

NOTE ABOUT THE MAGIC WAND

make sure that the magic wand tool's setting for minimum length for tracing segments is less than the smallest line segment in any poly line that will be used as a contour line created with the magic wand tool. If there are line segments shorter than the segment length set in the magic wand tools settings the magic wand will not work on that poly line

To use the magic wand you must have a tool selected in the tool menu.
To enable the magic wand either click on its icon or press the space bar.

A NOTE ABOUT ADDING INDIVIDUAL POINTS WITHOUT RIDGES

Individual nodes (not part of a ridge line) are created by selecting the mesh, selecting the mesh tool, selecting the polygon construction method, and double clicking anywhere in the mesh. Select each new node and assign it a height.

Individual nodes behave differently than nodes forming a user defined ridge line. Individual nodes often do not form a non user defined ridge when they are laid out in a pattern that would form smooth planes between adjacent ridges if they were nodes in a user defined ridge line.

Instead these individual nodes often form fractalated and jagged planes between adjacent ridges. The only way to correct this is to place more points between the points already placed until the fractilation is overcome.

CREATING A TOPO MESH THAT HAS ALL CONTOURS AT THE CORRECT LEVEL RELATIVE TO PROJECT ZERO

- In mesh settings: set skirt equal to the distance down from "project zero" to the lowest contour (bottom) of the mesh, set mesh elevation to ZERO.
if you want extra thickness below the lowest contour then add any amount to the skirt.
- Make a polyline of the perimeter of mesh, turn on the mesh tool, select the magic wand and click on the polyline.
This creates a mesh with a flat top surface.
- Determine the elevation of the main corners of the mesh relative to project zero and with the mesh selected and the mesh tool on assign each corner the appropriate elevation, make sure "apply to all" is unchecked. this makes the mesh have the general fall or slope of the site.
- Make all contours as grouped lines, polylines, or splines that either go to the edges of the mesh at both ends or are closed polylines that are completely within the boundaries of the mesh.
Using splines has one drawback and that is that they are composed of many nodes and editing ridges generated from splines is tedious
- With both the mesh selected and the mesh tool on, space-click on the first contour line, choose "apply to all" and "no surface fitting", click OK, and then with shift key down select just that contour then with shift key up click on the contour again and assign it an elevation with "apply to all" checked. Do this for each contour. Alternatively, you can create all of the contours first then assign a height to each one later.
- Check in 3D axo view for any nodes that are not correct these are often at edges, go to the plan and select the mesh and turn on the mesh tool and click on the node and assign it the correct elevation make sure that "apply to all" is unchecked
- To add points without ridges select mesh, turn on mesh tool, select the polygon construction method, and double-click anywhere inside the mesh perimeter choose "add new points" and "no surface fitting". Later you can assign an elevation to each point.
- To draw user defined ridges directly in the mesh select mesh, turn on the mesh tool, select the polygon construction method, and proceed to draw a segmented line as you would with any of the polygon tools.

BUILDING EXCAVATIONS

There are basically two methods for dealing with excavations in a mesh for building elements such as foundation stem walls and basements.

One method is to select all stem walls and basement slabs and make them an operator in a SEO with the mesh as target. Do a subtract with upward extrusion which creates a volume removed from the mesh. Note that, in plan, any contour lines running through the excavation will still be visible and need to be hidden with a fill or cover fill.

The other method is to cut a hole in the mesh as described below.

PREFERRED METHOD FOR CUTTING HOLES IN MESHES

- To cut a hole or to cut off a piece of a mesh, select the mesh turn on the mesh tool click any where on the edge of the mesh and the pet palette comes up. select the "MINUS" button and trace the outline of the hole or piece you want to remove. As soon as the tracing gets back to the start point the piece is removed.
- You can add to a mesh using the "Plus" button in the pet palette by tracing an area you want to add.
- It is possible with these palette tools to cross the edges of the mesh with no problem.

A NOTE ON HOLES IN MESHES

Holes in meshes accumulate nodes as contour lines that touch the edge of the hole are added and at points where existing contour lines are cut by the hole. Editing contour lines involving changing where they intersect a hole is difficult and often cause the mesh to be destroyed.

Therefore it is often necessary to delete the hole and then cut the hole again after contour lines are edited.

It is possible to select just the hole and delete it leaving the contour lines intact. Make a line or fill tracing of the hole you want to delete and then delete the hole and then use it to trace the new hole with the subtract from mesh hole cutting method when you are ready to replace the hole.

ALTERNATE METHOD FOR CUTTING HOLES IN MESHES (NOT AS RELIABLE)

Make a closed grouped polyline of the excavation out line, select the mesh and turn on mesh tool, space-click on polyline choose "make hole" and "fit to user ridges".

Note: Sometimes the "make hole" and "add points" is dimmed this will cause only the line segment that is selected to be added to the mesh not the complete polyline. The reason for this may be, the polyline is not continuous (closed), or the grouped polyline has extra lines or, Archicad decides that the polyline is too complex or that some line segments are too short and ignores them and adds only part of the polyline to the mesh.

MAKING INFILL MESHES TO FILL HOLES IN MESHES

Use the same polyline to make infill mesh with same settings as the topo mesh, place in hole and adjust top surface to correct height by determining the distance of the surface from zero and assigning all parameter points that value with "apply to all" checked.

NOTE: Make sure cutting polyline does not sit exactly on top of a contour that is parallel to it, coincident contours cause the model to be hollow, there is no warning about this.

NOTE sometimes after cutting a hole the model becomes hollow for no discernible reason. the only cure is to move the mesh around but keep the cut poly line in the needed position. OR USE THE PREFERRED METHOD

TECHNIQUES:

METHOD FOR DISCONNECTING CONTOUR LINES FROM THE EDGE OF A MESH OR HOLE

Put hotspots at each point where the contours you want to detach touch the edge of the mesh. Select the edge of the mesh, with mesh tool on and when the pet pallet comes up, use the polygon editing methods to either move edge or move points. To move the edge away from the mesh i.e. away from the end of the contour lines, select the edge segment and drag it in a direction away from the interior of the mesh.

As the edge is moved it leaves the ends of the contour lines detached from the edge. Select the end node of each detached contour and move it away from where the edge was. Then move the edge back to its original position using the hotspots that you put in at the beginning to relocate the edge.

ALTERNATE METHOD FOR DISCONNECTING CONTOUR LINES FROM THE EDGE OF A MESH OR HOLE

Select the contour line, select the mesh tool, drag the node which is at the edge to an adjacent edge hotspot, now select the same node again and drag it out along the path of the contour a short distance, the edge now appears to have a quirk in it, now select the node at the corner of the quirk and drag it to an adjacent node on the edge of the mesh or hole, now the contour line has a dangling end and is disconnected from the edge and can now be moved and changed freely because it is detached from the edge.

When you are sure of the new position of the contour it can be reconnected to any edge by dragging its free end until it touches the edge.

METHOD FOR DEALING WITH MULTIPLE NODES STACKED ON TOP OF EACH OTHER (ALWAYS AT EDGES AND HOLES AND POINT NODES)

Use the marquee tool w/ polygon construction method and draw a tiny polygon around the node(s) you want to move and drag to where you want them (be sure that you do not create a condition where ridges cross each other)

This method can be used to move collections of nodes belonging to one contour or several contours at one time. But you must be careful not to intersect a contour line outside of the selection polygon that you are moving by dragging the contour lines across ones outside the selection polygon.

METHOD FOR REMOVING EXCESS NODES BETWEEN RIDGE NODES AT EDGES OF A HOLE CREATED USING THE SUBTRACT METHOD

Use the marquee tool to draw a small rectangle around just one node and drag each node starting from the lowest to the next higher node along the edge until the last node moved is dragged to a ridge node at the edge of the hole. Leave all ridge nodes where they are.

METHOD FOR REMOVING UNCHAINED NODES (NODES NOT IN A RIDGE LINE)

Select mesh, select mesh tool, select node and drag outside of mesh. the node will be deleted

ROADS IN MESH TOPO MODEL

PREFERRED METHOD FOR MAKING ROADS IN MESH

- After the topo mesh is complete with all the ridges are at their correct elevations, rename it "topo proposed" in the ID field and draw the outline of the roadway with the polyline tool in the correct position on the mesh.
- Edit the contours so they are correct for a road. This could involve considerable editing to make the the transverse cross-section of the road level and the grade of the roadway even and at the correct slope.
- Select the mesh and the polyline and drag a copy a known distance away from the original. This new mesh is going to be the roadway mesh with every thing else removed.
- With the mesh tool selected, click on the edge of the mesh, the pet palette comes up, select the MINUS button and trace a closed polygon around all areas of the mesh that are not part of the roadway. Where the roadway ends at the edge of the mesh continue the selection line outside the mesh around to the point where the roadway meets the edge of the mesh again, when the selection line comes back to where it started that portion of the mesh that is within the selection polygon will be removed.
- When all that remains of the mesh is the roadway select the mesh and assign it an appropriate material and pen color and rename it "road proposed" to distinguish it from the "topo proposed" mesh.
- Drag the roadway poly line back to its original position on the "topo proposed" mesh. Using the same MINUS button method completely around the roadway, when the selection line comes back to its starting point the roadway area is removed. Delete the polyline and drag the "road proposed" mesh into position in the "topo proposed" mesh.

ANOTHER METHOD FOR MAKING ROADS IN A TERRAIN MESH IN AC 8.1 AND LATER VERSIONS

- After the topo mesh is complete with all the ridges at their correct elevations, draw the outline of the roadway with the polyline tool in the correct position on the mesh. Make sure the polyline is closed.
- Using the magic wand tool with the slab tool selected, trace the roadway drawing to create a slab that is as thick as the terrain mesh from the highest contour to the bottom of the mesh.
- Give it the attributes that you want for the roadway.
- Open the Solid Elements Operations control panel.
- Make the slab the target, make the mesh the operator, make targets retain their own attributes, and select the "Intersection" type of operation then execute.
- The slab top surface now follows exactly the surface of the mesh but the mesh also partially shows on the surface.
- The final step is to make the mesh the target, make the slab the operator, and do a "subtract with upwards extrusion" operation.

ALTERNATE METHOD FOR ROADS IN MESH

- On the mesh draw a closed grouped polyline of the outline of roadway, where roadway comes to the mesh edge, hold line in slightly from mesh edge. (the hole must be completely within the mesh parameter)
- Select the mesh, turn on the mesh tool, space-click on the polyline, choose "make hole" and "fit to user ridges".
- Turn on the mesh tool and edit settings for an infill mesh, make the skirt the same as the topo mesh, make the fill the same as the topo mesh, select an appropriate material for a road way and pen color.
- Space-click on the edge of the hole in the topo mesh. Make sure the topo mesh is not selected. A new mesh is created with its top surface flat and at zero elevation. Drag this mesh a known distance away from the topo mesh. This makes it a lot easier to edit.
- Select the infill mesh and name it "infill" or any name that will distinguish it when trying to select it, and with the mesh tool turned on click on one of its edges and assign it an elevation equal to the highest point of the roadway, make sure "apply to all" is checked. Now the roadway mesh has a flat top at the elevation of the roadway's highest point within the site.
- Drag the infill mesh back into the topo mesh and, keeping it selected click on its edge at each point where a node on the edge of the hole in the topo mesh occurs. this action places a node on the infill mesh edges that corresponds to a node on the edge of the hole in the topo mesh. these nodes will be used to edit the infill mesh so that the top of the infill mesh matches the surface of the topo mesh.
- Select the infill mesh and the topo mesh and go to the 3D window axo view, and rotate the view so that any side of the infill mesh is almost straight on to the viewer.
- Select the infill mesh by clicking on its surface and turn on the mesh tool and select each node on the infill mesh edge and drag it down to the corresponding point on the topo mesh edge, make sure the "elevation" icon in the pet pallet is selected, this dragging process is easy because you can only drag up or down and when the cursor reaches the corresponding node on the topo mesh the cursor changes to a check mark cursor. Do this dragging operation for all points on the infill mesh.
- If you want contours on the infill mesh then draw line segments between nodes of equal elevation and with the infill mesh selected and the mesh tool on, space-click on each line and choose "add points" and "no surface fitting", then go back and select each line and assign it an appropriate elevation.