



Getting Started

Product Overview

NavisWorks revolutionizes design review. NavisWorks provides interactive visualization and real-time walkthrough of even the largest and most complex 3D models.

Navigating and exploring the design to improve quality and compress the review process is effortless with NavisWorks.

The post-production value of 3D models is significantly increased by the wide-ranging access that NavisWorks offers for investigating and examining a design.

Publisher

The NavisWorks Publisher tool provides a way of communicating design intent. Publisher creates NWD files in which everyone can view and walk through the 3D models in real time, without specialist skills and free from the limitation of pre-programmed animation.

Compressed and secure for distribution, NavisWorks review files are faithful to the original native 3D data from which they are created.

TimeLiner

Embracing a fourth dimension of time, the NavisWorks TimeLiner tool available in the Autodesk® NavisWorks® Simulate and Manage products is aimed at satisfying the growing interest in affordable 4D construction simulation for building and site planning, as well as presentation of time-based modeling.

TimeLiner makes it easy to produce time simulations and “what-if” scenarios. While these can be set up solely in NavisWorks, you can also link to some major project software, such as Microsoft Project, Primavera (Sure Track/Power Project), and Asta Power Project. TimeLiner also supports any project scheduling software that can export the common MPX format.

Animator and Scripter

With the NavisWorks Animator and Scripter tools available in the Autodesk NavisWorks Simulate and Manage products, you can animate your model and interact with it. For example, you could animate how a crane moves around a site, or how a car is assembled or dismantled. You can also create interactive scripts, which link your animations to specific events, such as On Key Press or On Collision. For example, the doors will open as you approach them in your model.

You can also link Clash Detective, TimeLiner, and Object Animation together to enable clash testing of fully animated TimeLiner schedules. So, instead of visually inspecting a TimeLiner sequence to make sure, for example, that the moving crane didn't collide with a work group, you can run a Clash Detective test.

Presenter

The NavisWorks Presenter tool available in the Autodesk NavisWorks Simulate and Manage products, is an original visualization solution dedicated to enhancing the real-time experience and the creation of compelling rendered output to communicate design intent.

With Presenter, you can apply textures, materials, and lights quickly to 3D models, and is ideal for fast-moving collaborative review at every stage of the creative process.

With Presenter, everyone can enhance the realism of the interactive environment, and create both still and animated photorealistic rendered output to share a vision of a project and improve understanding and design quality.

Clash Detective

The NavisWorks Clash Detective tool available in the Autodesk NavisWorks Manage product enables the effective identification, inspection, and reporting of interference in a 3D project model. Clash Detective can eliminate a tedious manual task, with the accompanying risk of human error, to significantly reduce the expensive consequences of incomplete, inaccurate, and poorly coordinated production information.

For those who seek to complete design projects on time and within budget, the business case for Clash Detective is clear and unequivocal.

Freedom Viewer

Freedom is a free 3D viewer to look at NWD files created in NavisWorks. It is the answer for those without design software or specialist skills who want to explore a 3D project model. Easily open, view, and walk through NavisWorks NWD files, even those streamed across the Internet.

Objectives

After completing this chapter, you will be able to:

- Open and dock the required control windows and toolbars and customize the workspace layout.
- Open and append NavisWorks NWD files and other file formats within NavisWorks.
- Check and change file units.
- Save all opened files into one NavisWorks NWF file, and use Publisher to save as an NWD file.
- Merge similar NWF files into one file without duplication.
- Use Data Tools to link to an external database and select the data fields to be viewed from within the NavisWorks Properties window.

Lesson: Workspace Overview

Overview

This lesson describes the NavisWorks workspace layout. It also introduces you to the control bars and toolbars, and the methods of docking them.

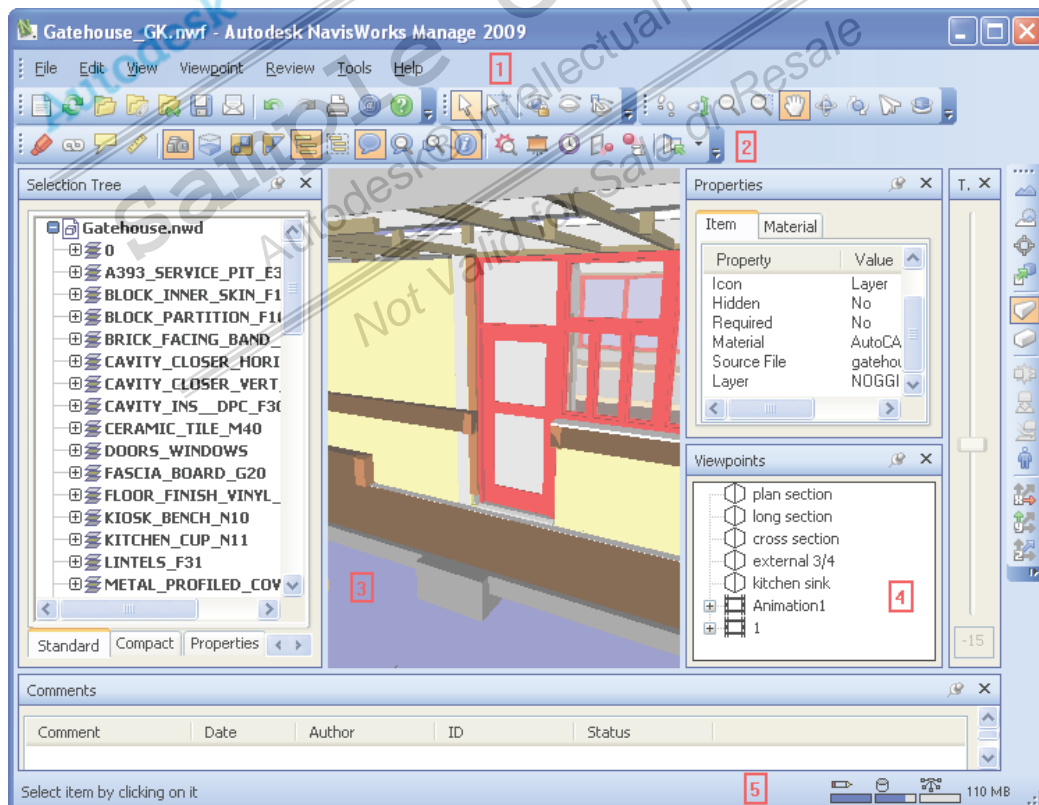
Objective

After completing this lesson, you will be able to:

- Open and dock the required control windows and toolbars and customize the workspace layout to personal preference.

Workspace

The NavisWorks interface is intuitive and easy to learn and use. It contains a number of traditional Windows elements, such as toolbars, control bars, dialog boxes, shortcut menus, and so on.



- 1 - Menu bar
- 2 - Toolbars
- 3 - Navigation window
- 4 - Control bars
- 5 - Status bar

Menu Bar (1)

The Menu bar contains all commands available in NavisWorks grouped together by similar functionality. For example, all commands related to review functionality are located under the Review menu, all commands related to user assistance are located under the Help menu, and so on.

Toolbars (2)



NavisWorks toolbars provide quick access to frequently used commands. Every button on a toolbar includes a tooltip, which describes the function the button activates. Placing the mouse over a button displays a brief instruction on how to use this feature in the Status bar.

You can rearrange, open, and close toolbars:

- To move a toolbar, click the dotted line at the edge of the toolbar, and drag it to a different location.
- To open or close a toolbar, right-click an empty area next to the last toolbar on the screen, and choose from the list of available toolbars on the shortcut menu.

In addition to rearranging the existing NavisWorks toolbars, you can customize their appearance and content, and create your own toolbars.



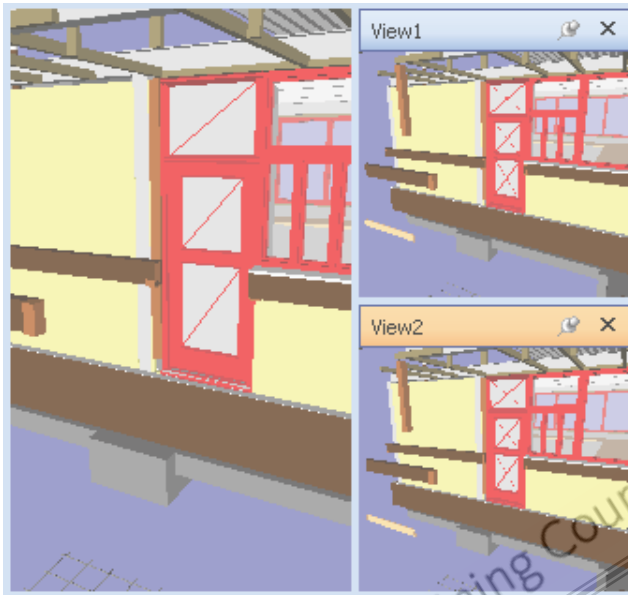
To quickly personalize a toolbar, click the Toolbar Options down arrow on the right, and click Add or Remove Buttons on the shortcut menu.

Main Navigation Window (3)

The main navigation window (also referred to as the main NavisWorks window and the main 3D navigation view) is used to interact with 3D models.

You can control how much space the main navigation window uses compared to the control bars by dragging the edges of the control bars as required. Alternatively, you could auto hide the control bars, or switch on full screen mode (F11).

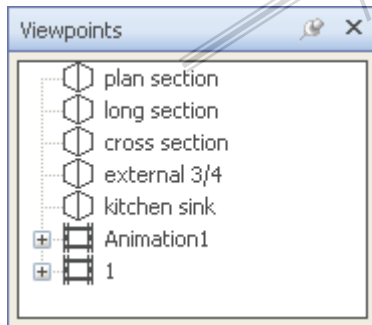
The main navigation window can be split vertically, horizontally, or into four segments.



- To split your current view horizontally, click View menu > Split Horizontal.
- To split your current view vertically, click View menu > Split Vertical.
- Resize a view by dragging its border, or click View menu > Window Size and enter the required values.
- To make a view dockable, click View menu > Toggle Title Bars. The views now have title bars and can be docked like control bars.

Control Bars (4)

Most features are accessible from the control bars. To display a control bar, click View menu > Control Bars, and then choose from the list of available control bars. Alternatively, click the desired control bar button on the Workspace toolbar.



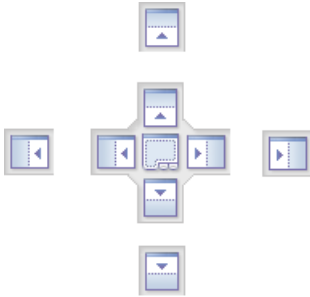
All control bars are dockable and resizable, and will automatically lock to specific locations near to where they are moved.



Holding down the CTRL key when moving a control bar prevents it from auto docking.

Using the Docking Tool

When you drag a control bar or a window pane from its current location towards a new destination on the interface, a docking tool is displayed.



The docking icons point towards the four edges of the interface.



When the control bar you are dragging is close to the place where you want it to dock, move the mouse over the corresponding area of the docking tool. You will see an outline of the control bar appear on the interface. To dock the control bar there, release the mouse button.

Tiling Control Bars

You can tile control bars and window panes on the interface. To do this, drag the control bar you want to tile over the control bar where you want it to be placed. When a rectangular outline appears, release the mouse button.

Auto Hiding Control Bars

You can auto hide control bars and window panes; this keeps the control bars active while maximizing the amount of available screen space. If auto-hide is active, the body of the control bar disappears when you move the cursor out of it, leaving only the title bar visible. Move the cursor over the title bar to display the entire control bar again.

To switch auto-hide on, click  on the title bar. To switch auto-hide off, click  on the title bar.

Status Bar (5)

The Status bar is displayed at the bottom of the NavisWorks screen.

The left-hand corner of the Status bar displays short instructions for using the NavisWorks features.


The right-hand corner of the Status bar contains four performance indicators that provide constant feedback as to how NavisWorks is performing on your computer.

Performance Indicators

The four performance indicators are Scene Drawing, Disk to Memory, Web Server Download, and Memory Usage.




Scene Drawing Indicator Bar

The Pencil  progress bar indicates how much of the current view is drawn (for example, how much drop-out there is in the current viewpoint). When the progress bar is at 100%, the view is completely drawn, with no drop-out.


While the view is being drawn, the pencil icon will change to yellow. If there is too much data to handle and the computer cannot process this quickly enough for NavisWorks, then the pencil icon will change to red, indicating a bottleneck.

Disk to Memory Indicator Bar

The Disk  progress bar indicates how much of the current model is loaded from disk (for example, how much is loaded into memory). When the progress bar is at 100%, the entire model, including geometry and property information, is loaded into memory.


While data is being read, the disk icon will change to yellow. If there is too much data to handle and the computer cannot process this quickly enough for NavisWorks, then the disk icon will change to red, indicating a bottleneck.

Web Server Download Indicator Bar

The Web Server  progress bar indicates how much of the current model is downloaded when opening a file via a URL (for example, how much has been downloaded from a Web server). When the progress bar is at 100%, the entire model has been downloaded.

While data is being downloaded, the Web Server icon will change to yellow. If there is too much data to handle and your computer cannot process this quickly enough for NavisWorks, then the Web Server icon will change to red, indicating a bottleneck.

Memory Usage Indicator

The field to the right of the icons  displays the amount of memory currently being used by NavisWorks.

Workspaces

NavisWorks comes with several default workspaces. You can use these workspaces as is or modify them for your own requirements.

With workspaces, you can work in a custom, task-oriented design review environment. Each workspace contains sets of toolbars and control bars with the tools required to perform a certain job, making it easy to switch between layouts as necessary. For example, you could set up and save workspaces called File Aggregation, Project Review, Object Animation, and Clash Detective and use them as appropriate. The workspaces can also be shared with other users. You could, for example, create separate workspaces for occasional and "heavy-weight" NavisWorks users, or set up your own corporate standard.

When you first start NavisWorks, a default workspace is displayed. You can choose a different workspace at any time by clicking View menu > Workspaces, and then selecting the required workspace from the list. Alternatively, click a workspace on the Workspace toolbar to open it.

Procedure: To Save a Workspace

1. Configure your workspace. For example, you can close all toolbars except the Standard, Selection Tools, Navigation Mode, and Workspace.
2. Click View menu > Workspaces > Save Workspace.
3. In the Save Current Workspace dialog box, enter a name for the new workspace. You can also select the name of an existing workspace to overwrite it with your modified configuration.
4. Click Save.

Procedure: To Load a Saved Workspace

1. Click View menu > Workspaces > Load Workspace.
2. In the Load Workspace dialog box, browse to the folder containing the workspace, select the workspace, and click Open.

Autodesk Official Training Courseware

Sample Chapter

Autodesk® Intellectual Property

Not Valid for Sale or Resale

Lesson: Opening and Appending Files in NavisWorks

Overview

This lesson describes how to open 3D files of multiple formats in NavisWorks and via a URL. It also introduces you to appending additional files in the scene and transforming file units.

Objectives

After completing this lesson, you will be able to:

- Open and append NavisWorks NWD files and other file formats within NavisWorks.
- Check and change file units.


Opening and Appending Files

New Files

Click New  on the Standard toolbar to close existing files, and create a new file.

Procedure: To Open a NavisWorks file (NWD format)

There are two ways to open an NWD file:

- In NavisWorks, click Open , then browse to the required file.
NOTE: Remember to select the NWD file type.
- In *My Computer*, select the file, then drag the file into the Selection Tree control bar pane.



To open multiple NWD files, select all the required files using CTRL and open them together.

After opening a file, additional files can be opened (appended). See Appending Files.

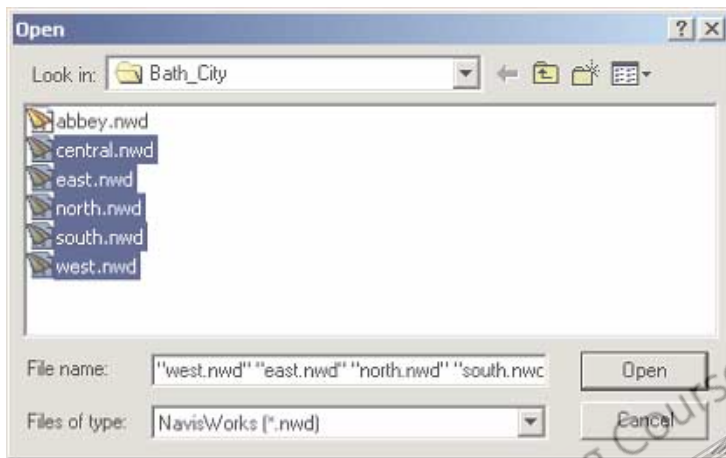
Appending Files

In NavisWorks, you can build a complex scene from smaller models by appending, or uniting, multiple model files together. They can be of any file type that NavisWorks supports.



INFORMATION: See Reading Files into NavisWorks for further information.

To open additional files into a current scene:



- Click Append  then select the additional files as required.



Exercise: Opening and Appending NavisWorks Files (C)

1. On the Training CD, open  *Training\Examples\Bath_City\Central.nwd*.
2. Click Append  and append the following files from the *Bath_City* folder: *East.nwd*, *North.nwd*, *South.nwd*, and *West.nwd*.

Exercise: Opening and Appending NavisWorks Files (P)

1. On the Training CD, open  *Training\Examples\Clash.nwd*.
2. Click Append  and append the following file from the *Examples* folder: *Clash2.nwd*.

Open Files Via URL

With NavisWorks, you can open published NWD files via the Internet. Having uploaded an NWD file to a Web server, you can then open this file in NavisWorks. With NavisWorks technology, the entire file does not need to be downloaded before you can start navigating—between 10% and 50% of the file is sufficient for this, depending on the file structure. (The greater the hierarchical structure of the model, the closer to 50% of the file is required for navigation.)

Exercise: Opening Files via URL

If Internet access is available, open a file from the NavisWorks website:

- Click File menu > Open URL. Enter the following URL and then click OK.
<http://download.autodesk.com/us/navisworks/Brewery.nwd>

Close Files on Open

When a user is viewing an NWC or NWD file, the file is locked for writing (an additional user is prevented from re-saving the file while another user has it open).

By selecting the Close NWC/NWD Files on Load option, NWC or NWD files are opened completely on the user's machine and the file closed again. The other user can open and re-save the file as required.

Procedure: To Set the Close NWC/NWD Option

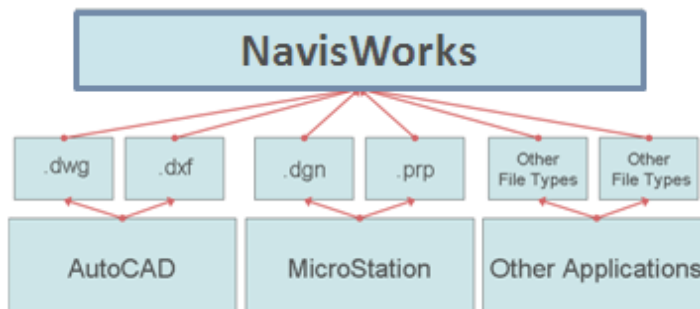
1. Click Tools menu > Global Options > Model > Performance.
2. Add a check mark to the Close NWC/NWD Files on Load option, and then click OK.
3. Restart NavisWorks then open the required NWC or NWD file.

The file is loaded completely and then closed, allowing an additional user to then open and re-save the file if required.

NOTE: Using this feature may incur greater memory usage and the computer may not be able to open files that it could previously open with this feature disabled.

Reading Files into NavisWorks

NavisWorks not only reads its own file type (NWD) but also a variety of files associated with the most common 3D CAD applications.



Exporter plug-ins are also available for certain applications; a file can be saved in NWC or NWD format. A number of readers exist where certain native file formats can be read directly into NavisWorks. These are the preferred methods by which to view files in NavisWorks.

NavisWorks also supports a number of additional file readers for applications without a native file reader or exporter. These applications can usually export to or save as one of these additional file formats.



For the latest information about CAD applications and file formats supported by NavisWorks, see the NavisWorks Support pages on the NavisWorks website.

<http://usa.autodesk.com/adsk/servlet/index?siteID=123112&id=10578828>

An additional feature in NavisWorks is that you can open and append multiple file types into the same scene.

File Units and Transform

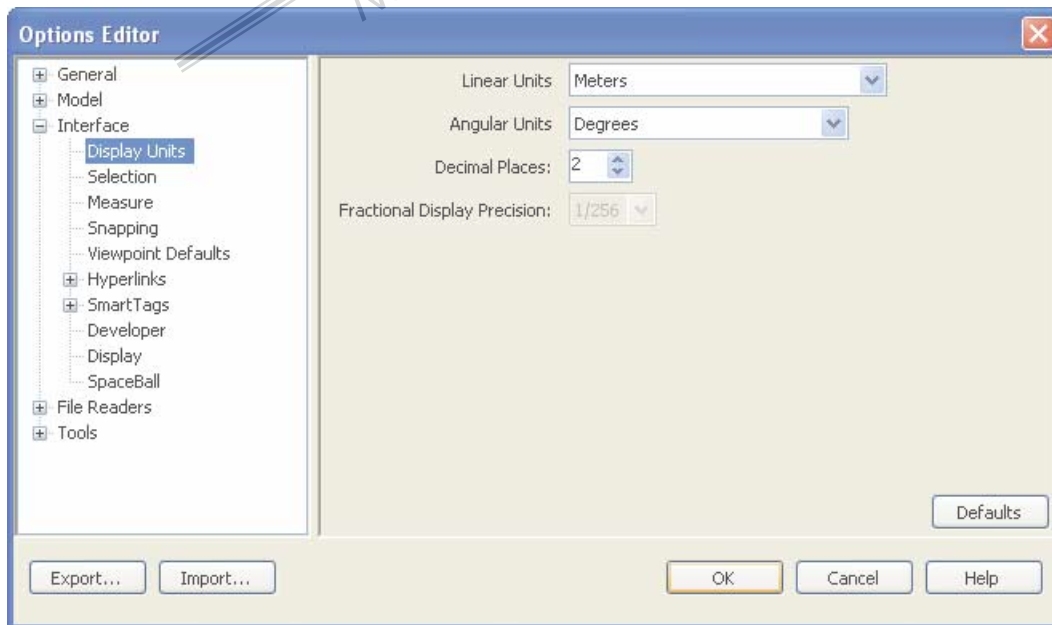
Each file has its own units and when appending more files to the scene, each file is automatically scaled to match the units of the first file loaded into the scene. Each file type has a default unit associated with it, which it uses when loading files of that type.

NavisWorks understands the concept of what unit (scale) the scene is presented in. This is useful when measuring items, setting tolerances for clash detection, or sizes of textures.

There is a single scene unit that is set from the Global Options dialog box and this unit is used throughout as appropriate.

Procedure: To Set File Units

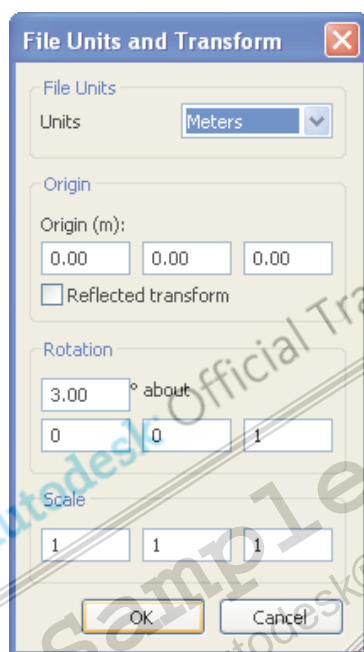
1. Click Tools menu > Global Options > Interface > Display Units.



2. In the Options Editor dialog box, in Linear Units field, select the unit (default setting is Meters), and then click OK.

There is a default unit setting for each file type so that when files are opened, they are scaled appropriately to the scene's units. They can, however, be rescaled if the units are found to be incorrect for the scene.





3. In the Selection Tree, select the file to be rescaled.
4. Click Edit menu > File Units and Transform.



5. In the File Units and Transform dialog box, in the File Units field, select the required units, and then click OK.

TIP: When reading CAD files into NavisWorks, it is good practice to check that the model is displayed in the correct units. This not only ensures that the appended models align correctly, but more importantly you need to ensure that any measurements or clash detective results are accurate.


Exercise: Check and Set File Units

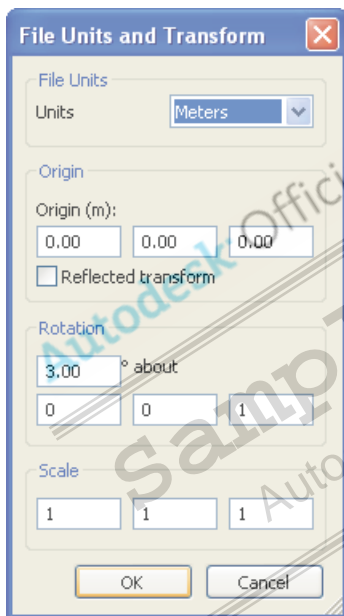
1. On the Training CD, open \Training\Examples\Bath_City, then open the files *center01.dxf* and *center02.dxf*.
2. Click Align-X  to move the camera to a side view of the model.
3. Use the Zoom Box  to zoom in on one of the brown doors.
4. Open Measure Tools  and select Point to Point .

5. Select a point at the left of the door and a second point at the right of the door, to measure its width. The door should be approximately one meter wide; however, the distance between the two points is only 0.001 meters.

The reason for this error is the default unit settings for DXF files are set incorrectly for this model.

TIP: Once a measure tool is selected, it will remain in this mode until another Navigation Mode is selected. If measuring an object that is larger than the current NavisWorks view, select the first point, then navigate to another part of the model, and then switch back to the measure tool and select the next point selection.




6. Click Clear  to remove the measure lines from the view.
7. In the Selection Tree, select *center01.dxf*, and click Edit menu > File Units and Transform.



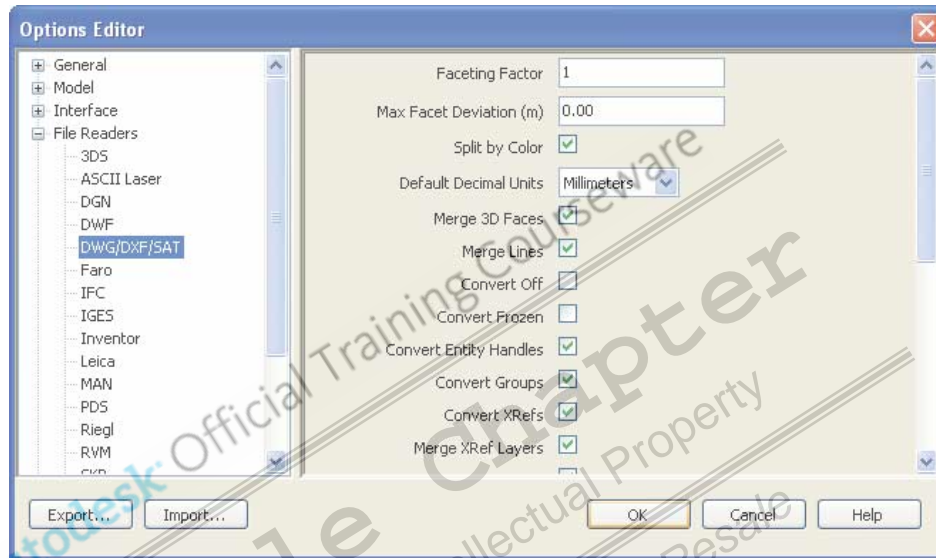
The file is currently set to millimeters; that's why the door was only 0.001 meters wide.

8. In the File Units and Transform dialog box, under File Units, in the drop-down list, change the file units to meters. Click OK.
9. In the Selection Tree, select *center02.dxf* and follow the same steps as above to change its file units to meters.

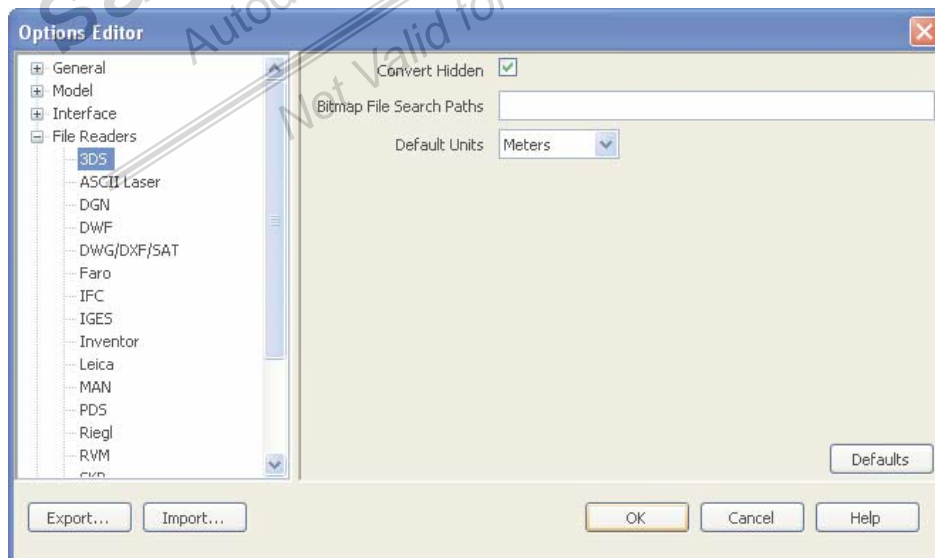
Taking these steps has changed the model units from millimeters to meters (1 model unit now equals 1 meter). The model will no longer be in view, as it has effectively been scaled by 1000.


10. Use View All  to view the model again and use Zoom Box  to zoom in on one of the brown doors again.
11. Measure the width of the door again. It should measure approximately 1 meter, which is correct.
12. Use Clear  to remove the measure lines from the view.

13. If appending CAD files from a variety of formats, carry out the above check for each format and set the default units accordingly for each file type.
14. The remaining files to be appended in this example were all modeled in meters,. Set all defaults to meters so that all files will be read correctly.
15. Click Tools menu > Global Options > > File Readers > DWG/DXF/SAT. In the Options Editor, in Default Decimal Units, change the default to Meters. Click OK.





16. Click Tools menu > Global Options > > File Readers > 3DS. In the Options Editor, in Default Units, change the default to Meters. Click OK.




17. Append  the 3D Studio 3DS files (for example, *center03.3ds*, *enter04.3ds*, *center05.3ds*).

TIP: The Selection Tree on the NavisWorks window lists each of the files opened/appended into the scene. Having appended a file, if it is no longer required, do either of the following:

- In the Selection Tree, select the file you no longer require and then select Hide . The file will be hidden (but retained), and can displayed again by selecting Hide  again.
- In the Selection Tree, select the file you no longer require and then click File menu > Delete. The file will be permanently deleted from the scene. (It can be re-appended if necessary.)

18. Append  the Architectural Desktop (DWG) files (for example, *center06 - center16.dwg* and *abbey.dwg*).

19. Click View All  to give an overall view of Bath City Center.

Cache Files

When NavisWorks opens a native CAD file, it first checks if there is a NavisWorks cache file present with the same name as the CAD file but with an NWC extension. If there is, and this cache file is newer than the native CAD file, then NavisWorks opens this file instead, as it has already been converted to NavisWorks format and will open much quicker. If, however, there is no cache file present, or the cache file is older than the native CAD file, then NavisWorks will open the CAD file and convert it.

Lesson: Saving, Merging, and Refreshing Files

Overview

This lesson describes how to save opened files of multiple formats into a single NavisWorks file. It also introduces you to the purpose of the NavisWorks file formats and how to refresh and merge files.

Objectives

After completing this lesson, you will be able to:

- Save all opened files into one NavisWorks NWF file, and use Publisher to save this file as an NWD file.
- Merge similar NWF files into one file without duplication.

About File Types

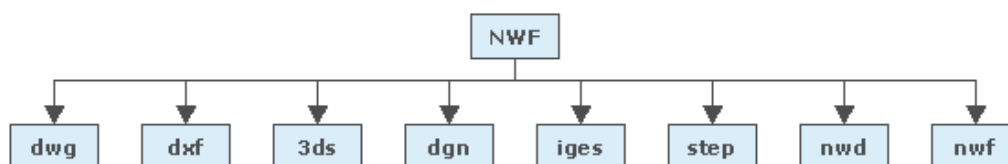
When you open a model file or files in NavisWorks, you can save the file as either an NWF file or an NWD file.

NWD File

An NWD file is a fully published NavisWorks file containing all geometry and review markups. An NWD file can be thought of as a “snapshot” of the current state of the model and can be viewed in both NavisWorks and Freedom (the NavisWorks free viewer). An NWD file is created with the Publisher tool, which is accessed by clicking File menu > Publisher. The file can also include features such as password access and file expiration dates.

NWF File

An NWF file contains the review markups, but no geometry. Instead, it includes links (acts as a pointer) to the original native CAD drawing files (as listed in the Selection Tree). This means an NWF is considerably smaller in file size than an NWD.



Generally, you should use NWF files whenever multiple files are brought together to create the scene, such as xrefs in AutoCAD®. This way, whenever one file changes, the whole model doesn't have to be re-published, only the file that has changed needs to be re-read.

NWF files can also be used as the design review “buffer” for NWD files. Comments, views, redlining, animations, material overrides, and clash tests can all be saved and added to in an NWF file. The NWD files may need to be re-published due to changes throughout the design process.

Procedure: To Save as an NWF or NWD File



An NWD file can be saved using the normal Save As procedure. However, there are additional features available if you use the Publisher tool. For more information, see Publisher.

1. Click File menu > Save As.
2. In the Save As dialog box, in the Save As Type drop-down list, select NWD or NWF.
3. Browse to the required directory then add an appropriate file name and click Save.



TIP: If a file will need to be read using an earlier version of NavisWorks, it should be saved as that version type. Newer versions of NavisWorks will read all NavisWorks files.

Merging NWF Files

An NWD file may be sent by a project coordinator to multiple parties for review. Each party will add review markups and data to the model, which may include any combination of viewpoints, comments, redlines, Clash Detective results, TimeLiner schedules, Presenter materials, and so on.


Each party can then save review session as an NWF referencing the original NWD file. The project coordinator can then merge all of the NWF files into a single file, duplicating neither the NWD file (referenced by all NWFs) nor any other review markup that is common to all NWFs.

Exercise: Merging NWF Files (C)


1. On the Training CD, open the file *Training\Examples\Merge\gatehouse.nwd*.
2. Click Viewpoints  to open the Viewpoints window. Notice the available viewpoints that are listed.
3. Click Merge . From the same directory on the Training CD, merge the file *Gatehouse_Design_Review.nwf*.

Notice that the *Gatehouse.nwd* file is not duplicated (as it would be if it had been appended). However, two new viewpoints have been added, including redlines and comments.

Exercise: Merging NWF Files (P)

1. On the Training CD, open the file *Training\Examples\Merge\heatingplant.nwd*.
Notice that there are no viewpoints available.
2. Click Merge . From the same directory on the Training CD, merge the file *Heatingplant_Presenter_Review.nwf*.

Notice that the *heatingplant.nwd* file is not duplicated (as it would be if it had been appended). However, a new viewpoint has been added that includes materials and lighting.

3. Click Merge . From the same directory on the Training CD, merge the file *Heatingplant_Design_Review.nwf*.

Notice the *heatingplant.nwd* file is not duplicated. However, additional design review viewpoints have been added.

Merging TimeLiner Data

If two or more merged files contain TimeLiner data, limited merging can be done with this data. This can depend on various situations (for example, if the data sets are identical and if the data contains the same primary link).

For more information, see Chapter 3, TimeLiner.



Refreshing Files

When working on files in NavisWorks, others may be working on the linked CAD files. To ensure that the data being reviewed is current, NavisWorks provides a refresh function to reload any files that have been modified since commencing the review session.

- To refresh the data, click Refresh .

This feature does not reload all of the files previously loaded, only those modified since last opening them.

Emailing Files

NavisWorks is also a communication tool. The Send  feature makes it easy to send the current model along with its viewpoints by email. The Send  command uses the available mail exchange service.

Sending a mail will first save the current working file, ensuring that the latest review is sent.

To send a file by email from within NavisWorks:

- On the standard toolbar, click Send .

This accesses available email software and sends the current file as an email attachment.

Receiving Files by Email

If an NWF file is received, NavisWorks searches for the appended files first using the absolute path with which the sender originally saved the file. This is useful if a team is on a local network and the files can be found using the Universal Naming Convention (UNC). Otherwise, a team not sharing a server can organize a project using the same file hierarchy and drive letter, and NavisWorks can find the files this way.

If NavisWorks is unable to find the files, then the recipient can save the attached NWF in a directory where all the appended files are located. The NWF can then look for these files relative to its own location.

This way, a whole sub-directory from the project's directory can be moved to a completely new location. Save the NWF file in this new place; it can search for the files from here.

Publishing an NWD File

With NavisWorks Publisher, you can take a “snapshot” of the model at any time. This can then be issued to other members of the design team, who may not be CAD users, but who need to view the 3D model. NWD files can be viewed in NavisWorks for full design review, or with the NavisWorks Freedom free viewer for a simple real-time walkthrough.

Publish

Title
SHU Library

Subject
Extension of the main SHU library

Author
Galyna Key

Publisher
Galyna Key

Published For
SHU

Copyright
BCDesign 2008

Keywords
library extension

Comments
Issue 4. Review only

Password
.....

☐ Display at password

☒ Expires
09/01/2008

☐ May be re-saved

☐ Display on open

☒ Embed Textures

☐ Embed Database Properties

☐ Prevent Object Property Export

OK Cancel

There is also the option to for entering publication information that is saved with the file. This includes password protection and file expiration options.

Procedure: To Publish an NWD File


1. In NavisWorks, open the file that is to be published.
2. Click File menu > Publisher.
3. In the Publish dialog box, enter information in the Title, Subject, Author, Publisher, Published For, Copyright, Keywords, and Comments fields as needed.
4. Click OK.
5. In the Save As window, browse to the required location, and enter a file name. (The name must be different if saved in the same folder as the original.) Click Save.


The published file can be viewed in NavisWorks or Freedom.

Publish Dialog Box Options

Option	Description
Password Field	<p>Sets up a password if the file is to be protected and only accessed by certain personnel. (The password will need to be passed to those people.)</p> <p>By default, this dialog box, including the entered information, will not be displayed until after the password has been entered and accepted. (See also Display on Open option.)</p>
Display at Password	Specifies that the dialog box, including the entered information, is to be displayed with the Password field.
Expires	Specifies an expiration date for the file. This can prevent the old files being used. After the expiration date is passed, the file cannot be opened.
May Be Re-Saved	Allows further changes to be made to a file. By default, a published file cannot be re-saved. This prevents changes being added to this publication.
Display on Open	Specifies that the Publish dialog box is displayed when the file is opened. By default, the Publish dialog box, with entered information, is not displayed unless the Display at Password box or the Display on Open box is checked.
Embed Textures	<p>Enables textures to be embedded in the one project file.</p> <p>If textures have been added to the model, these can be embedded in the file or it will be saved as a separate file (in the same folder). The benefits of using the Embed Textures option is that there is only one published project file and the textures, including any custom or imported textures, will benefit from the security features of Publisher.</p>
Embed Database Properties	<p>Enables all the linked database properties to be embedded in the project file.</p> <p>This feature enables any object properties accessed via an external database to be embedded in the NWD as normal properties. This adds value to database linkage as well as NWD publishing, giving a quick and easy way of getting a large amount of database data into the model, which is then viewable by all.</p>
Prevent Object Property Export	Prevents inclusion of the object properties from any native CAD package in the published file. This option prevents object properties from any native CAD package from being exported into the published file. This is intended primarily for protection of intellectual property.

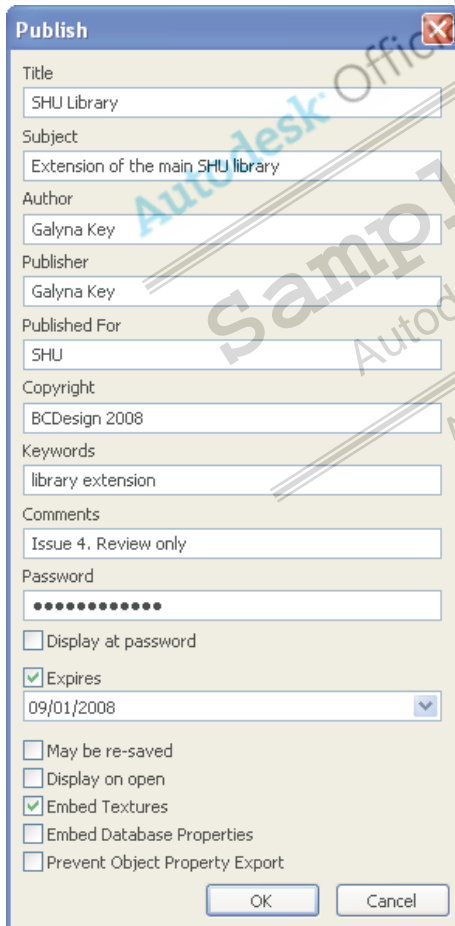
Exercise: Publish an NWD File

1. On the Training CD, open 
\\Training\\Examples\\Boiler Room\\
Boiler Room.nwd.

2. Click Selection Tree . At the bottom the Selection Tree window, click the Properties tab.

Notice the AutoCAD and Door Style property folders that are from the CAD application. Notice the Maintenance Database property folder, which contains data being read directly from an external database.

3. Click File menu > Publish.



4. In the Publish dialog box, enter some information in the available fields.
5. Enter a password.

6. Add a check mark to the following options:

- May Be Re-saved
- Display on Open
- Embed Textures
- Prevent Object Property Export

7. Click OK. In the Save As dialog box, save the file as **Desktop\\Temp\\Boiler Room.nwd**.

8. Close the current file and close NavisWorks.


9. Open NavisWorks then open the published file *Temp\\Boiler Room.nwd*.

10. Enter the password, and click OK.

Notice the Publish dialog box is displayed with the information previously entered.


11. Click OK.

The file will now open.

12. Click Selection Tree . At the bottom the Selection Tree window, click the Properties tab.

Notice the AutoCAD and Door Handle property folders that are from the CAD application are **NOT** displayed. Notice the Maintenance Details property folder that contained data being read directly from an external database is **NOT** displayed.

13. Close the current file.

14. On the Training CD, open 
\\Training\\Examples\\Boiler Room\\
Boiler Room.nwd.

15. Click File menu > Publish.

16. Enter a password.

17. Add a check mark to the following options:

- Display at Password
- Embed Database Properties

18. Remove the check mark from the following options:


- May Be Re-saved
- Display on Open
- Embed Textures
- Prevent Object Property Export

19. Click OK. In the Save As dialog box, save the file as **Desktop\Temp\Boiler Room2**.

NOTE: With Embed Database properties selected, it could take a few minutes to extract the required data from the linked database and embed into the project file prior to completing the save operation.

20. Close the current file.

21. Open the file *Temp\Boiler Room2*.

22. Click Selection Tree . At the bottom of the Selection Tree window, click the Properties tab.

Notice the AutoCAD and Door Handle property folders that are from the CAD application are displayed.

Notice the Maintenance Details property folder that contained data originally read from an external database is displayed with all the data embedded.

23. Click File menu > Publish.

24. In the Publish dialog box, click OK.

25. In the Save As dialog box, select a location and new name for the file. Click Save.

The file is prevented from re-saving. The May Be Re-saved option is not checked.

26. Close this file.

Lesson: Database Support (Data Tools)

Overview

This lesson describes how the NavisWorks Data Tools feature works. It also introduces you to the process used to connect NavisWorks to an external database and view its properties within NavisWorks.

Objective

After completing this lesson, you will be able to:

- Use Data Tools to link to an external database and select the data fields to be viewed from within the NavisWorks Properties window.

About Database Support

Databases are commonly used to store large amounts of data, such as equipment specifications, catalog data, and maintenance manuals.

With Data Tools, you can create a link between the stored data file and the model file.

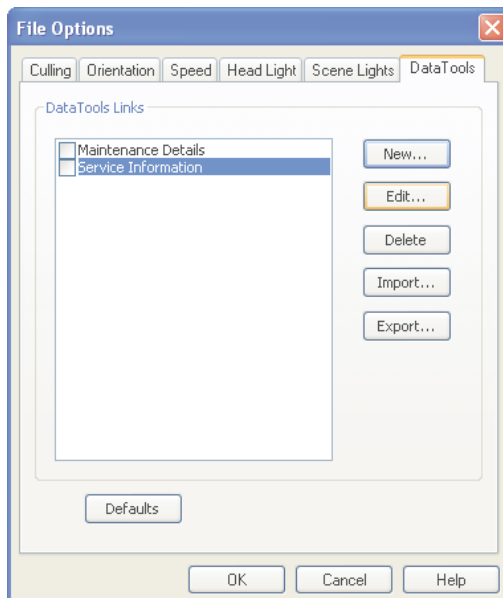
Procedure: To Link to an External Database

1. Open the Properties  control bar.

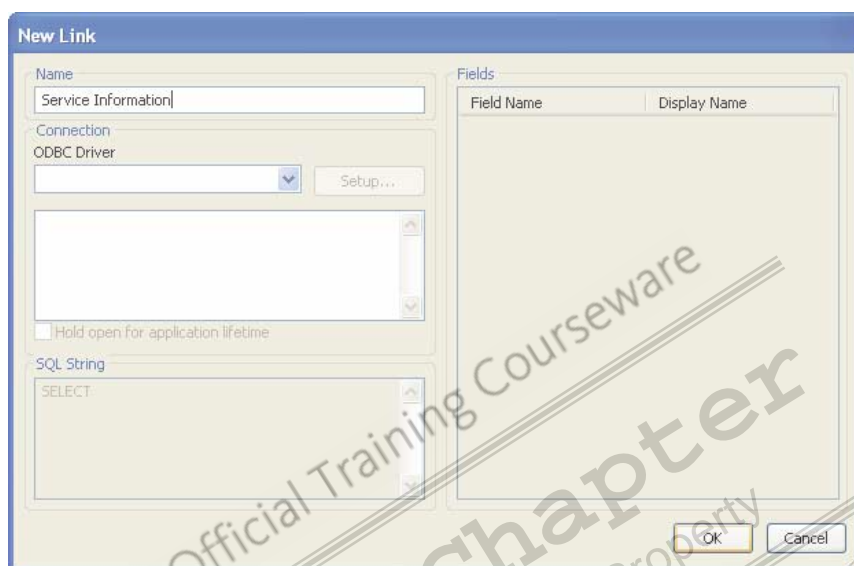
NOTE: The properties for the objects in the model brought in from the CAD application must include unique identifiers to the data in the data file to be linked to.

TIP: It may be useful to create a custom properties tab, name it Entity Handle, and insert a new Property String linked to the unique identifier in the model objects.

2. Click Tools menu > File Options > Data Tools.



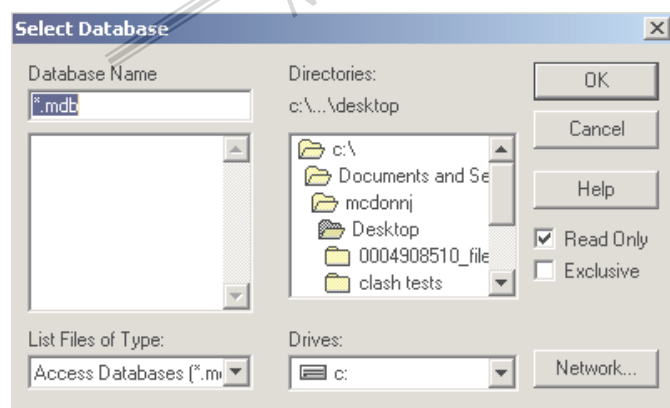
3. In the File Options dialog box, click New to create a new link.
4. In the New Link dialog box, in the Name field, enter a name for the new link (for example **Service Information**). This will be the name of the tab that will appear in the Properties dialog box.



5. Under Connection, select the appropriate ODBC Driver from the drop-down list. This defines the type of database to link to.

Tip: There are several similar options here, so take care to choose the correct one.

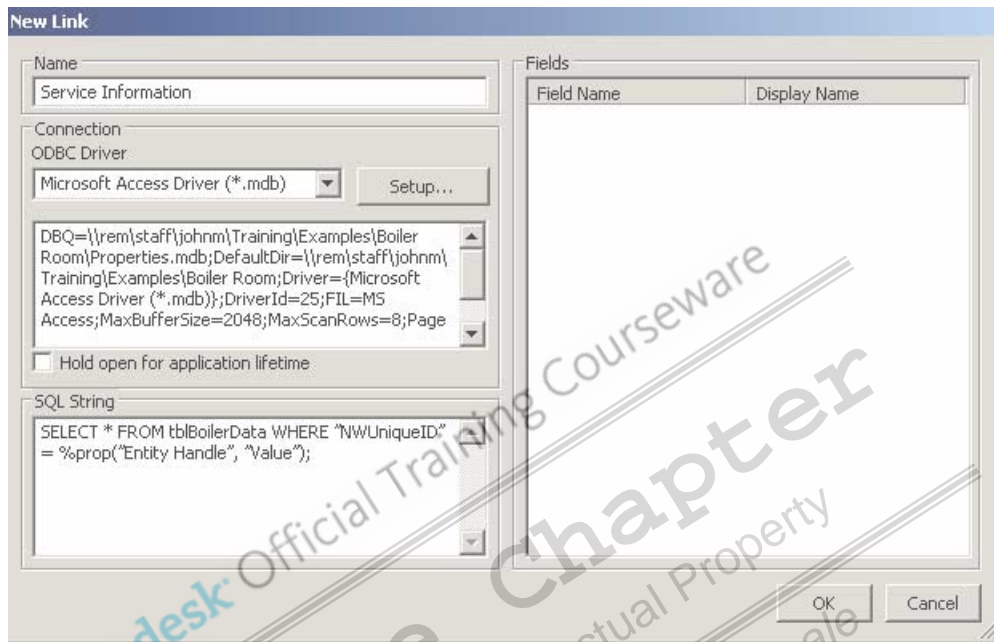
6. Click Setup.
7. In the ODBC Setup dialog box, under Database, click Select to select the database.
8. In the Select Database dialog box, under Directories, navigate to the folder that contains the database file to be linked to. Then select the file in the left pane.



9. Click OK. And then click OK in the ODBC Setup dialog box.

10. In the New Link dialog box, under SQL String field, click in the window after SELECT and enter the query string. For example, enter: **SELECT * FROM tblBoilerData WHERE "NWUniqueID" = %prop("Entity Handle", "Value");**

This defines which table in the database to query (or question).



TIP: SQL queries are quite technical and a database administrator would normally set these up, as a knowledge of the database being connected to is required.

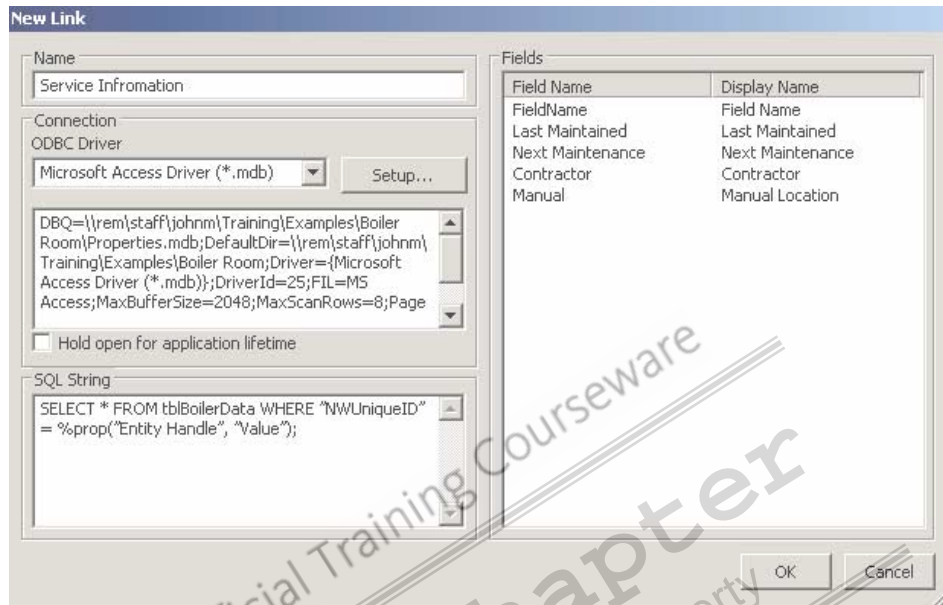
All queries start with SELECT and are followed by "what" is to be selected from "where" and with "which" conditions.

The * signifies to look at all columns in the specified table. (If only specific columns are required, they would be stated here).

- *tblBoilerData* is the name of the table in the database that is to be used.
- *NWUniqueID* refers to the column in the table that is to be the unique identifier.
- *%prop* signifies that the unique identifier in the table (NWUniqueID) is to link to a category/property pair in the 3D model.
- *Entity Handle* and *Value* define the category and property pair in the 3D model.



TIP: There are several example queries in the *NavisWorks User Guide*. Some of the queries are relatively simple when they are broken down.

11. Double-click in the Fields pane to define the columns to be looked at for answers when the table is queried.



12. In Field Name, enter the name of the field. (Enter the name exactly as displayed in the database column name.) Press ENTER.
The Display Name (which is the category name displayed in the Properties dialog box) is automatically completed.
13. If required, double-click the Display Name to edit it.
This is the first question of the query (look for the name of the part that has the specified ID).
14. Double-click under Field Name to enter the next required column name from the database.
15. Repeat the above process until all the column names to be queried are listed under Field Name with the appropriate Display Names.
16. Click OK to save the new link.
17. Add a check mark to the new link (for example, Service Information) and then click OK to finish.
The model is now linked to an external data source. Look at the model properties to see what this has added.

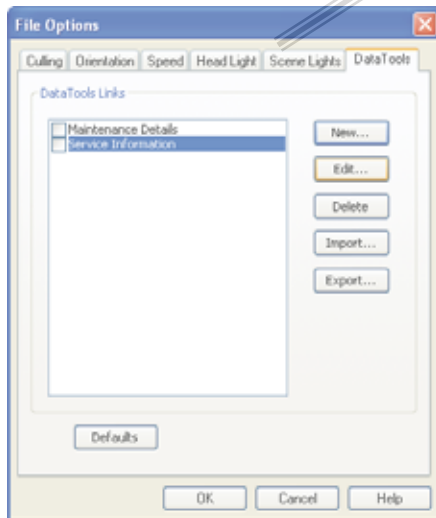
Exercise: Linking to an External Database

1. On the training CD, open the file
\\Training\\Examples\\Boiler Room\\
Boiler Room – Data Tools.nwd.
2. Click Properties  to display the properties control bar.
3. Click Tools menu > Global Options > Interface > Selection > Resolution. Select Last Unique.
4. Click Select , and click on one of the large white boilers. Notice that the property tabs that have come from the CAD application (Item, Entity Handle, and Material).

The Entity Handle property is the unique identifier in the model, which will be used to link this 3D model to the externally stored data.

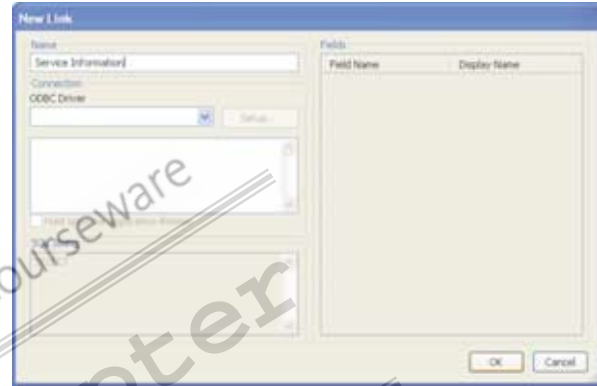
The external database (*Properties.mdb*) contains two tables. One of the tables lists some of the unique IDs (Entity Handles), each of which relates to a single object in the 3D model. There are also columns in this table containing additional data relevant to each object within the model.

5. Set up a link to the database.
Click Tools menu > File Options > Data Tools.



6. In the File Options dialog box, click New to create a new link.

7. In New Link dialog box, in the Name field, enter **Maintenance Details**. This is the name of the tab that will appear on the Properties control bar.



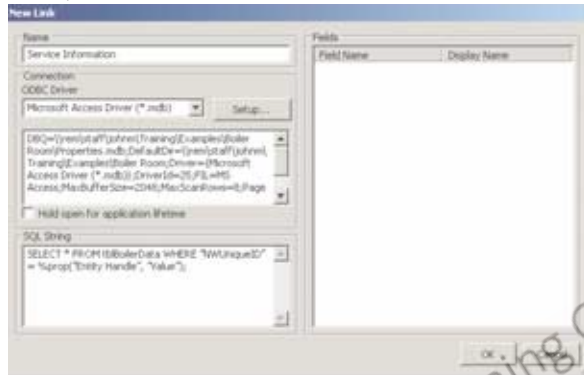
8. Under Connection, in the ODBC Driver drop-down list, select Microsoft Access Driver (*.mdb). This defines the type of database to link to.

NOTE: There are several similar options here; be sure to choose the correct one.

9. Click Setup.
10. In the ODBC Setup dialog box, click Select to select the database to be linked to.
11. Navigate to \\Training\\Examples\\Boiler Room then in the left pane, select *Properties.mdb*.
12. Click OK, and then click OK in the ODBC Setup dialog box.

13. In the New Link dialog box, in the SQL String field, click after SELECT.

NOTE: In this field, you enter the string that defines which table to look in and what to look for in that table. This will be in the form of a query.

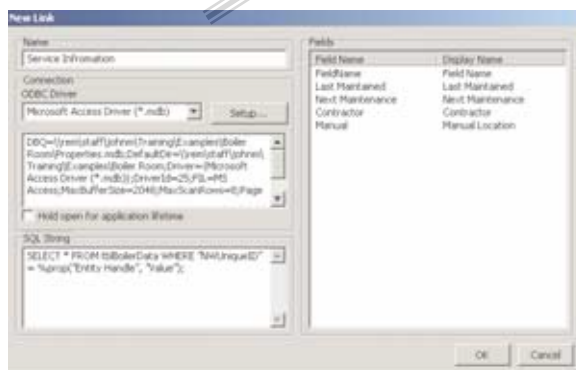


14. Enter the following string exactly so that the SQL String field is as shown below making sure spaces are added correctly:

NOTE: Spaces are vital; to help you add spaces in the correct places, replace the following backslashes \ with a space (for example, SELECT * FROM).

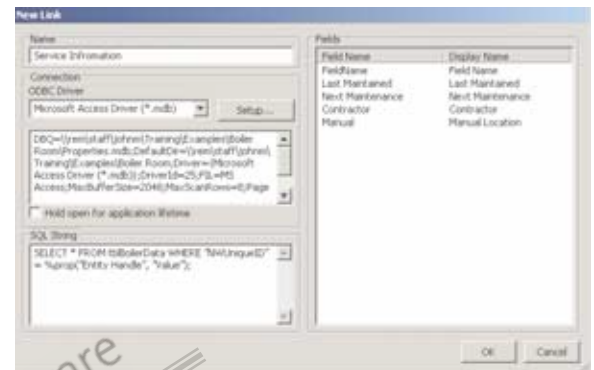
SELECT * FROM tblBoilerData WHERE \"NWUniqueID\" = %prop(\"Entity Handle\", \"Value\");

15. Double-click in the Fields pane under Field Name and enter **PartName** (no space between), and then press ENTER.



The Display Name (which will be the category name displayed in the Properties control bar) is automatically completed.

16. Double-click the Display Name to select and edit it.



17. Add a space in the display name, so that it reads, **Part Name**.

This is the first question (to look for the name of the part that has the specified ID).

18. Continue to add the following questions:

- Double-click under Field Name to add the next field name. Enter **Last Maintained**, then press ENTER.
- Double-click on the next row under Field Name. Enter **Next Maintenance**, then press ENTER.
- Double-click on the next row under Field Name. Enter **Contractor**, then press ENTER.
- Double-click on the next row under Field Name. Enter **Manual**, then press ENTER.
- Double-click on Manual under the Display Name column to edit it. Enter **Manual Location**, then press ENTER.


19. Click OK to save the new link.

20. The new link is listed on the Data Tools tab. Add a check mark to the link, and then click OK to finish.

The 3D model is now successfully linked to the external data source.

TIP: If the link cannot be made, check that the link string is correct and the Field Names are correct to the column names in the external data file.

21. Have a look at the model again to see what this has added:

- Use Select  and click on one of the large white boilers.
- Look at the Properties control bar and notice a new tab has been added – Maintenance Details.
- Click this tab and notice the five fields listed that were added (questions) and the values (answers) associated with the selected object.
- Save this file with the same name plus your initials to a new location, for example, *C:\Temp\Boiler Room-Data ToolsJMD.nwf*.

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Sample Chapter

Autodesk® Intellectual Property

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