

3 GENERATION OF 3D STRUCTURAL MODEL THROUGH REVIT AND ETABS MODEL IMPORT

In this exercise you will learn how to import an Autodesk REVIT® model into **ADAPT-Builder**. This requires the installation of the **ADAPT-Revit Link**.

Autodesk-Revit Structure → ADAPT-Builder

Through use of the **ADAPT-Revit link**, an exchange file is generated including level definitions, component geometry, material properties, loading, etc. This file is then imported into Builder for generation of the structural model. You will learn how to (a) generate the .INP file using the ADAPT-Revit link, (b) import the .INP file in Builder for generation of the structural model, and (c) modify imported material properties and check for component connectivity.

The figure shown below is a 7-story reinforced concrete structure which includes columns, shearwalls, both post-tensioned (PT) and conventional-reinforced concrete (RC) slabs and beams. The model includes a concrete mat foundation. The workflow and design of a mat foundation utilizing the integrated functionality of **ADAPT-Edge** and **ADAPT-MAT** are included in Section 8 of this document.

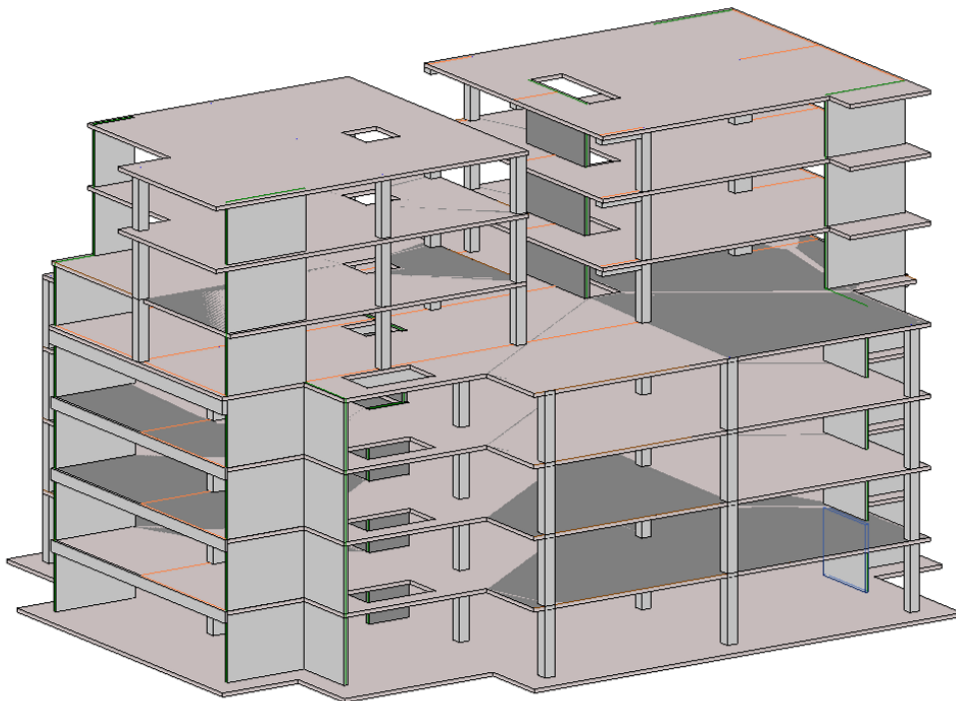


FIGURE 3-1 Hybrid PT/RC structure as modeled in Autodesk Revit Structure

3.1 EXPORT THE ADAPT EXCHANGE FILE FROM AUTODESK REVIT

- In Autodesk Revit, select *Analyze* ➔ *Export* from the ADAPT tools (FIGURE 3-2).

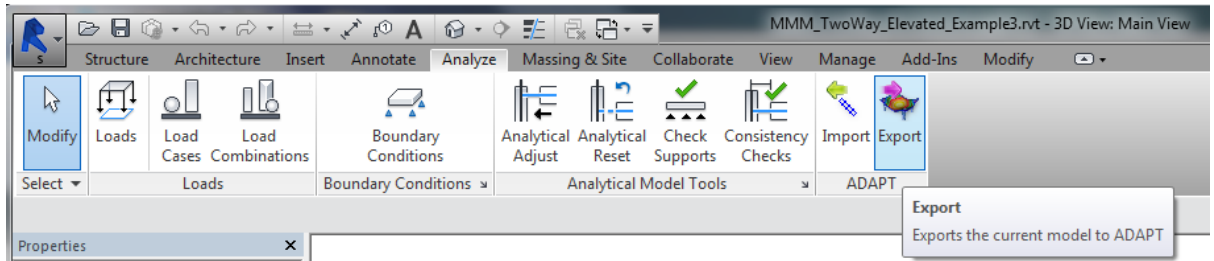
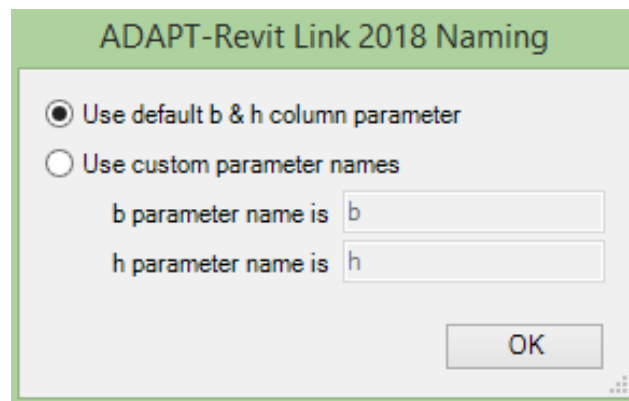


FIGURE 3-2 Export Model to ADAPT

- The **ADAPT-REVIT Link** Export screens will appear (FIGURE 3-3) where you can select custom parameter naming, which levels, components, loads, and load cases will be exported to ADAPT-Builder. Use the *ADAPT-Revit Link Naming* window to specify custom geometry parameters used for columns in your model. Ensure that all desired items are selected through each tab, and click on *Export Data*.



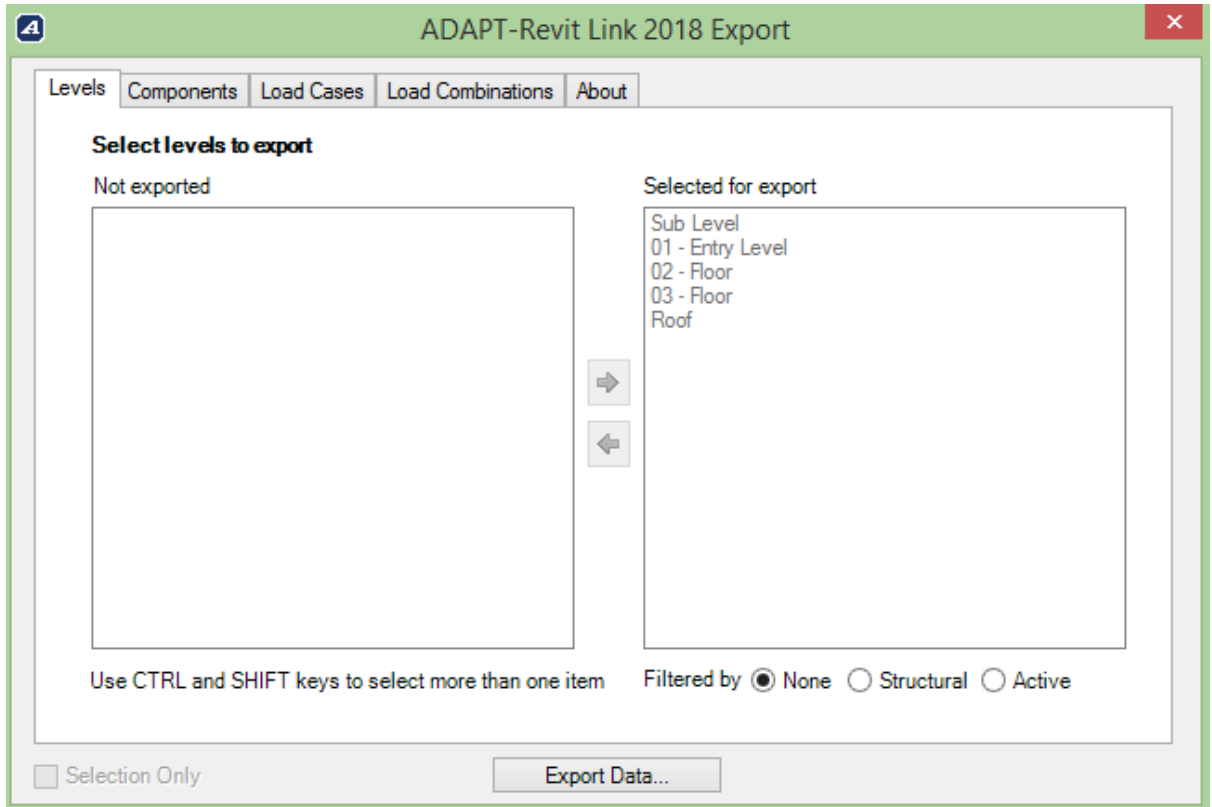


FIGURE 3-3 ADAPT-Revit Link 2018 Export screens

- In the *Save As* dialogue box, select the location of the ADAPT Model Exchange file and name the file (FIGURE 3-4).

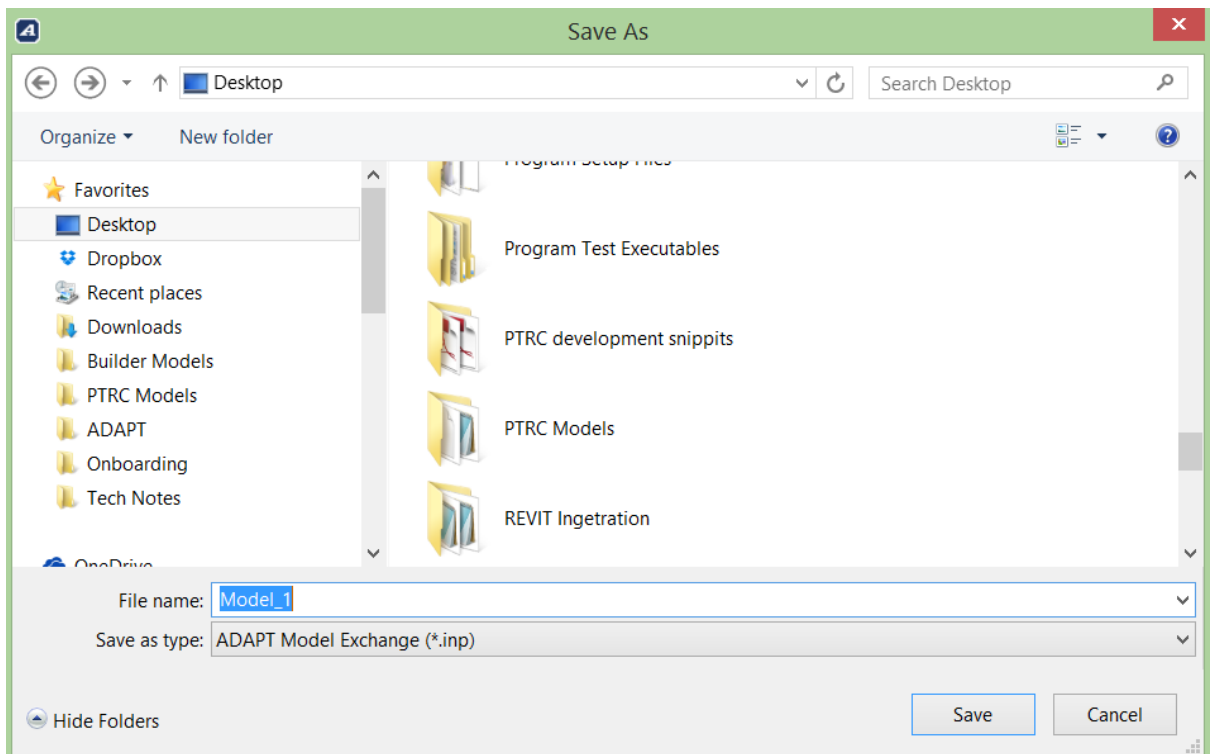


FIGURE 3-4 ADAPT data exchange file save-as dialogue window

3.2 IMPORT THE ADAPT EXCHANGE FILE INTO ADAPT-BUILDER FOR REVIT

- Open ADAPT-Builder 2018 as shown in the image below.



FIGURE 3-5 Builder Platform Module Selection

Note: In the Builder Platform Module Selection screen **Edge** and **Floor Pro** are selected while **MAT** and **SOG** are not selected. The Revit model import workflow described in this section works when opening Builder in Edge, Floor Pro, MAT, or combination modes. ADAPT-SOG is outside the scope of this Guide. Detailed descriptions of functionality, theory and a written tutorial are found in the **ADAPT-SOG User Manual**. Descriptions of workflows including integrated usage of Edge with Floor Pro and MAT are included in Sections 7 and 8 of this document.

- In Builder, select *File*→*Input*→*.INP*

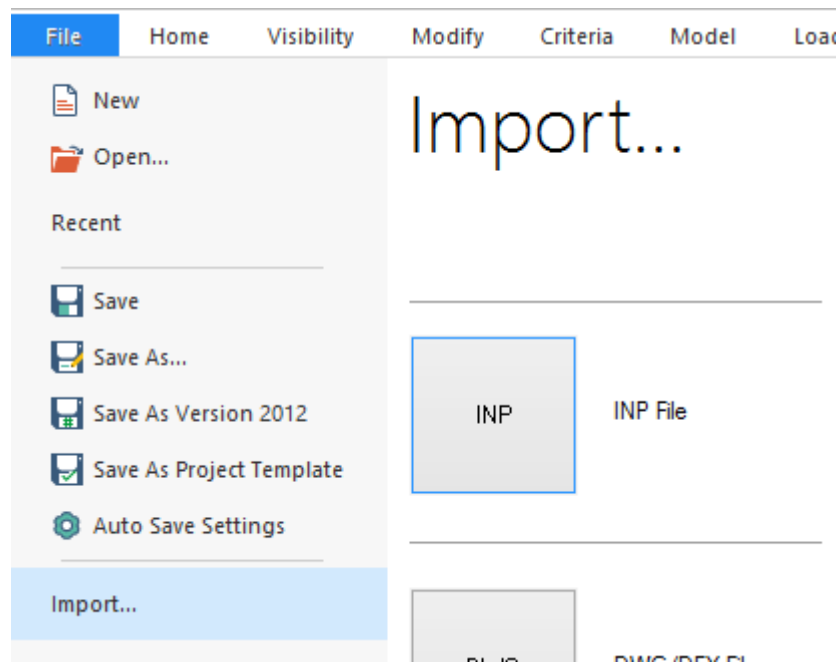


FIGURE 3-6 Import REVIT Model into Builder

- In the *Open* dialogue box (FIGURE 3-7), navigate to and select the ADAPT model exchange file that was created previously.

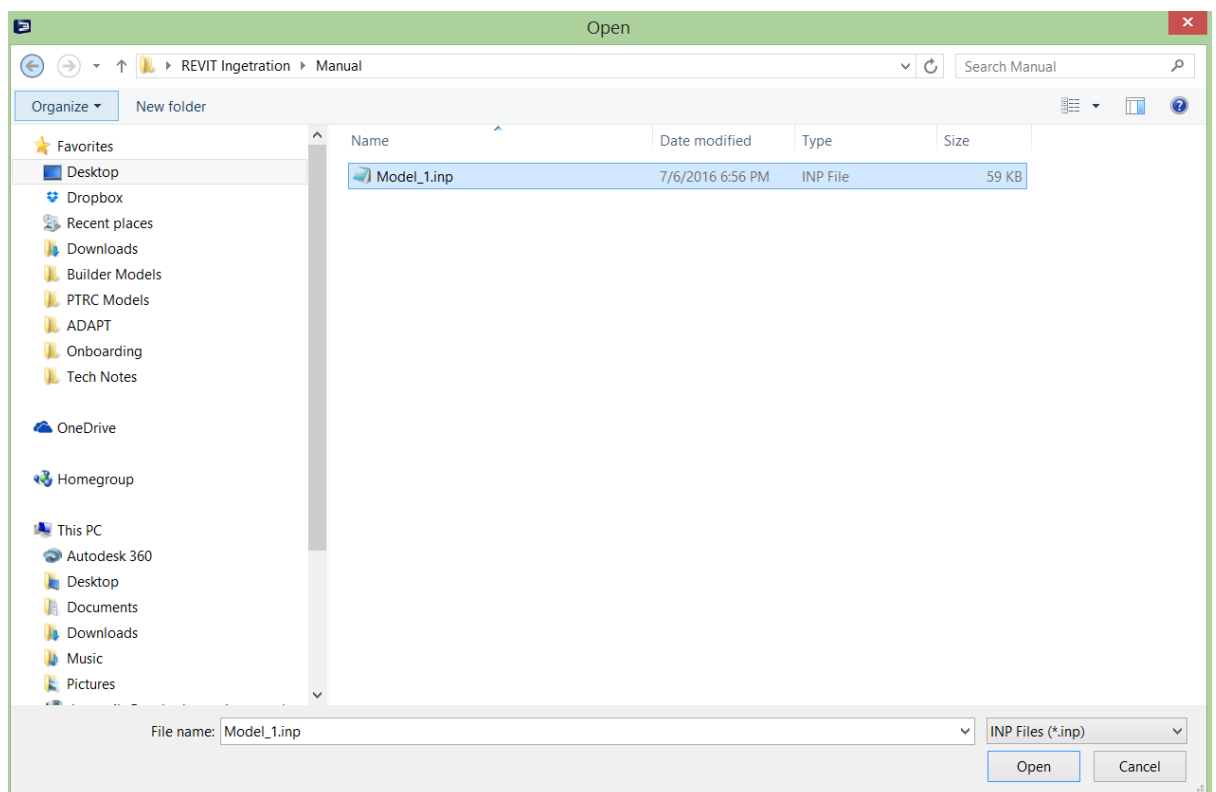


FIGURE 3-7 ADAPT Data Exchange File Open Dialogue Window

- In the *Import Options* dialogue window you will have the options of which components, loads, load cases and load combinations to import. You can also select to update a model or create a new model, to import the entire structure defined or generate a model of a single level. These can be selected under *Import Level*. By default, the working reference plane is set to *Current Plane*. When levels defined in the exchange file are imported, the program will update the reference planes. For example, slabs defined at “Level 5” will be assigned a reference plane of “Level 5” instead of *Current Plane*. For this example, we will create a new model of the entire structure, as shown in FIGURE 3-8.

The *Import Options* also includes a feature allowing similar slabs to be merged during the import. If slabs that are located on the same plane have the same thickness, offset and properties, the program will merge the slabs into one region.

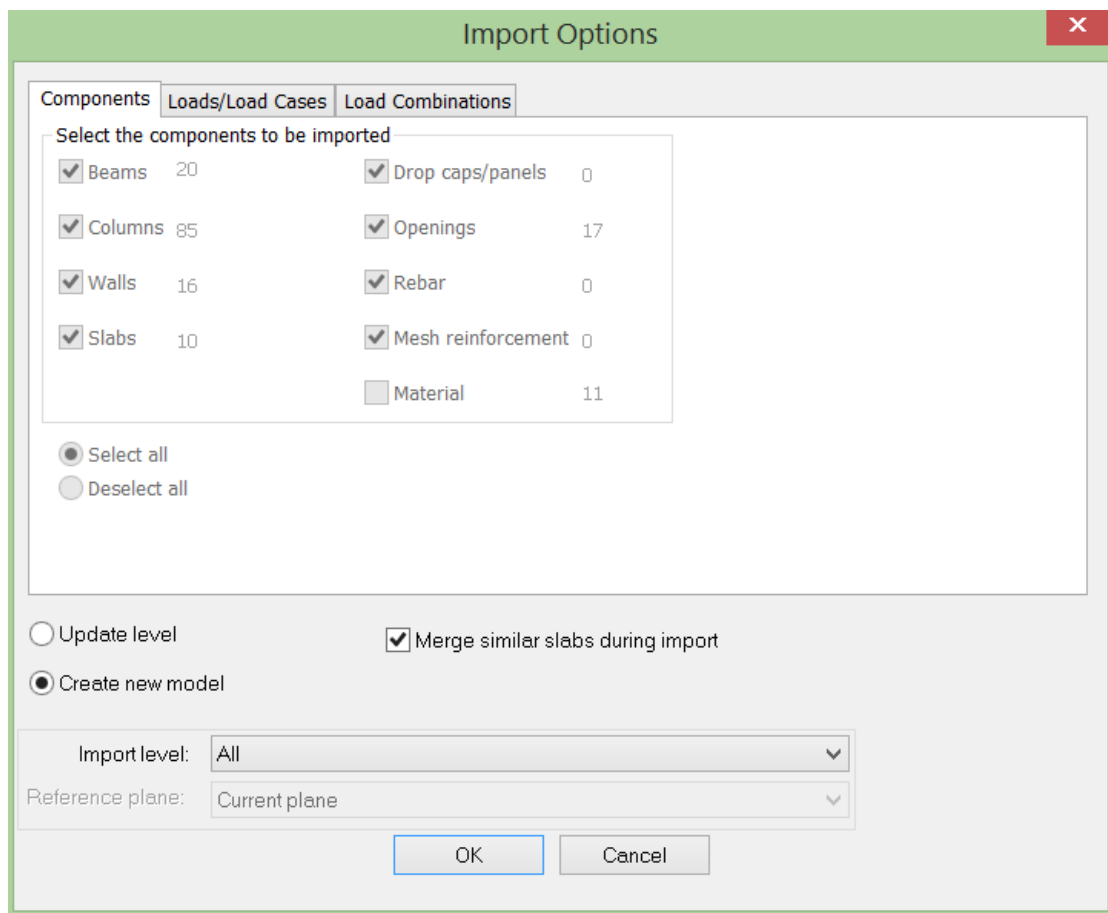



FIGURE 3-8 Import Options Dialogue Window

When the import is complete, the structure will open in *Multi-Level Mode*  mode. A plan view will appear as shown in FIGURE 3-9. All imported levels, components, and loads will be shown.

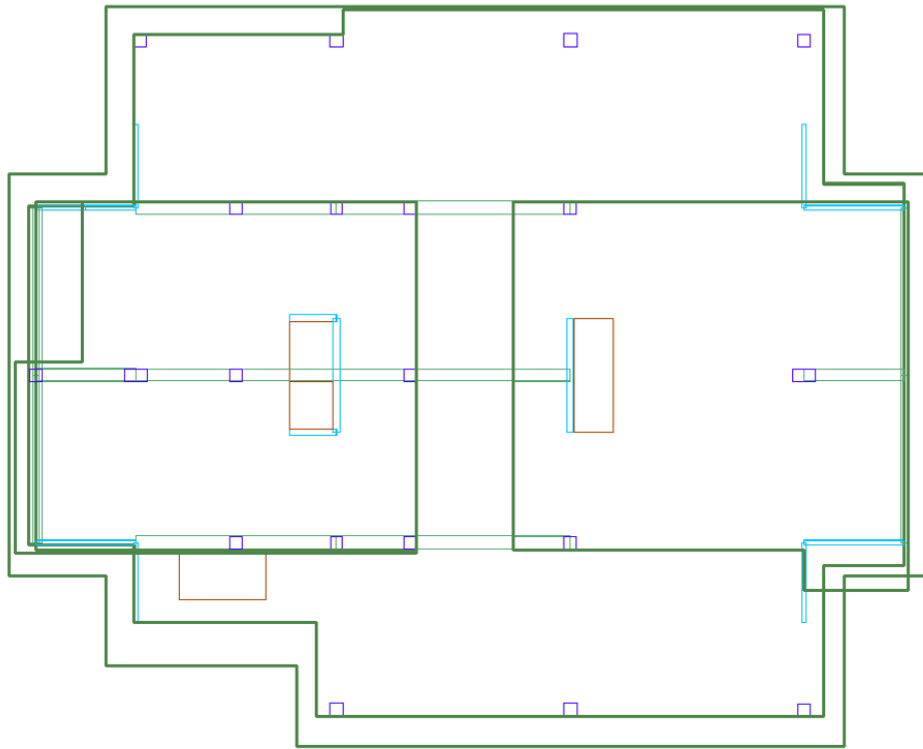

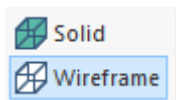


FIGURE 3-9 Imported 7-Story Structure Shown in Plan View in ADAPT-Edge

- Click on the *Top-Front-Right-View*  from *Home* → *Zoom/Camera* and you will see an isometric view of the imported structure in **ADAPT-Edge** (FIGURE 3-10). You can switch between wireframe and shaded views using *Visibility* → *Shading*.



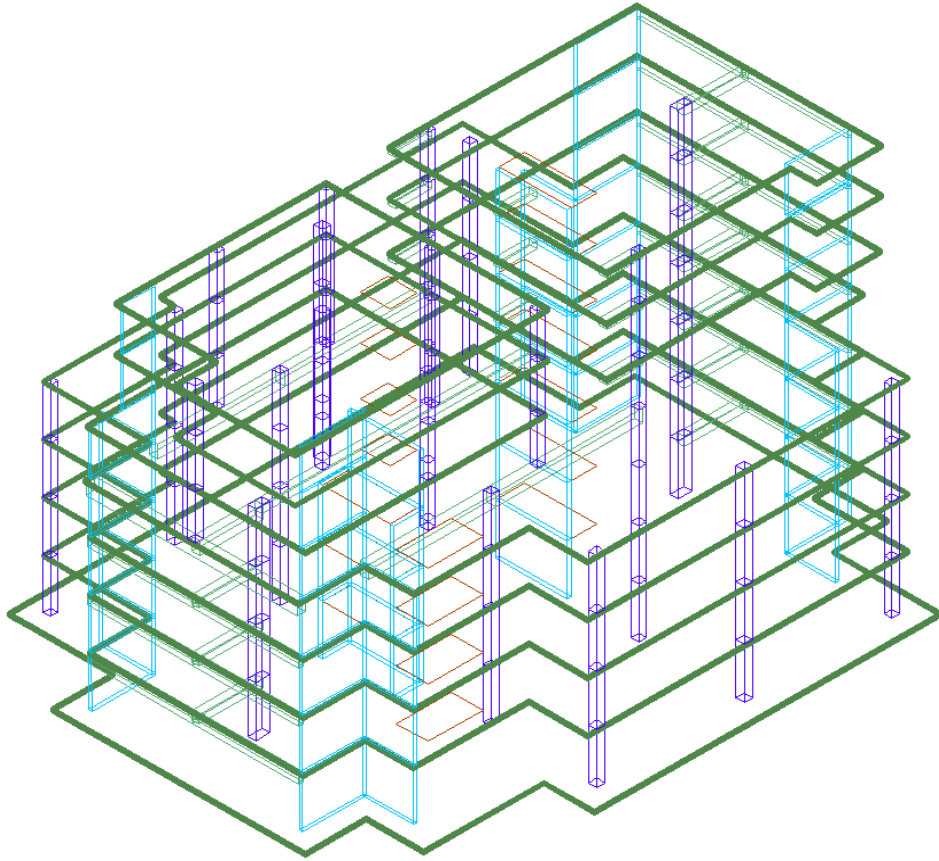


FIGURE 3-10 Imported Multistory Structure Shown in 3D View ADAPT-Edge