Building Technology III
New York City College of Technology

Course Day 13
Revit Day 05 (Project Day 2)

The New Academic Building –
Concrete Structural Foundations, Columns & Slabs

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125.00
Add New Level

- Level 3 @ 28' - 0"
- Level 2 @ 14' - 0"
- Level 1 @ 0' - 0"

- New Level 14-8” below
- Rename level T.O. FOOTING

- We will be adding an 8” slab on grade.
- By setting the T.O.FOOTING to -14'-8” the slab will sit 14'-0” below level 1 maintaining a consistent floor to floor.

Depending upon your method you may need to create the associated plan view.

- Create Plan View for Level

Structural Foundation Wall
- Atrium & LAB
- GYM

Visibility Settings
- View Depth
- Underlay

Add Structure
- Wall Footing
- Structural Columns
- Isolated Footings
- Modify Footings
- Simplify
- Slab on Grade

Structural Plans
- View Template
- S-100 & S-101

Wrap-Up
Extend Grids and Propagate Extents

- From your elevation views extend the grids below the new level.
- Do this for North-South & East-West
- Select Grids from a level that is well formatted and propagate these to all other levels.

New Level
Propagate Extents

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Wrap-Up
Draw Structural Foundation Wall

- Go to Level 1
- Structure > Wall Structural
- Foundation 12” Concrete

Level 1:
 Depth: T.O.FOOTING
 Location Line:
  - Finish Face Exterior
  - Or Core Face Exterior

Base Constraint:
- T.O.FOOTING
Base Offset: 0
Top Constraint:
- Up to Level: Level 1

Lab: G-8 & 16-A
(Snap to wall corners)

Atrium: G-1 & A-7
(Offset 1’-10” from grid)
Draw Structural Foundation Wall

- Go to Level 1
- Structure > Wall Structural
- Foundation 12” Concrete
- Edit Type > Duplicate > 17” Concrete

Level 1:
- Depth : T.O.FOOTING
- Location Line :
  - Finish Face Exterior
  - Offset (− ¼”) from face of brick

Base Constraint:
- T.O.FOOTING
- Top Constraint:
  - Up to Level : Level 1

GYM: NN-1.7 & FF-6.4 (Snap to wall corners)

Base Offset: 0

- Draw Foundation for GYM
- Draw from upper left to lower right
Visibility Settings: View Range > View Depth

- When working on Level 1 you will get the Warning that the created elements are not visible in the active view.
- Change the visibility:
- View Range > View Depth > Level Below

Visibility Notes:
- It is common to need visibility settings that help you work and edit and a different set of visibility settings for printing.
Visibility Settings: Underlay

Underlay Notes:
- Underlay allows you to see any other level below the current level. This is useful when you are trying to align vertical elements

Visibility Notes:
- It is common to need visibility settings that help you work and edit and a different set of visibility settings for printing

Underlay Notes:
- Underlay: None
- Only Foundation Wall is visible

Visibility Notes:
- Underlay: Level 1
- Curtain wall is visible
Add Foundation Wall Footings

- Structure > Foundation : Wall
- Wall Foundation 36” x 12”

- Select Multiple
- Select all foundation walls from upper right to lower left
- Finish the Sketch
Add Structural Columns at Grid Intersections

- Load Family > Structural Columns > Square
- Edit Type > Duplicate > 20 x 20

Best Practices:
- Never modify an existing family type
- Always use Edit Type > Duplicate to create a new family type
Add Structural Columns at Grid Intersections

- Select Grid Intersections from Upper-Right to Lower-Left

- Level 1
- Depth: T.O. Footing
- At Grids
- Finish Sketch
Add Structural Columns at Grid Intersections

- Columns are located on grids
- Columns are more easily seen in 3d View
Add Isolated Footings at Columns

- Structure > Isolated Footing
- No Structural Foundation Family is loaded > Yes
- Structural Foundations > Footing-Rectangular

- Edit Type > Duplicate > 48” x 48” x 18”
- Length > 4’- 0” (48” square)
Add Isolated Footings at Columns

- Structure > Isolated Footing
- 48” x 48” x 18”
- From level 1 or 3d View: Select columns
- Select from upper-right to lower-left
Edit Perimeter Isolated Footings at Foundation Wall

- 48” x 48” x 18” Deep Footings
- Edit Type > Duplicate > 48”x48”x12”
- Thickness to 12”
- Select all perimeter isolated footings

Match the depth of the isolated column footings with the foundation wall footings to simplify the formwork needed to pour the concrete

3d Views from Below
Simplify the Structure: Remove redundant columns

- Level: T.O.Footing
- TIP: Set View Range Offset to -1’ so you can select the columns and their footings

- Set Offset to -1’
- Delete redundant columns & Footings

- Remove redundant columns & columns along the central horizontal column grid
Slab on Grade (Top of Footing)

- Structure > Foundation > Slab > Structural Foundation Slab

- Edit Type > Duplicate
- 8” Foundation Slab

New Level
Propagate Extents

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Wrap-Up
Slab on Grade (Begin Sketch)

- Start with GYM
- Sketch Slab on Grade
- Trace Interior Face of Foundation

- Level: T.O. FOOTING
- Structure > Foundation > Slab > Structural Foundation Slab
- Height Offset from Level: 8"

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Wrap-Up
Slab on Grade (Edit Sketch)

- Level: T.O. FOOTING
- Hover over edge of slab and tap TAB
- Select the Slab and then Edit Sketch
- Trace around the columns to remove them from the foundation slab
Slab on Grade

- Complete Slabs for the GYM
- ATRIUM & LABORATORY

Trace around the columns to remove them from the foundation slab.
Add Structural Plans : Apply Template

- Apply the Architectural Template to the floor plans
- Apply the Structural template to the structural plans

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Wrap-Up

- Propagate Extents:
- Always propagate extents to be certain the grid displays properly
Structural Plans : Foundation & Framing

- S-100 Foundation Plan
- S-101 First Floor Framing Plan

Add sheets S-100 & S-101 at 1/16” = 1’-0” to your dwg set
New Level
Propagate Extents

- Modify Footings
- Simplify

Structural Foundation Wall

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Structural Plans
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- Wrap-Up

Add Structure
- Wall Footing
- Structural Columns
- Isolated Footings

Wrap-Up