

Automatic checking for ICU Submission

Current Practice

1. Submission in hardcopy only
2. Involves over thousands nos. of calculation
3. Requires more than a week to check

Proposed Practice

1. Submission in both hardcopy and softcopy in REVIT format
2. The softcopy allows an automatic checking by computer software.
3. The hardcopy allows a manual checking same as current practice.
4. Greatly improves efficiency of the checking process.

101010101110110101111001111001110101101011000



Close up of Calculation

Autodesk Revit Architecture 2011 - 不可转售版 - [AB Sample Project.rvt - 图纸: P19 - UFA DIAGRAM]

常用 插入 注释 结构 体量与场地 协作 视图 管理 附加模块 修改 | 房间

修改 | 房间

属性

房间 (1) 编辑类型

限制条件

标高 Level 1

上限 Level 1

高度偏移 2438.4

底部偏移 0.0

尺寸标注

面积 2.229 m²

周长 5980.0

房间标示高度 2438.4

体积 未计算

标识数据

数字 8

名称 KITCHEN

属性帮助 应用

AB Sample Project.rvt - 项目浏览器

- GFA
- LIFT SHAFT SCHEDULE
- SCHEDULE MINIMUM NUM
- SCHEDULE OF AREA TO BE C
- SCHEDULE OF PERSONS FOR
- SCHEDULE OF SANITARY FIT
- SCHEDULE OF SANITARY FIT
- SITE COVERAGE
- UFA & UFS SCHEDULE
- UFA SCHEDULE
- 图纸 (all)
- P19 - UFA DIAGRAM
- P20 - GFA DIAGRAM
- P21 - GFA SUMMARY AND
- P22 - FRC DIAGRAM
- 族
- 专用设备
- 坡道
- 填充图案

UFA & UFS SCHEDULE

ID	ROOM	CALCULATION	AREA (SQ.M)
FLAT 1			
1	LIVING ROOM	4 x 2.35	9.4
5	KITCHEN	1.415 x 1.575	2.229
			11.629
FLAT 2			
2	LIVING ROOM	2.35 x 4	9.4
6	KITCHEN	1.415 x 1.575	2.229
			11.629
FLAT 3			
3	LIVING ROOM	4 x 2.35	9.4
7	KITCHEN	1.575 x 1.415	2.229
			11.629
FLAT 4			
4	LIVING ROOM	4 x 2.35	9.4
8	KITCHEN	1.575 x 1.415	2.229
			11.629
FLAT 5			
9	LIVING ROOM	5.625 x 3	16.875
12	LIVING ROOM	0.75 x 0.485	0.364
13	LIVING ROOM	2.24 x 1.615	3.618

ID	ROOM
UNIT 13	
41	LIVING
42	LIVING
45	LIVING
53	KITCHI
56	KITCHI
58	LIVING
UNIT 14	
35	LIVING
36	LIVING
37	LIVING
47	LIVING
49	KITCHI
UNIT 15	
63	LIVING
64	KITCHI
67	LIVING

单击可进行选择; 按 Tab 键并单击可选择其他项目; 按 Ctrl 键并单击可将新项目添加到选择集; 按 Shift

主模型

单击和拖曳

18:37 2011/1/23

Automatic checking of calculation

Autodesk Revit Architecture 2011 - 不可转售版 - [AB Sample Project.rvt - 图纸: P19 - UFA DIAGRAM]

常用 插入 注释 结构 体量与场地 协作 视图 管理 附加模块 修改 | 房间

修改 | 房间

属性

房间 (1) 编辑类型

限制条件

标高 Level 1

上限 Level 1

高度偏移 2438.4

底部偏移 0.0

尺寸标注

面积 2.229 m²

周长 5980.0

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UFA & UFS SCHEDULE

ID	ROOM	CALCULATION	AREA (SQ.M)
FLAT 1			
1	LIVING ROOM	4 x 2.35	9.4
5	KITCHEN	1.415 x 1.575	2.229
			11.629
		2.35 x 4	9.4
		1.415 x 1.575	2.229
			11.629
		4 x 2.35	9.4
		1.575 x 1.415	2.229
			11.629
FLAT 4			
4	LIVING ROOM	!!!! ERROR FOUND !!!! 5 x 2 !!!!	10
8	KITCHEN	1.575 x 1.415	2.229
			12.229
FLAT 5			
9	LIVING ROOM	5.625 x 3	16.875
12	LIVING ROOM	0.75 x 0.485	0.364
UNIT 13			
80	KITCHI		
41	LIVING		
42	LIVING		
45	LIVING		
53	KITCHI		
56	KITCHI		
58	LIVING		
UNIT 14			
35	LIVING		
36	LIVING		
37	LIVING		
47	LIVING		
49	KITCHI		
UNIT 15			
63	LIVING		
64	KITCHI		

SCHEDULE OF SANITARY FIT
SCHEDULE OF SANITARY FIT
SITE COVERAGE
UFA & UFS SCHEDULE
UFA SCHEDULE

图纸 (all)

P19 - UFA DIAGRAM

P20 - GFA DIAGRAM

P21 - GFA SUMMARY AND:

P22 - FRC DIAGRAM

族

专用设备

坡道

填充图案

单击可进行选择; 按 Tab 键并单击可选择其他项目; 按 Ctrl 键并单击可将新项目添加到选择集; 按 Shift

主模型

单击和拖曳

18:36
2011/1/23

With one command The software will check all calculations and highlight if error found.

Support checking of area breakdown

Autodesk Revit Architecture 2011 - 不可转售版 - [AB Sample Project.rvt - 图纸 P21 - GFA SUMMARY AND SITE COVERAGE CALCULATION] 输入关键字或短语

常用 插入 注释 结构 体量与场地 协作 视图 管理 附加模块 修改 | 视口

修改 | 视口 在图纸上旋转: 无

属性

视口
Title w Line

视口 (1) 编辑类型

图形
视图比例: 1:100
比例值 1: 100
显示模型: 标准
详细程度: 粗略
详图编号: 1
在图纸上旋转: 无
可见性/图形... 编辑...
视觉样式: 隐藏线
图形显示选项: 编辑...
基线: G/F
基线方向: 平面
方向: 项目北

属性帮助 应用

AB Sample Project.rvt - 项目浏览器

- SCHEDULE OF SANITARY FIT
- SCHEDULE OF SANITARY FIT
- SITE COVERAGE
- UFA & UFS SCHEDULE
- UFA SCHEDULE
- 图纸 (all)
 - P19 - UFA DIAGRAM
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 - P22 - FRC DIAGRAM
- 族
 - 专用设备
 - 坡道
 - 填充图案
 - 墙
 - 叠层墙
 - 基本墙
 - 幕墙
 - 天花板

ID	SITE COVERAGE CALCULATION	AREA (SQ.M)
1	1.375 x 6.6	9.075
2	15.805 x 17.025	269.08
3	0.91 x 15.275	13.9
4	14.525 x 1.315	19.1
5	14.9 x 3.725	55.503
6	24.671 x 12.618 / 2 - 23.8 x 23.8 x 3.14 x 40 / 360 + 23.8 x 23.8 x sin(40 / 2) x cos(40 / 2)	140.075
7	23.563 x 2.935 / 2	34.579
8	20.768 x 4.848 / 2	50.342
9	23.563 x 0.644 / 2	7.587
10	16.884 x 0.797 / 2 - 16.85 x 16.85 x 3.14 x 7.342 / 360 + 16.85 x 16.85 x sin(7.342 / 2) x cos(7.342 / 2)	6.688
11	16.884 x 1.439 / 2	12.148
12	21.44 x 0.76 / 2	8.147
13	17.511 x 1.459 / 2 - (18.739 x 18.739 x 3.14 x 5.514 / 360 - 18.739 x 18.739 x sin(5.514 / 2) x cos(5.514 / 2))	12.757
14	23.938 x 12.747 / 2	152.569
15	1.153 x 14.4	16.603
16	4.96 x 13.45	66.712
17	4.186 x 9.465 / 2	19.81
18	0.402 x 4.186	1.683

Phrase

视图: 视口: Title w Line

主模型

单击和拖曳 1

11:45 2011/1/28

Gross Floor Area

Autodesk Revit Architecture 2011 - DEMO MODE - [ACS 2011 Sample Project.rvt - Sheet: A101 - GFA Summary and Diagrams]

Home Insert Annotate Structure Massing & Site Collaborate View Manage Add-Ins Modify

Modify External Tools Select External

Properties

Sheet: GFA Summary Edit Type

Graphics

Visibility/Graphic Edit...

Scale As indicated

Identity Data

Dependency Independent

Referencing S...

Referencing D...

Current Revisi...

Current Revisi...

Current Revisi...

Current Revisi...

Current Revisi...

Current Revisi...

Properties help Apply

ACS 2011 Sample Project.rvt - Proj...

Views (all)

- Floor Plans
- Ceiling Plans
- 3D Views
- Elevations (Building Elevation)
- Area Plans (FRC)
- Area Plans (GFA)
- Area Plans (Lift Shaft)
- Area Plans (Site Area)
- Area Plans (Site Coverage)
- Area Plans (UFA)
- Legends
- Schedules/Quantities
 - Checking for GFA
 - Checking for Site Area
 - Checking for Site Coverage
 - Checking FRC
 - Checking UFA
 - COMPARTMENT VOLUME

CLASS OF SITE: A

SITE AREA (SQ.M): 1990.642

BUILDING HEIGHT (M): 19

PERMITTED NON-DOMESTIC SC (%): 95

PERMITTED NON-DOMESTIC PR: 6.7

ACTUAL SITE COVERAGE (SQ.M): 788.919

ACTUAL SITE COVERAGE IN %: 788.919/1990.642x100

39.631<95

ACTUAL NON-DOMESTIC GFA (SQ.M): 2266.734

ACTUAL NON-DOMESTIC PR: 2266.734/1990.642

1.139<6.7

Viewports: Viewport: No Title

LIFT SHAFT SUMMARY

Phrase

Viewports: Viewport: No Title

Main Model

Press & Drag

CH

12:03
2011/1/28

Lift Shaft Concession

The screenshot displays the Autodesk Revit Architecture 2011 interface. The title bar indicates the project is 'AB Sample Project.rvt' and the current view is 'P21 - GFA SUMMARY AND SITE COVERAGE CALCULATION'. The '修改 | 视图' (Modify | View) ribbon is active. The '属性' (Properties) palette on the left shows the '视图' (View) properties for 'Title w Line', including a scale of 1:100 and a rotation of 0 degrees. The '项目浏览器' (Project Browser) on the left shows the project structure, with 'P21 - GFA SUMMARY AND SITE COVERAGE CALCULATION' selected. The main view area displays a table titled 'LIFT SHAFT SUMMARY' with the following data:

LIFT SHAFT SUMMARY	
DOMESTIC ACCOMMODATION	
OVERALL DOMESTIC GFA (SQ.M):	23054.08
DOMESTIC LIFT SHAFT AREA (SQ.M):	712.424
MAXIMUM EXEMPTED GFA (SQ.M):	23054.08x3.5%
	806.893
ACTUAL EXEMPTED GFA (SQ.M):	712.424-23054.08x2.5%
	136.072 (MAX.806.893)
ACTUAL DOMESTIC GFA (SQ.M):	23054.08-136.072
	22918.008

The status bar at the bottom shows the current view is '视图: 视图: Title w Line' and the model is in '主模型' (Main Model) state. The system tray at the bottom right shows the date and time as 11:48 on 2011/1/28.

Means of Escape and Sanitary Fitment Requirement

SCHEDULE OF PERSONS FOR MEANS OF ESCAPE												
LOCATION	AREA ID	USE	USABLE FLOOR AREA (SQ.M)	MOE PERMITTED CAPACITY DENSITY	ROOM CAPACITY	MIN. NO. OF EXIT ROUTE		MIN. TOTAL WIDTH OF				MIN
						REQ'D	PRO'D	EXIT DOORS		EXIT ROUTES		EXIT DOOR
								REQ'D	PRO'D	REQ'D	PRO'D	PRO'D
3/F												
3/F	38	ROOM	21.269	2	11	1		-		-		750
3/F	39	ROOM	14.616	30	1	1		-		-		-
3/F	40	ROOM	33.304	2	17	1		-		-		750

SCHEDULE MINIMUM NUMBER & WIDTH OF EXIT DOOR & EXIT ROUTE FROM EACH FLOOR											
LOCATION	FLOOR CAPACITY	MIN. NO. OF EXIT ROUTE		MIN. TOTAL WIDTH OF				MIN. WIDTH OF EACH			
		REQ'D	PRO'D	EXIT DOORS		EXIT ROUTES		EXIT DOOR		EXIT ROUTE	
				REQ'D	PRO'D	REQ'D	PRO'D	REQ'D	PRO'D	REQ'D	PRO'D
G/F	73	2		1750		2100		850		1050	
1/F	391	2		3000		3000		1050		1050	
2/F	469	2		3000		3000		1050		1050	
3/F	29	1		-		-		750		1050	

adds, SHIFT unselects.



Main Model

Press & Drag



CH

12:05
2011/1/28

Compartment Volume

Autodesk Revit Architecture 2011 - DEMO MODE - [ACS 2011 Sample Project.rvt - Sheet: A103 - FRC Diagrams]

Home Insert Annotate Structure Massing & Site Collaborate View Manage Add-Ins Modify

Modify External Tools Select External

Properties

Sheet: FRC Diagram Edit Type

Graphics

Visibility/Grap... Edit...

Scale 1 : 300

Identity Data

Dependency Independent

Referencing S...

Referencing D...

Current Revisi...

Current Revisi...

Current Revisi...

Current Revisi...

Current Revisi...

Current Revisi...

Properties help Apply

ACS 2011 Sample Project.rvt - Proje...

LIFT SHAFT SCHEDULE

SCHEDULE MINIMUM NUMI

SCHEDULE OF PERSONS FOI

SCHEDULE OF SANITARY FIT

SITE COVERAGE

Sheets (all)

A101 - GFA Summary and D

A102 - UFA Diagrams

A103 - FRC Diagrams

Families

Annotation Symbols

A1 metric

M_Area Tag

M_Area Tag_GBP_Compe

M_Area Tag_GBP_Compe

M_Area Tag_GBP_Dome

M_Area Tag_GBP_Dome

M_Area Tag_GBP_NonD

M_Area Tag_GBP_NonD

COMPARTMENT VOLUME

COMPARTMENT	AREA (SQ.M)	FLOOR HEIGHT (M)	VOLUME (CU.M)
B	143.495	4.3	617.029
C	78.954	4.3	339.502
D	393.832	4.3	1693.478

4225 20752400 3575 975

5 3/1

2500 5625 5125

Click to select, TAB for alternates, CTRL adds, SHIFT unselects.

Main Model

Press & Drag

12:06 2011/1/28

Fire Resistance Requirement

Autodesk Revit Architecture 2011 - DEMO MODE - [ACS 2011 Sample Project.rvt - Sheet: A103 - FRC Diagrams]

Home Insert Annotate Structure Massing & Site Collaborate View Manage Add-Ins Modify

Modify External Tools Select External

Properties

Sheet: FRC Diagram Edit Type

Graphics

Visibility/Grap... Edit...

Scale 1 : 300

Identity Data

Dependency Independent

Referencing S...

Referencing D...

Current Revisi...

Current Revisi...

Current Revisi...

Current Revisi...

Current Revisi...

Properties help Apply

ACS 2011 Sample Project.rvt - Proje...

LIFT SHAFT SCHEDULE

SCHEDULE MINIMUM NUMI

SCHEDULE OF PERSONS FOI

SCHEDULE OF SANITARY FIT

SITE COVERAGE

Sheets (all)

A101 - GFA Summary and D

A102 - UFA Diagrams

A103 - FRC Diagrams

Families

Annotation Symbols

A1 metric

M_Area Tag

M_Area Tag_GBP_Compe

M_Area Tag_GBP_Compe

M_Area Tag_GBP_Dome

M_Area Tag_GBP_Dome

M_Area Tag_GBP_NonD

M_Area Tag_GBP_NonD

FIRE RESISTANCE REQUIREMENT FOR ELEMENTS OF CONSTR

COMPARTME NT	CLASS	TOTAL VOLUME (CU.M)	FRP REQ'D	R.C. WALL => 1% V.R.		R.C. BEAM		R.C.
				THK.	COVER TO STEEL	THK.	COVER TO STEEL	THK.
A	-(BASEMENT)	204.513	4	180	25	280	60*	450
B	8 (CARPARKING)	617.029	1	75	15	200	30	200
C	8 (CARPARKING)	339.502	1	75	15	200	30	200
D	7 (PLACE OF ASSEMBLY)	1893.478	1	75	15	200	30	200
E	7 (PLACE OF ASSEMBLY)	4314.993	1	75	15	200	30	200
F	7 (PLACE OF ASSEMBLY)	3505.746	1	75	15	200	30	200
G	7 (PLACE OF ASSEMBLY)	433.478	1	75	15	200	30	200

Click to select, TAB for alternates, CTRL adds, SHIFT unselects.

Main Model

Press & Drag

12:08
2011/1/28

Conclusion

1. This greatly improves the efficiency of the checking mechanism
2. The software is easy to use with only one command required
3. Training and technical support can be provided to ensure a successful implementation
4. Hardcopy will also be submitted for manual checking



Thank you