

# Singapore International BIM Competition

BIM Evangelist Team

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*Wu Ling*

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# BIM Evangelist Team

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- 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*

# *1 Design Workflow*

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

# BIM - INFORMATION FLOW

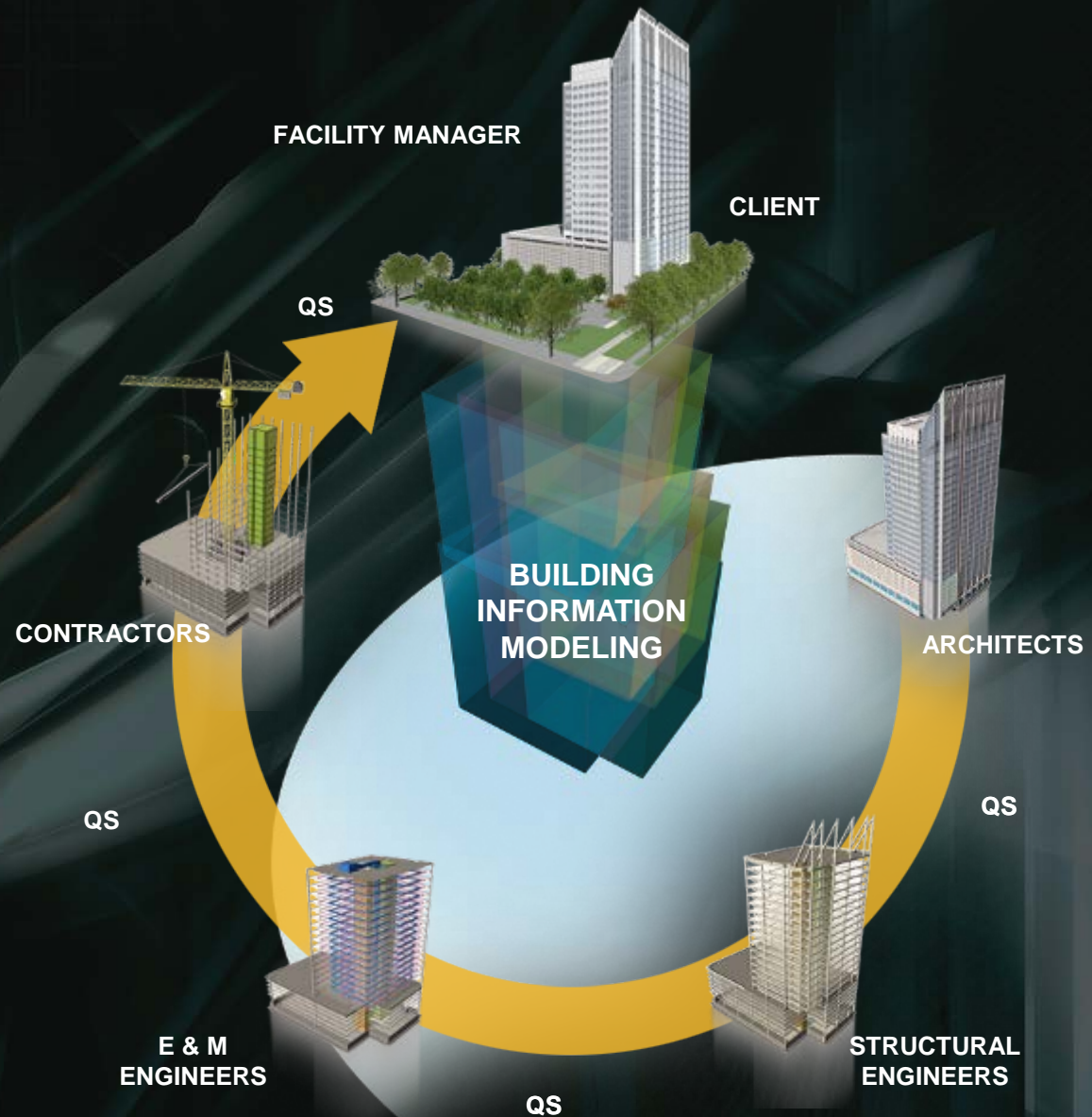
Graphical Data  
(model)

+

Non-Graphical  
Data  
(Information)

+

New workflow



## *2 Organic Parametric Design*

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

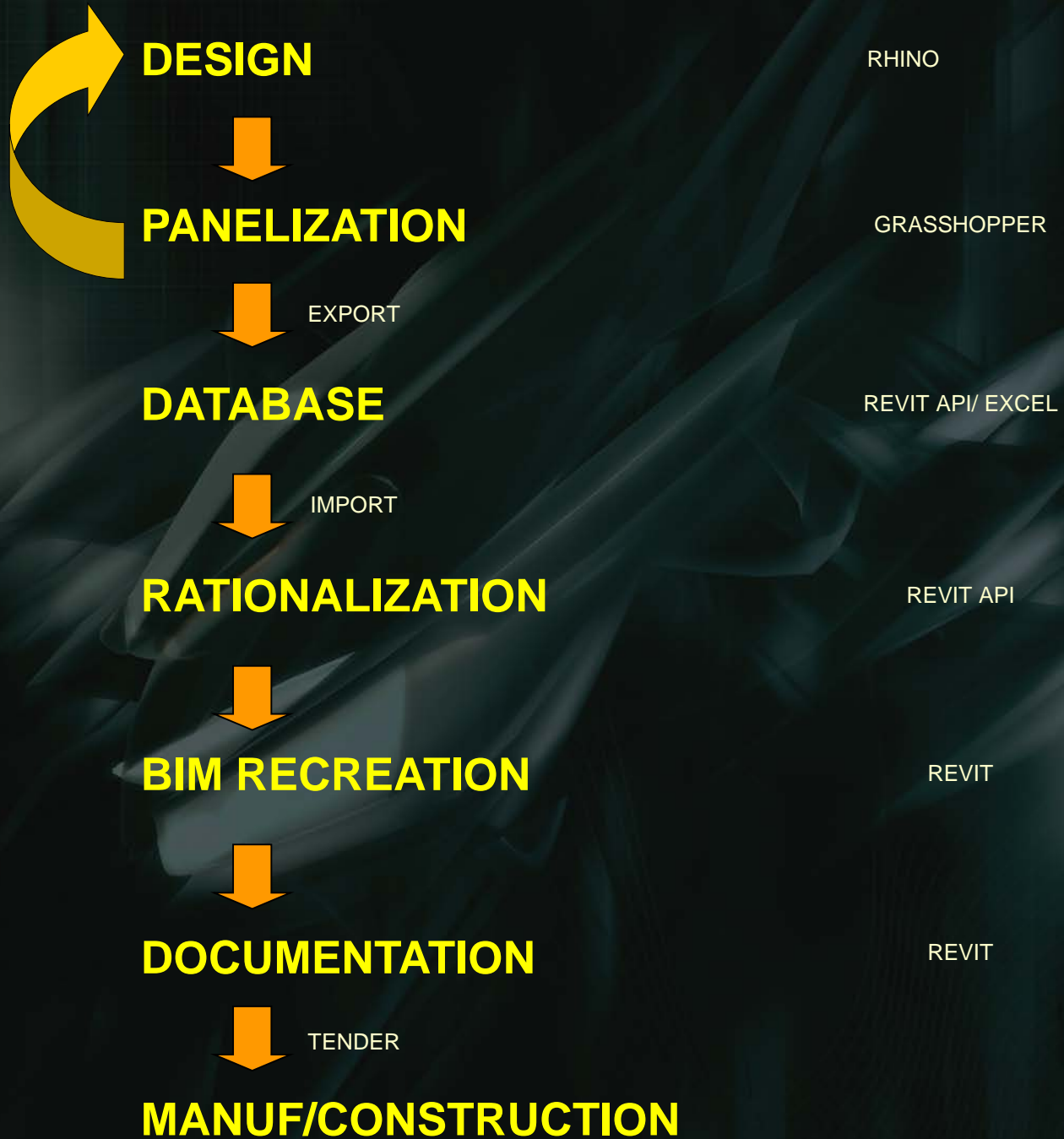
# SCULPTURE

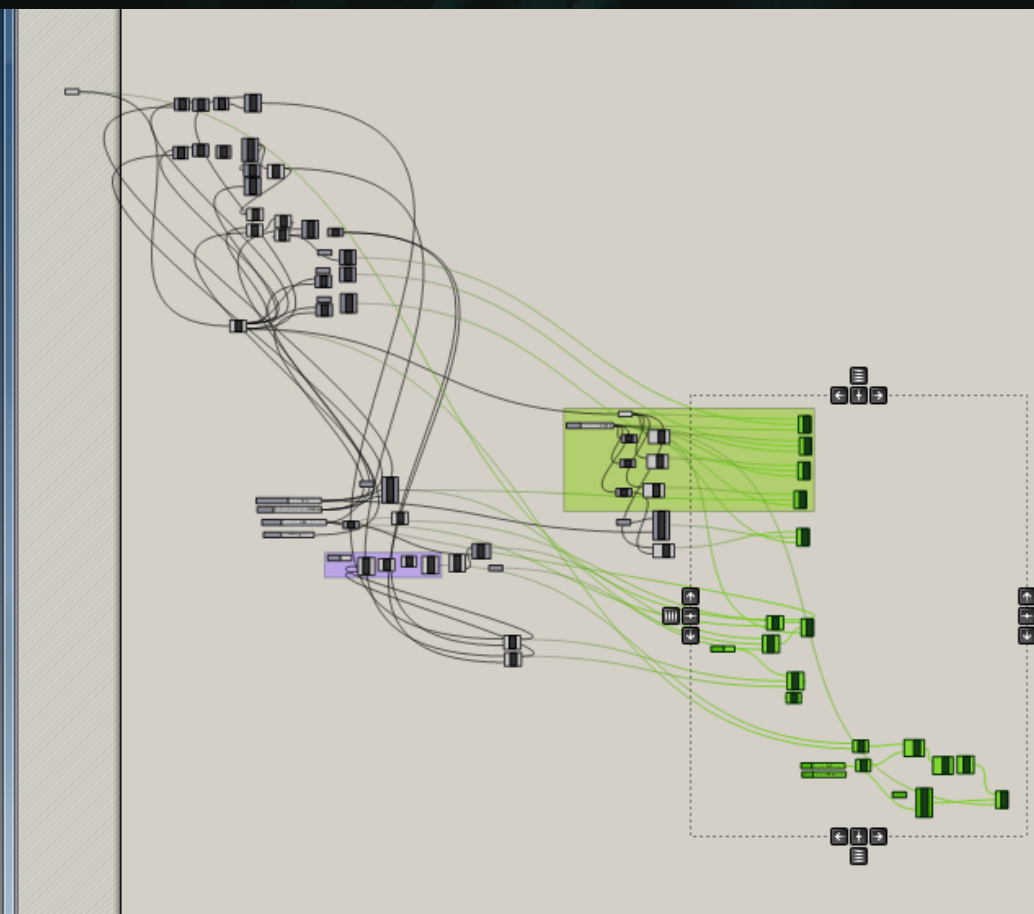
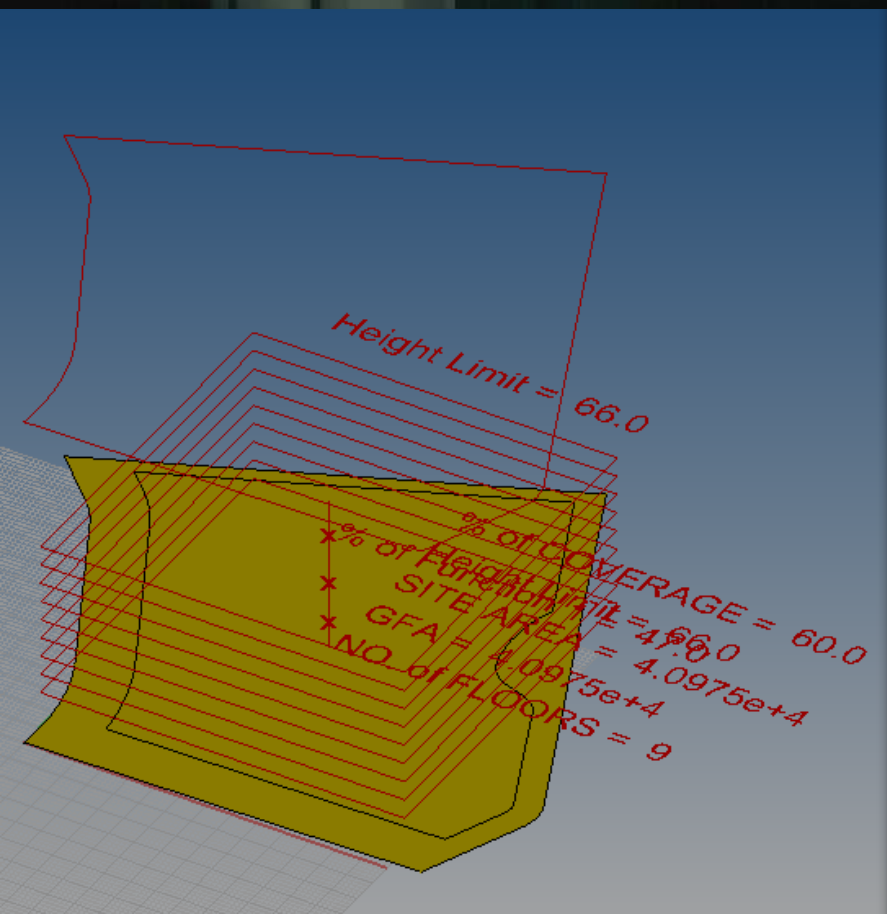
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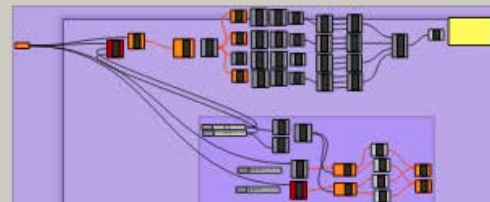
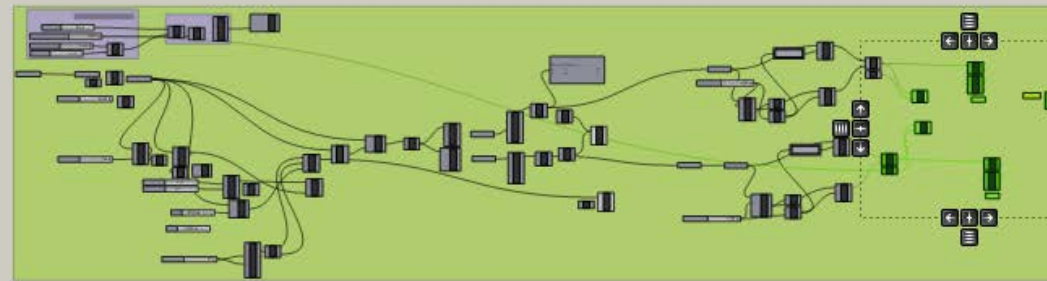
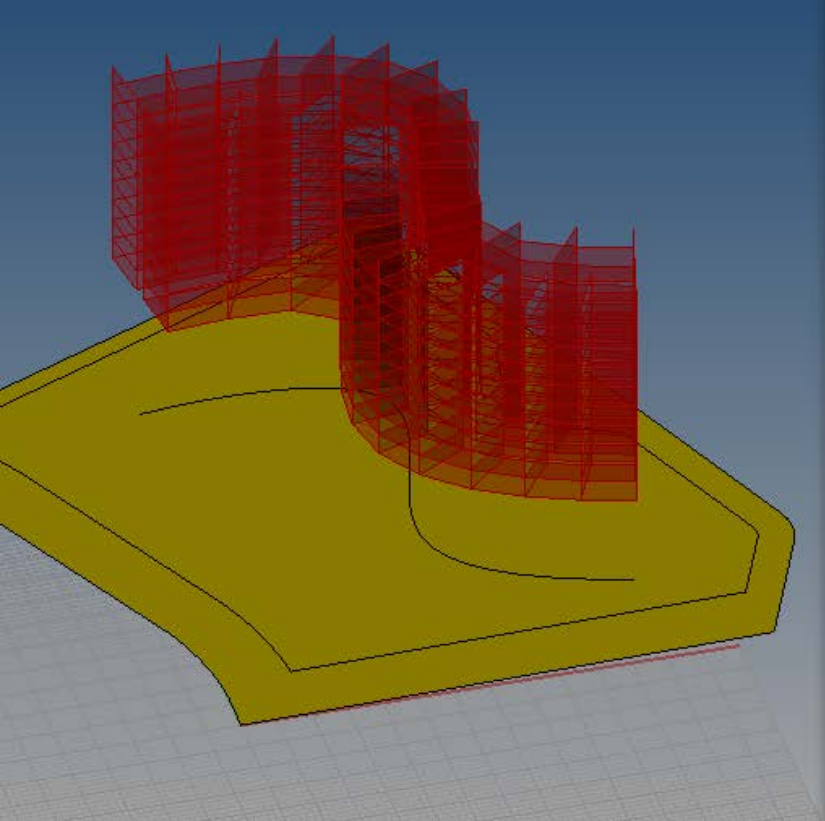
# ARCHITECTURE

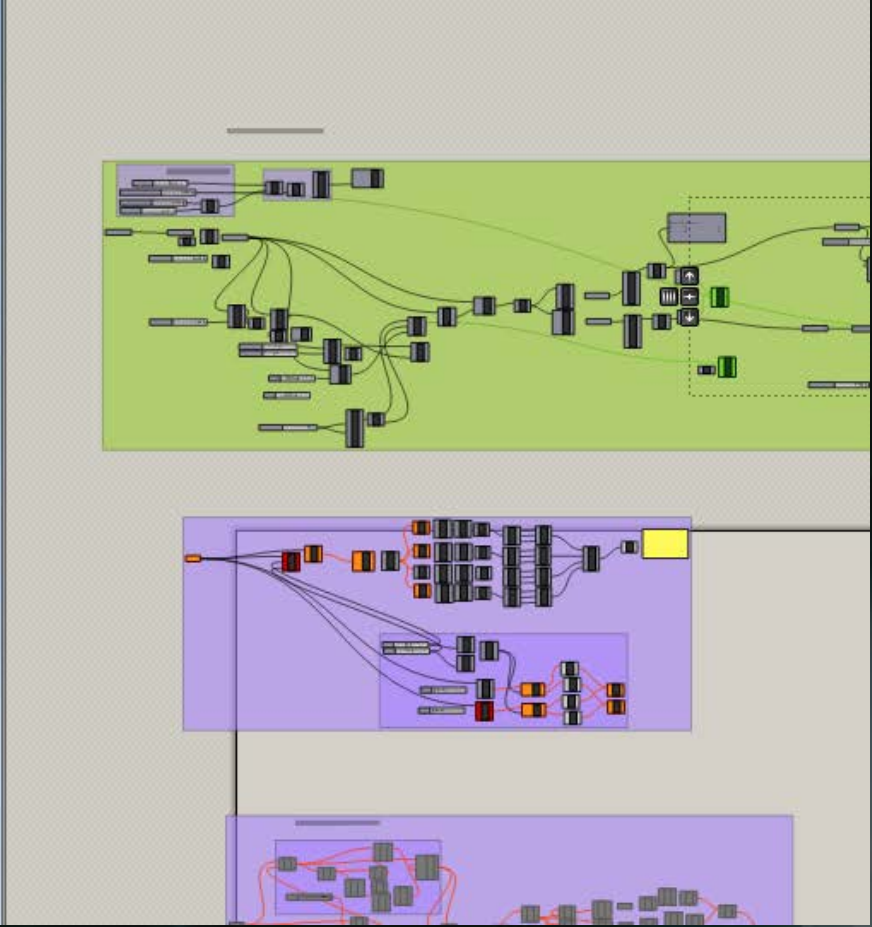
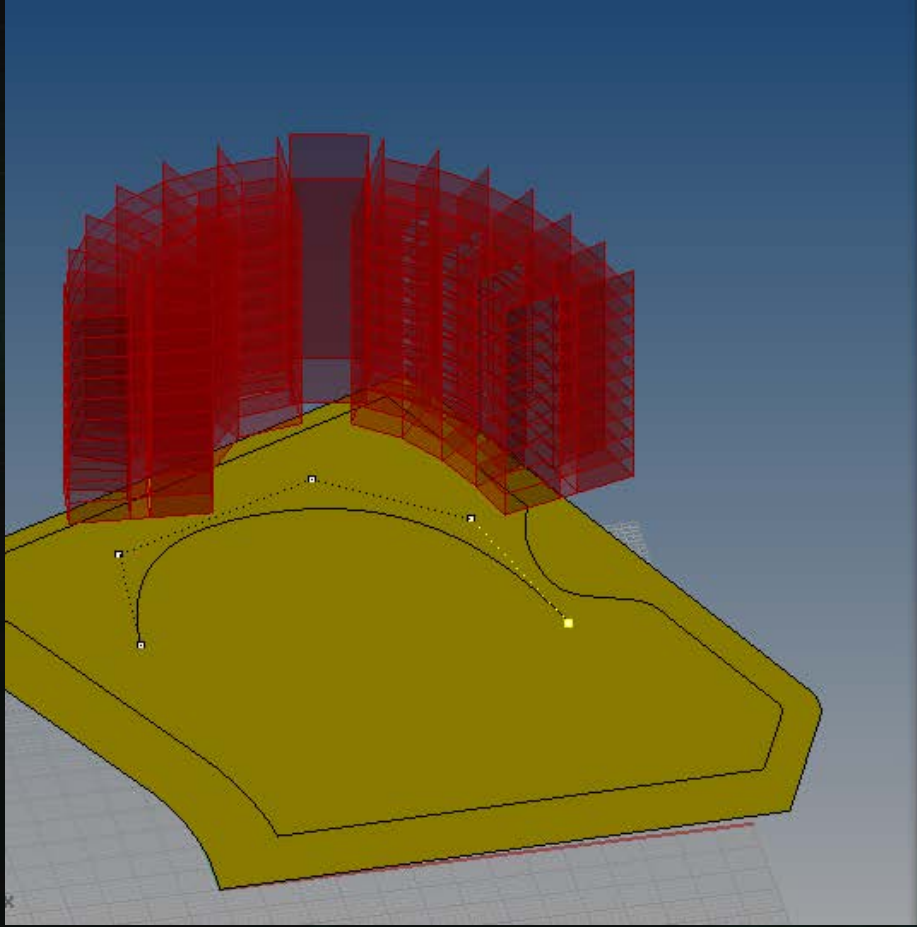


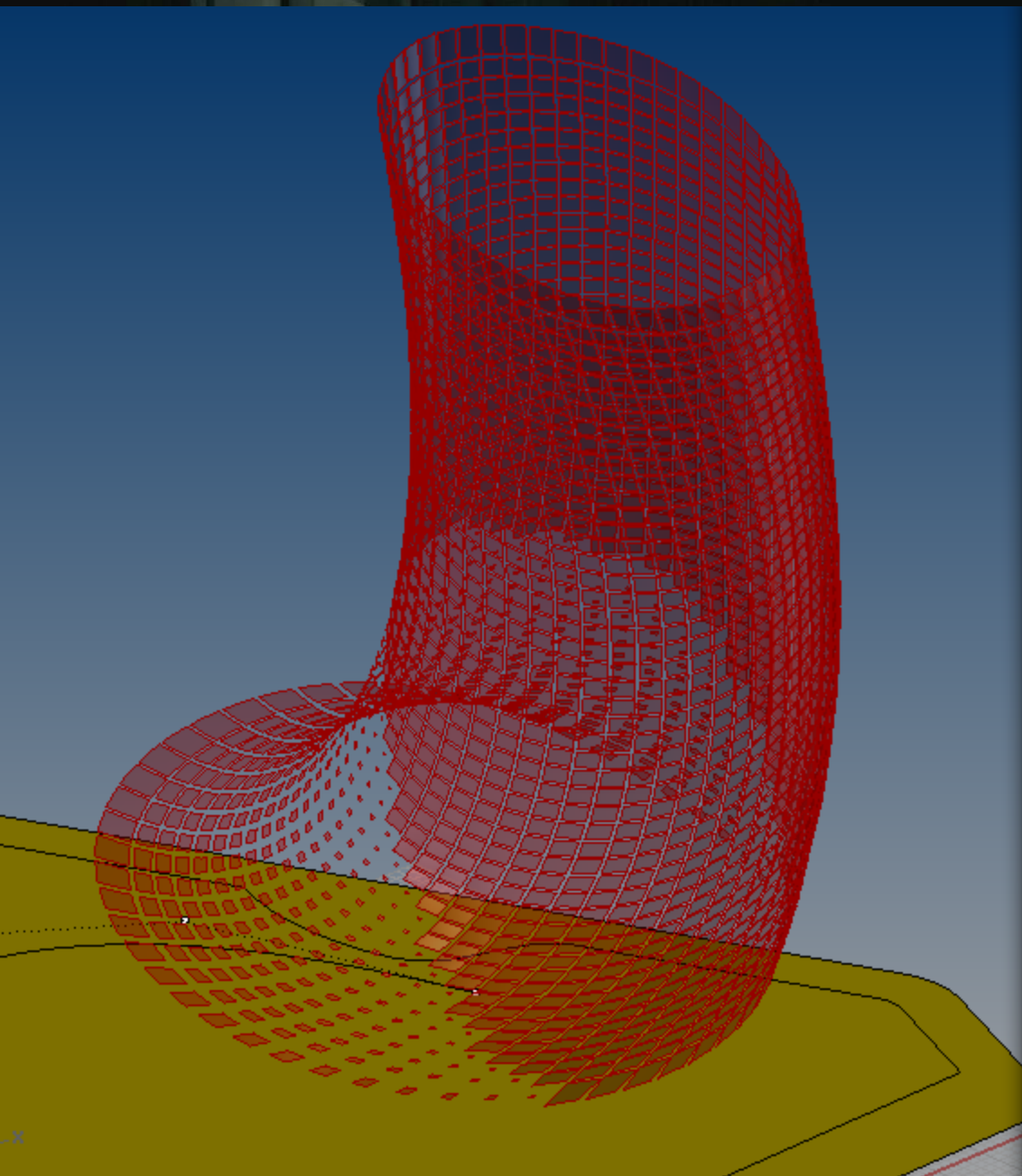
Purely decorative, NO accommodation	Accommodations - area, uses, clear height, travel distance constraints
Built by Sculptor (Designer)	Built by Workers (Not Designer)
Materials freedom of choice - malleable	Large size, material built up by sticks, sheets
Direct production	Drawings – form of communications
Changes as one thinks fit	Record of Changes => \$ and Time











File Edit View Arrange Solution Window Help

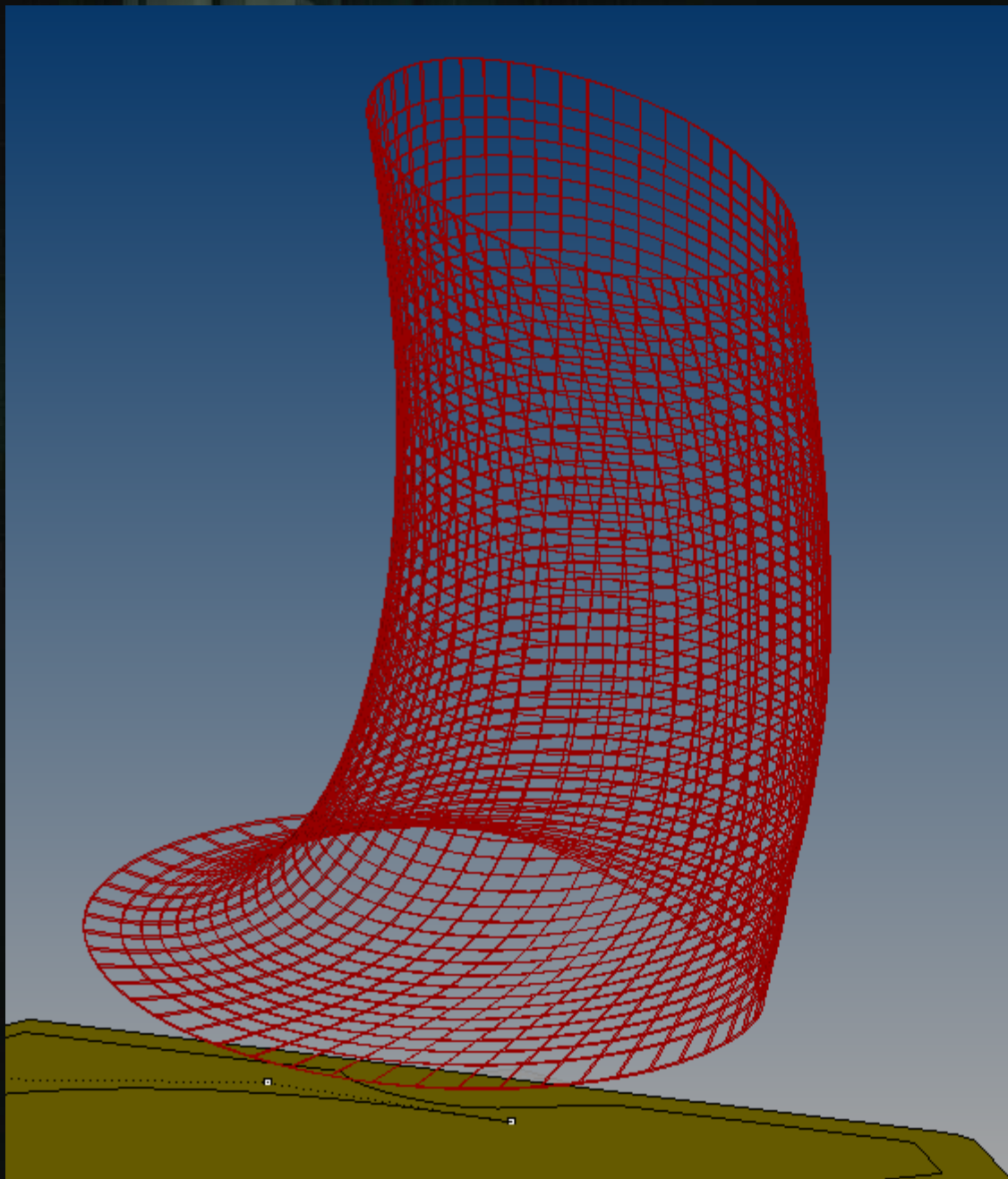
Params Math Sets Vector Curve Surface Mesh

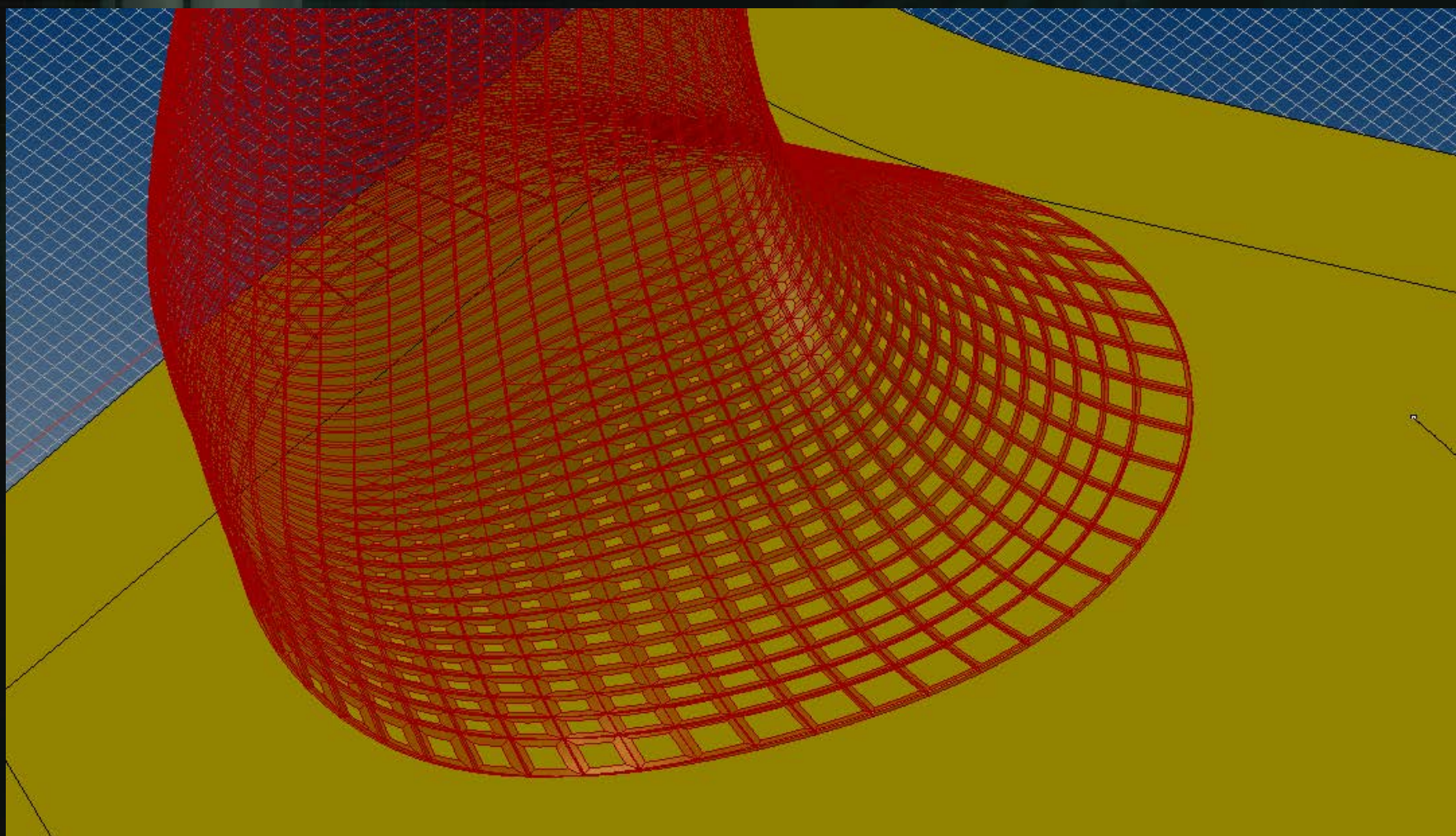
Geometry Primitive

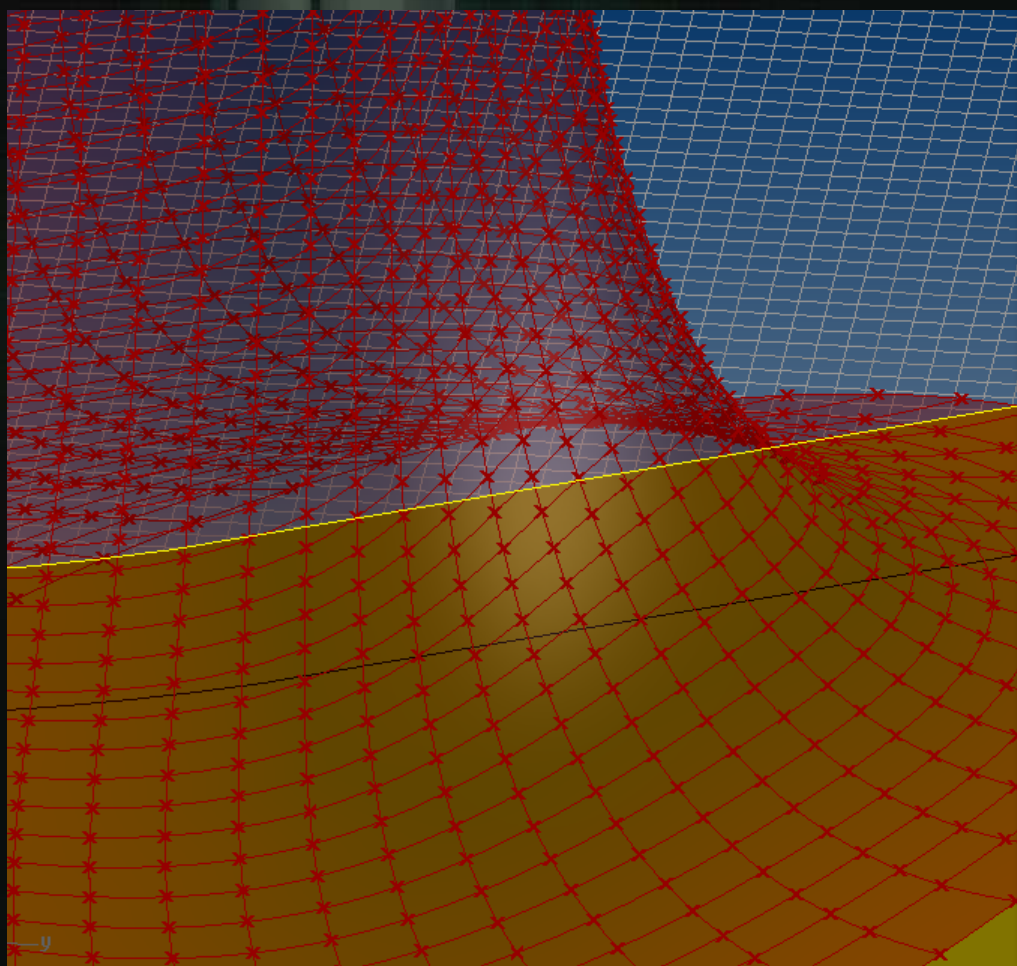
21%

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 consists of numerous black rectangular nodes connected by a network of lines, with some nodes highlighted in green. The interface includes a menu bar at the top with options like File, Edit, View, Arrange, Solution, Window, and Help. Below the menu bar are tabs for Params, Math, Sets, Vector, Curve, Surface, and Mesh. There are also toolbars with icons for Geometry and Primitive. A status bar at the bottom indicates that the solution was completed in approximately 24.9 seconds, 140 seconds ago.







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,
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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
{

```

TAG &amp; ANNOTATION

## BIM EVANGELIST

Panel Type		Material	Panelisation Schedule (Partial)																Diagonal	Area
			P01x	P01y	P02z	P02x	P02y	P03z	P03x	P03y	P04z	P04x	P04y	P04z	Edge 1	Edge 2	Edge 3	Edge 4		
P04-P004	Glazing	B	41.228	15.163	71.590	41.863	18.877	70.124	43.381	17.600	69.607	42.999	16.053	71.034	14.91	1.180	1.526	2.147	13.264	2.787 m²
P04-P005	Glazing	B	42.299	18.053	71.034	43.381	17.800	69.607	42.270	16.975	69.499	44.508	17.201	70.575	14.51	1.231	1.491	2.140	13.119	2.759 m²
P04-P006	Glazing	B	44.508	17.201	70.575	42.270	16.975	69.499	47.293	16.420	68.877	45.928	16.820	70.222	14.09	1.230	1.451	2.131	13.030	2.742 m²
P04-P007	Glazing	B	46.926	16.820	70.222	47.293	16.420	68.877	49.394	16.126	68.585	49.032	16.297	69.683	13.68	1.233	1.408	2.145	12.962	2.738 m²
P04-P008	Glazing	B	49.032	16.297	69.683	49.394	16.126	68.585	51.548	15.069	68.512	51.194	16.213	69.780	13.24	1.260	1.365	2.174	12.914	2.736 m²
P04-P009	Glazing	B	51.194	16.213	69.780	51.548	15.069	68.512	53.368	14.347	68.398	53.068	16.281	69.438	12.82	1.283	1.334	2.202	12.874	2.734 m²
P04-P010	Glazing	B	53.368	14.347	68.398	53.068	16.281	69.438	55.114	13.597	68.266	54.844	16.351	69.081	12.41	1.305	1.286	2.237	12.846	2.732 m²
P04-P011	Glazing	B	55.114	13.597	68.266	54.844	16.351	69.081	56.854	12.684	68.154	56.584	16.424	68.754	12.00	1.326	1.260	2.272	12.821	2.730 m²
P04-P012	Glazing	B	56.854	12.684	68.154	56.584	16.424	68.754	58.307	11.690	68.037	58.067	16.495	68.425	11.69	1.347	1.234	2.304	12.806	2.679 m²
P04-P013	Glazing	B	57.768	17.193	69.495	58.062	17.124	68.309	60.200	17.817	68.256	59.901	17.866	69.431	21.24	1.229	1.229	2.238	2.800	1.643 m²
P04-P014	Glazing	B	59.901	17.866	71.034	60.200	17.817	68.256	61.544	18.877	69.607	61.201	17.800	70.124	18.877	1.231	1.231	2.147	13.264	2.787 m²
P04-P015	Glazing	B	61.543	18.703	69.385	62.239	18.666	62.212	64.159	19.680	68.206	63.888	19.706	69.382	20.07	1.271	1.207	2.179	12.588	2.976 m²
P04-P016	Glazing	B	63.888	19.706	69.382	64.159	19.680	62.206	66.923	20.667	68.267	66.669	20.685	69.440	1.210	1.217	1.207	2.137	12.596	2.951 m²
P04-P017	Glazing	B	65.669	20.885	69.440	65.923	20.867	66.267	67.492	22.238	68.421	67.260	22.248	69.605	1.217	1.209	1.212	2.101	12.453	2.937 m²
P04-P018	Glazing	B	67.492	22.248	69.615	67.762	22.238	68.421	68.661	23.798	68.669	68.623	23.841	69.915	1.223	1.207	1.217	2.089	12.468	2.930 m²
P04-P019	Glazing	B	69.615	23.803	69.831	69.831	23.803	69.615	69.999	25.000	69.999	70.000	25.000	71.232	1.232	1.232	1.232	2.118	12.493	2.918 m²
P04-P019	Glazing	B	69.924	25.566	70.344	69.900	25.567	69.924	70.218	26.787	69.870	70.530	27.477	70.934	1.234	1.236	1.229	2.166	12.241	2.896 m²
P04-P020	Glazing	B	70.344	21.666	71.396	70.381	21.350	69.860	40.239	19.877	69.225	39.936	20.176	70.728	1.559	1.168	1.591	2.174	13.306	2.666 m²
P05-P021	Glazing	B	70.728	21.776	72.225	40.239	19.877	69.225	41.885	18.599	68.661	41.563	18.877	70.124	1.523	1.168	1.559	2.165	13.247	2.839 m²
P05-P022	Glazing	B	41.563	18.877	70.124	41.885	18.599	68.661	43.544	19.880	71.590	43.297	16.053	71.034	1.523	1.172	1.559	2.165	13.150	2.770 m²
P05-P023	Glazing	B	43.544	19.880	69.607	43.687	17.546	68.114	45.616	16.746	67.807	45.210	16.975	69.189	1.443	1.211	1.485	2.131	13.079	2.774 m²
Glazing B 20																				
P04-P011	Glazing	B	60.436	14.022	60.251	60.289	43.179	70.882	68.234	14.652	70.403	68.386	44.769	60.852	1.429	1.241	1.396	2.252	12.413	3.170 m²
P04-P012	Glazing	B	58.368	44.769	60.852	60.334	43.522	69.023	65.144	14.747	70.808	65.096	44.811	61.242	1.466	1.239	1.429	2.283	12.447	3.186 m²
P04-P013	Glazing	B	56.096	45.411	61.242	56.144	43.747	70.808	64.038	15.627	69.101	54.196	45.903	61.571	1.503	1.163	1.466	2.192	12.542	3.236 m²
P04-P014	Glazing	B	54.196	45.903	61.571	54.035	45.627	69.101	51.923	15.919	69.284	52.070	46.204	61.790	1.540	1.140	1.503	2.149	12.604	3.262 m²
P04-P015	Glazing	B	52.070	46.204	61.790	51.923	45.919	69.284	49.834	15.978	69.308	49.964	46.242	61.901	1.576	1.110	1.540	2.110	12.673	3.278 m²
P04-P016	Glazing	B	49.964	46.212	61.901	49.834	15.978	69.308	47.837	15.937	69.307	48.000	46.242	61.901	1.576	1.110	1.540	2.110	12.673	3.278 m²
P04-P017	Glazing	B	47.837	46.963	61.902	47.925	45.762	69.307	45.327	15.730	69.192	45.844	46.542	61.797	1.639	1.096	1.609	2.071	12.671	3.311 m²
P04-P018	Glazing	B	45.844	46.542	61.797	45.732	45.230	69.192	43.768	14.936	70.959	43.977	47.114	61.589	1.665	1.131	1.639	2.142	12.688	3.433 m²
P04-P019	Glazing	B	43.768	47.114	61.589	43.796	44.395	70.959	41.954	14.290	71.632	42.021	43.626	61.283	1.686	1.165	1.686	2.176	13.094	3.488 m²
P04-P020	Glazing	B	41.954	43.626	61.283	41.954	44.395	70.959	39.959	13.968	71.632	40.291	43.626	61.283	1.686	1.165	1.686	2.176	13.094	3.488 m²
P04-P011	Glazing	B	60.432	14.022	60.885	60.271	41.951	70.218	68.776	15.413	70.218	68.776	44.762	60.401	1.717	1.201	1.704	2.221	13.251	3.502 m²
P04-P012	Glazing	B	39.769	40.772	60.401	39.776	40.413	70.218	37.503	16.712	70.150	37.487	39.981	60.935	1.726	1.199	1.717	2.208	13.311	3.451 m²
P04-P013	Glazing	B	37.487	39.981	60.935	37.503	38.712	70.150	36.491	16.884	70.378	36.445	37.258	70.195	1.729	1.197	1.725	2.195	13.352	3.366 m²
P04-P014	Glazing	B	35.445	37.258	70.195	36.491	37.503	70.378	34.500	17.051	70.305	34.467	35.769	70.488	1.727	1.171	1.729	2.183	13.401	3.338 m²
P04-P015	Glazing	B	33.461	35.769	70.488	35.445	37.361	70.305	32.499	17.202	70.382	32.465	33.788	70.592	1.727	1.157	1.727	2.171	13.441	3.355 m²
P04-P016	Glazing	B	31.496	33.366	37.731	31.304	32.979	70.655	30.133	18.965	70.274	34.997	31.343	70.338	1.710	1.163	1.721	2.173	13.426	3.306 m²
P04-P017	Glazing	B	34.997	31.343	70.338	31.304	32.979	70.655	32.174	19.646	70.476	35.080	32.933	70.122	1.696	1.210	1.696	2.170	13.432	3.034 m²
P04-P018	Glazing	B	32.933	32.933	70.122	32.546	29.865	70.476	34.644	27.000	73.674	35.447	27.359	72.599	1.676	1.159	1.676	2.170	13.432	2.973 m²
P04-P019	Glazing	B	30.650	29.865	70.476	30.650	27.000	73.674	28.644	19.646	70.476	35.080	32.933	70.122	1.696	1.210	1.696	2.170	13.432	2.973 m²
P04-P020	Glazing	B	28.644	30.650	73.674	28.644	27.000	73.674	26.644	19.646	70.476	35.080	32.933	70.122	1.696	1.210	1.696	2.170	13.432	2.973 m²
P04-P021	Glazing	B	26.644	28.644	73.674	26.644	27.000	73.674	25.644	19.646	70.476	35.080	32.933	70.122	1.696	1.210	1.696	2.170	13.432	2.973 m²
P04-P022	Glazing	B	24.644	26.644	73.674	24.644	27.000	73.674	23.644	19.646	70.476	35.080	32.933	70.122	1.696	1.210	1.696	2.170	13.432	2.973 m²
P04-P023	Glazing	B	22.644	24.644	73.674	22.644	27.000	73.674	21.644	19.646	70.476	35.080	32.933	70.122	1.696	1.210	1.696	2.170	13.432	2.973 m²
P04-P024	Glazing	B	20.644	22.644	73.674	20.644	27.000	73.674	19.644	19.646	70.476	35.080	32.933	70.122	1.696	1.210	1.696	2.170	13.432	2.973 m²
P04-P025	Glazing	B	18.644	20.644	73.674	18.644	27.000	73.674	17.644	19.646	70.476	35.080	32.933	70.122	1.696	1.210	1.696	2.170	13.432	2.973 m²
P04-P026	Glazing	B	16.644	18.644	73.674	16.644	27.000	73.674	15.644	19.646	70.476	35.080	32.933	70.122	1.696	1.210	1.696	2.170	13.432	2.973 m²
P04-P027	Glazing	B	14.644	16.644	73.674	14.644	27.000	73.674	13.644	19.646	70.476	35.080	32.933	70.122	1.696	1.210	1.696	2.170	13.432	2.973 m²
P04-P028	Glazing	B	12.644	14.644	73.674	12.644	27.000	73.674	11.644	19.646	70.476	35.080	32.933	70.122	1.696	1.210	1.696	2.170	13.432	2.973 m²
P04-P029	Glazing	B	10.644	12.644	73.674	10.644	27.000	73.674	9.644	19.646	70.476	35.080	32.933	70.122	1.696	1.210	1.696	2.170	13.432	2.973 m²
P04-P030	Glazing	B	8.644	10.644	73.674	8.644	27.000	73.674	7.644	19.646	70.476	35.080	32.933	70.122	1.696	1.210	1.696	2.170	13.432	2.973 m²
P04-P031	Glazing	B	6.644	8.644	73.674	6.644	27.000	73.674	5.644	19.646	70.476	35.080	32.933	70.122	1.696	1.210	1.696	2.170	13.432	2.973 m²
P04-P032	Glazing	B	4.644	6.644	73.674	4.644	27.000	73.674	3.644	19.646	70.476	35.080	32.933	70.122	1.696	1.210	1.696	2.170	13.432	2.973 m²
P04-P033	Glazing	B	2.644	4.644	73.674	2.644	27.000	73.674	1.644	19.646	70.476	35.080	32.933	70.122	1.696	1.210	1.696	2.170	13.432	2.973 m²
P04-P034	Glazing	B	0.644	2.644	73.674	0.644	27.000	73.674	-0.356	19.646	70.476	35.080	32.933	70.122	1.696	1.210	1.696	2.170	13.4	

PROJECT NAME

## KALLANG RIVERSIDE HOTEL DEVELOPMENT

DRAWING TITLE

## PANELISATION ANNOTATION AND SCHEDULE

FILE

Project Name

**DRAWN**

	CHECK
--	-------

DRAWN  
Auth

for	CHECK
-----	-------

DRAINING NO.

10	1
----	---

SCALE

@A1

DATE \_\_\_\_\_

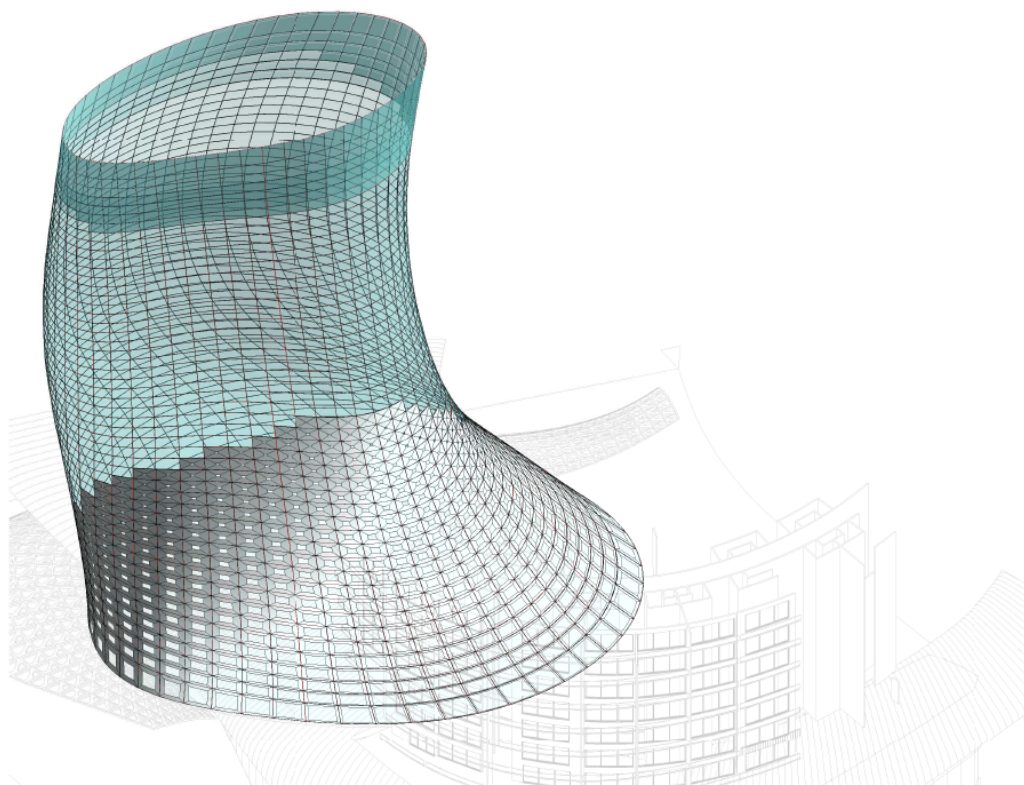
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DATE \_\_\_\_\_

10. SEPT 2011

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REVISION



① TOWER FACADE

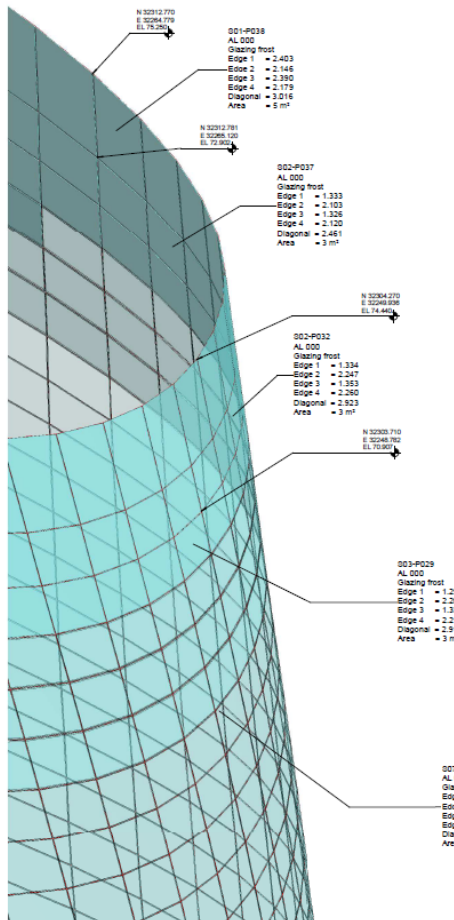
**BIM EVANGELIST**



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. <b>BIM_A101</b>			



		Panelisation Schedule (Partial)																													
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												
004-P001	Glazing b	41.228	19.163	71.590	41.563	18.877	70.124	43.351	17.800	69.607	42.999	18.063	71.034	1.491	2.130	1.529	2.157	1.304	2.787 m²												
004-P002	Glazing b	42.299	19.053	71.034	43.351	17.800	69.607	45.270	16.859	69.189	44.908	17.021	70.575	1.451	2.131	1.491	2.140	1.119	2.759 m²												
004-P003	Glazing b	44.908	18.720	70.575	45.270	16.859	69.189	47.293	16.420	68.677	46.928	16.922	69.363	1.451	2.131	1.406	2.142	0.748 m²													
004-P007	Glazing b	46.928	18.620	70.222	47.293	16.420	68.677	49.334	16.126	68.658	49.032	16.297	69.607	1.365	2.133	1.408	2.145	2.962	2.738 m²												
004-P004	Glazing b	48.032	18.297	69.963	49.334	16.126	68.658	51.548	16.069	68.512	51.194	16.213	69.780	1.244	2.130	1.365	2.172	2.972	2.714 m²												
004-P005	Glazing b	51.194	16.213	69.780	51.548	16.069	68.512	53.730	16.081	68.418	53.388	16.347	69.652	1.286	2.190	1.324	2.202	2.879	2.727 m²												
004-P030	Glazing b	53.730	16.348	69.652	53.730	16.231	68.418	55.917	16.090	68.357	55.589	16.681	69.564	1.254	2.186	1.266	2.227	2.851	2.708 m²												
004-P031	Glazing b	55.589	16.681	69.564	55.917	16.090	68.357	58.082	17.124	68.309	57.766	17.193	69.495	1.231	2.231	1.254	2.240	2.826	2.679 m²												
004-P032	Glazing b	57.766	17.193	69.495	58.082	17.124	68.309	60.230	20.717	68.566	59.901	17.866	69.431	1.214	2.229	1.229	2.238	2.800	2.643 m²												
004-P033	Glazing b	60.230	20.717	68.566	60.431	17.866	69.431	62.784	21.884	69.300	62.401	18.568	69.403	1.207	2.228	1.216	2.236	2.774 m²													
004-P034	Glazing b	61.563	18.703	69.385	62.239	18.666	68.212	64.159	15.680	68.205	63.888	15.706	69.382	1.207	2.171	1.207	2.179	2.686	2.576 m²												
004-P035	Glazing b	63.888	18.706	69.382	64.159	15.680	68.205	66.923	16.267	68.265	65.669	16.085	69.450	1.210	2.127	1.207	2.137	2.596	2.551 m²												
004-P036	Glazing b	65.669	20.885	68.450	65.923	20.867	68.267	67.492	22.238	68.421	67.280	22.244	69.615	1.217	2.089	1.210	2.101	2.493	2.523 m²												
004-P037	Glazing b	67.492	22.244	69.615	67.740	22.338	68.421	69.933	23.031	69.458	69.203	23.063	70.595	1.223	2.092	1.209	2.109	2.469	2.504 m²												
004-P038	Glazing b	69.933	23.031	69.505	69.831	23.798	68.689	69.607	25.587	69.628	69.794	25.266	70.344	1.229	2.102	1.223	2.164	2.304	2.566 m²												
004-P039	Glazing b	69.794	25.266	70.344	69.960	25.587	69.628	72.078	26.782	69.780	70.539	27.176	70.934	1.234	2.156	1.229	2.168	2.241	2.556 m²												
004-P022	Glazing b	72.078	26.782	71.395	72.390	26.781	71.350	74.890	27.429	69.877	74.225	29.938	70.476	1.238	2.159	1.258	1.991	2.144	2.306 m²												
004-P021	Glazing b	74.890	27.429	71.350	74.890	27.429	71.350	77.917	28.451	71.841	77.417	28.977	73.007	1.243	2.163	1.263	2.000	2.147	2.306 m²												
004-P024	Glazing b	77.917	28.451	71.841	77.917	28.451	71.841	80.467	29.146	73.007	80.467	29.146	74.890	1.245	2.141	1.523	2.150	3.170	2.807 m²												
004-P025	Glazing b	80.467	29.146	73.007	80.467	29.146	73.007	83.014	29.837	74.890	83.014	29.837	76.935	1.245	2.141	1.485	2.131	3.079	2.714 m²												
Glazing c - 20																															
004-P026	Glazing b	80.467	44.022	80.251	80.296	43.797	76.882	82.234	44.522	79.403	80.368	44.769	81.802	1.429	2.241	1.396	2.252	2.413	3.173 m²												
004-P027	Glazing b	82.234	44.769	80.292	82.234	44.522	79.403	84.564	45.147	79.608	82.596	45.481	81.242	1.466	2.219	1.429	2.289	2.481	3.188 m²												
004-P028	Glazing b	84.564	45.147	81.242	84.564	45.147	79.608	86.938	45.627	80.101	84.586	45.903	81.571	1.503	2.183	1.466	2.192	2.542	3.236 m²												
004-P004	Glazing b	86.938	45.903	81.571	84.564	45.627	80.101	91.523	45.919	80.284	82.070	45.804	81.790	1.540	2.140	1.503	2.149	2.604	3.262 m²												
004-P009	Glazing b	91.523	45.919	80.284	91.523	45.919	80.284	94.578	46.585	80.968	93.964	46.272	91.801	1.576	2.101	1.540	2.101	2.673	3.270 m²												
004-P010	Glazing b	94.578	46.272	91.801	94.578	46.272	91.801	97.628	47.256	82.596	96.620	46.940	93.964	1.576	2.092	1.576	2.092	2.706	3.276 m²												
004-P007	Glazing b	97.628	47.256	93.964	97.628	47.256	93.964	100.752	48.142	82.596	100.752	48.142	93.964	1.576	2.092	1.576	2.092	2.706	3.276 m²												
004-P008	Glazing b	100.752	48.142	93.964	100.752	48.142	93.964	103.876	49.024	82.596	103.876	49.024	93.964	1.576	2.092	1.576	2.092	2.706	3.276 m²												
004-P009	Glazing b	103.876	49.024	93.964	103.876	49.024	93.964	107.000	49.902	82.596	107.000	49.902	93.964	1.576	2.092	1.576	2.092	2.706	3.276 m²												
004-P010	Glazing b	107.000	49.902	93.964	107.000	49.902	93.964	110.124	50.780	82.596	110.124	50.780	93.964	1.576	2.092	1.576	2.092	2.706	3.276 m²												
004-P011	Glazing b	110.124	50.780	93.964	110.124	50.780	93.964	113.248	51.658	82.596	113.248	51.658	93.964	1.576	2.092	1.576	2.092	2.706	3.276 m²												
004-P012	Glazing b	113.248	51.658	93.964	113.248	51.658	93.964	116.372	52.536	82.596	116.372	52.536	93.964	1.576	2.092	1.576	2.092	2.706	3.276 m²												
004-P013	Glazing b	116.372	52.536	93.964	116.372	52.536	93.964	119.496	53.414	82.596	119.496	53.414	93.964	1.576	2.092	1.576	2.092	2.706	3.276 m²												
004-P014	Glazing b	119.496	53.414	93.964	119.496	53.414	93.964	122.620	54.292	82.596	122.620	54.292	93.964	1.576	2.092	1.576	2.092	2.706	3.276 m²												
004-P015	Glazing b	122.620	54.292	93.964	122.620	54.292	93.964	125.744	55.170	82.596	125.744	55.170	93.964	1.576	2.092	1.576	2.092	2.706	3.276 m²												
004-P016	Glazing b	125.744	55.170	93.964	125.744	55.170	93.964	128.868	56.048	82.596	128.868	56.048	93.964	1.576	2.092	1.576	2.092	2.706	3.276 m²												
004-P017	Glazing b	128.868	56.048	93.964	128.868	56.048	93.964	131.992	56.926	82.596	131.992	56.926	93.964	1.576	2.092	1.576	2.092	2.706	3.276 m²												
004-P018	Glazing b	131.992	56.926	93.964	131.992	56.926	93.964	135.116	57.804	82.596	135.116	57.804	93.964	1.576	2.092	1.576	2.092	2.706	3.276 m²												
004-P019	Glazing b	135.116	57.804	93.964	135.116	57.804	93.964	138.240	58.682	82.596	138.240	58.682	93.964	1.576	2.092	1.576	2.092	2.706	3.276 m²												
004-P020	Glazing b	138.240	58.682	93.964	138.240	58.682	93.964	141.364	59.560	82.596	141.364	59.560	93.964	1.576	2.092	1.576	2.092	2.706	3.276 m²												
004-P021	Glazing b	141.364	59.560	93.964	141.364	59.560	93.964	144.488	60.438	82.596	144.488	60.438	93.964	1.576	2.092	1.576	2.092	2.706	3.276 m²												
004-P022	Glazing b	144.488	60.438	93.964	144.488	60.438	93.964	147.612	61.316	82.596	147.612	61.316	93.964	1.576	2.092	1.576	2.092	2.706	3.276 m²												
004-P023	Glazing b	147.612	61.316	93.964	147.612	61.316	93.964	150.736	62.194	82.596	150.736	62.194	93.964	1.576	2.092	1.576	2.092	2.706	3.276 m²												
004-P024	Glazing b	150.736	62.194	93.964	150.736	62.194	93.964	153.860	63.072	82.596	153.860	63.072	93.964	1.576	2.092	1.576	2.092	2.706	3.276 m²												
004-P025	Glazing b	153.860	63.072	93.964	153.860	63.072	93.964	156.984	63.950	82.596	156.984	63.950	93.964	1.576	2.092	1.576	2.092	2.706	3.276 m²												
004-P026	Glazing b	156.984	63.950	93.964	156.984	63.950	93.964	160.108	64.828	82.596	160.108	64.828	93.964	1.576	2.092	1.576	2.092	2.706	3.276 m²												
004-P027	Glazing b	160.108	64.828	93.964	160.108	64.828	93.964	163.232	65.706	82.596	163.232	65.706	93.964	1.576	2.092	1.576	2.092	2.706	3.276 m²												
004-P028	Glazing b	163.232	65.706	93.964	163.232	65.706	93.964	166.356	66.584	82.596	166.356	66.584	93.964	1.576	2.092	1.576	2.092	2.706	3.276 m²												
004-P029	Glazing b	166.356	66.584	93.964	166.356	66.584	93.964	169.480	67.462	82.596	169.480	67.462	93.964	1.576	2.092	1.576	2.092	2.706	3.276 m²												
004-P030	Glazing b	169.480	67.462	93.964	169.480	67.462	93.964	172.604	68.340	82.596	172.604	68.340	93.964	1.576	2.092	1.576	2.092	2.706	3.276 m²												
004-P031	Glazing b	172.604	68.340	93.964	172.604	68.340	93.964	175.728	69.218	82.596	175.728	69.218	93.964	1.576	2.092	1.576	2.092	2.706	3.276 m²												
004-P032	Glazing b	175.728	69.218	93.964	175.728	69.218	93.964	178.852	70.096	82.596	178.852	70.096	93.964	1.576	2.092	1.576	2.092	2.706	3.276 m²												
004-P033	Glazing b	178.852	70.096	93.964	178.852	70.096	93.964	181.976	70.974	82.596	181.976	70.974	93.964	1.576	2.092	1.576	2.092	2.706	3.276 m²												
004-P034	Glazing b	181.976	70.974	93.964	181.976	70.974	93.964	185.100	71.852	82.596	185.100	71.852	93.964	1.576	2.092	1.576	2.092	2.706	3.276 m²												
004-P035	Glazing b	185.100																													

### *3 Analysis*

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

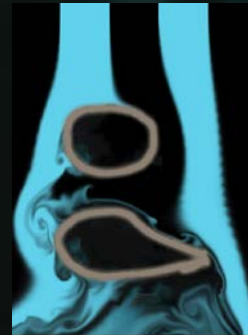
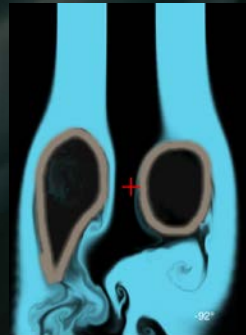
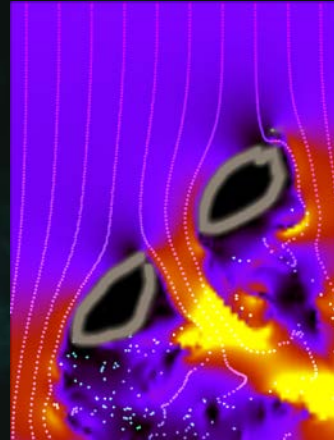
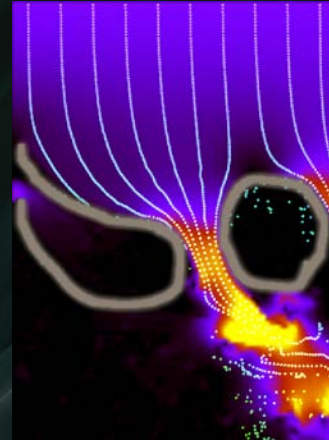
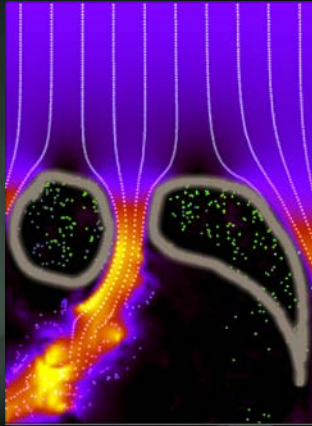
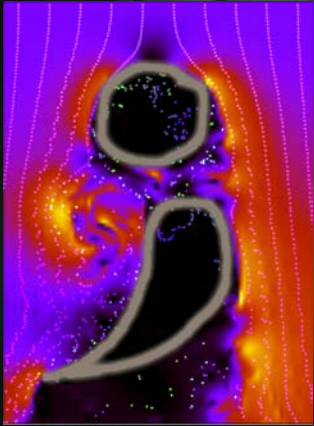
## Weather analysis

	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°)

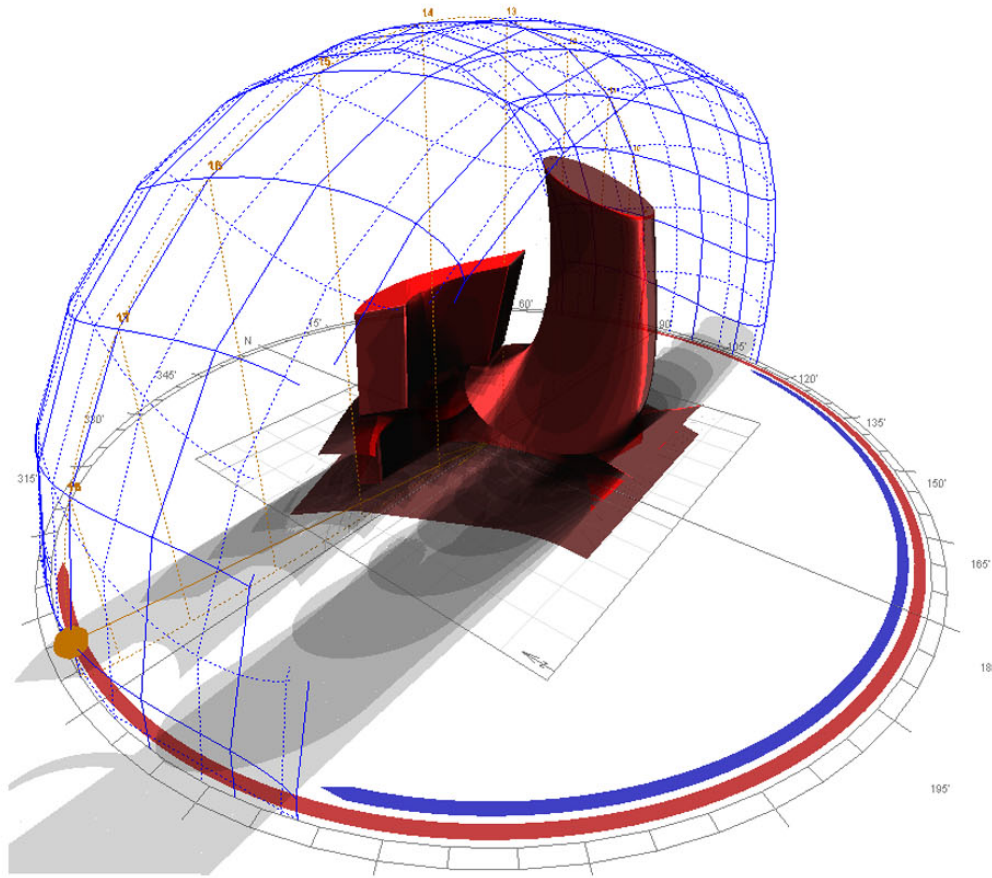
	Singapore Hourly Average Relative Humidity (%)											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0:01-1:00	91	89	91	90	89	86	89	87	89	91	94	91
1:01-2:00	91	90	91	91	90	87	89	87	91	92	95	92
2:01-3:00	92	91	92	91	91	87	91	89	92	92	95	92
3:01-4:00	92	91	93	92	92	88	91	91	91	93	96	92
4:01-5:00	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

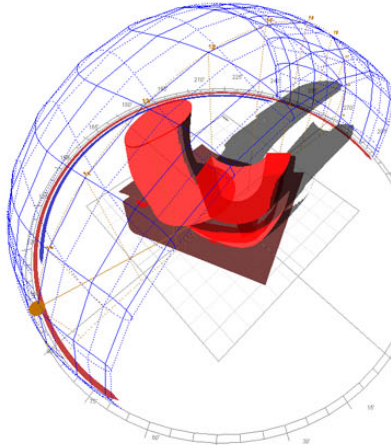


Wind Effect

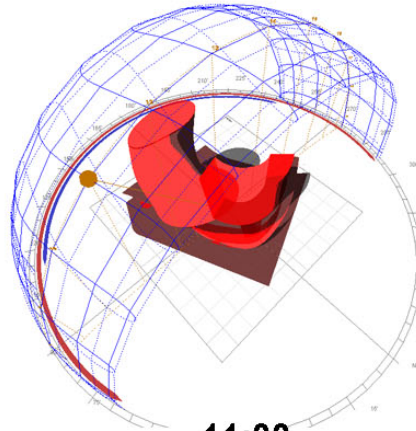
## Weather analysis



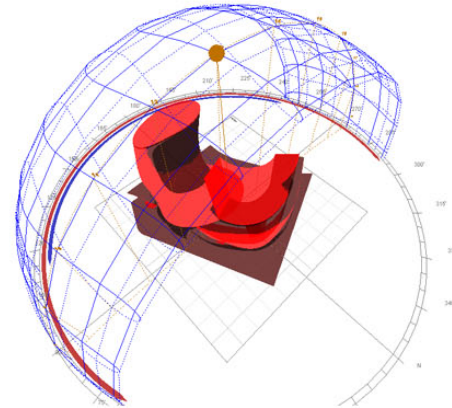
## Weather analysis



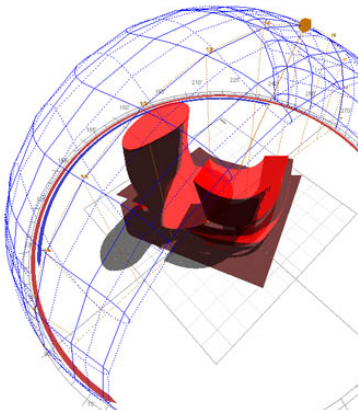
9:00



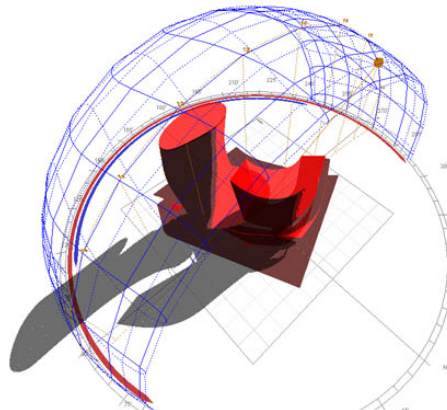
11:00



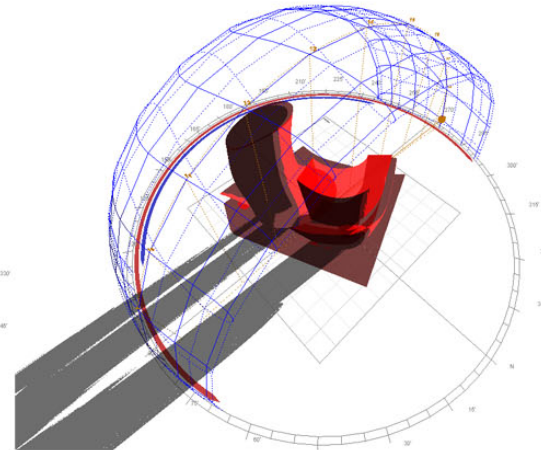
13:00



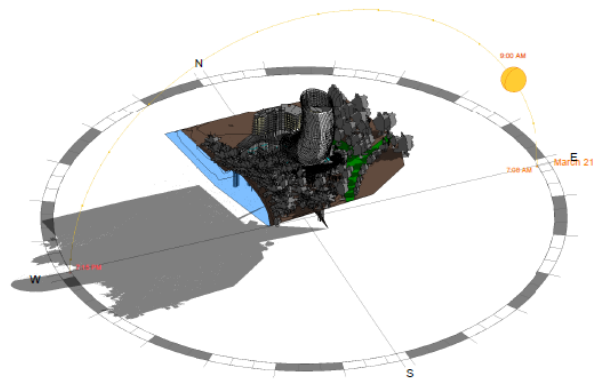
15:00



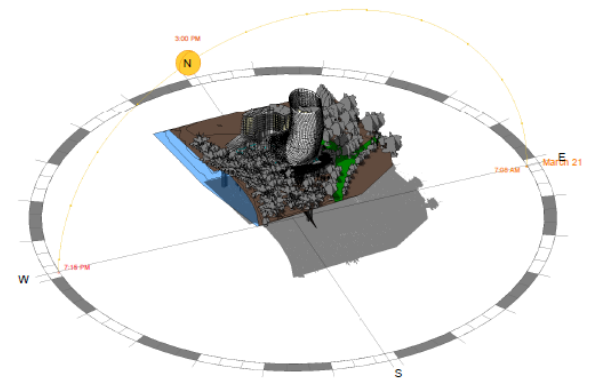
17:00



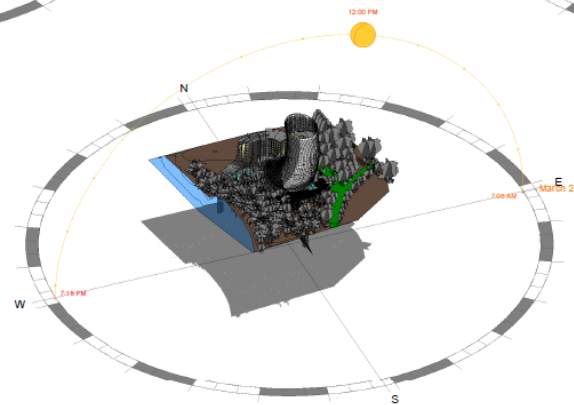
19:00



01 Spring 9am



03 Spring 3pm



02 Spring 12pm

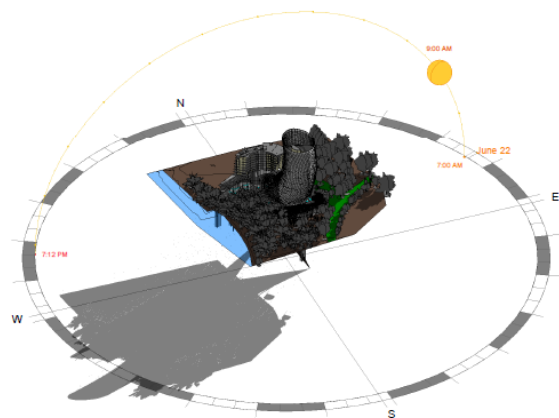
BIM EVANGELIST



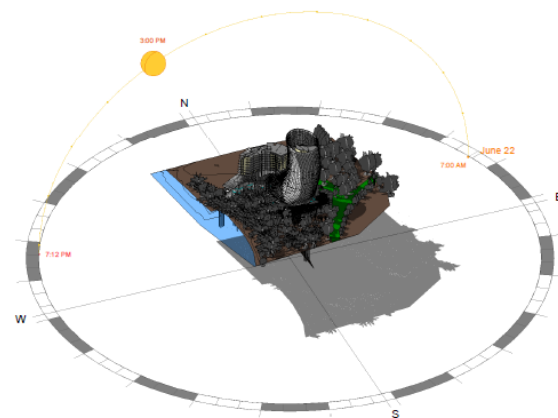
PROJECT NAME **KALLANG RIVERSIDE  
HOTEL DEVELOPMENT**

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

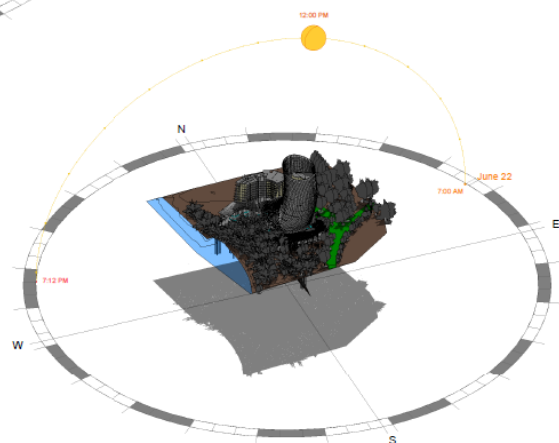
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DRAWN		Author	@ A1
CHECK		Checker	DATE
DRAWING NO.		10. SEPT.2011	
		REVISION	
		BIM_201	



01 Summer 9am



03 Summer 3pm



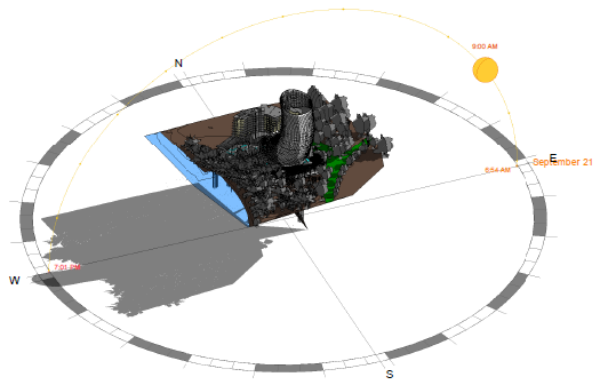
02 Summer 12pm

BIM EVANGELIST

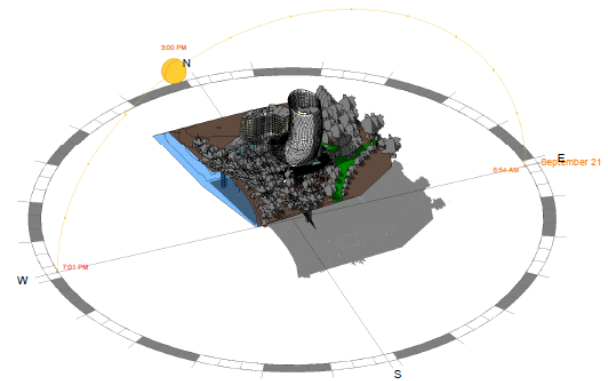


PROJECT NAME **KALLANG RIVERSIDE  
HOTEL DEVELOPMENT**  
DRAWING TITLE **SOLAR ANALYSIS -  
22nd of JUNE**

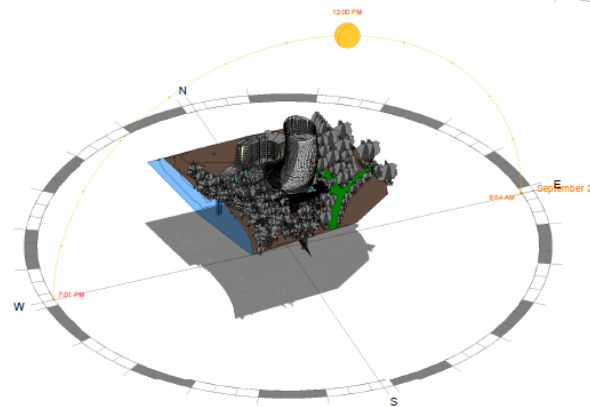
FILE	Project Name	SCALE	@ A1
DRAWN	Author	CHECK	Checker
DRAWING NO.	BIM_202	DATE	10. SEPT. 2011
		REVISION	



01 Fall 9am



03 Fall 3pm



02 Fall 12pm

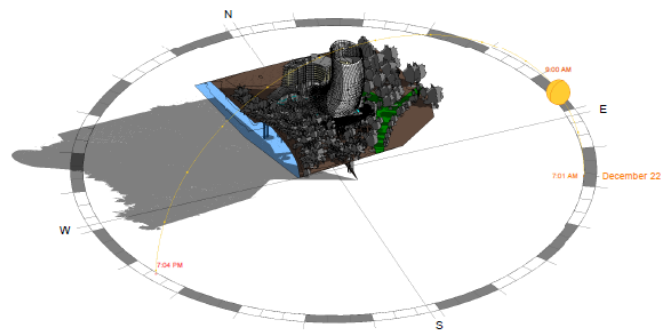
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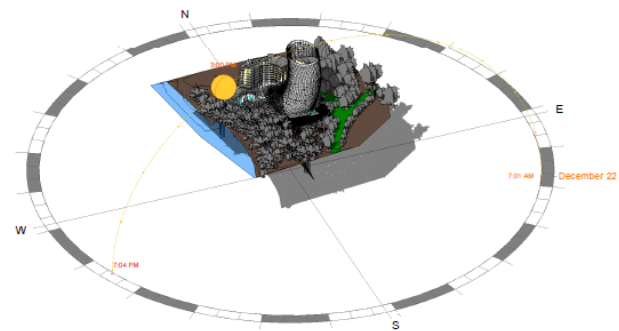
PROJECT NAME **KALLANG RIVERSIDE  
HOTEL DEVELOPMENT**  
DRAWING TITLE **SOLAR ANALYSIS -  
23rd of SEPTEMBER**

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

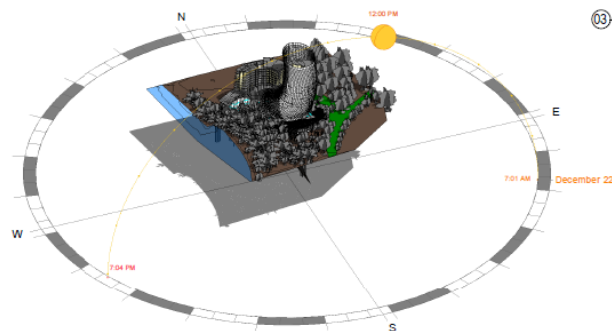
**BIM\_203**



01 Winter 9am



03 Winter 3pm



02 Winter 12pm

BIM EVANGELIST



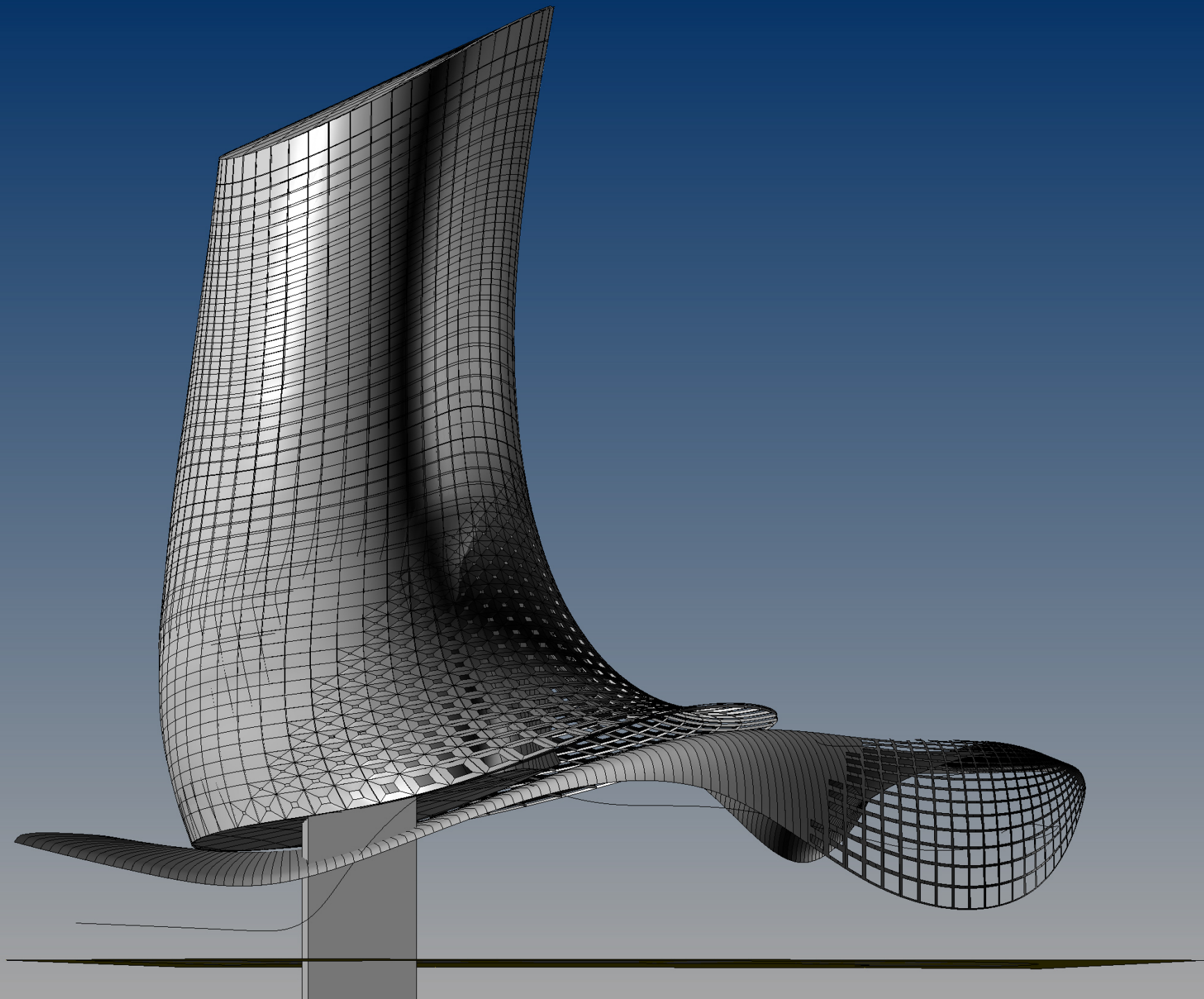
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HOTEL DEVELOPMENT**  
DRAWING TITLE **SOLAR ANALYSIS -  
22nd of DECEMBER**

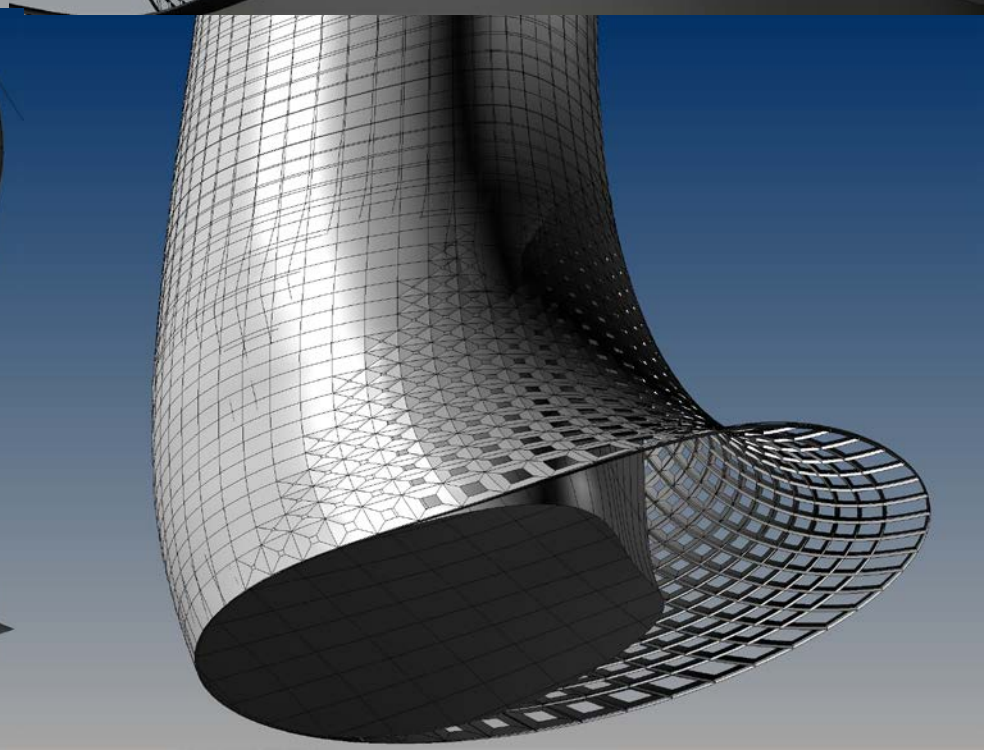
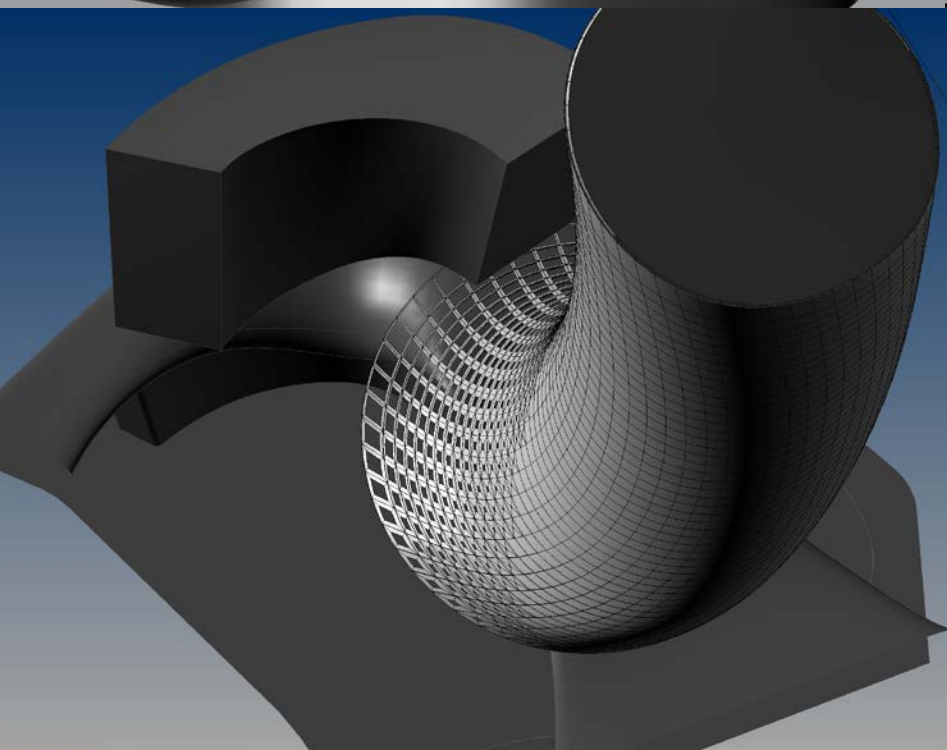
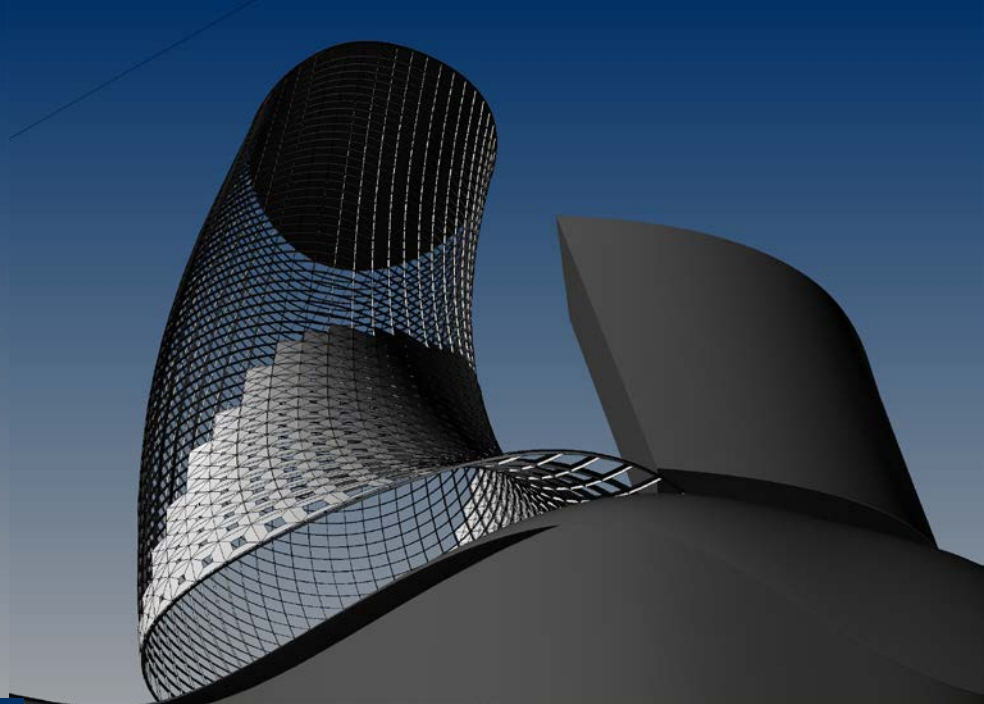
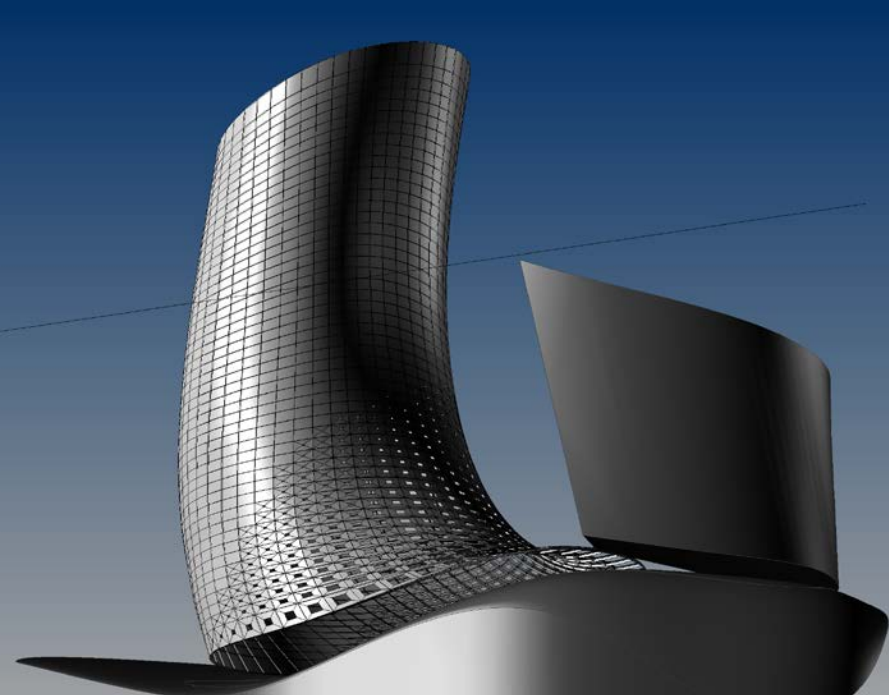
FILE	Project Name	SCALE	@ A1
DRAWN	Author	CHECK	Checker
DRAWING NO.	BIM_204	DATE	10. SEPT. 2011
		REVISION	

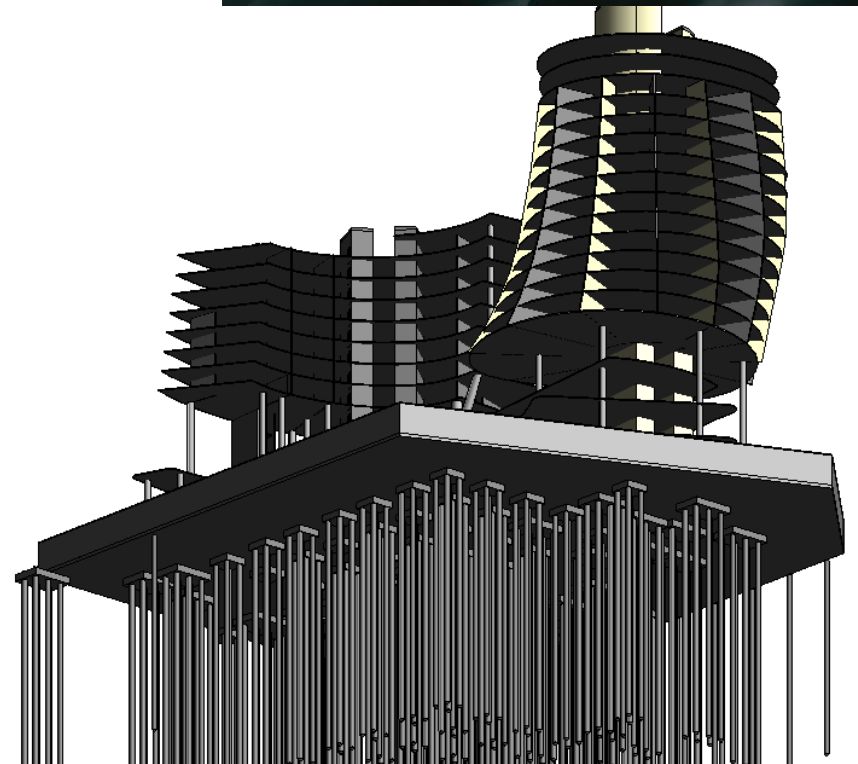
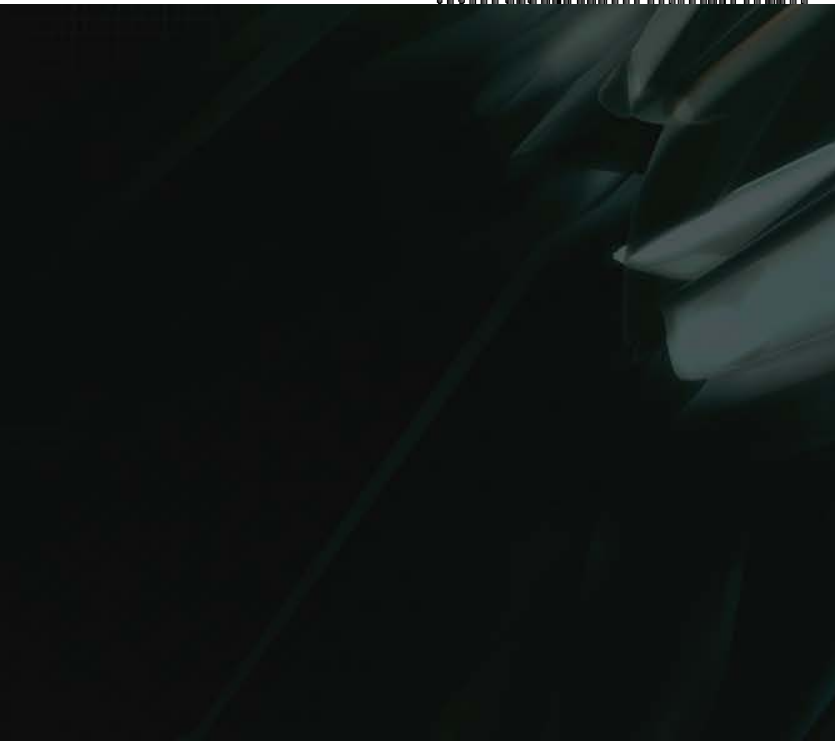
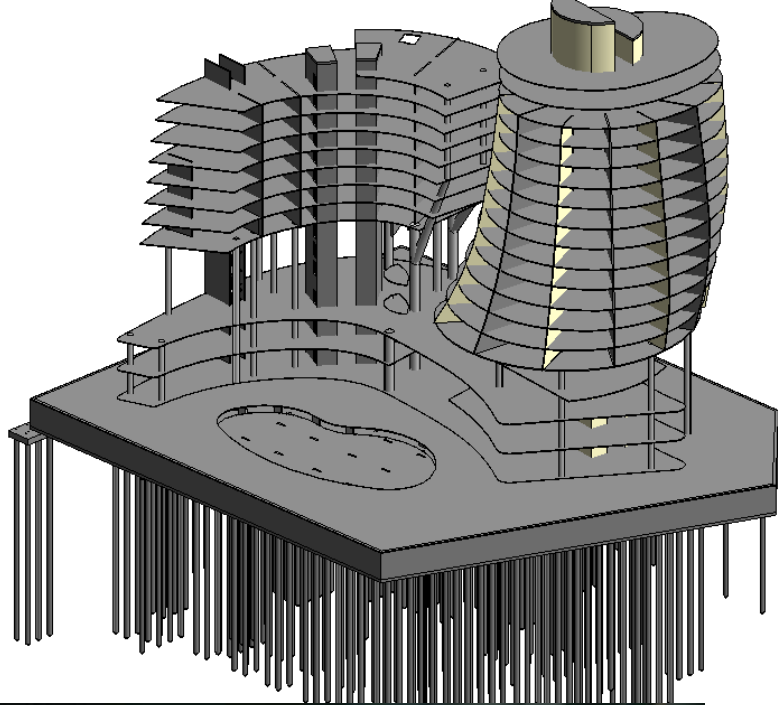
## 4 *Co-ordination*

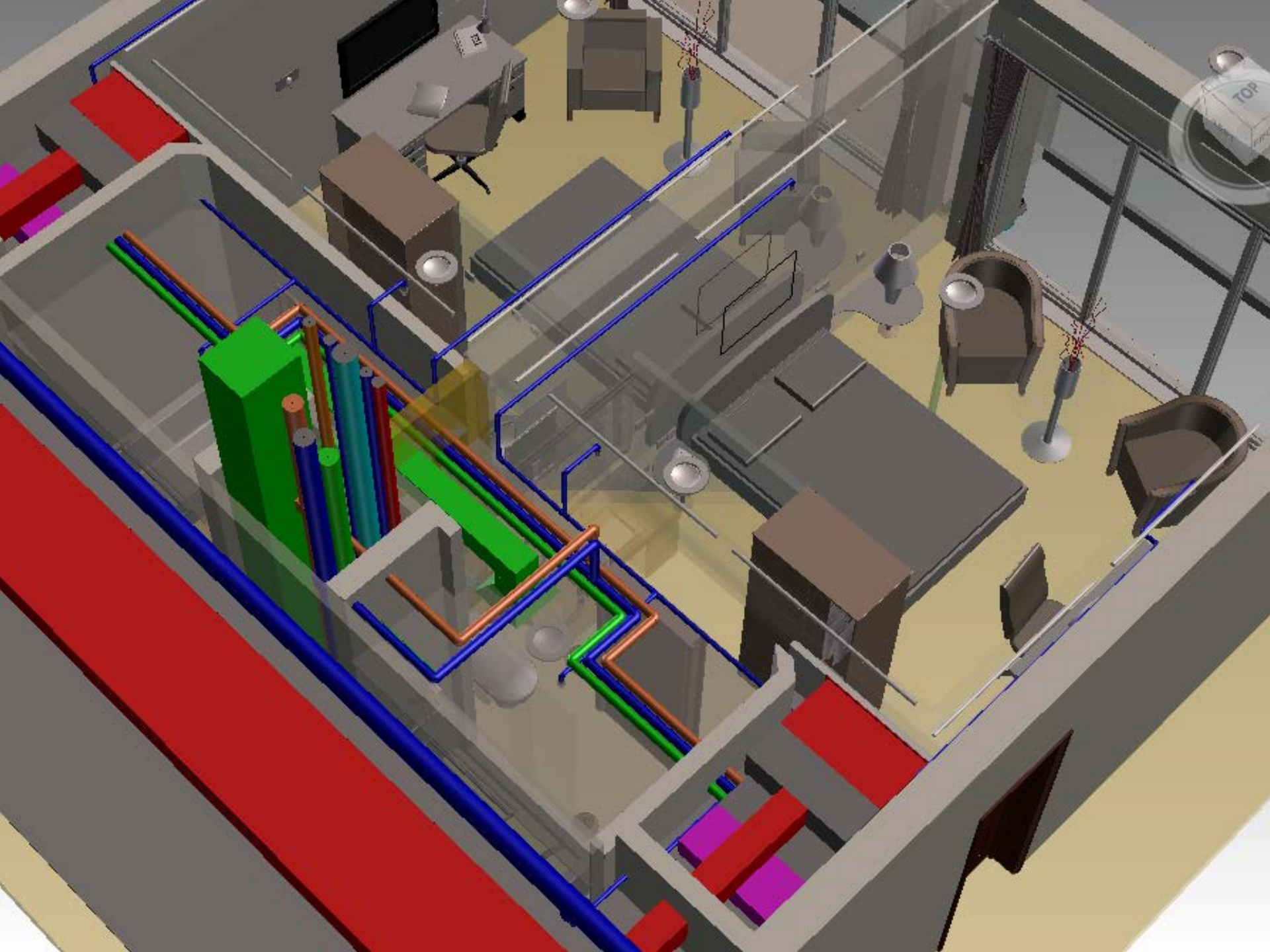
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Good practice makes Perfection. Good communication makes flawless design. BIM facilitates balance of mutual interest.









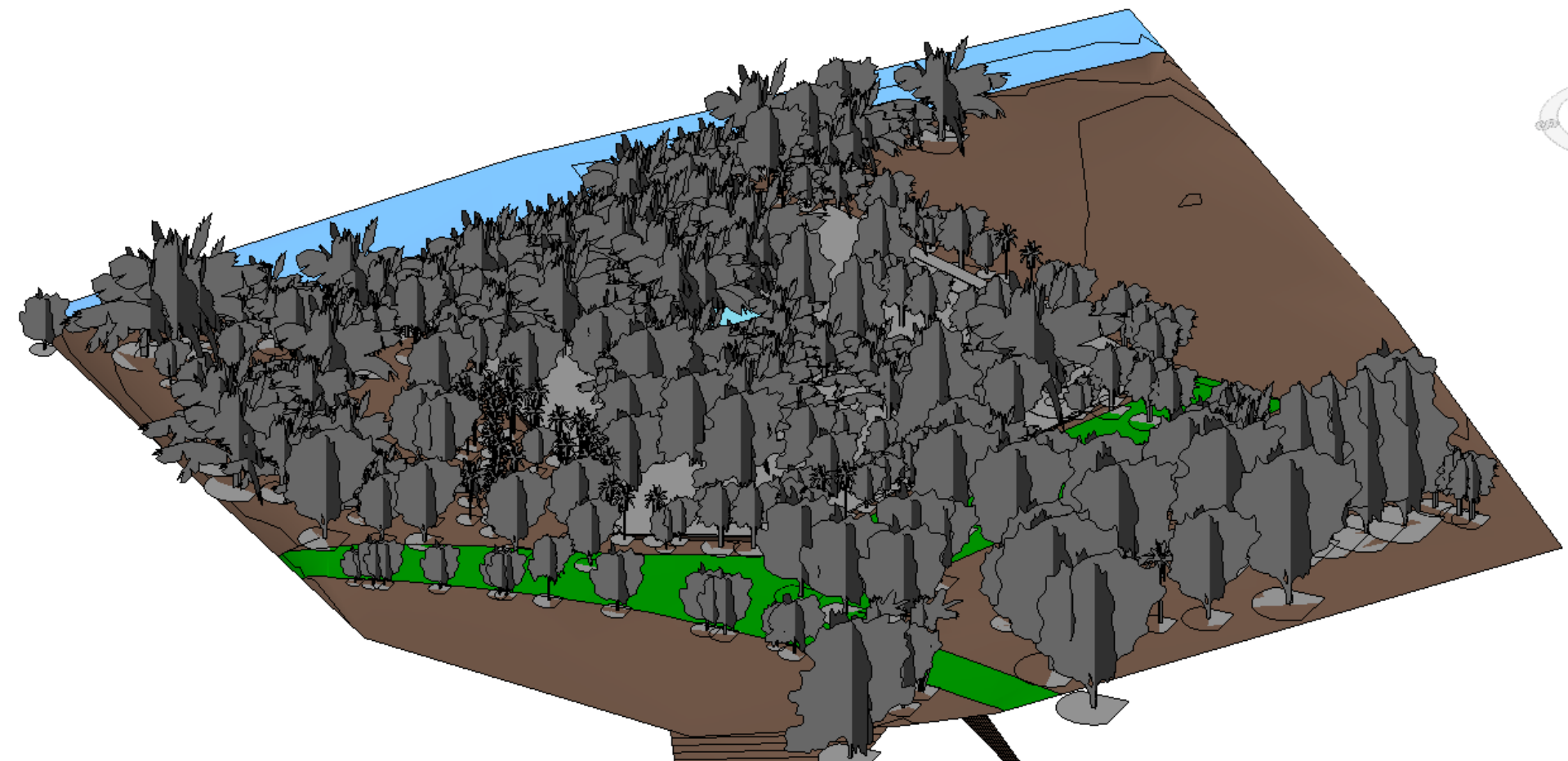


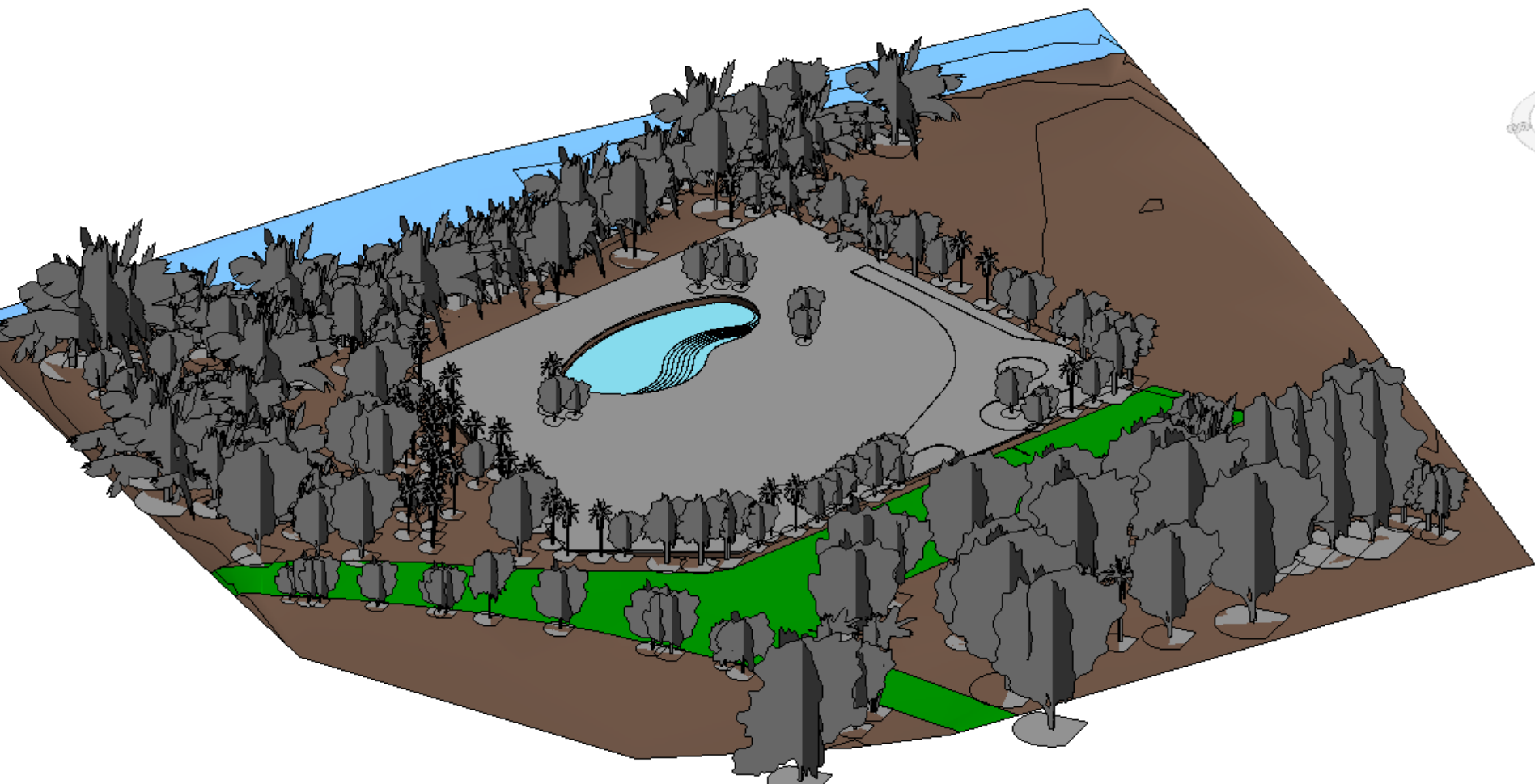


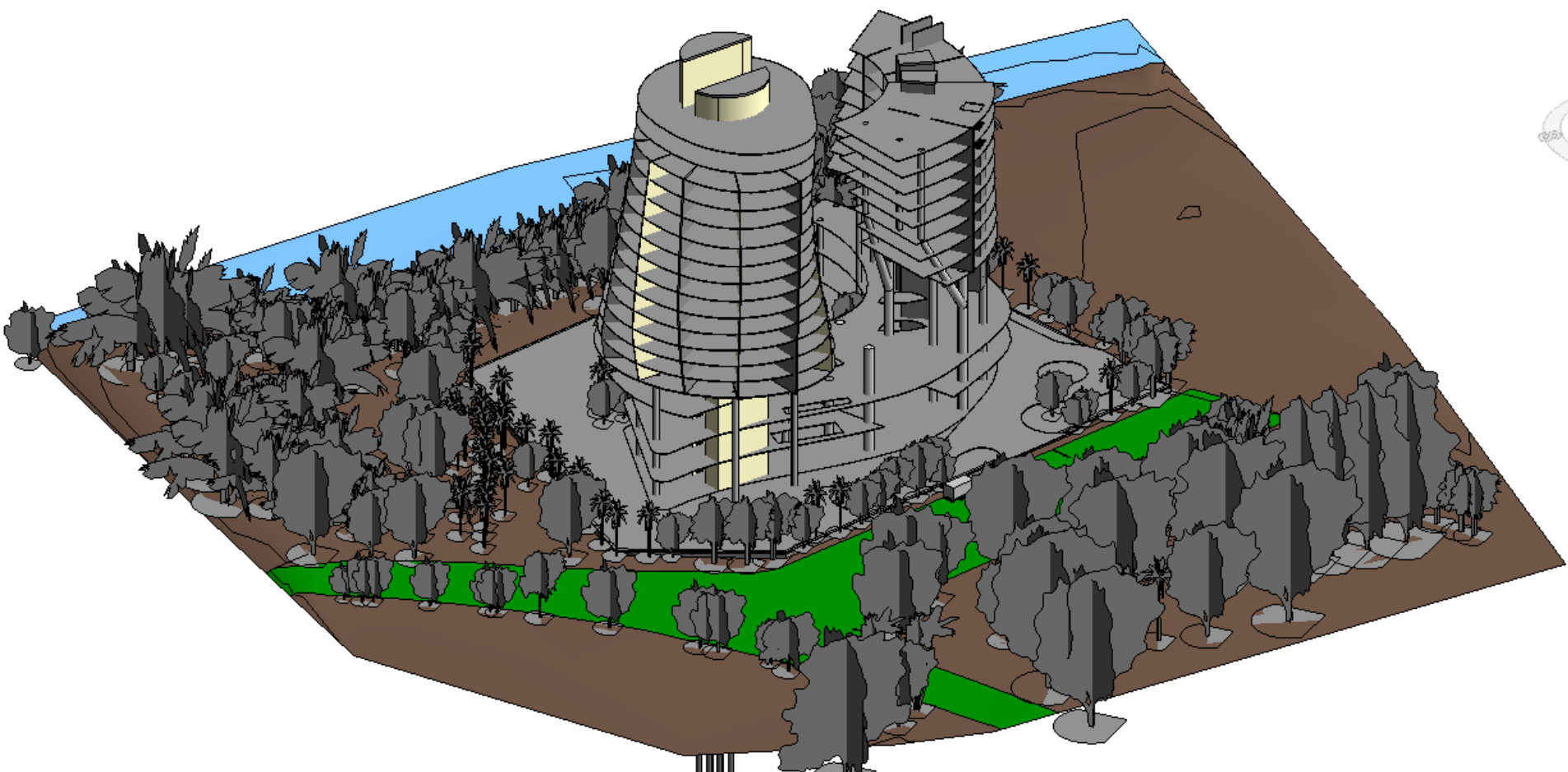
## *5 Constructability*

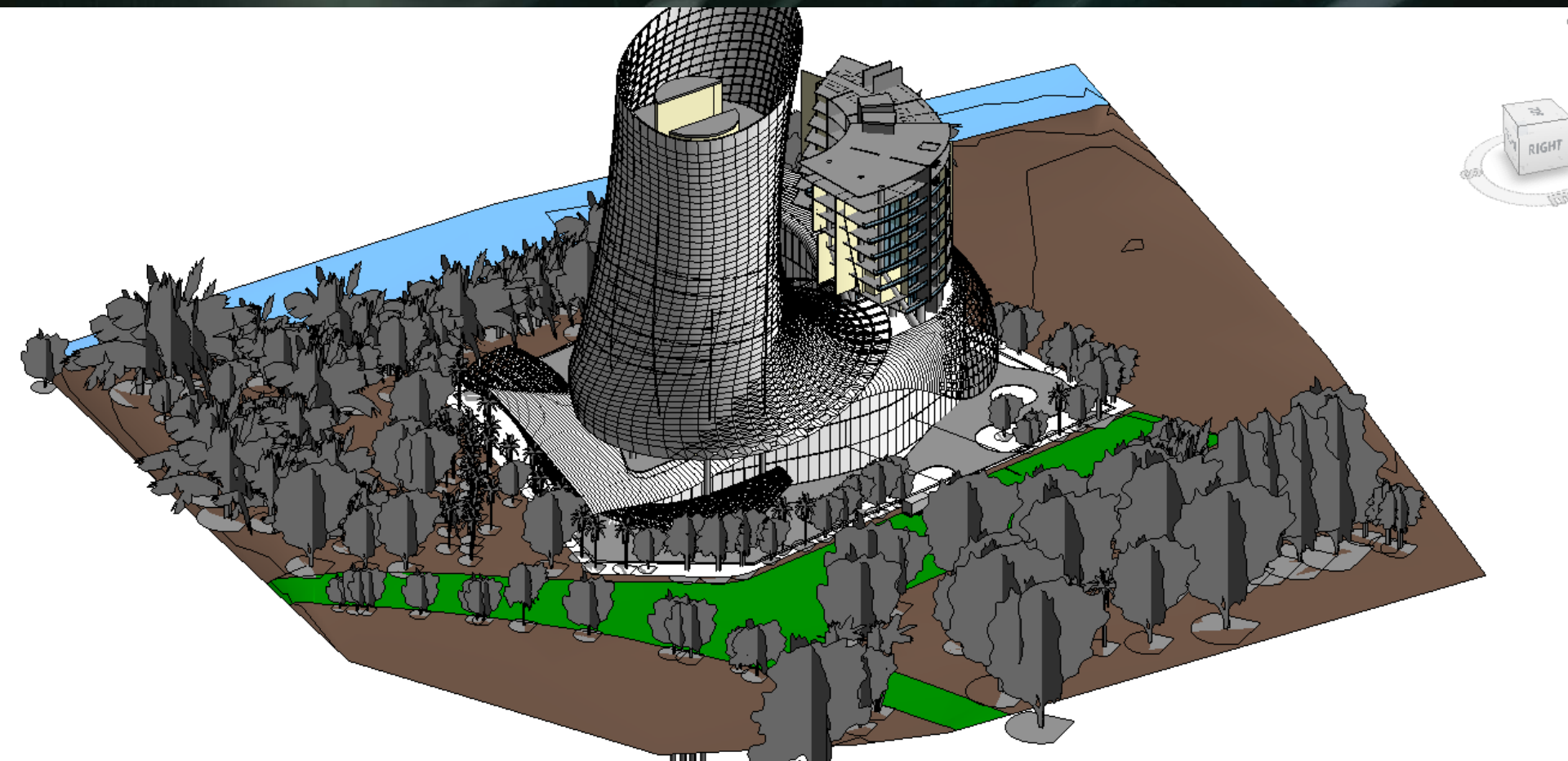
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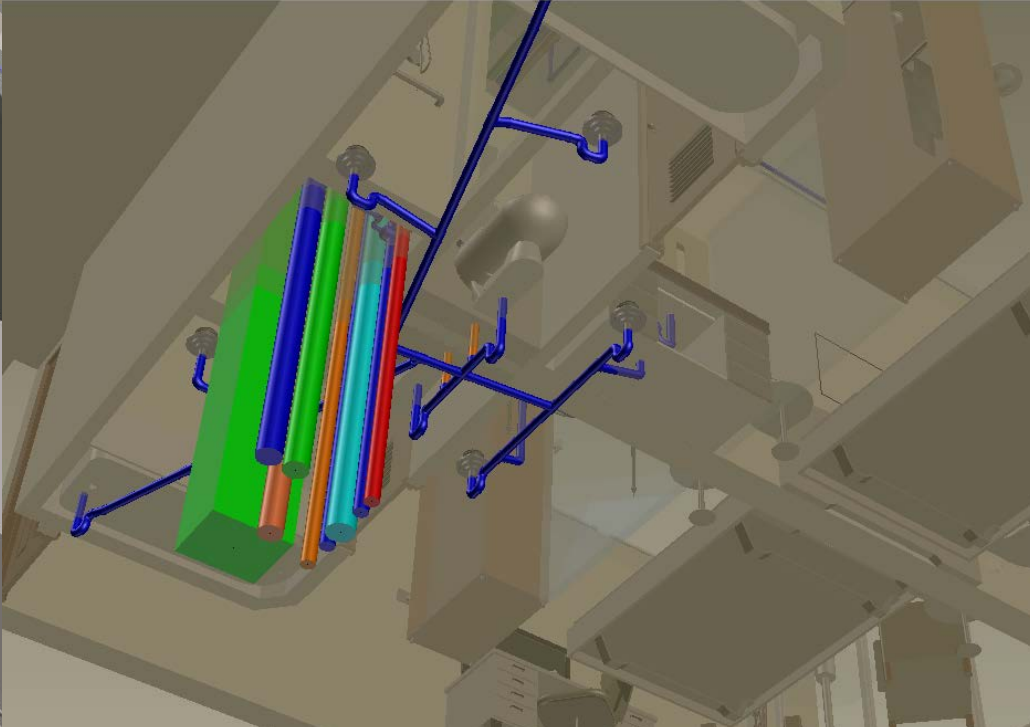
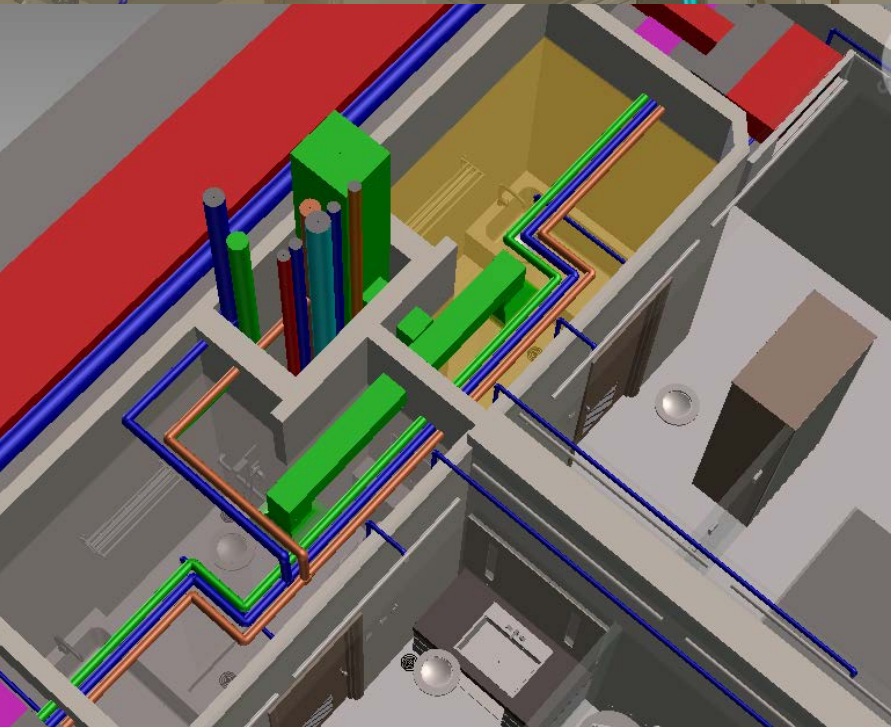
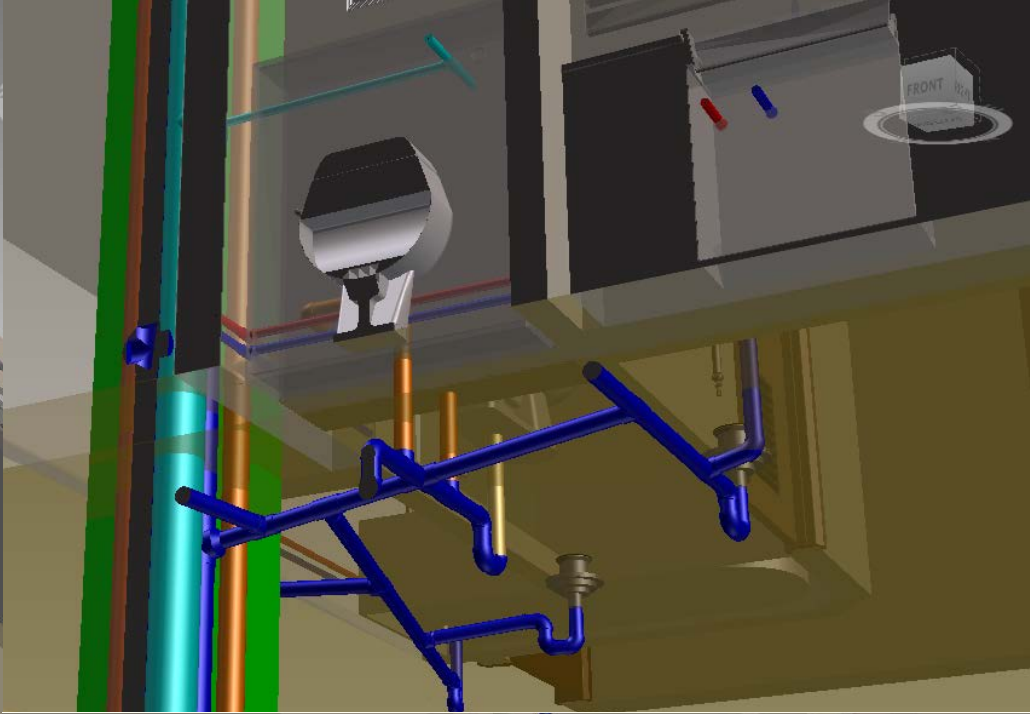
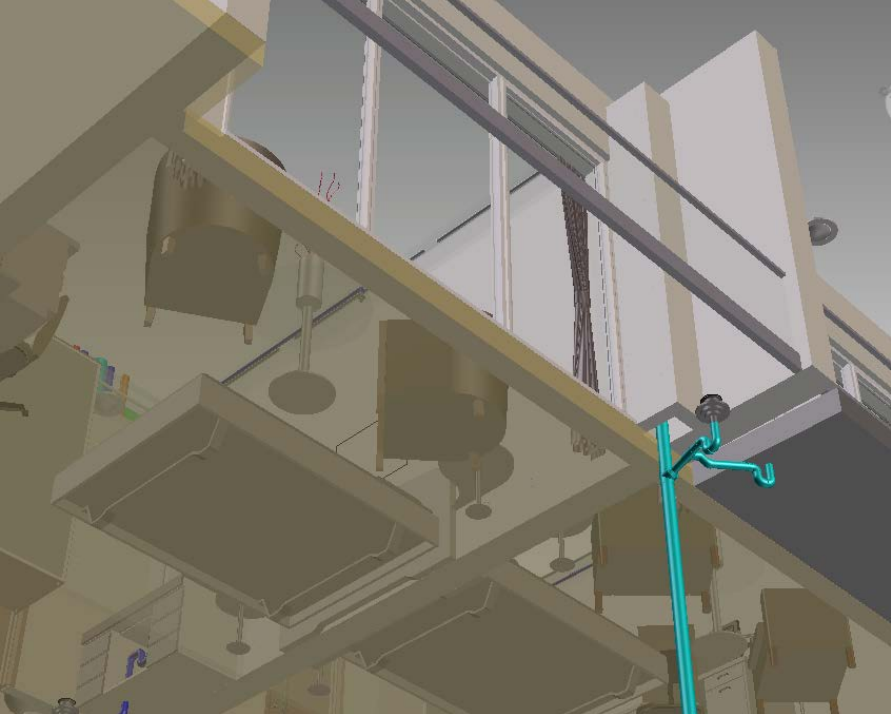
Nothing is more worthy than a well planned and well thought of project and clash free building projects.











## *6 Quantity Taking and Bills of Quantity*

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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.



# 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 加粗 斜體 下劃線 顏色 文字顏色 背景顏色 縮放 對齊方式 自動換行 跨欄置中 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 自動加總 填滿 清除 排序與篩選 尋找與選取 編輯

C136 SUSPENDED SLABS

Item	Description	Qty	Unit	Rate	HK\$
PROJECT NAME					
BILL NO. 2 - EXTENSION					
2.2 - CONCRETOR					
MAIN CONTRACT					
2.2 - CONCRETOR					
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		
BASEMENT SCREEN WALLS					
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		
Sawn formwork to					
2.2/ 2.2.1	Side of wall	290	m2		
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		
COLUMNS					

14 1 21 22 23 24 25 26 27 28 29 210 25 31 32 33 34 35 36 37 38 39 40

100%

14:33 2011/9/10

## *7 Documentation*

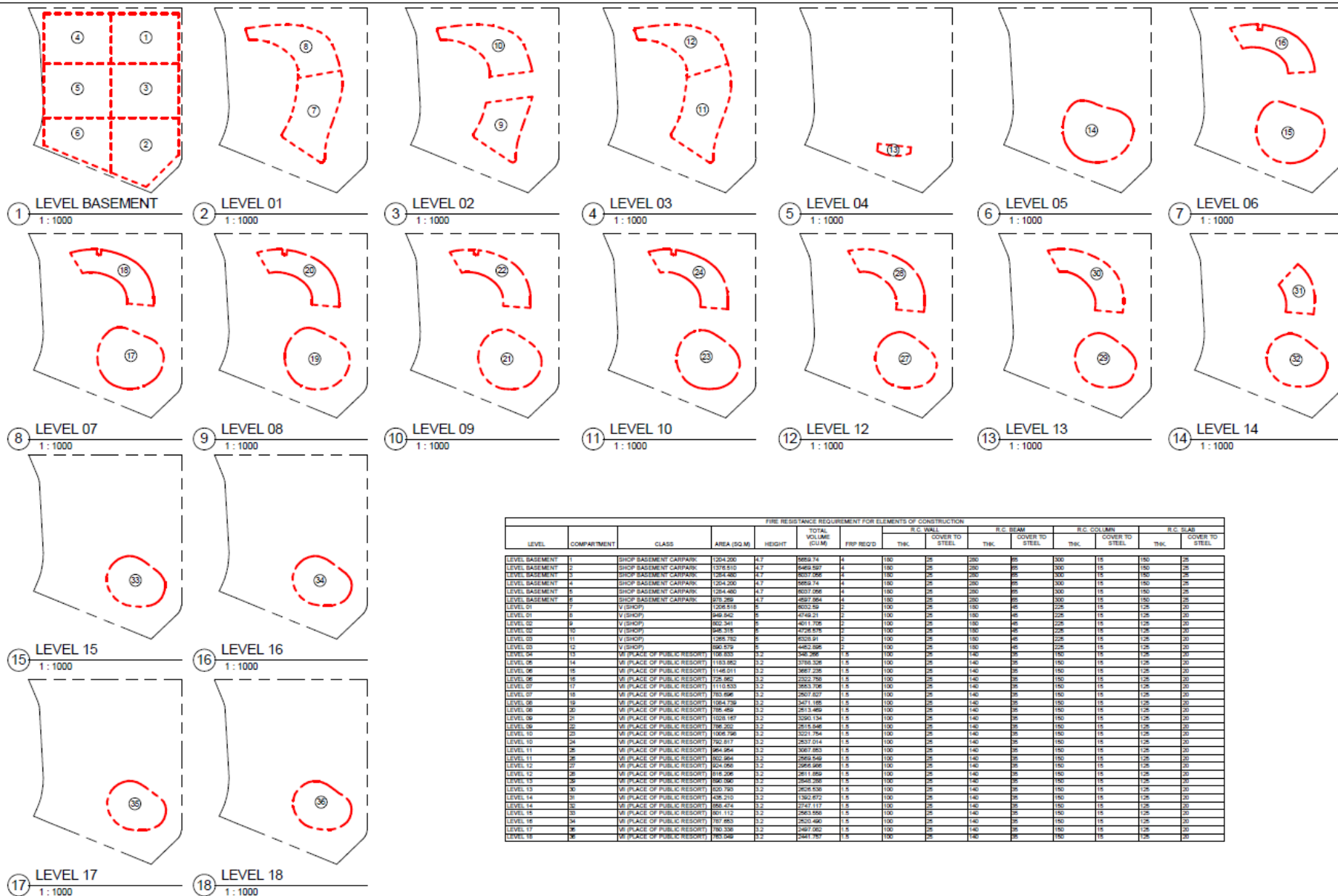
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Organic architecture documentation is no longer mission impossible. Manufacturing is no longer guess work for designers and owners, but carefully documented information transfer process.

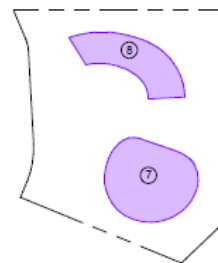
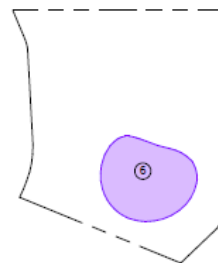
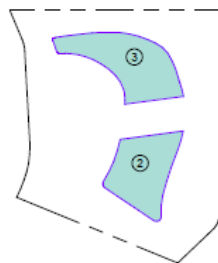
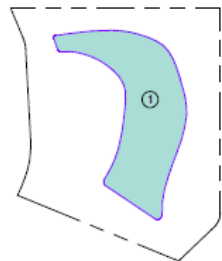
## *8 Automated Statutory Submission*

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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	1	SHOP BASEMENT CARPARK	1254.200	4.3	5400.74	4	180	25	200	25	300	15	180	25
LEVEL BASEMENT 2	2	SHOP BASEMENT CARPARK	1376.510	4.3	5940.507	4	180	25	200	25	300	15	180	25
LEVEL BASEMENT 3	3	SHOP BASEMENT CARPARK	1284.480	4.3	5523.568	4	180	25	200	25	300	15	180	25
LEVEL BASEMENT 4	4	SHOP BASEMENT CARPARK	1254.200	4.3	5400.74	4	180	25	200	25	300	15	180	25
LEVEL BASEMENT 5	5	SHOP BASEMENT CARPARK	1284.480	4.3	5523.568	4	180	25	200	25	300	15	180	25
LEVEL BASEMENT 6	6	SHOP BASEMENT CARPARK	876.288	4.3	3767.854	4	180	25	200	25	300	15	180	25
LEVEL 01	1	V (SHOP)	1256.518	3	3832.56	2	180	25	180	25	200	15	180	25
LEVEL 01	2	V (SHOP)	148.542	3	4748.21	2	180	25	180	25	200	15	180	25
LEVEL 02	1	V (SHOP)	502.341	3	1507.105	2	180	25	180	25	200	15	180	25
LEVEL 02	2	V (SHOP)	248.915	3	747.875	2	180	25	180	25	200	15	180	25
LEVEL 02	3	V (SHOP)	1285.752	3	4055.91	2	180	25	180	25	200	15	180	25
LEVEL 03	1	V (SHOP)	580.579	3	1742.596	2	180	25	180	25	200	15	180	25
LEVEL 04	13	MR (PLACE OF PUBLIC RESORT)	158.835	3.2	544.586	1.5	180	25	140	25	180	15	180	25
LEVEL 05	14	MR (PLACE OF PUBLIC RESORT)	1183.882	3.2	3793.328	1.5	180	25	140	25	180	15	180	25
LEVEL 06	15	MR (PLACE OF PUBLIC RESORT)	1148.511	3.2	3687.238	1.5	180	25	140	25	180	15	180	25
LEVEL 07	16	MR (PLACE OF PUBLIC RESORT)	128.885	3.2	413.195	1.5	180	25	140	25	180	15	180	25
LEVEL 07	17	MR (PLACE OF PUBLIC RESORT)	1110.533	3.2	3553.706	1.5	180	25	140	25	180	15	180	25
LEVEL 07	18	MR (PLACE OF PUBLIC RESORT)	785.886	3.2	2507.827	1.5	180	25	140	25	180	15	180	25
LEVEL 08	19	MR (PLACE OF PUBLIC RESORT)	1554.758	3.2	5017.185	1.5	180	25	140	25	180	15	180	25
LEVEL 08	20	MR (PLACE OF PUBLIC RESORT)	105.489	3.2	337.565	1.5	180	25	140	25	180	15	180	25
LEVEL 09	21	MR (PLACE OF PUBLIC RESORT)	1028.187	3.2	3290.134	1.5	180	25	140	25	180	15	180	25
LEVEL 09	22	MR (PLACE OF PUBLIC RESORT)	108.252	3.2	341.185	1.5	180	25	140	25	180	15	180	25
LEVEL 10	23	MR (PLACE OF PUBLIC RESORT)	1006.758	3.2	3221.754	1.5	180	25	140	25	180	15	180	25
LEVEL 10	24	MR (PLACE OF PUBLIC RESORT)	762.817	3.2	2437.014	1.5	180	25	140	25	180	15	180	25
LEVEL 11	25	MR (PLACE OF PUBLIC RESORT)	864.864	3.2	2767.485	1.5	180	25	140	25	180	15	180	25
LEVEL 11	26	MR (PLACE OF PUBLIC RESORT)	852.864	3.2	2703.548	1.5	180	25	140	25	180	15	180	25
LEVEL 12	27	MR (PLACE OF PUBLIC RESORT)	824.988	3.2	2654.668	1.5	180	25	140	25	180	15	180	25
LEVEL 13	28	MR (PLACE OF PUBLIC RESORT)	1118.308	3.2	3571.185	1.5	180	25	140	25	180	15	180	25
LEVEL 13	29	MR (PLACE OF PUBLIC RESORT)	100.580	3.2	321.888	1.5	180	25	140	25	180	15	180	25
LEVEL 13	30	MR (PLACE OF PUBLIC RESORT)	820.760	3.2	2642.336	1.5	180	25	140	25	180	15	180	25
LEVEL 14	31	MR (PLACE OF PUBLIC RESORT)	108.510	3.2	345.608	1.5	180	25	140	25	180	15	180	25
LEVEL 14	32	MR (PLACE OF PUBLIC RESORT)	958.474	3.2	3071.117	1.5	180	25	140	25	180	15	180	25
LEVEL 15	33	MR (PLACE OF PUBLIC RESORT)	801.112	3.2	2563.560	1.5	180	25	140	25	180	15	180	25
LEVEL 16	34	MR (PLACE OF PUBLIC RESORT)	787.843	3.2	2523.488	1.5	180	25	140	25	180	15	180	25
LEVEL 17	35	MR (PLACE OF PUBLIC RESORT)	780.338	3.2	2497.062	1.5	180	25	140	25	180	15	180	25
LEVEL 18	36	MR (PLACE OF PUBLIC RESORT)	783.546	3.2	2497.787	1.5	180	25	140	25	180	15	180	25



1 LEVEL 01  
1 : 1000

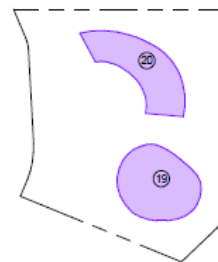
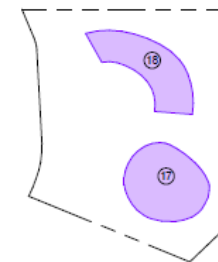
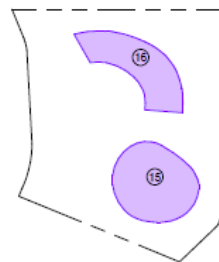
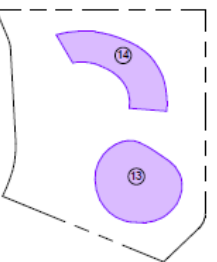
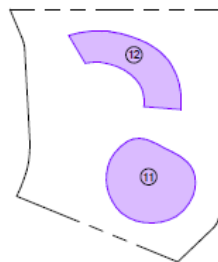
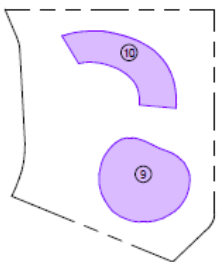
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3 LEVEL 03  
1 : 1000

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5 LEVEL 05  
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6 LEVEL 06  
1 : 1000



7 LEVEL 07  
1 : 1000

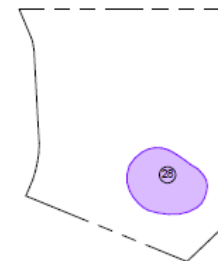
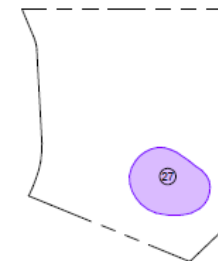
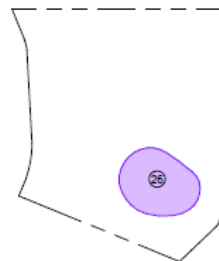
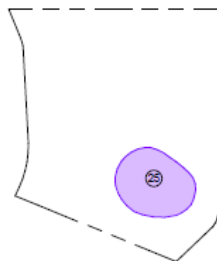
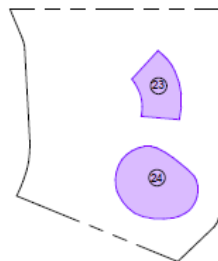
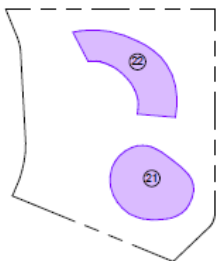
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1 : 1000

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1 : 1000

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1 : 1000

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1 : 1000



13 LEVEL 13  
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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	2108.100 m <sup>2</sup>
2	Commercial	802.341 m <sup>2</sup>
3	Commercial	840.310 m <sup>2</sup>
4	Commercial	2108.222 m <sup>2</sup>
5	Commercial	4000.340 m <sup>2</sup>
6	Hotel	100.033 m <sup>2</sup>
7	Hotel	1103.862 m <sup>2</sup>
8	Hotel	1140.071 m <sup>2</sup>
9	Hotel	738.520 m <sup>2</sup>
10	Hotel	1110.530 m <sup>2</sup>
11	Hotel	795.803 m <sup>2</sup>
12	Hotel	1004.789 m <sup>2</sup>
13	Hotel	743.735 m <sup>2</sup>
14	Hotel	1250.147 m <sup>2</sup>
15	Hotel	704.470 m <sup>2</sup>
16	Hotel	1006.780 m <sup>2</sup>
17	Hotel	921.520 m <sup>2</sup>
18	Hotel	904.364 m <sup>2</sup>
19	Hotel	811.380 m <sup>2</sup>
20	Hotel	521.190 m <sup>2</sup>
21	Hotel	815.320 m <sup>2</sup>
22	Hotel	846.500 m <sup>2</sup>
23	Hotel	833.790 m <sup>2</sup>
24	Hotel	420.210 m <sup>2</sup>
25	Hotel	350.474 m <sup>2</sup>
26	Hotel	801.172 m <sup>2</sup>
27	Hotel	707.683 m <sup>2</sup>
28	Hotel	780.350 m <sup>2</sup>
29	Hotel	180.040 m <sup>2</sup>
30	Hotel	20236.940 m <sup>2</sup>

Commercial  
Hotel

# Revit plugin for Automatic Statutory Checking

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

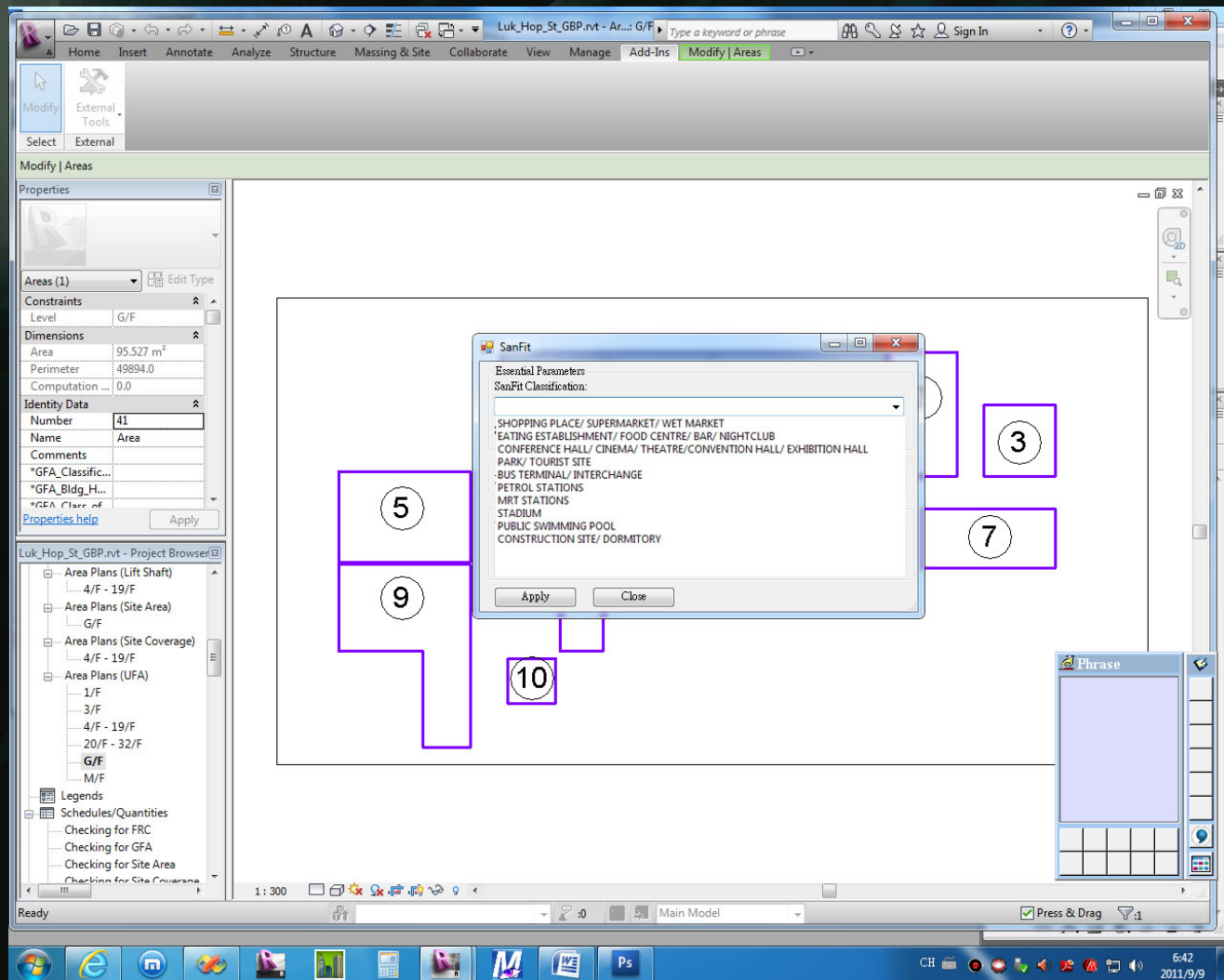
The plugin supports calculation for GFA, Means of Escape, Sanitary Fitment Provision, Fire Compartmentation & Fire Resisting Construction etc.

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 shows a software interface for area calculations. The left pane displays a tree view of project elements, including 'Area Plans (用地面积)' and 'Area Plans (绿化面积)'. The main area displays a list of calculations and their results in square meters (SQ.M).

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

# Support Means of Escape

- Calculation of exit door & route requirements

The screenshot displays a software interface with a ribbon at the top containing tabs like Home, Insert, Annotate, Analyze, Structure, Massing & Site, Collaborate, View, Manage, Add-Ins, and Modify. The left sidebar shows the 'Properties' panel for a 'Sheet' named 'GFA SUMMA' and a project browser on the left listing various levels and schedules. The main workspace contains a table titled 'MOE SCHEDULE'.

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			6		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 project named 'Luk\_Hop\_St\_GBP.rvt'. The 'Properties' panel on the left shows the 'Sheet: FRC Diagram' with a scale of 1:300. The 'Project Browser' on the bottom left lists various schedules and sheets, with 'A105 - FRC Diagrams' selected. The main view shows a large, irregular purple outline representing a fire compartment, labeled with a circled '2'. To the right of the diagram is a table titled 'COMPARTMENT VOLUME'.

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 the current view is 'Main Model' and the date is 23:37 on 2011/9/8.

# 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 (Home, Insert, Annotate, Analyze, Structure, Massing & Site, Collaborate, View, Manage, Add-Ins, Modify) and a Properties panel on the left. The main workspace contains a table titled "FIRE RESISTANCE REQUIREMENT FOR ELEMENTS OF CONSTRUCTION".

ELEMENT	R.C. WALL => 1% V.R.			R.C. BEAM		R.C. COLUMN		R.C. SLAB		TI
	FRP REQ'D	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:

SITE COVERAGE	
ID	AREA (SQ.)
1	1239.582

The interface also includes a Project Browser on the left with a tree view showing various project elements like "SCHEDULE OF PERSONS FOR...", "SCHEDULE OF REMAINING U...", "SCHEDULE OF SANITARY FIT...", "SCHEDULE OF SANITARY FIT...", "SCHEDULE OF UFA SUMMAR...", "SCHEDULE OF UFS SUMMAR...", "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".

# Advantages

## Efficiency

- One day vs one week

## Consistency

- 100% accuracy

## Easy to Use

- Complete calculation with three steps only

## Support wide range of Building Projects

- Achieve success approval for variety of projects including residential, retail, office, university and religious buildings.

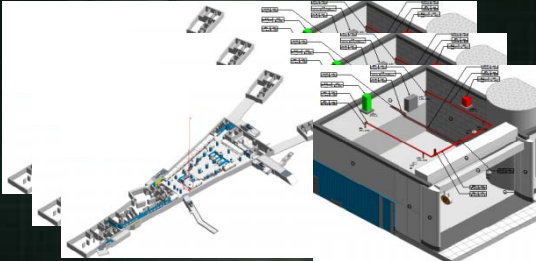
## *9 Facility Management*

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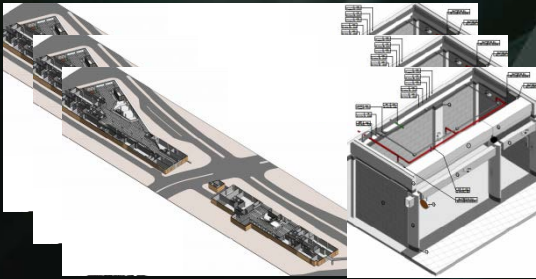
BIM building data extracted into Database. Data information integrated into FM database for analysis, reporting, maintenance & repair and placement of Work's order.

## MODELLING + INDIVIDUAL DATABASE

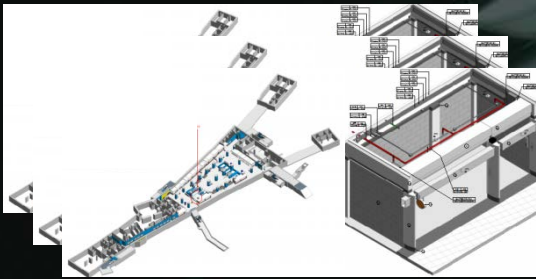
S1



S2



S3



## SYSTEM WIDE DATABASE

**MEGA  
DATABASE**

## APPLICATIONS

**APP 1**

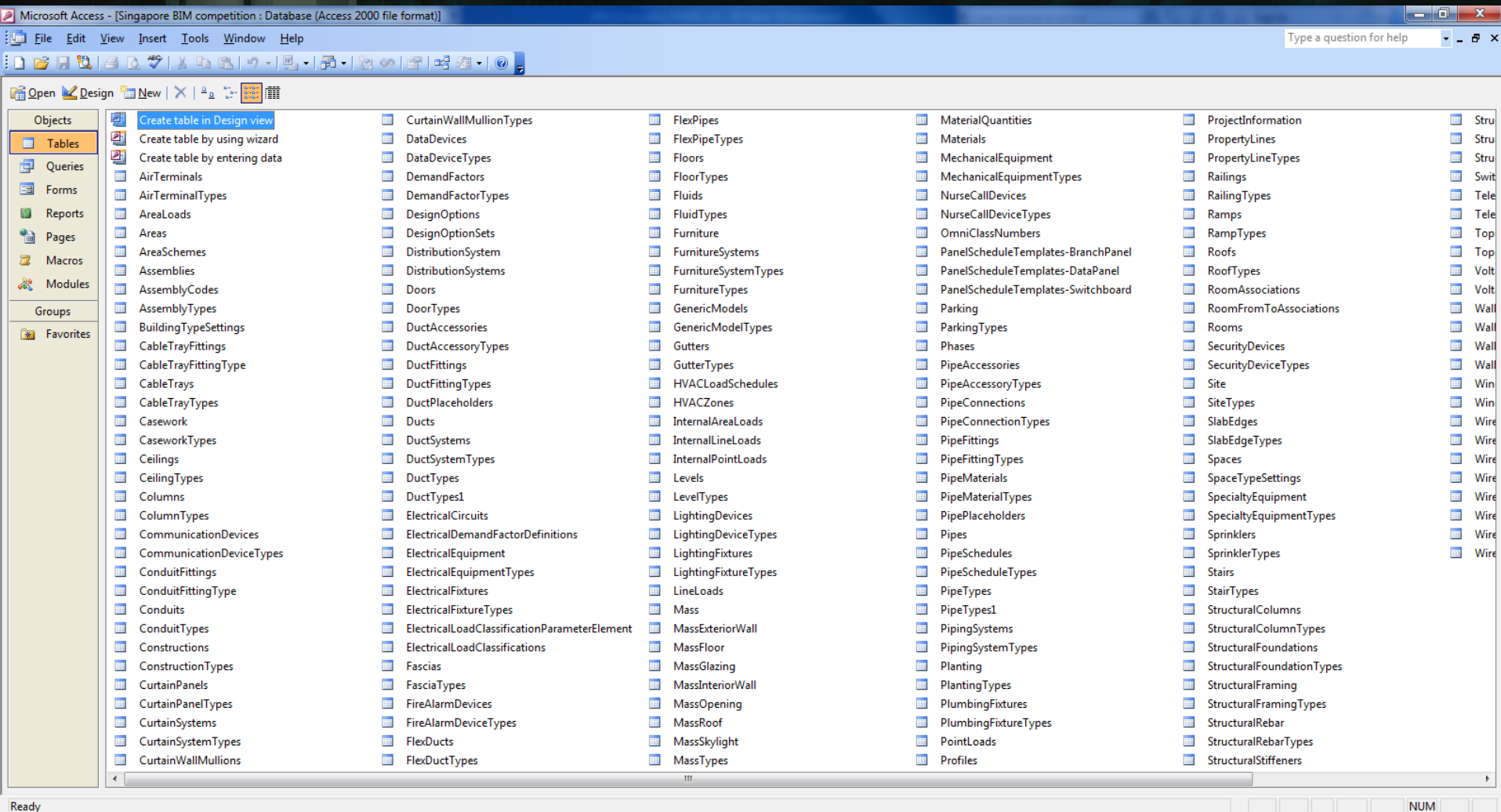
E.G. CCTV  
MONITORING

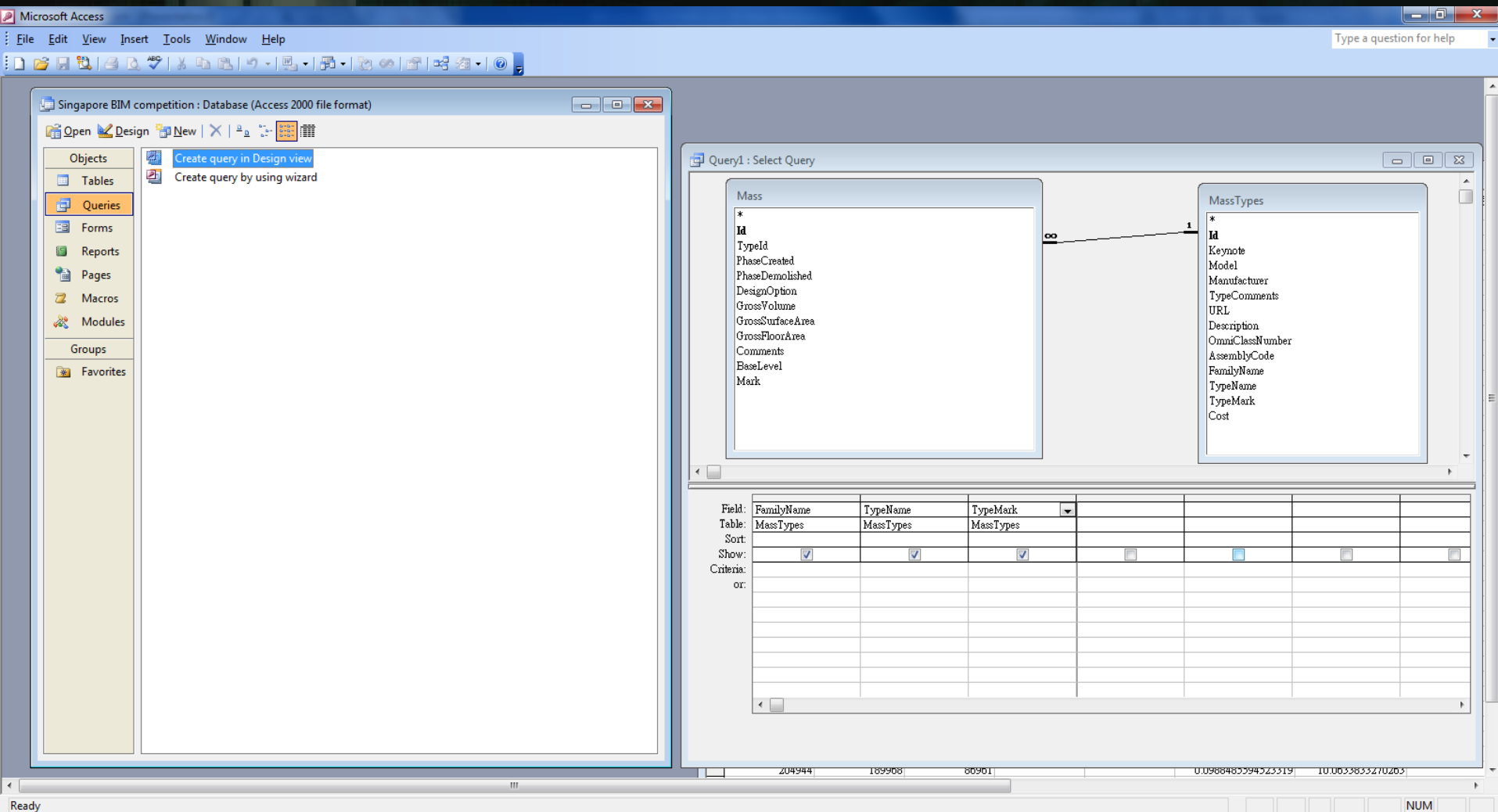
**APP 2**

E.G. RETAIL

**APP 3**







Query1 : Select Query

	FamilyName	TypeName	TypeMark
▶	<b>SAT Tower Mullion</b>	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!

