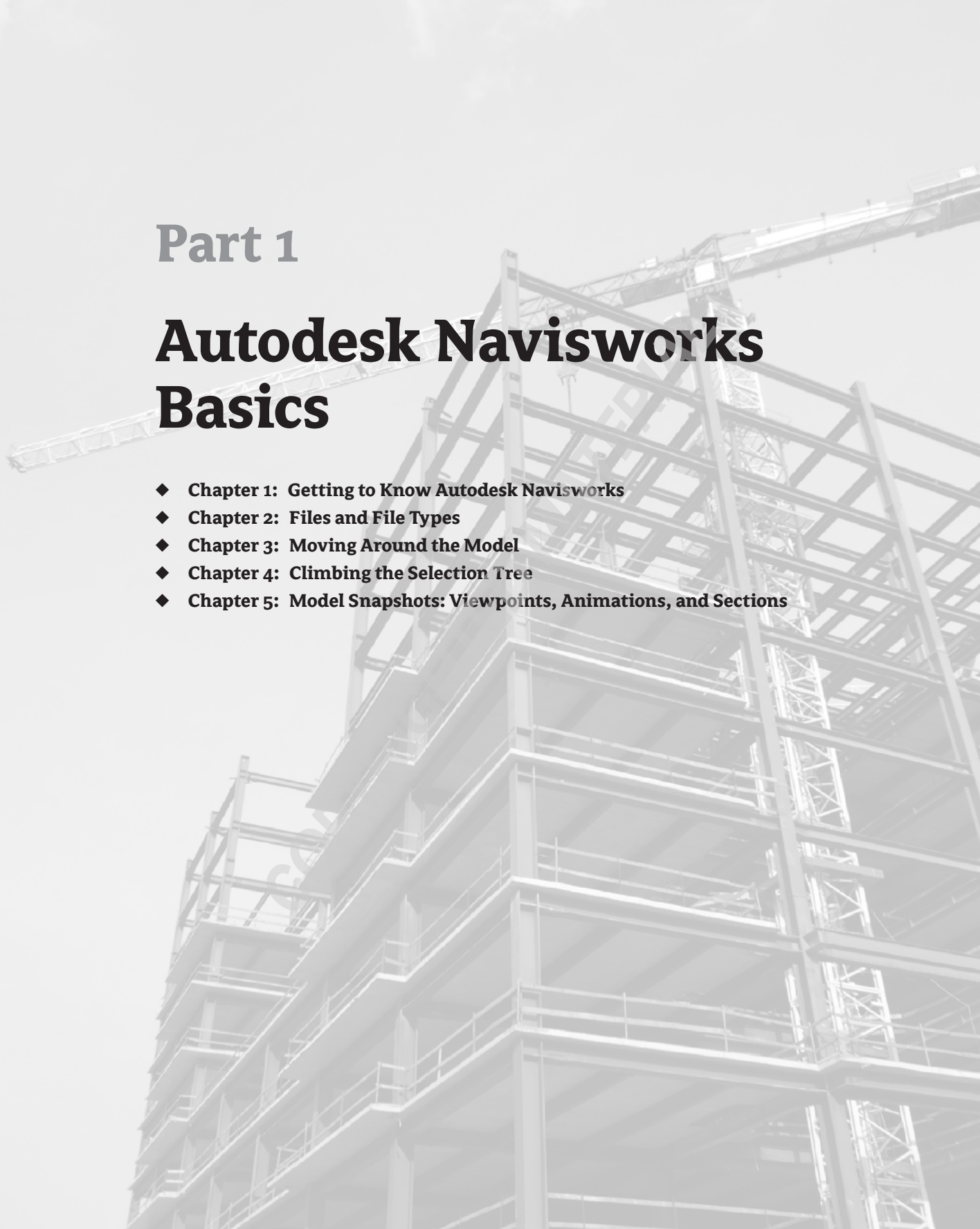


# Part 1

# Autodesk Navisworks Basics

Chapter 1

# Getting to Know Autodesk Navisworks

This chapter explains the Autodesk Navisworks interface, its tools, capabilities, recommended settings, and basic operating features. By understanding the interface, you will create a solid foundation for tool locations, understand each individual function, and increase your overall Navisworks awareness.

In this chapter, you'll learn to:

- Understand the ribbon
- Use the Measure and Redline tools

## Interface Organization

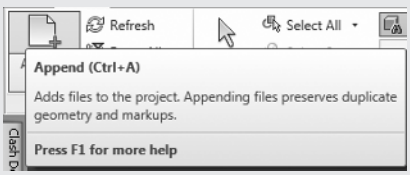
Over the years the Navisworks interface has remained relatively unchanged—until the 2011 release. Autodesk introduced a new interface based on tabs and panels, all the while keeping some of the features from the previous versions. With the Navisworks 2012 release, new features for TimeLiner and Clash Detective have been added, along with additional interface improvements.

### Application Menu: The Green N

A basic starting point within Navisworks, the Application menu, or green N, contains operations like New, Open, and Save. Several other useful operations that can be performed from here are explained in Figure 1.1.

**Tooltip**

If you hover your mouse cursor over any area in Navisworks, you get a tooltip, as shown here. Tooltips briefly explain the tool and may contain information about shortcuts (such as pressing Ctrl+A for Append). Also, if you leave your mouse in place a little longer, you will gain a longer explanation of the tool—the tooltip will expand into a definition from the help file.



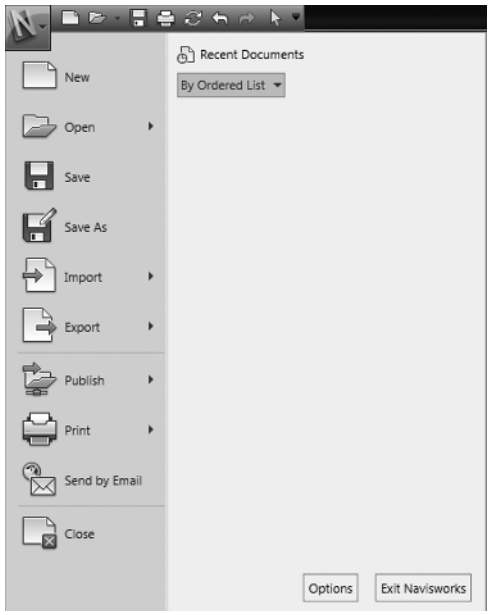



**FIGURE 1.1**
The green N, or Application menu

**New** Closes the currently open file and opens a new file.

**Open** Opens a new file (see Figure 1.2). See Chapter 2, "Files and File Types," for information on the types of files Navisworks can open. Note that using Open while another file is already open will close that currently open file. You want to use Append and Merge to add additional files. Options include:

**Append To Main Model (Append)** Appends additional files into already open files

**Merge Into Main Model (Merge)** Merges a selected file into other files

**Open URL** Opens a file from a URL, usually a website location

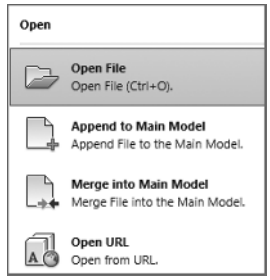



**FIGURE 1.2**
Additional open operations

**Save** Saves the current file.

**Save As** Allows you to create a "Save As" of the file. You can select from NWD and NWF file types. See Chapter 2 for more information on file types.

**Import** Imports various data types into the current project. Options include:

**Search XML** Loads previously saved search criteria in Find Items

**Search Sets XML** Loads previously saved search criteria in Search Sets

**PDS Display Sets** Converts PDS display sets into Search Sets and adds them to the Selection Sets window

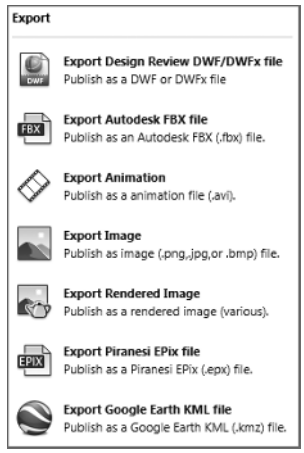
**PDS Tags** Loads tag information from Intergraph PDS into the current file

**Viewpoints XML** Loads saved viewpoints into the current file

**Clash Tests XML** Populates the Clash Detective tool with saved clash tests

**Export** Contains some of the Export operations (see Figure 1.3). Many of the other operations are located on the Output tab, explained later in this chapter.

**FIGURE 1.3**
Export Flyout




**Publish** Creates an NWD file. (NWD is a file that contains all model geometry together with Navisworks-specific data, such as review markups, viewpoints, or timeline sequence). Available on the Output tab.

**Print** Contains Print, Print Preview, and Print Setup. Available on the Output tab.

**Send By Email** Saves the current file as an NWD and uses your default email application to prepare an email to send. Available on the Output tab.

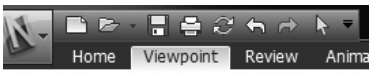
**Close** Closes the current file. If changes have been made, you will be prompted to save.

**Recent Documents** This list shows all of the recently open documents. You can control the order by Size, Access Date, Type, or Ordered List (default). Projects are only added to this list with the normal view selected. If Classic view is used to open a file, no project will be added to this list. All appended files will be added to this list when brought into a project.

## Quick Access Toolbar

The Quick Access toolbar (Figure 1.4), located adjacent to the Application menu, is a series of predefined operations. By default you can find New, Open, Append, Merge, Save, Print, Refresh, Undo, and Redo.

**FIGURE 1.4**
Quick Access toolbar




The Quick Access toolbar is customizable. You can remove tools by right-clicking the item you wish to remove. Also, you are able to add tools by selecting them from the tab and panel locations, right-clicking, and then choosing Add To Quick Access Toolbar.

## Help Toolbar

Another useful toolbar in Navisworks, the Help toolbar (Figure 1.5), provides a central location for Search, Subscription Center Access, Communication Center, Favorites, and general Help. This menu cannot be customized.

**FIGURE 1.5**
Help toolbar


**Search** Enter information in the search field to being searching within Navisworks, online, and within the help file. You can customize the locations with additional sites.

**Subscription Center** By clicking here you can get access to the Subscription Center (membership required) where you can create support requests and view the e-learning catalog as well as other Subscription Center items.

**Communication Center** Controls Navisworks product updates and announcements.

**Favorites** Stores information from the Search, Subscription, and Communication Centers.

**Help** Contains help, the Getting Started Guide, and the New Features Workshop. Help also contains information about which version of Navisworks you are using in addition to providing access to the license checkout function, if you are using a networked license.

## Navisworks Options

Options, or the Options Editor (sometimes referred to as Global Options), is used to adjust the program settings from Navisworks. The settings that you change here are retained across different Navisworks sessions. Settings can also be shared across a project team via the import/export feature (Figure 1.6).

Let's look at each page of the Options Editor.

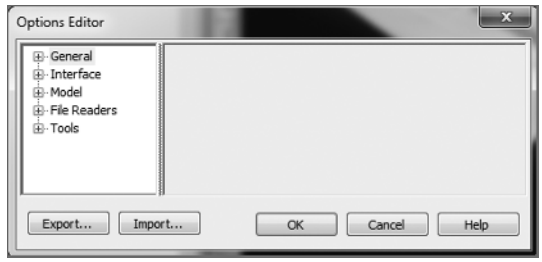



**FIGURE 1.6**
Navisworks Options Editor

### GENERAL

Use the General settings (see Figure 1.7) to adjust the buffer size, file locations, number of recent file shortcuts you want Navisworks to store, and the Auto-Save options. Additional options include:

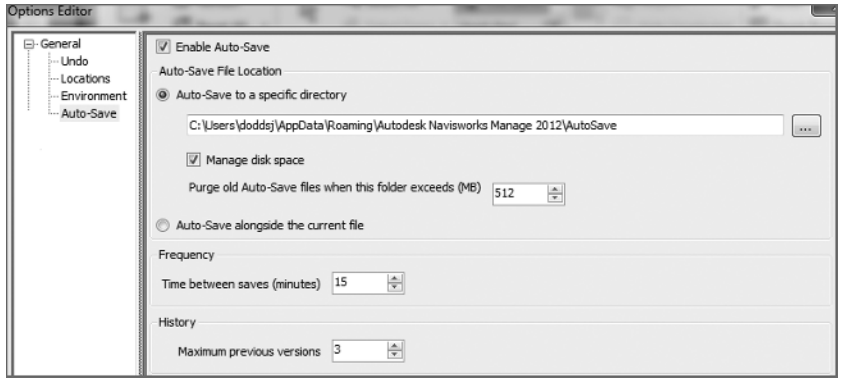



**FIGURE 1.7**
General options, with the Auto-Save settings shown

**Undo** Specifies the amount of space Navisworks uses for undo/redo operations.

**Locations** Enables the sharing of centralized project information for the project directory and site directory.

**Environment** Specifies the maximum number of recently opened files for Navisworks to display. The default setting is 4 with a maximum of 16.

**Auto-Save** Controls the settings for the Navisworks Auto-Save feature. From here you can specify save interval (30 minutes is recommended), the save location, and the number of save versions you want to maintain.

### INTERFACE

Use the settings on Interface page (see Figure 1.8) to customize Navisworks' behavior. Additional information includes:

**Display Units** Changes the Navisworks display units. Meters are the default setting for new Navisworks files.

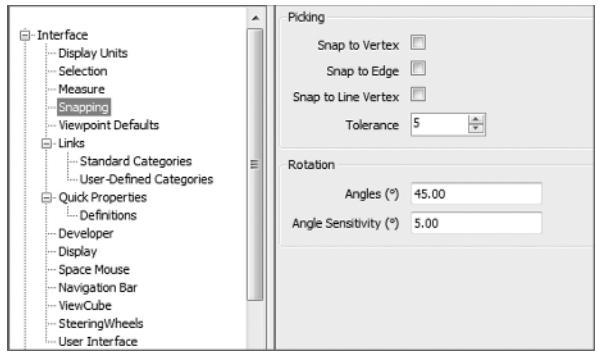



**FIGURE 1.8**
Interface options, with the Snapping options shown

**Selection** Configures the way geometry is selected and highlighted within Navisworks.

**Pick Radius** Specifies the radius that an object has to be within to be selected.

**Resolution** Specifies the level of selection. If you have problems selecting objects, you might try changing these settings.

**Compact Tree** Specifies the level of detail to display on the Compact tab of the selection tree.

**Highlight** Controls the Highlight settings. When the Enabled box is unchecked, selected items are no longer highlighted.

**Measure** Use these options to adjust the settings for the Measure tools.

**In 3D** Allows accurate measurements in 3D. This tool allows you to find the distance of 3D objects in a view. When 3D is not selected, Navisworks defaults to a 2D object defined by the points you are selecting.

**Use Center Lines** With this check box selected, the Shortest Distance measurements snap to the center lines of the selected object. When Use Center Lines is not selected, the surface of the object is used.

**Snapping** Enables Snaps within Navisworks (Vertex, Edge, and Line Vertex). Enabling this tool is useful in conjunction with Measure tools.

**Viewpoint Defaults** These options define the attributes that are saved with saved viewpoints.

**Settings** Opens the Default Collision dialog box. Allows you to control settings from the Third Person avatar. This dialog box can also be accessed from the Viewpoint tab under Edit Viewpoints.

**Links** This page allows you to customize how links are displayed within Navisworks.

**Quick Properties** Customizes the way Quick Properties are displayed. Use this page to set up additional Quick Properties categories or choose to hide Quick Properties using this tab.

**Developer** Select this check box if you want to enable the Geometry tab and the Transform tab within the Properties palette.

**Display** Adjusts display performance.

**Occlusion Culling** Select this check box to enable or disable the Culling feature. Enabling Culling means that Navisworks only draws visible objects and ignores other objects.

**Space Mouse** Controls the settings for a 3D mouse or motion controller mouse, often referred to as a Space Mouse (including speed). A space mouse can be used as an alternative (or in addition) to the mouse to move around the scene view.

**Navigation Bar** Used for customizing the Navigation Bar.

**ViewCube** Customizes behavior of the ViewCube.

**SteeringWheels** Customizes behavior of the SteeringWheels.

**User Interface** Used to switch between Standard (ribbon) and Classic (toolbars) interface mode.

### Model

Use the Model settings (see Figure 1.9) to optimize Navisworks' performance, and to customize parameters for NWD and NWC files. Additional options include:

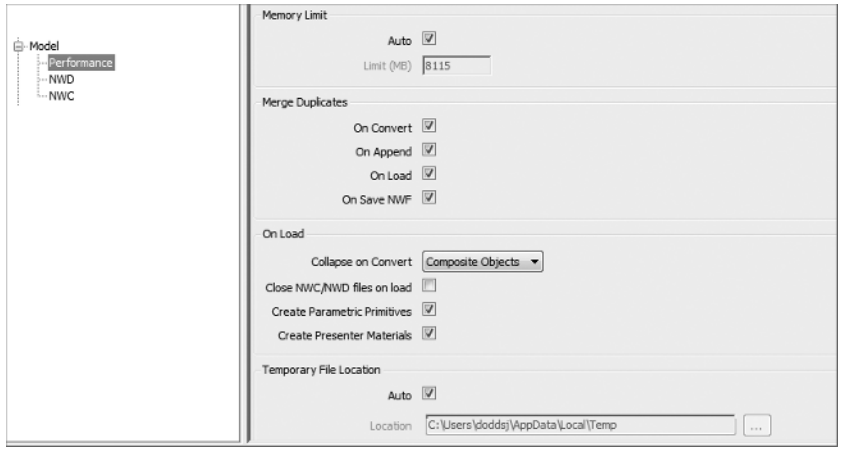



**FIGURE 1.9** Model options, with Performance options shown

**Performance** Optimizes the performance of Navisworks.

**Memory Limit** Specifies the amount of physical memory that Navisworks uses.

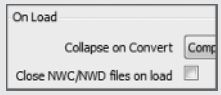
**NWD** Enables and disables geometry compression for the NWD file format.

**NWC** Use this page to manage the file options for the NWC file format.

**Caching** With these boxes checked, Navisworks creates and saves to a cache file, or NWC. This is a recommended setting as NWC files are typically smaller than their original files.

### Additional Information about the Close NWC/NWD Files On Load Option

Depending on your workflow and what your needs are, you should give this check box careful consideration. If you leave Close NWC/NWD Files On Load unchecked, you will not be able to update your NWC/NWD files on the fly. In other words, if you are working on an active project (coordination meetings, for example) and find yourself updating files often, you would have to close Navisworks in order to update the NWC/NWD files loaded in the project. With this box checked, you can modify your files during the project.




## File Readers

Use the File Readers settings (see Figure 1.10) to configure the file readers required to open native CAD and scanning applications file formats in Navisworks. For further information on file types and their uses, see Chapter 2.

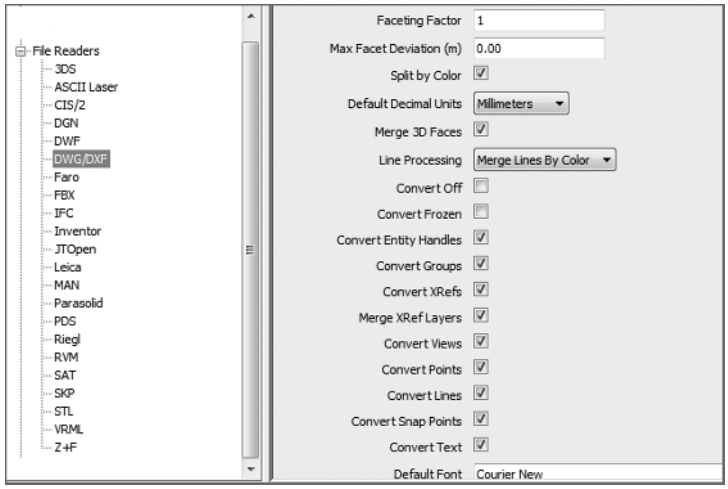



**FIGURE 1.10** File Readers page, with options for DWG shown

**DWG/DXF** Adjust options for the DWG/DXF file reader.

**Merge 3D Faces** Allows the file reader to merge the 3D faces of DWG/DXF objects into a single item in the selection tree. This helps to lessen the number of items selected.

**DWG Loader Version** Allows Navisworks to select which version of the Autodesk object enablers to use when loading a DWG. If the DWG Loader Version needs to change, Navisworks must be restarted for this setting to take effect.

**Advanced** Use the Convert Object Properties dialog box (click Advanced to open this dialog) to select third-party applications for the file reader to read additional options from (Figure 1.11).

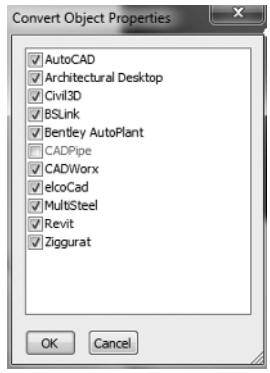



**FIGURE 1.11** Convert Object Properties dialog box

All other file readers adjust the options for the file type they are associated with.

### TOOLS

Use the Tools settings (see Figure 1.12) to adjust the options for Clash Detective, Presenter, TimeLiner, Scripter, and Animator. Options include:

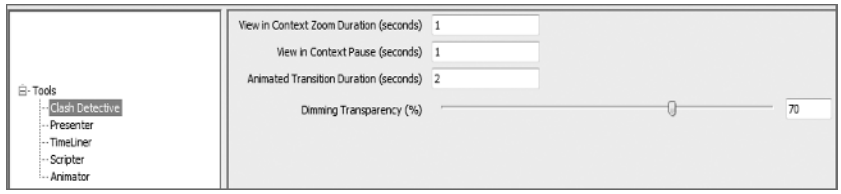



**FIGURE 1.12** Tools options, with setting for Clash Detective shown

**Clash Detective** Customizes Clash Detective options.

**Presenter** Customizes Presenter options.

**Profile** You can adjust Presenter Profiles to reflect your level of comfort or knowledge. The Basic setting is the Navisworks default and has a limited editing functionality. Standard has some advanced Presenter features. Advanced gives you access to such features as extra materials, lights, and render styles.

**Interactive Materials** When this check box is cleared, materials are not displayed during navigation. This decreases the load on the video card and can improve performance.

**Interactive Lighting** When this check box is cleared, lights are not displayed during navigation. This decreases the load on the video card and can improve performance.

**TimeLiner** Customizes TimeLiner options.

**Auto Select Attached Items** When enabled, automatically selects attached objects in TimeLiner

**Display Synchronization Errors** When enabled, indicates that error messages will display when synchronizing tasks from eternal links in TimeLiner

**CSV File: Read and Write Encoding** Specifies the file format of the imported or exported CSV file

**Scripter** Use these options to customize the Scripter options.

**Animator** This check box indicates whether or not manual entry is shown in the Animator.

#### Import and Export

These settings allow you to export the current Options settings into an Options XML file; you can choose which categories are exported. These items may also be imported using the Import feature.

From a workflow perspective, it may be useful to save individual files for each category (general, interface, and so forth) per project. This way, specific settings are retained as needed and can be shared among users quickly and easily.

For additional information on the Options Editor, see "External Options Editor" in Appendix B, "Additional Resources and Tips."

## The Ribbon Explored

The ribbon, located at the top of the user interface, is a palette that groups the entire Navisworks toolset into an easy-to-find and -use location. This section will explore the ribbon and its associated tools.

The ribbon is divided into tabs, with each tab supporting a specific activity or task. Within each tab is a series of panels that contain the available tools.

While you are not able to add to or remove custom commands from the ribbon, you can customize the appearance and location of the panels using one of these two methods:

- Right-click over the tab or panel to open the context menu. From here, you can turn tabs or panels on or off.
- Left-click and hold on a specific panel to move its location. You can change its location to a new place within the tab or drag it out into the workspace to make it more accessible. Panels may not be moved to other tabs.

#### Push-Pin

Any time you see a "push-pin" icon, you can click it to pin an item to the screen. This will allow the panel or palette to stay on top and keep from closing as you move to other tools in Navisworks.

### Home

The Home tab contains Project, Select & Search, Visibility, Display, and Tools panels (Figure 1.13 and Figure 1.15).

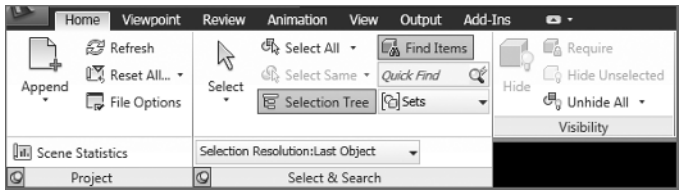



**FIGURE 1.13**
Home tab, showing additional tools enabled

### PROJECT

**Append** Appends, or combines files together. The drop-down also contains Merge.

**Refresh** To ensure that you are working with the most current information, Navisworks contains a Refresh feature.

**Reset All** Uses the various tools to reset changes applied in Navisworks.

**Appearance** Returns all color and transparency overrides back to their original state.

**Transforms** Resets all Transforms overrides back to their original state.

**Links** Resets all links applied back to their original state. Deletes all links made in Navisworks and retains only links inherited from the original files.

**File Options** This dialog box (see Figure 1.14) controls the appearance of the model as well as the speed of navigation around it. Changes made in this dialog box are for the current session only and are returned to the defaults when the model is closed.

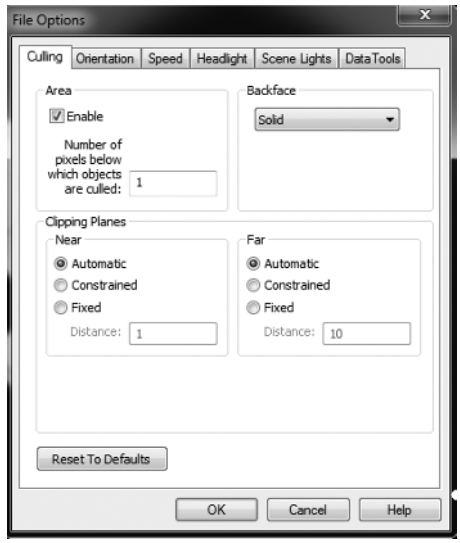



**FIGURE 1.14**
File Options dialog box

**Culling** Use this tab to adjust geometry culling (that is, the ability to navigate large areas) in the open Navisworks file.

**Orientation** Use this tab to adjust the real-world orientation of your model.

**Speed** Use this tab to adjust the frame rate speed to reduce the amount of dropout during navigation.

**Headlight** Use this tab to change the intensity of the scene's ambient light and headlight for Headlight mode. You will not likely use this setting often.

**Scene Lights** Use this tab to change the intensity of the scene's ambient light for Scene Lights mode. You will not likely use this setting often.

**Data Tools** Use this tab to create and manage links between open Navisworks files and external databases. You will not likely use this setting often.

**Scene Statistics** An extremely useful tool, Scene Statistics lists all of the files contributing to aggregated elements, or the "scene." It also shows the various graphic elements that help to make up the scene. Use Scene Statistics when an object enabler appears to be missing or when certain objects are not showing up properly.

### Select and Search

**Select** Allows you to select objects with your mouse. Also available within the drop-down list is Select box, which allows you to select all items within a defined box.

**Select All** Selects all objects within the model.

**Select None** Deselects the current selection. Pressing the Esc key has the same function.

**Invert Selection** Deselects the currently selected items and selects the currently unselected items. In short, it selects the opposite of what you had selected.

**Select Same** Allows you to select multiple instances of the selected item or group of items. Also opens to the Select Same drop-down for additional selection criteria and options.

**Selection Tree** Toggles the selection tree on and off. The selection tree is a palette that displays a variety of categorized views of the structure of the model depending on the loaded models.

**Find Items** Toggles the Find Items palette on and off.

**Quick Find** A simplified version of Find Items, Quick Find allows you to search the scene using the Quick Find dialog box.

**Sets** Displays a list of defined Search and Selection sets. You can access the Sets palette from this drop-down.

### Visibility

**Hide** Hides selected items from display. You can select multiple items to hide them and at different intervals. The items also appear as "grayed out" in the selection tree to represent hidden.

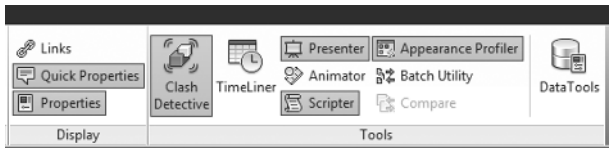
**Require** Forces an item to remain visible regardless of performance settings, such as culling. When an item is set to Require, it will appear as "Red" in the selection tree. Required items can still be hidden; the Require setting is mainly to help ensure that items will not be dropped from view when you have to change your performance settings.

**Hide Unselected** Hides all items except those that are currently selected. This tool is useful when you're trying to build a Selection Set and ensure the items that you have selected.

**Unhide All** Reveals all hidden items in the scene. The drop-down also contains Unrequire All, which sets required items back to optional.

### Display

**Figure 1.15**
Home tab continued




**Links** Displays or hides links. There are several types of links that display in Navisworks: Hyperlink, Label, Viewpoints, Clash Detective, TimeLiner, Sets, Redline tags, and user-defined links. You can use the Options Editor to toggle the display of each of the link categories, and also to control their appearance.

**Quick Properties** When enabled, Quick Properties displays brief information about the object in a tooltip type of display. You can edit the type of information that is displayed in the Options Editor.

**Properties** Toggles the Properties palette on and off. The Properties palette displays available properties for a selected item. If more than one item is selected, the Properties palette will only display the total number of selected items and no additional property information.

### Tools

**Clash Detective** Toggles the Clash Detective palette on and off. Clash Detective enables you to interactively search your model for clashes or interferences.

**TimeLiner** Toggles the TimeLiner palette on and off. TimeLiner allows you to create 4D simulations of your project, linking time with modeled objects.

**Presenter** Toggles the Presenter palette on and off. Presenter allows you to apply materials and lighting to your model to aid in creating renderings.

**Animator** Toggles the Animator palette on and off. Animator allows you to animate objects to bring realism to your project.

**Scripter** Toggles the Scripter palette on and off. Scripter adds interactivity to your animated objects.

**Batch Utility** Opens the Batch Utility dialog box. From here you can create a list of all design files, append multiple design files into a single NWD or NWF file, and convert multiple design files into individual NWDs.

**Appearance Profiler** Toggles the Appearance Profile palette on and off. This tool lets you create custom appearance profiles for items based on properties or sets (Search and Selection). Then use the appearance profiles to essentially color-code the objects in your model to help identify or differentiate status or type.

**Compare** Opens the Compare dialog box. You can look for differences between any two items selected in the model. These items can be files, layers, instances, groups, or geometry.

**Data Tools** Opens the Data Tools dialog box. From here you can connect Navisworks to external databases and create links to objects within the model.

## Viewpoint

The Viewport tab contains animation Tools, Camera, Motion Settings, Render Style, and Sectioning panels (Figure 1.16 and Figure 1.17).

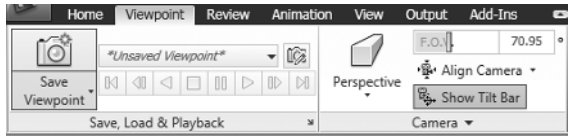



**FIGURE 1.16**
Viewpoint tab

### SAVE, LOAD & PLAYBACK

**Save Viewpoint** Saves a viewpoint of the current view. The saved viewpoint retains the properties and attributes of the current view. There is also a record feature to record your actions (Walk, Fly, Zoom, and other actions in Navisworks). The recording is saved in saved viewpoints.

**Animation Controls** See "Playback" in the section "Animation."


**Edit Viewpoint** Opens the Edit Viewpoint dialog box. This dialog box allows you to edit any viewpoints attributes, including camera position, field of view, speed of motion, and saved attributes. The Collision dialog box is also located within the Edit Viewpoint, allowing you to adjust collision settings for the current viewpoint.

**Saved Viewpoints Dialog Launcher** Toggles the Saved Viewpoints palette.

### CAMERA

**Perspective** Allows you to choose between Orthographic or Perspective mode. Walk and Fly navigation tools are not available in Orthographic mode.

**Field Of View (F.O.V.)** Defines the area of the scene that the camera can view. The lower the number, the narrower the camera angle or the closer you are to the object being viewed. You can you edit existing or saved viewpoints Field Of View settings using the Edit Viewpoint dialog box.

**Align Camera** Opens the Align Camera drop-down, which allows you to use these tools to align the camera to the chosen axis:

**Align X** Aligns the camera to the X-axis.

**Align Y** Aligns the camera to the Y-axis.

**Align Z** Aligns the camera to the Z-axis.

**Straighten** A useful tool to straighten the view when you find yourself askew, which can often occur when using some of the navigation tools such as Fly and Orbit.

**Show Tilt Bar** Toggles the Tilt Bar off and on. Tilt adjusts the vertical angle of the camera.

### Motion Settings

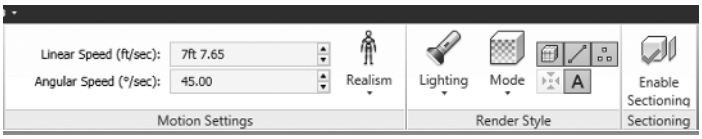



**Figure 1.17** Viewpoint tab continued

**Linear Speed** Sets the linear speed, which is the speed the Walk and Fly tools use when navigating through the model. The 5–10 ft/sec range is ideal for an average walking pace. This is a temporary setting specific to the view. If you change views, this setting will go back to the project default.

**Angular Speed** Sets the angular speed, which is the speed at which the Walk and Fly tools turn when navigating through the model. The 45–60 deg/sec range is ideal for an average walking pace.

**Realism** Toggles the Realism settings on and off for the following settings. Figure 1.18 shows one result of working with Realism settings: a construction worker avatar in a crouching position.

**Collision** Enabling Collision allows you to navigate the model with mass. As you interact with the model and come into contact with objects like doors or columns, you stop or are unable to pass through that object. The size of the Collision Volume can be changed or customized to reflect the needs of the user or collision requirements. Collision can only be used with the Walk and Fly tools.

**Gravity** This tool gives you the appearance of weight. When using the Walk tool and you begin to move, you will "fall" until you reach a surface. Gravity works best when Collision is also active so that when a surface is contacted the falling stops. Use Gravity in conjunction with Collision to walk up/down stairs. Gravity can only be used with the Walk tools. If Gravity is selected, Collision is automatically turned on. You cannot have Gravity without Collision.

**Crouch** With Crouch activated, you will automatically crouch under any objects that you cannot freely walk under at the specified avatar height. This can be useful for checking clearance heights under pipes and other equipment.

**Third Person** When Third Person is active, it turns on Third Person view, or an avatar, which you can use as a representation of yourself while navigating the model. Third Person has other added benefits like working with Gravity, Collision, and Crouch. When using the avatar for Collision, it will turn "red" when it approaches another item. Also, Third Person can be customized by changing the avatar selection and dimensions.

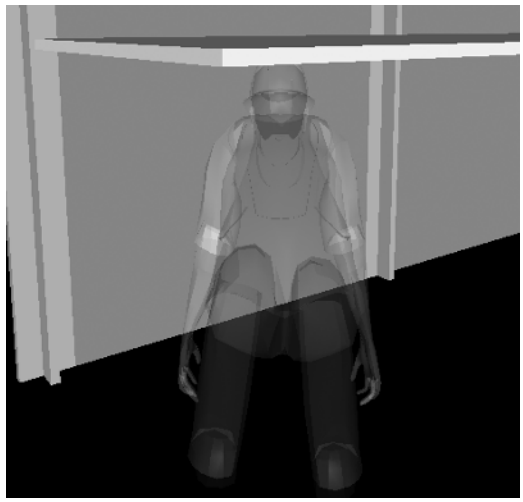


**FIGURE 1.18**
Third Person with Gravity, Collision, and Crouch enabled

### RENDER STYLE

**Lighting** Changes the Lighting mode within Navisworks to control how the 3D scene is lighting is displayed.

**Full Lights** Uses the highest quality lighting available. Controlled by Presenter.

**Scene Lights** Uses the lights supplied with the appended files. If no lights are added, two opposing lights will be added by Navisworks.

**Headlights** Uses a light that comes from the camera location.

**No Lights** Does not use any lights in the view; geometry is rendered with flat lights.

**Mode** The Mode drop-down controls the options for displaying the scene geometry rendering and the level of materials to display.

**Full Render** In Full Render mode the model is shown with materials and textures along with edges and smooth shading.

**Shaded** The model is shown with additional edges and smooth shading. Materials and textures are not included in this mode.

**Wireframe** The model is shown in Wireframe mode only. Materials and textures are not included in this mode.

**Hidden Line** The model is shown in Wireframe mode but only outline and facet edges are displayed; this hides additional lines over Wireframe mode. Materials and textures are not included in this mode.

**Surfaces** Toggles 3D surface geometry on and off.

**Lines** Toggles on and off the 2D lines that come from an appended file.

**Points** Toggles on and off the points that come from appended files. When you are inserting point cloud or laser scan data, it may be necessary to have the points enabled.

**Snap Points** Toggles on and off the rendering of snap points within the model.

**Text** Toggles on and off 2D or 3D text that comes from appended files.

Using a combination of these tools when bringing in AutoCAD or other vector-based file types helps to clean up the scene in Navisworks and create a display of only 3D geometry.

### Sectioning

**Enable Sectioning** Opens the Sectioning Tools tab (Figure 1.19). The Sectioning Tools allow you to create cross sections of your model. Sections can be enabled and disabled as needed. See Chapter 5, "Model Snapshots: Viewpoints, Animations, and Sections," for additional information on this tool.

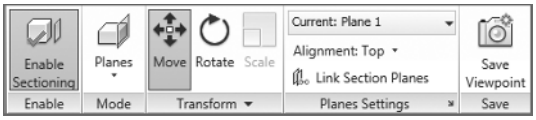



**Figure 1.19**
Sectioning Tools tab

## Review

The Review tab contains Measure, Redline, Tags, and Comments panels (Figure 1.20).


**Figure 1.20**
Review tab

### Measure

**Measure** Navisworks has tools that will allow you to measure between points, calculate area, and convert measurements to redlines. The Measure tools are exclusive to Navigation tools. If you activate the Navigation tools, you will have to go back to your Measure tool. Right-click to cancel any of the Measure tools or to clear the screen of the measurement after placement; the Esc key works as well.

**Point To Point** Measures the distance between two points

**Point To Multiple Points** Measures the distance between a starting point or base point and any number of additional selected points

**Point Line** Measures consecutive linear distances

**Accumulate** Measures the total length of nonconsecutive linear measurements (keeps a running total of the linear measurements) until cleared or canceled

**Angle** Measures the angular distance as defined by three selected points

**Area** Measures the area of selected points

**Shortest Distance** Measures the shortest distance between two selected objects (two objects must be selected; use the Ctrl key to select the objects as needed).

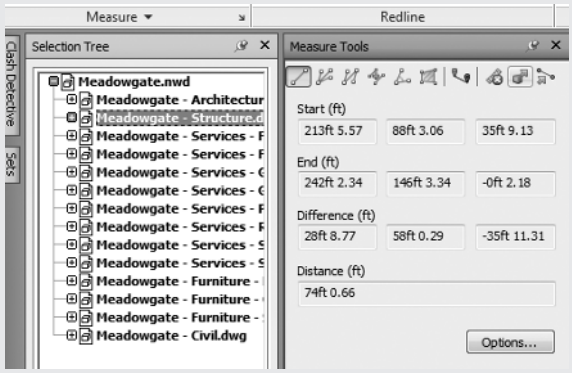
**Convert To Redline** Clears the measurement and converts it to a redline. The redline will be saved as part of the active viewpoint. If no viewpoint is selected, the Convert To Redline tool will create a new viewpoint automatically.

**Clear** Clears the current measurement from the screen.

**Transform Selected Items** Moves or rotates the currently selected object the specific distance. Use Transform Selected Items to move the object in the direction that you specified. For example, if you selected Bottom To Top, your object will be moved up. Keep in mind that this is not a temporary transform that can be reset by using Reset Transform, but that it affects the file units and transforms; this is a permanent change to the object.

### Moving an Incorrect Element

Learning the Transform tool can sometimes mean the difference between a project moving smoothly and creating additional conflicts for a misplaced appended item. There are times during an Append or Merge operation when objects could be improperly aligned, even given the best efforts of the project team. There is good news, though; many items in Navisworks can be moved. In most cases, entire files sets are selected and transformed to a new location.




Using the Transform tool in conjunction with the selection tree lets you specify a distance and relocate the object. It helps to know a good reference or common point between the items when selecting your points.

Another good point is to have your snaps enabled when using the Transform tool to help with selecting points.

## Redline

**Draw** Allows you to add redline shapes and text notes to your model. Redlines can only be added to a saved viewpoint or to a clash, which has a saved viewpoint. If there are no saved viewpoints, adding a tag will automatically create and save a viewpoint for you. Otherwise you will receive an error and you'll have to save a viewpoint before adding any redlines.

**Color** Allows you to change the color of redlines.

**Thickness** Changes the line thickness of the redlines being added; 9 is the maximum thickness.

### Tags

**Add Tag** Inserts a tag into your model. If you have a viewpoint selected, the tag will be created within that viewpoint; otherwise the tag will create its own viewpoint.

**Tag ID** Allows you to enter the tag ID or number to use with Go To Tag.

**Go To Tag** Once the desired number is entered, you can use the Go To Tag tool to take you to the tag.

**Tag Selection** Scrolls through the tag and its associated viewpoints.

**Renumber Tag IDs** Used to renumber the tag IDs; removes duplicates. This tool is useful when you're appending or merging files that may have existing tag IDs.

### Comments

**View Comments** Toggles the Comments palette on and off. From here you can manage the comments created throughout the model.

**Find Comments** Opens the Find Comments palette. You can search through both comments and tags for text, author, comment ID, status, comment, and date modified.

**Renumber Comment IDs** Used to renumber the comment IDs; removes duplicates. This tool is useful when you're appending or merging files that may have existing comment IDs.

## Animation

This tab contains the Create, Playback, and Script panels (Figure 1.21).

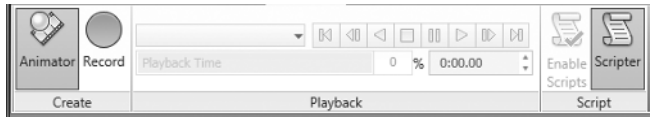



**Figure 1.21**
Animation tab

### Create

**Animator** Toggles the Animator palette on and off (same as the Animator located on the Home tab). Animator allows for the animation of objects to bring realism to your project.

**Record** Begins to record your actions (Walk, Fly, Zoom, and other actions in Navisworks). The recording is saved as an animation in saved viewpoints that you can later edit or add to as needed.

### Playback

After an animation has been created, you gain access to the Playback tools. From the drop-down, select the animation that you wish to play and use the tools available to play the

animation. You can also use the slide at the bottom of Playback to manually change the display of the playback.

### Script

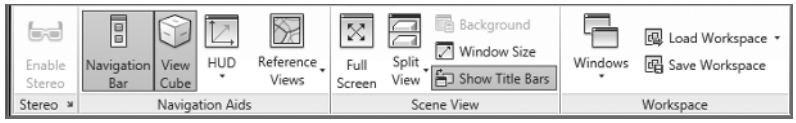
**Enable Scripts** Enables and disables scripts. Once a script has been created, it has to be enabled before the action created can be utilized. For example, if you created a script to operate a door on approach, enabling scripts will allow this to occur.

**Scripter** Toggles the Scripter palette on and off (same as the Scripter located on the Home tab). The Scripter adds interactivity to your animated objects.

## View

The View tab contains Stereo, Navigation Aids, Scene View, and Workspace panels (Figure 1.22).

**FIGURE 1.22**
View tab




### Stereo

**Enable Stereo** Stereo, or stereoscopic viewing, allows you to view the 3D model through stereo-enabled hardware (i.e., in true 3D), including active and passive stereo viewing glasses. This option is only available if you have the required hardware as well as the correct driver and display settings.

### Navigation Aids

**Navigation Bar** Toggles the Navigation Bar on and off. Contains ViewCube, SteeringWheel, Pan, Zoom, Orbit, Look, Walk, and Fly tools.

**ViewCube** Toggles the ViewCube on and off. The ViewCube allows you to switch between views of your model. Use ViewCube to set a Home view that you can easily get back as you navigate around your model.

**HUD** Toggles the X-, Y-, and Z-axes and the Position Readout display on and off. Displayed on the lower-left corner of the screen.

**XYZ Axes** As you can see in Figure 1.23, this option shows the X, Y, Z visual orientation of the camera (or the Third Person position if Third Person has been enabled).

**Position Readout** As you can see in Figure 1.23, this option shows the X, Y, Z textual position of the camera (or the Third Person position if Third Person has been enabled).

**Reference Views** Toggles the plan and section view on and off. Both reference views allow you to gain perspective and location within your model, especially in large models. To use, drag the white triangle to move yourself around. There are also additional tools available on the right-click menu to aid in navigation.

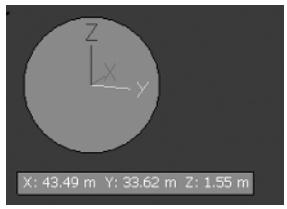



**FIGURE 1.23**
XYZ Axes and Position Readout

### SCENE VIEW

**Full Screen** Clears away all tabs and palettes and displays Navisworks in Full Screen mode. Press F11 to exit Full Screen mode and return to your tools.

**Split View** Allows you to add horizontal and vertical screen splits. Each view can be set to represent a different view of the model. Only one view can be active at a time.

**Background** Opens the Background Settings dialog box, which allows you to change the background color and scheme.

**Window Size** Opens the Window Size dialog box. The Window Size dialog box allows you change the size of the Navisworks canvas. If you change the size and want to return to the default, change back to Use View.

**Show Title Bars** Show or hides the title bars on secondary display view windows.

### WORKSPACE

**Windows** Serves as a central list all of the palettes and toggles them on and off.

**Load Workspace** Workspaces retain information about which windows are open, their positions, and the size of the application window. The Load Workspaces drop-down contains predefined workspaces. Workspaces do not maintain changes to the ribbon.

**Safe Mode** Opens the workspace with minimal features

**More Workspaces** Opens previously saved workspaces

**Save Workspace** Saves the current workspace as an XML file.

## Output

The Output tab contains Print, Send, Publish, Export Scene, Visuals, and Export Data panels (Figure 1.24 and Figure 1.26).

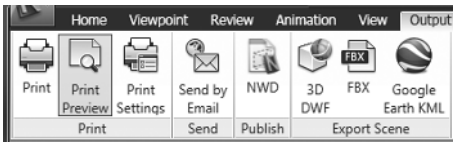



**FIGURE 1.24**
Output tab

### Print

**Print** Sends the current view to a printer

**Print Preview** Creates a preview of the view to be printed

**Print Settings** Allows you to specify the printer settings

### Send

**Send By Email** Saves the current file as an NWD and uses your default email application to prepare an email to send

### Publish

**NWD** Creates an NWD file (NWD is a file that contains all model geometry together with Navisworks-specific data, such as review markups, viewpoints, or timeline sequence). You can also set options such as May Be Re-saved or set the file to expire within a certain time-frame (Figure 1.25).


**Figure 1.25**
Publish To NWD dialog box

When using Publish to create an NWD, you are not able to save to previous versions of Navisworks, but you have access to all the other features and functions of Publish. If you need to create an NWD file for an older version of Navisworks, you will have to use Save As instead. The downside is that you will no longer have access to Publish options.

### Export Scene

**3D DWF** Exports all materials and geometry into a 3D DWF file.

**FBX** Exports an FBX file out of Navisworks. Allows you to include things like lights, cameras, and textures in your export.

**Google Earth KML** Google Earth KML files can be exported from Navisworks. The exporter creates a compressed KML file with the extension `.kmz`.

### Visuals

**Figure 1.26**
Output tab continued

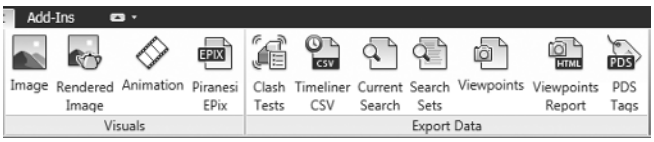



**Image** Opens the Export Image dialog box. This dialog box allows you to export an image of the current scene.

**Rendered Image** Opens the Rendered Image dialog box, which allows you to export a rendered image.

**Animation** Opens the Animation Export dialog box. You can choose from Source, Renderer, Output Type, and Size.

**Piranesi EPix** Exports an EPX file for rendering in Informatix's Piranesi.

### Export Data

**Clash Test** Exports the settings for all of the clash tests created in Clash Detective into a CSV file.

**TimeLiner CSV** Exports the current TimeLiner tasks into a CSV file.

**Current Search** Saved Find Items criteria can be exported from Navisworks into an XML file and imported into other sessions of Navisworks.

**Search Sets** Saved Search Sets can be exported from Navisworks into an XML file and imported into other sessions of Navisworks.

**Viewpoints** Exports all of the viewpoints into an XML file. This is a text-based XML file and the images are not exported. This files contains all associated data, including camera positions, sections, hidden items and material overrides, redlines, comments, tags, and collision detection settings.

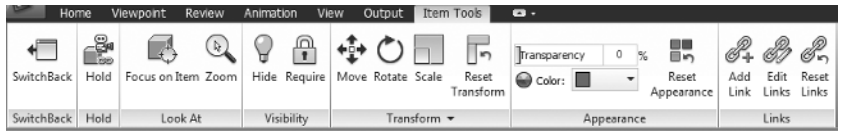
**Viewpoints Report** Creates an HTML file or report of JPEG files of all saved viewpoints. The report contains camera position, comments, and other associated data. If you have created an animation, the report will also include the animation frames as individual images as part of the report.

**PDS Tags** Exports all PDS tag data from the model into a TAG file.

## Item Tools

With the addition of the Item Tools tab (Figure 1.27) in 2012, you have access to a few new tools (Hold, for example) plus a centralized location for some existing tools (Zoom and SwitchBack). When you select an item from the selection tree or canvas, Item Tools will appear and lets you to take advantage of the following tools:

**FIGURE 1.27**
Item Tools tab




**SwitchBack** SwitchBack allows you to select an object and open a similar view for editing in its authoring program; in this case it would be Revit, AutoCAD and AutoCAD-based programs, and MicroStation and MicroStation-based programs. You must have the corresponding program installed on the same computer as Navisworks in order for SwitchBack to work.

In previous versions of Navisworks, you could only access SwitchBack from the Clash Detective Results tab. But it has been added here to improve workflow.

**Hold** The addition of the Hold function allows you to pick an object and physically "hold" on to it as you navigate through your model. That means, as you have an object selected and you're using a tool like Walk or Fly, you could have an object Walk along your path with you.

The object itself does not respect things like Gravity and Collision, but at least you have a visual representation of your item as your navigate through the model.

The Hold function can be useful for things like equipment moving down a hallway or moving a duct run briefly to understand the impact further down the line. Let's briefly explore the concept of how to use Hold:

1. Select an object.
2. Select Hold from the Item Tools panel of the Home tab.
3. Using a Navigation tool (Walk, Fly, Orbit, Pan, Zoom, etc.) to move around your model. Your object will move with you.
4. When you are finished, you can select the object again and use Reset Transform to return the object back to its original location.

**Look At** Provides quick access to the Focus On Item and Zoom tools, which are also located on the Navigation Bar.

**Visibility** Provides additional access to Hide and Require, which are also located on the Home tab.

**Transform** Within Navisworks you have the ability to both visually and dimensionally move objects. The Transform tools located here allow for moving, rotating, and scaling of objects. You also have access to the Dimensional drop-down as well.

When objects have been transformed, you can select the object later and use Reset Transform to return the object to its original position.

**Appearance** Gives you access to object appearance tools so you can change things like color and transparency of your objects. Use Reset Appearance to restore an object back to its original state.

**Links** Gives you a centralized location for the Link tools, where you can add, edit, and reset the links for your model.

## Status Bar, Performance Indicators, and Right-Click Menus

Located in the bottom-right corner of the screen are four performance indicators that give you feedback on the performance of your computer and currently loaded Navisworks model (Figure 1.28).

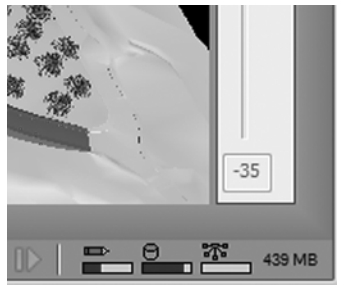



**FIGURE 1.28**
Status bar indicator

**Pencil Bar** Indicates how much of the current view is drawn. That is how much image "drop-out" there is in the current view. When the progress bar is at 100%, the scene is completely drawn, with no "drop-out." The icon changes color when a redraw is in progress. While the scene is being drawn, the pencil will change to yellow. If there is too much data to handle and your computer cannot process this quickly enough for Navisworks, then the pencil changes to red, indicating a potential problem.

**Disk Bar** Indicates how much of the current model is loaded from local hard drive. When the progress bar is at 100 percent, the entire model, including geometry and property information, is loaded into memory. The icon changes color when a file load is in progress. While the data is being read, the disk changes to yellow. If there is too much data to handle and your machine cannot process it quickly enough for Navisworks, then the disk changes to red, indicating a potential problem.

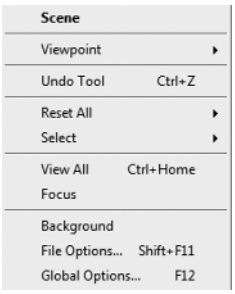
**Web Server Bar** Indicates how much of the current model is downloaded from a web server. When the progress bar is at 100 percent, the entire model has been downloaded. The icon changes color when a file load is in progress. While data is being downloaded, the web server changes to yellow. If there is too much data to handle and your computer cannot process it quickly enough for Navisworks, then the web server changes to red, indicating a potential problem.

**Memory Bar** Indicates the amount of system memory being utilized by Navisworks.

Navisworks uses a few right-click, or context, menus that contain various tools. These tools can help you save time once you master when and how to leverage them.

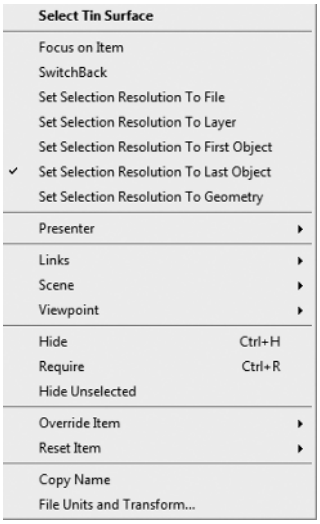
**No Item Selected** This right-click menu (Figure 1.29) has a variety of tools that are found across various tabs and toolbars within Navisworks but that have been centralized for easy access. Access this menu by right-clicking in white space away from geometry. Once the menu is open, select your tool.

**FIGURE 1.29**
Right-click menu, with no items selected




**With Item Selected** The With Item Selected right-click menu contains even more tools to help you along your way. Access this menu by right-clicking (Figure 1.30) once you've selected the geometry. If you right-click when no geometry is selected, Navisworks will select that single piece if geometry and open this right-click menu as well, saving you the step of having to select the object first.

**FIGURE 1.30**
Context menu, with an item selected



Notice that under the Scene flyout the No Item Selected right-click menu can still be accessed. Take note of the additional flyout tools available as well: Links, Viewpoint, Override Item, and Reset Item.

## The Bottom Line

**Understand the ribbon.** Knowing the locations of various tools within the Ribbon provides a good foundation for being able to quickly access items across the Navisworks Interface.

**Master It** Can you quickly locate Gravity and Collision?

**Use the Measure and Redline tools.** The Measure and Redline tools are useful in Navisworks throughout a project, and having a basic understanding of these tools is essential.

**Master It** Locate two columns and use the Measure Shortest Distance tool. Can you create a viewpoint and convert this to a redline?