

Singapore BIM Buzz 2011

International BIM Competition

BIM Evangelist Team

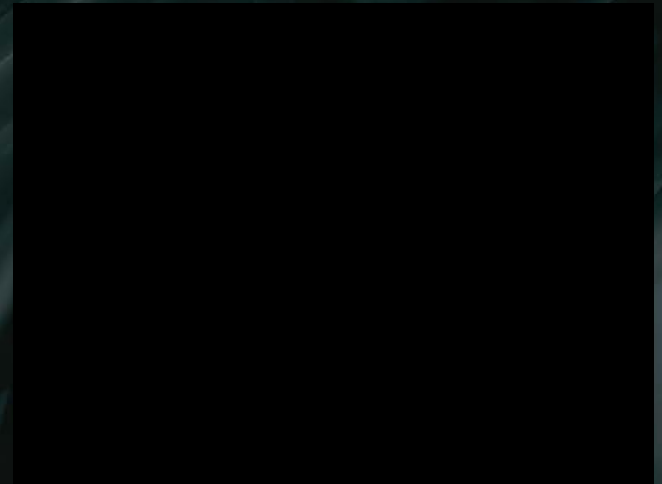
David Fung (Leader)

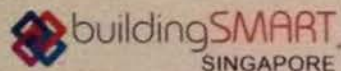
*Erica Lam
Jason Wong
Samantha Hui
Samson Wong
Sam Cho*



BIM Evangelist Team

- 1 *Design Workflow*
- 2 *Organic Parametric Design*
- 3 *Analysis*
- 4 *Co-ordination*
- 5 *Constructability*
- 6 *Quantity Taking and Bills of Quantity*
- 7 *Documentation*
- 8 *Automated Statutory Submission*
- 9 *Facility Management*





BCA ACADEMY
OF THE BUILT ENVIRONMENT

BIM BUZZ@Singapore 2011 Competition

8-10 September 2011

This certificate is awarded to

BIM EVANGELIST

(Hong Kong)

SPECIAL MENTION FOR OUTSTANDING BIM DESIGN

(Professional Category)

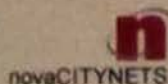
MR WILLIAM LAU

President, buildingSMART Singapore

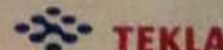
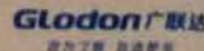
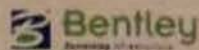
MR BENEDICT TAN

Managing Director, BCA Academy

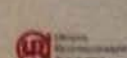
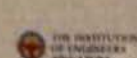
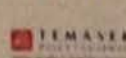
SPONSORED BY:



Autodesk



SUPPORTED BY:



1 Design Workflow

Design workflow from Architectural to Structural then MEP. BIM design information gravitate to form construction information and eventually recyclable FM information.

BIM - INFORMATION FLOW

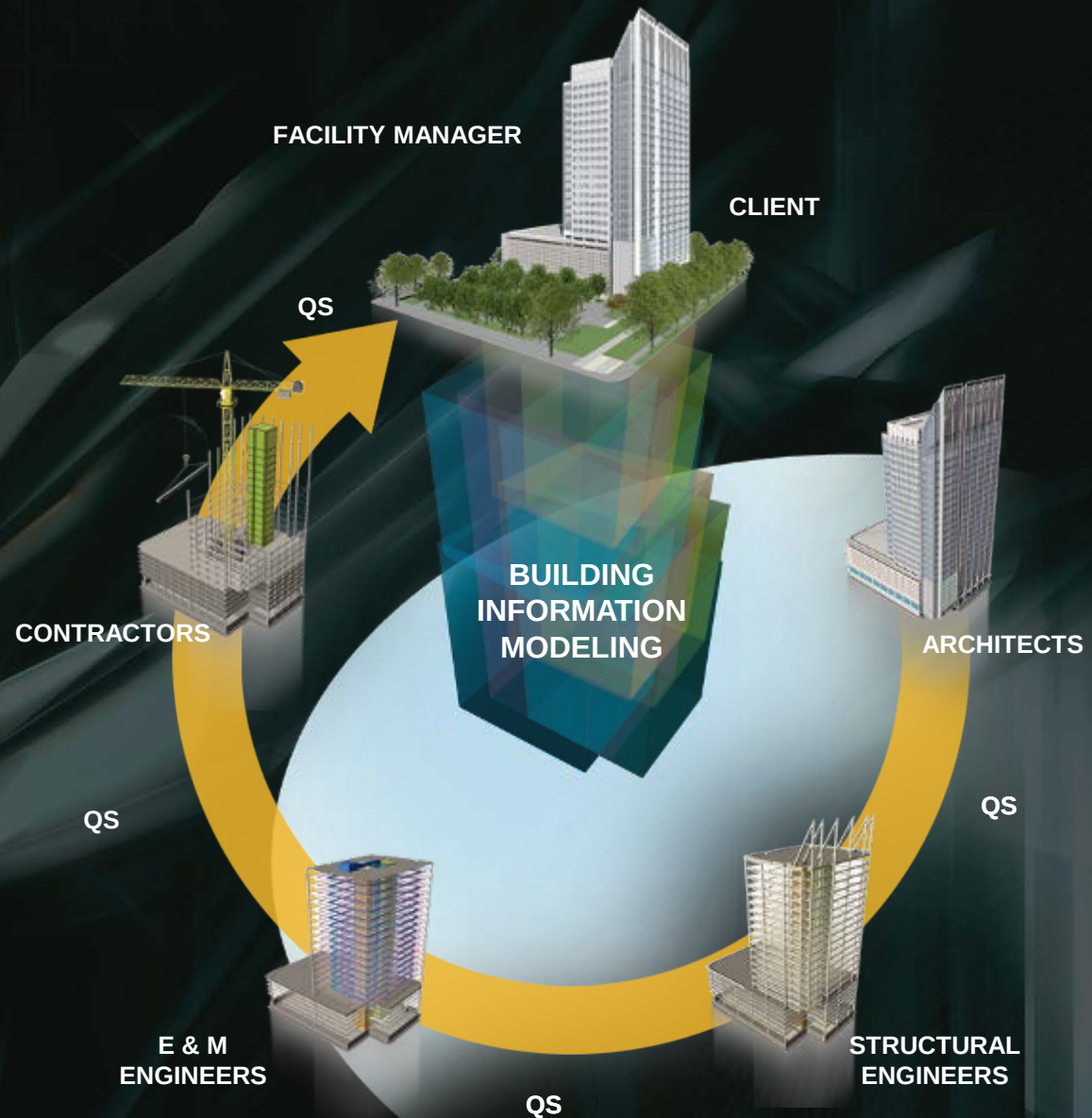
Graphical Data
(model)

+

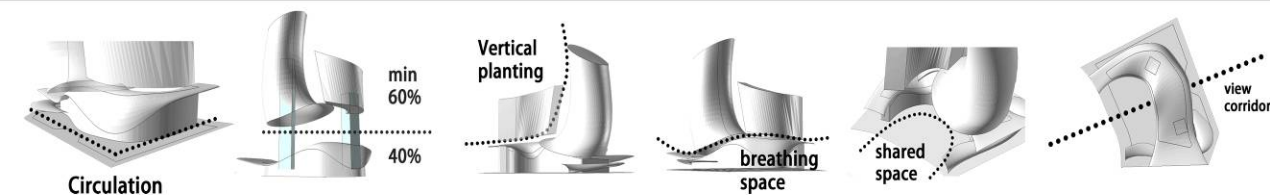
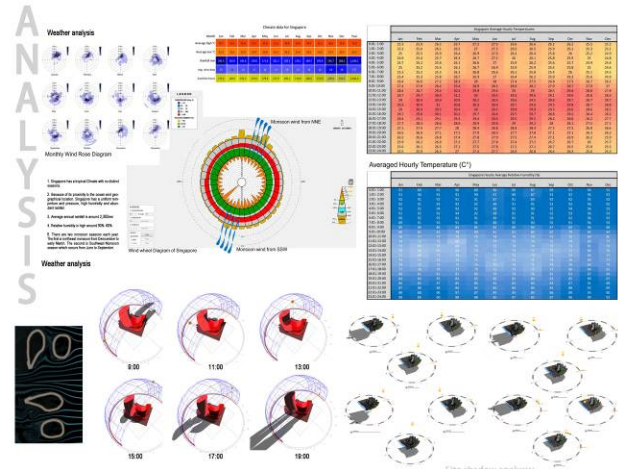
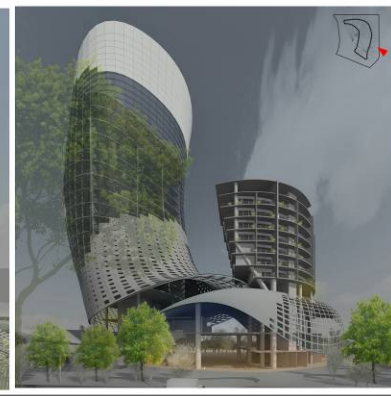
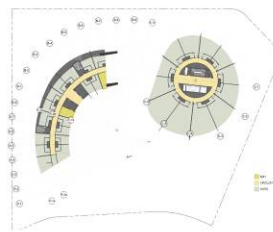
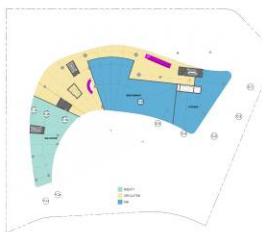
Non-Graphical
Data
(Information)

+

New workflow

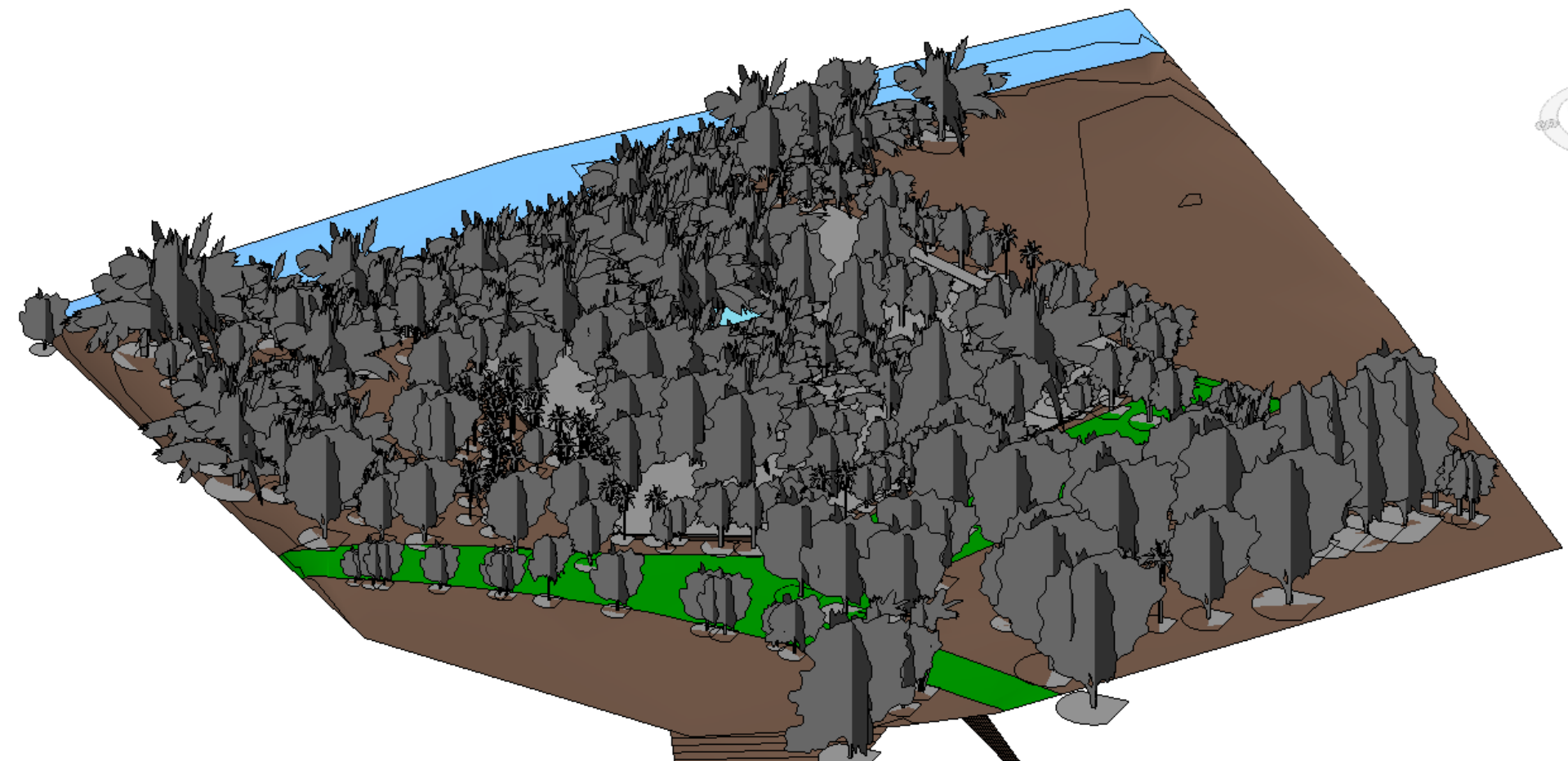


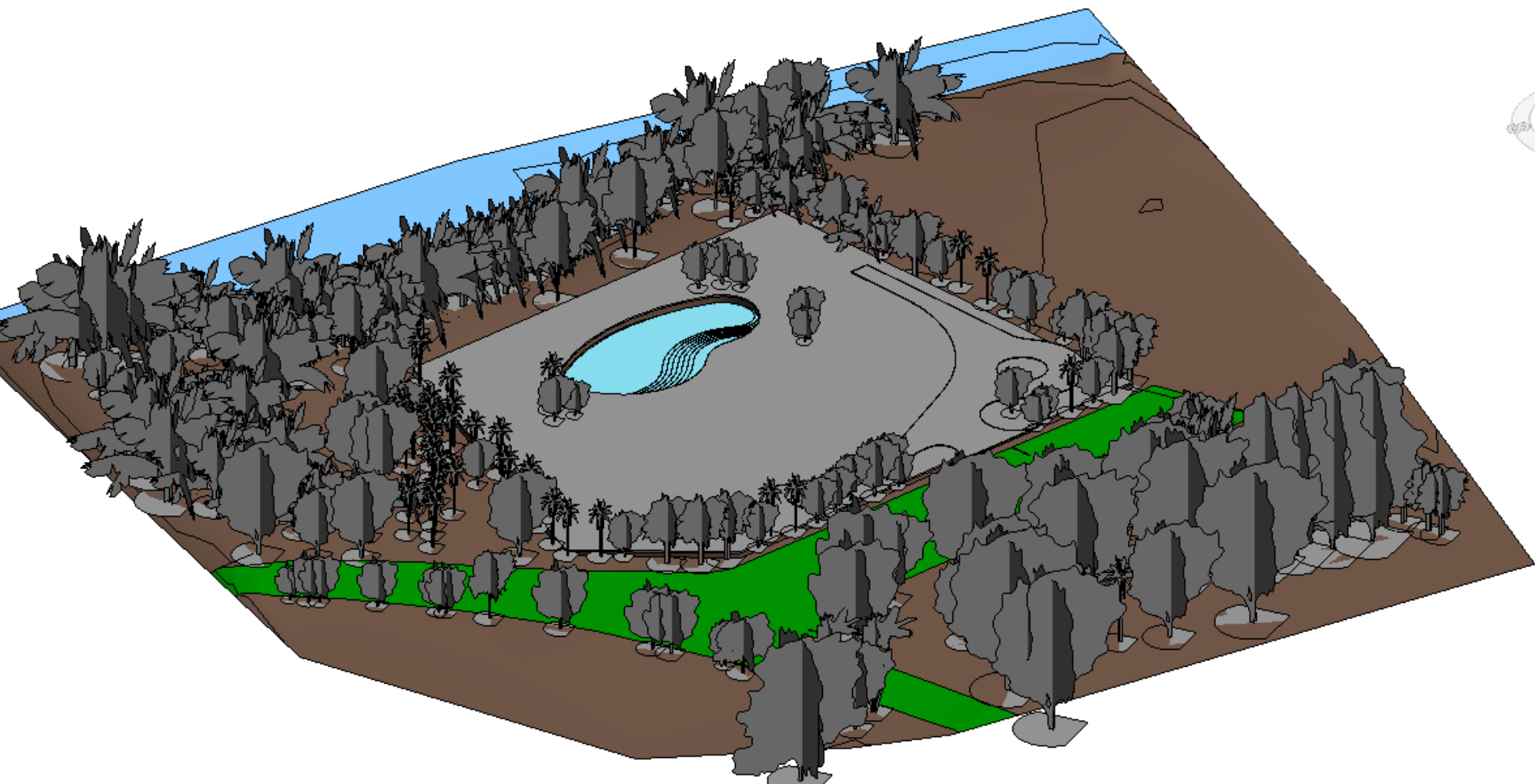
David Fung (Leader) Erica Lam Jason Wong Samantha Hui Samson Wong Sam Cho Wu Ling Xiao Ping

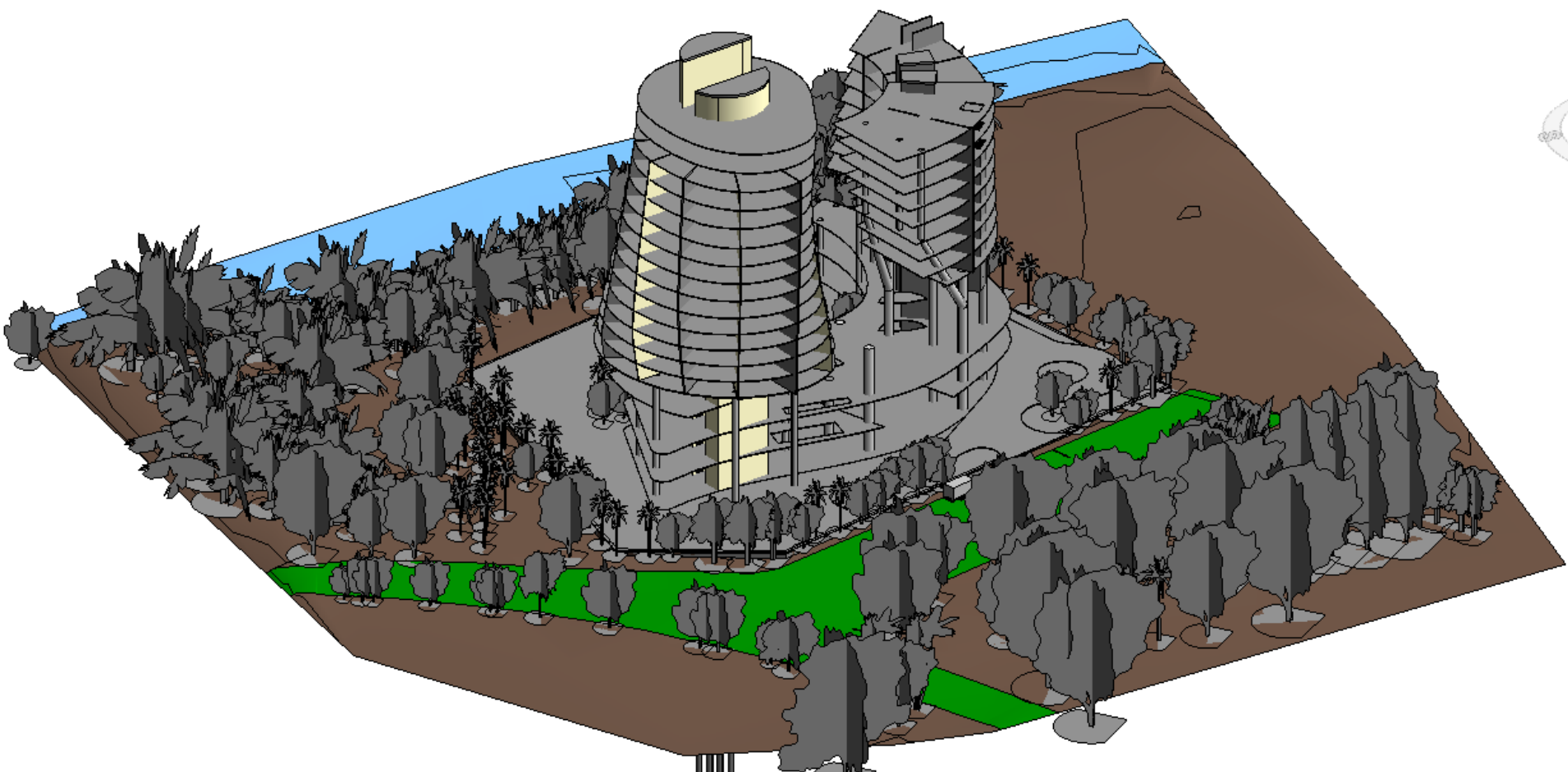


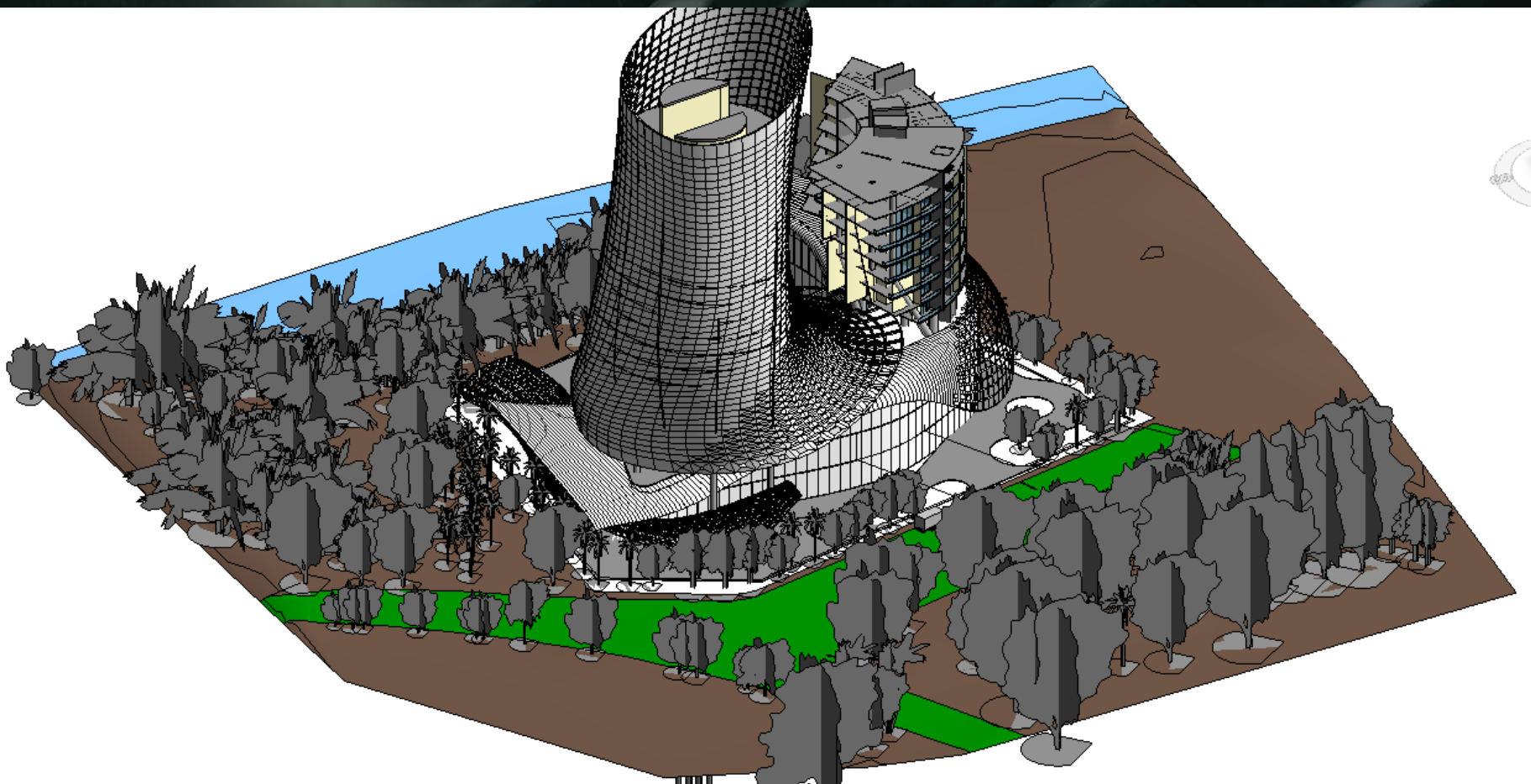
2 Organic Parametric Design

Parametric Design empowers repetitive exploring, testing and perfecting of design. BIM unconstrained the limit of design and bridges to reality.











DESIGN

RHINO



PANELIZATION

GRASSHOPPER



EXPORT

DATABASE

REVIT API/ EXCEL



IMPORT

RATIONALIZATION

REVIT API



BIM RECREATION

REVIT



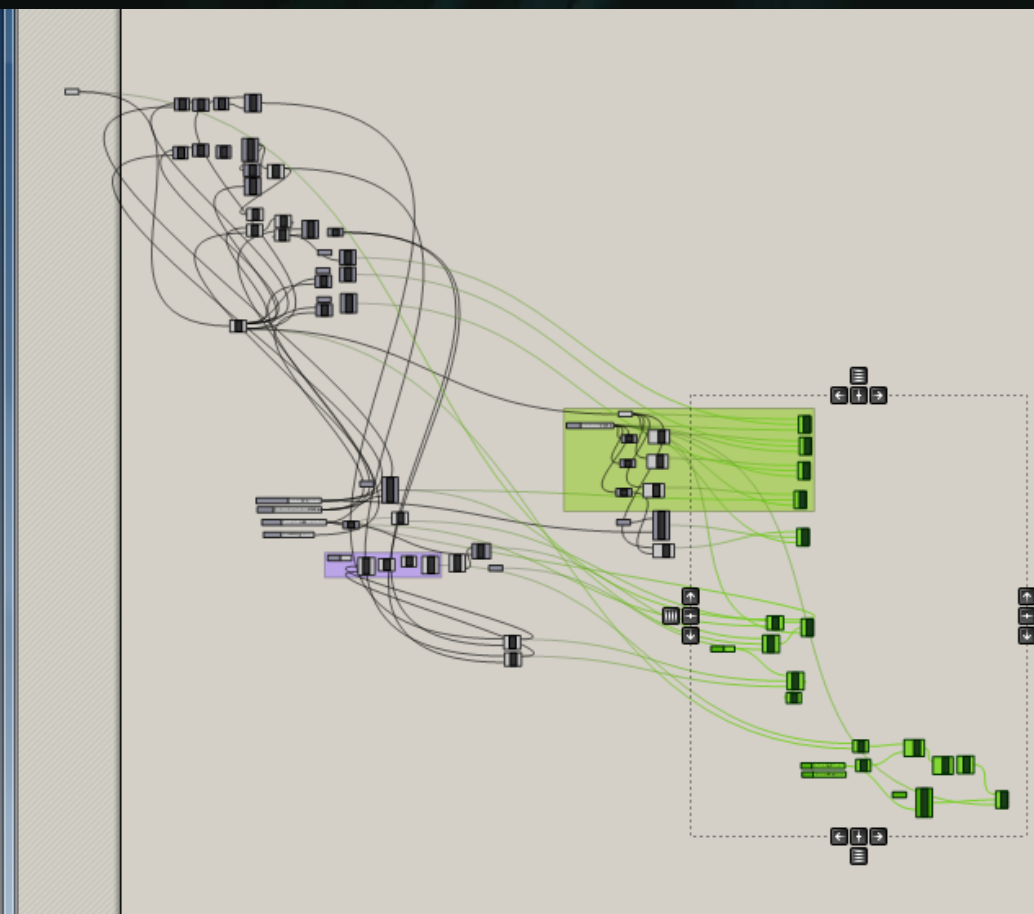
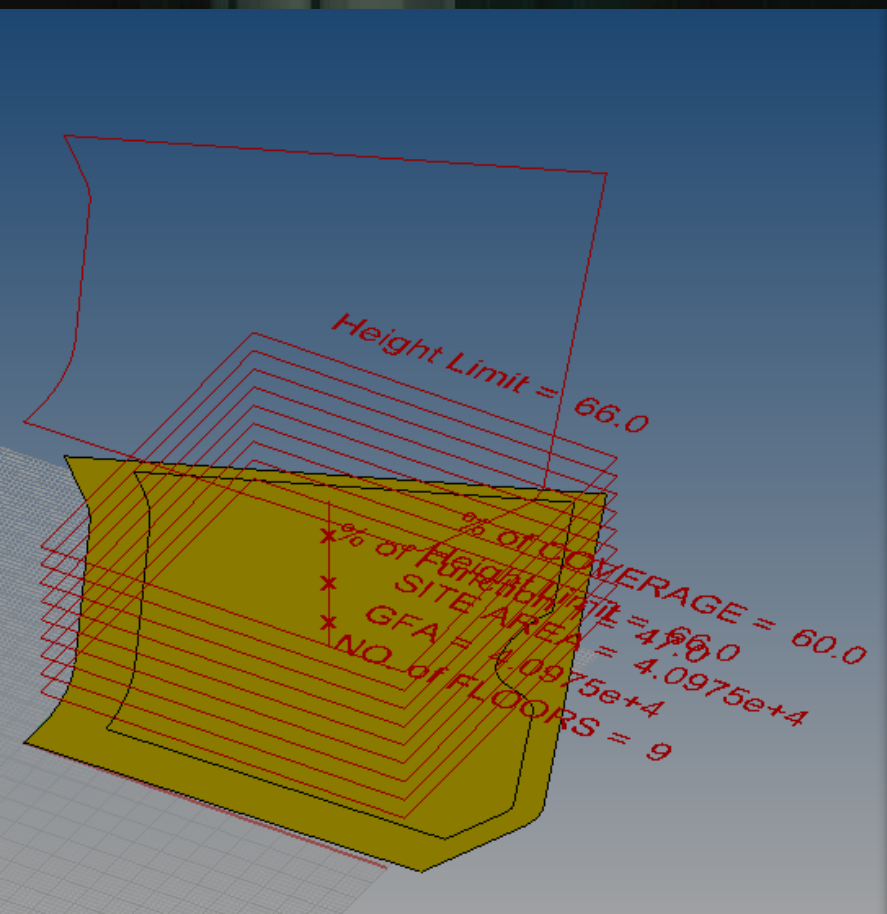
DOCUMENTATION

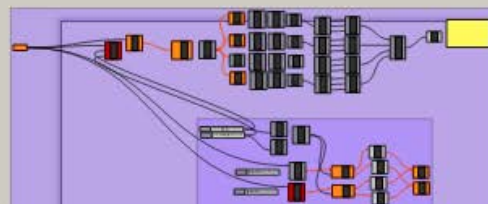
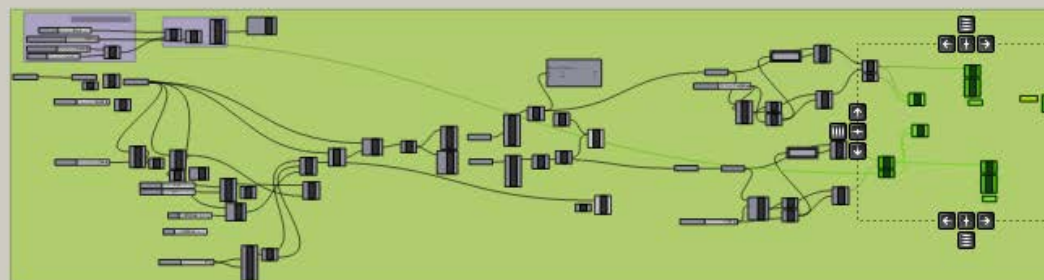
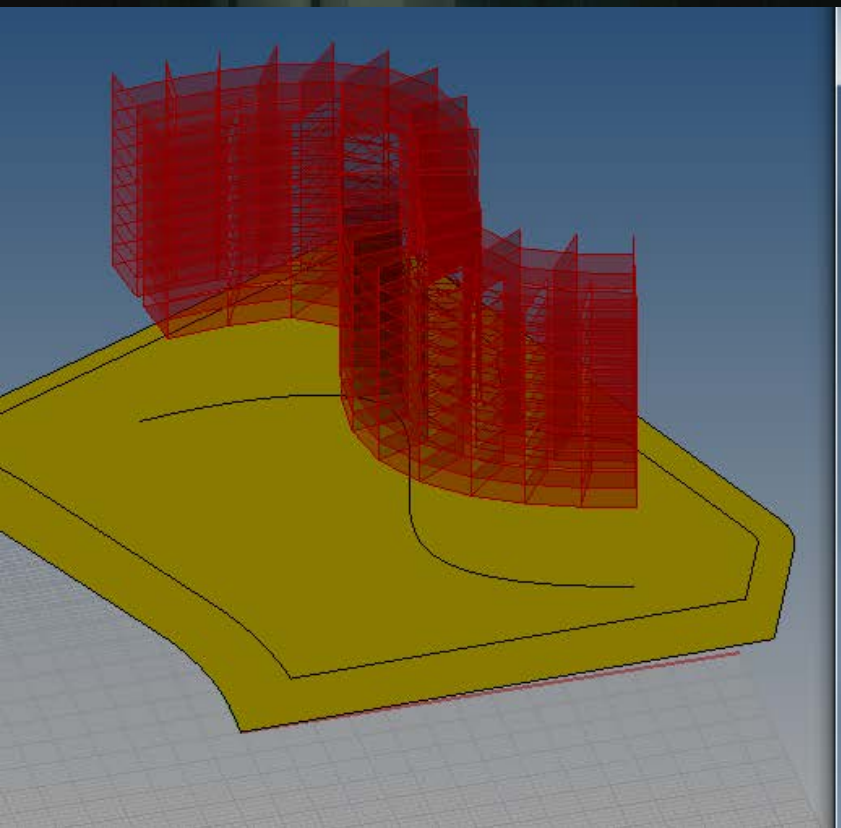
REVIT

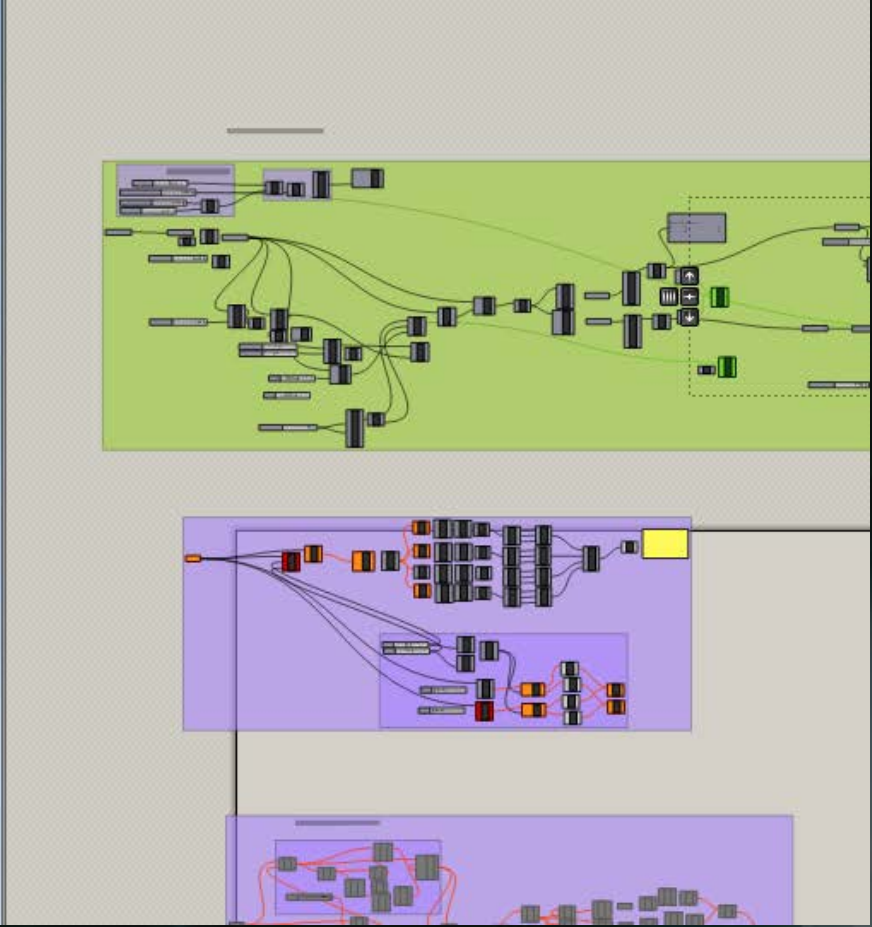
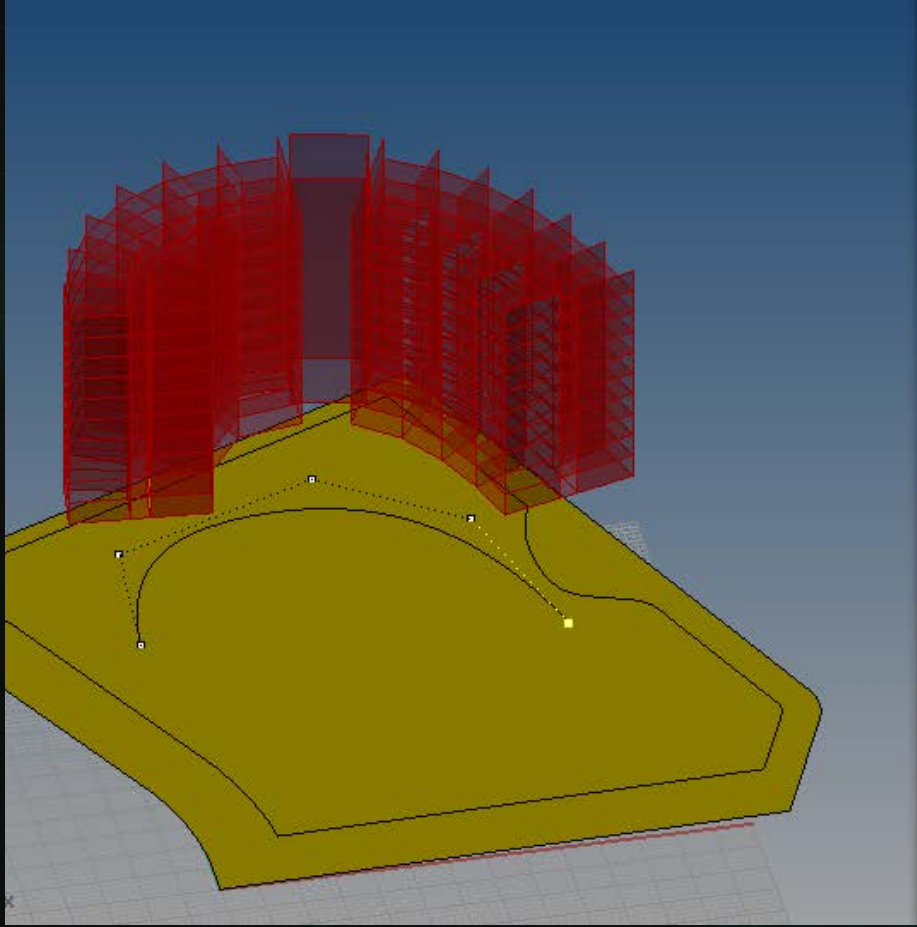


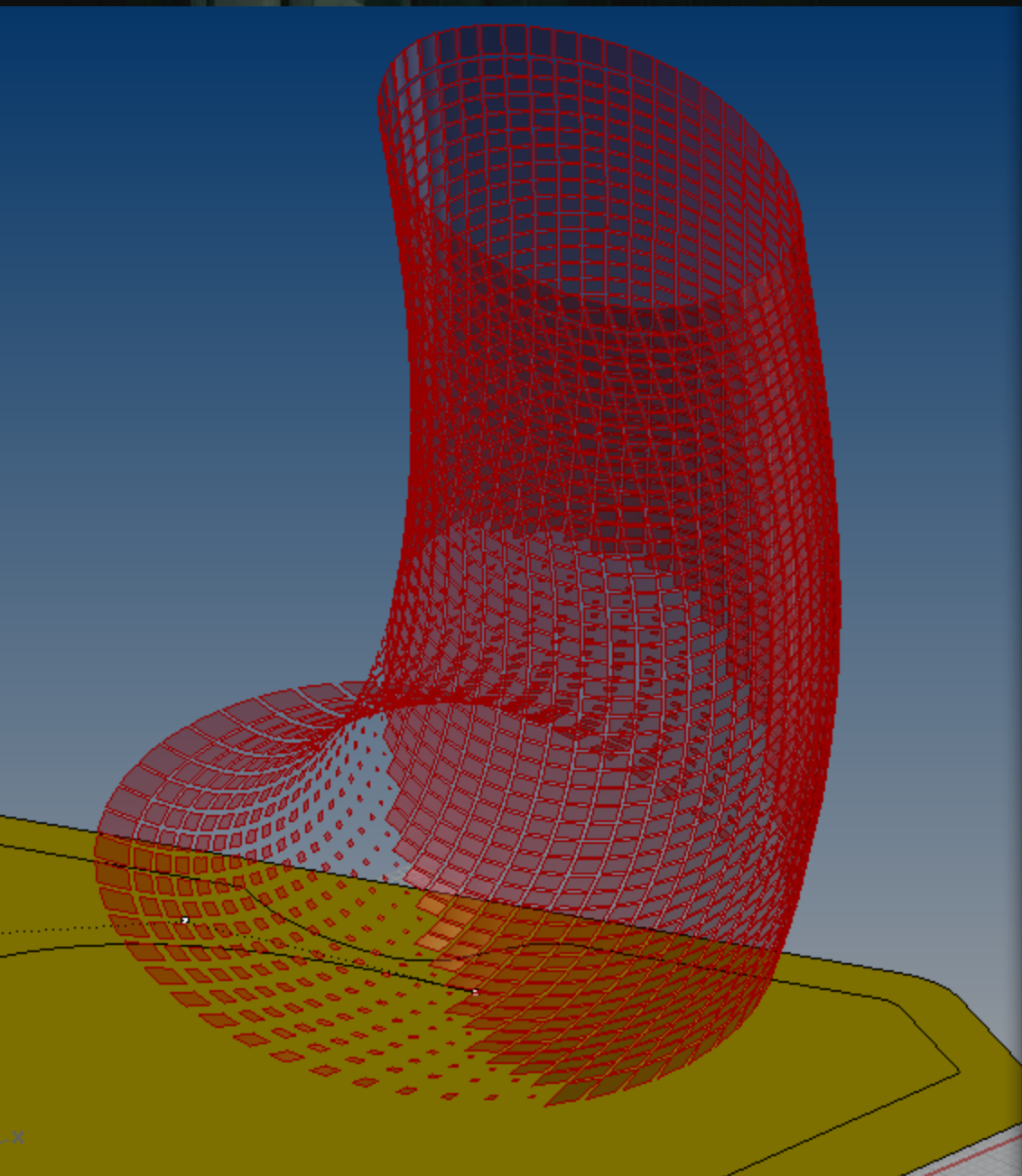
TENDER

MANUF/CONSTRUCTION









File Edit View Arrange Solution Window Help

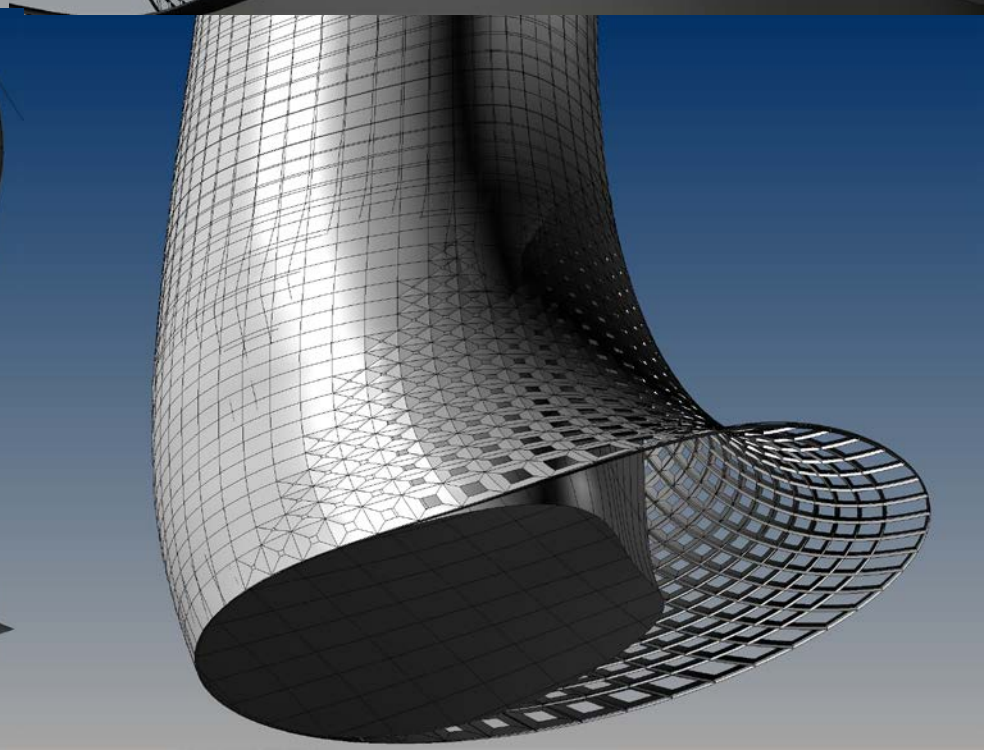
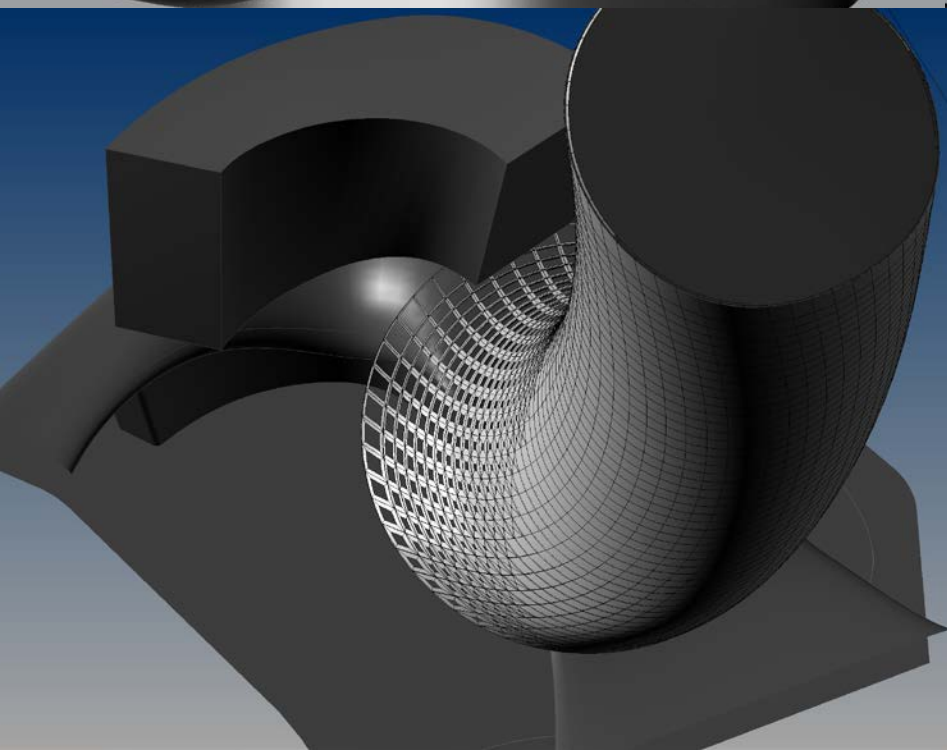
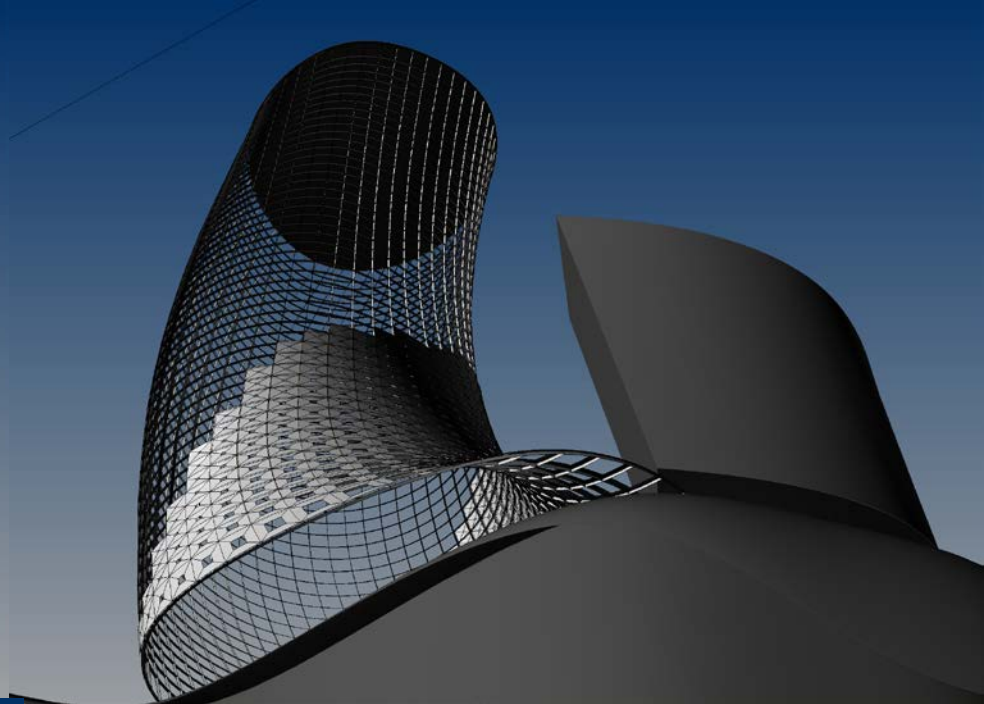
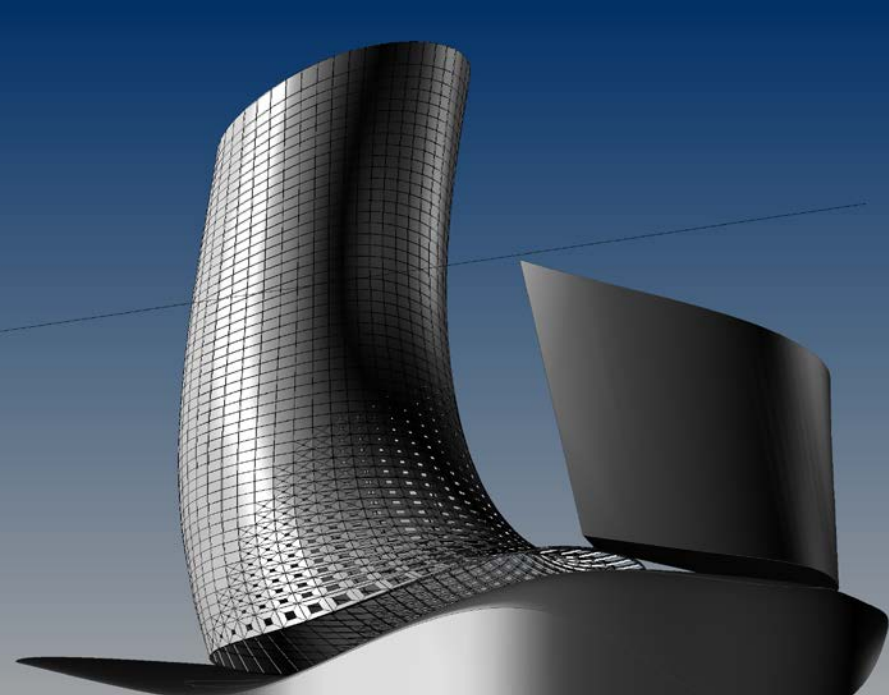
Params Math Sets Vector Curve Surface Mesh

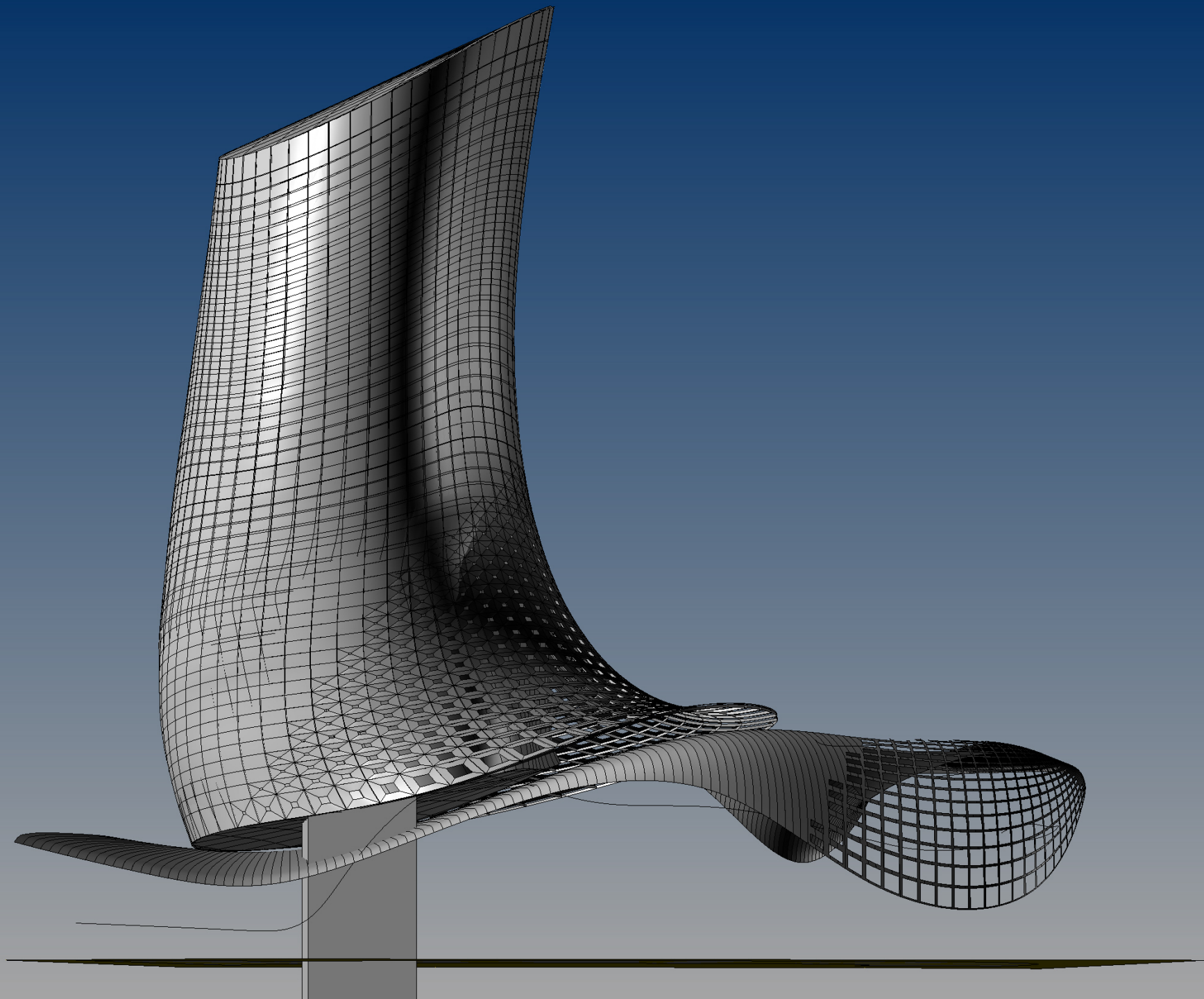
Geometry Primitive

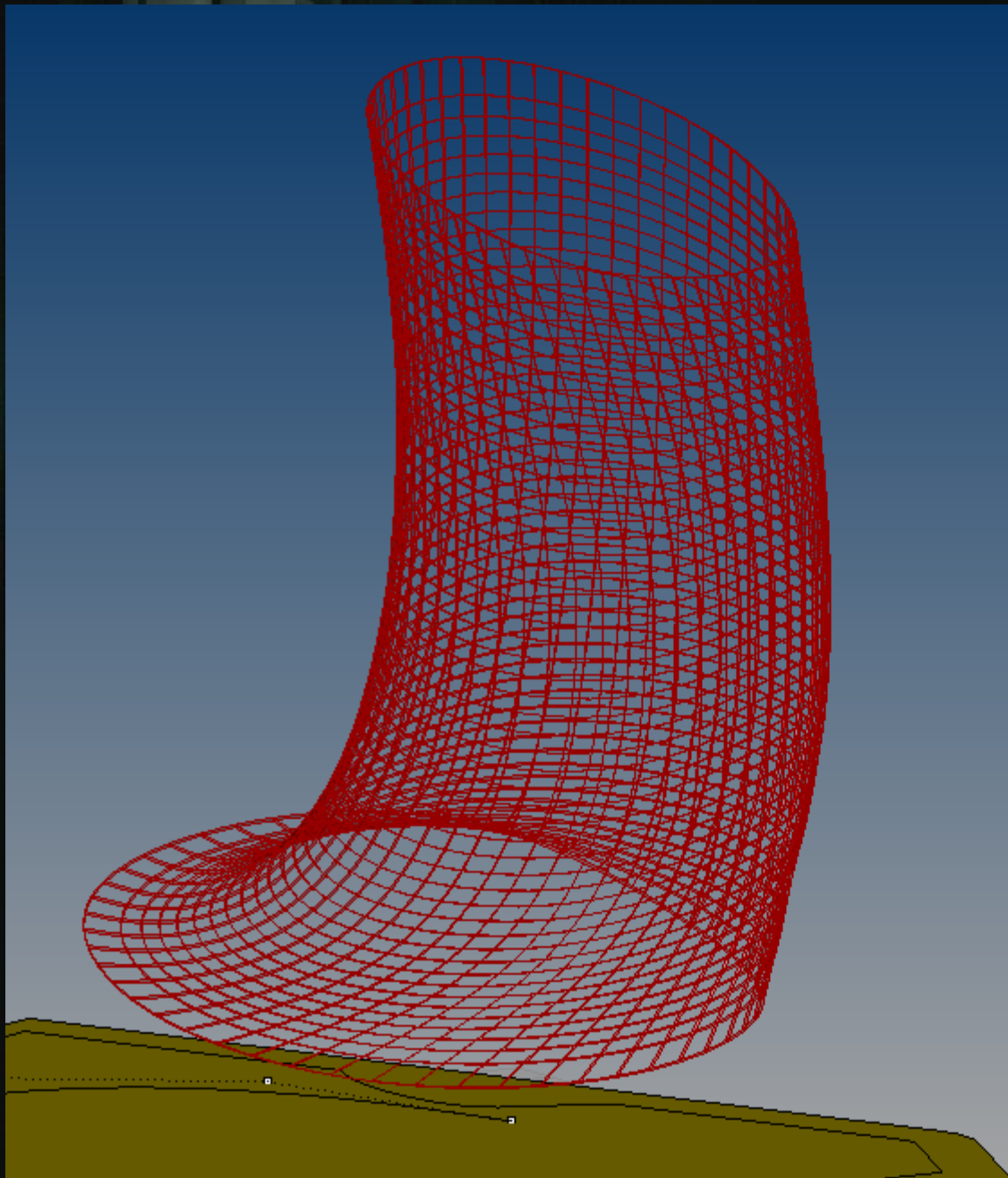
21%

Solution completed in ~24.9 seconds (140 seconds ago)

The screenshot shows a software interface with a 3D model on the left and a complex node-based diagram on the right. The 3D model is a red mesh surface over a yellow base. The node-based diagram is a complex network of interconnected nodes and lines, with a purple background. The interface includes a menu bar at the top with options like File, Edit, View, Arrange, Solution, Window, and Help. Below the menu bar is a toolbar with various icons for geometry, primitive, and other functions. The bottom status bar indicates that the solution was completed in approximately 24.9 seconds, 140 seconds ago.







File Edit View Arrange Solution Window

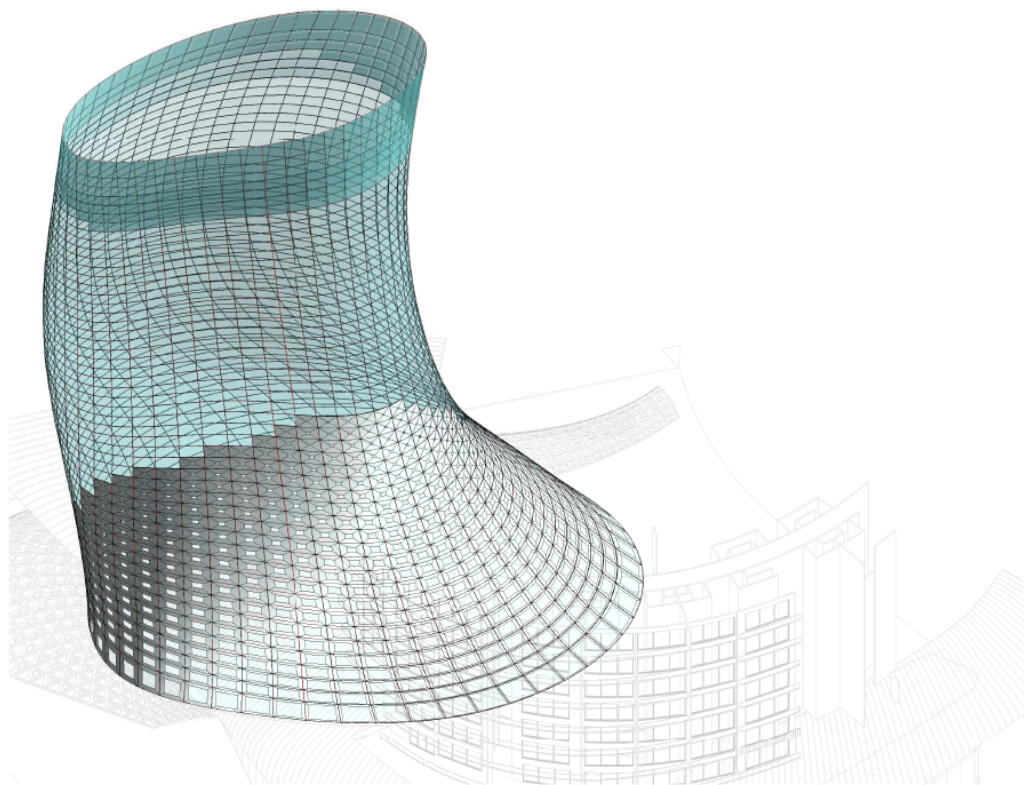
Params Math Sets Vector Curve Surface

Geometry Primitive

64%

Solution completed in ~24.9 seconds (250 seconds ago)

The interface displays a 3D view on the left and a node-based workflow graph on the right. The graph is set against a purple grid background. It includes various nodes such as 'Cull', 'Edges', 'Join', 'ReMap', 'Scale', and 'A+B'. The nodes are interconnected with lines, representing a complex data flow or geometry construction process. The 'Cull' nodes are used to filter out unwanted geometry, while the 'Edges' nodes likely define the mesh's boundaries. The 'Join' nodes combine different parts of the mesh. The 'ReMap' node is used for remapping textures or coordinates. The 'Scale' node adjusts the size of the geometry. The 'A+B' node represents a vector addition operation. The workflow starts from the left and moves towards the right, ending with a 'D' node. The interface also features a menu bar at the top with options like 'File', 'Edit', 'View', 'Arrange', 'Solution', and 'Window'. Below the menu bar are tabs for 'Params', 'Math', 'Sets', 'Vector', 'Curve', and 'Surface'. A toolbar below the tabs contains icons for various geometric operations. A status bar at the bottom indicates that the solution was completed in approximately 24.9 seconds, 250 seconds ago.



① TOWER FACADE

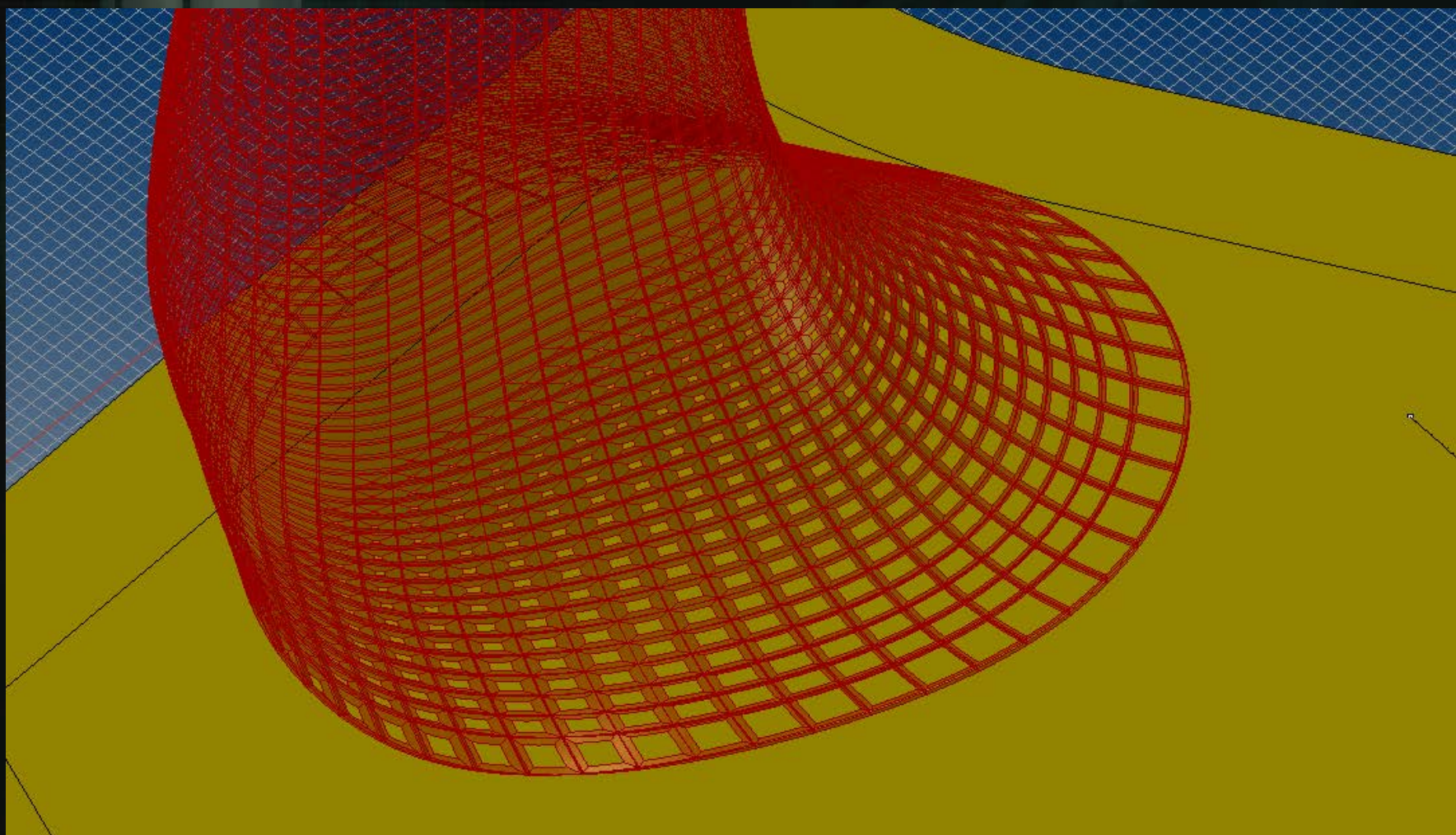
BIM EVANGELIST

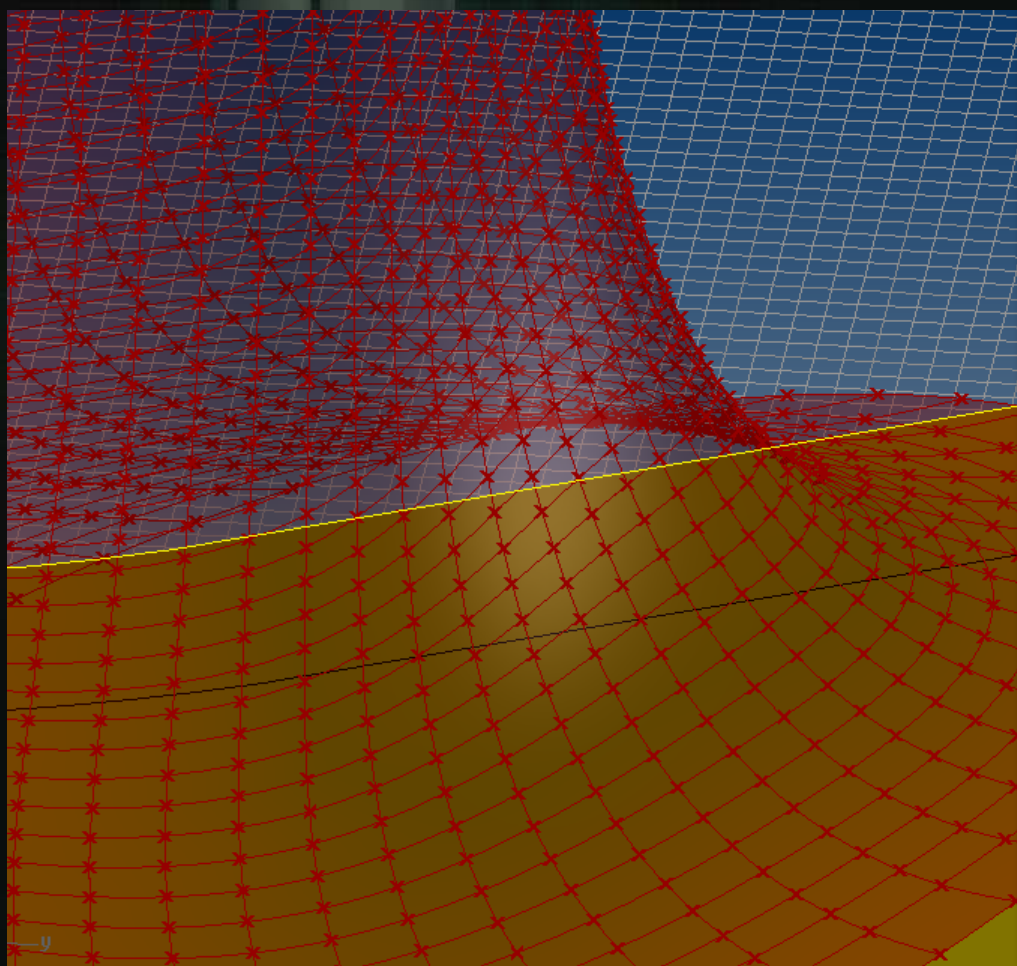


PROJECT NAME **KALLANG RIVERSIDE
HOTEL DEVELOPMENT**

DRAWING TITLE **TOWER ON
PANELISATION**

FILE Project Name		SCALE @ A1	
DRAWN Author	CHECK Checker	DATE 10_SEPT.2011	REVISION
DRAWING NO. BIM_A101			





Params Math Sets Vector Curve Surface Mesh Intersect Transform

Geometry Primitive Special

125%

(0)

```

point0, 61020.017, 44981.376, 85776.932, point01, 60741.499,
0 44511.051, 83120.315, point02, 58698.728, 45308.790,
83736.844, point03, 58989.108, 45819.827, 86451.051
point0, 58989.108, 45819.827, 86451.051, point01, 58698.728,
1 45308.790, 83736.844, point02, 56610.633, 45988.468,
84250.442, point03, 56906.455, 46527.415, 87029.756
point0, 56906.455, 46527.415, 87029.756, point01, 56610.633,
2 45988.468, 84250.442, point02, 54493.430, 46510.217,
84658.256, point03, 54787.256, 47068.069, 87507.497
point0, 54787.256, 47068.069, 87507.497, point01, 54493.430,
3 46510.217, 84658.256, point02, 52363.338, 46834.165,
84957.434, point03, 52646.712, 47405.714, 87878.722
point0, 52646.712, 47405.714, 87878.722, point01, 52363.338,
4 46834.165, 84957.434, point02, 50236.572, 46920.442,
85145.122, point03, 50500.019, 47504.278, 88137.881
point0, 50500.019, 47504.278, 88137.881, point01, 50236.572,
5 46920.442, 85145.122, point02, 48129.351, 46729.178,
85218.467, point03, 48362.378, 47327.686, 88279.424
point0, 48362.378, 47327.686, 88279.424, point01, 48129.351,
6 46729.178, 85218.467, point02, 46059.347, 46225.662,

```

0.8.0050

```

        {
            case 'x':
                p[index].x = System.Convert.ToDouble(para.AsValueString());
                break;
            case 'y':
                p[index].y = System.Convert.ToDouble(para.AsValueString());
                break;
            case 'z':
                p[index].z = System.Convert.ToDouble(para.AsValueString());
                break;
            default:
                MessageBox.Show("Wrong format of parameter name");
                break;
        }
    }
}

CladdingPanel cl = new CladdingPanel(p, PanelCounter); // new panel created from list of points.
double Area_m2 = cl.PanelArea / 1000000; // division by 1000000 to get area in m2 from mm2

//current family type parameter is updated with value of Area_m2 ;
document.BeginTransaction();
if( symbol.ParametersMap["Area"].Set(Area_m2) == false )
{
    MessageBox.Show("Wrong parameter type");
}
document.EndTransaction();

ArrayOfPanels.Add(cl); // new panel inserted into the array of panels

output += cl.UniqueNumber + " " + Area_m2 + " " + cl.T_edge[0] + " " + cl.T_edge[1] + " " + cl.T_edge[2] + " " + cl.T_edge[3]

// creating panel objects in space
document.BeginTransaction();
FamilyInstance instance = document.Create.NewFamilyInstance(location, symbol, StructuralType.NonStructural);
document.EndTransaction();
}
//MessageBox.Show(output);

```

```

    {
        if
        (
            Math.Abs(nextPanel.G_edge[0] - G_edge[0]) <= tolerance
            &&
            Math.Abs(nextPanel.G_edge[1] - G_edge[1]) <= tolerance
            &&
            Math.Abs(nextPanel.G_edge[2] - G_edge[2]) <= tolerance
            &&
            Math.Abs(nextPanel.G_edge[3] - G_edge[3]) <= tolerance
            &&
            Math.Abs(nextPanel.G_diagonal_1 - G_diagonal_1) <= tolerance * Math.Sqrt(2)
        )
        { return true; }
        else
        { return false; }
    }

}

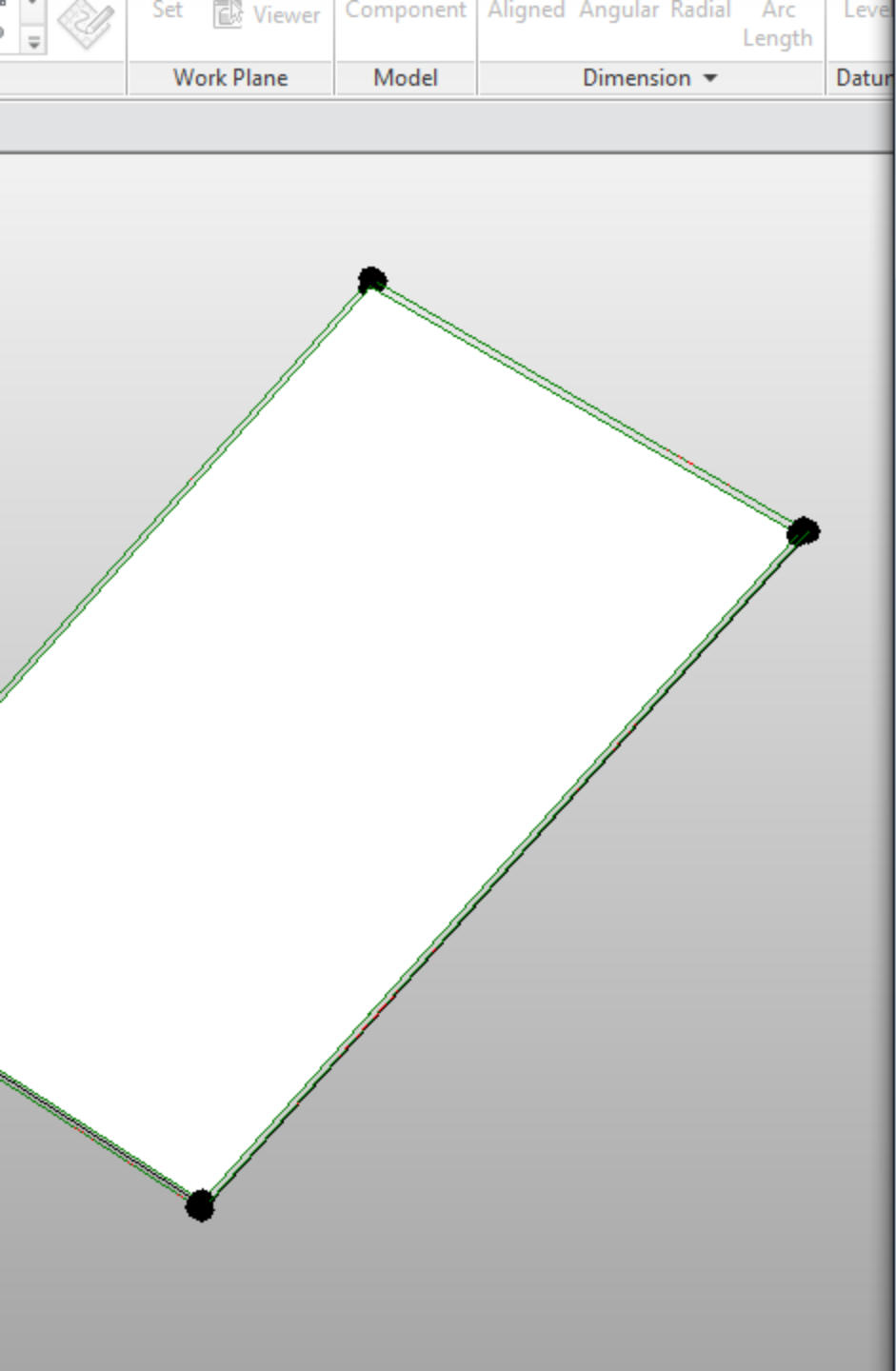
#endregion

public class Group
{
    public int GroupNumber;
    public double[] Edge; //array of lengths of groups's edges.
    public double Diagonal; //length of group's diagonal.
    public double Area; //area of a grouped panel;
}

double toFeet(double value) //conversion of linear sizes for family instances
{
    return value * FACTOR_MMtoFT;
}

double toSqFeet(double value) //conversion of areal sizes for family instances
{

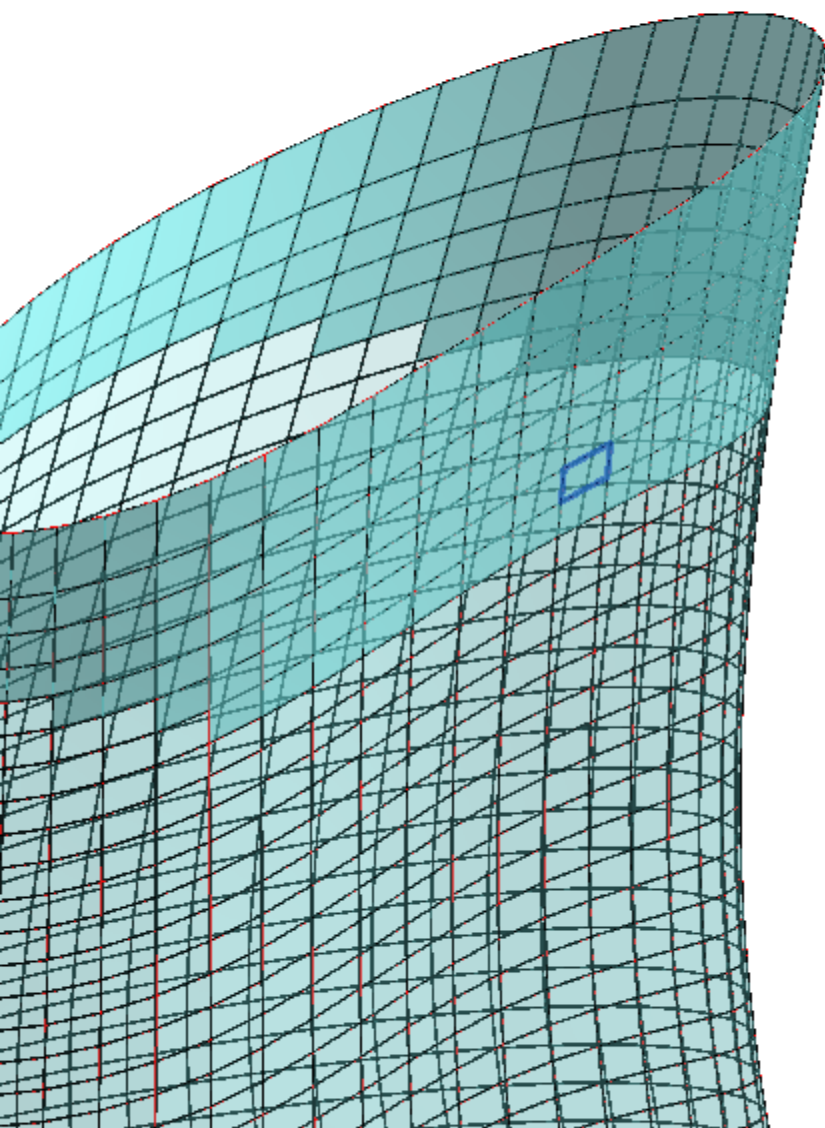
```



Parameter	Value	Formula
Construction		
Thickness Positive (default)	20.000	=
Thickness Negative (default)	0.000	=
Graphics		
Real Gap_Edge 4_p4 (default)	30.000	=
Real Gap_Edge 4_p1 (default)	30.000	=
Real Gap_Edge 3_p2 (default)	30.000	=
Real Gap_Edge 3_p1 (default)	30.000	=
Real Gap_Edge 2_p3 (default)	30.000	=
Real Gap_Edge 2_p2 (default)	30.000	=
Real Gap_Edge 1_p4 (default)	30.000	=
Real Gap_Edge 1_p3 (default)	30.000	=
Offset_Edge 4_p4 (default)	15.018	= (Real Gap_Edge 4_p4 / 2) / cos(90° - Ar
Offset_Edge 4_p1 (default)	15.046	= (Real Gap_Edge 4_p1 / 2) / cos(90° - Ar
Offset_Edge 3_p2 (default)	15.026	= (Real Gap_Edge 3_p2 / 2) / cos(90° - Ar
Offset_Edge 3_p1 (default)	15.046	= (Real Gap_Edge 3_p1 / 2) / cos(90° - Ar
Offset_Edge 2_p3 (default)	15.006	= (Real Gap_Edge 2_p3 / 2) / cos(90° - Ar
Offset_Edge 2_p2 (default)	15.026	= (Real Gap_Edge 2_p2 / 2) / cos(90° - Ar
Offset_Edge 1_p4 (default)	15.018	= (Real Gap_Edge 1_p4 / 2) / cos(90° - Ar
Offset_Edge 1_p3 (default)	15.006	= (Real Gap_Edge 1_p3 / 2) / cos(90° - Ar
Angle 4 (default)	87.206°	= acos(((L14) ^ 2 + (L34) ^ 2 - (D13) ^ 2)
Angle 3 (default)	91.647°	= acos(((L23) ^ 2 + (L34) ^ 2 - (D24) ^ 2)
Angle 2 (default)	86.659°	= acos(((L23) ^ 2 + (L12) ^ 2 - (D13) ^ 2)
Angle 1 (default)	94.457°	= acos(((L12) ^ 2 + (L14) ^ 2 - (D24) ^ 2)
Text		
Panel Type		=
Materials and Finishes		
Material	Aluminium	=
Dimensions		
P04z	19271.305	=
P04y	217643.627	=
P04x	127470.774	=
P03z	19039.194	=
P03y	216749.299	=
P03x	128408.865	=
P02z	17907.163	=
P02y	215837.201	=

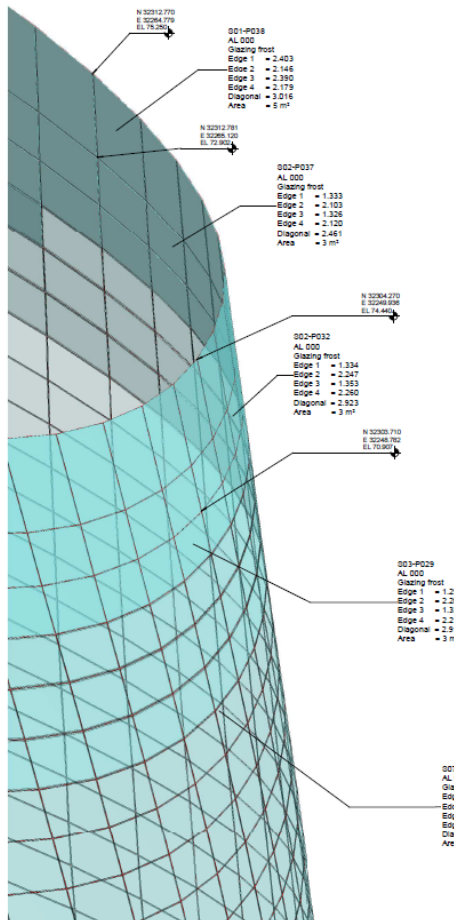


M_Evangelist_PANEL.rvt



Schedule: Mass Schedule - BIM_Evangelist_PANEL.rvt

Panel Type	Material	P01x	P01y	P01z	P02x	P02y
S11-P012	Glazing b	38.549	38.445	68.734	38.475	38.163
S11-P013	Glazing b	37.437	36.678	68.131	37.386	36.384
S11-P014	Glazing b	36.591	34.799	67.485	36.564	34.495
S11-P015	Glazing b	36.028	32.845	66.808	36.025	32.534
S11-P016	Glazing b	35.747	30.849	66.111	35.771	30.532
S11-P017	Glazing b	35.749	28.844	65.409	35.799	28.524
S11-P018	Glazing b	36.034	26.862	64.714	36.111	26.542
S11-P019	Glazing b	36.602	24.936	64.041	36.705	24.618
S11-P020	Glazing b	37.452	23.098	63.402	37.580	22.786
S11-P021	Glazing b	38.574	21.381	62.811	38.726	21.076
S11-P022	Glazing b	39.934	19.812	62.279	40.108	19.518
S11-P023	Glazing b	41.500	18.421	61.817	41.693	18.140
S11-P024	Glazing b	43.236	17.237	61.436	43.444	16.971
S11-P025	Glazing b	45.107	16.288	61.149	45.327	16.040
S11-P026	Glazing b	47.079	15.602	60.967	47.307	15.374
S11-P027	Glazing b	49.120	15.200	60.893	49.351	14.993
S11-P028	Glazing b	51.209	15.063	60.907	51.439	14.880
S11-P029	Glazing b	53.327	15.166	60.978	53.552	15.006
S11-P030	Glazing b	55.455	15.482	61.078	55.673	15.345
S11-P031	Glazing b	57.575	15.985	61.178	57.785	15.870
S11-P032	Glazing b	59.667	16.647	61.248	59.870	16.551
S11-P033	Glazing b	61.713	17.446	61.284	61.908	17.367
S11-P034	Glazing b	63.677	18.381	61.242	63.864	18.315
S11-P035	Glazing b	65.516	19.465	61.221	65.694	19.410
S11-P036	Glazing b	67.188	20.709	61.238	67.357	20.664
S11-P037	Glazing b	68.652	22.127	61.331	68.808	22.090
S11-P038	Glazing b	69.864	23.730	61.538	70.005	23.701
S11-P039	Glazing b	70.783	25.528	61.895	70.904	25.509
S11-P040	Glazing b	71.388	27.490	62.407	71.487	27.478
S11-P041	Glazing b	71.681	29.539	63.049	71.754	29.534
S11-P042	Glazing b	71.662	31.597	63.792	71.706	31.596
S11-P043	Glazing b	71.332	33.587	64.608	71.348	33.586
S11-P044	Glazing b	70.692	35.430	65.470	70.680	35.424



Panelisation Schedule (Partial)																						
Panel Type	Material	P01x	P01y	P01z	P02x	P02y	P02z	P03x	P03y	P03z	P04x	P04y	P04z	P05x	P05y	P05z	Edge 1	Edge 2	Edge 3	Edge 4	Diagonal	Area
004-P001	Glazing b	41.228	19.163	71.590	41.563	18.877	70.124	43.351	17.870	69.607	42.999	18.063	71.034	43.911	1.491	2.130	1.529	2.157	2.157	2.157	2.787 m²	
004-P002	Glazing b	42.299	18.053	71.034	43.351	17.870	69.607	45.270	16.859	69.189	44.908	17.201	70.575	44.511	1.491	2.130	1.529	2.157	2.157	2.157	2.787 m²	
004-P003	Glazing b	44.908	17.201	70.575	44.511	1.491	2.130	1.529	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.157	2.787 m²	
004-P004	Glazing b	46.928	16.620	70.222	47.293	16.420	68.877	49.334	16.126	66.555	49.032	16.297	69.963	1.365	2.133	1.406	2.145	2.145	2.145	2.145	2.738 m²	
004-P005	Glazing b	48.032	16.297	69.963	49.334	16.126	66.555	51.548	16.069	66.512	51.194	16.213	69.780	1.365	2.133	1.406	2.145	2.145	2.145	2.145	2.738 m²	
004-P006	Glazing b	51.194	16.213	69.780	51.548	16.069	66.512	53.730	16.231	68.418	53.388	16.347	69.652	1.286	2.190	1.324	2.202	2.202	2.202	2.202	2.879 m²	
004-P007	Glazing b	53.730	16.231	68.418	53.388	16.347	69.652	56.418	16.417	67.877	56.026	16.561	70.524	1.286	2.190	1.324	2.202	2.202	2.202	2.202	2.879 m²	
004-P008	Glazing b	56.418	16.417	67.877	56.026	16.561	70.524	59.082	17.124	68.309	57.769	17.193	69.455	1.286	2.190	1.324	2.202	2.202	2.202	2.202	2.879 m²	
004-P009	Glazing b	57.769	17.193	69.455	56.026	17.124	68.309	60.200	17.817	67.187	58.901	17.868	69.431	1.214	2.229	1.229	2.238	2.238	2.238	2.238	2.800 m²	
004-P010	Glazing b	59.082	17.868	69.431	60.200	17.817	67.187	62.256	18.666	68.212	61.953	18.703	69.385	1.207	2.208	1.214	2.216	2.216	2.216	2.216	2.607 m²	
004-P011	Glazing b	61.953	18.703	69.385	62.256	18.666	68.212	64.139	19.690	65.206	63.588	19.706	69.352	1.207	2.208	1.217	2.207	2.207	2.207	2.207	2.595 m²	
004-P012	Glazing b	63.588	19.706	69.352	64.139	19.690	65.206	65.903	20.967	66.926	65.669	20.965	69.450	1.210	2.207	1.207	2.217	2.217	2.217	2.217	2.595 m²	
004-P013	Glazing b	65.669	20.885	69.450	65.903	20.967	66.926	67.282	22.338	68.421	67.280	22.348	69.515	1.217	2.209	1.210	2.218	2.218	2.218	2.218	2.537 m²	
004-P014	Glazing b	67.280	22.348	69.515	67.492	22.236	68.421	68.931	23.798	68.699	68.623	23.803	69.905	1.223	2.075	1.217	2.088	2.088	2.088	2.088	2.539 m²	
004-P015	Glazing b	69.623	23.803	69.905	68.623	23.798	68.699	69.900	25.057	69.724	69.724	25.055	70.344	1.226	2.082	1.216	2.104	2.104	2.104	2.104	2.566 m²	
004-P016	Glazing b	69.724	25.055	70.344	69.900	25.057	69.724	70.578	27.042	68.708	70.578	27.042	70.344	1.234	2.156	2.277	2.165	2.165	2.165	2.165	2.598 m²	
004-P017	Glazing b	70.578	27.042	70.344	69.900	25.057	69.724	70.578	27.042	68.708	70.578	27.042	70.344	1.234	2.156	2.277	2.165	2.165	2.165	2.165	2.598 m²	
004-P018	Glazing b	70.578	27.042	70.344	69.900	25.057	69.724	70.578	27.042	68.708	70.578	27.042	70.344	1.234	2.156	2.277	2.165	2.165	2.165	2.165	2.598 m²	
004-P019	Glazing b	70.578	27.042	70.344	69.900	25.057	69.724	70.578	27.042	68.708	70.578	27.042	70.344	1.234	2.156	2.277	2.165	2.165	2.165	2.165	2.598 m²	
004-P020	Glazing b	70.578	27.042	70.344	69.900	25.057	69.724	70.578	27.042	68.708	70.578	27.042	70.344	1.234	2.156	2.277	2.165	2.165	2.165	2.165	2.598 m²	
004-P021	Glazing b	70.578	27.042	70.344	69.900	25.057	69.724	70.578	27.042	68.708	70.578	27.042	70.344	1.234	2.156	2.277	2.165	2.165	2.165	2.165	2.598 m²	
004-P022	Glazing b	70.578	27.042	70.344	69.900	25.057	69.724	70.578	27.042	68.708	70.578	27.042	70.344	1.234	2.156	2.277	2.165	2.165	2.165	2.165	2.598 m²	
004-P023	Glazing b	70.578	27.042	70.344	69.900	25.057	69.724	70.578	27.042	68.708	70.578	27.042	70.344	1.234	2.156	2.277	2.165	2.165	2.165	2.165	2.598 m²	
004-P024	Glazing b	70.578	27.042	70.344	69.900	25.057	69.724	70.578	27.042	68.708	70.578	27.042	70.344	1.234	2.156	2.277	2.165	2.165	2.165	2.165	2.598 m²	
004-P025	Glazing b	70.578	27.042	70.344	69.900	25.057	69.724	70.578	27.042	68.708	70.578	27.042	70.344	1.234	2.156	2.277	2.165	2.165	2.165	2.165	2.598 m²	
004-P026	Glazing b	70.578	27.042	70.344	69.900	25.057	69.724	70.578	27.042	68.708	70.578	27.042	70.344	1.234	2.156	2.277	2.165	2.165	2.165	2.165	2.598 m²	
004-P027	Glazing b	70.578	27.042	70.344	69.900	25.057	69.724	70.578	27.042	68.708	70.578	27.042	70.344	1.234	2.156	2.277	2.165	2.165	2.165	2.165	2.598 m²	
004-P028	Glazing b	70.578	27.042	70.344	69.900	25.057	69.724	70.578	27.042	68.708	70.578	27.042	70.344	1.234	2.156	2.277	2.165	2.165	2.165	2.165	2.598 m²	
004-P029	Glazing b	70.578	27.042	70.344	69.900	25.057	69.724	70.578	27.042	68.708	70.578	27.042	70.344	1.234	2.156	2.277	2.165	2.165	2.165	2.165	2.598 m²	
004-P030	Glazing b	70.578	27.042	70.344	69.900	25.057	69.724	70.578	27.042	68.708	70.578	27.042	70.344	1.234	2.156	2.277	2.165	2.165	2.165	2.165	2.598 m²	
004-P031	Glazing b	70.578	27.042	70.344	69.900	25.057	69.724	70.578	27.042	68.708	70.578	27.042	70.344	1.234	2.156	2.277	2.165	2.165	2.165	2.165	2.598 m²	
004-P032	Glazing b	70.578	27.042	70.344	69.900	25.057	69.724	70.578	27.042	68.708	70.578	27.042	70.344	1.234	2.156	2.277	2.165	2.165	2.165	2.165	2.598 m²	
004-P033	Glazing b	70.578	27.042	70.344	69.900	25.057	69.724	70.578	27.042	68.708	70.578	27.042	70.344	1.234	2.156	2.277	2.165	2.165	2.165	2.165	2.598 m²	
004-P034	Glazing b	70.578	27.042	70.344	69.900	25.057	69.724	70.578	27.042	68.708	70.578	27.042	70.344	1.234	2.156	2.277	2.165	2.165	2.165	2.165	2.598 m²	
004-P035	Glazing b	70.578	27.042	70.344	69.900	25.057	69.724	70.578	27.042	68.708	70.578	27.042	70.344	1.234	2.156	2.277	2.165	2.165	2.165	2.165	2.598 m²	
004-P036	Glazing b	70.578	27.042	70.344	69.900	25.057	69.724	70.578	27.042	68.708	70.578	27.042	70.344	1.234	2.156	2.277	2.165	2.165	2.165	2.165	2.598 m²	
004-P037	Glazing b	70.578	27.042	70.344	69.900	25.057	69.724	70.578	27.042	68.708	70.578	27.042	70.344	1.234	2.156	2.277	2.165	2.165	2.165	2.165	2.598 m²	
004-P038	Glazing b	70.578	27.042	70.344	69.900	25.057	69.724	70.578	27.042	68.708	70.578	27.042	70.344	1.234	2.156	2.277	2.165	2.165	2.165	2.165	2.598 m²	
004-P039	Glazing b	70.578	27.042	70.344	69.900	25.057	69.724	70.578	27.042	68.708	70.578	27.042	70.344	1.234	2.156	2.277	2.165	2.165	2.165	2.165	2.598 m²	
004-P040	Glazing b	70.578	27.042	70.344	69.900	25.057	69.724	70.578	27.042	68.708	70.578	27.042	70.344	1.234	2.156	2.277	2.165	2.165	2.165	2.165	2.598 m²	
004-P041	Glazing b	70.578	27.042	70.344	69.900	25.057	69.724	70.578	27.042	68.708	70.578	27.042	70.344	1.234	2.156	2.277	2.165	2.165	2.165	2.165	2.598 m²	
004-P042	Glazing b	70.578	27.042	70.344	69.900	25.057	69.724	70.578	27.042	68.708	70.578	27.042	70.344	1.234	2.156	2.277	2.165	2.165	2.165	2.165	2.598 m²	
004-P043	Glazing b	70.578	27.042	70.344	69.900	25.057	69.724	70.578	27.042	68.708	70.578	27.042	70.344	1.234	2.156	2.277	2.165	2.165	2.165	2.165	2.598 m²	
004-P044	Glazing b	70.578	27.042	70.344	69.900	25.057	69.724	70.578	27.042	68.708	70.578	27.042	70.344	1.234	2.156	2.277	2.165	2.165	2.165	2.165	2.598 m²	
004-P045	Glazing b	70.578	27.042	70.344	69.900	25.057	69.724	70.578	27.042	68.708	70.578	27.042	70.344	1.234	2.156	2.277	2.165	2.165	2.165	2.165	2.598 m²	
004-P046	Glazing b	70.578	27.042	70.344	69.900	25.057	69.724	70.578	27.042	68.708	70.578	27.042	70.344	1.234	2.156	2.277	2.165	2.165	2.165	2.165	2.598 m²	
004-P047	Glazing b	70.578	27.042	70.344	69.900	25.057	69.724	70.578	27.042	68.708	70.578	27.042	70.344	1.234	2.156	2.277	2.165	2.165	2.165	2.165	2.598 m²	
004-P048	Glazing b	70.578	27.042	70.344	69.900	25.057	69.724	70.578	27.042	68.708	70.578	27.042	70.344	1.234	2.156	2.277	2.165</					

3 Analysis

Sustainability is achieved by means of scientific analysis to achieve optimum design solutions to external forces.

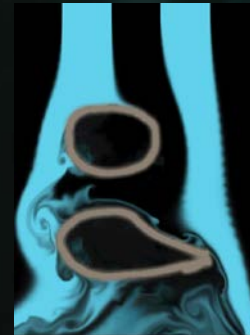
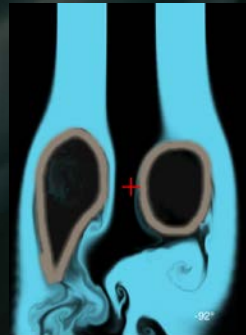
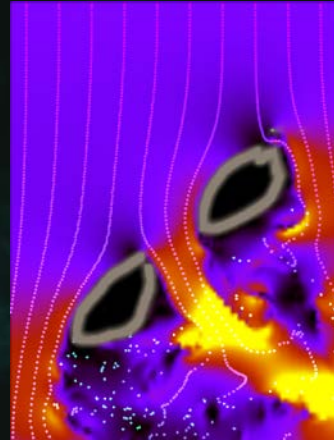
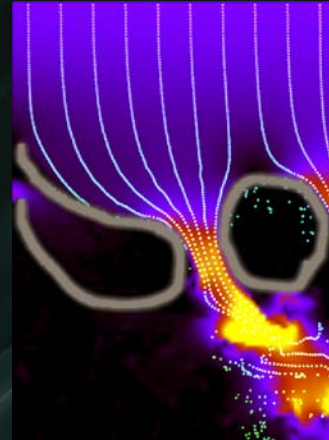
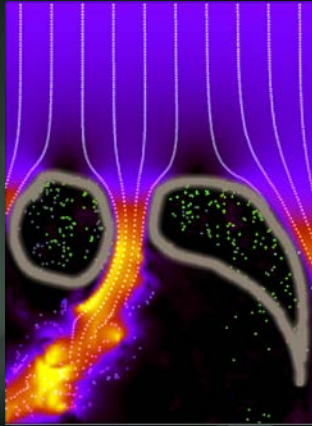
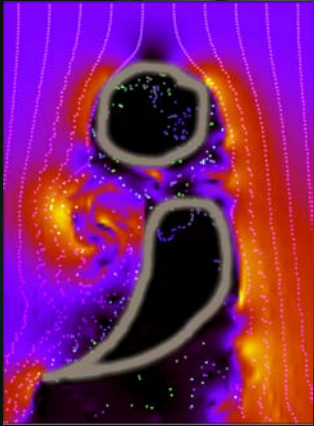
Weather analysis

	Singapore Average Hourly Temperatures											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0:01-1:00	25.3	25.9	26.2	26.7	27.2	27.5	26.6	26.6	26.2	26.2	25.5	25.2
1:01-2:00	25.2	25.6	26.1	26.5	27	27.3	26.5	26.5	25.9	26.1	25.3	25.1
2:01-3:00	25	25.5	25.9	26.4	26.9	27.3	26.2	26.4	25.8	26	25.2	24.9
3:01-4:00	24.9	25.4	25.7	26.3	26.7	27.2	26	26.1	25.8	25.9	25	24.8
4:01-5:00	24.7	25.2	25.6	26.1	26.6	27	25.9	26.2	25.6	25.7	24.9	24.6
5:01-6:00	25	25.2	25.4	26.1	26.7	26.9	25.9	25.9	25.4	25.8	25	24.6
6:01-7:00	25.2	25.2	25.3	26.2	26.8	26.6	26.1	25.8	25.4	26	25.1	24.5
7:01-8:00	25.4	25.3	25.8	26.7	26.9	27	26.4	26.2	25.9	26.3	25.6	24.9
8:01-9:00	26.4	26.6	27.2	28.3	28	28	27.4	27.5	26.8	27.5	26.7	26.1
9:01-10:00	27.4	27.8	28.4	29.4	28.9	28.5	28.4	28.2	27.9	28.7	27.9	27
10:01-11:00	28.4	28.7	29.4	30.3	29.9	29.4	29	29	28.5	29.6	28.8	27.8
11:01-12:00	28.7	29.7	30.4	31.2	30	30.3	29.5	29.6	29.1	29.6	28.8	28.4
12:01-13:00	29	30.4	30.9	30.9	30.2	30.5	29.6	29.5	29.6	29.7	28.7	28.7
13:01-14:00	29.3	30.4	31	30.8	30.3	30.4	29.7	29.6	29.5	29.8	28.7	28.8
14:01-15:00	29	30.4	30.5	30.4	30	30.5	29.9	29.9	29.3	29.6	28.6	28.5
15:01-16:00	28.7	29.8	30.1	30.1	29.7	30.4	29.7	29.7	28.8	29.2	28.4	28.2
16:01-17:00	28.4	29.1	29.1	29.4	29.4	30.3	29.5	29.5	28.4	28.8	28.2	27.7
17:01-18:00	27.7	28.3	28.6	28.9	28.9	29.6	29	29.2	28	28.1	27.5	27.1
18:01-19:00	27.1	27.4	27.7	28	28.4	28.8	28.4	28.4	27.3	27.5	26.9	26.6
19:01-20:00	26.5	26.9	27.1	27.5	27.9	28.3	27.7	27.8	27.1	27.1	26.3	26.2
20:01-21:00	26.2	26.6	26.8	27.4	27.8	27.9	27.5	27.4	27.1	26.9	26.2	25.9
21:01-22:00	25.9	26.2	26.6	27.2	27.7	27.8	27.4	27.2	26.7	26.7	26	25.7
22:01-23:00	25.6	26.1	26.5	27.1	27.5	27.8	27.2	27.1	26.7	26.5	25.8	25.5
23:01-24:00	25.5	25.9	26.4	27	27.4	27.7	26.9	26.8	26.4	26.3	25.6	25.3

Averaged Hourly Temperature (C°)

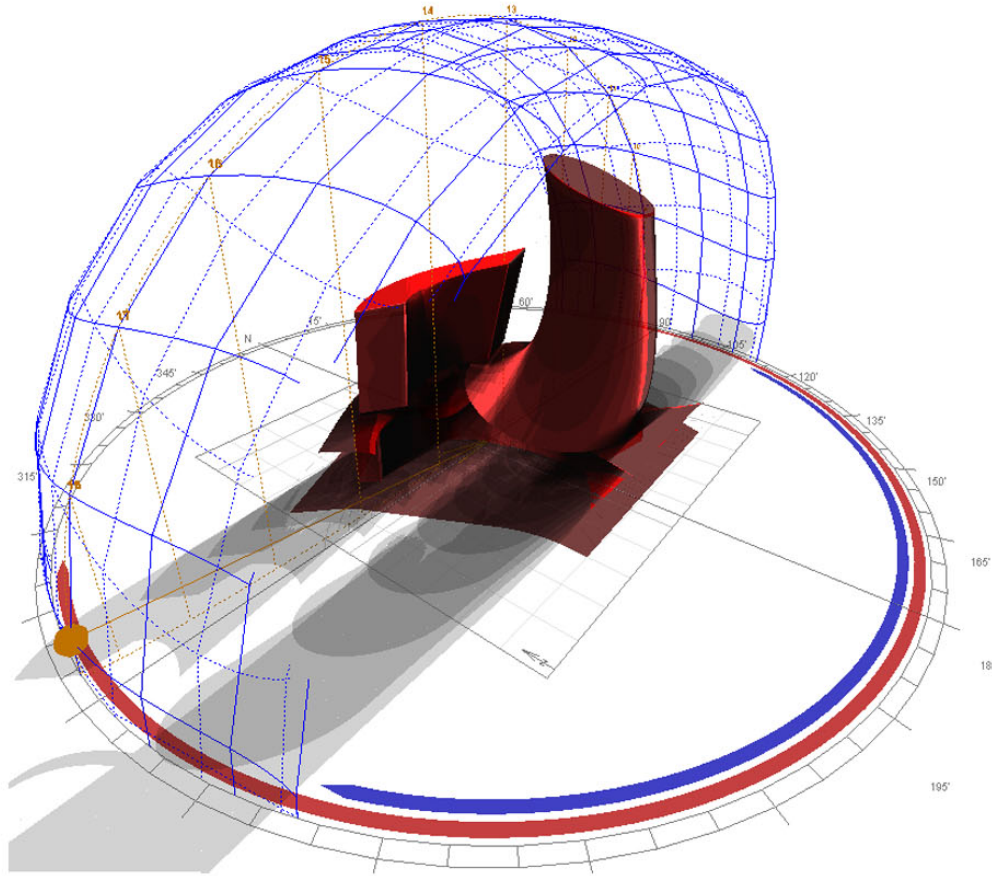
	Singapore Hourly Average Relative Humidity (%)											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
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1:01-2:00	91	90	91	91	90	87	89	87	91	92	95	92
2:01-3:00	92	91	92	91	91	87	91	89	92	92	95	92
3:01-4:00	92	91	93	92	92	88	91	91	91	93	96	92
4:01-5:00	93	92	94	93	92	88	92	90	92	94	96	93
5:01-6:00	92	92	95	94	92	88	92	91	92	93	96	93
6:01-7:00	90	92	95	92	91	89	92	91	93	92	96	93
7:01-8:00	89	91	93	91	91	88	92	90	92	91	94	93
8:01-9:00	85	86	86	84	85	84	86	84	87	85	88	88
9:01-10:00	80	81	81	78	80	81	81	80	82	79	84	84
10:01-11:00	76	77	77	73	76	78	78	76	79	75	80	80
11:01-12:00	74	72	73	68	75	74	75	74	75	74	80	77
12:01-13:00	72	69	70	69	74	73	74	74	72	73	81	76
13:01-14:00	70	68	69	69	73	74	73	72	70	72	80	76
14:01-15:00	71	68	71	70	74	71	71	70	72	73	80	77
15:01-16:00	73	71	72	72	75	71	72	71	73	76	80	77
16:01-17:00	74	72	75	75	76	70	73	71	74	78	80	79
17:01-18:00	77	76	78	77	79	73	75	72	77	80	84	81
18:01-19:00	80	81	81	81	80	78	78	76	81	83	87	84
19:01-20:00	84	84	85	84	83	80	82	80	82	85	89	87
20:01-21:00	86	85	87	85	84	83	83	83	83	87	91	88
21:01-22:00	87	88	88	86	85	83	84	84	85	88	92	89
22:01-23:00	89	88	90	87	87	84	85	84	86	89	93	90
23:01-24:00	90	89	90	88	88	85	87	85	87	90	94	91

Averaged Hourly Relative Humidity

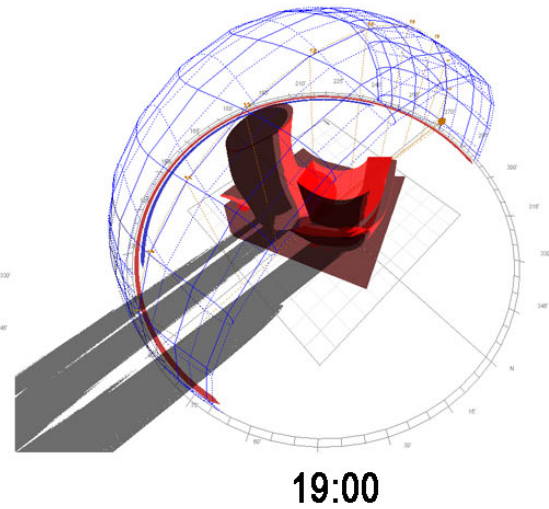
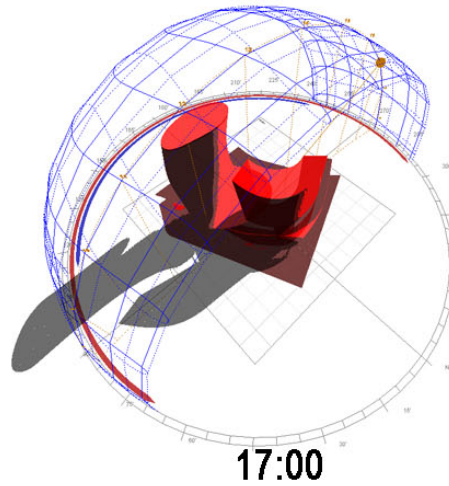
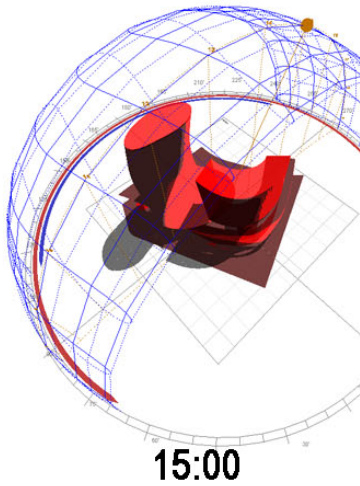
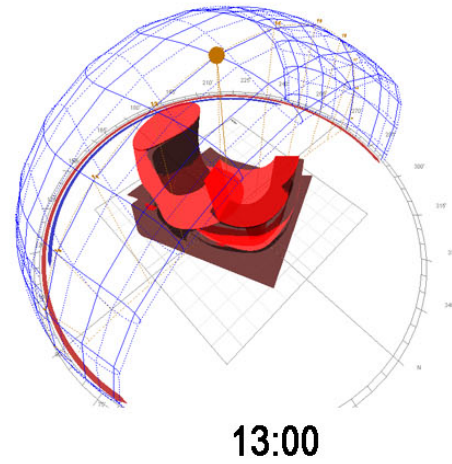
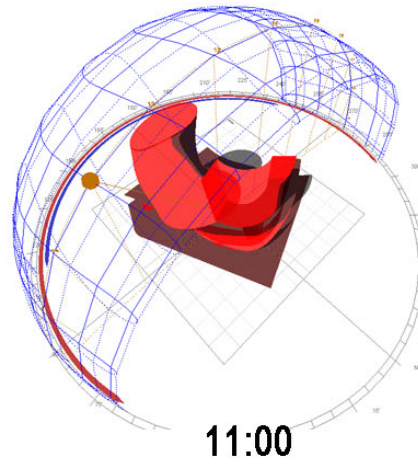
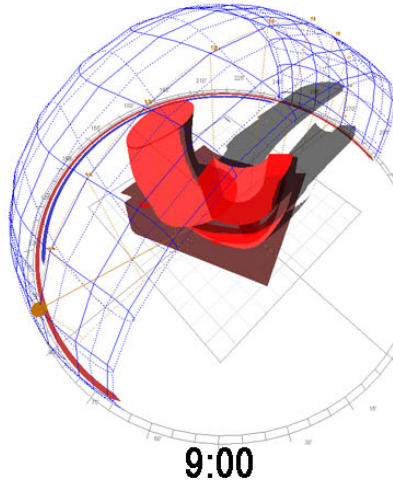


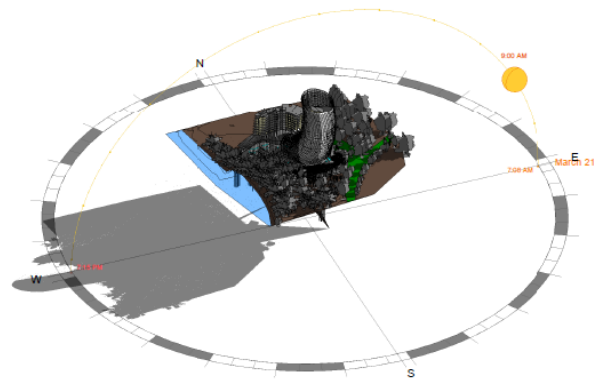
Wind Effect

Weather analysis

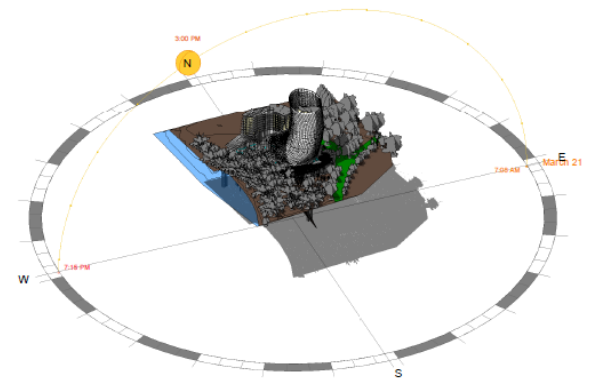


Weather analysis

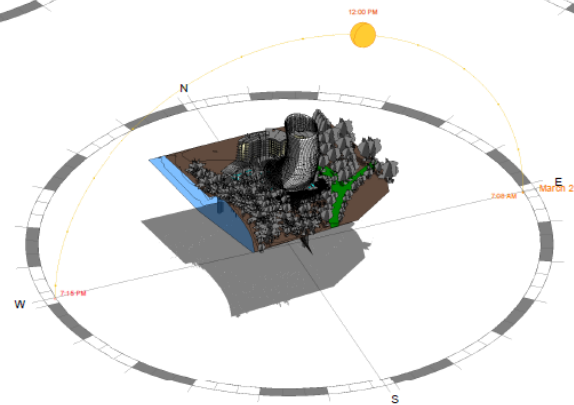




01 Spring 9am



03 Spring 3pm



02 Spring 12pm

BIM EVANGELIST

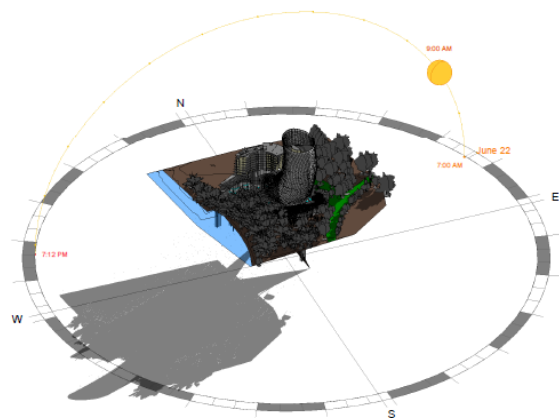


PROJECT NAME **KALLANG RIVERSIDE
HOTEL DEVELOPMENT**

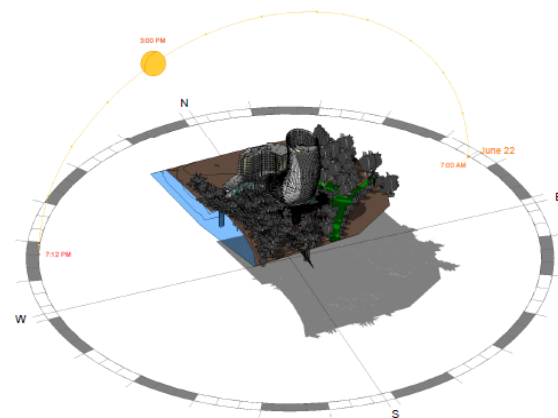
DRAWING TITLE **SOLAR ANALYSIS -
23rd of MARCH**

FILE	Project Name	SCALE
DRAWN	Author	CHECK
DRAWING NO.	Checker	DATE
		REVISION

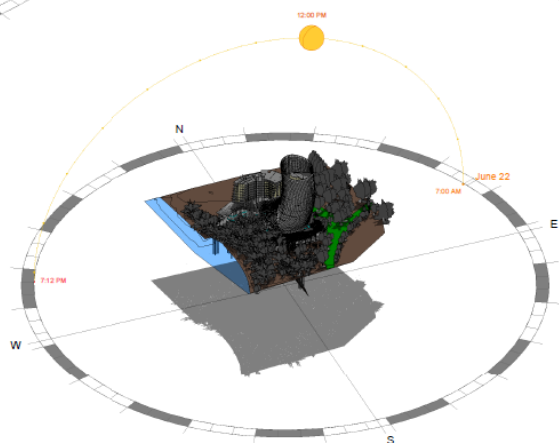
BIM_201



01 Summer 9am



03 Summer 3pm



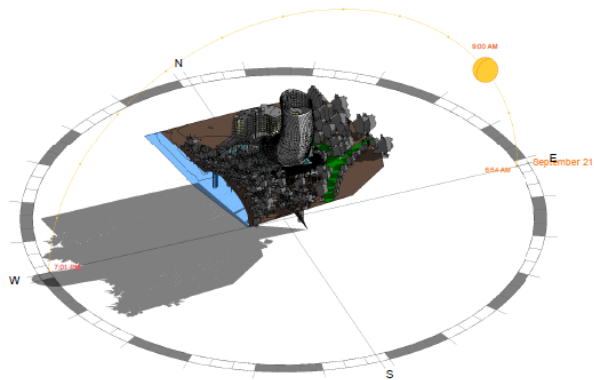
02 Summer 12pm

BIM EVANGELIST

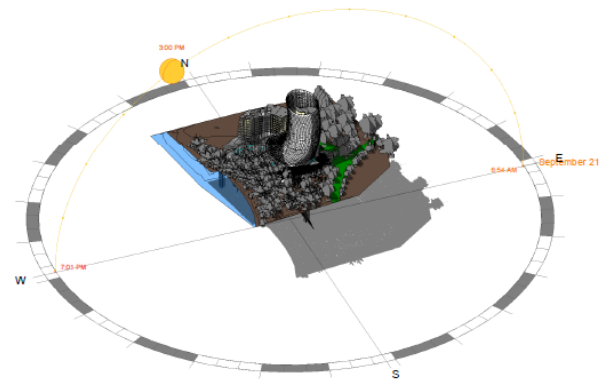


PROJECT NAME **KALLANG RIVERSIDE
HOTEL DEVELOPMENT**
DRAWING TITLE **SOLAR ANALYSIS -
22nd of JUNE**

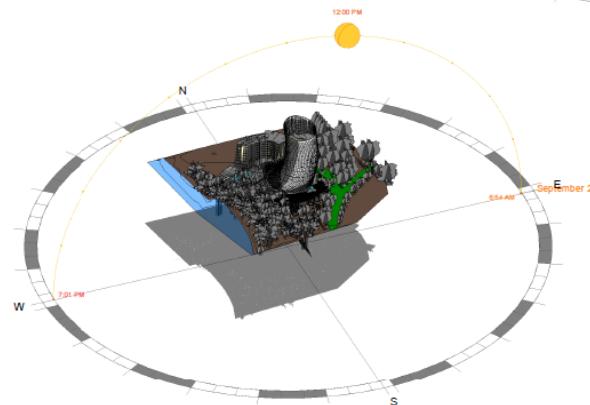
FILE	Project Name	SCALE	@ A1
DRAWN	Author	CHECK	Checker
DRAWING NO.	BIM_202	DATE	10. SEPT. 2011
		REVISION	



01 Fall 9am



03 Fall 3pm



02 Fall 12pm

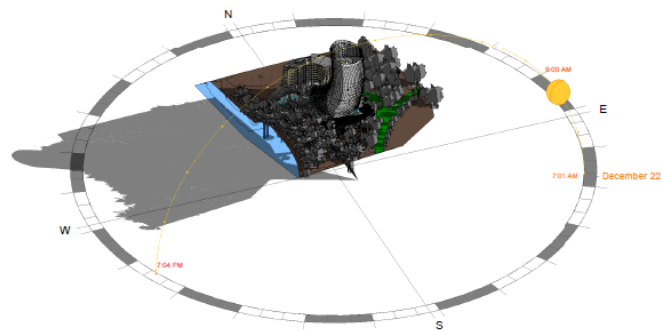
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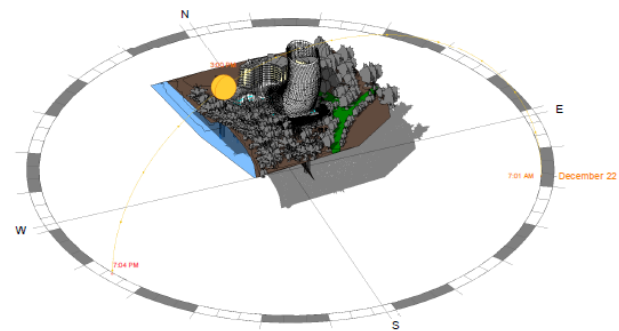
PROJECT NAME **KALLANG RIVERSIDE
HOTEL DEVELOPMENT**
DRAWING TITLE **SOLAR ANALYSIS -
23rd of SEPTEMBER**

FILE	Project Name	SCALE
DRAWN	Author	CHECK
	Checker	DATE
DRAWING NO.		10. SEPT.2011
		REVISION

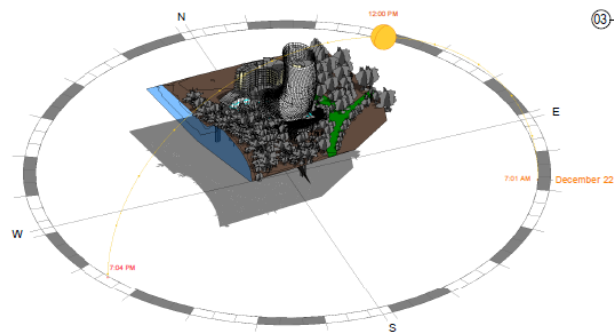
BIM_203



01 Winter 9am



03 Winter 3pm



02 Winter 12pm

BIM EVANGELIST

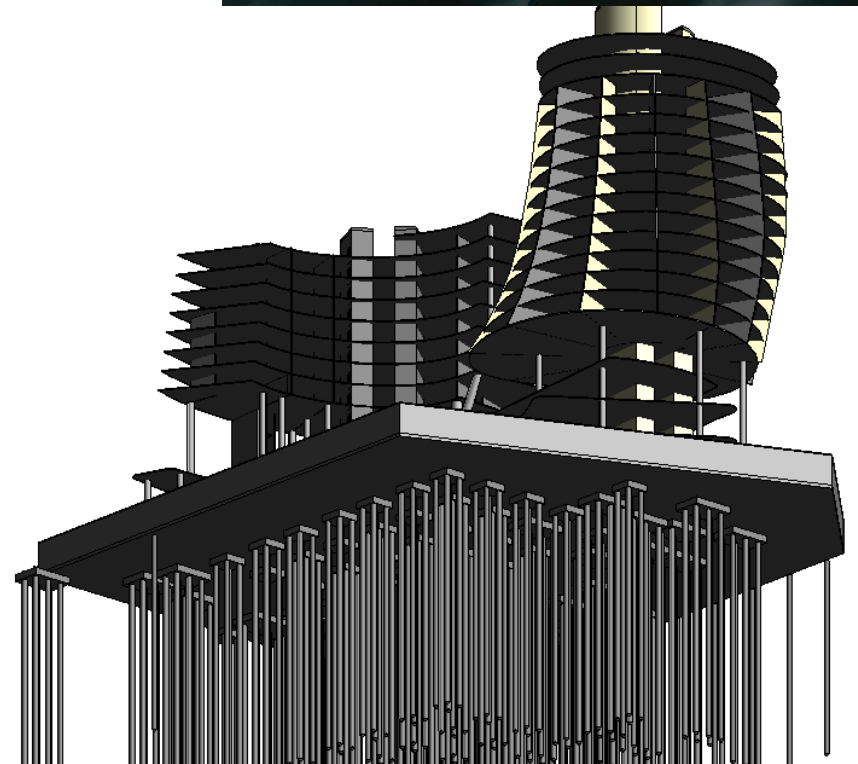
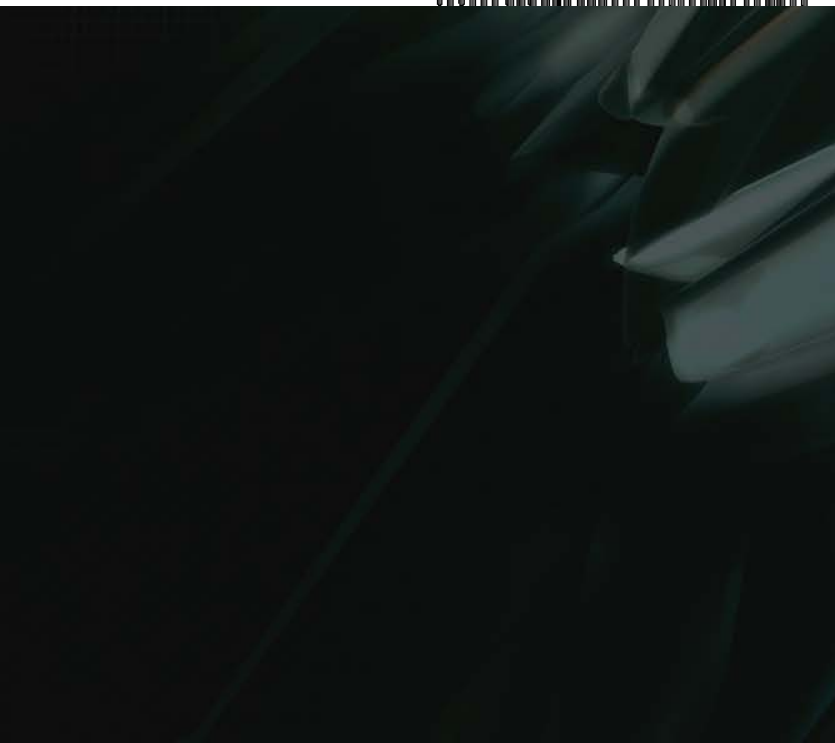
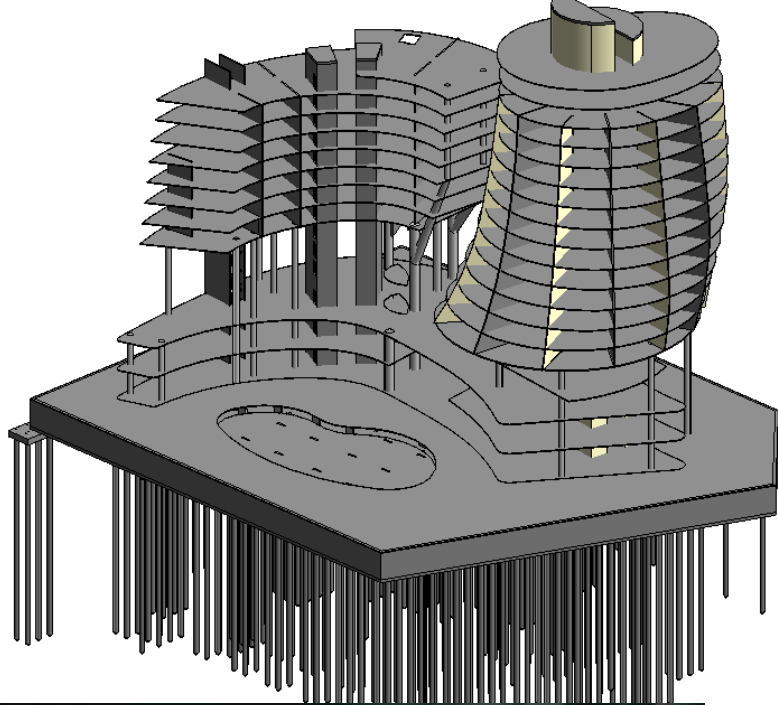


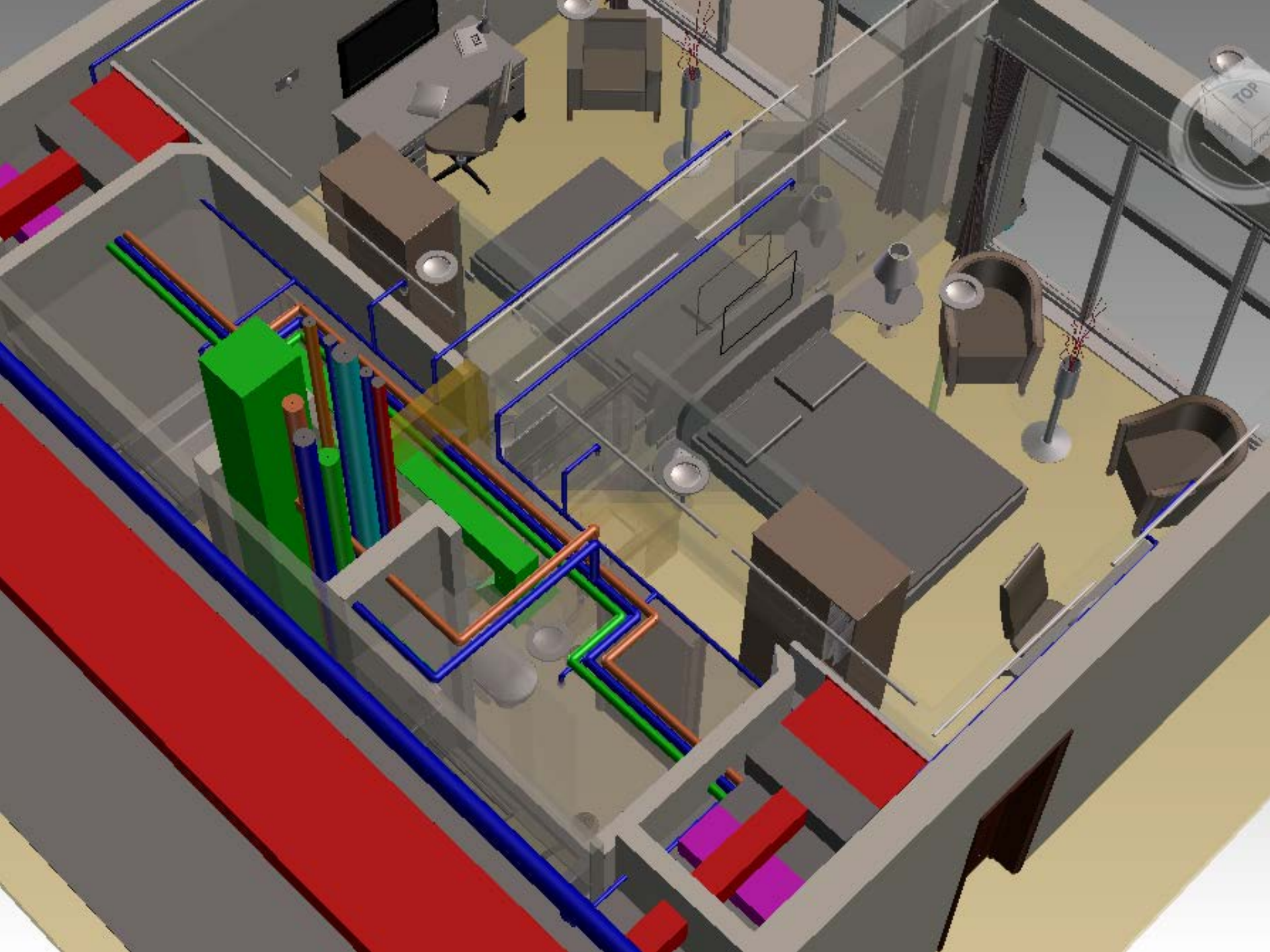
PROJECT NAME **KALLANG RIVERSIDE
HOTEL DEVELOPMENT**
DRAWING TITLE **SOLAR ANALYSIS -
22nd of DECEMBER**

FILE	Project Name	SCALE	@ A1
DRAWN	Author	CHECK	Checker
DRAWING NO.	BIM_204	DATE	10. SEPT. 2011
		REVISION	

4 *Co-ordination*

Good practice makes Perfection. Good communication makes flawless design. BIM facilitates balance of mutual interest.



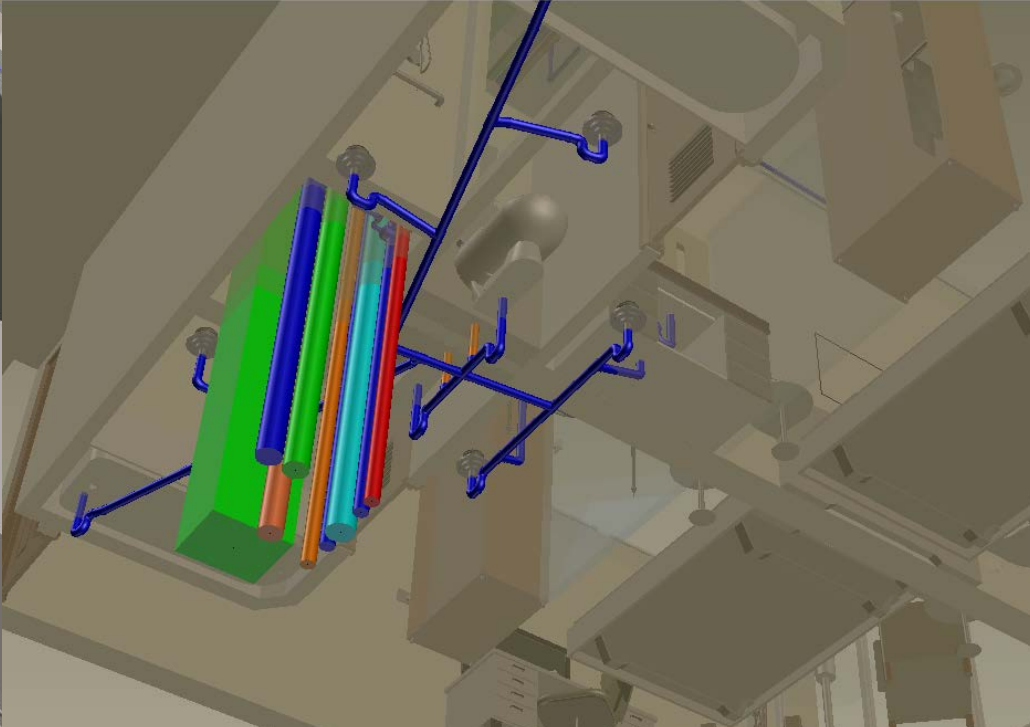
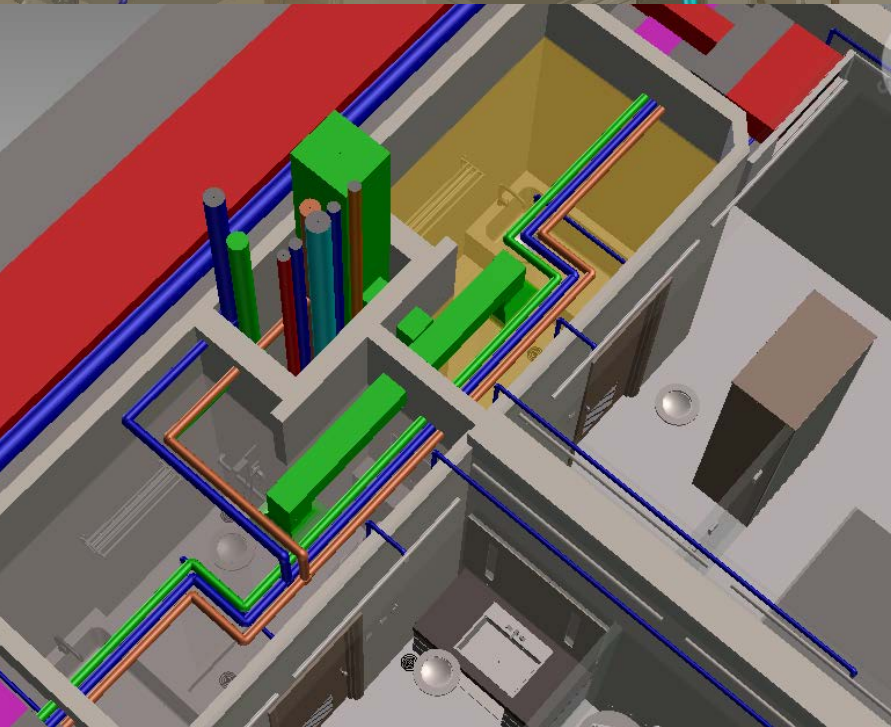
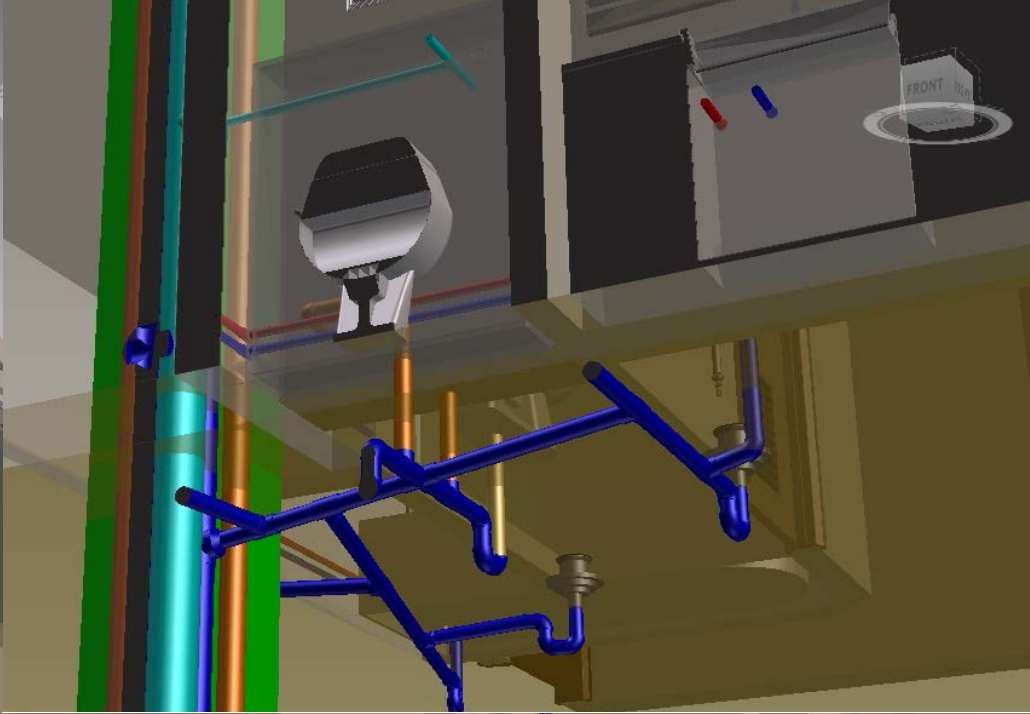
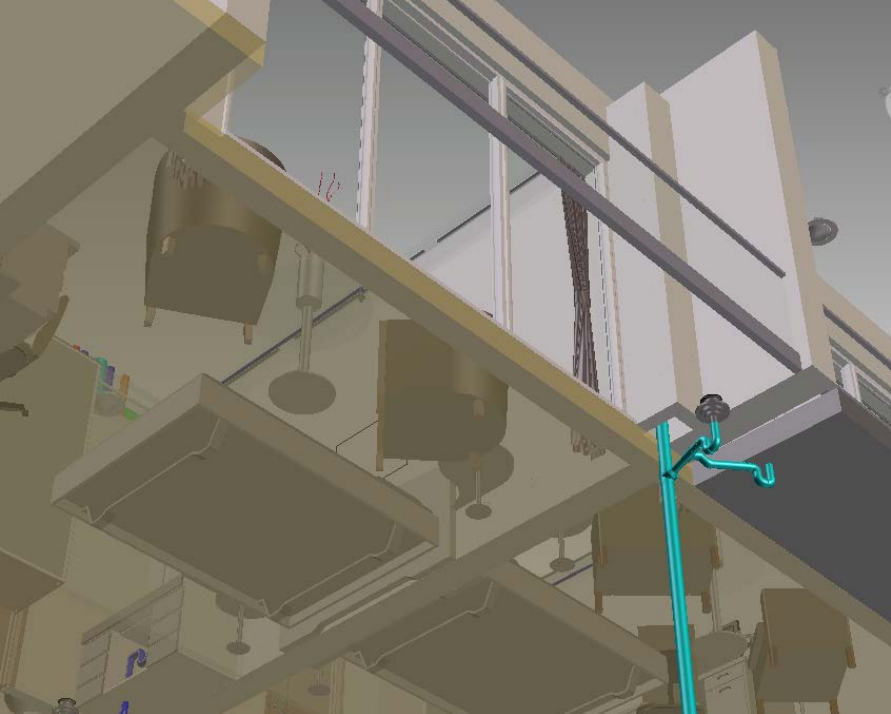






5 Constructability

Nothing is more worthy than a well planned and well thought of project and clash free building projects.



6 Quantity Taking and Bills of Quantity

Cost Control is the primary concern. While changes in design at any stage implies change in cost, the live connectivity of BIM data and cost enable certainty, enable confidence and reduce risk to all parties.

Properties	Group Ungroup	New Delete	Hide Unhide All	Highlight in Model
Properties	Headers	Rows	Columns	Element

Modify Schedule/Quantities

BIM Evangelist PANEL.rvt - Proje...

- Views (all)
 - Floor Plans
 - LEVEL 01
 - LEVEL BASEMENT
 - Level BH
 - LEVEL POOL
 - Site
 - Ceiling Plans
 - LEVEL 01
 - LEVEL BASEMENT
 - Level BH
 - 3D Views
 - 3d annotated
 - 3D View 1
 - New Site view
 - (3D - dskfung)
 - Elevations (Building Elevat
 - East
 - North
 - South
 - West
- Legends
- Schedules/Quantities
 - Mass Schedule**
 - Panel Schedule
- Sheets (all)
- Families
 - Annotation Symbols
 - Ceilings
 - Columns
 - Curtain Panels
 - Curtain Systems
 - Curtain Wall Mullions
 - Detail Items
 - Doors

Mass Schedule																			
Panel Type	Material	P01x	P01y	P01z	P02x	P02y	P02z	P03x	P03y	P03z	P04x	P04y	P04z	Edge 1	Edge 2	Edge 3	Edge 4	Diagonal	Area
S06-P013	Glazing fro	37.512	38.352	76.470	37.514	37.998	74.794	36.562	36.155	74.149	36.529	36.517	75.826	1.716	2.172	1.713	2.179	3.334	3.310 m²
S06-P014	Glazing fro	36.529	36.517	75.826	36.562	36.155	74.149	35.889	34.225	73.454	35.826	34.591	75.127	1.714	2.159	1.716	2.166	3.360	3.222 m²
S06-P015	Glazing fro	35.826	34.591	75.127	35.889	34.225	73.454	35.499	32.241	72.721	35.403	32.608	74.386	1.708	2.151	1.714	2.159	3.379	3.145 m²
S06-P016	Glazing fro	35.403	32.608	74.386	35.499	32.241	72.721	35.390	30.236	71.966	35.263	30.601	73.618	1.697	2.146	1.708	2.154	3.389	3.075 m²
S06-P017	Glazing fro	35.263	30.601	73.618	35.390	30.236	71.966	35.565	28.243	71.202	35.406	28.603	72.837	1.681	2.142	1.697	2.151	3.390	3.013 m²
S06-P018	Glazing fro	35.406	28.603	72.837	35.565	28.243	71.202	36.024	26.294	70.443	35.835	26.646	72.056	1.662	2.141	1.681	2.150	3.383	2.962 m²
S06-P019	Glazing fro	35.835	26.646	72.056	36.024	26.294	70.443	36.767	24.423	69.702	36.549	24.764	71.290	1.639	2.145	1.662	2.154	3.369	2.927 m²
S06-P044	Glazing fro	70.734	35.459	71.764	70.724	35.450	70.504	69.888	37.134	71.431	69.928	37.162	72.701	1.271	2.096	1.260	2.104	1.906	2.376 m²
S06-P045	Glazing fro	69.928	37.162	72.701	69.888	37.134	71.431	68.750	38.584	72.351	68.817	38.638	73.632	1.284	2.060	1.271	2.069	1.880	2.358 m²
S06-P046	Glazing fro	68.817	38.638	73.632	68.750	38.584	72.351	67.349	39.825	73.244	67.440	39.910	74.537	1.299	2.073	1.284	2.082	1.927	2.431 m²
S06-P047	Glazing fro	67.440	39.910	74.537	67.349	39.825	73.244	65.730	40.891	74.089	65.840	41.009	75.396	1.318	2.115	1.299	2.123	2.022	2.562 m²
S06-P048	Glazing fro	65.840	41.009	75.396	65.730	40.891	74.089	63.935	41.814	74.867	64.061	41.966	76.192	1.340	2.163	1.318	2.171	2.135	2.717 m²
S06-P049	Glazing fro	64.061	41.966	76.192	63.935	41.814	74.867	62.008	42.629	75.557	62.147	42.813	76.903	1.366	2.203	1.340	2.211	2.249	2.870 m²
S06-P050	Glazing fro	62.147	42.813	76.903	62.008	42.629	75.557	59.993	43.368	76.141	60.141	43.579	77.512	1.395	2.225	1.366	2.232	2.352	3.002 m²
S07-P001	Glazing fro	59.993	43.368	76.141	59.844	43.164	74.769	57.769	43.828	75.200	57.927	44.051	76.601	1.428	2.220	1.395	2.224	2.458	3.105 m²
S07-P002	Glazing fro	57.927	44.051	76.601	57.769	43.828	75.200	55.670	44.408	75.506	55.832	44.644	76.940	1.462	2.200	1.428	2.203	2.534	3.170 m²
S07-P003	Glazing fro	55.832	44.644	76.940	55.670	44.408	75.506	53.562	44.856	75.694	53.725	45.102	77.162	1.498	2.163	1.462	2.168	2.599	3.204 m²
S07-P004	Glazing fro	53.725	45.102	77.162	53.562	44.856	75.694	51.462	45.122	75.769	51.621	45.376	77.272	1.533	2.118	1.498	2.124	2.657	3.211 m²
S07-P005	Glazing fro	51.621	45.376	77.272	51.462	45.122	75.769	49.386	45.159	75.739	49.386	45.420	77.277	1.567	2.076	1.533	2.084	2.719	3.206 m²
S07-P006	Glazing fro	49.386	45.420	77.277	49.386	45.159	75.739	47.351	44.918	75.611	47.491	45.186	77.180	1.598	2.053	1.567	2.062	2.795	3.211 m²
S07-P007	Glazing fro	47.491	45.186	77.180	47.351	44.918	75.611	45.374	44.355	75.391	45.499	44.634	76.988	1.626	2.067	1.598	2.076	2.894	3.255 m²
S07-P008	Glazing fro	45.499	44.634	76.988	45.374	44.355	75.391	43.485	43.482	75.084	43.591	43.774	76.706	1.651	2.103	1.626	2.112	3.001	3.322 m²
S07-P009	Glazing fro	43.591	43.774	76.706	43.485	43.482	75.084	41.719	42.337	74.698	41.803	42.644	76.339	1.671	2.140	1.651	2.147	3.098	3.378 m²
S07-P010	Glazing fro	41.803	42.644	76.339	41.719	42.337	74.698	40.111	40.958	74.239	40.171	41.279	75.895	1.688	2.168	1.671	2.174	3.181	3.409 m²
S07-P011	Glazing fro	40.171	41.279	75.895	40.111	40.958	74.239	38.697	39.384	73.711	38.729	39.718	75.377	1.700	2.182	1.688	2.187	3.246	3.405 m²
S07-P012	Glazing fro	38.729	39.718	75.377	38.697	39.384	73.711	37.511	37.651	73.121	37.514	37.998	74.794	1.708	2.181	1.700	2.185	3.293	3.363 m²
S07-P013	Glazing fro	37.514	37.998	74.794	37.511	37.651	73.121	36.588	35.800	72.476	36.562	36.155	74.149	1.711	2.167	1.708	2.172	3.326	3.287 m²
S07-P014	Glazing fro	36.562	36.155	74.149	36.588	35.800	72.476	35.946	33.865	71.784	35.889	34.225	73.454	1.709	2.153	1.711	2.159	3.349	3.203 m²
S07-P015	Glazing fro	35.889	34.225	73.454	35.946	33.865	71.784	35.585	31.879	71.061	35.499	32.241	72.721	1.702	2.144	1.709	2.151	3.365	3.129 m²
S07-P016	Glazing fro	35.499	32.241	72.721	35.585	31.879	71.061	35.507	29.875	70.319	35.390	30.236	71.966	1.690	2.138	1.702	2.146	3.372	3.063 m²
S07-P017	Glazing fro	35.390	30.236	71.966	35.507	29.875	70.319	35.712	27.886	69.572	35.565	28.243	71.202	1.675	2.134	1.690	2.142	3.370	3.006 m²
S07-P045	Glazing fro	69.888	37.134	71.431	69.859	37.113	70.161	68.695	38.537	71.069	68.750	38.584	72.351	1.285	2.050	1.271	2.060	1.877	2.352 m²
S07-P046	Glazing fro	68.750	38.584	72.351	68.695	38.537	71.069	67.271	39.746	71.948	67.349	39.825	73.244	1.300	2.065	1.285	2.073	1.924	2.426 m²
S07-P047	Glazing fro	67.349	39.825	73.244	67.271	39.746	71.948	65.629	40.778	72.779	65.730	40.891	74.089	1.319	2.109	1.300	2.115	2.020	2.560 m²
S07-P048	Glazing fro	65.730	40.891	74.089	65.629	40.778	72.779	63.815	41.668	73.540	63.935	41.814	74.867	1.341	2.159	1.319	2.163	2.138	2.718 m²
S07-P049	Glazing fro	63.935	41.814	74.867	63.815	41.668	73.540	61.872	42.451	74.210	62.008	42.629	75.557	1.366	2.200	1.341	2.203	2.257	2.872 m²
S07-P050	Glazing fro	62.008	42.629	75.557	61.872	42.451	74.210	59.844	43.164	74.769	59.993	43.368	76.141	1.395	2.221	1.366	2.225	2.365	3.005 m²
Grand total: 2503																			8258.798 m

Automatic Bills of Quantity

- Automatic BQ generation from BIM Model

ABQ Template.xls [相容模式] - Microsoft Excel

常用 插入 版面配置 公式 資料 校閱 檢視

剪貼簿 剪下 複製 貼上 複製格式

字體 Arial 10 A A B I U 顏色 文字顏色 對齊方式 自動換行 通用格式 數值 設定格式化的條件 格式化為表格 儲存格的樣式 插入 刪除 格式 儲存格 編輯 自動加總 填滿 清除 排序與篩選 尋找與選取

C136 SUSPENDED SLABS

Item	Description	Qty	Unit	Rate	HK\$
PROJECT NAME					
BILL NO. 2 - EXTENSION					
2.2 - CONCRETOR					
MAIN CONTRACT					
2.2 - CONCRETOR					
2.2/ 1	PREPARATION				
2.2/ 1.1	Allow for cleaning off top of raft foundation and footings and starter bars to receive new concrete, bending, straightening and remedying any non-aligned existing starter bars constructed by the Foundation Contractor	1	Item		
2.2/ 2	BASEMENT SCREEN WALLS				
2.2/ 2.1	Waterproof reinforced concrete grade 35D/20 designed mix in				
2.2/ 2.1.1	400 mm Wall including embedded columns	64	m3		
2.2/ 2.1.2	425 mm Wall	3	m3		
2.2/ 2.1.3	525 mm Wall	1	m3		
2.2/ 2.2	Sawn formwork to				
2.2/ 2.2.1	Side of wall	290	m2		
2.2/ 2.3	Deformed high yield steel bar reinforcement				
2.2/ 2.3.1	10 mm Link, stirrup and binder	1,232	kg		
2.2/ 2.3.2	10 mm Bar	842	kg		
2.2/ 2.3.3	12 mm Bar	78	kg		
2.2/ 2.3.4	16 mm Bar	3,770	kg		
2.2/ 2.3.5	20 mm Bar	1,397	kg		
2.2/ 3	COLUMNS				

14 1 21 22 23 24 25 26 27 28 29 31 32 33 34 35 36 37 38 39 40

100%

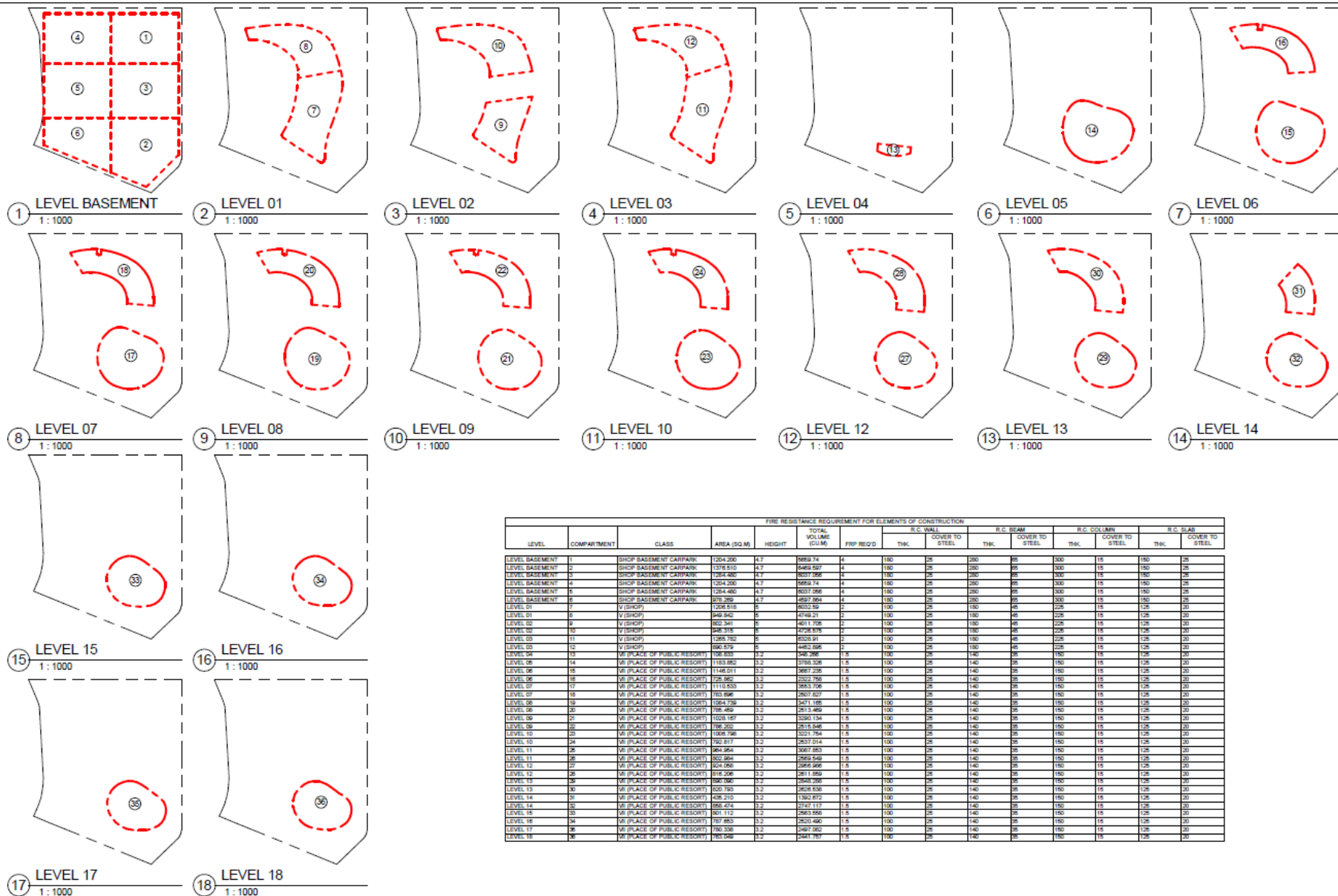
14:33 2011/9/10

7 *Documentation*

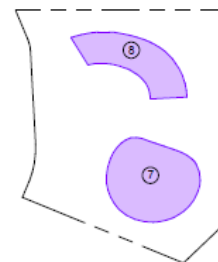
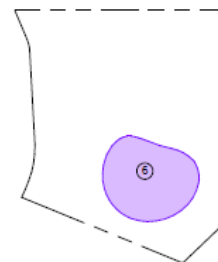
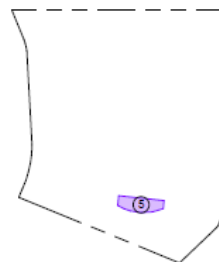
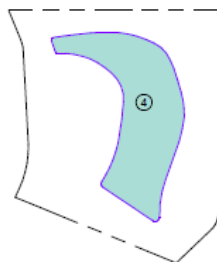
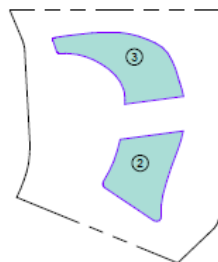
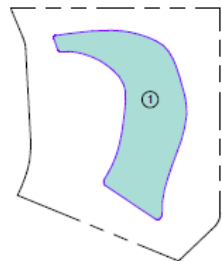
Organic architecture documentation is no longer mission impossible. Manufacturing is no longer guess work for designers and owners, but carefully documented information transfer process.

8 Automated Statutory Submission

Maximization of Development Potential requires accuracy and code compliance.



FIRE RESISTANCE REQUIREMENT FOR ELEMENTS OF CONSTRUCTION														
LEVEL	COMPARTMENT	CLASS	AREA (SQ.M)	HEIGHT	TOTAL VOLUME (CU.M)	FRP REQ'D	R.C. WALL		R.C. BEAM		R.C. COLUMN		R.C. SLAB	
							THK.	COVER TO STEEL	THK.	COVER TO STEEL	THK.	COVER TO STEEL	THK.	COVER TO STEEL
LEVEL BASEMENT	1	SHOP BASEMENT CARPARK	1254.200	4.7	5893.74	4	180	25	250	25	300	15	180	25
LEVEL BASEMENT	2	SHOP BASEMENT CARPARK	1376.512	4.7	6465.507	4	180	25	250	25	300	15	180	25
LEVEL BASEMENT	3	SHOP BASEMENT CARPARK	1254.480	4.7	6037.568	4	180	25	250	25	300	15	180	25
LEVEL BASEMENT	4	SHOP BASEMENT CARPARK	1254.200	4.7	5893.74	4	180	25	250	25	300	15	180	25
LEVEL BASEMENT	5	SHOP BASEMENT CARPARK	1254.480	4.7	6037.568	4	180	25	250	25	300	15	180	25
LEVEL BASEMENT	6	SHOP BASEMENT CARPARK	876.288	4.7	4097.854	4	180	25	250	25	300	15	180	25
LEVEL 01	1	V (SHOP)	1254.518	3	3763.254	2	150	25	150	25	150	15	125	20
LEVEL 01	2	V (SHOP)	146.542	3	4748.21	2	150	25	150	25	150	15	125	20
LEVEL 02	1	V (SHOP)	502.341	3	1507.105	2	150	25	150	25	150	15	125	20
LEVEL 02	2	V (SHOP)	248.915	3	746.735	2	150	25	150	25	150	15	125	20
LEVEL 02	3	V (SHOP)	1285.752	3	3855.91	2	150	25	150	25	150	15	125	20
LEVEL 03	1	V (SHOP)	580.579	3	1741.735	2	150	25	150	25	150	15	125	20
LEVEL 04	1	MR (PLACE OF PUBLIC RESORT)	1700.833	3.2	5442.266	1.5	150	25	140	25	140	15	125	20
LEVEL 05	1	MR (PLACE OF PUBLIC RESORT)	1183.852	3.2	3793.328	1.5	150	25	140	25	140	15	125	20
LEVEL 06	1	MR (PLACE OF PUBLIC RESORT)	1148.511	3.2	3687.238	1.5	150	25	140	25	140	15	125	20
LEVEL 07	1	MR (PLACE OF PUBLIC RESORT)	128.865	3.2	4132.795	1.5	150	25	140	25	140	15	125	20
LEVEL 07	2	MR (PLACE OF PUBLIC RESORT)	1110.533	3.2	3583.706	1.5	150	25	140	25	140	15	125	20
LEVEL 07	3	MR (PLACE OF PUBLIC RESORT)	785.886	3.2	2507.827	1.5	150	25	140	25	140	15	125	20
LEVEL 08	1	MR (PLACE OF PUBLIC RESORT)	1554.758	3.2	5047.185	1.5	150	25	140	25	140	15	125	20
LEVEL 08	2	MR (PLACE OF PUBLIC RESORT)	105.489	3.2	3413.485	1.5	150	25	140	25	140	15	125	20
LEVEL 09	1	MR (PLACE OF PUBLIC RESORT)	1028.187	3.2	3295.134	1.5	150	25	140	25	140	15	125	20
LEVEL 09	2	MR (PLACE OF PUBLIC RESORT)	106.252	3.2	3413.485	1.5	150	25	140	25	140	15	125	20
LEVEL 10	1	MR (PLACE OF PUBLIC RESORT)	1006.758	3.2	3221.754	1.5	150	25	140	25	140	15	125	20
LEVEL 10	2	MR (PLACE OF PUBLIC RESORT)	762.817	3.2	2437.014	1.5	150	25	140	25	140	15	125	20
LEVEL 11	1	MR (PLACE OF PUBLIC RESORT)	864.864	3.2	2767.485	1.5	150	25	140	25	140	15	125	20
LEVEL 11	2	MR (PLACE OF PUBLIC RESORT)	552.864	3.2	1750.548	1.5	150	25	140	25	140	15	125	20
LEVEL 12	1	MR (PLACE OF PUBLIC RESORT)	824.988	3.2	2654.688	1.5	150	25	140	25	140	15	125	20
LEVEL 12	2	MR (PLACE OF PUBLIC RESORT)	816.206	3.2	2611.859	1.5	150	25	140	25	140	15	125	20
LEVEL 12	3	MR (PLACE OF PUBLIC RESORT)	1048.188	3.2	3244.288	1.5	150	25	140	25	140	15	125	20
LEVEL 13	1	MR (PLACE OF PUBLIC RESORT)	820.760	3.2	2624.838	1.5	150	25	140	25	140	15	125	20
LEVEL 14	1	MR (PLACE OF PUBLIC RESORT)	436.210	3.2	1362.872	1.5	150	25	140	25	140	15	125	20
LEVEL 14	2	MR (PLACE OF PUBLIC RESORT)	580.474	3.2	1747.117	1.5	150	25	140	25	140	15	125	20
LEVEL 15	1	MR (PLACE OF PUBLIC RESORT)	801.112	3.2	2483.580	1.5	150	25	140	25	140	15	125	20
LEVEL 16	1	MR (PLACE OF PUBLIC RESORT)	787.853	3.2	2520.460	1.5	150	25	140	25	140	15	125	20
LEVEL 17	1	MR (PLACE OF PUBLIC RESORT)	780.338	3.2	2487.062	1.5	150	25	140	25	140	15	125	20
LEVEL 18	1	MR (PLACE OF PUBLIC RESORT)	783.546	3.2	2487.787	1.5	150	25	140	25	140	15	125	20



1 LEVEL 01
1 : 1000

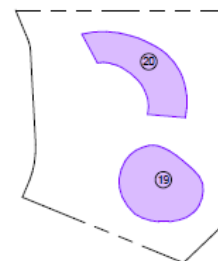
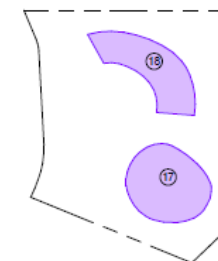
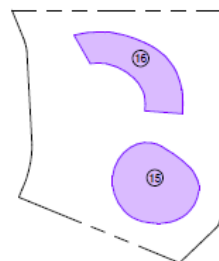
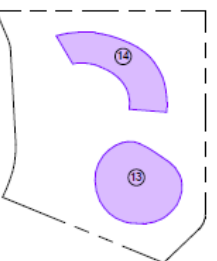
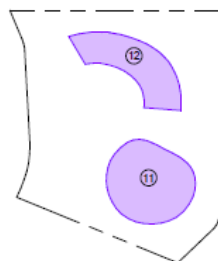
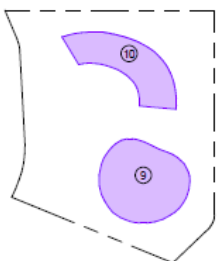
2 LEVEL 02
1 : 1000

3 LEVEL 03
1 : 1000

4 LEVEL 04
1 : 1000

5 LEVEL 05
1 : 1000

6 LEVEL 06
1 : 1000



7 LEVEL 07
1 : 1000

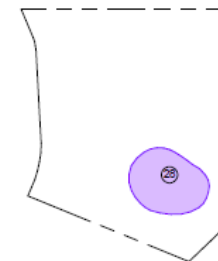
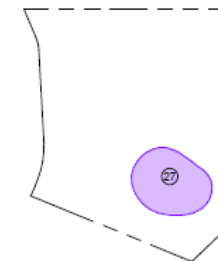
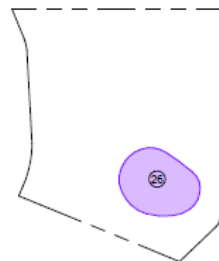
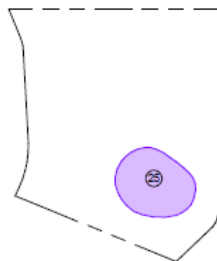
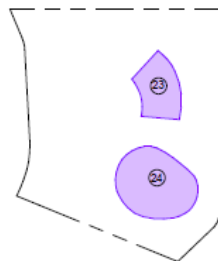
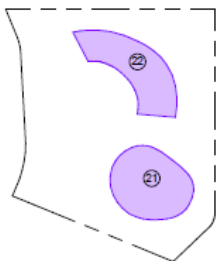
8 LEVEL 08
1 : 1000

9 LEVEL 09
1 : 1000

10 LEVEL 10
1 : 1000

11 LEVEL 11
1 : 1000

12 LEVEL 12
1 : 1000



13 LEVEL 13
1 : 1000

14 LEVEL 14
1 : 1000

15 LEVEL 15
1 : 1000

16 LEVEL 16
1 : 1000

17 LEVEL 17
1 : 1000

18 LEVEL 18
1 : 1000

GFA SCHEDULE		
ID	Use	Area
1	Commercial	2108.188 m ²
2	Commercial	882.341 m ²
3	Commercial	845.318 m ²
4	Commercial	2108.222 m ²
5	Commercial	4092.343 m ²
6	Hotel	158.833 m ²
7	Hotel	1183.862 m ²
8	Hotel	1148.071 m ²
9	Hotel	738.528 m ²
10	Hotel	1110.533 m ²
11	Hotel	795.863 m ²
12	Hotel	1084.788 m ²
13	Hotel	763.735 m ²
14	Hotel	1258.187 m ²
15	Hotel	754.478 m ²
16	Hotel	1096.786 m ²
17	Hotel	821.523 m ²
18	Hotel	964.364 m ²
19	Hotel	811.389 m ²
20	Hotel	521.193 m ²
21	Hotel	815.328 m ²
22	Hotel	846.580 m ²
23	Hotel	833.793 m ²
24	Hotel	428.210 m ²
25	Hotel	358.474 m ²
26	Hotel	861.172 m ²
27	Hotel	757.883 m ²
28	Hotel	780.358 m ²
29	Hotel	183.546 m ²
30	Hotel	20236.948 m ²

Commercial
Hotel

Revit plugin for Automatic Statutory Checking

The team has developed Revit plugins to automate the government submission for China and Hong Kong.

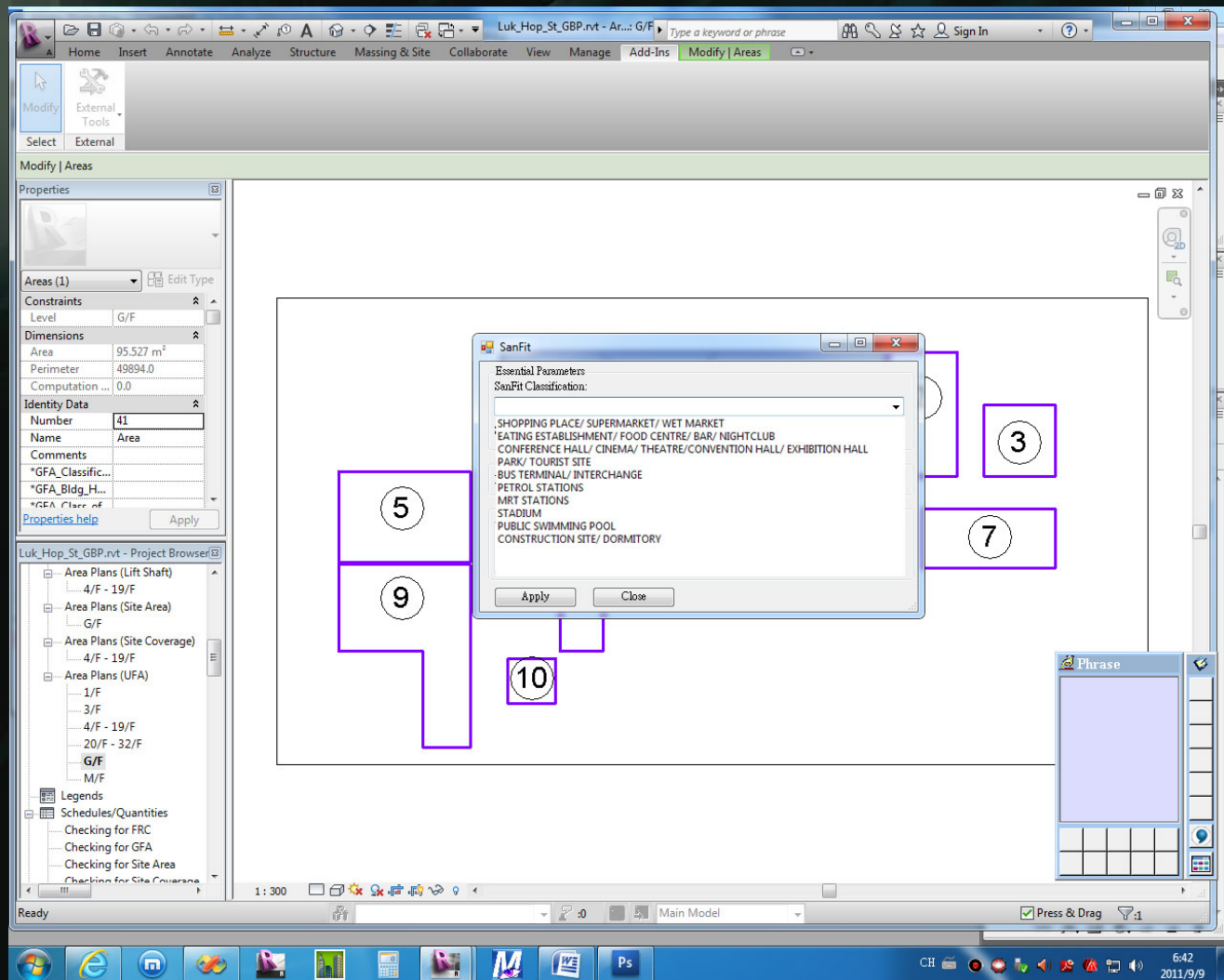
The plugin supports calculation for GFA, Means of Escape, Sanitary Fitment Provision, Fire Compartmentation & Fire Resisting Construction etc.

Simply defining the use of area and the plugin will automate the statutory checking.

Same concept applies to Singapore projects and it was adopted in this competition.

Concept of Automatic Statutory Checking

-define the use of area and the plugin will automate the statutory checking



Support GFA Calculation

-Calculation of GFA Provision & Plot Ratio

The screenshot displays the ACSC Sample Project Calculation software interface. The main window shows a list of area calculations with their respective values in square meters (SQ.M). The left sidebar contains a tree view of the project structure, including Floor Plans, Ceiling Plans, 3D Views, Elevations, Area Plans, and Schedules/Quantities. The top menu bar includes options like Home, Insert, Annotate, Analyze, Structure, Massing & Site, Collaborate, View, Manage, Add-Ins, and Modify. The bottom status bar shows the current scale as 1:500 and the main model.

Calculation	Value (SQ.M)
SITE AREA	46651.54
GROSS FLOOR AREA	53084.75
- COMMERCIAL	34198.45
- HOTEL	6387.83
- ANCILLARY	776.6
- OFFICE	11721.87
PLOT RATIO	1.14
SITE COVERED AREA	16655.56
SITE COVERAGE IN %	35.7%
GREEN AREA	3513.17
GREEN AREA IN %	7.53%

Support Means of Escape

- Calculation of exit door & route requirements

The screenshot displays a software interface with a ribbon menu at the top and a Properties panel on the left. The main workspace shows a table titled "MOE SCHEDULE". The table has columns for Level, ID, Use, Capacity, Door, Staircase, and Corridor & Ramp. The data is organized into two sections, with the first section containing levels 01 to 03 and the second section containing levels 04 to 18. The table is titled "MOE SCHEDULE" and "MIN. WIDTH IN METRE".

Level	ID	Use	CAPACITY	MIN. WIDTH IN METRE		
				DOOR	STAIRCASE	CORRIDOR & RAMP
LEVEL 01	1	Commercial	730	3.65	6.084	3.65
LEVEL 02	2	Commercial	260	1.625	2.167	1.3
LEVEL 02	3	Commercial	310	1.938	2.584	1.55
LEVEL 03	4	Commercial	730	4.563	6.084	3.65
LEVEL 04	5	Hotel	5	1	1	1
LEVEL 05	6	Hotel	120	1	1	1
LEVEL 06	7	Hotel	36	1	1	1
LEVEL 06	8	Hotel	24	1	1	1
LEVEL 07	9	Hotel	36	1	1	1
LEVEL 07	10	Hotel	24	1	1	1
LEVEL 08	11	Hotel	36	1	1	1
LEVEL 08	12	Hotel	24	1	1	1
LEVEL 09	13	Hotel	36	1	1	1
LEVEL 09	14	Hotel	24	1	1	1
LEVEL 10	15	Hotel	36	1	1	1
LEVEL 10	16	Hotel	24	1	1	1
LEVEL 11	17	Hotel	36	1	1	1
LEVEL 11	18	Hotel	24	1	1	1
LEVEL 12	19	Hotel	36	1	1	1
LEVEL 12	20	Hotel	24	1	1	1
LEVEL 13	21	Hotel	36	1	1	1
LEVEL 13	22	Hotel	24	1	1	1
LEVEL 14	23	Hotel	5	1	1	1
LEVEL 14	24	Hotel	24	1	1	1
LEVEL 15	25	Hotel	24	1	1	1
LEVEL 16	26	Hotel	24	1	1	1
LEVEL 17	27	Hotel	24	1	1	1
LEVEL 18	28	Hotel	24	1	1	1

Support Sanitary Fitment Provision

- Calculation of sanitary fitment requirements

The screenshot shows a software interface for calculating sanitary fitment requirements. The main window displays two tables: 'SCHEDULE OF SANITARY FITMENTS PROVISIONS' and 'SCHEDULE OF SANITARY FITMENTS PROVISIONS FOR HOTEL TYPICAL UNIT'. The left sidebar shows a project browser with a tree view of sheets and families.

SCHEDULE OF SANITARY FITMENTS PROVISIONS

LOCATION	USE	CAPACITY			W.C.						
		TOTAL	M.	F.	M.		F.		M.		
					REQ'D	PRO'D	REQ'D	PRO'D	REQ'D	PRO'D	
0/F - 3/F	OFFICE	81	54	27	3			3		3	2
0/F - 3/F	WORKPLACE	224	112	112	5			5		5	5
0/F - 3/F	RESTAURANT	384	192	192	2			4		4	4
3/F	PLACE OF PUBLIC	91	46	45	1			2		1	1
Typical Floor	WORKPLACE	3	2	1	1			1		1	1

SCHEDULE OF SANITARY FITMENTS PROVISIONS FOR HOTEL TYPICAL UNIT

LOCATION	USE	CAPACITY		W.C.		BASIN		BATH	
		TOTAL	REQ'D	PRO'D	REQ'D	PRO'D	REQ'D	PRO'D	
Typical Hotel Room Unit	DOMESTIC	4	1		1		1		

The left sidebar shows a project browser with a tree view of sheets and families. The main window displays two tables: 'SCHEDULE OF SANITARY FITMENTS PROVISIONS' and 'SCHEDULE OF SANITARY FITMENTS PROVISIONS FOR HOTEL TYPICAL UNIT'. The left sidebar shows a project browser with a tree view of sheets and families.

Support Fire Compartmentation

- Calculation of compartment volume

The screenshot displays the Revit software interface for a Fire Resistance Calculation (FRC) diagram. The main view shows a diagram of a compartment with a purple outline and a circled number '2'. The Properties panel on the left shows the 'Sheet' tab with 'Sheet: FRC Diagram' selected. The Project Browser on the left shows the 'A105 - FRC Diagrams' folder selected. The table on the right, titled 'COMPARTMENT VOLUME', lists the following data:

ID	COMPARTMENT	AREA (SQ.M)	FLOOR HEIGHT (M)	VOLUME (CU.M)
1	G01	693.613	3	2080.839
2	G02	1055.728	3	3167.184

The bottom status bar indicates 'Click to select, TAB for alternates, CTRL adds, SHIFT unselects' and 'Main Model'.

Support Fire Resisting Construction

- Calculation of FRP & required thickness for elements of construction

The screenshot displays a software interface with a ribbon menu at the top containing tabs like Home, Insert, Annotate, Analyze, Structure, Massing & Site, Collaborate, View, Manage, Add-Ins, and Modify. The ribbon includes various tool icons for building elements such as Wall, Door, Window, Component, Column, Roof, Ceiling, Floor, Mullion, Curtain System, Curtain Grid, Model Text, Model Line, Model Group, Railing, Ramp, Shaft, Stairs, Opening, Datum, Room, Legend, Tag, Viewer, Area, Set, Ref Plane, and Work Plane.

On the left, the Properties panel shows the 'Sheet' tab with options for 'Sheet: Project Sumr' and 'Edit Type'. Below this, the 'Identity Data' section includes fields for 'Dependency' (set to 'Independent') and 'Referencing S...'. The Project Browser on the left lists various project components, including 'SCHEDULE OF PERSONS FOR...', 'SCHEDULE OF REMAINING U...', 'SCHEDULE OF SANITARY FIT...', 'SCHEDULE OF SANITARY FIT...', 'SCHEDULE OF UFA SUMMA...', 'SCHEDULE OF UFS SUMMA...', 'SITE COVERAGE', 'Sheets (all)', 'A101 - Project Summary', 'A102 - GFA Diagrams', 'A103 - UFA Diagrams', 'A104 - UFA Diagrams', 'A105 - FRC Diagrams', 'Families', 'Annotation Symbols', 'A1 metric', 'Elevation Mark Circle - U', and 'Elevation Mark Printer'.

The main workspace contains a table titled 'FIRE RESISTANCE REQUIREMENT FOR ELEMENTS OF CONSTRUCTION'. The table has columns for 'ELEMENT', 'FRP REQ'D', 'THK.', 'COVER TO STEEL', and 'TI'. The data is organized by element type: R.C. WALL, R.C. BEAM, R.C. COLUMN, and R.C. SLAB. Each element type has a 'THK.' and 'COVER TO STEEL' column. The 'TI' column is present for R.C. WALL, R.C. BEAM, and R.C. COLUMN, but not for R.C. SLAB.

ELEMENT	FRP REQ'D	R.C. WALL => 1% V.R.		R.C. BEAM		R.C. COLUMN		R.C. SLAB		TI
		THK.	COVER TO STEEL	THK.	COVER TO STEEL	THK.	COVER TO STEEL	THK.	COVER TO STEEL	
1	75	15	200	30	200	25	100	20	95	
1	75	15	200	30	200	25	100	20	95	
1	75	15	200	30	200	25	100	20	95	
1	75	15	200	30	200	25	100	20	95	

Below the table, there is a 'SITE COVERAGE' table with columns 'ID' and 'AREA (SQ.)'. The data shows a single entry with ID '1' and area '1239.582'.

SITE COVERAGE	
ID	AREA (SQ.)
1	1239.582

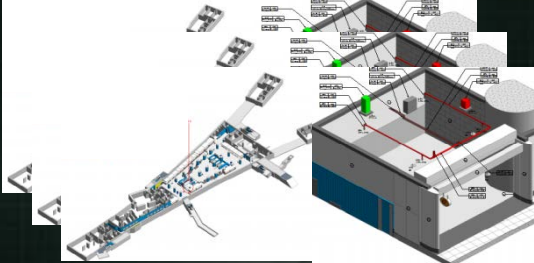
The bottom of the interface shows a status bar with the text 'Click to select, TAB for alternates, CTRL adds, SHIFT unselects', a 'Main Model' dropdown, and a 'Press & Drag' button. The Windows taskbar at the very bottom shows the time as 23:40 on 2011/9/8.

9 Facility Management

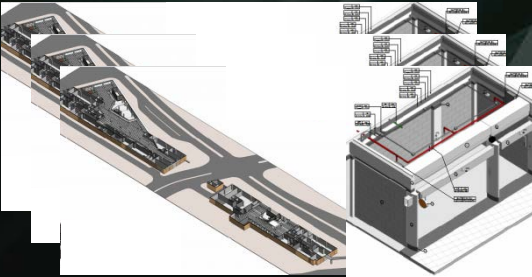
BIM building data extracted into Database. Data information integrated into FM database for analysis, reporting, maintenance & repair and placement of Work's order.

MODELLING + INDIVIDUAL DATABASE

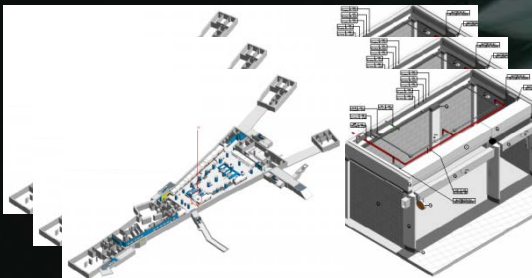
S1



S2



S3



SYSTEM WIDE DATABASE

MEGA
DATABASE

APPLICATIONS

APP 1

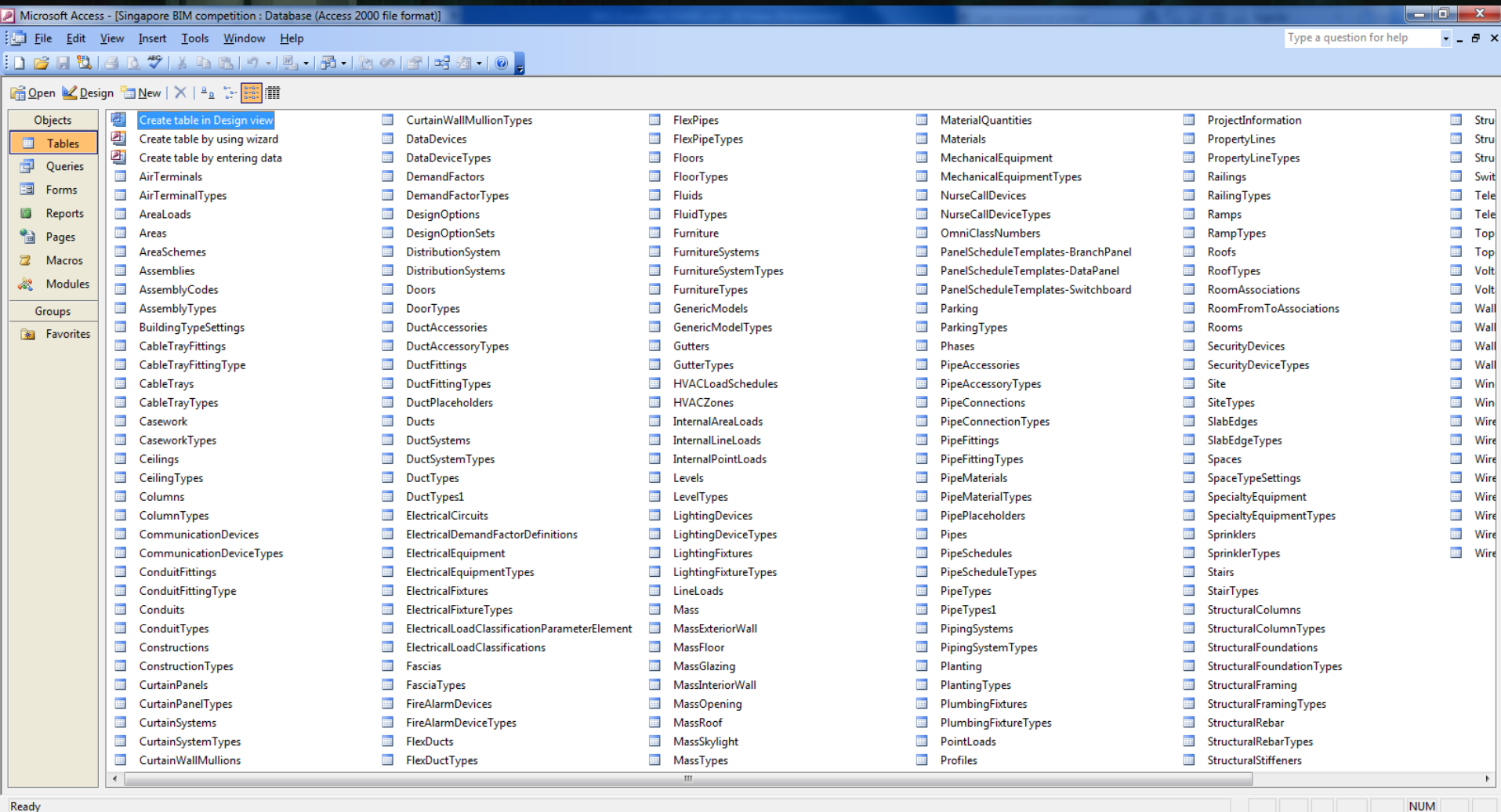
E.G. CCTV
MONITORING

APP 2

E.G. RETAIL

APP 3







Query1 : Select Query

	FamilyName	TypeName
▶	SAT Tower Mullion	SAT Tower Mullion
	SAT Tower Surface Ref	SAT Tower Surface Ref
	Tower Panel	S01-P001
	Tower Panel	S01-P002
	Tower Panel	S01-P003
	Tower Panel	S01-P004
	Tower Panel	S01-P005
	Tower Panel	S01-P006
	Tower Panel	S01-P007
	Tower Panel	S01-P008
	Tower Panel	S01-P009
	Tower Panel	S01-P010
	Tower Panel	S01-P011
	Tower Panel	S01-P012
	Tower Panel	S01-P013
	Tower Panel	S01-P014
	Tower Panel	S01-P015
	Tower Panel	S01-P016
	Tower Panel	S01-P017
	Tower Panel	S01-P018
	Tower Panel	S01-P019
	Tower Panel	S01-P020
	Tower Panel	S01-P021
	Tower Panel	S01-P022
	Tower Panel	S01-P023
	Tower Panel	S01-P024
	Tower Panel	S01-P025
	Tower Panel	S01-P026
	Tower Panel	S01-P027
	Tower Panel	S01-P028
	Tower Panel	S01-P029
	Tower Panel	S01-P030
	Tower Panel	S01-P031
	Tower Panel	S01-P032
	Tower Panel	S01-P033
	Tower Panel	S01-P034
	Tower Panel	S01-P035
	Tower Panel	S01-P036
	Tower Panel	S01-P037
	Tower Panel	S01-P038
	Tower Panel	S01-P039
	Tower Panel	S01-P040



THANK YOU!

