LUA BIM LABS

MEP BIM Model Quality Self-Check Checklist

The 31 points that cause submission rejection and rework

MEP BIM Model Quality Audit

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How to use

Mark every item with one of four grades. What matters is not how many you mark, but how many land on Critical.

Pass	Meets the standard	No action
Minor	Off standard, work proceeds	Fix before submission
Major	The other side works twice	Fix as a priority
Critical	Shipping this causes an incident	Fix now, report to client

> Decision rule: one Critical or more means the model does not go out in that state. Five or more Majors means the problem is the standard itself (BEP, template).

Time required: sections 1-2 take about 10 minutes without opening the model.
Sections 3-6 take about 40 minutes with it open. The hour before submission,
spent in this order, is how this document is meant to be used.

1. Files and versions (5 items)

> **Why this matters —** fail here and the model is rejected before anyone opens it. You only need the file list, so this is the cheapest failure to prevent.

1 Do filenames carry project, discipline, and version information

☐ Pass ☐ Minor ☐ Major ☐ Critical

Check	look at the file list in the submission folder. No need to open anything.
Critical	two or more files share a name and the latest cannot be identified
Major	no discipline or date marker, so the recipient must open files to know what they are
Minor	a naming rule exists but differs from the BEP or client convention

2 Is the Revit / IFC / NWD version of the delivered model identifiable

☐ Pass ☐ Minor ☐ Major ☐ Critical

Check	file properties, or the version shown on opening. For IFC, the schema in the header (IFC2x3/IFC4).
Critical	saved in a version above the one the client specified, so they cannot open it
Major	mixed versions, only some files open, and no list says which file is which version
Minor	versions match but are not stated in the documentation

3 Are any linked files missing

☐ Pass ☐ Minor ☐ Major ☐ Critical

Check	open the model and look for "not found" entries in link management.
Critical	the architectural or structural link is missing, so clash review is impossible
Major	some links are broken, so those areas silently drop out of review
Minor	links resolve but point at a personal local path

4 Are there models that fail to open or are corrupted

☐ Pass ☐ Minor ☐ Major ☐ Critical

Check	open every submitted file one by one. Confirming that they open is the point.
Critical	a file will not open, or errors out immediately on opening
Major	it opens but raises a recovery warning and some elements were lost
Minor	it opens but takes abnormally long (performance cleanup needed)

5 Do the submitted model and the reference drawings share the same cutoff date

☐ Pass ☐ Minor ☐ Major ☐ Critical

Check	put the model save date next to the revision date of the reference drawings.
Critical	the drawings are newer and carry a design change the model does not have
Major	dates differ and the scope of change is not documented anywhere
Minor	dates differ but it is confirmed that nothing changed

2. Coordinates and links (5 items)

> Why this matters — if coordinates are off, the entire clash review result is void. The later you find it the more it costs, so this comes before model quality.

1 Is the project base point / survey point state confirmed

☐ Pass ☐ Minor ☐ Major ☐ Critical

Check	display the base point and survey point and read their position and coordinates.
Critical	the base point has been moved or rotated and no document says so
Major	coordinates are readable but there is no shared-coordinate history to reproduce them
Minor	the base point is correct but clipping settings are untidy

2 Do architectural, structural, and MEP models sit in the same position

☐ Pass ☐ Minor ☐ Major ☐ Critical

Check	turn on every link and visually confirm walls, columns, and ducts align on any level.
Critical	disciplines are wholesale offset from each other (tens of metres, or rotated)
Major	one discipline is offset by a level, voiding review of that level
Minor	a small offset exists but does not affect clash results

3 Is the link insertion method consistent

☐ Pass ☐ Minor ☐ Major ☐ Critical

Check	compare the placement basis (origin, shared coordinates, etc.) of each link.
Critical	links use different bases, so positions shift as soon as the file is reopened
Major	the basis matches but some links were moved by hand and will not reproduce
Minor	the method is consistent but the basis is not documented

4 Is the model origin free of excessive offset

☐ Pass ☐ Minor ☐ Major ☐ Critical

Check	measure how far model elements sit from the internal origin.
Critical	far enough that elements distort, or snapping and clash maths become unreliable
Major	the offset is large but no symptom yet — it will surface on linking or export
Minor	slightly beyond the recommended range

5 Do level and grid references match across disciplines

☐ Pass ☐ Minor ☐ Major ☐ Critical

Check	transcribe level names, elevations, and grid numbers per discipline into one table.
Critical	the same level name points at different elevations in different disciplines
Major	level naming systems differ, so nothing can be discussed without a mapping table
Minor	elevations match and only the notation differs

3. MEP model quality (6 items)

> Why this matters — the most common failure is a model whose geometry is right and whose data is empty. It looks finished and is useless for quantities, procurement, or maintenance. This section asks whether it can be used, not whether it was drawn.

1 Are system names, type names, and equipment names identifiable

☐ Pass ☐ Minor ☐ Major ☐ Critical

Check	build one schedule and scan the name columns for blanks and defaults.
Critical	defaults left in place, so the system cannot be identified from the model
Major	names exist but follow no rule, so one system is scattered across several names
Minor	a rule exists but some elements remain as exceptions

2 Is size information present on duct, pipe, and electrical elements

☐ Pass ☐ Minor ☐ Major ☐ Critical

Check	in each discipline schedule, sort the size column so blanks and zeros rise to the top.
Critical	main runs have no size, so both quantities and clash results are impossible
Major	some terminal branches are blank, so quantities come out under-counted
Minor	sizes exist but units and decimal places are inconsistent

3 Are equipment connections and system routing reasonable

☐ Pass ☐ Minor ☐ Major ☐ Critical

Check	start at major equipment and follow each system looking for breaks.
Critical	equipment is not connected to its system, so the system does not exist
Major	connected, but along a route that cannot be built (sharp turns, passing through clashes)
Minor	connections are fine but connection fittings are simplified

4 Are slope, access, and maintenance clearance items identifiable

☐ Pass ☐ Minor ☐ Major ☐ Critical

Check	confirm drainage slope and equipment front clearance in section.
Critical	drainage slope is reversed or zero
Major	no front access clearance, so the equipment cannot be replaced after handover
Minor	clearance exists but is not annotated on drawings or in the model

5 Are duplicate or temporary objects left in the model

☐ Pass ☐ Minor ☐ Major ☐ Critical

Check	count elements per discipline and look for categories with abnormal counts.
Critical	duplicated elements in the same position, so quantities are double counted
Major	review-only temporary objects remain and create false clashes in the report
Minor	unused views and types have not been cleaned up

6 Can views, filters, and worksets be managed per discipline

☐ Pass ☐ Minor ☐ Major ☐ Critical

Check	read the workset list and view naming, then try switching one discipline off.
Critical	no discipline separation, so a single discipline cannot be isolated for review or delivery
Major	separation exists but elements sit in the wrong worksets
Minor	separation is fine but view naming is inconsistent

4. Clash and coordination (5 items)

> **Why this matters —** clash count is not a quality metric. Whether you can assign a responsible discipline and a priority is the metric. Without item 5 the clash report is never used in a meeting.

1 Are clashes with primary structural members identified

☐ Pass ☐ Minor ☐ Major ☐ Critical

Check	run a rule of beams, columns, and slabs against MEP, then read counts and locations.
Critical	a primary beam is penetrated and no sleeve has been planned
Major	many clashes concentrated in one area, meaning the design condition needs rethinking
Minor	contacts within tolerance are being reported as clashes (rule needs tuning)

2 Are clashes with ceiling height or finish zones identified

☐ Pass ☐ Minor ☐ Major ☐ Critical

Check	set the ceiling finish level as the reference plane and read clearance in section.
Critical	the required ceiling height cannot be achieved without changing storey height or routing
Major	clearance falls short only in specific runs, requiring local redesign
Minor	clearance is adequate but insulation and hanger thickness are not accounted for

3 Are clashes between fire protection piping / heads and other trades identified

☐ Pass ☐ Minor ☐ Major ☐ Critical

Check	overlay head positions and coverage with other disciplines along the pipe route.
Critical	head layout is fixed in a state that does not meet code
Major	heads meet code but pipework conflicts with other trades and must be rerouted
Minor	no clash, but inspection and installation clearance is tight

4 Are equipment delivery, inspection, and maintenance space problems identified

☐ Pass ☐ Minor ☐ Major ☐ Critical

Check	trace the delivery route for major equipment from the entrance to its final position.
Critical	an opening on the route is smaller than the equipment, so delivery is impossible
Major	delivery is possible only by dismantling work already installed
Minor	delivery is possible but the route is not documented

5 Can each clash issue be assigned a responsible discipline and a priority

☐ Pass ☐ Minor ☐ Major ☐ Critical

Check	see whether the clash result list carries discipline, zone, and owner as columns.
Critical	results are only coordinate lists, so nothing can be assigned to anyone
Major	disciplines are separated but nothing is prioritised, leaving hundreds of equal-weight items
Minor	assignment works but is not linked to meeting minutes or issue tracking

5. Parameters and data (5 items)

> Why this matters — a model that does not carry through to quantities and cost items ends its life as a design review aid. This is where BIM investment stops paying back.

1 Is a required parameter list defined

☐ Pass ☐ Minor ☐ Major ☐ Critical

Check	look for the required parameter table in the BEP or the client requirements.
Critical	no list exists, so nothing has been agreed about what must be filled in
Major	a list exists but its names do not match the parameters actually in the model
Minor	names match but some exist only as project parameters and are not shared

2 Do key objects carry discipline, system, level, and zone information

☐ Pass ☐ Minor ☐ Major ☐ Critical

Check	put the four fields as columns in a schedule and count the blank ratio.
Critical	no zone information, so quantities cannot be split by level or zone
Major	only some disciplines are filled in, so totals come out with gaps
Minor	values exist but notation is inconsistent (for example "3F" and "Level 3" mixed)

3 Is the size / length / count data reliable enough for quantity take-off

☐ Pass ☐ Minor ☐ Major ☐ Critical

Check	pick an arbitrary run and compare the model figure against the drawing take-off.
Critical	the difference is large enough that model quantities cannot be used
Major	broadly correct, but one discipline shows a systematic error
Minor	the error is small but the measurement basis (centreline, outside diameter) is undocumented

4 Can cost codes or ItemCodes be linked

☐ Pass ☐ Minor ☐ Major ☐ Critical

Check	actually match one real item between the cost code system and a model parameter.
Critical	no key exists at all, leaving manual comparison as the only route
Major	a key exists but resolves many-to-many, so automatic matching does not hold
Minor	matching works but there is no rule for handling exceptions

5 If COBie / FM delivery is required, can the fields be mapped

☐ Pass ☐ Minor ☐ Major ☐ Critical

Check	put the required field list beside the model parameters and count the empty cells.
Critical	a large share of required fields do not exist in the model and must be created
Major	fields exist but hold no values, requiring bulk entry before handover
Minor	mapping works but the conversion rule is undocumented

6. Delivery readiness (5 items)

> **Why this matters —** rejection usually comes from format and file structure, not model quality. All of these are confirmable in the last 30 minutes before submission.

1 Does the actual model format match the client's delivery format

☐ Pass ☐ Minor ☐ Major ☐ Critical

Check	compare the format list in the client requirements against the submission folder directly.
Critical	a required format is missing entirely
Major	the format matches but the version or export options differ from what was required
Minor	format and version match but the folder structure differs

2 Is the file structure sufficient to produce a submission register

☐ Pass ☐ Minor ☐ Major ☐ Critical

Check	actually produce a submission register once from the file list.
Critical	files cannot be mapped to drawings and documents, so no register can be produced
Major	it can be produced but has gaps, so resubmission is likely
Minor	it can be produced but naming differs from the register template and needs manual fixing

3 Is key information preserved through PDF / IFC / NWD conversion

☐ Pass ☐ Minor ☐ Major ☐ Critical

Check	open the converted file, pick the same element as in the source, and compare properties.
Critical	properties disappear on conversion, so the recipient cannot use the data
Major	only some properties survive, so required fields are missing
Minor	they survive but are renamed, so a mapping table is needed

4 Are warnings and errors that must be cleared before delivery identified

☐ Pass ☐ Minor ☐ Major ☐ Critical

Check	open the warning list and read the count and the types.
Critical	warnings that break data trust are present (duplicate elements, references to deleted elements)
Major	the warning count is high enough that the recipient will question model management
Minor	warnings exist but are minor in type and the list is organised

5 Are items likely to trigger rejection clearly flagged

☐ Pass ☐ Minor ☐ Major ☐ Critical

Check	collect everything you marked Critical or Major in this checklist onto one page.
Critical	the risk items are known and the intent is to submit anyway
Major	risk items are collected but have not been raised with the client in advance
Minor	collected and raised, but not recorded in writing

Overall judgement

Critical count

Major count

Overall grade (Pass / Conditional Pass / Rework Required / High Risk)

Top action 1

Top action 2

Top action 3

Grade scale Critical 0 and Major 0-2 -> Pass
Critical 0 and Major 3-4 -> Conditional Pass
Critical 0 and Major 5+ -> Rework Required
Critical 1 or more -> High Risk (hold delivery)

If your own run turned up a Critical

We can advise which items to address first and what review scope your model needs. Tell us the model's condition and delivery schedule, and we will come back with a proposed scope and quotation.

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