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# 1— Level of Development Definitions

A Model Element Author (MEA) is responsible for developing each Model Element at the end of each phase of a project to a minimum Level of Development (LOD) in accordance with the BIMForum Level of Development Specification December 2022.

A summary of LOD definitions and responsibilities is provided in the tables below. If there is conflict between the definitions in these tables and the BIMForum Level of Development Specification December 2022, the tables below take precedence.

1.1 LOD Definitions For Building Structure

| **#** | **DESCRIPTION** | **EXAMPLE - STRUCTURAL COLUMN** |
| --- | --- | --- |
| **LOD 100** | The Model Element may be graphically represented in the Model with a symbol or other generic representation but does not satisfy the requirements for LOD 200.  *Note: LOD 100 elements are not always geometric representations. Examples are information attached to other Model Elements and symbols showing the existence of components.* | **LOD 100** - 2D or 3D geometry, generic column element  A grey rectangular object with a white background  Description automatically generated |
| **LOD 200** | The Model Element is graphically represented within the Model as a generic system, object, or assembly with an approximate quantity, size, shape, location, and orientation.  *Note: At this LOD elements are generic placeholders. They may be recognisable as the components they represent, or they may be volumes for space reservation. Any information derived from LOD 200 elements must be considered approximate.* | **LOD 200** - Generic 3D geometry, approximate size, shape and location  A black and white drawing of a rectangular object  Description automatically generated |
| **LOD 300** | The Model Element is graphically represented within the Model as a design-specified system, object, or assembly in terms of quantity, size, shape, location, and orientation.  *Note: The quantity, size, shape, location, and orientation of the primary elements as designed that are shown on verified drawings at a scale of 1:50 or above can be measured directly from the model with reference to non-modelled information such as notes amd dimension*  *call-outs.* | **LOD 300** - 3D design intent geometry, specific size, shape and location.  A close-up of a piece of paper  Description automatically generated |
| **LOD 350** | The Model Element is graphically represented within the Model as a specific system, object, or assembly in terms of quantity, size, shape, location and orientation, and interfaces with other building systems.  *Note: Parts necessary for coordination of the element with nearby or attached elements are modelled. These parts will include such items as supports and connections. The quantity, size, shape, location, and orientation of the primary elements as designed that are shown on verified drawings at a scale of 1:50 or above can be measured directly from the model with reference to non-modelled information such as notes and dimension call-outs.* | **LOD 350** - 3D actual design geometry, specific size, shape, location and interface with other elements.  A yellow and orange rectangular object with red legs  Description automatically generated |
| **LOD 400** | The Model Element is graphically represented within the Model as a specific system, object, or assembly in terms of size, shape, location, quantity, and orientation with detailing, fabrication, assembly, and installation information.  *Note: An LOD 400 element is modelled at sufficient detail and accuracy for fabrication of the represented component. The quantity, size, shape, location, and orientation of the element as designed can be measured directly from*  *the model without referring to non-modelled information such as notes or dimension call- outs.* | **LOD 400** - 3D fabrication geometry including member coping, end plates, washers, nuts, etc.  A yellow and red stand with a rectangular object on it  Description automatically generated |

1.2 LOD Definitions for Landscape Architecture

The role of a Landscape Architect overlaps many other disciplines, with Architects, Civil Engineers, Environmental consultants, Structural Engineers, Surveyors, and Arborists being a few. Much of the modelling for Landscape Architecture relies on information from other consultants to commence, and appropriate hold points become critical to the discipline’s workflow.

| **#** | **DESCRIPTION** | **EXAMPLE - LANDSCAPE** |
| --- | --- | --- |
| **LOD 100** | The Model Element may be graphically represented in the Model with a symbol or other generic representation but does not satisfy the requirements for LOD 200.  *Note: LOD 100 elements often do not have geometric representations. Examples are information attached to other Model Elements and symbols showing the existence of components.* | **LOD 100** - 2D layout of design and geometry with 2D symbols as representation of elements.  A green circle with a white brick wall  Description automatically generated |
| **LOD 200** | The Model Element is graphically represented within the Model as a generic system, object, or assembly with an approximate quantity, size, shape, location, and orientation. Non-graphic information may also be attached to the Model Element.  *Note: At this LOD, elements are generic placeholders. They may be recognisable as the components they represent, or they may be volumes for space reservation. Any information derived from LOD 200 elements must be considered approximate.* | **LOD 200** - Design intent is represented graphically and illustrated as flat areas. Landscape site elements such as trees, furniture, and landscape structures are generic placeholder elements in approximate locations. Any landscape architectural controlled fencing is shown as 2D linework. Existing trees are shown in approximate locations.  A drawing of a wall  Description automatically generated |
| **LOD 300** | The Model Element is graphically represented within the Model as a specific system, object, or assembly in terms of quantity, size, shape, location, and orientation. Non-graphic information may also be attached to the Model Element. | **LOD 300** - Design intent is shown as 3D elements that have depth and can be quantified. 3D solids are now defined in terms of different soft and hard landscape types and draped to terrain. Site furniture and landscape structural elements can be quantified. Landscape architecture discipline controlled fencing is modelled in basic forms with indicative footings. Proposed trees have accurate locations and the representations of tree canopy size and root ball are graphically shown. Tree-protection zones are illustrated as 2D linework.  A cartoon of a person sitting on a bench under a tree  Description automatically generated |
| **LOD 350** | The Model Element is graphically represented within the Model as a specific system, object, or assembly in terms of quantity, size, shape, location, orientation, and interfaces with other building systems. Non-graphic information may also be attached to the Model Element. | **LOD 350** - 3D solids for hard and soft landscape now include material breakdown. Hard landscape is broken down into different types with associated indicative depths and build-ups. Planting types of all habits are now clearly defined through areas or elements. Root requirements and excavation pit allowances are reflected in the model. Site furniture and landscape structural elements are reflected as a modelled form with footing requirements indicative.  A cartoon of a person sitting on a bench  Description automatically generated |

1.3 LOD Definitions for Building Services

| **# DESCRIPTION** | | **EXAMPLE - SERVICES EQUIPMENTS** |
| --- | --- | --- |
| **LOD 100** | Diagrammatic or schematic Model Elements; conceptual and/or schematic layout/flow diagram; design performance parameters as defined in the BEP to be associated with model elements as non-graphic information. | **LOD 100** - Diagrammatic or schematic model elements. |
| **LOD 200** | Schematic model elements and layout with approximate size, shape, and location of equipment; approximate access and clearance requirements modelled.  *Note: The external dimensions of ducts and pipework will be accurate in terms of design intent. The location of all services elements modelled to LOD 200 will be accurate to +/- 50mm where applicable at Detailed Design. Prior to detailed design the location will be approximate only.* | **LOD 200** - Schematic layout with approximate size, shape, and location (to +/-50mm where applicable at Detailed Design) of mains and risers  A green watering can with a long handle  Description automatically generated |
| **LOD 300** | Modelled as design-specified size, shape, spacing, and location of equipment; access/code clearance requirements are modelled. | **LOD 300** - 3D design intent geometry, specific size, shape and location.  A close-up of a green and orange object  Description automatically generated |
| **LOD 350** | The Model Element is graphically represented within the Model as a specific system, object, or assembly in terms of quantity, size, shape, location, orientation, and interfaces with other building systems. | **LOD 350** - 3D actual design geometry, specific size, shape, location, and interface with other elements.  A yellow and green pipe with a yellow tube  Description automatically generated with medium confidence |
| **LOD 400** | The Model Element is graphically represented within the Model as a specific system, object, or assembly in terms of size, shape, location, quantity, and orientation with detailing, fabrication, assembly, and installation information.  *Note: An LOD 400 element is modelled at sufficient detail and accuracy for fabrication of the represented component. The quantity, size, shape, location, and orientation of the element as designed can be measured directly from*  *the model without referring to non-modelled information such as notes or dimension call- outs.* | **LOD 400** - 3D fabrication geometry including bracing, field installation components, etc.  A close-up of a pipe  Description automatically generated |

1.4 LOD Definitions for Water

| **#** | **DESCRIPTION** | **EXAMPLE - WATER** |
| --- | --- | --- |
| **LOD 100** | Diagrammatic or schematic model elements; conceptual and/or schematic flow diagrams; design performance parameters as defined in the BEP to be associated with model elements as non-graphic information. | **LOD 100** - Diagrammatic or schematic model elements. |
| **LOD 200** | Schematic model elements and layout with approximate size, shape, and location (to +/- 50mm) of equipment; approximate access and clearance requirements modelled.  *Note: The external dimensions of pipework will be accurate in terms of design intent. The location of all water elements modelled to LOD 200 will be accurate to +/-50mm where applicable at Detailed Design. Prior to detailed design the location will be approximate only.* | **LOD 200** - Schematic layout with approximate size, shape, and location (to +/-50mm where applicable at Detailed Design) of mains and risers.  A green sticks arranged in a line  Description automatically generated |
| **LOD 300** | Modelled as design-specified size, shape, spacing, and location of pipe and valves for risers, mains, and branches; approximate allowances for spacing and clearances required for all specified hangers, supports, vibration, and seismic control that are to be utilised in the layout of all risers, mains, and branches; access/ code clearance requirements modelled. | **LOD 300** - Modelled as design-specified size, shape, spacing, and location of pipe and valves for risers, mains, and branches.  A group of green sticks  Description automatically generated |
| **LOD 350** | The Model Element is graphically represented within the Model as a specific system, object, or assembly in terms of quantity, size, shape, location, orientation, and interfaces with other building systems. | **LOD 350** - 3D actual design geometry, specific size, shape, location, and interface with other elements.  A green pipes on a white background  Description automatically generated |
| **LOD 400** | The Model Element is graphically represented within the Model as a specific system, object, or assembly in terms of size, shape, location, quantity, and orientation with detailing, fabrication, assembly, and installation information.  *Note: An LOD 400 element is modelled at sufficient detail and accuracy for fabrication of the represented component. The quantity, size, shape, location, and orientation of the element as designed can be measured directly from*  *the model without referring to non-modelled information such as notes or dimension call- outs.* | **LOD 400** - 3D fabrication geometry including bracing and field installation components.  A green and yellow pipes  Description automatically generated |

1.5 LOD Definitions for HV Power

| **#** | **DESCRIPTION** | **EXAMPLE - POWER** |
| --- | --- | --- |
| **LOD 100** | The Model Element may be graphically represented in the Model with a symbol or other generic representation but does not satisfy the requirements for LOD 200.  Information related to the Model Element (i.e. cost per square foot, tonnage of HVAC, etc.) can be derived from other Model Elements.  *Note: LOO 100 elements are not always geometric representations. Examples are information attached to other model elements and symbols showing the existence of components.*  *Specific example: An LOD 100 CT is a generic cylindrical shape* | **LOD 100** - 2D or 3D geometry, generic CT element with cost/unit.  A close up of a pole  Description automatically generated |
| **LOD 200** | The Model Element is graphically represented within the Model as a generic system, object, or assembly with an approximate quantity, size, shape, location, and orientation.  *Note: At this LOO elements are generic placeholders. They may be recognisable as the components they represent, or they may be volumes for space reservation. Any information derived from LOO 200 elements must be considered approximate.*  *Specific example: An LOD200 CT is a generic, recognisable shape.* | **LOD 200** - Generic 3D geometry, approximate size, shape, and location.  A grey pipe with a white background  Description automatically generated |
| **LOD 300** | The Model Element is graphically represented within the Model as a specific system, object, or assembly in terms of quantity, size, shape, location, and orientation.  *Note: The quantity, size, shape, location, and orientation of the primary elements as designed that are shown on drawings at a scale of*  *1:50 or above can be measured directly from the model without referring to non-modelled information such as notes and dimension call- outs.*  *Specific example: An LOD300 CT is a specific, recognisable shape. Terminals are modelled to support coordination with interfacing objects. Holes in the terminals are not modelled.* | **LOD 300** - 3D design intent geometry, specific size, shape, and location.  A close up of a pole  Description automatically generated |
| **LOD 350** | The Model Element is graphically represented within the Model as a specific system, object, or assembly in terms of quantity, size, shape, location, orientation, and interfaces with other systems.  *Note: Parts necessary for the coordination of the element with nearby or attached elements are modelled. These parts will include such items as supports and connections. The quantity, size, shape, location, and orientation of the primary elements as designed that are shown on drawings at a scale of 1:50 or above can be measured directly from the model without referring to non-modelled information such as notes and dimension call-outs.*  *Specific example: An LOD350 CT is a specific, recognisable shape. Terminals are modelled to support coordination with interfacing objects. Holes in the terminals are also modelled. The additional detail shown in the insulator is optional.* | **LOD 350** - 3D design intent geometry, specific size, shape, and location.  A black and grey cylindrical object  Description automatically generated with medium confidence |
| **LOD 400** | The Model Element is graphically represented within the Model as a specific system, object, or assembly in terms of size, shape, location, quantity, and orientation with detailing, fabrication, assembly, and installation information.  *Note: An LOD 400 element is modelled at sufficient detail and accuracy for fabrication of the represented component. The quantity, size, shape, location, and orientation of the element as designed can be measured directly from*  *the model without referring to non-modelled information such as notes and dimension call- outs.*  *Specific example: An LOD400 CT is a specific, recognisable shape. Terminals are modelled to support coordination with interfacing objects. Holes in the terminals are also modelled, along with any nuts and bolts that are considered to be part of the CT assembly.* | LOD 400 - 3D design intent geometry, specific size, shape, and location.  A close-up of a screw  Description automatically generated |

1.6 LOD Definitions for Civil

| **#** | **DESCRIPTION** | **EXAMPLE - EXISTING SUBSURFACE** |
| --- | --- | --- |
| **LOD 100** | The Model Element may be graphically represented in the Model with a symbol or other generic representation but does not satisfy the requirements for LOD 200.  *Note: LOD 100 elements often do not have geometric representations. Examples are information attached to other model elements and symbols showing the existence of components.* | **LOD 100** - 22D and generic representation |
| **LOD 200** | The Model Element is graphically represented within the Model as generic with an approximate quantity, size, shape, location, depth, and orientation. | **LOD 200** - Sublayers are modelled as 3D triangulated surfaces or masses, e.g. top and bottom of soft soil.  A black cube with lines and lines  Description automatically generated with medium confidence |
| **LOD 300** | Not typically defined | **Not typically defined** |
| **LOD 350** | Not typically defined | **Not typically defined** |
| **LOD 400** | Not typically defined | **Not typically defined** |

1.7 LOD Definitions for Boundaries

| **#** | **DESCRIPTION** | **EXAMPLE - BOUNDARIES** |
| --- | --- | --- |
| **LOD 100** | The Model Element may be graphically represented in the Model with a symbol or other generic representation but does not satisfy the requirements for LOD 200.  *Note: LOD 100 elements often do not have geometric representations. Examples are information attached to other model elements and symbols showing the existence of components.* | **LOD 100** - Boundaries and areas are modelled as lines and polygons..  A map of a city  Description automatically generated |
| **LOD 200** | The Model Element is graphically represented within the Model as a generic object with accurate size, shape, location, depth, and orientation. | **LOD 200** - Boundaries and areas are modelled in 3D and draped to terrain. Boundaries are modelled in 3D, so they are visible in section view.  A map of a city  Description automatically generated |
| **LOD 300** | Not typically defined | **Not typically defined** |
| **LOD 350** | Not typically defined | **Not typically defined** |
| **LOD 400** | Not typically defined | **Not typically defined** |

1.8 LOD Definitions for Lighting

| **#** | **DESCRIPTION** | **EXAMPLE - LIGHTING** |
| --- | --- | --- |
| **LOD 100** | The Model Element may be graphically represented in the Model with a symbol or other generic representation, but does not satisfy the requirements for LOD 200.  *Note: LOD 100 elements often do not have geometric representations. Examples are information attached to other model elements and symbols showing the existence of components.* | **LOD 100** - 2D signature of lighting columns, bracket arms, luminaires, and cabinets. 2D lines of the ground cables and ducts.  A black circle with two circles  Description automatically generated |
| **LOD 200** | The Model Element is graphically represented within the Model as a generic system, object, or assembly with an approximate quantity, size, shape, location, depth, and orientation.  *Note: At this LOD elements are generic placeholders. They may be recognisable as the components they represent or they may be volumes for space reservation. Any information derived from LOD 200 elements must be considered approximate.* | **LOD 200** - 3D model of the generic placeholder of the structure. 3D point of centre top of foundation for setting-out.  A black and grey rectangle  Description automatically generated |
| **LOD 300** | The Model Element is graphically represented within the Model as a design specified system, object, or assembly in terms of quantity, size, shape, location, and orientation. | **LOD 300** - 3D solids (“indicated shape and dimension”) of lighting columns, bracket arms, luminaires, foundations, and cabinets.  A diagram of a street light  Description automatically generated with medium confidence |
| **LOD 350** | The Model Element is graphically represented within the Model as a specific system, object, or assembly in terms of quantity, size, shape, location, orientation, and interfaces with other building systems. | **LOD 350** - 3D solids (“correct shape and dimension”) of lighting columns, bracket arms, luminaires, foundations, and cabinets.  A black pole with a white background  Description automatically generated |
| **LOD 400** | The Model Element is graphically represented within the Model as a specific system, object, or assembly in terms of size, shape, location, quantity, and orientation with detailing, fabrication, assembly, and installation information. | **LOD 400** - 3D fabrication geometry.  A black pole with a white background  Description automatically generated |

1.9 LOD Definitions Existing Terrain

| **#** | **DESCRIPTION** | **EXAMPLE - EXISTING TERRAIN** |
| --- | --- | --- |
| **LOD 100** | Not typically defined | **Not typically defined** |
| **LOD 200** | The Model Element is graphically represented within the Model as a generic system, object, or assembly with an approximate quantity, size, shape, location, depth, and orientation. | **LOD 200** - 3D triangulated surface of existing terrain based on survey data.  A snow covered area with a road  Description automatically generated with medium confidence |
| **LOD 300** | Not typically defined | **Not typically defined** |
| **LOD 350** | Not typically defined | **Not typically defined** |
| **LOD 400** | Not typically defined | **Not typically defined** |

1.10 LOD Definitions for Geotechnical Drilling

| **#** | **DESCRIPTION** | **EXAMPLE - GEOTECHNICAL DRILLING** |
| --- | --- | --- |
| **LOD 100** | The Model Element may be graphically represented in the Model with a symbol or other generic representation but does not satisfy the requirements for LOD 200.  *Note: LOD 100 elements often do not have geometric representations. Examples are information attached to other model elements and symbols showing the existence of a component.* | **LOD 100** - Geotechnical drillings are drafted as 2D points.  A screenshot of a computer  Description automatically generated |
| **LOD 200** | The Model Element is graphically represented within the Model as a generic system, object, or assembly with an approximate quantity, size, shape, location, depth, and orientation.  *Note: At this LOD elements are generic placeholders. They may be recognisable as the components they represent, or they may be volumes for space reservation. Any information derived from LOD 200 elements must be considered approximate.* | **LOD 200** - Geotechnical drillings are modelled as 3D generic points.  A screenshot of a computer  Description automatically generated |
| **LOD 300** | The Model Element is graphically represented within the Model as a design-specified system, object, or assembly in terms of quantity, size, shape, location, and orientation. | **LOD 300** - Geotechnical drillings are modelled as 3D cylinders with layers of substructure.  A screenshot of a video game  Description automatically generated |
| **LOD350** | Not typically defined | **Not typically defined** |
| **LOD400** | Not typically defined | **Not typically defined** |

1.11 LOD Definitions for Civil Structural Elements

| **#** | **DESCRIPTION** | **EXAMPLE - STRUCTURAL (CONCRETE I GIRDER BRIDGE)** |
| --- | --- | --- |
| **LOD 100** | The Model Element may be graphically represented in the Model with a symbol or other generic representation, but does not satisfy the requirements for LOD 200.  *Note: LOD 100 elements often do not have geometric representations. Examples are information attached to other model elements and symbols showing the existence of a component.* | **LOD 100** - 2D or 3D geometry, generic element. |
| **LOD 200** | The Model Element is graphically represented within the Model as a generic system, object, or assembly with approximate quantity, size, shape, location, depth, and orientation.  *Note: At this LOD elements are generic placeholders. They may be recognisable as the components they represent, or they may be volumes for space reservation. Any information derived from LOD 200 elements must be considered approximate.* | **LOD 200** - Generic 3D geometry with approximate size, shape, and location.  A grey rectangular object with shadow  Description automatically generated |
| **LOD 300** | The Model Element is graphically represented within the Model as a design-specified system, object, or assembly in terms of quantity, size, shape, location, and orientation.  *Note: At LOD 300 main concrete structural members modelled per defined structural grid with the correct orientation. All sloping surfaces will be included in the Model Element except for elements affected by manufacturer selection.* | **LOD 300** - Generic 3D geometry with approximate size, shape, and location.  A close-up of a beam  Description automatically generated |
| **LOD 350** | The Model Element is graphically represented within the Model as a specific system, object, or assembly in terms of quantity, size, shape, location, orientation, and interfaces with other building systems.  *Note: Parts necessary for coordination of the element with nearby or attached elements are modelled. Element modelling to include reinforcing post-tension profiles and strand locations, reinforcement only in congested areas, chamfer, pour joints and sequences to help identify reinforcing lap splice locations, expansion joints, lifting devices, embeds and anchor rods, penetrations for items such as MEP and any permanent forming or shoring components.* | **LOD 350** - 3D actual design geometry with specific size, shape, and location plus interface with other elements.  A drawing of a bridge  Description automatically generated |
| **LOD 400** | The Model Element is graphically represented within the Model as a specific system, object, or assembly in terms of size, shape, location, quantity, and orientation with detailing, fabrication, assembly, and installation information.  *Note: An LOD 400 element is modelled at sufficient detail and accuracy for fabrication of the represented component. The quantity, size, shape, location, and orientation of the element as designed can be measured directly from the model without referring to non-modelled information such as notes and dimension callouts. All reinforcement including post-tension elements detailed and modelled at LOD 400.* | **LOD 400** - 3D fabrication geometry  A 3d model of a bridge  Description automatically generated with medium confidence |

1.12 LOD Definitions for Underground Utilities

| **#** | **DESCRIPTION** | **EXAMPLE - UTILITIES EQUIPMENT** |
| --- | --- | --- |
| **LOD 100** | Diagrammatic or schematic 2D elements; conceptual and/or schematic layout/flow diagram. | **LOD 100** - 2D diagrammatic or schematic elements.  A map of a road  Description automatically generated with medium confidence |
| **LOD 200** | Schematic Model Elements and layout with approximate size, shape, and location of equipment; approximate access and clearance requirements modelled. | **LOD 200** - 3D diagrammatic or schematic elements with approximate size, shape, and location.  A close-up of a kite  Description automatically generated |
| **LOD 300** | Modelled as design-specified size, shape, spacing, and location of equipment; approximate allowances for spacing and clearances required for all specified anchors, supports, and vibration and seismic control that are utilised in the layout of equipment; access/ code clearance requirements modelled. | **LOD 300** - 3D design intent geometry with specific size, shape, and location.  A wireframe of a pipe  Description automatically generated |
| **LOD 300** | The Model Element is graphically represented within the Model as a specific system, object, or assembly in terms of quantity, size, shape, location, orientation, and interfaces with other systems.  *Note: Parts necessary for coordination of the element with nearby or attached elements are modelled.* | **LOD 300** - 3D actual design geometry with specific size, shape, location plus interface with other elements.  A wireframe of a pipe  Description automatically generated |
| **LOD 400** | Not typically defined | **Not typically defined** |

1.13 LOD Definitions for Stormwater

| **#** | **DESCRIPTION** | **EXAMPLE - UTILITIES EQUIPMENT** |
| --- | --- | --- |
| **LOD 100** | Diagrammatic or schematic 2D elements; conceptual and/or schematic flow diagrams. | **LOD 100** - 2D diagrammatic or schematic elements.  A diagram of a road  Description automatically generated with medium confidence |
| **LOD 200** | Schematic Model Elements and layout with approximate size, shape, and location of equipment; approximate access and clearance requirements modelled. | **LOD 200** - 3D diagrammatic or schematic elements with approximate size, shape, and location.  A close-up of a graph  Description automatically generated |
| **LOD 300** | Modelled as **design-specified** size, shape, spacing, and location of pipe and valves for risers, mains, and branches; approximate allowances for spacing and clearances required for all specified hangers, supports, and vibration and seismic control that are to be utilised in the layout of all risers, mains, and branches; access/ code clearance requirements modelled. | **LOD 300** - 3D design intent geometry with specific size, shape, and location.  A green lines on a grey background  Description automatically generated |
| **LOD 350** | Modelled as **actual construction** elements; actual size, shape, spacing, and locations/ connections of pipe and valves for risers, mains, and branches; actual size, shape, spacing, and clearances required for all hangers, supports, and vibration and seismic control that are utilised in the layout of all risers, mains, and branches; actual floor and wall penetration elements modelled. actual access/code clearance requirements modelled. | **LOD 350** - 3D actual design geometry, specific size, shape, location, and interface with other elements.  A close-up of a metal object  Description automatically generated |
| **LOD 400** | Supplementary components added to the model  required for fabrication and field installation. | **LOD 400** - 3D fabrication geometry including bracing and field installation components.  A yellow and white cylinder with a yellow handle  Description automatically generated with medium confidence |

2— Level of Development   
for Buildings

2.1 Model Element Author Schedule

The following table assigns responsibilities to Model Elements via an Author and defines the minimum required LOD for Model Elements across the project stages.

*Note: If there are two or more disciplines in the MEA Column, the first is the primary owner of the element and the second/third is required to coordinate with the first.*

**Model Element Author Key for Buildings LOD for Buildings**

|  |  |  |  |
| --- | --- | --- | --- |
| Architectural Consultant | **ARC** | Process Consultant | **PCS** |
| Structural Consultant | **STR** | Topographic Survey Consultant | **TS** |
| HVAC & Mechanical Consultant | **MEC** | Security Consultant | **SEC** |
| Electrical Consultant | **ELE** | Medical Gas Consultant | **MED** |
| Plumbing & Drainage consultant | **PLU** | Audio Visual Consultant | **AUD** |
| Fire Consultant | **FIR** | Passive Fire Protection Consultant | **PAS** |
| Civil Consultant | **CIV** | Information Technology Services Consultant | **ITS** |
| Geotechnical Consultant | **GEO** | Contractor/Sub-contractor | **CON** |
| Landscape Architecture Consultant | **LSP** | Building Services Seismic Restraints | **BSR** |
| Nurse Call Consultant | **NCS** |  |  |

|  |  |
| --- | --- |
| 100 | Conceptual |
| 200 | Approximate Geometry |
| 300 | Design Specified Geometry |
| 350 | Interface Coordination |
| 400 | Fabrication and Assembly |
| FV | Field Verified |

2.2 Model Element Author & Level of Development Schedule for Buildings

Spatial-related elements such as site boundaries, grids, levels, zones, and spaces are not assigned LODs because they are not technically elements that are modelled in three dimensions. There is a requirement to show them in the table below to make sure that they are assigned MEAs.

The LODs indicated below are minimum requirements by the end of each of the design and construction phases noted, the design and/or construction team may choose to implement a higher LOD. It should be noted that it is essential for the following disciplines to achieve the same LOD for a common end-of-stage deadline, then early completion of prior modelling to the required accuracy and certainty. For example, to achieve coordinated LOD 300 diffuser locations for the end of detailed design, accurately modelled ceiling grids will be required for the beginning of the detailed design stage.

**MEA Table for Building Projects**

2.3 MEA Table for Building Projects

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| PROJECT PHASE | CONCEPT  DESIGN | | PRELIM.  DESIGN | | DEVELOPED  DESIGN | | DETAILED  DESIGN | | CONSTRUCTION | | HANDOVER | |  | COMMENTS |
| **Model Element** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **Field Verification** |  |
| **SPATIAL** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Site boundaries, setbacks | **-** | **-** | **TS** | **FV** | **TS** | **FV** | **TS** | **FV** | **CON** | **FV** |  |  |  | To be coordinated between MEA and other design teams during concept design and to be finalised max during first two weeks of prelim design. |
| Grids | **ARC** | **-** | **ARC** | **-** | **ARC** | **-** | **ARC** | **-** | **CON** | **-** |  |  |  | Critical set-out information. To be coordinated between MEA and other design teams during concept design and to be finalised max during first two weeks of prelim design. |
| Levels (FFL) | **ARC** | **-** | **ARC** | **-** | **ARC** | **-** | **ARC** | **-** | **CON** | **-** |  |  |  |  |
| Levels (SSL) | **STR** | **-** | **STR** | **-** | **STR** | **-** | **STR** | **-** | **CON** | **-** |  |  |  |  |
| Slab Set-Out Planes | **ARC** | **-** | **ARC** | **-** | **ARC** | **-** | **ARC** | **-** | **CON** | **-** |  |  |  |  |
| Roof Set-Out Planes (incl. pitch points) | **ARC** | **-** | **ARC** | **-** | **ARC** | **-** | **ARC** | **-** | **CON** | **-** |  |  |  |  |
| Process Levels | **PCS** | **-** | **PCS** | **-** | **PCS** | **-** | **PCS** | **-** | **CON** | **-** |  |  |  | To be coordinated between MEA and other design teams during concept design and to be finalised max during first two weeks of prelim design. |
| Process zones | **PCS** | **-** | **PCS** | **-** | **PCS** | **-** | **PCS** | **-** | **CON** | **-** |  |  |  |
| Process spaces, rooms | **PCS** | **-** | **PCS** | **-** | **PCS** | **-** | **PCS** | **-** | **CON** | **-** |  |  |  |
| ARC Spaces, rooms | **ARC** | **-** | **ARC** | **-** | **ARC** | **-** | **ARC** | **-** | **CON** | **-** |  |  |  |
| ARC zones | **ARC** | **-** | **ARC** | **-** | **ARC** | **-** | **ARC** | **-** | **CON** | **-** |  |  |  |

**MEA Table for Building Projects**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| PROJECT PHASE | CONCEPT  DESIGN | | PRELIM.  DESIGN | | DEVELOPED  DESIGN | | DETAILED  DESIGN | | CONSTRUCTION | | HANDOVER | |  | COMMENTS |
| **Model Element** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **Field Verification** |  |
| **SITE** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Topography – Existing | **CIV** | **-** | **CIV** | **200** | **CIV** | **200** | **CIV** | **200** | **CON** | **-** |  |  |  | Existing ground surface to be provided, ideally in 3D. |
| Topography – Proposed | **CIV** | **-** | **CIV** | **100** | **CIV** | **200** | **CIV** | **300** | **CON** | **-** |  |  |  |  |
| Site Services – Existing | **CIV** | **-** | **CIV** | **200** | **CIV** | **200** | **CIV** | **200** | **CON** | **-** |  |  |  |  |
| Services (In Ground) – Proposed | **CIV** | **-** | **CIV** | **100** | **CIV** | **300** | **CIV** | **300** | **CON** | **-** |  |  |  | Greater than 1m from the building. |
| Excavation | **CIV** | **-** | **CIV** | **200** | **CIV** | **200** | **CIV** | **200** | **CON** | **-** |  |  |  |  |
| Site Water, Stormwater, Sewer | **CIV** | **-** | **CIV** | **200** | **CIV** | **300** | **CIV** | **300** | **CON** | **-** |  |  |  | Greater than 1m from the building. |
| External and in-ground tanks and pipework | **CIV** | **-** | **CIV** | **100** | **CIV** | **300** | **CIV** | **300** | **CON** | **-** |  |  |  | In conjunction with advice from relevant services disciplines. |
| Surface finishes | **CIV** | **-** | **CIV** | **100** | **CIV** | **200** | **CIV** | **300** | **CON** | **-** |  |  |  |  |
| Site Power | **ELE** | **-** | **ELE** | **100** | **ELE** | **200** | **ELE** | **300** | **CON** | **-** |  |  |  |  |
| Site Communications | **ELE** | **-** | **ELE** | **100** | **ELE** | **200** | **ELE** | **300** | **CON** | **-** |  |  |  |  |
| Site Lighting | **ELE** | **-** | **ELE** | **100** | **ELE** | **200** | **ELE** | **300** | **CON** | **-** |  |  |  |  |
| Site Furniture (fences, gates, etc.) | **LSP** | **-** | **LSP** | **100** | **LSP** | **200** | **LSP** | **200** | **CON** | **-** |  |  |  |  |
| Site Landscaping | **LSP** | **-** | **LSP** | **200** | **LSP** | **200** | **LSP** | **200** | **CON** | **-** |  |  |  | Subject to appointed scope. |

**MEA Table for Building Projects**

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| PROJECT PHASE | CONCEPT  DESIGN | | PRELIM.  DESIGN | | DEVELOPED  DESIGN | | DETAILED  DESIGN | | CONSTRUCTION | | HANDOVER | |  | COMMENTS |
| **Model Element** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **Field Verification** |  |
| **ROADING** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Parking | **ARC** | **100** | **CIV** | **200** | **CIV** | **300** | **CIV** | **300** | **CON** | **-** |  |  |  |  |
| Pavement | **CIV** | **100** | **CIV** | **200** | **CIV** | **300** | **CIV** | **300** | **CON** | **-** |  |  |  |  |
| Curbs | **CIV** | **100** | **CIV** | **200** | **CIV** | **300** | **CIV** | **300** | **CON** | **-** |  |  |  |  |
| Retaining walls | **CIV** | **100** | **CIV** | **200** | **CIV** | **300** | **CIV** | **300** | **CON** | **-** |  |  |  |  |
| Noise walls | **CIV** | **100** | **CIV** | **200** | **CIV** | **300** | **CIV** | **300** | **CON** | **-** |  |  |  |  |
| Barriers | **CIV** | **-** | **CIV** | **200** | **CIV** | **300** | **CIV** | **300** | **CON** | **-** |  |  |  |  |
| Signage | **CIV** | **100** | **CIV** | **200** | **CIV** | **300** | **CIV** | **300** | **CON** | **-** |  |  |  |  |
| Road Lighting | **CIV** | **100** | **CIV** | **200** | **CIV** | **300** | **CIV** | **300** | **CON** | **-** |  |  |  |  |
| Traffic Signals | **CIV** | **100** | **CIV** | **200** | **CIV** | **300** | **CIV** | **300** | **CON** | **-** |  |  |  |  |
| Road Furniture | **CIV** | **100** | **CIV** | **200** | **CIV** | **300** | **CIV** | **300** | **CON** | **-** |  |  |  |  |
| Corridor Fencing | **CIV** | **100** | **CIV** | **200** | **CIV** | **300** | **CIV** | **300** | **CON** | **-** |  |  |  |  |
| Environmental and Cultural Heritage Protection Measures | **CIV** | **100** | **CIV** | **200** | **CIV** | **300** | **CIV** | **300** | **CON** | **-** |  |  |  |  |
| Earthworks Surface | **CIV** | **100** | **CIV** | **200** | **CIV** | **300** | **CIV** | **300** | **CON** | **-** |  |  |  |  |
| Road Surface | **CIV** | **100** | **CIV** | **200** | **CIV** | **300** | **CIV** | **300** | **CON** | **-** |  |  |  |  |
| Alignment Geometry | **CIV** | **100** | **CIV** | **200** | **CIV** | **300** | **CIV** | **300** | **CON** | **-** |  |  |  |  |

**MEA Table for Building Projects**

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| PROJECT PHASE | CONCEPT  DESIGN | | PRELIM.  DESIGN | | DEVELOPED  DESIGN | | DETAILED  DESIGN | | CONSTRUCTION | | HANDOVER | |  | COMMENTS |
| **Model Element** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **Field Verification** |  |
| **PROCESS** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Plant – Existing | **PCS** | **-** | **PCS** | **100** | **PCS** | **200** | **PCS** | **200** | **CON** | **-** |  |  |  |  |
| Plant – New | **PCS** | **-** | **PCS** | **100** | **PCS** | **200** | **PCS** | **300** | **CON** | **-** |  |  |  |  |
| Plant – Vendor Supply | **PCS** | **-** | **PCS** | **100** | **PCS** | **200** | **PCS** | **350** | **CON** | **400** |  |  |  |  |
| Plant – Foundations | **PCS** | **-** | **PCS** | **100** | **STR** | **200** | **STR** | **300** | **CON** | **-** |  |  |  |  |
| Plant Ground improvements | **GEO** | **-** | **GEO** | **100** | **STR** | **200** | **STR** | **300** | **CON** | **-** |  |  |  |  |
| Pipework | **PCS** | **-** | **PCS** | **100** | **PCS** | **200** | **STR** | **300** | **CON** | **-** |  |  |  |  |
| Pipework Supports | **PCS** | **-** | **PCS** | **100** | **STR** | **200** | **STR** | **300** | **CON** | **-** |  |  |  |  |
| Pipework fittings, valves, sensors | **PCS** | **-** | **PCS** | **100** | **PCS** | **200** | **PCS** | **300** | **CON** | **-** |  |  |  |  |
| Piping underground encasements | **PCS** | **-** | **PCS** | **100** | **STR** | **200** | **STR** | **300** | **CON** | **-** |  |  |  |  |
| Plant access structures | **PCS** | **-** | **PCS** | **100** | **STR** | **200** | **STR** | **300** | **CON** | **-** |  |  |  |  |
| Plant handrailing and gates | **PCS** | **-** | **PCS** | **100** | **STR** | **200** | **STR** | **300** | **CON** | **-** |  |  |  |  |

**MEA Table for Building Projects**

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| PROJECT PHASE | CONCEPT DESIGN | | | | PRELIM.  DESIGN | | | DEVELOPED  DESIGN | | | DETAILED  DESIGN | | CONSTRUCTION | | HANDOVER | |  | COMMENTS |
| **Model Element** | **MEA** | | | **LOD** | **MEA** | | **LOD** | **MEA** | | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **Field Verification** |  |
| **FOUNDATIONS** |  | | |  |  | |  |  | |  |  |  |  |  |  |  |  | **Waterproofing, taking, sealants to ARC detail** |
| Piles (Timber, Steel and Concrete) | **S** | | **A** | **100** | **STR** | | **200** | **STR** | | **300** | **STR** | **300** |  |  |  |  |  | Refer 2D drawings for pile lengths and details. Pile length dependent on soil conditions and thus at risk of changing after commencement of construction. |
| Proprietary piles (Screw Piles etc) | **S** | | **A** | **100** | **STR** | | **200** | **STR** | | **200** | **STR** | **200** |  |  |  |  |  | Modelled indicatively only. |
| Pile caps | **S** | | **A** | **100** | **STR** | | **200** | **STR** | | **300** | **STR** | **300** |  |  |  |  |  |  |
| Pad Footing/Ground Beam/Strip Footing | **S** | | **A** | **100** | **STR** | | **200** | **STR** | | **300** | **STR** | **300** |  |  |  |  |  |  |
| Lift Pit Foundation/Sumps/ Foundation Rafts | **A** | | **S** | **100** | **A** | **S** | **200** | **S** | **A** | **300** | **STR** | **300** |  |  |  |  |  | Structural will model structural component, all setout and detail information by **ARC**. LOD 200 max where lift procurement not finalised before end of Detailed Design. |
| Ground Retention | **A** | **S** | **C** | **100** | **STR** | | **200** | **STR** | | **300** | **STR** | **300** |  |  |  |  |  | Where using proprietary retention systems LOD 200 max. |

**MEA Table for Building Projects**

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| PROJECT PHASE | CONCEPT  DESIGN | | | PRELIM.  DESIGN | | | DEVELOPED DESIGN | | | | DETAILED DESIGN | | | | CONSTRUCTION | | HANDOVER | |  | COMMENTS |
| **Model Element** | **MEA** | | **LOD** | **MEA** | | **LOD** | **MEA** | | | **LOD** | **MEA** | | | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **Field Verification** |  |
| **FLOORING - STRUCTURAL** |  | |  |  | |  |  | | |  |  | | |  |  |  |  |  |  | **Reinforcement, saw cuts, construction joints not modelled – shown in 2D.** |
| Slab-on-Grade/Rafts | **A** | **S** | **100** | **A** | **S** | **200** | **S** | | **A** | **300** | **S** | | **A** | **300** |  |  |  |  |  |  |
| Suspended Floors – Timber/ Concrete/Proprietary (Comflor, Traydek, Double T, Hollow Core, Flat Slab) | **A** | **S** | **100** | **A** | **S** | **200** | **S** | | **A** | **300** | **S** | | **A** | **300** |  |  |  |  |  | Floor zone modelled. Floor profile typically not modelled. |
| Zones where post-pour slab coring is NOT permitted. | **STR** | | **100** | **STR** | | **200** | **STR** | | | **300** | **STR** | | | **300** |  |  |  |  |  | Zones where post pour slab coring is NOT permitted to be highlighted on drawings and in the model. |
| Ramps (Access ramps etc) | **ARC** | | **100** | **A** | **S** | **200** | **A** | | **S** | **300** | **A** | | **S** | **300** |  |  |  |  |  |  |
| Slab Set Downs/Steps | - | | - | **ARC** | | **100** | **A** | | **S** | **200** | **A** | | **S** | **300** |  |  |  |  |  | Slab setdown depths to be defined at beginning of Developed Design to avoid impact on support beams. |
| Pits/Trenches | - | | - | **ARC** | | **100** | **A** | **M** | **S** | **200** | **A** | **M** | **S** | **300** |  |  |  |  |  |  |
| Nibs – Structural | - | | - | - | | - | **A** | | **S** | **200** | **S** | | **A** | **300** |  |  |  |  |  | Nibs not covered by standard drawings to be modelled as agreed. Setout by **ARC**. |

**MEA Table for Building Projects**

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| PROJECT PHASE | CONCEPT  DESIGN | | | PRELIM.  DESIGN | | | DEVELOPED  DESIGN | | | DETAILED  DESIGN | | | CONSTRUCTION | | HANDOVER | |  | COMMENTS |
| **Model Element** | **MEA** | | **LOD** | **MEA** | | **LOD** | **MEA** | | **LOD** | **MEA** | | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **Field Verification** |  |
| **FLOORING -**  **NON-STRUCTURAL** |  | |  |  | |  |  | |  |  | |  |  |  |  |  |  |  |
| In situ Screed | - | | - | **ARC** | | **100** | **ARC** | | **200** | **ARC** | | **300** |  |  |  |  |  | Not modelled in **STR** model but allowances in **STR** flooring made with any required steps shown. |
| Nibs, kerbs, plinths, upstands | - | | - | **ARC** | | **100** | **ARC** | | **200** | **ARC** | | **300** |  |  |  |  |  | Not modelled in structural model. Reinforcing shown on engineering 2D details/standard drawings.  Setout by **ARC**. |
| **WALLS - LOADBEARING** |  | |  |  | |  |  | |  |  | |  |  |  |  |  |  |  |
| Concrete – In situ | **A** | **S** | **100** | **A** | **S** | **200** | **A** | **S** | **300** | **A** | **S** | **300** |  |  |  |  |  |  |
| Concrete – Precast | **A** | **S** | **100** | **A** | **S** | **200** | **A** | **S** | **300** | **A** | **S** | **300** |  |  |  |  |  | **STR** to dimension max/min  dimensions. Final setout by **ARC**. |
| Masonry | **A** | **S** | **100** | **A** | **S** | **200** | **A** | **S** | **300** | **A** | **S** | **300** |  |  |  |  |  | **STR** to model loadbearing walls only (non-loadbearing and 90 series walls be modelled by **ARC**. |
| Timber Framing | **A** | **S** | **100** | **A** | **S** | **200** | **A** | **S** | **300** | **A** | **S** | **300** |  |  |  |  |  | If within bound/scope of NZS3604 – **ARC** to design and draw. Outside limits of NZS3604 – **ARC** to draw. Engineer to provide size and detail on 2D drawings. |
| Mass Timber | **A** | **S** | **100** | **A** | **S** | **200** | **A** | **S** | **300** | **A** | **S** | **300** |  |  |  |  |  |  |
| Proprietary Structural Insulated Panels | **A** | **S** | **100** | **A** | **S** | **200** | **A** | **S** | **300** | **A** | **S** | **300** |  |  |  |  |  |  |

**MEA Table for Building Projects**

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| PROJECT PHASE | CONCEPT  DESIGN | | PRELIM.  DESIGN | | DEVELOPED  DESIGN | | | DETAILED  DESIGN | | | CONSTRUCTION | | HANDOVER | |  | COMMENTS |
| **Model Element** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | | **LOD** | **MEA** | | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **Field Verification** |  |
| **WALLS -  NON-LOADBEARING** |  |  |  |  |  | |  |  | |  |  |  |  |  |  | **STR can model in later stage; however, setout is by ARC and this is to be frozen at start of Detailed Design.** |
| Concrete – Precast Cladding/Façade | **ARC** | **100** | **ARC** | **100** | **A** | **S** | **200** | **A** | **S** | **300** |  |  |  |  |  | Reinforcement, construction joints not modelled – shown in 2D. |
| Masonry | **ARC** | **100** | **ARC** | **100** | **A** | **S** | **200** | **A** | **S** | **300** |  |  |  |  |  | **STR** to dimension max/min dimensions. Final setout by ARC. |
| Timber Framing | **ARC** | **100** | **ARC** | **100** | **ARC** | | **200** | **ARC** | | **300** |  |  |  |  |  | If within bound/scope of NZS3604 – ARC to design and draw. Outside limits of NZS3604 – **ARC** to draw. **STR** to provide size and detail on 2D drawings. |
| Brickwork | **ARC** | **100** | **ARC** | **100** | **ARC** | | **200** | **ARC** | | **300** |  |  |  |  |  |  |
| **PRIMARY - CONNECTIONS** |  |  |  |  |  | |  |  | |  |  |  |  |  |  | **Complex Connections Can Be Modelled to LOD 300 Where Agreed, Not All Connections Require Modelling.** |
| Baseplates |  | **-** |  | **-** |  | | **-** | **STR** | | **100** |  |  |  |  |  | Coordination mass to be modelled. |
| Intrusive Connections (Moment Frame Collars/Gussets/BRB ends) |  | **-** | **STR** | **100** | **STR** | | **200** | **STR** | | **300** |  |  |  |  |  | Proprietary product connections to be considered LOD 200 until product confirmation. |
| Castin Plates |  | **-** |  | **-** | **STR** | | **100** | **STR** | | **200** |  |  |  |  |  |  |

**MEA Table for Building Projects**

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| PROJECT PHASE | CONCEPT  DESIGN | | | | PRELIM.  DESIGN | | | DEVELOPED  DESIGN | | | DETAILED  DESIGN | | CONSTRUCTION | | HANDOVER | |  | COMMENTS |
| **Model Element** | **MEA** | | | **LOD** | **MEA** | | **LOD** | **MEA** | | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **Field Verification** |  |
| **STEELWORK - PRIMARY** |  | | |  |  | |  |  | |  |  |  |  |  |  |  |  | **All structure supporting and bracing floors/roofs. Setout to be frozen at beginning of Developed Design.** |
| Beams | **A** | **M** | **S** | **100** | **S** | **M** | **200** | **A** | **S** | **300** | **STR** | **300** |  |  |  |  |  | For all penetrations through beams refer Penetration section below. |
| Columns | **A** | **S** | | **100** | **STR** | | **200** | **STR** | | **300** | **STR** | **300** |  |  |  |  |  |  |
| Trusses | **A** | **M** | **S** | **100** | **A** | **S** | **200** | **STR** | | **300** | **STR** | **300** |  |  |  |  |  |  |
| Brace Frames (EBF, CBF) | **S** | **A** | | **100** | **STR** | | **200** | **STR** | | **200** | **STR** | **300** |  |  |  |  |  | Associated flybraces to be modelled. |
| Proprietary Brace Frames (BRB etc) | **S** | **A** | | **100** | **STR** | | **200** | **STR** | | **200** | **STR** | **200** |  |  |  |  |  | Proprietary element and end connections by supplier. Can only be modelled to LOD 200 prior to final supplier design. |
| Roof bracing (EA, Flat etc) | **S** | **A** | | **100** | **S** | **A** | **200** | **STR** | | **200** | **STR** | **300** |  |  |  |  |  | Roof plane to be frozen before structural modelling commences. |

**MEA Table for Building Projects**

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| PROJECT PHASE | CONCEPT  DESIGN | | PRELIM.  DESIGN | | | | DEVELOPED  DESIGN | | | DETAILED  DESIGN | | | CONSTRUCTION | | HANDOVER | |  | COMMENTS |
| **Model Element** | **MEA** | **LOD** | **MEA** | | | **LOD** | **MEA** | | **LOD** | **MEA** | | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **Field Verification** |  |
| **STEELWORK - SECONDARY** |  |  |  | | |  |  | |  |  | |  |  |  |  |  |  |  |
| Beams | **-** | **-** | **A** | **M** | **S** | **100** | **S** | **M** | **200** | **STR** | | **300** |  |  |  |  |  | For all penetrations through beams, refer Penetration section below. |
| Columns | **-** | **-** | **A** | **S** | | **100** | **STR** | | **200** | **STR** | | **300** |  |  |  |  |  |  |
| Purlins | **-** | **-** | **ARC** | | | **100** | **A** | **S** | **200** | **A** | **S** | **200** |  |  |  |  |  | Roof plane to be frozen before structural modelling commences. Size and spacing will be defined, final setout by **ARC** (to suit gutter/ridgeline details). |
| Girts | **-** | **-** | **ARC** | | | **100** | **A** | **S** | **200** | **A** | **S** | **200** |  |  |  |  |  | Wall setout plane to be frozen before modelling commences. Size and spacing will be defined, final setout by **ARC**. |
| Façade – Lightweight |  | **-** | **S** | **A** | | **100** | **S** | **A** | **200** | **STR** | | **300** |  |  |  |  |  | Primary support lines must be agreed in Preliminary Design and frozen at Developed Design. Typically these are horizontal support lines at floor level (often the slab edge) with additional  horizontal support lines to support large windows and doors. LOD 200 max when support lines not frozen, final setout to be by **ARC**. |
| Façade – Curtainwall | **-** | **-** | **S** | **A** | | **100** | **S** | **A** | **200** | **STR** | | **300** |  |  |  |  |  |
| Fly Bracing – Façade Supports | **-** | **-** | **S** | **A** | | **100** | **S** | **A** | **100** | **STR** | | **100** |  |  |  |  |  | Where agreed coordination mass to be modelled. |
| Fly Bracing – Roof | **-** | **-** | - | | | - | **STR** | | **100** | **STR** | | **100** |  |  |  |  |  |
| Fly Bracing – Beam Supports | **-** | **-** | - | | | - | **STR** | | **100** | **STR** | | **100** |  |  |  |  |  |
| Fly Bracing – Wall head restraints and ceiling supports | **-** | **-** | - | | | - | **STR** | | **100** | **STR** | | **100** |  |  |  |  |  |
| Lift Columns and Framing | **-** | **-** | **A** | **S** | | **100** | **S** | **A** | **200** | **STR** | | **300** |  |  |  |  |  | LOD 200 max where lift procurement not finalised before end of Detailed Design. |

**MEA Table for Building Projects**

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| PROJECT PHASE | CONCEPT  DESIGN | | PRELIM.  DESIGN | | | DEVELOPED  DESIGN | | | DETAILED  DESIGN | | | CONSTRUCTION | | HANDOVER | |  | COMMENTS |
| **Model Element** | **MEA** | **LOD** | **MEA** | | **LOD** | **MEA** | | **LOD** | **MEA** | | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **Field Verification** |  |
| **STEELWORK - SECONDARY** |  |  |  | |  |  | |  |  | |  |  |  |  |  |  |  |
| Lift Rail Supports and Lifting Beams | - | - | - | | - | **S** | **A** | **-** | **STR** | | **200** |  |  |  |  |  | Accurate geometry, setout by lift consultant. |
| Stair Columns and Framing | - | - | **A** | **S** | **100** | **S** | **A** | **200** | **STR** | | **300** |  |  |  |  |  | Not including stringers (see stair section). |
| Support frames carrying significant loads (>1000kg). Defined setout | - | - | **A** | **S** | **100** | **S** | **A** | **200** | **STR** | | **300** |  |  |  |  |  | Where setout can be frozen at the beginning of Developed Design. |
| Support frames carrying significant loads (>1000kg). Setout reliant on architecture | - | - | **A** | **S** | **100** | **S** | **A** | **200** | **S** | **A** | **200** |  |  |  |  |  | Where setout is determined by an architectural element (wall/ceiling/ cladding/feature etc). Final setout to be by ARC. |
| Plant Platforms |  |  | **M** | **S** | **100** | **M** | **S** | **200** | **STR** | | **300** |  |  |  |  |  | LOD 200 max where proprietary product procurement not finalised before end of Detailed Design. |
| Parapets |  |  | **ARC** | | **100** | **A** | **S** | **200** | **S** | **A** | **300** |  |  |  |  |  |  |
| Canopies |  |  | **ARC** | | **100** | **A** | **S** | **200** | **S** | **A** | **300** |  |  |  |  |  |  |
| Operable Wall Supports |  |  | **ARC** | | **100** | **A** | **S** | **200** | **STR** | | **300** |  |  |  |  |  |  |
| Engineered Ceilings and Bulkheads |  |  | **ARC** | | **100** | **A** | **S** | **200** | **STR** | | **300** |  |  |  |  |  |  |
| Fixed Internal Walls, Doors/Windows Supports |  |  | **ARC** | | **100** | **A** | **S** | **200** | **STR** | | **300** |  |  |  |  |  | When outside of NZS3604 scope, project specific, needs to be agreed. LOD 200 max where proprietary product procurement not finalised before end of Detailed Design. |
| Monorails/Hoists/Medical pendants |  |  | **ARC** | | **100** | **A** | **S** | **200** | **S** | **A** | **300** |  |  |  |  |  |  |

**MEA Table for Building Projects**

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| PROJECT PHASE | CONCEPT  DESIGN | | | PRELIM.  DESIGN | | | DEVELOPED  DESIGN | | | DETAILED  DESIGN | | CONSTRUCTION | | HANDOVER | |  | COMMENTS |
| **Model Element** | **MEA** | | **LOD** | **MEA** | | **LOD** | **MEA** | | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **Field Verification** |  |
| **STEELWORK - TERTIARY** |  | |  |  | |  |  | |  |  |  |  |  |  |  |  |  |
| Fixed Internal Walls, Doors/ Windows Supports | **-** | | **-** | **ARC** | | **100** | **ARC** | | **200** | **ARC** | **300** |  |  |  |  |  | **ARC** to design and draw. |
| Balustrade Systems | **-** | | **-** | **ARC** | | **100** | **ARC** | | **200** | **ARC** | **300** |  |  |  |  |  | Not modelled structurally, structural typical details provided. (For steel floor beam and steel stringer supporting Balustrade systems, refer steelwork secondary and stairs.) |
| Support frames carrying between 100kg and 1000kg | **-** | | **-** | - | | - | **ARC** | | **100** | **ARC** | **200** |  |  |  |  |  | **ARC** to draw. Engineer to provide size and detail. |
| Support frames carrying <100kg | **-** | | **-** | - | | - | **ARC** | | **100** | **ARC** | **200** |  |  |  |  |  | **ARC** to design and draw. |
| Light Metal Framing (Studs, top hats, ceiling framing etc.) |  | | **-** | **ARC** | | **100** | **ARC** | | **200** | **ARC** | **300** |  |  |  |  |  | **ARC** to design and draw. |
| **CONCRETE - PRIMARY** |  | |  |  | |  |  | |  |  |  |  |  |  |  |  |  |
| Beams | **A** | **S** | **100** | **S** | **M** | **200** | **S** | **M** | **300** | **STR** | **300** |  |  |  |  |  | Reinforcement, saw cuts, construction joints not modelled – shown in 2D. |
| Columns | **A** | **S** | **100** | **STR** | | **200** | **STR** | | **300** | **STR** | **300** |  |  |  |  |  | Reinforcement, saw cuts, construction joints not modelled – shown in 2D. |

**MEA Table for Building Projects**

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| PROJECT PHASE | CONCEPT  DESIGN | | | PRELIM.  DESIGN | | | DEVELOPED  DESIGN | | | DETAILED  DESIGN | | | CONSTRUCTION | | HANDOVER | |  | COMMENTS |
| **Model Element** | **MEA** | | **LOD** | **MEA** | | **LOD** | **MEA** | | **LOD** | **MEA** | | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **Field Verification** |  |
| **ENGINEERED TIMBER -**  **PRIMARY** |  | |  |  | |  |  | |  |  | |  |  |  |  |  |  | **All STR supporting and bracing floors/roofs. Setout to be frozen at beginning of Developed Design.** |
| Beams | **A** | **S** | **-** | **S** | **M** | **100** | **S** | **M** | **200** | **STR** | | **300** |  |  |  |  |  | For all penetrations through beams refer Penetration section below. |
| Columns | **A** | **S** | **-** | **STR** | | **100** | **STR** | | **200** | **STR** | | **300** |  |  |  |  |  |  |
| Trusses | **A** | **S** | **-** | **A** | **S** | **100** | **STR** | | **200** | **STR** | | **200** |  |  |  |  |  | LOD 200 max where proprietary truss system specified. |
| Brace Frames | **A** | **S** | **-** | **A** | **S** | **100** | **STR** | | **200** | **STR** | | **200** |  |  |  |  |  |  |
| **TIMBER - SECONDARY** |  | |  |  | |  |  | |  |  | |  |  |  |  |  |  | **ARC to draw. When outside NZ604 STR to provide size and detail. May not be modelled by STR** |
| Beams | **-** | | **-** | **ARC** | | **100** | **A** | **S** | **200** | **A** | **S** | **300** |  |  |  |  |  |  |
| Columns | **-** | | **-** | **ARC** | | **100** | **A** | **S** | **200** | **A** | **S** | **300** |  |  |  |  |  |  |
| Floor Joists/Panels | **-** | | **-** | **ARC** | | **100** | **A** | **S** | **200** | **A** | **S** | **200** |  |  |  |  |  |  |

**MEA Table for Building Projects**

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| PROJECT PHASE | CONCEPT  DESIGN | | PRELIM.  DESIGN | | | DEVELOPED  DESIGN | | | DETAILED  DESIGN | | | CONSTRUCTION | | HANDOVER | |  | COMMENTS |
| **Model Element** | **MEA** | **LOD** | **MEA** | | **LOD** | **MEA** | | **LOD** | **MEA** | | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **Field Verification** |  |
| **STAIRS** |  |  |  | |  |  | |  |  | |  |  |  |  |  |  | **Stair flights to be dimensioned by ARC** |
| Precast Stairs (Tread + Throat) | **ARC** | **100** | **A** | **S** | **100** | **A** | **S** | **300** | **A** | **S** | **300** |  |  |  |  |  |  |
| Concrete Insitu Stairs (Tread + Throat) | **ARC** | **100** | **A** | **S** | **100** | **A** | **S** | **300** | **A** | **S** | **300** |  |  |  |  |  |  |
| Steel Stair Treads | **ARC** | **100** | **A** | **S** | **100** | **A** | **S** | **300** | **A** | **S** | **300** |  |  |  |  |  |  |
| Steel Stringers | **-** | **-** | **-** | | **-** | **A** | **S** | **200** | **A** | **S** | **300** |  |  |  |  |  | Where setout can be frozen at the beginning of Developed Design. |
| Engineered Timber Stairs (CLT, LVL etc) | **ARC** | **100** | **ARC** | | **100** | **A** | **S** | **200** | **A** | **S** | **300** |  |  |  |  |  | **STR** will model structural component, all setout and detail information by **ARC**. |
| Timber Stairs (Treads + Stringers) | **ARC** | **100** | **ARC** | | **100** | **ARC** | | **200** | **ARC** | | **300** |  |  |  |  |  | If within bound/scope of NZS3604 – **ARC** to design and draw. |

**MEA Table for Building Projects**

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| PROJECT PHASE | CONCEPT  DESIGN | | | | PRELIM.  DESIGN | | | | DEVELOPED  DESIGN | | | | DETAILED  DESIGN | | | | CONSTRUCTION | | HANDOVER | |  | COMMENTS |
| **Model Element** | **MEA** | | | **LOD** | **MEA** | | | **LOD** | **MEA** | | | **LOD** | **MEA** | | | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **Field Verification** |  |
| **PENETRATIONS** |  | | |  |  | | |  |  | | |  |  | | |  |  |  |  |  |  | **All penetrations in STR elements that require specific details (greater than 150mm diameter or width for concrete elements and greater than 50mm for steel elements) need to be added in STR model. Typical penetrations in STR elements (less than 149mm diameter or width for concrete elements and less than 49mm for steel elements) are not required. All penetrations through engineered timber to be modelled** |
| Shaft Openings | **ARC** | | | **100** | **A** | | **S** | **100** | **A** | | **S** | **200** | **A** | | **S** | **300** |  |  |  |  |  |  |
| Walls – Loadbearing Openings | **-** | | | **-** | **A** | **M** | **S** | **100** | **A** | **M** | **S** | **200** | **A** | **M** | **S** | **300** |  |  |  |  |  |  |
| Walls – Non- Loadbearing Openings | **-** | | | **-** | **A** | **M** | **S** | **100** | **A** | **M** | **S** | **200** | **A** | **M** | **S** | **300** |  |  |  |  |  |  |
| Floor penetrations | **-** | | | **-** | **A** | **M** | **S** | **100** | **A** | **M** | **S** | **200** | **A** | **M** | **S** | **300** |  |  |  |  |  | Where setout can be frozen at the beginning of Developed Design. |
| Beam Penetrations | **-** | | | **-** | **MEC** | | | **100** | **M** | | **S** | **200** | **M** | | **S** | **300** |  |  |  |  |  | **STR** will model structural component, all setout and detail information by **ARC**. |
| Penetrations through no post coring zones (Where agreed with Structural Engineer) | **A** | **M** | **S** | **100** | **A** | **M** | **S** | **100** | **A** | **M** | **S** | **200** | **A** | **M** | **S** | **300** |  |  |  |  |  | If within bound/scope of NZS3604 – **ARC** to design and draw. |

**MEA Table for Building Projects**

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| PROJECT PHASE | CONCEPT  DESIGN | | PRELIM.  DESIGN | | DEVELOPED  DESIGN | | DETAILED  DESIGN | | CONSTRUCTION | | HANDOVER | |  | COMMENTS |
| **Model Element** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **Field Verification** |  |
| **BUILDING SEISMIC RESTRAINTS** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Seismic restraints of services and fitout | **BSR** | **TBC** | **BSR** | **TBC** | **BSR** | **TBC** | **BSR** | **TBC** |  |  |  |  |  |  |
| Seismic and gravity restraints  ((combined) of services – Off site fabricated services ‘crates’ and risers |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **BSR** | **TBC** | **BSR** | **TBC** | **BSR** | **TBC** | **BSR** | **TBC** |  |
|  |  |  |  |  |  |  |  |  |
| Seismic Restraints of services- non complex | **BSR** | **TBC** | **BSR** | **TBC** | **BSR** | **TBC** | **BSR** | **TBC** |  |  |  |  |  |  |
| Gravity Support of services- non complex | **BSR** | **TBC** | **BSR** | **TBC** | **BSR** | **TBC** | **BSR** | **TBC** |  |  |  |  |  | TBC subject to project scope. **BSR** LOD levels to be aligned with MEP LOD, e.g. where MEP LOD 200, **BSR** to be LOD 200 max |
| Seismic Restraints (partition, ceiling & FF&E Bracing, Supports etc) | **BSR** | **TBC** | **BSR** | **TBC** | **BSR** | **TBC** | **BSR** | **TBC** |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| Seismic Restraints (door and partition glazing Opening  H-frames) |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **BSR** | **TBC** | **BSR** | **TBC** | **BSR** | **TBC** | **BSR** | **TBC** |  |
|  |  |  |  |  |  |  |  |  |
| Seismic Movement Deflection Head (spatial coordination Zone) | **BSR** | **TBC** | **BSR** | **TBC** | **BSR** | **TBC** | **BSR** | **TBC** |  |  |  |  |  |  |
| Seismic Movement Crush Zones (spatial coordination Zone) | **BSR** | **TBC** | **BSR** | **TBC** | **BSR** | **TBC** | **BSR** | **TBC** |  |  |  |  |  |  |

**MEA Table for Building Projects**

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| PROJECT PHASE | CONCEPT  DESIGN | | PRELIM.  DESIGN | | DEVELOPED  DESIGN | | DETAILED  DESIGN | | CONSTRUCTION | | HANDOVER | |  | COMMENTS |
| **Model Element** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **Field Verification** |  |
| **BUILDING INTERIOR** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Partitions | **ARC** | **-** | **ARC** | **100** | **ARC** | **200** | **ARC** | **300** | **CON** | - |  |  |  |  |
| Internal doors | **ARC** | **-** | **ARC** | **100** | **ARC** | **200** | **ARC** | **300** | **CON** | - |  |  |  |  |
| Ceilings | **ARC** | **-** | **ARC** | **100** | **ARC** | **200** | **ARC** | **300** | **CON** | - |  |  |  |  |
| Balustrading | **ARC** | **-** | **ARC** | **100** | **ARC** | **200** | **ARC** | **300** | **CON** | - |  |  |  |  |
| Furniture | **ARC** | **-** | **ARC** | **100** | **ARC** | **200** | **ARC** | **300** | **CON** | - |  |  |  |  |
| Fixtures | **ARC** | **-** | **ARC** | **100** | **ARC** | **200** | **ARC** | **300** | **CON** | - |  |  |  |  |
| Fittings | **ARC** | **-** | **ARC** | **100** | **ARC** | **200** | **ARC** | **300** | **CON** | - |  |  |  |  |
| Equipment – nonservices | **ARC** | **-** | **ARC** | **100** | **ARC** | **200** | **ARC** | **300** | **CON** | - |  |  |  |  |
| Signage | **ARC** | **-** | **ARC** | **100** | **ARC** | **200** | **ARC** | **300** | **CON** | - |  |  |  |  |
| Speed walls | **ARC** | **-** | **ARC** | **100** | **ARC** | **200** | **ARC** | **300** | **CON** | - |  |  |  |  |
| **PASSIVE FIRE** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Passive Fire Protection |  |  |  |  | **PAS** | **100** | **PAS** | **300** | **CON** | **-** |  |  |  | By **FIR** or of dedicated **PAS** protection discipline TBC subject to specific project scope |

**MEA Table for Building Projects**

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| PROJECT PHASE | CONCEPT  DESIGN | | PRELIM.  DESIGN | | DEVELOPED  DESIGN | | DETAILED  DESIGN | | CONSTRUCTION | | HANDOVER | |  | COMMENTS |
| **Model Element** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **Field Verification** |  |
| **MECHANICAL** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Plant external | **MEC** | **-** | **MEC** | **100** | **MEC** | **200** | **MEC** | **200** | **CON** | **350** |  |  |  |  |
| Plant external – support structure | **MEC** | **-** | **MEC** | **100** | **MEC** | **200** | **STR** | **300** | **CON** | **350** |  |  |  | To be determined at Developed Design if  LOD300 is required during Detailed Design |
| Plant internal | **MEC** | **-** | **MEC** | **100** | **MEC** | **200** | **MEC** | **200** | **CON** | **350** |  |  |  |  |
| Plant internal – support structure | **MEC** | **-** | **MEC** | **100** | **MEC** | **200** | **STR** | **300** | **CON** | **350** |  |  |  | To be determined at Developed Design if  LOD 300 is required during Detailed Design |
| Major Equipment | **MEC** | **100** | **MEC** | **100** | **MEC** | **200** | **MEC** | **300** | **CON** | **-** |  |  |  | E.g. Chillers, Boilers, internal tanks, Cooling towers or overall plant volumes required |
| 2nd Tier Equipment | **-** | **-** | **MEC** | **100** | **MEC** | **200** | **MEC** | **300** | **CON** | **-** |  |  |  | E.g. AHUs, Fresh air supply units, Ventilation Fans, Silencers, Pumps & VSDs, Unitary Packaged A/C units, Condensing Units, Air Cooled Chillers & Condensers |
| Minor Equipment | **-** | **-** | **-** | **-** | **MEC** | **200** | **MEC** | **300** | **CON** | **-** |  |  |  | E.g. Fan coil units, Hydronic units, VAV terminal units, Ceiling Diffusers, Extract Grilles, Radiators/Heating Units LOD 300 subject to early selection of specific  supplier/ configurations as design basis at  commencement of Developed Design |
| Dampers | **-** | **-** | **-** | **-** | **MEC** | **100** | **MEC** | **200** | **CON** | **-** |  |  |  | Fire dampers, Flexible duct and damper. Requires ARC to tag all fire compartment elements as fire separations to allow automated checking |
| Duct Lining and Insulation | **-** | **-** | **-** | **-** | **-** | **-** | **MEC** | **200** | **CON** | **-** |  |  |  | Acoustic Duct Lining, External Duct Insulation |
| Weather louvres – Architectural Model | **-** | **-** | **ARC** | **100** | **ARC** | **200** | **ARC** | **200** | **CON** | **-** |  |  |  | Modelled by MEC as well as **ARC** to allow scheduling and performance requirements from model file |

**MEA Table for Building Projects**

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| PROJECT PHASE | CONCEPT  DESIGN | | PRELIM.  DESIGN | | DEVELOPED  DESIGN | | DETAILED  DESIGN | | CONSTRUCTION | | HANDOVER | |  | COMMENTS |
| **Model Element** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **Field Verification** |  |
| **MECHANICAL** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Weather louvres – Mechanical requirements | **-** | **-** | **-** | **-** | **MEC** | **100** | **MEC** | **200** | **CON** | **-** |  |  |  | Modelled by **MEC** as well as **ARC** to allow scheduling and performance requirements from model file |
| Major Distribution – Ductwork (in Risers) | **MEC** | **100** | **MEC** | **200** | **MEC** | **200** | **MEC** | **300** | **CON** | **-** |  |  |  | Spatial block modelling only at concept |
| 2nd Tier Distribution – Ductwork (Main Runs) | **-** | **-** | **MEC** | **100** | **MEC** | **200** | **MEC** | **300** | **CON** | **-** |  |  |  |  |
| Minor Distribution – Ductwork  (Branches) | **-** | **-** | **-** | **-** | **MEC** | **200** | **MEC** | **200** | **CON** | **-** |  |  |  |  |
| Major Distribution – Pipework in Risers | **MEC** | **100** | **MEC** | **200** | **MEC** | **200** | **MEC** | **300** | **CON** | **-** |  |  |  | HHW and CHW Pipework >= 50mm diameter and insulation |
| 2nd Tier Distribution – Pipework | **-** | **-** | **MEC** | **100** | **MEC** | **200** | **MEC** | **300** | **CON** | **-** |  |  |  | HHW and CHW main routes >= 50mm dia. and insulation |
| Minor Distribution – Pipework | **-** | **-** | **-** | **-** | **MEC** | **100** | **MEC** | **200** | **CON** | **-** |  |  |  | HHW and CHW Pipework <50mm diameter and insulation |
| Plant and equipment final pipework and connections <50mm | **-** | **-** | **-** | **-** | **MEC** | **100** | **MEC** | **200** | **CON** | **-** |  |  |  |  |
| Refrigerant Pipework | **-** | **-** | **-** | **-** | **MEC** | **100** | **MEC** | **100** | **CON** | **-** |  |  |  |  |
| Flexible pipes | **MEC** | **-** | **MEC** | **100** | **MEC** | **200** | **MEC** | **200** | **CON** | **350** |  |  |  | LOD 200 Pipework modelled to accurate overall external diameter, with the location accurate to +/-50mm |
| Controls | **MEC** | **-** | **MEC** | **100** | **MEC** | **200** | **MEC** | **200** | **CON** | **-** |  |  |  |  |
| Wall mounted sensors and switches | **-** | **-** | **-** | **-** | **MEC** | **100** | **MEC** | **100** | **CON** | **-** |  |  |  |  |

**MEA Table for Building Projects**

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| PROJECT PHASE | CONCEPT  DESIGN | | PRELIM.  DESIGN | | DEVELOPED  DESIGN | | DETAILED  DESIGN | | CONSTRUCTION | | HANDOVER | |  | COMMENTS |
| **Model Element** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **Field Verification** |  |
| **MECHANICAL** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Mechanical Control Centres (MCCs) | **-** | **-** | **-** | **-** | **MEC** | **100** | **MEC** | **200** | **CON** | **-** |  |  |  | Detail by specialist supplier via Design & Build to achieve specified performance requirements |
| Flues, fuel supply and storage tanks, and support equipment | **-** | **-** | **MEC** | **100** | **MEC** | **100** | **MEC** | **200** | **CON** | **-** |  |  |  | Detail by specialist supplier via Design & Build to achieve specified performance requirements |
| Kitchen Hoods | **-** | **-** | **ARC** | **100** | **MEC** | **200** | **MEC** | **300** | **CON** | **-** |  |  |  |  |
| Condensate drains | **-** | **-** | **-** | **-** | **-** | **-** | **MEC** | **200** | **CON** | **-** |  |  |  |  |
| Valves, Flow meters | **-** | **-** | **-** | **-** | **MEC** | **100** | **MEC** | **200** | **CON** |  |  |  |  | May only be on schematic for 5DD |
| Registers | **MEC** | **-** | **MEC** | **100** | **MEC** | **200** | **MEC** | **200** | **CON** | **350** |  |  |  |  |
| Electrical for Mechanical; Traywork – Main routes only | **-** | **-** | **-** | **-** | **MEC** | **100** | **MEC** | **200** | **CON** | **-** |  |  |  | Minor routes by **CON** |
| Mechanical services in risers | **MEC** | **-** | **MEC** | **100** | **MEC** | **200** | **MEC** | **200** | **CON** | **350** |  |  |  | LOD 200 Ductwork modelled to accurate overall external dimensions, with the location accurate to +/-50mm |

**MEA Table for Building Projects**

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| PROJECT PHASE | CONCEPT  DESIGN | | PRELIM.  DESIGN | | DEVELOPED  DESIGN | | | DETAILED  DESIGN | | | CONSTRUCTION | | HANDOVER | |  | COMMENTS |
| **Model Element** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | | **LOD** | **M** | **EA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **Field Verification** |  |
| **ELECTRICAL** |  |  |  |  |  | |  |  | |  |  |  |  |  |  |  |
| Incoming mains cables | **ELE** | **100** | **ELE** | **100** | **ELE** | | **100** | **ELE** | | **100** | **CON** | **-** |  |  |  | With LOD 200 Incoming cable duct  from Developed Design stage |
| Major Equipment | **ELE** | **100** | **ELE** | **100** | **ELE** | | **200** | **ELE** | | **300** | **CON** | **-** |  |  |  | E.g. Main switchboards HV & LV |
| Electrical fixtures | **-** | **-** | **-** | **-** | **A** | **E** | **200** | **A** | **E** | **300** | **CON** | **-** |  |  |  | Wall elevations/setout by **ARC** |
| Light switches, power outlets, fixed wired outlets, equipment and machinery outlets | **-** | **-** | **-** | **-** | **ELE** | | **200** | **ELE** | | **200** | **CON** | **-** |  |  |  |  |
| Power outlets for health projects  – modelled by architect | **-** | **-** | **-** | **-** | **MEC** | | **200** | **MEC** | | **200** | **CON** | **-** |  |  |  | Including Medical Services Panels by  **ARC**, cleaners outlets by **ELE** |
| Sub-main cables | **-** | **-** | **-** | **-** | **ELE** | | **200** | **ELE** | | **100** | **CON** | **-** |  |  |  |  |
| Distribution boards, UPS racks  and panels | **ELE** | **100** | **ELE** | **100** | **ELE** | | **100** | **ELE** | | **300** | **CON** | **-** |  |  |  |  |
| Trunking, cable trays, baskets, ladders – Major Routes/ Risers | **-** | **-** | **ELE** | **100** | **ELE** | | **100** | **ELE** | | **300** | **CON** | **-** |  |  |  |  |
| Trunking, cable trays, baskets, droppers and ladders >100mm wide | **-** | **-** | **ELE** | **100** | **ELE** | | **100** | **ELE** | | **200** | **CON** | **-** |  |  |  |  |
| Cable trays | **ELE** | **-** | **ELE** | **100** | **ELE** | | **200** | **ELE** | | **200** | **CON** | **-** |  |  |  |  |
| Lighting | **ELE** | **-** | **ELE** | **100** | **ELE** | | **200** | **ELE** | | **200** | **CON** | **-** |  |  |  |  |
| Communications | **ELE** | **-** | **ELE** | **100** | **ELE** | | **100** | **ELE** | | **200** | **CON** | **-** |  |  |  |  |
| Security | **ELE** | **-** | **ELE** | **100** | **ELE** | | **200** | **ELE** | | **200** | **CON** | **-** |  |  |  |  |
| Controls | **ELE** | **-** | **ELE** | **100** | **ELE** | | **200** | **ELE** | | **200** | **CON** | **-** |  |  |  |  |

**MEA Table for Building Projects**

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| PROJECT PHASE | CONCEPT  DESIGN | | PRELIM.  DESIGN | | DEVELOPED  DESIGN | | DETAILED  DESIGN | | CONSTRUCTION | | HANDOVER | |  | COMMENTS |
| **Model Element** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **Field Verification** |  |
| **ELECTRICAL** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Light fittings (surface, suspended, recessed) | **-** | **-** | **-** | **-** | **ELE** | **200** | **ELE** | **300** | **CON** | **-** |  |  |  | Final Setting out by **ARC** |
| Light control panels | **-** | **-** | **-** | **-** | **ELE** | **100** | **ELE** | **200** | **CON** | **-** |  |  |  |  |
| Lighting Control Switches/ Dimmers/ Push Buttons/ etc | **-** | **-** | **-** | **-** | **ELE** | **100** | **ELE** | **200** | **CON** | **-** |  |  |  | Final Setting out by **ARC** |
| Emergency Egress Lighting and Signage | **-** | **-** | **-** | **-** | **ELE** | **200** | **ELE** | **200** | **CON** | **-** |  |  |  | Final Setting out by **ARC** |
| Floor boxes, pedestals and skirting trunking | **-** | **-** | **ELE** | **100** | **ELE** | **200** | **ELE** | **300** | **CON** | **-** |  |  |  | Final Setting out by **ARC** |
| External lighting | **-** | **-** |  |  | **ELE** | **200** | **ELE** | **200** | **CON** | **-** |  |  |  |  |
| In-ground cable ducts | **-** | **-** | **ELE** | **100** | **ELE** | **100** | **CIV** | **200** | **CON** | **-** |  |  |  |  |
| Lighting control sensors | **-** | **-** | **-** | **-** | **ELE** | **200** | **ELE** | **200** | **CON** | **-** |  |  |  | E.g. PIR, HF, DT  Positions reviewed and confirmed by specialist trade based on actual performance |
| Modular Wiring Starter Outlets | **-** | **-** | **-** | **-** | **ELE** | **200** | **ELE** | **200** | **CON** |  |  |  |  | Final Setting out by **ARC** |
| Electrical services in risers | **ELE** | **-** | **ELE** | **100** | **ELE** | **200** | **ELE** | **200** | **CON** | **-** |  |  |  | LOD 200 services modelled to accurate overall external dimensions, with the location accurate to +/-50mm |

**MEA Table for Building Projects**

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| PROJECT PHASE | CONCEPT  DESIGN | | PRELIM.  DESIGN | | DEVELOPED  DESIGN | | DETAILED  DESIGN | | CONSTRUCTION | | HANDOVER | |  | COMMENTS |
| **Model Element** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **Field Verification** |  |
| **SECURITY – CCTV, INTRUDER DETECTION AND ACCESS CONTROL** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Control Panels | **-** | **-** | **SEC** | **100** | **SEC** | **200** | **SEC** | **300** | **CON** | **-** |  |  |  | Final Setting out by **ARC** |
| CCTV Camera Mounting Brackets | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** |  |  |
| CCTV Viewing Monitors and Control Devices | **-** | **-** | **-** | **-** | **SEC** | **200** | **SEC** | **200** | **CON** | **-** |  |  |  |  |
| Client Equipment | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** |  | e.g. CCTV Network Video Recorders (NVR's) |
| Cabling | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** |  |  |
| CCTV Control Devices | **-** | **-** | **-** | **-** | **SEC** | **200** | **SEC** | **200** | **CON** | **-** |  |  |  | Final Setting out by **ARC** |
| CCTV Field Switches |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| CCTV Equipment Racks | **-** | **-** | **SEC** | **100** | **SEC** | **200** | **SEC** | **200** | **CON** | **-** |  |  |  |  |
| Intruder Alarm Detection Devices | **-** | **-** | **-** | **-** | **SEC** | **100** | **SEC** | **200** | **CON** | **-** |  |  |  |  |
| Intruder Alarm User Interfaces | **-** | **-** | **-** | **-** | **SEC** | **100** | **SEC** | **200** | **CON** | **-** |  |  |  | E.g. Keypads, Touch screens, etc Final Setting out by **ARC** |
| Access Control User Interfaces (swipe cards, request to exits, break glass, etc) | **-** | **-** | **-** | **-** | **SEC** | **100** | **SEC** | **200** | **CON** | **-** |  |  |  | E.g. swipe cards, request to exits, break glass, etc  Final Setting out by **ARC** |
| Access Control Locking Devices | **-** | **-** | **-** | **-** | **SEC** | **100** | **SEC** | **200** | **CON** | **-** |  |  |  | E.g. Maglock, Mortice, Strike, V-lock Typical 2D details and annotation only |
| Access Control Furniture | **-** | **-** | **-** | **-** | **SEC** | **100** | **ARC** | **200** | **CON** | **-** |  |  |  | E.g. pedestals, Traffic Barrier Arms, Traffic Control Lights etc.  Final Setting out by **ARC** |
| Door & window interfaces | **-** | **-** | **-** | **-** | **-** | **-** | **SEC** | **100** | **CON** | **-** |  |  |  | E.g. Auto Doors and Roller Shutter Door, reed switches  Typical 2D details and annotation only |
| Underground Sensor Loops | **-** | **-** | **-** | **-** | **SEC** | **100** | **SEC** | **200** | **CON** | **-** |  |  |  |  |

**MEA Table for Building Projects**

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| PROJECT PHASE | CONCEPT  DESIGN | | PRELIM.  DESIGN | | DEVELOPED  DESIGN | | DETAILED  DESIGN | | CONSTRUCTION | | HANDOVER | |  | COMMENTS |
| **Model Element** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **Field Verification** |  |
| **ICT/COMMUNICATIONS** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Major Equipment | **ITS** | **100** | **ITS** | **200** | **ITS** | **200** | **ITS** | **300** | **CON** | **-** |  |  |  | E.g. Communications room sizes and Racks |
| Communications Outlets (RJ45, etc) HEALTH Projects | **-** | **-** | **-** | **-** | **ARC**  **ARC** | **200** | **ARC**  **ARC** | **200** | **CON** | **-** |  |  |  | All internal walls elevated by **ARC**. Final Setting out by **ARC** |
| Communications Outlets (RJ45, etc) in specific user briefed rooms and spaces | **-** | **-** | **-** | **-** | **200** | **200** | **CON** | **-** |  |  |  | Final Setting out by **ARC** |
| Communications Outlets (RJ45, etc) non user briefed health project spaces and non-health projects | **-** | **-** | **-** | **-** | **ITS** | **200** | **ITS** | **200** | **CON** | **-** |  |  |  | Final Setting out by **ARC** |
| Communications (Tray, Basket, Ladder, Ducts, etc) >100mm wide | **-** | **-** | **ELE** | **100** | **ELE** | **200** | **ELE** | **200** | **CON** | **-** |  |  |  |  |
| Distributors (Building, Floor, Area, Fibre) | **-** | **-** | **ITS** | **200** | **ITS** | **200** | **ITS** | **200** | **CON** | **-** |  |  |  |  |
| Intercoms | **-** | **-** | **-** | **-** | **ITS** | **100** | **ITS** | **200** | **CON** | **-** |  |  |  | E.g. Video, Push Button Call, etc. |
| Final Setting out by ARC | **-** | **-** | **SEC** | **100** | **SEC** | **200** | **SEC** | **200** | **CON** | **-** |  |  |  |  |
| Intercom Panels | **-** | **-** | **ITS** | **100** | **ITS** | **200** | **ITS** | **200** | **CON** | **-** |  |  |  |  |
| Consolidation Points | **-** | **-** | **-** | **-** | **ITS** | **100** | **ITS** | **200** | **CON** | **-** |  |  |  |  |

**MEA Table for Building Projects**

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| PROJECT PHASE | CONCEPT  DESIGN | | PRELIM.  DESIGN | | DEVELOPED  DESIGN | | DETAILED  DESIGN | | CONSTRUCTION | | HANDOVER | |  | COMMENTS |
| **Model Element** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **Field Verification** |  |
| **AUDIO VISUAL** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Speakers | **-** | **-** | **-** | **-** | **AUD** | **200** | **AUD** | **200** | **CON** | **-** |  |  |  |  |
| Amplifiers | **-** | **-** | **-** | **-** | **AUD** | **200** | **AUD** | **200** | **CON** | **-** |  |  |  |  |
| Racks | **-** | **-** | **AUD** | **200** | **AUD** | **200** | **AUD** | **200** | **CON** | **-** |  |  |  |  |
| Projectors, Projector Screens, TVs | **-** | **-** | **-** | **-** | **AUD** | **200** | **AUD** | **200** | **CON** | **-** |  |  |  |  |
| Input Plates (HDMI, L and R, etc) | **-** | **-** | **-** | **-** | **-** | **-** | **AUD** | **200** | **CON** | **-** |  |  |  |  |
| Interfaces (Touch screens, push buttons , microphones etc) | **-** | **-** | **-** | **-** | **-** | **-** | **AUD** | **200** | **CON** | **-** |  |  |  |  |
| Assisted Hearing Loops | **-** | **-** | **-** | **-** | **AUD** | **100** | **AUD** | **100** | **CON** | **-** |  |  |  |  |
| **NURSE CALL SYSTEMS** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Nurse Call Devices (Patient stations, Pull Cords and Call Points) | **-** | **-** | **-** | **-** | **NCS** | **100** | **ARC** | **200** | **CON** | **-** |  |  |  | Detailed Design positioning by **ARC** as part of user briefing process based on **NCS** modelling |
| Nurse Station | **-** | **-** | **-** | **-** | **NCS** | **100** | **ARC** | **200** | **CON** | **-** |  |  |  |
| Output Devices (Alarm, Speaker, Sounder, Over-door light) | **-** | **-** | **-** | **-** | **NCS** | **100** | **ARC** | **200** | **CON** | **-** |  |  |  |
| Annunciator Panels | **-** | **-** | **-** | **-** | **NCS** | **100** | **ARC** | **200** | **CON** | **-** |  |  |  |

**MEA Table for Building Projects**

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| PROJECT PHASE | CONCEPT  DESIGN | | PRELIM.  DESIGN | | DEVELOPED  DESIGN | | DETAILED  DESIGN | | CONSTRUCTION | | HANDOVER | |  | COMMENTS |
| **Model Element** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **Field Verification** |  |
| **DURESS/ PERSONAL ATTACK SYSTEMS** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| User Interface (Push Buttons, DA Strips) | **-** | **-** | **-** | **-** | **SEC** | **100** | **ARC** | **200** | **CON** | **-** |  |  |  | Detailed Design positioning by **ARC** as part of user briefing process based on **SEC** modelling |
| Indicator Panels and Indicator lights | **-** | **-** | **-** | **-** | **SEC** | **100** | **ARC** | **200** | **CON** | **-** |  |  |  |
| Output Devices (Alarm, Speaker, Sounder,  Beacon) | **-** | **-** | **-** | **-** | **SEC** | **100** | **ARC** | **200** | **CON** | **-** |  |  |  |
| **PLUMBING & DRAINAGE** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Sanitary fixtures | **PLU** | **-** | **PLU** | **100** | **PLU** | **200** | **ARC** | **300** | **CON** | **350** |  |  |  |  |
| Plant | **PLU** | **-** | **PLU** | **100** | **PLU** | **200** | **PLU** | **200** | **CON** | **350** |  |  |  |  |
| Equipment | **PLU** | **-** | **PLU** | **100** | **PLU** | **200** | **PLU** | **200** | **CON** | **350** |  |  |  |  |
| Pipework | **PLU** | **-** | **PLU** | **100** | **PLU** | **200** | **PLU** | **200** | **CON** | **350** |  |  |  | LOD 200 Pipework modelled to accurate overall external diameter, with the location accurate to +/- 50mm |
| Plumbing & Drainage services in risers | **PLU** | **-** | **PLU** | **100** | **PLU** | **200** | **PLU** | **200** | **CON** | **350** |  |  |  | LOD 200 Pipework modelled to accurate overall external diameter, with the location accurate to +/- 50mm |
| Storage Tanks | **-** | **-** | **PLU** | **100** | **PLU** | **200** | **PLU** | **300** | **CON** | **-** |  |  |  | Tanks within buildings. Refer to sitewide and Civil input for external and buried tanks |
| Hot & Cold-water supply pipework <=32mm | **-** | **-** | **-** | **-** | **PLU** | **100** | **PLU** | **200** | **CON** | **-** |  |  |  |  |
| Hot & Cold-water supply pipework >32mm | **PLU** | **100** | **PLU** | **100** | **PLU** | **200** | **PLU** | **200** | **CON** | **-** |  |  |  | Spatial allowances/zones in concept design. |

**MEA Table for Building Projects**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| PROJECT PHASE | CONCEPT  DESIGN | | PRELIM.  DESIGN | | DEVELOPED  DESIGN | | DETAILED  DESIGN | | CONSTRUCTION | | HANDOVER | |  | COMMENTS |
| **Model Element** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **Field Verification** |  |
| **PLUMBING & DRAINAGE** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Hot & Cold-water supply final pipework to fixtures, outlets, incl valves and insulation | **-** | **-** | **-** | **-** | **PLU** | **100** | **PLU** | **100** | **CON** | **-** |  |  |  | Typically not modelled – specific project agreement where required |
| Hot water cylinders | **-** | **-** | **PLU** | **100** | **PLU** | **200** | **PLU** | **300** | **CON** | **-** |  |  |  |  |
| Sanitary fittings, sinks and bowls  associated traps and valves | **-** | **-** | **ARC** | **100** | **ARC** | **200** | **ARC** | **300** | **CON** | **-** |  |  |  |  |
| Floor Wastes – Architectural model for  location and set out | **-** | **-** | **-** | **-** | **ARC** | **200** | **ARC** | **300** | **CON** | **-** |  |  |  |  |
| Floor Wastes – for coordination and connection to drainage system | **-** | **-** | **-** | **-** | **PLU** | **100** | **PLU** | **200** | **CON** | **-** |  |  |  |  |
| Rainwater gutters, overflows & inlets,  External downpipes | **-** | **-** | **ARC** | **100** | **ARC** | **200** | **ARC** | **300** | **CON** | **-** |  |  |  | Where identified as within PLU scope, otherwise by **ARC** |
| Rainwater downpipes & lines to external drainage | **-** | **-** | **-** | **-** | **PLU** | **200** | **PLU** | **300** | **CON** | **-** |  |  |  | Where identified as within PLU scope, otherwise by **ARC** |
| Soil, waste, overflow and vent piping | **PLU** | **100** | **PLU** | **100** | **PLU** | **200** | **PLU** | **300** | **CON** | **-** |  |  |  | Where identified as within PLU scope, otherwise by CIV. Spatial allowances/ zones in concept design. |
| Chemical drains | **-** | **-** | **-** | **-** | **PLU** | **100** | **PLU** | **200** | **CON** | **-** |  |  |  |  |
| Channels and gratings | **-** | **-** | **-** | **-** | **ARC** | **100** | **ARC** | **200** | **CON** | **-** |  |  |  |  |
| Inspection chambers, manholes, holding tanks and soak holes | **-** | **-** | **CIV** | **100** | **CIV** | **100** | **CIV** | **200** | **CON** | **-** |  |  |  |  |
| Pumps (within Building) | **-** | **-** | **-** | **-** | **PLU** | **100** | **PLU** | **200** | **CON** | **-** |  |  |  |  |
| Septic tanks and grease traps | **-** | **-** | **-** | **-** | **CIV** | **100** | **CIV** | **200** | **CON** | **-** |  |  |  | All in ground vessels and tanks – outside of building – by **CIV** |
| Insulation – thermal and acoustic to pipes | **-** | **-** | **-** | **-** | **-** | **-** | **PLU** | **200** | **CON** | **-** |  |  |  |  |
| Tank restraints/platforms | **-** | **-** | **-** | **-** | **PLU** | **100** | **PLU** | **100** | **CON** | **-** |  |  |  | Detail by specialist supplier via Design & Build to achieve specified performance requirements |
| Valves, Flow meters | **-** | **-** | **-** | **-** | **PLU** | **100** | **PLU** | **200** | **CON** | **-** |  |  |  | May only be on schematic for 5DD |

**MEA Table for Building Projects**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| PROJECT PHASE | CONCEPT  DESIGN | | PRELIM.  DESIGN | | DEVELOPED  DESIGN | | DETAILED  DESIGN | | CONSTRUCTION | | HANDOVER | |  | COMMENTS |
| **Model Element** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **Field Verification** |  |
| **FIRE PROTECTION** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Major Equipment | **FIR** | **100** | **FIR** | **100** | **FIR** | **200** | **FIR** | **200** | **CON** | **-** |  |  |  | e.g. Tanks, pumps and key equip. within sprinkler valve room, inlets, Panels – Fire alarm, LED Mimic, EWIS  Detail by specialist supplier via Design & Build to achieve specified performance requirements |
| 2nd Tier equipment – Building Hydrants & test drain, Sprinkler feed | **-** | **-** | **FIR** | **100** | **FIR** | **200** | **FIR** | **200** | **CON** | **-** |  |  |  |  |
| 2nd Tier Equipment – Extinguishers and hose reels | **-** | **-** | **FIR** | **100** | **FIR** | **200** | **FIR** | **200** | **CON** | **-** |  |  |  |  |
| Minor Equipment – Sprinkler heads (below Ceiling only) | **-** | **-** | **-** | **-** | **-** | **-** | **FIR** | **200** | **CON** | **-** |  |  |  |  |
| Minor Equipment – Detectors, manual call points, Speakers, strobes, warden intercoms, hold opens | **-** | **-** | **-** | **-** | **-** | **-** | **FIR** | **200** | **CON** | **-** |  |  |  |  |
| Major services distribution | **FIR** | **100** | **FIR** | **100** | **FIR** | **200** | **FIR** | **200** | **CON** | **-** |  |  |  | e.g. Pipes from town main to major equip. & to vertical distribution |
| 2nd Tier distribution. | **-** | **-** | **-** | **-** | **FIR** | **200** | **FIR** | **200** | **CON** | **-** |  |  |  | e.g. Horizontal main routes from risers to all  areas of building to connect minor pipes |
| Minor distribution. | **-** | **-** | **-** | **-** | **-** | **-** | **FIR** | **200** | **CON** | **-** |  |  |  | e.g. runouts (range pipes) from main routes to points for sprinkler head connection |
| In Ground Hydrant mains and Hydrants | **-** | **-** | **FIR** | **100** | **CIV** | **100** | **CIV** | **100** | **CON** | **-** |  |  |  | During Developed and Detailed design, **FIR** input  also needed. |
| Sprinklers | **FIR** | **-** | **FIR** | **100** | **FIR** | **200** | **FIR** | **200** | **CON** | **350** |  |  |  |  |
| Extinguishers | **FIR** | **-** | **FIR** | **100** | **FIR** | **200** | **FIR** | **200** | **CON** | **350** |  |  |  |  |

**MEA Table for Building Projects**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| PROJECT PHASE | CONCEPT  DESIGN | | PRELIM.  DESIGN | | DEVELOPED  DESIGN | | DETAILED  DESIGN | | CONSTRUCTION | | HANDOVER | |  | COMMENTS |
| **Model Element** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **Field Verification** |  |
| **FIRE PROTECTION** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Pipework (main) | **FIR** | **-** | **FIR** | **100** | **FIR** | **200** | **FIR** | **200** | **CON** | **350** |  |  |  | LOD 200 Pipework modelled to accurate overall external diameter, with the location accurate to +/-50mm |
| Pipework (branch) | **FIR** | **-** | **FIR** | **100** | **FIR** | **200** | **FIR** | **200** | **CON** | **350** |  |  |  |  |
| Detection | **FIR** | **-** | **FIR** | **100** | **FIR** | **200** | **FIR** | **200** | **CON** | **350** |  |  |  |  |
| Alarm systems | **FIR** | **-** | **FIR** | **100** | **FIR** | **200** | **FIR** | **200** | **CON** | **350** |  |  |  |  |
| Fire services in risers | **FIR** | **-** | **FIR** | **100** | **FIR** | **200** | **FIR** | **200** | **CON** | **350** |  |  |  | LOD 200 Pipework modelled to accurate overall external diameter, with the location accurate to +/-50mm |
| Passive Fire Protection | **FIR** | **-** | **FIR** | **100** | **FIR** | **200** | **FIR** | **200** | **CON** | **350** |  |  |  | In scope of work of Fire Protection consultant (not Fire Engineering Consultant) |

**MEA Table for Building Projects**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| PROJECT PHASE | CONCEPT  DESIGN | | PRELIM.  DESIGN | | DEVELOPED  DESIGN | | DETAILED  DESIGN | | CONSTRUCTION | | HANDOVER | |  | COMMENTS |
| **Model Element** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **Field Verification** |  |
| **MEDICAL GAS SERVICES** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Major Equipment | **MED** | **100** | **MED** | **100** | **MED** | **200** | **MED** | **200** | **CON** | **-** |  |  |  | e.g. Pumps, Compressors, Receivers, Manifolds, VIE |
| 2nd Tier Equipment – AVSU (Area Valve Service Unit) | - | **-** | **MED** | **100** | **ARC** | **200** | **ARC** | **200** | **CON** | **-** |  |  |  |  |
| 2nd Tier Equipment – Outlets, Bollards and Medical Service Panels | - | **-** | **-** | **-** | **ARC** | **200** | **ARC** | **200** | **CON** | **-** |  |  |  |  |
| Minor Equipment | - | **-** | **-** | **-** | **MED** | **200** | **MED** | **200** | **CON** | **-** |  |  |  | e.g. Alarm Panels |
| Major Services Distribution | **MED** | **100** | **MED** | **100** | **MED** | **200** | **MED** | **200** | **CON** | **-** |  |  |  | e.g. Pipework from source to riser |
| Second Tier Services Distribution | **-** | **-** | **-** | **-** | **MED** | **200** | **MED** | **200** | **CON** | **-** |  |  |  | e.g. Pipework from riser to AVSU |
| Minor Services Distribution | **-** | **-** | **-** | **-** | **-** | **-** | **MED** | **200** | **CON** | **-** |  |  |  | e.g. Pipework from AVSU to outlet |
| **SPECIALIST BUILDING SERVICES** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Gases and compressed air services | **-** | **-** | **PLU** | **100** | **PLU** | **100** | **PLU** | **200** | **CON** | - |  |  |  |  |
| Liquids of various types | **-** | **-** | **PLU** | **100** | **PLU** | **100** | **PLU** | **200** | **CON** | - |  |  |  |  |
| Fume extraction systems | **-** | **-** | **MEC** | **100** | **MEC** | **100** | **MEC** | **200** | **CON** | - |  |  |  |  |
| Pneumatic and vacuum tube systems | **-** | **-** | **-** | **-** | **MEC** | **100** | **MEC** | **200** | **CON** | - |  |  |  |  |
| Local refrigeration and cool room installation | **-** | **-** | **-** | **-** | - | **-** | **ARC** | **200** | **CON** | - |  |  |  |  |
| Specialists laboratory equipment | **-** | **-** | **-** | **-** | **ARC** | **100** | **ARC** | **200** | **CON** | - |  |  |  |  |
| Pool Water Services equipment and primary pipework | **-** | **-** | **-** | **-** | **PLU** | **100** | **PLU** | **200** | **CON** | - |  |  |  |  |

**MEA Table for Building Projects**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| PROJECT PHASE | CONCEPT  DESIGN | | PRELIM.  DESIGN | | DEVELOPED  DESIGN | | DETAILED  DESIGN | | CONSTRUCTION | | HANDOVER | |  | COMMENTS |
| **Model Element** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **Field Verification** |  |
| **CONVEYING** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Gantry cranes including support structures, e.g. rails and corbels | **ARC** | **-** | **ARC** | **100** | **ARC** | **100** | **ARC** | **100** | **CON** | **-** |  |  |  | Detail by specialist supplier via Design & Build to achieve specified performance requirements |
| Passenger escalators, travellators, goods escalators, and conveyers | **ARC** | **-** | **ARC** | **100** | **ARC** | **200** | **ARC** | **200** | **CON** | **-** |  |  |  | Detail by specialist supplier via Design & Build to achieve specified performance requirements |
| Passenger and goods lifts | **ARC** | **-** | **ARC** | **100** | **ARC** | **200** | **ARC** | **200** | **CON** | **-** |  |  |  | Detail by specialist supplier via Design & Build to achieve specified performance requirements |
| Dumb waiters | **ARC** | **-** | **ARC** | **100** | **ARC** | **200** | **ARC** | **200** | **CON** | **-** |  |  |  | Detail by specialist supplier via Design & Build to achieve specified performance requirements |

3— Level of Development for Water

3.1 Model Element Author Schedule

The following table assigns responsibilities to Model Elements via an Author and defines the minimum required LOD for Model Elements across the project stages.

*Note: if there are two or more disciplines in the MEA Column, the first is the primary owner of the element and second/third is required to coordinate with the first.*

**Model Element Author Key for Water**

|  |  |  |  |
| --- | --- | --- | --- |
| Architectural Consultant | **ARC** | Fire Consultant | **FIR** |
| Structural Consultant  *(for all Structural engineering elements refer to Buildings*  *MEA table, section 2.3)* | **STR** | Civil Consultant | **CIV** |
| HVAC & Mechanical Consultant | **MEC** | Process Consultant | **PCS** |
| Electrical Consultant | **ELE** | Contractor/Sub-contractor | **CON** |
| Plumbing & Drainage consultant | **PLU** | Landscape Architect | **LDS** |

3.2 Model Element Author & Level of Development Schedule for Water

Spatial related elements such as site boundaries, grids, levels, zones and spaces are not assigned an LOD because aren’t technically elements that are modelled in 3 dimensions. There is a requirement to show them in the table below to make sure that they are assigned an MEA.

The LOD’s indicated below are a minimum requirement by the end of each of the design and construction phases noted, the design and/or construction team may choose to implement a higher LOD. For model handover requirements which will be developed during the Construction phase.

**LOD for Water**

|  |  |
| --- | --- |
| 100 | Conceptual |
| 200 | Approximate Geometry |
| 300 | Design Specified Geometry |
| 350 | Interface Coordination |
| 400 | Fabrication and Assembly |
| FV | Field Verified |

**MEA Table for Water Projects**

3.2 MEA for Water Projects

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| PROJECT PHASE | CONCEPT  DESIGN | | PRELIM.  DESIGN | | DEVELOPED  DESIGN | | DETAILED  DESIGN | | FABRICATION | | CONSTRUCTION | | HANDOVER | | COMMENTS |
| **Model Element** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** |  |
| **SPATIAL** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Site boundaries, setbacks | **ARC** | **-** | **ARC** | **-** | **ARC** | **-** | **ARC** | **-** | **CON** | **FV** | **CON** | **FV** |  |  | To be coordinated between MEA and other design teams during concept design and  to be finalised during first two weeks of prelim design. |
| Grids | **ARC** | **-** | **ARC** | **-** | **ARC** | **-** | **ARC** | **-** | **CON** | **-** | **CON** | **-** |  |  |  |
| Building Levels | **ARC** | **-** | **ARC** | **-** | **ARC** | **-** | **ARC** | **-** | **CON** | **-** | **CON** | **-** |  |  |  |
| Process Levels | **PCS** | **-** | **PCS** | **-** | **PCS** | **-** | **PCS** | **-** | **CON** | **-** | **CON** | **-** |  |  |  |
| Process zones | **PCS** | **-** | **PCS** | **-** | **PCS** | **-** | **PCS** | **-** | **CON** | **-** | **CON** | **-** |  |  |  |
| Process spaces, rooms | **PCS** | **-** | **PCS** | **-** | **PCS** | **-** | **PCS** | **-** | **CON** | **-** | **CON** | **-** |  |  |  |
| ARC Spaces, rooms | **ARC** | **-** | **ARC** | **-** | **ARC** | **-** | **ARC** | **-** | **CON** | **-** | **CON** | **-** |  |  |  |
| ARC zones | **ARC** | **-** | **ARC** | **-** | **ARC** | **-** | **ARC** | **-** | **CON** | **-** | **CON** | **-** |  |  |  |
| Process spaces, rooms | **PCS** | **-** | **PCS** | **-** | **PCS** | **-** | **PCS** | **-** | **CON** | **-** |  |  |  |  |  |
| ARC Spaces, rooms | **ARC** | **-** | **ARC** | **-** | **ARC** | **-** | **ARC** | **-** | **CON** | **-** |  |  |  |  |  |
| ARC zones | **ARC** | **-** | **ARC** | **-** | **ARC** | **-** | **ARC** | **-** | **CON** | **-** |  |  |  |  |  |

**MEA Table for Water Projects**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| PROJECT PHASE | CONCEPT  DESIGN | | PRELIM.  DESIGN | | DEVELOPED  DESIGN | | DETAILED  DESIGN | | FABRICATION | | CONSTRUCTION | | HANDOVER | | COMMENTS |
| **Model Element** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** |  |
| **SITE** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Topography-Existing | **CIV** | **-** | **CIV** | **200** | **CIV** | **200** | **CIV** | **200** | **CON** | **-** | **CON** | **-** |  |  |  |
| Site Services Existing | **CIV** | **-** | **CIV** | **200** | **CIV** | **200** | **CIV** | **200** | **-** | **-** | **-** | **-** |  |  |  |
| Topography | **CIV** | **-** | **CIV** | **100** | **CIV** | **200** | **CIV** | **300** | **CON** | **-** | **CON** | **FV** |  |  | 2D CAD or 3D TIN file |
| Site Water, Stormwater, Sewer | **CIV** | **-** | **CIV** | **100** | **CIV** | **200** | **CIV** | **300** | **CON** | **-** | **CON** | **FV** |  |  | 1m beyond footprint of buildings |
| Roading | **CIV** | **-** | **CIV** | **100** | **CIV** | **200** | **CIV** | **300** | **CON** | **-** | **CON** | **-** |  |  | 2D CAD if appropriate |
| Road kerb | **CIV** | **-** | **CIV** | **100** | **CIV** | **200** | **CIV** | **300** | **CON** | **-** | **CON** | **-** |  |  | 2D CAD if appropriate |
| Surface finishes | **CIV** | **-** | **CIV** | **100** | **CIV** | **200** | **CIV** | **300** | **CON** | **-** | **CON** | **FV** |  |  | 2D CAD if appropriate |
| Site Power | **ELE** | **-** | **ELE** | **100** | **ELE** | **200** | **ELE** | **300** | **CON** | **-** | **CON** | **FV** |  |  | **CIV** to provide trench input, 2D CAD if appropriate |
| Site Communications | **ELE** | **-** | **ELE** | **100** | **ELE** | **200** | **ELE** | **300** | **CON** | **-** | **CON** | **FV** |  |  | **CIV** to provide trench input, 2D CAD if appropriate |
| Site lighting | **ELE** | **-** | **ELE** | **100** | **ELE** | **200** | **ELE** | **300** | **CON** | **-** | **CON** | **FV** |  |  |  |
| Site Furniture (fences, gates, etc..) | **LDS** | **-** | **LDS** | **100** | **LDS** | **200** | **LDS** | **300** | **CON** | **-** | **CON** | **FV** |  |  |  |
| Site landscaping | **LDS** | **-** | **LDS** | **100** | **LDS** | **200** | **LDS** | **300** | **CON** | **-** | **CON** | **FV** |  |  |  |
| Plant – Existing | **PCS** | **-** | **PCS** | **100** | **PCS** | **200** | **PCS** | **200** | **CON** | **-** | **CON** | **-** |  |  |  |
| Plant – New | **PCS** | **-** | **PCS** | **100** | **PCS** | **200** | **PCS** | **300** | **CON** | **-** | **CON** | **FV** |  |  |  |
| Plant – Vendor Supply | **PCS** | **-** | **PCS** | **100** | **PCS** | **200** | **PCS** | **350** | **CON** | **400** | **CON** | **FV** |  |  | Will involve importing vendor provided exports which would need to be co-ordinated |
| Plant – Foundations | **PCS** | **-** | **PCS** | **100** | **STR** | **200** | **STR** | **300** | **CON** | **-** | **CON** | **FV** |  |  | **PCS**-**STR** Dev. first week |

**MEA Table for Water Projects**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| PROJECT PHASE | CONCEPT  DESIGN | | PRELIM.  DESIGN | | DEVELOPED  DESIGN | | DETAILED  DESIGN | | FABRICATION | | CONSTRUCTION | | HANDOVER | | COMMENTS |
| **Model Element** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** |  |
| **SITE** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Plant Ground improvements | **CIV** | **-** | **CIV** | **100** | **STR** | **200** | **STR** | **300** | **CON** | **-** | **CON** | **FV** |  |  | **CIV**-**STR** Dev. first week |
| Pipework | **PCS** | **-** | **PCS** | **100** | **PCS** | **200** | **STR** | **300** | **CON** | **-** | **CON** | **FV** |  |  |  |
| Pipework Supports | **PCS** | **-** | **PCS** | **100** | **STR** | **200** | **STR** | **300** | **CON** | **-** | **CON** | **FV** |  |  | **PCS**-**STR** Dev. first week |
| Pipework fittings, valves, sensors | **PCS** | **-** | **PCS** | **100** | **PCS** | **200** | **STR** | **300** | **CON** | **-** | **CON** | **FV** |  |  |  |
| Piping underground encasements | **PCS** | **-** | **PCS** | **100** | **STR** | **200** | **STR** | **300** | **CON** | **-** | **CON** | **FV** |  |  | **PCS**-**STR** Dev. first week |
| Plant access structures | **PCS** | **-** | **PCS** | **100** | **STR** | **200** | **STR** | **300** | **CON** | **-** | **CON** | **FV** |  |  | **PCS**-**STR** Dev. first week |
| Plant handrailing & gates | **PCS** | **-** | **PCS** | **100** | **STR** | **200** | **STR** | **300** | **CON** | **-** | **CON** | **FV** |  |  | **PCS**-**STR** Dev. first week |
| Plant hold down bolts | **PCS** | **-** | **PCS** | **100** | **STR** | **200** | **STR** | **350** | **CON** | **-** | **CON** | **-** |  |  | **PCS**-**STR** Dev. first week |
| **PENETRATIONS** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| For details relating to penetrations (both **ARC** and **STR** engineering elements) refer to 2.3 MEA for Buildings | | | | | | | | | | | | | | |  |
| **SUBSTRUCTURE** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| For all **STR** engineering elements, refer to 2.3 MEA for Buildings | | | | | | | | | | | | | | |  |
| Underground encasements | **ARC** | **-** | **STR** | **100** | **STR** | **200** | **STR** | **300** | **CON** | **-** | **CON** | **FV** |  |  | **ARC**–**STR** Prelim. first week |
| Ground improvements | **CIV** | **-** | **CIV** | **100** | **STR** | **200** | **STR** | **300** | **CON** | **-** | **CON** | **FV** |  |  | **CIV**-**STR** Dev. first week |
| Pond | **CIV** | **-** | **CIV** | **100** | **CIV** | **200** | **CIV** | **300** | **CON** | **-** | **CON** | **FV** |  |  |  |
| **BUILDING STRUCTURE** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| For all **STR** engineering elements, refer to 2.3 MEA for Buildings | | | | | | | | | | | | | | |  |

**MEA Table for Water Projects**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| PROJECT PHASE | CONCEPT  DESIGN | | PRELIM.  DESIGN | | DEVELOPED  DESIGN | | DETAILED  DESIGN | | FABRICATION | | CONSTRUCTION | | HANDOVER | | COMMENTS |
| **Model Element** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** |  |
| **BUILDING ENCLOSURE** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Architectural Roofing | **ARC** | **100** | **ARC** | **200** | **ARC** | **300** | **ARC** | **300** | **CON** | **-** | **CON** | **FV** |  |  |  |
| Cladding | **ARC** | **-** | **ARC** | **100** | **ARC** | **300** | **ARC** | **300** | **CON** | **-** | **CON** | **-** |  |  |  |
| Column cladding | **ARC** | **-** | **ARC** | **100** | **ARC** | **300** | **ARC** | **300** | **CON** | **-** | **CON** | **-** |  |  |  |
| Curtain walls | **ARC** | **100** | **ARC** | **200** | **ARC** | **300** | **ARC** | **300** | **CON** | **-** | **CON** | **-** |  |  |  |
| Windows | **ARC** | **100** | **ARC** | **200** | **ARC** | **300** | **ARC** | **300** | **CON** | **-** | **CON** | **FV** |  |  |  |
| External doors | **ARC** | **100** | **ARC** | **200** | **ARC** | **300** | **ARC** | **300** | **CON** | **-** | **CON** | **FV** |  |  |  |
| Wall openings – non structural | **ARC** | **100** | **ARC** | **200** | **ARC** | **300** | **ARC** | **300** | **CON** | **-** | **CON** | **-** |  |  |  |

**MEA Table for Water Projects**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| PROJECT PHASE | CONCEPT  DESIGN | | PRELIM.  DESIGN | | DEVELOPED  DESIGN | | DETAILED  DESIGN | | FABRICATION | | CONSTRUCTION | | HANDOVER | | COMMENTS |
| **Model Element** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** |  |
| **BUILDING INTERIOR** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Partitions | **ARC** | **100** | **ARC** | **200** | **ARC** | **300** | **ARC** | **300** | **CON** | **-** | **CON** | **FV** |  |  |  |
| Internal doors | **ARC** | **100** | **ARC** | **200** | **ARC** | **300** | **ARC** | **300** | **CON** | **-** | **CON** | **FV** |  |  |  |
| Internal openings – non structural | **ARC** | **100** | **ARC** | **200** | **ARC** | **300** | **ARC** | **300** | **CON** | **-** | **CON** | **-** |  |  |  |
| Ceilings | **ARC** | **100** | **ARC** | **200** | **ARC** | **300** | **ARC** | **300** | **CON** | **-** | **CON** | **FV** |  |  |  |
| Flooring | **ARC** | **100** | **ARC** | **200** | **ARC** | **300** | **ARC** | **300** | **CON** | **-** | **CON** | **FV** |  |  |  |
| Balustrading | **ARC** | **-** | **ARC** | **100** | **ARC** | **200** | **ARC** | **300** | **CON** | **-** | **CON** | **-** |  |  |  |
| Furniture | **ARC** | **-** | **ARC** | **100** | **ARC** | **200** | **ARC** | **300** | **CON** | **-** | **CON** | **-** |  |  |  |
| Fixtures | **ARC** | **-** | **ARC** | **100** | **ARC** | **200** | **ARC** | **300** | **CON** | **-** | **CON** | **-** |  |  |  |
| Fittings | **ARC** | **-** | **ARC** | **100** | **ARC** | **200** | **ARC** | **300** | **CON** | **-** | **CON** | **-** |  |  |  |
| Equipment – non services | **ARC** | **-** | **ARC** | **100** | **ARC** | **200** | **ARC** | **e300** | **CON** | **-** | **CON** | **-** |  |  |  |
| Signage | **ARC** | **-** | **ARC** | **100** | **ARC** | **200** | **ARC** | **300** | **CON** | **-** | **CON** | **-** |  |  |  |
| Speed walls | **ARC** | **-** | **ARC** | **100** | **ARC** | **200** | **ARC** | **300** | **CON** | **-** | **CON** | **-** |  |  |  |

**MEA Table for Water Projects**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| PROJECT PHASE | CONCEPT  DESIGN | | PRELIM.  DESIGN | | DEVELOPED  DESIGN | | DETAILED  DESIGN | | FABRICATION | | CONSTRUCTION | | HANDOVER | | COMMENTS |
| **Model Element** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** |  |
| **MECHANICAL** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Plant external | **MEC** | **-** | **MEC** | **100** | **MEC** | **200** | **MEC** | **300** | **CON** | **350** | **CON** | **FV** |  |  |  |
| Plant external – support structure | **MEC** | **-** | **STR** | **100** | **STR** | **200** | **STR** | **300** | **CON** | **350** | **CON** | **FV** |  |  | **MEC**-**STR** Prelim. first week |
| Plant internal | **MEC** | **-** | **MEC** | **100** | **MEC** | **200** | **MEC** | **300** | **CON** | **350** | **CON** | **FV** |  |  |  |
| Plant internal – support structure | **MEC** | **-** | **MEC** | **100** | **MEC** | **200** | **STR** | **300** | **CON** | **350** | **CON** | **FV** |  |  |  |
| Louvers | **MEC** | **-** | **ARC** | **100** | **ARC** | **200** | **MEC** | **300** | **CON** | **-** | **CON** | **-** |  |  |  |
| Ductwork | **MEC** | **-** | **MEC** | **100** | **MEC** | **200** | **MEC** | **300** | **CON** | **350** | **CON** | **FV** |  |  |  |
| Registers | **MEC** | **-** | **MEC** | **100** | **MEC** | **200** | **MEC** | **300** | **CON** | **350** | **CON** | **FV** |  |  |  |
| Pipework | **MEC** | **-** | **MEC** | **100** | **MEC** | **200** | **MEC** | **300** | **CON** | **350** | **CON** | **FV** |  |  | Minor pipes <50mm dia LOD 200 at Det. |
| Flexible pipes | **MEC** | **-** | **MEC** | **100** | **MEC** | **200** | **MEC** | **200** | **CON** | **350** | **CON** | **FV** |  |  |  |
| Controls | **MEC** | **-** | **MEC** | **100** | **MEC** | **200** | **MEC** | **300** | **CON** | **-** | **CON** | **FV** |  |  |  |
| Mechanical services in risers | **MEC** | **-** | **MEC** | **100** | **MEC** | **200** | **MEC** | **300** | **CON** | **350** | **CON** | **FV** |  |  |  |

**MEA Table for Water Projects**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| PROJECT PHASE | CONCEPT  DESIGN | | PRELIM.  DESIGN | | DEVELOPED  DESIGN | | DETAILED  DESIGN | | FABRICATION | | CONSTRUCTION | | HANDOVER | | COMMENTS |
| **Model Element** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** |  |
| **ELECTRICAL** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Electrical fixtures | **ELE** | **-** | **ELE** | **100** | **ELE** | **200** | **ARC** | **300** | **CON** | **-** | **CON** | **FV** |  |  |  |
| Power outlets | **ELE** | **-** | **ELE** | **100** | **ELE** | **200** | **ARC** | **300** | **CON** | **-** | **CON** | **-** |  |  |  |
| Switches | **ELE** | **-** | **ELE** | **100** | **ELE** | **200** | **ARC** | **300** | **CON** | **-** | **CON** | **-** |  |  |  |
| Distribution boards | **ELE** | **-** | **ELE** | **100** | **ELE** | **200** | **ELE** | **300** | **CON** | **-** | **CON** | **FV** |  |  |  |
| Cable trays | **ELE** | **-** | **ELE** | **100** | **ELE** | **200** | **ELE** | **300** | **CON** | **-** | **CON** | **FV** |  |  |  |
| Lighting | **ELE** | **-** | **ELE** | **100** | **ELE** | **200** | **ELE** | **300** | **CON** | **-** | **CON** | **FV** |  |  |  |
| Communications | **ELE** | **-** | **ELE** | **100** | **ELE** | **200** | **ELE** | **300** | **CON** | **-** | **CON** | **FV** |  |  |  |
| Security | **ELE** | **-** | **ELE** | **100** | **ELE** | **200** | **ELE** | **300** | **CON** | **-** | **CON** | **FV** |  |  |  |
| Controls | **ELE** | **-** | **ELE** | **100** | **ELE** | **200** | **ELE** | **300** | **CON** | **-** | **CON** | **FV** |  |  |  |
| Electrical services in risers | **ELE** | **-** | **ELE** | **100** | **ELE** | **200** | **ELE** | **300** | **CON** | **-** | **CON** | **FV** |  |  |  |
| **PLUMBING AND DRAINAGE** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Sanitary fixtures | **PLU** | **-** | **PLU** | **100** | **PLU** | **200** | **ARC** | **300** | **CON** | **350** | **CON** | **FV** |  |  |  |
| Plant | **PLU** | **-** | **PLU** | **100** | **PLU** | **200** | **PLU** | **300** | **CON** | **350** | **CON** | **FV** |  |  |  |
| Equipment | **PLU** | **-** | **PLU** | **100** | **PLU** | **200** | **PLU** | **300** | **CON** | **350** | **CON** | **FV** |  |  |  |
| Pipework | **PLU** | **-** | **PLU** | **100** | **PLU** | **200** | **PLU** | **300** | **CON** | **350** | **CON** | **FV** |  |  | Minor pipes <50mm dia LOD 200 at Det.  out to 1m past building footprint |
| Plumbing & Drainage services in risers | **PLU** | **-** | **PLU** | **100** | **PLU** | **200** | **PLU** | **300** | **CON** | **350** | **CON** | **FV** |  |  |  |

**MEA Table for Water Projects**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| PROJECT PHASE | CONCEPT  DESIGN | | PRELIM.  DESIGN | | DEVELOPED  DESIGN | | DETAILED  DESIGN | | FABRICATION | | CONSTRUCTION | | HANDOVER | | COMMENTS |
| **Model Element** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** |  |
| **FIRE** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Sprinklers | **FIR** | **-** | **FIR** | **100** | **FIR** | **200** | **FIR** | **300** | **CON** | **350** | **CON** | **FV** |  |  |  |
| Hydrants | **FIR** | **-** | **FIR** | **100** | **FIR** | **200** | **FIR** | **300** | **CON** | **-** | **CON** | **-** |  |  |  |
| Extinguishers | **FIR** | **-** | **FIR** | **100** | **FIR** | **200** | **FIR** | **300** | **CON** | **350** | **CON** | **FV** |  |  |  |
| Pipework (main) | **FIR** | **-** | **FIR** | **100** | **FIR** | **200** | **FIR** | **300** | **CON** | **350** | **CON** | **FV** |  |  | To 1m beyond building footprint |
| Pipework (branch) | **FIR** | **-** | **FIR** | **100** | **FIR** | **200** | **FIR** | **300** | **CON** | **350** | **CON** | **FV** |  |  |  |
| Detection | **FIR** | **-** | **FIR** | **100** | **FIR** | **200** | **FIR** | **300** | **CON** | **350** | **CON** | **FV** |  |  |  |
| Alarm systems | **FIR** | **-** | **FIR** | **100** | **FIR** | **200** | **FIR** | **300** | **CON** | **350** | **CON** | **FV** |  |  |  |
| Fire services in risers | **FIR** | **-** | **FIR** | **100** | **FIR** | **200** | **FIR** | **300** | **CON** | **350** | **CON** | **FV** |  |  |  |
| Fire stopping elements | **FIR** | **-** | **FIR** | **100** | **FIR** | **200** | **FIR** | **200** | **CON** | **350** | **CON** | **FV** |  |  |  |
| **CONVEYING** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Cranes | **ARC** | **-** | **ARC** | **100** | **ARC** | **200** | **ARC** | **300** | **CON** | **-** | **CON** | **400** |  |  |  |
| Escalators | **ARC** | **-** | **ARC** | **100** | **ARC** | **200** | **ARC** | **300** | **CON** | **-** | **CON** | **400** |  |  |  |
| Lifts | **ARC** | **-** | **ARC** | **100** | **ARC** | **200** | **ARC** | **300** | **CON** | **-** | **CON** | **400** |  |  |  |
| Structural supports | **ARC** | **-** | **ARC** | **100** | **ARC** | **200** | **ARC** | **300** | **CON** | **-** | **CON** | **FV** |  |  |  |

4— Level of Development for HV Power

4.1 Model Element Author Schedule

The following table assigns responsibilities to Model Elements via an Author and defines the minimum required LOD for Model Elements across the project stages.

*Note: if there are two or more disciplines in the MEA Column, the first is the primary owner of the element and second/third is required to coordinate with the first.*

**Model Element Author Key for HV Power**

|  |  |  |  |
| --- | --- | --- | --- |
| Architectural Consultant | **ARC** | Fire Consultant | **FIR** |
| Landscape Architect | **LDS** | Civil Consultant | **CIV** |
| Structural Consultant  *(for all Structural engineering elements refer to Buildings*  *MEA table, section 2.3)* | **STR** | Power | **POW** |
| HVAC & Mechanical Consultant | **MEC** | Transmission Line | **TRA** |
| Electrical Consultant | **ELE** | Contractor/Sub-contractor | **CON** |
| Plumbing & Drainage consultant | **PLU** |  |  |

4.2 Model Element Author & Level of Development Schedule for HV Power

Spatial related elements such as site boundaries, grids, levels, zones and spaces are not assigned an LOD because aren’t technically elements that are modelled in 3 dimensions. There is a requirement to show them in the table below to make sure that they are assigned an MEA.

The LODs indicated below are a minimum requirement by the end of each of the design and construction phases noted, the design and/or construction team may choose to implement a higher LOD. For model handover requirements which will be developed during the Construction phase.

**LOD for HV Power**

|  |  |
| --- | --- |
| 100 | Conceptual |
| 200 | Approximate Geometry |
| 300 | Accurate Geometry |
| 350 | Interface Coordination |
| 400 | Fabrication and Assembly |
| FV | Field verified |

**MEA Table for HV Power Projects**

4.3 MEA for HV Power Projects

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| PROJECT PHASE | CONCEPT  DESIGN | | PRELIM.  DESIGN | | DETAILED  DESIGN | | CONSTRUCTION | | HANDOVER | | COMMENTS |
| **Model Element** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** |  |
| **ELECTRICAL (BUILDINGS)** |  |  |  |  |  |  |  |  |  |  |  |
| HV Switchboards | **-** | **-** | **POW** | **200** | **POW** | **300** | **POW** | **300** | **POW** | **FV** |  |
| LV Switchboards | **-** | **-** | **POW** | **200** | **POW** | **300** | **POW** | **300** | **POW** | **FV** |  |
| Electrical fixtures | **-** | **-** | **ARC** | **200** | **ARC** | **300** | **ARC** | **300** | **ARC** | **300** |  |
| Power outlets | **-** | **-** | **ARC** | **200** | **ARC** | **300** | **ARC** | **300** | **ARC** | **300** |  |
| Switches | **-** | **-** | **ARC** | **200** | **ARC** | **200** | **ARC** | **200** | **ARC** | **200** |  |
| Distribution boards | **-** | **-** | **ELE** | **200** | **ELE** | **300** | **ELE** | **300** | **ELE** | **300** |  |
| Cable trays | **-** | **-** | **ELE** | **200** | **ELE** | **200** | **CON** | **300** | **CON** | **FV** |  |
| Lighting | **-** | **-** | **ELE** | **200** | **ELE** | **300** | **CON** | **300** | **CON** | **300** |  |
| Communications | **-** | **-** | **ELE** | **200** | **ELE** | **300** | **CON** | **300** | **CON** | **300** |  |
| Security | **-** | **-** | **ELE** | **200** | **ELE** | **300** | **ELE** | **300** | **ELE** | **300** |  |

**MEA Table for HV Power Projects**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| PROJECT PHASE | CONCEPT  DESIGN | | PRELIM.  DESIGN | | DETAILED  DESIGN | | CONSTRUCTION | | HANDOVER | | COMMENTS |
| **Model Element** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** |  |
| **ELECTRICAL (SWITCHYARD)** |  |  |  |  |  |  |  |  |  |  |  |
| Indoor circuit breakers (CB) | **POW** | **100** | **POW** | **200** | **POW** | **350** | **POW** | **350** | **POW** | **FV** | Includes Arc Vent Ducts (Arc Chutes) for switchgear |
| Outdoor circuit breakers (CB) | **POW** | **100** | **POW** | **200** | **POW** | **350** | **POW** | **350** | **POW** | **FV** |  |
| Disconnecting circuit breaker (DCB) | **POW** | **100** | **POW** | **200** | **POW** | **350** | **POW** | **350** | **POW** | **FV** |  |
| Voltage transformers (VT) | **POW** | **100** | **POW** | **200** | **POW** | **350** | **POW** | **350** | **POW** | **FV** |  |
| Capacitive voltage transformer (CVT) | **POW** | **100** | **POW** | **200** | **POW** | **350** | **POW** | **350** | **POW** | **FV** |  |
| Current transformers (CT) | **POW** | **100** | **POW** | **200** | **POW** | **350** | **POW** | **350** | **POW** | **FV** | Including Neutral Current Transformers (NCT) |
| Power transformers | **POW** | **100** | **POW** | **200** | **POW** | **350** | **POW** | **350** | **POW** | **FV** |  |
| Earthing transformers | **POW** | **100** | **POW** | **200** | **POW** | **350** | **POW** | **350** | **POW** | **FV** |  |
| Local service transformer | **POW** | **100** | **POW** | **200** | **POW** | **350** | **POW** | **350** | **POW** | **FV** |  |
| Insulators | **POW** | **100** | **POW** | **200** | **POW** | **350** | **POW** | **350** | **POW** | **FV** |  |
| Surge arrestors | **POW** | **100** | **POW** | **200** | **POW** | **350** | **POW** | **350** | **POW** | **FV** |  |
| Natural earthing resistors | **POW** | **100** | **POW** | **200** | **POW** | **350** | **POW** | **350** | **POW** | **FV** |  |
| Natural earthing reactors | **POW** | **100** | **POW** | **200** | **POW** | **350** | **POW** | **350** | **POW** | **FV** |  |
| Primary electrical fittings and connectors | **-** | **-** | **POW** | **100** | **POW** | **350** | **POW** | **350** | **POW** | **FV** | Includes AIS conductors, Busbars, Adaptor Plates, Bus Fittings, Dead Ends, Earthing Horns, jumper terminals, Line Fittings, Spacer clamps, and Transition Plates etc. |
| Outdoor junction boxes & outdoor  cabinets | **-** | **-** | **POW** | **200** | **POW** | **300** | **POW** | **300** | **POW** | **FV** |  |

**MEA Table for HV Power Projects**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| PROJECT PHASE | CONCEPT  DESIGN | | PRELIM.  DESIGN | | DETAILED  DESIGN | | CONSTRUCTION | | HANDOVER | | COMMENTS |
| **Model Element** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** |  |
| **ELECTRICAL (SWITCHYARD)** |  |  |  |  |  |  |  |  |  |  |  |
| Conductors | **-** | **-** | **POW** | **100** | **POW** | **300** | **POW** | **300** | **POW** | **FV** | Includes strung and tubular bus |
| HV cables | **-** | **-** | **POW** | **100** | **POW** | **300** | **POW** | **300** | **POW** | **FV** |  |
| Cable sealing ends | **-** | **-** | **POW** | **100** | **POW** | **300** | **POW** | **300** | **POW** | **FV** |  |
| HV cable trays | **-** | **-** | **POW** | **100** | **POW** | **200** | **POW** | **200** | **POW** | **FV** |  |

**MEA Table for HV Power Projects**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| PROJECT PHASE | CONCEPT  DESIGN | | PRELIM.  DESIGN | | DETAILED  DESIGN | | CONSTRUCTION | | HANDOVER | | COMMENTS |
| **Model Element** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** |  |
| **SITE** |  |  |  |  |  |  |  |  |  |  |  |
| Topography | **CIV** | **100** | **CIV** | **200** | **CIV** | **200** | **-** | **-** | **CON** | **300** |  |
| Excavation | **CIV** | **100** | **CIV** | **200** | **CIV** | **300** | **-** | **-** | **-** | **-** |  |
| Stormwater | **CIV** | **100** | **CIV** | **200** | **CIV** | **300** | **CON** | **400** | **CON** | **FV** |  |
| Wastewater | **CIV** | **100** | **CIV** | **200** | **CIV** | **200** | **CON** | **400** | **CON** | **FV** |  |
| Control cable trenches |  |  | **CIV** | **200** | **CON** | **200** | **CON** | **200** | **CON** | **FV** |  |
| Control cable conduits | **-** | **-** | **CIV** | **200** | **CIV** | **200** | **CON** | **200** | **CON** | **FV** |  |
| Earthing grid | **-** | **-** | **POW** | **100** | **POW** | **300** | **POW** | **300** | **POW** | **FV** |  |
| Gas pipes | **CIV** | **100** | **CIV** | **200** | **CIV** | **300** | **CON** | **300** | **CON** | **FV** |  |
| Oil pipes | **CIV** | **100** | **CIV** | **200** | **CIV** | **300** | **CON** | **300** | **CON** | **FV** |  |
| Comms/Fibre | **-** | **-** | **CIV** | **200** | **CIV** | **200** | **CON** | **200** | **CON** | **FV** |  |
| Water (mains) | **CIV** | **100** | **CIV** | **200** | **CIV** | **300** | **CON** | **400** | **CON** | **FV** |  |
| Water (Fire) | **-** | **-** | **FIR** | **200** | **FIR** | **200** | **FIR** | **400** | **FIR** | **FV** |  |
| Compressed air | **CIV** | **100** | **CIV** | **200** | **CIV** | **300** | **CON** | **400** | **CON** | **FV** |  |
| Roads | **CIV** | **100** | **CIV** | **200** | **CIV** | **300** | **-** | **-** | **CON** | **300** |  |
| Parking | **ARC** | **100** | **ARC** | **200** | **ARC** | **300** | **-** | **-** | **ARC** | **300** |  |
| Footpaths | **ARC** | **100** | **ARC** | **200** | **ARC** | **300** | **-** | **-** | **ARC** | **300** |  |
| Walls | **ARC** | **100** | **CIV** | **200** | **CIV** | **300** | **-** | **-** | **CON** | **300** |  |
| Fencing | **ARC** | **100** | **ARC** | **200** | **ARC** | **300** | **-** | **-** | **ARC** | **300** |  |
| Landscaping | **LDS** | **100** | **LDS** | **200** | **LDS** | **300** | **-** | **-** | **LDS** | **300** |  |

**MEA Table for HV Power Projects**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| PROJECT PHASE | CONCEPT  DESIGN | | PRELIM.  DESIGN | | DETAILED  DESIGN | | CONSTRUCTION | | HANDOVER | | COMMENTS |
| **Model Element** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** |  |
| **SPATIAL (BUILDING)** |  |  |  |  |  |  |  |  |  |  |  |
| Site boundaries, setbacks | **ARC** | **-** | **ARC** | **-** | **ARC** | **-** | **ARC** | **-** | **ARC** | **-** |  |
| Grids | **ARC** | **-** | **ARC** | **-** | **ARC** | **-** | **ARC** | **-** | **ARC** | **-** |  |
| Levels | **ARC** | **-** | **ARC** | **-** | **ARC** | **-** | **ARC** | **-** | **ARC** | **-** |  |
| Zones | **ARC** | **-** | **ARC** | **-** | **ARC** | **-** | **ARC** | **-** | **ARC** | **-** |  |
| Spaces, rooms | **ARC** | **-** | **ARC** | **-** | **ARC** | **-** | **ARC** | **-** | **ARC** | **-** |  |
| **SPATIAL (SWITCHYARD)** |  |  |  |  |  |  |  |  |  |  |  |
| Site boundaries, setbacks | **POW** | **-** | **POW** | **-** | **POW** | **-** | **POW** | **-** | **POW** | **-** |  |
| Site grid | **POW** | **-** | **POW** | **-** | **POW** | **-** | **POW** | **-** | **POW** | **-** |  |
| Height datum | **POW** | **-** | **POW** | **-** | **POW** | **-** | **POW** | **-** | **POW** | **-** |  |
| Switchyard | **POW** | **-** | **POW** | **-** | **POW** | **-** | **POW** | **-** | **POW** | **-** | Separated by voltage, i.e. 110 kV switchyard |
| Switchyard bays | **POW** | **-** | **POW** | **-** | **POW** | **-** | **POW** | **-** | **POW** | **-** |  |
| Clearance zones | **-** | **-** | **POW** | **-** | **POW** | **-** | **POW** | **-** | **POW** | **-** |  |
| Lightning zones | **-** | **-** | **POW** | **-** | **POW** | **-** | **POW** | **-** | **POW** | **-** |  |
| **SUBSTRUCTURE** |  |  |  |  |  |  |  |  |  |  |  |
| Foundations | **-** | **-** | **STR** | **200** | **STR** | **300** | **STR** | **300** | **STR** | **FV** |  |
| Retaining Walls | **-** | **-** | **STR** | **200** | **STR** | **300** | **STR** | **300** | **STR** | **300** |  |
| Sub-surface Drainage | **-** | **-** | **CIV** | **200** | **CIV** | **200** | **CON** | **400** | **CON** | **FV** |  |

**MEA Table for HV Power Projects**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| PROJECT PHASE | CONCEPT  DESIGN | | PRELIM.  DESIGN | | DETAILED  DESIGN | | CONSTRUCTION | | HANDOVER | | COMMENTS |
| **Model Element** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** |  |
| **STRUCTURE** |  |  |  |  |  |  |  |  |  |  |  |
| Floors | **ARC** | **100** | **STR** | **200** | **STR** | **300** | **STR** | **300** | **STR** | **300** |  |
| Primary Framing | **-** | **-** | **STR** | **200** | **STR** | **300** | **CON** | **400** | **CON** | **FV** |  |
| Primary Columns | **-** | **-** | **STR** | **200** | **STR** | **300** | **CON** | **400** | **CON** | **FV** |  |
| Secondary Framing | **-** | **-** | **STR** | **100** | **STR** | **200** | **CON** | **400** | **CON** | **FV** |  |
| Secondary Columns | **-** | **-** | **STR** | **100** | **STR** | **200** | **CON** | **400** | **CON** | **FV** |  |
| Pre-cast Concrete Panels | **ARC** | **100** | **STR** | **200** | **STR** | **300** | **CON** | **350** | **CON** | **FV** |  |
| Pre-cast Concrete Stairs | **ARC** | **100** | **STR** | **200** | **STR** | **200** | **CON** | **350** | **CON** | **FV** |  |
| Steel Stairs | **ARC** | **100** | **STR** | **200** | **STR** | **200** | **CON** | **400** | **CON** | **FV** |  |
| Ramps | **ARC** | **100** | **STR** | **200** | **STR** | **300** | **STR** | **300** | **STR** | **300** |  |
| Load Bearing Walls | **ARC** | **100** | **STR** | **200** | **STR** | **300** | **STR** | **300** | **STR** | **FV** |  |
| Penetrations – Walls | **ARC** | **100** | **STR** | **200** | **STR** | **300** | **STR** | **300** | **STR** | **FV** |  |
| Penetrations – Floors | **ARC** | **100** | **STR** | **200** | **STR** | **300** | **STR** | **300** | **STR** | **FV** |  |
| Fire Walls | **ARC** | **100** | **STR** | **200** | **STR** | **300** | **STR** | **300** | **STR** | **FV** |  |
| Pole Structures | **-** | **-** | **TRA** | **200** | **TRA** | **300** | **CON** | **400** | **CON** | **FV** |  |

**MEA Table for HV Power Projects**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| PROJECT PHASE | CONCEPT  DESIGN | | PRELIM.  DESIGN | | DETAILED  DESIGN | | CONSTRUCTION | | HANDOVER | | COMMENTS |
| **Model Element** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** |  |
| **ENCLOSURE** |  |  |  |  |  |  |  |  |  |  |  |
| Roofing | **ARC** | **100** | **ARC** | **200** | **ARC** | **300** | **ARC** | **300** | **ARC** | **300** |  |
| Concrete Roofing | **ARC** | **100** | **STR** | **200** | **STR** | **300** | **STR** | **300** | **STR** | **300** |  |
| Cladding | **ARC** | **100** | **ARC** | **200** | **ARC** | **300** | **ARC** | **300** | **ARC** | **300** |  |
| Column Cladding | **ARC** | **100** | **ARC** | **200** | **ARC** | **300** | **ARC** | **300** | **ARC** | **300** |  |
| Curtain walls | **ARC** | **100** | **ARC** | **200** | **ARC** | **300** | **ARC** | **300** | **ARC** | **300** |  |
| Windows | **ARC** | **100** | **ARC** | **200** | **ARC** | **300** | **ARC** | **300** | **ARC** | **300** |  |
| External doors | **ARC** | **100** | **ARC** | **200** | **ARC** | **300** | **ARC** | **300** | **ARC** | **FV** |  |
| Penetrations – Non-Structural Elements | **ARC** | **100** | **ARC** | **200** | **ARC** | **300** | **ARC** | **300** | **ARC** | **FV** |  |

**MEA Table for HV Power Projects**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| PROJECT PHASE | CONCEPT  DESIGN | | PRELIM.  DESIGN | | DETAILED  DESIGN | | CONSTRUCTION | | HANDOVER | | COMMENTS |
| **Model Element** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** |  |
| **INTERIOR** |  |  |  |  |  |  |  |  |  |  |  |
| Partitions | **ARC** | **100** | **ARC** | **200** | **ARC** | **300** | **ARC** | **300** | **ARC** | **300** |  |
| Internal Doors | **ARC** | **100** | **ARC** | **200** | **ARC** | **300** | **ARC** | **300** | **ARC** | **FV** |  |
| Penetrations – Non-Structural Elements | **ARC** | **100** | **ARC** | **200** | **ARC** | **300** | **ARC** | **300** | **ARC** | **FV** |  |
| Penetrations – Load Bearing Walls | **ARC** | **100** | **STR** | **200** | **STR** | **300** | **STR** | **300** | **STR** | **FV** |  |
| Ceilings | **ARC** | **100** | **ARC** | **200** | **ARC** | **300** | **ARC** | **300** | **ARC** | **300** |  |
| Flooring | **ARC** | **100** | **ARC** | **200** | **ARC** | **300** | **ARC** | **300** | **ARC** | **300** |  |
| Balustrading | **ARC** | **100** | **ARC** | **200** | **ARC** | **300** | **ARC** | **300** | **ARC** | **300** |  |
| Casework, Joinery | **-** | **-** | **ARC** | **200** | **ARC** | **200** | **ARC** | **200** | **ARC** | **200** |  |
| Fixtures | **-** | **-** | **ARC** | **200** | **ARC** | **300** | **ARC** | **300** | **ARC** | **300** |  |
| Fittings | **-** | **-** | **ARC** | **200** | **ARC** | **300** | **ARC** | **300** | **ARC** | **300** |  |
| Furniture | **-** | **-** | **ARC** | **100** | **ARC** | **200** | **ARC** | **200** | **ARC** | **200** |  |
| Signage | **-** | **-** | **ARC** | **100** | **ARC** | **200** | **ARC** | **200** | **ARC** | **200** |  |

**MEA Table for HV Power Projects**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| PROJECT PHASE | CONCEPT  DESIGN | | PRELIM.  DESIGN | | DETAILED  DESIGN | | CONSTRUCTION | | HANDOVER | | COMMENTS |
| **Model Element** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** |  |
| **MECHANICAL** |  |  |  |  |  |  |  |  |  |  |  |
| Mechanical Plant | **-** | **-** | **MEC** | **200** | **MEC** | **200** | **CON** | **400** | **CON** | **FV** |  |
| Valves | **-** | **-** | **MEC** | **200** | **MEC** | **200** | **CON** | **400** | **CON** | **FV** |  |
| Actuators | **-** | **-** | **MEC** | **200** | **MEC** | **200** | **CON** | **400** | **CON** | **FV** |  |
| Pipe Fittings | **-** | **-** | **MEC** | **200** | **MEC** | **200** | **CON** | **400** | **CON** | **FV** |  |
| Pipe Supports | **-** | **-** | **MEC** | **200** | **MEC** | **300** | **CON** | **400** | **CON** | **FV** |  |
| Louvres | **-** | **-** | **MEC** | **200** | **MEC** | **200** | **CON** | **200** | **CON** | **200** |  |
| Ductwork | **-** | **-** | **MEC** | **200** | **MEC** | **300** | **CON** | **400** | **CON** | **FV** |  |
| Registers | **-** | **-** | **MEC** | **200** | **MEC** | **200** | **CON** | **400** | **CON** | **FV** |  |
| Pipework | **-** | **-** | **MEC** | **200** | **MEC** | **300** | **CON** | **400** | **CON** | **FV** |  |
| Controls | **-** | **-** | **MEC** | **200** | **MEC** | **200** | **CON** | **400** | **CON** | **FV** |  |
| **MECHANICAL** |  |  |  |  |  |  |  |  |  |  |  |
| Sanitary fixtures | **-** | **-** | **ARC** | **200** | **ARC** | **300** | **ARC** | **300** | **ARC** | **300** |  |
| Plant | **-** | **-** | **PLU** | **200** | **PLU** | **300** | **PLU** | **300** | **PLU** | **FV** |  |
| Equipment | **-** | **-** | **PLU** | **200** | **PLU** | **300** | **PLU** | **300** | **PLU** | **FV** |  |
| Pipework | **-** | **-** | **PLU** | **200** | **PLU** | **300** | **PLU** | **300** | **PLU** | **FV** |  |

5— Level of Development for Transport and Infrastructure

5.1 Model Element Author Schedule

The following table assigns responsibilities to Model Elements via an Author and defines the minimum required LOD for Model Elements across the project stages.

*Note: if there are two or more disciplines in the MEA Column, the first is the primary owner of the element and second/third is required to coordinate with the first.*

**Model Element Author Key for Transport and Infrastructure**

**MEA Table for Transport and Infrastructure Projects**

|  |  |  |  |
| --- | --- | --- | --- |
| Architectural Consultant | **ARC** | Three Waters Consultant | **TWA** |
| Civil Structural Consultant | **STR** | Geotechnical Consultant | **GEO** |
| Utilities Consultant | **UTI** | Landscape Architecture Consultant | **LSP** |
| Geometrics/Roading & Civil/Pavement consultant | **GMT** | Transport Consultant | **TRA** |
| Street Lighting Consultant | **SLI** | Contractor/Sub-contractor | **CON** |

5.2 Model Element Author & Level of Development Schedule

Spatial related elements such as site boundaries, grids, levels, zones, and spaces are not assigned an LOD because they aren’t technically elements that are modelled in 3 dimensions. There is a requirement to show them in the table below to make sure that they are assigned an MEA.

The LODs indicated below are a minimum requirement by the end of each of the design and construction phases noted, the design and/or construction team may choose to implement a higher LOD.

**LOD for Transport and Infrastructure**

|  |  |
| --- | --- |
| 100 | Conceptual |
| 200 | Approximate Geometry (partially  accurate) |
| 300 | Accurate Design Geometry |
| 350 | Actual Construction Geometry with Interface Coordination |
| 400 | Fabrication and Assembly with Supplementary Components |
| FV | Field verified |

**MEA Table for Transport and Infrastructure Projects**

5.3 MEA for Transport and Infrastructure Projects

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **PROJECT PHASE** | **CONCEPT**  **DESIGN** | | **PRELIM.**  **DESIGN** | | **DEVELOPED**  **DESIGN** | | **DETAILED**  **DESIGN** | | **CONSTRUCTION** | | **HANDOVER** | | **COMMENTS** |
| **Model Element** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** |  |
| **LANDSCAPING** |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Street furniture | **-** | **-** | **LSP** | **200** | **LSP** | **200** | **LSP** | **300** |  |  |  |  | 3D. Urban Design-related elements. Accurate Design  Geometry |
| Plantings | **-** | **-** | **LSP** | **200** | **LSP** | **200** | **LSP** | **200** |  |  |  |  | 3D. Approximate Geometry (partially accurate) |
| Existing Trees | **-** | **-** | **LSP** | **200** | **LSP** | **200** | **LSP** | **200** |  |  |  |  | 3D Approximate Geometry (partially accurate) |
| Street Trees | **-** | **-** | **LSP** | **200** | **LSP** | **200** | **LSP** | **300** |  |  |  |  | 3D. Accurate Design Geometry |
| Shelter Structure | **-** | **-** | **LSP** | **200** | **LSP** | **200** | **LSP** | **300** |  |  |  |  | 3D. Accurate Design Geometry |
| Fences | **-** | **-** | **LSP** | **200** | **LSP** | **200** | **LSP** | **300** |  |  |  |  | 3D. Accurate Design Geometry |
| Bus Driver Facility | **-** | **-** | **ARC** | **200** | **ARC** | **200** | **ARC** | **300** |  |  |  |  | 3D. Accurate Design Geometry |
| Shelter Structure | **-** | **-** | **ARC** | **200** | **ARC** | **200** | **ARC** | **300** |  |  |  |  | 3D. Accurate Design Geometry |
| Bus Stops | **-** | **-** | **ARC** | **200** | **ARC** | **200** | **ARC** | **300** |  |  |  |  | 3D. Accurate Design Geometry |

**MEA Table for Transport and Infrastructure Projects**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| PROJECT PHASE | CONCEPT  DESIGN | | PRELIM.  DESIGN | | DEVELOPED  DESIGN | | DETAILED  DESIGN | | CONSTRUCTION | | HANDOVER | | COMMENTS |
| **Model Element** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** |  |
| **GEOMETRICS** |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Existing Property Boundaries | **-** | **-** | **GMT** | **200** | **GMT** | **200** | **GMT** | **FV** | **-** | **-** |  |  | 3D. Approximate Geometry (partially accurate). |
| Proposed Designation Boundaries | **-** | **-** | **GMT** | **200** | **GMT** | **200** | **GMT** | **300** | **-** | **-** |  |  | 3D. Accurate Design Geometry |
| Edge & Median Concrete Barriers | **-** | **-** | **GMT** | **200** | **GMT** | **200** | **GMT** | **300** | **-** | **-** |  |  | 3D. Accurate Design Geometry |
| Barrier Transitions (incl. foundations) | **-** | **-** | **GMT** | **200** | **GMT** | **200** | **GMT** | **300** | **-** | **-** |  |  | 3D. Accurate Design Geometry |
| Ridged barriers | **-** | **-** | **GMT** | **200** | **GMT** | **200** | **GMT** | **300** | **-** | **-** |  |  | 3D. Accurate Design Geometry |
| Semi-Ridged barriers | **-** | **-** | **GMT** | **200** | **GMT** | **200** | **GMT** | **300** | **-** | **-** |  |  | 3D. Accurate Design Geometry |
| Kerbs | **-** | **-** | **GMT** | **200** | **GMT** | **200** | **GMT** | **300** | **-** | **-** |  |  | 3D. Accurate Design Geometry |
| Fencing | **-** | **-** | **GMT** | **200** | **GMT** | **200** | **GMT** | **300** | **-** | **-** |  |  | 3D. Accurate Design Geometry |
| Pavement Markings | **-** | **-** | **GMT** | **200** | **GMT** | **200** | **GMT** | **200** | **-** | **-** |  |  | 3D. Approximate Geometry |
| Accessways | **-** | **-** | **GMT** | **200** | **GMT** | **200** | **GMT** | **300** | **-** | **-** |  |  | 3D. Accurate Design Geometry |
| Existing Ground Surface | **-** | **-** | **GMT** | **200** | **GMT** | **200** | **GMT** | **200** | **-** | **-** |  |  | 3D. Approximate Geometry (partially accurate). |
| Road Surface Course (Finished Surface) including shoulders. | **-** | **-** | **GMT** | **200** | **GMT** | **200** | **GMT** | **300** | **-** | **-** |  |  | 3D. Accurate Design Geometry |
| Proposed Ground Surface | **-** | **-** | **GMT** | **200** | **GMT** | **200** | **GMT** | **300** | **-** | **-** |  |  | 3D. Accurate Design Geometry |
| Pathways (Finished Surface) | **-** | **-** | **GMT** | **200** | **GMT** | **200** | **GMT** | **300** | **-** | **-** |  |  | 3D. Accurate Design Geometry |
| Batters (Finished Surface) | **-** | **-** | **GMT** | **200** | **GMT** | **200** | **GMT** | **300** | **-** | **-** |  |  | 3D. Accurate Design Geometry |
| Treatment swale (Finished Surface) | **-** | **-** | **GMT** | **200** | **GMT** | **200** | **GMT** | **300** | **-** | **-** |  |  | 3D. Accurate Design Geometry |
| Conveyance swale (Finished Surface) | **-** | **-** | **GMT** | **200** | **GMT** | **200** | **GMT** | **300** | **-** | **-** |  |  | 3D. Accurate Design Geometry |
| Pavement drainage (Subsoil) | **-** | **-** | **GMT** | **200** | **GMT** | **200** | **GMT** | **300** | **-** | **-** |  |  | 3D. Accurate Design Geometry |

**MEA Table for Transport and Infrastructure Projects**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| PROJECT PHASE | CONCEPT  DESIGN | | PRELIM.  DESIGN | | DEVELOPED  DESIGN | | DETAILED  DESIGN | | CONSTRUCTION | | HANDOVER | | COMMENTS |
| **Model Element** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** |  |
| **GEOMETRICS** |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Embankments | **-** | **-** | **GMT** | **200** | **GMT** | **200** | **GMT** | **200** | **-** | **-** |  |  | 3D. Approximate Geometry (partially accurate) |
| Pavements | **-** | **-** | **GMT** | **200** | **GMT** | **200** | **GMT** | **300** | **-** | **-** |  |  | 3D. Accurate Design Geometry. Overall thickness will be modelled. |
| **SIGNALS AND SIGNAGE** |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Signages (Gantry) | **-** | **-** | **TRA** | **200** | **TRA** | **200** | **TRA** | **300** | **-** | **-** |  |  | 3D Accurate Design Geometry. |
| Signages (Regulatory, Guidance) | **-** | **-** | **TRA** | **200** | **TRA** | **200** | **TRA** | **300** | **-** | **-** |  |  | 3D. Accurate Design Geometry |
| Signage Foundations (Regulatory, Guidance, Gantry) | **-** | **-** | **TRA** | **200** | **TRA** | **200** | **TRA** | **200** | **-** | **-** |  |  | 3D. Approximate Geometry (partially accurate) |
| Traffic Signal Poles | **-** | **-** | **TRA** | **200** | **TRA** | **200** | **TRA** | **300** | **-** | **-** |  |  | 3D. Accurate Design Geometry |
| Traffic Signal Foundations | **-** | **-** | **TRA** | **200** | **TRA** | **200** | **TRA** | **200** | **-** | **-** |  |  | 3D. Approximate Geometry (partially accurate) |
| Traffic Signal Ducting | **-** | **-** | **TRA** | **200** | **TRA** | **200** | **TRA** | **300** | **-** | **-** |  |  | 3D. Accurate Design Geometry |
| Traffic Signal Pull Pit | **-** | **-** | **TRA** | **200** | **TRA** | **200** | **TRA** | **200** | **-** | **-** |  |  | 3D. Approximate Geometry (partially accurate) |
| Traffic Signal Controller | **-** | **-** | **TRA** | **200** | **TRA** | **200** | **TRA** | **200** | **-** | **-** |  |  | 3D. Approximate Geometry (partially accurate) |
| **LIGHTING** |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Lighting Poles | **-** | **-** | **SLI** | **200** | **SLI** | **200** | **SLI** | **300** | **-** | **-** |  |  | 3D. Accurate Design Geometry |
| Lighting Pole Foundations | **-** | **-** | **SLI** | **200** | **SLI** | **200** | **SLI** | **300** | **-** | **-** |  |  | 3D. Accurate Design Geometry |

**MEA Table for Transport and Infrastructure Projects**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| PROJECT PHASE | CONCEPT  DESIGN | | PRELIM.  DESIGN | | DEVELOPED  DESIGN | | DETAILED  DESIGN | | CONSTRUCTION | | HANDOVER | | COMMENTS |
| **Model Element** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** |  |
| **STRUCTURAL** | **-** | **-** |  |  |  |  |  |  |  |  |  |  |  |
| Foundations | **-** | **-** | **STR** | **200** | **STR** | **200** | **STR** | **300** | **-** | **-** |  |  | 3D. Accurate Design Geometry |
| Structural Concrete Steps | **-** | **-** | **STR** | **200** | **STR** | **200** | **STR** | **300** | **-** | **-** |  |  | 3D. Accurate Design Geometry |
| Concrete Reinforcements | **-** | **-** | **STR** | **100** | **STR** | **100** | **STR** | **100** | **-** | **-** |  |  | 3D. Accurate Design Geometry |
| Concrete Vehicle Barriers | **-** | **-** | **STR** | **200** | **STR** | **200** | **STR** | **300** | **-** | **-** |  |  | 3D. Accurate Design Geometry |
| Pedestrian Barriers | **-** | **-** | **STR** | **200** | **STR** | **200** | **STR** | **300** | **-** | **-** |  |  | 3D. Accurate Design Geometry |
| Handrails | **-** | **-** | **STR** | **200** | **STR** | **200** | **STR** | **300** | **-** | **-** |  |  | 3D. Accurate Design Geometry |
| Pilings | **-** | **-** | **STR** | **200** | **STR** | **200** | **STR** | **300** | **-** | **-** |  |  | 3D. Accurate Design Geometry. Depths of piles to be confirmed on site. |
| Permanent Steel Casings | **-** | **-** | **STR** | **200** | **STR** | **200** | **STR** | **300** | **-** | **-** |  |  | 3D. Accurate Design Geometry. Depths to be confirmed on site. |
| Pile Caps | **-** | **-** | **STR** | **200** | **STR** | **200** | **STR** | **300** | **-** | **-** |  |  | 3D. Accurate Design Geometry |
| Retaining Walls | **-** | **-** | **STR** | **200** | **STR** | **200** | **STR** | **300** | **-** | **-** |  |  | 3D. Accurate Design Geometry |
| King Post Retaining Walls and Anchors | **-** | **-** | **STR** | **200** | **STR** | **200** | **STR** | **300** | **-** | **-** |  |  | 3D. Accurate Design Geometry |
| Gabion Walls | **-** | **-** | **STR** | **200** | **STR** | **200** | **STR** | **300** | **-** | **-** |  |  | 3D. Accurate Design Geometry |
| Cantilevered ‘L’ Shaped Walls | **-** | **-** | **STR** | **200** | **STR** | **200** | **STR** | **300** | **-** | **-** |  |  | 3D. Accurate Design Geometry |
| Soil Nail stabilised Wall | **-** | **-** | **STR** | **200** | **STR** | **200** | **STR** | **300** | **-** | **-** |  |  | 3D. Accurate Design Geometry |
| Facing Panels | **-** | **-** | **STR** | **200** | **STR** | **200** | **STR** | **300** | **-** | **-** |  |  | 3D. Accurate Design Geometry |
| Beams | **-** | **-** | **STR** | **200** | **STR** | **200** | **STR** | **300** | **-** | **-** |  |  | 3D. Accurate Design Geometry |

**MEA Table for Transport and Infrastructure Projects**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| PROJECT PHASE | CONCEPT  DESIGN | | PRELIM.  DESIGN | | DEVELOPED  DESIGN | | DETAILED  DESIGN | | CONSTRUCTION | | HANDOVER | | COMMENTS |
| **Model Element** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** |  |
| **STRUCTURAL** | **-** | **-** |  |  |  |  |  |  |  |  |  |  |  |
| Trusses (For sign gantry) | **-** | **-** | **STR** | **200** | **STR** | **200** | **STR** | **300** | **-** | **-** |  |  | 3D. Accurate Design Geometry |
| Penetrations in permanent structural elements | **-** | **-** | **STR** | **200** | **STR** | **200** | **STR** | **300** | **-** | **-** |  |  | Accurate Design Geometry. Penetrations in 3D design elements will be modelled accurately for design coordination purposes. Actual location of penetrations to be confirmed on site |
| Bracings | **-** | **-** | **STR** | **200** | **STR** | **200** | **STR** | **200** | **-** | **-** |  |  | 3D. Approximate Geometry (partially accurate) |
| Ramps | **-** | **-** | **STR** | **200** | **STR** | **200** | **STR** | **300** | **-** | **-** |  |  | 3D. Accurate Design Geometry |
| Columns | **-** | **-** | **STR** | **200** | **STR** | **200** | **STR** | **300** | **-** | **-** |  |  | 3D. Accurate Design Geometry |

**MEA Table for Transport and Infrastructure Projects**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| PROJECT PHASE | CONCEPT  DESIGN | | PRELIM.  DESIGN | | DEVELOPED  DESIGN | | DETAILED  DESIGN | | CONSTRUCTION | | HANDOVER | | COMMENTS |
| **Model Element** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** |  |
| **THREE WATERS (POTABLE, WASTE AND STORM)** |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Existing Three Water Elements (Applicable Areas) | **-** | **-** | **TWA** | **200** | **TWA** | **200** | **TWA** | **200** | **-** | **-** |  |  | 3D. Approximate Geometry (partially accurate). Locations to be confirmed on site by construction teams |
| Three Water Pipework | **-** | **-** | **TWA** | **200** | **TWA** | **200** | **TWA** | **300** | **-** | **-** |  |  | 3D. Accurate Design Geometry |
| Culverts | **-** | **-** | **TWA** | **200** | **TWA** | **200** | **TWA** | **300** | **-** | **-** |  |  | 3D. Accurate Design Geometry |
| Bioretention Basins | **-** | **-** | **TWA** | **200** | **TWA** | **200** | **TWA** | **300** | **-** | **-** |  |  | 3D. Accurate Design Geometry |
| Stormwater Treatment Filters | **-** | **-** | **TWA** | **200** | **TWA** | **200** | **TWA** | **300** | **-** | **-** |  |  | 3D. Accurate Design Geometry |
| Manholes | **-** | **-** | **TWA** | **200** | **TWA** | **200** | **TWA** | **300** | **-** | **-** |  |  | 3D. Accurate Design Geometry |
| Scruffy Domes | **-** | **-** | **TWA** | **200** | **TWA** | **200** | **TWA** | **300** | **-** | **-** |  |  | 3D. Accurate Design Geometry |
| Catchpits | **-** | **-** | **TWA** | **200** | **TWA** | **200** | **TWA** | **300** | **-** | **-** |  |  | 3D. Accurate Design Geometry |
| Soak Pits | **-** | **-** | **TWA** | **200** | **TWA** | **200** | **TWA** | **300** | **-** | **-** |  |  | 3D. Accurate Design Geometry |
| Cut off Drains | **-** | **-** | **TWA** | **200** | **TWA** | **200** | **TWA** | **300** | **-** | **-** |  |  | 3D. Accurate Design Geometry |
| Rock Riprap (scour protection) | **-** | **-** | **TWA** | **200** | **TWA** | **200** | **TWA** | **100** | **-** | **-** |  |  | 3D. Accurate Design Geometry |
| Valves | **-** | **-** | **TWA** | **200** | **TWA** | **200** | **TWA** | **200** | **-** | **-** |  |  | 3D. Accurate Design Geometry |
| Hydrants | **-** | **-** | **TWA** | **200** | **TWA** | **200** | **TWA** | **200** | **-** | **-** |  |  | 3D. Accurate Design Geometry |
| Thrust Blocks | **-** | **-** | **TWA** | **200** | **TWA** | **200** | **TWA** | **200** | **-** | **-** |  |  | 3D. Accurate Design Geometry |
| Outfall Structure | **-** | **-** | **TWA** | **200** | **TWA** | **200** | **TWA** | **200** | **-** | **-** |  |  | 3D. Accurate Design Geometry |

**MEA Table for Transport and Infrastructure Projects**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| PROJECT PHASE | CONCEPT  DESIGN | | PRELIM.  DESIGN | | DEVELOPED  DESIGN | | DETAILED  DESIGN | | CONSTRUCTION | | HANDOVER | | COMMENTS |
| **Model Element** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** | **MEA** | **LOD** |  |
| **GEOTECH** |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Structural Fill | **-** | **-** | **GEO** | **200** | **GEO** | **200** | **GEO** | **200** | **-** | **-** |  |  | 3D. Approximate Geometry (partially accurate) |
| Landscape Fill | **-** | **-** | **GEO** | **200** | **GEO** | **200** | **GEO** | **200** | **-** | **-** |  |  | 3D. Approximate Geometry (partially accurate) |
| Subsoil Drains | **-** | **-** | **GEO** | **200** | **GEO** | **200** | **GEO** | **200** | **-** | **-** |  |  | 3D. Approximate Geometry (partially accurate) |
| Geotextiles | **-** | **-** | **GEO** | **200** | **GEO** | **200** | **GEO** | **200** | **-** | **-** |  |  | 3D. Approximate Geometry (partially accurate) |
| **UTILITIES** |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Existing Utilities (Applicable Assets) | **-** | **-** | **UTI** | **200** | **UTI** | **200** | **UTI** | **200** | **-** | **-** |  |  | 3D. Approximate Geometry (partially accurate). Locations to be confirmed on site by CON |
| Cables | **-** | **-** | **UTI** | **200** | **UTI** | **200** | **UTI** | **200** | **-** | **-** |  |  | 3D. Accurate Design Geometry |
| Ducts | **-** | **-** | **UTI** | **200** | **UTI** | **200** | **UTI** | **200** | **-** | **-** |  |  | 3D. Accurate Design Geometry |
| Transformers | **-** | **-** | **UTI** | **200** | **UTI** | **200** | **UTI** | **200** | **-** | **-** |  |  | 3D. Accurate Design Geometry |
| Gas Valves | **-** | **-** | **UTI** | **200** | **UTI** | **200** | **UTI** | **200** | **-** | **-** |  |  | 3D. Accurate Design Geometry |
| Pits/Chambers | **-** | **-** | **UTI** | **200** | **UTI** | **200** | **UTI** | **200** | **-** | **-** |  |  | 3D. Accurate Design Geometry |
| Switch | **-** | **-** | **UTI** | **200** | **UTI** | **200** | **UTI** | **200** | **-** | **-** |  |  | 3D. Accurate Design Geometry |

[A screenshot of a computer

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