

# 1.0. Introduction to Ansys Workbench

ANSYS Workbench is a project-management tool that handles the passing of data between ANSYS Geometry / Mesh / Solver / Postprocessing tools. This attribute makes it a great help in project management. A project manager need not worry about the individual files on disk (geometry, mesh etc.). Graphically, you can see at-a-glance how a project has been built. The capability of Workbench in the management of individual applications and passing of data between, makes it easy to automatically perform design studies (parametric analyses) for design optimization.

## 1.1. Workbench Overview

### Main Screen

Figure 1 below presents the main interface of the ANSYS Workbench software. The components of this window are: Top menu – Toolbox – Project schematics – Messages – Progress

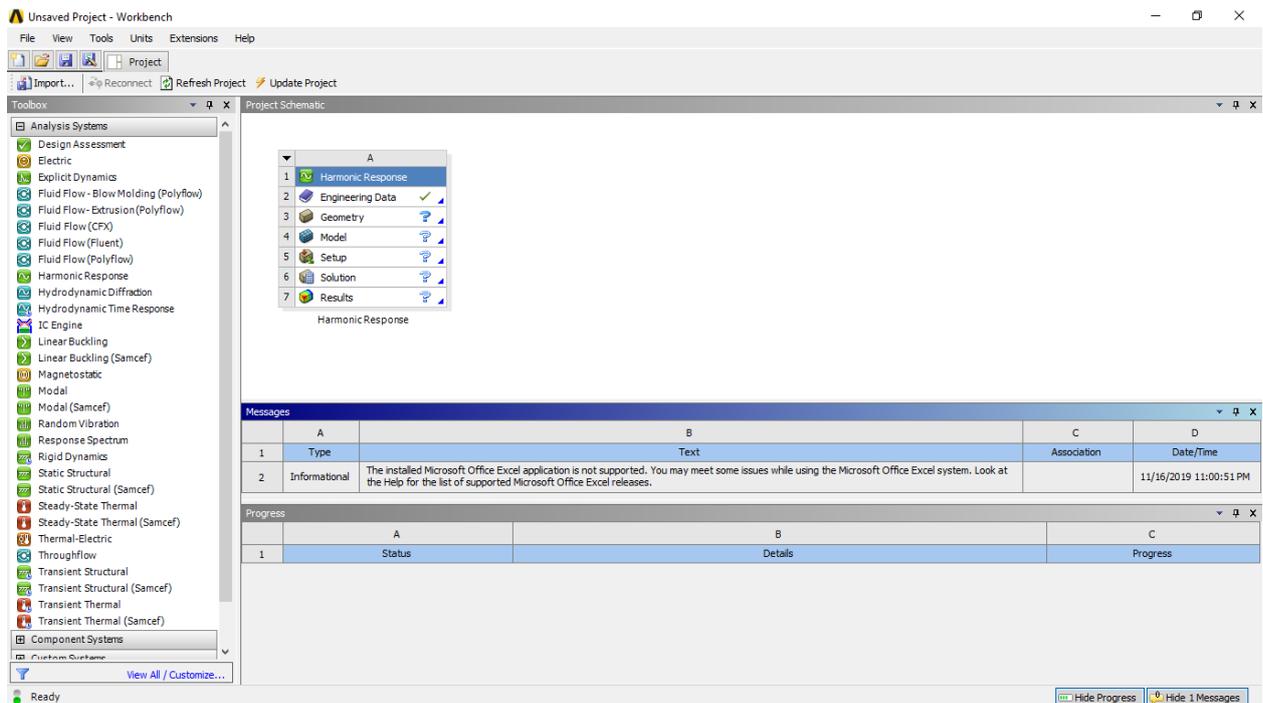
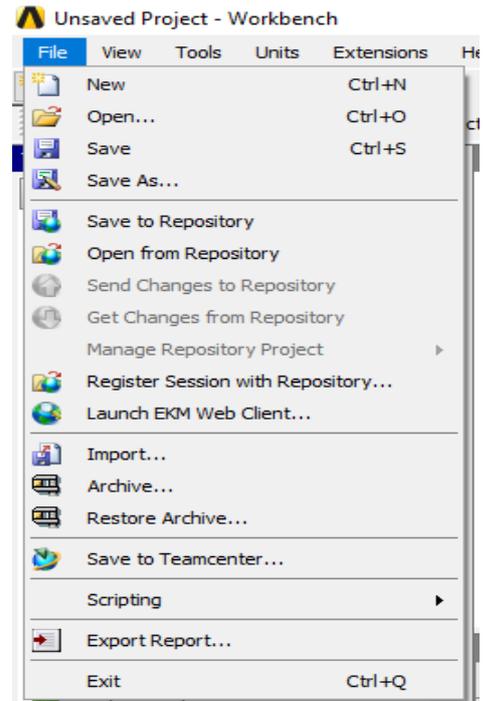


Figure 1 ANSYS Workbench Software Interface

## Top Menu

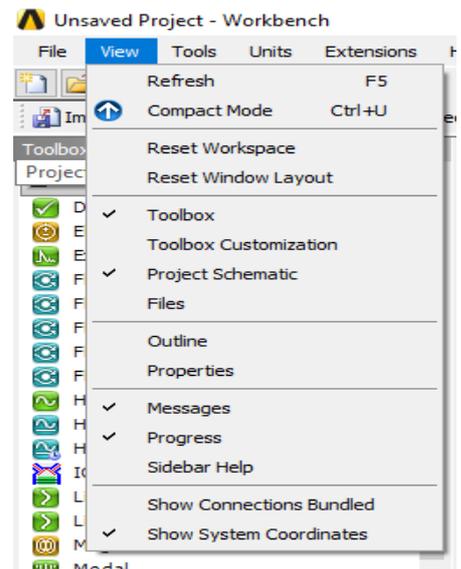
### i. Top Menu – File

- Create /Open/Save a Workbench project file
- Saves data from all the components
- Import: Import file (of acceptable file types)
- Archive: Quickly generate a single compressed file (.wbzp or zip file) containing all important files for easy transfer. Zipped file can be saved at any required location
- Restore Archive: Unzip and open zipped project files
- Scripting: Record and Run journal files
- EKM: Launch and connect to EKM (Engineering Knowledge Manager)



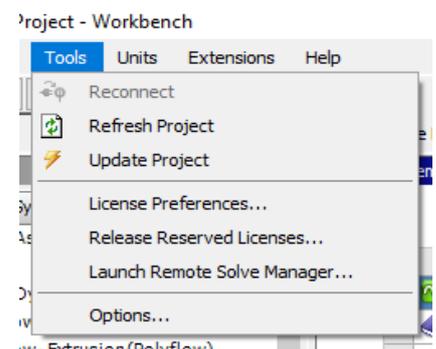
### ii. Top Menu – View

- Refresh and Reset Window layout
- View Toolbox, Toolbox Customization, Project Schematic, Message, Progress. Etc. windows on Project page
- Reset Workspace: restores current workspace to default setting
- Reset window layout: restores original window layout



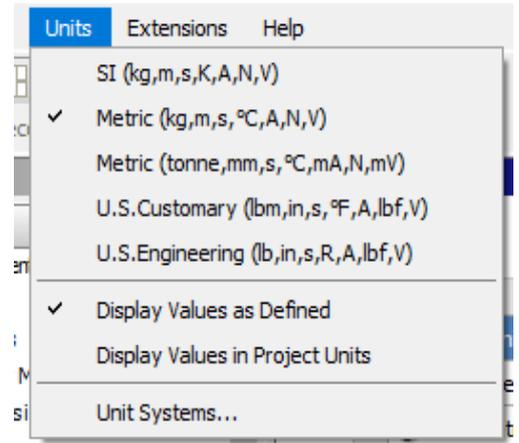
### iii. Top Menu – Tools

- Refresh or Update entire project
- Modify Global Setting through options



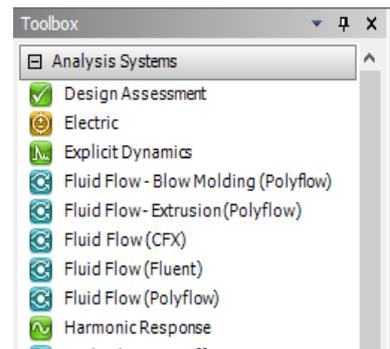
iv. Top Menu – Units

- Select Unit System to be used for the project
- Sets the default unit system for all systems
- Units can be changed within components like DM. AMP
- Display Values as Defined: displays values and unit as defined in Workbench or original source application
- Display Values in Project Unit: displays values converted to selected project unit system
- Modify Unit Systems through Unit System

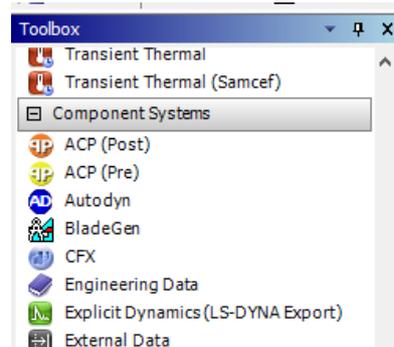


**Toolbox**

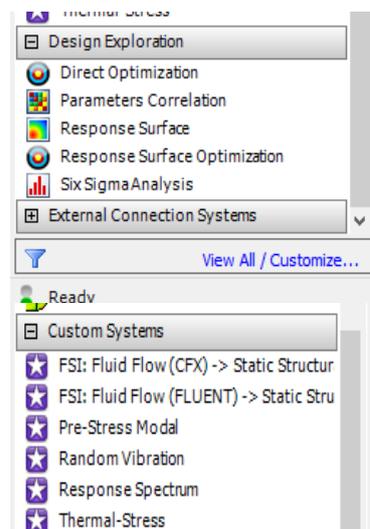
- i. Analysis Systems: are ready-made stencils that include all the individual systems (applications) needed for common analyses (for example Geometry + Mesh + Solver + Post-Processor)



- ii. Component Systems: are the individual building-blocks for each stage of the analysis which can be setup by user



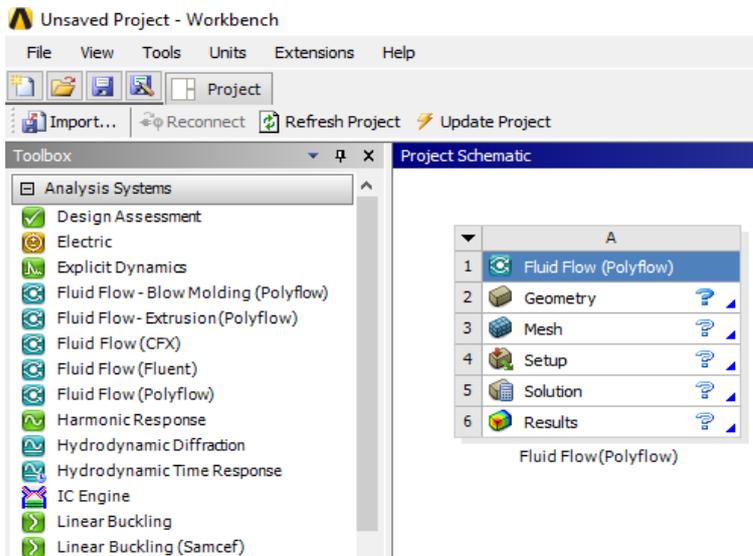
- iii. Design Exploration: provides tools for optimizing designs and understanding the parametric response



- iv. Custom Systems: predefined systems with some interactions between them. It is also possible to define new custom-systems

## 2.0. Basic Workflow

Starting a new project in the Project Schematic Window requires dragging a corresponding Analysis System onto the Project Schematic Window. A workflow, comprising all the steps needed for a typical analysis. For instance, the Fluid Flow (Polyflow) Analysis System in Fig. 2



Workflow is from top to bottom. As each stage is complete, the icon at the right-hand side changes

Figure 2 Analysis System in Project Schematic Window

An alternative method to creating a workflow within the Project Schematic Window is by dragging and dropping necessary systems into the Project Schematic Window from the Component Systems and linking the components accordingly with connectors Fig. 3.

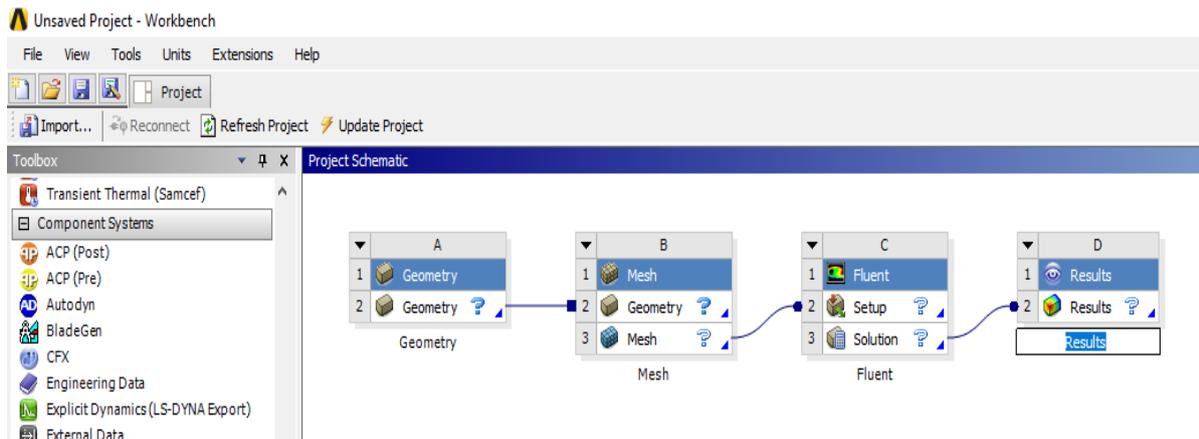


Figure 3 Alternative Method to Workflow Creation

There are two types of connectors: square and round connector. The square connector as seen in Fig. 3 shows that the output of the preceding cell is being shared with the destination cell. A round connector means the output of the preceding cell is being transferred as a setup (input) condition to be used in the destination cell.

## 2.1. Cell States

Status of each cell in ANSYS Workbench are denoted by distinct icons. Here these icons and their interpretation are presented.

-  Up to Date
-  Refresh required. Upstream data has changed
-  Refresh required. Upstream data has changed
-  Unfulfilled. Upstream data does not exist
-  Attention Required
-  Solving
-  Update Failed
-  Update Interrupted
-  Changes pending (was up-to-date, but upstream data has changed)

## 2.2. Sharing Data between Different Solvers

Data can be transfer between solvers in Workbench. In this 1-way FSI (fluidstructure-interaction) example, we transfer the loads from a Fluent CFD simulation over to a Mechanical system to perform a stress analysis.

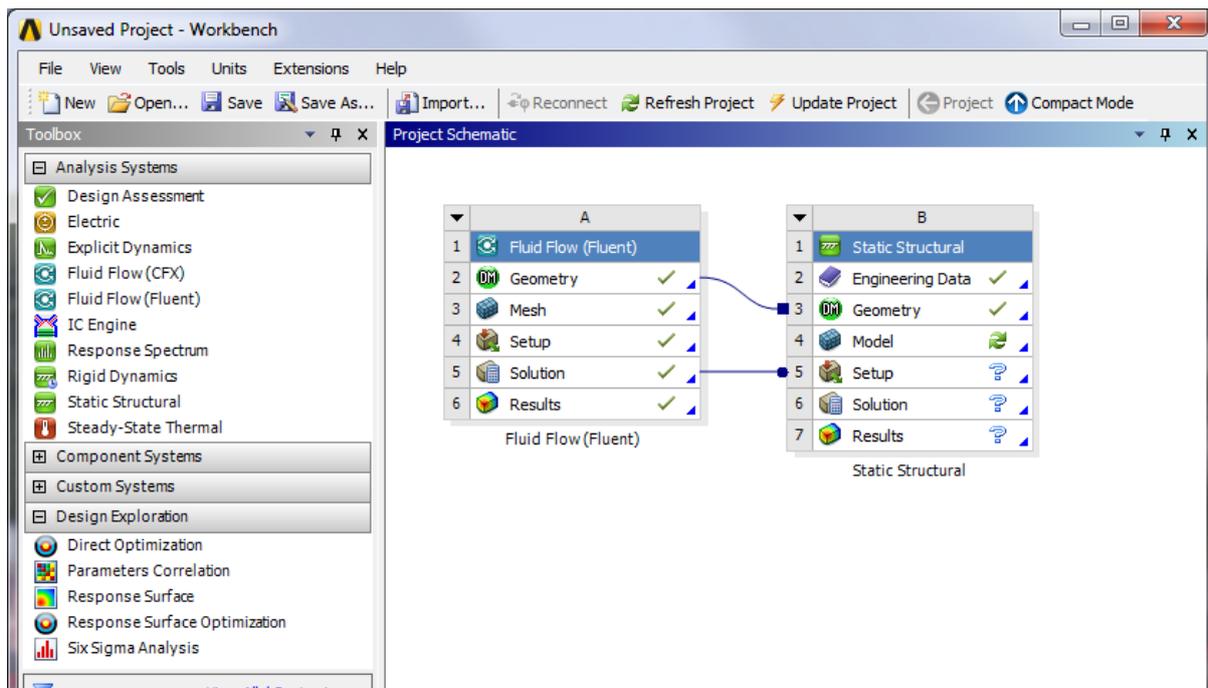


Figure 4 Sharing Data between Different Solvers

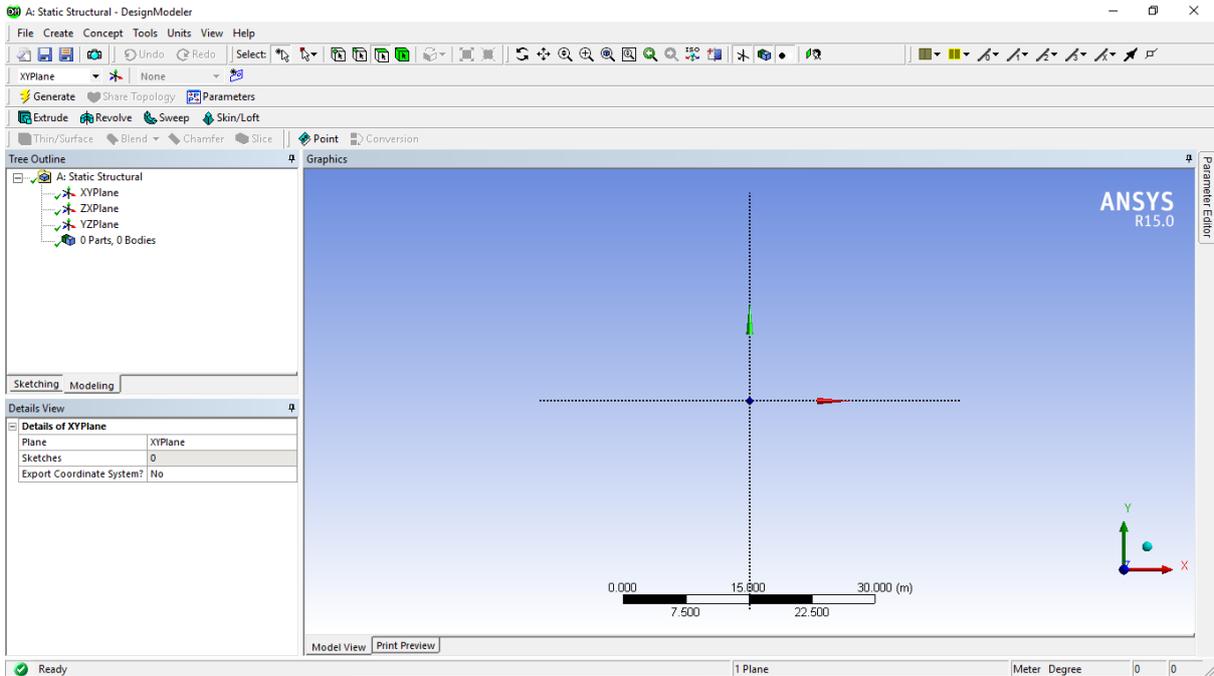


Figure 5 Design Modeler Window

Figure 5 presents the Design Modeler window in ANSYS Workbench consisting of two sub-windows in the Tree Outline: sketching window and modeling window. In the Sketching window a new model can be created or an imported model can be improved as requisite for the intended analysis. In the Modeling window the necessary 3D feature is applied to the model and meshing pattern is also added.

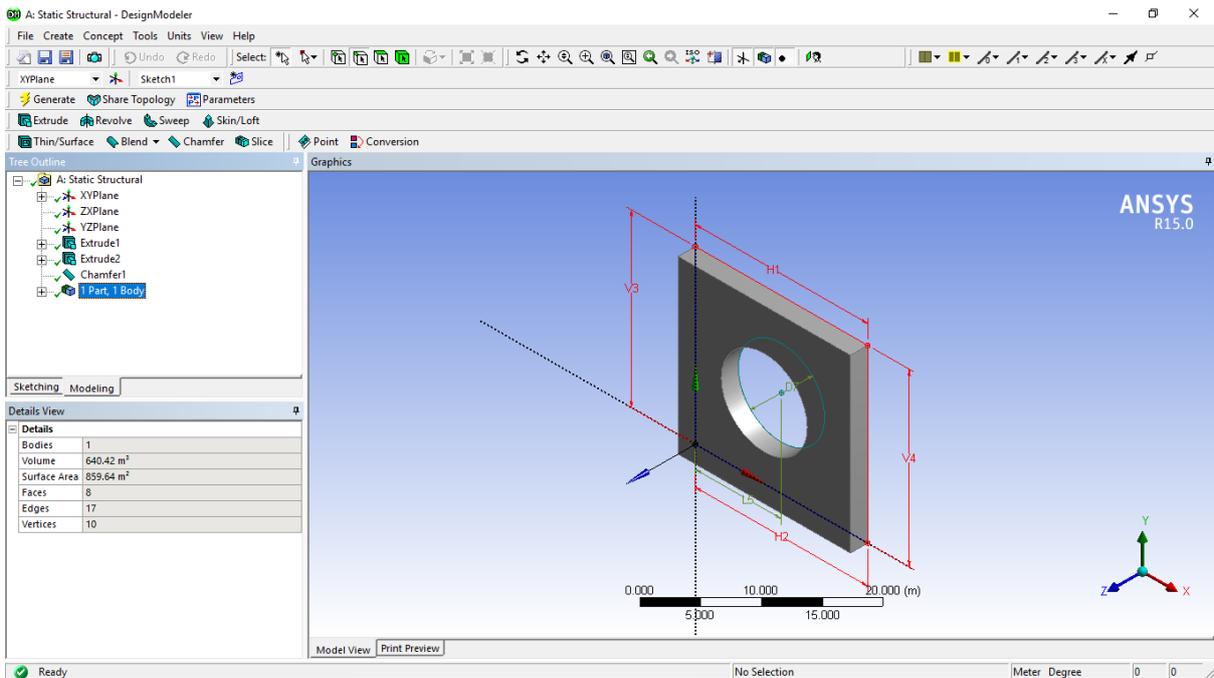


Figure 6 Design Modeler Showing a Created Model

### 2.3. File Location on the Disk

Should you need to identify the individual files on your disk for each stage of the project, these can be found by enabling View > Files. The resulting table will cross-reference the directory and filename with the project cells.

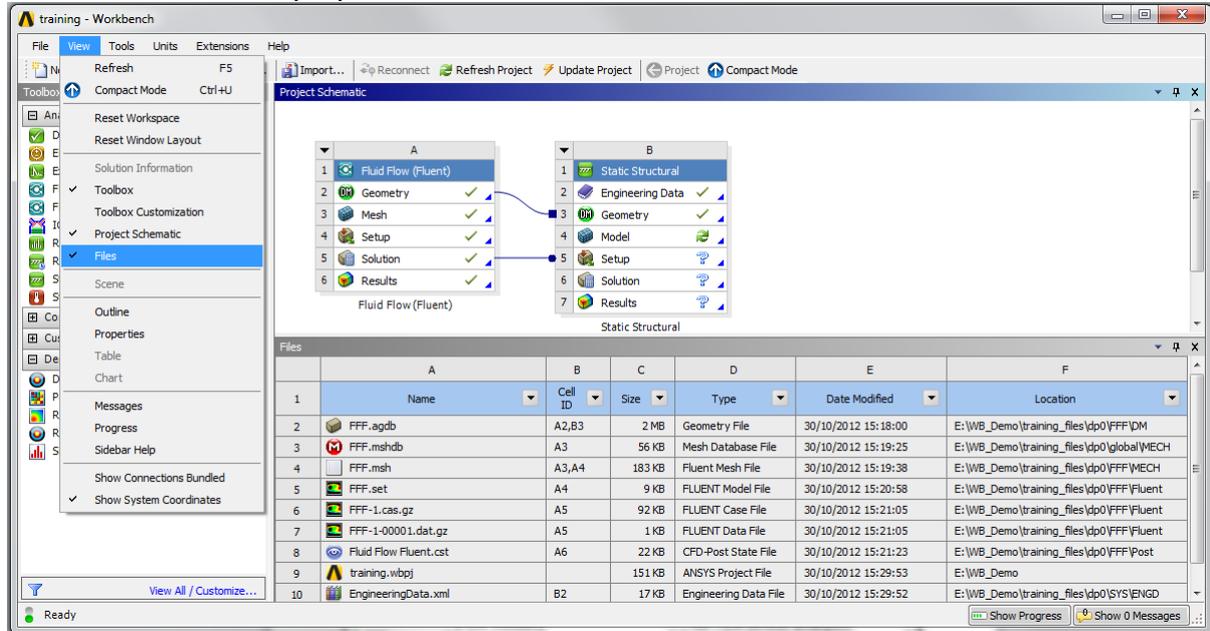


Figure 7 File location Directory

Now we will be running a demo on static structural system, Fluid Flow (Fluent) etc.