### Topics Covered
- Conceptual Mass Family
- Reference Planes
- Reference Lines
- Parameters
- Create Form
- Mass Floors
- Mass Roof
- 3D Section

### Parametric Conceptual Mass Form

**STEP 1:** from the big “R” scroll over New, click on Conceptual Mass.

**STEP 2:** select Mass from the list of templates, click on Open.

**STEP 3:** select the East/West reference plane.

**STEP 4:** hold down Ctrl and drag to make a copy, hold down Shift to keep ortho, copy 3 more reference planes on both sides of the East/West reference plane.

Select & Pin the East/West reference plane.

Create 6 more reference planes.
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STEP 5: from the Ribbon under the home tab click on Show _ select the Level 1 work plane to activate it

STEP 6: type DI (aligned dimension) _ create an EQ EQ dimension as shown in image 6

STEP 7: type DI (aligned dimension) _ create an dimension as shown in image 7

STEP 8: select the Dimension _ from the Options Bar click on the Label pull down menu _ select <Add parameter...>

Name it: Inner Width _ Make it: Type
Group parameter under: Dimensions _ click OK

save the file as:
your initials_parametric_dome.rfa
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STEP 9: type DI (aligned dimension) _ create an EQ EQ dimension as shown in image 9

STEP 10: type DI (aligned dimension) _ create an dimension as shown in image 10

STEP 11: select the Dimension _ from the Options Bar click on the Label pull down menu _ select <Add parameter...>

Name it: Width _ Make it: Type
Group parameter under: Dimensions _ click OK

STEP 12: type DI (aligned dimension) _ create an EQ EQ dimension as shown in image 12
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STEP 13: type DI (aligned dimension) _ create an
dimension as shown in image 13

STEP 14: select the Dimension _ from the
Options Bar click on the Label pull down menu _
select <Add parameter...>

Name it: Outer Width _ Make it: Type
Group parameter under: Dimensions _ click OK

STEP 15: select the North/South reference plane

STEP 16: hold down Ctrl and drag to make a
copy _ hold down Shift to keep ortho _ copy 2
more reference planes on both sides of the North/
South reference plane

select & Pin the North/South reference plane

create 4 more reference planes
Topics Covered
Conceptual Mass Family _ Reference Planes _ Reference Lines _ Parameters _ Create Form _ Mass Floors _ Mass Roof _ 3D Section

STEP 17: set the work plane to Level 1

STEP 18: type DI (aligned dimension) _ create an EQ EQ dimension as shown in image 18

STEP 19: type DI (aligned dimension) _ create an dimension as shown in image 19

STEP 20: select the Dimension _ from the Options Bar click on the Label pull down menu _ select <Add parameter...>

Name it: Inner Length _ Make it: Type
Group parameter under: Dimensions _ click OK
Topics Covered
Conceptual Mass Family _ Reference Planes _ Reference Lines _ Parameters _ Create Form _ Mass Floors _ Mass Roof _ 3D Section

STEP 21: type DI (aligned dimension) _ create an EQ EQ dimension as shown in image 21

STEP 22: type DI (aligned dimension) _ create an dimension as shown in image 19

STEP 23: select the Dimension _ from the Options Bar click on the Label pull down menu _ select <Add parameter...>

Name it: Outer Length _ Make it: Type
Group parameter under: Dimensions _ click OK

STEP 24: set the first North/South reference plane to the Work Plane
Topics Covered
Conceptual Mass Family _ Reference Planes _ Reference Lines _ Parameters _ Create Form _ Mass Floors _ Mass Roof _ 3D Section

STEP 25: using a REFERENCE LINE & a PARTIAL ELLIPSE draw the shape shown in image 25 (height is not important)

STEP 26: set the second North/South reference plane to the Work Plane _ using a REFERENCE line & a partial ellipse draw the shape shown in image 26 (height not important)

STEP 27: set the center North/South reference plane to the Work Plane _ using a REFERENCE line & a partial ellipse draw the shape shown in image 27 (height not important)

STEP 28: set the fourth North/South reference plane to the Work Plane _ using a REFERENCE line & a partial ellipse draw the shape shown in image 28 (height not important)
Topics Covered
Conceptual Mass Family _ Reference Planes _ Reference Lines _ Parameters _ Create Form _ Mass Floors _ Mass Roof _ 3D Section

STEP 29: set the last North/South reference plane to the Work Plane _ using a REFERENCE line & a partial ellipse draw the shape shown in image 29 (height not important)

STEP 30: from the Ribbon click on the Family Types button _ click on Add

STEP 31: Name it: E Cen Height _ Make it: Type Set Type of Parameter to: Length _ Group parameter under: Dimensions _ click OK

STEP 32: Family Types window _ click on Add
Name it: E Mid Height _ Make it: Type Set Type of Parameter to: Length _ Group parameter under: Dimensions _ click OK
Topics Covered
Conceptual Mass Family _ Reference Planes _ Reference Lines _ Parameters _ Create Form _ Mass Floors _ Mass Roof _ 3D Section

STEP 33: click OK in the Family Types window

STEP 34: set the center North/South reference plane to the Work Plane _ type DI (dimension) _ dimension the height of the ellipse

STEP 35: select the height dimension _ from the Ribbon in the Options Bar click on the Label pull down _ select E Cen Height

STEP 36: draw a short Reference Line off to the side at any height as shown in image 36
Topics Covered
Conceptual Mass Family _ Reference Planes _ Reference Lines _ Parameters _ Create Form _ Mass Floors _ Mass Roof _ 3D Section

STEP 37: type DI (aligned dimension) _ create an dimension from Level 1 to the Reference Line as shown in image 37

STEP 38: select the Dimension _ from the Options Bar click on the Label pull down menu _ select <Add parameter...>

Name it: E Cen Height Driver _ Make it: Type
Group parameter under: Dimensions _ click OK

STEP 39: from the Ribbon click on the Family Types button _ set the E Cen Height parameter = E Cen Height Driver _ Click OK

(note: the reference line should now drive the height of the center ellipse _ move the reference line up & down to change the height

STEP 40: set the work plane for the mid height ellipse _ type DI (aligned dimension) _ dimension the height of the mid ellipse as shown in image 40
Topics Covered
Conceptual Mass Family _ Reference Planes _ Reference Lines _ Parameters _ Create Form _ Mass Floors _ Mass Roof _ 3D Section

STEP 41: select the height dimension _ from the Ribbon in the Options Bar click on the Label pull down _ select E Mid Height

STEP 42: draw a short Reference Line off to the side at any height as shown in image 42

STEP 43: type DI (aligned dimension) _ create an dimension from Level 1 to the Reference Line as shown in image 43

STEP 44: select the Dimension _ from the Options Bar click on the Label pull down menu _ select <Add parameter...>

Name it: E Mid Height Driver _ Make it: Type
Group parameter under: Dimensions _ click OK
**Revit - Parametric Form Workshop**

**Professor: Alphonso Peluso**

**Spring 2011**

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**STEP 45:** from the Ribbon click on the *Family Types* button, set the **E Mid Height** parameter = **E Mid Height Driver**, click OK.

**STEP 46:** set the work plane for the end ellipse type *DI* (aligned dimension), dimension the height of the end ellipse as shown in image 46.

**STEP 47:** select the **Dimension** from the Options Bar click on the **Label** pull down menu, select *Add parameter...*

Name it: **E End Height**, Make it: **Type**
Group parameter under: **Dimensions**, click OK.

**STEP 48:** from the Ribbon click on the *Family Types* button, set the **E End Height** parameter = **E Mid Height / 2**, click OK.
Topics Covered
Conceptual Mass Family _ Reference Planes _ Reference Lines _ Parameters _ Create Form _ Mass Floors _ Mass Roof _ 3D Section

STEP 49: dimension the height of the mid ellipse on the opposite side of the center ellipse as shown in image 49

STEP 50: select the height dimension __ from the Ribbon in the Options Bar click on the Label pull down __ select E Mid Height

STEP 51: dimension the height of the end ellipse on the opposite side of the center ellipse as shown in image 51

STEP 52: select the height dimension __ from the Ribbon in the Options Bar click on the Label pull down __ select E End Height

Ctrl + S
Topics Covered
Conceptual Mass Family _ Reference Planes _ Reference Lines _ Parameters _ Create Form _ Mass Floors _ Mass Roof _ 3D Section

STEP 53: use the Ctrl key to select all of the ellipse shapes _ type HI (isolate elements)

STEP 54: from the Ribbon click on Create Form / Solid form

STEP 55: type HR (hide reset) _ adjust the reference planes to create a dome shape as shown in image 55

STEP 56: from the big “R” _ scroll over New _ click on Project
Topics Covered
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Reference Lines _ Parameters _ Create Form _
Mass Floors _ Mass Roof _ 3D Section

STEP 57: in the New Project pop-up window _
click OK

STEP 58: Ctrl + Tab back over to the Mass
Family _ click on: Load Into Project _ click Close
in the Massing pop-up window

STEP 59: from the ribbon click on Place on work
Plane

STEP 60: click Once to place the mass _ press
ESC twice
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Mass Floors _ Mass Roof _ 3D Section

STEP 61: from above the Ribbon click on the “house” to go to a 3D View

STEP 62: select the Mass _ from the ribbon click on Mass Floors _ check Level 1 _ click OK

STEP 63: type SD (shaded view)

STEP 64: from the Ribbon click on the Massing & Site tab _ click on Floor _ select the Mass Floor _ from the Ribbon click on Create Floor
Topics Covered
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STEP 63: from the Ribbon click on Roof / Roof by Face

STEP 64: select the Mass _ from the Ribbon click on Create Roof _ press ESC twice

STEP 65: from the Ribbon click on Show Mass by View Settings

STEP 66: right click in the canvas _ select View Properties from the flyout menu _ from the Properties window Check on Section Box
Topics Covered
Conceptual Mass Family _ Reference Planes _ Reference Lines _ Parameters _ Create Form _ Mass Floors _ Mass Roof _ 3D Section

STEP 67: select the section box _ adjust the handles to create a 3D Section

save the file as:

your_form_project.rvt