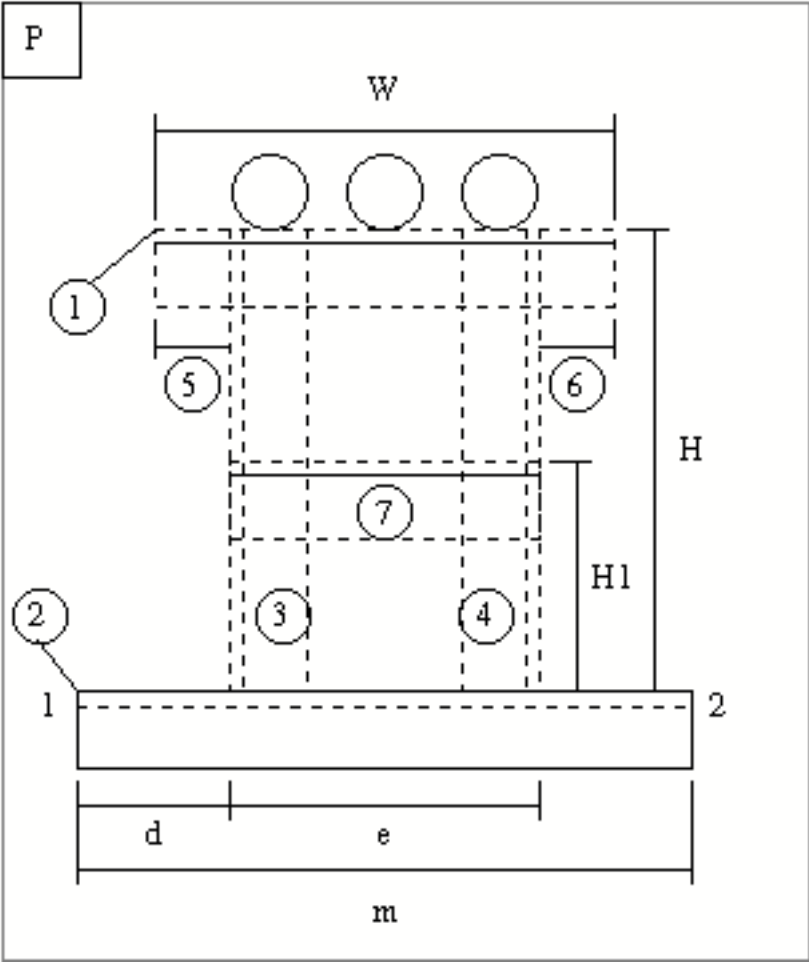


Type - P

1. Dimension “7” is optional. This is similar to type A.
2. When point “2” is on the left side of point “1”, then the dimension “5” is 10mm.
3. Dimension “6” is defined similarly to dimension “5”.
4. When point “1” is on the left side of point “2”, then the dimension “d” is calculated as follows:
 $d = \text{length of face} + 50 \text{ mm}$ and
 $(m - d - e) = 50 \text{ mm}$.

- 5. If “e” <= (2*Width of leg of L-section + 30mm) then an error message is issued and the processing terminates.

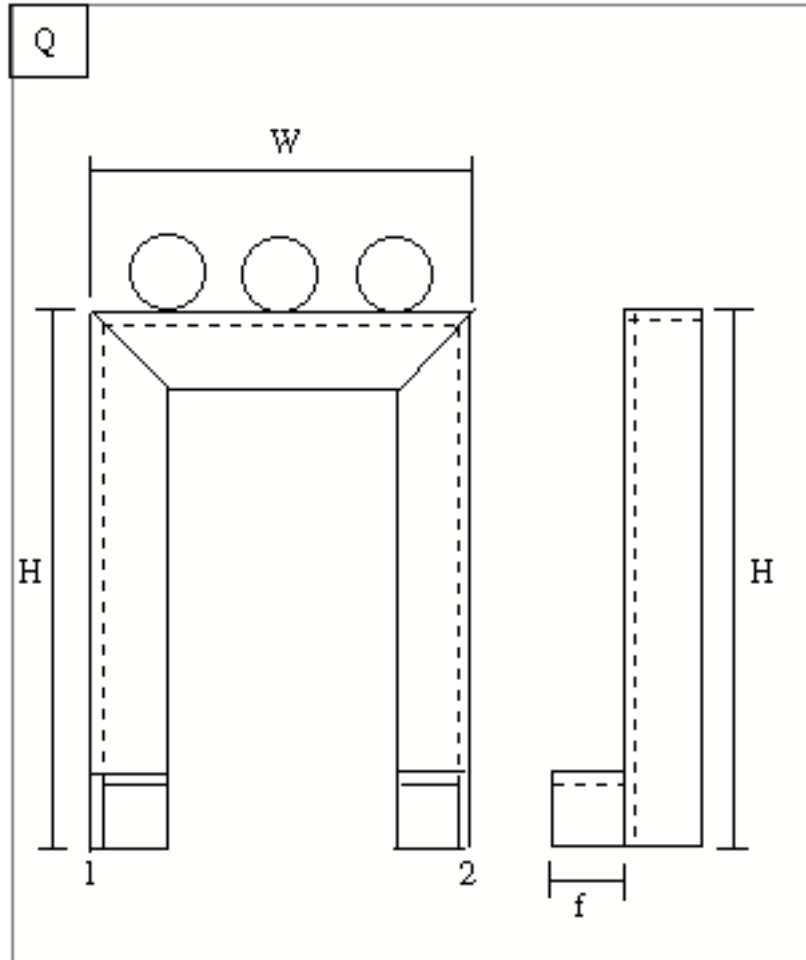
Figure A-17 Support Type - P



Type - Q

1. The dimension “f” is calculated as follows:
If END type is selected then “f” is defined accordingly. Otherwise $f = 100\text{mm}$.

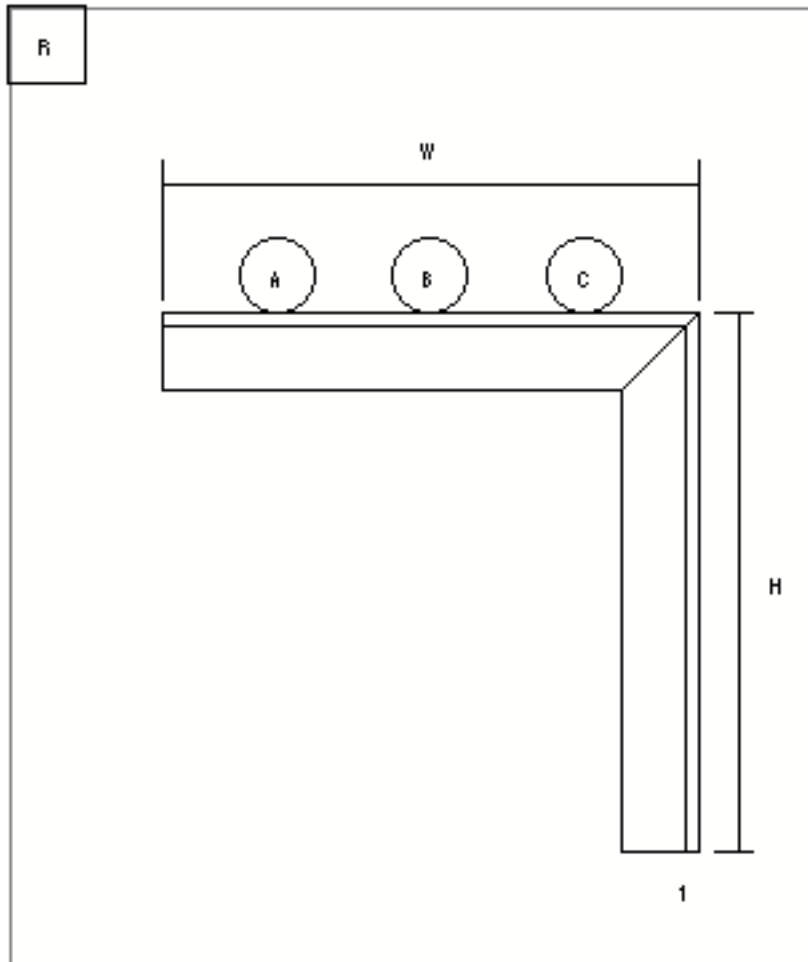
Figure A-18 Support Type - Q



Type - R

1. The number of anchor points is one.

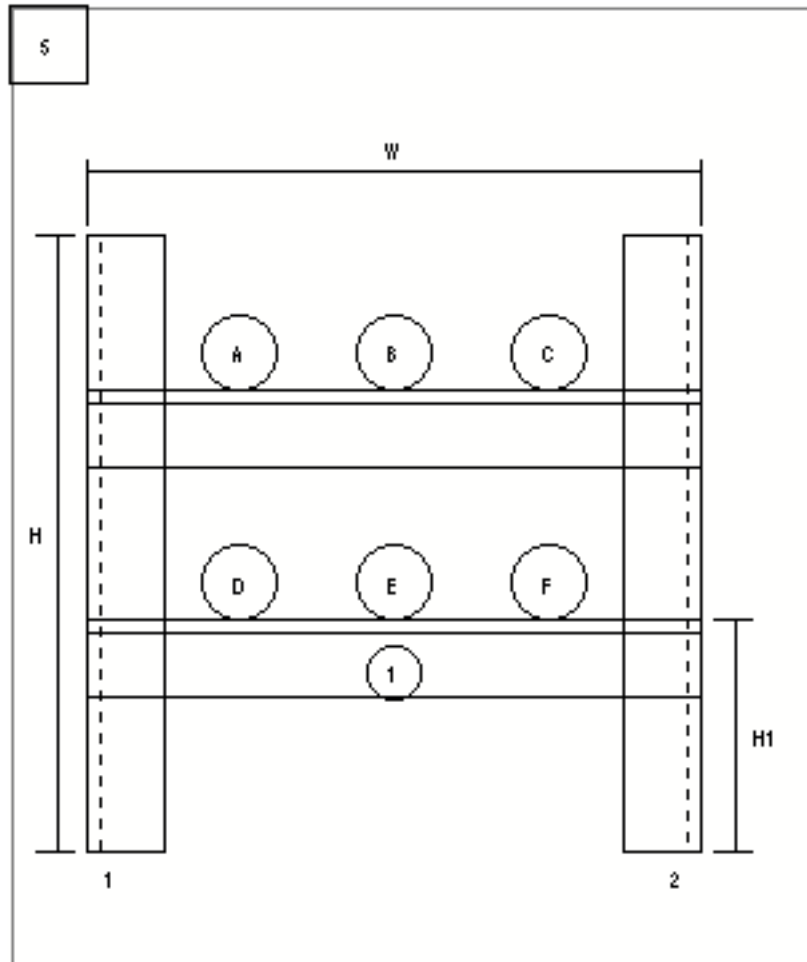
Figure A-19 Support Type - R



Type - S

1. This type requires one additional digitize to define the dimension “H”, (d3).
2. Member “1” is optional according to existence of the pipe line it is intended to support.

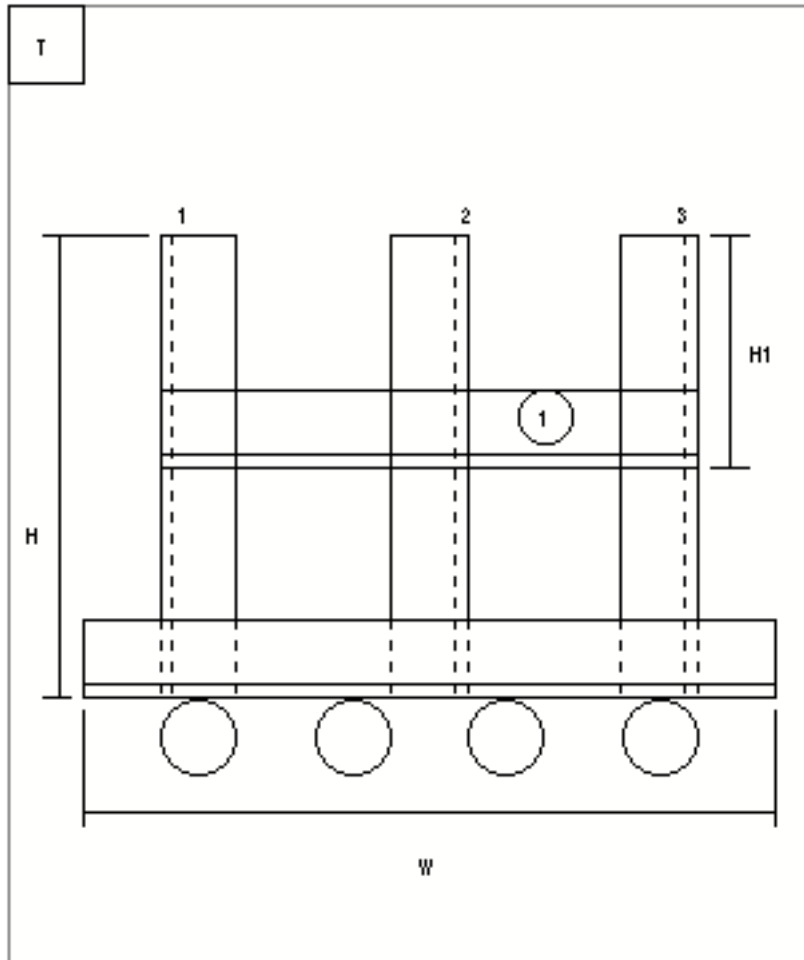
Figure A-20 Support Type - S



Type - T

1. Member “1” is optional.

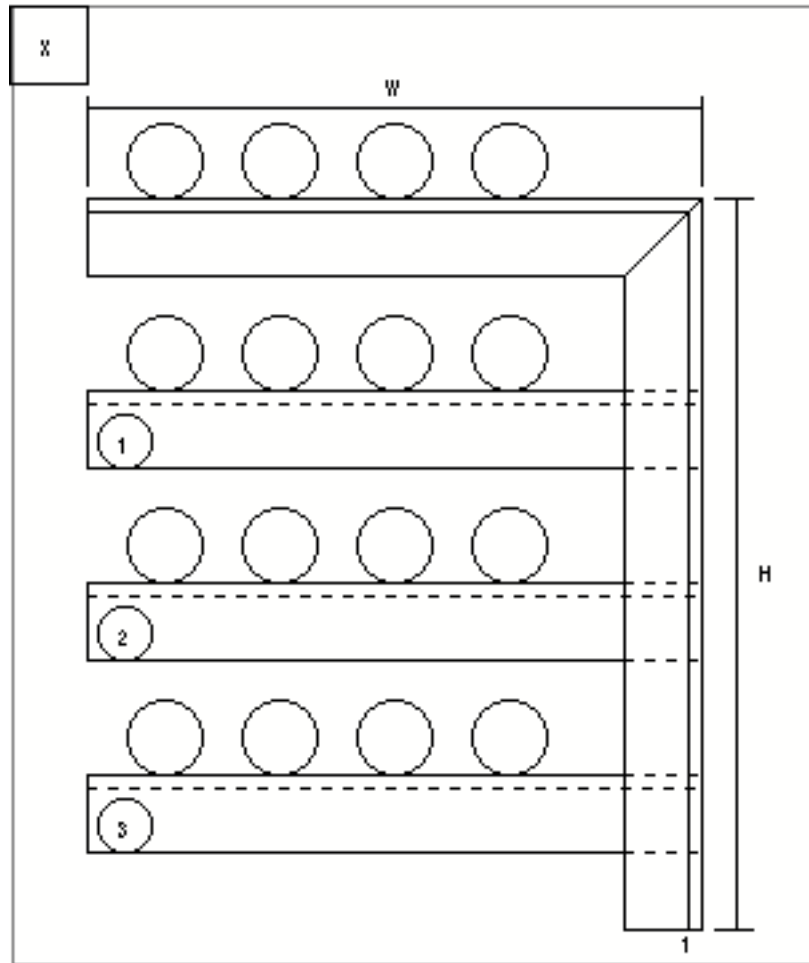
Figure A-21 Support Type - T



Type - X

1. Members “1”, “2” and “3” are optional.
2. The digitized pipe lines would be used to determine the dimension “W”.
3. The supported pipes may be same pipe line. (for example HEATING COIL)

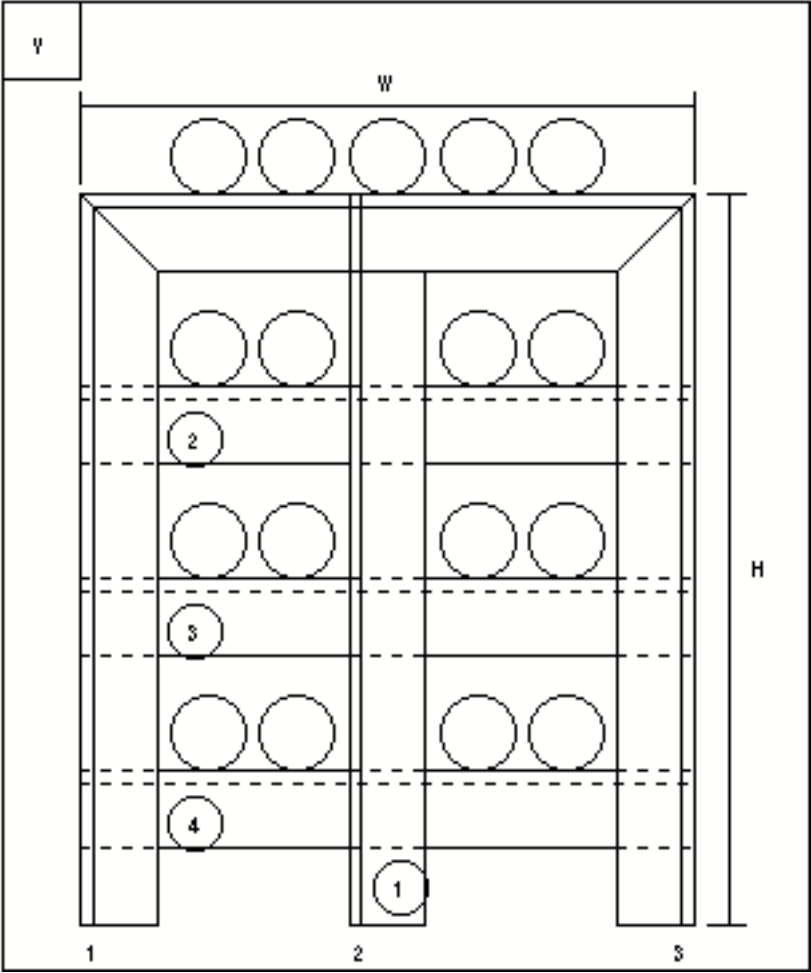
Figure A-22 Support Type - X



Type - Y

1. Members “1”, “2”, “3” and “4” are optional.
2. The supported pipes may be same pipe line.

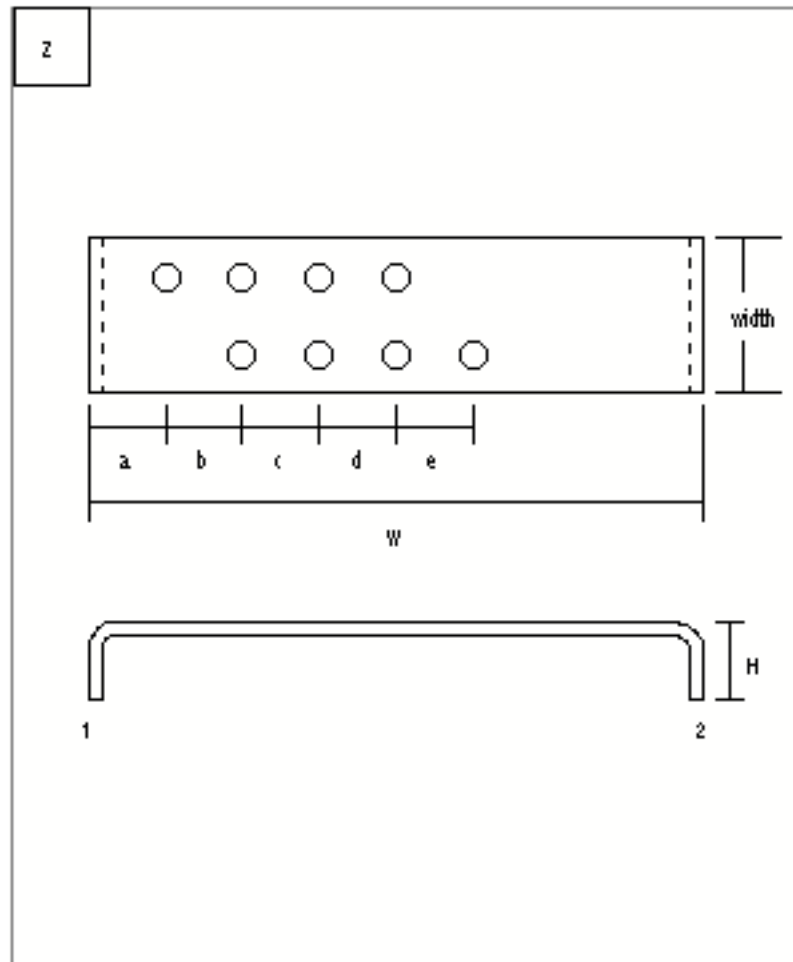
Figure A-23 Support Type - Y



Type - Z

- 1. This pipe support is made from bent flat bar.
- 2. The “width” and the dimensions “a”, “b”, “c”, “d”, “e” are fixed and are equal.
- 3. This type is inserted as STANDALONE type.

Figure A-24 Support Type - Z



Directory Files

This appendix contains the directory and library file listings. It also contains a list of the pipe support clamp, pad and sliding pad Selection tables.

- Cross Section Definitions
- Auto-Selection Directory File
- Cross Section Selection
- Clamp Selection
- Pad Selection
- Sliding Pad Selection Table
- Cable Tray Selection

Cross Section Definitions

Supported Cross Section Definitions

The supported cross section type, dimension and weight for Pipe Supports are defined in an external section library file. Other cross sections may be created and used in the Pipe Support package by using the cross section library creation and manipulation commands available in the CADD Structural Modeler package.

The default cross section types supported are:

- Channel
- Equal Angle
- Flat Bar (Rectangular)
- I-Beam (H-Beam)
- Pipe (Round)

Pipe Support Cross Section Library

The default cross section library is in CVAEC.PIPESUPPORT._BCD.SECLIB. The Pipe Support Cross Section Definition Library file appears as shown.

```
*
* COMPUTERVISION CORPORATION - AEC/Pipe Support
*
* Filename :CVAEC.PIPESUPPORT._BCD.SECLIB
*
*      WGT      WEIGHT(KG/LINEAR METER)
*      DEP      DEPTH (MM)
*      FWDT     FLANGE WIDTH(MM)
*      TFLG     FLANGE THICKNESS(MM)
*      TWEB     WEB THICKNESS(MM)
*      R1       ROOT RADIUS (FILLET RADIUS)(MM)
*      R2       TOE RADIUS (FILLET RADIUS)(MM)
*      CD       CENTER DISTANCE (X-BAR); ANGL:Y=CX(MM)
*      SCTR     SHEAR CENTER (E-NAUGHT); ANGL:X=CY(MM)
*      S1       GAGE DISTANCE (ALONG FLANGE)(MM)
*      S2       GAGE DISTANCE (ALONG WEB)(MM)
*
UNITS = MM
REV_NO = 1.0
*
*2345678901234567890123456789012345678901234567890123456789012345
678901234567890
*
* Channel
*
```


*NAME	TYPE	WEIGHT	DEPTH	TFLG	TWEB	FWDT	R1	R2	CD	SCTR	S1	S2
C75X40X5	4	6.920	75.0	7.0	5.04	0.0	0.0	0.0				
C100X50X5	4	9.360	100.0	7.5	5.05	0.0	0.0	0.0				
C125X65X6	4	13.400	125.0	8.0	6.06	5.0	0.0	0.0				
C150X75X6.5	4	18.600	150.0	10.0	6.57	5.0	0.0	0.0				
C150X75X9	4	24.000	150.0	12.5	9.07	5.0	0.0	0.0				
C180X75X7	4	21.400	180.0	10.5	7.07	5.0	0.0	0.0				
C200X90X7.5	4	24.600	200.0	11.0	7.59	0.0	0.0	0.0				
C200X90X8	4	30.300	200.0	13.5	8.09	0.0	0.0	0.0				
C250X90X9	4	34.600	250.0	13.0	9.09	0.0	0.0	0.0				
C250X90X11	4	40.200	250.0	14.5	11.0	90.0	0.0	0.0				
C300X90X9	4	38.100	300.0	13.0	9.0	90.0	0.0	0.0				
C300X90X10	4	43.800	300.0	15.5	10.0	90.0	0.0	0.0				
C300X90X12	4	48.600	300.0	16.0	12.0	90.0	0.0	0.0				
C380X100X10	4	54.500	380.0	16.0	10.5	100.0	0.0	0.0				

*

* Flat-bar

*

*NAME	TYPE	WEIGHT	DEPTH	TFLG	TWEB	FWDT	R1	R2	CD	SCTR	S1	S2
F25X6	10	1.178	25.0	-	-	6.0	-	-	0	0	00	
F38X4.5	10	1.342	38.0	-	-	4.5	-	-	0	0	00	
F38X6	10	1.790	38.0	-	-	6.0	-	-	0	0	00	
F50X4.5	10	1.766	50.0	-	-	4.5	-	-	0	0	00	
F50X6	10	2.355	50.0	-	-	6.0	-	-	0	0	00	
F65X9	10	4.592	65.0	-	-	16.0	-	-	0	0	00	
F75X6	10	3.532	75.0	-	-	6.0	-	-	0	0	00	

*

* I-beam

*

*NAME	TYPE	WEIGHT	DEPTH	TFLG	TWEB	FWDT	R1	R2	CD	SCTR	S1	S2
H100X50X5	3	9.300	100.0	7.0	5.0	50.0	0.0	0.0				
H100X100X6	3	17.200	100.0	8.0	6.0	100.0	0.0	0.0				
H125X60X6	3	13.200	125.0	8.0	6.0	60.0	0.0	0.0				
H125X125X6.5	3	23.800	125.0	9.0	6.5	125.0	0.0	0.0				
H150X75X5	3	14.000	150.0	7.0	5.0	75.0	0.0	0.0				
H150X100X6	3	21.100	150.0	9.0	6.0	100.0	0.0	0.0				
H150X150X7	3	31.500	150.0	10.0	7.0	150.0	0.0	0.0				
H175X90X5	3	18.100	175.0	8.0	5.0	90.0	0.0	0.0				
H175X175X7.5	3	40.200	175.0	11.0	7.5	175.0	0.0	0.0				
H200X100X4.5	3	18.200	198.0	7.0	4.5	99.0	0.0	0.0				
H200X100X5.5	3	21.300	200.0	8.0	5.5	100.0	0.0	0.0				
H200X150X6	3	30.600	194.0	9.0	6.0	150.0	0.0	0.0				
H200X200X8	3	49.900	200.0	12.0	8.0	200.0	0.0	0.0				
H250X125X5	3	25.700	248.0	8.0	5.0	124.0	0.0	0.0				
H250X125X6	3	29.600	250.0	9.0	6.0	125.0	0.0	0.0				
H250X175X7	3	44.100	244.0	11.0	7.0	175.0	0.0	0.0				
H250X250X9	3	72.100	250.0	14.0	9.0	260.0	0.0	0.0				

*

* Equal Angle

*

*NAME	TYPE	WEIGHT	DEPTH	TFLG	TWEB	FWDT	R1	R2	CD	SCTR	S1	S2
L40X5	5	2.950	40.0	5.0	5.0	40.0	0.0	0.0				
L50X5	5	3.770	50.0	5.0	5.0	50.0	0.0	0.0				
L50X6	5	4.430	50.0	6.0	6.0	50.0	0.0	0.0				

Directory Files
 Cross Section Definitions

L65X6	5	5.910	65.0	6.0	6.0	65.0	0.0	0.0
L65X8	5	7.660	65.0	8.0	8.0	65.0	0.0	0.0
L75X6	5	6.850	75.0	6.0	6.0	75.0	0.0	0.0
L75X9	5	9.960	75.0	9.0	9.0	75.0	0.0	0.0
L90X10	5	13.300	90.0	10.0	10.0	90.0	0.0	0.0
L90X13	5	17.000	90.0	13.0	13.0	90.0	0.0	0.0
L100X10	5	14.900	100.0	10.0	10.0	100.0	0.0	0.0
L130X12	5	23.400	130.0	12.0	12.0	130.0	0.0	0.0
L130X15	5	28.800	130.0	15.0	15.0	130.0	0.0	0.0
L150X12	5	27.300	150.0	12.0	12.0	150.0	0.0	0.0
L150X15	5	33.600	150.0	15.0	15.0	150.0	0.0	0.0

*

* Pipe

*

*NAME	TYPE	WEIGHT	DEPTH	TFLG	TWEB	FWDT	R1	R2	CD	SCTR	S1	S2
P25	8	2.600	34.0	-	-	8.0	-	-	0	0	0	0
P32	8	3.500	42.7	-	-	8.0	-	-	0	0	0	0
P40	8	4.100	48.0	-	-	8.0	-	-	0	0	0	0
P50	8	5.400	60.5	-	-	8.0	-	-	0	0	0	0
P65	8	9.100	76.3	-	-	8.0	-	-	0	0	0	0
P80	8	11.300	89.1	-	-	8.0	-	-	0	0	0	0
P100	8	16.000	114.3	-	-	8.0	-	-	0	0	0	0
P125	8	21.700	139.8	-	-	8.0	-	-	0	0	0	0
P150	8	27.700	165.2	-	-	8.0	-	-	0	0	0	0
P200	8	42.100	216.3	-	-	8.0	-	-	0	0	0	0

*

Auto-Selection Directory File

Pipe Support Directory File Definition

This directory file provides the list of auto-selection files to be used for various types of computation for the Pipe Support commands. The system version of this directory file is in CVAEC.PIPESUPPORT.DRFILE. However, the user can select a different directory file using the SELECT SUPPORT command. The following is a list of defined keywords.

Table B-1 Keywords

CABLETRAY	Cable tray selection file
CLAMP	Clamp Selection File
ENDTYPE	Pipe Support Insertion Attachment Endtype Selection File
PAD	Attachment Pad Selection File
SECTION	Pipe Support Cross Section Selection File
SPAD	Sliding Pad Selection File

The Auto-Selection Directory File is shown below:

```

INFO                                DIRY
*2345678901234567890123456789012345678901234567890123456789012345
678901234567890
*****
*****
*
* FILENAME                          :CVAEC.PIPESUPPORT.DRFILE
* TYPE                              :DIRECTORIES FILE FOR SUPPORT
* EXPERT                            :Daewoo
* DESCRIPTION                        : Auto-selection directory file
*
*2345678901234567890123456789012345678901234567890123456789012345
678901234567890
*****
*****
CABLETRAY                          CVAEC.PIPESUPPORT.CABLETRAY
CLAMP                              CVAEC.PIPESUPPORT.CLAMP
ENDTYPE                            CVAEC.PIPESUPPORT.ENDTYPE
PAD                                 CVAEC.PIPESUPPORT.PAD
SECTION                            CVAEC.PIPESUPPORT.SECTION
SPAD                               CVAEC.PIPESUPPORT.SPAD
ALLTYPESEC                        CVAEC.PIPESUPPORT.CROSS&SECTION
MTYPESEC                          CVAEC.PIPESUPPORT.CROSS&SECTIO&TYPE&M
NTYPESEC                          CVAEC.PIPESUPPORT.CROSS&SECTIO&TYPE&N
HOF                               CVAEC.PIPESUPPORT.HCF

```

Cross Section Selection

The pipe support member cross section type is determined by the support unit type, the size of the biggest pipe line supported by the support unit and the length of this pipe supporting member. The selection of the support member cross section is defined in the Pipe Support Cross Section Table, in the directory CVAEC.PIPESUPPORT.SECTION. The table appears as shown below.

Please note: Note that this table only applies to equal angle cross sections.

Table B-2 Pipe Support Cross Section Selection

```

UNITS=MM
TYPE          SIZE          LENGTH          SECTION
*****
*****
*2345678901234567890123456789012345678901234567890123456789012345
678901234567890
*
* FILENAME      : CVAEC.PIPESUPPORT.CROSS&SECTION
* EXPERT        : Daewoo
* PURPOSE       : Angle selection for type except M and N type.
                  Find the appropriate SECTION NAME of equal leg
                  ANGLE(L-SECTION). The base is nominal
                  diameter of PIPE and dimension of pipe
                  support.
* DESCRIPTION   : If nominal diameter of related pipe is 15A
                  and the dimension is 2500 then the SECTION
                  NAME is L50X6.
                  If nominal diameter of related pipe is 20A
                  and the dimension is 780 then the SECTION
                  NAME is L40X5.
                  If nominal diameter of related pipe is 32A
                  and dimension is 300 then the SECTION NAME is
                  L40X5
                  If nominal diameter of related pipe is 150A
                  and dimension is 1000 then the SECTION NAME is
                  L65X6
                  When nominal diameter of related pipe is
                  greater than 550A then the SECTION NAME may be
                  L100X10.
*2345678901234567890123456789012345678901234567890123456789012345
678901234567890
*****
*****
A      100A  440   L40X5
A      100A 1050  L50X6
  
```

A	100A	1540	L65X6
A	100A	1750	L75X6
A	100A	2220	L90X10
A	100A	3000	L100X10
A	125A	400	L40X5
A	125A	1000	L50X6
A	125A	1500	L65X6
A	125A	1750	L75X6
A	125A	2190	L90X10
A	125A	3000	L100X10
A	150A	1430	L65X6
A	150A	1740	L75X6
A	150A	2150	L90X10
A	150A	3000	L100X10
A	15A	1000	L40X5
A	15A	3000	L50X6
A	200A	1340	L65X6
A	200A	1700	L75X6
A	200A	2100	L90X10
A	200A	3000	L100X10
A	20A	780	L40X5
A	20A	3000	L50X6
A	250A	1200	L65X6
A	250A	1620	L75X6
A	250A	2050	L90X10
A	250A	3000	L100X10
A	25A	620	L40X5
A	25A	1300	L50X6
A	25A	1640	L65X6
A	25A	3000	L75X6
A	300A	840	L65X6
A	300A	1500	L75X6
A	300A	1990	L90X10
A	300A	3000	L100X10
A	32A	560	L40X5
A	32A	1270	L50X6
A	32A	1620	L65X6
A	32A	3000	L75X6
A	350A	770	L65X6
A	350A	1340	L75X6
A	350A	1900	L90X10
A	350A	3000	L100X10
A	400A	1020	L75X6
A	400A	1790	L90X10
A	400A	3000	L100X10
A	40A	560	L40X5
A	40A	1240	L50X6
A	40A	1610	L65X6
A	40A	1900	L75X6
A	40A	2300	L90X10
A	40A	3000	L100X10
A	450A	950	L75X6
A	450A	1570	L90X10
A	450A	3000	L100X10

Directory Files
Cross Section Selection

A	500A	1010	L90X10
A	500A	3000	L100X10
A	50A	550	L40X5
A	50A	1200	L50X6
A	50A	1600	L65X6
A	50A	1850	L75X6
A	50A	2280	L90X10
A	50A	3000	L100X10
A	550A	3000	L100X10
A	600A	3000	L100X10
A	650A	3000	L100X10
A	65A	510	L40X5
A	65A	1150	L50X6
A	65A	1590	L65X6
A	65A	1800	L75X6
A	65A	2260	L90X10
A	65A	3000	L100X10
A	700A	3000	L100x10
A	750A	3000	L100X10
A	800A	3000	L100X10
A	80A	470	L40X5
A	80A	1100	L50X6
A	80A	1560	L65X6
A	80A	1760	L75X6
A	80A	2250	L90X10
A	80A	3000	L100X10
A	850A	3000	L100X10
A	900A	3000	L100X10
M	100A	700	L50X6
M	100A	1200	L65X6
M	100A	1500	L75X6
M	100A	2120	L90X10
M	100A	2360	L100X10
M	100A	3000	L130X12
M	125A	650	L50X6
M	125A	1110	L65X6
M	125A	1400	L75X6
M	125A	2050	L90X10
M	125A	2300	L100X10
M	125A	3000	L130X12
M	150A	620	L50X6
M	150A	1020	L65X6
M	150A	1290	L75X6
M	150A	1960	L90X10
M	150A	2200	L100X10
M	150A	3000	L130X12
M	15A	620	L40X5
M	15A	1160	L50X6
M	15A	1550	L65X6
M	15A	3000	L75X6
M	200A	600	L50X6
M	200A	920	L65X6
M	200A	1170	L75X6
M	200A	1850	L90X10

M	200A	2080	L100X10
M	200A	3000	L130X12
M	20A	600	L40X5
M	20A	1100	L50X6
M	20A	1520	L65X6
M	20A	3000	L75X6
M	250A	800	L65X6
M	250A	1050	L75X6
M	250A	1710	L90X10
M	250A	1930	L100X10
M	250A	3000	L130X12
M	25A	560	L40X5
M	25A	1040	L50X6
M	25A	1480	L65X6
M	25A	1900	L75X6
M	25A	3000	L90X10
M	300A	700	L65X6
M	300A	940	L75X6
M	300A	1550	L90X10
M	300A	1770	L100X10
M	300A	3000	L130X12
M	32A	490	L40X5
M	32A	980	L50X6
M	32A	1450	L65X6
M	32A	1850	L75X6
M	32A	3000	L90X10
M	350A	1350	L90X10
M	350A	1600	L100X10
M	350A	3000	L130X12
M	400A	1140	L90X10
M	400A	1400	L100X10
M	400A	3000	L130X12
M	40A	400	L40X5
M	40A	920	L50X6
M	40A	1420	L65X6
M	40A	1800	L75X6
M	40A	3000	L90X10
M	450A	1220	L100X10
M	450A	3000	L130X12
M	500A	1150	L100X10
M	500A	3000	L130X12
M	50A	300	L40X5
M	50A	860	L50X6
M	50A	1370	L65X6
M	50A	1740	L75X6
M	50A	2200	L90X10
M	50A	2450	L100X10
M	50A	3000	L130X12
M	550A	3000	L130X12
M	600A	3000	L130X12
M	650A	3000	L130X12
M	65A	800	L50X6
M	65A	1330	L65X6
M	65A	1660	L75X6

Directory Files
Cross Section Selection

M	65A	2190	L90X10
M	65A	2430	L100X10
M	65A	3000	L130X12
M	700A	3000	L130X12
M	750A	3000	L130X12
M	800A	3000	L130X12
M	80A	750	L50X6
M	80A	1260	L65X6
M	80A	1590	L75X6
M	80A	2170	L90X10
M	80A	2410	L100X10
M	80A	3000	L130X12
M	850A	3000	L130X12
M	900A	3000	L130X12
N	100A	270	L65X6
N	100A	500	L90X10
N	100A	620	L100X10
N	100A	850	L100X13
N	100A	3000	L130X12
N	125A	230	L65X6
N	125A	440	L90X10
N	125A	570	L100X10
N	125A	600	L100X13
N	125A	850	L130X12
N	125A	3000	L130X15
N	150A	380	L90X10
N	150A	500	L100X10
N	150A	540	L100X13
N	150A	750	L130X12
N	150A	3000	L130X15
N	15A	350	L40X5
N	15A	500	L50X6
N	15A	850	L65X6
N	15A	3000	L90X10
N	200A	310	L90X10
N	200A	440	L100X10
N	200A	470	L100X13
N	200A	650	L130X12
N	200A	3000	L130X15
N	20A	300	L40X5
N	20A	450	L50X6
N	20A	560	L65X6
N	20A	850	L90X10
N	20A	3000	L100X10
N	250A	250	L90X10
N	250A	360	L100X10
N	250A	470	L100X13
N	250A	560	L130X12
N	250A	3000	L130X15
N	25A	250	L40X5
N	25A	400	L50X6
N	25A	510	L65X6
N	25A	850	L90X10
N	25A	3000	L100X10

N	300A	300	L100X10
N	300A	470	L100X13
N	300A	490	L130X12
N	300A	3000	L130X15
N	32A	200	L40X5
N	32A	350	L50X6
N	32A	480	L65X6
N	32A	780	L90X10
N	32A	3000	L100X10
N	350A	410	L130X12
N	350A	3000	L130X15
N	400A	350	L130X12
N	400A	3000	L130X15
N	40A	150	L40X5
N	40A	300	L50X6
N	40A	440	L65X6
N	40A	720	L90X10
N	40A	3000	L100X10
N	450A	3000	L130X15
N	500A	3000	L130X15
N	50A	100	L40X5
N	50A	250	L50X6
N	50A	400	L65X6
N	50A	660	L90X10
N	50A	3000	L100X10
N	550A	3000	L130X15
N	600A	3000	L130X15
N	650A	3000	L130X15
N	65A	200	L50X6
N	65A	350	L65X6
N	65A	600	L90X10
N	65A	3000	L100X10
N	700A	3000	L130X15
N	750A	3000	L130X15
N	800A	3000	L130X15
N	80A	150	L50X6
N	80A	310	L65X6
N	80A	550	L90X10
N	80A	700	L100X10
N	80A	850	L100X13
N	80A	3000	L130X12
N	850A	3000	L130X15
N	900A	3000	L130X15

Clamp Selection

The selection of the pipe support clamp type depends on the system name and size of the related pipe line as defined in the Pipe Support Clamp Selection Table.

Pipe Support Clamp Selection Table

This table contains the list of pipe support clamp and its definition parameters. The pipe support clamp attributes are attached to the related pipe line as properties. For more details see the table shown below.

Table B-3 Pipe Support Clamp Selection

```

UNITS=MM
SYSTEM SIZE CLAMP HSIZE  PITCH BOFFSET EOFFSET REFERENCE
DESCRIPTION                                     &
*****
*****
*234567890123456789012345678901234567890123456789012345
678901234567890
*
* Filename   : CVAEC.PIPESUPPORT.CLAMP
* Expert    : Daewoo
* Purpose    : Pipe Support Clamp selection file
* Definition: Field Data Item Description
*           SYSTEM - pipe system name
*               BA   : Ballast System
*               CL   : Cargo System
*               CW   : Fire & Deck Wash System
*               DH   : Deck Machinery System
*               SC   : Steam system
*               SN   :
*               VR   : V/V Remote Control System
*               WD   : Fire & Deck Wash System
*           OTHERS: anything not listed explicitly
*               above
*           SIZE   - pipe size, norminal diameter
*           CLAMP  - clamp type name
*           HSIZE  - clamp screw hole size, circular or
*                   elliptical
*                   circular - dimension is the diameter
*                   elliptical - dimension shown as "mmXnn",
*                   where
*                   mm is the minor axis and
*                   nn is the major axis
*           PITCH  - clamp screw hole pitch distance
*           BOFFSET - minimum offset distace from support bend
*           EOFFSET - minimum offset distance from support cut
*                   edge
*           REFERENCE - clamp reference name or number
*           DESCRIPTION - textual description for clamp

```

```

*
* Usage: Given the name and size of a pipe line, determine the
*       clamp to be used to fasten the pipe line to the support.
*
*234567890123456789012345678901234567890123456789012345678901234567890123456789012345
678901234567890
*****
*****
BA  15A  GRP  -  -   35  50  DSE-P5721S  STRAP FOR G.R.P. PIPE
BA  20A  GRP  -  -   40  50  DSE-P5721S  STRAP FOR G.R.P. PIPE
BA  25A  GRP  -  -   45  55  DSE-P5721S  STRAP FOR G.R.P. PIPE
BA  32A  GRP  -  -   50  60  DSE-P5721S  STRAP FOR G.R.P. PIPE
BA  40A  GRP  -  -   50  60  DSE-P5721S  STRAP FOR G.R.P. PIPE
BA  50A  GRP  -  -   60  70  DSE-P5721S  STRAP FOR G.R.P. PIPE
BA  65A  GRP  -  -   70  80  DSE-P5721S  STRAP FOR G.R.P. PIPE
BA  80A  GRP  -  -   75  90  DSE-P5721S  STRAP FOR G.R.P. PIPE
BA  100A GRP  -  -   95  110 DSE-P5721S  STRAP FOR G.R.P. PIPE
BA  125A GRP  -  -  110  120 DSE-P5721S  STRAP FOR G.R.P. PIPE
BA  150A GRP  -  -  125  135 DSE-P5721S  STRAP FOR G.R.P. PIPE
BA  200A GRP  -  -  160  170 DSE-P5721S  STRAP FOR G.R.P. PIPE
BA  250A GRP  -  -  185  195 DSE-P5721S  STRAP FOR G.R.P. PIPE
BA  300A GRP  -  -  220  240 DSE-P5721S  STRAP FOR G.R.P. PIPE
BA  350A GRP  -  -  235  255 DSE-P5721S  STRAP FOR G.R.P. PIPE
BA  400A GRP  -  -  265  285 DSE-P5721S  STRAP FOR G.R.P. PIPE
BA  450A GRP  -  -  305  330 DSE-P5721S  STRAP FOR G.R.P. PIPE
BA  500A GRP  -  -  330  355 DSE-P5721S  STRAP FOR G.R.P. PIPE
BA  550A GRP  -  -  365  390 DSE-P5721S  STRAP FOR G.R.P. PIPE
BA  600A GRP  -  -  405  430 DSE-P5721S  STRAP FOR G.R.P. PIPE
BA  650A GRP  -  -  430  455 DSE-P5721S  STRAP FOR G.R.P. PIPE
BA  700A GRP  -  -  460  485 DSE-P5721S  STRAP FOR G.R.P. PIPE
BA  750A GRP  -  -  485  510 DSE-P5721S  STRAP FOR G.R.P. PIPE
BA  800A GRP  -  -  520  545 DSE-P5721S  STRAP FOR G.R.P. PIPE
BA  900A GRP  -  -  570  595 DSE-P5721S  STRAP FOR G.R.P. PIPE
CL  15A  USP  12  34   35  50  DSE-P5723S  U-BOLT FOR SLIDING PAD
CL  20A  USP  12  40   40  50  DSE-P5723S  U-BOLT FOR SLIDING PAD
CL  25A  USP  12  46   45  55  DSE-P5723S  U-BOLT FOR SLIDING PAD
CL  32A  USP  12  56   50  60  DSE-P5723S  U-BOLT FOR SLIDING PAD
CL  40A  USP  12  62   50  60  DSE-P5723S  U-BOLT FOR SLIDING PAD
CL  50A  USP  12  74   60  70  DSE-P5723S  U-BOLT FOR SLIDING PAD
CL  65A  USP  14  92   70  80  DSE-P5723S  U-BOLT FOR SLIDING PAD
CL  80A  USP  14  104  75  90  DSE-P5723S  U-BOLT FOR SLIDING PAD
CL  100A USP  18  134  95  110 DSE-P5723S  U-BOLT FOR SLIDING PAD
CL  125A USP  18  160  110 120 DSE-P5723S  U-BOLT FOR SLIDING PAD
CL  150A USP  18  186  125 135 DSE-P5723S  U-BOLT FOR SLIDING PAD
CL  200A USP  28  242  160 170 DSE-P5723S  U-BOLT FOR SLIDING PAD
CL  250A USP  28  294  185 195 DSE-P5723S  U-BOLT FOR SLIDING PAD
CL  300A USP  28  502  202 40D DSE-P5723S  U-BOLT FOR SLIDING PAD
CL  350A USP  28  386  235 255 DSE-P5723S  U-BOLT FOR SLIDING PAD
CL  400A USP  28  438  265 285 DSE-P5723S  U-BOLT FOR SLIDING PAD
CL  450A USP  35  496  305 330 DSE-P5723S  U-BOLT FOR SLIDING PAD
CL  500A USP  35  548  330 355 DSE-P5723S  U-BOLT FOR SLIDING PAD
CL  550A USP  35  598  365 390 DSE-P5723S  U-BOLT FOR SLIDING PAD
CL      600A USP  42  656  405 430 DSE-P5723S  U-BOLT FOR SLIDING PAD
CL      650A USP  42  706  430 455 DSE-P5723S  U-BOLT FOR SLIDING PAD

```

CL	700A	USP	42	758	460	485	DSE-P5723S	U-BOLT FOR SLIDING PAD
CL	750A	USP	42	810	485	510	DSE-P5723S	U-BOLT FOR SLIDING PAD
CW	6A	NFS	7	40	35	45	DSE-P5705S	NON-FERROUS PIPE STRAP
CW	8A	NFS	7	40	35	45	DSE-P5705S	NON-FERROUS PIPE STRAP
CW	10A	NFS	10	40	35	45	DSE-P5705S	NON-FERROUS PIPE STRAP
CW	15A	NFS	10	48	35	45	DSE-P5705S	NON-FERROUS PIPE STRAP
CW	20A	NFS	12	60	45	55	DSE-P5705S	NON-FERROUS PIPE STRAP
CW	25A	NFS	12	70	50	60	DSE-P5705S	NON-FERROUS PIPE STRAP
CW	32A	NFS	12	80	55	65	DSE-P5705S	NON-FERROUS PIPE STRAP
CW	40A	NFS	12	90	60	70	DSE-P5705S	NON-FERROUS PIPE STRAP
CW	50A	NFS	12	110	70	80	DSE-P5705S	NON-FERROUS PIPE STRAP
DH	15A	PC	10	34	40	50	DSE-P5704S	PLASTIC CLAMP
DH	20A	PC	10	41	45	55	DSE-P5704S	PLASTIC CLAMP
DH	25A	PC	12	51	50	60	DSE-P5704S	PLASTIC CLAMP
DH	32A	PC	12	59	55	65	DSE-P5704S	PLASTIC CLAMP
DH	40A	PC	12	67	60	70	DSE-P5704S	PLASTIC CLAMP
DH	50A	PC	12	79	65	75	DSE-P5704S	PLASTIC CLAMP
DH	65A	UBP	14	92	80	90	DSE-P5703S	U-BOLT & PLASTIC SEAT
DH	80A	UBP	14	104	85	100	DSE-P5703S	U-BOLT & PLASTIC SEAT
DH	100A	UBP	18	134	105	120	DSE-P5703S	U-BOLT & PLASTIC SEAT
DH	125A	UBP	18	160	120	130	DSE-P5703S	U-BOLT & PLASTIC SEAT
DH	150A	UBP	18	186	135	145	DSE-P5703S	U-BOLT & PLASTIC SEAT
DH	200A	UBP	24	242	170	180	DSE-P5703S	U-BOLT & PLASTIC SEAT
OTHERS	15A	UB	12X20	34	35	50	DSE-P5702S	U-BOLT/NUT
OTHERS	20A	UB	12X20	40	40	50	DSE-P5702S	U-BOLT/NUT
OTHERS	25A	UB	12X20	46	45	55	DSE-P5702S	U-BOLT/NUT
OTHERS	32A	UB	12X20	56	50	60	DSE-P5702S	U-BOLT/NUT
OTHERS	40A	UB	12X20	62	50	60	DSE-P5702S	U-BOLT/NUT
OTHERS	50A	UB	12X20	74	60	70	DSE-P5702S	U-BOLT/NUT
OTHERS	65A	UB	14X22	92	00	80	DSE-P5702S	U-BOLT/NUT
OTHER	S80A	UB	14X22	104	05	90	DSE-P5702S	U-BOLT/NUT
OTHERS	100A	UB	18X25	134	95	110	DSE-P5702S	U-BOLT/NUT
OTHERS	125A	UB	18X25	160	110	120	DSE-P5702S	U-BOLT/NUT
OTHERS	150A	UB	18X25	186	125	135	DSE-P5702S	U-BOLT/NUT
OTHERS	200A	UB	24X33	242	160	170	DSE-P5702S	U-BOLT/NUT
OTHERS	50A	UB	24X33	294	185	195	DSE-P5702S	U-BOLT/NUT
OTHERS	300A	UB	28X32	350	220	240	DSE-P5702S	U-BOLT/NUT
OTHERS	350A	UB	28X32	386	235	255	DSE-P5702S	U-BOLT/NUT
OTHERS	400A	UB	28X32	438	265	285	DSE-P5702S	U-BOLT/NUT
OTHERS	450A	UB	35	496	305	330	DSE-P5702S	U-BOLT/NUT
OTHERS	500A	UB	35	548	330	355	DSE-P5702S	U-BOLT/NUT
OTHERS	550A	UB	35	598	365	390	DSE-P5702S	U-BOLT/NUT
OTHERS	600A	UB	42	656	405	430	DSE-P5702S	U-BOLT/NUT
OTHERS	650A	UB	42	706	430	455	DSE-P5702S	U-BOLT/NUT
OTHERS	700A	UB	42	758	460	485	DSE-P5702S	U-BOLT/NUT
OTHERS	750A	UB	48	810	485	510	DSE-P5702S	U-BOLT/NUT
OTHERS	800A	UB	48	868	520	545	DSE-P5702S	U-BOLT/NUT
OTHERS	900A	UB	48	970	570	595	DSE-P5702S	U-BOLT/NUT
SC	25A	EXHC	12	170	105	120	DSE-P5726S	EXPANSION STRAP FORH.COIL
SC	50A	EXHC	12	200	120	135	DSE-P5726S	EXPANSION STRAP FOR H.COIL
SC	25A	ANHC	12	70	55	70	DSE-P5727S	ANCHOR STRAP FOR H.COIL
SC	50A	ANHC	12	110	75	90	DSE-P5727S	ANCHOR STRAP FOR H.COIL
SN	10A	WP	14	92	80	90	DSE-P5719S	FREON PIPE WOODEN PAD
SN	15A	WP	14	92	80	90	DSE-P5719S	FREON PIPE WOODEN PAD

SN	20A	WP	14	104	85	100	DSE-P5719S	FREON PIPE	WOODEN PAD
SN	25A	WP	14	104	85	100	DSE-P5719S	FREON PIPE	WOODEN PAD
SN	32A	WP	18	134	95	110	DSE-P5719S	FREON PIPE	WOODEN PAD
SN	40A	WP	18	134	95	110	DSE-P5719S	FREON PIPE	WOODEN PAD
SN	50A	WP	18	134	95	110	DSE-P5719S	FREON PIPE	WOODEN PAD
SN	65A	WP	18	160	110	120	DSE-P5719S	FREON PIPE	WOODEN PAD
SN	80A	WP	18	160	110	120	DSE-P5719S	FREON PIPE	WOODEN PAD
SN	100A	WP	18	186	125	135	DSE-P5719S	FREON PIPE	WOODEN PAD
SN	125A	WP	28	242	160	170	DSE-P5719S	FREON PIPE	WOODEN PAD
VR	15A	PC	10	34	40	50	DSE-P5704S	PLASTIC CLAMP	
VR	20A	PC	10	41	45	55	DSE-P5704S	PLASTIC CLAMP	
VR	25A	PC	12	51	50	60	DSE-P5704S	PLASTIC CLAMP	
VR	32A	PC	12	59	55	65	DSE-P5704S	PLASTIC CLAMP	
VR	40A	PC	12	67	60	00	DSE-P5704S	PLASTIC CLAMP	
VR	50A	PC	12	79	65	05	DSE-P5704S	PLASTIC CLAMP	
VR	65A	UBP	14	92	80	90	DSE-P5703S	U-BOLT & PLASTIC SEAT	
VR	80A	UBP	14	104	85	100	DSE-P5703S	U-BOLT & PLASTIC SEAT	
VR	100A	UBP	18	134	105	120	DSE-P5703S	U-BOLT & PLASTIC SEAT	
VR	125A	UBP	18	160	120	130	DSE-P5703S	U-BOLT & PLASTIC SEAT	
VR	150	AUBP	18	186	135	145	DSE-P5703S	U-BOLT & PLASTIC SEAT	
VR	200A	UBP	24	242	170	180	DSE-P5703S	U-BOLT & PLASTIC SEAT	
WD	15A	U15T	12	34	35	50	DSE-P5724S	U-BOLT FOR 15T SUPPORT	
WD	20A	U15T	12	40	40	50	DSE-P5724S	U-BOLT FOR 15T SUPPORT	
WD	25A	U15T	12	46	45	55	DSE-P5724S	U-BOLT FOR 15T SUPPORT	
WD	32A	U15T	12	56	50	60	DSE-P5724S	U-BOLT FOR 15T SUPPORT	
WD	40A	U15T	12	62	50	60	DSE-P5724S	U-BOLT FOR 15T SUPPORT	
WD	50A	U15T	12	74	60	70	DSE-P5724S	U-BOLT FOR 15T SUPPORT	
WD	65A	U15T	14	92	70	80	DSE-P5724S	U-BOLT FOR 15T SUPPORT	
WD	80A	U15T	14	104	75	90	DSE-P5724S	U-BOLT FOR 15T SUPPORT	
WD	100A	U15T	18	134	95	110	DSE-P5724S	U-BOLT FOR 15T SUPPORT	
WD	125A	U15T	18	160	110	120	DSE-P5724S	U-BOLT FOR 15T SUPPORT	
WD	150A	U15T	18	186	125	135	DSE-P5724S	U-BOLT FOR 15T SUPPORT	
WD	200A	U15T	28	242	160	170	DSE-P5724S	U-BOLT FOR 15T SUPPORT	
WD	250A	U15T	28	294	185	195	DSE-P5724S	U-BOLT FOR 15T SUPPORT	
WD	300A	U15T	28	350	220	240	DSE-P5724S	U-BOLT FOR 15T SUPPORT	
WD	350A	U15T	28	386	235	255	DSE-P5724S	U-BOLT FOR 15T SUPPORT	
WD	400A	U15T	28	438	265	285	DSE-P5724S	U-BOLT FOR 15T SUPPORT	
WD	450A	U15T	35	496	305	330	DSE-P5724S	U-BOLT FOR 15T SUPPORT	
WD	500A	U15T	35	548	330	355	DSE-P5724S	U-BOLT FOR 15T SUPPORT	
WD	550A	U15T	35	598	365	390	DSE-P5724S	U-BOLT FOR 15T SUPPORT	
WD	600A	U15T	42	656	405	430	DSE-P5724S	U-BOLT FOR 15T SUPPORT	
WD	650A	U15T	42	706	430	455	DSE-P5724S	U-BOLT FOR 15T SUPPORT	
WD	700A	U15T	42	758	460	485	DSE-P5724S	U-BOLT FOR 15T SUPPORT	
WD	750A	U15T	42	810	485	510	DSE-P5724S	U-BOLT FOR 15T SUPPORT	

Pad Selection

The creation of the support pad depends on the selection of the PAD and NOPAD modifier in the INSERT SUPPORT command. If neither of these modifiers is selected, it depends on the selection of the PAD and NOPAD modifier in the SELECT SUPPORT command. The default is NOPAD. The selection of the support pad depends on the associated support member's cross section type and its definition parameters are defined in the Pipe Support Pad Selection Table, CVAEC.PIPESUPPORT.PAD.

Pipe Support Pad Selection Table

For each pipe support member cross section type, this table defines the pipe support pad type name, cross section name to be used to create pad profile, thickness and weight of the pad.

For more details see the table shown below.

Table B-4 Pipe Support Pad Selection

```

UNITS=MM
SNAME          PAD          PROFILE          THICKNESS WEIGHT XORIGIN YORIGIN
*****
*
* Filename      : CVAEC.PIPESUPPORT.PAD
* Purpose       : Pipe support pad auto-selection file
* Usage        : Given the support member's cross section, return the
*               support pad name and its definition parameters.
* Description   : Data field/column  Description
*               SNAME      selection name, structure cross section name
*               PAD        pad name
*               PROFILE    pad profile, or section name
*               THICKNESS  pad thickness
*               WEIGHT     pad weight
*               XORIGIN    pad x-offset, to control the pad origin for
*               insertion along x-axis
*               YORIGIN    pad y-offset, to control the pad origin for
*               insertion along y-axis
* Restriction  : (1) Line 1 must be the unit card.
*               (2) Line 2 must be the file format header card.
*               (3) Sorted by the column 1, SNAME.
*               (4) cross section can contain 12 characters maximum,
*                   SMS limitation.
*
*234567890123456789012345678901234567890123456789012345678901234567890
*NAME          PAD          PROFILE          THICKNESS WEIGHT XORIGIN YORIGIN
*****
C100X50X5     PAD-C100X50X5     C100X50X5     10      1.0    0      0
C125X65X6     PAD-C125X65X6     C125X65X6     10      1.0    0      0
C150X75X6.5   PAD-C150X75X6.5   C150X75X6.5   10      1.0    0      0
C150X75X9     PAD-C150X75X9     C150X75X9     10      1.0    0      0

```

C180X75X7	PAD-C180X75X7	C180X75X7	10	1.0	0	0
C200X90X7.5	PAD-C200X90X7.5	C200X90X7.5	10	1.0	0	0
C200X90X8	PAD-C200X90X8	C200X90X8	10	1.0	0	0
C250X90X11	PAD-C250X90X11	C250X90X11	10	1.0	0	0
C250X90X9	PAD-C250X90X9	C250X90X9	10	1.0	0	0
C300X90X10	PAD-C300X90X10	C300X90X10	10	1.0	0	0
C300X90X12	PAD-C300X90X12	C300X90X12	10	1.0	0	0
C300X90X9	PAD-C300X90X9	C300X90X9	10	1.0	0	0
C380X100X10	PAD-C380X100X10	C380X100X10	10	1.0	0	0
C75X40X5	PAD-C75X40X5	C75X40X5	10	1.0	0	0
F25X6	PAD-F25X6	F25X6	10	1.0	0	0
F38X4.5	PAD-F38X4.5	F38X4.5	10	1.0	0	0
F38X6	PAD-F38X6	F38X6	10	1.0	0	0
F50X4.5	PAD-F50X4.5	F50X4.5	10	1.0	0	0
F50X6	PAD-F50X6	F50X6	10	1.0	0	0
F65X16	PAD-F65X16	F65X16	10	1.0	0	0
F65X9	PAD-F65X9	F65X9	10	1.0	0	0
F75X6	PAD-F75X6	F75X6	10	1.0	0	0
H100X100X6	PAD-H100X100X6	H100X100X6	10	1.0	0	0
H100X50X5	PAD-H100X50X5	H100X50X5	10	1.0	0	0
H125X125X6.5	PAD-H125X125X6.5	H125X125X6.5	10	1.0	0	0
H125X60X6	PAD-H125X60X6	H125X60X6	10	1.0	0	0
H150X100X6	PAD-H150X100X6	H150X100X6	10	1.0	0	0
H150X150X7	PAD-H150X150X7	H150X150X7	10	1.0	0	0
H150X75X5	PAD-H150X75X5	H150X75X5	10	1.0	0	0
H175X175X7.5	PAD-H175X175X7.5	H175X175X7.5	10	1.0	0	0
H175X90X5	PAD-H175X90X5	H175X90X5	10	1.0	0	0
H200X100X4.5	PAD-H200X100X4.5	H200X100X4.5	10	1.0	0	0
H200X100X5.5	PAD-H200X100X5.5	H200X100X5.5	10	1.0	0	0
H200X150X6	PAD-H200X150X6	H200X150X6	10	1.0	0	0
H200X200X8	PAD-H200X200X8	H200X200X8	10	1.0	0	0
H250X125X5	PAD-H250X125X5	H250X125X5	10	1.0	0	0
H250X125X6	PAD-H250X125X6	H250X125X6	10	1.0	0	0
H250X175X7	PAD-H250X175X7	H250X175X7	10	1.0	0	0
H250X250X9	PAD-H250X250X9	H250X250X9	10	1.0	0	0
L100X10	PAD-L100X10	L100X10	10	1.0	0	0
L130X12	PAD-L130X12	L130X12	10	1.0	0	0
L130X15	PAD-L130X15	L130X15	10	1.0	0	0
L150X12	PAD-L150X12	L150X12	10	1.0	0	0
L150X15	PAD-L150X15	L150X15	10	1.0	0	0
L40X5	PAD-L40X5	L40X5	10	1.0	0	0
L50X5	PAD-L50X5	L50X5	10	1.0	0	0
L50X6	PAD-L50X6	L50X6	10	1.0	0	0
L65X6	PAD-L65X6	L65X6	10	1.0	0	0
L65X8	PAD-L65X8	L65X8	10	1.0	0	0
L75X6	PAD-L75X6	L75X6	10	1.0	0	0
L75X9	PAD-L75X9	L75X9	10	1.0	0	0
L90X10	PAD-L90X10	L90X10	10	1.0	0	0
L90X13	PAD-L90X13	L90X13	10	1.0	0	0
P100	PAD-P100	P100	10	1.0	0	0
P125	PAD-P125	P125	10	1.0	0	0
P150	PAD-P150	P150	10	1.0	0	0
P200	PAD-P200	P200	10	1.0	0	0
P25	PAD-P25	P25	10	1.0	0	0

Directory Files
Pad Selection

P32	PAD-P32	P32	10	1.0	0	0
P40	PAD-P40	P40	10	1.0	0	0
P50	PAD-P50	P50	10	1.0	0	0
P65	PAD-P65	P65	10	1.0	0	0
P80	PAD-P80	P80	10	1.0	0	0

Sliding Pad Selection Table

A sliding pad exists between a pipe support member and the pipe line it supports. The existence of the sliding pad depends on the system name of the related pipe line and the pipe system inclusion or exclusion list set in the SELECT SUPPORT SPAD command. The sliding pad does not have any graphics, only the attribute(s) are attached to the related pipe line. The selection of the sliding pad and its definition parameters are defined in the Pipe Support Sliding Pad Selection Table. The filename of the selection table to be used is defined in the “Auto-Selection Directory File” on page B-5 .

Pipe Support Sliding Pad Selection Table

The selection of the sliding pad depends on the size of the related pipe line and it is defined in the Pipe Support Sliding Pad Selection Table. Its definition parameters are also defined in the selection table. For details, see the table shown below.

Table B-5 Pipe Support Sliding Pad Selection

```

UNITS=MM
PIPESIZE      SPAD              HOLESIZE      THICKNESS     STOCKNO
*****
*****
*2345678901234567890123456789012345678901234567890123456789012345
678901234567890
*****
*****
*
* Filename      : CVAEC.PIPESUPPORT.SPAD
* Expert        : Daewoo
* Purpose       : Pipe Support Sliding Pad selection file
* Definition    : PIPESIZE  - pipe size, norminal diameter
*                SPAD      - sliding pad type name
*                HOLESIZE  - sliding pad screw hole size
*                THICKNESS - sliding pad thickness
*                STOCKNO   - sliding pad stock reference/number
* Usage: Given the pipe size, define the sliding pad type and its
screw
*             hole size and thickness.
*
*2345678901234567890123456789012345678901234567890123456789012345
678901234567890
*****
*****
100A   SS1    18    10
125A   SS1    18    10
150A   SS1    18    10
200A   SS2    23    10
250A   SS2    23    10
300A   SS2    23    10

```

Directory Files
Sliding Pad Selection Table

350A	SS2	23	10
400A	SS2	23	10
450A	SS3	34	10
500A	SS3	34	10
550A	SS3	34	10
600A	SS4	44	10
650A	SS4	44	10
65A	SS1	18	10
700A	SS4	44	10
750A	SS4	44	10
800A	SS4	44	10
80A	SS1	18	10
850A	SS4	44	10
900A	SS4	44	10
950A	SS4	44	10

Cable Tray Selection

Only pipe support type K, N and R can have cable tray attached to it. User should select the cable tray needed through the modifier TRAY in the INSERT SUPPORT command. The cable tray definition parameters would be extracted from the Pipe Support Cable Tray Selection Table. The filename of the selection table to be used is defined in the “Auto-Selection Directory File” on page B-5 .

Pipe Support Cable Tray Selection Table

This table provides the definition parameters for cable tray. The cable tray is only valid for pipe support type K, N and R. The user selected cable tray name would be used to read the definition parameters from this table. For details, see the table shown below.

Table B-6 Pipe Support Cable Tray Selection File

```

UNITS=MM
TRAY          SECTION      PITCH        SIZE          OFFSET
&
*2345678901234567890123456789012345678901234567890123456789012345
678901234567890
* 01-Apr-93 thlee; created
*****
*****
*
* Pipe Support Cable Tray Definition Table
*
* Filename      : CVAEC.PIPESUPPORT.CABLETRAY
* Expert       : Daewoo
* Description   : Cable tray auto-selection file for pipe support
*               unit type K, N & R.
* Definition    : TRAYTYPE- cable tray type/name.
*               SECTION- cable tray cross section type (channel)
*               PITCH- screw hole pitch distance for tray.
*               SIZE- screw hole size in diameter.
*               OFFSET- mininum offset distance from the cut
*               edge of pipe support member.
* Usage        : TRAYTYPE would be used as input to extract the
*               associated attributes/parameters.
*
*2345678901234567890123456789012345678901234567890123456789012345
678901234567890
CT-1          C125X65X6      100          8            20
CT-2          C125X65X6      100          8            20
CT-3          C125X65X6      100          8            20
CT-4          C125X65X6      100          8            20
CT-5          C125X65X6      100          8            20
CT-6          C125X65X6      100          8            20

```


External RDBMS Tables

This appendix contains a description of the RDBMS data files. The Pipe Support attributes are maintained in these data files.

- Setting Up Oracle Tables for Pipe Support
- PSUPPORT FABRICATION STAGE Table
- PSUPPORT UNIT Table
- PSUPPORT MEMBER Table
- PSUPPORT MEMBER AXIS Table
- PSUPPORT PIPE Table
- MDF Table

Setting Up Oracle Tables for Pipe Support

Perform the following steps to set up Oracle tables for Pipe Support.

1. Install and start Oracle.

Follow the instructions in the Oracle Manual to install the software and create the database.

To start Oracle, you must login as Oracle administrator on the server machine, and give the following command:

```
% dbstart
```

After starting Oracle, run SQLPLUS on the client machine to ensure proper connection to the Oracle server.

2. Set up your user environment.

Set up your `.login` and `.chsrc` files to access Oracle depending on your local environment settings. Typical system environment variables defined are:

- `ORACLE_HOME` - Specifies the base directory where Oracle is installed
- `ORACLE_HOST` - Specifies the Oracle server hostname
- `ORACLE_SID` - Specifies the database.

For example, the environment variables can be set as follows:

```
setenv ORACLE_HOME /opt/oracle
setenv ORACLE_HOST your_server
setenv ORACLE_SID demo
```

Before starting CADD5, ensure that the `DBMS_HOST` and `DBMS` variables are defined in your `.caddsrc` or `.caddsrc-local` file as:

```
setenv DBMS_HOST $ORACLE_HOST
setenv DBMS 300007
```

3. Start the DBMS process on the Oracle server.

Login in to the Oracle server, and unset `TWO_TASK` environment variable before starting the DBMS process.

```
% rlogin <server> -l <user>
% unsetenv TWO_TASK
% /usr/apl/cadds/bin/DBMS -d &
```

You need to have only one DBMS process running on the Oracle server. Perform this process only once.

4. Create the Pipe Support database tables.

Login as database administrator and run the following script to create the Pipe Support database tables. Do this only once for each project.

```
%/usr/apl/cadds/data/cvaec/pipesupport/scripts/create_psup_tables
```

Run the following script to create the PS_MDF table (Material Description File table). For details, see “MDF Table” on page C-11.

```
%/usr/apl/cadds/data/cvaec/pipesupport/scripts/create_ps_mdf_table
```

Do this once for all projects. You can insert records using SQLPLUS without going into CADD5 5.

5. Enrol yourself to access the Pipe Support database.

Login as database administrator and run the following script to grant yourself permission to access the Pipe Support database. Perform this process once every project.

```
% /usr/apl/cadds/data/cvaec/pipesupport/scripts/enroll_psup_users
```

For each new user you define, use SQLPLUS to create a synonym for that user to link to the PS_MDF table. Also grant permissions to the new user to connect to the database table.

6. Populate the Pipe Support Fabrication Stage table.

Set up the fabrication stage and installation stage information in the Fabrication Stage table. For details, see “PSUPPORT FABRICATION STAGE Table” on page C-4.

a. Enter an SQLPLUS session, with the following command:

```
% sqlplus <user>/<passwd>
```

b. Once you are active in the SQLPLUS session, use the following command to list available tables:

```
SQL> select * from tab;
```

c. Lists all records in the table PS_FAB_STAGE_<project_name>. Where the <project_name> is the project name you used while executing the create_psup_tables script. This table is empty initially.

```
SQL> select PS_FAB_STAGE_<project name>;
```

d. Add two records to the PS_FAB_STAGE_<project_name> table. The first field is the fabrication stage (text data) and the second is the installation stage (text data). You can specify different fabrication and installation stage names. Use these values of the fabrication and installation stages when using Pipe Support commands in CADD5 5. The Pipe Support commands can be GENERATE SLABEL, GENERATE UPPDBA, and DRAW SUPPORT. The fabrication and the installation stage data must exist in the table prior to execution of these commands in CADD5 5.

```
SQL> insert into PS_FAB_STAGE_<project name> values ('F1','S1',1);
```

```
SQL> insert into PS_FAB_STAGE_<project name> values ('F1','S2',1);
```

e. Exit the SQLPLUS session, using the following commands:

```
SQL> commit;
```

```
SQL> quit
```

PSUPPORT FABRICATION STAGE Table

PS_FAB_STAGE_<project_name>Table

This table contains the overall project information for pipe support installation, like fabrication stage, installation stage and revision number. You can use the RDBMS utility to prepare the data for this table outside CADDs. The data defined in this table can only be read and not modified using the GENERATE SUPPDBA and DRAW SUPPORT commands. The data field SUPPORT_INSTALLATION_STAGE is the primary key and should uniquely identify a record in this table. Note that the revision control mechanism is not implemented. The GENERATE SUPPDBA command reads the revision number from the SUPPORT_REVISION field in the PS_FAB_STAGE_<project_name> table and writes to the corresponding field in the PS_UNIT_<project_name> table. The data format of this table is defined as shown below.

Table C-1 PS_FAB_STAGE_<project_name>TABLE

Date Field Name	Data Type	Description
SUPPORT_FABRICATION_STAGE	Text	Pipe Support fabrication stage
SUPPORT_INSTALLATION_STAGE	Text	Pipe Support installation stage
SUPPORT_REVISION	Integer	Pipe Support Revision Number

Here <project_name> varies for different projects, where each project will have its own set of tables, except MDF table which is used for all projects.

PSUPPORT UNIT Table

PS_UNIT_<project_name>Table

This table contains the general attributes of a pipe support unit, for example its installation stage, weight, installation location, and so on. The data field **SUPPORT_INSTALLATION_STAGE** and **SUPPORT_LABEL** can uniquely identify a pipe support unit in the RDBMS database.

The **GENERATE SUPPDBA** command always sets the **SUPPORT_QUANTITY** field to "1" to indicate the quantity count of pipe support unit.

The **GENERATE SUPPDBA** command reads the current revision number from the **SUPPORT_REVISION** field in the **PS_FAB_STAGE** <project_name>table and stores the revision number in the corresponding **SUPPORT_REVISION** field in the **PS_UNIT_<project_name>** table.

While calculating the unit weight of a pipe support, the **GENERATE SUPPDBA** command first determines the weight of an individual member and pad. The total pipe support unit weight is calculated as the sum of the weight of all the members and pads of the support unit.

- In computing the individual weight of a support member, it tries to read it from the **STMASS** property attached to the member if it exists. If such a property does not exist on the member, it just takes the multiplication of the weight per unit length as defined in the cross section library and the length of the definition curve of the support member. It just ignores any snip, cutout and clamp hole on the member.
- In computing the individual weight of a support pad, it tries to read it from the **STMASS** property attached to the pad if it exists. If such property does not exist on the pad, it reads the pad weight as defined in the pad auto-selection file.

Please note: You should use the **CALCULATE STQUANTITIES** command to compute the mass properties (like area, volume, mass, centroid, and so on) of the structural objects and the result is stored as **CADDS** properties on the corresponding structural object. In this case, the mass of a structural object is to be stored with the **STMASS** property of the corresponding structural object.

The values of **SUPPORT_FRAME**, **SUPPORT_LONGITUDE**, and **SUPPORT_DECK** fields in the unit table are automatically obtained during the execution of **GENERATE SUPPDBA** command by checking the location of support against the following file if it exists.

```
/cadds/src/data/cvaec/pipesuppor/hcf
```

If the file does not exist, a null value is assigned to the above fields in the unit table for the support unit. SUPPORT_ZONE and SUPPORT_BLOCK are retrieved from the ZONE and BLOCK property in support parent nfig. Use INSERT PROPERTY command to insert ZONE and BLOCK properties.

The data format of this table is defined as below.

Table C-2 PS_UNIT_<project_name> Table

Date Field Name	Data Type	Description
SUPPORT_INSTALLATION_STAGE	Text	Pipe Support Installation Stage
SUPPORT_LABEL	Text	Pipe Support Label
SUPPORT_QUANTITY	Integer	Pipe Support Quantity Count
SUPPORT_WEIGHT	Real	Pipe Support Unit Weight
SUPPORT_PAINT_CODE	Text	Pipe Support Paint Code
SUPPORT_LOCATION_X	Real	Support unit's location, X-coordinates
SUPPORT_LOCATION_Y	Real	Y-coordinates
SUPPORT_LOCATION_Z	Real	Z-coordinates
SUPPORT_FRAME	Text	Support unit's frame number, as defined in the HCF file
SUPPORT_LONGITUDE	Text	Support unit's longitudinal number, as defined in the HCF file
SUPPORT_DECK	Text	Support unit's deck level number as defined in the HCF file
SUPPORT_ZONE	Text	Support zone name
SUPPORT_BLOCK	Text	Support block name
SUPPORT_REVISION	Integer	Pipe Support Revision Number

PSUPPORT MEMBER Table

PS_MEMBER_<project_name> Table

This table contains the definition parameters or attributes of a pipe support member. The data fields SUPPORT_INSTALLATION_STAGE, SUPPORT_LABEL and SUPPORT_MEMBER_UID together can uniquely identify a pipe support member in the RDBMS database. The data format of this table is defined as below.

Table C-3 PS_MEMBER_<project_name> Table

Date Field Name	Data Type	Description
SUPPORT_INSTALLATION_STAGE	Text	Pipe Support Installation Stage
SUPPORT_LABEL	Text	Pipe Support Label
SUPPORT_MEMBER_UID	Integer	Member User Identification Number
SUPPORT_MEMBER_SECTION	Text	Pipe Support Member Cross Section
SUPPORT_MEMBER_MATERIAL	Integer	Pipe Support Member Material Number
SUPPORT_MEMBER_LENGTH	Real	Pipe Support Member Length
SUPPORT_MEMBER_WEIGHT	Real	Pipe Support Member Weight
SUPPORT_MEMBER_LOCALX_X	Real	Member local X-axis unit vector, x-coordinates
SUPPORT_MEMBER_LOCALX_Y	Real	Member local X-axis unit vector, y-coordinates
SUPPORT_MEMBER_LOCALX_Z	Real	Member local X-axis unit vector, z-coordinates
SUPPORT_MEMBER_LOCALY_X	Real	Member local Y-axis unit vector, x-coordinates
SUPPORT_MEMBER_LOCALY_Y	Real	Member local Y-axis unit vector, y-coordinates
SUPPORT_MEMBER_LOCALY_Z	Real	Member local Y-axis unit vector, z-coordinates
SUPPORT_MEMBER_PAD	Text	Pad Name
SUPPORT_MEMBER_PAD_STATUS	Integer	Pad existence status flag on support member = 0 none, 1 start, 2 end, 3 both
SUPPORT_MEMBER_SNIIP_STATUS	Integer	Snip existence status flag on support member = 0 none, 1 start, 2 end, 3 both
SUPPORT_CABLETRAY	Text	Cable tray name

Table C-3 PS_MEMBER_<project_name> Table

Date Field Name	Data Type	Description
SUPPORT_CABLETRAY_X	Real	Cable tray location on supporting member
SUPPORT_CABLETRAY_Y	Real	Cable tray location on supporting member
SUPPORT_CABLETRAY_Z	Real	Cable tray location on supporting member
SUPPORT_TUBESTRAP	Text	Tube strap name
SUPPORT_TUBE_COUNT	Integer	Number of tubes in the tube strap set
SUPPORT_TUBESTRAP_X	Real	Tube strap location on supporting member
SUPPORT_TUBESTRAP_Y	Real	Tube strap location on supporting member
SUPPORT_TUBESTRAP_Z	Real	Tube strap location on supporting member

PSUPPORT MEMBER AXIS Table

PS_MEMBER_AXIS_<project_name> Table

This table contains the support member's projection axis control points. The data field SUPPORT_INSTALLATION_STAGE, SUPPORT_LABEL and SUPPORT_MEMBER_UID can uniquely identify a support member's projection axis in the RDBMS database. Furthermore, the data field SUPPORT_MEMBER_POINT_INDEX can be used to identify a definition point on the projection axis. The data format of this table is defined below.

Table C-4 PS_MEMBER_AXIS_<project_name> TABLE

Date Field Name	Data Type	Description
SUPPORT_INSTALLATION_STAGE	Text	Pipe Support Installation Stage
SUPPORT_LABEL	Text	Pipe support unit label
SUPPORT_MEMBER_UID	Integer	Member User Identification Number
SUPPORT_MEMBER_POINT_INDEX	Integer	Member axis control point index, = 1,2,3,...
SUPPORT_MEMBER_POINT_X	Real	Member axis control point, X-coordinates
SUPPORT_MEMBER_POINT_Y	Real	Y-coordinates
SUPPORT_MEMBER_POINT_Z	Real	Z-coordinates
SUPPORT_MEMBER_BRADIUS	Real	Member segment bending radius

PSUPPORT PIPE Table

PS_PIPE_<project_name> Table

This table contains the definition parameters and attributes of a pipe line related to a pipe support unit. The data field SUPPORT_INSTALLATION_STAGE, SUPPORT_LABEL, SUPPORT_MEMBER_UID and SUPPORT_PIPE_UID can uniquely identify a related pipe line in the RDBMS database. The data format of this table is defined below.

Table C-5 PS_PIPE_<project_name> TABLE

Date Field Name	Data Type	Description
SUPPORT_INSTALLATION_STAGE	Text	Pipe Support Installation Stage
SUPPORT_LABEL	Text	Pipe support unit label
SUPPORT_MEMBER_UID	Integer	Pipe Support Member User Identification
		Number
SUPPORT_PIPE_UID	Integer	Pipe User Identification Number
SUPPORT_PIPE_LABEL	Text	Pipe Support Label
SUPPORT_PIPE_SIZE	Real	Pipe Size, Nominal Diameter
SUPPORT_PIPE_ANCHOR_X	Real	Pipe anchor location on supporting member
SUPPORT_PIPE_ANCHOR_Y	Real	
SUPPORT_PIPE_ANCHOR_Z	Real	
SUPPORT_PIPE_CLAMP	Text	Pipe Support Clamp Type Name
SUPPORT_PIPE_SPAD	Text	Pipe Support Sliding Pad Type Name
SUPPORT_PIPE_SPAD_HOLE_STATUS	Integer	Sliding pad screw hole existence status flag
		= 0 no hole, 1 with hole

MDF Table

PS_MDF Table

The MDF (Material Description File) table contains selection name and description text for pipe support components. The selection name is the primary key and must be unique. You can use the RDBMS utility to prepare the database outside CADDSS. The data defined in the MDF table can only be read and not modified when you use the DRAW SUPPORT command. The data format of this table is defined below.

Table C-6 MDF TABLE

Date Field Name	Data Type	Description
SNAME	Text	Selection Name
TEXT	Text	Description Text

Please note: The above table is not specific to individual projects. It needs to be installed only once for all the projects.

DRAW SUPPORT Form Part Preparation

This appendix describes the information provided by the Tnode entity and the properties to be attached to it. Tnode entities are created in the CADDSS database while preparing a form part.

- DRAW SUPPORT Form Part Preparation

DRAW SUPPORT Form Part Preparation

The Tnode entities provide the following information.

Data Anchor Location

The location of the Tnode entity itself indicates the anchor location for the creation of both graphical and textual data. For text data, Ntext entities would be created and attached to the corresponding Tnode entities. For graphical data, the Tnode entities define the boundary of the display area.

Associated Data Type

Each Tnode entity must have the property DWGOBJATTR, whose value indicates the type of data that must be attached to it.

Properties to be attached to the Tnode entity

DWGOBJATTR		-	indicates the data type for the Ntext to be attached to the Tnode in a pipe support installation drawing (integer)
	=	1	installation drawing form rectangular boundary point
		2	installation drawing graphics display area rectangular boundary point
		3	project/external database name
		4	revision number
		1001	fabrication process/drawing name
		1002	support unit installation stage
		1003	support unit label
		1004	support unit quantity count
		1005	support unit weight
		1006	paint code for the support unit
		1007	support unit location, along the X-axis
		1008	support unit location, along the Y-axis
		1009	support unit location, along the Z-axis
		1010	frame number (along X-axis) where support unit resides (marine)
		1011	longitudinal number (along Y-axis) where support unit resides (marine)
		1012	deck number (along Z-axis) where support unit resides (marine)
		1013	block name where support unit resides
		1014	zone name where support unit resides
		1101	support object quantity count, member or pad. This is the multiple of the support unit quantity count and the support object quantity count in a support unit.
		1102	support object item number, member or pad.
		1103	support object description, member or pad, to be read from the MDF table. For member, the section name will be used to read from the MDF table. For pad, the pad name will be used to read from the MDF table.
		1104	support member cross section name
		1105	support member material number
		1106	support member length
		1107	material description
DWGOBJIDX		-	index number for identification purpose if there are multiple instances (Tnode) for the same type of data in the same installation drawing.
	=	1, 2, 3, ...	

- Pipe Support Installation Drawing Form Size

For the installation drawing form, there must be two Tnodes which have the property DWGOBJATTR with value 1. The location of these two Tnodes define the rectangular boundary of the installation drawing form. All the related entities belonging to this installation drawing must be inside this form boundary.

You can have more than one installation drawing in the current CADDs part. The property DWGOBJIDX is used to identify one drawing form from the other. It takes an integer value starting from 1. The two Tnodes that define the installation drawing form boundary having the property DWGOBJATTR with value 1 must have the property DWGOBJIDX with the same value.

For example, there are 2 installation drawings in the current part. There must be four Tnodes which have the property DWGOBJATTR with value 1. Two of them have the property DWGOBJIDX with a value 1 and they define the boundary for the first installation drawing form. The other two have the property DWGOBJIDX with a value 2 and they define the boundary for the second installation drawing form.

- Pipe Support Installation Drawing Graphics Display Area

For each installation drawing graphics display area, there must be two Tnodes which have the property DWGOBJATTR with value 2. The location of these two Tnodes defines the rectangular boundary of the installation drawing graphics display area. The graphical display of the pipe support unit would be shown inside this rectangular area. You can have more than one display area in one installation drawing. The property DWGOBJIDX would be used to identify one display area from the other, it takes an integer value starting from 1. The two Tnodes which define the display area boundary having the property DWGOBJATTR with value 2, must have the property DWGOBJIDX with the same value.

- Textual data Anchor Tnodes

Tnode entity must be inserted at the appropriate location in the form part, and the property DWGOBJATTR must be attached to it with the appropriate value, depending on the type of textual data it expects.

Also, the appropriate text parameters must be attached to the Tnode. The parameters for the creation of the Ntext entity in the DRAW SUPPORT command is determined as follows.

- Use the text parameters in the associated Tnode entity if they exist.
- Use default parameters as selected in the SELECT TEXT command.

In the DRAW SUPPORT command, textual data is created as Ntext entities and they are attached to the appropriate Tnodes in the installation drawing. The Tnode's location is the anchor point for the creation of the Ntext.

For example, the project name attached to the Tnode has the property DWGOBJATTR having a value 3.

Similarly, if there are multiple instances of the same type of data, the property DWGOBJIDX is used to provide the order of the Ntext creation.

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