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PRACTICAL GUIDE TO AUTODESK NAVISWORKS

BIM COORDINATION

CLASH DETECTION

4D AND 5D WORKFLOWS

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Title	Practical Guide to Autodesk Navisworks
Subtitle	BIM Coordination, Clash Detection, 4D and 5D Workflows
Author	Athanasios Zagkliveris
Publisher	North Stardust Studio
Edition	First Edition
Version	1.0
First published	2026
Language	English (United Kingdom)
Website	northstardust.studio
Contact	Via northstardust.studio

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This publication is an independent educational resource prepared to help engineers, BIM professionals, architects, students, project managers and other readers develop practical knowledge of Autodesk Navisworks and BIM coordination workflows.

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Preface

When I first began writing about Autodesk Navisworks on LinkedIn, my intention was simply to share practical knowledge with other engineers and BIM professionals. The first article explored why Navisworks has become an important tool in BIM coordination. From there, the series continued to grow, covering model preparation, clash detection, project coordination, publishing workflows, 4D BIM, 5D BIM, and the processes that connect them.

Each article focused on a specific topic while explaining the concepts behind it, how the workflow fits into the wider BIM process, common mistakes to avoid, best practices to follow, and the key points worth remembering. As the collection expanded, I realised the articles naturally formed a structured learning path.

That is how this guide began.

Rather than leaving the information spread across individual articles, I decided to bring everything together into a single publication. The original content has been reviewed, expanded, updated, and reorganised to create a guide that can be read from beginning to end or used as a reference whenever a particular topic needs revisiting.

This guide provides a structured introduction to Autodesk Navisworks for engineers, architects, BIM professionals, students, and anyone beginning their journey into Building Information Modelling (BIM). It follows the natural progression of BIM coordination, from understanding the software and preparing BIM models to reviewing projects, managing clashes, publishing coordination models, and introducing 4D and 5D workflows.

The content is based on professional training, practical experience, and continuous study of BIM coordination processes and industry best practices. While the software continues to evolve, the principles behind model coordination, collaboration, and information management remain the foundation of effective BIM workflows, and those principles are the focus of this guide.

Whether you are opening Navisworks for the first time or looking to strengthen your existing knowledge, I hope this guide helps you better understand not only the software itself, but also the role it plays within the wider BIM process.

Thank you for choosing this guide. I hope it becomes a useful companion throughout your professional development and encourages you to continue exploring the possibilities of BIM.

How to Use This Guide

This guide is designed to support both step-by-step learning and quick reference. If you are new to Autodesk Navisworks, you can follow the chapters in order to build your understanding from the ground up. If you already have experience with the software, you can use the table of contents to navigate directly to the topics that are most relevant to your work.

Learning Path

The chapters are organised in a logical sequence that reflects how most professionals become familiar with Navisworks. You will begin by exploring the workspace, navigation, and core concepts before progressing to model review, coordination, clash detection, 4D BIM, and 5D BIM. Each chapter builds upon the previous one, helping you understand how the different tools and workflows fit into the wider BIM coordination process.

The guide is divided into three parts:

- **Part I — BIM Coordination Fundamentals** covers preparing models, organising them, detecting and managing clashes, publishing results, and the coordination cycle that ties them together.
- **Part II — 4D BIM** connects the coordinated model to a construction programme so that the planned sequence can be reviewed visually.
- **Part III — 5D BIM** uses the same coordinated model to produce and maintain quantity information for cost planning.

Before Part I begins, a short orientation section introduces the Navisworks workspace so that the panels and commands referred to throughout the guide are already familiar.

Chapter Structure

Every chapter follows the same pattern, so you always know where you are:

Table 0.1 — The structure used by every chapter

Element	Purpose
What this chapter covers	A short summary of the chapter's purpose and outcome.
Before you start	The knowledge assumed, and where it was introduced.
Body sections	The concepts and workflows themselves, illustrated with figures and tables.
Common mistakes	The errors most often made in practice, and how to avoid them.
Key takeaways	The points worth remembering, in a single reference table.
Looking ahead	How the chapter connects to the one that follows.

Using This Guide as a Reference

As your experience grows, this guide can also serve as a reference manual. The detailed table of contents, consistent chapter structure, numbered figures and tables, glossary, the index, and Appendices A to C make it easy to locate information whenever you need it. **Appendix B** is arranged by symptom for when something has gone wrong; **Appendix C** collects the conventions and checklists on four pages you can keep open beside the software.

Software Version

Unless otherwise stated, all descriptions and workflows presented in this guide are based on Autodesk Navisworks Manage 2027. If you are using a different version, you may notice minor differences in the interface or available features. However, the concepts and workflows discussed throughout this guide remain applicable across most recent versions of Navisworks.

Some tools described in this guide are available only in Autodesk Navisworks Manage:

Table 0.2 — Navisworks editions and the tools available in each

Edition	Model review	Sets	TimeLiner	Quantification	Clash Detective
Navisworks Freedom (free viewer)	Yes	—	—	—	—
Navisworks Simulate	Yes	Yes	Yes	Yes	—
Navisworks Manage	Yes	Yes	Yes	Yes	Yes

> **NOTE**
>
> Clash Detective, covered in Chapters 3 and 4, is available only in Navisworks Manage. If you are working in Simulate, every other workflow in this guide is still available to you.

About the Demonstration Project

The screenshots throughout this guide were captured using a deliberately small demonstration project: a single-room building with an architectural model and a structural model. A small project keeps each interface element clearly visible, which is difficult to achieve with screenshots of a real scheme containing hundreds of thousands of objects.

> **NOTE**
>
> The demonstration models were appended from DWF files rather than the NWC files recommended in Chapter 1. You may therefore see `.dwf` file names in the Selection Tree, and property categories prefixed *DWF* in the Properties window. The workflows themselves are identical; only the property category names differ depending on the format used.

FREE SAMPLE

What This Sample Contains

A working extract from the complete 136-page guide

This sample is taken directly from *Practical Guide to Autodesk Navisworks*. Nothing has been reformatted or simplified. The page numbers shown in the running feet are the real page numbers from the full guide, so you can see exactly where each extract sits.

Included in this sample	Pages in the full guide
Preface	11
How to Use This Guide	12 to 13
Chapter 3 — Running Clash Detection in Navisworks, complete	36 to 43
Chapter 8 — Building a 4D Construction Simulation, opening extract	69 to 72
Appendix A — Workspace Reference, opening extract	107 to 110
Appendix B — Troubleshooting, opening extract	118 to 119
Appendix C — Coordination Quick Reference, opening extract	122 to 123
Glossary, opening extract	126 to 127
About the Author	136

> **WHY CHAPTER 3**
>
> Clash detection is where most Navisworks projects either become efficient or become unmanageable. The chapter is included in full, with its figures, tables, procedures and the Common Mistakes box, so you can judge the guide on a complete piece of work rather than on selected paragraphs.

Not included in this sample

- Chapters 1, 2, 4, 5 and 6, covering model preparation, Sets, managing clash results, publishing and the coordination cycle
- Chapters 7 and 9, the rest of Part II on 4D BIM
- Part III in full, chapters 10 to 12 on Quantification and 5D workflows
- The remainder of Appendices A, B and C, and the rest of the glossary
- The index

CHAPTER 3

Running Clash Detection in Navisworks

From Clash Tests to coordination reports

WHAT THIS CHAPTER COVERS

How to build clash tests that produce results worth reviewing: choosing what to compare, selecting the right clash type, setting a sensible tolerance, and turning the output into a report the design teams can act on.

> **Before you start:** Chapters 1 and 2. You need a Federated Model organised into Sets. Clash Detective is available only in Navisworks Manage.

After preparing your BIM models and organising them with Selection Sets and Search Sets, the project is ready for one of the most important stages of BIM coordination: Clash Detection.

Clash Detection compares models from different disciplines and identifies conflicts before construction begins. Detecting these issues during design is significantly more efficient than discovering them on site, where changes often affect programme, cost and construction sequencing.

Understanding Clash Detection

A Clash Test compares two predefined groups of model objects and identifies where they conflict.

Instead of comparing every object in the project, BIM Coordinators compare specific disciplines or systems using the Sets created during project preparation. This approach produces clearer results and makes coordination easier to manage.

Table 3.1 — Typical discipline comparisons

Compare	Typical purpose
Architecture ↔ Structure	Check walls, doors and stairs against structural elements.
Architecture ↔ MEP	Review services within architectural spaces.
Structure ↔ MEP	Verify that ducts, pipes and cable trays avoid structural members.
MEP ↔ MEP	Coordinate building services with each other.

Step 1 — Open Clash Detective

Clash Detection is performed using **Clash Detective**, found on the **Home** tab in the **Tools** panel.

Before creating any tests, confirm the following.

Table 3.2 — Pre-flight checks

Check	Why it matters
Latest models are loaded	Avoid reviewing outdated information.
Selection Sets and Search Sets are organised	Simplify Clash Test creation.
The Federated Model has been reviewed	Confirm models are correctly positioned.

A few minutes spent checking the project can prevent hundreds of unnecessary clash results.

Step 2 — Create a Clash Test

Each Clash Test compares two Sets. Giving each test a clear name makes the project easier to review later.

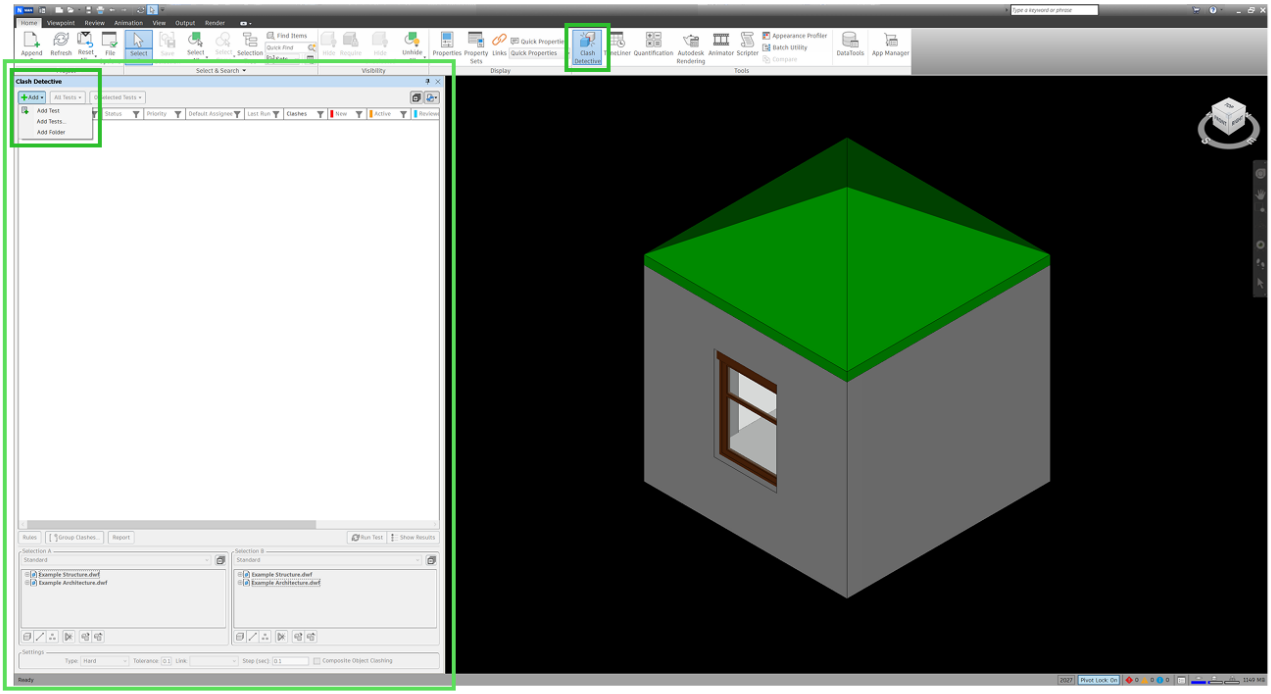

Figure 3.1 — Adding a Clash Test. The Add drop-down creates a single test, several tests at once, or a folder to group them. Selection A and Selection B define what is being compared, and the Settings bar along the bottom controls clash type and tolerance.

Table 3.3 — Clash Test settings

Setting	Purpose
Test Name	Identifies the comparison.
Selection A	First Set to compare.
Selection B	Second Set to compare.
Clash Type	Defines the type of clash to detect.
Tolerance	Controls how severe a conflict must be before it is reported.

Examples of well-structured test names include *Architecture vs Structure*, *HVAC vs Structure*, *Plumbing vs Structure*, *Electrical vs HVAC* and *Fire Protection vs Structure*.

> **BEST PRACTICE**
>
> Use descriptive names that clearly identify the disciplines or systems being compared. A project full of tests named *Test 1*, *Test 2* and *Test 3* becomes impossible to interpret three revisions later, including by the person who created them.

Step 3 — Choose the Right Sets

The quality of a Clash Test depends on the quality of the Sets being compared. Instead of selecting objects manually every time, reuse the Selection Sets and Search Sets created during project preparation.

Table 3.4 — Example Set pairings

Selection A	Selection B
Walls	Columns
Walls	Structural Beams
HVAC Ducts	Structural Framing
Plumbing Pipes	Slabs
Cable Trays	HVAC Ducts
Fire Protection Pipes	Structural Columns

Smaller, focused Clash Tests are easier to review than one large test comparing the entire project. Divide large projects into logical comparisons rather than creating one global Clash Test.

Step 4 — Select the Clash Type

Navisworks supports four types of Clash Test, each answering a different question.

Table 3.5 — The four clash types

Clash Type	Purpose	Example
Hard	Detects geometry that physically intersects by more than the tolerance.	A duct passing through a concrete beam.
Hard (Conservative)	Treats objects as intersecting even where the geometry triangles do not strictly overlap, reporting a wider range of potential conflicts.	A duct running immediately against a beam face with no measurable overlap.
Clearance	Detects objects that come closer to one another than the tolerance, whether or not they intersect.	Insufficient maintenance space around equipment.
Duplicates	Detects objects that are identical in both type and position.	The same column modelled twice in the same location.

Understanding Tolerance

Tolerance is the single setting that most determines whether a Clash Test produces a usable result or several thousand pieces of noise. It is worth understanding properly.

Tolerance controls the severity of the clashes reported and allows negligible conflicts to be filtered out. These are the conflicts that can reasonably be assumed to be worked around on site. What it means in practice depends on the clash type.

Table 3.6 — How tolerance behaves for each clash type

Clash Type	Tolerance means	Effect of increasing it
Hard	The depth of intersection that must be exceeded before a clash is reported.	Fewer, more severe results.
Hard (Conservative)	As above, applied more cautiously to the geometry.	Fewer, more severe results.
Clearance	The separation distance below which objects are reported.	More results, as a wider gap is treated as too close.
Duplicates	The distance within which identical objects are treated as duplicated.	More results.

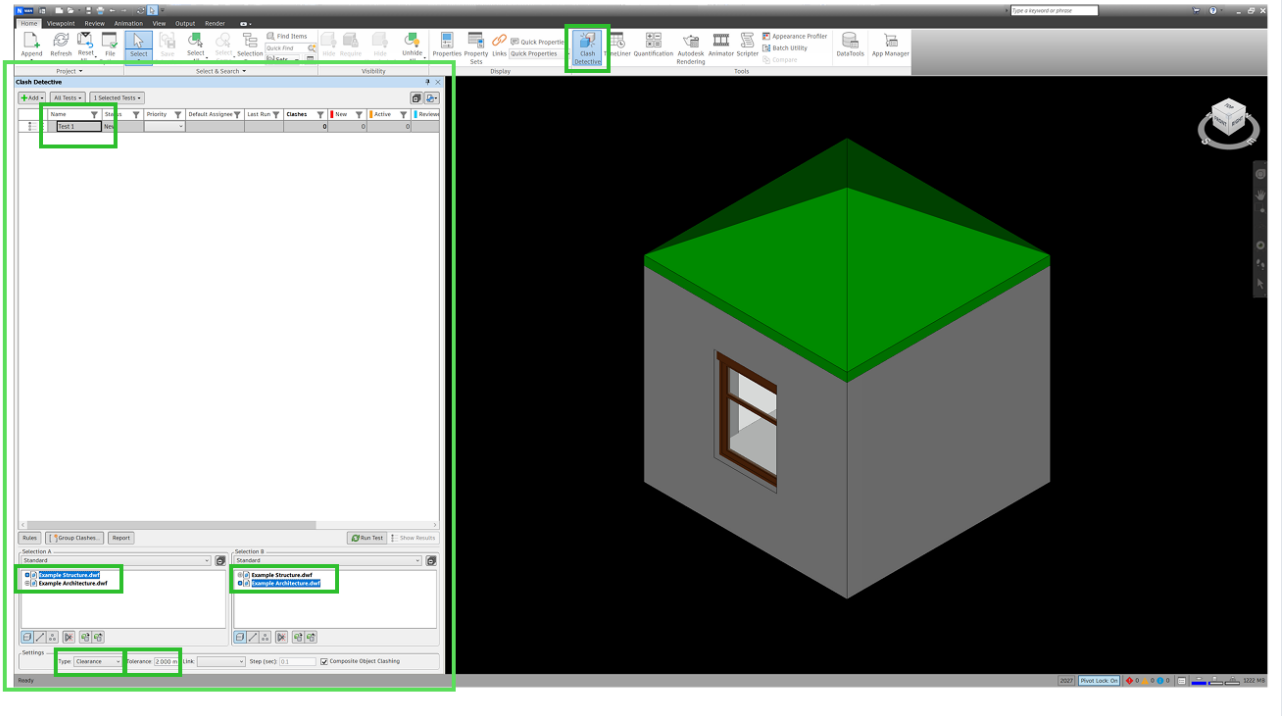

Figure 3.2 — A configured Clearance test. Here a Clearance test compares the structural model against the architectural model with a tolerance of 2.000 m. Note that a Hard test with tolerance set to zero, the default, reports every intersection however slight — which is rarely what you want on a real project.

> **NOTE**
>
> There is no universally correct tolerance value. It depends on the discipline, the stage of design, the modelling standards in use and, frequently, on what the project's BIM Execution Plan requires. Agree the values with the project team and record them, so that results remain comparable between coordination cycles.

Step 5 — Run the Clash Test

Once the test has been configured, Navisworks analyses the selected Sets and generates a list of clashes. Each clash contains useful information for coordination.

Table 3.7 — Information held against each clash

Information	Purpose
Clash Name	Identifies the clash.
Objects Involved	Shows the conflicting elements.
Location	Identifies where the clash occurs.
Viewpoint	Saves the clash location for future review.
Properties	Displays object information from each model.

Depending on the size of the project, a Clash Test may identify a handful of clashes or several thousand. The objective is not to eliminate every clash immediately, but to organise and review the results efficiently.

Step 6 — Review and Organise the Results

Large Clash Tests often produce many similar results. Navisworks provides tools to group, filter and organise clashes before they are shared with the project team.

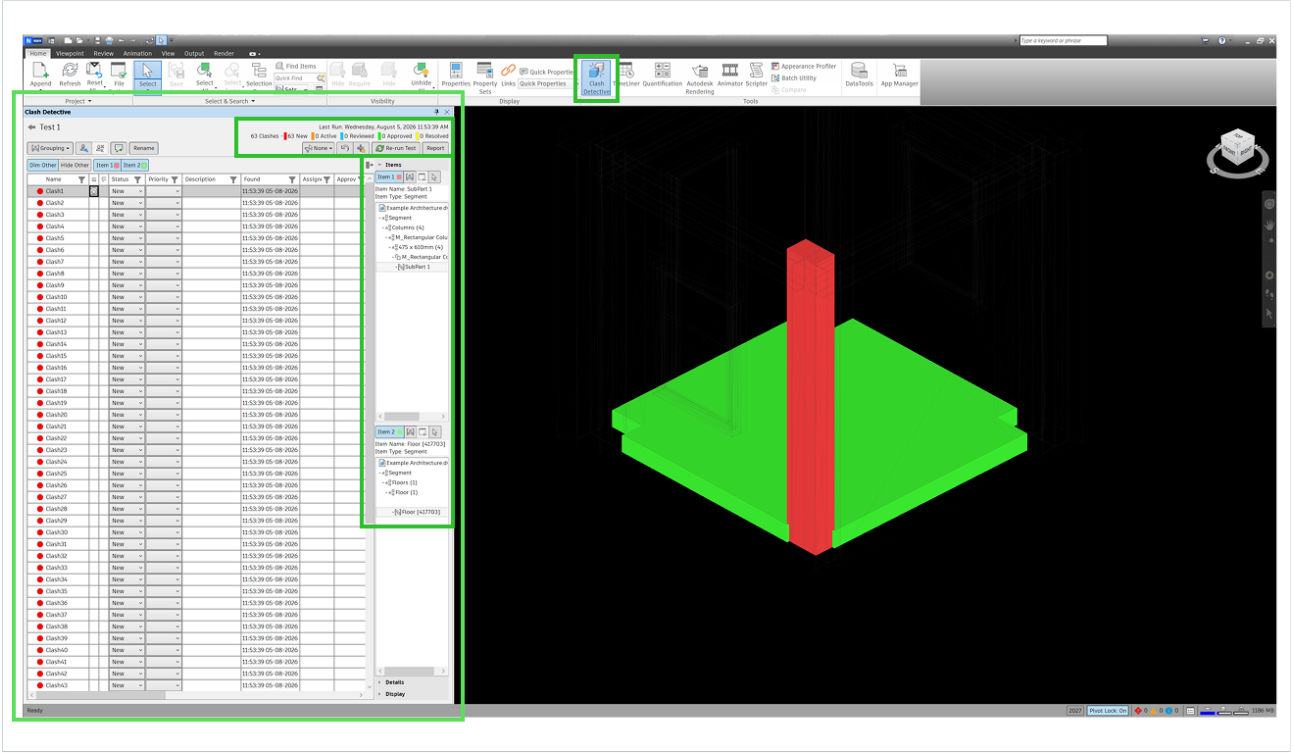

Figure 3.3 — Reviewing clash results. Each result can be selected to isolate the conflicting objects in the Scene View — here a column passing through a floor slab. The Items panes on the right identify the two elements involved, and the status column tracks progress.

The **Grouping** control above the results list is the tool that makes a large result set manageable. It collapses many individual clashes into a smaller number of meaningful groups.

Table 3.8 — Ways to group clash results

Review method	Purpose
Group by Level	Review clashes floor by floor.
Group by Discipline	Separate architectural, structural and MEP issues.
Group by System	Review HVAC, plumbing or electrical systems independently.
Sort by Status	Track coordination progress.

Organising clashes before reporting them makes coordination meetings shorter and more productive.

Understanding Clash Statuses

Every clash progresses through a coordination workflow. Updating the clash status allows the project team to track progress throughout the design process.

Table 3.9 — Clash statuses

Status	Typical meaning
New	Clash identified and awaiting review.
Active	Clash requires investigation or action.
Reviewed	Clash has been assessed.
Approved	Clash accepted as intentional.
Resolved	Clash removed following model updates.

Maintaining accurate statuses helps everyone understand which issues still require attention.

Step 7 — Generate Coordination Reports

After reviewing the clashes, the results can be shared with the wider project team using the **Report** tab.

Table 3.10 — Report formats

Report format	Typical use
PDF	Coordination meetings and client reviews.
HTML	Interactive project review.
XML	Data exchange with other applications.
CSV	Filtering and analysis using spreadsheet software.

Reports typically include a clash description, the objects involved, viewpoints, object properties, status and screenshots. A clear report helps each discipline understand exactly what needs to be reviewed within its own authoring software.

> **COMMON MISTAKES**
>
> **Running one global test.** Comparing everything against everything produces a result set nobody will read.
>
> **Leaving tolerance at zero.** On a real model this reports every incidental overlap, including those caused by modelling tolerance rather than by a genuine conflict.
>
> **Naming tests generically.** *Test 1* tells a reviewer nothing about what was compared.
>
> **Reporting before grouping.** A raw list of two thousand clashes is not a coordination report; it is a data dump.

Key Takeaways

Table 3.11 — Chapter 3 key takeaways

Point	Why it matters
Compare Sets, not whole models	Focused tests produce results that can actually be reviewed.
Four clash types answer four questions	Hard, Hard (Conservative), Clearance and Duplicates.
Tolerance controls severity	It is the difference between a usable result and noise.
Grouping makes large results manageable	Coordination meetings depend on it.
Statuses track progress	They turn a list of problems into a workflow.
Reports must be readable	The design teams, not Navisworks, resolve the clashes.

LOOKING AHEAD

Finding clashes is the easy part. The next chapter deals with what happens afterwards: deciding which results matter, who owns them, and how progress is measured between coordination cycles.

CHAPTER 8

Building a 4D Construction Simulation

Using TimeLiner in Autodesk Navisworks

WHAT THIS CHAPTER COVERS

The complete TimeLiner workflow, worked through end to end on a small example project: importing a construction programme, linking tasks to model elements, configuring and running the simulation, exporting it, and keeping it aligned as the project changes.

> **Before you start:** Chapter 2, for Selection Sets and Search Sets, and Chapter 7, for the principles of 4D BIM. TimeLiner is available in both Navisworks Simulate and Navisworks Manage.

Building a 4D construction simulation involves more than combining a model with a programme. Both sources of information must first be prepared, organised and connected so that they accurately represent the planned construction sequence.

What TimeLiner Does

TimeLiner is Navisworks' dedicated 4D simulation tool. It connects a coordinated Federated Model with a construction programme to visualise the planned sequence.

Unlike scheduling applications such as Microsoft Project or Oracle Primavera P6, TimeLiner does not create or manage construction programmes. It uses the planning information they produce, together with the Federated Model, to generate a visual simulation.

Table 8.1 — What each information source contributes

Information source	Purpose
Federated Model	Represents what will be constructed.
Construction Programme	Defines when construction activities should occur.
TimeLiner	Connects both to visualise how construction is planned to progress over time.

NOTE

Selection Sets and Search Sets were introduced in Chapter 2. If it has been a while since you organised a project, it is worth reviewing that chapter before linking tasks. The quality of your Sets determines how much work maintaining the simulation will require later.

The TimeLiner Window

TimeLiner opens from the **Home** tab, in the **Tools** panel. It docks at the bottom of the workspace and is organised into four tabs, each corresponding to a stage of the workflow.

Table 8.2 — The four TimeLiner tabs

Tab	What it is for
Tasks	Create, review and edit construction activities, and attach them to model elements.
Data Sources	Import and refresh programmes from external planning software.
Configure	Define task types and how each appears before, during and after its activity.
Simulate	Play back the sequence, adjust playback settings and export the result.

The workflow runs broadly left to right across these tabs.

Table 8.3 — The TimeLiner workflow

Step	Where	Purpose
1. Open TimeLiner	Home tab	Access the 4D environment.
2. Import the programme	Data Sources	Bring the schedule in from planning software.
3. Review the imported tasks	Tasks	Confirm activities, dates and hierarchy are correct.
4. Link tasks to model elements	Tasks	Associate activities with the corresponding objects.
5. Configure appearance	Configure	Define how activities are displayed during playback.
6. Run the simulation	Simulate	Generate and review the sequence.
7. Export and maintain	Simulate / Data Sources	Share the result and keep it current.

The Example Project

The rest of this chapter follows a small worked example so that each step can be seen in context. It uses two things you have already met:

- The **demonstration model** introduced earlier in this guide, with its Selection Sets: *Foundation*, *Floor*, *Walls*, *Ceiling*, *Doors & Windows* and *Roof*.
- A short **construction programme**, supplied as a CSV file.

Table 8.4 — The example construction programme

#	Task	Start	End	Type
1	Foundation	15 Aug 2026	18 Aug 2026	Construct
2	Floor	19 Aug 2026	21 Aug 2026	Construct
3	Walls	22 Aug 2026	25 Aug 2026	Construct
4	Ceiling	26 Aug 2026	28 Aug 2026	Construct
5	Doors & Windows	29 Aug 2026	30 Aug 2026	Construct
6	Roof	29 Aug 2026	31 Aug 2026	Construct

Notice that the task names match the Set names exactly. This is not a coincidence, and it is the single most useful habit in 4D work. It allows Navisworks to attach tasks to geometry automatically, as Step 4 will show.

> **TIP**
>
> Look at the sequence in Table 8.4 and ask yourself whether it is the order you would build in. Chapter 9 returns to this question. Programmes that read perfectly well as a list often look quite different once you watch them.

Step 1 — Open TimeLiner

On the **Home** tab, in the **Tools** panel, click **TimeLiner**. The panel opens at the bottom of the workspace on the Tasks tab.

Step 2 — Set the Date Format Before Importing

This step takes ten seconds and prevents the most common import problem on the whole workflow.

Construction programmes carry dates, and date formats differ between regions. A file written as `08/15/2026` is unambiguous only if Navisworks knows it is month-first. If it does not, the import either fails or, worse, succeeds with the wrong dates.

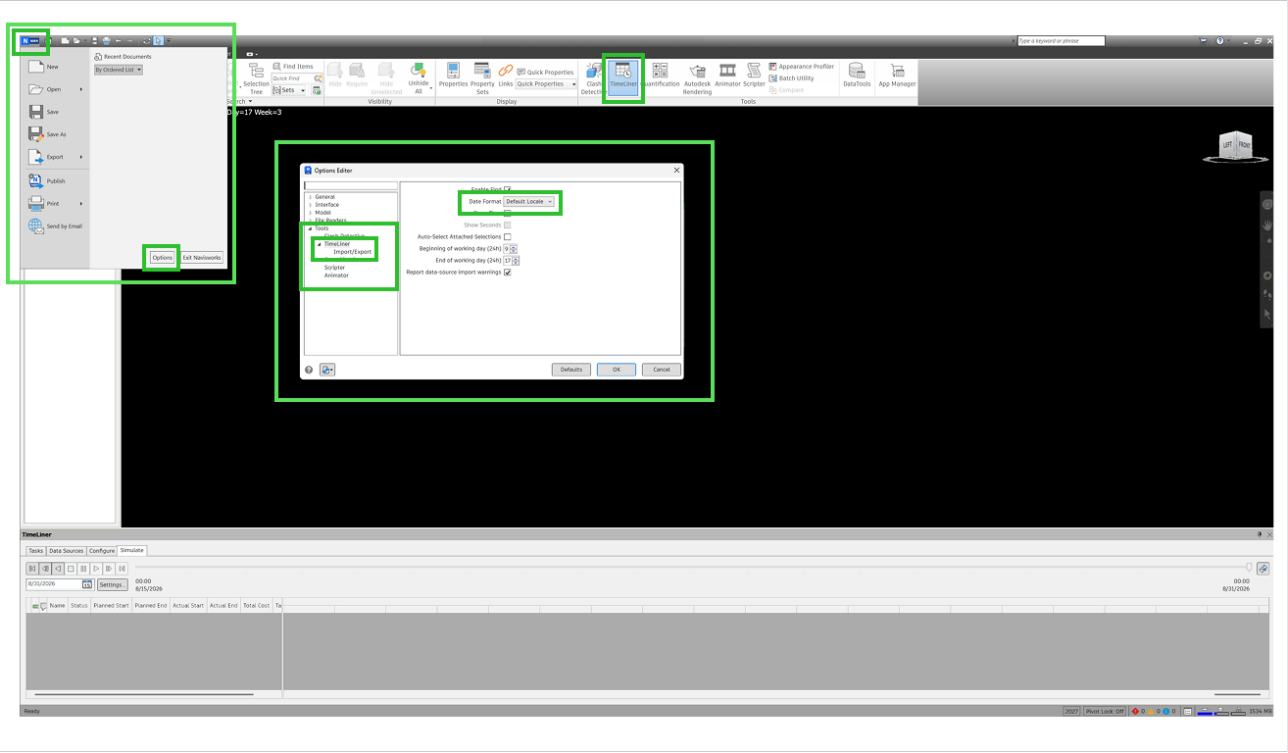

Figure 8.1 — TimeLiner import options. Open the application menu, click Options, then navigate to Tools → TimeLiner → Import/Export. Date Format controls how incoming dates are interpreted. The working-day settings below it determine how durations are converted into working time.

Leave **Date Format** on *Default Locale* if your programme uses the same convention as your operating system. If it does not, as with the example file, which is month-first, set the format explicitly, or specify it during the import itself.

Leave **Report data-source import warnings** enabled. It is how Navisworks tells you that something did not import cleanly.

Step 3 — Import the Construction Programme

Switch to the **Data Sources** tab and click **Add**. TimeLiner can read Microsoft Project files, Primavera P6 projects, and CSV files. The example programme is a CSV.

Selecting the file opens the **Field Selector**, where you tell Navisworks what each column contains.

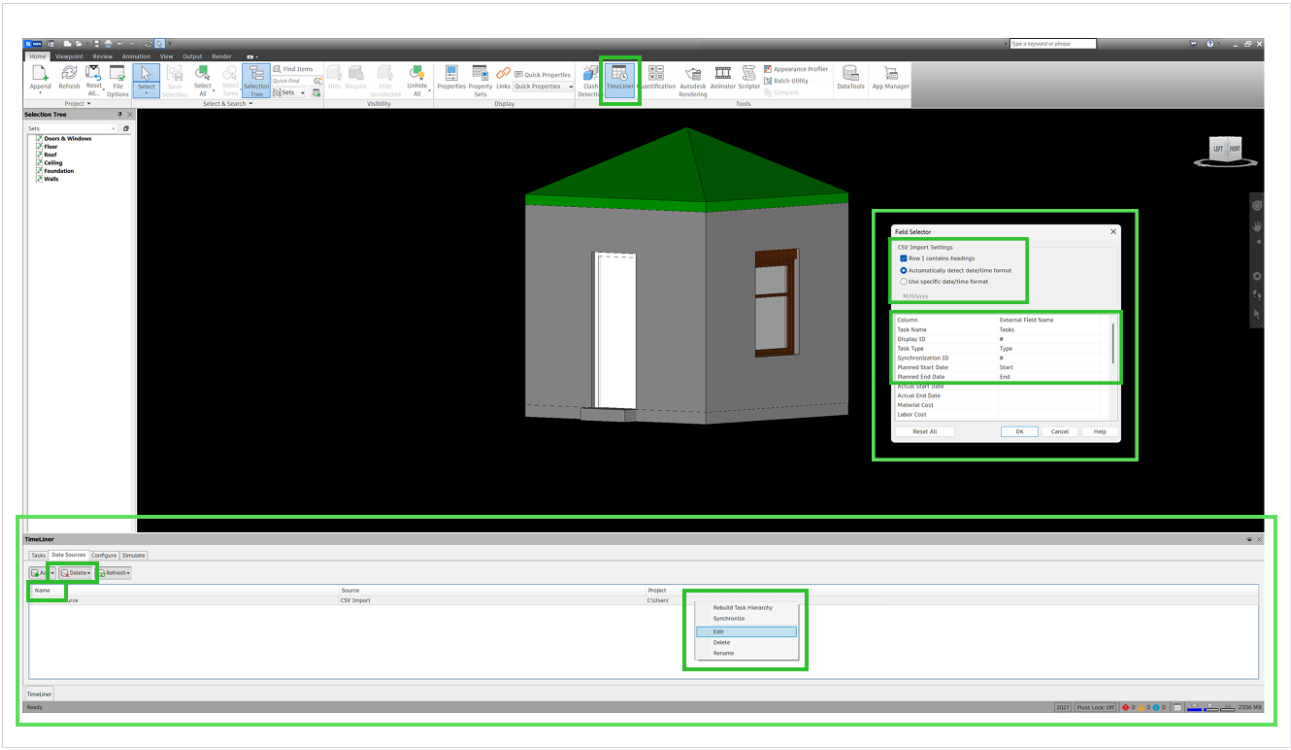

Figure 8.2 — Mapping the columns of an imported programme. The Field Selector maps TimeLiner's fields, on the left, to the column headings in the source file, on the right. Tick "Row 1 contains headings" if your file has a header row, and use "Use specific date/time format" when the file does not follow your system's convention.

For the example programme, the mapping is:

Table 8.5 — Field mapping for the example programme

TimeLiner field	Column in the CSV
Task Name	`Tasks`
Display ID	`#`
Task Type	`Type`
Planned Start Date	`Start`
Planned End Date	`End`

APPENDIX A

Autodesk Navisworks Workspace Reference

A quick reference to the interface

Autodesk Navisworks provides a wide range of tools for reviewing, coordinating and analysing BIM models. These tools are organised into different areas of the workspace, each designed to support a specific aspect of the software.

This appendix is a quick reference to the main interface components. Rather than explaining complete workflows, it introduces the purpose of each workspace area and supporting window, allowing you to identify an unfamiliar tool while working with the software.

It is organised into three categories:

- **Core Workspace Components**: the primary interface used during everyday model review.
- **Advanced Workspaces**: specialised environments for BIM coordination and project analysis.
- **Supporting Windows**: additional tools that provide information, annotations and inspection capabilities.

Two further appendices complement this one: **Appendix B — Troubleshooting**, arranged by symptom, and **Appendix C — Coordination Quick Reference**, which collects the conventions and checklists used throughout the guide.

A.1 Workspace Structure

Table A.1 — How the Navisworks interface is organised

Category	Components
Core Workspace Components	Ribbon · Scene View · Selection Tree · Properties · Find Items · Navigation Bar & ViewCube · Status Bar · Saved Viewpoints
Advanced Workspaces	Sets · Clash Detective · TimeLiner · Quantification
Supporting Windows	Comments · Selection Inspector · Measure Tools · Sectioning Tools

Availability depends on the Navisworks edition and project configuration. See Table 0.2 in *How to Use This Guide* for a comparison of the editions.

A.2 Core Workspace Components

The Core Workspace Components form the main Navisworks interface. They are used throughout every project, regardless of the workflow being performed.

Together, they provide access to software commands, display the 3D model, organise project information and support everyday interaction with BIM models. They are shown and numbered in Figures A.1 and A.2.

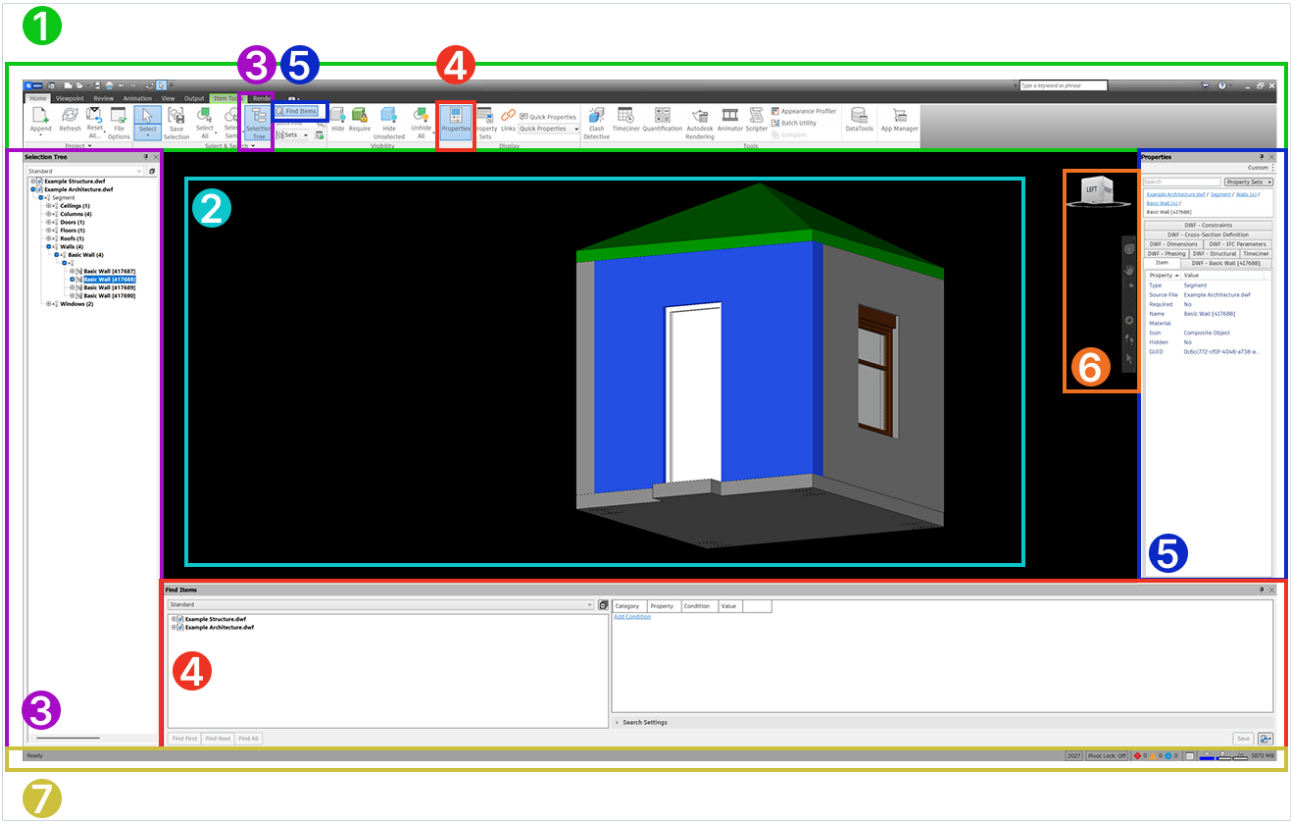

Figure A.1 — Core Navisworks Workspace Components. The numbered callouts identify components 1 to 7. Where a number appears twice, it marks both the ribbon command and the panel that command opens.

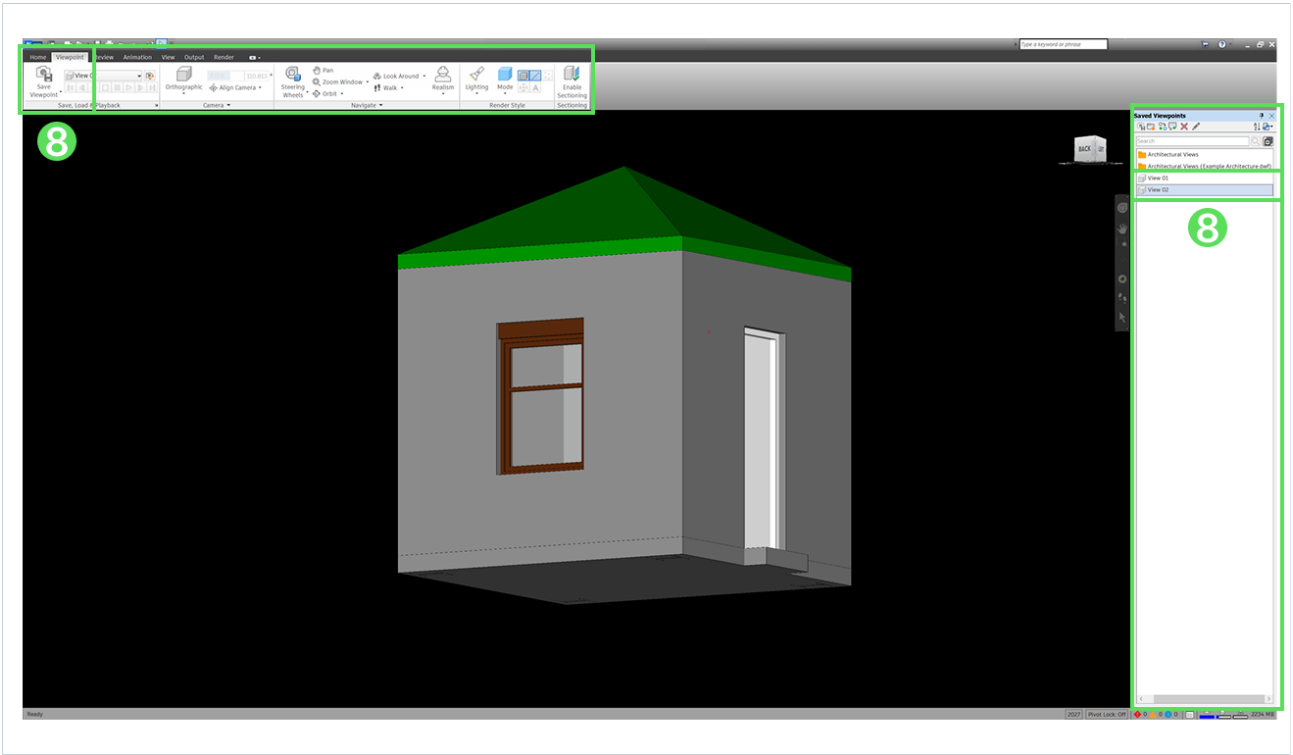

Figure A.2 — Viewpoint Workspace and Saved Viewpoints. Callout 8 marks the Viewpoint tab and the Saved Viewpoints panel, which can be organised into folders.

1. Ribbon

The Ribbon is the primary command interface. Commands are organised into tabs and groups, allowing users to access the tools required for viewing, reviewing and managing BIM models.

Rather than memorising every command, new users should first become familiar with the overall layout of the Ribbon and the purpose of its main tabs, which are listed in Table 0.4.

2. Scene View

The Scene View is the central area of the workspace where the loaded models are displayed. This is where you will spend most of your time navigating the project, selecting objects and reviewing the Federated Model. As different tools are used throughout the guide, their results are typically reflected here.

Common uses: display the Federated Model · navigate the project · select model objects · review project information · display measurements and sectioning.

3. Selection Tree

The Selection Tree displays the hierarchical structure of the models loaded into the project.

Instead of locating objects visually, you can browse the project hierarchy and select models or individual elements directly from the tree. This is particularly useful when working with large federated models containing multiple disciplines. Four views of the hierarchy are available; they are compared in Table 2.3.

Common uses: browse loaded models · expand and collapse the hierarchy · select individual objects · understand the organisation of the project.

4. Properties

The Properties window displays the information associated with the selected object. When an element is selected, its available properties are listed in organised categories. The information shown depends on the data exported from the authoring software.

Table A.2 — Typical property categories

Category	Examples
Object Information	Name, type and category.
Geometry	Size and dimensions.
Materials	Assigned material information.
Identity Data	Element identifiers and project data.
Source Properties	Properties imported from the original BIM model.

5. Find Items

The Find Items window allows you to search the model using object properties rather than manually locating elements in the Scene View.

Instead of browsing the project hierarchy, you can search for objects based on information such as their name, category or other available properties. This makes it easier to locate specific elements within large or complex models.

Common uses: search for model objects · locate elements using properties · filter search results · prepare objects for review.

> **NOTE**
>
> Find Items is also used to create Search Sets, which are covered in Chapter 2.

6. Navigation Bar and ViewCube

The Navigation Bar and ViewCube help you move around and orient yourself within the model. The Navigation Bar provides quick access to the most common navigation commands, while the ViewCube allows you to switch instantly between standard views and rotate the model.

Table A.3 — Common navigation tools

Tool	Purpose
Orbit	Rotate around the model.
Pan	Move the view horizontally or vertically.
Zoom	Move closer to or further from the model.
Walk	Navigate through the model at eye level.
ViewCube	Change the viewing orientation and switch between standard views.

7. Status Bar

The Status Bar is located at the bottom of the workspace and provides information about the current application and project status. Although one of the smallest interface components, it provides useful feedback while working and includes quick access to several display and navigation options.

Typical information: application status · progress indicators · navigation settings · warning and notification icons · display controls.

8. Saved Viewpoints

The Saved Viewpoints window stores predefined views of the model, allowing you to return to important locations without manually navigating through the project each time.

A saved viewpoint records the camera position and can also preserve the current display settings, making it useful for reviewing specific areas of the model.

Common uses: save important model views · return to review locations · organise viewpoints for project reviews · share consistent views with other team members.

APPENDIX B

Troubleshooting

Symptoms, likely causes and where to look

Most difficulties in Navisworks have a small number of causes, and almost all of them are questions of preparation rather than of the software. This appendix is arranged by **symptom**, meaning what you are actually seeing, rather than by topic, so that you can find an answer without knowing which chapter it belongs to.

B.1 Preparing and Appending Models

Table B.1 — Model preparation and federation

Symptom	Likely cause	What to check	See
Appended models do not line up; disciplines sit far apart	Models exported using different coordinate systems	Confirm every discipline exports using the same agreed shared coordinates. This is the most common cause by a wide margin	Ch. 1
Autodesk Navisworks is missing from Revit's Add-Ins → External Tools	The Navisworks Revit exporter is not installed	Install the free exporter for your Revit release, then restart Revit	Ch. 1
Exported NWC is missing elements that are visible in Revit	Elements hidden in the exported view, or a section box is active	The export takes its content from the current 3D view. Unhide, clear the section box, re-export	Ch. 1
Object properties are missing in Navisworks	Properties excluded during export	Re-export using **Navisworks Settings** with element properties and room data enabled	Ch. 1, 2
Property categories are prefixed *DWF* rather than showing Revit parameters	The model was appended from a DWF rather than an NWC	Re-export as NWC for full property access	Ch. 1
The project takes a long time to open	Native RVT files appended directly instead of NWC	Export each discipline to NWC and append those instead	Ch. 1

B.2 Sets and Searching

Table B.2 — Selection Sets and Search Sets

Symptom	Likely cause	What to check	See
A Search Set returns no objects	The property being searched does not exist in the exported model	Select an object and read its Properties panel to confirm the exact category, property and value names	Ch. 2
A Search Set returns far too many objects	The condition is too broad, or *Contains* used where *Equals* was intended	Tighten the condition, or combine two conditions	Ch. 2
A Search Set worked last month and returns nothing now	Property naming changed in the authoring model	Check the current property values, then update the search criteria	Ch. 2
New objects are missing from a Set after a model update	The Set is a Selection Set, which does not update automatically	Review the Selection Set manually, or rebuild it as a Search Set	Ch. 2
Sets are difficult to find in a large project	No folder structure in place	Group Sets into discipline folders and adopt a naming convention	Ch. 2

B.3 Clash Detection

Table B.3 — Clash Detective

Symptom	Likely cause	What to check	See
Clash Detective is not on the Home tab	You are running Navisworks Simulate or Freedom	Clash Detective is available only in Navisworks Manage	Table 0.2
A clash test returns thousands of results	Tolerance left at zero, or whole models compared instead of Sets	Set a sensible tolerance and compare focused Sets	Ch. 3
A clash test returns no results at all	Selection A and Selection B contain the same objects, or one selection is empty	Confirm both selections resolve to objects before running	Ch. 3
Obvious conflicts are not reported	Tolerance set too high, or the wrong clash type chosen	Reduce the tolerance; try **Hard (Conservative)** for near-misses	Ch. 3
Results are impossible to review	Grouping not applied	Group by level, discipline or system before reporting	Ch. 3
Two coordination cycles cannot be compared	The test definition changed between runs	Keep Sets, clash type and tolerance constant between cycles	Ch. 4
Clashes reappear after being resolved	The Federated Model was not refreshed before re-running	Refresh, then re-run the existing test	Ch. 4

APPENDIX C

Coordination Quick Reference

The conventions and checklists from this guide, on four pages

Everything in this appendix is taught somewhere in the guide. It is collected here so that it can be kept open beside the software.

C.1 File Types at a Glance

Table C.1 — Which file, and when

File	What it is	Updated	Share it for
RVT	Native Revit project	By the design team	Design and editing only
NWC	Optimised coordination export	Every issue	Bringing a discipline model into coordination
IFC	Open, vendor-neutral exchange	Every issue	Consultants using non-Autodesk software
NWF	Live coordination project	Continuously	Continuing coordination
NWD	Published milestone	Never — it is a snapshot	Review, meetings, clients, site, archive

C.2 Clash Types and Tolerance

Table C.2 — Choosing a clash type

Ask	Use
Do these objects physically intersect?	**Hard**
Do they touch or nearly touch without measurable overlap?	**Hard (Conservative)**
Is there enough space between them?	**Clearance**
Has the same object been modelled twice?	**Duplicates**

Tolerance behaves differently by type. For Hard clashes it is the depth of intersection that must be exceeded before a clash is reported, so raising it reports fewer, more severe results. For Clearance it is the separation distance below which objects are reported, so raising it reports more. Agree values with the project team and record them, so results stay comparable between cycles.

C.3 Clash Matrix Template

Complete one of these at the start of a project and reuse it every cycle. Mark each intersection with the clash type and tolerance agreed.

Table C.3 — Clash matrix template

	Structure	Mechanical	Electrical	Plumbing	Fire
Architecture					
Structure	—				
Mechanical	—	—			
Electrical	—	—	—		
Plumbing	—	—	—	—	

C.4 Naming Conventions

Table C.4 — Conventions worth agreeing before work starts

What	Pattern	Example
Clash test	`Discipline A vs Discipline B`	`HVAC vs Structure`
Search Set	`Discipline – System`	`Mechanical – Supply Ducts`
Selection Set	`Area or zone`	`Level 02 Plant Room`
Published NWD	`Project_Rev_YYYY-MM-DD.nwd`	`Office_Rev03_2026-07-15.nwd`
TimeLiner task	Matches the Set name exactly	`Foundation` → Set `Foundation`

> **BEST PRACTICE**
>
> Matching task names to Set names is the single convention with the highest return. It is what makes **Auto-Attach Using Rules** possible, and it turns 4D linking from an afternoon's work into one command.

C.5 Clash Statuses

Table C.5 — What each status means in practice

Status	Meaning
New	Identified, not yet reviewed
Active	Requires investigation or action
Reviewed	Assessed, decision pending
Approved	Accepted as intentional
Resolved	Removed following a model update

REFERENCE

Glossary

Key terms used throughout this guide

This glossary provides a consistent reference for Autodesk Navisworks, BIM coordination, 4D BIM and 5D BIM terminology. The definitions are intended to support understanding rather than replace the explanations provided within each chapter. Where appropriate, Autodesk terminology has been used to maintain consistency with the software while keeping the definitions accessible to readers who are new to BIM.

Numbers

4D BIM

The integration of BIM models with construction programmes to simulate construction sequencing over time. It helps project teams visualise, review and communicate how a project is planned to be constructed before work begins on site. *See Chapter 7.*

4D Simulation

A visual representation of the planned construction sequence created by linking a BIM model with a construction programme. A 4D simulation supports planning, communication and project reviews throughout the construction lifecycle.

5D BIM

The integration of quantity and cost information with BIM models to support quantity-based cost planning, estimating and commercial decision-making. *See Chapter 10.*

A

Append

The process of adding a model to a Navisworks project while maintaining a live reference to the original source file. Changes made to the source model can be reflected by refreshing the appended file. *See Chapter 1.*

Authoring Software

Software used to create and edit BIM models, such as Autodesk Revit, Civil 3D or AutoCAD. Models created in authoring software are exported or referenced into Navisworks for review and coordination.

Auto-Attach Rules

A TimeLiner feature that links construction tasks to model elements automatically according to defined rules, most commonly by matching a task name to a Set of the same name. It is the most maintainable linking method on large programmes. *See Chapter 8.*

Autodesk Construction Cloud (ACC)

Autodesk's cloud-based platform for storing, sharing and coordinating project information throughout the construction lifecycle. ACC supports collaboration between project teams using a Common Data Environment.

B

BCF (BIM Collaboration Format)

An open format for exchanging coordination issues between different BIM applications. A BCF issue carries a viewpoint, the objects involved and the comment history, allowing an issue raised in one application to be opened in another. *See Chapter 4.*

BIM Model

A digital representation of a built asset containing geometric and non-geometric information. BIM models support design, coordination, construction planning and asset management throughout the project lifecycle.

C

Clash Detection

The process of comparing discipline models to identify physical conflicts and insufficient clearances before construction begins. In Navisworks it is performed using Clash Detective. *See Chapter 3.*

Clash Detective

The Navisworks workspace used to detect, review and manage clashes between discipline models. It is available only in Navisworks Manage. *See Chapter 3.*

Clash Grouping

The process of combining related clash results into a smaller number of meaningful groups, for example by level, discipline or system, so that a large result set can be reviewed efficiently. *See Chapter 3.*

Clash Test

A comparison between two model selections used to identify physical intersections or clearance conflicts between model elements. Clash Tests form the basis of the clash detection process. *See Chapter 3.*

Classification

The process of organising model elements or quantity information into logical groups using recognised standards, project requirements or organisational structures. Classification improves consistency, searching, reporting and quantity management.

Clearance Clash

A clash type reporting objects that come within a distance of one another less than the set tolerance, whether or not they physically intersect. Severity increases as the objects come closer together. *See Chapter 3.*

Common Data Environment (CDE)

A shared digital environment used to collect, manage, store and distribute approved project information throughout a BIM project. A CDE provides a single source of information for all project participants. *See Chapter 5.*

Construction Approach

The overall strategy for delivering a construction project, including sequencing, methodologies, logistics, temporary works and resource planning.

Construction Methodology

The planned method by which construction activities are organised and executed to deliver the project safely and efficiently.

Construction Programme

A project schedule defining construction activities, durations, dependencies and milestones. Construction programmes form the planning foundation for 4D BIM simulations.

ABOUT

About the Author

Athanasios Zagkliveris

Athanasios Zagkliveris is a Civil Infrastructure Engineer with a background in civil engineering, Building Information Modelling (BIM), 3D visualisation, and digital production.

His professional journey has taken him through engineering, architectural visualisation, and the animation industry, giving him experience in structured workflows, collaboration, and technical documentation. Those experiences have shaped the way he approaches BIM and technical education today.

Alongside his professional work, Athanasios has completed advanced training in Autodesk Revit, Autodesk Navisworks, Microsoft Project, and other technologies that support BIM coordination, project planning, and digital engineering.

Through North Stardust Studio, he publishes practical technical guides, documentation, and educational resources for engineers and BIM professionals. His work focuses on making technical subjects easier to understand by explaining not only how software works, but also how it supports real engineering workflows.

This guide was developed from a series of technical articles originally published on LinkedIn. The articles were expanded, refined, and brought together into a structured reference to help readers develop a clearer understanding of Autodesk Navisworks and BIM coordination.

He believes that good technical documentation should remain useful long after it has been read. Whether someone is learning a new workflow or revisiting a familiar topic, a guide should provide clear explanations, practical context, and a reliable reference that supports continuous professional development.

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THE COMPLETE GUIDE

Get the Full Guide

Everything this sample leaves out, in one 136-page reference

The complete guide follows the whole coordination workflow rather than treating it as a set of separate tools. It runs from getting discipline models into Navisworks, through organising and clash-testing them, to publishing agreed milestones, then on to 4D construction simulation and 5D quantity take-offs built on the same coordinated model.

In the complete guide	
Part I — BIM Coordination Fundamentals	Chapters 1 to 6
Part II — 4D BIM and TimeLiner	Chapters 7 to 9
Part III — 5D BIM and Quantification	Chapters 10 to 12
Appendix A — Workspace Reference	Every panel and window
Appendix B — Troubleshooting	Arranged by symptom
Appendix C — Coordination Quick Reference	Conventions on four pages
Glossary and Index	Full reference

136 pages, 32 figures and 113 tables, based on Autodesk Navisworks Manage 2027. Written for BIM Coordinators and Technicians, and for the engineers, architects, project managers and quantity surveyors who work alongside them.

Practical Guide to Autodesk Navisworks

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The complete PDF, 136 pages, First Edition, Version 1.0. Purchasers of the First Edition receive updates to that edition at no additional cost.

Published by North Stardust Studio · Athanasios Zagkliveris · 2026