

MEP DISCLAIMER

Mercer Mass Timber (MMT) performs Glulam and CLT framing on its CNC machines, and as the elements are already on its CNC tables, MMT has the ability to offer a basic MEP framing package which allows for the CNC framing of openings for Mechanical, Electrical and Plumbing services.

To provide this package, MMT requires that all the following conditions be met and by signing this document, the client attests to the following:

1. MMT will only include MEP from a 3D model meeting the requirements indicated in the subsequent pages of this document.
2. 3D Model submissions that do not meet the indicated requirements by **return of the LOD 300 package** will not be considered.
3. Meeting these requirements will require a coordinated effort of a BIM manager or similar to consolidate all trades' models into one unique file of cut elements only. MMT will not provide or participate in this coordination. The client or owner's representative will need to lead the coordination effort. MMT will not be responsible for the costs incurred, whether the design team is able to meet the date indicated in **2.** or not.
4. Understand that MMT will load and cut exactly what is in the provided 3D model. This will supersede any paper documents and MMT is not responsible for ensuring that the provided model meets structural, architectural or code requirements, nor that the designed penetration has sufficient tolerance for MEP.
5. Where MEP will appear on our drawing set, it will not be dimensioned. MMT is not responsible for modeling errors, inconsistency, or omissions in the 3D model that is provided.
6. The client will need to get the structural engineer to sign off on all penetrations before providing the 3D model to MMT. MMT is not responsible for the structural design of the mass timber elements.
7. MMT will not provide any form of approval for MEP openings.

Company Name

Print Name

Project

Title

Signature

Date



MEP FREQUENTLY ASKED QUESTIONS

For projects containing CLT panels, Mercer Mass Timber (MMT) offers a basic MEP framing package which allows for the CNC framing of openings for Mechanical, Electrical and Plumbing services.

Please note, MEP requires focused coordination on your part. Please inform MMT if MEP is a service required for this project. If so, please note the following important points and FAQ's:

What are MEP penetrations?

MEP (penetrations) are cut-outs or voids in the CLT panels or Glulam which allow for mechanical, electrical and plumbing to enter or pass through the panel or beams.

How are MEP penetrations created?

MEP are modeled using solid volumes in a 3D model (coordinated with our 3d project model) and exported to a file type acceptable to MMT (refer to the attached MEP Guidelines document)

Who creates the MEP penetrations?

Ultimately, the contractor is responsible to fully coordinate and supply the 3D file, at their cost. Size and location of penetrations must be accurately modelled, as we will cut exactly what is in this model.

We don't have BIM (3D Modeling) staff. Who can provide this service?

Often the architectural firm may have a source available (for a fee) or there are BIM companies that can provide this service. Many construction companies have developed internal BIM arms to handle this type of coordination.

Are there limitations to what can be cut on the PBA CNC equipment?

YES! Please refer to the attached MEP Guidelines document, also please note MMT will include MEP penetrations within reason at no additional costs, subject to schedule. Excessive MEP penetrations may include additional costs due to additional CNC time required to frame a multitude of MEP features.

Does MMT create or coordinate MEP files?

NO, MMT does not take any responsibility in the creation or coordination of the MEP files.

What does MMT do with the file?

MMT will add the 3D MEP file into our model and use the volumes to cut hard into our panels. MMT will not review or check the model. The results will be CNC framed and delivered.



Will we see the results of the MEP and panels?

MMT can send, upon request, a 3D file with all MEP information incorporated, for viewing.

When does MMT require the final MEP file?

MMT requires a fully coordinated 3D file upon the receipt of the **LOD 300** markups.

After the LOD 300 markups are incorporated and the model is complete, the last step is to incorporate the MEP model.

Can a delay in the MEP file delivery affect the project fabrication schedule?

YES, it can. This is a common risk item when not adequately addressed in due time.

Layout drawings, panel fabrication lists and single-piece shop drawings are all affected by the MEP model. A delay in the MEP model will directly affect the production schedule.

MEP can also be cut on site to avoid project schedule delays.

What is an acceptable level of MEP?

A general rule of thumb is four MEP penetrations on average per panel.

Will we be charged for MEP?

No, MMT will not charge extra if the level of MEP is standard and all information is received in due time.

If there is more than a normal amount or information is received late, we may need to charge or limit the amount available.

Is it a requirement to provide MEP for this project?

NO! MEP can be field framed as well, but we have found that if coordinated properly, this can be a time-saver on site and is an added benefit for using Mass Timber construction with CNC machinery.



MEP REQUIREMENTS

When designing CLT buildings it is essential that any holes required for MEP (Mechanical, Electrical, Plumbing) requirements are integrated and coordinated at the early stages of the design process.

Generally

All holes of 50mm or more should be pre-cut in CLT panels and Glulam elements at the factory. The position and size of holes in any Glulam columns and beams must be approved by the EOR or specialty Timber Engineer.

Cutouts within panels will have a radius due to the machining, see below for the radii of such cut-outs.

In order to properly integrate an MEP model into Mercer's 3D Fabrication Model, we require the following standards to be met.

Model Format

Model submissions must consist of a single coordinated and finalized 3D model. This model should only include the cut elements that extend through Mercer's CLT and Glulam. An example of such a model can be found below in [Figure 1](#).

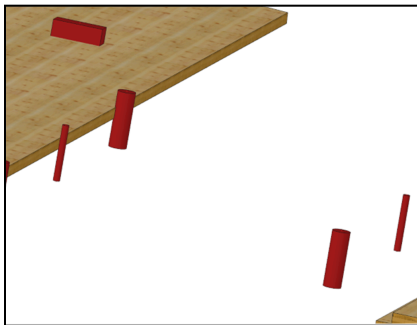


Figure 1 - Cut Elements

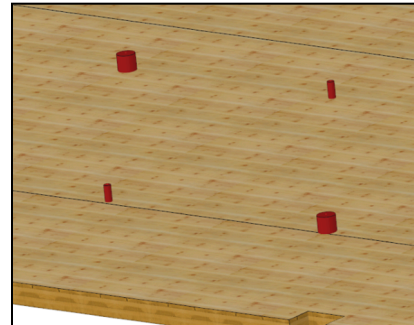


Figure 2 - Cut Element Extensions

Please note that the provided cut elements must be accurate in terms of their required locations and must include installation tolerances.

In the event that a penetration fails to extend fully from the panel, it will be cut as provided. If a cut extends beyond the intended member and collides with another member, both members will receive the cut. Based on experience, it is recommended to address both concerns by ensuring a small 150mm (6") extension of each cut element from the top and bottom of the CLT and Glulam elements, as shown above in [Figure 2](#).

Each model must come with a supplied and coordinated grid line reference or reference element to allow for proper integration and overlay with Mercer's fabrication model. (IE. Block or Pyramid at GL A/1, top = Z/0) See [Figure 3](#) below.



Lastly the submission must be given in one of the following file formats to allow for integration with our existing model: .IFC, .STP, .SAT, .3D (Cadwork).

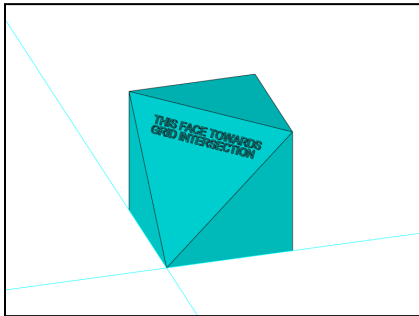


Figure 3 - Grid Reference Block

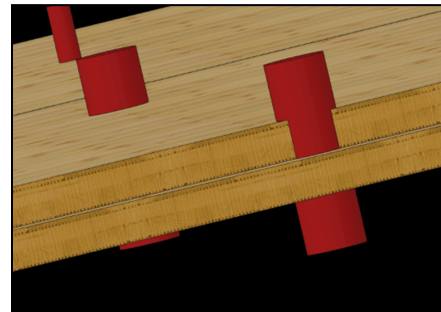


Figure 4 - Cylindrical Openings Perpendicular to Panel

All Openings

Penetration sizes and shapes are dependent on machining limitations and available cutting tools. All openings and penetrations must be perpendicular to the panel surface. See [Figure 4](#) above.

Cylindrical Openings (ref. Figure 4)

Panel Thickness	Diameter of Openings
175mm (6 7/8") or less	32mm (1.26") or $\geq$ 50mm (1.97")
Greater than 175mm (6 7/8")	32mm (1.26") or $\geq$ 90mm (3.54")

Rectangular Openings (ref. Figure 5)

Panel Thickness	Width and Length of Openings	Radiused Corners
175mm (6 7/8") or less	$\geq$ 50mm (1.97")	20mm (3/4")r
Greater than 175mm (6 7/8")	$\geq$ 90mm (3.54")	40mm (1 1/2")r

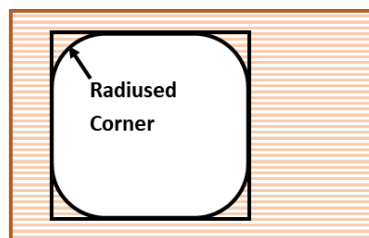


Figure 5 - Rectangular Opening with Radiused Corner

Good Practice Notes:

1. Early appointment of the M&E subcontractor.
2. All holes of 50mm or more should be pre-cut in CLT panels and Glulam elements at the factory.
3. Provide a single finalized and approved 3D model
4. An agreed upon grid reference must be supplied
5. Files must be : .IFC, .STP, .SAT, or .3D (Cadwork)
6. Provide exact elements to be used for cutting including tolerances
7. Elements must be supplied as volumes, surface elements will not be accepted
8. Ensure a 150mm (6") Extension beyond the top and bottom of each panel
9. All cuts must be perpendicular to the CLT surfaces

**Mercer assumes all penetrations provided in the 3D model have been checked and approved by the Structural Engineer of Record (SEOR).*

