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

To use the magic wand tool you <u>must</u> have a tool selected in the tool menu
 to enable the magic wand tool 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 the 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 "<u>project zero</u>" to the lowest contour (bottom)
 of the mesh, set mesh elevation to ZERO.
 if you want extra thickness bellow 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 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 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.

• 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 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

<u>PREFERRED METHOD FOR CUTTING HOLES IN MESHES</u>
• 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.
• Also 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.

<u>A NOTE ON HOLES IN MESHES</u>
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. Therefor 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 hole with the subtract from mesh hole cutting method
when you are ready to replace the hole.

<u>ALTERNATE METHOD FOR CUTTING HOLES IN MESHES (NOT AS RELIABLE)</u>
• make a closed grouped polyline of the excavation out line, select the mesh and turn on mesh tool
  space-click on poly line choose " make hole" and " fit to user ridges".

   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 to
  complex or that some line segments are to short and ignores them and adds only part of the polyline to
  the mesh.

• 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 descendible 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
first put hotspots at each point where the contours you want to detach touch the edge
select the edge of the mesh,with mesh tool on and when the pet pallet comes up,
use the polygon editing methods either move edge or move points. To move the edge away
from the mesh i.e. away from the end of the contour lines the edge must not intersect the contour lines
as the edge is moved it leaves the ends of the contour lines detached from the edge,
then select the end node of each detached contour and move it away from where the edge was

then move the edge back to it original position using the hotspots that you put in at the beginning

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 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 it's 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 sever 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 on a ridge line)

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

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ROADS IN MESH TOPO MODEL

Preferred method for making roads in mesh
• After the topo mesh is complete with all the topo lines at there correct elevations, rename it "topo proposed"
  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 line color and rename it "road proposed" to distinguish it from the "topo proposed" mesh.

• drag the roadway poly line back to it's original position on the "topo proposed" mesh, using the same
  MINUS button method trace completely around the roadway, when the selection line comes back to
 i it's starting point the roadway area is removed. Delete the polyline and drag the "road proposed" mesh
 into position in the "topo proposed" mesh.

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 line colors

• 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 it's 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 it's 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 roadways 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 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 strait on to the viewer.

• select the infill mesh by clicking on it's 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.