

Autodesk® Navisworks® 2013

Basic Training

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1. Autodesk® Navisworks® shortly

The Autodesk® Navisworks® family of products helps architecture, engineering, and construction teams improve control over the outcome of their projects. With Navisworks solutions, detailed design models can be aggregated and reviewed by all project stakeholders, helping users to benefit from the competitive advantages of building information modelling (BIM) workflows. BIM processes allow team members to explore a project's key physical and functional characteristics digitally before it is built, helping to deliver projects faster, more economically, and with reduced environmental impact. With Autodesk® Navisworks® solutions, users can combine design data created in applications—such as the AutoCAD® software and Autodesk® Revit®-based applications—with geometry and information from other design tools in multiple file formats, regardless of file size. The result is a whole-project view that helps all project stakeholders to make better design decisions, increase accuracy of construction documentation, and predict performance and planning. The Autodesk® Navisworks® software family offers three products to provide project stakeholders with the right tools to help collaborate, coordinate, and communicate more effectively. Autodesk® Navisworks® is a perfect tool for project groups in building and process plant industry

Autodesk® Navisworks® Manage

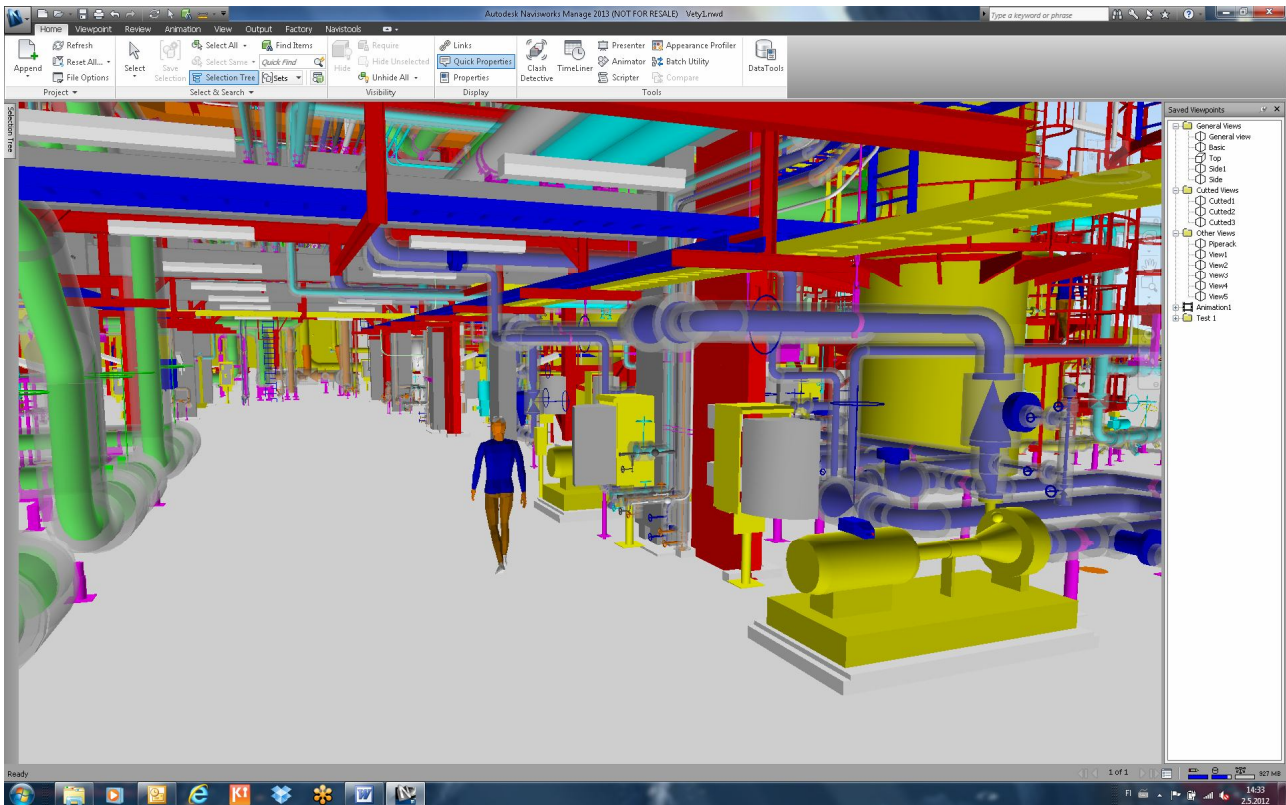
Autodesk® Navisworks® Manage software is a comprehensive review solution for analysis, simulation, and coordination of project information. Multidisciplinary design data can be combined into a single integrated project model for interference management and clash detection. Navisworks Manage helps design and construction professionals anticipate and avoid potential problems before construction.

Autodesk® Navisworks® Simulate

Autodesk® Navisworks® Simulate software provides advanced tools for reviewing, analysis, simulation, and coordination of project information. Comprehensive 4D simulation, animation and photorealism capabilities enable the demonstration of design intent and simulation of construction to provide better insight and predictability. Real-time navigation combines with review toolsets to support collaboration among the project team.

Autodesk® Navisworks® Freedom

Autodesk® Navisworks® Freedom software is the free viewer for NWD and 3D DWF™ files. Navisworks® Freedom extends the whole-project view to all project stakeholders, helping to improve communication and collaboration



Profox Companies - Realise Your Vision



Profox Companies Oy is a software house established in 1991 that specializes in providing CAD and data management tools for industrial plant design and AEC companies. Profox Companies is also an authorized Autodesk AEC, Autodesk Plant and Navisworks VAR in Europe.

Product portfolio:

AutoCAD® P&ID & AutoCAD Plant 3D® - PlantTools

Profox offers total AutoCAD P&ID and AutoCAD Plant 3D based solutions for industrial plant customers including solutions also for automation and electrical designers.

Autodesk® Navisworks® - Navistools

Profox was among the first companies in Europe to start to work with Navisworks products and the first company that has brought a complete product suite of Navistools to the markets.



CADMill Plant Design System

A total plant design solution with versatile modules for piping layouts, P&ID, Instrumentation, Electrical and Interlocking diagrams. Compatible with AutoCAD® P&ID, AutoCAD Plant 3D®, AutoCAD® and AutoCAD® Mechanical.

2. To open and append models in Navisworks®

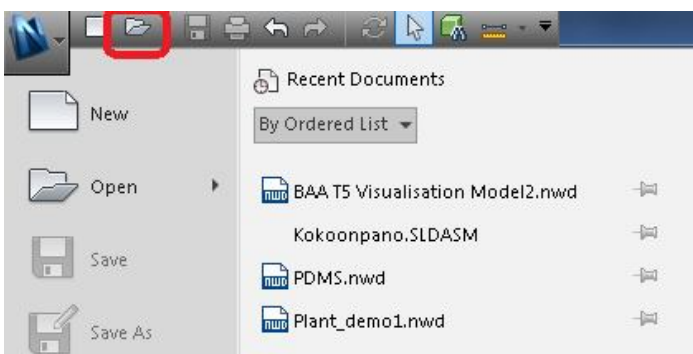
To open files in Autodesk Navisworks, you can either use a standard Open dialog box or drag and drop files directly into the Selection Tree window.

Note if the chosen file is a CAD or laser scan file, Autodesk Navisworks automatically uses an appropriate file reader to open it, provided this file format is supported.

Autodesk Navisworks keeps a list of recently opened files (by default, up to 4 files are shown). You can open any of these files by clicking the application button . If you want to modify the size of this list, use the Options Editor (General node  Environment page).

You can use the SHIFT and CTRL keys to open several files at the same time. This automatically creates a new “Untitled” Navisworks file with the selected files appended together.

For NWD files, it is possible to publish them to a web server, and then open them directly from within Navisworks. You can start navigating the model even before the file has been fully downloaded. For this, 10 - 50% is usually sufficient. The greater the hierarchical structure of the model, the closer to 50% download is required. Similarly, the lesser the hierarchical structure of the model, the sooner you can begin the navigation.



When you save a Navisworks file, you have a choice between an NWD and NWF file formats.

As a rule of thumb, use an NWF file format to save the scene you created by bringing all model files together, and an NWD file format when you simply want a snapshot of your current work.

Both formats store the review mark up's, but NWD file stores the file geometry, while NWF file stores the links to original files. This makes NWF files considerably smaller in size. Also when you open an NWF file, Autodesk Navisworks automatically reloads all modified referenced files, which means the geometry is always up-to-date, even for the most complex models.

On the other hand, whenever you need to share the scene you created and review markups with others, it is best to distribute a published NWD file, which includes additional features such as password protection and file expiration date. The published files can be viewed in both Autodesk Navisworks Manage 2013 and Autodesk Navisworks Freedom 2013 (a free viewer).

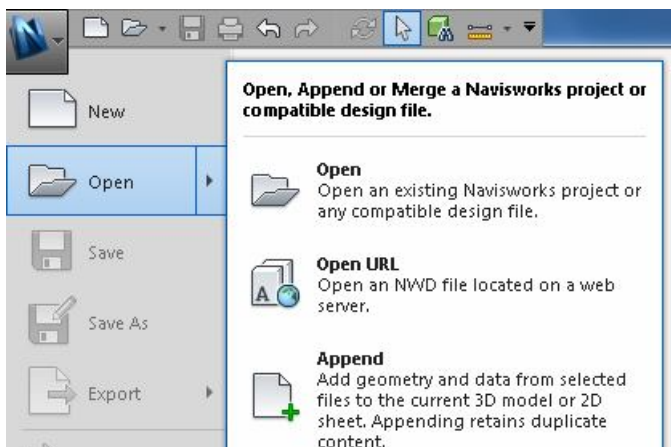
Important when you publish an NWD file, you cannot include any RPCs added to your scene.

To add more models to an existing scene, you need to **append** model files.

Note If you try to drag and drop files directly into the Selection Tree window or to use the Open dialog box, you will create a new Navisworks file instead.

You can **delete** files appended to your Navisworks file.

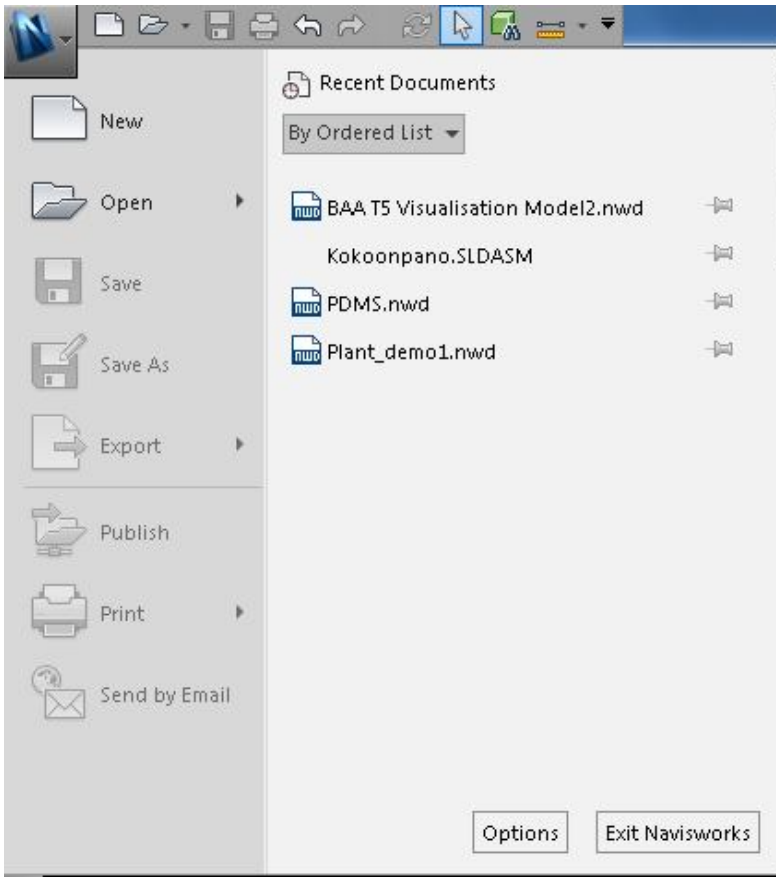
Note You cannot delete any files from a published NWD file.



Autodesk Navisworks is a collaborative solution, and although users may be reviewing the model in different ways, their resultant files can be merged into a single Navisworks file, with any duplicate geometry and mark up automatically removed.

When **merging** multiple NWF files that each comprise the same referenced files, Autodesk Navisworks only loads a single set of the combined models, along with all review mark up (such as tags, viewpoints or comments) from each NWF file. Any duplicate geometry or markup is removed when merged.

Application Menu



Application Menu

Quick Access Toolbar

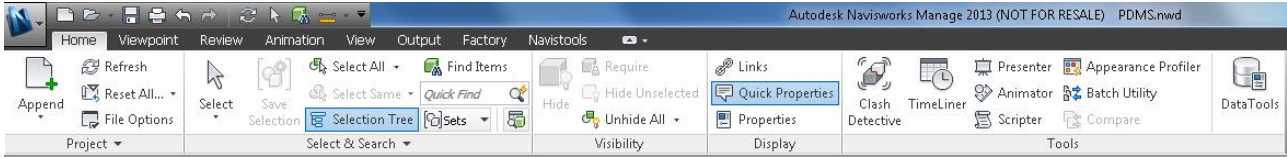


Quick Access Toolbar



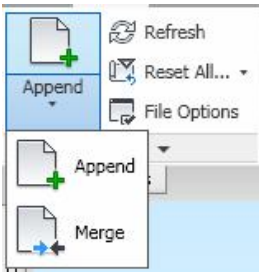
How to add Record Animation to Quick Access Toolbar

3. Home Ribbon



Home Ribbon

Project



Refresh

When working in Autodesk Navisworks, it is possible that others may be working on the CAD files you are currently reviewing. For example, if you are coordinating various disciplines on a project, then you may have an NWF file referencing numerous design files. During the iterative stages of the project, any member of the design team could potentially be modifying their CAD files.

To ensure the data you are reviewing is current, Autodesk Navisworks provides a refresh function to reopen the files that have been modified on the disk since commencing the review session.

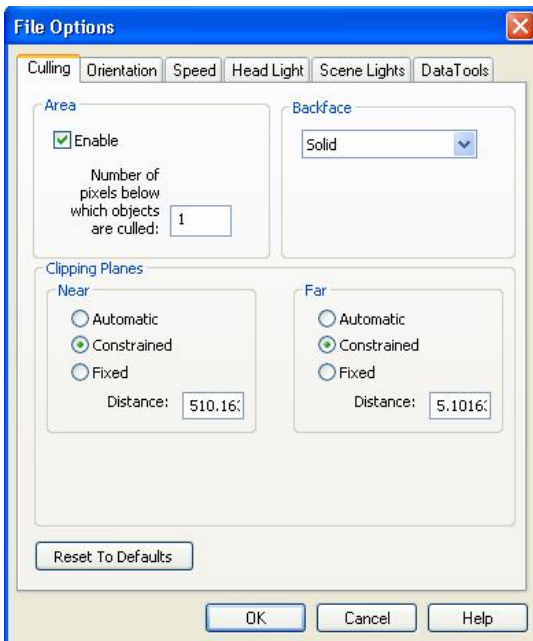
Reset All Appearances, Transforms, Links

In Autodesk Navisworks, you can reset object attributes back to the values in the original CAD files.

File Options

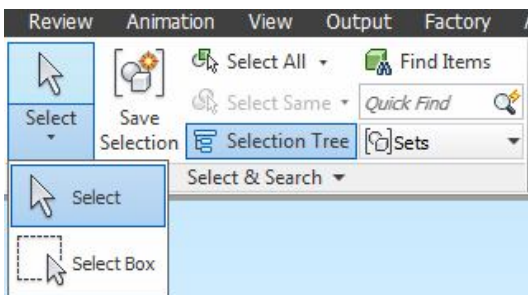
Use this dialog box to control the appearance of the model and the speed of navigation around it, and also to create and configure links to external databases.

When you modify any of the options in this dialog box, your changes are saved in the currently opened Autodesk Navisworks file, and apply to this file only.



Ribbon: Home panel Project tab File Options

Select&Search



Select, Select Box

There are two selection tools (Select and Select Box) available from Home tab Select & Search panel to control the way you select geometry.

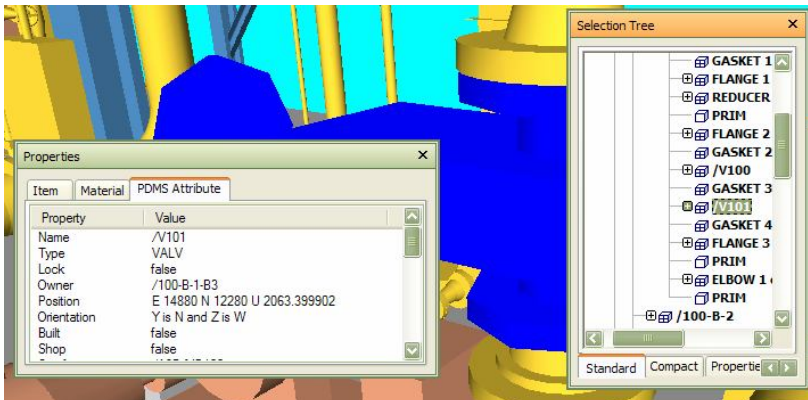
Typically, using selection tools is mutually exclusive to using navigation tools (see [Product-Specific Navigation Tools](#), so that when you are selecting you cannot navigate and vice versa.

Note When using a SpaceBall in conjunction with the standard mouse control, the SpaceBall can be configured for navigation and the mouse for selecting. See [SpaceBall](#) for more information.

Selecting geometry in the Scene View automatically selects the corresponding objects in the Selection Tree.

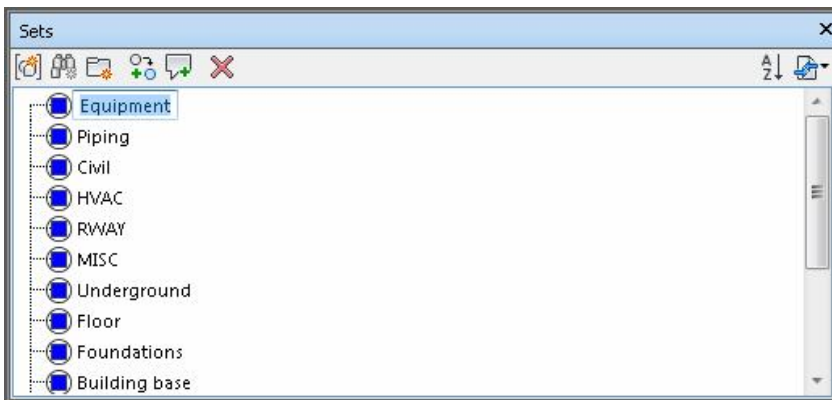
Holding the SHIFT key whilst selecting items in the Scene View cycles through the selection resolution, allowing you to get more specific with your selections.

You can use the Options Editor to customize the distance from an item you have to be for it to be selected (pick radius). This is useful when you select lines and points.



Save Selection

This command opens Selection Set dialog to create automatically Set of selected objects. You can re name new set after created it.

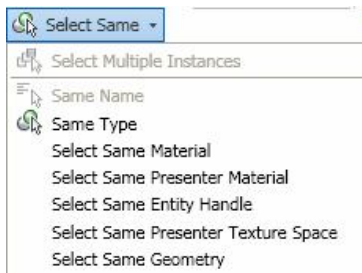


Select All, Select None, Invert Selection

Selection commands enable you to quickly alter the current selection using logic. You can select multiple items based on the currently selected items' properties, or quickly invert the set, select everything or nothing.

Select Same

Selection commands enable you to quickly alter the current selection using logic. You can select multiple items based on the currently selected items' properties, or quickly invert the set, select everything or nothing.



Selection Tree

The Selection Tree is a dockable window, which displays a variety of hierarchical views of the structure of the model, as defined by the CAD application in which the model was created.

Autodesk Navisworks uses this hierarchical structure to identify object-specific paths (from the file name down to a particular object).

By default there are four tabs:

- **Standard.** Displays the default tree hierarchy, including all instancing. The contents of this tab can be sorted alphabetically.
- **Compact.** Displays a simplified version of the hierarchy on the Standard tab, omitting various items. You can customize the level of complexity of this tree in the Options Editor.
- **Properties.** Displays the hierarchy based on the items' properties. This enables simple manual searching of the model by item property.
- **Sets.** Displays a list of selection and search sets. If no selection and search sets have been created, this tab is not shown.

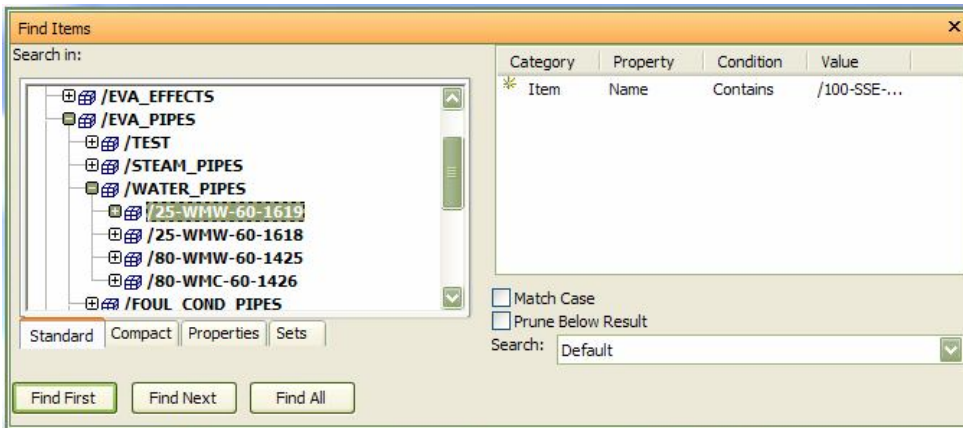
Note The list of the items on the Sets tab is exactly the same as the list on the Sets dockable window.

Find Items

Finding is a quick and powerful way of selecting items into the current selection based on items' properties.

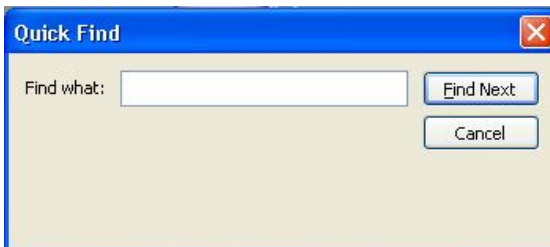
You can use the Find Items window to set up and run a search, which can then be saved and re-run in later sessions or shared with other users.

You can also use Quick Find, which is a faster way of searching. It simply looks for the specified string in all property names and values attached to items in the scene.



Quick Find

To locate and select the objects quickly, use the Quick Find feature. (Ctrl+F).



Sets

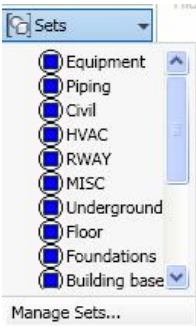
In Autodesk Navisworks, you can create and use sets of like objects. This makes it easier to review and analyze your model.

Selection Sets

Selection sets are static groups of items, and are useful for saving a group of objects that you want to regularly perform some action on, such as hiding them, changing transparency and so on. They simply store a group of items for later retrieval. There is no intelligence behind this set - if the model changes at all, the same items are selected (assuming they are still available in the model) when recalling the selection set.

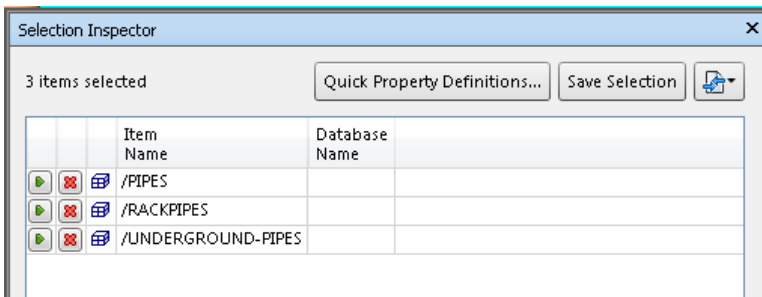
Search Sets

Search sets are dynamic groups of items, and work in a similar way to selection sets, except that they save search criteria instead of the results of a selection, so that you can re-run the search at a later date as and when the model changes. Search sets are much more powerful and can save you time, especially if your CAD files are continuing to be updated and revised. It is also possible to export search sets, and share them with other users.



Selection Inspector

The Selection Inspector is a dockable window, which displays a list of all the selected objects and the Quick Properties associated with those objects.

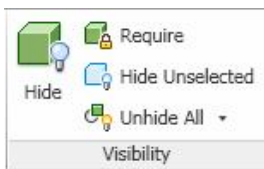


You can inspect a selection from the Selection Tree or Scene View. Alternatively, choose a Selection Set or a Search Set. You can then zoom the selection to display it within the model, or modify it by deselecting objects and adding property definitions.

When you save a selection it appears in the Selection Sets window. You can then rename your selection set. See [Sets Window](#) for more details.

All the objects that are visible within the Selection Inspector window may be exported into a CSV file. You must deselect objects if you wish to exclude them from the exported file.

Visibility



Hide

Autodesk Navisworks provides tools that can be used to hide and display objects or groups of objects. Hidden objects are not drawn in the Scene View..

Require

Although Autodesk Navisworks intelligently prioritizes objects for culling in the scene, sometimes it drops out geometry that needs to remain visible while navigating. You can make sure the objects are always rendered during interactive navigation by making them required.

Hide Unselected

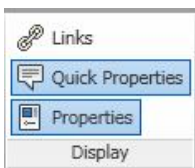
You can hide all items except those currently selected so that they are not drawn in the Scene View. This is useful when you only want to see specific parts of the model.

Note: In the Selection Tree, the items appear gray when marked as hidden.

Unhide All, Unrequire All

You can unhide or unrequire all items

Display



Links

There are several sources of links in Autodesk Navisworks: original links that have been converted from the native CAD files, links that have been added by Autodesk Navisworks users, and links that have been automatically generated by the program (for example, selection set links, viewpoint links, TimeLiner task links and so on).

The links converted from the native CAD files, and the links added by Autodesk Navisworks users are treated as object properties. This means, you can examine them in the Properties window.

You can also use the Find Items window to search for them.

All links are saved with Autodesk Navisworks files so that as the model changes, the links remain there for you and others to view.

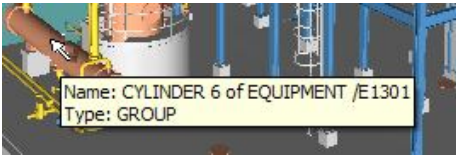
.



Quick Properties

You can switch quick properties in the Scene View on and off. Autodesk Navisworks remembers the selected visibility setting between sessions.

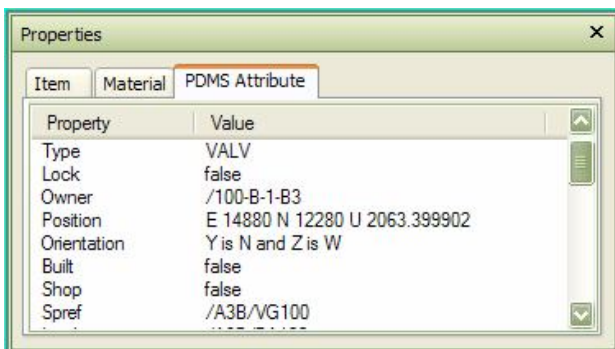
When Quick Properties are switched on, you can view property information in a tooltip style window as you move your cursor over objects in the Scene View. You don't need to select objects first. The quick properties tooltip disappears after a few seconds.



By default, quick properties show the name and type of the object, but you can use the Options Editor to define which properties are shown. Each definition that you configure enables you to display an additional category/property combination in quick properties. You can choose whether to hide category names in quick properties or not.

Properties

Once brought into Autodesk Navisworks, the object properties can be examined in the Properties window.



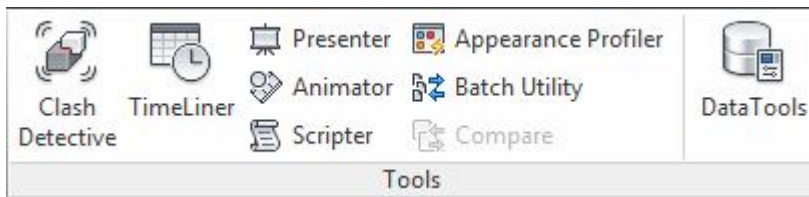
The Properties window is a dockable window, which has a dedicated tab for each property category associated with the currently selected object.

Internal file properties, such as transform and geometry properties, are not shown by default. The Options Editor enables you to switch this on.

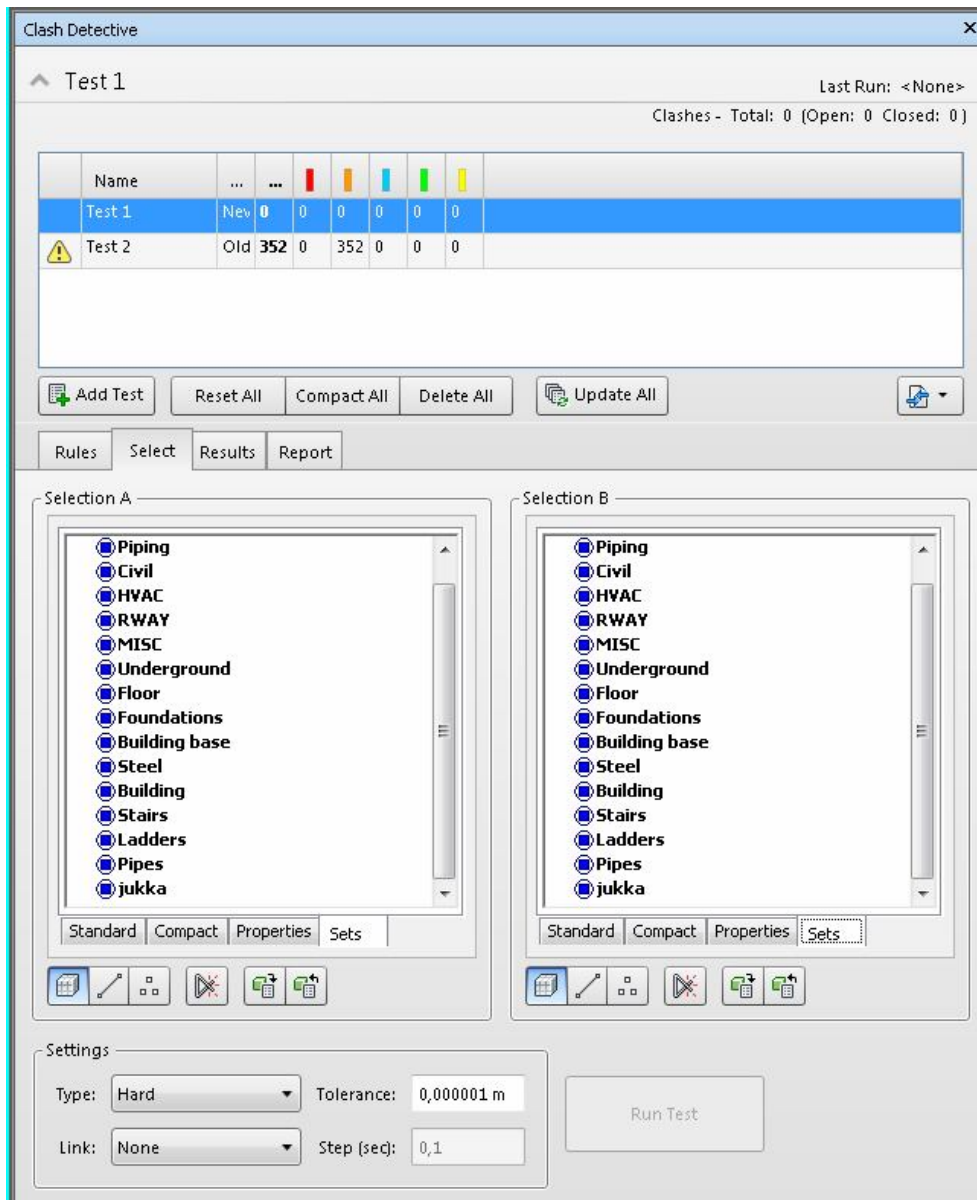
You can use the Properties shortcut menu to create and manage custom object properties, and [links](#).

You can also bring more object properties into Autodesk Navisworks from external databases, and show on the database-specific tabs in the Properties window.

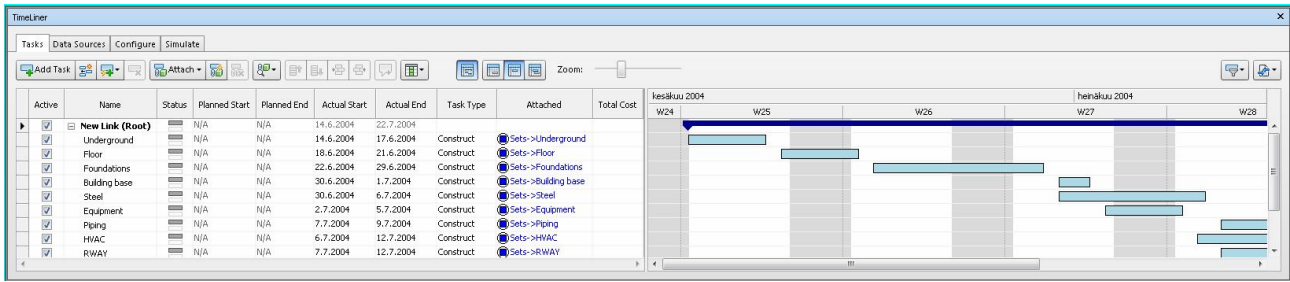
Tools



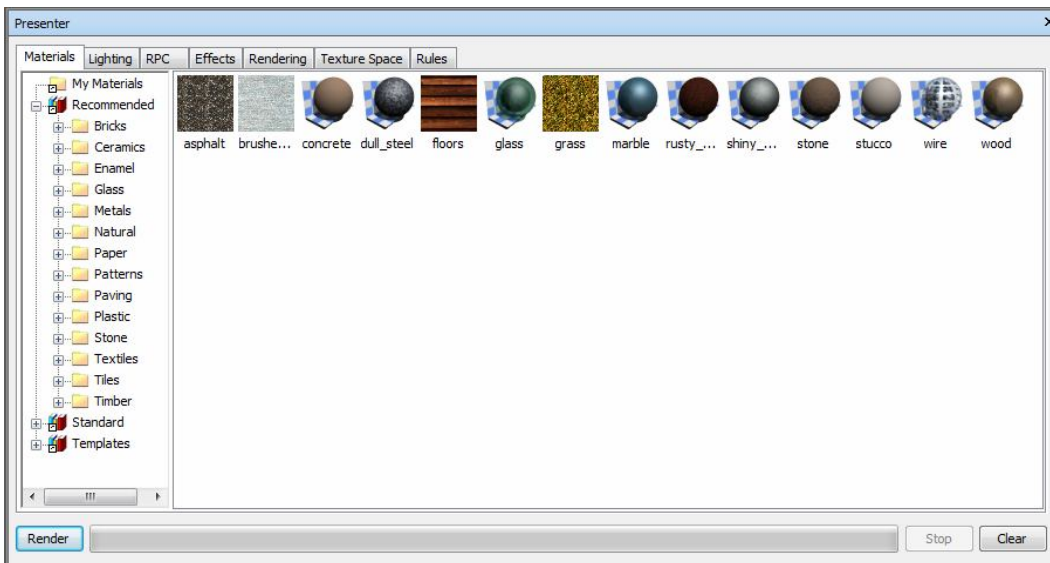
Clash Detective (only in Manage)



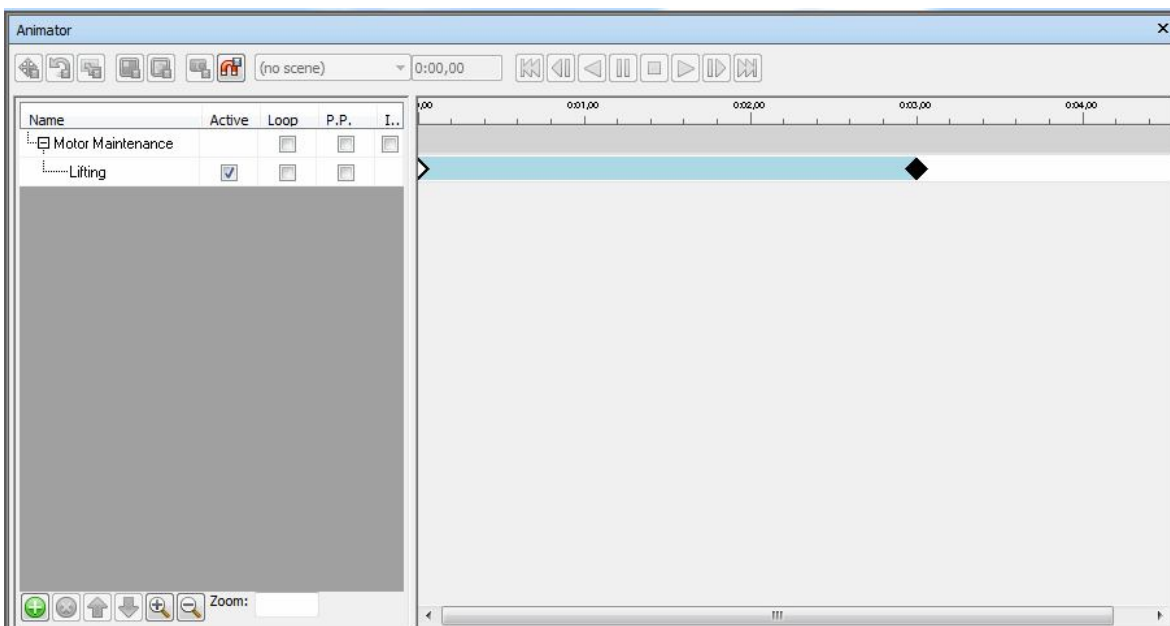
TimeLiner



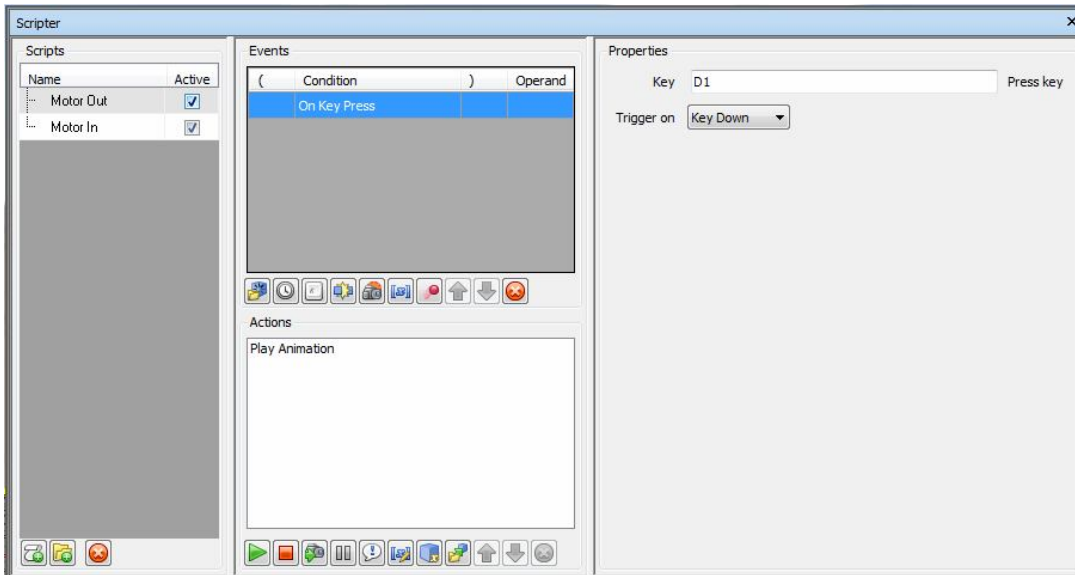
Presenter



Animator

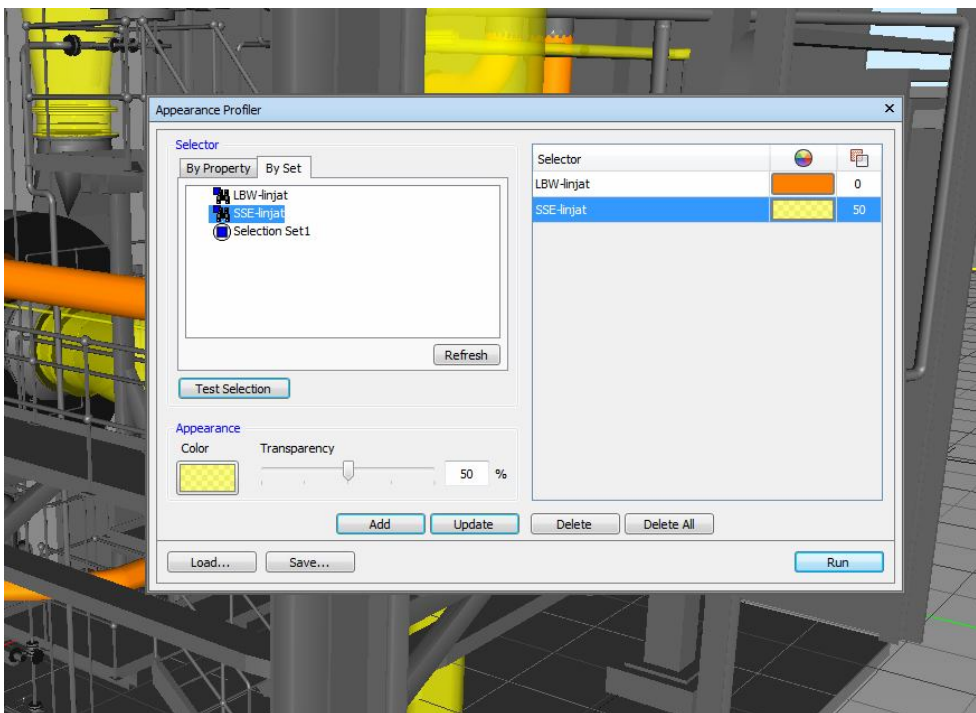


Scripter

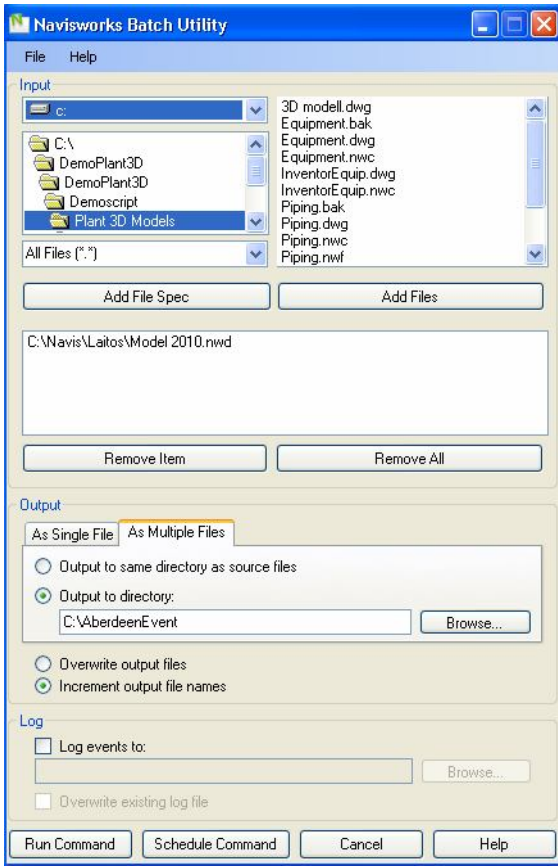


Appearance Profiler

With the help of this function you easily control over several objects (Sets etc.) at same time.



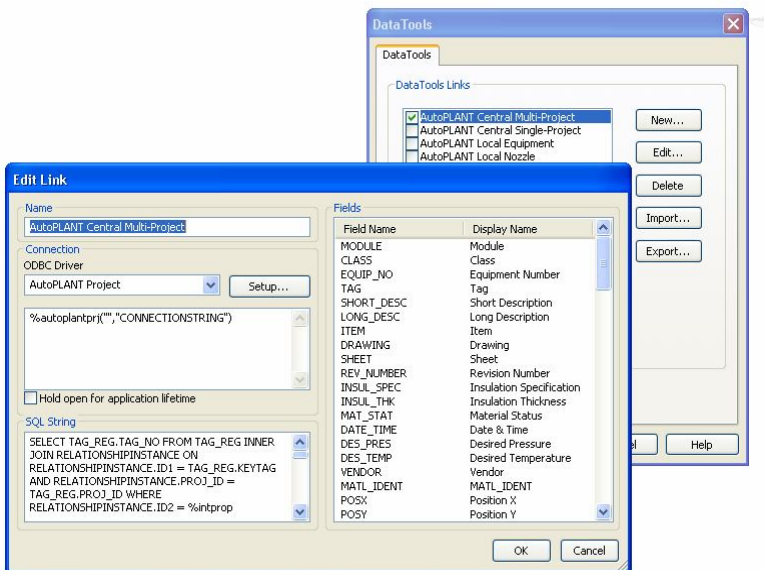
Batch Utility



Compare

You can look for differences between any two selected items in the scene. These items can be files, layers, instances, groups, or just geometry. You can also use this feature to investigate the differences between two versions of the same model.

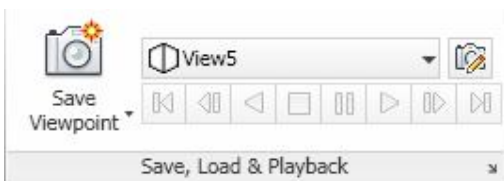
DataTools



4. Viewpoint Ribbon



Save, Load & Playback



Save Viewpoint

New viewpoints are named “ViewX” where “X” is the next available number added to the list. This new viewpoint takes all the attributes of the current viewpoint in the Scene View.

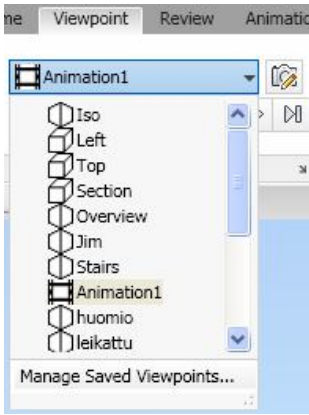
Record

You can play back both pre-recorded object animation and viewpoint animation in the Scene View.

The viewpoint animations play in real time; this means that the Autodesk Navisworks engine is still attempting to maintain the guaranteed frame rate so some drop-out may still occur, just as in real-time navigation.

Current Viewpoints

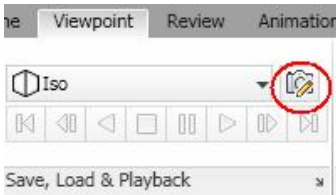
You can return to any of previously saved viewpoints. On recalling viewpoints the navigation mode that was active when the viewpoint was created will be re-selected. Any redlines and comments associated with the viewpoint will also be reinstated.



Edit Current Viewpoint

You can edit any viewpoints attributes, including camera position, field of view, speed of motion and saved attributes. All entries are measured in [Display Units](#).

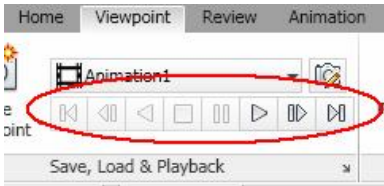
TipClick Viewpoint tab Motion Settings panel to quickly adjust linear and angular speed of motion for your current viewpoint.



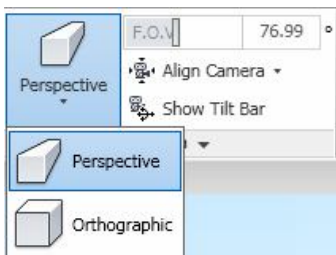
Playback Animation

You can play back both pre-recorded object animation and viewpoint animation in the Scene View.

The viewpoint animations play in real time; this means that the Autodesk Navisworks engine is still attempting to maintain the guaranteed frame rate so some drop-out may still occur, just as in real-time navigation.



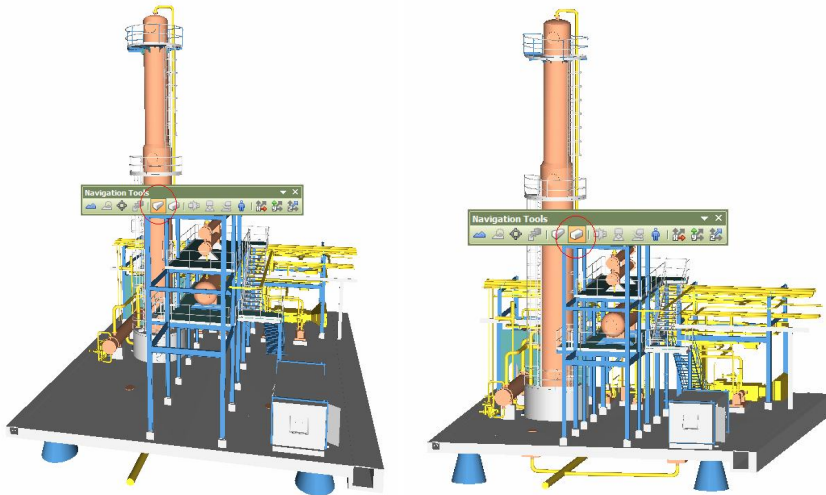
Camera



Perspective / Orthographic

You can choose to use a perspective camera or an orthographic camera during navigation.

Note Orthographic cameras are not available with Walk and Fly navigation tools.

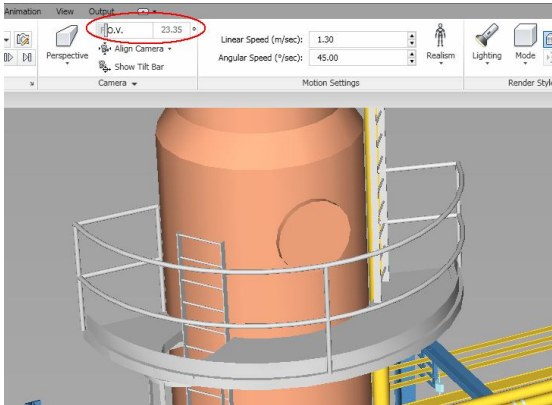


Field Of View

You can define the area of the scene that can be viewed through the camera.

For the current viewpoint, you can move the FOV slider on the ribbon to adjust the Horizontal Field of View. For previously saved viewpoints, you can use the [Edit Viewpoint dialog box](#) to adjust the values for both vertical and horizontal angles of view.

Note When you modify the Horizontal Field of View, the Vertical Field of View is automatically adjusted, and vice versa to match the aspect ratio in Autodesk Navisworks.



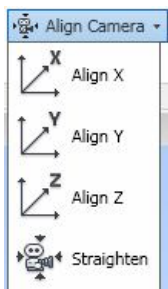
Align Camera

In Autodesk Navisworks, you can align a camera to one of the axis, or select one of six predefined face views to instantly change the camera's position and orientation in the scene.

When you align the camera position along one of the axis:

- Aligning with X axis toggles between front and back face views.
- Aligning with Y axis toggles between left and right face views.
- Aligning with Z axis toggles between top and bottom face views.

Note You can customize the location of the front face by using the ViewCube tool. This change is global, and affects all viewpoints.



Show Tilt Bar

You can adjust the angle of the camera during navigation.

For the current viewpoint, use the Tilt window to rotate the camera up/down, and the Roll entry box on the ribbon to rotate the camera left/right. For saved viewpoints, you can use the [Edit Viewpoint dialog box](#) to adjust the camera values.

Navigate

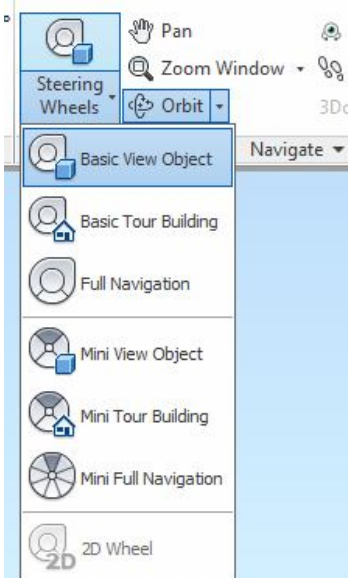
Linear Speed, Angular Speed

You can edit any viewpoints attributes, including camera position, field of view and speed of motion and saved attributes. All entries are measured in [Display Units](#).



SteeringWheels

Collection of wheels that offer rapid switching between specialized navigation tools.



Pan tool

Activates the pan tool and moves the view parallel to the screen.

Zoom tools

Set of navigation tools for increasing or decreasing the magnification of the current view of the model

Look tools

Set of navigation tools for rotating the current view vertically and horizontally.

Walk and Fly tools

Set of navigation tools for moving around the model and controlling realism settings.

Realism



Collision

This function defines you as a collision volume - a 3D object that can navigate around and interact with the model, obeying certain physical rules that confine you within the model itself. In other words, you have a mass and as such, cannot pass through other objects, points or lines in the scene.

You can walk over, or climb over objects in the scene that are up to half the height of the collision volume, thus allowing you to walk up stairs, for example.

Gravity

Note This function only works in connection with collision.

Where collision gives you mass, gravity gives you weight. As such, you (as the collision volume) will be pulled downwards whilst walking through the scene.

Note Gravity can only be used with the Walk navigation tool.

This allows you to walk down stairs, for example, or follow terrain.

Crouch

Note This function only works in connection with collision.

When walking or flying around the model with collision activated, you may encounter object that are too low to walk under, a low pipe for example. This function enables you to crouch under any such objects.

With crouching activated, you will automatically crouch under any objects that you cannot walk under at your specified height, thereby not impeding your navigation around the model.

Tip To temporarily crouch under a low object, hold down the Space bar to allow navigation to proceed.

Third person

This function allows you to navigate scene from a third person perspective.

When third person is activated, you will be able to see an avatar which is a representation of yourself within the 3D model. Whilst navigating you will be controlling the avatar's interaction with the current scene.

Render Style

Lightning

In Autodesk Navisworks, you can use four lighting modes to control how the 3D scene is lit.

The spheres below demonstrate the effect the lighting styles have on them. In order from the top, these are Full Lights, Scene Lights, Head Light, and No Lights.



Full Lights

This mode uses lights that have been defined with the Presenter tool.

Scene Lights

This mode uses the lights that have been brought through from the native CAD file. If no lights are available, two default opposing lights are used instead. You can customize the intensity of scene lights in the File Options dialog box.

Head Light

This mode uses a single directional light located at the camera that always points in the same direction as the camera.

You can customize the Head Light properties in the File Options dialog box (Home tab Project panel).

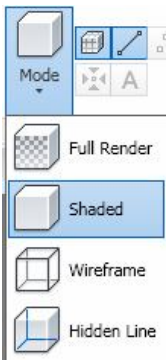
No Lights

This mode switches off all lights. The scene is shaded with flat rendering.

Mode

Rendering shades the scene's geometry using the lighting you've set up, and the materials and environmental settings (such as background) you've applied.

In Autodesk Navisworks, you can use four render modes to control how the items are rendered in the Scene View. The spheres below demonstrate the effect that the render modes have on model appearance. In order from the top, these are Full Render, Shaded, Wire frame, and Hidden Line.



Full Render

In Full Render mode, the model is rendered with smooth shading including any materials that have been applied using the Presenter tool, or have been brought through from the native CAD file. Note Autodesk Navisworks does not convert all native CAD file's textures. For more details, see [Use File Readers](#) and [Use File Exporters](#).

Shaded

In Shaded mode, the model is rendered with smooth shading and without textures.

Wire frame

In Wire frame mode, the model is rendered in wire frame. As Autodesk Navisworks uses triangles to represent surfaces and solids, all triangle edges are visible in this mode.

Hidden Line

In Hidden Line mode, the model is rendered in wire frame, but only the outline and facet edges of surfaces that are visible to the camera are displayed.

Note Unlike wire frame mode, where surfaces are rendered transparent, hidden line mode renders surfaces opaque.



You can toggle the rendering of Surfaces, lines, points, snap points and 3D text in the model.

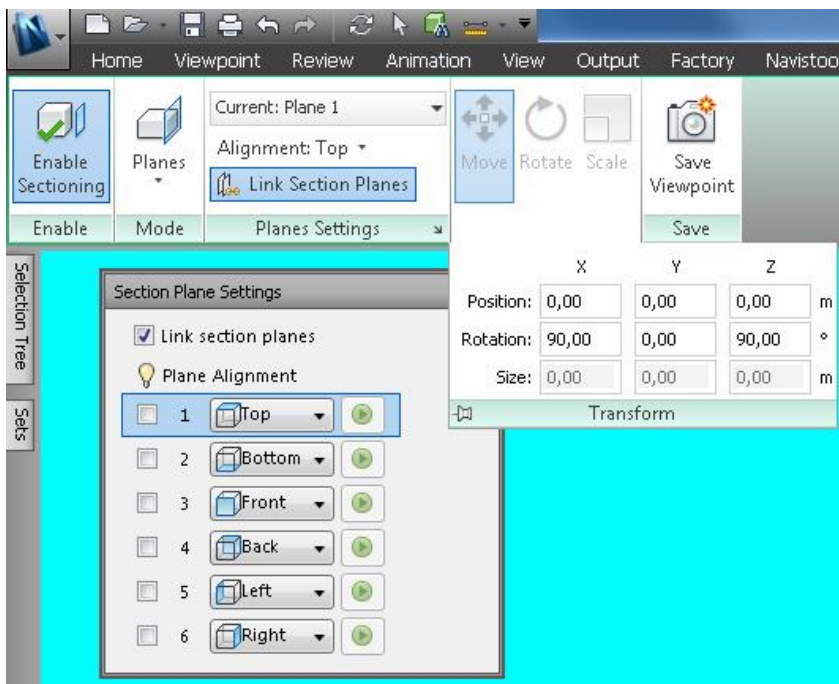
Sectioning

Autodesk Navisworks enables you to turn on sectioning for the current viewpoint and to create cross sections of your model.

A cross section is a cut-away view of a 3D object that enables you to see inside it. You can turn sectioning on and off for the current viewpoint by clicking Viewpoint tab Sectioning panel Enable Sectioning. When the sectioning is turned on, the Sectioning Tools contextual tab is automatically displayed on the ribbon.

There are two sectioning modes available from the Sectioning Tools tab Mode panel: Planes and Box.

Planes mode allows you to make up to six sectional cuts in any plane while still being able to navigate around the scene, enabling you to see inside models without hiding any item. By default section planes are created through the center of the visible area of the model.



To view cross-sectional cuts of your model, you can enable up to six section planes. When a plane is 'enabled' it means that it affects (cuts through) the scene. The current plane is the one that is rendered visibly in the Scene View. Selecting a plane as current automatically enables that plane if it was not already enabled.

When a section plane is first enabled, it is created with the default alignment and position. Afterwards, enabling a section plane restores the saved alignment, position, and rotation if it is available for the current viewpoint.

Note To save the settings for enabled section planes (alignment, position, rotation), you need to save the current viewpoint with sectioning enabled and in sectioning mode.

By default, a section plane is created within the view, and as close to the centre of the view as possible. Visually, a section plane is represented by a light blue wire frame. You can hide the visual plane representation by toggling the corresponding gizmo button.

By default, section planes are mapped to one of the six primary directions as follows:

Plane No	Plane Name	Default Alignment
1	Plane 1	Top
2	Plane 2	Bottom
3	Plane 3	Front
4	Plane 4	Back
5	Plane 5	Left
6	Plane 6	Right

You can select a different alignment for the current section plane. There are 6 fixed alignments and 3 custom alignments to choose from:

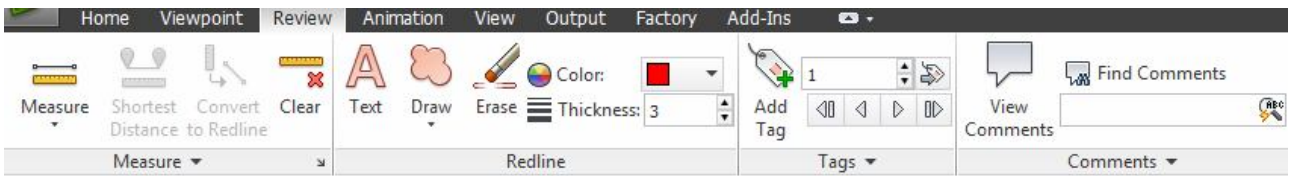
- Top - aligns the current plane to the top of model.
- Bottom - aligns the current plane to the bottom of model.
- Front - aligns the current plane to the front of model.
- Back - aligns the current plane to the back of model.
- Left - aligns the current plane to the left of model.
- Right - aligns the current plane to the right of model.
- Align To View - aligns the current plane to the current viewpoint camera.
- Align To Surface- enables you to pick a surface, and place the current plane 'on' that surface, with its normal aligned to the normal of the triangle picked.
- Align To Line - enables you to pick a line, and place the current plane 'on' that line, at the point where you clicked, and aligned so that its normal is on the line itself, facing towards the camera.

Export an Image

With this function you can render current viewpoint and export the result as an image file.

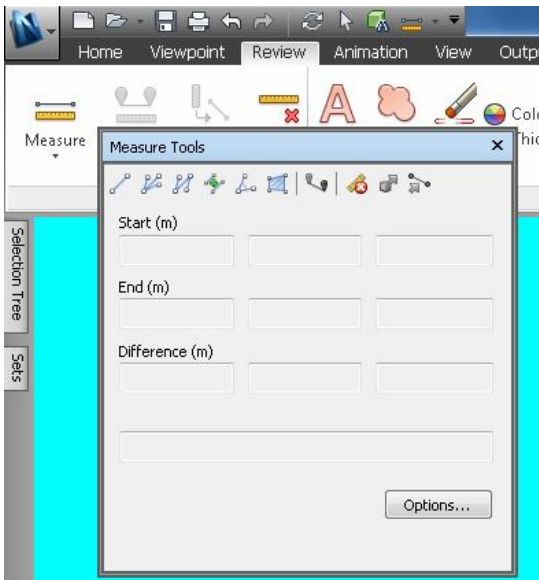


5. Review Ribbon













Measure

The Measure Tools window is a dockable window, which contains a number of buttons at the top enabling you to select the type of measurement you want to do.



For all measurements, the X, Y, and Z coordinates of the Start point and End point are displayed in the text boxes underneath the buttons, together with the Difference and the absolute Distance. If you use accumulative measure, such as Point Line or Accumulate, Distance shows the accumulated distance for all points registered in the measurement.

Button	Description
	Measures the distance between two points.
	Measures the distance between a base point and various other points.
	Measures a total distance between multiple points along a route.
	Calculates the sum total of several point-to-point measurements.
	Calculates an angle between two lines.
	Calculates an area on a plane.
	Measures the shortest distance between two selected objects.
	Clears all measuring lines in the Scene View.
	Enables you to move or rotate an object.
	Converts the endpoint markers, the lines, and any displayed measurement values into redlines.

Shortest Distance



Redline

The Redline Tools panel on the Review tab enables you to mark up viewpoints and clash results with redline annotations.










In the classic user interface, you can use the Redline Tools dockable window to add redlines, and tags.

The Thickness and Colour controls enable you to modify the redline settings. These changes do not affect already drawn redlines. Also, thickness only applies to lines; it does not affect redline text, which has a default size and weight and cannot be modified.

All redlines can only be added to a saved viewpoint or to a clash result which has a saved viewpoint. If you don't have any saved viewpoints, adding a tag will automatically create and save a viewpoint for you.

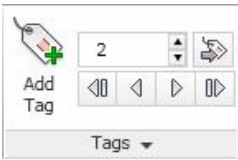
You can also convert measurements to redline. For more information, see [Measuring](#).

Tool	Description
	Adds text to a viewpoint.
	Enables you to draw freehand in a viewpoint.
	Draws a line in a viewpoint.
	Draws a string of lines in a view point.
	Draws an ellipse in a viewpoint.
	Draws a cloud in a viewpoint.
	Erases redlines.

Color



Tags

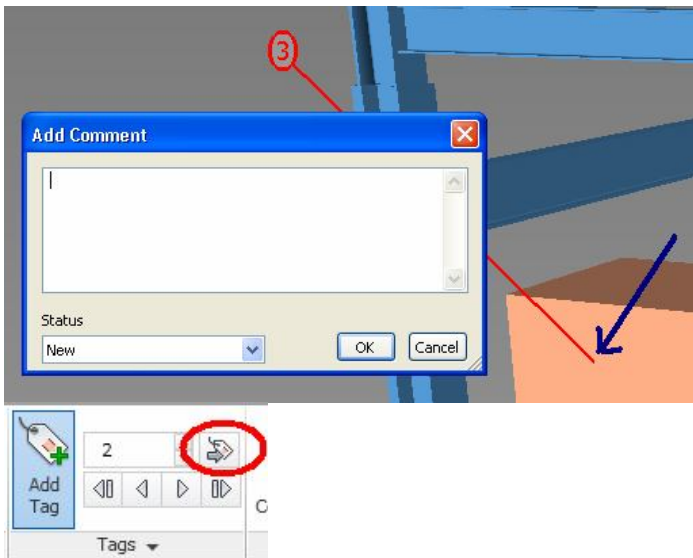


Add Tag

The Tags panel on the Review tab enables you to add and manage tags.

Tags combine the features of redlining, viewpoints and comments into a single, easy to use review tool. This allows you to tag anything you want to identify in the model scene. A viewpoint is automatically created for you, and you can add a comment and status to the tag.

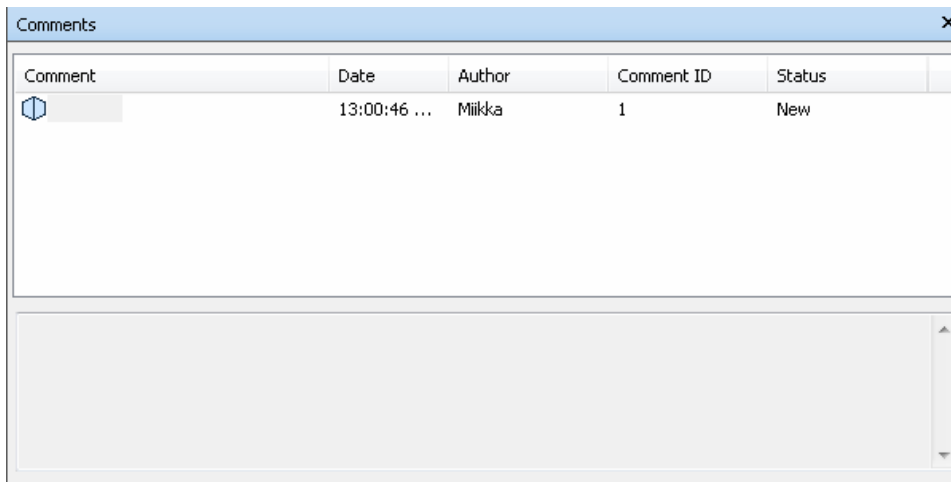
For example, during a review session, you locate an item in the scene that is incorrectly sized or positioned. You can tag this item, stating the problem, save your review results as an NWF file, and pass the file to the design team. The design team can search the file, for any tags of status 'new', and locate your review comments. Once any necessary modifications are made to the drawing files, these can be reloaded into the *.nwf file, and the tag status can be changed accordingly. You can review this latest version of the NWF file, ensure all tags have been resolved and finally 'approve' them.



Comments

The Comments window is a dockable window that enables you to view and manage comments.

The Comments window shows the name, time and date, author, ID, status, and subject (or first line) of each comment. There are different icons helping you to identify the source of each comment at a glance.



The Comment shortcut menu has the following options:

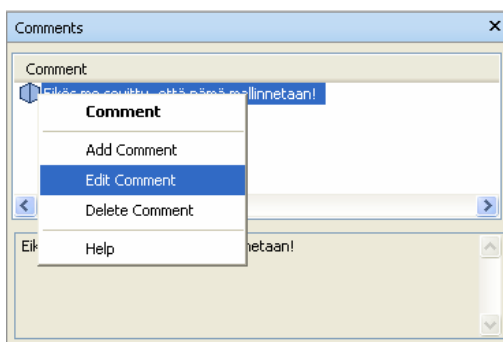
- *Add Comment.* Opens the Add Comment dialog box.
- *Edit Comment.* Opens the Edit Comment dialog box for the selected item.
- *Delete Comment.* Deletes the selected comment.
- *Help.* Launches the online Help system and displays the topic for comments.

You can add as many comments as you wish to a source, either from the Comments window, or from the source itself.

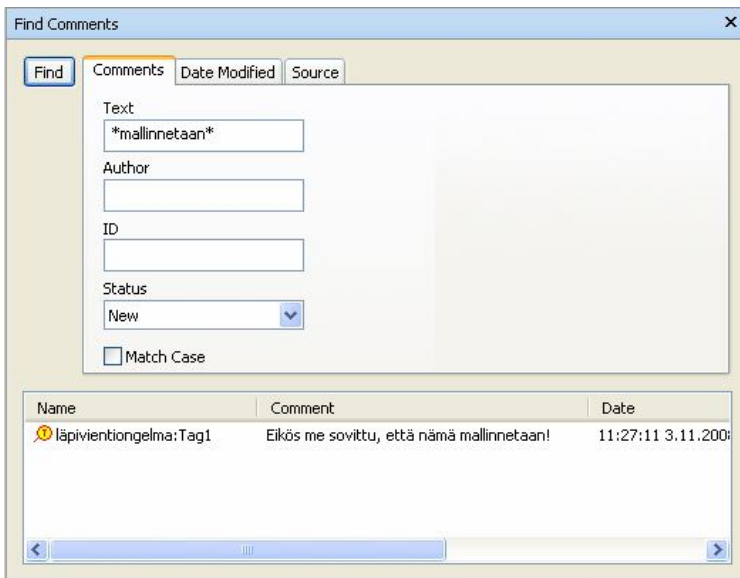
Tip To add a comment to a specific object in the Scene View, use tags.



View Comments



Find Comments



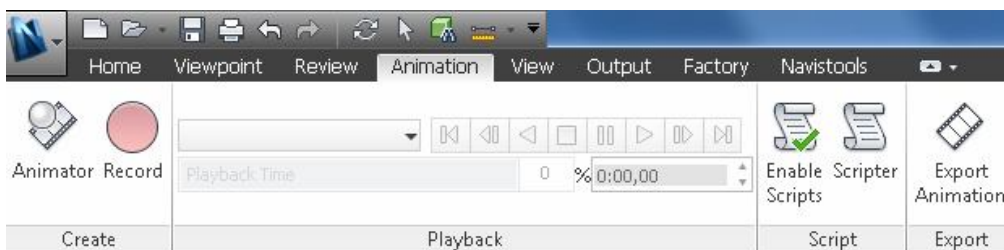
Collaborate

This function enables multiple users to participate in a single design review session across a Local Area Network (LAN).

The Collaborate tool has two noteworthy limitations.

- Collaboration between different versions of Autodesk Navisworks is not supported.
- This feature is only available for Windows XP users, as it utilizes the shared program features of Windows NetMeeting, which is unavailable in the Vista and Windows 7 operating systems.

6. Animation Ribbon



Create

Animator

The Animator and Scripter windows are the two dockable windows that are used to create and edit object animation in Autodesk Navisworks 2013. Use the Animator window to create animated objects in your model.

The Animator Toolbar

The Animator toolbar is located at the top of the Animator window.

The Animator Tree View

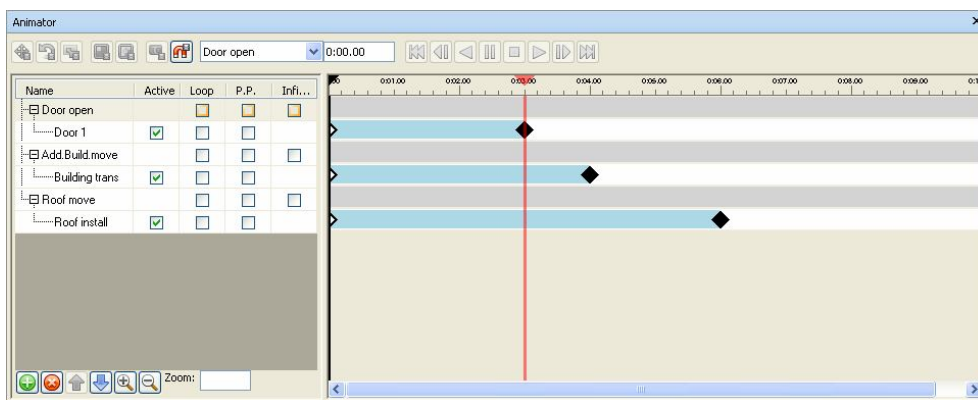
The Animator tree view lists all scenes and scene components in a hierarchical list view.

The Animator Timeline View

The timeline view shows the timelines with keyframes for animation sets, cameras, and section planes in your scenes.

The Manual Entry Bar

The optional Manual Entry bar is located at the bottom of the Animator window, and enables you to manipulate geometry objects by typing in numerical values, instead of using gizmos in the Scene View.



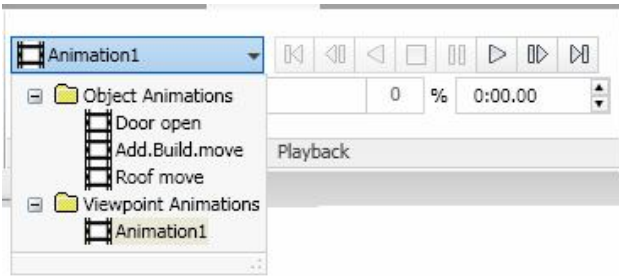
Record

Record a viewpoint animation.

Playback

You can play back both pre-recorded object animation and viewpoint animation in the Scene View.

The viewpoint animations play in real time; this means that the Autodesk Navisworks engine is still attempting to maintain the guaranteed frame rate so some drop-out may still occur, just as in real-time navigation.



Script

Use the Scripser window to add interactivity to animated objects in your model.



Scripter

The Scripter Tree View

The Scripter tree view contains all scripts available in your Navisworks file in a hierarchical list view.

The Events View

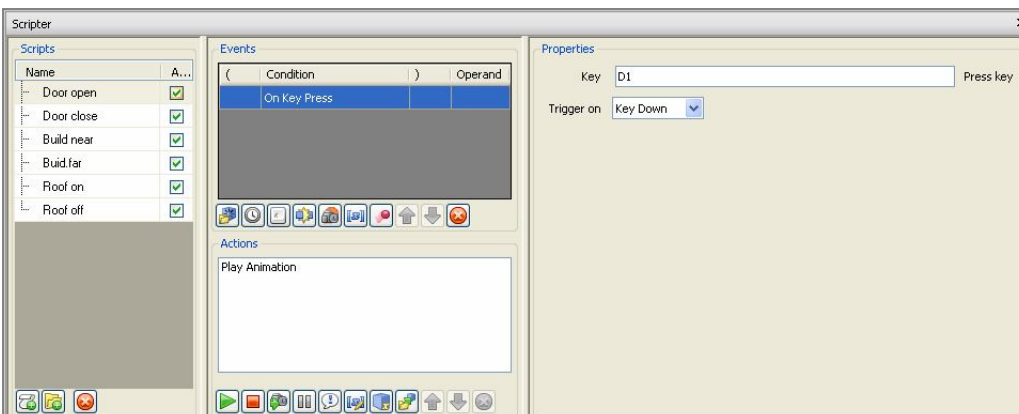
The Events view shows all events associated with the currently selected script.

The Actions View

The Actions view shows the actions associated with the currently selected script.

The Properties View

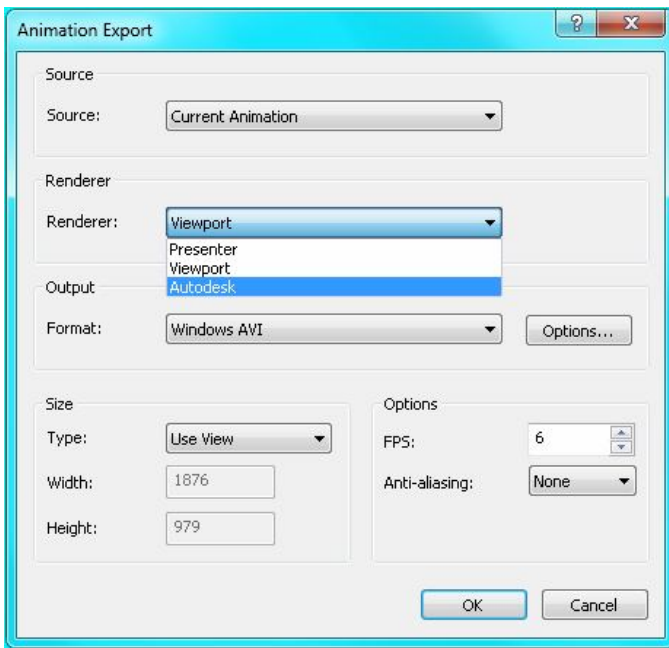
The Properties view shows the properties for the currently selected event or action.



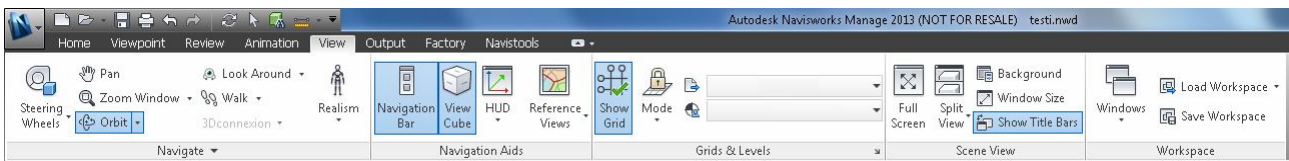
Export

Export Animation

Export an animation from your project to an AVI file or a sequence of image file.



7. View Ribbon



Navigate

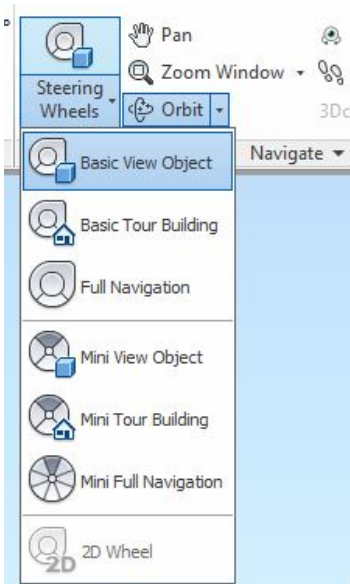
Linear Speed, Angular Speed

You can edit any viewpoints attributes, including camera position, field of view and speed of motion and saved attributes. All entries are measured in [Display Units](#).



SteeringWheels

Collection of wheels that offer rapid switching between specialized navigation tools.



Pan tool

Activates the pan tool and moves the view parallel to the screen.

Zoom tools

Set of navigation tools for increasing or decreasing the magnification of the current view of the model

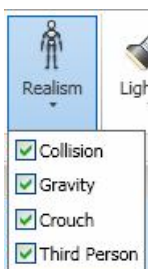
Look tools

Set of navigation tools for rotating the current view vertically and horizontally.

Walk and Fly tools

Set of navigation tools for moving around the model and controlling realism settings.

Realism



Collision

This function defines you as a collision volume - a 3D object that can navigate around and interact with the model, obeying certain physical rules that confine you within the model itself. In other words, you have a mass and as such, cannot pass through other objects, points or lines in the scene.

You can walk over, or climb over objects in the scene that are up to half the height of the collision volume, thus allowing you to walk up stairs, for example.

Gravity

Note This function only works in connection with collision.

Where collision gives you mass, gravity gives you weight. As such, you (as the collision volume) will be pulled downwards whilst walking through the scene.

Note Gravity can only be used with the Walk navigation tool.

This allows you to walk down stairs, for example, or follow terrain.

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Crouch

Note This function only works in connection with collision.

When walking or flying around the model with collision activated, you may encounter object that are too low to walk under, a low pipe for example. This function enables you to crouch under any such objects.

With crouching activated, you will automatically crouch under any objects that you cannot walk under at your specified height, thereby not impeding your navigation around the model.

Tip To temporarily crouch under a low object, hold down the Space bar to allow navigation to proceed.

Third person

This function allows you to navigate scene from a third person perspective.

When third person is activated, you will be able to see an avatar which is a representation of yourself within the 3D model. Whilst navigating you will be controlling the avatar's interaction with the current scene.

Navigation Adds

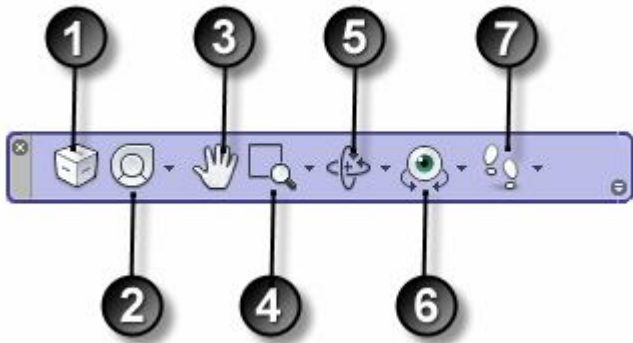
Navigation Bar

Unified and product-specific navigation tools can be accessed from the navigation bar.

The navigation bar is a user interface element where you can access both unified and product-specific navigation tools.

Unified navigation tools (such as Autodesk® ViewCube®, and SteeringWheels®) are those that can be found across many Autodesk products. Product-specific navigation tools are unique to a product. The navigation bar floats over and along one of the sides of the Scene View.

You start navigation tools by clicking one of the buttons on the navigation bar or selecting one of the tools from a list that is displayed when you click the smaller portion of a split button.



1. [ViewCube](#). Indicates the current orientation of a model, and is used to reorient the current view of a model. Clicking this button displays the ViewCube in the Scene View when it's not visible.

2. [SteeringWheels](#). Collection of wheels that offer rapid switching between specialized navigation tools.

3. [Pan tool](#). Activates the pan tool and moves the view parallel to the screen.

4. [Zoom tools](#). Set of navigation tools for increasing or decreasing the magnification of the current view of the model.

5. [Orbit tools](#). Set of navigation tools for rotating the model around a pivot point while the view remains fixed.

6. [Look tools](#). Set of navigation tools for rotating the current view vertically and horizontally.

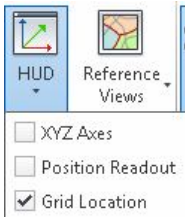
7. [Walk and Fly tools](#). Set of navigation tools for moving around the model and controlling realism settings.

The position and orientation of the navigation bar can be adjusted by linking it to the ViewCube tool, docking it when the ViewCube tool is not displayed, or freely positioning it along one of the edges of the current window.

When linked to the ViewCube tool, the navigation bar is positioned below the ViewCube tool and in a vertical orientation. When not linked or docked, the navigation bar can be freely aligned along one of the edges of the Scene View.

You can specify how the navigation bar can be repositioned from the Customize menu. When the navigation bar is not linked to the ViewCube tool or docked, a grip handle is displayed. Drag the grip handle on the navigation bar to reposition it along one of the sides of the Scene View.

HUD

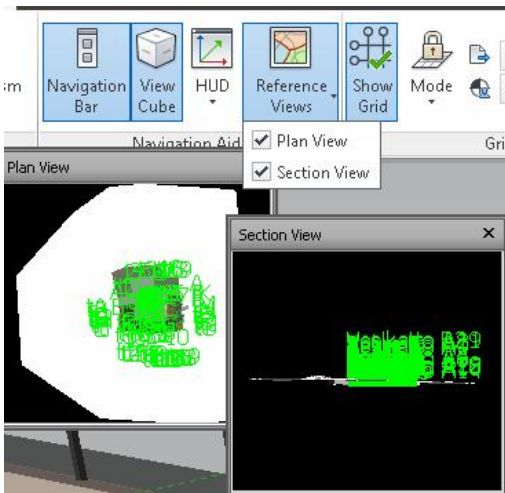


Head-up display elements are on-screen displays that provide information about your location and orientation in the 3D world.

In Autodesk Navisworks, you can use the following head-up display (HUD) elements:

- *XYZ Axes*. Shows the X, Y, Z orientation of the camera (or the avatar's eye if the avatar is visible). The XYZ Axes indicator is located at the bottom-left of the Scene View.
- *Position Readout*. Shows the absolute X, Y, Z position of the camera (or the avatar's eye position if the avatar is visible). The Position Readout is located at the bottom-left of the Scene View.
- *Grid Location*. Shows the grid and level location of the camera relative to the active grid. The HUD display is based on the closest grid intersection to the current camera position, and the closest level below the current camera position. The Grid Location indicator is located at the bottom-left of the Scene View.

Reference Views



Reference views are useful to get an overall view of where you are in the whole scene and to quickly move the camera to a location in a large model.

There are two types of reference views available in Autodesk Navisworks:

- Section View
- Plan View

The reference views show a fixed view of the model. By default, the section view shows the view from the front of the model and the plan view shows a top view of the model.

Reference views are displayed inside the dockable windows. A triangular marker represents your current viewpoint. This marker moves as you navigate, showing the direction of your view. The marker may also be dragged by holding the left mouse button over it and dragging to move the camera in the Scene View.

Note The marker changes to a small dot when the reference view is in the same plane as the camera view.

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Grids & Levels

A grid is a set of lines, where the intersections of the lines are the grid points.

Note Models can contain none, one or more grid systems, and you can select which of these is displayed.

Grids and levels are displayed at each level of the building and are configured by default in relation to your camera position. For example, if you are standing on Level 2 of your building model, then the grid will be displayed in green on the floor below you, and displayed in red on the floor above you. You can change which levels of the grid are displayed, and in what colours, as required.

Grid locations are displayed on the [Head-Up Display](#), showing the grid and level location of the camera relative to the active grid. The HUD display is based on the closest grid intersection to the current camera position, and the closest level below the current camera position.

You can customize the colours in which the grid is displayed, the font size on grid labels, and whether gridlines are drawn transparently when they are hidden by objects (this is known as X-ray mode).

Grid systems can be applied to models in Revit before importing them into Autodesk Navisworks.

Note To utilise the full functionality of grids and levels you must be viewing the model with perspective camera set. With orthographic camera set grids and levels are displayed only when a face view is selected, such as top view or front view, but not all of the features are available.

Show Grid

Toggles Grid on or off.

Grid Modes

Grid modes provide a number of options for how to display grids and levels in the Scene View.

In Autodesk Navisworks, the default grid mode is to display above and below levels of the grid in the Scene View. You can select to display grid levels relative to the camera position according to the following criteria:

- Above and Below. Displays the active grid on the levels directly above and directly below the camera position.
- Above. Displays the active grid on the level directly above the camera position.
- Below. Displays the active grid on the level directly above the camera position.
- All. Displays the active grid on all available levels.
- Fixed. Displays the active grid on a single, user-specified level.

Note If you select this option then you can specify a level on the Display Level drop-down list

Active Grid

The active grid is the grid system currently in use from the grid systems available for your model.

If you have more than one grid system available for your model then you can choose which one you want to use - this is the active grid. Grid systems come from the files that you append to your model. Entries are named according to their file names.

Display Level

You can select the level on which the active grid is displayed.

Note You can only select a display level if you have selected Fixed as the grid mode.

Scene View

This is the area where you view and interact with your 3D models.

When you start Navisworks, the Scene View contains only one scene view, but you can add more scene views, if needed. Custom scene views are named "ViewX" where "X" is the next available number. The default scene view cannot be moved

Full Screen

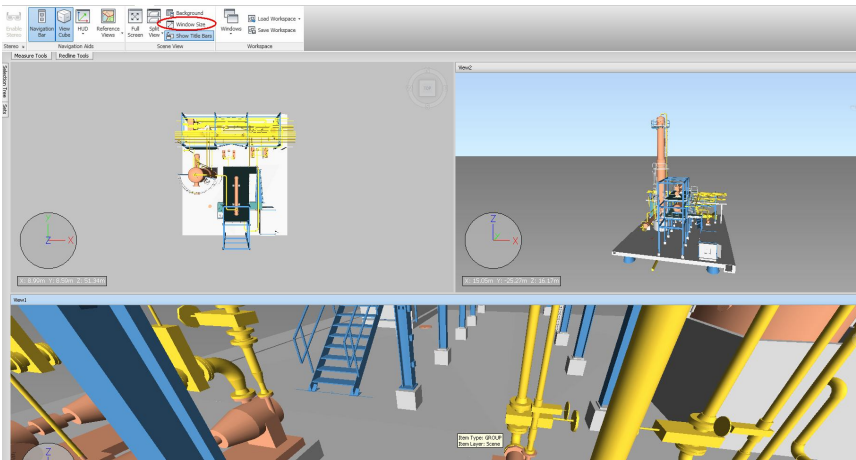
In Full Screen mode your current scene view takes up the full screen.

To interact with the model in the scene view, you can use the ViewCube, the Navigation Bar, the keyboard shortcuts, and the shortcut menu.

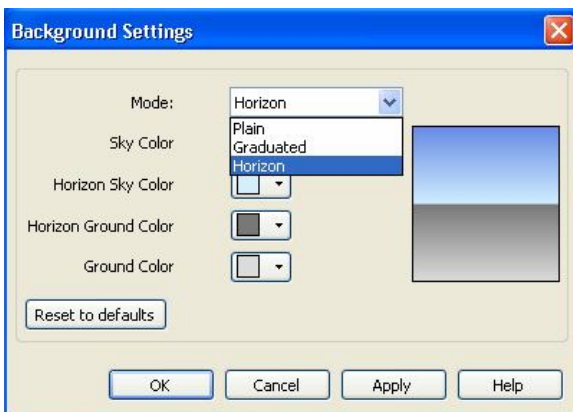
Tip If you use two monitors, your default scene view is automatically placed on the primary display, and the interface can be placed on the secondary display to control the interaction.

Also F11-button

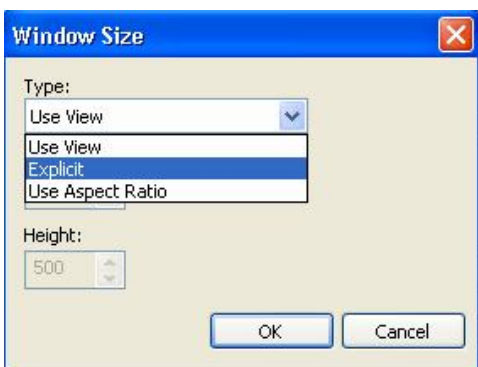
Split View



Background



Window Size



Show Title Bars

Workspace

Most Navisworks features are accessible from dockable windows.

There are several windows to choose from, which are grouped into several functional areas:

Main Tools Windows

Review-related Windows

Viewpoint-related Windows

Windows can be moved and resized, and either floated in the Scene View or docked (pinned or auto-hidden).

Tip You can quickly dock and undock a window by double-clicking the window's title bar.

A docked window shares one or more edges with adjacent windows and toolbars. If a shared edge is moved, the windows change shape to compensate. You can also float windows anywhere on the screen, if necessary.

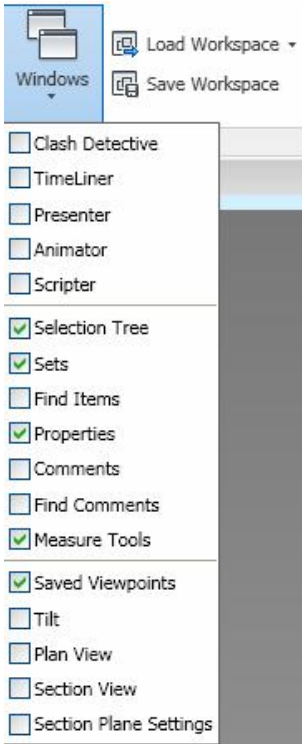
Note The Tilt window can only be docked vertically on the left or right, taking up the full height of the canvas, or be floating.

By default, a docked window is pinned, meaning that the window remains displayed at its current size and can be moved. When you auto hide a window and move the mouse pointer away from it, the window is reduced to a tab displaying the window name. Moving the mouse pointer over the tab displays the window fully, but temporarily, over the canvas. Auto-hiding a window can show more of the canvas while still keeping the window available. Auto-hiding a window also prevents it from being undocked, grouped, or ungrouped.

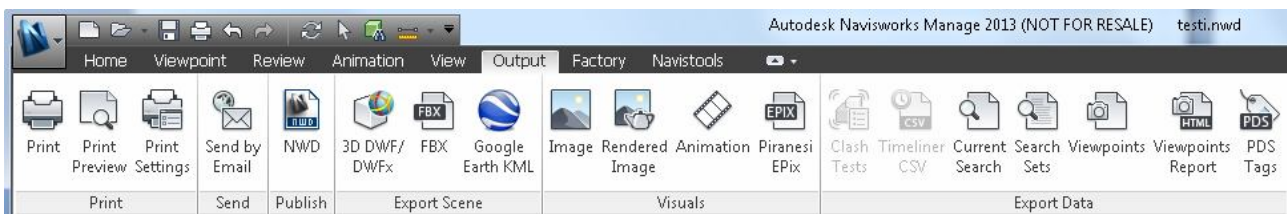
Note When you dock windows inside the default scene view, you do not get pin and auto-hide functionality. This does not affect custom scene views.

An undocked window is one that has been separated from the program window. Each undocked window can be moved around the screen or screens as desired. Although undocked windows cannot be pinned, they can be resized and grouped.

A window group is a way to have more than one window occupy the same amount of space on the screen. When windows are grouped, each window is represented by a tab at the bottom of the group. In a group, click a tab to display that window. You can group or ungroup window as necessary and save custom workspaces. After changing window positions, you can save your settings as a custom workspace.



8. Output ribbon



Print

You can print a hard copy of the current viewpoint to any printer or plotter.

Send

You can send and receive Navisworks files by email.

Publish

Publishes NWD file which includes additional features such as password protection and file expiration date. .



Publish-toiminnon asetudialogi

Export Scene

3D DWF files can be exported from Autodesk Navisworks. The file exporter creates a DWF file containing:

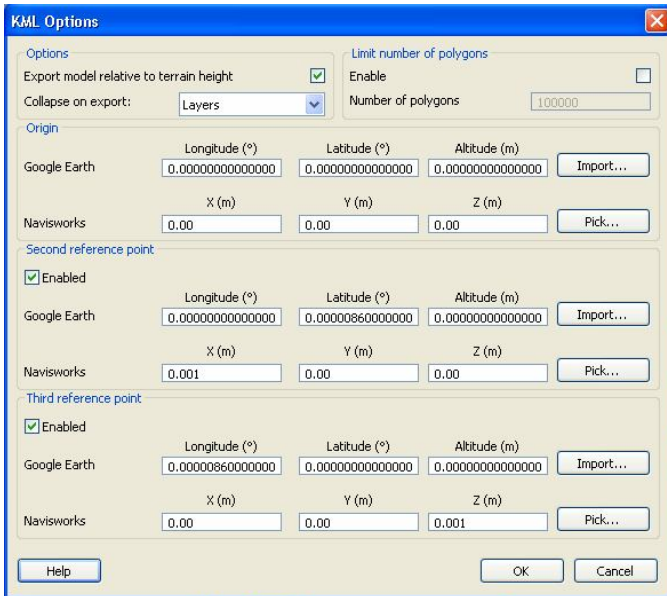
- All geometry
- All materials
- Per-vertex colours

FBX files can be exported from Autodesk Navisworks. The exporter creates an FBX file with the extension .fbx and supports the export of:

- Triangles
- Lines
- Materials (colour, flat transparency, and wrapped image texture only)
- Viewpoints
- Lights
- Model Hierarchy
- Properties (where available)

Google Earth KML files can be exported from Autodesk Navisworks. The exporter creates a compressed KML file with the extension .kmz and supports the export of:

- Triangles
- Lines
- Materials (colour and flat transparency only)
- Viewpoints (adjustments may occur due to Google Earth limitations)
- Model Hierarchy
- Hyperlinks (currently only URLs work correctly in Google Earth)



Visuals

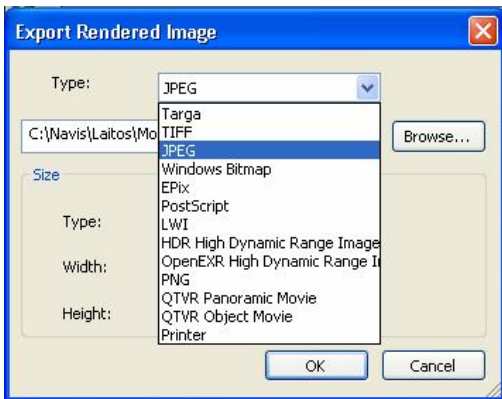


Image

To export an image as a bitmap, PNG, or JPEG file.

Rendered Image

Scenes rendered in Presenter can be exported out as images, so they can be used in presentations, on websites, in print, and so on. For more information, see [Photo-Realistic Scene Rendering](#)..



Animation

To export an animation to an AVI file, or a sequence of image files.

Piranesi EPIx

To export an EPX file for rendering in Informatix's Piranesi

Export Data



Clash Tests

Clash tests can be exported from the Clash Detective tool for use by other Autodesk Navisworks users. For more information, see [Export Clash Tests](#).

Timeliner CSV

You can export CSV data from TimeLiner. The columns exported, and their order, will be precisely as in the TimeLiner Task View.

Note When exporting a CSV from TimeLiner, the hierarchy of tasks is not represented. All available tasks are exported without any hierarchical structure. This means that collapsing/expanding task nodes in the TimeLiner grid does not affect whether or not tasks are output to CSV.

Current Search

The search criteria specified in the Find Items window can be exported to an XML file. This can then be imported into other Autodesk Navisworks sessions. For example, if you have specified a complicated search criteria, containing various logic statements, that relates to all projects you work on, then this feature allows you to specify it once and use it on all projects..

Search Sets

Saved search sets can be exported from Autodesk Navisworks as an XML file. These can then be imported into other Autodesk Navisworks sessions and re-used. For example, if you have a number of generic searches that you perform on all of your projects, this feature allows you to specify the searches once and use them on all projects.

Viewpoints

Viewpoints can be exported from Autodesk Navisworks to an XML file.

These viewpoints contain all associated data, including camera positions, sections, hidden items and material overrides, redlines, comments, tags and collision detection settings.

Once the viewpoint data is exported to this text-based file format, it can either be imported into other Autodesk Navisworks sessions, or it can be accessed and used in other applications. For example, you may want to set up the same viewpoints in your CAD application.

Viewpoints Report

An HTML file can be exported containing a JPEG of all of the saved viewpoints and associated data, including camera position and comments.

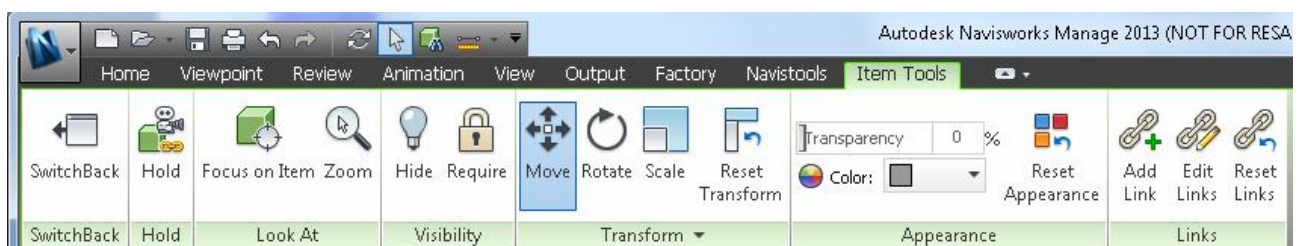
Note To customize the appearance or layout of the HTML file, you will need to edit the viewpoints_report.xsl file. The installed file is located in the style sheets subdirectory of the Autodesk Navisworks install directory. You can copy the edited file to the style sheets subdirectory of any of the Autodesk Navisworks search directories. For more information, see [Search Directories](#).

PDS Tags

To export PDS tags

9. Item Tools

When object is selected this Ribbon is in use.



SwitchBack

You can use the SwitchBack functionality to send the current view of the currently loaded file back to AutoCAD (version 2004 or later) or MicroStation-based CAD products (/J and v8).

Important The native CAD package must be installed on the same machine as Autodesk Navisworks for SwitchBack to work.

Hold

When you navigate around a model in Autodesk Navisworks, it is possible to “pick up” or hold selected items and move around with them in the model.

For example you may be viewing a plan for a factory and would like to see different configurations of machine layouts.

Look At

You can put the Scene View into **focus** mode until the next click.

When you are in focus mode, clicking on an item swivels the camera so that the point clicked is in the center of the view. This point becomes the focal point for the Orbit tools (SteeringWheels and navigation bar).

Set of navigation tools for increasing or decreasing the magnification of the current view of the model.

The following **zoom tools** are available:

- Zoom Window. Allows you to draw a box and zoom into that area.
- Zoom. Standard click/drag zoom.
- Zoom Selected. Zooms in/out to show the selected geometry.
- Zoom All. Zooms out to show the whole scene.

Visibility

Autodesk Navisworks provides tools that can be used to hide and display objects or groups of objects. Hidden objects are not drawn in the Scene View.

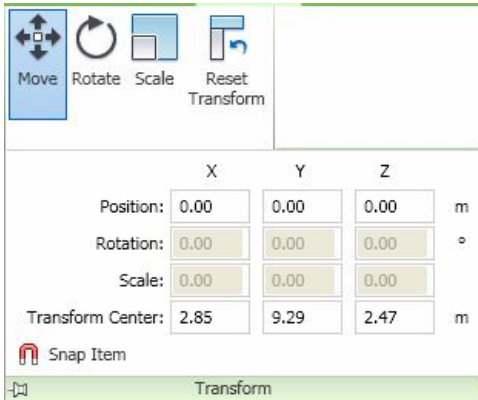
Hide Selected Objects

Hide Unselected Objects

Although Autodesk Navisworks intelligently prioritizes objects for culling in the scene, sometimes it drops out geometry that needs to remain visible while navigating.

You can make sure the objects are always rendered during interactive navigation by making them required.

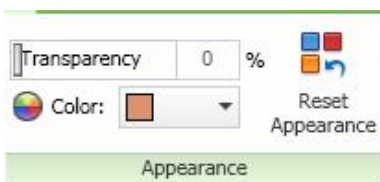
Transform



To transform objects, you can use three visual manipulation tools, or gizmos, available from the Item Tools tab Transform panel. You can also transform objects numerically.

To get a clearer view of objects as you manipulate them, you can use the Options Editor to adjust the way in which the current selection is highlighted.

Appearance



You can apply custom colours and transparencies to geometry in the scene.

For example, when you are dealing with models with unsupported materials and textures, all geometry is displayed in its wire frame colour. You can change (or override) the appearance of objects in the scene for more realistic presentation.

You can also choose to use Presenter tool to apply texture materials to objects in the scene to obtain even better results.

Note Any materials applied with the Presenter tool supersede any colour and transparency changes.

Links



There are several sources of links in Autodesk Navisworks: original links that have been converted from the native CAD files, links that have been added by Autodesk Navisworks users, and links that have been automatically generated by the program (for example, selection set links, viewpoint links, TimeLiner task links and so on).

The links converted from the native CAD files, and the links added by Autodesk Navisworks users are treated as object properties. This means, you can examine them in the Properties window.

You can also use the Find Items window to search for them.

All links are saved with Autodesk Navisworks files so that as the model changes, the links remain there for you and others to view.