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BIM GUIDE

August 2026

As Theatre Consultants, we love theatre and we are committed to building performance venues that align with contemporary construction technologies. We continuously adapt our methods to match good practices from around the world, and we are proud to be at the forefront of BIM integration in theatre design. This guide presents a typical approach. Every project is different, and this note is helpful as a basis of discussion when defining BIM Execution Plans at the outset of any project.

We have deep and extensive expertise in:

- Modelling technical theatre equipment in **Revit**
- Collaborating within **Autodesk Construction Cloud (ACC)**, **Aconex**, and other common **CDE platforms**
- Interpreting and aligning with **BIM Execution Plans (BEPs)** and project-specific information requirements

We have dedicated BIM Managers who lead our workflows, ensuring coordination, compliance, and innovation in every project. Participating in classification development; we are currently in communication with **Uniclass** to improve classification granularity for theatre-specific elements.

As theatre consultancy is a non-licensed provision, we cannot fully design for construction in the way that architects and engineers can. Therefore, we produce **Design Intent** information suitable for tender, and a specialist contractor / integrator completes the design under a **Contractor's Design Portion (CDP)**. While many of us now work natively in Revit at all stages, the **Level of Detail (LOD)** incorporated in our models is typically restricted to LOD 300, which means items may be modelled as placeholder volumes showing basic attributes, approximate dimensions and locations.

Theatre consultancy includes multiple disciplines, systems, and design responsibilities. Each has a defined role within a document called the **Division of Responsibility matrix (DOR)**. We collaborate closely with design and executive architects, as well as engineering teams, to clarify modelling boundaries and data needs. This document differs from the **Master Information Delivery Plan (MIDP)** and **Task Information Delivery Plan (TIDP)** that control the information flow of a project. The DOR is detailed enough to clarify all the interfaces between designers and contractors on every element of theatre design and extends to include the responsibilities of main and specialist contractors during construction and commissioning.

As stated above, every project is different, but we typically work on the following elements of theatre design:

- **Theatre Design** – the layout of auditoria and seating. This work is typically done through geometric planning sketches and layouts, that are then fed into the architect's information.
- **Theatre Planning** – the sizing and layout of all the rooms and spaces needed to make a performance venue work, ensuring correct relationships with each other. This work is typically done through geometric planning sketches and layouts, that are then fed into the architect's information.
- **Stage Engineering (SE)** – any moving elements used for shows or for stage and auditorium setup including rigging and flying systems, stage elevators, movable seating units, and fixed elements like pipe grids and rigging beams.
- **Stage Lighting (SL)** – power distribution and control of show lighting equipment and control of house lights and work lights within the performance space and any room opening onto that space
- **AV** – all show sound, production communication, and audio-visual power distribution and control systems, and audio and video paging and show relay to back of house and public spaces

Prior to working in 3D, much of our initial design work is done in 2D, often with iterative sketch designs to ensure successful relationships between spaces and alignment of levels in plan and section. We recommend incorporating the theatre equipment elements into the 3D model after the initial design work is completed in 2D, as transitioning to 3D too early can hinder productive discussions that are more effectively conducted in 2D.

Typically, because of the bespoke, custom, and specialist nature of the stage engineering equipment specified by Theatre Consultants, and because the final design for construction will be the responsibility of the Stage Engineering Contractor, the modelling of these elements by the consultant will express the design intent with enough detail to represent the components as they will appear in the finished structure, and will be suitable for use for coordination, analysis, and documentation purposes. However, we will usually leave space for the selection of components by specialist subcontractors which meet the performance requirements and objectives of the project.

For SLAV, typically, the modelling details the positions of the distributed equipment and facility panels but will not include circuiting in the way that a general electrical model would. This must be coordinated with the MEP engineer and appear in their model.

Principal Worksets in Models

We organize our models using discipline-specific worksets to ensure clarity, visibility control, and coordination with collaborators.

Design Worksets

These are elements we design and model directly. All of these elements are theatre specific and should not mix with standard electrical or mechanical equipment.

- **Electrical Accommodation – Power and Heat Loads associated with Technical Stage Equipment** (Company Switches, Theatre Specific Electrical Supply Equipment)
- **Cable Passes** (For routing of temporary event specific cabling: Wall and Floor Cable Passes, Cable Trays and Cable Hangers)
- **Stage Lighting – Layout** (Outlet boxes, dimmers, and racks)
- **AV – Layout** (Outlet boxes, and racks)
- **AV – Loudspeakers** (Eg: Line arrays, Subwoofers, Side Fills, Front Fills etc.)
- **AV – Paging** (Eg: Paging Speakers, Show Relay Screens etc.)
- **AV – Video** (Eg: Screens, Projectors, Cameras etc.)
- **Stage Engineering Equipment** (All machinery and related equipment for a venue including retractable seating systems, acoustic banners, acoustic concert shells etc. even though they may be in a different workset time to time)
- **Stage Engineering – Acoustic Curtain** (Deployed & Stored) – These dynamic devices which may be curtains or banners, adjust room acoustics. We model both stored and deployed positions to communicate intent. Architects often prefer viewing the stored position for coordination with architectural elements; the specific workset setup enables flexible visibility control.

There are, of course, some where a crossover is necessary or indeed preferred.

- **Production Lighting – Worklights** (Installed white and blue functional lighting in technical areas)
These are typically designed in concept by the consultant at an early stage and then handed over to the MEP engineer for detailing.

Missing from the list above is House Lighting in the Auditorium. This may be designed by the MEP consultant or an Architectural Lighting Designer; however, the theatre consultant will provide guidance on the appropriate type of luminaires, including emergency lighting and exit signs.

Typically, all lighting inside the theatre space and any room that opens onto the theatre is controlled by a system designed and specified by the theatre consultant.

Placeholder Worksets

To lead design coordination with other disciplines, we model placeholders that define design intent, space, weight, or clearance requirements.

- **Stage Engineering Placeholder – Structural Steel** – We include placeholder secondary steel where stage machinery requires structural support, helping guide structural engineering early.
- **Stage Engineering Placeholder – By Others (Walls, Floors, etc.)** – Where stage equipment (e.g., curtain tracks) needs integration into architecture, we model placeholder walls or rooms for storage or clearance, prompting other disciplines to develop accordingly.

Floor finishes in retractable or mobile systems may require placeholders in specific worksets. This allows coordination without conflicting with architectural or interior finish schedules.

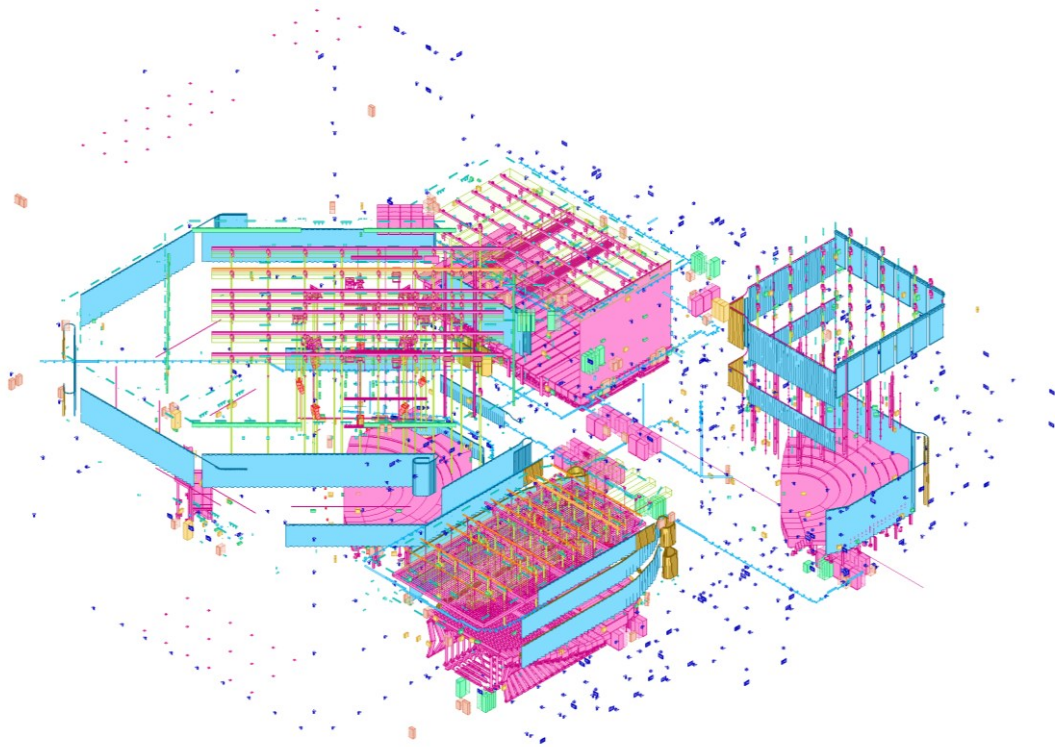
Note: to facilitate clean coordinated drawings Architects' floor models related to Stage Engineering Equipment should be in a specific workset as well.

- **Distribution Boards (Electrical Accommodation)** – We model distribution boards for installed equipment, including access zones, to coordinate their location to our requirements. The final specification and selection of these boards is normally by the project electrical engineer.
- **Theatre Seats (Static)** – While we prefer sightline design to begin in 2D, we sometimes place placeholder seats in 3D models to guide architectural teams in final modelling.
- **Exclusion Zone Workset** – Theatre equipment often includes moving components (e.g., elevators, curtains, or flying systems). We define **exclusion zones** to ensure safety and prevent clashes. These are modelled in a dedicated workset and included in **NWC exports** for clash detection and spatial coordination.

Worksets Recommended for Architects

- **Seats (Dynamic Systems Only)** – Seat for retractable or moving systems should be modelled in a dedicated workset to communicate dynamic behaviour. Static seating (e.g., in balconies or stalls) is typically excluded to prevent duplication.

Architects modelling seats should place their seats in specific workset for us to be able to turn them off.



An example view of a multi-venue building, with each item coloured according to its respective workset.

IFC vs NWC Export Strategy

- **NWC Export** – Includes all designed elements and placeholders to visualize spatial relationships and detect clashes.
- **IFC Export** – Includes only final, approved elements designed by theatre consultants. Placeholders are excluded to streamline coordination.

Design Options in Theatre

Theatres are dynamic spaces. For example, a black box theatre may support multiple configurations. We use Revit's **Design Options** feature to model variations:

- The **Primary Option** is selected in collaboration with the design team
- The Primary Option is typically included in **NWC exports** and shared RVT files

Other related matters

While discussions on BIM inevitably focus on 3D modelling, BIM implementation is much broader and includes the delivery and management of information typically on a CDE. The following are core to the theatre consultant's work.

Cost Estimation

The costing of most projects is conducted by a QS or Cost Consultant, who have detailed information and experience in how to measure and cost complex engineering systems. However, they are heavily reliant on the theatre consultant to provide cost estimates for systems within their scope.

The cost estimation process for performance equipment in a performing arts centre is a multi-stage, evidence-based methodology that leverages historical data, market intelligence, and real-time engagement with specialist contractors. This structured approach ensures that the budget remains realistic, competitive, and responsive to the unique requirements of each project.

This information is only properly understood if viewed alongside the Division of Responsibilities, which will ensure that the QS is allowing for all elements of work excluded by the theatre consultant.

Briefing & System Definition

Initially based on the project brief and as the design develops the performance system requirements are clarified. Through each subsequent design stage, the cost estimate evolves accordingly. The design intent is broken down into discrete packages that typically align with procurement lots or work packages:

- Stage engineering (SE) (Rigging systems, orchestra elevators, etc)
- Production Lighting infrastructure (PL)
- Sound & Communications (SC)

Each of these packages is scoped and costed individually.

Not every item within the theatre specialist packages requires full modelling in BIM and as such, generating costing information from the BIM models for these disciplines is not always possible. To deliver accurate cost estimates our process includes:

- **Benchmarking** from past projects
- **Market testing** with suppliers
- **Calculated rates** (e.g., per metre/unit)
- Validation through **specialist contractor tenders**

This blended approach delivers cost certainty without over-modelling. Within the Production Lighting, and Sound & Communications packages, a large percentage of the budget cost is made up of portable and deployable items such as stage lights, microphones and extension leads. These items exist in multiples and are often physically very small. Modelling of them adds no coordination benefit to the project, while creating a very data-heavy model.

Specialists Contractor considerations

Generally, theatre consultants include specialist contractor 'overheads', 'profits' and 'preliminaries' in our cost estimations, these are estimates and based on benchmarking as described above. This is difficult to estimate accurately and coordination between the QS and theatre consultant is essential to ensure these figures are robust.

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