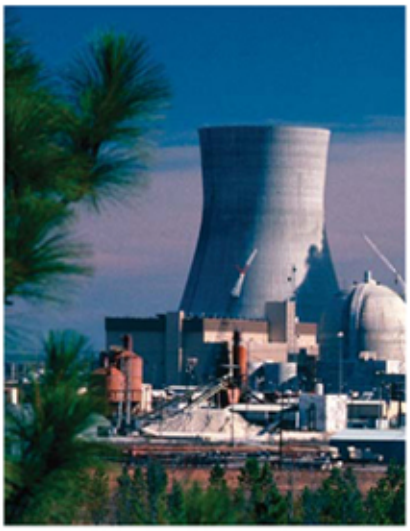
Grids
User's Guide

Process, Power & Marine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Preface

This document is a user's guide for the SmartPlant® 3D Grids task and provides command reference information and procedural instructions.

SmartPlant 3D Documentation Set

The SmartPlant® 3D documentation set is available as Adobe® PDF files. The content of the PDF files is the same content as online Help. To access these PDF documents in the software, click **Help > Printable Guides**.

The documentation set is divided into four categories:

- Administrative guides contain information about installing, configuring, customizing, and troubleshooting SmartPlant 3D.
- User's guides provide command reference and how-to information for working in each SmartPlant 3D task.
- Reference data guides define the reference data workbooks. Not all tasks have reference data.
- ISOGEN guides.

Administrative Guides

Project Management User's Guide - Provides instructions for setting up the databases, creating permission groups, backing up and restoring project data, assigning access permissions to the model, managing interference detection, defining and managing locations for Global Workshare, controlling duplication and consolidation of plants, tools for synchronization, regeneration of report databases, and version upgrade.

SmartPlant 3D Database Integrity Guide - Provides information about the error messages in the database integrity reports, including meaning, cause, and possible corrective action.

SmartPlant 3D Global Workshare Guide - Provides instructions for setting up the software and the databases to work in a workshare environment.

SmartPlant 3D Installation Guide - Provides instructions on installing and configuring the software on both the client and server computers.

SmartPlant 3D Installation Checklist - Provides a recommended installation workflow for installing SmartPlant 3D. The installation checklist,

SP3DInstall_Checklist.pdf and **SP3DInstall_Checklist.xls**, is available in two file formats in the **Help** folder on the product CD.

SmartPlant 3D/SmartMarine 3D Programmer's Guide - Provides information about custom commands, naming rules, and symbol programming.

SmartPlant 3D Integration Reference Guide - Provides information about installing, configuring, and using SmartPlant 3D in an integrated environment.

SmartPlant 3D Interference Checking Guide - Provides information on installing, configuring, and using the interference detection service.

SmartPlant 3D Interpreting Human Piping Specifications - Provides information about how to interpret human piping specifications so that you can create the corresponding piping specification in the software.

SmartPlant 3D Plant Design System (PDS) Guide - Provides all information needed to use PDS with SmartPlant 3D. Topics include referencing active PDS projects in SmartPlant 3D, exporting PDS data and importing that data into SmartPlant 3D, converting PDS reference data to SmartPlant 3D reference data, and converting EDEN symbols to Visual Basic symbols.

SmartPlant 3D Release Bulletin - Provides what's new, hardware/software requirements, and support information for the current release.

SmartPlant 3D Troubleshooting Guide - Provides information on how to resolve errors that you may encounter in the software by documenting troubleshooting tips, error messages, and to do list messages.

User's Guides

Catalog User's Guide - Provides information about viewing, editing, and creating reference data and select lists (codelists).

Common User's Guide - Provides information about defining workspaces, navigating in the model, precision input, filtering, manipulating views, and running reports.

Electrical User's Guide - Provides information about routing electrical cable, cableway, cable tray, and conduit.

Equipment and Furnishings User's Guide - Provides information about placing equipment.

Grids User's Guide - Provides instructions for creating coordinate systems, elevation grid planes, vertical grid planes, radial cylinders, radial planes, grid arcs, and grid lines.

Hangers and Supports User's Guide - Provides instructions on placing piping, duct, cableway, and conduit supports in the model.

HVAC User's Guide - Provides instructions for routing HVAC duct.

Orthographic Drawings User's Guide - Provides information about creating and managing orthographic drawings.

Piping Isometric Drawings User's Guide - Provides information about creating and managing piping isometric drawings.

Piping User's Guide - Provides instructions for routing pipe and placing valves, taps, and pipe joints.

Reports User's Guide - Provides information about creating and managing spreadsheet reports.

Space Management User's Guide - Provides instructions for placing volumes (such as drawing volumes, obstruction zones) in the model.

Structural Analysis User's Guide - Provides instructions for defining loads, load cases, load combinations, and the importing and exporting of analytical data.

Structure User's Guide - Provides instructions for placing structural members such as: beams, columns, braces, slabs, openings, stairs, ladders, equipment foundations, and handrails.

Systems and Specifications User's Guide - Provides instructions for creating systems and their hierarchies and selecting which specifications are available for each system type.

SmartPlant 2D Symbols User's Guide - Provides instructions for creating cross section symbols.

Reference Data Guides

Drawings and Reports Reference Data Guide - Provides information about reports reference data.

Electrical Reference Data Guide - Provides information about electrical cable, cableway, cable tray, and conduit reference data.

Equipment and Furnishings Reference Data Guide - Provides information about equipment reference data and name rules.

Hangers and Supports Reference Data Guide - Provides information about hangers and supports reference data.

HVAC Reference Data Guide - Provides information about HVAC reference data.

Piping Reference Data Guide - Provides information about piping reference data including piping specifications, piping specification rules, piping parts, piping symbols, and name rules.

SmartPlant 2D Symbols Reference Data Guide - Provides information about the two-dimensional symbols used in all tasks.

SmartPlant 3D Reference Data Guide - Provides instructions about the Bulkload utility, codelists, and the reference data common to several disciplines.

SmartPlant 3D Symbols Reference Data Guide - Provides information about the Visual Basic Part Definition Wizard and the three-dimensional symbols used in all tasks.

Space Management Reference Data Guide - Provides information about space management reference data.

Structure Reference Data Guide - Provides information about structural reference data and name rules.

ISOGEN Guides

AText Reference Guide - Provides information about alternative text for isometric drawings. This guide is from Alias, the makers of ISOGEN®.

Option Switches Reference Guide - Provides information about the ISOGEN option switches for isometric drawings. This guide is from Alias, the makers of ISOGEN.

Symbol Keys Reference Guide - Provides information about the symbol keys for isometric drawings. This guide is from Alias, the makers of ISOGEN.

Documentation Comments

Send documentation comments or suggestions to PPMdoc@intergraph.com.

What's New in Grids

The following changes have been made to the Grids task.

Version 2007 Service Pack 3

- All Grid entities now have a **Drawing Style** category when you edit them by means of the **Edit** > **Properties** command. This category contains two properties, **Drawing Style 1** and **Drawing Style 2**. (P3 CP:126583)

Version 2007 Service Pack 1

- You can now define coordinate systems, and planes in coordinates systems, relative to another coordinate system when using the Grid Wizard. (P2 CP:113946)
- Two new naming rules, Global Position and Imperial Global Position, are now available for grid planes. (P2 CP:113929)

Version 2007

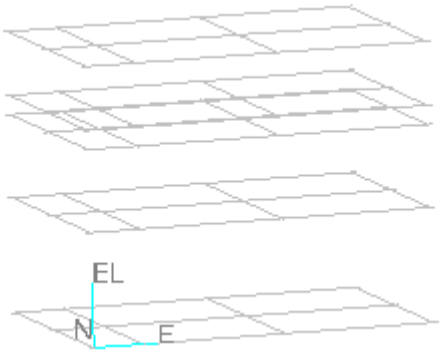
- When you insert an elevation or grid plane, the software renames only those planes that were modified.
- The orientation property for coordinate systems is now stored in the Model database.
- The software consistently stores coordinates regardless of which task generates the coordinates.
- You can create a filter to display only the gridlines on specific elevation planes.

Understanding Grids: An Overview

The Grids task creates and manipulates coordinate systems, elevation planes, vertical grid planes, radial cylinders/planes, grid arcs, and grid lines.

Coordinate systems provide a locating scheme when working in the model. The grid lines of a coordinate system represent the relative positioning requirements for a specific design purpose.

When designing your model, you may want different coordinate systems for individual pipe racks, buildings, or areas of the model.



The Grids task contains the following commands:

	Select - Used to select objects in the model. For more information, see *Selecting Objects: An Overview*, page 14.
	Grid Wizard - Creates a new coordinate system and all the related planes/cylinders in operation. For more information, see *Grid Wizard Command*, page 21.
	Place Coordinate System - Creates a new coordinate system. For more information, see *Place Coordinate System Command*, page 32.
	Place Elevation Planes - Places elevation planes in the model. For more information, see *Place Elevation Plane Command*, page 42.
	Place Grid Planes - Places grid planes in the model. For more information, see *Place Grid Plane Command*, page 50.
	Place Radial Grid - Places radial grid planes in the model. For more information, see *Place Radial Grid Command*, page 60.

Related Topics

- *Understanding Coordinate Systems: An Overview*, page 31
- *Understanding Elevation Planes: An Overview*, page 41
- *Understanding Grid Planes: An Overview*, page 49
- *Understanding the Grids Workflow: An Overview*, page 13

Understanding the Grids Workflow: An Overview

For rectangular coordinate systems, use the **Grid Wizard** to create coordinate systems, elevation planes, and grid planes in one process. Then use the **Place Elevation Plane** and **Place Grid Plane** commands to add additional planes as needed.

For radial coordinate systems, use the **Grid Wizard** to create coordinate systems, elevation planes, radial cylinders, and radial planes in one process. Then use the **Place Elevation Plane** and the **Place Radial Grid** command to add additional planes and radial grids as needed.

Related Topics

- *Grids Common Tasks*, page 13

Grids Common Tasks

The following tasks are used frequently when you create grids.

Grid Wizard Command

- Define coordinate systems, elevation planes, vertical grid planes, radial cylinders, and radial planes in a single process using the **Grid Wizard** command. For more information, see *Grid Wizard Command*, page 21.

Place Coordinate Systems

- Place coordinates systems in the model. For more information, see *Place a Coordinate System*, page 36.

Place Elevation Planes

- Place elevation planes in the model. For more information, see *Place an Elevation Plane*, page 45.

Place Grid Planes

- Place grid planes in the model. For more information, see *Place a Grid Plane*, page 55.

Place Radial Grids

- Place radial cylinders in the model. For more information, see *Place a Radial Cylinder*, page 65.
- Place radial grid planes in the model. For more information, see *Place a Radial Plane*, page 63.

Selecting Objects: An Overview

Most objects in the Grids task have properties that you can edit. Using the **Select** command on the vertical toolbar, you select the object that you want to edit.

Note

- Grid lines and grid arcs do not have properties that you can edit.

An important part of the **Select** command is the **Locate Filter** box that appears on the ribbon. The **Locate Filter** box contains the available, pre-defined filters for the **Select** command. When you choose a filter in the **Locate Filter** box, the software allows you to select only the filtered objects in a graphical view and in the **Workspace Explorer**. For example, if you select **Elevation Plane**, you can select only elevation planes in a graphic view or in the **Workspace Explorer**.

Note

- You can create a filter to display only the gridlines on specific elevation planes.

The Grids task includes these filters:

Grids Entities - Allows you to select coordinate systems, grid lines, grid arcs, elevation planes, vertical grid planes, radial cylinders, and radial planes in a graphic view and in the **Workspace Explorer**. Objects placed using other tasks, such as equipment, cannot be selected using this filter.

Coordinate System - Limits your selection in a graphic view or in the **Workspace Explorer** to coordinate systems. You can place coordinate systems using the **Place Coordinate System** command. For more information, see *Place Coordinate System Command*, page 32.

Elevation Plane - Limits your selection in a graphic view or in the **Workspace Explorer** to elevation planes. You can place elevation planes using the **Place Elevation Plane** command. For more information, see *Place Elevation Plane Command*, page 42.

Grid Plane - Limits your selection in a graphic view or in the **Workspace Explorer** to grid planes. You can place grid planes using the **Place Grid Plane** command. For more information, see *Place Grid Plane Command*, page 50.

Radial Plane - Limits your selection in a graphic view or in the **Workspace Explorer** to radial planes. You can place grid planes using the **Place Radial Grid** command. For more information, see *Place Radial Grid Command*, page 60.

Radial Cylinder - Limits your selection in a graphic view or in the **Workspace Explorer** to radial cylinders. You can place radial cylinders using the **Place Radial Grid** command. For more information, see *Place Radial Grid Command*, page 60.

Grid Line - Limits your selection in a graphic view to grid lines. Grid lines represent the intersection of an elevation plane and either a grid plane or a radial plane.

Grid Arc - Limits your selection in a graphic view to grid arcs. Grid arcs represent the intersection of an elevation plane and a radial cylinder.

Axis - Limits your selection in a graphic view or in the **Workspace Explorer** to the three-axes of the coordinate system.

All - Allows you to select any object, even objects created in another task.

 Use the **Inside** fence command to select all objects entirely inside the fence.

 Use the **Inside/Overlapping** fence command to select all objects entirely inside the fence and those objects outside but touching the fence at some point.

Related Topics

- *Coordinate System Properties Dialog Box*, page 34
- *Elevation Planes Properties Dialog Box*, page 43
- *Grid Line Properties Dialog Box*, page 54
- *Grid Plane Properties Dialog Box*, page 53
- *Radial Grid Properties Dialog Box*, page 62

Naming Rules: An Overview

The software provides several options for naming the elevation planes, grid planes, radial cylinders, and radial planes that you place in the model. In addition to the delivered sample naming rules that are described here, you can create your own naming rules. For more information on creating naming rules, see the *SmartPlant 3D Reference Data Guide*, available from the **Help > Printable Guides** command in the software.

Alphanumeric and Percent

The **Alphanumeric and Percent** name rule uses the position of the plane relative to the other planes to assign the name. The first primary plane is given the name 1 or A, the second primary plane 2 or B, the third primary plane 3 or C, and so forth. The secondary planes are suffixed to the primary plane with a decimal indicator. The number to the right of the decimal indicator is the relative position between the previous primary plane and the next primary plane, expressed as a percentage. For example, if the secondary plane is directly between the two primary planes, .50 is the suffix. The locations of the tertiary plane are suffixed to the secondary plane location using the same method.

Primary	Secondary	Tertiary
A		
B		
	B.5	
		B.5.3
		B.5.8
	B.6	
C		

The Alphanumeric and Percent naming rule cannot be used for elevation planes.

For grid planes perpendicular to the X-axis of the coordinate system, a letter is used. Some examples of plane names using this rule are A, B, C, and D.

For grid planes perpendicular to the Y-axis of the coordinate system, a number is used. Some examples of plane names using this rule are 1, 2, 3, and 4.

Position

The **Position** name rule uses the physical position of the plane for the name of the plane. The position is relative to the origin of the coordinate system to which the plane belongs. The position is always displayed in meters, regardless of the session working units.

For elevation planes, the letters "El" are pre-pended to the position to form the name of the plane. Some examples of plane names using this rule are El -3.00m, El 3.00 m, El 6.00m, and El 9.50m.

For grid planes perpendicular to the X-axis of the coordinate system, the letter "E" is pre-pended to the position to form the name of the plane. Some examples of plane names using this rule are E -3.00, E 3.00 m, E 6.00m, and E 9.50m.

For grid planes perpendicular to the Y-axis of the coordinate system, the letter "N" is pre-pended to the position to form the name of the plane. Some examples of plane names using this rule are N -3.00m, N 3.00 m, N 6.00m, and N 9.50m.

For radial cylinders, the letter "C" is pre-pended to the position to form the name of the cylinder. Some examples of cylinder names using this rule are C 3.0m, C 6.0m, and C 9.0m.

For radial planes, the letter "R" is pre-pended to the position to form the name of the plane. Some examples of radial plane names using this rule are R 15deg, R 30deg, and R 45deg.

Global Position

The **Global Position** name rule uses the physical position of the plane for the name of the plane. The position is relative to the origin of the global coordinate system. The position is always displayed in meters, regardless of the session working units.

For elevation planes, the letters "El" are pre-pended to the position to form the name of the plane. Some examples of plane names using this rule are El -3.00m, El 3.00 m, El 6.00m, and El 9.50m.

For grid planes perpendicular to the X-axis of the coordinate system, the letter "E" is pre-pended to the position to form the name of the plane. Some examples of plane names using this rule are E -3.00, E 3.00 m, E 6.00m, and E 9.50m.

For grid planes perpendicular to the Y-axis of the coordinate system, the letter "N" is pre-pended to the position to form the name of the plane. Some examples of plane names using this rule are N -3.00m, N 3.00 m, N 6.00m, and N 9.50m.

For radial cylinders, the letter "C" is pre-pended to the position to form the name of the cylinder. Some examples of cylinder names using this rule are C 3.0m, C 6.0m, and C 9.0m.

For radial planes, the letter "R" is pre-pended to the position to form the name of the plane. Some examples of radial plane names using this rule are R 15deg, R 30deg, and R 45deg.

Imperial Position

The **Imperial Position** name rule uses the physical position of the plane for the name of the plane. The position is relative to the origin of the coordinate system to which

the plane belongs. The position is always displayed in feet and inches, regardless of the session working units.

For elevation planes, the letters "EL" are pre-pended to the position to form the plane name. The elevation plane type is added to the end of the name. Some examples of plane names using this rule are EL 0ft 0.00in (Grade), EL 15ft 0.00in (TOS), and EL 18ft 0.00in (Splice).

For grid planes perpendicular to the X-axis of the coordinate system, the letter "E" is pre-pended to the position to form the name of the plane. Some examples of plane names using this rule are E -3ft 0.00in, E 3ft 0.00in, E 6ft 5.00in, and E 9ft 6.00in.

For grid planes perpendicular to the Y-axis of the coordinate system, the letter "N" is pre-pended to the position to form the name of the plane. Some examples of plane names using this rule are N -3ft 0.00in, N 3ft 0.00in, N 6ft 8.00in, and N 9ft 6.50in.

For radial cylinders, the letter "C" is pre-pended to the offset position to form the name of the cylinder. Some examples of cylinder names using this rule are C 15ft 0.00in and C 30ft 0.00in.

For radial planes, the letter "R" is pre-pended to the offset position to form the name of the plane. Some examples of radial plane names using this rule are R 30.0 deg and R 45.0 deg.

Imperial Global Position

The **Imperial Global Position** name rule uses the physical position of the plane for the name of the plane. The position is relative to the origin of the global coordinate system. The position is always displayed in feet and inches, regardless of the session working units.

For elevation planes, the letters "EL" are pre-pended to the position to form the name of the plane. The elevation plane type is added to the end of the name. Some examples of plane names using this rule are EL 0ft 0.00in (Grade), EL 15ft 0.00in (TOS), and EL 18ft 0.00in (Splice).

For grid planes perpendicular to the X-axis of the coordinate system, the letter "E" is pre-pended to the position to form the name of the plane. Some examples of plane names using this rule are E -3ft 0.00in, E 3ft 0.00in, E 6ft 5.00in, and E 9ft 6.00in.

For grid planes perpendicular to the Y-axis of the coordinate system, the letter "N" is pre-pended to the position to form the name of the plane. Some examples of plane names using this rule are N -3ft 0.00in, N 3ft 0.00in, N 6ft 8.00in, and N 9ft 6.50in.

For radial cylinders, the letter "C" is pre-pended to the offset position to form the name of the cylinder. Some examples of cylinder names using this rule are C 15ft 0.00in and C 30ft 0.00in.

For radial planes, the letter "R" is pre-pended to the offset position to form the name of the plane. Some examples of radial plane names using this rule are R 30.0 deg and R 45.0 deg.

Index

The **Index** name rule uses the position of the plane relative to the other planes to assign the name. The first plane is given the name 1, the second plane 2, the third plane 3, and so forth. The secondary planes are suffixed with an additional decimal indication of the sequential order, and so forth for tertiary planes.

Primary	Secondary	Tertiary
GPX1		
GPX2		
	GPX2.1	
		GPX2.1.1
		GPX2.1.2
	GPX2.2	
GPX3		

For elevation planes, the letters "ElevPlane" are pre-pended to the position to form the name of the plane. Some examples of plane names using this rule are ElevPlane1, ElevPlane2, ElevPlane3, and ElevPlane4.

For grid planes perpendicular to the X-axis of the coordinate system, the letter "GPX" is pre-pended to the position to form the name of the plane. Some examples of plane names using this rule are GPX1, GPX2, GPX3, and GPX4.

For grid planes perpendicular to the Y-axis of the coordinate system, the letter "GPY" is pre-pended to the position to form the name of the plane. Some examples of plane names using this rule are GPY1, GPY2, GPY3, and GPY4.

For radial cylinders, the letter "C" is pre-pended to the position to form the name of the cylinder. Some examples of cylinder names using this rule are C1, C2, and C3.

For radial planes, the letter "R" is pre-pended to the position to form the name of the plane. Some examples of radial plane names using this rule are R1, R2, and R3.

Index and Percent

The **Index and Percent** name rule uses the position of the plane relative to the other planes to assign the name. The first primary plane is given the name 1, the second primary plane 2, the third primary plane 3, and so forth. The secondary planes are suffixed to the primary plane with a decimal indicator. The number to the right of the decimal indicator is the relative position between the previous primary plane and the next primary plane, expressed as a percentage. For example, if the secondary plane is

directly between the two primary planes, .50 is the suffix. The tertiary planes locations are suffixed to the secondary plane location using the same method.

Primary	Secondary	Tertiary
GPX1		
GPX2		
	GPX2.5	
		GPX2.5.3
		GPX2.5.8
	GPX2.6	
GPX3		

For elevation planes, the letters "ElevPlane" are pre-pended to the position to form the name of the plane. Some examples of plane names using this rule are ElevPlane1, ElevPlane2, ElevPlane3, and ElevPlane4.

For grid planes perpendicular to the X-axis of the coordinate system, the letter "GPX" is pre-pended to the position to form the name of the plane. Some examples of plane names using this rule are GPX1, GPX2, GPX3, and GPX4.

For grid planes perpendicular to the Y-axis of the coordinate system, the letter "GPY" is pre-pended to the position to form the name of the plane. Some examples of plane names using this rule are GPY1, GPY2, GPY3, and GPY4.

For radial cylinders, the letter "C" is pre-pended to the position to form the name of the cylinder. Some examples of cylinder names using this rule are C1, C2, and C3.

For radial planes, the letter "R" is pre-pended to the position to form the name of the plane Some examples of radial plane names using this rule are R1, R2, and R3.

User Defined

The **User Defined** naming rule allows you to define the name of the plane. After selecting this naming rule, type the name for the plane in the **Name** box.

Grid Wizard Command

Opens a wizard that steps you through the process of creating elevation planes, grid planes, radial cylinders, radial planes, and design coordinate systems in your model. You then have the option of creating grid lines/grid arcs along the intersections with the elevation planes.

Related Topics

- *Grid Wizard*, page 21
- *Understanding Coordinate Systems: An Overview*, page 31
- *Understanding Grids: An Overview*, page 11

Grid Wizard

Steps you through the process of creating elevation planes, grid planes, radial cylinders, radial planes, and design coordinate systems in your model. You then have the option of creating grid lines/grid arcs along the intersections with the elevation planes.

Related Topics

- *Associated Elevation Planes (Grid Wizard)*, page 30
- *Create Coordinate System (Grid Wizard)*, page 22
- *Create Elevation Planes (Grid Wizard)*, page 23
- *Create Grid X-Planes (Grid Wizard)*, page 24
- *Create Grid Y-Planes (Grid Wizard)*, page 26
- *Create Radial Cylinder (Grid Wizard)*, page 27
- *Create Radial Planes (Grid Wizard)*, page 28
- *Grid Wizard Command*, page 21

Create Coordinate System (Grid Wizard)

Defines the coordinate system with which you want to associate the elevation planes, grid planes, radial planes, and radial cylinders. You create these planes/cylinders later in the wizard. In addition to selecting existing coordinate systems, you can also create a new coordinate system to which you can assign the elevation planes, grid planes, radial planes, and radial cylinders. You then have the option of creating grid lines/arcs along the intersections with the elevation planes.

New Coordinate System - Assigns the elevation planes, grid planes, radial planes, and radial cylinders that you are creating to a new coordinate system with a north arrow and an origin that you define on this page.

Existing Coordinate System - Assigns the elevation planes, grid planes, radial planes, and radial cylinders that you are creating to an existing coordinate system.

Name - Defines the name of the coordinate system that you are creating.

Axis for Bearing - Select the X- or Y-axis as the axis to define the coordinate system North.

Bearing - Specifies the bearing angle of the axis that you selected in the **Axis for Bearing** box. This bearing angle is defined with respect to the global coordinate system.

Reference CS - Select the coordinate system in which to define the origin of the coordinate system that you are creating.

East (X) - Specifies the easting coordinate of the coordinate system origin. If you are creating the coordinate system, you define this value with respect to the coordinate system that you selected in the **Reference CS** box.

North (Y) - Specifies the northing coordinate of the coordinate system origin. If you are creating the coordinate system, you define this value with respect to the coordinate system that you selected in the **Reference CS** box.

Up (Z) - Specifies the elevation coordinate of the coordinate system origin. If you are creating the coordinate system, you define this value with respect to the coordinate system that you selected in the **Reference CS** box.

Related Topics

- *Grid Wizard Command*, page 21
- *Grid Wizard*, page 21
- *Understanding Coordinate Systems: An Overview*, page 31

Create Elevation Planes (Grid Wizard)

Defines the settings for the elevation planes that you want to place in the model.

Elevation Plane Settings

Reference CS - Select the coordinate system to reference for the location of the **Start Plane**.

Start plane - Specify the location of the first elevation plane. The location is relative to the **Up (Z)** coordinate in the coordinate system that you specified in the **Reference CS** box. If elevation planes already exist, you can select one from the list.

Copies - Type the number of elevation plane copies to create.

Spacing - Type the spacing between the elevation planes. Be sure to include the units, for example ft or m, when defining the spacing.

End plane - Displays the location of the last elevation plane. You cannot edit this value.

Name rule - Select the name rule that you want to use to name the elevation planes that you are creating. For more information about what each naming rule does, see *Naming Rules: An Overview*, page 16.

Nesting level - Defines the nesting level for the elevation plane. You can select **Primary**, **Secondary**, or **Tertiary**. Between two adjacent planes, a difference of only one level is allowed. Therefore, secondary planes are only allowed between two primary planes. Similarly, tertiary planes are only allowed between two secondary planes.

Type - Select the type of elevation plane to place. Examples of grid elevation plane types are: Bottom of Base Plate, Bottom of Concrete, Top of Steel, Top of Concrete, Grade Elevation, and Column Splice Elevation. You can define elevation plane types in the reference data.

Add - Adds the defined elevation plane settings to the **Elevation Plane Locations** list.

Elevation Plane Locations

Note

- If you are editing an existing coordinate system, the **Elevation Plane Locations** grid displays existing elevation planes in blue and new elevation planes in black.

Location - Displays the location of the elevation plane relative to its parent coordinate system.

Type - Specifies the type of elevation plane. You can change the elevation plane type if needed.

Name - Displays the name of the elevation plane. You can select and edit the text in the box if needed.

Nesting level - Defines the nesting level for the elevation plane. You can select **Primary**, **Secondary**, or **Tertiary**. Between two adjacent elevation planes, a difference of only one level is allowed. Therefore, secondary elevation planes are only allowed between two primary elevation planes. Similarly, tertiary elevation planes are only allowed between two secondary elevation planes.

Global Location - Displays the location of the elevation plane relative to the global coordinate system.

Delete - Deletes the selected elevation plane. You cannot delete elevation planes that have already been placed in the model.

Related Topics

- *Grid Wizard Command*, page 21
- *Grid Wizard*, page 21

Create Grid X-Planes (Grid Wizard)

Creates new grid planes that are perpendicular to the X-axis of the coordinate system.

Grid X-Plane Settings

Reference CS - Select the coordinate system to reference for the location of the **Start Plane**.

Start plane - Specify the location of the first grid plane. The location is relative to the **East (X)** coordinate of the reference coordinate system. If grid planes already exist, you can select one from the list.

Copies - Type the number of grid plane copies to create.

Spacing - Type the spacing between the grid planes along the X-axis.

End plane - Displays the location of the last grid plane. You cannot edit this value.

Name rule - Select the name rule you want to use to name the grid planes that you are creating. For more information about what each naming rule does, see *Naming Rules: An Overview*, page 16.

Nesting level - Defines the nesting level for the grid plane. You can select **Primary**, **Secondary**, or **Tertiary**. Between two adjacent grid planes, a difference of only one level is allowed. Therefore, secondary grid planes are only allowed between two

primary grid planes. Similarly, tertiary grid planes are only allowed between two secondary grid planes.

Type - Specifies the type of grid plane. Examples of grid plane types are: E-W Grid Plane, N-S Grid Plane, and Expansion Joint Plane. You can define grid plane types in the reference data.

Add - Adds the defined grid plane settings to the **Grid X-Plane Locations** list.

Grid X-Plane Locations

Note

- If you are editing an existing coordinate system, the **Grid X-Plane Locations** grid displays existing planes in blue and new planes in black.

Location - Displays the location of the grid plane relative to its parent coordinate system.

Type - Specifies the type of grid plane. You can change the grid plane type if needed.

Name - Displays the name of the grid plane. You can edit the name by selecting the box and typing a new name.

Nesting level - Displays the nesting level of the grid plane.

Global Location - Displays the location of grid plane relative to the global coordinate system.

Delete - Deletes the selected grid plane. You cannot delete grid planes that have already been placed in the model.

Related Topics

- *Grid Wizard Command*, page 21
- *Grid Wizard*, page 21

Create Grid Y-Planes (Grid Wizard)

Creates new grid planes that are perpendicular to the Y-axis of the coordinate system.

Grid Y-Plane Settings

Reference CS - Select the coordinate system to reference for the location of the **Start Plane**.

Start plane - Specify the location of the first grid plane. The location is relative to the **North (Y)** coordinate of the reference coordinate system. If grid planes already exist, you can select one from the list.

Copies - Type the number of grid plane copies to create.

Spacing - Type the spacing between the grid planes along the Y-axis.

End plane - Displays the location of the last grid plane. You cannot edit this value.

Name rule - Select the name rule to use to name the grid planes that you are creating. For more information about what each naming rule does, see *Naming Rules: An Overview*, page 16.

Nesting level - Defines the nesting level for the grid plane. You can select **Primary**, **Secondary**, or **Tertiary**. Between two adjacent grid planes, a difference of only one level is allowed. Therefore, secondary grid planes are only allowed between two primary grid planes. Similarly, tertiary grid planes are only allowed between two secondary grid planes.

Type - Specifies the type of grid plane. Examples of grid plane types are: E-W Grid Plane, N-S Grid Plane, and Expansion Joint Plane. You can define grid plane types in the reference data.

Add - Adds the defined grid plane settings to the **Grid Y-Plane Locations** list.

Grid Y-Plane Locations

Note

- If you are editing an existing coordinate system, the **Grid Y-Plane Locations** grid displays existing planes in blue and new planes in black.

Location - Displays the location of the grid plane relative to its parent coordinate system.

Type - Specifies the type of grid plane. You can change the grid plane type if needed.

Name - Displays the name of the grid plane. You can edit the name by selecting the box and then typing a new name.

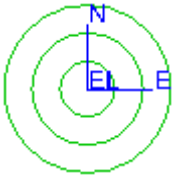
Nesting level - Displays the nesting level of the grid plane.

Global Location - Displays the location of the grid plane relative to the global coordinate system.

Delete - Deletes the selected grid plane. You cannot delete grid planes that have already been placed in the model.

Related Topics
- *Grid Wizard Command*, page 21
- *Grid Wizard*, page 21

Create Radial Cylinder (Grid Wizard)



Creates new radial cylinders by defining the location of the start cylinder, the offset from that location, and the number of copies to generate.

Radial Cylinder Settings

Reference CS - Select the coordinate system to reference for the location of the **Start cylinder**.

Start cylinder - Specify the location of the first cylinder. The location is relative to the **East (X)** coordinate of the coordinate system specified in the **Reference CS** box. If radial cylinders already exist, you can select one from the list.

Copies - Type the number of radial cylinders copies to create.

Spacing - Type the spacing between the radial cylinders.

End cylinder - Displays the location of the last radial cylinder. You cannot edit this value.

Name rule - Select the name rule to use to name the radial cylinder that you are creating. For more information about what each naming rule does, see *Naming Rules: An Overview*, page 16.

Nesting level - Defines the nesting level for the radial cylinder. You can select **Primary**, **Secondary**, or **Tertiary**. Between two adjacent cylinders, a difference of only one level is allowed. Therefore, secondary cylinders are only allowed between two primary cylinders. Similarly, tertiary cylinders are only allowed between two secondary cylinders.

Type - Specifies the type of radial cylinder. Examples of radial cylinders are: E-W Grid Plane, N-S Grid Plane, and Expansion Joint Plane. You can define new radial cylinders in the reference data.

Add - Adds the defined radial cylinders to the **Radial Cylinder Locations** list.

Radial Cylinder Locations

Note

- If you are editing an existing coordinate system, the **Radial Cylinder Locations** list displays existing cylinders in blue and new cylinders in black.

Location - Displays the location of the cylinder with respect to the parent coordinate system origin.

Type - Specifies the type of cylinder. You can change the type if needed.

Name - Displays the name of the cylinder. You can edit the name by selecting the box and then typing a new name.

Nesting level - Displays the nesting level of the cylinder.

Global Location - Displays the location of the cylinder relative to the global coordinate system origin.

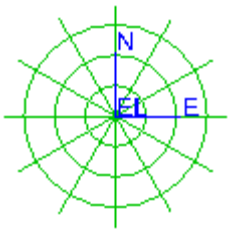
Delete - Deletes the selected cylinder. You cannot delete cylinders that have already been placed in the model.

Related Topics

- *Grid Wizard Command*, page 21
- *Grid Wizard*, page 21

Create Radial Planes (Grid Wizard)

Creates new radial planes around the radial cylinders. Radial planes are placed with respect to the North axis being 0 degrees. Radial planes are placed across the entire radial cylinder. Therefore, you cannot place a plane that is equal to or greater than 180 degrees (the 0 degree plane is the 180 degree plane, the 45 degree plane is the 135 degree plane, and so forth).



Radial Plane Settings

Reference CS - Select the coordinate system to reference for the location of the **Start plane**.

Start plane - Specify the location of the first radial plane. The location is relative to the **North (Y)** coordinate specified for the selected reference coordinate system. If radial planes already exist, you can select one from the list.

Copies - Type the number of radial plane copies to create.

Spacing - Type the spacing between the radial planes along the Y-axis.

End plane - Displays the location of the last radial plane. You cannot edit this value.

Name rule - Select the name rule to use to name the radial planes that you are creating. For more information about what each naming rule does, see *Naming Rules: An Overview*, page 16.

Nesting level - Defines the nesting level for the radial plane. You can select **Primary**, **Secondary**, or **Tertiary**. Between two adjacent radial planes, a difference of only one level is allowed. Therefore, secondary radial planes are only allowed between two primary radial planes. Similarly, tertiary radial planes are only allowed between two secondary radial planes.

Type - Specifies the type of radial plane. You can define radial plane types in the reference data.

Add - Adds the defined radial plane settings to the **Radial Plane Locations** list.

Radial Plane Locations

Note

- If you are editing an existing coordinate system, the **Radial Plane Locations** grid displays existing planes in blue and new planes in black.

Location - Displays the location of the radial plane with respect to the North axis of the parent coordinate system.

Type - Specifies the type of radial plane. You can change the radial plane type if needed.

Name - Displays the name of the radial plane. You can edit the name by selecting the box and then typing a new name.

Nesting level - Displays the nesting level of the radial plane.

Global Location - Displays the location of the radial plane relative to the North axis of the global coordinate system.

Delete - Deletes the selected radial plane. You cannot delete radial planes that have already been placed in the model.

Related Topics

- *Grid Wizard Command*, page 21
- *Grid Wizard*, page 21

Associated Elevation Planes (Grid Wizard)

Specifies where grid lines or arcs appear in the model. You can place grid lines or arcs only where grid planes/cylinders intersect elevation planes. Therefore, you must place at least one elevation plane and one grid plane/cylinder before you can successfully use this page.

Display grid lines on - Specifies how you want to choose the elevation planes that the grid planes/cylinders intersect. The selected elevation planes display a grid line or a grid arc.

Available Elevation Planes - Displays all elevation planes that intersect the active grid plane/cylinder. Elevation planes in this list do not have a grid line/arc.

Selected Elevation Planes - Displays all elevation planes that you have selected to have a grid line/arc.

Add - Moves the selected plane from the **Available Elevation Planes** list to the **Selected Elevation Planes** list.

Remove - Deletes the selected plane from the **Selected Elevation Planes** list. When a plane is removed, it appears in the **Available Elevation Planes** list.

Related Topics

- *Grid Wizard Command*, page 21
- *Grid Wizard*, page 21

Understanding Coordinate Systems: An Overview

You can place rectangular Cartesian coordinate systems, radial coordinate systems, or combine both radial and rectangular planes in a single coordinate system. Both coordinate system shapes are three-dimensional and define points within the space by measuring distances along the X-, Y-, and Z-axes.

There are two types of coordinate systems: the global coordinate system (always a rectangular Cartesian shape) and a design coordinate system (can be either shape).

Global Coordinate System

Each model contains one global coordinate system that you cannot see, edit, or delete. The global coordinate system origin is at (0,0,0) in the model. The positive Y-axis is set as the global north (0 degrees). The positive Z-axis is set as positive elevation.

Design Coordinate System

Design coordinate systems are always created in relation to the global coordinate system. Because you cannot see the global coordinate system, you may want to create your first design coordinate system at global (0,0,0) with the Y-axis bearing set to 0 so that you can visually reference the global coordinate system.

A design coordinate system is used to specify locations more conveniently when modeling. For example, it may be more convenient to route piping in a pipe rack with respect to the southwest corner of the pipe rack than to route piping with respect to the global coordinate system origin. This instance is especially the case if the pipe rack is located a great distance from the global coordinate system origin. Therefore, you would create a new design coordinate system with the origin corresponding to the southwest corner of the pipe rack. Then, using the pipe rack coordinate system as the active coordinate system, place the structural members of the pipe rack and route the piping through the rack.

Another useful feature of design coordinate systems is the ability to rotate the design coordinate system north from the global coordinate system north. This rotation would further ease placement operations if the pipe rack were rotated at an odd angle with respect to the global coordinate system.

You can also use design coordinate systems to specify a model monument. Think of the model monument as the master reference point for the model. For most models, the origin corresponds to a survey benchmark or some well-known, immovable landmark at the model site from which measurements can be made.

Important

- Due to the 32-bit precision limitations of graphic cards, you may need to create several design coordinate systems so that the objects being modeled are within 10,000 meters (6.2 miles) of the global coordinate system. Objects modeled outside this limit will not display correctly. If your model

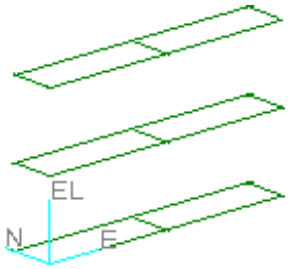
coordinate values are larger that this limit (for example, E = 20,000, N = 30,000), to get the coordinate readout that you want, you should define a coordinate system at correspondingly large negative values (example, E = -20,000, N = -30,000). Then, use the coordinate system you created as your active coordinate system for modeling and output. Do not bring this new coordinate system into your workspace or you will have the display problems that you are trying to avoid.

Related Topics

- *Copy a Coordinate System*, page 37
- *Delete a Coordinate System*, page 39
- *Edit a Coordinate System Name*, page 37
- *Edit Coordinate System Properties*, page 38
- *Modify Coordinate System Bearing*, page 38
- *Modify Coordinate System System*, page 39
- *Move a Coordinate System Origin*, page 38
- *Place a Coordinate System*, page 36
- *Understanding Grids: An Overview*, page 11

Place Coordinate System Command

Defines a geographical reference that you can use to specify distances for input, read positions for output, and view orientation of the model. For example, your design might have a building or a pipe rack that is skewed in relation to the global coordinate system. To make modeling easier, you can create a rotated design coordinate system for that building or pipe rack.



Generally, you create all of your needed design coordinate systems at the beginning of a project. However, you can place design coordinate systems at any time during a project.

The software represents each design coordinate system that you place using a triad showing the north (N), east (E), and elevation (EL) axes of the design coordinate system.

Related Topics

- *Copy a Coordinate System*, page 37
- *Delete a Coordinate System*, page 39
- *Edit a Coordinate System Name*, page 37
- *Edit Coordinate System Properties*, page 38
- *Modify Coordinate System Bearing*, page 38
- *Modify Coordinate System System*, page 39
- *Move a Coordinate System Origin*, page 38
- *Place a Coordinate System*, page 36
- *Understanding Coordinate Systems: An Overview*, page 31

Coordinate System Ribbon

Sets options for the design coordinate system that you are placing.

Properties - Activates the **Coordinate System Properties** dialog box. For more information, see *Coordinate System Properties Dialog Box*, page 34.

Origin - Specifies the origin of the new design coordinate system in relation to the global coordinate system. A red dot, which provides visual feedback for the location of the origin, follows the pointer while you are defining the coordinate system origin. The software places a coordinate system triad at the origin when you have defined it.

Axis Direction - Defines the orientation of the axis. The system uses a point that you define and the origin of the coordinate system to define the orientation of the axis. The coordinate system triad rotates as you are defining the axis direction.

Axis - Specifies the axis that you want to use to define the rotation of the coordinate system that you are placing. You can select the **North**, **South**, **East**, or **West** axis.

Lock/Unlock Bearing Angle - Turns locking on and off for the bearing angle.

Bearing Angle - Displays or sets the bearing angle for the axis. This box displays the bearing angle defined by the origin and the point that you defined in the **Axis Direction** box. Valid values are **0** to **90**.

System - Specifies the parent system for the design coordinate system that you are creating.

Name - Defines the name of the design coordinate system that you are creating.

Related Topics

- *Modify Coordinate System Bearing*, page 38
- *Place a Coordinate System*, page 36
- *Place Coordinate System Command*, page 32

Coordinate System Properties Dialog Box

Sets properties, or options, for the selected coordinate system.

Related Topics

- *Configuration Tab*, page 35
- *Coordinate System Ribbon*, page 33
- *General Tab (Coordinate System Properties Dialog Box)*, page 34
- *Relationship Tab*, page 36

General Tab (Coordinate System Properties Dialog Box)

Sets the general properties of the selected design coordinate system.

Standard

Parent System - Displays the name of the system to which the coordinate system belongs.

Name - Specifies the name of the design coordinate system.

Description - Displays a description of the design coordinate system.

Global X - Sets the origin X-coordinate of the design coordinate system. The X-coordinate is given in relation to the Global Coordinate System.

Global Y - Sets the origin Y-coordinate of the design coordinate system. The Y-coordinate is given in relation to the Global Coordinate System.

Global Z - Sets the origin Z-coordinate of the design coordinate system. The Z-coordinate is given in relation to the Global Coordinate System.

North (Y) Axis Direction - Sets the compass bearing of the Y-axis of the coordinate system relative to the Y-axis of the Global Coordinate System.

Drawing Style

You can use the **Drawing Style** property to suppress or include user-selected grid entities in a drawing document. When you create a drawing view style in the Drawings and Reports task, you can specify a filter that looks for the **Drawing Style** and uses that property to specify how the grid entities are symbolized in the drawing document.

Drawing Style 1 - Select a drawing style for which you want grid entities to appear in your drawings.

Drawing Style 2 - Select a second drawing style for which you want grid entities to appear in your drawings.

Tip

- You can add your own custom drawing styles by adding them to the *[Product Directory]*\CatalogData\Bulkload\DataFiles\GridsDrawingStyleIntf.xls. You also need to add the property values to the codelist defined in *[Product Directory]*\CatalogData\Bulkload\DataFiles\GridsCodelist.xls. The modified workbooks will need to be bulkloaded for the changes to appear.

Related Topics

- *Coordinate System Properties Dialog Box*, page 34

Configuration Tab

Displays the creation, modification, and status information about an object.

Plant - Displays the name of the model. You cannot change this value.

Permission Group - Specifies the permission group to which the object belongs. You can select another permission group, if needed. Permission groups are created in the Project Management task.

Transfer - Re-assigns ownership of the selected model objects from their current permission group to another satellite or host permission group. This button is only available if the active model/project is replicated in a workshare configuration. The button is not available if all of the objects in the select set already belong to another location and are non-transferable.

Note

- The **Transfer** option does not apply to the Surface Style Rules.

Status - Specifies the current status of the selected object or filter. Depending on your access level, you may not be able to change the status of the object.

Created - Displays the date and time that the object was created.

Created by - Displays the user name of the person who created the object.

Modified - Displays the date and time when the object was modified.

Modified by - Displays the user name of the person who modified the object.

Relationship Tab

Displays all objects related to the object for which you are viewing properties. For example, if you are viewing the properties of a pipe run, the related pipeline, features, parts, associated control points, hangers or supports, and equipment display on this tab. All WBS assignments, including project relationships, appear on this tab.

Name - Displays the name of the related object.

Type - Displays the type of related object.

Go To - Displays the properties of the selected object.

Place a Coordinate System

1. Click **Place Coordinate System** on the vertical toolbar.
2. Specify the origin of the coordinate system by clicking in a graphical view.
3. Select the reference axis in the **Axis** box on the ribbon.
4. Define the direction of the reference axis by clicking in a graphic view.

Notes

- You can also define the bearing of the reference axis by using the **Bearing Angle** box on the ribbon.
- The software always assumes that up is vertical.

Related Topics

- *Understanding Coordinate Systems: An Overview*, page 31

Copy a Coordinate System

1. Click **Select** on the vertical toolbar.
2. Select **Coordinate System** in the **Locate Filter** box.
3. In the **Workspace Explorer**, select the coordinate system to copy.
4. Click **Edit > Copy**.
5. Click **Edit > Paste**.
6. In the **Selection** column, select a parent system for the newly copied coordinate system, and then click **OK** on the **Paste Special** dialog box.
7. Click **Origin** on the ribbon.
8. Identify the origin location for the copied coordinate system in a graphic view.
9. Click in the **Name** box on the ribbon, and then type a new name for the copied coordinate system.

Related Topics

- *Understanding Coordinate Systems: An Overview*, page 31

Edit a Coordinate System Name

1. Click **Select** on the vertical toolbar.
2. Select **Coordinate System** in the **Locate Filter** box.
3. Select the coordinate system to rename.
4. Click **Edit > Properties**.
5. Select the **General** tab.
6. Type a new name in the **Name** box.

Related Topics

- *Understanding Coordinate Systems: An Overview*, page 31

Move a Coordinate System Origin

1. Click **Select** on the vertical toolbar.
2. Select **Coordinate System** in the **Locate Filter** box.
3. Select the coordinate system to move.
4. Click **Origin** on the ribbon.
5. Identify the new origin location in a graphic view.

Related Topics

- *Understanding Coordinate Systems: An Overview*, page 31

Edit Coordinate System Properties

1. Click **Select** on the vertical toolbar.
2. Select **Coordinate System** in the **Locate Filter** box.
3. Select the coordinate system to edit.
4. Click **Edit** > **Properties**.
5. Edit the properties as needed.

Related Topics

- *Coordinate System Properties Dialog Box*, page 34

Modify Coordinate System Bearing

1. Click **Select** on the vertical toolbar.
2. Select **Coordinate System** in the **Locate Filter** box.
3. Select the coordinate system to modify.
4. If the bearing angle is locked, click **Lock/Unlock Bearing Angle** to modify the angle.
5. Type a new bearing in the **Bearing Angle** box.

Related Topics

- *Understanding Coordinate Systems: An Overview*, page 31

Modify Coordinate System System

1. Click **Select** on the vertical toolbar.
2. Select **Coordinate System** in the **Locate Filter** box.
3. Select the coordinate system to edit.
4. Click **Edit > Properties**.
5. Select the **General** tab.
6. Select a new system from the **System** box.

Related Topics

- *Understanding Coordinate Systems: An Overview*, page 31

Delete a Coordinate System

1. Click **Select** on the vertical toolbar.
2. Select **Coordinate System** in the **Locate Filter** box.
3. Select the coordinate system to delete.
4. Click **Edit > Delete**.

Note

- All grid and elevation planes associated with the deleted coordinate system are also deleted.

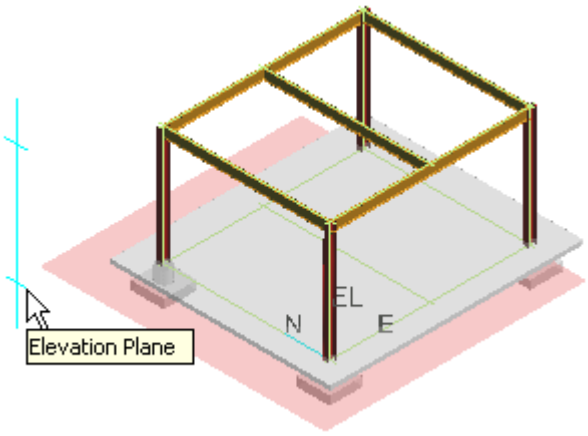
Related Topics

- *Understanding Coordinate Systems: An Overview*, page 31

Understanding Elevation Planes: An Overview

Grid planes are used to define the location of grid lines in the model. Assigned to individual coordinate systems, there are two types of grid planes: elevation planes and grid planes.

Elevation planes define the elevation, or height, of the grid line with respect to the origin of the coordinate system. Elevation planes are always parallel to the X-Y plane of the coordinate system.



Related Topics

- *Change Elevation Plane Type*, page 46
- *Copy an Elevation Plane*, page 45
- *Delete Elevation Plane*, page 48
- *Edit Elevation Plane Name*, page 48
- *Edit Elevation Plane Properties*, page 46
- *Modify Elevation Plane Offset*, page 46
- *Modify Elevation Plane Position*, page 47
- *Modify the Offset Between Elevation Planes*, page 47
- *Place an Elevation Plane*, page 45
- *Place Multiple Elevation Planes*, page 45
- *Understanding Grids: An Overview*, page 11

Place Elevation Plane Command

 Creates elevation planes in the coordinate system with which it is associated. Generally, you create elevation planes after you have created the design coordinate system but before you have modeled anything.

For example, you created a design coordinate system for a pipe rack to model. Now, using the **Place Elevation Plane** command, you create an elevation plane for each level in the pipe rack including the ground level.

Related Topics

- *Change Elevation Plane Type*, page 46
- *Copy an Elevation Plane*, page 45
- *Delete Elevation Plane*, page 48
- *Edit Elevation Plane Name*, page 48
- *Edit Elevation Plane Properties*, page 46
- *Modify Elevation Plane Offset*, page 46
- *Modify Elevation Plane Position*, page 47
- *Modify the Offset Between Elevation Planes*, page 47
- *Place an Elevation Plane*, page 45
- *Place Multiple Elevation Planes*, page 45
- *Understanding Elevation Planes: An Overview*, page 41

Place Elevation Plane Ribbon

Displays the available options when placing or editing elevation planes.

 **Properties** - Activates the **Elevation Planes Properties** dialog box. For more information about this dialog box, see *Elevation Planes Properties Dialog Box*, page 43.

 **Position** - Specifies the elevation location of the elevation plane in reference to the **Up (Z)** origin coordinate of the specified design coordinate system.

CS - Identifies the design coordinate system to which the plane belongs. The origin of this coordinate system is used to define the position of the elevation plane.

Type - Specifies the type of elevation plane. The types of elevation planes are defined in the reference data.

Reference - Defines the reference plane from which the elevation plane is referenced.

Offset - Specifies the offset between the reference plane and the elevation plane that you are creating.

Copies - Specifies the number of elevation planes to create using the specified **Reference** plane as the starting point and the **Offset** as the distance between the elevation planes. This option is only available when placing elevation planes.

Nesting level - Defines the nesting level for the elevation plane. You can select **Primary**, **Secondary**, or **Tertiary**. Between two adjacent planes, a difference of only one level is allowed. Therefore, secondary planes are only allowed between two primary planes. Similarly, tertiary planes are only allowed between two secondary planes.

Related Topics

- *Change Elevation Plane Type*, page 46
- *Copy an Elevation Plane*, page 45
- *Delete Elevation Plane*, page 48
- *Edit Elevation Plane Name*, page 48
- *Edit Elevation Plane Properties*, page 46
- *Modify Elevation Plane Offset*, page 46
- *Modify Elevation Plane Position*, page 47
- *Modify the Offset Between Elevation Planes*, page 47
- *Place an Elevation Plane*, page 45
- *Place Elevation Plane Command*, page 42
- *Place Multiple Elevation Planes*, page 45

Elevation Planes Properties Dialog Box

Sets properties, or options, for the selected elevation plane.

Related Topics

- *Associated Elevation Planes Dialog Box*, page 52
- *Configuration Tab*, page 35
- *General Tab (Elevation Plane Properties Dialog Box)*, page 44
- *Place Elevation Plane Ribbon*, page 42
- *Relationship Tab*, page 36

General Tab (Elevation Plane Properties Dialog Box)

Sets the general properties of the selected elevation plane.

Standard

Coordinate System - Specifies the name of the coordinate system associated with the elevation plane.

Naming Rule - Specifies the name rule used to specify the default elevation plane name.

Name - Specifies the name of the elevation plane. Type a new name if needed.

Nesting level - Defines the nesting level for the elevation plane. You can select **Primary**, **Secondary**, or **Tertiary**. Between two adjacent planes, a difference of only one level is allowed. Therefore, secondary planes are only allowed between two primary planes. Similarly, tertiary planes are only allowed between two secondary planes.

Type - Specifies the type of elevation plane, such as, top-of-steel. The elevation plane types are defined in the reference data.

Elevation - Displays the elevation of the elevation plane with reference to the coordinate system origin.

Drawing Style

You can use the **Drawing Style** property to suppress or include user-selected grid entities in a drawing document. When you create a drawing view style in the Drawings and Reports task, you can specify a filter that looks for the **Drawing Style** and uses that property to specify how the grid entities are symbolized in the drawing document.

Drawing Style 1 - Select a drawing style for which you want grid entities to appear in your drawings.

Drawing Style 2 - Select a second drawing style for which you want grid entities to appear in your drawings.

Tip

- You can add your own custom drawing styles by adding them to the *[Product Directory]*\CatalogData\Bulkload\DataFiles\GridsDrawingStyleIntf.xls. You also need to add the property values to the codelist defined in *[Product Directory]*\CatalogData\Bulkload\DataFiles\GridsCodelist.xls. The modified workbooks will need to be bulkloaded for the changes to appear.

Related Topics

- *Elevation Planes Properties Dialog Box*, page 43

Place an Elevation Plane

1. Click **Place Elevation Plane** on the vertical toolbar.
2. Select the coordinate system to associate with the elevation plane.
3. In the **Type** box, select the type of elevation plane.
4. In the **Reference** box, select the reference plane.
5. In the **Offset** box, type the offset, if any, from the reference plane at which you want to place the elevation plane.

Related Topics

- *Understanding Elevation Planes: An Overview*, page 41

Place Multiple Elevation Planes

1. Click **Place Elevation Plane** on the vertical toolbar.
2. Select the coordinate system to associate with the elevation planes.
3. In the **Type** box, select the type of elevation planes.
4. In the **Reference** box, select the reference plane from which to offset the first elevation plane.
5. In the **Copies** box, type the number of copies to place.

Related Topics

- *Understanding Elevation Planes: An Overview*, page 41

Copy an Elevation Plane

1. Click **Select** on the vertical toolbar.
2. Select **Elevation Plane** in the **Locate Filter** box.
3. Select the plane to copy.
4. Click **Edit > Copy**.
5. Click **Edit > Paste**.
6. In the **Selection** column of the **Paste Special** dialog box, select the coordinate system to which to copy the plane.
7. Click **OK** on the **Paste Special** dialog box.

Notes

- The coordinate system that you are copying to cannot have an existing plane at that same relative location.

- The nesting level must be maintained. For example, if you are copying a secondary plane, you must paste it between two primary planes in the new coordinate system.

Related Topics
- *Understanding Elevation Planes: An Overview*, page 41

Change Elevation Plane Type

1. Click **Select** on the vertical toolbar.
2. Select **Elevation Plane** in the **Locate Filter** box.
3. Select the elevation plane to edit.
4. In the **Type** box, select the new elevation plane type.

Related Topics
- *Understanding Elevation Planes: An Overview*, page 41

Edit Elevation Plane Properties

1. Click **Select** on the vertical toolbar.
2. Select **Elevation Plane** in the **Locate Filter** box.
3. Select the elevation plane to edit.
4. Click **Edit > Properties**.
5. Edit the properties as needed.

Related Topics
- *Elevation Planes Properties Dialog Box*, page 43

Modify Elevation Plane Offset

1. Click **Select** on the vertical toolbar.
2. Select **Elevation Plane** in the **Locate Filter** box.
3. Select the elevation plane to edit.
4. Type the new offset value in the **Offset** box.

Related Topics
- *Understanding Elevation Planes: An Overview*, page 41

Modify the Offset Between Elevation Planes

1. Click **Select** on the vertical toolbar.
2. Select **Elevation Plane** in the **Locate Filter** box.
3. Select the elevation planes to edit.
4. Type a new offset value in the **Offset** box.

Notes

- You must select a continuous set of elevation planes to modify. That is, you cannot select the bottom elevation plane and the very top elevation plane to modify without selecting all intermediate planes.

Related Topics

- *Understanding Elevation Planes: An Overview*, page 41

Modify Elevation Plane Position

1. Click **Select** on the vertical toolbar.
2. Select **Elevation Planes** in the **Locate Filter** box.
3. Select the elevation plane to edit.
4. Click **Position** on the ribbon.
5. Specify the new elevation plane position by clicking in the graphic view.

Notes

- You can also define the new position by typing a new offset value in the **Offset** box.

Related Topics

- *Understanding Elevation Planes: An Overview*, page 41

Edit Elevation Plane Name

1. Click **Select** on the vertical toolbar.
2. Select **Elevation Planes** in the **Locate Filter** box.
3. Select the elevation plane to edit.
4. In the **Name** box, type a new name for the elevation plane.

Related Topics

- *Understanding Elevation Planes: An Overview*, page 41

Delete Elevation Plane

1. Click **Select** on the vertical toolbar.
2. Select **Elevation Planes** in the **Locate Filter** box.
3. Select the elevation plane to delete.
4. Click **Delete**.

Note

- You cannot delete elevation planes that have constraints with other objects in the model.

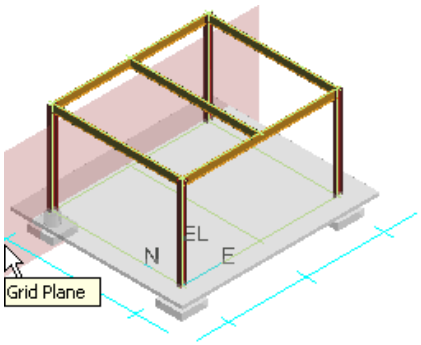
Related Topics

- *Understanding Elevation Planes: An Overview*, page 41

Understanding Grid Planes: An Overview

Grid planes are used to define the location of grid lines in the model. Assigned to individual coordinate systems, there are two types of grid planes: elevation planes and grid planes.

In rectangular coordinate systems, grid planes define the grid line location with respect to the X- or Y-axis of the coordinate system. Grid planes are generally parallel to the X-Z or Y-Z plane of the coordinate system, but can be placed rotated (sloped) about the placement axis, which is the X- or Y-axis. The grid line is defined by the intersection of the grid plane with the elevation plane. You optionally can place grid lines at all or some intersections. In general, use the *Place Grid Plane Command*, page 50 with rectangular coordinate systems.



In radial coordinate systems, grid planes define the grid line location with respect to the north axis of the coordinate system. The grid planes are rotated about the coordinate system origin. The grid line is defined by the intersection of the grid plane with the elevation plane. You optionally can place grid lines at all or some intersections. In general, use the *Place Radial Grid Command*, page 60 with radial coordinate systems.

Related Topics

- *Change Grid Plane Type*, page 58
- *Copy a Grid Plane*, page 56
- *Delete a Grid Line*, page 59
- *Delete a Grid Plane*, page 59
- *Edit Grid Plane Name*, page 58
- *Edit Grid Plane Nesting Level*, page 58
- *Edit Grid Plane Properties*, page 57
- *Modify the Grid Plane Offset*, page 57
- *Modify the Grid Plane Position*, page 56
- *Modify the Offset Between Grid Planes*, page 57
- *Place a Grid Plane*, page 55
- *Place Multiple Grid Planes*, page 55
- *Regenerate Grid Lines*, page 59
- *Understanding Grids: An Overview*, page 11

Place Grid Plane Command

Creates grid planes that are perpendicular to the X- or Y-axes in the associated coordinate system. Generally, you create your design coordinate system, then create the elevation planes, and then create the grid planes. The intersection of the grid plane and the elevation plane create grid lines. You control which intersections create grid lines and which intersections do not.

Note

- Place more than one grid plane on the axis. If the grid lines are not bounded by two planes, the software creates them 100 m long.

For example, you created a design coordinate system for a pipe rack that you want to model. Using the **Place Elevation Plane** command, you create an elevation plane for each level in the pipe rack, including the ground level. Then you use this command to create the grid planes for each column row.

Related Topics

- *Change Grid Plane Type*, page 58
- *Copy a Grid Plane*, page 56
- *Delete a Grid Line*, page 59
- *Delete a Grid Plane*, page 59
- *Edit Grid Plane Name*, page 58
- *Edit Grid Plane Nesting Level*, page 58
- *Edit Grid Plane Properties*, page 57
- *Modify the Grid Plane Offset*, page 57
- *Modify the Grid Plane Position*, page 56
- *Modify the Offset Between Grid Planes*, page 57
- *Place a Grid Plane*, page 55
- *Place Multiple Grid Planes*, page 55
- *Regenerate Grid Lines*, page 59
- *Understanding Grid Planes: An Overview*, page 49

Place Grid Plane Ribbon

Displays the available grid plane options when placing or editing a grid plane.

Properties - Activates the **Grid Plane Properties** dialog box. For more information, see *Grid Plane Properties Dialog Box*, page 53.

Elevation Plane Position - Activates the **Associated Elevation Planes** dialog box. Use this dialog box to specify the elevation planes that the grid plane intersects where you want the software to generate grid lines. For more information, see *Associated Elevation Planes Dialog Box*, page 52.

Grid Plane Position - Specifies the intercept point of the grid plane to the axis.

CS - Specifies the coordinate system to which the grid plane belongs.

Axis - Identifies the coordinate system axis used to define the grid plane. The **Axis** value must be **X** or **Y**.

Type - Specifies the type of grid plane. You can define grid plane types in the reference data.

Reference - Defines the reference plane from which the grid plane is referenced.

Offset - Specifies the offset between the reference plane and the grid plane that you are creating.

Copies - Specifies the number of grid planes to create using the specified **Reference** plane as the starting point and the **Offset** as the distance between the grid planes.

Nesting Level - Defines the nesting level for the grid plane. You can select **Primary**, **Secondary**, or **Tertiary**. Between two adjacent grid planes, a difference of only one level is allowed. Therefore, secondary grid planes are only allowed between two primary grid planes. Similarly, tertiary grid planes are only allowed between two secondary grid planes.

Related Topics

- *Change Grid Plane Type*, page 58
- *Copy a Grid Plane*, page 56
- *Delete a Grid Line*, page 59
- *Delete a Grid Plane*, page 59
- *Edit Grid Plane Name*, page 58
- *Edit Grid Plane Nesting Level*, page 58
- *Edit Grid Plane Properties*, page 57
- *Modify the Grid Plane Offset*, page 57
- *Modify the Grid Plane Position*, page 56
- *Modify the Offset Between Grid Planes*, page 57
- *Place a Grid Plane*, page 55
- *Place Grid Plane Command*, page 50
- *Place Multiple Grid Planes*, page 55
- *Regenerate Grid Lines*, page 59

Associated Elevation Planes Dialog Box

The **Associated Elevation Planes** dialog box specifies where grid lines appear in the model. You can place grid lines only where grid planes intersect elevation planes. Therefore, you must place at least one elevation plane and one grid plane before you can successfully use this dialog box.

Grid lines displayed on - Specifies how you want to choose the elevation planes that the grid planes intersect. The selected elevation planes will display a grid line.

If you select **All Planes**, all elevation planes that the grid plane intersects will display a grid line. In addition, if you add another elevation plane that intersects the grid plane, that elevation plane will automatically display a grid line without having to select that elevation plane in this dialog box.

If you select **Selected Elevation Planes**, only the elevation planes that you specify in the **Selected Elevation Planes** list will display a grid line.

Available Elevation Planes - Displays all elevation planes that intersect the active grid plane. Elevation planes in this list will not have a grid line.

Selected Elevation Planes - Displays all elevation planes that you have selected to have a grid line.

Add - Moves the selected plane from the **Available Elevation Planes** list to the **Selected Elevation Planes** list.

Remove - Deletes the selected plane from the **Selected Elevation Planes** list. When a plane is removed, it appears in the **Available Elevation Planes** list.

Related Topics

- *Associated Elevation Planes Dialog Box*, page 52
- *Change Grid Plane Type*, page 58
- *Copy a Grid Plane*, page 56
- *Delete a Grid Line*, page 59
- *Delete a Grid Plane*, page 59
- *Edit Grid Plane Name*, page 58
- *Edit Grid Plane Nesting Level*, page 58
- *Edit Grid Plane Properties*, page 57
- *Modify the Grid Plane Offset*, page 57
- *Modify the Grid Plane Position*, page 56
- *Modify the Offset Between Grid Planes*, page 57
- *Place a Grid Plane*, page 55
- *Place Grid Plane Command*, page 50
- *Place Grid Plane Ribbon*, page 51
- *Place Multiple Grid Planes*, page 55
- *Regenerate Grid Lines*, page 59

Grid Plane Properties Dialog Box

Sets properties, or options, for the selected grid plane.

Related Topics

- *Associated Elevation Planes Dialog Box*, page 52
- *Configuration Tab*, page 35
- *General Tab (Grid Plane Properties Dialog Box)*, page 53
- *General Tab (Radial Grid Properties Dialog Box)*, page 62
- *Place Grid Plane Ribbon*, page 51
- *Relationship Tab*, page 36

General Tab (Grid Plane Properties Dialog Box)

Sets the general properties of the selected grid plane.

Standard

Coordinate System - Specifies the coordinate system to which the grid plane belongs.

Naming Rule - Specifies the user-defined rule used to generate the name of the grid plane.

Name - Specifies the name of the grid plane.

Nesting Level - Defines the nesting level for the grid plane. You can select **Primary**, **Secondary**, or **Tertiary**. Between two adjacent grid planes, a difference of only one level is allowed. Therefore, secondary grid planes are only allowed between two primary grid planes. Similarly, tertiary grid planes are only allowed between two secondary grid planes. The name rule uses this value to automatically create nested grid plane names.

Axis of Placement - Identifies the coordinate system axis used to define the grid plane. The **Axis of Placement** value must be **X** or **Y**.

Axis of Rotation - Identifies the coordinate system axis about which the grid plane rotates to give a skewed orientation. This **Axis of Rotation** value cannot be the axis that you specified in the **Axis of Placement** box. For example, if the **Axis of Placement** is the X-axis, then the **Axis of Rotation** must be the Y- or Z-axis. This option is useful when you want to model something with sloped sides, such as an offshore jacket.

Angle of Rotation Axis - Specifies the angle the plane makes about the **Axis of Rotation** using the right-hand rule. A rectangular grid plane is perpendicular to the **Axis of Rotation**.

Type - Specifies the type of grid plane. Examples of grid plane types are: interior wall, building edge, and girt line. You can define grid plane types in the reference data.

Position - Specifies the intersection point of the grid plane to the axis.

Drawing Style

You can use the **Drawing Style** property to suppress or include user-selected grid entities in a drawing document. When you create a drawing view style in the Drawings and Reports task, you can specify a filter that looks for the **Drawing Style** and uses that property to specify how the grid entities are symbolized in the drawing document.

Drawing Style 1 - Select a drawing style for which you want grid entities to appear in your drawings.

Drawing Style 2 - Select a second drawing style for which you want grid entities to appear in your drawings.

Tip

- You can add your own custom drawing styles by adding them to the *[Product Directory]*\CatalogData\Bulkload\DataFiles\GridsDrawingStyleIntf.xls. You also need to add the property values to the codelist defined in *[Product Directory]*\CatalogData\Bulkload\DataFiles\GridsCodelist.xls. The modified workbooks will need to be bulkloaded for the changes to appear.

Related Topics

- *Grid Plane Properties Dialog Box*, page 53
- *Radial Grid Properties Dialog Box*, page 62

Grid Line Properties Dialog Box

Sets properties, or options, for the selected grid line.

Related Topics

- *Configuration Tab*, page 35
- *Relationship Tab*, page 36

Place a Grid Plane

1. Click **Place Grid Plane** on the vertical toolbar.
2. In the **CS** box, select the coordinate system to which the grid plane belongs.
3. In the **Axis** box, select the coordinate system axis along which to place the grid plane.
4. In the **Type** box, select the type of grid plane to place.
5. Specify the location of the grid plane by clicking in a graphic view.
6. In the **Nesting Level** box, select the nesting level of the grid planes.

Note

- Place more than one grid plane on the axis. If the grid lines are not bounded by two planes, the software creates them 100 m long.

Related Topics

- *Understanding Grid Planes: An Overview*, page 49

Place Multiple Grid Planes

1. Click **Place Grid Plane** on the vertical toolbar.
2. In the **CS** box, select the coordinate system to which the grid planes belong.
3. In the **Axis** box, select the coordinate system axis along which to place the grid planes.
4. In the **Type** box, select the type of grid planes to place.
5. In the **Copies** box, type the number of copies to place.
6. In the **Offset** box, type the offset between the grid planes.
7. Specify the location of the grid planes by clicking in a graphic view.
8. Select the nesting level of the grid planes.

Related Topics

- *Understanding Grid Planes: An Overview*, page 49

Copy a Grid Plane

1. Click **Select** on the vertical toolbar.
2. Select **Grid Plane** in the **Locate Filter** box.
3. Select the grid plane to copy.
4. Click **Edit > Copy**.
5. Click **Edit > Paste**.
6. In the **Paste Special** dialog box, select the coordinate system to which to copy the grid plane.
7. Click **OK** on the **Paste Special** dialog box.

Notes

- The coordinate system that you are copying to cannot have an existing grid plane at that same relative location.
- The nesting level must be maintained. For example, if you are copying a secondary grid plane, you must paste it between two primary grid planes in the new coordinate system.

Related Topics

- *Understanding Grid Planes: An Overview*, page 49

Modify the Grid Plane Position

1. Click **Select** on the vertical toolbar.
2. Select **Grid Plane** in the **Locate Filter** box.
3. Select the grid plane to move.
4. Click **Grid Plane Position** on the ribbon.
5. Specify the new location.

Related Topics

- *Understanding Grid Planes: An Overview*, page 49

Modify the Grid Plane Offset

1. Click **Select** on the vertical toolbar.
2. Select **Grid Plane** in the **Locate Filter** box.
3. Select the grid plane to move.
4. Type a new offset value.

Related Topics

- *Understanding Grid Planes: An Overview*, page 49

Modify the Offset Between Grid Planes

1. Click **Select** on the vertical toolbar.
2. Select **Grid Plane** in the **Locate Filter** box.
3. Select the multiple grid planes to edit.
4. Type a new offset value.

Note

- You must select a continuous set of grid planes of the same nesting level to modify. That is, you cannot select the west-most grid plane and the east-most grid plane to modify without selecting all intermediate planes.

Related Topics

- *Understanding Grid Planes: An Overview*, page 49

Edit Grid Plane Properties

1. Click **Select** on the vertical toolbar.
2. Select **Grid Plane** in the **Locate Filter** box.
3. Select the grid plane to edit.
4. Click **Edit > Properties**.
5. Edit the properties as needed.

Related Topics

- *Grid Plane Properties Dialog Box*, page 53
- *Radial Grid Properties Dialog Box*, page 62

Edit Grid Plane Name

1. Click **Select** on the vertical toolbar.
2. Select **Grid Plane** in the **Locate Filter** box.
3. Select the grid plane to edit.
4. Type a new name for the grid plane.

Related Topics

- *Understanding Grid Planes: An Overview*, page 49

Edit Grid Plane Nesting Level

1. Click **Select** on the vertical toolbar.
2. Select **Grid Plane** in the **Locate Filter** box.
3. Select the grid plane to edit.
4. Select a new nesting level.

Note

- Between two adjacent grid planes, a difference of only one level is allowed. Therefore, secondary grid planes are only allowed between two primary grid planes. Similarly, tertiary grid planes are only allowed between two secondary grid planes.

Related Topics

- *Understanding Grid Planes: An Overview*, page 49

Change Grid Plane Type

1. Click **Select** on the vertical toolbar.
2. Select **Grid Plane** in the **Locate Filter** box.
3. Select the grid plane to edit.
4. Select a new type from the list.

Note

- You can define the grid planes types in the reference data.

Related Topics

- *Understanding Grid Planes: An Overview*, page 49

Delete a Grid Plane

1. Click **Select** on the vertical toolbar.
2. Select **Grid Plane** in the **Locate Filter** box.
3. Select the grid plane to delete.
4. Click **Delete**.

Related Topics

- *Understanding Grid Planes: An Overview*, page 49

Delete a Grid Line

1. Click **Select** on the vertical toolbar.
2. Select **Grid Line** in the **Locate Filter** box.
3. Select the grid line to delete.
4. Click **Delete**.

Note

- When you delete the gridline, the software also deletes all relationships to that gridline.

Related Topics

- *Understanding Grid Planes: An Overview*, page 49

Regenerate Grid Lines

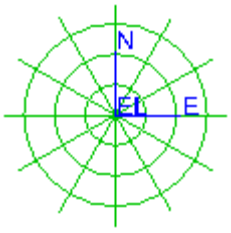
1. Click **Select** on the vertical toolbar.
2. Select **Grid Plane** in the **Locate Filter** box.
3. Select the grid plane that contains the grid lines to regenerate.
4. Click **Elevation Plane Position** on the ribbon.
5. Use the dialog box to specify the elevation planes that the grid plane intersects where you want the software to generate grid lines. For more information, see *Associated Elevation Planes Dialog Box*, page 52.

Related Topics

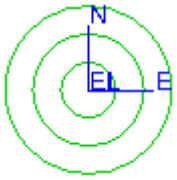
- *Understanding Grid Planes: An Overview*, page 49

Place Radial Grid Command

Creates radial planes and cylinders in the associated coordinate system. Generally, you create your design coordinate system, then create the elevation planes, and then create the cylinders and radial planes. The intersection of the radial planes and the elevation plane create grid lines. The intersection of the cylinders and the elevation plane create grid arcs. There are 4 grid arcs, one of each quadrant of the coordinate system. You control which intersections create grid lines/arcs and which intersections do not.



Radial planes are placed with respect to the North axis being 0 degrees. Radial planes are placed across the entire radial cylinder. Therefore, you cannot place a plane that is equal to or greater than 180 degrees (the 0 degree plane is the 180 degree plane, the 45 degree plane is the 135 degree plane, and so forth).



Cylinders are placed by defining the location of the start cylinder with regard to a reference location, the offset from that location, and the number of copies to generate. The spacing between the cylinder copies is equal to the defined offset.

Related Topics

- *Copy a Radial Cylinder*, page 65
- *Copy a Radial Plane*, page 64
- *Place a Radial Cylinder*, page 65
- *Place a Radial Plane*, page 63
- *Place Multiple Radial Cylinders*, page 65
- *Place Multiple Radial Planes*, page 64
- *Understanding Grid Planes: An Overview*, page 49

Place Radial Grid Ribbon

Displays the available radial plane options when placing or editing a radial grid plane or cylinder.

Properties - Activates the **Radial Grid Properties** dialog box. For more information, see *Radial Grid Properties Dialog Box*, page 62.

Elevation Plane Position - Activates the **Associated Elevation Planes** dialog box. Use this dialog box to specify the elevation planes that the cylinder or radial plane intersects where you want the software to generate grid lines or grid arcs. For more information, see *Associated Elevation Planes Dialog Box*, page 52.

Radial Grid Position - Specifies the intercept point of the cylinder or radial grid plane to the axis. This option is currently not available.

CS - Specifies the coordinate system to which the cylinder or radial plane belongs.

Axis - Select **C** to place a cylinder. Select **R** to place a radial plane.

Type - Specifies the type of cylinder or radial grid plane. You can define radial grid plane types in the reference data.

Reference - Defines the reference point from which place the cylinder or radial grid plane. If you are placing a cylinder, you can select the coordinate system origin or another existing cylinder. If you are placing a radial grid plane, you can select another existing plane or the north axis origin.

Offset - Specifies the offset between the reference object and the cylinder or radial grid plane that you are creating. Specify the offset in linear units if you are placing a cylinder. Specify the offset in degrees if you are placing a radial grid plane.

Copies - Specifies the number of cylinders or radial grid planes to create using the specified **Reference** object as the starting point and the **Offset** as the distance between the cylinders or radial grid planes.

Nesting Level - Defines the nesting level for the cylinders or radial grid planes. You can select **Primary**, **Secondary**, or **Tertiary**. Between two adjacent cylinders or radial grid planes, a difference of only one level is allowed. For example, secondary radial grid planes are only allowed between two primary radial grid planes. Similarly, tertiary radial grid planes are only allowed between two secondary radial grid planes.

Related Topics

- *Copy a Radial Cylinder*, page 65
- *Copy a Radial Plane*, page 64
- *Place a Radial Cylinder*, page 65
- *Place a Radial Plane*, page 63
- *Place Multiple Radial Cylinders*, page 65
- *Place Multiple Radial Planes*, page 64
- *Place Radial Grid Command*, page 60

Radial Grid Properties Dialog Box

Sets properties, or options, for the selected grid plane.

Related Topics

- *Associated Elevation Planes Dialog Box*, page 52
- *Configuration Tab*, page 35
- *General Tab (Grid Plane Properties Dialog Box)*, page 53
- *General Tab (Radial Grid Properties Dialog Box)*, page 62
- *Place Grid Plane Ribbon*, page 51
- *Relationship Tab*, page 36

General Tab (Radial Grid Properties Dialog Box)

Sets the general properties of the selected grid plane.

Standard

Coordinate System - Specifies the coordinate system to which the grid plane belongs.

Naming Rule - Specifies the user-defined rule used to generate the grid plane name.

Name - Specifies the name of the grid plane.

Nesting Level - Defines the nesting level for the grid plane. You can select **Primary**, **Secondary**, or **Tertiary**. Between two adjacent grid planes, a difference of only one level is allowed. Therefore, secondary grid planes are only allowed between two primary grid planes. Similarly, tertiary grid planes are only allowed between two secondary grid planes. The name rule uses this value to automatically create nested grid plane names.

Axis of Placement - Identifies the object as a radial grid plane **R** or a cylinder **C**.

Type - Specifies the type of grid plane. Examples of grid plane types are: interior wall, building edge, and girt line. You can define grid plane types in the reference data.

Offset - Specifies the offset from the reference object.

Drawing Style

You can use the **Drawing Style** property to suppress or include user-selected grid entities in a drawing document. When you create a drawing view style in the Drawings and Reports task, you can specify a filter that looks for the **Drawing Style** and uses that property to specify how the grid entities are symbolized in the drawing document.

Drawing Style 1 - Select a drawing style for which you want grid entities to appear in your drawings.

Drawing Style 2 - Select a second drawing style for which you want grid entities to appear in your drawings.

Tip

- You can add your own custom drawing styles by adding them to the *[Product Directory]*\CatalogData\Bulkload\DataFiles\GridsDrawingStyleIntf.xls. You also need to add the property values to the codelist defined in *[Product Directory]*\CatalogData\Bulkload\DataFiles\GridsCodelist.xls. The modified workbooks will need to be bulkloaded for the changes to appear.

Related Topics

- *Grid Plane Properties Dialog Box*, page 53
- *Radial Grid Properties Dialog Box*, page 62

Place a Radial Plane

1. Click **Place Radial Grid** on the vertical toolbar.
2. In the **CS** box, select the coordinate system to which the radial grid plane belongs.
3. In the **Axis** box, select **R** to signify that you want to place a radial plane.
4. In the **Reference** box, select a reference object.
5. In the **Offset** box, key in the offset, in degrees, from the reference object. The offset must be less than 180 degrees.

Note

- Radial planes are placed across the entire radial cylinder. Therefore, you cannot place a plane that is equal to or greater than 180 degrees (the 0 degree plane is the 180 degree plane, the 45 degree plane is the 135 degree plane, and so forth).

Related Topics

- *Understanding Grid Planes: An Overview*, page 49

Place Multiple Radial Planes

1. Click **Place Radial Grid** on the vertical toolbar.
2. In the **CS** box, select the coordinate system to which the radial grid planes belong.
3. In the **Axis** box, select **R** to signify that you want to place radial planes.
4. In the **Reference** box, select the reference object from which to place the first plane.
5. In the **Copies** box, type the number of copies to place.
6. In the **Offset** box, type the offset, in degrees, between the grid planes.

Note

- Radial planes are placed across the entire radial cylinder. Therefore, you cannot place a plane that is equal to or greater than 180 degrees (the 0 degree plane is the 180-degree plane, the 45-degree plane is the 135-degree plane, and so forth). Be careful when you specify the offset and number of copies values as not to define a plane past the 180-degree point.

Related Topics

- *Understanding Grid Planes: An Overview*, page 49

Copy a Radial Plane

1. Click **Select** on the vertical toolbar.
2. Select **Radial Plane** in the **Locate Filter** box.
3. Select the radial plane to copy.
4. Click **Edit > Copy**.
5. Click **Edit > Paste**.
6. In the **Paste Special** dialog box, select the coordinate system to which to copy the radial plane.
7. Click **OK** on the **Paste Special** dialog box.

Notes

- The coordinate system that you are copying to cannot have an existing radial plane at that same relative location.
- The nesting level must be maintained. For example, if you are copying a secondary radial plane, you must paste it between two primary radial planes in the new coordinate system.

Related Topics

- *Understanding Grid Planes: An Overview*, page 49

Place a Radial Cylinder

1. Click **Place Radial Grid** on the vertical toolbar.
2. In the **CS** box, select the coordinate system to which the cylinder belongs.
3. In the **Axis** box, select **C** to signify that you want to place a cylinder.
4. In the **Reference** box, select a reference object.
5. In the **Offset** box, key in the offset, in linear units, from the reference object at which to place the cylinder.

Related Topics

- *Understanding Grid Planes: An Overview*, page 49

Place Multiple Radial Cylinders

1. Click **Place Radial Grid** on the vertical toolbar.
2. In the **CS** box, select the coordinate system to which the cylinder belongs.
3. In the **Axis** box, select **C** to signify that you want to place a cylinder.
4. In the **Reference** box, select a reference object from which to place the first cylinder.
5. In the **Copies** box, key in the number of copies to make.
6. In the **Offset** box, key in the offset, in linear units, from the reference object at which to place the first cylinder.

Related Topics

- *Understanding Grid Planes: An Overview*, page 49

Copy a Radial Cylinder

1. Click **Select** on the vertical toolbar.
2. Select **Radial Cylinder** in the **Locate Filter** box.
3. Select the cylinder to copy.
4. Click **Edit > Copy**.
5. Click **Edit > Paste**.
6. In the **Paste Special** dialog box, select the coordinate system to which to copy the cylinder.
7. Click **OK** on the **Paste Special** dialog box.

Notes

- The coordinate system that you are copying to cannot have an existing cylinder at that same relative location.

- The nesting level must be maintained. For example, if you are copying a secondary cylinder, you must paste it between two primary cylinders in the new coordinate system.

Related Topics

- *Understanding Grid Planes: An Overview*, page 49

Grids Glossary

A

axis

An imaginary line used to define the orientation of a system or object normally defined in terms of an x, y, and z-axis. Some 3-D graphic objects have an associated axis used to define the center or axis for rotations.

B

bay

The distance between two trusses.

C

coordinate

The location of a point along the X-, Y-, or Z-axis.

E

easting

A term that describes an east coordinate location in a coordinate system.

elevation (grids)

The height, or value along the Z-axis of the coordinate system, of a point.

G

grid

A network of uniformly spaced horizontal and perpendicular lines that help to identify either 2-D or 3-D relationships.

N

northing

A term that describes a north coordinate location in a coordinate system.

O

origin

In coordinate geometry, the point where the X-, Y-, and Z-axes intersect.

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