Digital Canal Corporation

Solution Papers

Summary: ***Creating Tapered Floor Joists***

Overview: This solution paper will take you through the necessary steps to create Tapered Floor Joists to achieve a flat floor that sits directly on a sloped roof. This solution paper will use the example of creating a 10' x 10' deck surface area that rests on top of a roof that has a ½" pitch per foot. The same steps can be applied for other sizes, and slopes. Located at the end of this solution paper is a simple drawing that will also aid you when using these steps.

Solution:

1. Within SolidBuilder create a wall (preferably an exterior wall) using the following options:
   - ➥ Width = 10'
   - ➥ Height = 1'
   - ➥ When you are actually creating the wall within the model make the wall 10' long. This should create you a wall that is 10' wide x 10' long x 1' tall.
   - ➥ When prompted to mark the B-Side of the wall select away from the side of the wall that will have the largest part of the taper cut.
   - ➥ See the general figure for an example as to what should be selected as the B-side

2. Once the wall is created we will need to create three reference lines one three sides of the wall
   - ➥ Outline – Reference Line (does not matter what elevation these are created at)
   - ➥ The reference lines should be created on the three sides that **will not** carry the actual roof – and will be used later to generate the roof. The side that does not need a reference line will be the side that has the largest part of the taper cut – or actually the A-Side of the wall. See the general figure for an example of where the reference lines need to be created
   - ➥ Draw the three reference lines for the three sides of the previously created walls – make sure that you jump to the appropriate corner to insure they are in the right location.

3. Now you will need to create a roof plane that has a slope of 0.5/12 of this one single wall.
   - ➥ Roof – Planes – Options – Enter 0.5 for the slope
   - ➥ Set your rafter width to 11_1/4" for a 2x12
   - ➥ Select on the wall that was previously created.

4. Now using the visibility command make the wall that was previously created invisible, and you should be left with three reference lines that define three side of our wall.
   - ➥ Select Visibility – Wall – Shells – Invisible – and select the wall that was previously created.

5. Now will create the first of two roofs that will needed to get the tapered joists
   - ➥ Roof – Single
   - ➥ Create the roof by selecting on the plane first then each of three lines going either clock wise or counter clock wise around our 10' x 10' box.
   - ➥ After selecting finished you should have a roof created a 0.5/12 pitch.

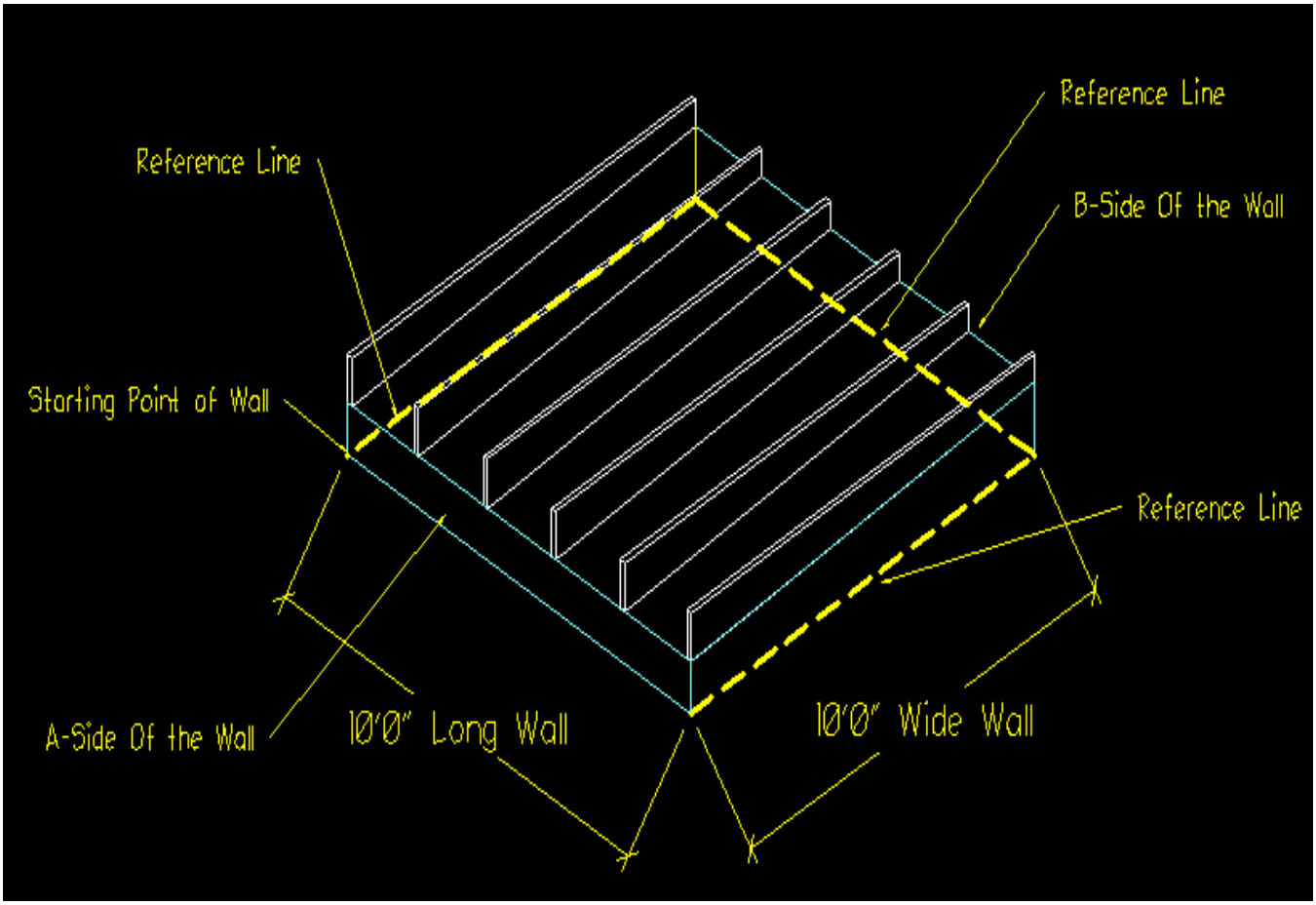
6. Now you will need to create a second roof but in order to do that first you will need to make the wall visible again, and also remove the plane that was previously created.
   - ➥ Select Visibility – Wall – Shells – Visible – and select the wall that was previously created.
   - ➥ Now you will need to remove the plane
   - ➥ Select Roof – Remove – Plane – and select the plane that was previously created.

7. Now you will need to create a roof plane that has 0/12 slope – so it will be flat.
   - ➥ Select Roof – Plane – Options – Enter 0 for the slope
   - ➥ Set your rafter width to 11_1/4" for a 2x12.
   - ➥ Select on the wall that was previously created.

8. Now you will create the second roof, but first make the wall invisible using the process that where listed in step #4 above.
   - ➥ After the wall is made invisible use the same procedure that was listed in step #5 above to create the second roof.
   - ➥ After you finish creating the roof you can use the procedures listed in step #6 above to make the wall visible once again.

9. Well you have everything created that is necessary, now you will just need to do some simple recreating of the wall and removing of roofs, before you can frame it.
   - ➥ Select Wall – Shape – Recreate – To Roof/Ceiling and recreate the wall to the roof that has the pitch
   - ➥ After you have selected the wall to be recreated SolidBuilder will prompt you "select roof/ceilings that are above the wall." Make sure that you select the roof that has the 0.5/12 slope
   - ➥ SolidBuilder will then prompt you for the type of condition you would like at the top of this wall. Make sure that you select beveled.
   - ➥ Now you will need to remove the roof at the 0.5/12 pitch
   - ➥ Select Roof – Remove – Roof – and click on the roof that has the 0.5/12 pitch
   - ➥ You should be left with your wall that is going to have sloped top, the flat roof, and three reference lines. Now it is time to frame the roof.

10. Now the roof can be framed, and the production drawings can be created for each of these tapered floor joists.
    - ➥ Select Framing – Select Roof – Click on the roof to frame
    - ➥ This will generate your tapered joist
    - ➥ Now you can create a production drawing by selecting on Production Drawings – Roofs – and then by clicking on the roof.


Reference Line
Reference Line
B-Side Of the Wall
Starting Point of Wall
Reference Line
A-Side Of the Wall
10'0" Long Wall
10'0" Wide Wall