CONSTRUCTION INDUSTRY COUNCIL
建造業議會

BIM

Appendix 3

CIC BIM User Guide for Preparation of Statutory Plan Submissions

Revit

December 2020

Disclaimer

Whilst reasonable efforts have been made to ensure the accuracy of the information contained in this publication (Reference Materials), the CIC nevertheless encourages readers to seek appropriate independent advice from their professional advisers where possible. Readers should not treat or rely on this publication (Reference Materials) as a substitute for such professional advice.

Enquiries

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Preface

The Construction Industry Council (CIC) is committed to seeking continuous improvement in all aspects of the construction industry in Hong Kong. To achieve this aim, the CIC forms Committees, Task Forces and other forums to review specific areas of work with the intention of producing Alerts, Reference Materials, Guidelines and Codes of Conduct to assist participants in the industry to strive for excellence.
The CIC appreciates that some improvements and practices can be implemented immediately whilst others may take more time for implementation. It is for this reason that four separate categories of publication have been adopted, the purposes of which are as follows:

Alerts	The Alerts are reminders in the form of brief leaflets produced quickly to draw the immediate attention of relevant stakeholders to the need to follow some good practices or to implement some preventive measures in relation to the construction industry.
Reference Materials	The Reference Materials are standards or methodologies generally adopted and regarded by the industry as good practices. The CIC recommends the adoption of the Reference Materials by industry stakeholders where appropriate.
Guidelines	The Guidelines provide information and guidance on particular topics relevant to the construction industry. The CIC expects all industry stakeholders to adopt the recommendations set out in the Guidelines where applicable.
Codes of Conduct	The Codes of Conduct set out the principles that all relevant industry participants should follow. Under the Construction Industry Council (Cap 587), the CIC is tasked to formulate codes of conduct and enforce such codes. The CIC may take necessary actions to ensure compliance with the codes.

If you have read this publication, we encourage you to share your feedback with us. Please take a moment to fill out the Feedback Form attached to this publication in order that we can further enhance it for the benefit of all concerned. With our joint efforts, we believe our construction industry will develop further and will continue to prosper for years to come.

Foreword

I am glad to see the release of **CIC BIM User Guide for Preparation of Statutory Plan Submissions Revit (December 2020)**. This software specific user guide shall be read in conjunction with the **CIC BIM Standards for Preparation of Statutory Plan Submissions (December 2020)**.

This software specific user guide is only provided to demonstrate the feasibility of drawings generation with the Standards.

With the software specific user guides which contains step by step procedures of modelling, BIM users can easily apply the templates for the generation of statutory plan submission drawings.

Feedback on the CIC BIM User Guide for Preparation of Statutory Plan Submissions Revit (December 2020) from practitioners subsequent to the issuance of this publication will be considered in future revisions.

On behalf of the CIC, I would like to thank everyone who has contributed to producing this CIC BIM User Guide for Preparation of Statutory Plan Submissions Revit (December 2020), in particular to the members of the Task Force on BIM Standards.

Ar. Ada FUNG, BBS

Chairperson

Committee on Building Information Modelling

Construction Industry Council

December 2020

1 Hardware / System Requirements

1.1 General

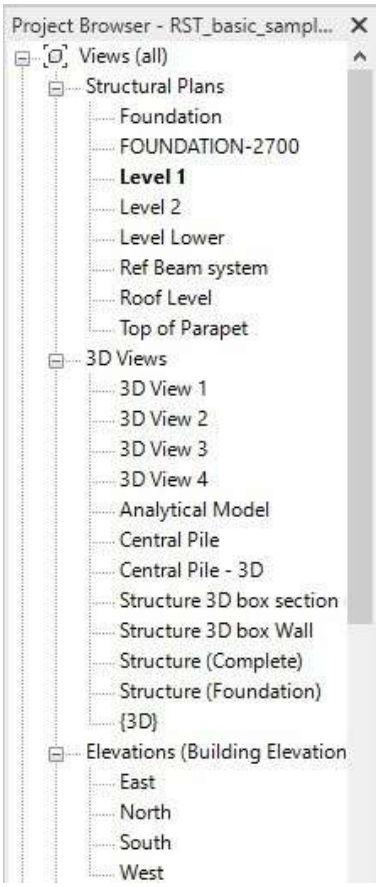
Hardware / system requirement for modellings, coordination and visualisation on desktop/notebook computers and mobile devices should be determined by the BIM managers for different projects on a case by case basis. The minimum requirement varies for different applications, project sizes and operating systems.

https://www.autodesk.com/collections/architecture-engineering-construction/included- software

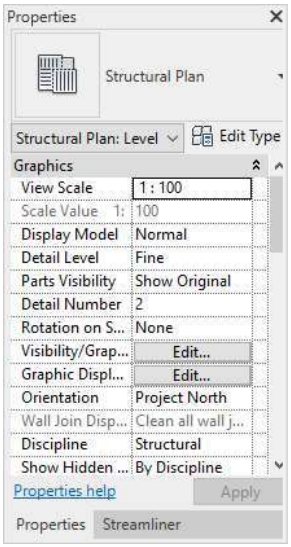
2 Revit Basics

2.1 User Interface

- Open a project or family or create either one from a template to get started. The user interface provides the tools need to work in a model. The user interface can customise the interface to support the way for different works.
- Project Browser: organise the views, schedules, and sheets of the current project.



- Properties palette: modify properties of select elements.



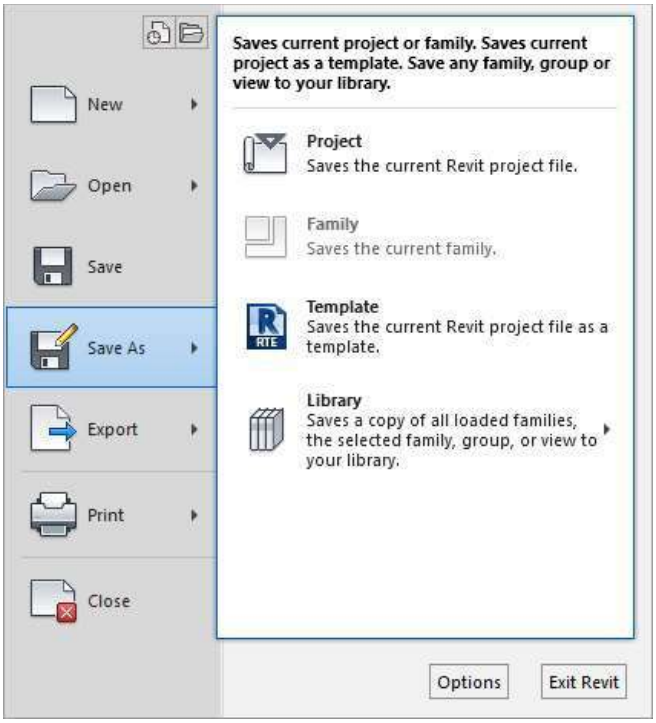
- Ribbon: select the tools need to design the building model.

- View Control Bar: provide options for changing the view display, including scale or visual style.

2.2 Difference of RVT, RTE, RFA files

It will eventually become necessary to save our work and share our progress with others in the model. RTEs are project template file. RVTs are working project files. Both files can be generated from Revit® projects. The difference is that the template is used when you start a new project.

RFAs are family files that can either be loaded into a project or saved externally.



2.3 Types of Family (system families, loadable families, in place family)

A group of elements with common parameters and graphical representation call family. There are three types of families in the model, system families, loadable families and in-place families.

System Families

System families are basic elements to assembly on a construction site. It can be predefined in the model, for example: wall, ceiling, beam and duct.

Loadable Families

Loadable families are families used to create non-standard or customised components such as windows, furniture, pump and chiller. It includes customisation of annotation elements, such as symbols and title blocks.

In-Place Families

In-place elements are unique elements for a specific project. It can be created in-place geometry or import to other projects to resize the shape.

2.4 Categories and Types

Category assigns the properties of a predefined family category to the component.

Types define components that apply across all types in that family.

2.5 Project base point, Grid, Levels and Work Planes

Project base point defines the origin (0,0,0) of the project coordinate system initially. Location of point can be determined by the team as a reference point. It can be used to establish a reference for measuring distances and positioning objects in relation to the model and used to position the building on site.

Gridline, annotation element help to determine whether gridlines appear in each plan view that you create for a project.

Level can act as a reference for level-based elements for story or reference plane within a building. In a section view or elevation view, it can add a level line in a model and create an associated plan view.

Work plane defines a virtual 2-dimensional surface used as the origin for viewing or for sketching in the model. It can create on Architecture / Structure / System tab.

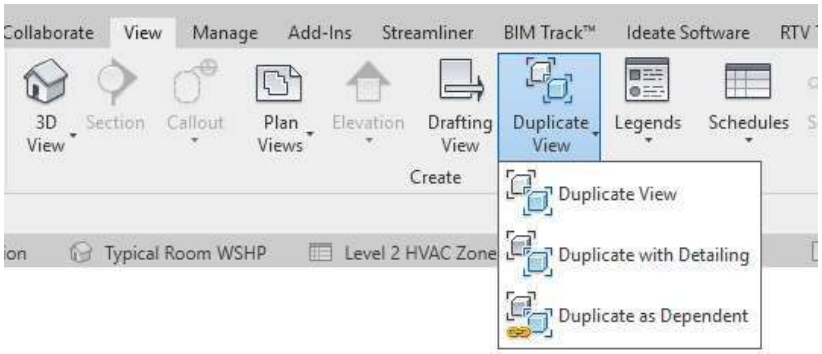
2.6 Suggested Model Nesting Method

When you import a model that contains a linked model, links become nested. Nested linked models can be shown or hid in the host model. The nested links display according to Reference Type setting in the host model.

1. Overlay - unload nested models into the host model, do not display in the project
2. Attachment - load nested linked models in the host model, displays in the project

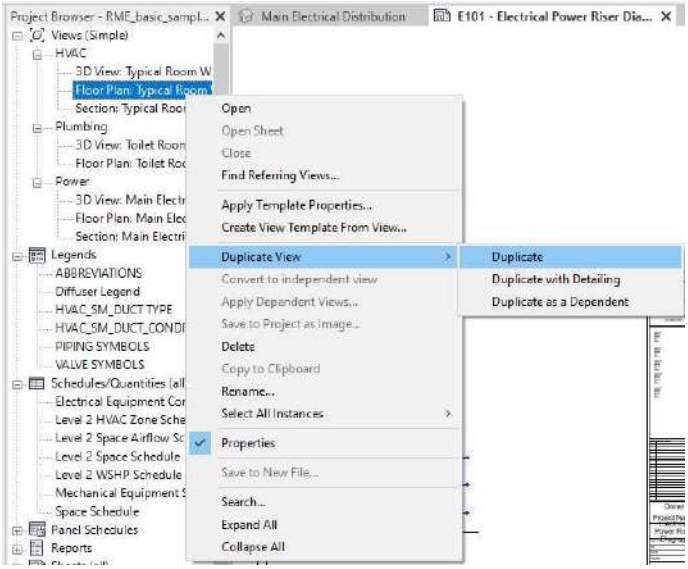
2.7 2D Views and Sheets

2D views are oriented to specific coordinates such as plan, elevation and section. Schedule and details are another way of viewing information in neither 2D nor 3D. A new view can be generated from the Create panel on



View tab of the ribbon.

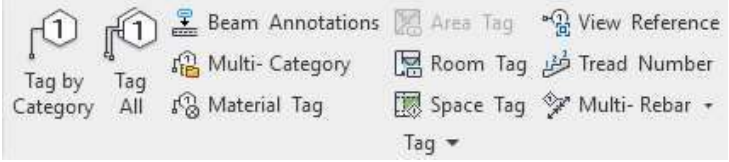
Or you can right-click a view name in Project browser and select one of the Duplicate View commends.



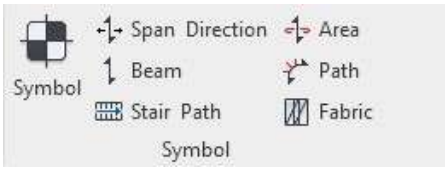
After creating a model in Revit, you can print the sheets by creating viewport for collecting documents. A sheet set consists of many sheets. Layout, elevation, section, schematic, details, schedule, legend etc. can be included in the sheet set.

2.8 Tag, Symbols and Dimensions

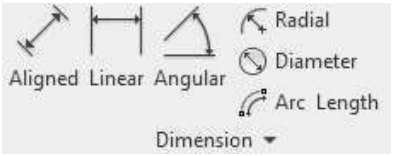
Tag is an annotation (text label) to identify elements in a drawing. Tag is intelligent, bi-directional graphics that report information stored in an object's properties. Once you have tagged an element and entered a value in the tag, the tagged element will retain that value until you remove it.



The symbol is a graphic representation of an annotation or other object.



Dimensions are used to convey the distance or angle between elements or part of elements. It is a bi-directional annotation that you can edit the distance directly within the dimension string to move elements a specific distance apart and updates automatically. There are permanent dimension and temporary dimension can be used in the model.



2.9 Different Parameters

All contents in the model have parameters, which are simply the information or data about the objects/ items.

Parameters that you create display in the Properties palette or Type Properties dialogue under the group you define and with the values you define.

Project Parameters - specific to a single project file and cannot share with other projects. They are added to elements by assigning them to multiple categories of elements, sheets, or views. It can be used for sorting, scheduling, and filtering.

Family Parameters - control variable values of the family, such as materials. It is specific to the family.

Shared Parameters - can be used in multiple families or projects. After you add a shared parameter definition to a family or project, you can use it as a family or project parameter. Because the definition of a shared parameter is stored in a separate file, it is protected from change. So, it can be tagged and scheduled.

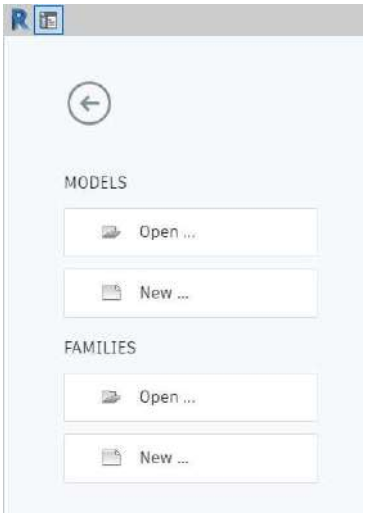
Global Parameters - specific to a single project file but are not assigned to categories. It can be simple values, values derived from equations, or values taken from the model using other global parameters.

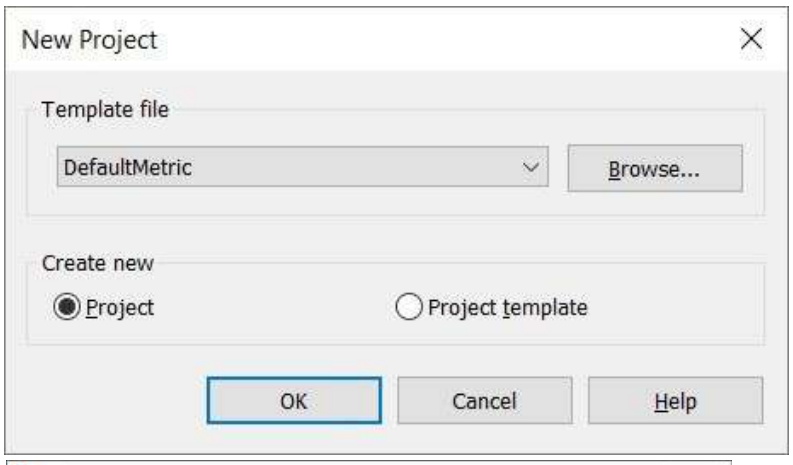
3 Getting Start

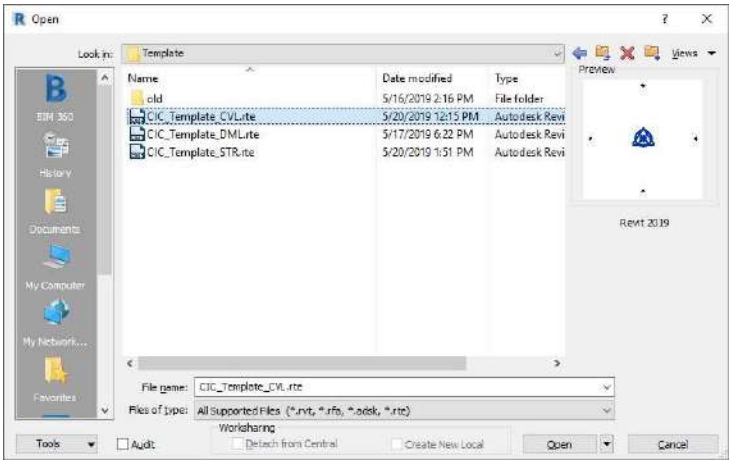
In this chapter, it covers how to configure and manage standards through the development and use of a project template. This template can be rich with information that goes beyond the out of box content that Revit provides. The template setting is established and content as well as explain how the reuse of work will increase productivity and standardise with each project for Building Department submission.

1. Open a new project in Revit by the following steps:

Open Revit ➔ click “New” button ➔ click “Browse” in New Project browser to open template (CIC_Template_STR.rte for Superstructure Plans; CIC_Template_DML.rte for Demolition Plan; CIC_Template_CVL.rte for Hoarding Plan) ➔ click “OK”

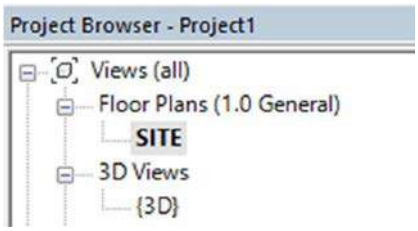




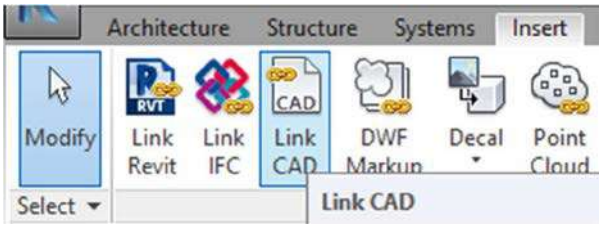


2. Create Site Boundary

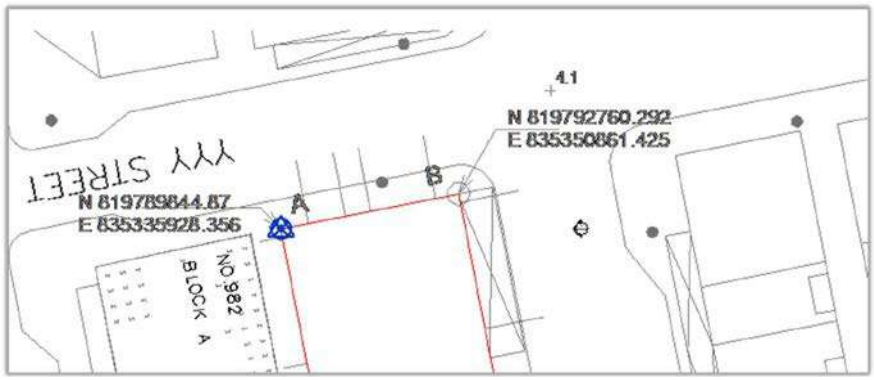
In the project browser, click “Site” plan under the Structural Plan of View.



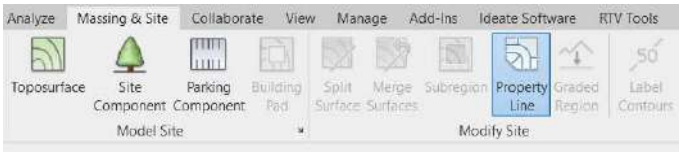
Insert CAD drawing of block plan to the view, click “Insert” ➔ “Link CAD”



Move the CAD link towards the location of the project base point such that point A of the site boundary and the project base point is overlapped.

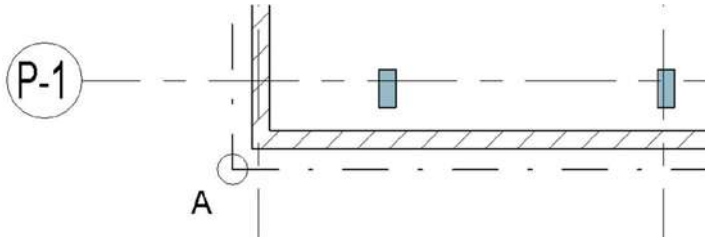


Open a structural plan in Revit, click “Massing & Site” ➔ “Modify Site” ➔ “Property Line” to add property line.



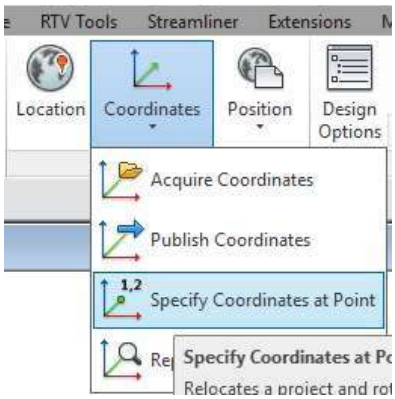
Add site boundary symbol in plan view (Refer to section 7.1.4 Add annotation symbol)

Category	Family	Type
Generic Annotation	ANN-GNN-CIC-Site_Boundary_Mark	/

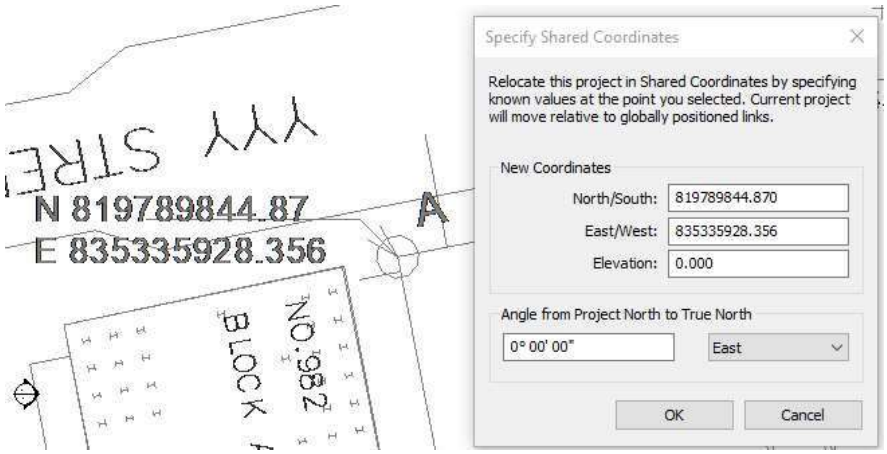


3. Set the project base point (for civil model only):

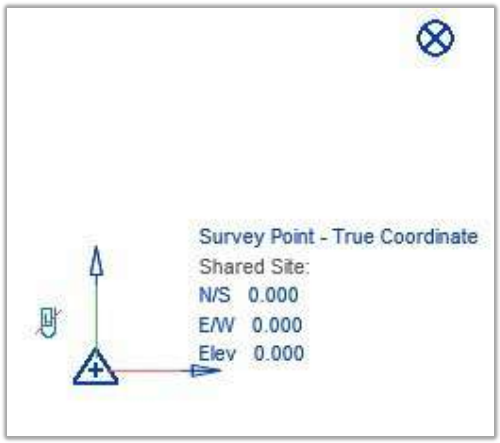
Inside Site Plan ➔ Click “Manage” in ribbon ➔ “Project Location” ➔” Coordinates”➔ click “Specify Coordinates at Point”.



Select one of the site boundary points. In the dialogue box, type the true coordination of the point.



In the same view, select the survey point, click the clip to change its state to unclipped.



Move the survey point towards the project base point so that they are overlapped. Then click the clip to change its state to clipped.

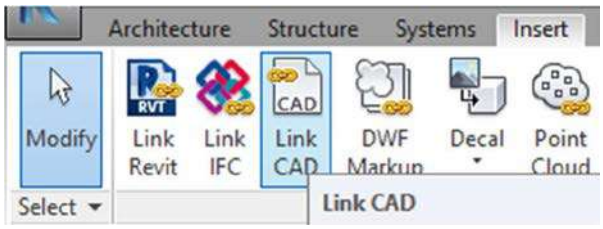
4. Create a grid and level

Open a structural plan in Revit, click “Architecture” ➔ “Datum” to create a grid in the model according to a specific design.

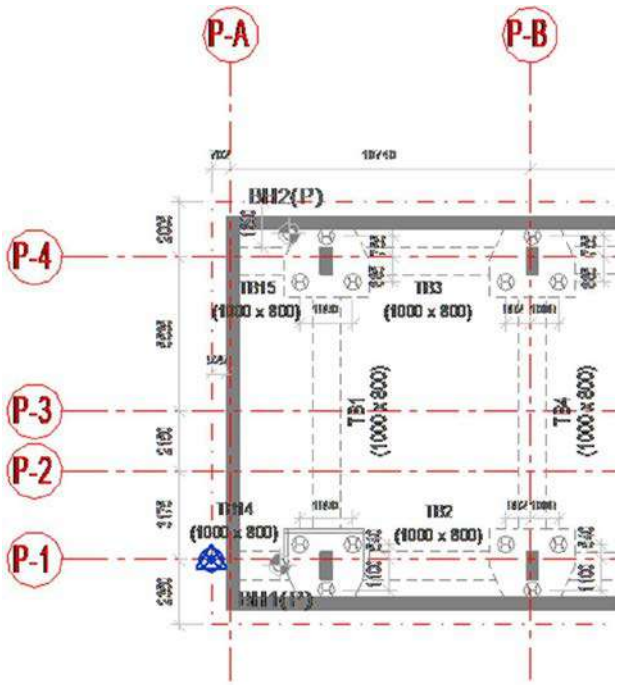
Open an elevation in Revit, click “Architecture” ➔ “Datum” to create a level in the model according to a specific design.

5. Acquire a shared coordinate system from the civil model (for structure and demolition models only)

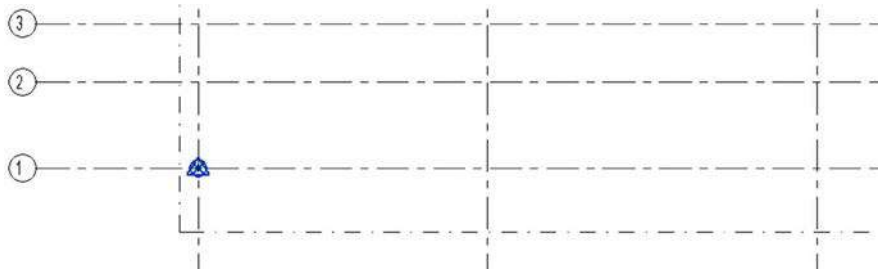
In the project browser, open Level 0 plan under Structural Plan of View. Insert CAD drawing of block plan to the view, click “Insert” ➔ “Link CAD”



Move the CAD link towards the location of the project base point such that the intersection of Grid A and Grid 1 is placed in the project base point.

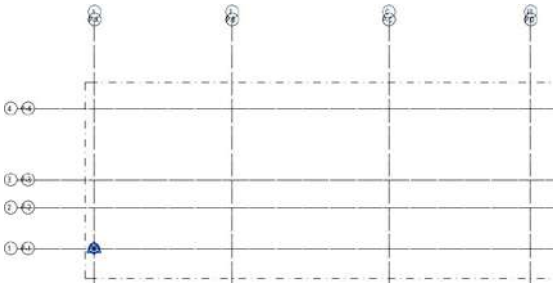


Create grids and site boundary.

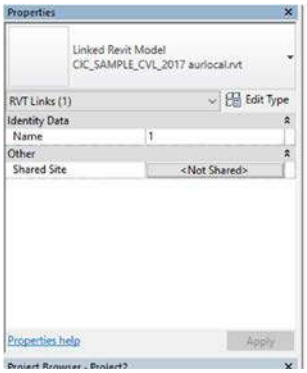


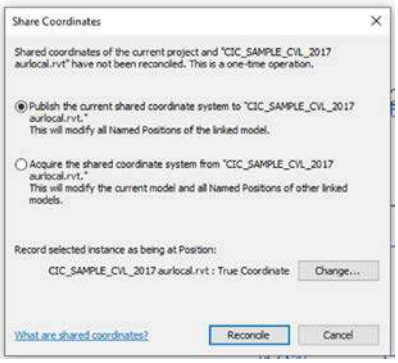
Link civil model file to the view, click “Insert” ➜ “Link Revit”

Move and rotate the civil model so that their site boundary and grids are overlapped.

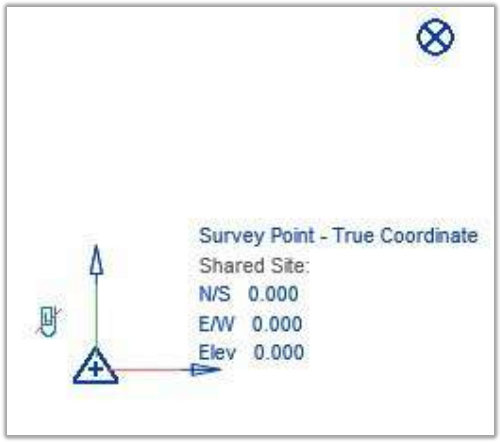


Select the civil model, in the properties panel, click “Not Shared” in “Shared Site” ➜ select “Acquire the shared coordinate system form xxx.rvt” -> click “Reconcile”.





Select the survey point, click the clip to change its state to unclipped.



Move the survey point towards the project base point so that they are overlapped. Then click the clip to change its state to clipped.

Save the project.

4 Creating Model Objects

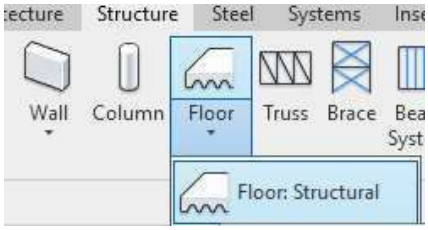
4.1 Superstructure

The following objects will be modelled in the structural plan:

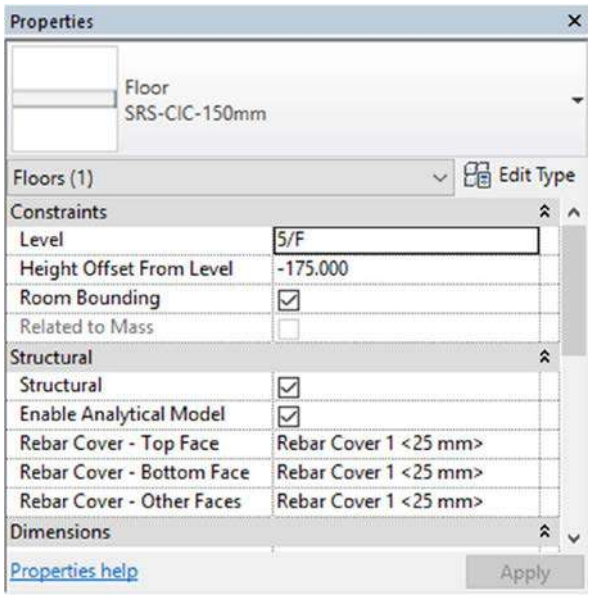
- Slab
- Column
- Wall
- Beam
- Lift Shaft
- Staircase
- Water Tank
- Reinforcement

4.1.1 Create a Slab

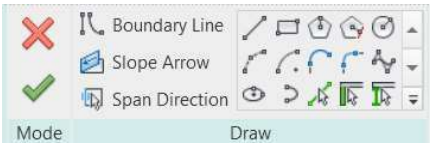
Open a structural plan in Revit → Click “Structure” in ribbon → click “Floor” → click “Floor: Structural”

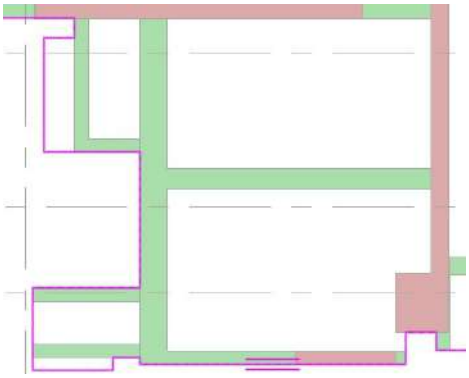


In the properties panel, you may choose the specific types of the slab from floor family or create by your own. Adjust the value for “Height Offset From Level”.

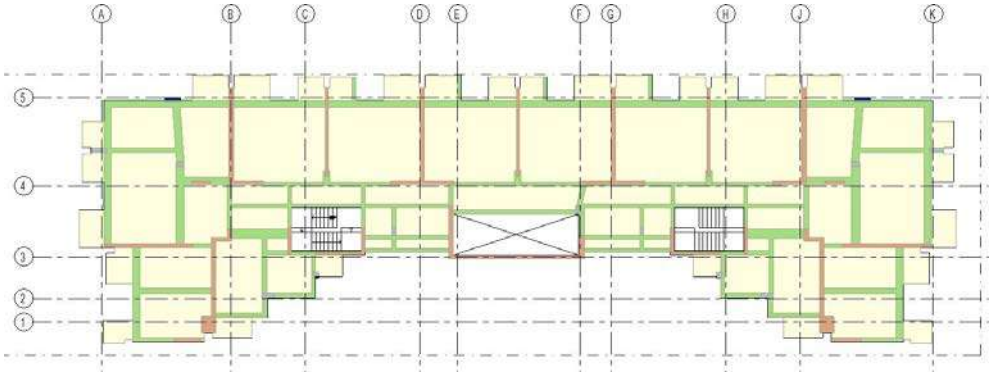


Create the slab by drawing boundary line ➜ select “Span Direction” ➜ click “tick”.



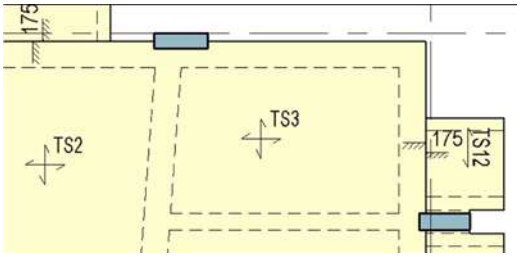


Repeat the above steps.



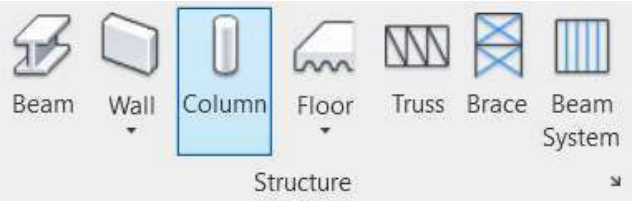
Add level difference symbol and span direction symbol in plan view (Refer to section 7.1.4 Add annotation symbol)

Category	Family	Type
Generic Annotation	ANN-GNN-CIC-Level_Difference	/
Generic Annotation	ANN-GNN-CIC-Span_Direction	Two Way Slab - 2.5mm One Way Slab - 2.5mm Cantilever Slab - 2.5mm

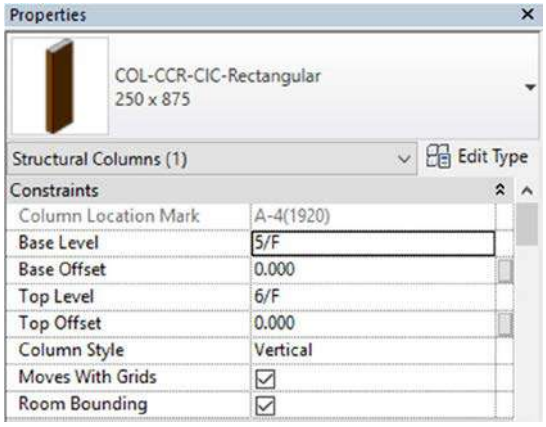


4.1.2 Create Column

Open a structural plan in Revit ➔ Click “Structure” in ribbon ➔ click “Column”.



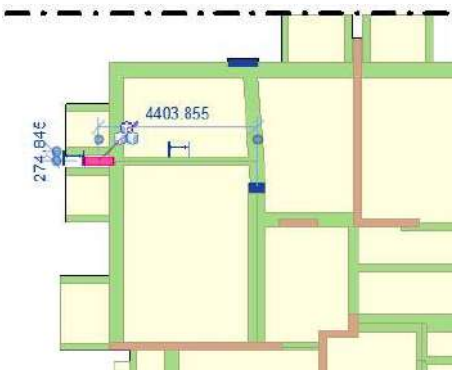
In the properties panel, you may choose the specific types of the column from column family or create by your own. Adjust the value for “Base Level”, “Base Offset”, “Top Level” and “Top Offset”.



In the properties panel, type column mark in “Mark” of identity data. For example, C1A was typed for column mark in this case. ➔ Place the column into designed location.

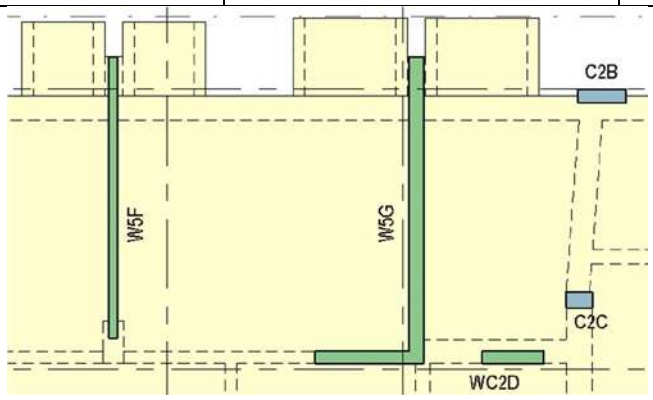
Identity Data	
Image	
Comments	
Mark	C1A
Fire Designation	
Workset	Superstructure
Edited by	

Repeat the above steps.



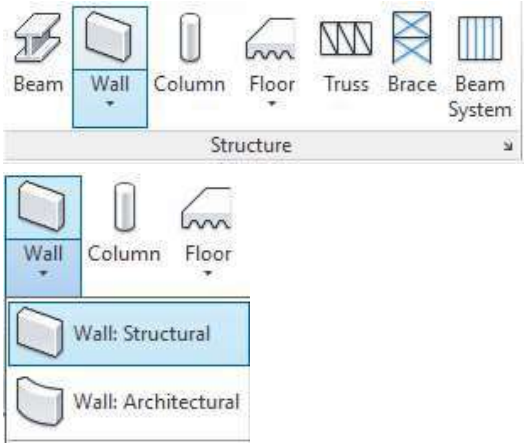
Add Tag in plan view (Refer to section 7.1.2 Add Tags – Tag by Category)

Category	Family	Type
Structural Column	ANN-SCG-CIC	Mark

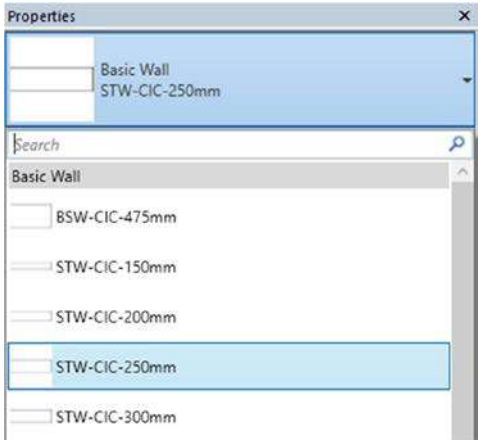


4.1.3 Create Wall

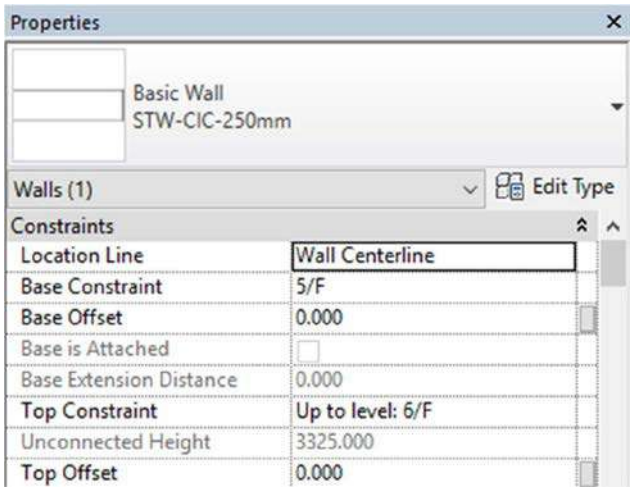
Open a structural plan in Revit ➔ Click “Architecture” in the ribbon ➔ “Build” ➔ click “Wall” ➔ click “Wall: Structural”.



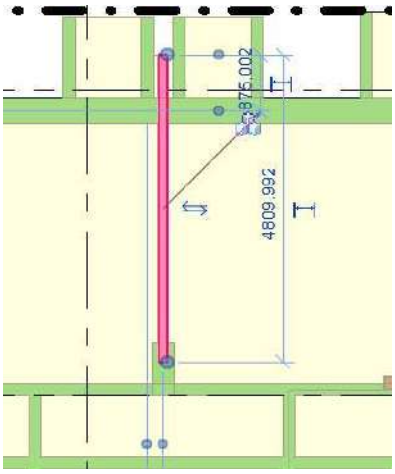
In the properties panel, you may choose the specific types of the wall from column family or create by your own.



In the properties panel, place the wall by setting base constraint and top constraint to demonstrate the floor extension of the wall. Adjust the value for “Base Constraint”, “Base Offset”, “Top Constraint” and “Top Offset”.



Drag the wall from the start point to endpoint.

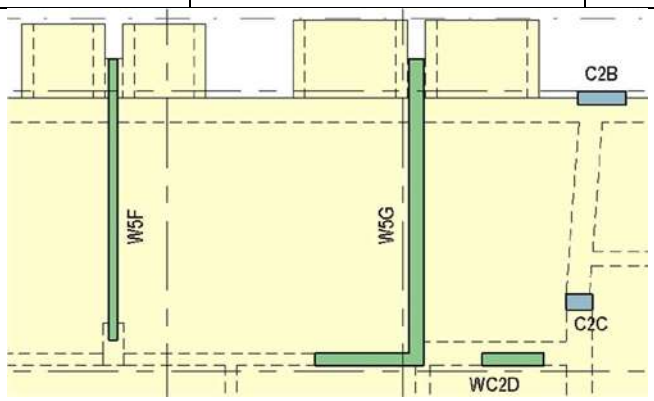


In the properties panel, type wall mark in “Mark” of identity data. For example, W5B was typed for wall mark in this case.

Identity Data	
Image	
Comments	
Mark	W5B
Fire Designation	
Workset	Superstructure
Edited by	

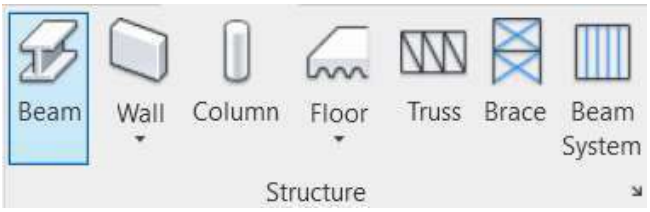
Add Tag in plan view (Refer to section 7.1.2 Add Tags – Tag by Category)

Category	Family	Type
Wall	ANN-WLG-CIC	Mark Type Mark

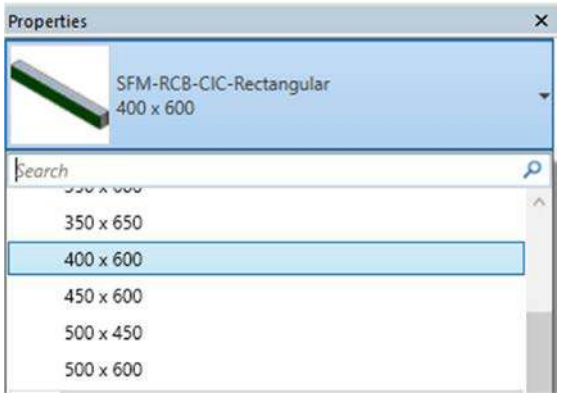


4.1.4 Create Beam

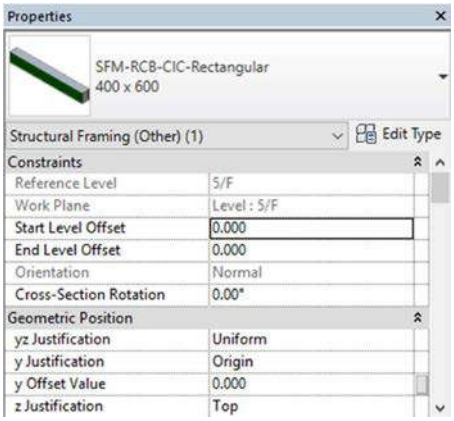
Open a structural plan in Revit ➔ Click “Structure” in ribbon ➔ click “Structure” ➔ click “Beam”



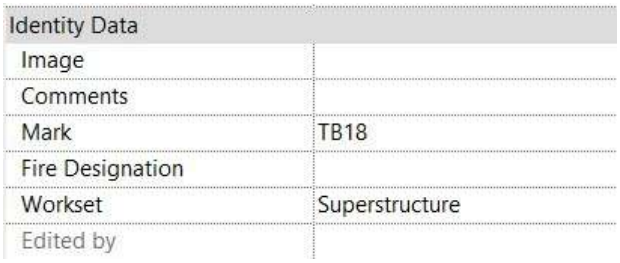
In the properties panel, you may choose the specific types of the beam from beam family or create by your own.



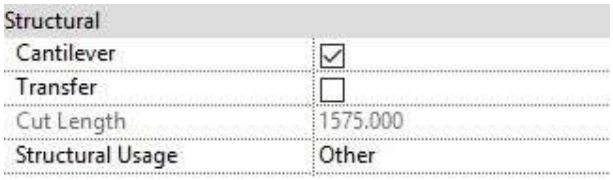
Create the slab by drawing start point and endpoint ➔ Enter the value for “Start Level Offset” and “End Level Offset” or “Z Offset Value” for beam or inverted beam in the constraint of properties.



In the properties panel, add beam mark in “Mark” of identity data. For example, TB18 was typed for beam mark in this case.

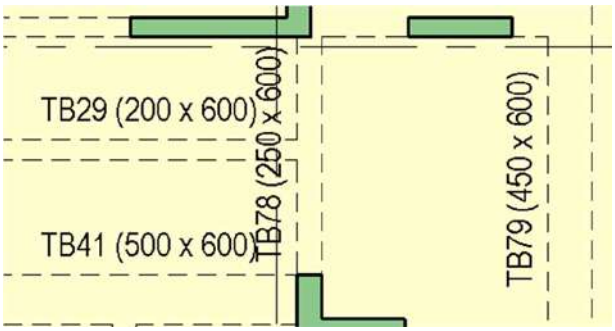


In Structural group, tick the property “Cantilever” or “Transfer” to identify the specific beam.



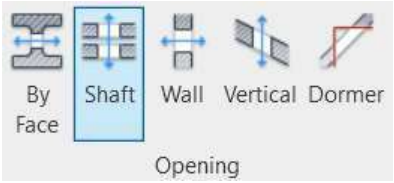
Add Tag in plan view (Refer to section 7.1.2 Add Tags – Tag by Category)

Category	Family	Type
Structural Framing	ANN-FRG-CIC-Rectangular	Standard

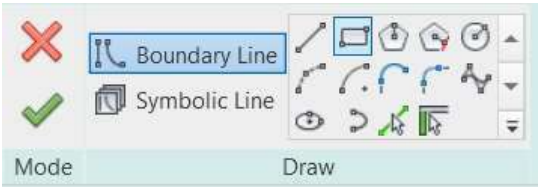


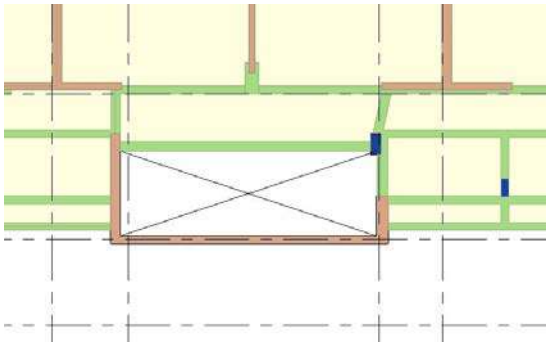
4.1.5 Create Lift Shaft

Open a structural plan in Revit ➜ Click “Structure” in ribbon ➜ click “Opening” ➜ click “Shaft”

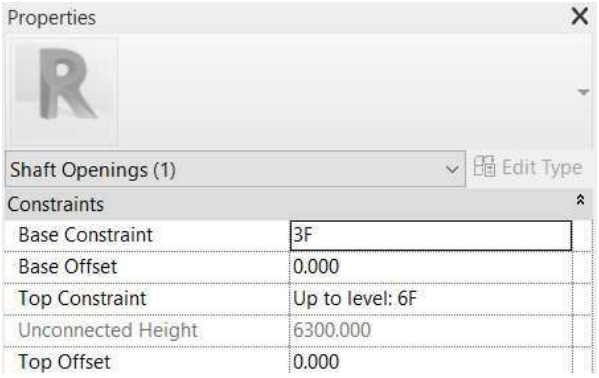


Create the shaft by drawing boundary line / using detail line on plan ➜ click “symbolic line” to create cross indication for shaft ➜ click “tick”.





In the properties panel, enter the value for base constraint, base offset, top constrain and top offset to control the shaft location and level.

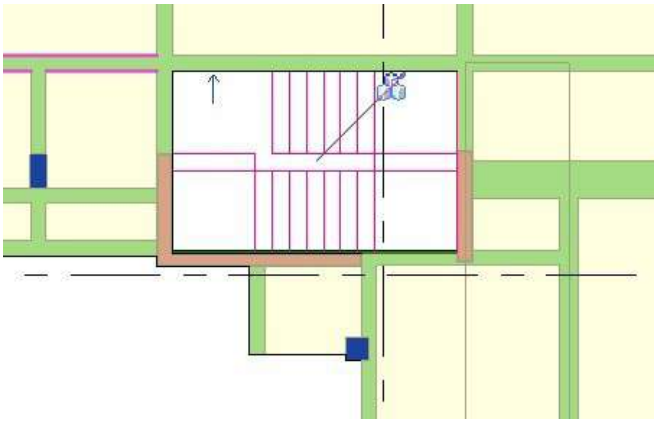


4.1.6 Create a Staircase

Open a structural plan in Revit ➜ Click “Architecture” in ribbon ➜ “Circulation” ➜ click “Stair”

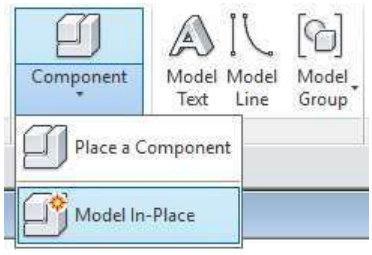
Click “Run” ➔ Create the staircase by drawing start point to endpoint, and landing on plan ➔ click “tick”.

In the properties panel, use the base level, top-level and offset to control the staircase location and level.



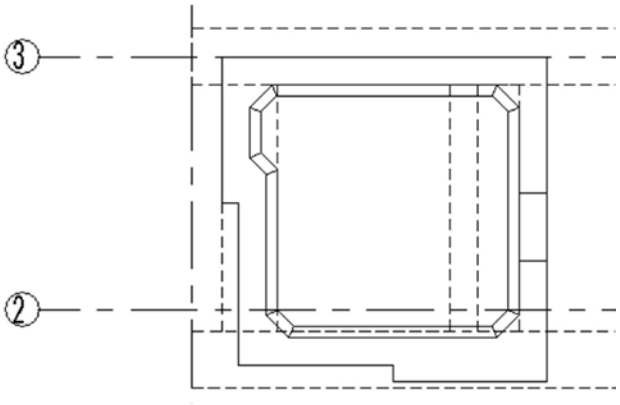
4.1.7 Create a Water Tank

Open a structural plan in Revit ➔ Click “Structure” in ribbon ➔ “Model” ➔ ”Component” ➔ click “Model In-Place”



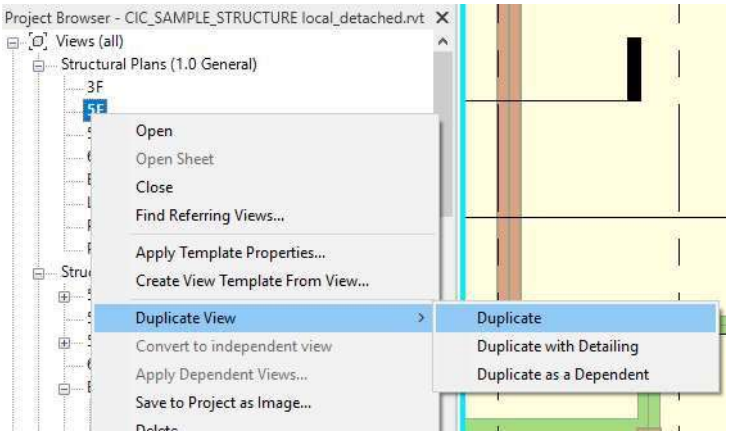
Select “Generic Models” in the Family Category and Parameters dialogue and fill in the name of the water tank.

Draw the water tank by using “Forms” tools.

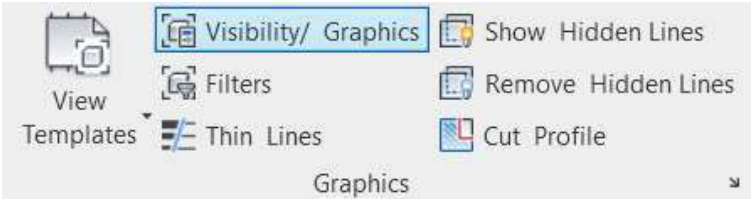


4.1.8 Create Reinforcement (Beam / Column / Wall / Staircase / Water Tank)

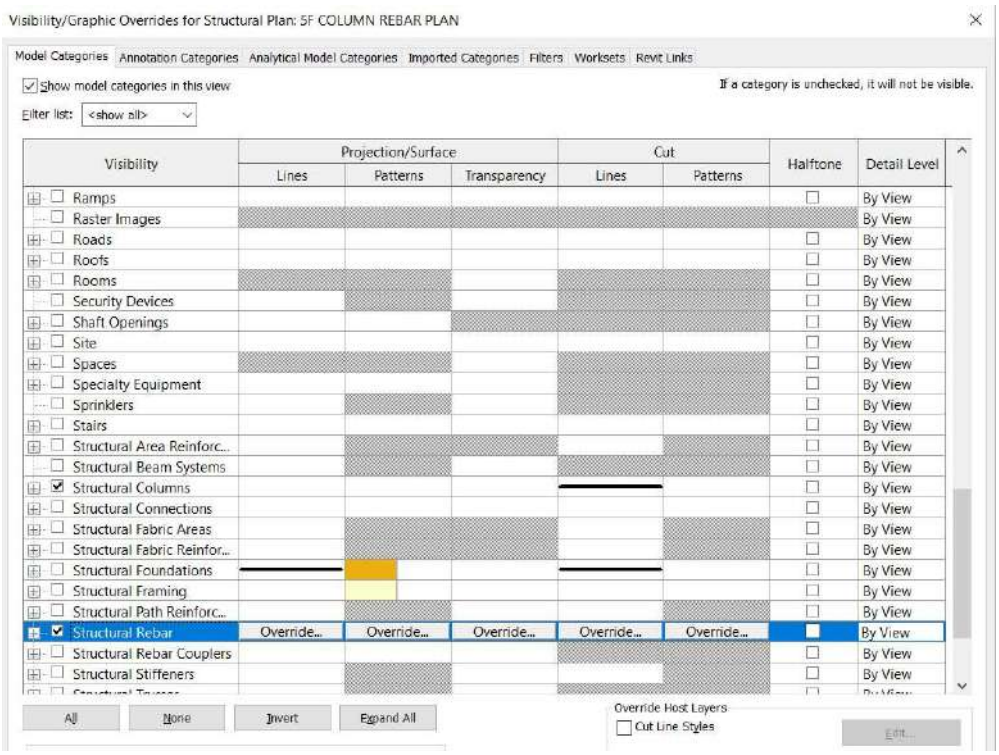
After the creation of Beam, Column, Wall, Staircase ➜ Open a structural plan in Revit ➜ right click the plan in project browser ➜ click “Duplicate View” to duplicate the plan ➜ click “Duplicate”



Create column rebar plan ➜ click “View” ➜ “Graphics” ➜ click “Visibility/ Graphics” to show the column and rebar in plan only.

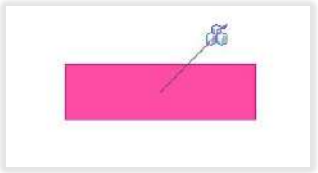


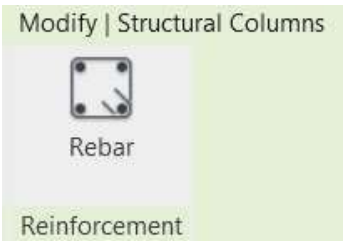
Unclick all items, except “Structural Column” and “Structural Rebar” in Visibility/ Graphics window ➜click “Apply” ➜ click “OK”.



Only column is shown on the screen.

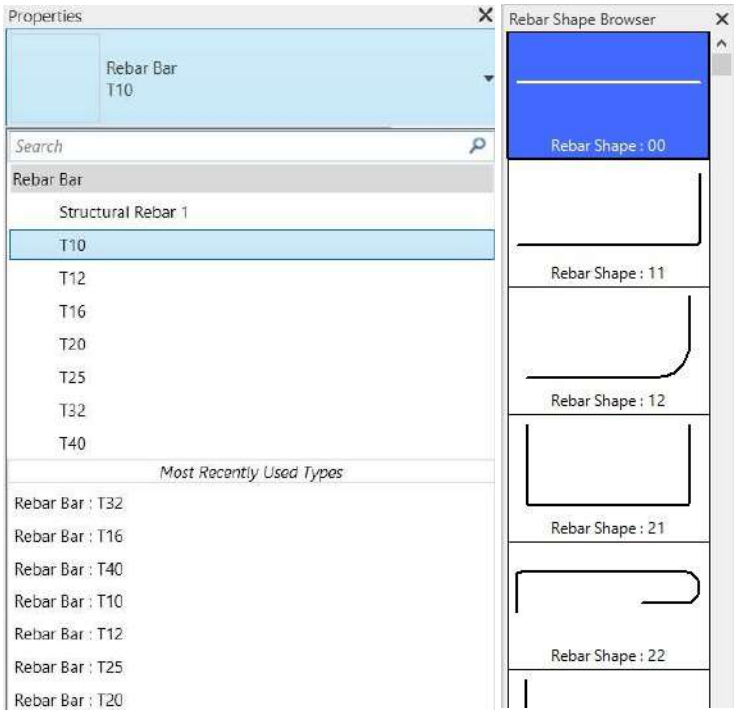
Select a column ➜ click “Reinforcement” in ribbon ➜ click “Rebar”.

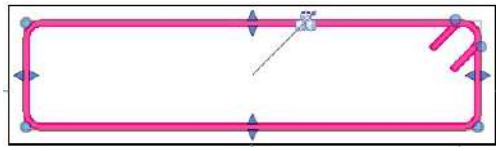




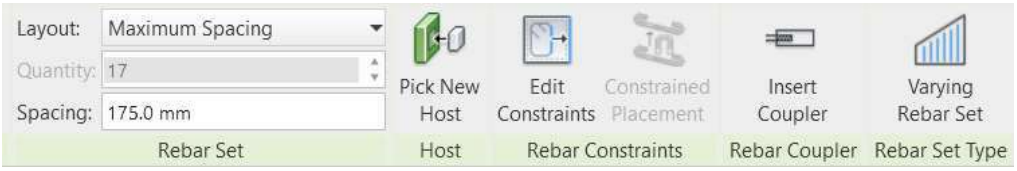
Select the “Placement Plane” in Ribbon ➜ select “current work plane / near cover reference / far cover reference” to place the rebar plane.

Create a stirrup ➜ In the properties panel, you may choose the specific rebar bar and rebar shape from rebar family or create by your own.

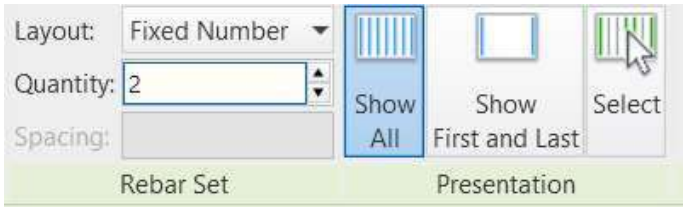




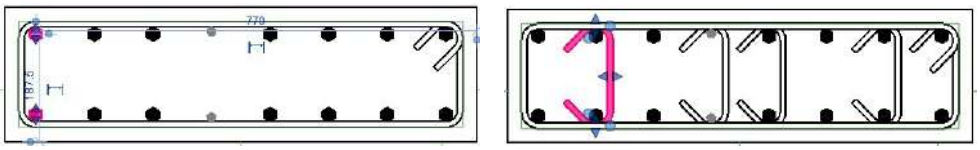
Change the rebar spacing in rebar set of Ribbon.



Change the quantity of rebar and direction in rebar set of Ribbon.



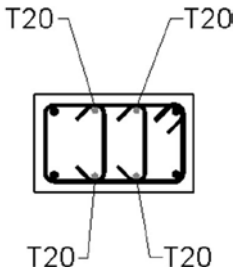
Repeat the above step for mains and links.



Repeat the above steps for Beam and Wall.

Add Tag in plan view/ section view (Refer to section 7.1.2 Add Tags – Tag by Category)

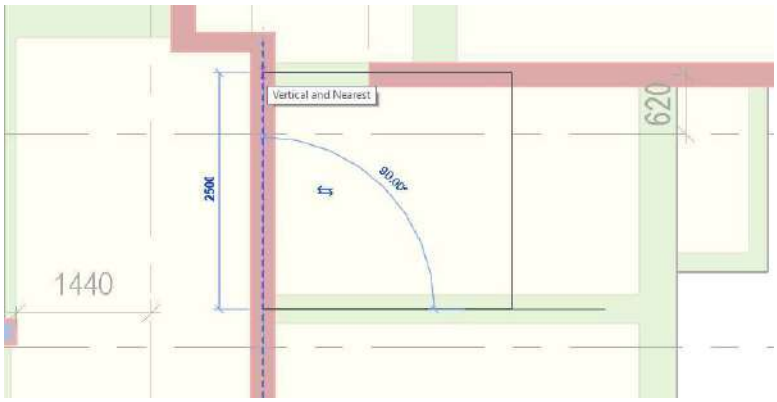
Category	Family	Type
Structural Rebar	ANN-RBG-CIC	ANN-RBG-CIC Quantity & Type Quantity & Type & Spacing Quantity & Type (Rebar Set) Quantity Type & Number Quantity Type Spacing & Number - 1 Line Quantity Type Spacing & Number - 2 Line Shape Code Tag Shape Only Type & Number Type & Spacing Type & Spacing (D.S.) Type & Spacing (Round) Type & Spacing (S.S.) Type Only Type Spacing & Number

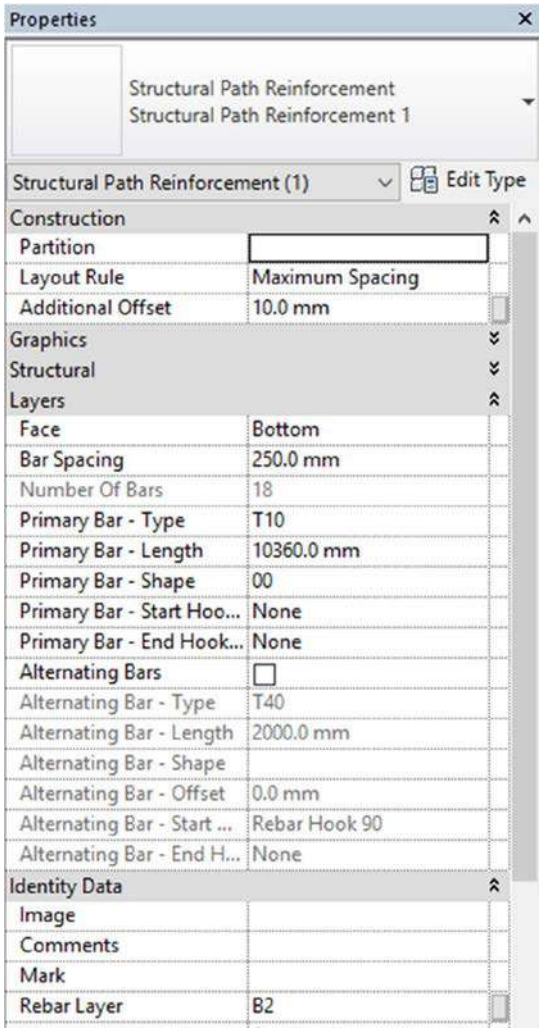


4.1.9 Create Reinforcement (Path)

After the creation of Slab ➜ Click “Structure” in ribbon ➜ “Reinforcement” ➜ Click “Path”

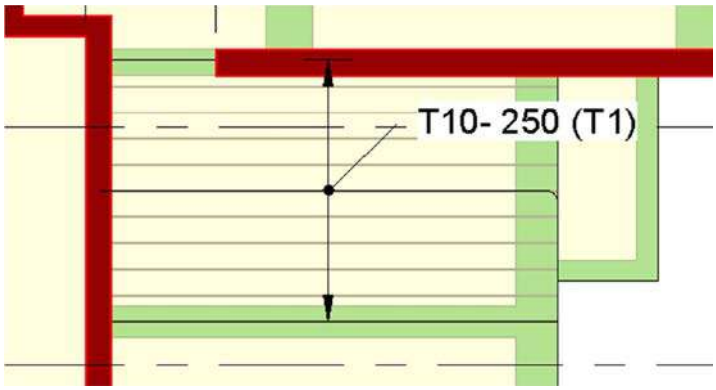
Select the floor ➜ Sketch the line of the path on the floor.



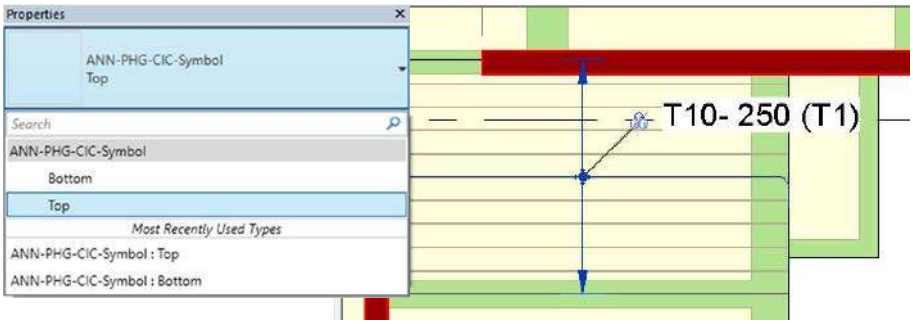


In the properties panel, fill in the information of “Layout Rule”, “Additional Offset”, “Face”, “Bar Spacing”, “Primary Bar – Type”, “Primary Bar – Length”, “Primary Bar – Shape”, “Primary Bar – Start Hook”, “Primary Bar – End Hook”.

For “Rebar Layer”, fill in T1/T2/B1/B2, etc.



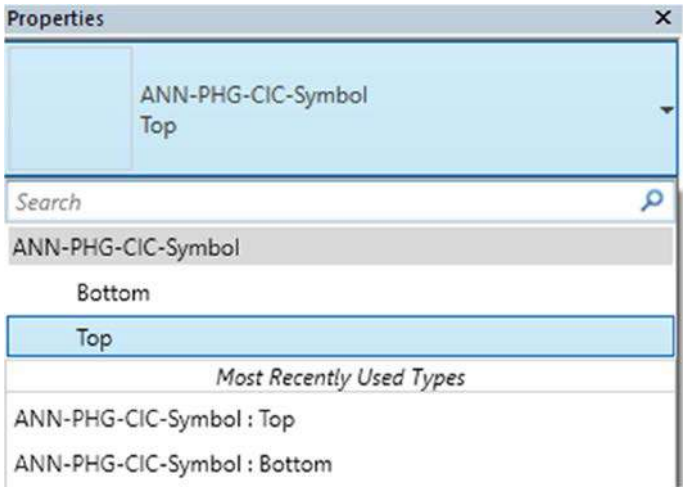
Select the structural path reinforcement symbol. In the properties panel, select “ANN-PHG-CIC-Symbol (Top)” for top layer rebar and “ANN-PHG-CIC-Symbol (Bottom)” for bottom layer rebar.

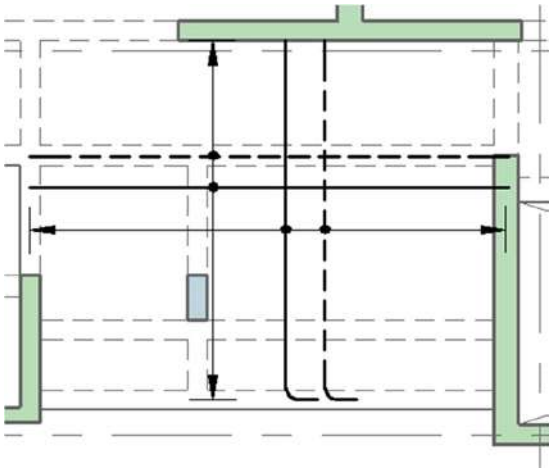


Add path reinforcement symbol in plan view

Click “Annotation” in ribbon ➔ ”Symbol” ➔ click “Path”.

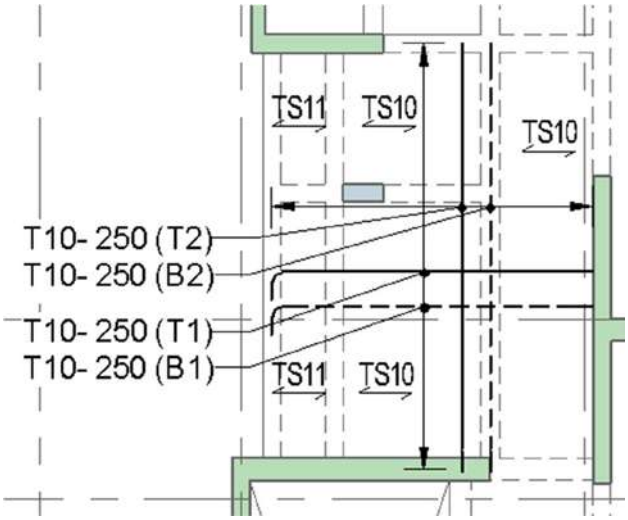
Select between “Top” or “Bottom” for a different layer of the rebar.





Add Tag in plan view (Refer to section 7.1.2 Add Tags – Tag by Category)

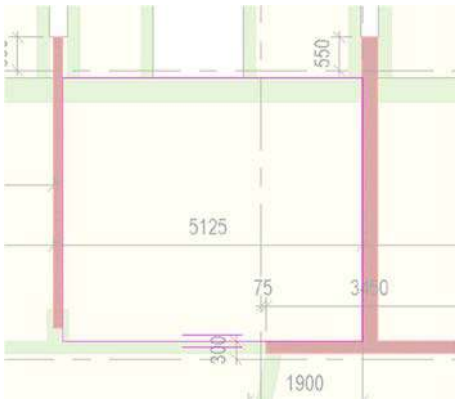
Category	Family	Type
Structural Path Reinforcement	ANN-PHG-CIC-Tag	Standard



4.1.10 Create Reinforcement (Area)

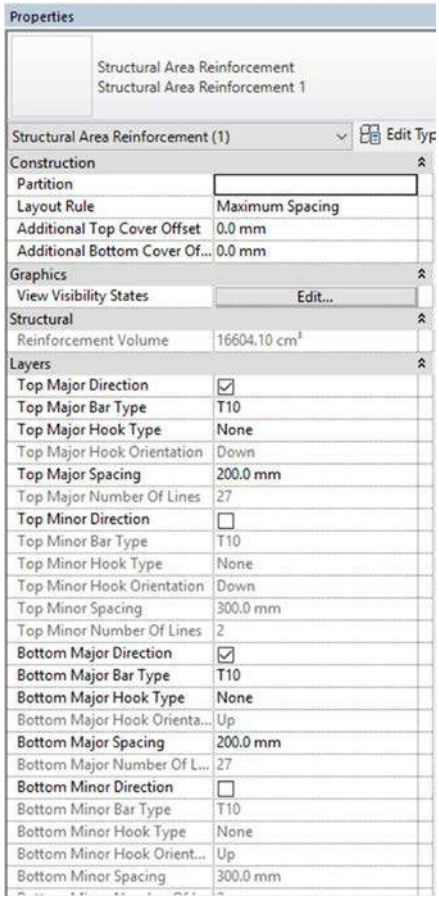
After the creation of Slab ➜ Click “Structure” in ribbon ➜ “Reinforcement” ➜ Click “Area”

Select the floor ➜ sketch the boundary of slab to form a closed loop



A parallel line symbol indicates the major direction edge of the area reinforcement.

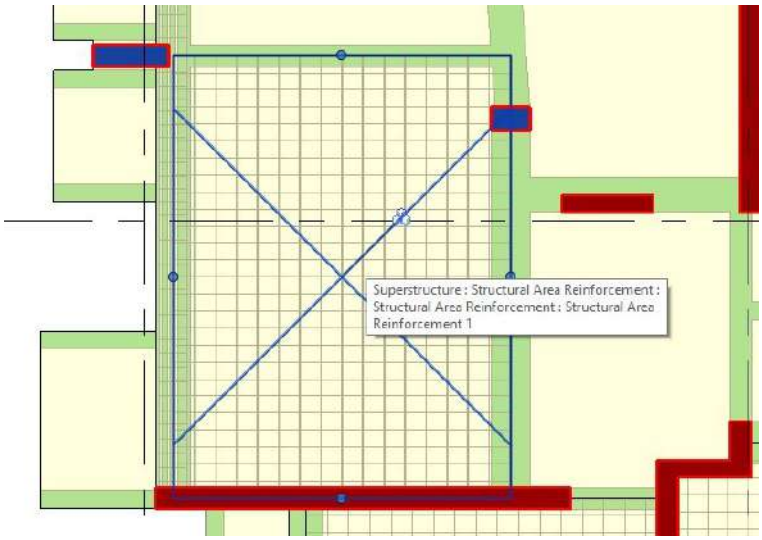
For major direction, tick “Top Major Direction” and “Bottom Major Direction” in the properties panel. Select the “Top Major Bar Type” and “Top Major Spacing”. Set the value of “Bottom Major Bar Type “and “Bottom Major Spacing”,



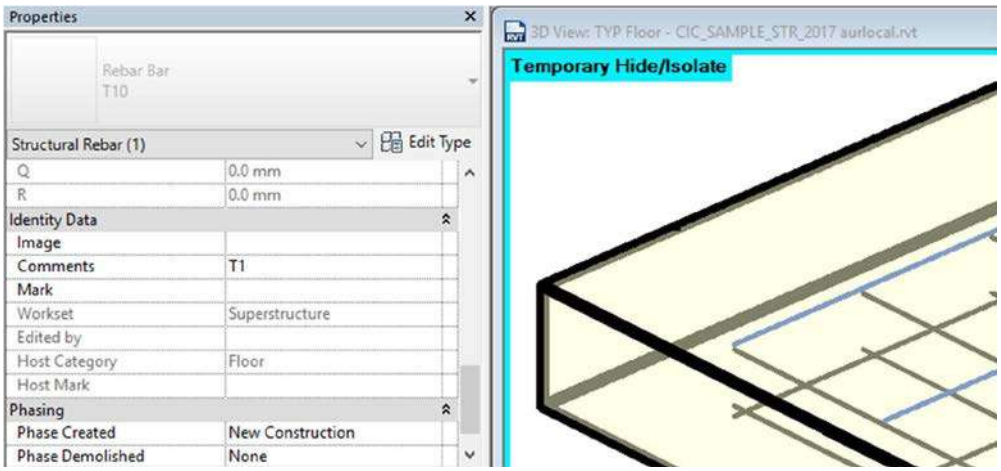
Copy the previous Structural Area Reinforcement object and paste “Aligned to the Same Place” as the rebars for minor direction.

For minor direction, tick “Top Minor Direction” and “Bottom Minor Direction” in the properties panel. Select the “Top Minor Bar Type” and “Top Minor Spacing”. Set the value of “Bottom Minor Bar Type “, “Bottom Minor Spacing”, “Additional

Top Cover Offset” and “Additional Bottom Cover Offset”.

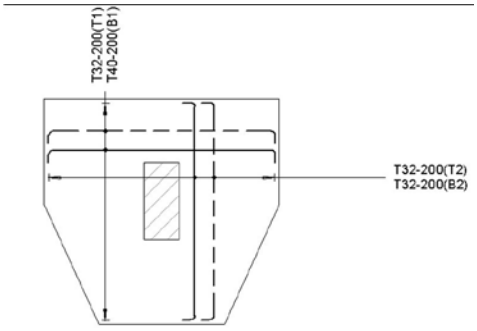


Go to 3D View, there are four layers of rebars. Select the first layer of rebars and add “T1” to Comments in the properties panel. Select the second layer of rebars and add “T2” to Comments. For the bottom layer of rebar, add “B2” to Comments for the third layer and add “B1” to Comments for the fourth layer.



Add Tag in plan view (Refer to section 7.1.2 Add Tags – Tag by Category)

Category	Family	Type
Structural Area Reinforcement	ANN-ARG-CIC	Major / Minor



4.2 Demolition including hoarding

The following objects will be modelled in the demolition plan:

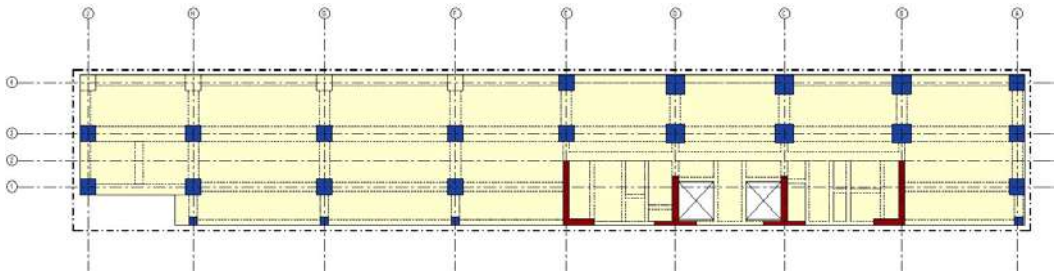
- Existing Building Structure
- Bamboo Scaffolding
- Propping
- Debris Chute
- Video Camera

The following objects will be modelled in hoarding plan:

- Topo surface
- Counterweight
- Hoarding
- Railing
- Street Furnitures (Traffic Light / Fire Hydrant / Pillar Box / Street Light)

4.2.1 Create an Existing Building Structure

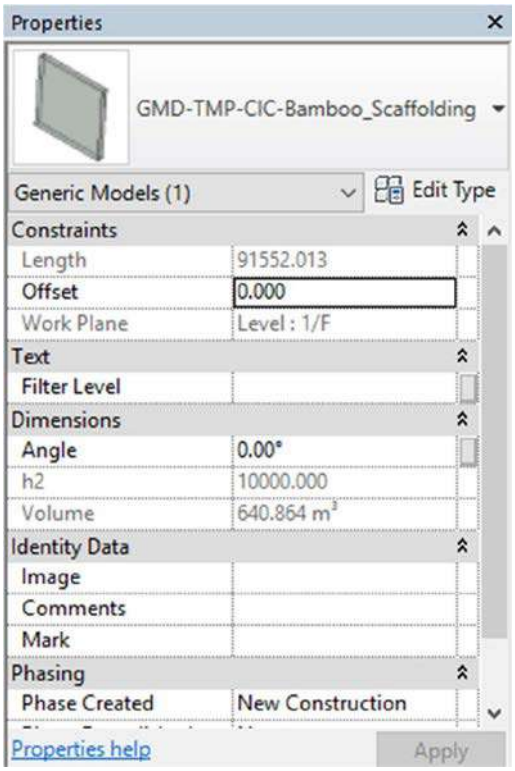
Steps of creating existing building structure can be referred to Section 4.1 “Superstructure”. Structural wall, beam, slab and shaft are created.



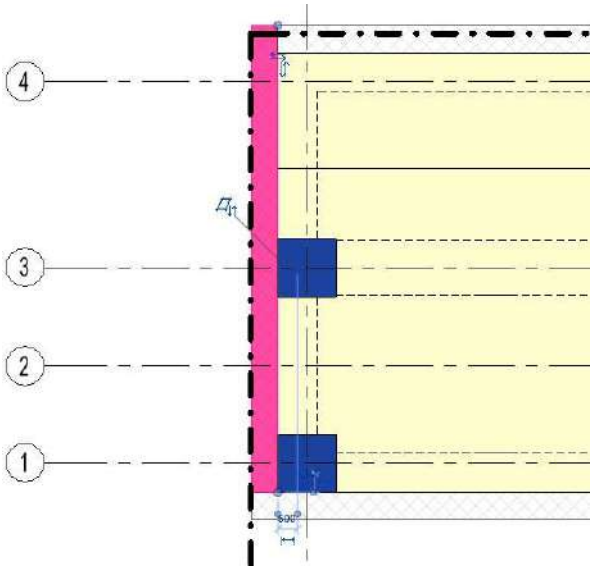
4.2.2 Create Bamboo Scaffolding

Open a structural plan in Revit ➔ click “Structure” in ribbon ➔ click “Component”.

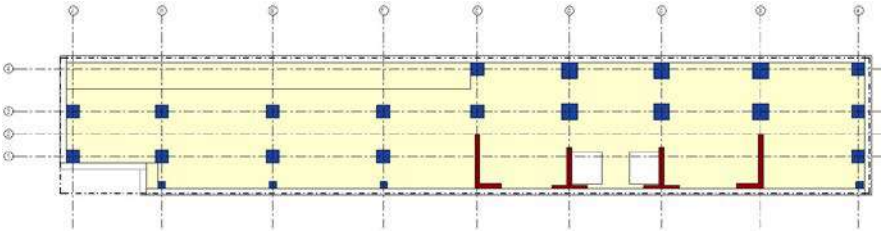
In the properties panel, you may choose the specific types of scaffolding from family “GMD-TMP-CIC- Bamboo_Scaffolding” or create by your own.



Create the scaffolding by stretch starting point to endpoint



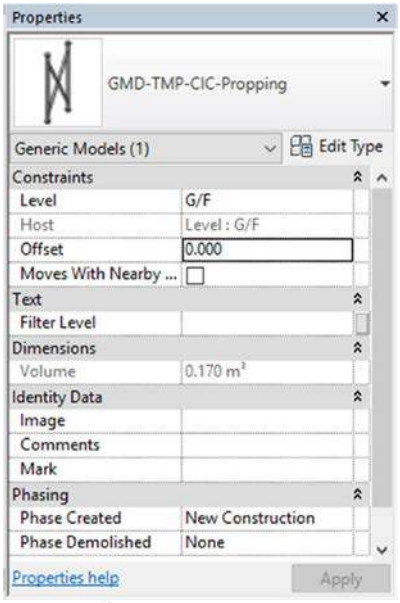
Repeat the above steps.

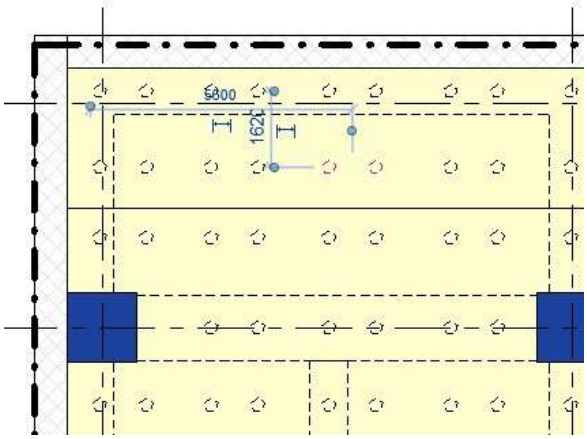


4.2.3 Create Propping

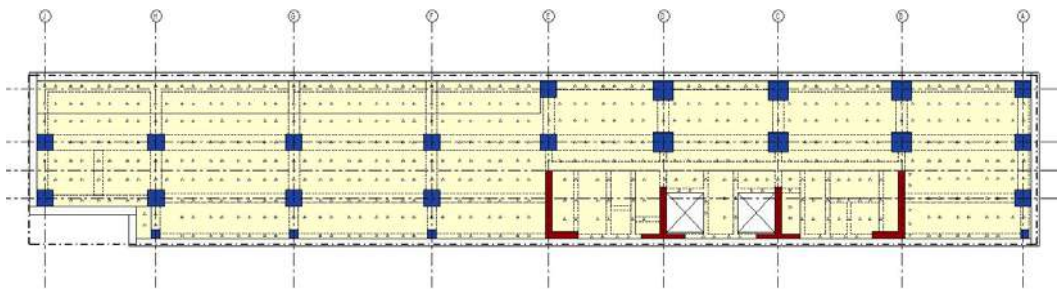
Open a structural plan in Revit ➔ click “Structure” in ribbon ➔ click “Component”.

In the properties panel, you may choose the specific types of propping from family “GMD-TMP-CIC- Propping” or create by your own. Place it to the desired location.





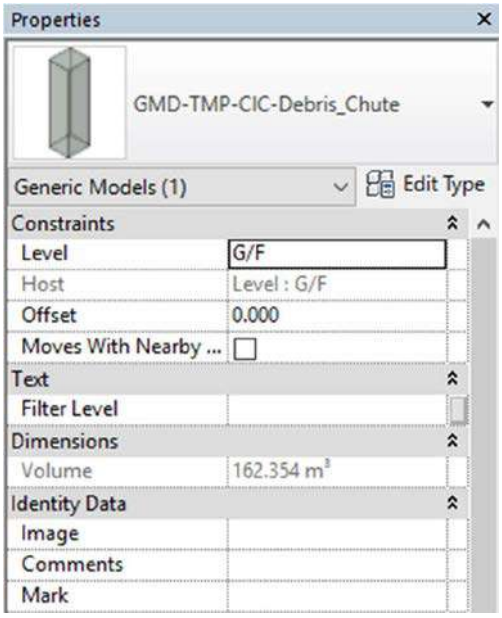
Repeat the above steps.



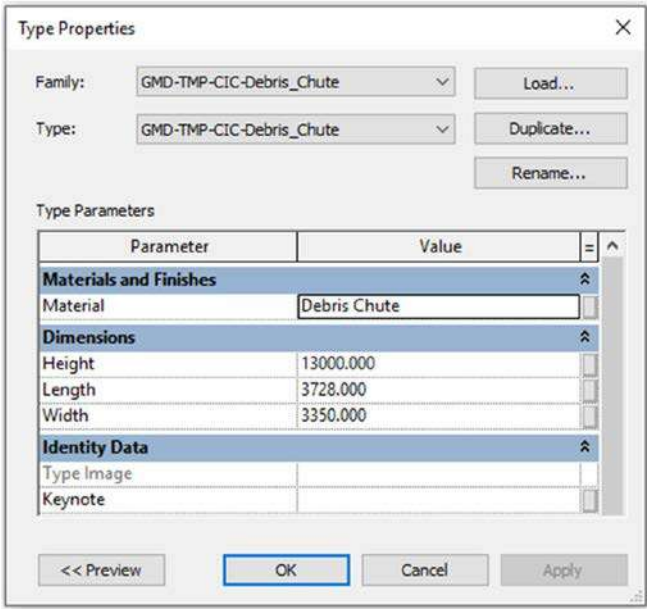
4.2.4 Create Debris Chute

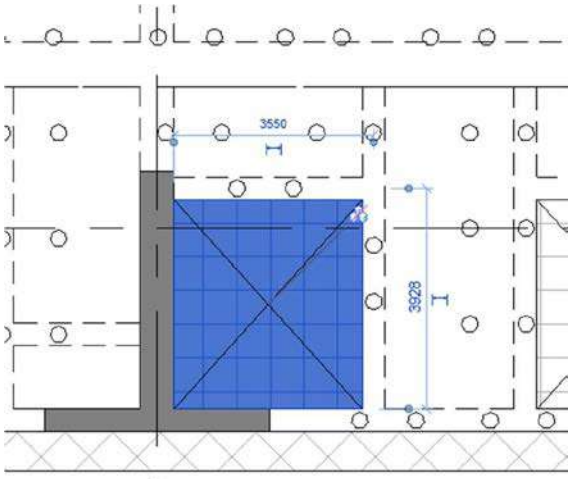
Open a structural plan in Revit ➜ click “Structure” in ribbon ➜ click “Component”.

In the properties panel, you may choose the specific types of debris chute from family “GMD-TMP-CIC- Debris_Chute” or create by your own. Place it to the desired location.

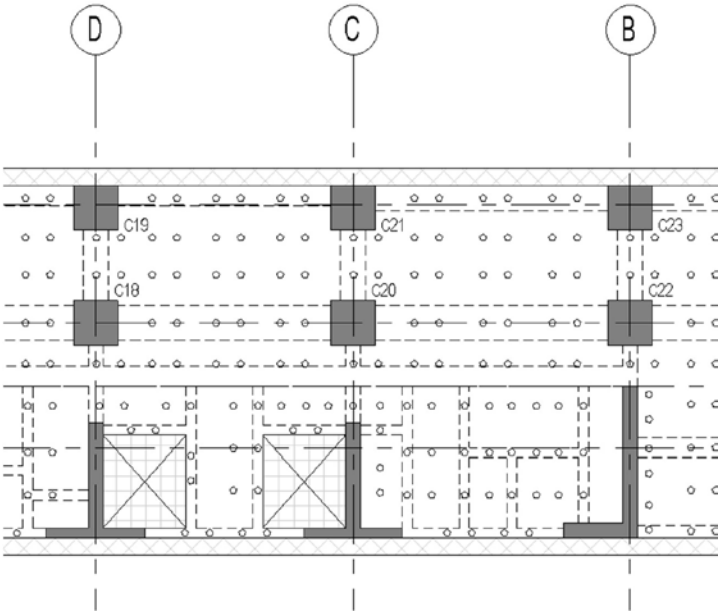


Dimension can be adjusted by clicking “Edit Type” in properties panel ➜ type the dimensions of width / length / height by your own to suit the design ➜ click “OK”.



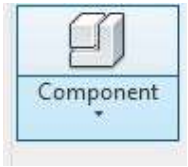


Repeat the above steps.

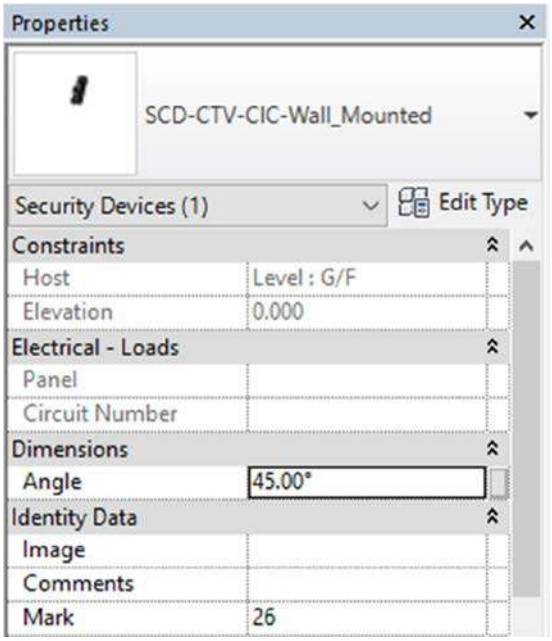


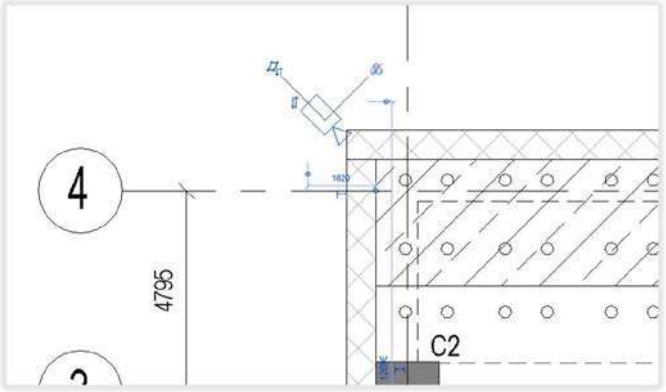
4.2.5 Create a Video Camera

Open a structural plan in Revit ➜ click “Structure” in ribbon ➜ click “Component”.



In the properties panel, you may choose the specific types of debris chute from family “SCD-CTV-CIC- Wall_Mounted” or create by your own. Place it to the desired location.

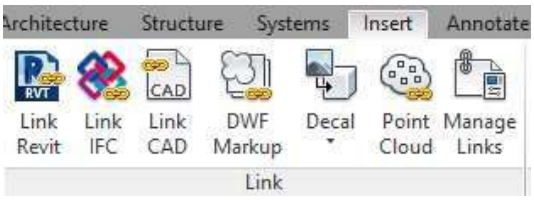


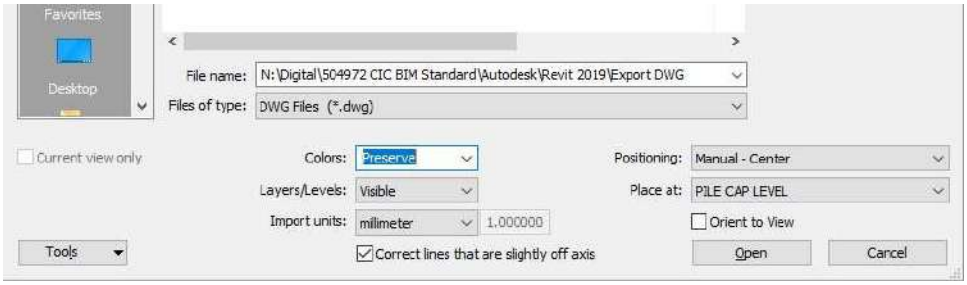


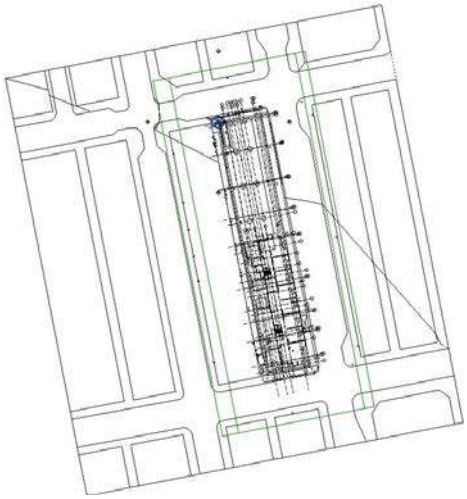
4.2.6 Create Topographic Surface

Insert CAD as a reference to create a 3D topo surface.

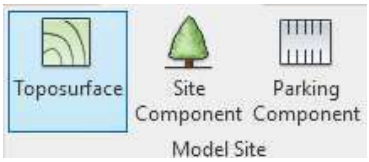
Open a site plan in Revit ➜ click “Insert” in Ribbon ➜ click “Link CAD”➜ find the CAD location ➜ click “OK”



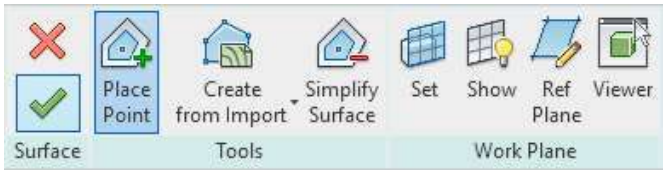


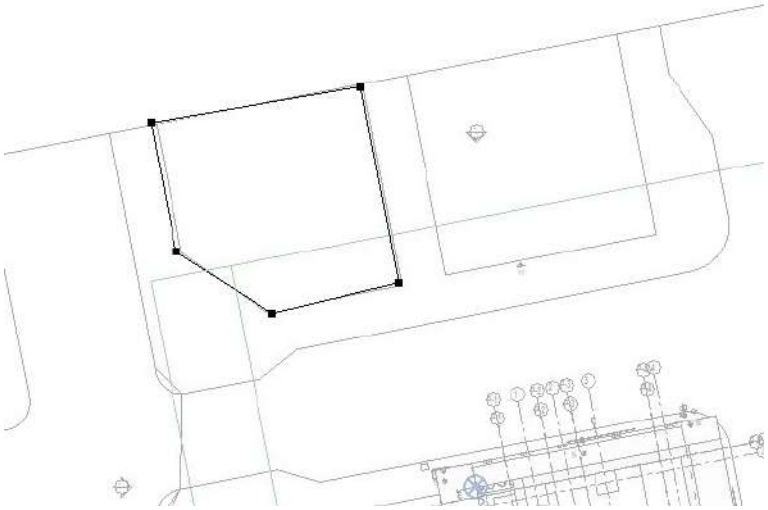


Open a site plan in Revit ➜ click “Massing & Site” in ribbon ➜ click “Toposurface” under Model Site.

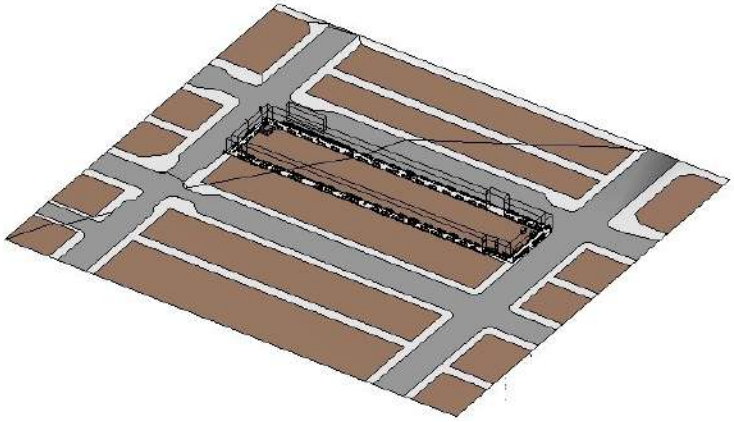


Place point and set the elevation on the Toposurface to create ➜ click “Tick”.



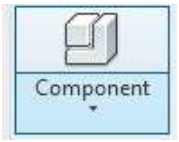


Repeat the above steps for other Toposurface with different levels.



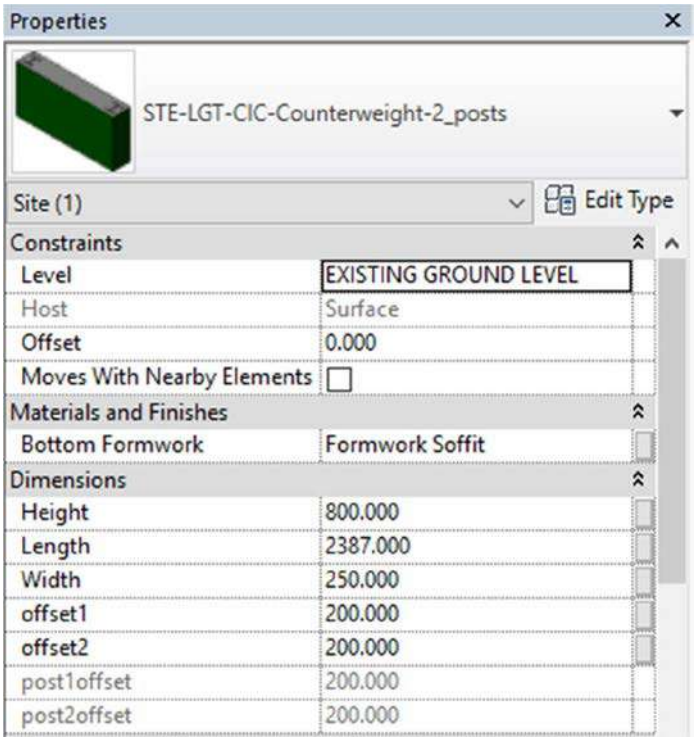
4.2.7 Create Counterweight

Open a site plan in Revit ➔ click “Structure” in ribbon ➔ click “Component”.

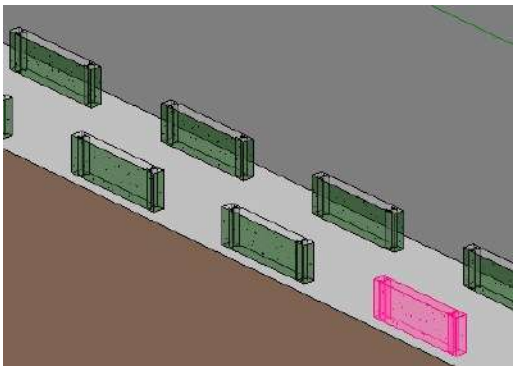


In the properties panel, you may choose the specific types of counterweight from family

“STE-LGT-CIC-Counterweight-2 / 3 / 4 posts” or create by your own. Place it to the desired location.



Repeat the above steps.



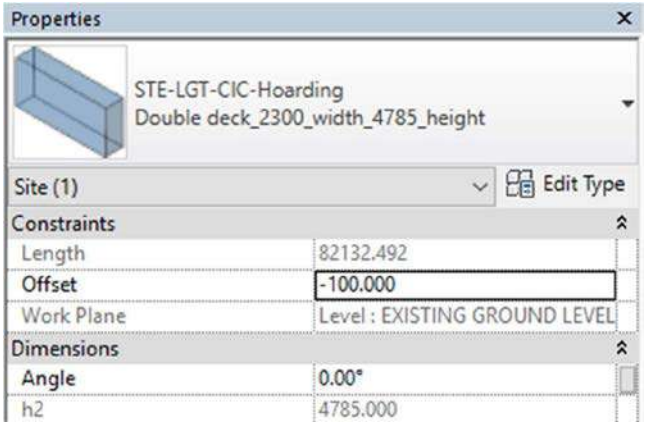
4.2.8 Create Hoarding

Open a site plan in Revit ➜ click “Structure” in ribbon ➜ click “Component”.

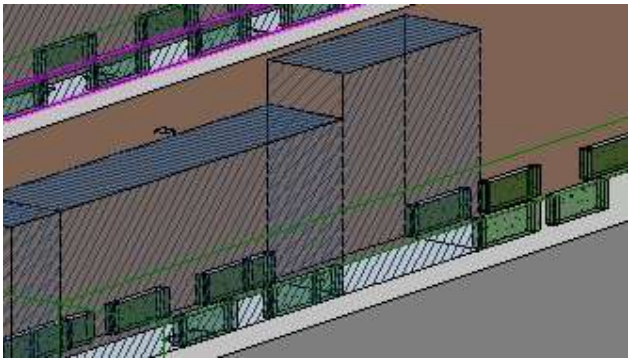
In the properties panel, you may choose the specific types of hoarding from family

“STE-LGT-CIC-Hoarding-Gantry / Double Deck / Corner” or create by your own. Place it to the desired location.

Adjust Angle for the sloped surface.

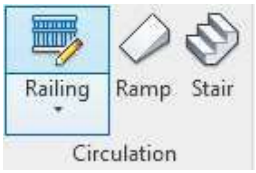


Repeat the above steps.

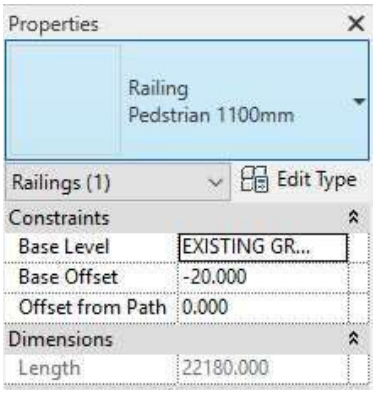


4.2.9 Create Railing

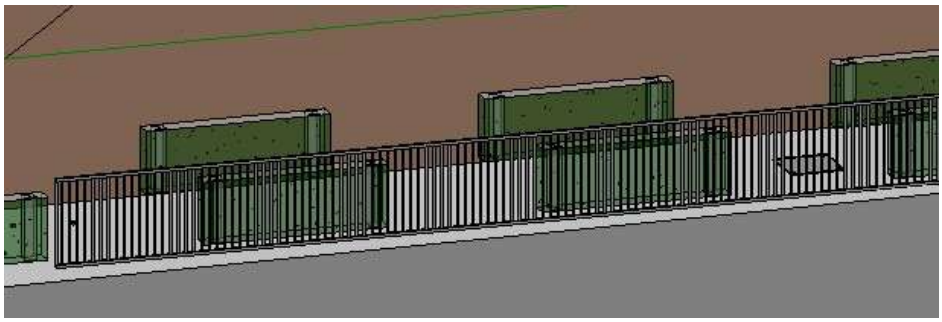
Open a site plan in Revit ➔ click “Architecture” in ribbon ➔ click “Railing”.



In the properties panel, you may choose the specific type of counterweight from family “ste-lgt-CIC- Counterweight-2 / 3 / 4 posts” or create on your own. Drag the railing from a start point to end. Place it to the desired location.



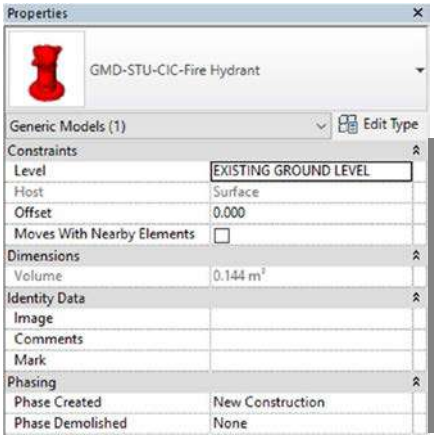
Repeat the above steps.

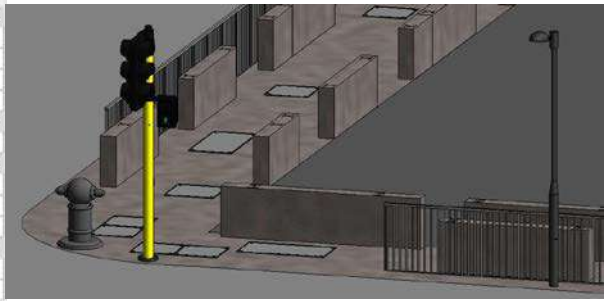


4.2.10 Create Street Furnitures (Traffic Light/Fire Hydrant/Pillar Box/Street Light)

Open a structural plan in Revit ➔ click “Structure” in ribbon ➔ click “Component”

In the properties panel, you may choose the specific types of elements from family or create by your own. Place it to the desired location.





Repeat the above steps.

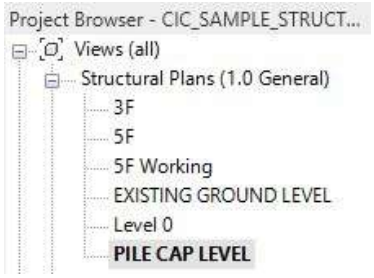
4.3 Foundation

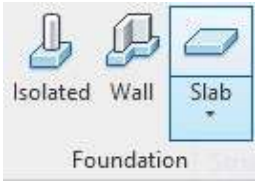
The following objects will be modelled in a foundation plan:

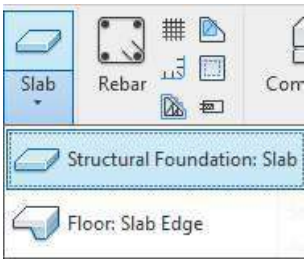
- Pile Cap
- Bored Pile
- Socket H-Pile
- Tie Beam
- Screen Wall
- Foundation Slab
- Column/Wall above pile cap

4.3.1 Create Pile Cap

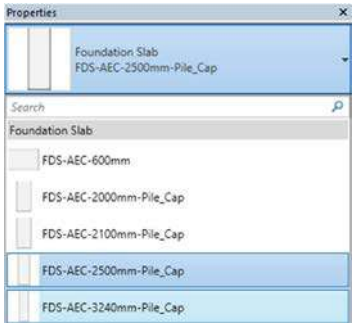
Open a pile cap level plan in Revit ➔ Click “Structure” in ribbon ➔ click “Foundation” ➔ click “Slab” ➔ “Structural Foundation: Slab”



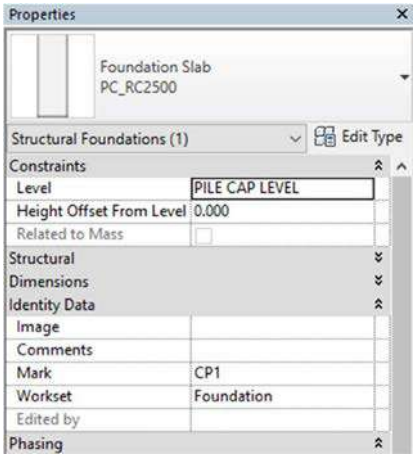




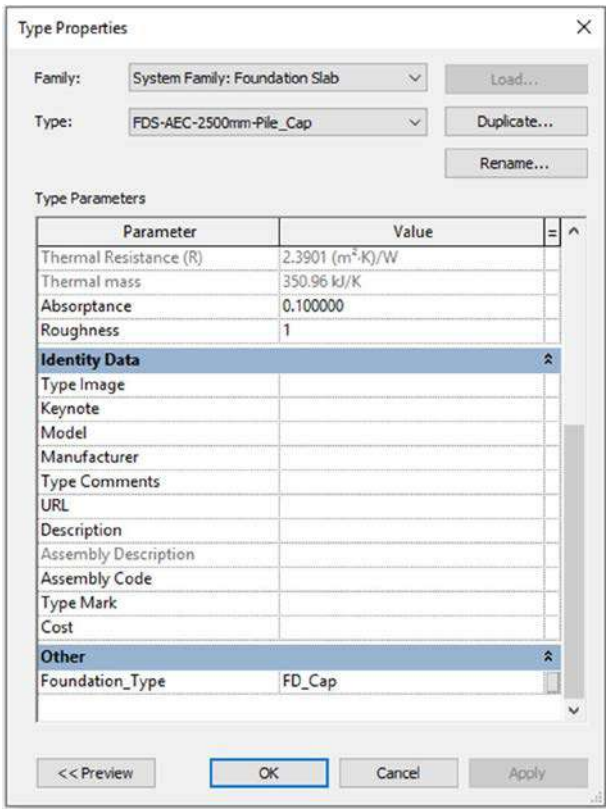
In the properties panel, you may choose the specific types of the slab from foundation slab family or create by your own.



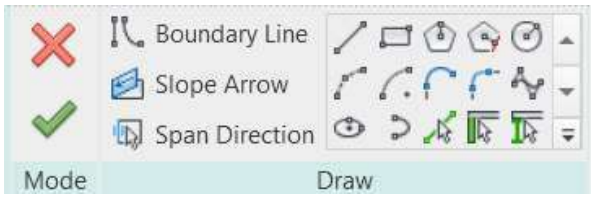
Type slab mark in “Mark” of identity data. For example, CP1 was typed for slab mark in this case.

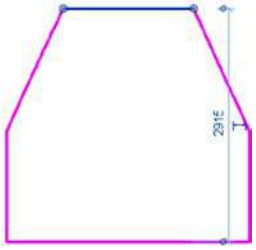


Click “Edit Type” in Properties browser ➜ Under Type Parameter ➜ Under Other ➜ Select the Foundation_Type as “FD_Cap” to ensure the filtering function of template format can be functional.

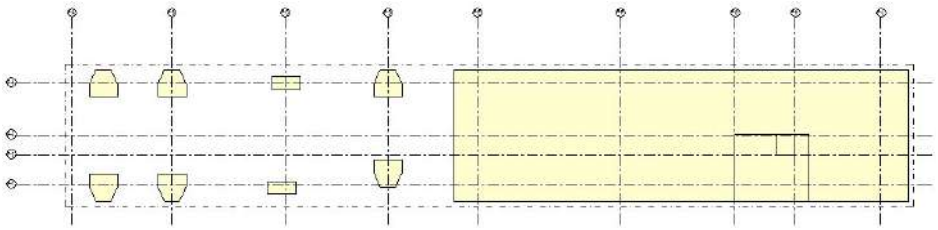


Use Draw tool to create a slab by drawing a boundary line → click “Tick” when finishing



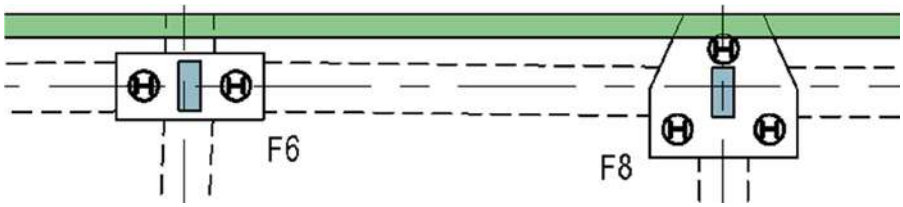


Repeat the above steps.



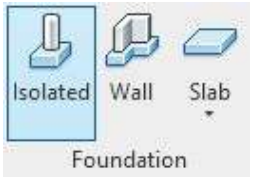
Add Tag in plan view/ section view (Refer to section 7.1.2 Add Tags – Tag by Category)

Category	Family	Type
Structural Foundation	ANN-FDG-CIC-Rectangular	Mark & FDN Thickness

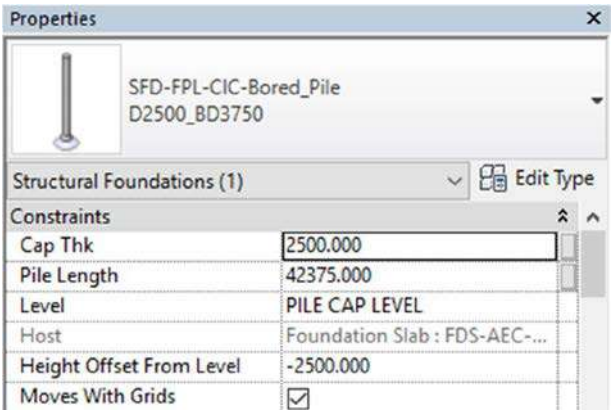


4.3.2 Create Bored Pile

Open a pile cap level plan in Revit ➔ click “Structure” in ribbon ➔ click “Foundation” ➔ click “Isolated



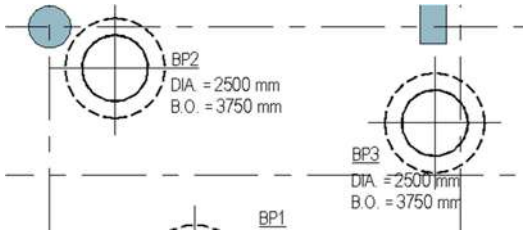
In the properties panel, you may choose the specific types of a pile from pile family “SFD-FPL-CIC- Bored_Pile” or create by your own.



Type pile mark in “Mark” of identity data. For example, BP3 was typed for the mark in this case ➔ place the pile into the designed ocation.

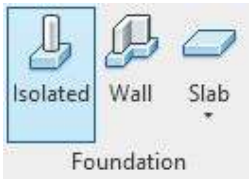
Add Tag in plan view/ section view (Refer to section 7.1.2 Add Tags – Tag by Category)

Category	Family	Type
Structural Foundation	ANN-FDG-CIC-Bored_Pile	Mark & Size Mark



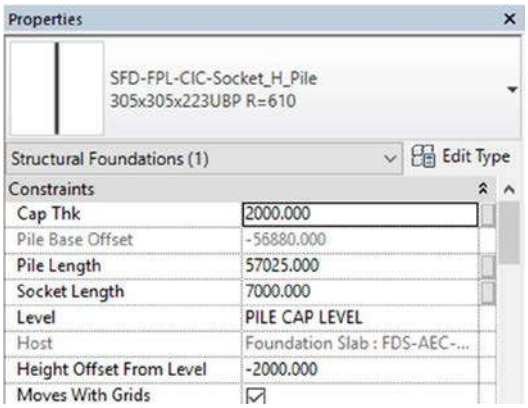
4.3.3 Create Socket H-Pile

Open a pile cap level plan in Revit ➜ click “Structure” in ribbon ➜ click “Foundation” ➜ click “Isolated”

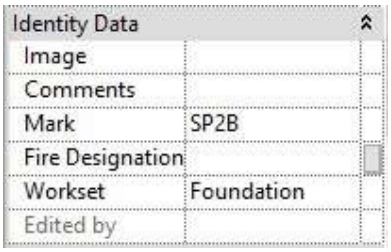


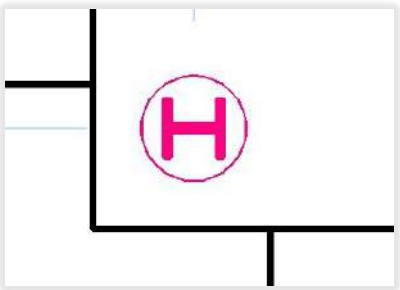
In the properties panel, you may choose the specific types of the pile from pile family “SFD-FPL-CIC- Socket_H_Pile” or create by your own.

Create the pile by setting cap thickness, pile length, socket length and height offset in constraint. The universal beam dimension and steel plate dimension of the pile can be set in “Edit Type”.

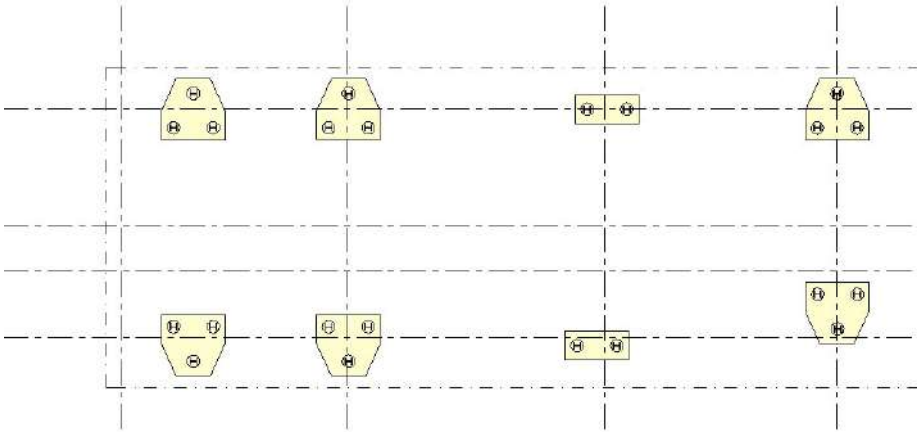


Type pile mark in “Mark” of identity data. For example, SP2B was typed for the mark in this case. ➜Place the pile into designed location.





Repeat the above steps.

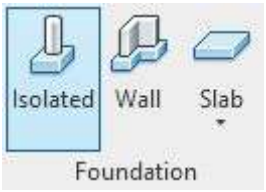


Add Tag in plan view/ section view (Refer to section 7.1.2 Add Tags – Tag by Category)

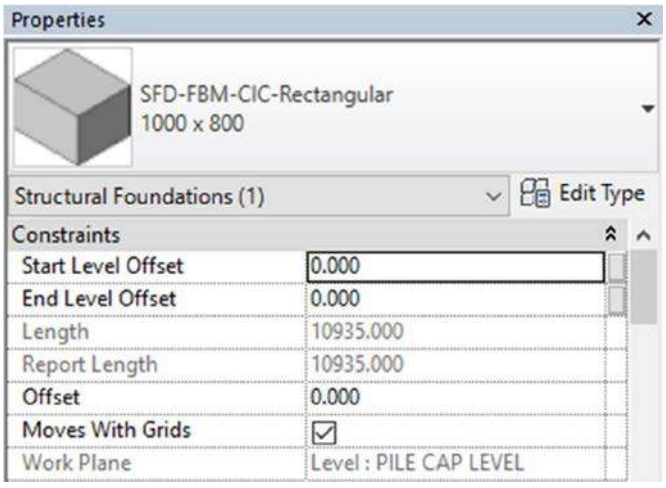
Category	Family	Type
Structural Foundation	ANN-FDG-CIC-Rectangular	Mark Only

4.3.4 Create Tie Beam

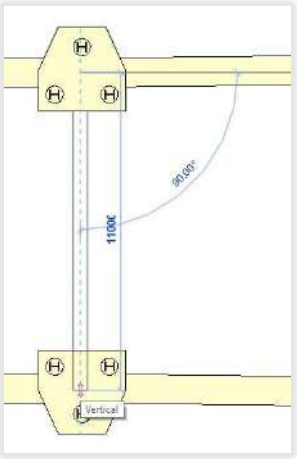
Open a pile cap level plan in Revit ➔ click “Structure” in ribbon ➔ click “Foundation” ➔ click “Isolated”.



In the properties panel, you may choose the specific types of the beam from family “SFD-FBM-CIC- Rectangular” or create by your own.

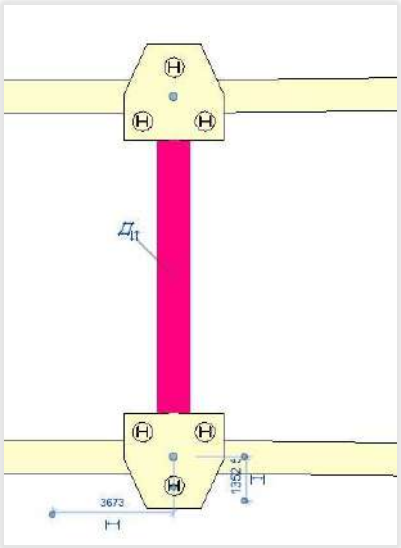


Click “Place on Work Plane” in Ribbon ➔ draw the beam from starting point to end at the centre of slabs.



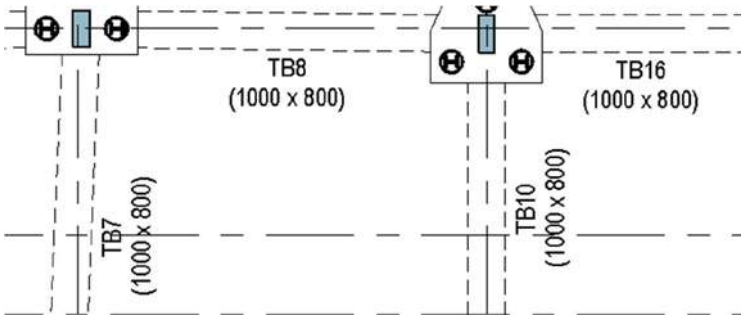
Type beam mark in “Mark” of identity data. For example, TB10 was typed for the mark in this case.

Identity Data	
Image	
Comments	
Mark	TB10
Fire Designation	
Workset	Foundation
Edited by	



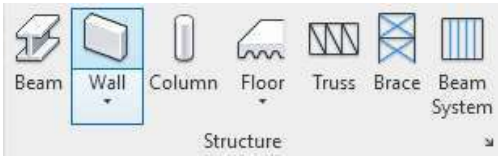
Add Tag in plan view (Refer to section 7.1.2 Add Tags – Tag by Category)

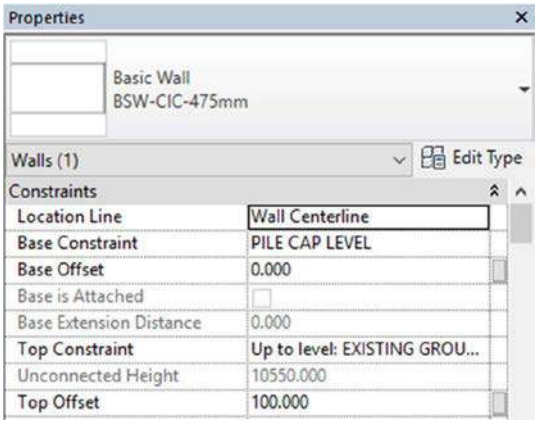
Category	Family	Type
Structural Foundation	ANN-FDG-CIC-Rectangular	Standard 2 Lines Standard



4.3.5 Create Screen Wall

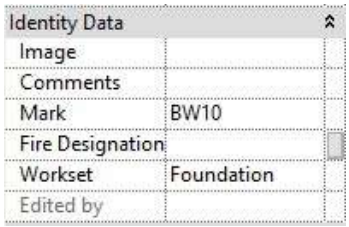
Open a pile cap level plan in Revit ➜ click “Structure” in ribbon ➜ click “Wall”.



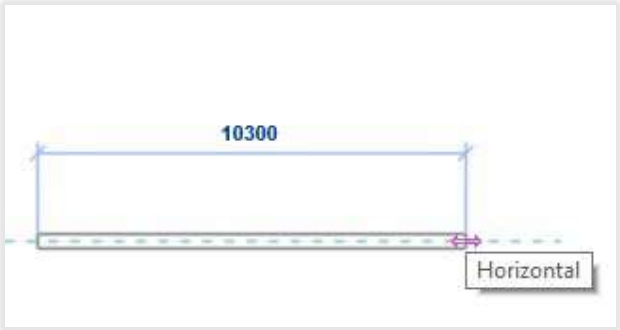


In the properties panel, you may choose the specific types of a wall from family or create by your own ➜ set the “Base Constraint” and “Top Constraint” of screen wall height.

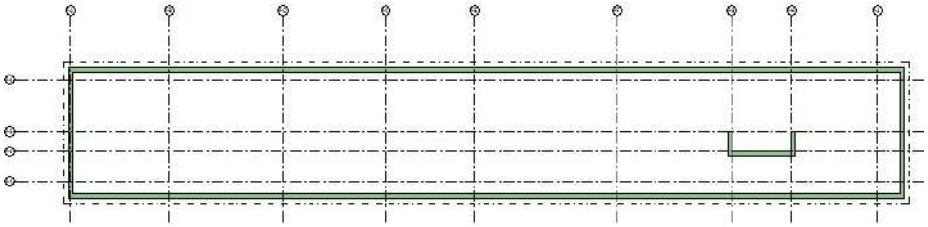
Type wall mark in “Mark” of identity data. For example, BW10 was typed for the mark in this case.



Draw the screen wall from starting point to end.

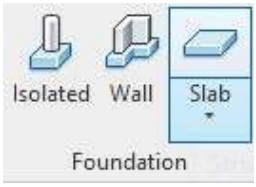


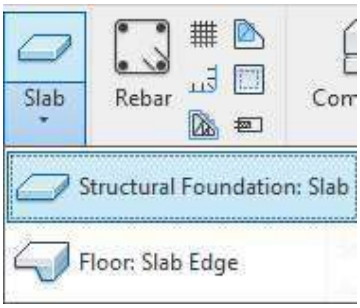
Repeat the above steps.



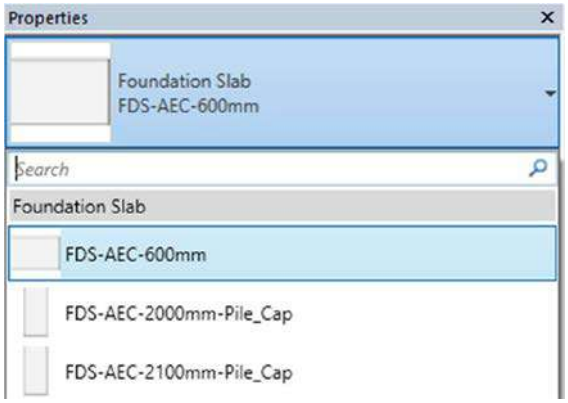
4.3.6 Create Foundation Slab

Click “Structure” in ribbon ➔ click “Foundation” ➔ click “Slab” ➔ “Structural Foundation: Slab”

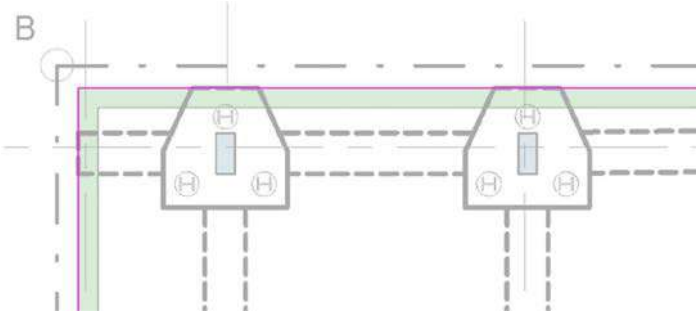




In the properties panel ,you may choose the specific types of the slab from foundation slab family or create on your own.



Use Draw tool to create a slab by drawing a boundary line ➔ click “Tick” when finishing

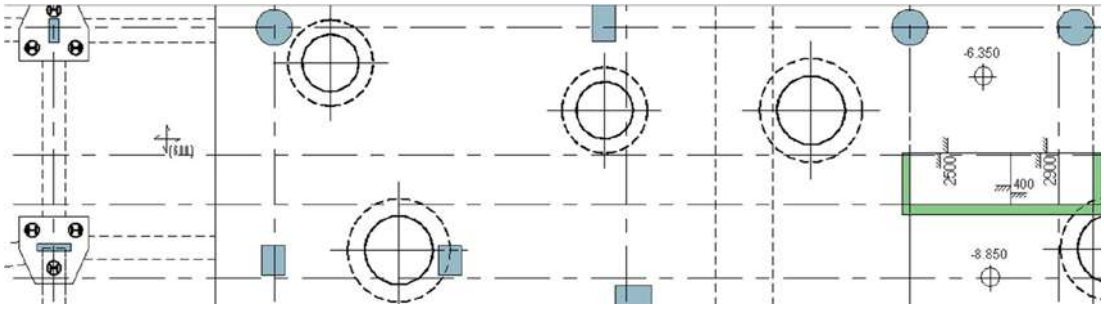


Add Tag in plan view (Refer to section 7.1.2 Add Tags – Tag by Category)

Category	Family	Type
Structural Foundation	ANN-FDG-CIC-Rectangular	Mark

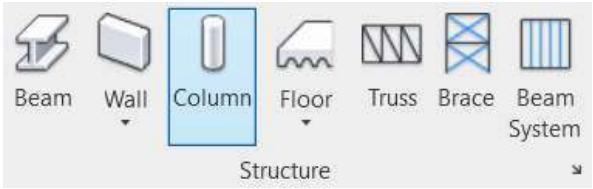
Add level difference symbol and span direction symbol in plan view (Refer to section 7.1.4 Add annotation symbol)

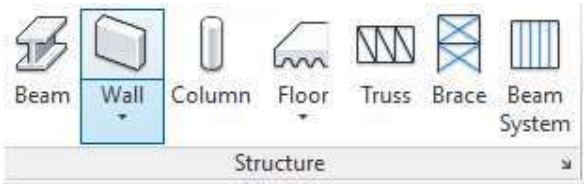
Category	Family	Type
Generic Annotation	ANN-GNN-CIC-Level_Difference	/
Generic Annotation	ANN-GNN-CIC-Span_Direction	Two Way Slab - 2.5mm One Way Slab - 2.5mm Cantilever Slab - 2.5mm



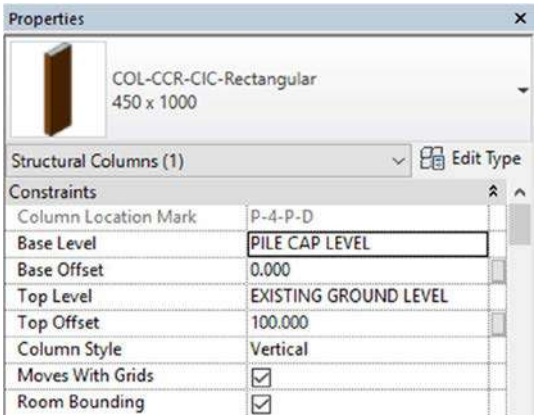
4.3.7 Create Column/Wall

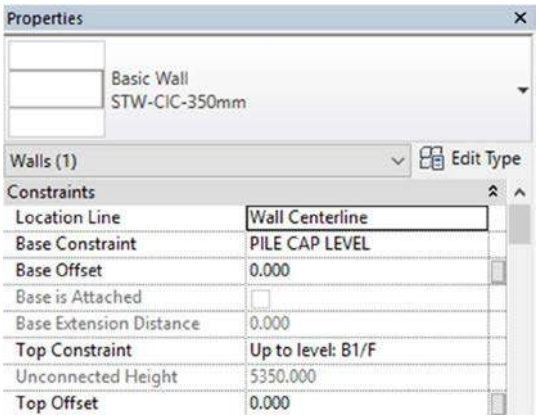
Open a structural plan in Revit ➔ Click “Structure” in ribbon ➔ click “Column”/”Wall”.



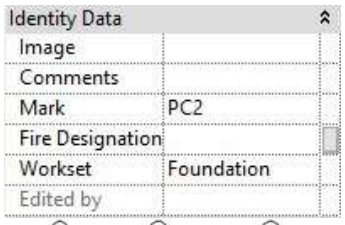


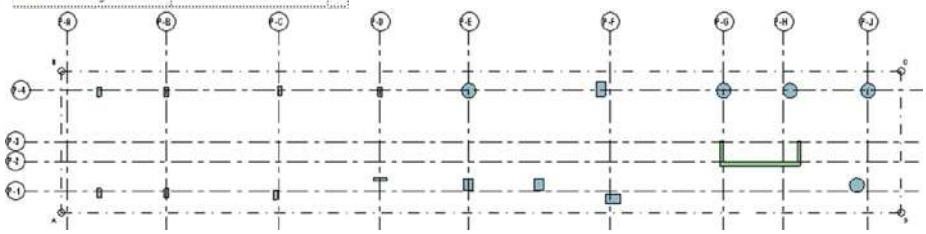
In the properties panel, you may choose the specific types of a column from column family or create by your own.





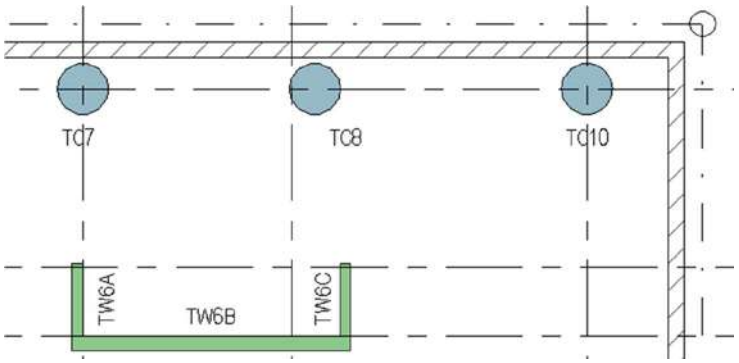
In the properties panel, type column mark in “Mark” of identity data. For example, PC2 was typed for column mark in this case. ➔ Place the column into designed location.





Add Tag in plan view/ section view (Refer to section 7.1.2 Add Tags – Tag by Category)

Category	Family	Type
Structural Column	ANN-SCG-CIC	Mark
Wall	ANN-WLG-CIC	Mark



4.4 Excavation and lateral support

The following objects will be modelled in a foundation plan:

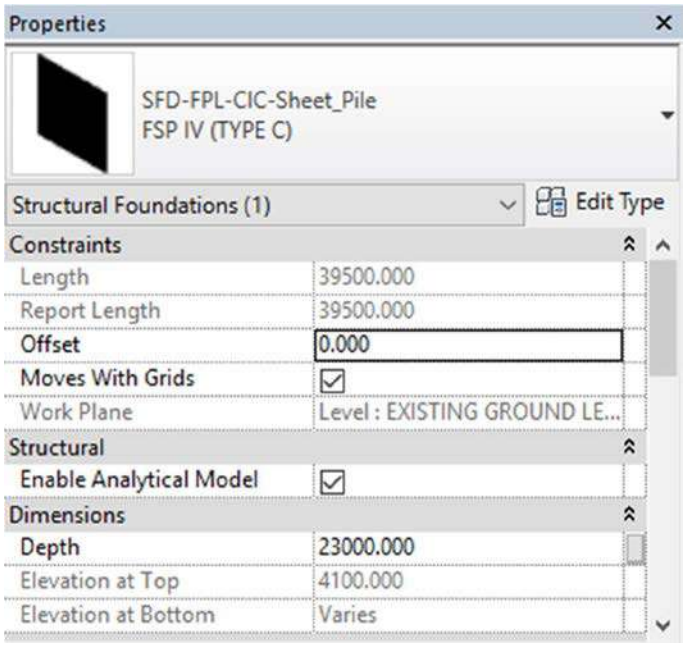
- Sheet Pile
- Walling
- Struct / Tie / Short Struct
- Stage Topo / Final Topo
- Basement Wall

4.4.1 Create Sheet Pile

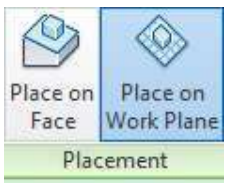
In the Project Browser, open an existing ground level Click “Structural” in ribbon ➔ click “Isolated”

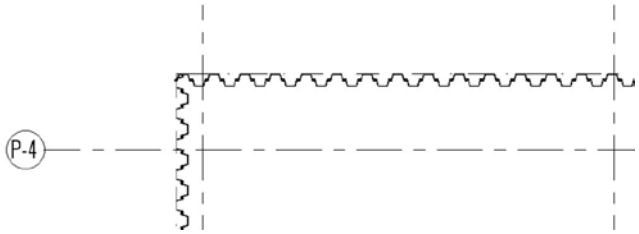
In the Properties panel, select family type “SFD-FPL-CIC-Sheet_Pile” ➔ change “Offset” to set level ➔

Click “Edit Type” to change properties by your own if any



Click “Place on Work Plane” ➔ Drag from starting point to end to create sheet pile



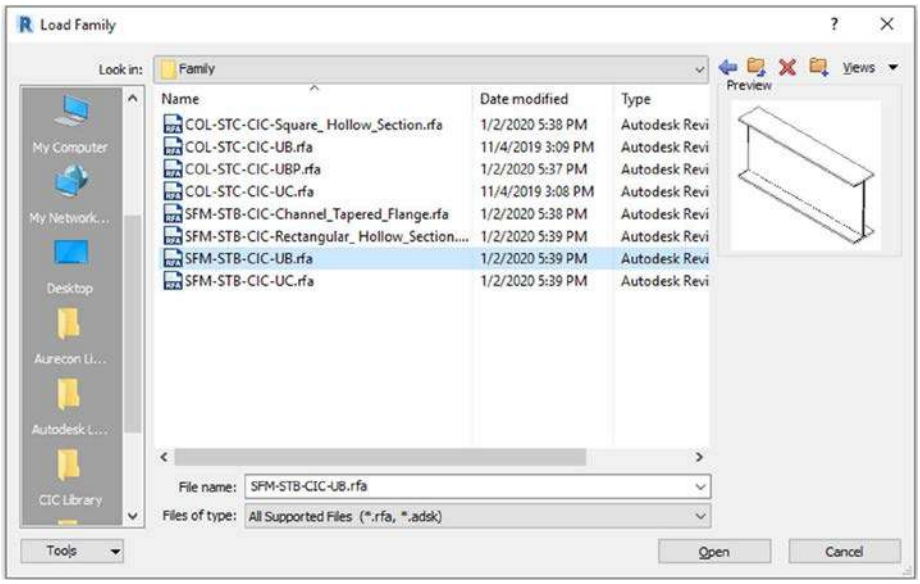


Repeat the above steps

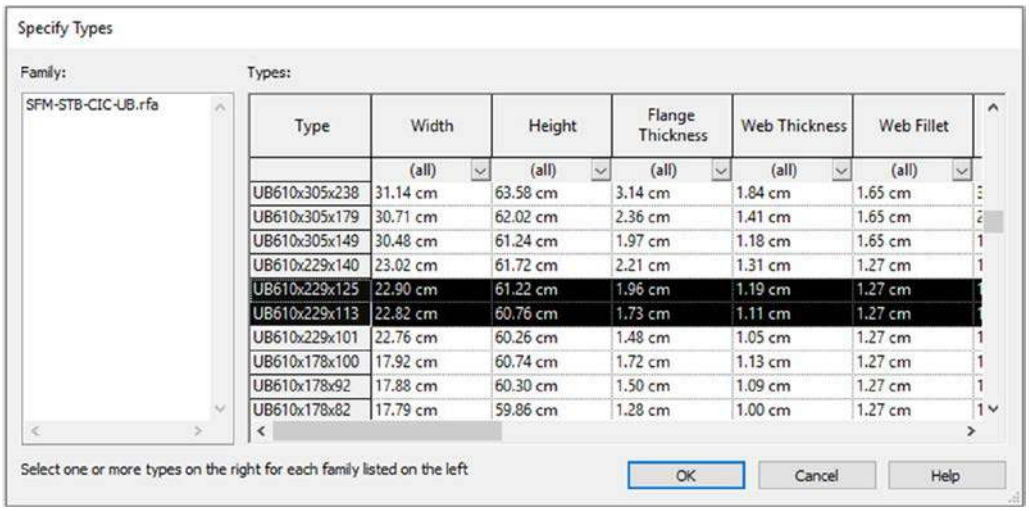
4.4.2 Create Walling

In the Project Browser, open an existing ground level

Click “Insert” ➜ click “Load Family” ➜ Open “SFM-STB-CIC-UB.rfa” file in Browser ➜ click “Open” Remark: repeat the above steps to load different types can be loaded into the model

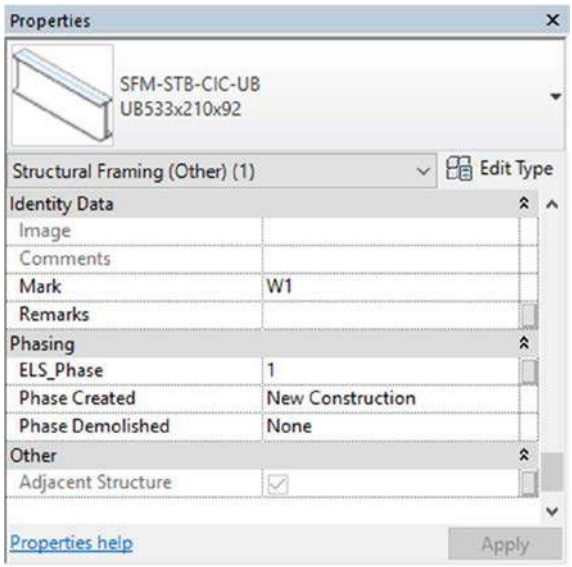


Select the required type to load into the project.

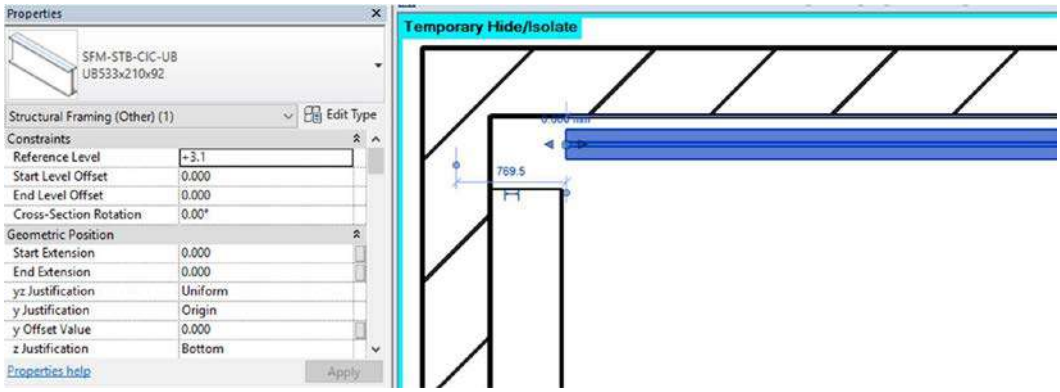


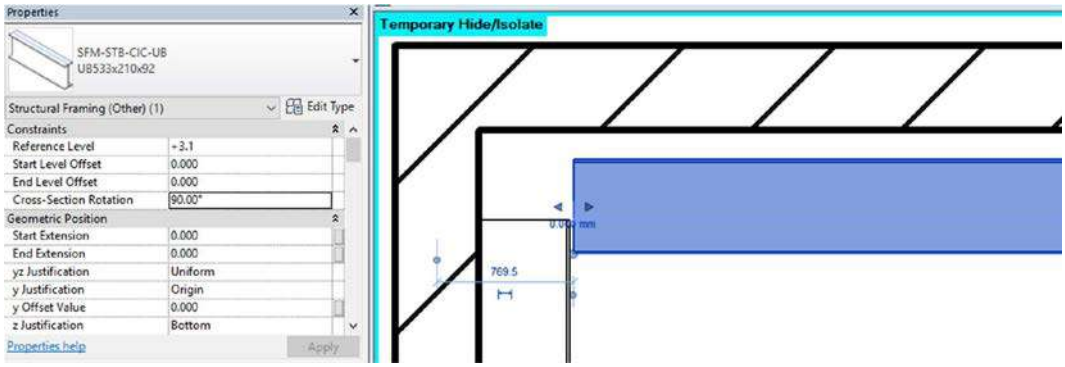
In Ribbon, click “Structure” ➔ draw walling by dragging starting point to end

In the Properties panel, select the corresponding type and dimension of walling ➔ fill in “mark” for identification of element ➔Fill in “ELS_Phase” to identify the phasing (i.e. 1,2,3,4 …etc)



Set cross-section rotation if necessary

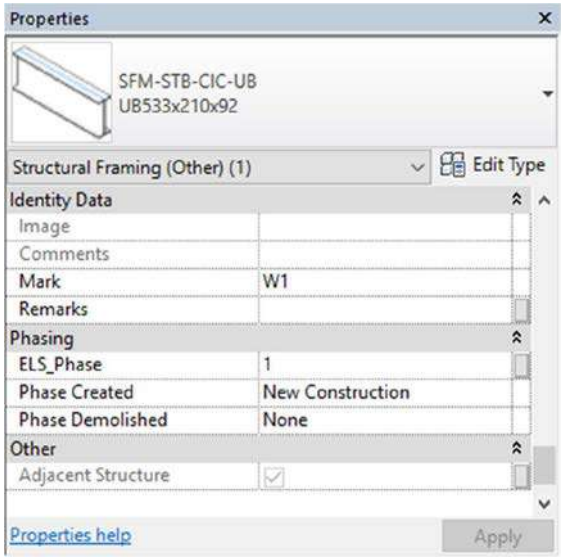


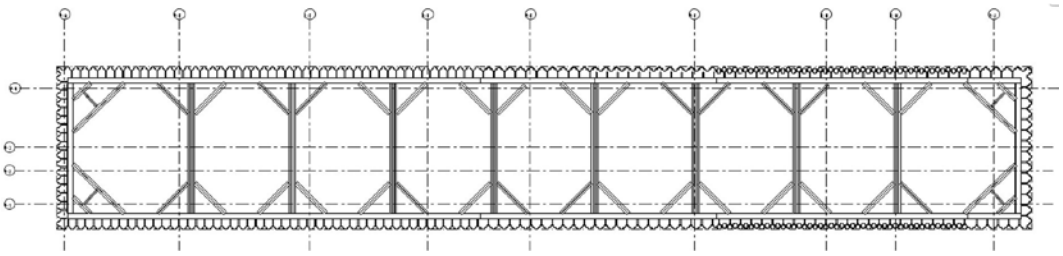


4.4.3 Create Strut / Short Strut / Tie

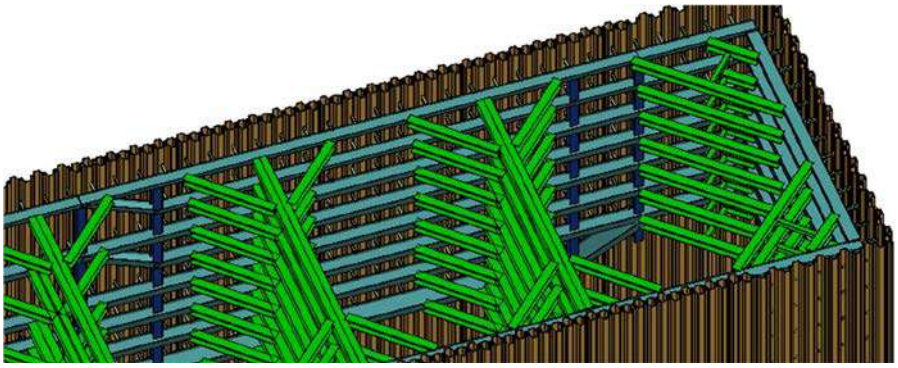
In Ribbon, click “Structure” ➜ click “BEAM” ➜ drag from starting point to end to create the strut / tie /short strut

In the Properties panel, select the corresponding type and dimension ➜ select the reference level ➜ Fill in “Mark” for identification of element ➜ Fill in “ELS_Phase” to identify the phasing (i.e. 1,2,3,4 …etc.)



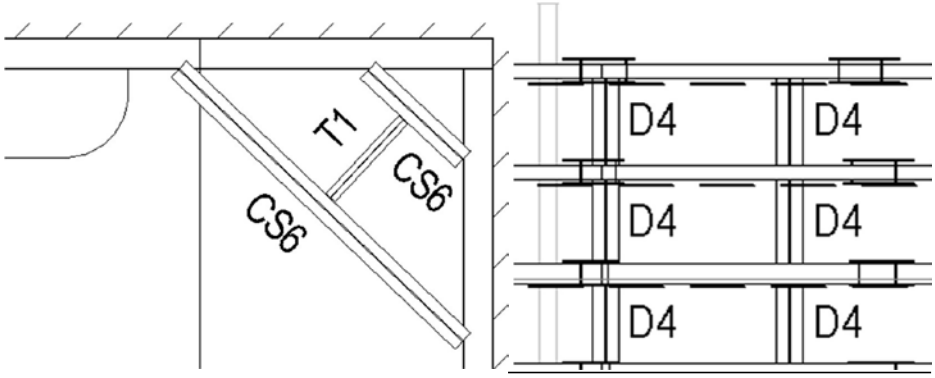


Repeat the above steps



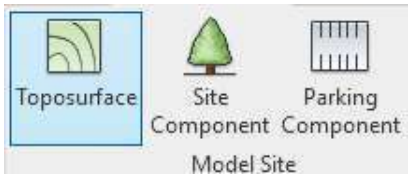
Add Tag in plan view/ section view (Refer to section 7.1.2 Add Tags – Tag by Category)

Category	Family	Type
Structural Framing	ANN-FTG-CIC-Rectangular	Standard
Structural Column	ANN-SCG-CIC	Mark

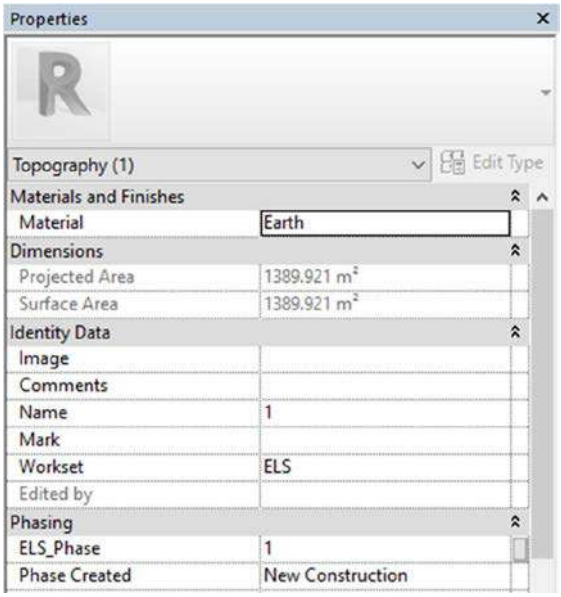


4.4.4 Create Stage Topo / Final Topo

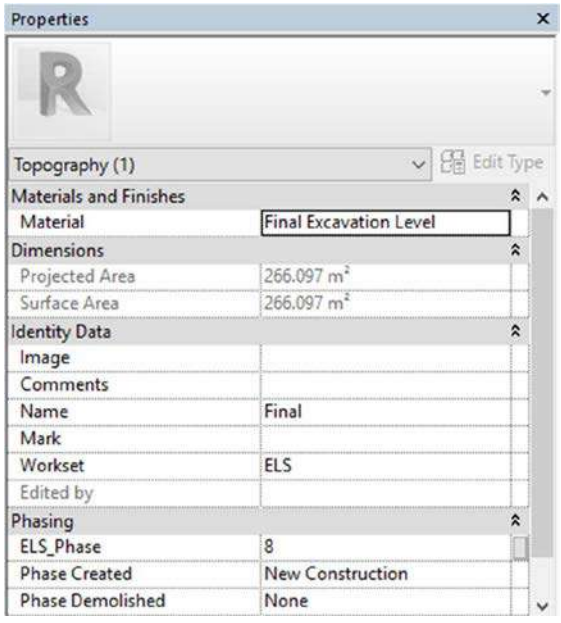
In Ribbon, click “Massing & Site” ➔ click “Toposurface” ➔ Input surface “Elevation” ➔ click “Place Point” on specific elevation ➔ click “Tick” ➔ Repeat above steps for different elevations

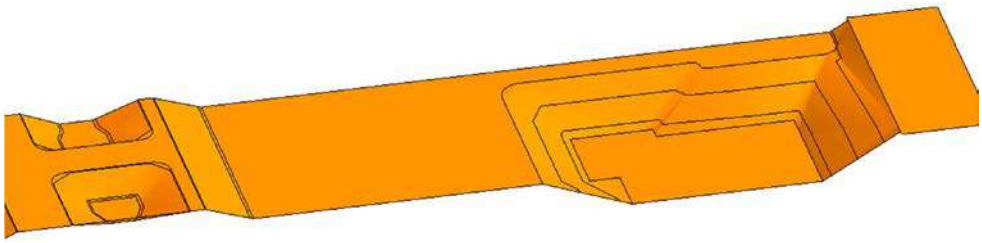


In the Properties panel, fill in “ELS_Phase” and “Name” to identify the phasing (i.e. 1,2,3,4 …etc.) and the name of the toposurface (i.e. 1,2,3,4 …etc.). Select “Earth” for Material.



For final excavation toposurface, fill in “Final” for Name and select “Final Excavation Level” for Material.



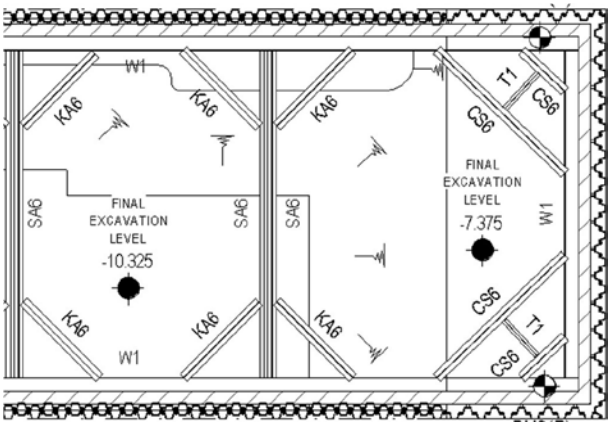


Add Symbol in plan view (Refer to section 7.1.4 Add annotation symbol)

Category	Family	Type
Generic Annotation	ANN-GNN-CIC-Cut_Slope	5mm 10mm

Add spot elevation for final excavation in plan view

In ribbon ➔ click “Annotate” ➔ “Spot Elevation” ➔ select “SPE-AEC-Final_Excavation_Level_Prefix” in properties panel ➔ place to the desired location.



4.5 Ground Investigation

The following objects will be modelled:

- Bored Hole
- Standard penetration tests result
- Profile for inferred boundaries of different geological strata
- Instrument checkpoints

4.5.1 Insert Bored Hole using Dynamo

Prepare the bored hole coordination table in excel format for dynamo input. Basic information shall be input by the user:

- Bored hole number
- Soil / rock layer
- Easting coordination

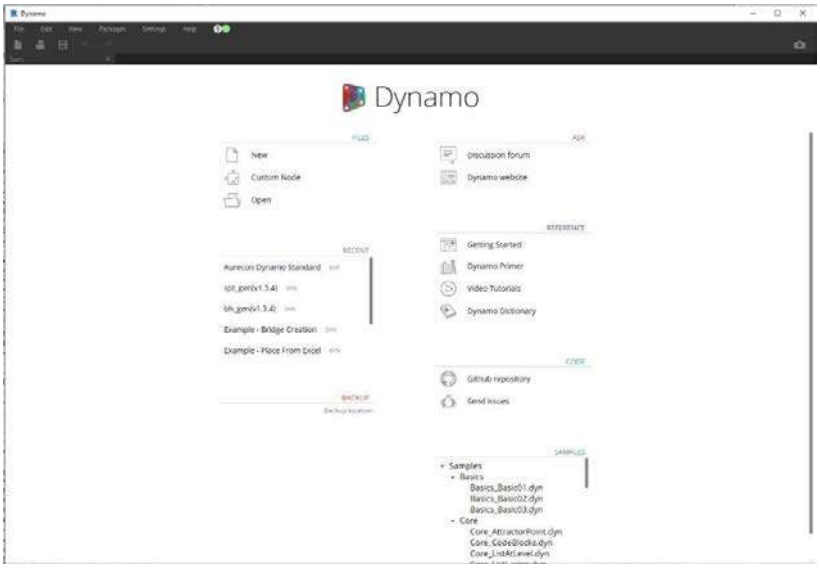
- Northing coordination
- Layer top-level (mPD)
- Layer bottom level (mPD)

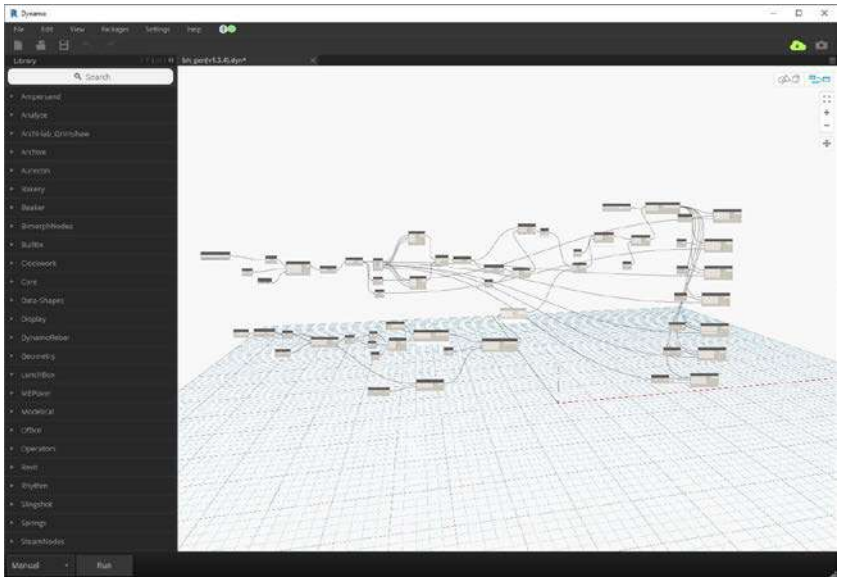
BH no.	Soil / Rock Layer	Easting	Northing	Layer Top Level (mPD)	Layer Bottom Level (mPD)
BH1	FILL	835338517	819787853.8	4019.447	-4480.553
BH1	V	835338517	819787853.8	-4480.553	-5980.553
BH1	II	835338517	819787853.8	-5980.553	-8480.553
BH1	V	835338517	819787853.8	-8480.553	-27480.5529
BH1	IV	835338517	819787853.8	-27480.5529	-30100.5529
BH1	III	835338517	819787853.8	-30100.5529	-33780.5529
BH1	IV	835338517	819787853.8	-33780.5529	-34680.5529
BH1	III	835338517	819787853.8	-34680.5529	-36860.5529
BH1	II	835338517	819787853.8	-36860.5529	-38800.5529
BH1	III	835338517	819787853.8	-38800.5529	-39380.5529
BH1	II	835338517	819787853.8	-39380.5529	-40730.5528
BH1	III	835338517	819787853.8	-40730.5528	-41090.5528
BH1	II	835338517	819787853.8	-41090.5528	-41880.5528
BH1	III	835338517	819787853.8	-41880.5528	-42560.5528
BH1	II	835338517	819787853.8	-42560.5528	-43430.5528
BH1	III	835338517	819787853.8	-43430.5528	-43800.5528
BH1	II	835338517	819787853.8	-43800.5528	-44930.5528

Click “Manage” in ribbon ➜ click “Dynamo”

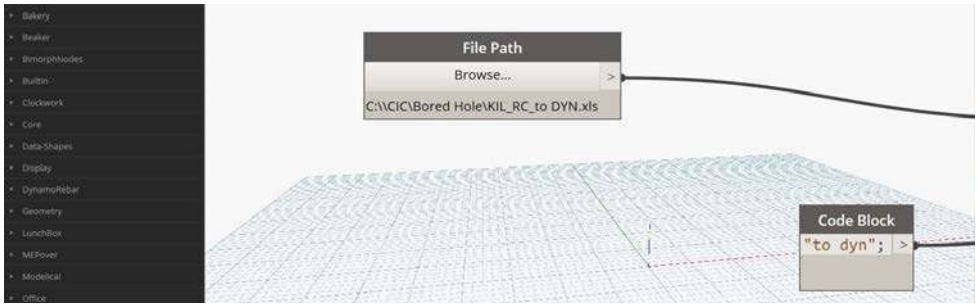
(Remark: User may download Dynamo from the below website: https://dynamobim.org/download/)

Open dynamo user interface in window ➜ Open dynamo file “bh_gen(v1.3.4).dyn”





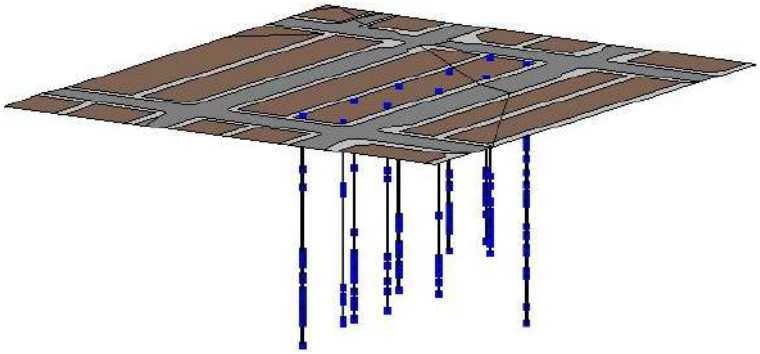
Click to edit “File Path” ➜ Choose the corresponding excel file of the bored hole coordination table.



Edit “Family Type” in Dynamo window ➜ change the type to “STE-OTR-CIC-Borehole: STE-OTR-CIC- Borehole”

Click “Run” in Dynamo window

Close the Dynamo window ➜ present bored hole elements in Revit screen



4.5.2 Insert Standard penetration test result using Dynamo

Prepare a standard penetration test point table in excel format for dynamo input. Basic information shall be input by user:

- Count
- Easting
- Northing
- Position Z
- Value

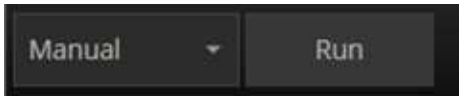
Count	Easting	Northing	Position Z	Value
BH1	835338517	819787853.8	501.0366	N=9
BH1	835338517	819787853.8	-1498.9634	N=10
BH1	835338517	819787853.8	-4998.9634	N=15
BH1	835338517	819787853.8	-8998.9634	N=15
BH1	835338517	819787853.8	-10998.963	N=19
BH1	835338517	819787853.8	-12998.963	N=24
BH1	835338517	819787853.8	-14998.963	N=26
BH1	835338517	819787853.8	-16998.963	N=72
BH1	835338517	819787853.8	-18998.963	N=76
BH1	835338517	819787853.8	-20998.963	N=97

Click “Manage” in ribbon ➜ click “Dynamo” again for standard penetration test (SPT) input

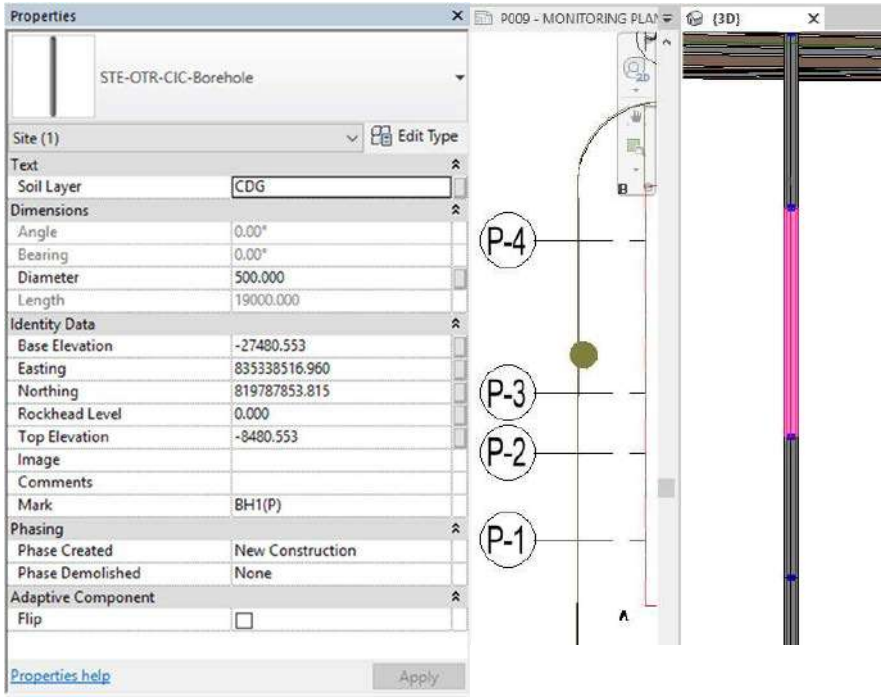
Open dynamo user interface in window ➜ Open dynamo file “spt_gen(v1.3.4).dyn” Click to edit “File Path” ➜ Choose the corresponding excel file

Edit “Family Type” in Dynamo window ➜ change the family type to “STE-OTR-CIC-Borehole_SPT: STE-OTR-CIC-Borehole_SPT”

Click “Run” in Dynamo window



Close the Dynamo window ➜ present SPT elements in Revit screen Select a bored hole ➜ edit the rockhead level manually.

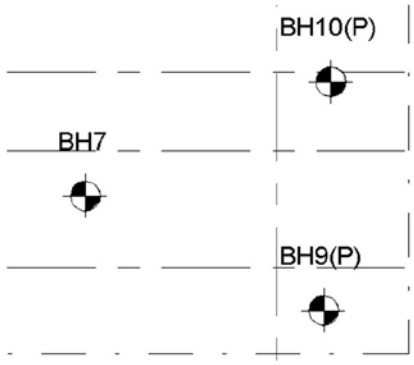


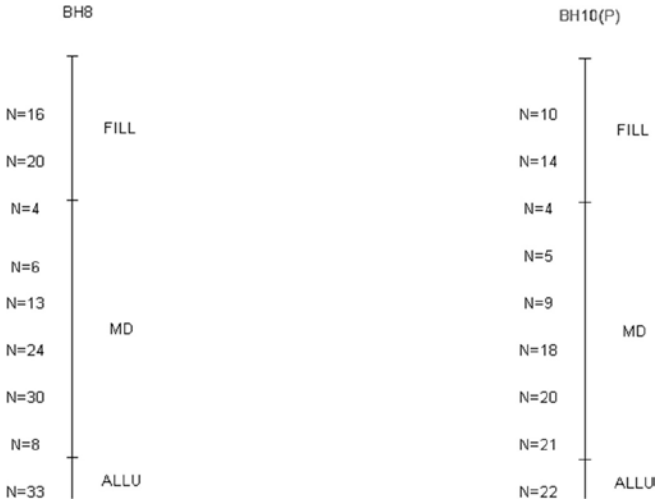
Important Note:

In the properties panel, “soil layer”, “Diameter”, “Base Elevation”, “Easting”, “Northing”, “Rock Head Level”, “Mark” are automatically generated by Dynamo input from previous steps.

Add Tag in plan view/ section view (Refer to section 7.1.2 Add Tags – Tag by Category)

Category	Family	Type
Site	ANN-STG-CIC-Boredhole	Elevation – Layer Elevation – Mark Elevation - N Value Plan – Down Plan - Up

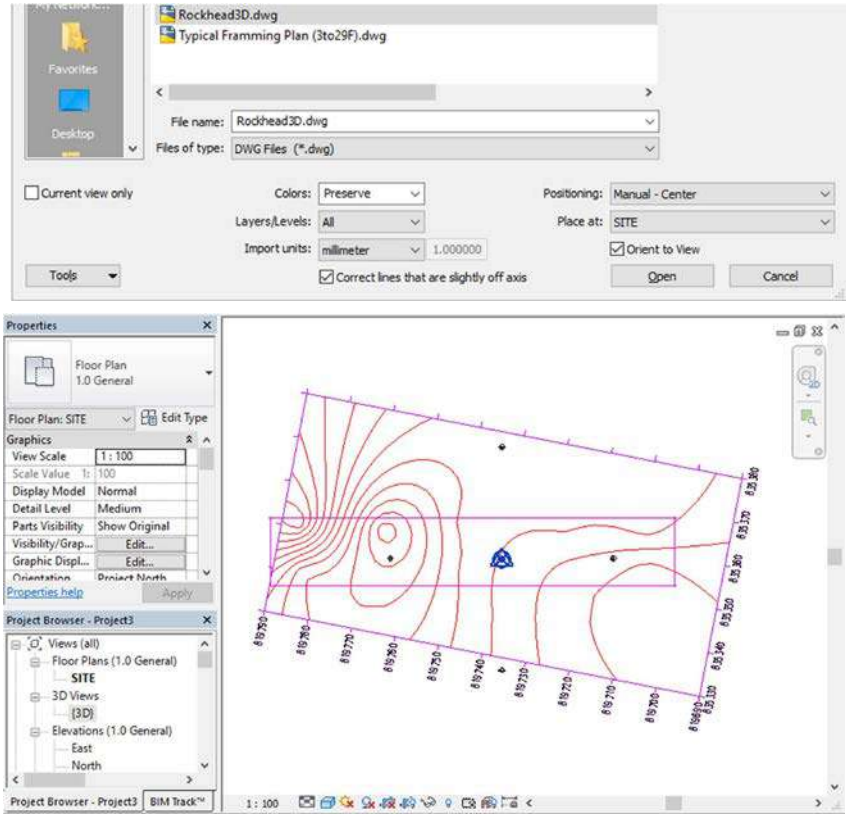

BH10(P)
BH7
BH9(P)


BH8
N=16
N=20
N=4
N=6
N=13
N=24
N=30
N=8
N=33
FILL
MD
ALLU
BH10(P)
N=10
N=14
N=4
N=5
N=9
N=18
N=20
N=21
N=22
FILL
MD
ALLU

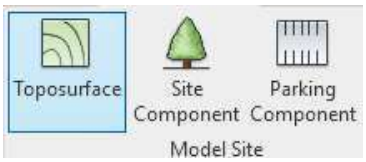
4.5.3 Create rockhead profile

In Ribbon, click “Insert” ➔ click “Import CAD” ➔ select the rockhead CAD file

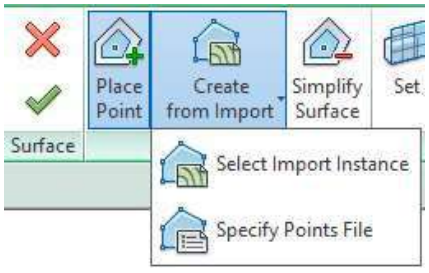
Make sure to unclick “Current view only” ➔ place the CAD file to the desired location.



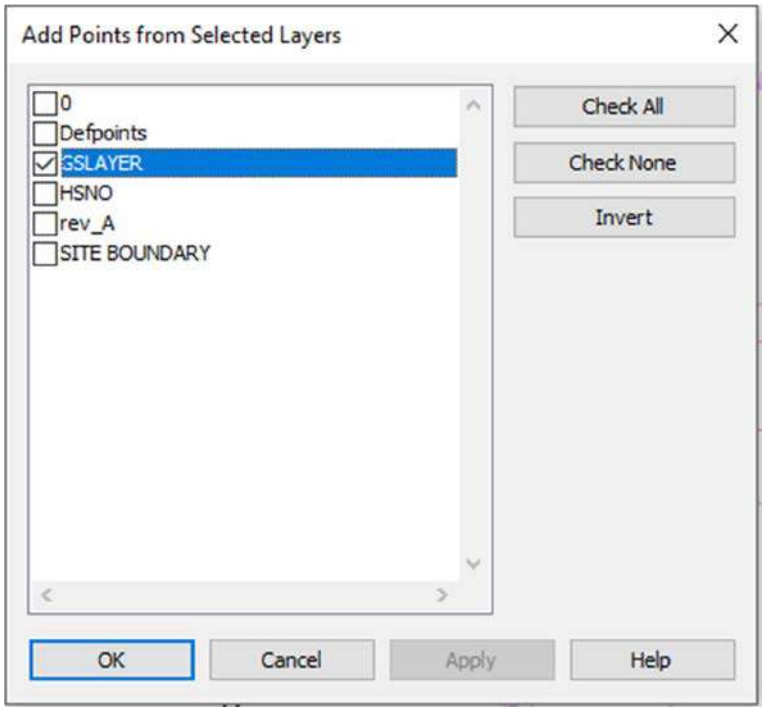
In Ribbon, click “Massing & Site” ➔ click “Toposurface”



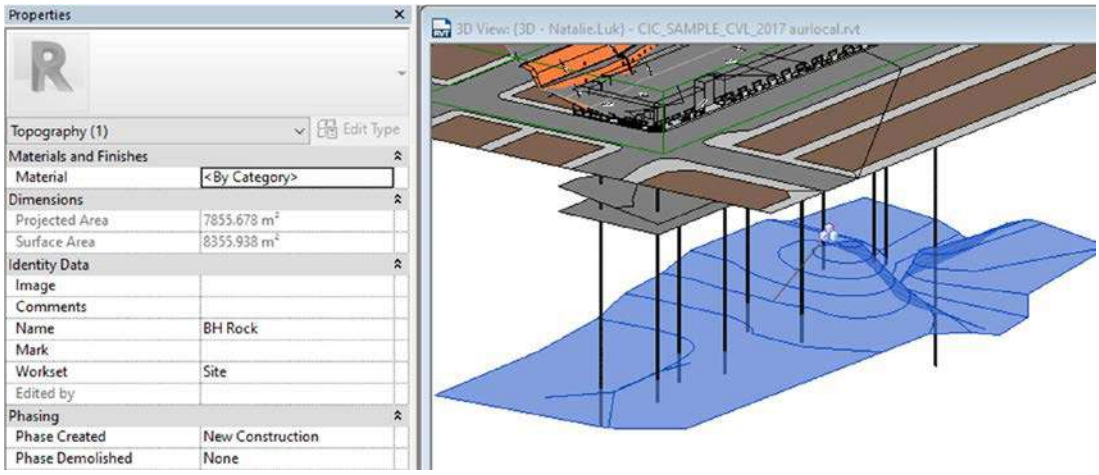
Click “Select Import Instance” ➔ select the imported rockhead CAD file



Select the layer(s) that contains the elevation points of the profile ➔ click “OK” to generate the toposurface.



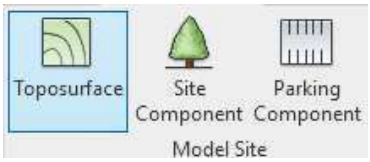
In properties panel, fill in “BH Rock” for Name.



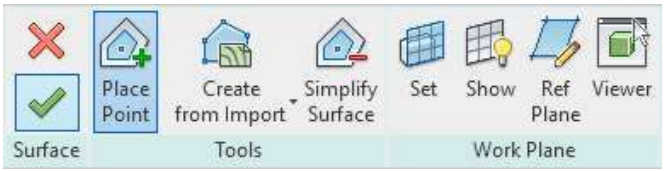
4.5.4 Create profile for inferred boundaries of different geological strata

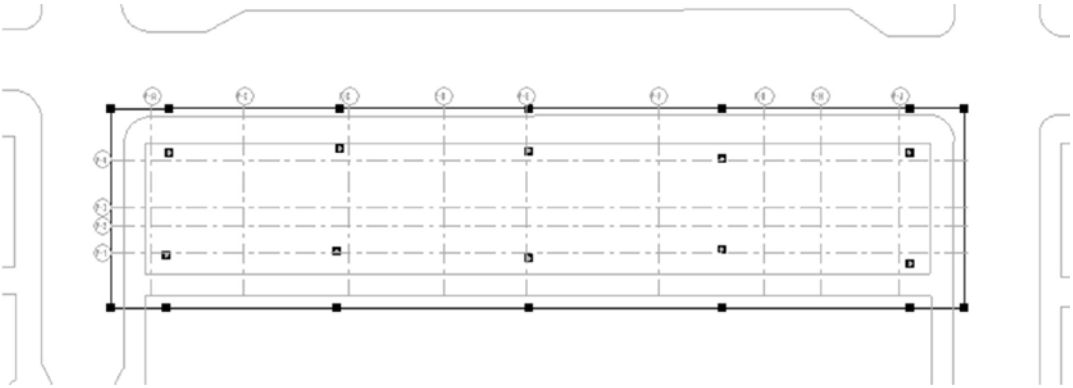
Select “BOREDHOLE” plan under Floor Plans in Project Browser. In Ribbon, click “Insert” ➔ click

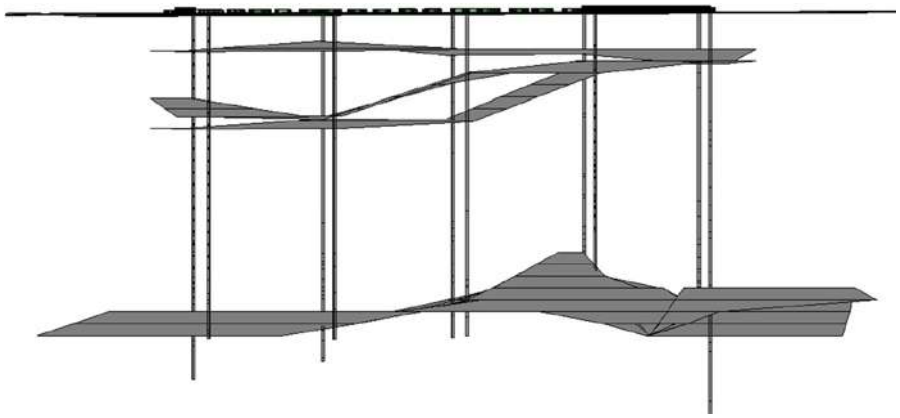
Open a site plan in Revit ➔ click “Massing & Site” in ribbon ➔ click “Toposurface” under Model Site.



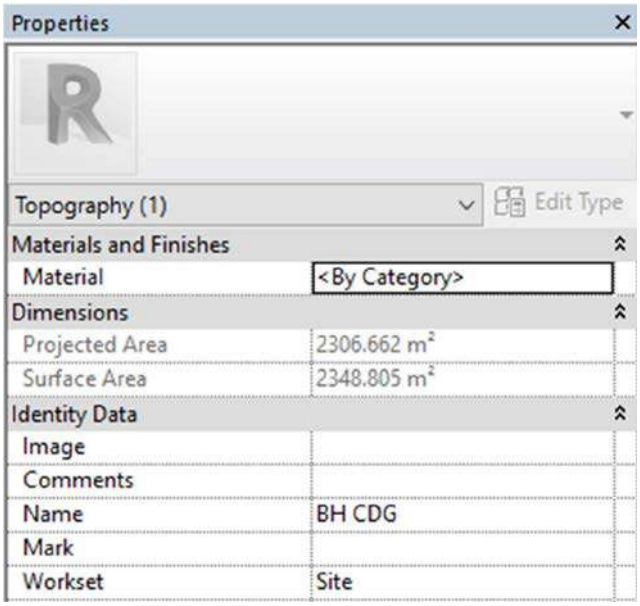
Place point and set the elevation on the Toposurface according to the inferred boundaries for each bored hole ➔ click “Tick”.







In the properties panel, fill in the name of each boundary (ie. BH MD, BH ALLU, BH CDG, etc.) in “Name”



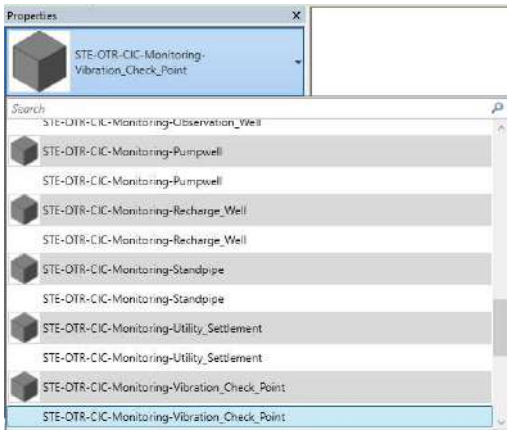
4.5.5 Create Instrument check point

The followings instrument check point object will be modelled:

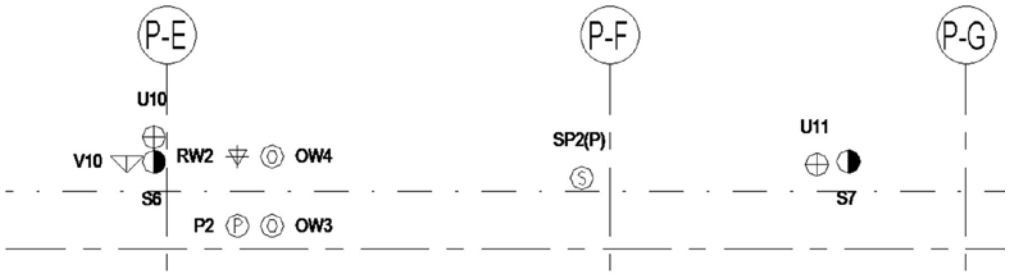
- Building settlement marker
- Building Tilting check point with vertical displacement
- Ground settlement check point
- Utility settlement monitoring point on ground
- Vibration check point
- Observation Well
- Pump Well
- Recharge Well
- Standpipe with piezometer

Select “MONITORING CHECK POINT” plan under Floor Plans in Project Browser. In Ribbon, click “Massing & Site” ➔ click “Site Component”

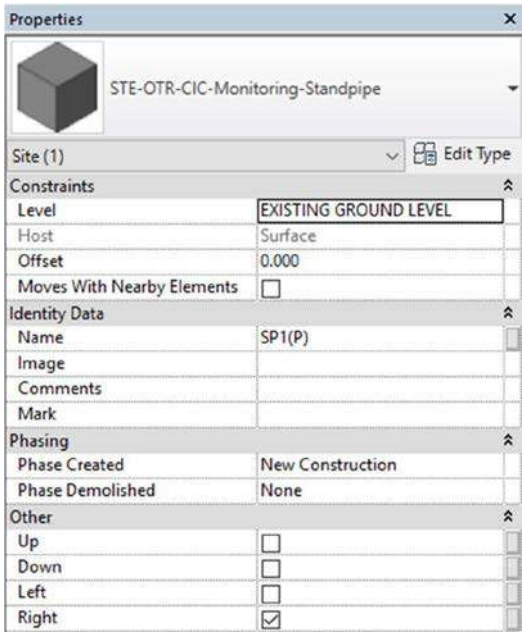
Select the specific types of instrument marker in the properties panel.



Place the object to the designed location.



In the properties panel, fill in “Name” for identification of element. Select Up/Down/Left/Right for the display location of the name.



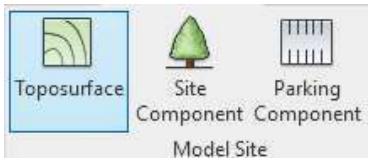
4.6 Site Formation

The following objects will be modelled for site formation plan:

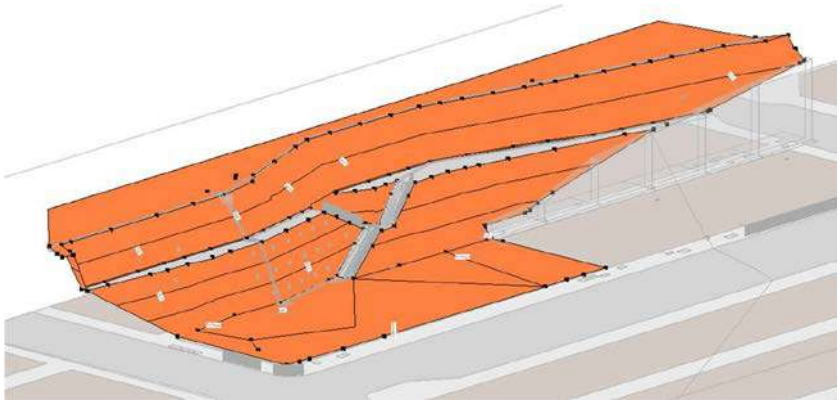
- Site formation profile
- Site drainage
- Retaining wall
- Soil nail

4.6.1 Create Site formation profile

Open a “SITE FORMATION” plan under Floor Plans in Project Browser ➜ click “Massing & Site” in ribbon ➜ click “Toposurface” under Model Site.

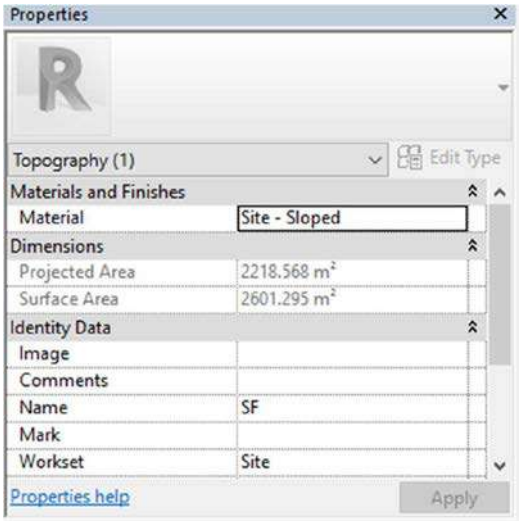


Place point and set the elevation on the Toposurface to create ➜ click “Tick”.



Repeat the above steps for a different stage of site profile.

In the properties panel, fill in “SF” for Name for identification of element.

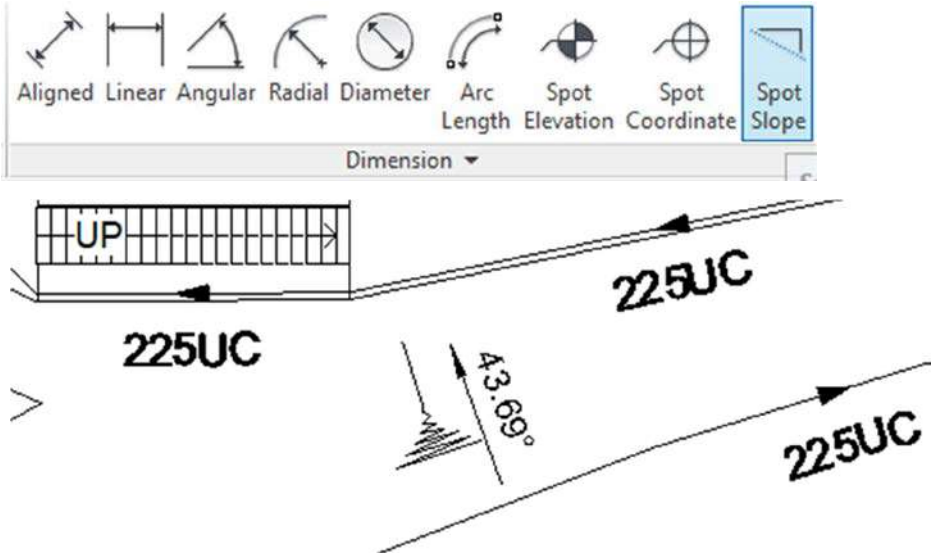


Add Symbol in plan view (Refer to section 7.1.4 Add annotation symbol)

Category	Family	Type
Detail Item	DTL-OTR-CIC-Slope_Label	Soil Cut Slope Soil Fill Slope Rock Cut Slope Rock Fill Slope

<u>Add Spot slope in plan view</u>

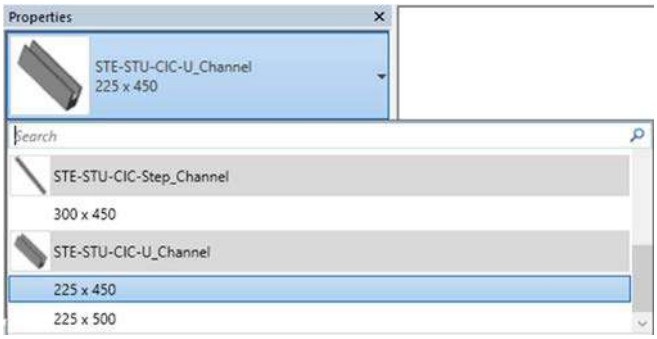
In ribbon ➔ click “Annotate” ➔ “Spot Slope” ➔ select “Sloped Toposurface” in properties panel ➔ place to the desired slope.



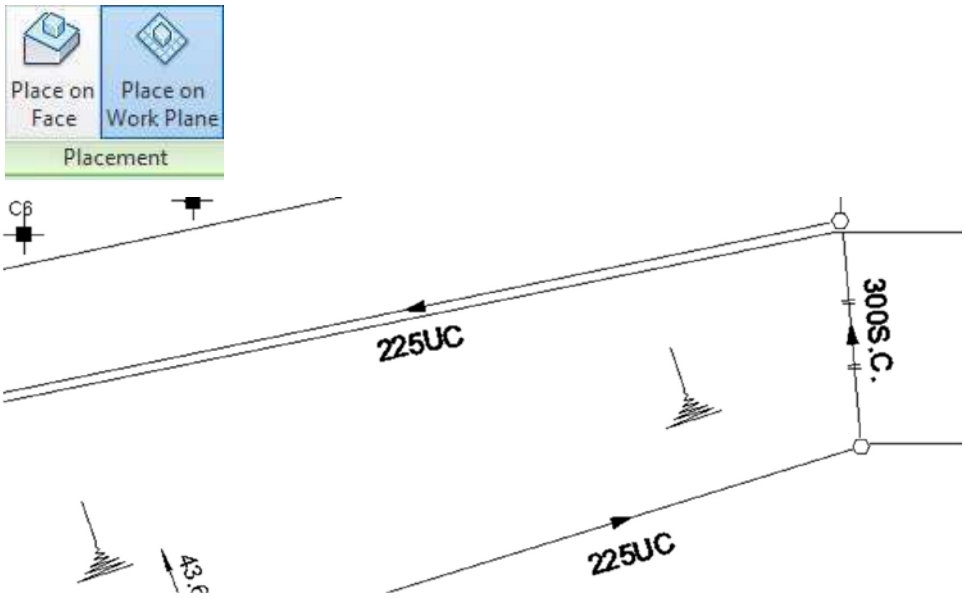
4.6.2 Create Site drainage

Open “SITE FORMATION” plan under Floor Plans in Project Browser. In Ribbon, click “Massing & Site” ➔ click “Site Component”

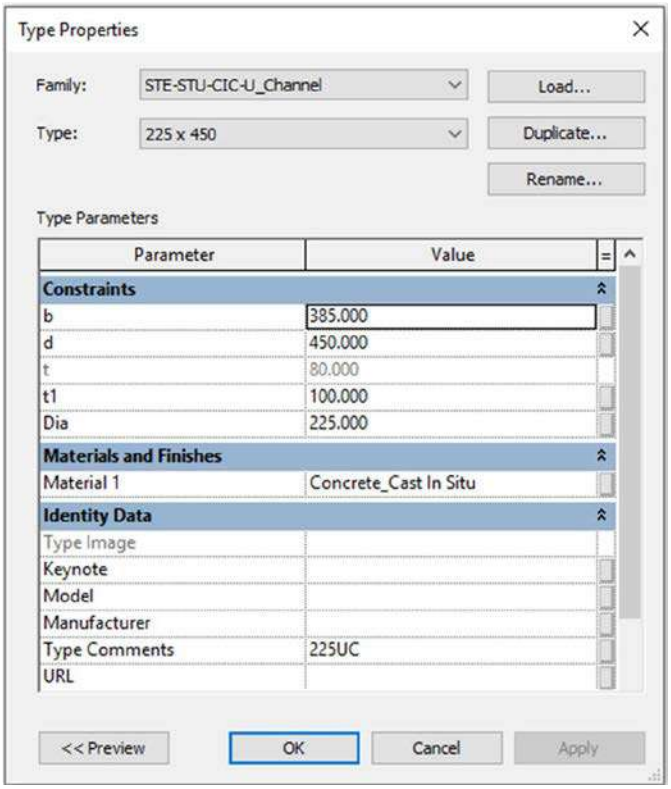
Select “STE-STU-CIC-Step_Channel” or “STE-STU-CIC-U_Channel” in the properties panel.



Click “Place on Work Plane” ➔ Drag from starting point to end to create the channel.

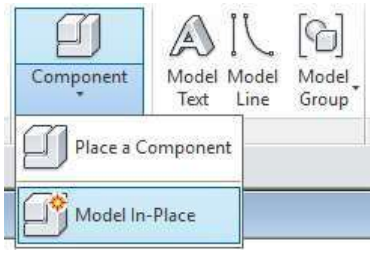


Channel sizes can be adjusted by clicking “Edit Type” in the properties panel. “Type Comments” define the text showing on the plan view.

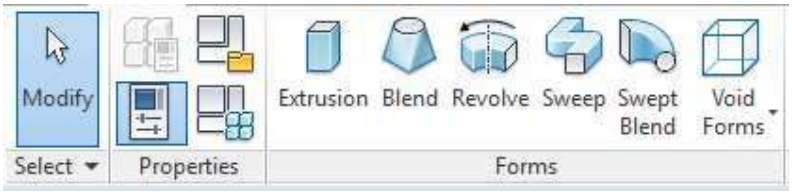


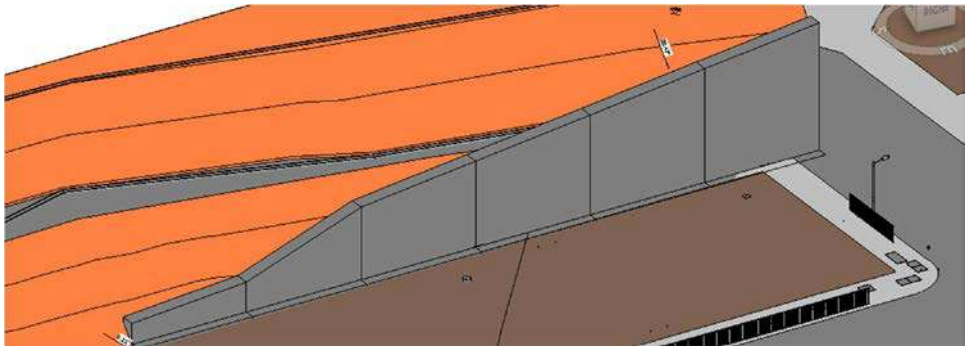
4.6.3 Create Retaining wall

Open “SITE FORMATION” under Floor Plans in Project Browser ➔ Click “Structure” in ribbon ➔“Model” ➔ ”Component” ➔ click “Model In-Place”



Select “Site” in the Family Category and Parameters dialogue and fill in the name of retaining wall. Draw the retaining wall by using “Forms” tools.

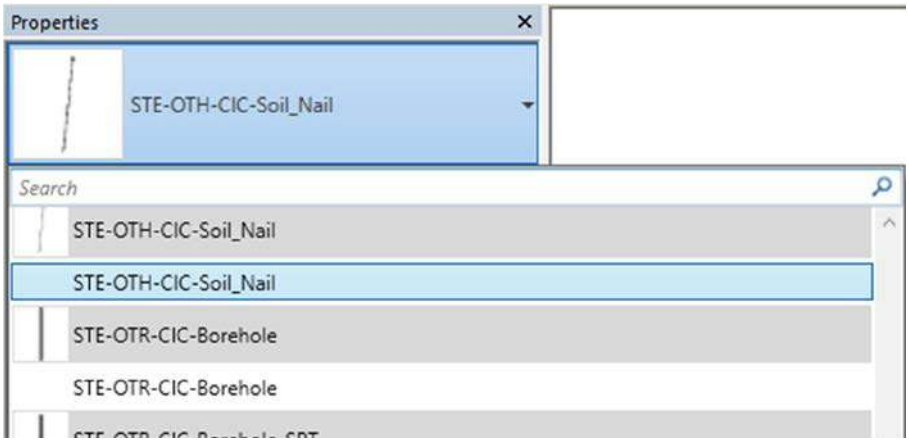




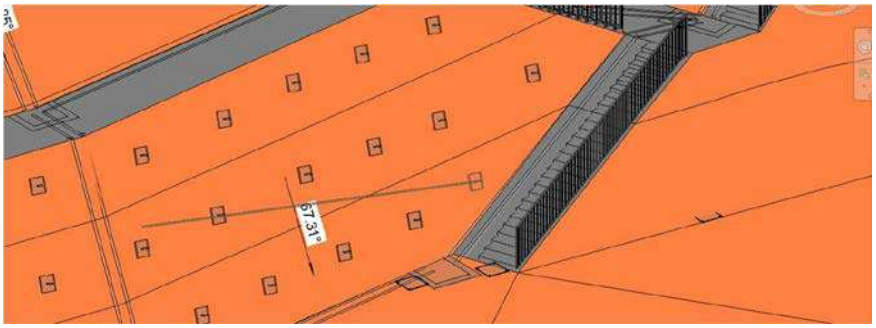
4.6.4 Create Soil nail

Open “Site Formation 3D” under 3D Views in Project Browser. In Ribbon, click “Massing & Site” ➔ click “Site Component”

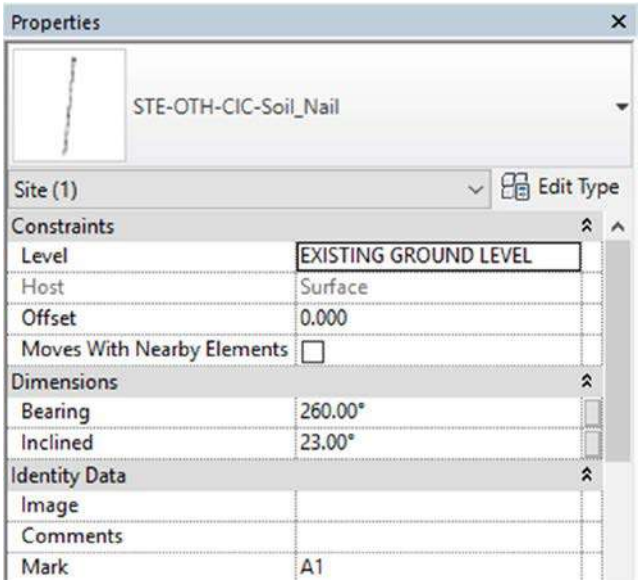
Select “STE-OTH-CIC-Soil_Nail” in the properties panel.



Place it to the designed location along the surface of the toposurface.

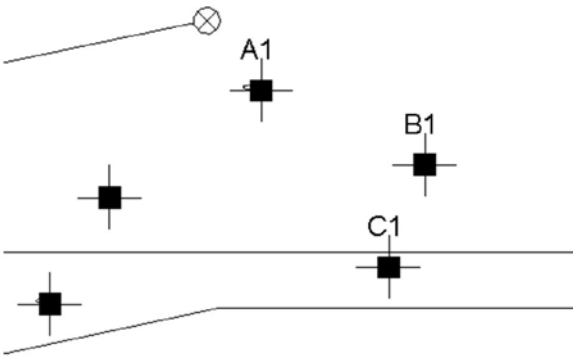


In the properties panel, fill in “Name” for identification of element.



Add Tag in plan view (Refer to section 7.1.2 Add Tags – Tag by Category)

Category	Family	Type
Site	ANN-STG-CIC-Soil_Nail	Up Down



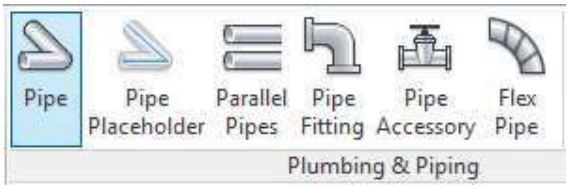
4.7 Drainage

The following objects will be modelled for drainage plan:

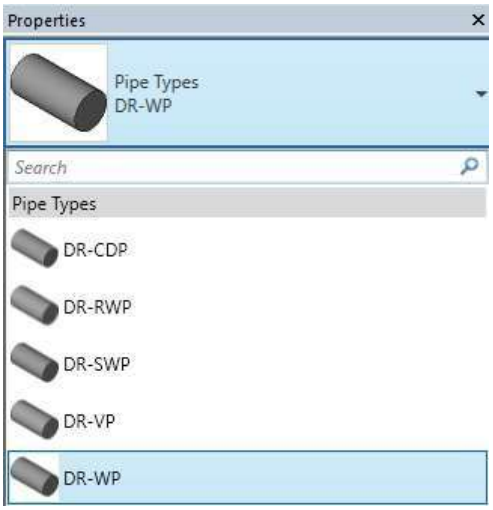
- Drainage pipe
- Drain
- Sanitary fitment
- Manhole / Sump Pit / Gully / Trap / Petrol Interceptor

4.7.1 Create Drainage pipe

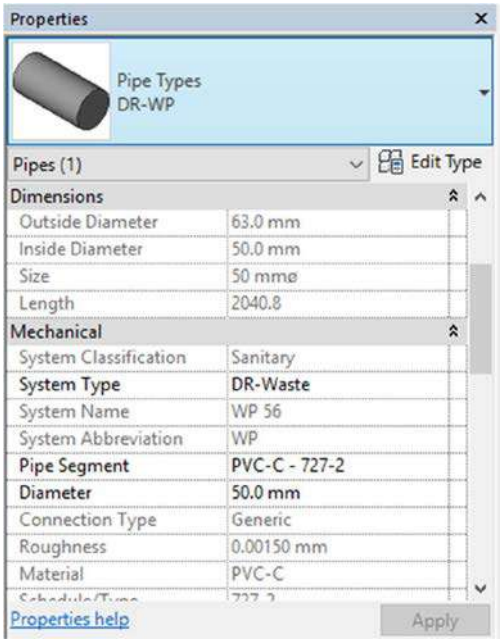
In Ribbon, click “System” ➔ click “Pipe” under “Plumbing & Piping”



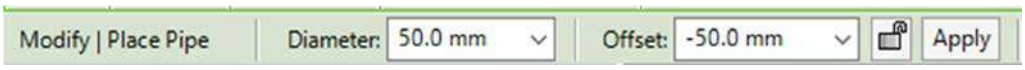
Select the specific system type in the properties panel.



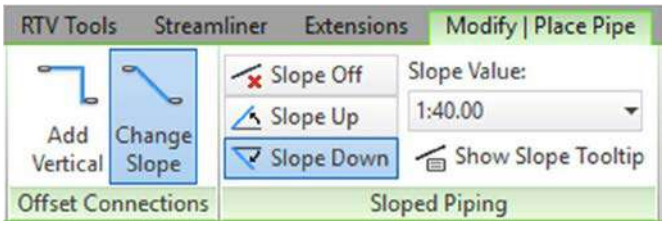
In the properties panel, specific the System Type of the pipe.



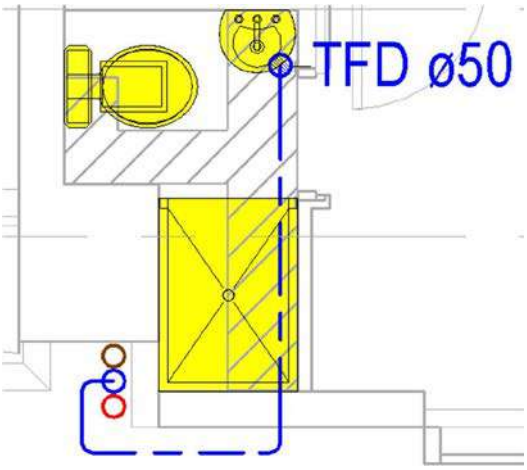
Under ribbon panel, select pipe diameter and offset from level.



Specific the slope value for the sloped pipe.

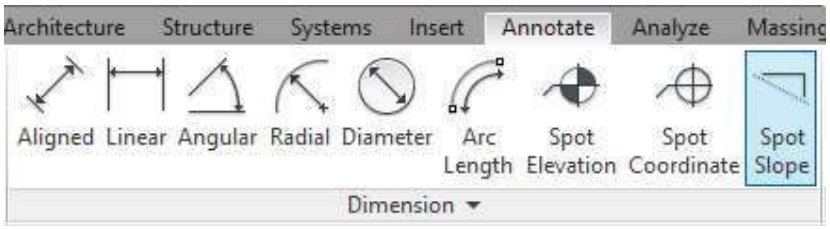


Drag from starting point to end to create the pipe.

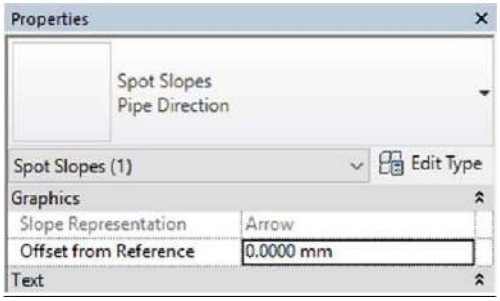


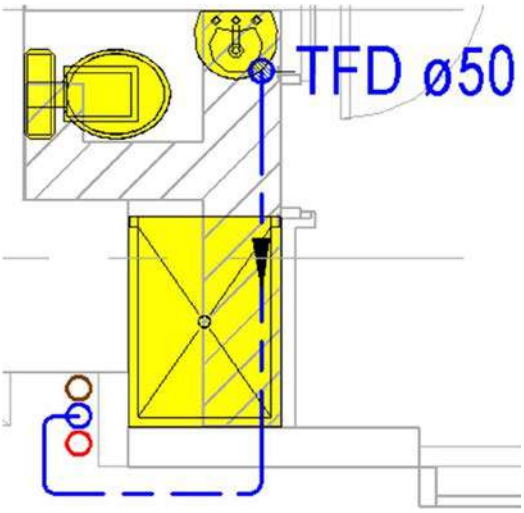
Add slope symbol to the sloped pipe

In ribbon ➔ click "Annotate" ➔ "Spot Slope" ➔ select "Pipe Direction" in properties panel ➔ place to the desired pipe.



In the properties panel, fill in 0mm to "Offset from Reference".

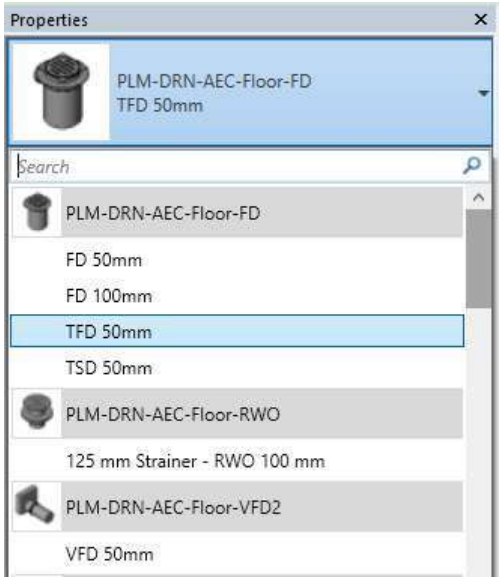




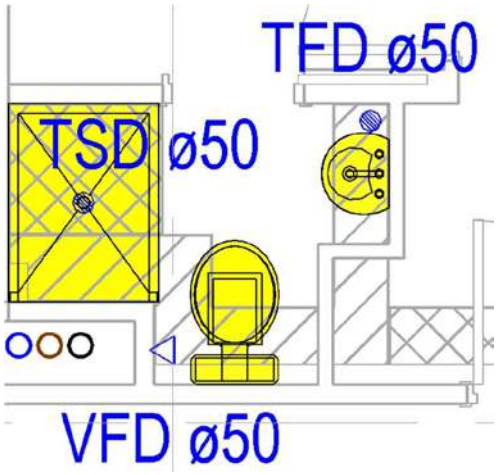
4.7.2 Create Drain

In Ribbon, click “System” ➔ click “Plumbing Fixture” under “Plumbing & Piping”

Select the specific drain type in the properties panel.



Place it to the designed location.



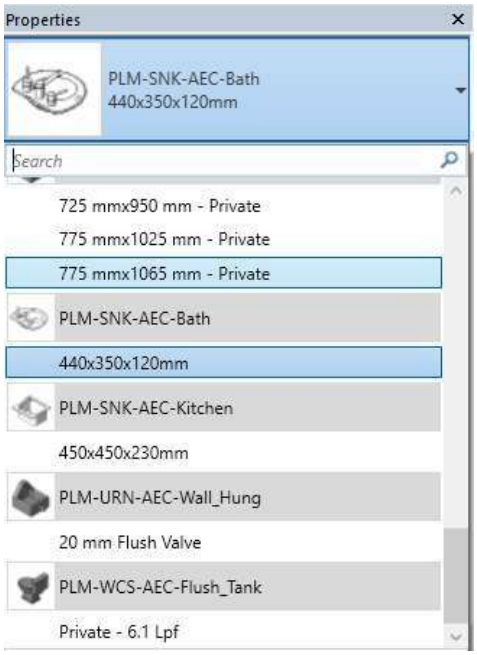
Add Tag in plan view (Refer to section 7.1.2 Add Tags – Tag by Category)

Category	Family	Type
Plumbing Fixture	ANN-PMG-CIC	Type Mark (RWP) Type Mark (WP)

4.7.3 Create Sanitary fitment

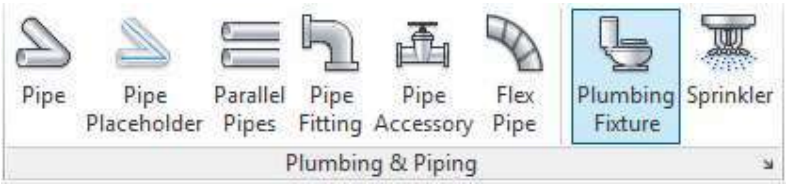
In Ribbon, click “System” ➔ click “Plumbing Fixture” under “Plumbing & Piping”

Select the specific sanitary fitment item in properties panel ➔Place it to the designed location

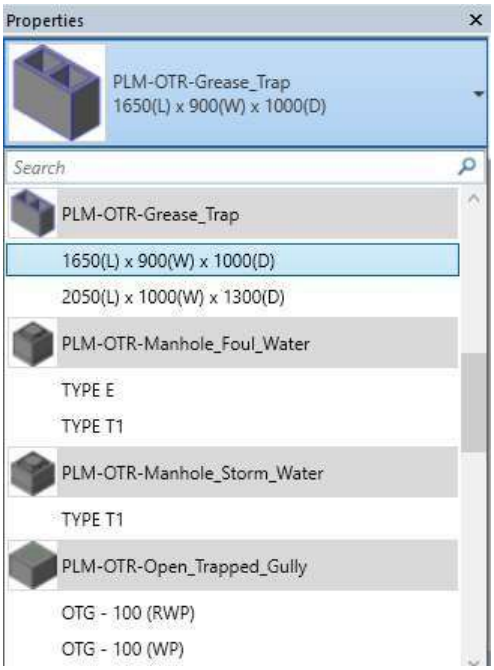


4.7.4 Create Manhole / Sump Pit / Gully / Trap / Petrol Interceptor

In Ribbon, click “System” ➔ click “Plumbing Fixture” under “Plumbing & Piping”



Select the specific item in properties panel ➔Place it to the designed location



Add Tag in plan view (Refer to section 7.1.2 Add Tags – Tag by Category)

Category	Family	Type
Plumbing Fixture	ANN-PMG-CIC	Detail (RWP) Detail (SWP) Detail (WP)

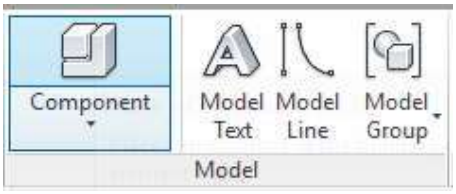
4.8 Curtain Wall

The following objects will be modelled for curtain wall plan:

- Embed
- Mullion and transom
- Glass panel and louvre

4.8.1 Create Embed

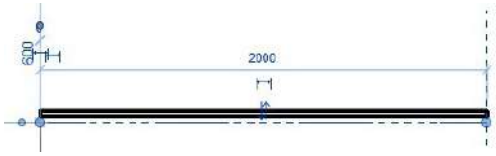
In Ribbon, click “Structure” ➔ click “Component” under “Model”



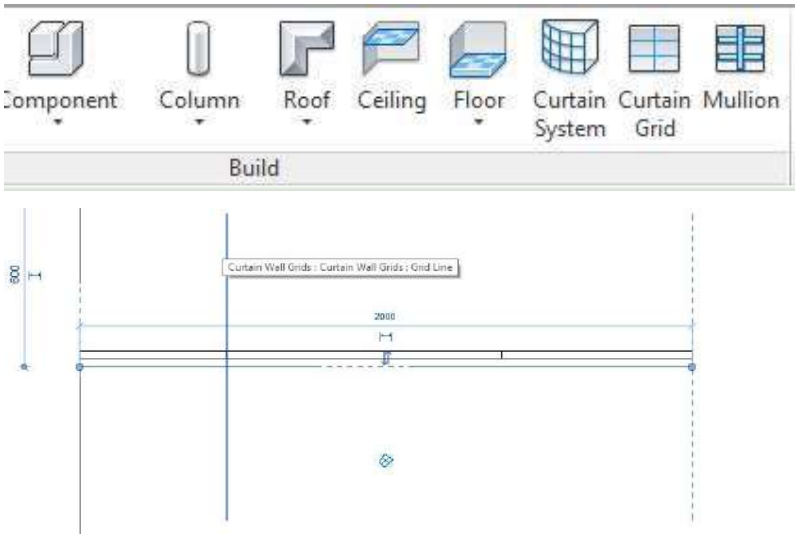
Select the specific item in properties panel ➔Place it to the designed location

4.8.2 Create mullion and transom

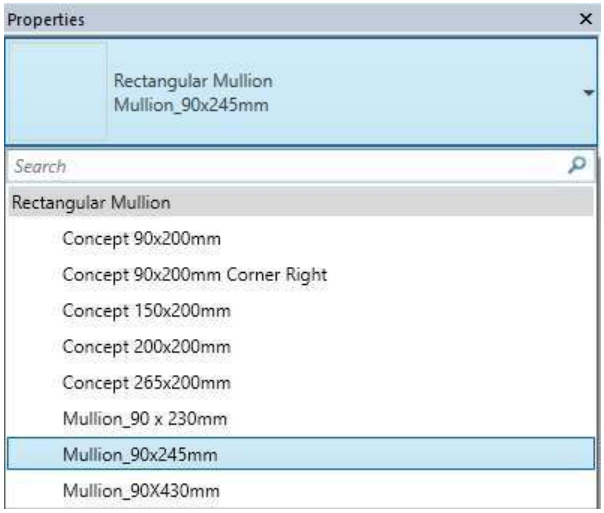
Create Curtain wall by clicking “Architecture” ➔ “Wall” ➔ select “Curtain Wall” in the properties panel

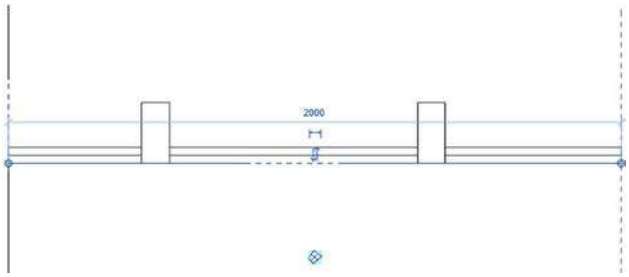


Create curtain grid by clicking “Architecture” ➔ “Build” ➔“Curtain Grid”



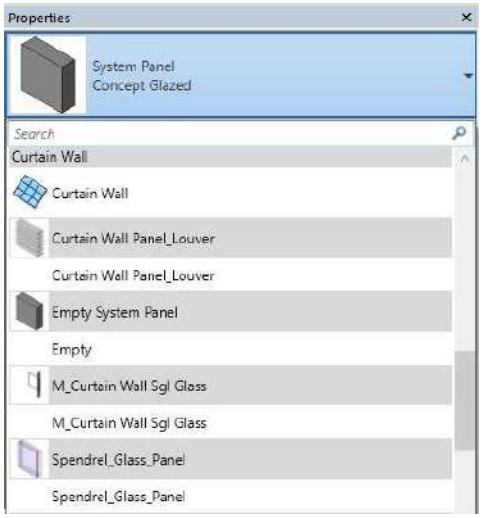
Add mullion by clicking “Architecture” ➔ “Build” ➔“Mullion” ➔□Select the specific type of mullion in properties□➔ Place it to the designed curtain grid location

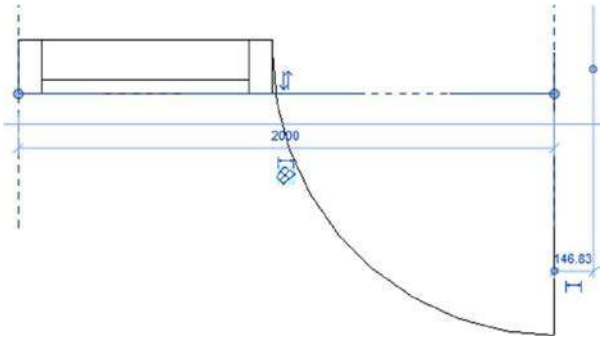




4.8.3 Create glass panel / louvre

For each panel inside, select the type of curtain wall panel in properties.



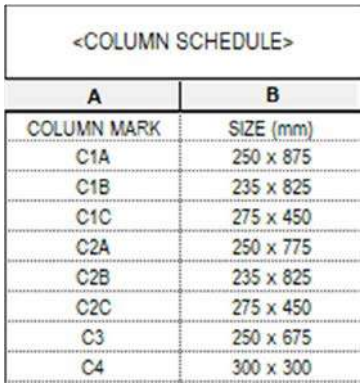


5 Configuring Schedules

5.1 Superstructure

5.1.1 Column Schedule

Click “COLUMN SCHEDULE” in Schedules/Quantities (all) of Project Browser.



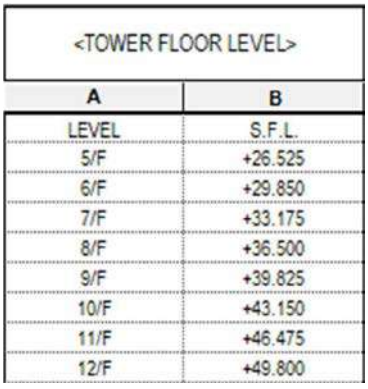
<COLUMN SCHEDULE>

A	B
COLUMN MARK	SIZE (mm)
C1A	250 x 875
C1B	235 x 825
C1C	275 x 450
C2A	250 x 775
C2B	235 x 825
C2C	275 x 450
C3	250 x 675
C4	300 x 300

Auto generated field	COLUMN MARK, SIZE
Manually Input field	/

5.1.2 Tower Floor Level Schedule

Click “TOWER FLOOR LEVEL” in Schedules/Quantities (all) of Project Browser.



<TOWER FLOOR LEVEL>

A	B
LEVEL	S.F.L.
5/F	+26.525
6/F	+29.850
7/F	+33.175
8/F	+36.500
9/F	+39.825
10/F	+43.150
11/F	+46.475
12/F	+49.800

Auto generated field	LEVEL, S.F.L.
Manually Input field	/

5.1.3 Wall RC Schedule

Click “R.C. WALL SCHEDULE” in Schedules/Quantities (all) of Project Browser.

<R.C. WALL SCHEDULE>

A	B	C	D	E	F
FLOOR	WALL MARK	CONCRETE GRADE	THICKNESS (mm)	VERTICAL BARS	HORIZONTAL BARS
3F	W1	C60	250	T40-150	T10-150
3F	W2	C60	250	T25-125	T12-125
3F	W3	C60	200	T20-125	T10-100
3F	W4	C60	150	T20-150	T10-150
3F	W4	C60	200	T20-125	T10-100
3F	W5A	C60	200	T20-125	T10-100

G	H	I
BINDER		
HORIZONTAL	VERTICAL	STEEL RATIO (%)
T12-150	150	3.4
		1.3
		1.3
		1.4
		1.3
		1.3

Auto generated field	FLOOR, WALL MARK, THICKNESS
Manually Input field	CONCRETE GRADE, VERTICAL BARS, HORIZONTAL BARS, BINDER (HORIZONTAL), BINDER(VERTICAL), STEEL RATIO

5.1.4 Beam RC Schedule

Click “R.C. BEAM SCHEDULE” in Schedules/Quantities (all) of Project Browser.

<R.C. BEAM SCHEDULE>

A	B	C	D	E	F	G	H	I	J	K	L	M
BEAM MARK	BEAM SIZE (BXD)	ELEV. REFER	REINFORCEMENT									
			a	a1	a2	b	b1	c	d	e	f	g
CTB1	200 x 300	E9	2T20	-	-	-	2T16	-	-	-	-	-
CTB1a	200 x 300	E9	2T20	-	-	-	2T16	-	-	-	-	-
CTB51	200 x 600	E9a	2T20	2T20	2T20	2T20	-	-	-	-	-	T10-225 E.F.
CTB54	200 x 900	E9a	2T20	2T20	2T20	2T20	-	-	-	-	-	T10-225 E.F.
TB2	200 x 300	E10	2T16	-	-	2T16	-	-	-	-	-	-
TB3	400 x 600	E5	4T25	-	-	4T25	-	4T25	4T25	4T25	4T20	-
TB4	400 x 600	E4	4T25	-	-	4T25	-	-	4T25	-	4T20	-
TB5	400 x 600	E4	4T25	-	-	4T25	-	-	4T25	-	4T20	-

N	O	P	Q	R	S	T
REINFORCEMENT			DIMENSION			
LINKS 1	LINKS 2	LINKS 3	A	B	C	D
<----------	T10-150(2 LEGS)	---------->	2550	-	-	-
<----------	T10-150(2 LEGS)	---------->	2550	-	-	-
<----------	T10-150(2 LEGS)	---------->	1000	-	-	-
<----------	T10-150(2 LEGS)	---------->	1000	-	-	-
<----------	T10-200(2 LEGS)	---------->	-	-	-	-
<----------	T10-200(4 LEGS)	---------->	-	1300	1000	-
<----------	T10-200(2 LEGS) TORSIONAL LI	---------->	-	1000	1800	-
<----------	T10-200(2 LEGS) TORSIONAL LI	---------->	-	1800	1800	-

Auto generated field	BEAM MARK, BEAM SIZE
Manually Input field	ELEV. REFER, REINFORCEMENT (a-g), REINFORCEMENT (Links 1-3), DIMENSION (A-D)

5.2 Foundation

5.2.1 Bored Pile Loading Schedule

Click “BORED PILE LOADING SCHEDULE” in Schedules/Quantities (all) of Project Browser.

						(X)	(AA)	(W)	Z=W-0.3-(X)-(Y)	(AB)=(AA)-(Z)
BORED PILE MARK	BORED PILE CAP THICKNESS (FOR REFERENCE ONLY)	BORED PILE DIAMETER	BORED PILE EFFECTIVE SHAFT DIAMETER	ROCK SOCKET DIAMETER	PILE BASE DIAMETER	BELLOUT DEPTH	CUT-OFF LEVEL	TENTATIVE ROCKHEAD LEVEL	TENTATIVE FOUNDING LEVEL	TENTATIVE PILE LENGTH
	(m)	(m)	(m)	(m)	(m)	(m)	(mPD)	(mPD)	(mPD)	(m)
BP1	2.5	3.0	2.80	2.80	4.5	1.5	-8.775	-45.5	-50.90	42.125
BP2	2.5	2.5	2.35	2.35	3.75	1.25	-8.775	-44.5	-49.15	40.375
BP3	2.5	2.5	2.35	2.35	3.75	1.25	-8.775	-46.5	-51.15	42.375
BP4	2.5	3.0	2.80	2.80	4.5	1.5	-11.275	-47.0	-52.40	43.625
BP5	2.5	3.0	2.80	2.80	4.5	1.5	-11.275	-50.0	-56.80	45.525

(Y)	(a)	(b)	(c)=(a)+(b)	(d)	(b)+(d)	(e)	(f)=(b)+(d)+(e)	(h)	(i)	(j)	(k)
EFFECTIVE ROCK SOCKET LENGTH	SELF-WEIGHT OF BORED PILE (SUBMERGED) (SWP)	Dmin (total)	Dmin + SWP	SDL(total)	TOTAL DEAD LOAD (DL) = Dmin + SDL	LIVE LOAD (LL) (total)	DL + SDL + LL	Wmax (total)	TOTAL UPLIFT FORCE DUE TO GROUND WATER (U)	ADDITIONAL LOAD DUE TO STEPPING EFFECT	
										WITHOUT WIND	WITH WIND
(m)	(kN)	(kN)	(kN)	(kN)	(kN)	(kN)	(kN)	(kN)	(kN)	(kN)	(kN)
3.6	3920	43000	46920	14700	57700	13700	71400	18500	-20400	80	99
3.1	2580	33700	36280	14100	47800	9100	56900	18000	-9600	0	0
3.1	2700	37500	40200	13500	51000	13000	64000	14700	-15500	0	0
3.6	3950	45600	49550	17500	63100	15200	78300	15800	-21400	0	0
5.0	4120	49000	53120	18100	67100	15900	83000	24900	-25300	49	61

	(f)	(f)+(h)	(f)+(a)+(j)	(f)+(h)+(a)+(k)	(l)=(b)+(i)	(m)=(b)-(h)+(i)	(n)=(b)-1.5*(h)+1.5*(i)			
BORED PILE MARK	MAX. PILE LOAD				MIN. PILE LOAD			VERTICAL BARS		LINKS
	DL + SDL + LL	DL + SDL + LL + Wmax	DL + SDL + LL + Stopping Load	DL + SDL + LL + Wmax + Stopping Load	Dmin + SWP -U	Dmin + SWP - Wmax - U	Dmin + SWP - 1.5Wmax - 1.5U	LAYER 1	LAYER 2	
	(kN)	(kN)	(kN)	(kN)	(kN)	(kN)	(kN)			
BP1	71400	89900	75300	93819	26420	7920	-11530	54 T40	50 T40	T16 / 300 (2 rings)
BP2	56900	74900	59480	77480	26680	8680	-5120	44 T50	40 T50	T16 / 200 (1 rings)
BP3	64000	78700	66700	81400	24700	10000	-5100	44 T50	40 T50	T16 / 200 (1 rings)
BP4	78300	94100	82250	98050	28150	12350	-6250	54 T40	50 T40	T16 / 300 (2 rings)
BP5	83000	107900	87169	112081	27820	2920	-22180	54 T40	50 T40	T16 / 300 (2 rings)

(o)	(p)=(o)*1.25	(q)	(r)=(q)*1.25	(r1)	(p1)	(s1)=Min of((r1),(p1)/3))-(o)	(u1)=Min of((r1)*2,(p1))-(o)	(u)=(o)+(q)	(v)=(u)*1.25	(b)+0.9*(u1)-1.5*(h)+1.5*(i)-0	(b)+(o1)-(h)+(i)>0	
PILE BARING CAPACITY (COMPRESSION)		ROCK FRICTION (COMPRESSION)		ROCK FRICTION (TENSION)	ROCK/SOIL MASS (SUBMERGED)	UPLIFT RESISTANCE		BORED PILE BEARING CAPACITY (COMPRESSION)		STABILITY CHECK		REFERENCE BORED HOLE
WITHOUT WIND	WITH WIND	WITHOUT WIND	WITH WIND			ALLOWABLE	ULTIMATE	WITHOUT WIND	WITH WIND	Dmin + 0.9*Ru -1.5Wmax - 1.5U	Dmin + Ra - Wmax - U	
(kN)	(kN)	(kN)	(kN)	(kN)	(kN)	Ra (kN)	Ru (kN)	(kN)	(kN)	(kN)	(kN)	
79530	99413	17250	21563	11090	21101	10854	24921	96780	120975	7079	14954	
55230	69038	12150	15188	8020	14707	7482	17287	67380	84225	7858	13562	
55230	69038	12150	15188	8020	15477	7859	18177	67380	84225	8559	15159	
79530	99413	17250	21563	11090	21899	11250	25849	96780	120975	13064	19650	
79530	99413	17250	21563	15400	32120	14827	34920	96780	120975	5128	13627	

Auto generated field	BORED PILE MARK, BORED PILE DIAMETER, PILE BASE DIAMETER, CUT-OFF LEVEL, TENTATIVE FOUNDING LEVEL
Manually Input field	BORED PILE CAP THICKNESS, BORED PILE EFFECTIVE SHAFT DIAMETER, ROCK SOCKET DIAMETER, BELLOUT DEPTH, TENTATIVE ROCKHEAD LEVEL, TENTATIVE PILE LENGTH, EFFECTIVE ROCK SOCKET LENGTH, SELF-WEIGHT OF BORED PILE (SUBMERGED) (SWP), Dmin (total), SDL(total), LIVE LOAD (LL) (total), Wmax (total), TOTAL UPLIFT FORCE DUE TO GROUND WATER (U), ADDITIONAL LOAD DUE TO STEPPING EFFECT, VERTICAL BARS, LINKS, PILE BARING CAPACITY (COMPRESSION), ROCK FRICTION (COMPRESSION), ROCK FRICTION (TENSION), ROCK/SOIL MASS (SUBMERGED), REFERENCE BORED HOLE

5.2.2 Socket H-Pile Loading Schedule

Click “SOCKET H-PILE LOADING SCHEDULE” in Schedules/Quantities (all) of Project Browser.

		(A)	(AA)	(W)	(Z)=(W)-0.3-(Y)	(AB)=(AA)-(Z)	(Y)
PILE MARK	PILE CAP THICKNESS (FOR REFERENCE ONLY)	NUMBER OF PILES PER CAP	CUT-OFF LEVEL	TENTATIVE ROCKHEAD LEVEL	TENTATIVE FOUNDING LEVEL	TENTATIVE PILE LENGTH	EFFECTIVE ROCK SOCKET LENGTH
	(m)		(mPD)	(mPD)	(mPD)	(m)	(m)
SP1A	2.0	3	-8.275	-46.0	-53.3	45.025	7
SP1B	2.0	3	-8.275	-46.0	-53.3	45.025	7
SP1C	2.0	3	-8.275	-46.0	-53.3	45.025	7
SP2A	2.0	3	-8.275	-58.0	-65.3	57.025	7

(b)	(d)	(b)+(d)	(e)	(f)=(b)+(d)+(e)	(h)	(i)	(a)	(j)	(k)
Dmin	SDL	TOTAL DEAD LOAD (DL) = Dmin + SDL	LIVE LOAD (LL)	DL + SDL + LL	Wmax	UPLIFT FORCE DUE TO GROUND WATER (U)	SELF-WEIGHT(SUBMERGED) (SWP)	ADDITIONAL LOAD DUE TO STEPPING EFFECT	
								WITHOUT WIND	WITH WIND
(kN)	(kN)	(kN)	(kN)	(kN)	(kN)	(kN)	(kN)	(kN)	(kN)
6590	3700	10290	3200	13490	1000	-7500	230	441	551
6590	3700	10290	3200	13490	1000	-7500	230	441	551
6590	3700	10290	3200	13490	1000	-7500	230	441	551
6890	4300	11190	3500	14690	1000	-8800	290	190	210

		(A)	(AA)	(W)	(Z)=(W)-0.3-(Y)	(AB)=(AA)-(Z)	(Y)
PILE MARK	PILE CAP THICKNESS (FOR REFERENCE ONLY)	NUMBER OF PILES PER CAP	CUT-OFF LEVEL	TENTATIVE ROCKHEAD LEVEL	TENTATIVE FOUNDING LEVEL	TENTATIVE PILE LENGTH	EFFECTIVE ROCK SOCKET LENGTH
	(m)		(mPD)	(mPD)	(mPD)	(m)	(m)
SP1A	2.0	3	-8.275	-46.0	-53.3	45.025	7
SP1B	2.0	3	-8.275	-46.0	-53.3	45.025	7
SP1C	2.0	3	-8.275	-46.0	-53.3	45.025	7
SP2A	2.0	3	-8.275	-58.0	-65.3	57.025	7

(b)	(d)	(b)+(d)	(e)	(f)=(b)+(d)+(e)	(h)	(i)	(a)	(j)	(k)
Dmin	SDL	TOTAL DEAD LOAD (DL) = Dmin + SDL	LIVE LOAD (LL)	DL + SDL + LL	Wmax	UPLIFT FORCE DUE TO GROUND WATER (U)	SELF-WEIGHT(SUBMERGED) (SWP)	ADDITIONAL LOAD DUE TO STEPPING EFFECT	
								WITHOUT WIND	WITH WIND
(kN)	(kN)	(kN)	(kN)	(kN)	(kN)	(kN)	(kN)	(kN)	(kN)
6590	3700	10290	3200	13490	1000	-7500	230	441	551
6590	3700	10290	3200	13490	1000	-7500	230	441	551
6590	3700	10290	3200	13490	1000	-7500	230	441	551
6890	4300	11190	3500	14690	1000	-8800	290	190	210

Auto generated field	PILE MARK, CUT-OFF LEVEL, TENTATIVE ROCKHEAD LEVEL, TENTATIVE FOUNDING LEVEL
Manually Input field	PILE CAP THICKNESS, NUMBER OF PILES PER CAP, TENTATIVE PILE LENGTH, EFFECTIVE ROCK SOCKET LENGTH, Dmin, SDL, LIVE LOAD (LL), Wmax, UPLIFT FORCE DUE TO GROUND WATER (U), SELF- WEIGHT (SUBMERGED) (SWP), ADDITIONAL LOAD DUE TO STEPPING EFFECT, COMPRESSION CAPACITY (PER PILE), TENSION CAPACITY (TENSION), ROCK/SOIL MASS (SUBMERGED) (PER PILE), REFERENCE BORED HOLE

5.2.3 Column Loading Schedule above Pile Cap

Click “COLUMN LOADING SCHEDULE ABOVE PILE CAP” in Schedules/Quantities (all) of Project Browser.

COLUMN LOADING SCHEDULE ABOVE PILE CAP (1 OF 2)

COLUMN MARK	ANGLE	MIN DEAD LOAD (Dmin)						SDL						DEAD LOAD (DL) = Dmin + SD			
		P (kN)	Mx (kNm)	My (kNm)	Vx (kN)	Vy (kN)	Mz (kNm)	P (kN)	Mx (kNm)	My (kNm)	Vx (kNm)	Vy (kNm)	Mz (kNm)	P (kN)	Mx (kNm)	My (kNm)	Vx (kNm)
PC1	0	1600	0	0	0	0	0	800	0	0	0	0	0	2400	0	0	0
PC2	0	2100	0	0	0	0	0	1400	0	0	0	0	0	3500	0	0	0
PC3	0	2400	0	0	0	0	0	1700	0	0	0	0	0	4100	0	0	0
PC4	0	2300	0	0	0	0	0	2000	0	0	0	0	0	4300	0	0	0
PC5	0	2300	0	0	0	0	0	1400	0	0	0	0	0	3700	0	0	0

XL		LIVE LOAD (LL)						DL + LL					
Vy (kNm)	Mz (kNm)	P (kN)	Mx (kNm)	My (kNm)	Vx (kNm)	Vy (kNm)	Mz (kNm)	P (kN)	Mx (kNm)	My (kNm)	Vx (kNm)	Vy (kNm)	Mz (kNm)
0	0	700	0	0	0	0	0	3100	0	0	0	0	0
0	0	900	0	0	0	0	0	4400	0	0	0	0	0
0	0	1000	0	0	0	0	0	5100	0	0	0	0	0
0	0	1000	0	0	0	0	0	5300	0	0	0	0	0
0	0	900	0	0	0	0	0	4600	0	0	0	0	0

COLUMN LOADING SCHEDULE ABOVE PILE CAP (2 OF 2)

COLUMN MARK	ANGLE	W0						W90						WU					
		P (kN)	Vx (kN)	Vy (kN)	Mx (kNm)	My (kNm)	Mz (kNm)	P (kN)	Vx (kN)	Vy (kN)	Mx (kNm)	My (kNm)	Mz (kNm)	P (kN)	Vx (kN)	Vy (kN)	Mx (kNm)	My (kNm)	Mz (kNm)
PC1	0	-200	10	30	0	0	0	-1000	10	300	0	0	0	-400	10	80	0	0	0
PC2	0	100	10	30	0	0	0	1000	-10	290	0	0	0	200	10	80	0	0	0
PC3	0	-200	10	30	0	0	0	-1600	-10	390	0	0	0	-500	10	90	0	0	0
PC4	0	200	10	30	0	0	0	1600	10	370	0	0	0	400	10	90	0	0	0
PC5	0	-200	10	30	0	0	0	-1800	10	380	0	0	0	-500	10	90	0	0	0

WV						WMAX					
P (kN)	Vx (kN)	Vy (kN)	Mx (kNm)	My (kNm)	Mz (kNm)	P (kN)	Vx (kN)	Vy (kN)	Mx (kNm)	My (kNm)	Mz (kNm)
-700	-10	230	0	0	0	1000	10	300	0	0	0
800	-10	230	0	0	0	1000	10	290	0	0	0
-1200	-10	300	0	0	0	1600	10	390	0	0	0
1300	-10	290	0	0	0	1600	10	370	0	0	0
-1400	-10	300	0	0	0	1800	10	380	0	0	0

Auto generated field	COLUMN MARK, DEAD LOAD (DL), DL + LL,
Manually Input field	ANGLE, MIN DEAD LOAD (Dmin), SDL, LIVE LOAD (LL), W0, W90, WU, WV, WMAX

5.2.4 Wall Loading Schedule above Pile Cap

Click “WALL LOADING SCHEDULE ABOVE PILE CAP” in Schedules/Quantities (all) of Project Browser.

WALL LOADING SCHEDULE ABOVE PILE CAP (1 OF 2)

WALL MARK	ANGLE	MIN DEAD LOAD (Dmin)						SDL						DEAD LOAD (DL) = Dmin + SDL					
		P (kN)	Mx (kNm)	My (kNm)	Vx (kNm)	Vy (kNm)	Mz (kNm)	P (kN)	Mx (kNm)	My (kNm)	Vx (kNm)	Vy (kNm)	Mz (kNm)	P (kN)	Mx (kNm)	My (kNm)	Vx (kNm)	Vy (kNm)	Mz (kNm)
BW1	0	2300	0	-900	0	0	0	700	0	-500	0	0	0	3000	0	-1400	0	0	0
BW2	0	3200	0	-600	0	0	0	1100	0	-300	0	0	0	4300	0	-900	0	0	0
BW3	0	3200	0	-600	0	0	0	900	0	-300	0	0	0	4100	0	-900	0	0	0
BW4	0	2600	0	-300	0	0	0	400	0	-100	0	0	0	3000	0	-400	0	0	0
BW5	0	11300	0	-2500	0	0	0	2200	0	2600	0	0	0	13500	0	100	0	0	0

LIVE LOAD (LL)						DL + LL					
P (kN)	Mx (kNm)	My (kNm)	Vx (kNm)	Vy (kNm)	Mz (kNm)	P (kN)	Mx (kNm)	My (kNm)	Vx (kNm)	Vy (kNm)	Mz (kNm)
400	0	-200	0	0	0	3400	0	-1600	0	0	0
700	0	-100	0	0	0	5000	0	-1000	0	0	0
600	0	-100	0	0	0	4700	0	-1000	0	0	0
400	0	-100	0	0	0	3400	0	-500	0	0	0
4000	0	-3300	0	0	0	17500	0	-3200	0	0	0

WALL LOADING SCHEDULE ABOVE PILE CAP (2 OF 2)

WALL MARK	ANGLE	W0						W90						WD1					
		P (kN)	Vx (kN)	Vy (kN)	Mx (kNm)	My (kNm)	Mz (kNm)	P (kN)	Vx (kN)	Vy (kN)	Mx (kNm)	My (kNm)	Mz (kNm)	P (kN)	Vx (kN)	Vy (kN)	Mx (kNm)	My (kNm)	Mz (kNm)
TW6A	90	-2600	-280	-10	0	-1100	0	8300	4880	-10	0	25500	0	-3300	200	-10	0	1800	0
TW6B	0	900	3170	10	0	27700	0	-47600	-160	-10	0	600	0	-5300	5340	-10	0	46800	0
TW6C	90	2400	120	-10	0	300	0	9100	5150	10	0	26700	0	5300	910	10	0	4100	0
Grand total: 3		700	3010	-10	0	26900	0	-30200	9870	-10	0	52800	0	-3300	6450	-10	0	52700	0

WD2						WMAX					
P (kN)	Vx (kN)	Vy (kN)	Mx (kNm)	My (kNm)	Mz (kNm)	P (kN)	Vx (kN)	Vy (kN)	Mx (kNm)	My (kNm)	Mz (kNm)
9400	4330	-10	0	2220	0	9400	4880	10	0	25500	0
-40200	-3190	-10	0	-26100	0	47600	5340	10	0	46800	0
5300	4160	10	0	21900	0	9100	5150	10	0	26700	0
-25500	5300	-10	0	-1980	0	66100	15370	30	0	99000	0

Auto generated field	WALL MARK, DEAD LOAD (DL), DL + LL,
Manually Input field	ANGLE, MIN DEAD LOAD (Dmin), SDL, LIVE LOAD (LL), W0, W90, WU, WV, WMAX

5.2.5 Tie Beam R.C. Details Schedule

Click “TIE BEAM R.C. DETAILS SCHEDULE” in Schedules/Quantities (all) of Project Browser.

TIE BEAM R.C. DETAILS SCHEDULE									
TIE BEAM MARK	BEAM SIZE (D x B)	LENGTH (m)	TOP LEVEL (Lv1)	Top Level (Lv2)	STEEL BAR				
					T1	T2	B1	B2	SB
TB1	1000 x 800	10.935	-6350	-6350	10T40	6T40	10T40	6T40	5T12 E.F.
TB2	1000 x 800	7.400	-6350	-6350	10T40	6T40	10T40	6T40	5T12 E.F.
TB3	1000 x 800	7.329	-6350	-6350	10T40	6T40	10T40	6T40	5T12 E.F.
TB4	1000 x 800	10.936	-6350	-6350	10T40	6T40	10T40	6T40	5T12 E.F.

Link	SECTION REFERENCE	ELEVATION REFERENCE
T12-150 T.S.	SECTION S1	ELEVATION E1
T12-150 T.S.	SECTION S1	ELEVATION E1
T12-150 T.S.	SECTION S1	ELEVATION E1
T12-150 T.S.	SECTION S1	ELEVATION E1

Auto generated field	TIE BEAM MARK, BEAM SIZE, LENGTH, TIE BEAM TOP LEVEL, TOP LEVEL (Lv1), TOP LEVEL (Lv2),
Manually Input field	PILE CAP (P1), PILE CAP (P2), STEEL BAR, LINK, SECTION REFERENCE, ELEVATION REFERENCE

5.2.6 Ground Investigation Table of Rock Head

Click “GROUND INVESTIGATION TALBE OF ROCK HEAD” in Schedules/Quantities (all) of Project Browser.

<GROUND INVESTIGATION TALBE OF ROCK HEAD>	
A	B
DRILL HOLE MARK	ROCKHEAD LEVEL (mPD)
BH1(P)	-42.58
BH2(P)	-59.31
BH3	-38.48
BH4	-34.69
BH5(P)	-44.93

Auto generated field	DRILL HOLE MARK
Manually Input field	ROCKHEAD LEVEL

5.3 Excavation and Lateral Support

5.3.1 Schedule of Horizontal Tie

Click “SCHEDULE OF HORIZONTAL TIE” in Schedules/Quantities (all) of Project Browser.

SCHEDULE OF HORIZONTAL TIE			
ITEM	MEMBER MARK	GRADE	MEMBER SIZE
TIE	T1	S355	UC203x203x46

Auto generated field	ITEM, GRADE, MEMBER SIZE
Manually Input field	MEMBER MARK

5.3.2 Schedule of Main Strut

Click “SCHEDULE OF MAIN STRUT” in Schedules/Quantities (all) of Project Browser.

SCHEDULE OF MAIN STRUT						
PILE TYPE	LAYER	WALING MEMBER SIZE	PRELOAD (kN/m)	PRELOAD PER STRUT (kN)	HORIZONTAL LOAD (kN/m)	DESIGN LOAD FOR STRUT (kN)
A	1	305X305X97 kg/m UC	20	95	86	569
A	2	305X305X97 kg/m UC	50	237	130	860
A	3	356X368X177 kg/m UC	100	473	251	1661
A	4	356X368X177 kg/m UC	300	1418	452	2990

Auto generated field	WALING MEMBER SIZE,
Manually Input field	PILE TYPE, LAYER, PRELOAD, PRELOAD PER STRUT, HORIZONTAL LOAD, DESIGN LOAD FOR STRUT

5.3.3 Schedule of Secondary Strut and Corner Strut

Click “SCHEDULE OF SECONDARY STRUT AND CORNER STRUT” in Schedules/Quantities (all) of Project Browser.

SCHEDULE OF SECONDARY STRUT AND CORNER STRUT			
PILE TYPE	LAYER	WALING MEMBER SIZE	STRUT LEVEL (mPD)
A	1	356X368X202 kg/m UC	+3.1
A	2	356X368X202 kg/m UC	+1.6
A	3	356X368X202 kg/m UC	+0.1

Auto generated field	STRUT LEVEL, WALING MEMBER SIZE
Manually Input field	PILE TYPE, LAYER

5.3.4 Schedule of Vertical Tie

Click “SCHEDULE OF VERTICAL TIE” in Schedules/Quantities (all) of Project Browser.

SCHEDULE OF VERTICAL TIE			
ITEM	MEMBER MARK	GRADE	MEMBER SIZE
VERTICAL TIE	D4	S355	UBP356x368x174

Auto generated field	ITEM, GRADE, MEMBER SIZE
Manually Input field	MEMBER MARK

5.3.5 Schedule of Wailing

Click “SCHEDULE OF WAILING” in Schedules/Quantities (all) of Project Browser.

SCHEDULE OF WAILING					
PILE TYPE	LAYER	WALING MEMBER SIZE	COMPRESSION (kN)	SHEAR (kN)	MOMENT (kNm)
			=1.4*Fh* (1.414*3.15)	=1.4*Fh* (0.6*3.15)	=1.4*Fh* (3.15^2/9)
A	1	533X210X92 kg/m UB	531	228	100
A	2	533X210X92 kg/m UB	803	344	151
A	3	610X305X179 kg/m UB	1550	665	291

Auto generated field	WALING MEMBER SIZE
Manually Input field	PILE TYPE, LAYER, COMPRESSION, SHEAR, MOMENT

5.3.6 Section Properties of Horizontal Tie

Click “SECTION PROPERTIES OF HORIZONTAL TIE” in Schedules/Quantities (all) of Project Browser.

SECTION PROPERTIES OF HORIZONTAL TIE									
ITEM	GRADE	SECTION AREA (cm^2)	MOMENT OF INERTIA (cm^4)	WEIGHT (kg/m)	SECTION MODULUS (cm^3)	DEPTH D (mm)	WIDTH B (mm)	WEB THICKNESS t (mm)	FLANGE THICKNESS T (mm)
203X203X46 kg/m UC	S355	58.7	4570	46	450	203.2	203.6	7.2	11.0

Auto generated field	ITEM, GRADE, SECTION AREA, MOMENT OF INERTIA, WEIGHT, SECTION MODULUS, DEPTH D, WIDTH B, WEB THICKNESS t, FLANGE THICKNESS T
Manually Input field	/

5.3.7 Section Properties of Short Strut/ Spacer

Click “SECTION PROPERTIES OF SHORT STRUT / SPACER” in Schedules/Quantities (all) of Project Browser.

SECTION PROPERTIES OF SHORT STRUT / SPACER									
ITEM	GRADE	SECTION AREA (cm^2)	MOMENT OF INERTIA (cm^4)	WEIGHT (kg/m)	SECTION MODULUS (cm^3)	DEPTH D (mm)	WIDTH B (mm)	WEB THICKNESS t (mm)	FLANGE THICKNESS T (mm)
152x89x24 kg/m CH	S355	30.4	1168	23.87	153	152.4	88.9	7.1	11.6

Auto generated field	ITEM, GRADE, SECTION AREA, MOMENT OF INERTIA, WEIGHT, SECTION MODULUS, DEPTH D, WIDTH B, WEB THICKNESS t, FLANGE THICKNESS T
Manually Input field	/

5.3.8 Section Properties of Struts

Click “SECTION PROPERTIES OF STRUTS” in Schedules/Quantities (all) of Project Browser.

SECTION PROPERTIES OF STRUTS									
ITEM	GRADE	SECTION AREA (cm^2)	MOMENT OF INERTIA (cm4)	WEIGHT (kg/m)	SECTION MODULUS (cm^3)	DEPTH D (mm)	WIDTH B (mm)	WEB THICKNESS t (mm)	FLANGE THICKNESS T (mm)
305X305X97 kg/m UC	S355	123	22200	97	1450	307.9	305.3	9.9	15.4
356X368X177 kg/m UC	S355	226	57100	177	3100	368.2	372.6	14.4	23.8
356X368X202 kg/m UC	S355	257	66300	202	3540	374.6	374.7	16.5	27.0

Auto generated field	ITEM, GRADE, SECTION AREA, MOMENT OF INERTIA, WEIGHT, SECTION MODULUS, DEPTH D, WIDTH B, WEB THICKNESS t, FLANGE THICKNESS T
Manually Input field	/

5.3.9 Section Properties of Vertical Tie

Click “SECTION PROPERTIES OF VERTICAL TIE” in Schedules/Quantities (all) of Project Browser.

SECTION PROPERTIES OF VERTICAL TIE									
ITEM	GRADE	SECTION AREA (cm^2)	MOMENT OF INERTIA	WEIGHT (kg/m)	SECTION MODULUS (cm^3)	DEPTH D (mm)	WIDTH B (mm)	WEB THICKNESS t (mm)	FLANGE THICKNESS T (mm)
356X368X174 kg/m UBP	S355	221	51000	173.9	2820	361.4	378.5	20.3	20.4

Auto generated field	ITEM, GRADE, SECTION AREA, MOMENT OF INERTIA, WEIGHT, SECTION MODULUS, DEPTH D, WIDTH B, WEB THICKNESS t, FLANGE THICKNESS T
Manually Input field	/

5.3.10 Section Properties of Wailing

Click “SECTION PROPERTIES OF WAILING” in Schedules/Quantities (all) of Project Browser.

SECTION PROPERTIES OF WAILING									
ITEM	GRADE	SECTION AREA (cm^2)	MOMENT OF INERTIA (cm4)	WEIGHT (kg/m)	SECTION MODULUS (cm^3)	DEPTH D (mm)	WIDTH B (mm)	WEB THICKNESS t (mm)	FLANGE THICKNESS T (mm)
533X210X92 kg/m UB	S355	117	55200	92	2070	533.1	209.3	10.1	15.6
610X305X179 kg/m UB	S355	228	153000	179	4930	620.2	307.1	14.1	23.6
610X305X238 kg/m UB	S355	303	209000	238	6590	635.8	311.4	18.4	31.4
914X305X289 kg/m UB	S355	368	504000	289	10900	926.6	307.7	19.5	32.0

Auto generated field	ITEM, GRADE, SECTION AREA, MOMENT OF INERTIA, WEIGHT, SECTION MODULUS, DEPTH D, WIDTH B, WEB THICKNESS t, FLANGE THICKNESS T
Manually Input field	/

5.3.11 Sheet Pile Schedule

Click “SHEET PILE SCHEDULE” in Schedules/Quantities (all) of Project Browser.

SHEET PILE SCHEDULE						
SHEET PILE TYPE	MEMBER SIZE	TOE LEVEL (mPD)	MAX RETAINING HEIGHT (m)	FINAL EXCAVATION LEVEL (mPD)	MIN EMBEDMENT LENGTH (m)	GRADE
A	FSP-VIL (BOX TYPE)	-23.0	12.675	-10.325	14.225	S275
AA	FSP-VIL	-18.9	11.275	-7.375	11.525	S275
B	FSP-VIL	-18.9	12.175	-8.075	10.825	S275
C	FSP-IV	-18.9	12.175	-8.075	10.825	S275

Auto generated field	MEMBER SIZE, TOE LEVEL
Manually Input field	SHEET PILE TYPE, MAX RETAINING HEIGHT, MIN EMBEDMENT LENGTH, FINAL EXCAVATION LEVEL, GRADE

5.3.12 Sheet Pile Section Properties

Click “SHEET PILE SECTION PROPERTIES” in Schedules/Quantities (all) of Project Browser.

SHEET PILE SECTION PROPERTIES											
MEMBER SIZE	DIMENSIONS (mm)			SECTION AREA (PER PILE) (cm²)	MOMENT OF INERTIA (PER PILE) (cm4)	WEIGHT (PER PILE) (kg/m)	SECTION MODULUS (PER PILE) (cm³)	SECTION AREA (PER 1m PILE) (cm²)	MOMENT OF INERTIA (PER 1m PILE) (cm4)	WEIGHT (PER 1m PILE) (kg/m)	SECTION MODULUS (PER 1m PILE) (cm³)
	w	h	t								
FSP IV	400	170	15.5	153	11400	120	680	306	86000	240	3820
FSP VIL	500	225	27.6	153	11400	120	680	306	86000	240	3820
FSP VIL (BOX)	500	207.1	27.6	153	11400	120	680	306	86000	240	3820

Auto generated field	DIMENSIONS, SECTION AREA (PER PILE), MOMENT OF INERTIA (PER PILE), WEIGHT (PER PILE), SECTION MODULUS (PER PILE), SECTION AREA (PER 1m PILE), MOMENT OF INERTIA (PER 1m PILE), WEIGHT (PER 1m PILE), SECTION MODULUS (PER 1m PILE)
Manually Input field	MEMBER SIZE

5.3.13 Instrument Schedule

Click “INSTRUMENT SCHEDULE” in Schedules/Quantities (all) of Project Browser.

INSTRUMENT SCHEDULE		
SYMBOL	TYPE	NUMBER
BS1	BUILDING SETTLEMENT MARKER (BS1-BS12)	12
T1	BUILDING TILTING CHECK POINT WITH VERTICAL DISPLACEMENT (T1-T11)	11
S1	GROUND SETTLEMENT CHECK POINT (S1-S10)	10
OW1	OBSERVATION WELL (OW1-OW14)	14
P1	PUMP WELL (P1 TO P7)	7
RW1	RECHARGE WELL (RW1-RW7)	7
SP1(P)	STANDPIPE (WITH PIEZOMETER) (SP1(P) TO SP5(P))	5
U1	UTILITY SETTLEMENT MONITORING POINT ON GROUND (U1-U12)	12
V1	VIBRATION CHECK POINT (V1-V11)	11

Auto generated field	TYPE
Manually Input field	SYMBOL, NUMBER

5.4 Drainage

5.4.1 Strom Water Manhole Schedule

STORM WATER MANHOLE SCHEDULE						
MANHOLE NO.	PIPE DIAMETER (mm)	C.L.	I.L.	D.T.I.L.	DEPTH (mm)	TYPE
STMH	225	+3.43	+2.43	+2.28	755	T1

Grand total: 1

Auto generated field	DEPTH
Manually Input field	MANHOLE NO., PIPE DIAMETER, C.L., I.L., D.T.I.L., TYPE

5.4.2 Foul Water Manhole Schedule

FOUL WATER MANHOLE SCHEDULE						
MANHOLE NO.	PIPE DIAMETER (mm)	C.L.	I.L.	D.T.I.L.	DEPTH (mm)	TYPE
FTMH	150	+3.42	+2.42	+2.27	1980	T1
SMH-01	150	-5.85	-6.6	-6.3	1750	E
WMH-01	150	-5.85	-6.6	-6.3	1750	E
WMH-02	150	-6.6	-6.85	-5.55	1750	E

Grand total: 4

Auto generated field	DEPTH
Manually Input field	MANHOLE NO., PIPE DIAMETER, C.L., I.L., D.T.I.L., TYPE

5.4.3 Petrol Interceptor Schedule

PETROL INTERCEPTOR SCHEDULE				
PETROL INTERCEPTOR NO.	C.L.	I.L.	B.L.	DEPTH (mm)
PI-01	+5.9	+6.9	+8.4	2500

Grand total: 1

Auto generated field	DEPTH
Manually Input field	PETROL INTERCEPTOR NO., C.L., I.L., B.L.

5.4.4 Sump Pit Schedule

SUMP PIT SCHEDULE							
						PUMP DUTY (EACH)	
SUMP PIT NO.	SUMP PIT SIZE (LxWxD)	C.L.	I.L.	B.L.	PUMP NO.	FLOW (l/s)	HED (m)
SWPP-02	2000(L) x 1500(W) x 600(D)	-5.85	-6.5	-7.5	SSP02-01,02	6.0	20
SWPP-03	2000(L) x 1500(W) x 600(D)	-5.85	-6.5	-7.5	SSP03-01,02	3.0	20
SWPP-04	2000(L) x 1450(W) x 600(D)	-5.85	-6.5	-7.5	SSP04-01,02	3.0	20

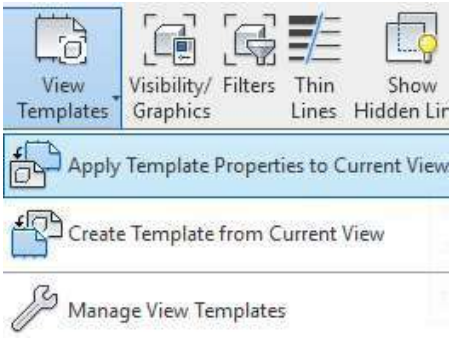
Grand total: 3

Auto generated field	SUMP PIT SIZE
Manually Input field	SUMP PIT NO., C.L., I.L., B.L., PUMP NO., PUMP DUTY

6 Standardising View Setting

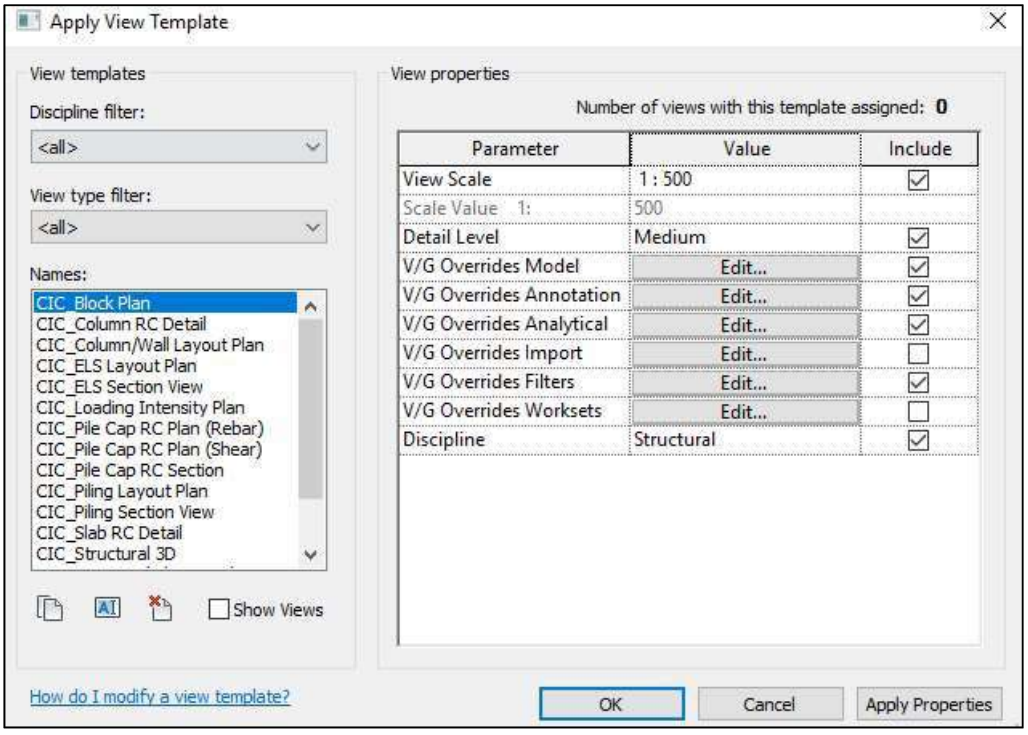
This template has defined the desired settings. The users can use view templates to manage these settings by applying the view template, user efficiency on projects enhanced by assigning default view template for each view type. The standardised view properties include, but not limited to, view scale, detail level, model display setting.

Open either view plan ➔ On the “View” tab ➔ find the “Graphics” panel ➔ select “View Templates” ➔select “Apply Template Properties to Current View”



In “View Templates” dialogue box ➔ on the right, select the view template applied to the corresponding view ➔ click “OK” to close the window.

Changes to view templates are automatically reflected in the views to which they have been assigned.



6.1 Superstructure

The following view templates can be applied into view:

View Type	View template name
Plans	CIC_Block Plan CIC_Structural Framing Plan CIC_Column RC Detail CIC_Wall RC Detail CIC_Slab RC Detail CIC_Water Tank Layout Plan CIC_Structural Loading Key Plan CIC_Stairs Layout Plan CIC_Water Tank Layout Plan
Sections / Elevations	CIC_Beam RC Detail CIC_Stairs RC Detail CIC_Water Tank Section View
3D Views	CIC_Structural 3D

6.2 Demolition including hoarding

The following view templates can be applied into view:

View Type	View template name
Plans	CIC_Block Plan CIC_Demolition Plan CIC_Hoarding Layout Plan
Sections / Elevations	CIC_Hoarding Section View
3D Views	CIC_Structural 3D

6.3 Foundation

The following view templates can be applied into view:

View Type	View template name
Plans	CIC_Block Plan CIC_ Pile Cap RC Plan (Shear) CIC_Column/Wall Layout Plan CIC_Piling Layout Plan CIC_Loading Intensity Plan CIC_Pile Cap Layout Plan CIC_Pile Cap RC Plan (Rebar) CIC_Monitoring Plan (FDN)
Sections / Elevations	CIC_Pile Cap RC Section CIC_Piling Section View
3D Views	CIC_Structural 3D

6.4 Excavation and lateral support

The following view templates can be applied into view:

View Type	View template name
Plans	CIC_Block Plan CIC_ELS Layout Plan CIC_Monitoring Plan (ELS)
Sections / Elevations	CIC_ELS Elevation View CIC_ELS Section View CIC_ELS Section View (SEQ)
3D Views	CIC_ELS 3D

6.5 Site Formation

The following view templates can be applied into view:

View Type	View template name
Plans	CIC_Block Plan CIC_Site Formation Layout Plan
Sections / Elevations	CIC_Site Formation Section View
3D Views	CIC_ Site Formation 3D

6.6 Drainage

The following view templates can be applied into view:

View Type	View template name
Plans	CIC_Drainage Layout Plan
Sections / Elevations	CIC_Drainage Schematic Diagram
3D Views	/

6.7 Curtain Wall

The following view templates can be applied into view:

View Type	View template name
Plans	CIC_Curtain Wall Cast-in Layout Plan CIC_Curtain Wall Location Plan CIC_Embed Plan View
Sections / Elevations	CIC_Curtain Wall Cast-in Section View

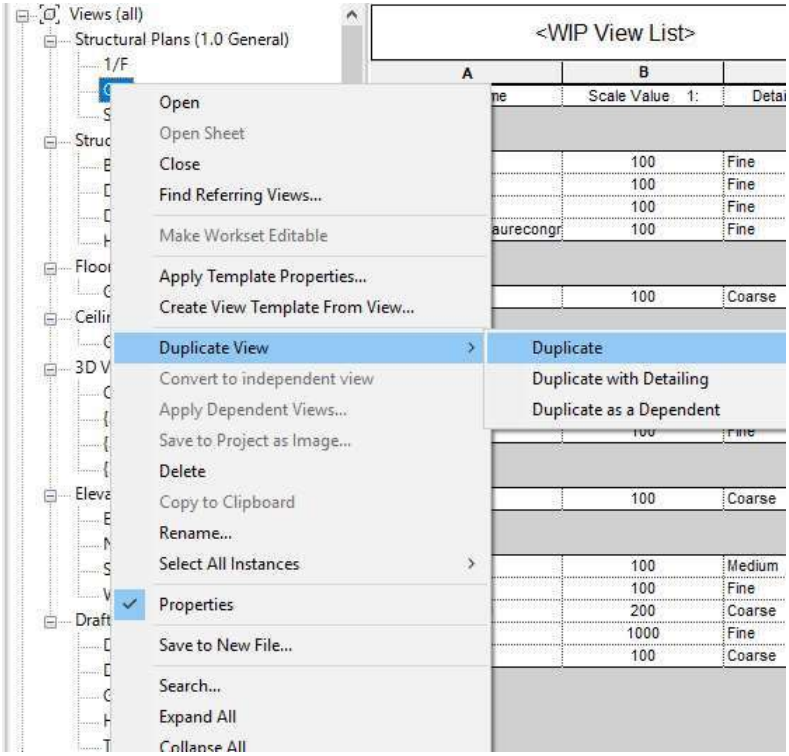
	CIC_Curtain Wall Elevation CIC_Curtain Wall Section View CIC_Embed Section View

7 Preparing Drawing Production

7.1 Duplicating Views

For drawing production, the users may duplicate the view for further editing instead of the working view.

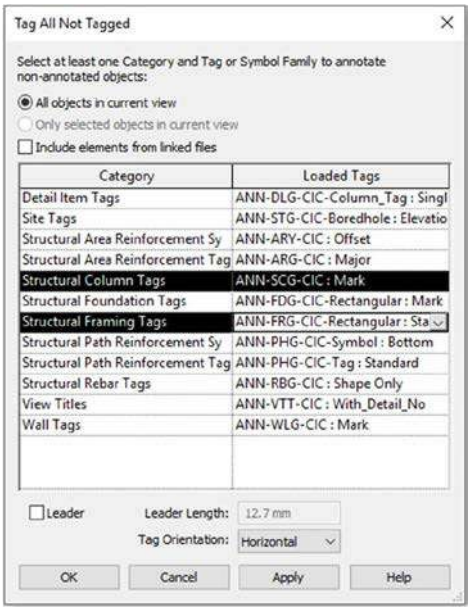
Select a structural plan ➜ right click ➜ click “Duplicate View” ➜ “Duplicate” ➜ re-naming the sheet to “DEMOLITION PLAN – EXISTING FRAMING PLAN” or re-naming by your own.



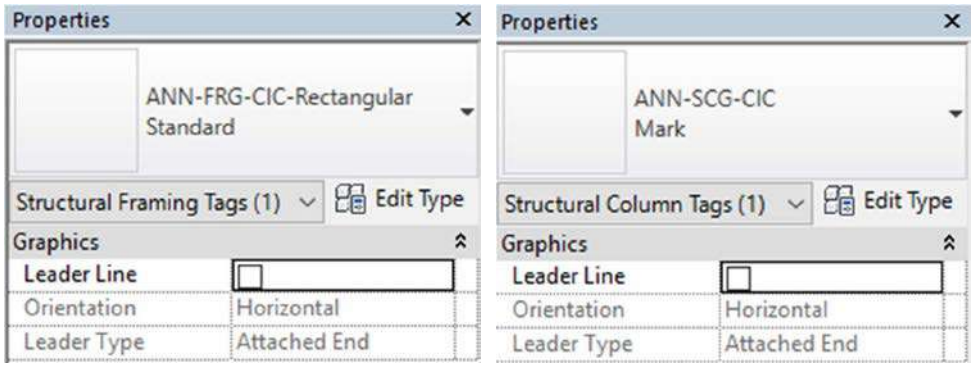
7.1.1 Add Tags (Tag All not tagged)

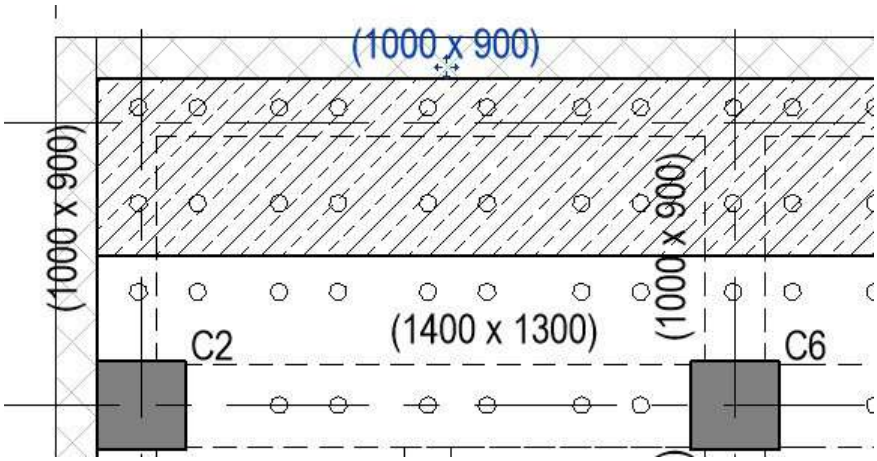
Click “Annotation” in ribbon ➜ click “Tag All” for column and beam marks.

Click both “Structural Column Tags” and “Structural Framing Tags” in below Window ➜ click “OK”.



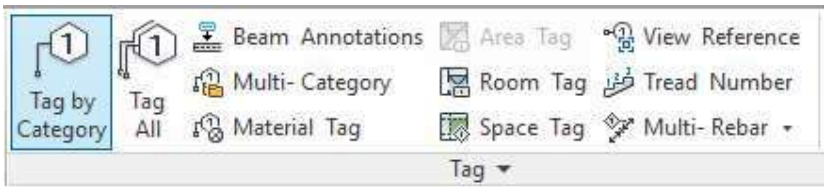
Choose “ANN-FTG-CIC-Rectangular” or “ANN-SCG-CIC” for the standard markings of beam and column respectively.





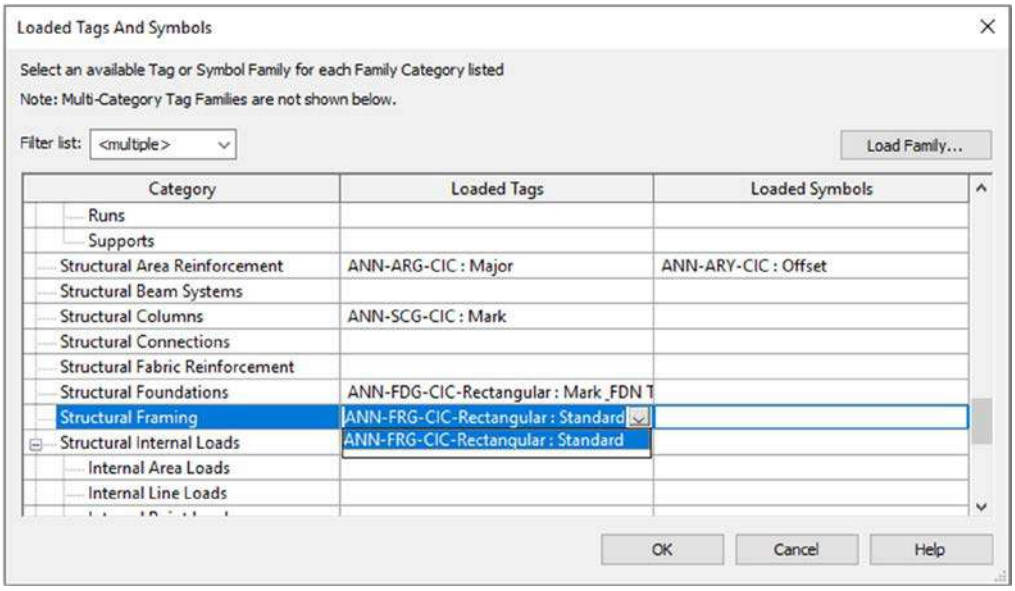
7.1.2 Add Tags (Tag by Category)

Click “Annotation” in ribbon ➔ click “Tag by Category” for column and beam marks.



Click “Tags..” in Option bar.

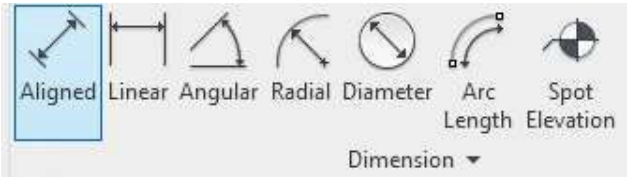
Assign the required tag family and type to each category and click “OK”.



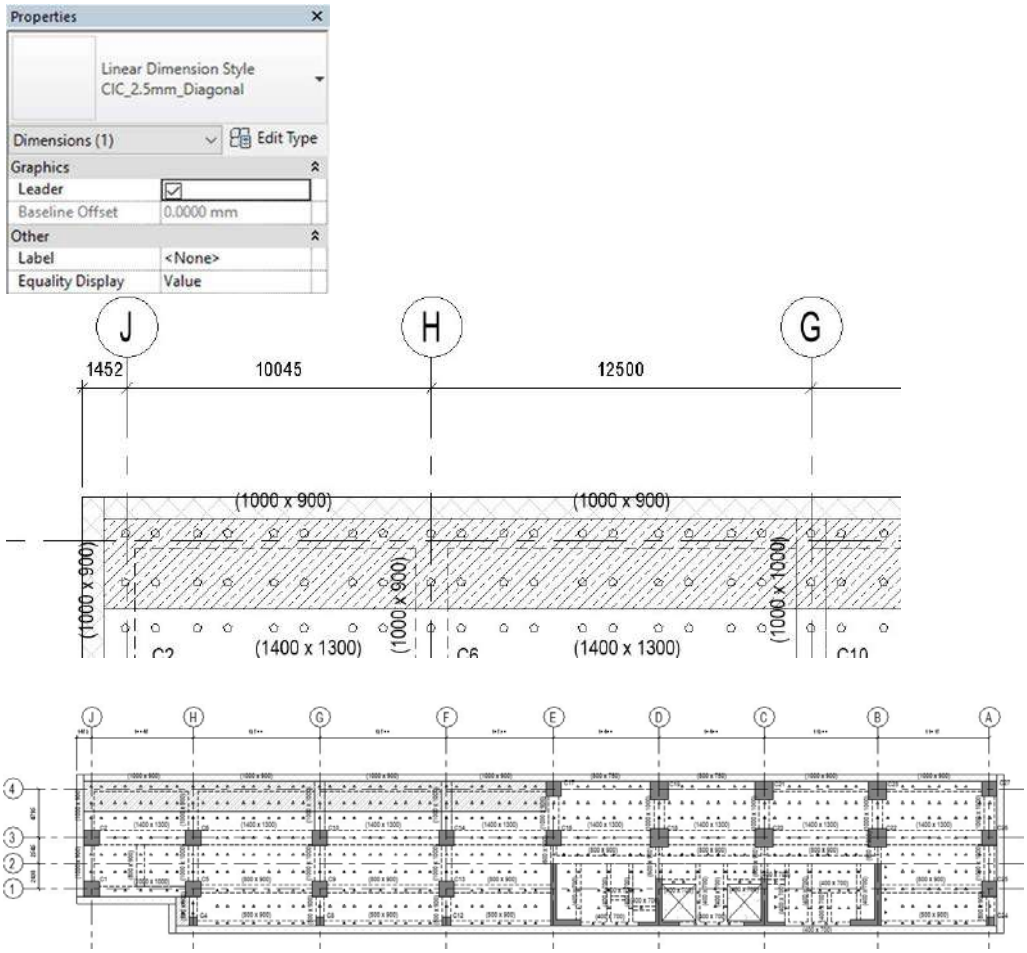
Click the desired object to tag.

7.1.3 Add Dimensions

Create the grid dimension from “Aligned” under Dimension in Ribbon.



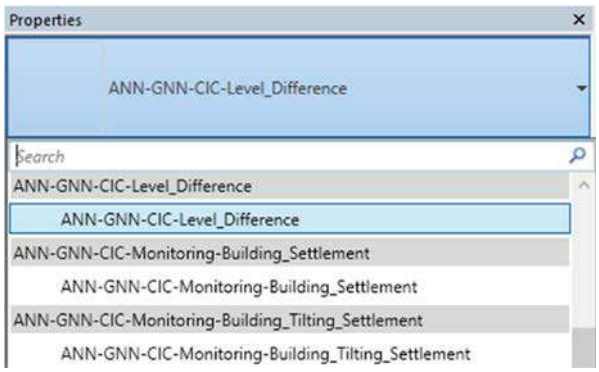
Choose “CIC_2.5_Con_Diagonal” under Linear Dimension Style family for the standard style of dimension.



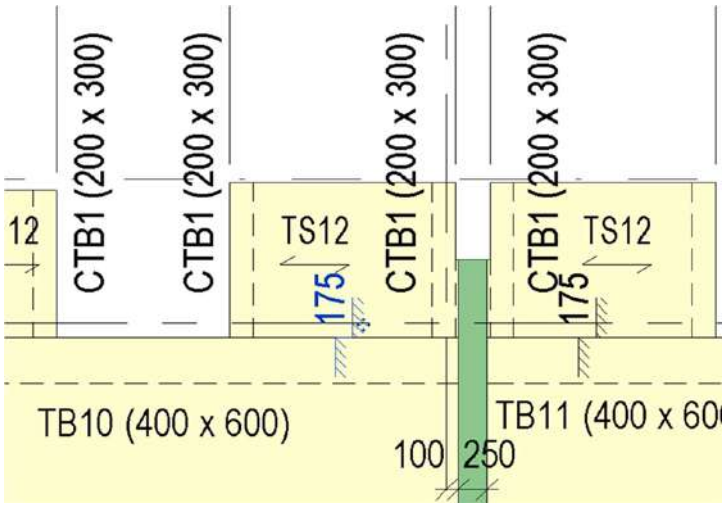
7.1.4 Add Annotation Symbols

Click “Annotation” in ribbon ➔ click “Symbol” to place annotation symbols.

Select the specific type of symbol from “Properties”.



Place it to desired location.



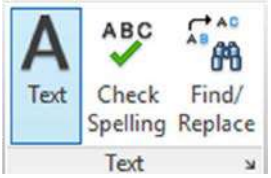
7.2 Create Drafting View

Despite creating 3D objects, 2D information can also be drafted in the drafting view when appropriate. For example, general notes and typical details.

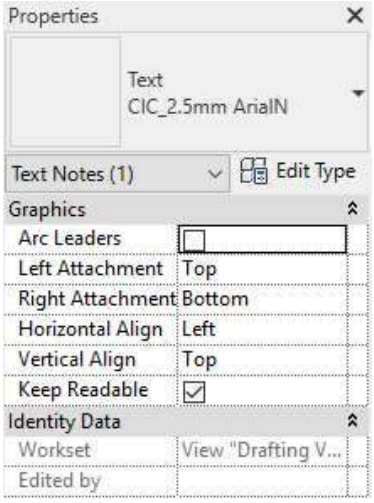
Click “Drafting View” under Create in View ➔ Re-naming the drafting view to “GENERAL NOTES FOR DEMOLITION” or by your own for easy reference.

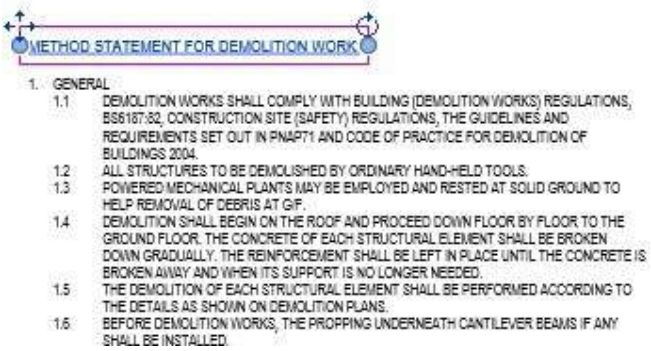
7.2.1 Text Note

Insert text from the annotation.



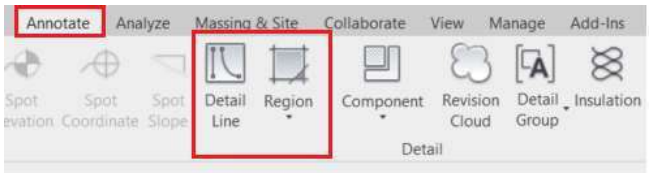
In the properties panel, choose the specific type of text.

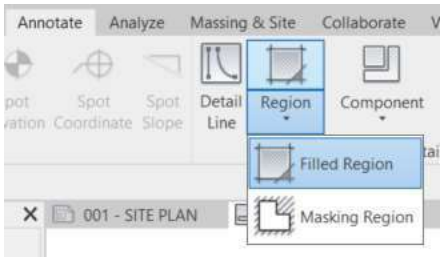




7.2.2 Typical Details

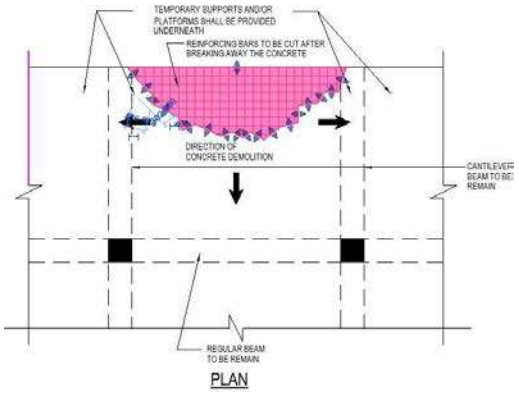
Create detail line / region.



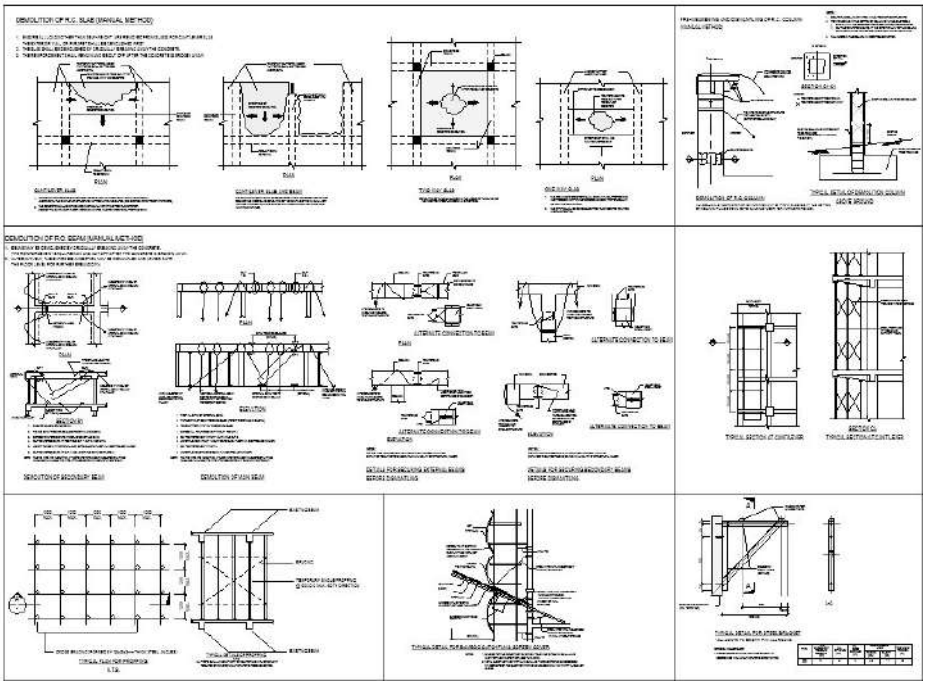


Create lines and choose different Line Style.

Drafting the region by drawing tools.

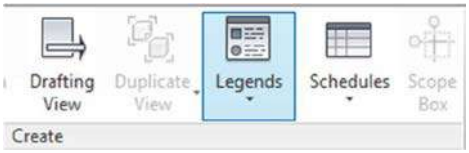


Examples of Detail for Demolition Works:

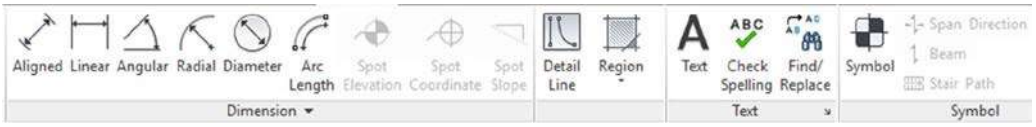


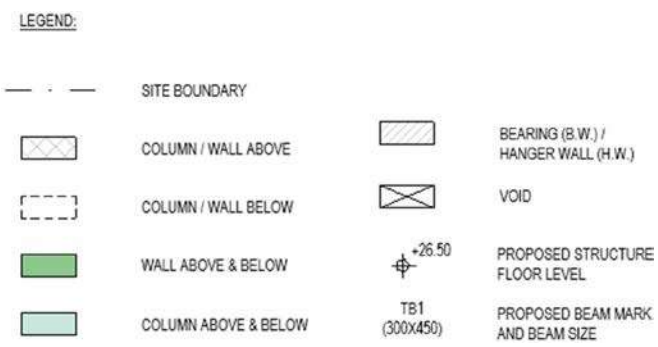
7.3 Create Legend

Click “View” in ribbon ➜ click “Legends” to create a new legend view.

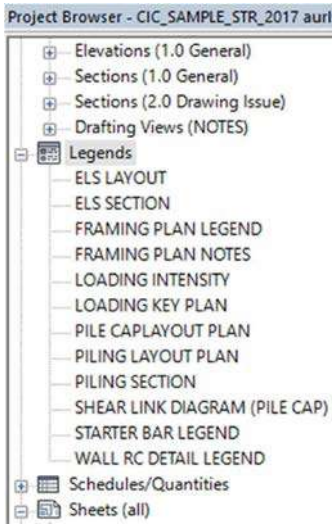


Use Annotation tool such as text, filled region and symbols to create the components in legends.





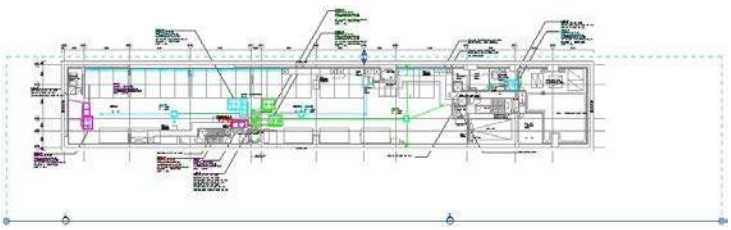
Example of legends that already created in the Structural template.



7.4 Create Drainage Schematic Diagram

7.4.1 Create Elevation View

Create an exterior elevation view in plan ➜☐adjust the width and length of the crop region

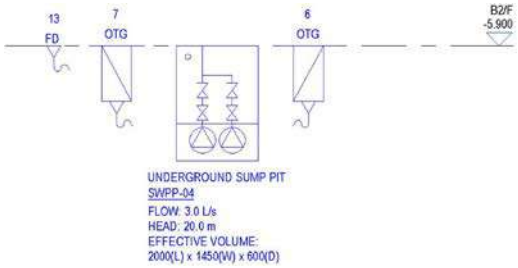


7.4.2 Add Tags to non-pipework drainage object

Add Tag in elevation view (Refer to section 7.1.2 Add Tags – Tag by Category)

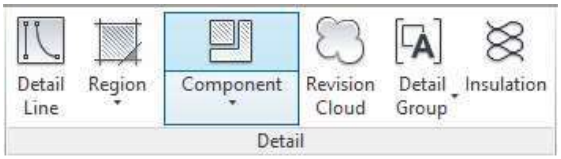
Category	Tag family	Drainage object
Plumbing Fixture	ANN-PMG-CIC-Schem-Floor_Drain ANN-PMG-CIC-Schem-Vertical_Floor_Drain ANN-PMG-CIC-Schem-Water_Closet	Floor_Drain Vertical_Floor_Drain Water_Closet

Drag the tags to the location manually.

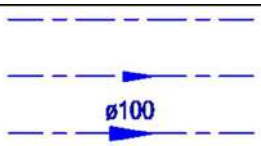
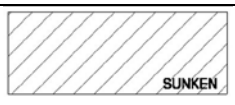


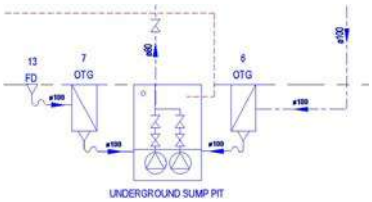
7.4.3 Add detail item to routing of pipes

Click “Annotation” in ribbon ➔ click “Component” in “Detail” to place detail item.



In “Properties”, select “CIC_Pipe Line” ➔☐select the specific type of line

Family	Type	Graphics
CIC_Pipe Line	DR-Waste DR-Waste with arrow DR-Waste with radius	
CIC_Pump Symbol	WP	
CIC_Room Boundary	F. LAV	
CIC_Sunken	D1800	



7.4.4 Apply view template

Apply view template “CIC_Drainage Schematic Diagram” to the view. (Refer to section 6 Standardising View Setting)

8 Creating Sheet

8.1 Sheet List

Using a template sheet, the users can create a tabular view of sheets in a project. From “View” tab in ribbon ➔ click “Schedule” ➔ click “Sheet List”.

In the field tab of the sheet list, add the field name sheet number, sheet name, sheet issue date and sheet revision to the list of scheduled fields.

To begin adding sheets to the sheet list, go to the row panel in ribbon ➔ click “Insert” ➔ click “Data Rows”. The users can continue populating the schedule in this way.

<SHEET LIST>

A	B	C	D
Sheet Number	Sheet Name	Sheet Issue Date	Sheet Revision
A101		04/16/19	
E001	EXCAVATION & LATRAL SUPPORT LAYOUT PLAN	04/18/19	
E002	EXCAVATION & LATERAL SUPPORT SECTIONS (1 OF 2)	04/18/19	
E004	EXCAVATION & LATERAL SUPPORT CONSTRUCTION SEQUENCE (1 OF 2)	04/18/19	
E007	EXCAVATION & LATERAL SUPPORT GENERAL NOTES	04/18/19	
P003	PILING SECTION A & SECTION B	04/18/19	
P002	PILING LAYOUT PLAN	04/18/19	
P005	PILE LOAD SCHEDULE	04/18/19	
E003	EXCAVATION & LATERAL SUPPORT SECTIONS (2 OF 2)	04/18/19	
P004	PILING SECTION C	04/18/19	
P007	COLUMN / WALL LOADING SCHEDULE	04/18/19	
P008	LOADING INTENSITY PLANS	04/18/19	
P001	GENERAL NOTES FOR FOUNDATION	04/18/19	
S002	TYPICAL FLOOR FRAMING PLAN	04/23/19	
E005	EXCAVATION & LATERAL SUPPORT CONSTRUCTION SEQUENCE (2 OF 2)	04/26/19	

8.1.1 Superstructure

For superstructure submission, this template shows the following examples for your reference.

Sheet Number	Sheet Name
S001	GENERAL NOTES FOR SUPERSTRUCTURE
S002	TYPICAL FLOOR FRAMING PLAN
S003	BEAM R.C. SCHEDULE
S004	BEAM R.C. DETAIL (SCHEDULE VERSION)
S005	BEAM R.C. DETAIL
S006	COLUMN R.C. DETAIL
S007	WALL R.C. DETAIL (1 OF 2)
S007A	WALL R.C. DETAIL (Schedule)
S008	WALL R.C. DETAIL (2 OF 2)

S009	SLAB R.C. DETAIL
S010	STAIRCASE R.C. DETAIL
S011	WATER TANK R.C. DETAIL

8.1.2 Demolition including hoarding

For Demolition submission, this template shows the following examples for your reference.

Sheet Number	Sheet Name
D001	GENERAL NOTES FOR DEMOLITION
D002	DEMOLITION PLAN – EXISTING G/F, 1/F FRAMING PLAN
D003	DEMOLITION DETAILS (BY HAND HELD TOOLS)
D004	DETAIL FOR DEMOLITION WORKS (1/2)
D005	DETAIL FOR DEMOLITION WORKS (2/2)
H001	HOARDING LAYOUT PLAN
H002	HOARDING TYPICAL DETAIL

8.1.3 Foundation

For Foundation submission, this template shows the following examples for your reference.

Sheet Number	Sheet Name
P001	GENERAL NOTES FOR FOUNDATION
P002	PILING LAYOUT PLAN
P003	PILING SECTION A & SECTION B
P004	PILING SECTION C
P005	COLUMN / WALL LOADING PLAN
P006	COLUMN / WALL LOADING SCHEDULE
P007	LOADING INTENSITY PLAN
P008	PILE LOAD SCHEDULE
P009	MONITORING PLAN
P010	PILE CAP REINFORCEMENT LAYOUT PLAN
P010A	PILE CAP REINFORCEMENT LAYOUT PLAN (2 OF 2)
P011	COLUMN AND WALL STARTER DETAILS
P012	TIE BEAM DETAILS & SCHEDULE
P013	PILE CAP LAYOUT PLAN
P014	GENERAL NOTES FOR PILE CAP

8.1.4 Excavation and Lateral Support

For Excavation and lateral support submission, this template shows the following examples for your reference.

Sheet Number	Sheet Name
E001	EXCAVATION & LATERAL SUPPORT GENERAL NOTES
E002	EXCAVATION & LATERAL SUPPORT LAYOUT PLAN
E003	EXCAVATION & LATERAL SUPPORT SECTIONS (1 OF 2)
E004	EXCAVATION & LATERAL SUPPORT SECTIONS (2 OF 2)
E005	EXCAVATION & LATERAL SUPPORT CONSTRUCTION SEQUENCE (1 OF 2)
E006	EXCAVATION & LATERAL SUPPORT CONSTRUCTION SEQUENCE (2 OF 2)
E007	EXCAVATION & LATERAL SUPPORT ELEVATION
E008	EXCAVATION & LATERAL SUPPORT WORKS MONITORING PLAN
E009	EXCAVATION & LATERAL SUPPORT WORKS PUMPING TEST SETTING OUT PLAN

8.1.5 Ground Investigation

For Ground Investigation submission, this template shows the following examples for your reference.

Sheet Number	Sheet Name
/	/

8.1.6 Site Formation

For Site Formation submission, this template shows the following examples for your reference.

Sheet Number	Sheet Name
T001	GENERAL NOTES FOR SITE FORMATION
T002	SITE FORMATION LAYOUT PLAN
T003	SITE FORMATION SECTIONS

8.1.7 Drainage

For Site Formation submission, this template shows the following examples for your reference.

Sheet Number	Sheet Name
M001	GENERAL NOTES FOR DRAINAGE
M002	SCHEMATIC DIAGRAM OF DRAINAGE SYSTEM
M003	DRAINAGE LAYOUT PLAN FOR TYPICAL FLOOR

M004	DRAINAGE INSTALLATION DETAILS
M005	DRAINAGE SCHEDULES

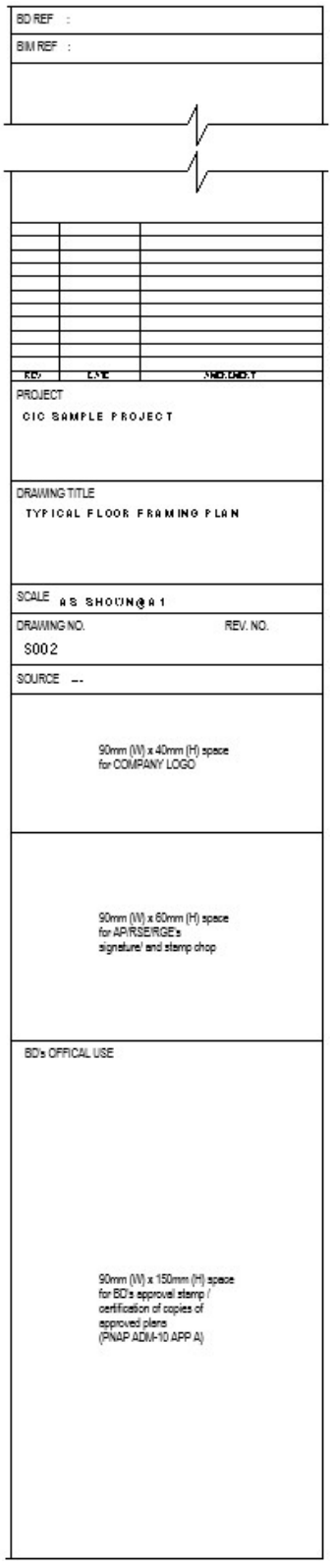
8.1.8 Curtain Wall

For Site Formation submission, this template shows the following examples for your reference.

Sheet Number	Sheet Name
C001	GENERAL NOTES FOR CURTAIN WALL
C002	CURTAIN WALL LOCATION PLAN
C003	CURTAIN WALL CAST-IN LAYOUT PLAN
C004	DETAIL OF EMBED AND MEMBER SECTION PROPERTIES
C005	CURTAIN WALL PARTIAL ELEVATIONS AND SECTIONS

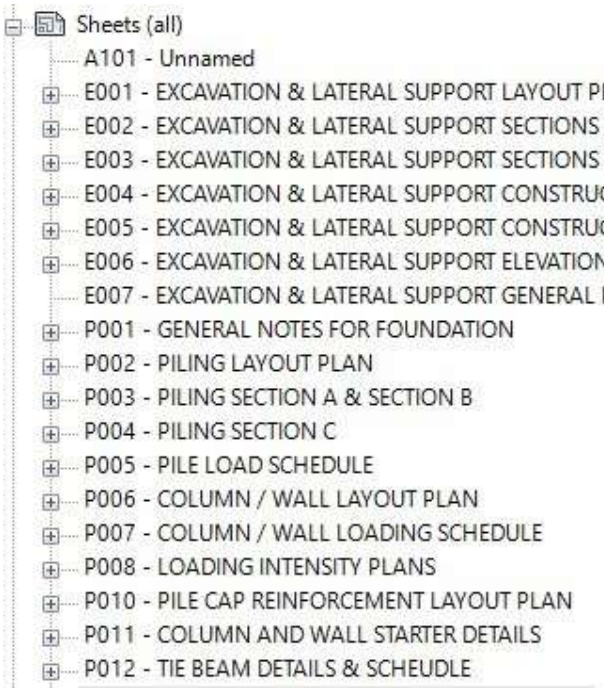
8.2 Title Block

The title block includes standardised view and location of BD's approval stamp chop and RSE's name chop.



8.3 Examples of sheets

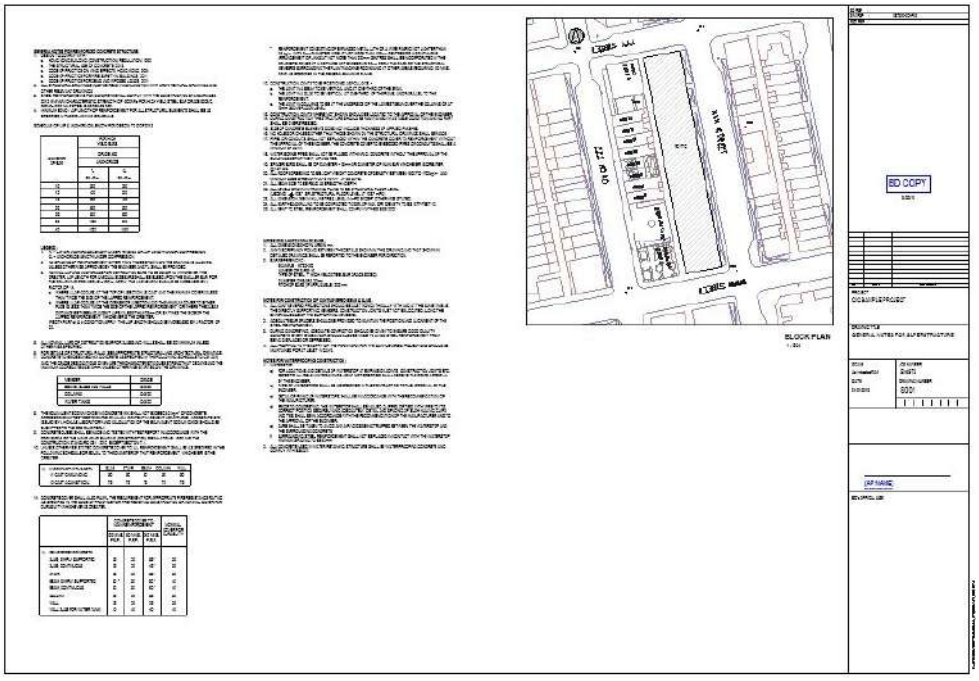
Examples of sheets can be found in Sheet (all) from the project browser.



8.3.1 Superstructure

8.3.1.1 General Notes

From the project browser, click “S001 - GENERAL NOTES FOR SUPERSTRUCTURAL” in Sheet (all). The sheet consists of general notes and block plan, as basic components.

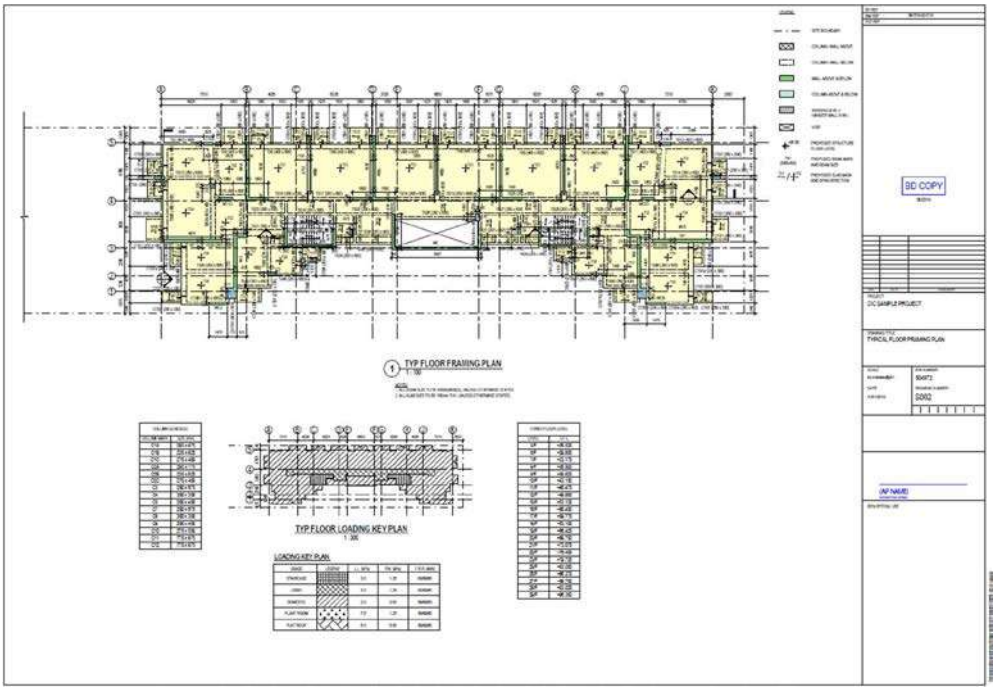


Drag the following views to the sheet.

View Type	View Name
Structural Plan	BLOCK PLAN
Drafting view	NOTES FOR SUPERSTRUCTURE

8.3.1.2 Typical Floor Framing Plan

From project browser, click “S002 - TYPICAL FLOOR FRAMING PLAN” in Sheet (all). The sheet consists of notes, legend, plans and schedules, as basic components.



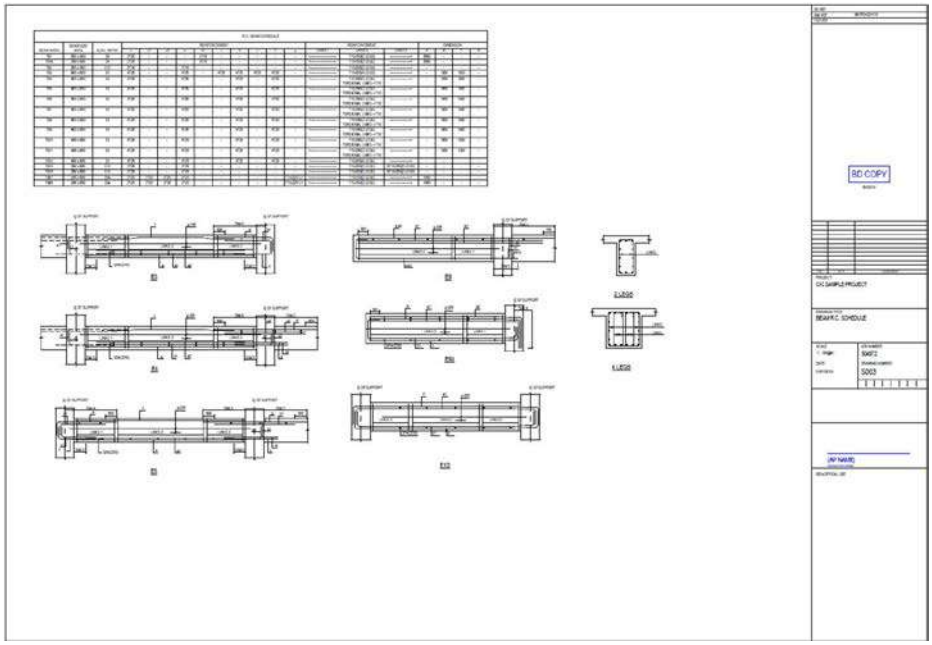
Drag the following views to the sheet.

View Type	View Name
Structural Plan	TYP FLOOR FRAMING PLAN TYP FLOOR LOADING KEY PLAN
Drafting view	LOADING KEY PLAN FRAMING PLAN NOTES
Schedule	COLUMN SCHEDULE TOWER FLOOR LEVEL
Legend	FRAMING PLAN LEGEND

8.3.1.3 Beam R.C. Detail

From the project browser, click “S003 – BEAM R.C. SCHEDULE” in Sheet (all).

Drag beam R.C. detail from drafting view into the sheet. 3

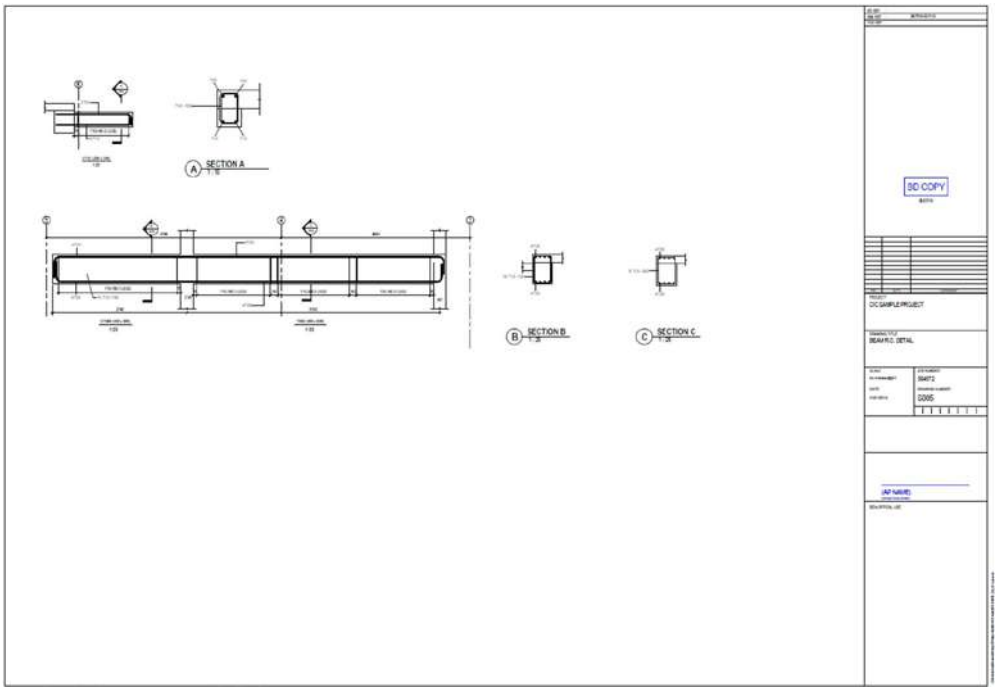


Drag the following views to the sheet.

View Type	View Name
Schedule	R.C. BEAM SCHEDULE
Drafting View	BEAM RC DETAIL

8.3.1.4 Beam R.C. Detail

From project browser, click “S004 – BEAM R.C. DETAIL” in

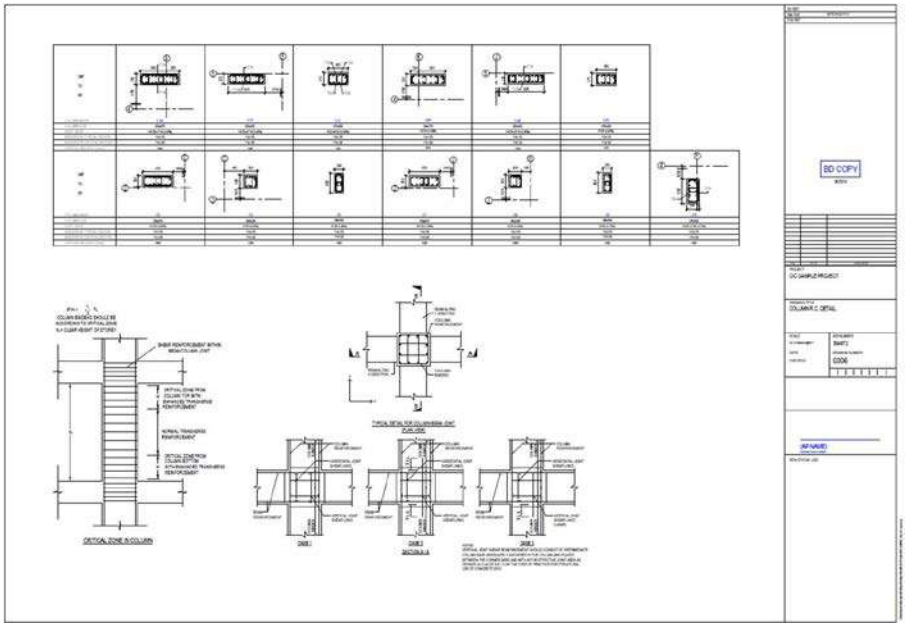


Drag the following views to the sheet.

View Type	View Name
Section	CTB1 SECTION 1, CTB1 SECTION A, CTB56 SECTION 1, CTB56 SECTION B, CTB56 SECTION C

8.3.1.5 Column R.C. Detail

From project browser, click “S005 – COLUMN R.C. DETAIL” in Sheet (all).

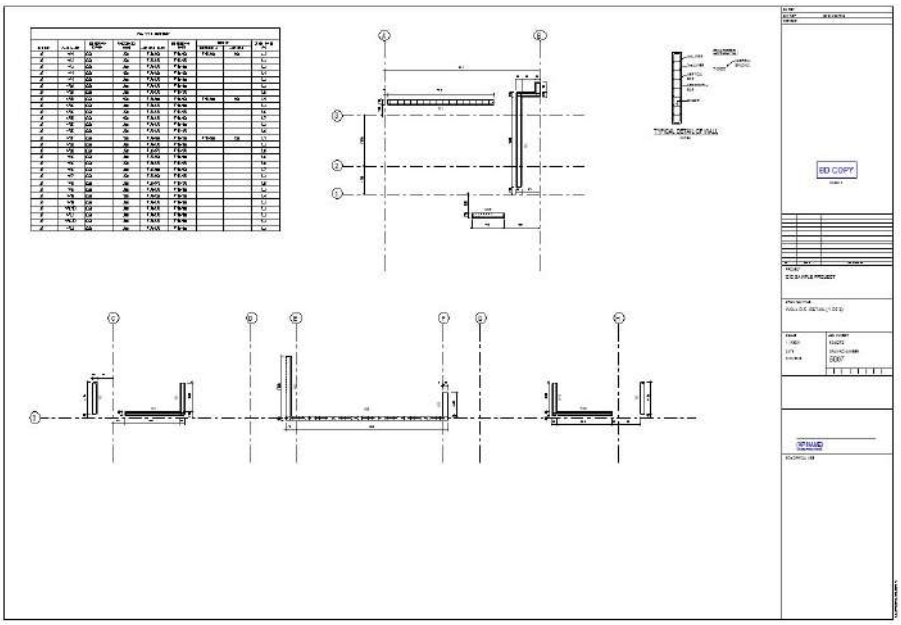


Drag the following views to the sheet.

View Type	View Name
Structural Plan	COLUMN REBAR PLAN (C1-C10)
Drafting View	COLUMN REBAR TABLE COLUMN CRITICAL ZONE COLUMN BEAM JOINT DETAIL

8.3.1.6 Wall R.C. Detail

From the project browser, click “S006 – WALL R.C. DETAIL (1 OF 2)” in Sheet (all).

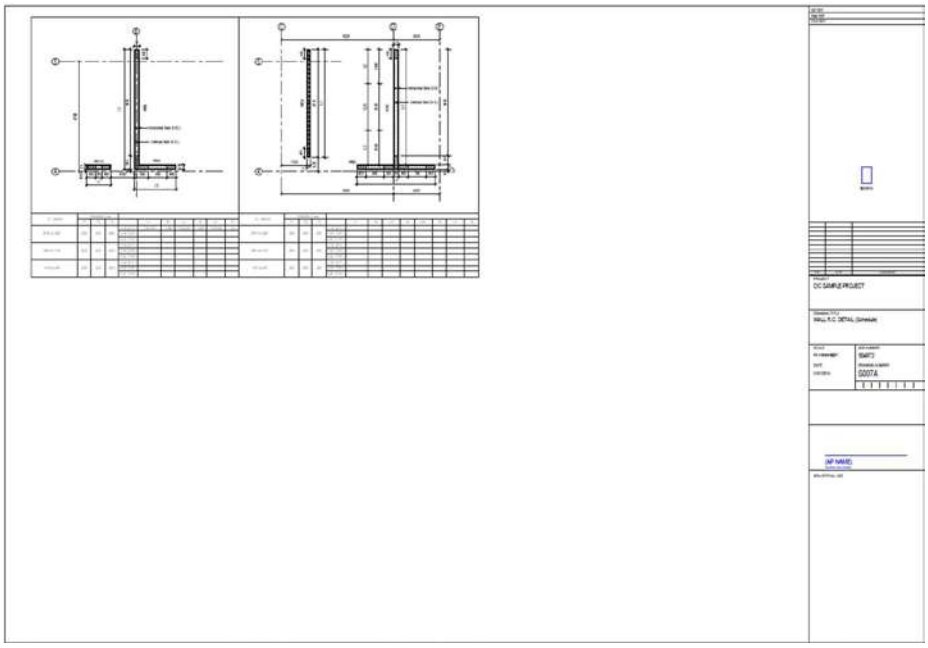


Drag the following views to the sheet.

View Type	View Name
Structural Plan	5F WALL REBAR PLAN (WALL DETAIL 1-5)
Legend	WALL RC DETAIL LEGEND
Schedule	R.C. WALL SCHEDULE

8.3.1.7 Wall R.C. Detail (Schedule)

From project browser, click “S007 – WALL R.C. DETAIL (Schedule)” in Sheet (all).

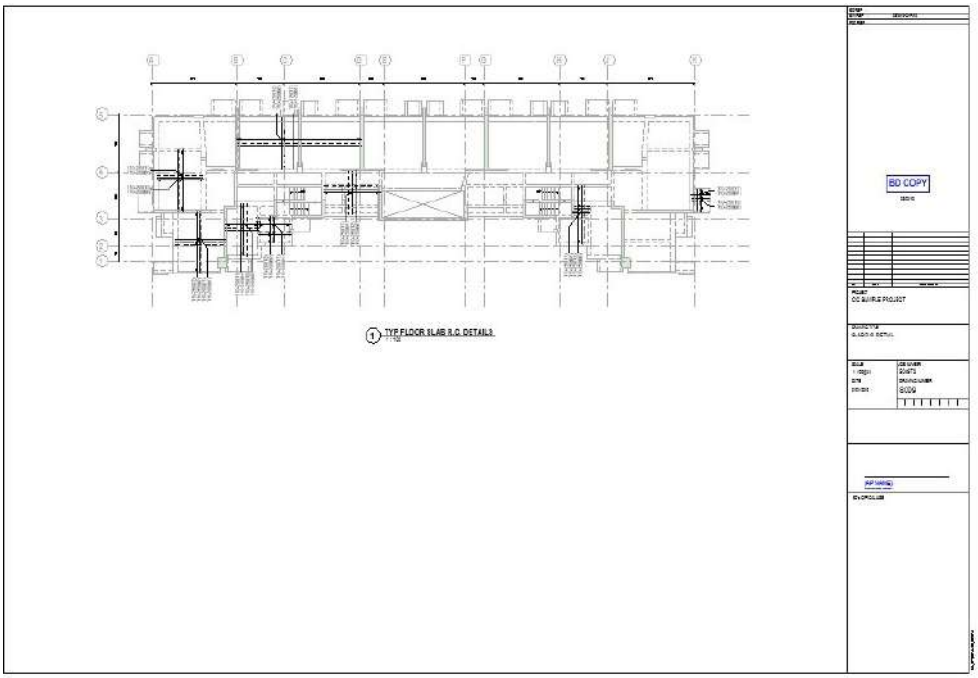


Drag the following views to the sheet.

View Type	View Name
Structural Plan	WALL DETAIL (SCHEDULE) 1 WALL DETAIL (SCHEDULE) 2
Drafting View	WALL REBAR TABLE

8.3.1.8 Slab R.C. Detail

From project browser, click “S009 – SLAB R.C. DETAIL” in Sheet (all).

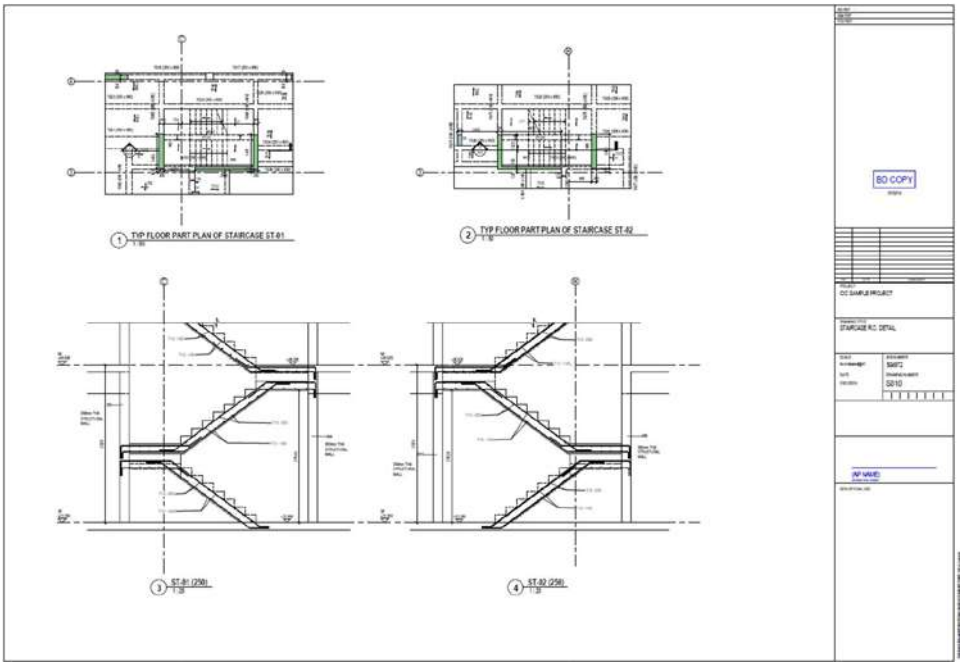


Drag the following views to the sheet.

View Type	View Name
Structural Plan	TYP FLOOR SLAB R.C. DETAILS

8.3.1.9 Staircase R.C. Detail

From the project browser, click “S010 – STAIRCASE R.C. DETAIL” in Sheet (all).

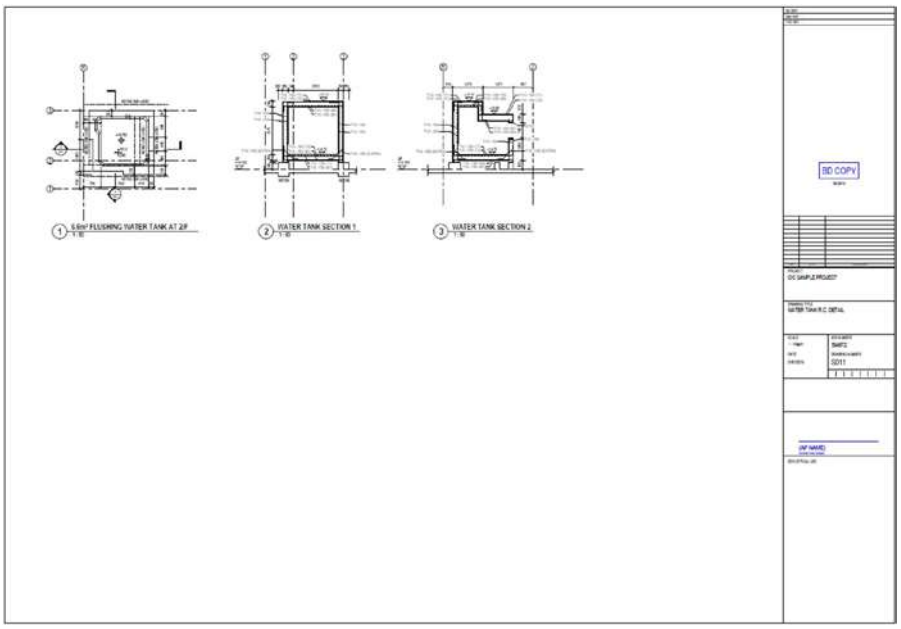


Drag the following views to the sheet.

View Type	View Name
Structural Plan	ST1, ST2
Section	STAIRS RC DETAIL (ST-01) STAIRS RC DETAIL (ST-02)

8.3.1.10 Water Tank R.C. Detail

From the project browser, click “S011 – WATER TANK R.C. DETAIL” in Sheet (all).



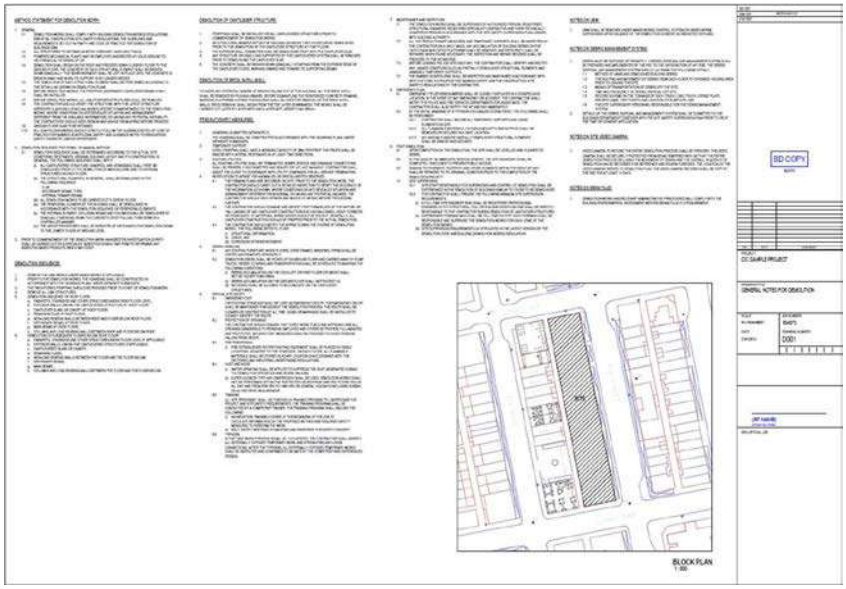
Drag the following views to the sheet.

View Type	View Name
Structural Plan	2/F Water Tank
Section	WATER TANK SECTION 1 WATER TANK SECTION 2

8.3.2 Demolition including hoarding

8.3.2.1 General Notes

From the project browser, click “D001 - GENERAL NOTES FOR DEMOLITION” in Sheet (all). The sheet consists of general notes and title block, as basic components.

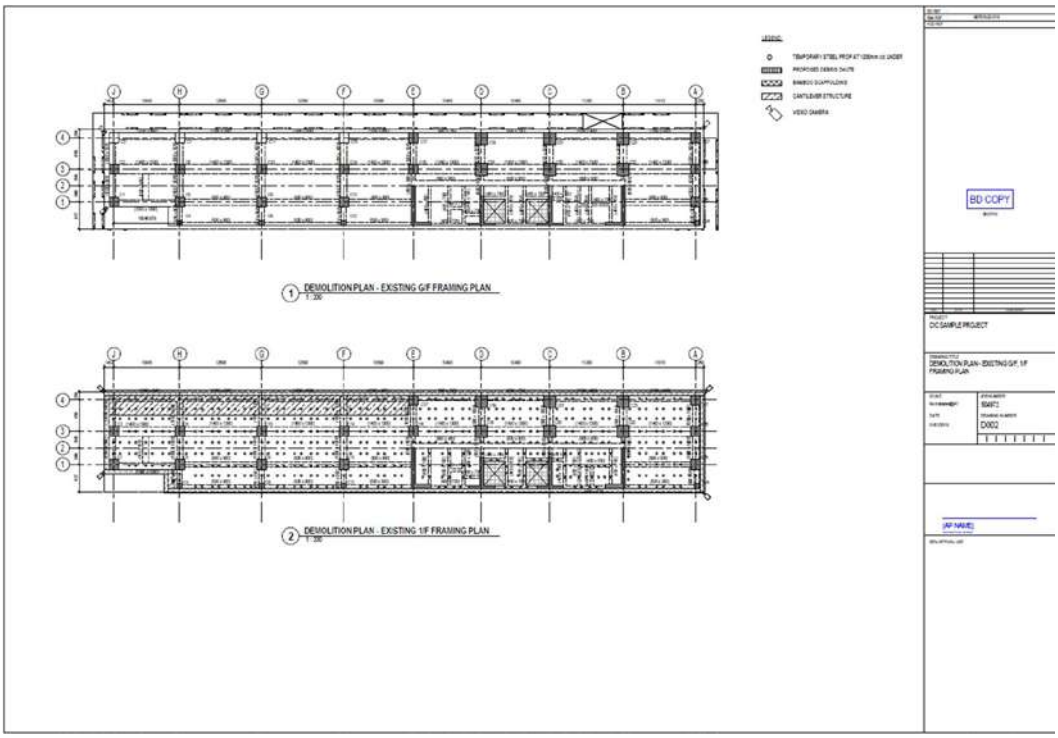


Drag the following views to the sheet.

View Type	View Name
Structural Plan	BLOCK PLAN
Drafting View	GENERAL NOTES FOR DEMOLITION

8.3.2.2 Demolition Plan – Existing G/F, 1/F Framing Plan

From the project browser, click “D002 – DEMOLITION PLAN – EXISTING G/F, 1/F FRAMING PLAN” in Sheet (all).

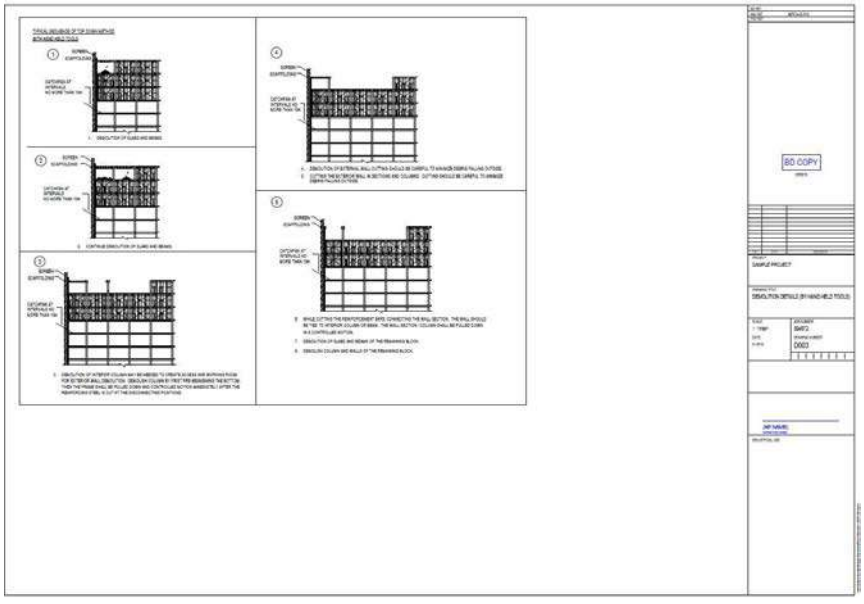


Drag the following views to the sheet.

View Type	View Name
Structural Plan	DEMOLITION PLAN - EXISTING G/F FRAMING PLAN DEMOLITION PLAN - EXISTING 1/F FRAMING PLAN
Legend	CIC_DEMOLITION PLAN

8.3.2.3 Demolition Details (By Hand Held Tools)

From the project browser, click “D003 – DEMOLITION DETAILS (BY HAND HELD TOOLS)” in Sheet (all).

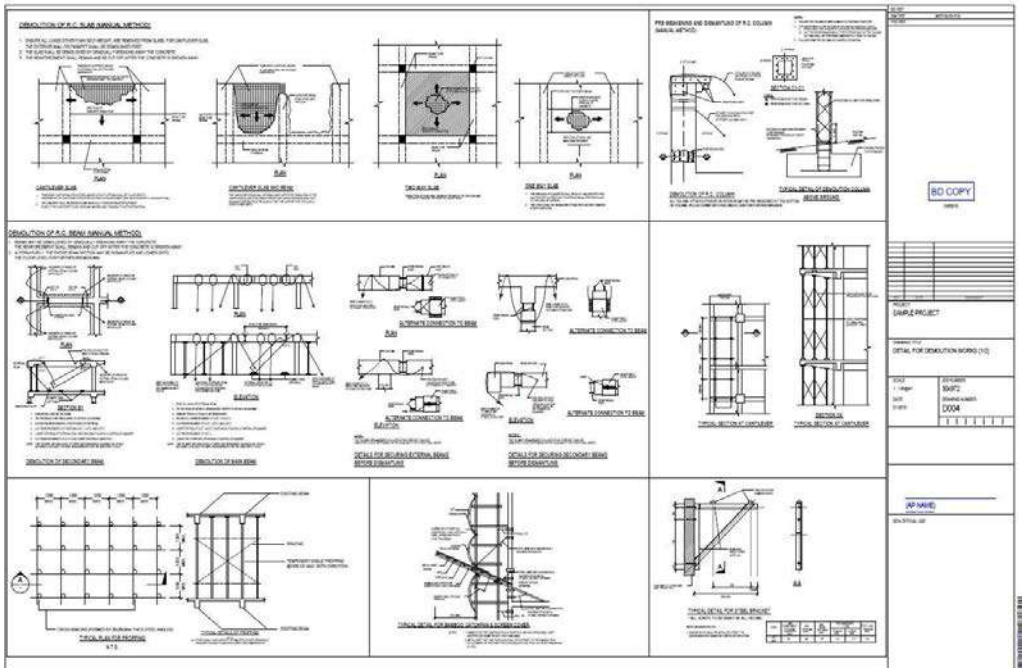


Drag the following views to the sheet.

View Type	View Name
Drafting View	TYPICAL SEQUENCE OF TOP DOWN METHOD

8.3.2.4 Details for Demolition works

From the project browser, click “D004 – DETAIL FOR DEMOLITION WORKS” in Sheet (all).

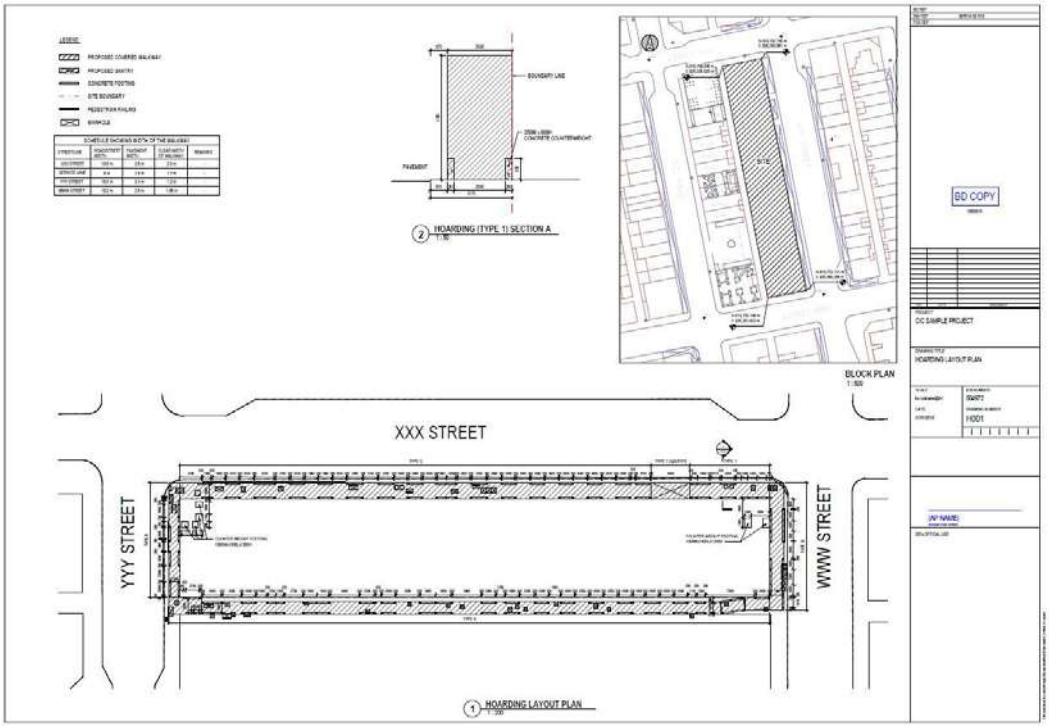


Drag the following views to the sheet.

View Type	View Name
Drafting View	DETAIL FOR DEMOLITION WORKS (1) DETAIL FOR DEMOLITION WORKS (2)

8.3.2.5 Hoarding Layout Plan

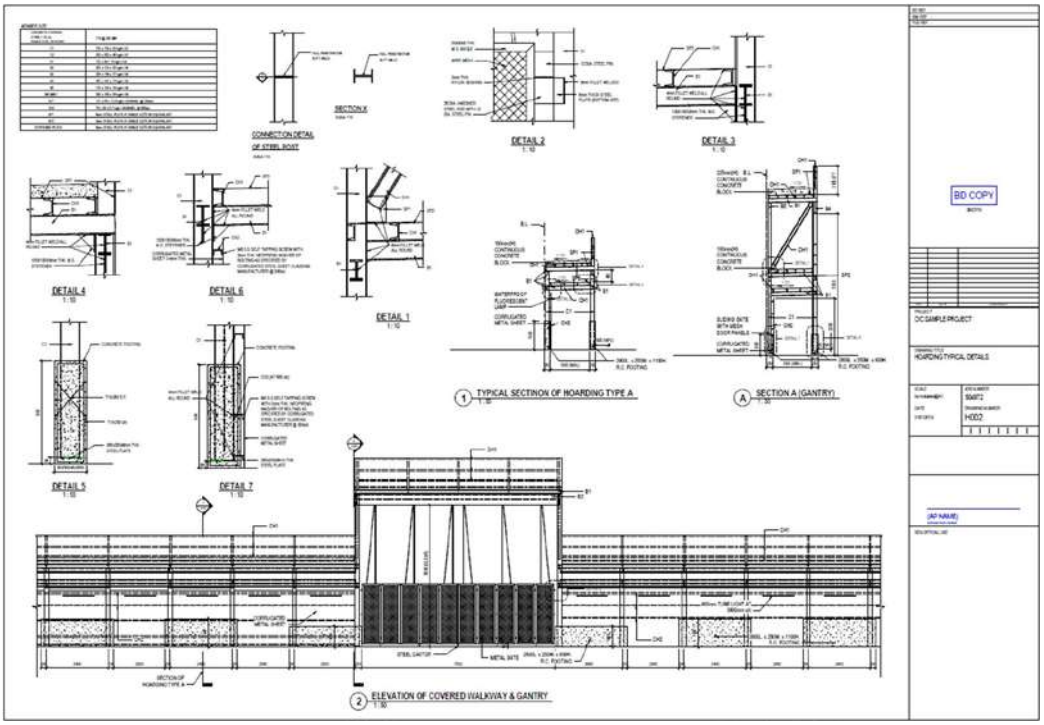
From the project browser, click “H001 – HOARDING LAYOUT PLAN” in Sheet (all).



Drag the following views to the sheet.

View Type	View Name
Drafting View	HOARDING PLAN
Structural Plan	HOARDING PLAN BLOCK PLAN
Section	HOARDING (TYPE C) SECTION A1

8.3.2.6 Hoarding Typical Detail



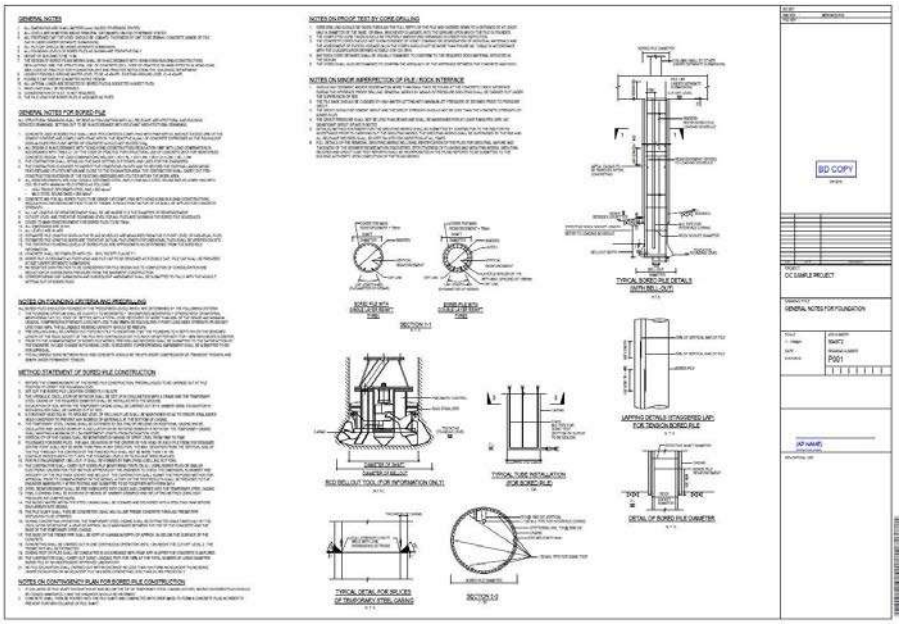
Drag the following views to the sheet.

View Type	View Name
Drafting View	HOARDING TYPICAL DETAIL
Section	DETAIL 1-7 ELEVATION OF COVERED WALKWAY & GANTRY SECTION A (GANTRY) TYPICAL SECTINON OF HOARDING TYPE A

8.3.3 Foundation

8.3.3.1 General Notes

From the project browser, click “P001 - GENERAL NOTES FOR FOUNDATION” in Sheet (all).

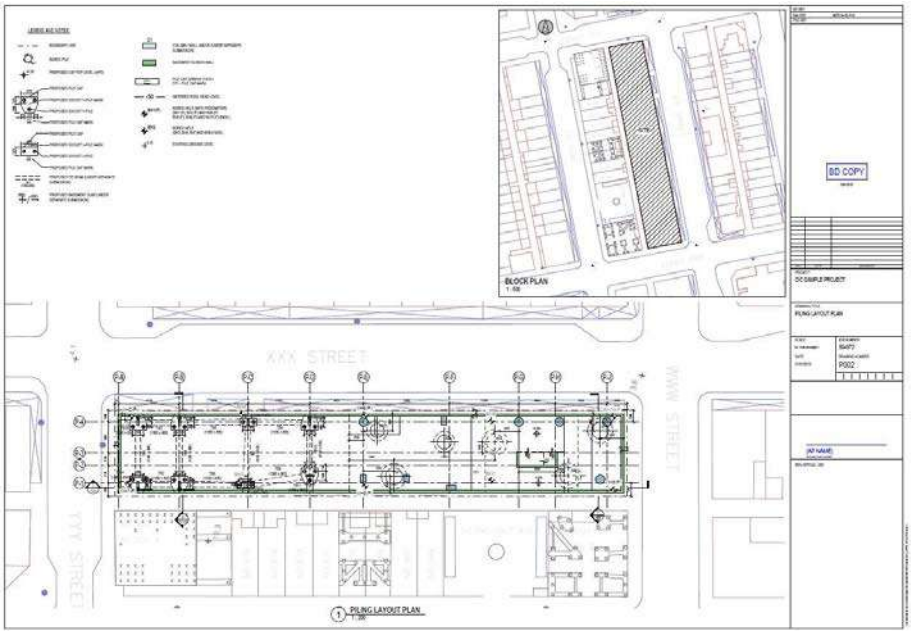


Drag the following views to the sheet.

View Type	View Name
Drafting View	NOTES FOR FOUNDATION

8.3.3.2 Piling Layout Plan

From project browser, click “P002 – PILING LAYOUT PLAN” in Sheet (all).

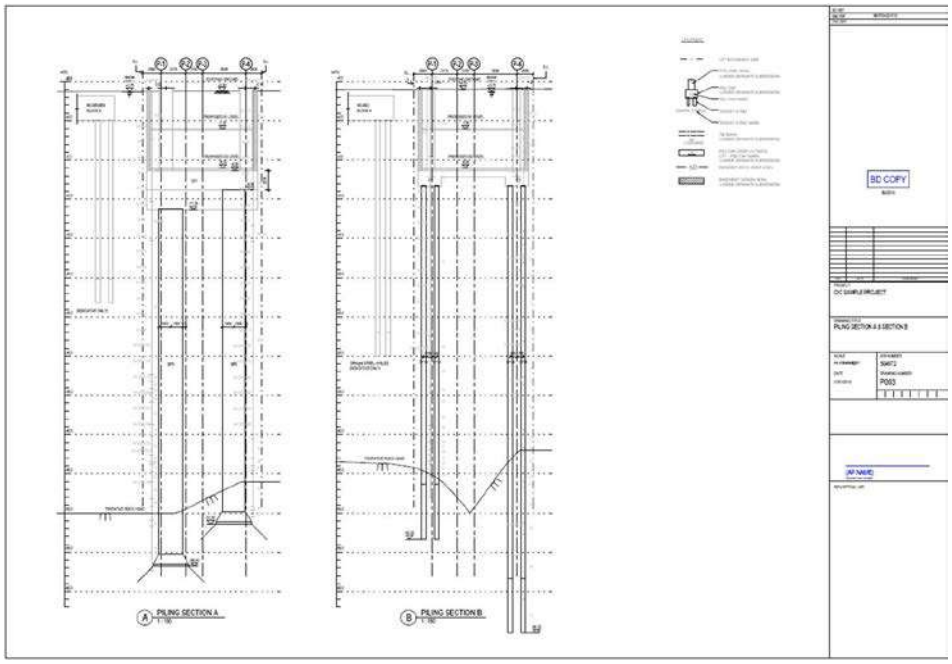


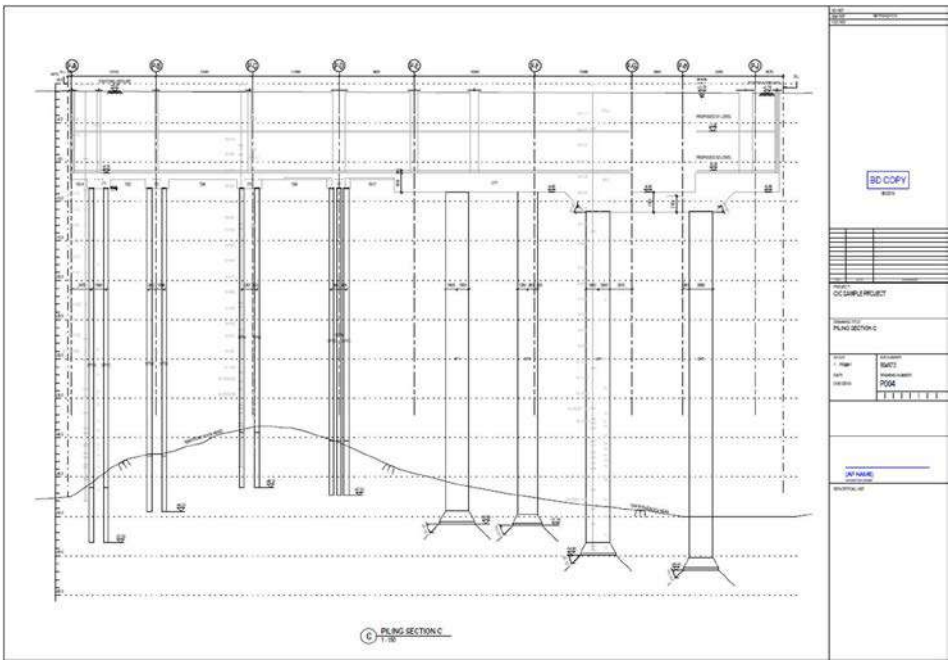
Drag the following views to the sheet.

View Type	View Name
Legend	PILING LAYOUT PLAN
Structural Plan	PILING LAYOUT PLAN BLOCK PLAN

8.3.3.3 Piling Section

From project browser, click “P003 – Piling Section A & Section B” or “P004 – Piling Section C” in Sheet (all).



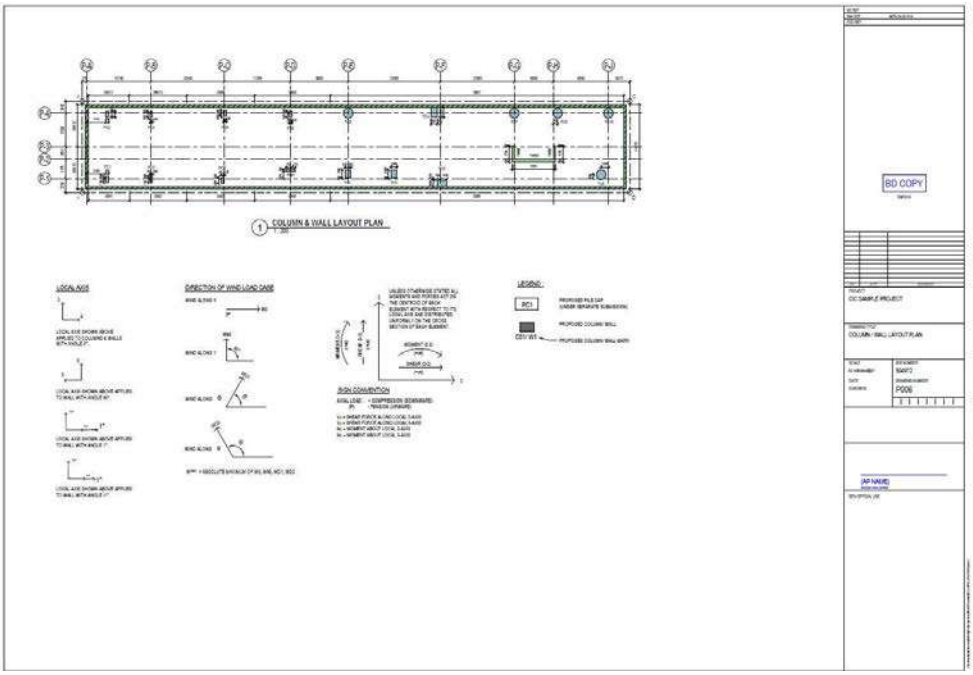


Drag the following views to the sheet.

View Type	View Name
Legend	PILING SECTION
Section	PILING SECTION A-C

8.3.3.4 Column/Wall Loading Plan

From project browser, click “P005 – COLUMN / WALL LOADING PLAN” in Sheet (all).

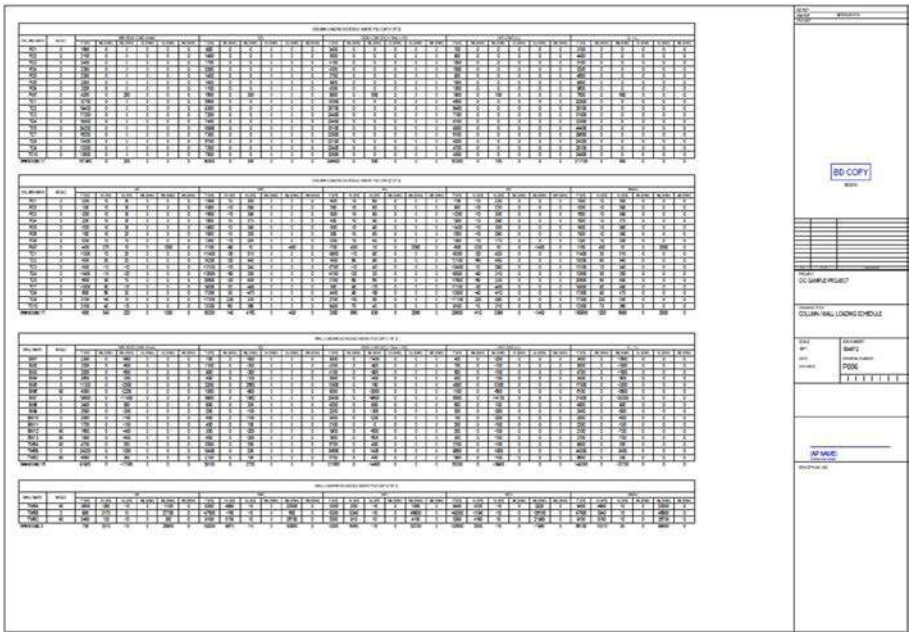


Drag the following views to the sheet.

View Type	View Name
Structural Plan	COLUMN & WALL LAYOUT PLAN
Drafting View	COLUMN WALL LOADING NOTES

8.3.3.5 Column/Wall Loading Schedule

From project browser, click “P006 – COLUMN / WALL LOADING SCHEDULE” in Sheet (all).

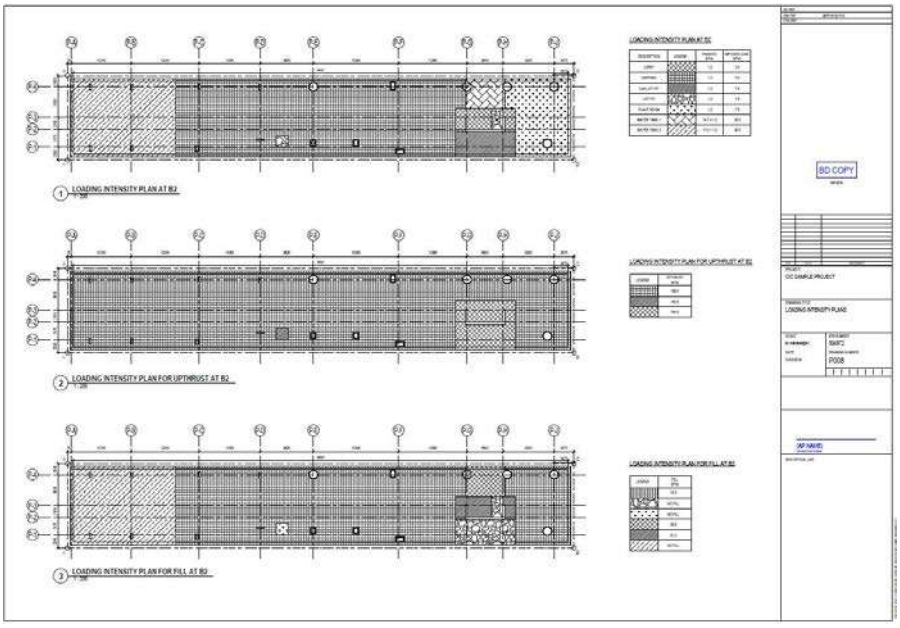


Drag the following views to the sheet.

View Type	View Name
Schedule	COLUMN LOADING SCHEDULE ABOVE PILE CAP (1 OF 2) COLUMN LOADING SCHEDULE ABOVE PILE CAP (2 OF 2) WALL LOADING SCHEDULE ABOVE PILE CAP (1 OF 2) WALL LOADING SCHEDULE ABOVE PILE CAP (2 OF 2)

8.3.3.6 Loading Intensity Plan

From project browser, click “P007 – LOADING INTENSITY PLAN” in Sheet (all).

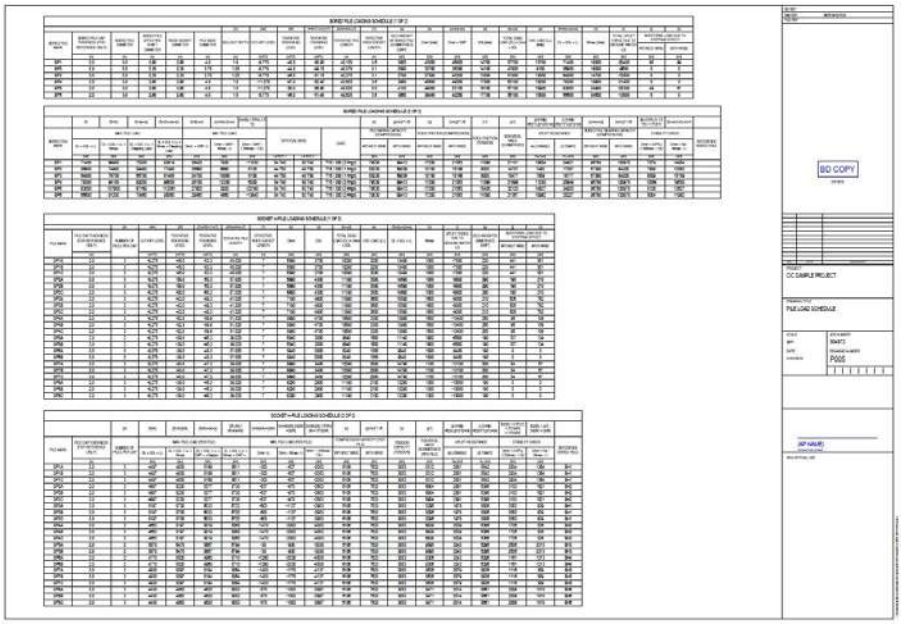


Drag the following views to the sheet.

View Type	View Name
Structural Plan	LOADING INTENSITY PLAN AT B2 LOADING INTENSITY PLAN FOR FILL AT B2 LOADING INTENSITY PLAN FOR UPTHRUST AT B2
Legend	LOADING INTENSITY

8.3.3.7 Pile Load Schedule

From project browser, click “P008 – PILE LOAD SCHEDULE” in Sheet (all).

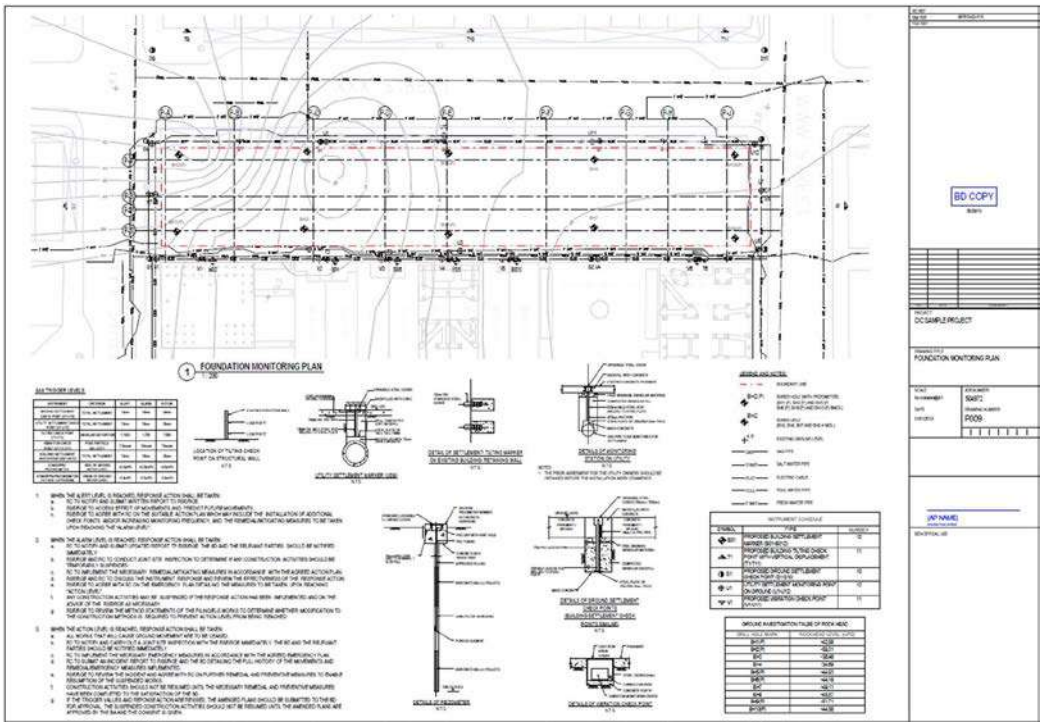


Drag the following views to the sheet.

View Type	View Name
Schedule	BORED PILE LOADING SCHEDULE (1 OF 2) BORED PILE LOADING SCHEDULE (2 OF 2) SOCKET H-PILE LOADING SCHEDULE (1 OF 2) SOCKET H-PILE LOADING SCHEDULE (2 OF 2)

8.3.3.8 Foundation Monitoring Plan

From project browser, click “P009 – FOUNDATION MONITORING PLAN” in Sheet (all).

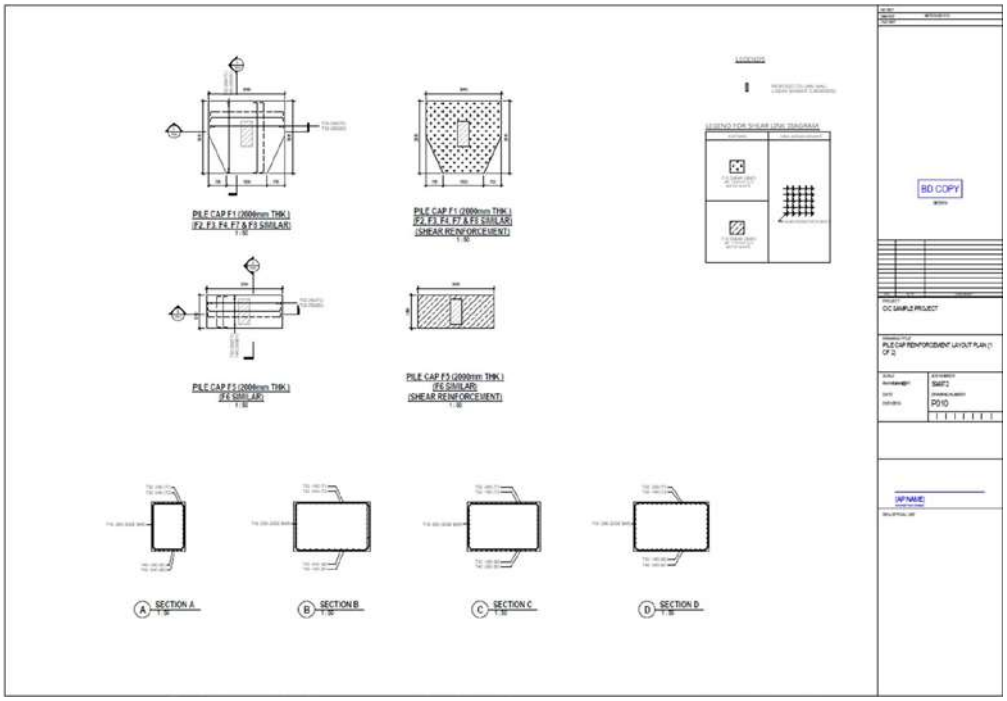


Drag the following views to the sheet.

View Type	View Name
Structural Plan	MONITORING PLAN (FDN)
Legend	MONITORING PLAN
Drafting View	NOTES FOR MONITORING PLAN
Schedule	INSTRUMENT SCHEDULE GROUND INVESTIGATION TALBE OF ROCK HEAD

8.3.3.9 Pile Cap Reinforcement Layout Plan

From project browser, click “P010 – Pile Cap Reinforcement Layout Plan” in Sheet (all).

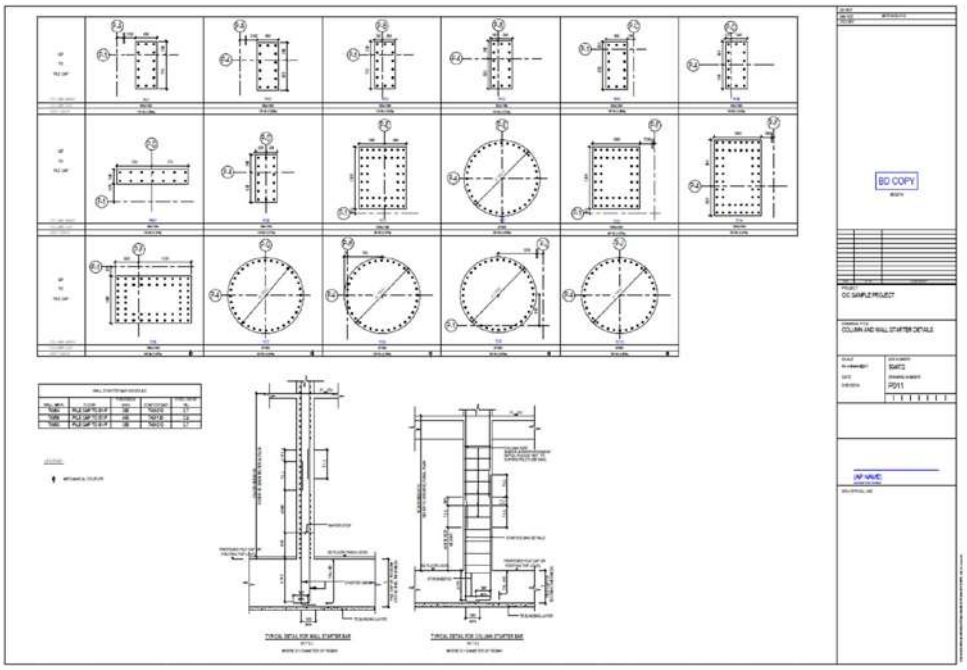


Drag the following views to the sheet.

View Type	View Name
Structural Plan	PILE CAP REBAR PLAN - F1 PILE CAP SHEAR PLAN - F1 PILE CAP REBAR PLAN - F5 PILE CAP SHEAR PLAN - F5
Legend	SHEAR LINK DIAGRAM (PILE CAP)
Section	SECTION A-D

8.3.3.10 Column and Wall Starter Details

From project browser, click “P011 – Column and Wall Starter Details” in Sheet (all).

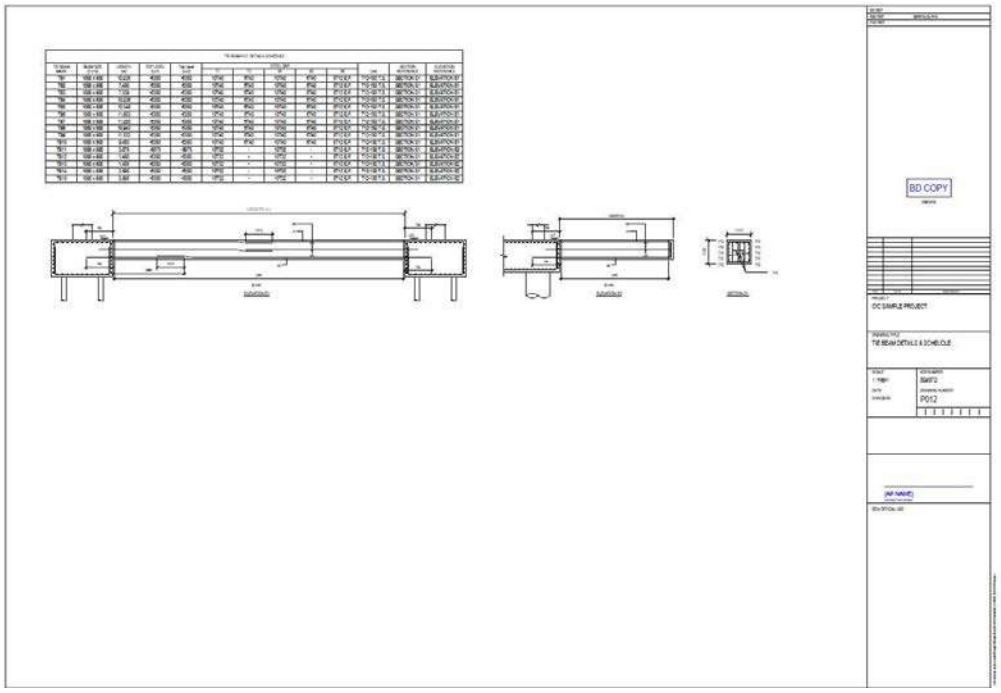


Drag the following views to the sheet.

View Type	View Name
Structural Plan	PILE CAP COLUMN REBAR PLAN - PC1-TC10
Legend	STARTER BAR LEGEND
Schedule	WALL STARTER BAR SCHEDULE
Drafting View	STARTER BAR DETAIL STARTER BAR TABLE

8.3.3.11 Tie Beam Details and Schedule

From project browser, click “P012 – Tie Beam Details & Schedule” in Sheet (all).

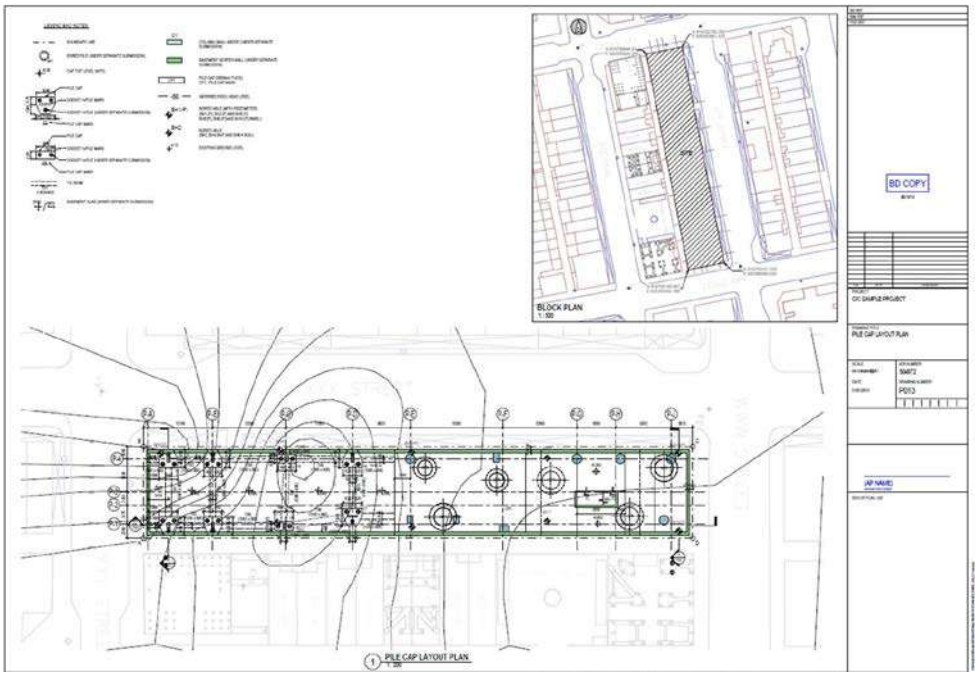


Drag the following views to the sheet.

View Type	View Name
Schedule	TIE BEAM R.C. DETAILS SCHEDULE
Drafting View	TIE BEAM RC DETAIL

8.3.3.12 Pile Cap Layout Plan

From project browser, click “P013 – PILE CAP LAYOUT PLAN” in Sheet (all).

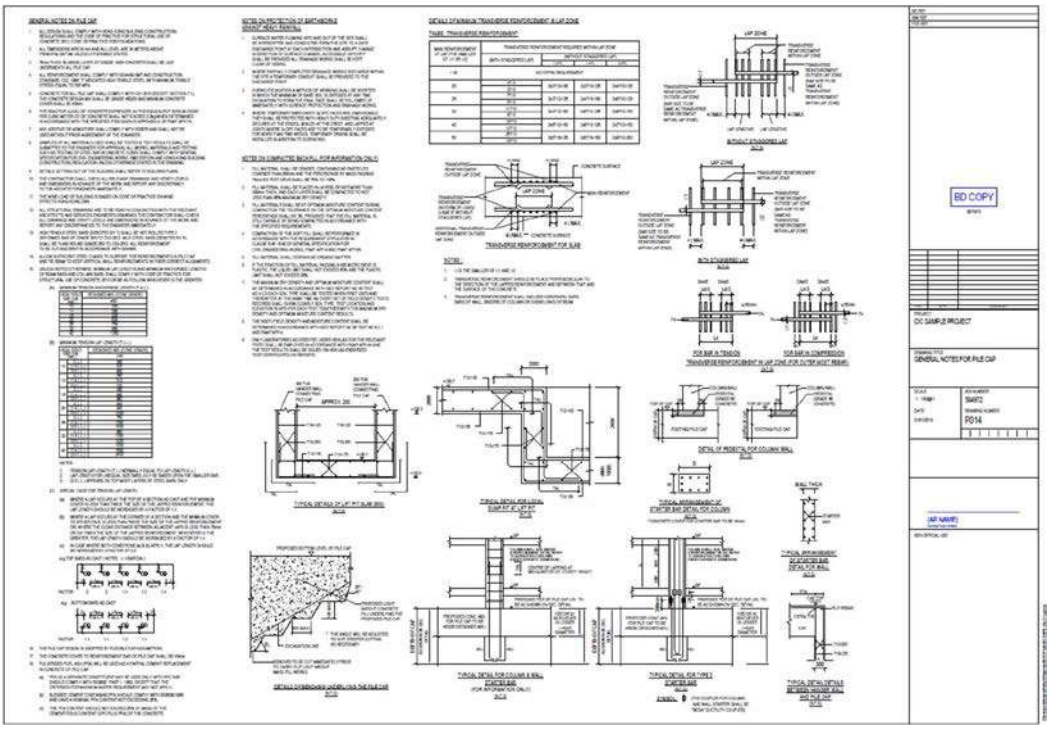


Drag the following views to the sheet.

View Type	View Name
Legend	PILE CAPLAYOUT PLAN
Structural Plan	PILE CAP LAYOUT PLAN BLOCK PLAN

8.3.3.13 General Notes for Pile Cap

From project browser, click “P014 – GENERAL NOTES FOR PILE CAP” in Sheet (all).



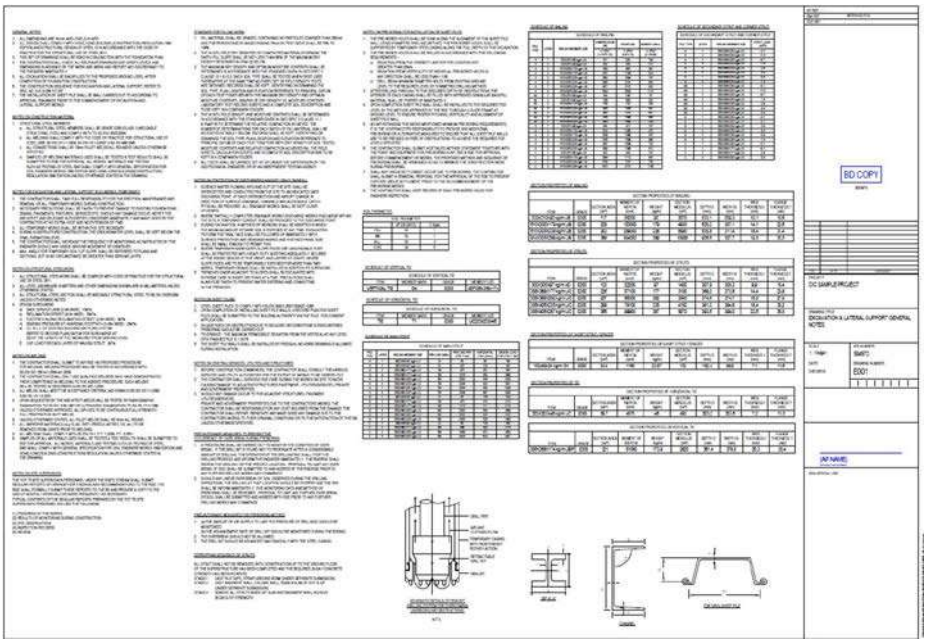
Drag the following views to the sheet.

View Type	View Name
Drafting View	NOTES FOR PILE CAP

8.3.4 Excavation and Lateral Support

8.3.4.1 Excavation and Lateral Support General Notes

From project browser, click “EXCAVATION & LATERAL SUPPORT GENERAL NOTES” in Sheet (all).

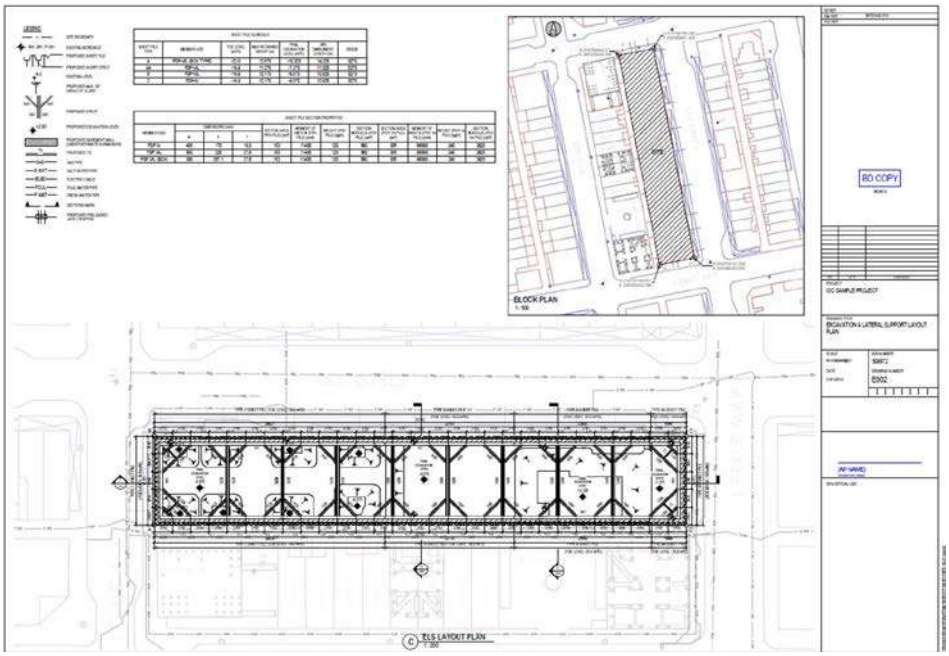


Drag the following views to the sheet.

View Type	View Name
Drafting View	NOTES FOR ELS
Schedule	SCHEDULE OF HORIZONTAL TIE SCHEDULE OF MAIN STRUT SCHEDULE OF SECONDARY STRUT AND CORNER STRUT SCHEDULE OF VERTICAL TIE SCHEDULE OF WAILING SECTION PROPERTIES OF HORIZONTAL TIE SECTION PROPERTIES OF SHORT STRUT / SPACER SECTION PROPERTIES OF STRUTS SECTION PROPERTIES OF VERTICAL TIE SECTION PROPERTIES OF WAILING SOIL PARAMETER

8.3.4.2 Excavation and Lateral Support Layout Plan

From the project browser, click “EXCAVATION & LATERAL SUPPORT LAYOUT PLAN” in Sheet (all).

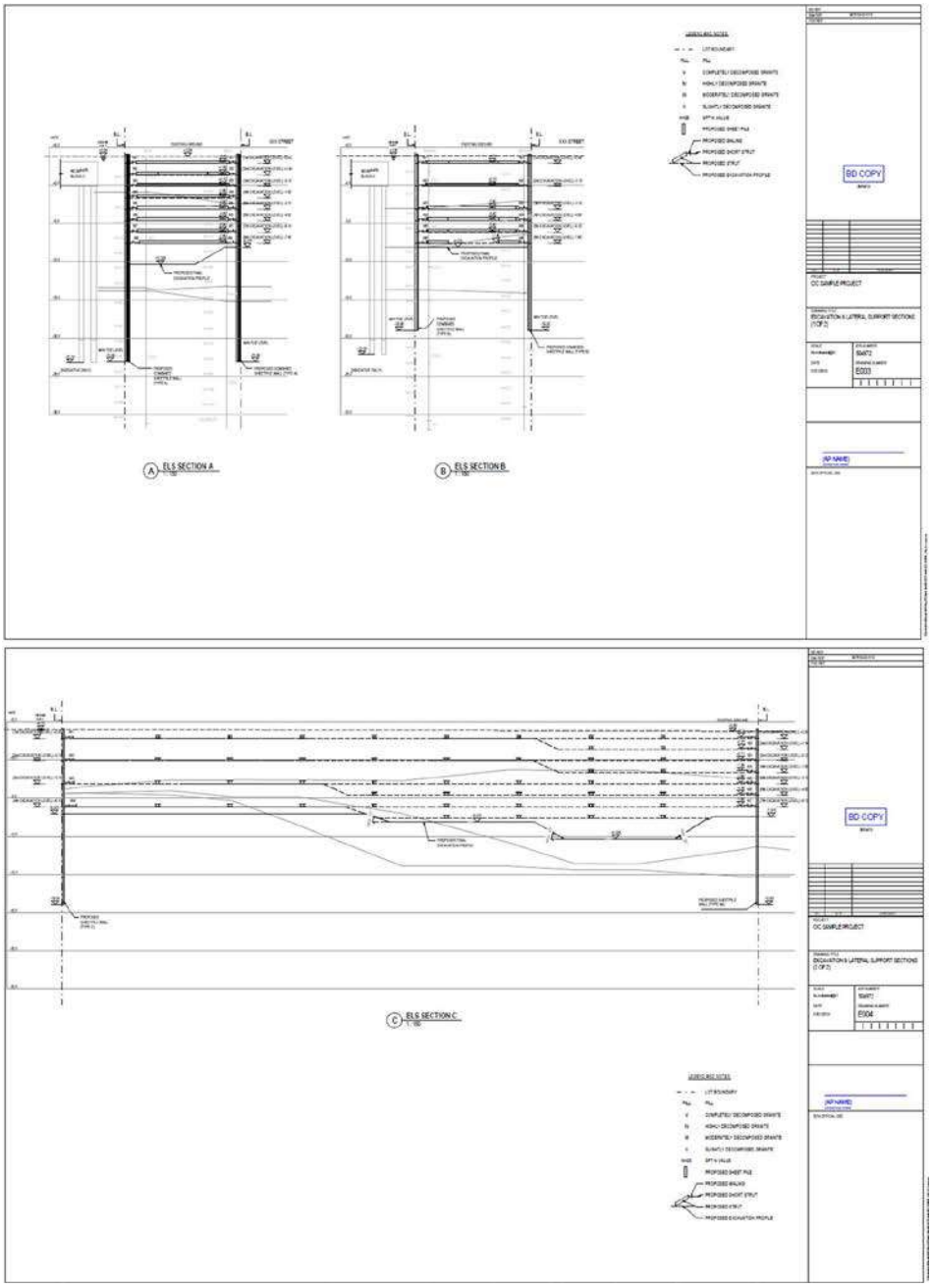


Drag the following views to the sheet.

View Type	View Name
Legend	ELS LAYOUT
Structural Plan	BLOCK PLAN ELS LAYOUT PLAN
Schedule	SHEET PILE SCHEDULE SHEET PILE SECTION PROPERTIES

8.3.4.3 Excavation and Lateral Support Sections

From project browser, click “EXCAVATION & LATERAL SUPPORT SECTIONS (1 OF 2)” in Sheet (all).

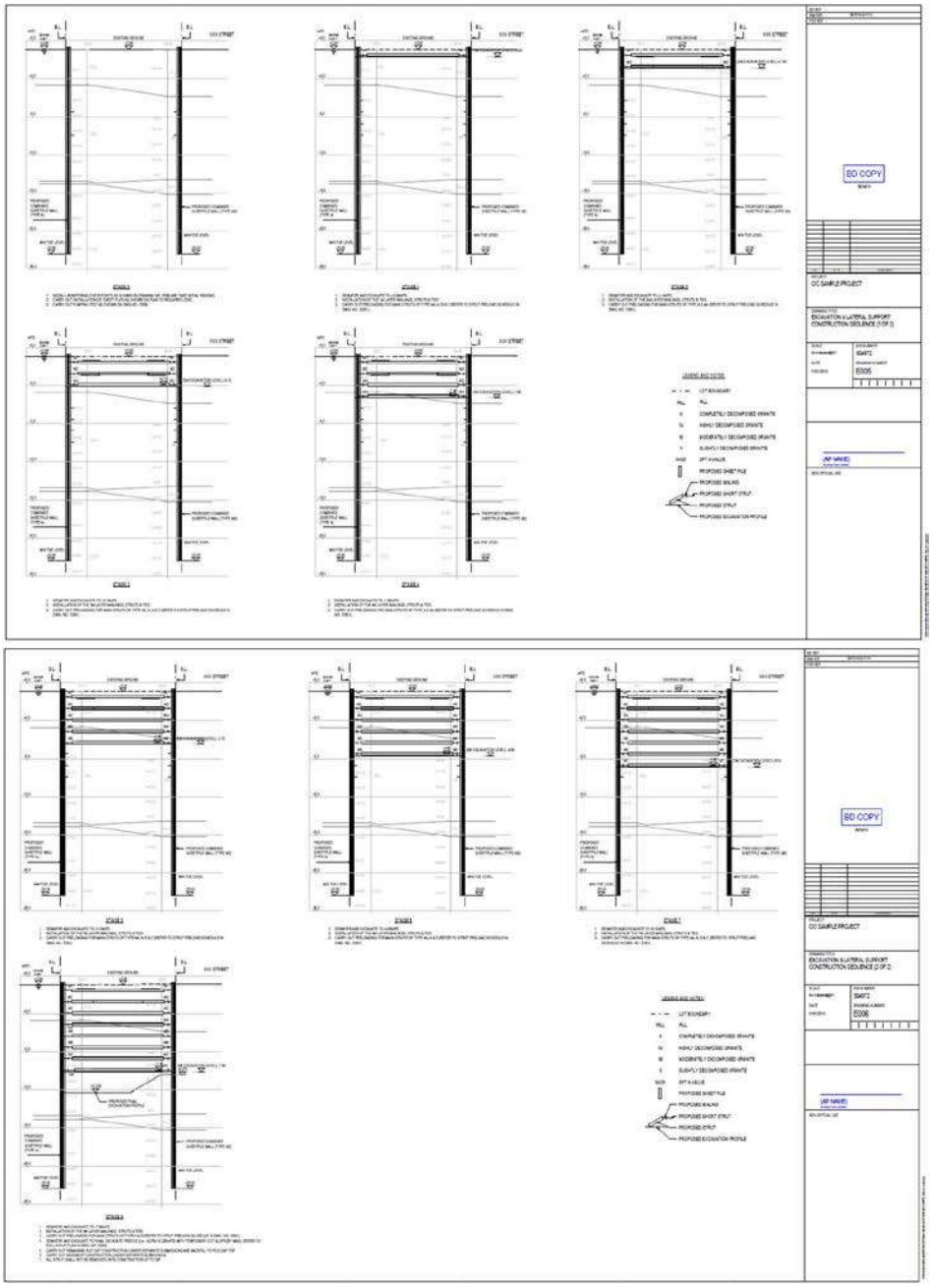


Drag the following views to the sheet.

View Type	View Name
Legend	ELS SECTION
Section	ELS SECTION A to ELS SECTION C

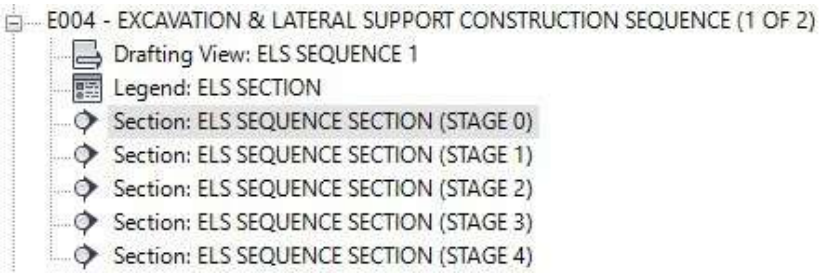
8.3.4.4 Excavation and Lateral Support Construction Sequence

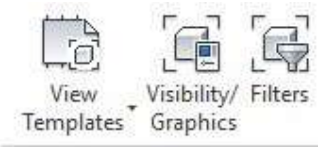
From the project browser, click “EXCAVATION & LATERAL SUPPORT CONSTRUCTION SEQUENCE (1 OF 2)” in Sheet (all).



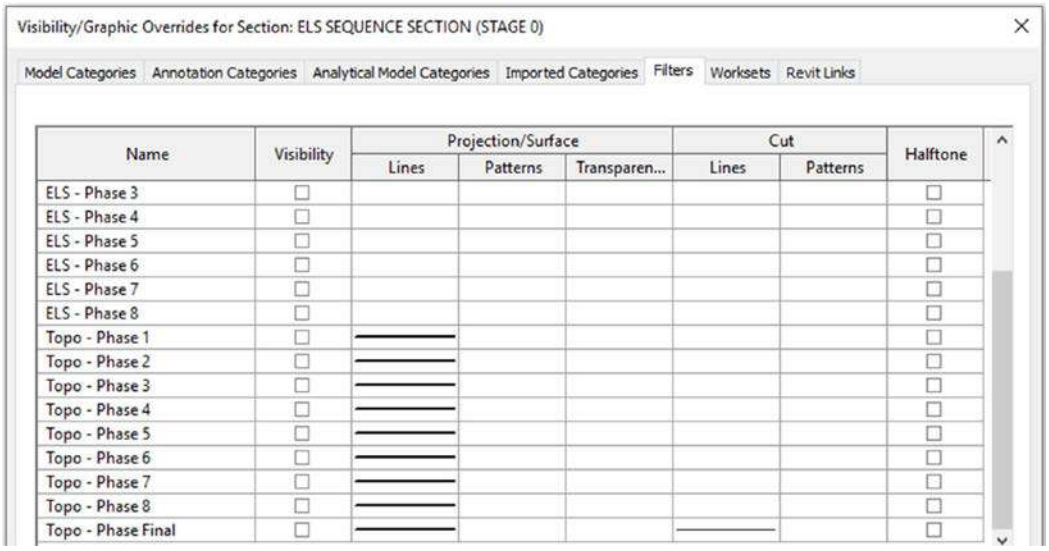
For different phase of construction sequence, it can be set from filter in this template.

Select a section under the drawing ➔ in Ribbon, select “View” ➔ select “Visibility / Graphics”

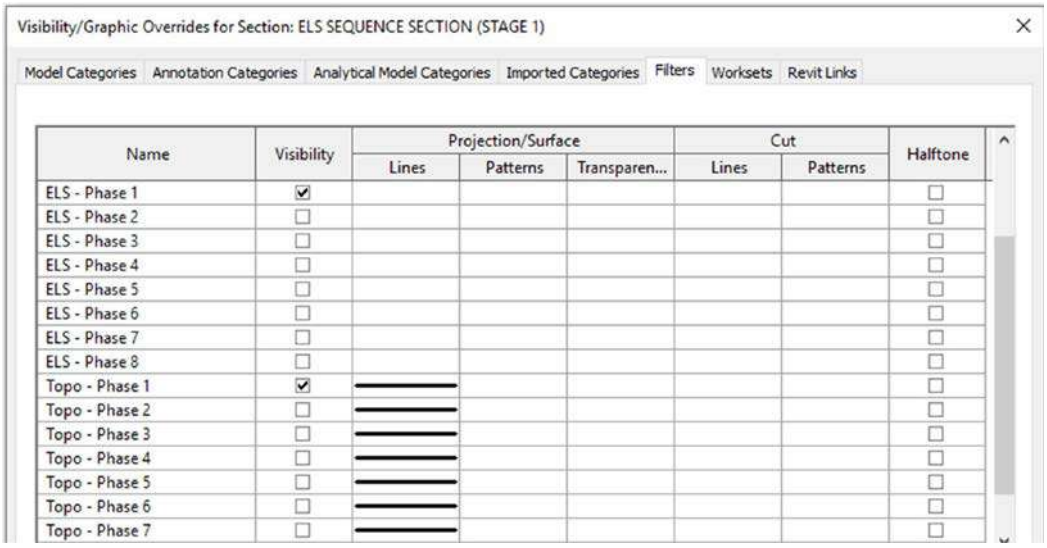




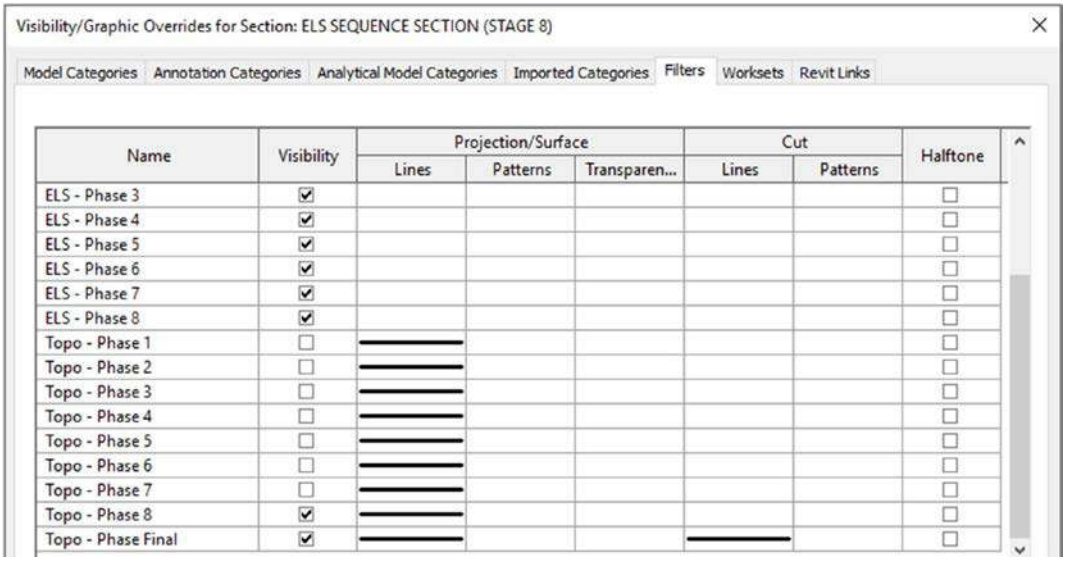
In a window, select “Filter” ➜ For phase 0, unclick all filter under Visibility ➜ click “OK”



For phase 1, click “ELS – Phase 1” and “Topo - Phase 1” under visibility ➜ click “OK”



For final phase, select all “ELS – Phase 1 to 8” and both “Topo – Phase 8” and “Topo – Final” ➜ click “OK”

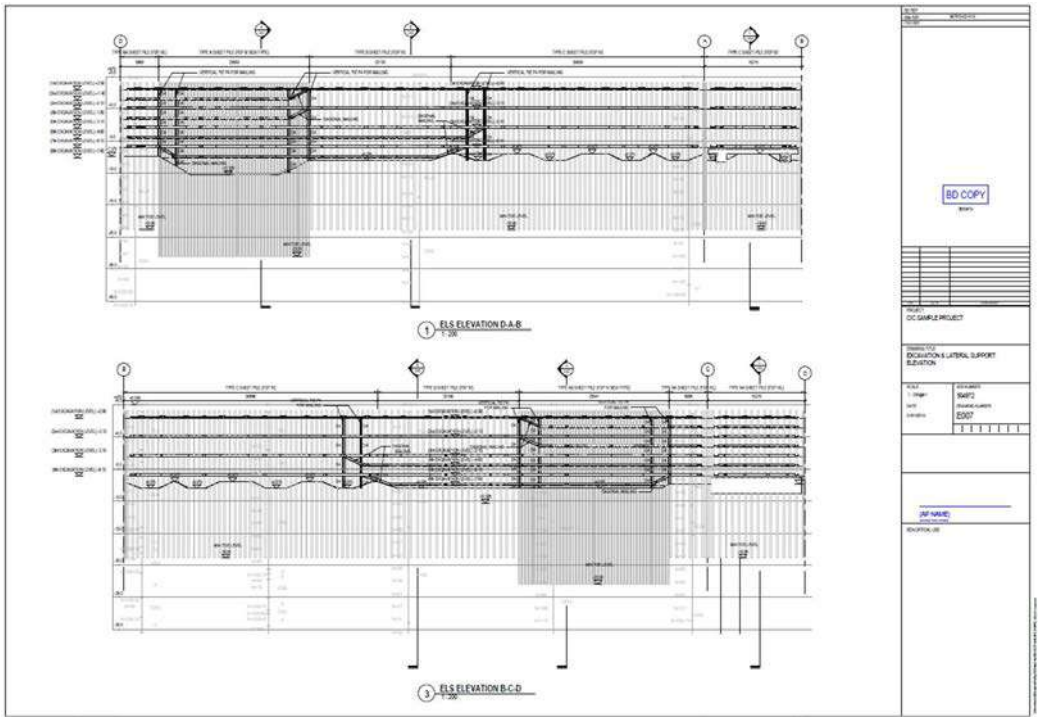


Drag the following views to the sheet.

View Type	View Name
Drafting View	ELS SEQUENCE 2
Schedule	SCHEDULE OF HORIZONTAL TIE
Legend	ELS SECTION
Section	ELS SEQUENCE SECTION (STAGE 0) to ELS SEQUENCE SECTION (STAGE 8)

8.3.4.5 Excavation and Lateral Support Elevation

From the project browser, click “EXCAVATION & LATERAL SUPPORT ELEVATION” in Sheet (all).

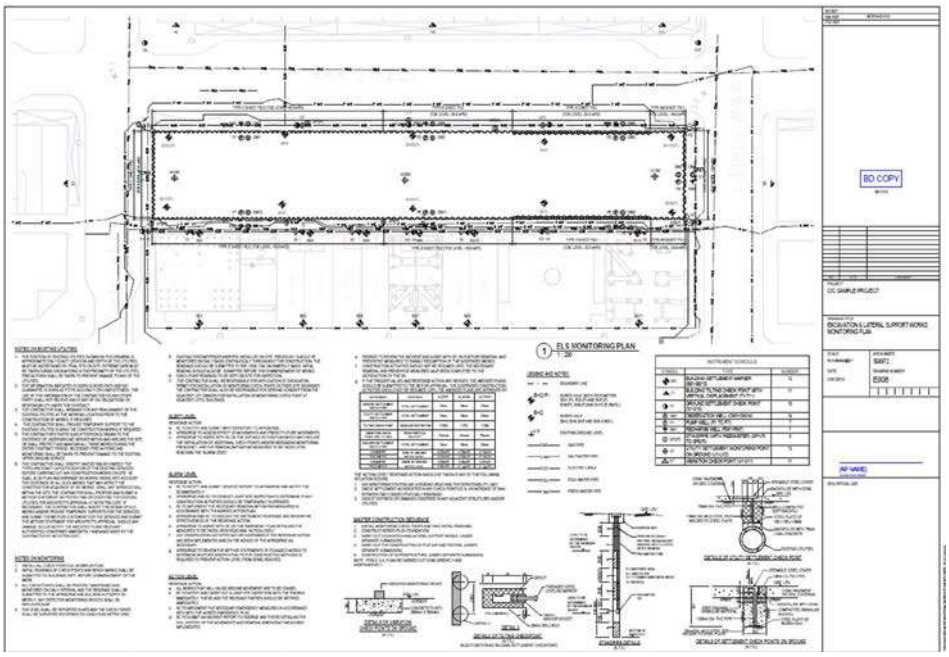


Drag the following views to the sheet.

View Type	View Name
Elevation	ELS ELEVATION A-B ELS ELEVATION B-C ELS ELEVATION C-D ELS ELEVATION D-A

8.3.4.6 Excavation and Lateral Support Monitoring Plan

From the project browser, click “EXCAVATION & LATERAL SUPPORT WORKS MONITORING PLAN” in Sheet (all).

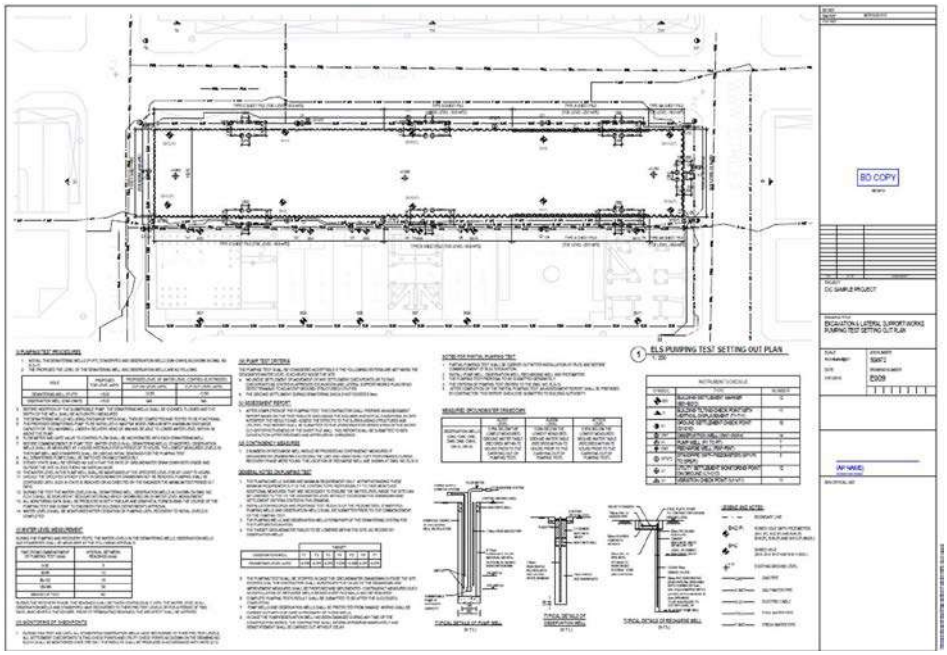


Drag the following views to the sheet.

View Type	View Name
Drafting View	NOTES FOR ELS MONITORING
Legend	ELS MONITORING
Structural Plan	ELS MONITORING PLAN
Schedule	INSTRUMENT SCHEDULE

8.3.4.7 Excavation and Lateral Support Pumping test setting out Plan

From the project browser, click “EXCAVATION & LATERAL SUPPORT WORKS PUMPING TEST SETTING OUT PLAN” in Sheet (all).



Drag the following views to the sheet.

View Type	View Name
Drafting View	NOTES FOR ELS PUMPING TEST
Legend	ELS MONITORING
Structural Plan	ELS PUMPING TEST SETTING OUT PLAN
Legend	INSTRUMENT SCHEDULE

8.3.5 Site Formation

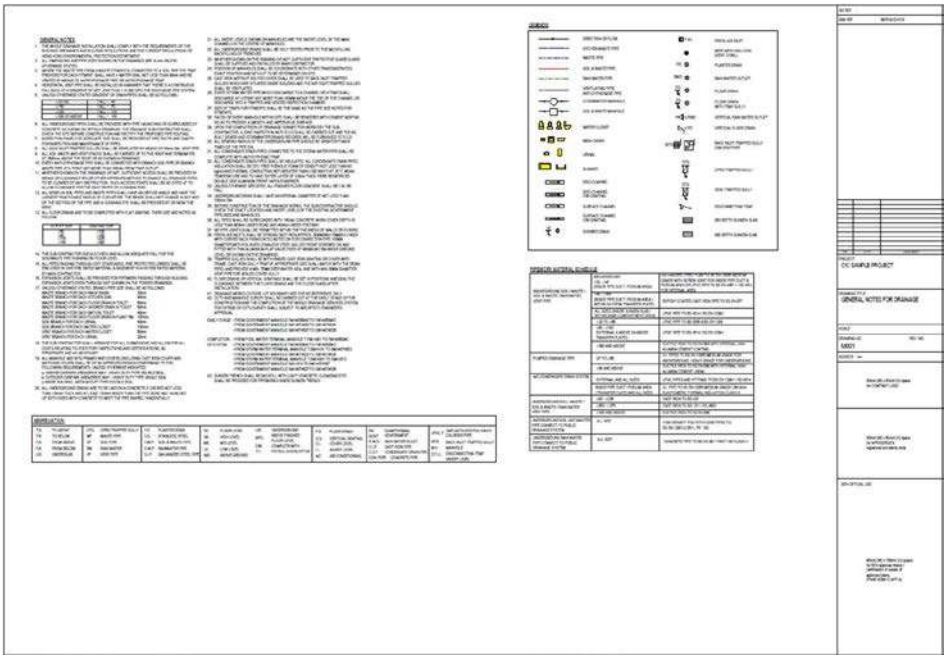
8.3.5.1 General Notes

From project browser

8.3.6 Drainage

8.3.6.1 General Notes for Drainage

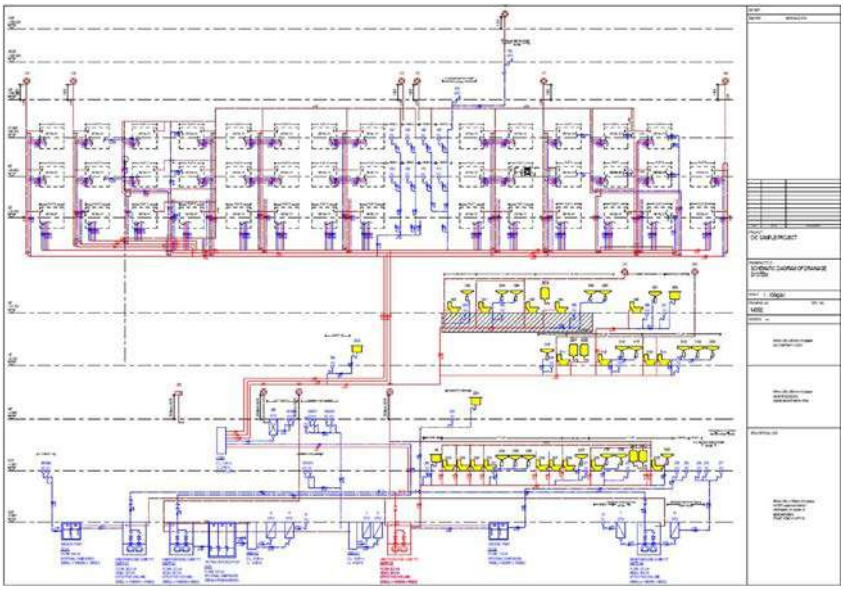
From the project browser, click “GENERAL NOTES FOR DRAINAGE” in Sheet (all).



View Type	View Name
Drafting View	GENERAL NOTES

8.3.6.2 Schematic Diagram of Drainage System

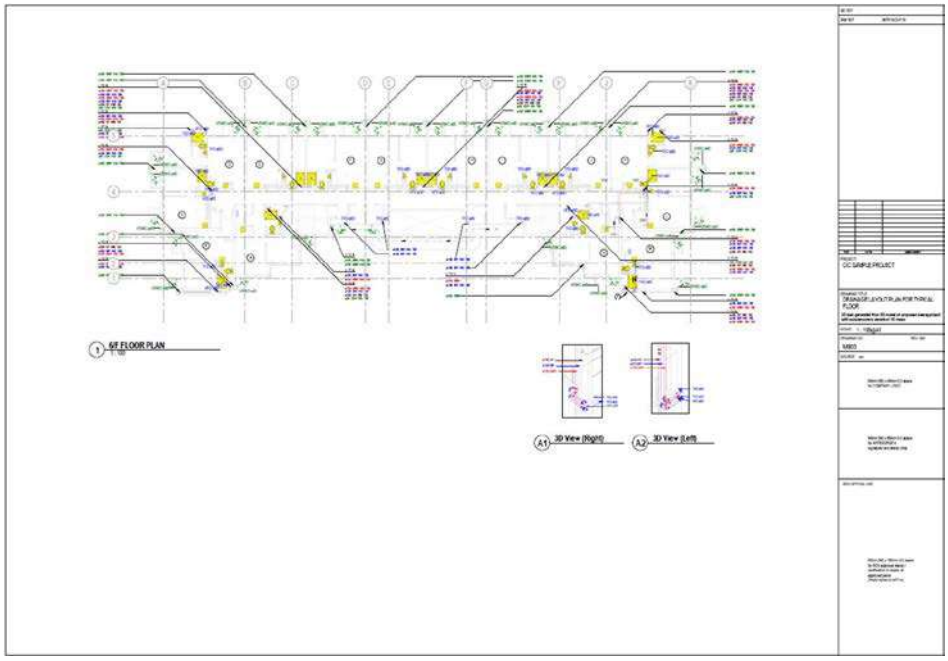
From the project browser, click “SCHEMATIC DIAGRAM OF DRAINAGE SYSTEM” in Sheet (all).



View Type	View Name
Elevation	Drainage Schematic

8.3.6.3 Drainage Layout Plan for Typical Floor

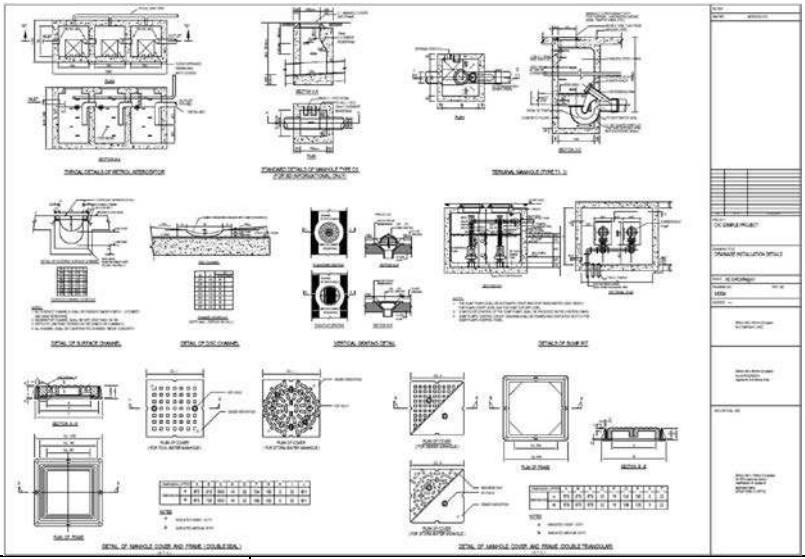
From the project browser, click “DRAINAGE LAYOUT PLAN FOR TYPICAL FLOOR” in Sheet (all).



View Type	View Name
Floor Plans	6/F FLOOR PLAN
3D View	3D View (Right), 3D View (Left)

8.3.6.4 Drainage Installation Details

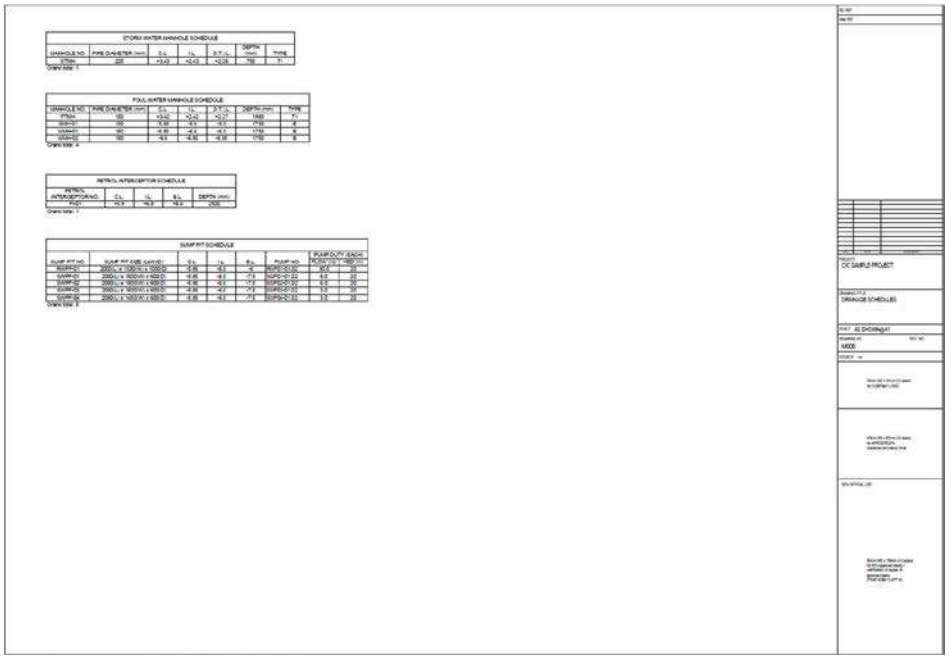
From the project browser, click “DRAINAGE INSTALLATION DETAILS” in Sheet (all).



View Type	View Name
Drafting View	DRAINAGE INSTALLATION

8.3.6.5 Drainage Schedules

From the project browser, click “DRAINAGE SCHEDULES” in Sheet (all).

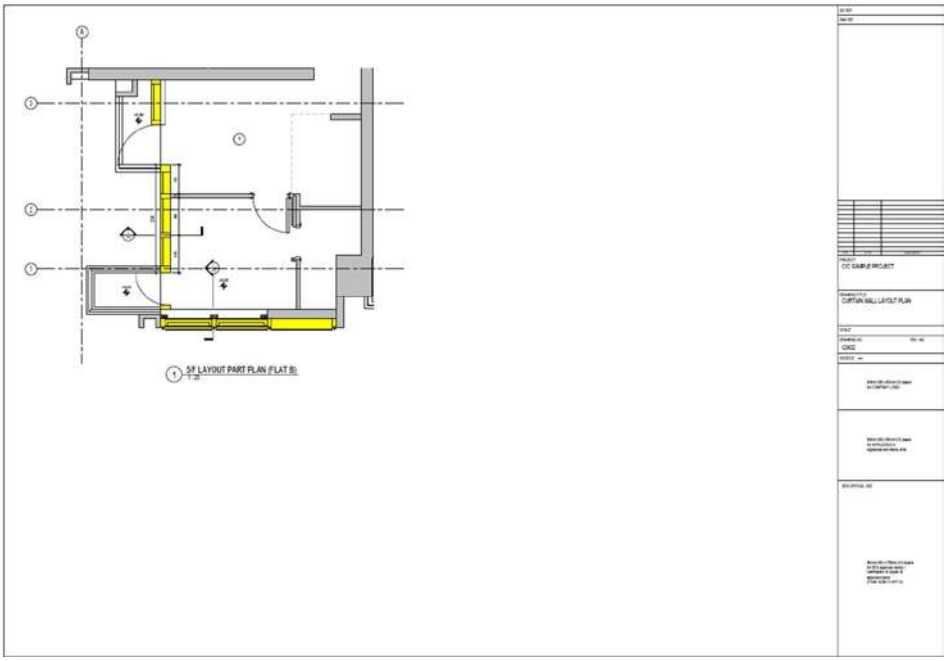


View Type	View Name
Schedule	FOUL WATER MANHOLE SCHEDULE PETROL INTERCEPTOR SCHEDULE STORM WATER MANHOLE SCHEDULE SUMP PIT SCHEDULE

8.3.7 Curtain Wall

8.3.7.1 Curtain Wall Layout Plan

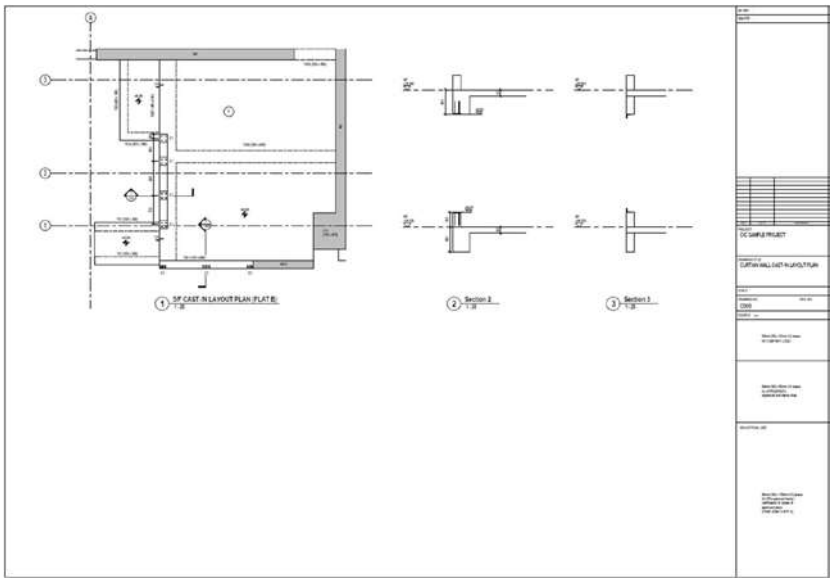
From the project browser, click “CURTAIN WALL LAYOUT PLAN” in Sheet (all).



View Type	View Name
Floor Plan	5/F LAYOUT PART PLAN (FLAT B)

8.3.7.2 Curtain Wall Case-in Layout Plan

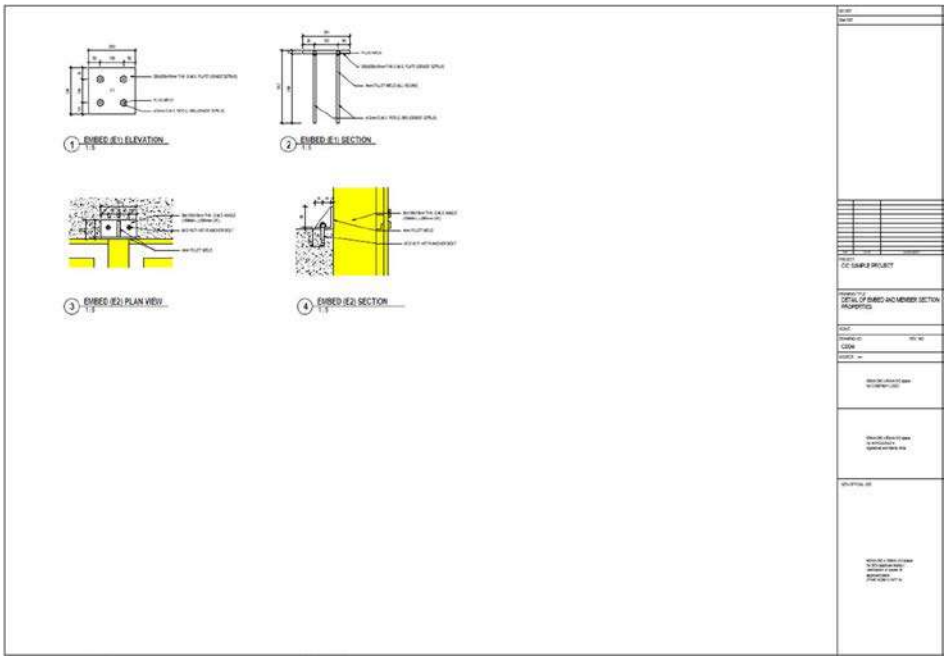
From the project browser, click “CURTAIN WALL CAST-IN LAYOUT PLAN” in Sheet (all).



View Type	View Name
Floor Plan	5/F CAST-IN LAYOUT PLAN (FLAT B)
Section	CAST-IN SECTION 1, CAST-IN SECTION 2

8.3.7.3 Detail of Embed and Member Section Properties

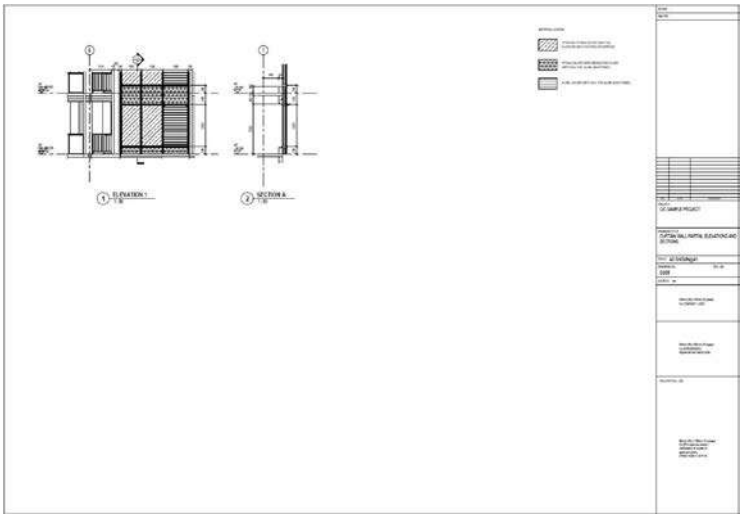
From project browser, click “DETAIL OF EMBED AND MEMBER SECTION PROPERTIES” in Sheet (all).



View Type	View Name
Floor Plan	5/F EMBED E2 LAYOUT PLAN
Section	EMBED (E2) SECTION

8.3.7.4 Curtain Wall Partial Elevations and Sections

From project browser, click “CURTAIN WALL PARTIAL ELEVATIONS AND SECTIONS” in Sheet (all).



View Type	View Name
Elevation	CURTAIN WALL ELEVATION
Section	CURTAIN WALL SECTION A

9 Exporting Models as Deliverables

9.1 Exporting 3D models as NWC

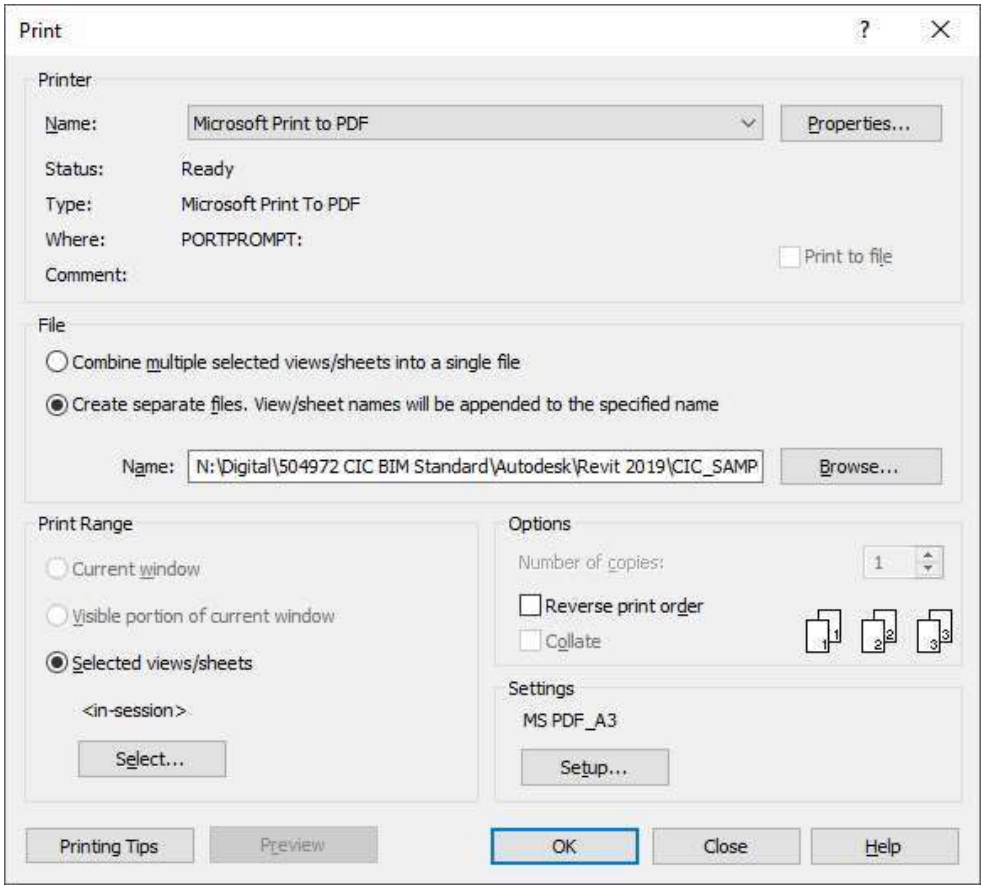
Publishing to 3D, the user can create a single 3D representation of the model that can be orbited, control visibility of element categories, and be queried for the properties of any of elements.

Click “Add-ins” ➔ click “Naviswork” and setting ➔ click “OK” to publish a 3D model for sharing.

9.2 Exporting 2D models as PDF

Publishing to 2D can create either a single view or a whole collection of interconnected views and sheets packaged as one file.

Click “File” ➔ click “Print” ➔ edit “Properties / File Location / Print Range / Settings” ➔ click “OK” to publish PDF.



Feedback Form

CIC BIM User Guide for Preparation of Statutory Plan Submissions Revit December 2020

To improve future editions of this publication, we would be grateful to have your comments.

(Please put a "✓" in the appropriate box.)

1. **As a whole, I feel that the publication is:**	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Informative	❑	❑	❑	❑	❑
Comprehensive	❑	❑	❑	❑	❑
Useful	❑	❑	❑	❑	❑
Practical	❑	❑	❑	❑	❑
2. **Does the publication enable you to understand more about the subject?**	Yes		No		No Comment
	❑		❑		❑
3. **Have you made reference to the publication in your work?**	Quite Often		Sometimes		Never
	❑		❑		❑
4. **To what extent the publication benefits you?**	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Supply chain Information/data integrity	❑	❑	❑	❑	❑
Work efficiency	❑	❑	❑	❑	❑
Project Collaborations	❑	❑	❑	❑	❑
5. **Overall, how would you rate our publication?**	Excellent	Very Good	Satisfactory	Fair	Poor
	❑	❑	❑	❑	❑
6. **Other comments and suggestions, please specify (use separate sheets if necessary).**					
Personal Particulars (optional):* Name: Mr. / Mrs./ Ms./ Dr./ Prof./ Ar. / Ir / Sr ^ Company: Tel: Address: E-mail:					

* The personal data in this form will be used only for this survey. Your data will be kept confidential and dealt with only by the Construction Industry Council.

^ Circle as appropriate.

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