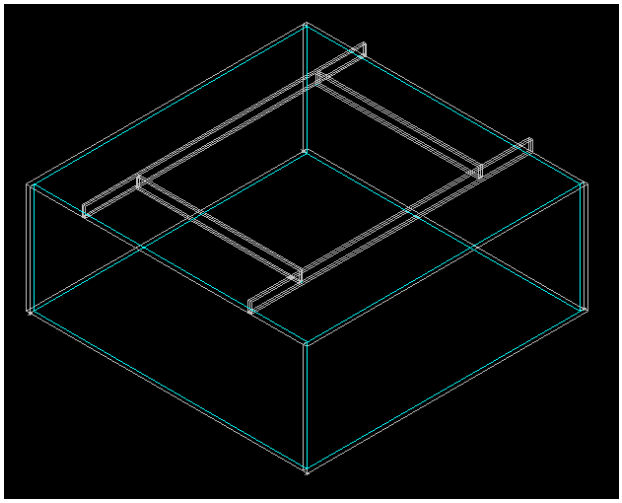
Digital Canal Corporation

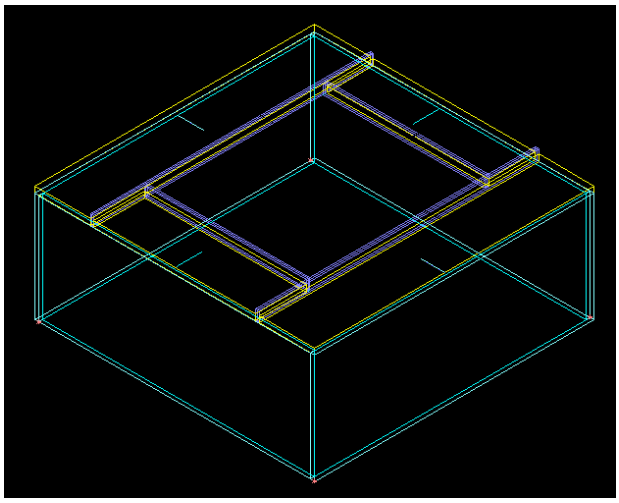
Solution Papers

Summary: ***Creating Coffered (tray) Ceilings***

Overview: This Solution Paper will step you through creating a typical sloped coffered ceiling for the purpose of producing rafters and production drawings. Use this solution as a guide to produce other variations. Since this is an advanced operation, it is assumed the User has an understanding of the basic commands in SolidBuilder

Solution:





1. Insert Support Girders.

The first step is to define the opening in the main ceiling. Insert the proper number of girders as king and headers at the proposed coffer based on your structural requirements.

- Set the **Reference Elevation** to top of desired wall.
- Select the **Girder/Post** Icon and set type to **Girder**.
- Set **Options** of the girders.
  Example: (2) 2x10, rectangle shape.
- Place the girders at parameter of lower edge of the coffer opening.

Note: The Girder will be used to define the sloped ceiling planes in later steps. The direction on plane slope will be to same side you select while creating the beams.

2. Create the main level ceilings.

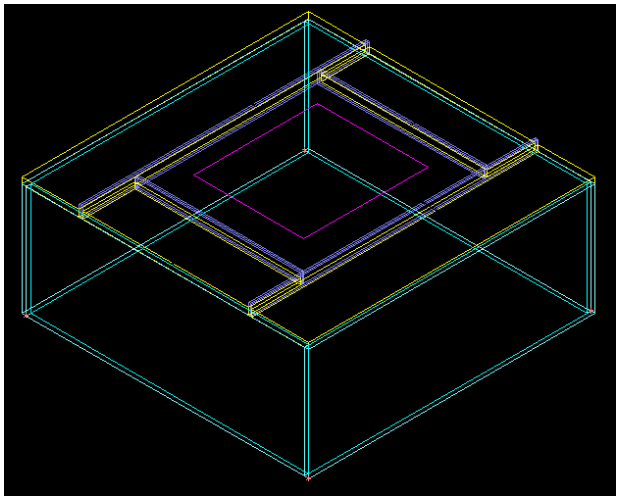
- Set the **Reference Elevation** to top of desired wall.
- Select the **Ceiling** Icon and set type to **Flat**.
- Set O**ptions** of the ceiling plane.
  Example: 2x6 @ 16” o.c., set rim and end joists to (0).
- Input the extent of the each ceiling plane and define the rafter direction for each area to be framed.
- Select the **Modify** button, select **Layout**, select **layout point** and select one of the ceilings, select the opposing ceiling. Set the alignment point to the middle of the opening. Repeat for the other two ceilings.

Note: The ceiling plane should set on the supporting walls and extend to the inside face of the girders. Set

the rafter direction to span the short direction as indicate to the right.

3. Establish work line for the upper coffer dimensions.
These lines will be used the establish the extent of the four sloped ceilings.

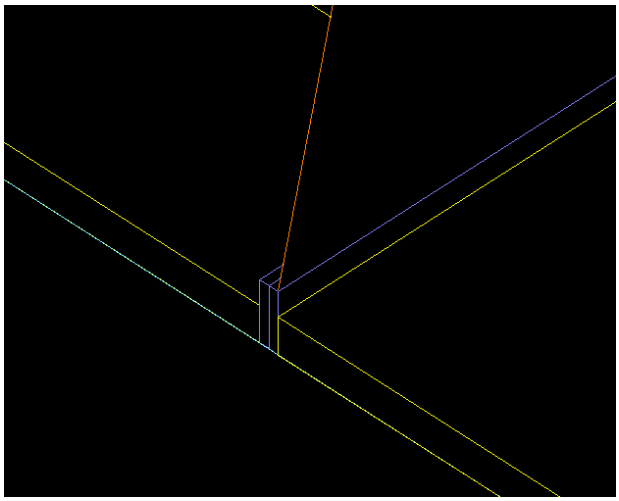
- In **Outline** mode set type to **Reference Line**
- Set reference elevation to bottom of Ceiling and vertical offset to 0.
- Set the end of each of the four reference lines 2' in from each corner.
- When complete you should have a dark magenta box representing the break in the ceiling at the upper surface of the coffer as shown to the right.



Note: The elevation height of the Reference Lines can be any height.

4. Create the sloped ceilings planes.
Here we are going to use roof planes to create the sloped planes.

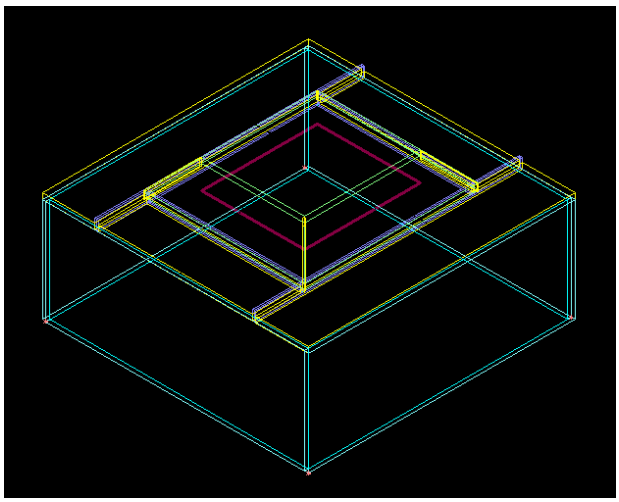
- Selected the **Roof** button and set type to **Planes**
- Set **Options** of the plane.
  Example: Rafter Depth 3.5, Elevation; Frame Resting, Birdsmouth 4_15/16", Cantilever 3", Slope; 12/12
- Input the planes by selecting the out most girders at each edge.
- Select the **Modify** button, select **Plane**, and select **Reverse**. Select the plane and enter **1.5** for the Width of Wall. Repeat this step for all planes.



Note: The program orients the direction of the plane to the side the girder was created. The modify step flips the planes to the inside and it is also gives you the option of moving the plane in relation to the girder thickness. Here we are moving the planes to the outside edge of the girders.

5. Create sloped ceilings.

- Once again we are going to use roof planes
- Selected the **Roof** button and set type to **Single.**
- Set Options of the ceiling plane.
  Example: 2x6 @ 16" o.c.
- Input the extent of each ceiling plane using the reference lines to define the upper extent of the planes.
- Selected the **Roof** button and set type to **Joiner**.
- Set **Options** of the Joiner.
  Example: Joiner Width 3.5,
- Insert joiners at each corner.
- Select the **Modify** button, select **Layout**, and select one of the sloped ceilings, select the opposing sloped ceiling. Set the alignment point to

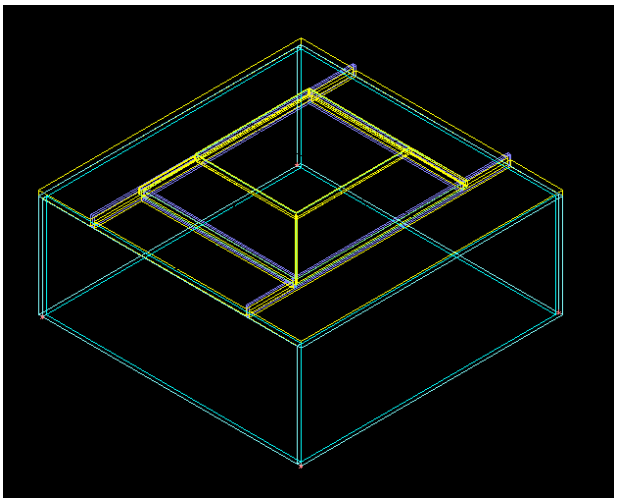


the middle of the top edge. Repeat for the other two ceilings

Note: The joiners will not have birdsmouth cuts and will have to be field cut to fit.

6. Create the upper ceiling plane.

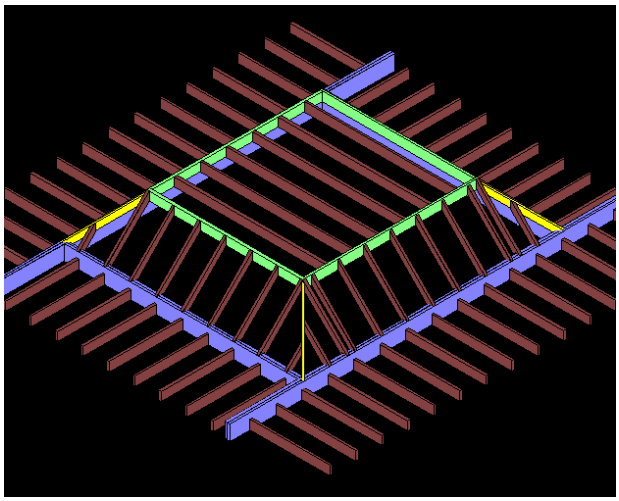
- Set the **Reference Elevation** by using **Mark** and selecting a point along the top edge of a ceiling shell lower face.
- Selected the **Ceiling** button and set type to **Flat.**
- Set **Options** of the ceiling plane. Example: 2x6 @ 16" o.c., set rim and end joists to (1-1/2").
- Input the extent of the ceiling plane and define the rafter direction.
- Select the **Modify** button, select **Layout**, select **Layout point** and select the ceiling. Set the alignment point to the middle of one side.
- Select the **Modify** button, select **Outliner**, and select the ceiling. Set the Joist Ends number to (1) and thickness to (1.5"). Set the Rim Blocking number to (1), thickness to (1.5") and type to (Joists). Repeat this for each edge of ceiling. ***NOTE: You must enter the inch mark in the thickness field, the default is feet.***



Congratulations, you have now completed all the required shells and the characteristics of each.

7. Framing

- Select the Frame button and then select the desired shells to be framed.
- At this point, using the Modify function, you can copy or move any piece of framing.



Note the manual addition of joists at the Joiners. While not necessary the joist could assist during installation.

There are many variations possible. If you do not require the birdsmouth on the sloped Joists and a vertical cut will work. You can create the sloped ceilings using ceiling shells in lieu of the roof shells. This has the advantage of providing a double joist with a flat nailing surface for each ceiling plane where the Joiner is.

8. Shop Drawings

- Select the **Production Drawing** button and produce the shop drawings.

The illustration to the right shows the Framing Member Cutting Profiles for two of the joists.