Digital Canal Corporation

Solution Papers

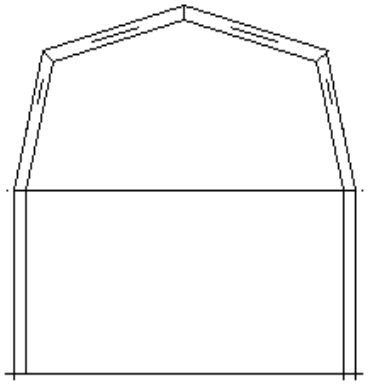
Summary: ***Creating Gambrel Roof Rafters***

Product(s): SolidBuilder for Windows
Release(s): 15.0
Platform(s): Windows 98 or later

Solution Paper: Gambrel Rafters
Revision: 7/04
Creation Date: 7/19/99

Overview: The following procedures below will take you through the necessary steps to create a gambrel roof for a small barn so that the rafters are framed correctly on the wall.

Solution:



1. Create the four walls.

2. On the two side walls that will carry the roof, select **Wall → Modify → Reverse**. This will reverse the A&B sides so that the bottom of the roof is created to the inside edge of the wall.

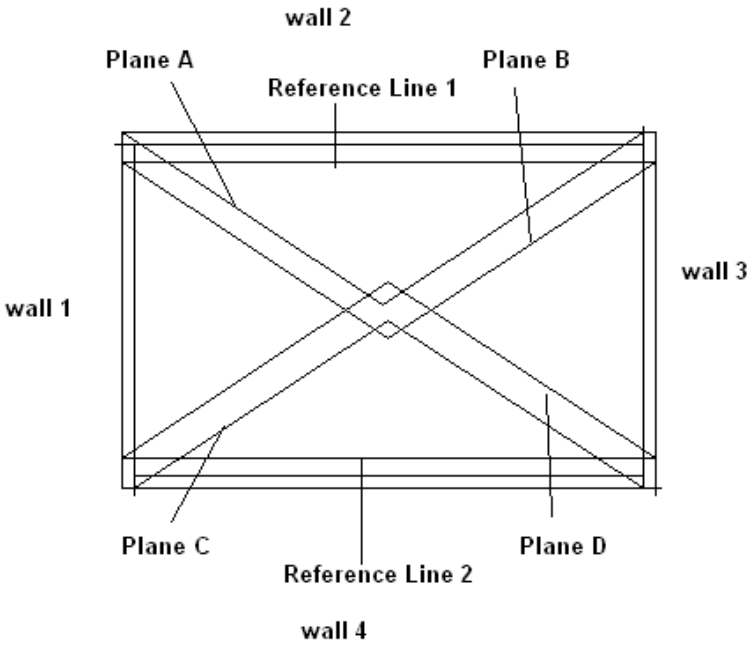
3. Select **Roof → Planes → Options**. Set the Elevation to **Framing Rest** and **Butt.** Set the Cantilever to 0.
   For this example the pitch was 54/12.

4. Create the planes. You will note that they are pointing the wrong way. Select **Modify→ Plane** and reverse both planes and set the **Width of Wall to 0.** This will leave the top edge of the roof matching the outside edge of the side wall.

5. You will need to determine the point at which the upper roof sections meet the lower roof sections. In this example, it is 8” in from the outside edge of the side walls. Select **Outline → Reference line**. select Plan view. Create one reference line 8” in from each side wall the length of the sidewall. These will be used to create the upper roof sections.

6. Select **Roof → Plane → Options**. Set the toggle in the upper left corner to Line. Set the **Elevation** to **Geometry Match** and **Plane**. Set the **Pitch** to 3.6 for this example.

7. Select the Roof icon to start the command. You are prompted to Select lines to locate a plane. Select both reference lines. You are prompted to Mark a point to indicate the up-slope direction. Move the cross hair toward the center of the roof. **You are promted to select plane to meet.** Select the 54/12 plane on the same side wall as you are working on. Repeat for the other side.



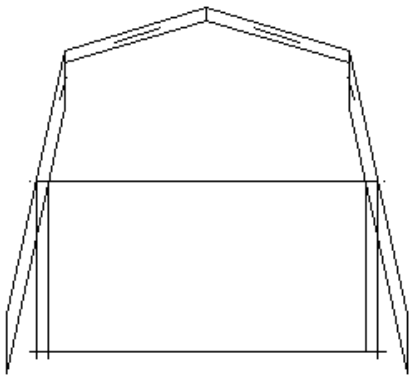
8. To create the roof select plane A, wall 1, reference line 1 wall 3. This creates the lower roof section.

9. To create the other lower roof section select plane C, wall 1, reference line 2, wall 3.

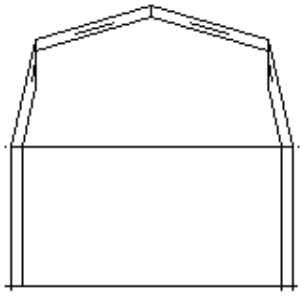
10. Create the first upper section. Select plane B, wall 1 plane D, wall 3.

11. To create the other upper roof section select plane D, wall 1, plane B, wall 3. The 4 roof sections are now created.

12. The next step is to shape the ends where the roof sits on the wall. Select **Roof → Shape → Project → Distance**. Enter 12" for the distance. Select one of the lower roof sections and highlight the bottom face for projecting. This will extend the bottom of the roof by 12" past the side wall.



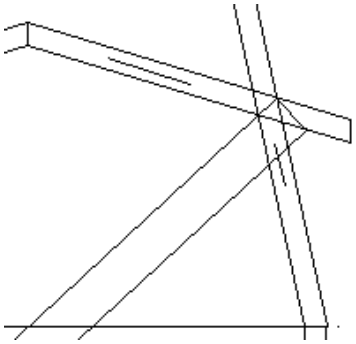
13. Next select **Shape → Project → To Another → Wall.** Select the side wall as the destination and the top face. Select the roof you just extended to project to it and select the bottom edge to project. This create the nice clean cut where the rafter will sit on the wall. Repeat this for the other side.



14. For the upper roof section, select **Roof → Project → Distance** and 12" is fine. Project the lower edge. This will create an overlap where the upper section meets the lower section. The two now need to be modified so that a miter forms between them. The trim command will not form a miter and there is no miter command for roofs. The miter in this example is 42.5 degrees.

15. A shell will need to be inserted at a 42.5 angle so that the upper roof shell may be projected to it. We will use a girder. Place the drawing in a plan view. Select girder and draw a girder perpendicular to the side wall (size, length and location are not important).

16. To rotate the girder select **File → Cad Menu → Left View**. Hit F6 and align to view. Zoom area around girder. Select **Geometry → Rotate → Object.** Select the girder. The Rotate dialog box opens. Select **Base Point** and enter 42.5. This rotates the girder. Select **Geometry → Move → Object**. Select the girder. Using the E jump select the upper right corner of the girder (still in a left view). Using the I intersect command select the intersection of the top lines of the upper roof and lower roof. The girder moves to this position.



17. Now using the **Roof → Shape → Project** the lower roof top edge back to the top face of the girder. Then project the bottom edge of the upper roof to the upper edge of the lower roof and the miter forms.

Repeat this for the other side. Remove the girder and the roof is now complete.