

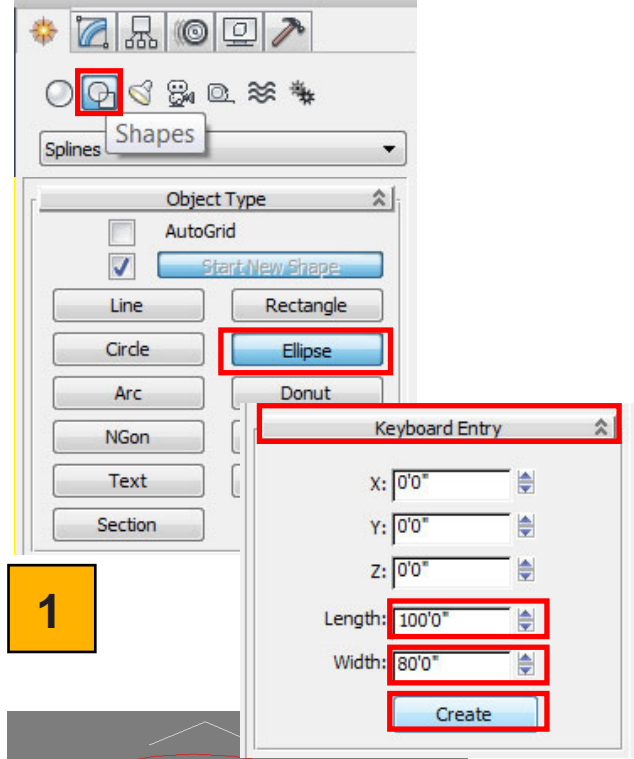
Topics Covered

Conceptual Massing _ Splines _ **Clone** - Copy / Reference / Instance _ Sub-Object Manipulation _ **Transform** - Absolute vs. Offset _ Mirror _ **Vertex** - Corner / Smooth / Bezier _ Attach _ **Modifiers** - Cross Section / Edit Spline / Surface

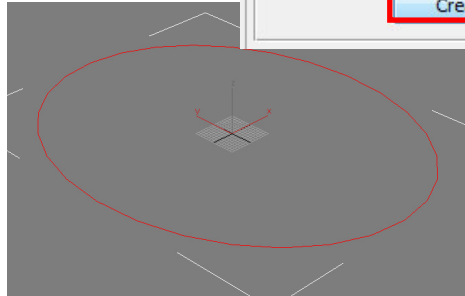
3DS Max Design - Basics

Splines

STEP 1: open 3DS Max 2010 _ Save the Max file in your Arch 508 / Class-09 / Max folder as your initials_class-09 _ from the **Command Panel** (upper right) under the **Create** tab click on **Shapes** (**note:** shapes are really Splines) _ under Object Type click on **Ellipse** _ Expand the **Keyboard Entry** tab type **100'** Length & **80'** Width _ click on **Create** _ press **esc** _ press **Z** to zoom extents



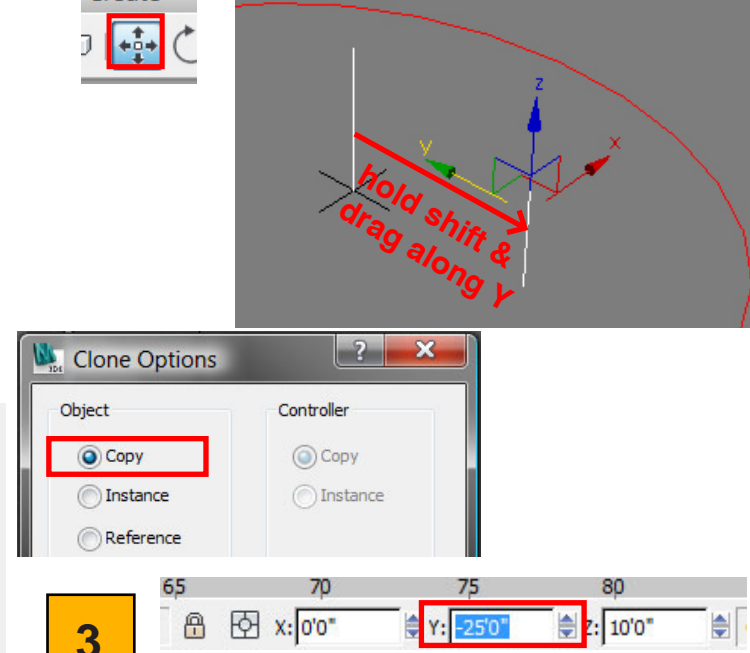
1



STEP 2: command panel / create / shapes / **Line** _ Expand the **Keyboard Entry** _ click on **Add Point** _ enter **20'** in the **Z** _ click on **Add Point**

Clone - Copy

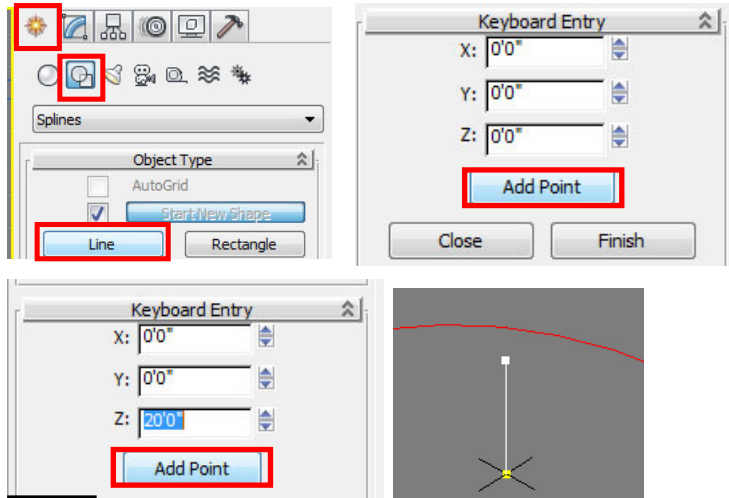
STEP 3: main toolbar / **Move** _ hold down the shift key & drag along the **Y** axis _ select **Copy** from the Clone Options window _ From the bottom of the screen set the **Y: -25'**



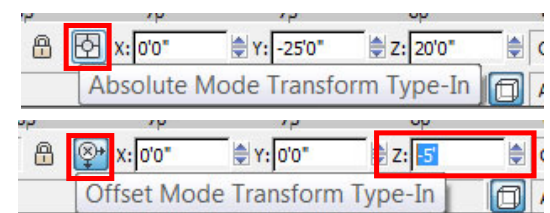
3

Vertex / Transform / Mirror

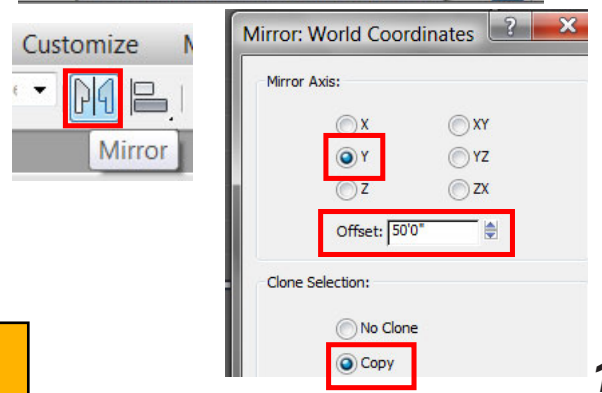
STEP 4: command panel / **Modify** _ click on the **+** to expand **Line** _ click to **activate** **Vertex** (**note:** there are 3 sub-objects Vertex, Segment & Spline) _ in the viewport select the top **Vertex** _ change the **Absolute** Mode Transform (world) to **Offset** Mode Transform _ move the vertex down **5'** _ **de-activate** **Vertex** from the command panel _ main toolbar / **Mirror** _ set the mirror axis to: **Y** _ set the offset to: **50'** _ set the clone selection to: **Copy** _ click **OK** _ lower the top vertex of the new line **5'**



2



4



1

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STEP 5: Alt + W to switch to 4 viewports _ right-click in the **Left** viewport to make it current _ from the **main menu** click on the **Snaps Toggle** _ right-click on the snaps toggle _ set snaps to **Endpoint** only _ click on the **red X** to close the snaps window _ command panel / create / shapes / **Line**

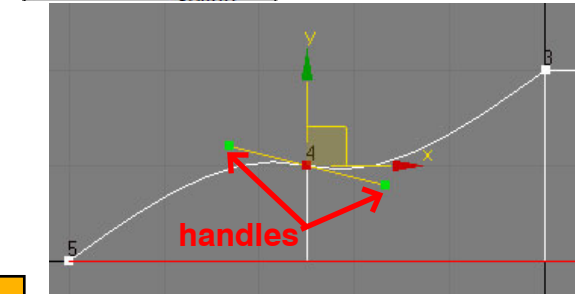
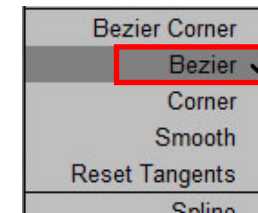
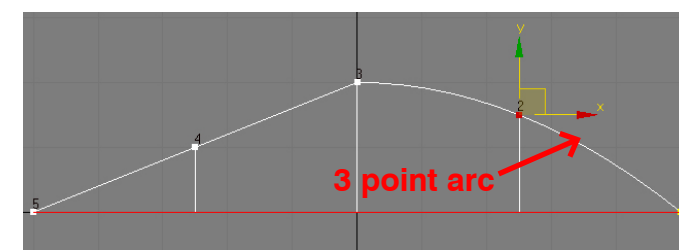
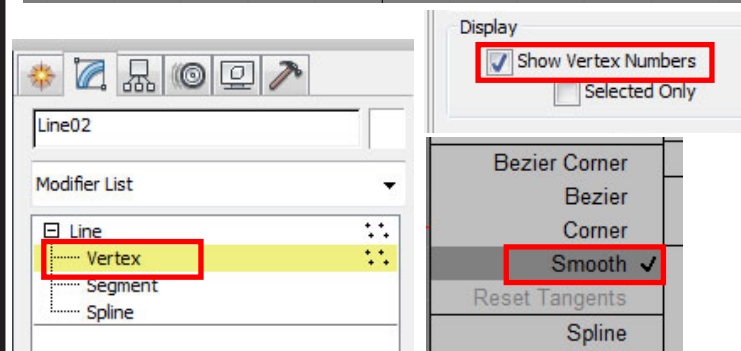
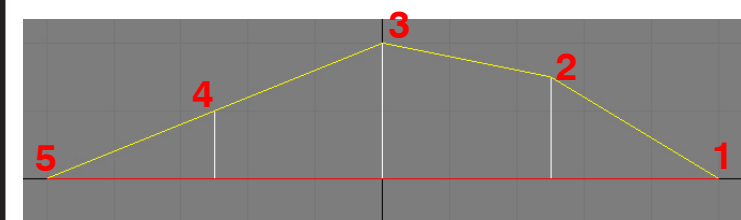
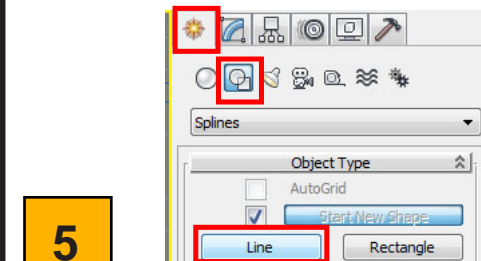
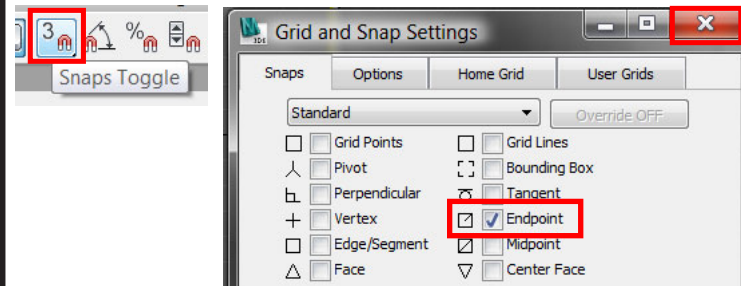
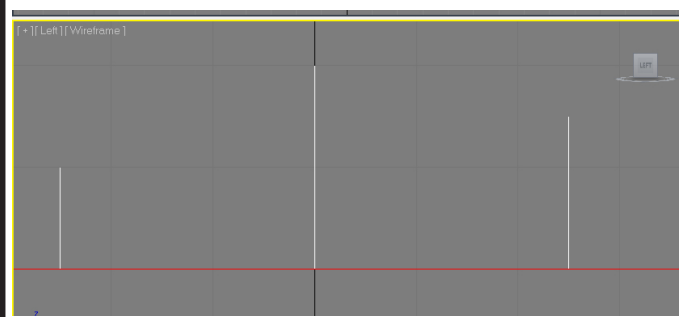
Vertex types: Corner / Smooth / Bezier

STEP 6: using the endpoint snap draw a line from right to left _ (**note:** by default all vertices are set to corner) _ command panel / **activate** vertex _ from the command under display check on **Show Vertex Numbers** _ select vertex #2 _ right-click _ select **Smooth** from the Tools 1 flyout menu _ (**notice:** we now have a 3-point arc from 1,2,3)

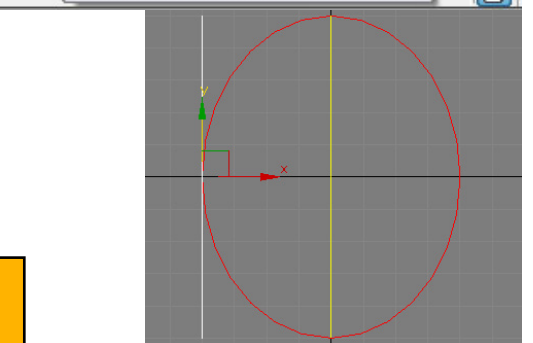
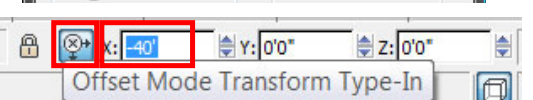
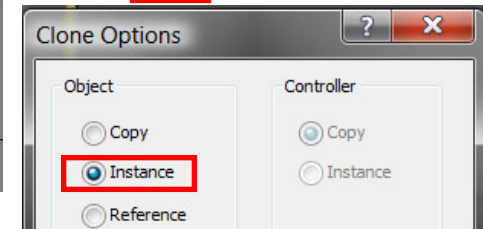
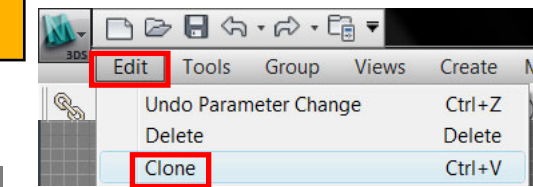
STEP 7: select vertex #4 _ right-click _ select **Bezier** from the Tools 1 flyout menu _ (**notice:** the vertex now has 2 handles that control the curve going in & out of the vertex) _ select all of the vertices & set them to **Smooth** _ **de-activate** vertex

Clone - Instance

STEP 8: right-click in the top viewport to make it current _ main menu / edit / **Clone (Ctrl+V)** _ select **Instance** from the Clone Options window _ using **Offset** transform mode move the new line 40' to the left by entering **-40'** for the **X** _ Ctrl + S



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Topics Covered

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STEP 9: right-click in the perspective viewport _ **activate** vertex _ move vertex #3 to an **Absolute Z of 10'** _ (**notice:** the move affected the original spline & the **Instance**)

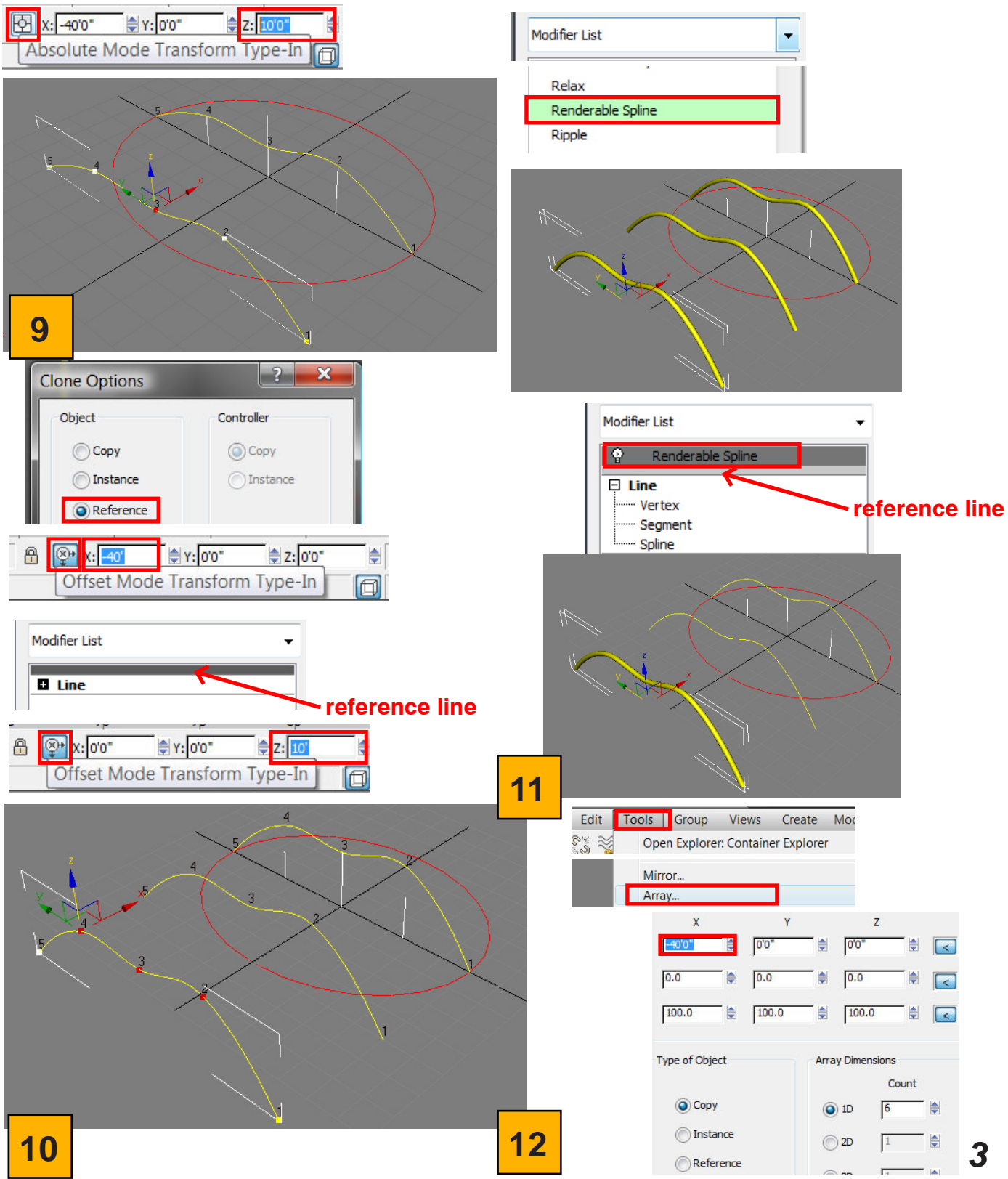
Clone - Reference

STEP 10: right-click in the top viewport to make it current _ main menu / edit / **Clone (Ctrl+V)** _ select **Reference** from the Clone Options window _ using **Offset** transform mode move the new line 40' to the left by entering **-40'** for the **X** _ (**notice:** there is now a Gray bar above Line in the modifier stack) _ right-click in the perspective viewport _ **activate** vertex _ select vertices # 2, 3, 4 _ move them up using **Offset Z of 10'** _ (**notice:** the move affected the original, instance & reference splines)

STEP 11: **de-activate** vertex _ command panel / modifier list _ select **Renderable Spline** _ (**notice:** the modifier affected the original, instance & reference lines) _ in the modifier stack click, drag & move the renderable spline modifier above the Gray bar reference line _ (**notice:** the modifier no longer affects the original spline)

Attach

STEP 12: select the instance & reference splines _ press the delete key _ right-click in the top viewport to make it current _ select the original spline _ main menu / tools / **Array** _ enter **-40'** for the **X** _ set the type of object to: **Copy** _ set the 1D count to: **5** _ click OK



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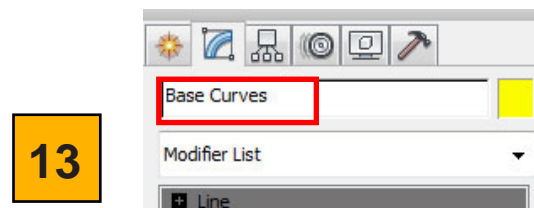
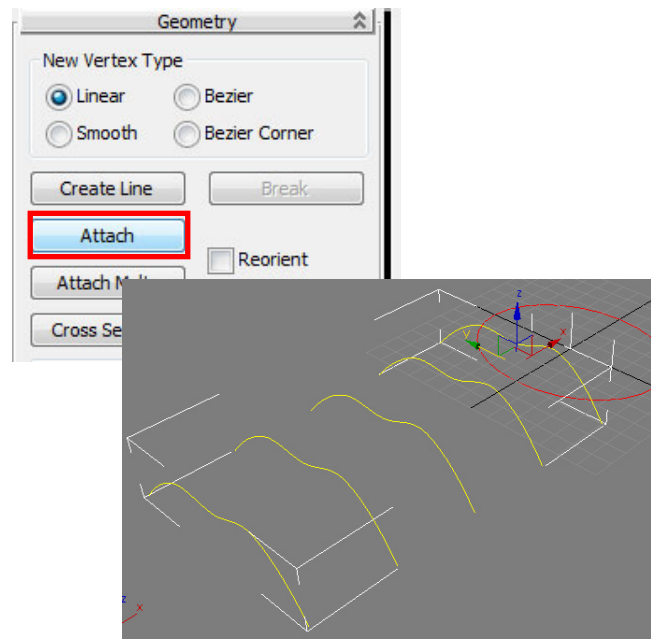
STEP 13: select & delete the original spline _ select anyone of the splines _ command panel / scroll down under geometry _ click on **Attach** _ click on individually on each spline to attach _ press Esc _ re-name the spline to **Base Curve**

Cross Section

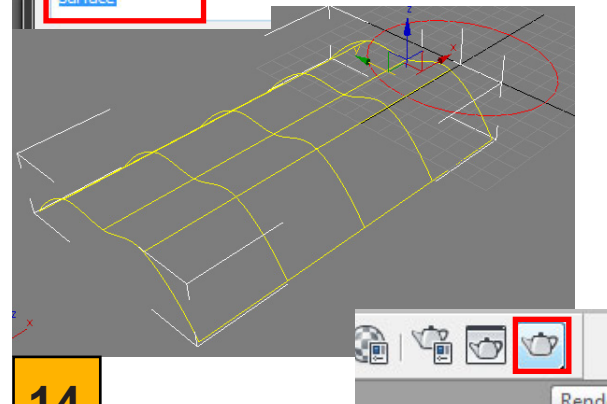
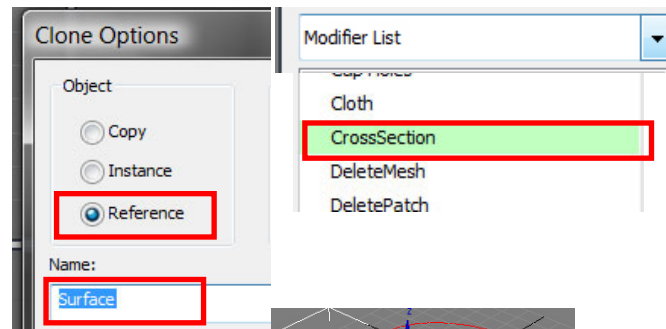
STEP 14: Ctrl + V _ select **Reference** _ re-name it **Surface** _ command panel / modifier list _ select **CrossSection** _ click on the **last teapot** to quick render _ (**notice:** the cross section modifier did not create a 3D renderable surface)

STEP 15: main toolbar / select from scene (Short-cut Key H) _ select **Base Curves** _ from the command panel click on the + to expand line & access the sub-geometry _ **activate Spline** _ from the perspective view select spline #3 _ using the offset mode transform raise the spline 10' _ (a couple of things to **notice:** 1. the Base Curves are driving object with the cross section modifier 2. the cross section is creating straight line segments to connect the splines (corner))

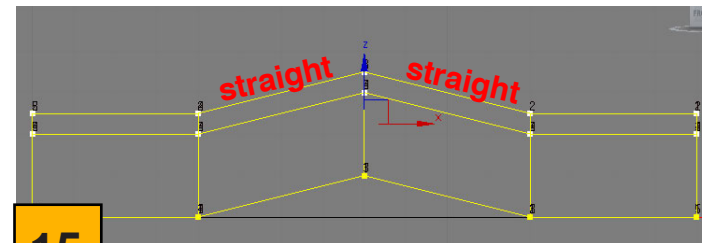
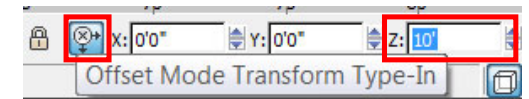
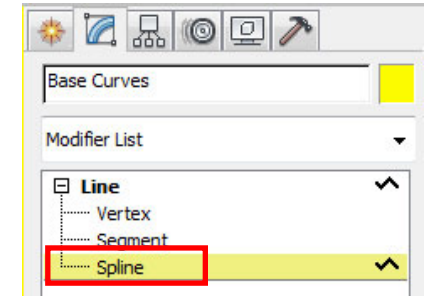
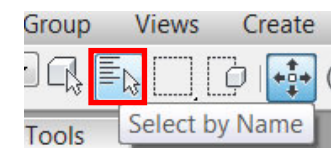
STEP 16: de-activate Spline _ select the object named Surface _ from the command panel under parameters / spline options _ click on **Smooth**



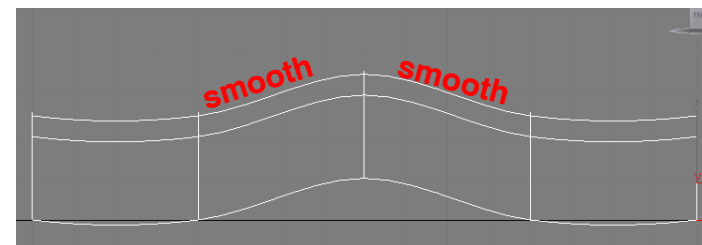
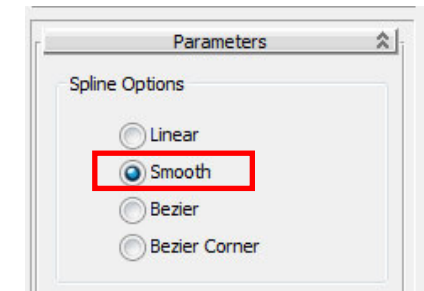
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15



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STEP 17: select the object Base Curves _ expand line _ activate Spline _ (**notice:** sub-object mode keeps the last item selected from previous editing) _ move spline #3 back down 10'

Edit Spline

STEP 18: command panel / modifier list _ select **Edit Spline** _ using the sub-object mode spend some time creating a more dynamic cross section form _ de-activate sub-object mode _ to turn a modifier on & off click on the **Light Bulb** in the modifier stack

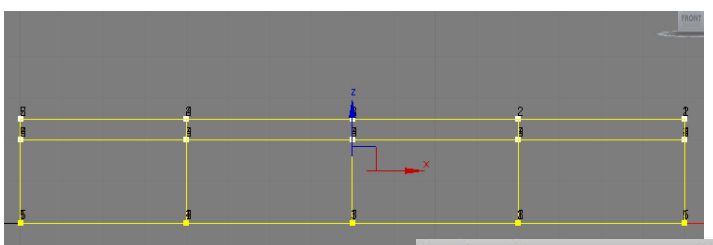
Surface

STEP 19: select the object named Surface _ (**notice:** now we have a 3D renderable surface)

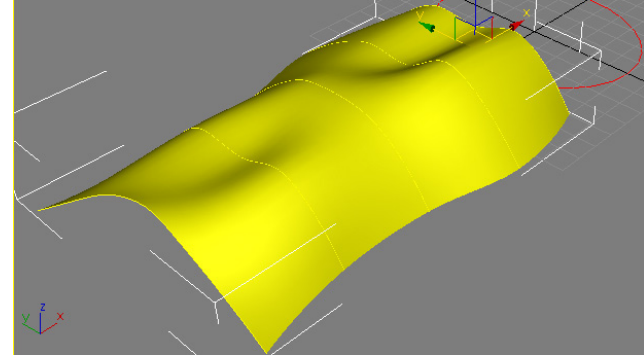
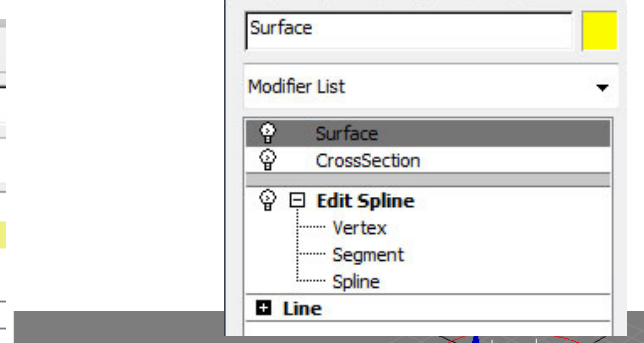
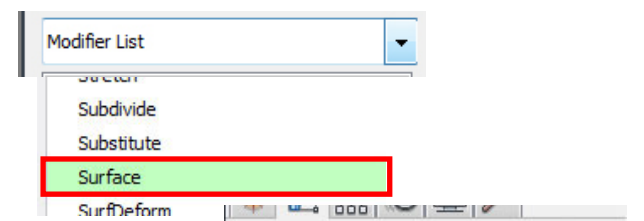
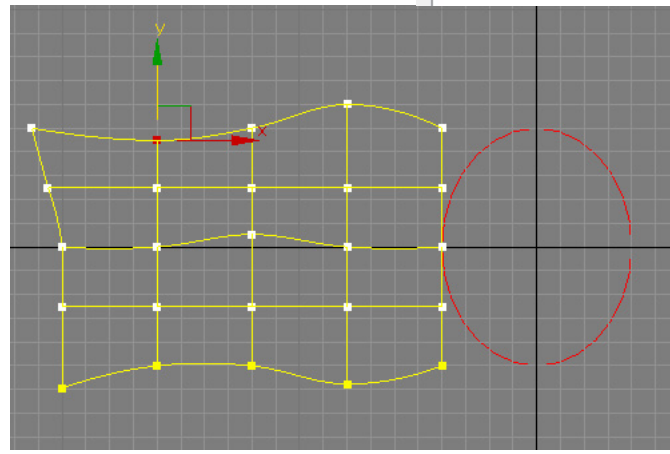
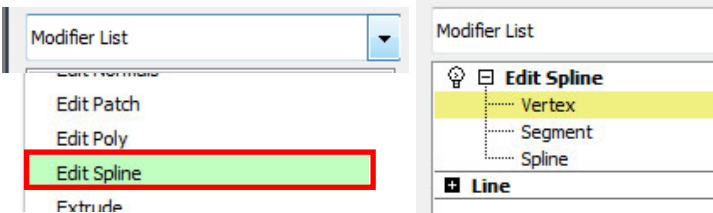
STEP 20: (so everything above the gray reference bar is only effecting the Surface form) _ to continue the direct manipulation we don't need to keep going back to the base curve object _ click on sub-object **Vertex** _ (**notice:** the surface disappeared) _ click on the show **end result** toggle _ you can continue to edit the form _ click on the **Teapot** for a quick render _ **Ctrl +S**

Class Assignment 05:

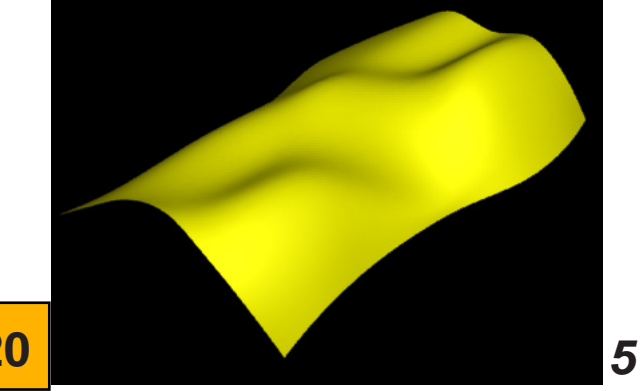
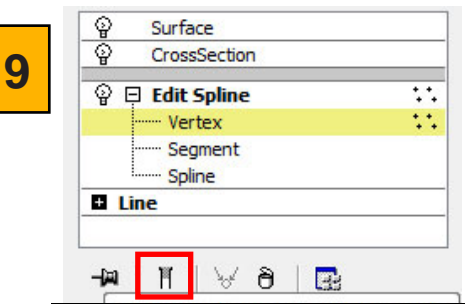
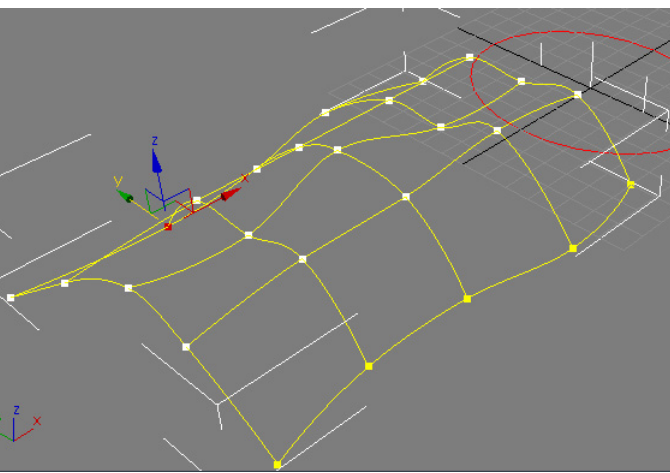
Create plan, elevation, & 3D view jpegs of the Base building form _ Assemble them into one 800 pixels wide X 600 pixels high jpeg with labels _ upload the jpeg to your webpage



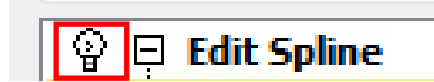
17



19



18



20