Publish Date

CLASH DETECTION SMP COLLABORATION & COORDINATION

Company Name

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| 8068-ORG-XX-XX-SP-X-5630 |

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| Company Address | Company Address |
| Originator Code | ORG |
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**Document Location:**

Template Usage Instructions

Getting Started

**Update Cover Logo:** Right-click the large logo on the cover and select 'Change Picture' to replace it.

**Second Page Logo:** Similarly, right-click the logo on the second page and choose 'Change Picture' to update it.

Entering Data

**Form Fields:** The form fields are bordered in blue for easy identification. Start by entering data in the form fields on the second page; the Company Name and Client Name will propagate automatically across the document.

**Document Issue Table:** Update this table on the second page to reflect the current document issue details. (The Document Location will update automatically.)

Editing Document

**Continued Data Entry:** Proceed with entering data in the remaining form fields throughout the document.

**Content Modification:** Adjust the remaining content of the document as necessary.

Finalizing the Document

**Updating References:** Refresh the Table of Contents, table captions, figure captions, and Document Location by pressing CTRL+A then F9.

**Clean-Up:** Remove this instruction text box by deleting it.

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TABLE OF CONTENTS

[1. Collaboration and Coordination 5](#_Toc168559575)

[1.1 Clash Detection 5](#_Toc168559576)

[1.2 Clash Detection Process 7](#_Toc168559577)

# Collaboration and Coordination

## Clash Detection

The BIM Coordinators will conduct clash detection, coordination analysis and data checks against the latest shared models. The workflows involve a combination of visual and automated checks, which are curated into issues and reported back to the team via an online Issue Management System Dalux - Clash Detection System Name.

The Clash Detection Sets Matrix is provided in 0000-XXX-XX-XX-SP-X-XXXX\_BEP Post-Appointment and includes the agreed project clash sets, type of clash (hard or clearance) and agreed tolerances. This is a live information container that will be reviewed and updated throughout the project as required.

Clash detection is typically carried out using clearance clash type settings in line with specified installation tolerances. This includes any unique manufacturer's requirements, such as clearance required for intumescent coatings to expand effectively.

The diagram below summarizes the clash status/resolution workflow.

Diagram

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Figure 1 - Clash detection

Following identification of a clash/issue within the model, the BIM Coordinator will assign one of three statuses:

‘New’ status, along with a unique number, is assigned to every item not previously identified.

‘Active’ status is assigned to any clash/issue that has previously been identified but has been neither ‘Resolved’ nor ‘Approved’ during the previous review cycle (model changes may have been made but have not solved the clash/issue).

‘Resolved’ status is assigned to any previously raised clash/issue that has now been solved through adjustments made in the model.

All ‘New’ and ‘Active’ items will be reviewed at the Weekly/Fortnightly/Monthly BIM Coordination Meeting (BCM) and a further status assigned:

* ‘Approved’ status is assigned to any item considered to be a non-issue, e.g. a concrete column clashing with a concrete slab (consideration, however, needs to be given to the model Use, for example, if the model is intended for 5D quantification then the noted column example may not be acceptable).
* ‘Reviewed’ status is assigned when it has been agreed that a change to the model is required and responsible for implementing the change has been designated.
* ‘Active’ status is assigned when an issue is acknowledged as valid but will not be resolved during the current phase, e.g. pipes passing through a concrete wall flagged up as a clash during the design stage, but no action required, as a builders work opening will be added to the model during the detailed design phase or following a design freeze.
* Clash analysis should be presented in the form of a report to compare the different clashes, record the clash detection and assumption on elements tolerances, areas, and elements, identify any significant conflict discovered in the process and generate resolution result summary.

The report shall address the following.

* Software to be used.
* Workflow overview.
* Responsibilities.
* Outputs.
* Technical query workflow.
* Clash resolution workflow.
* An action plan with target completion schedule to handle and resolve detected clashes.
* Tolerance levels (mm) for different discipline.
* Operation clearance.
* Maintenance clearance.
* Buildability.
* Service compatibility.
* A clash/issue with an ‘Active’ status will be reviewed again as appropriate at the BCM.

## Clash Detection Process

Please follow the steps

### Export to NWC

1. With the Revit file open select file from the top toolbar - browse to Export - Select NWC (saves the scene as a Navisworks NWC file)

Graphical user interface, application

Description automatically generated

* + - * 1. Before saving the NWC file, select Navisworks Settings - File Readers\_Revit, and ensure the settings shown are correct. This is to ensure all Revit links to be coordinated against are exported alongside the ORG Revit information.

Graphical user interface, application

Description automatically generated

* + - * 1. Save the Navisworks (\*.nwc) file in a suitable location, using the correct naming strategy for the job with a suffix of date exported for clarity and ease of investigation later.

Graphical user interface, application, table, Excel

Description automatically generated

* + - * 1. Navisworks NWC Exporter will pop up, wait for the process to finish. When complete open Navisworks Manage.

Graphical user interface, application, table

Description automatically generated

### Clash Detection process

* + - * 1. Open Navisworks Manage, select the N application button - Open - Open an existing Navisworks project. Select the file previously saved.

A screenshot of a computer

Description automatically generated

* + - * 1. Clash Detective - add test: In the Tools ribbon on the top ribbon bar, select Clash Detective. Next, select Add Test, creating the first test rule panel for setting out the clash detection items. Next, double click into the name field and choose a unique name clearly identifying the detection items for detection, i.e. ORG /SALE Lighting\_First Floor.

Graphical user interface, application, PowerPoint

Description automatically generated

* + - * 1. Clash Detective - set test type and tolerance: Ensure the Settings of the Clash Detective panel are correctly set before beginning the below process. The surfaces option has been selected (this is considered the best option when defining clash tests between 3D objects). Ensure the type is set to HARD and the tolerance is set to the correct level as set out in the Employer Specification document.

Graphical user interface

Description automatically generated

* + - * 1. Clash Detective - Selection A: In the Clash Detective panel under Selection A, Click the + icon (Drill into) to expand the list of levels and links for selection.

Graphical user interface, application

Description automatically generated

* + - * 1. Clash Detective select required items: Drill into the first-floor levels and select the lighting fixtures (for this demonstration only, this is to be followed for all services that require clash detection, i.e. Electrical Fixtures, Containment, Fire alarm etc.) options for each level, control-click to select multiple options at once.

Graphical user interface, application

Description automatically generated

* + - * 1. Clash Detective Panel Selection B: In the Clash Detective Panel under Selection B, Click the + icon (Drill into) to expand the list of levels and links for selection. For this demonstration, select both Upper First Floor FFL and 01 USSL, again using a control click to select multiple options at once. With all selections chosen - RUN TEST

Graphical user interface, application

Description automatically generated

* + - * 1. RUN TEST
        2. Once RUN TEST has been completed, Navisworks will automatically move the user to the next panel - Results, where the results of the clash test are displayed. For this demonstration, no clashes existed between ORG /SALE Lighting\_First Floor. In this instance, the process above is followed again for the next floor until a floor and items have a discovered clash, as shown below.

Graphical user interface, application, Word

Description automatically generated

* + - * 1. In the Clash Detective panel, it can now be seen that 1no clash exists for the Third Floor Lighting. Therefore, clash 1 is highlighted along with the fitting description in Item 1 column and Item 2 column. Item 1 is displayed in the main viewer in RED and Item 2 in GREEN.
        2. Repeat test for all disciplines
        3. Repeat steps 1-7 described in **Error! Reference source not found.** **Error! Reference source not found.** for all floors and services between ORG/(CONTRACTOR) and ORG/ORG. Set out each rule to clearly define the floor and service being detected against, i.e., ORG/SALE Containment\_First Floor. When all levels and services have been set up for a clash detection rule, move to the next step of the process below.

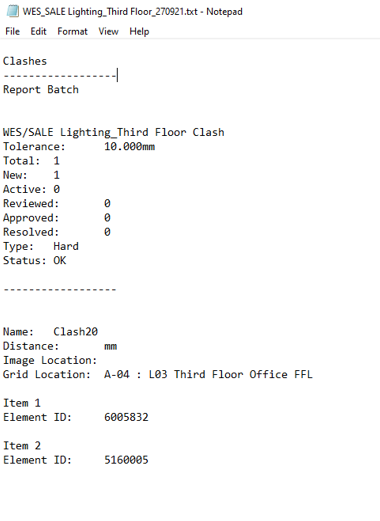
### Reporting

* + - * 1. Move to the Reports panel next to the Results panel with the complete test and set out the rules below. This gives the simplest form of reporting that can be easily followed by the user and contractor receiving the clash report. A **Summary** of the report is included, which details the clash name, i.e. Clash 1. In addition, an **Item ID** is included, which is used to locate the clash within Revit, see section (3.2.2) and a **Grid Location** to assist with location and confirmation of the highlighted clash.
        2. In the Output settings under **Report Type** ensure it is set to the current test, and this will be the selected test in the clash detective panel, i.e. ORG/SALE Lighting\_Third Floor. All tests (separate) can be selected; however, selecting the current test and saving it as a separate file with a suitable name is considered the best working practice. Finally, the report format should be set to text; this is a ORG preference as it easily sets out the report as shown below.
        3. With all options set out to the user's preference, click **Write Report** to produce a report in the user's chosen format. Save the file in a suitable location, including the test report description and date.

Graphical user interface

Description automatically generated

* + - * 1. Browse to the file location used to save the clash report and open it. If using Report Format - Text, the information will be displayed as shown below.
        2. In the text software below, the information included in the report is set out for ease of identification. This information will be used as a basis for the clash report in either a Word Document or BIM Track depending on the clash reporting options set out in the Employer Specification.



### Element ID

* + - * 1. Highlight the Element ID - copy to clipboard - open Revit - navigate to a suitable view, i.e. 03-1000\_Lighting - navigate to: Manage panel > Select Elements by ID >paste the Element ID > into the Select Elements by ID pop-up > OK.

Graphical user interface, application, Word

Description automatically generated

Graphical user interface, application

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* + - * 1. Element ID - Clash Number identification: The Element ID will now highlight the Item Clash 20 element; in this instance, ORG\_Lighting Fixture\_Fagerhurt\_B Type BE.

A screenshot of a computer

Description automatically generated with medium confidence

* + - * 1. Selection Box: With the element still selected, navigate to the Selection Box widget as shown below and click.

Graphical user interface, application

Description automatically generated

* + - * 1. Open 3D View: This will open a 3D view in a new Revit window, zoom into the elements and rotate the view to a suitable position to clearly show the elements clashing. Finally, take a snapshot of the clash issue to be used in a later clash report document/software.

Graphical user interface, application

Description automatically generated

### Documentation of Clash issues found

Section **Error! Reference source not found.** **Error! Reference source not found.** refer to a report document/software. The employer specification will determine the exact style of reporting; both will be covered within this section.

For information - London Southbank University required ORG to use BIM Track as a clash detection reporting platform. Therefore, the process of reporting within a Word Document format is not followed.

### Word Document Reports

Create a new Word Document suitably named and dated I.e., Company Name Report\_Third Floor Lighting.

Using the information within the Note Text file, Copy the information into the Word Document and include the image of the clash item under review and a clash summary and potential resolution. Produce an item-by-item report as detailed; this report can be sent in advance to the contractor in question and discussed within an M&E Design meeting/Coordination meeting for review and resolution of each item by both parties. An agreement of the resolution should be recorded, and a date for completion agreed by both parties.

Both parties shall take away a copy of their report when all are discussed and agreed and begin working on the agreed solutions. When done, the clash detection process will begin again as detailed from Step 1 until such a time that all parties are "Clash Free”, and a coordinated model/sheet can be produced.

Graphical user interface, text, application, email

Description automatically generated

Figure 2 - Example of clash report in Microsoft Word

### BIM Track document process

To allow reporting of clash issues using the BIM Track software, the workflow in section **Error! Reference source not found.** **Error! Reference source not found.** through to the end of section **Error! Reference source not found.** **Error! Reference source not found.** shall be followed.

After selecting the Selection Box and creating a 3D view, the user should leave the 3D View open for the following stages of the BIM Track documentation process. First, to ensure the information presented in the BIM Track viewer is suitable and precise, set up correct View Templates with suitable selections to ensure all users can view the Issue from the inbuilt viewer.

* + - * 1. Open BIM Track: With the View open and set correctly, navigate to the BIM Track ribbon - Open BIM Track
        2. BIM Track - create Issue: With the BIM Track services window open, select the drop-down menu on the left - create Issue.

Graphical user interface, application

Description automatically generated

Graphical user interface

Description automatically generated

* + - * 1. BIM Track - fill in details: All fields within the issue menu are marked with an asterisk (the user must fill out \*).
        2. The requirements are project-specific and shall be included in Post-Appointment Bim Execution Plan (BEP); for example, the following shall be filled in by selecting the drop-down menu: Assigned to, Priority, Zone where the Clash Item is located, Discipline (code of task team member related to the Issue), Room number, Type, Status and Level

Graphical user interface

Description automatically generated with low confidence

Status shall be changed after the clash has been actioned; the typical status values are: **Open, Resolved or Closed.**

Typically, the Issue's closing is done by the person responsible only, as per the project in Project Information Requirements (PIM) workflow.

Fields not marked by an asterisk are not required. However, the two fields advised to fill out are Due Date and Notify. This is to ensure all parties know the required change and the date requested for the item to be resolved.

An issue name is a required field and advised to be as straightforward as possible to define the clash, i.e. Electrical Fixture Clash with Mechanical Duct.

An issue description is also suggested, and this should be as descriptive as possible, including a potential resolution or reasons that limit a change request. Again, clear, concise points are suggested. When all fields have been correctly filled out, the user will Publish the clash, making it possible for all connected to view in either the Revit Plug-in or the Internet Browser version.

* + - * 1. BIM Track View in a model, View/Edit. Users can View in Model via the BIM Track dashboard to begin working through a solution.

Graphical user interface

Description automatically generated

Figure 3 - BIMTrack Dashboard

Viewing in the model takes the user to a 3D view set up by the Clash Author. The user can now clearly see the clash issue and make plans for a solution to the clash.

Diagram, engineering drawing

Description automatically generated

Figure 4 - Clash view in Revit

* + - * 1. Clash update: If the clash has been resolved or requires more information, the status shall be updated using the View/Edit button

Graphical user interface, text, application

Description automatically generated

Figure 5 - Edit clash details

Here the users shall add comments supporting their findings or discuss potential issues/solutions for the clash.

A suitable solution discussed with the assigned parties shall be communicated to the clash author, provide evidence to support the clash resolution and set the status to **Resolved**. The clash author in line with PIR shall review the item and, if the solution is acceptable, change the status to **Closed** or offer reasons for the clash resolution not being accepted, which should result in an **Open** clash status

A screenshot of a computer

Description automatically generated

Figure 6 - BIM Track clash status update

* + - * 1. Coordination model share: With frequency aligned to Project Information Requirements (PIR), coordination models shall be shared with the project team via Common Data Environment (CDE) in an agreed format also set out in PIR. Unless agreed otherwise, typically, the status of the Project Information Model remain as 'work in process' for information only until Project close-out (clause 5.8 BS EN ISO 19650-2 2018).