MINIMALIST MODELLING AND CODING OF REVIT FOR QUANTITIES

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CAPABILITIES OF REVIT

Can Revit produce Bills of Quantities from Revit model with the press of a button?

Can Revit model provide quantities?

- elements
- parameters
- parametric modelling

Are the quantities in compliance with the standard method of measurement?

Are the quantities provided by a Revit model sufficient and ready enough to be converted to quantities according to the standard method of measurement?

- some parameters not schedulable
- not the desired for SMM purposes
- concrete shoulders
- formwork
- wall and ceiling finish areas

Then, how can we use Revit model to produce quantities for estimates or BQ?

- third party quantity take-off software
- still need to write the descriptions and do some linking
- linking process may be quick or tedious
- changes can be monitored
- license and training costs

Quantity Surveyors are still required

Can we still get something useful from Revit models without third party QTO software?

SHOULD QS BUILD MODELS?

Are Revit models readily available from Architects and Engineers?

Without a BIM model, should QS build up models?

- dimension sheet
- cut-and-shuffle
- schedule
- scale rule
- curvimeter
- planimeter
- Lotus 1-2-3 spreadsheet
- Excel worksheet
- digitizer
- on-screen taking off, etc.
- why textural and not graphical

Modelling Revit vs drafting 2D CAD

- within the capability of the average QS

Bulk items like structure, fabric and finishes

- shorter time

Models provided by Architects and Engineers

- inspect and understand
- integrity
- QS parameters

Therefore, the answer should be yes

Should QS model every detail?
- items like windows, doors, fittings and furniture

Level of details of the models if provided by the Architects and Engineers
- no less than those traditionally provided for 2D CAD drawings
- for estimating, tendering and construction

HOW MUCH DO WE NEED TO MEASURE?

Measure every bit net each time?

Inter-relationship between dimensions and quantities

Description	Primary Qty	Multiplier	Unit
Wall - grade C40 - T thick (centre line area)	A		Super
• Reinforced concrete Grade C40	A	T	Cube
• Wall formwork	A	2	Super
• To deduct junction with slab if wall measured through slab			
• To adjust for openings			
• To measure end of wall			

Description	Primary Qty	Multiplier	Unit
Column - grade C40 - W wide x D deep (height)	H		Run
• Reinforced concrete Grade C40	H	W x D	Cube
• Column formwork (junction with slab to deduct if measured through slab)	H	(W + D) x 2	Super
• To deduct junction with slab if column measured through slab			
Suspended beam - grade C30 - W wide x D deep - S slab (length)	L		Run
• Reinforced concrete Grade C30	L	W x (D – S)	Cube
• Beam formwork below slab	L	W + (D – S) x 2	Super
• Deduct slab formwork	L	W x -1	Super
• To adjust for shoulders to higher grade walls or columns			
Suspended slab - grade C30 - S thick (area)	A		Super
• Reinforced concrete Grade C30	A	S	Cube
• Slab formwork	A	2	Super
• To deduct junctions with walls, columns and beams			
• To adjust for openings			
Room - finishes group A - net plan area	A		Super
• Floor finishes	A		Super
• Ceiling finishes	A		Super
• To adjust for beam sides			
• To adjust for door opening			
• To adjust for work behind fixtures			

Description	Primary Qty	Multiplier	Unit
Room - finishes group A - perimeter including columns - H room height - S skirting height	L		Run
• Skirting	L		Run
• Wall finishes	L	H – S	Super
• To adjust for beam sides and ends			
• To adjust for openings			
• To adjust for work behind fixtures			
Window W1 - W wide x H high opening - T thick concrete wall - Room A	N		Nr
• Window W1, fully described	N		Nr
• Glazing	N	Detailed dimensions of W1	Super
• Deduct T wall concrete	N	W x H x T x -1	Cube
• Deduct wall formwork	N	W x H x 2	Super
• Add jambs and soffit formwork, T thick (or boxing number as appropriate)	N	W + H x 2	Run
• Deduct Room A wall finishes (assuming no dado)	N	W x H x -1	Super
• Add Room A wall finishes to window reveal	N	(W + H x 2) x reveal width	Run
• Add Room A window cill	N	W	Run
Door D1 - W wide x H high opening - T thick brickwall - Room finishes group A	N		Nr
• Door D1, fully described	N		Nr
• Deduct T thick brickwall	N	W x H x -1	Super
• Add lintol	N	W + end laps x 2	Run

Description	Primary Qty	Multiplier	Unit
• Deduct Room A skirting	N	W	Run
• Deduct Room A wall finishes	N	W x H x -1	Super
• Add Room A floor finishes	N	W x part of T as appropriate	Run
• Door frames, architraves, painting, dowels, holdfasts, etc.	N	Detailed dimensions of D1	As appropriate

Aggregate areas, lengths, girth first

- *primary quantities*
- converting into secondary quantities

Overall gross quantities first before making detailed adjustments

Descriptions can be very short

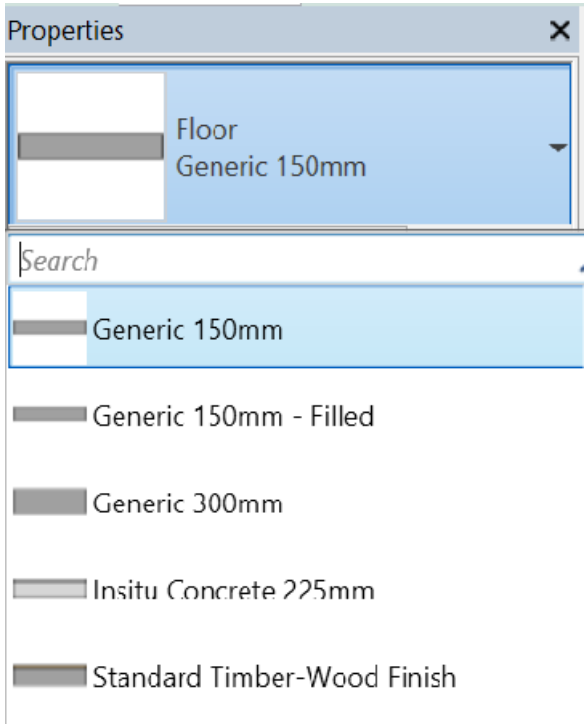
Just extract the primary quantities adequately described from the Revit model

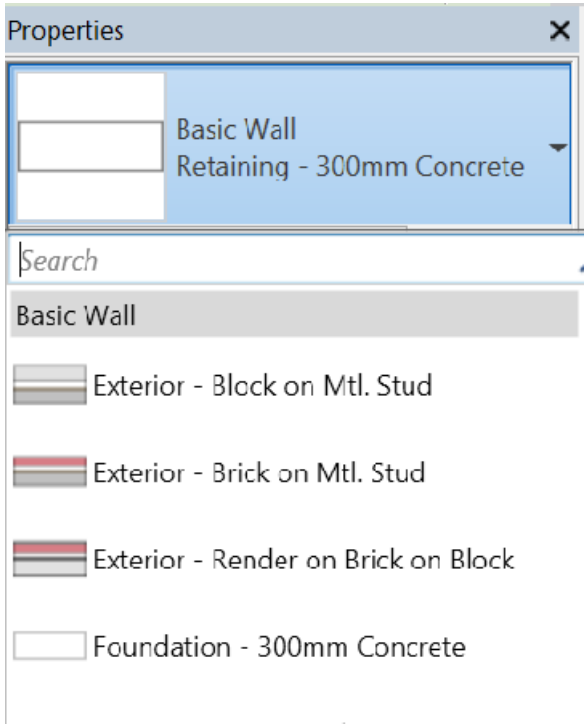
Use Excel to handle the secondary processing

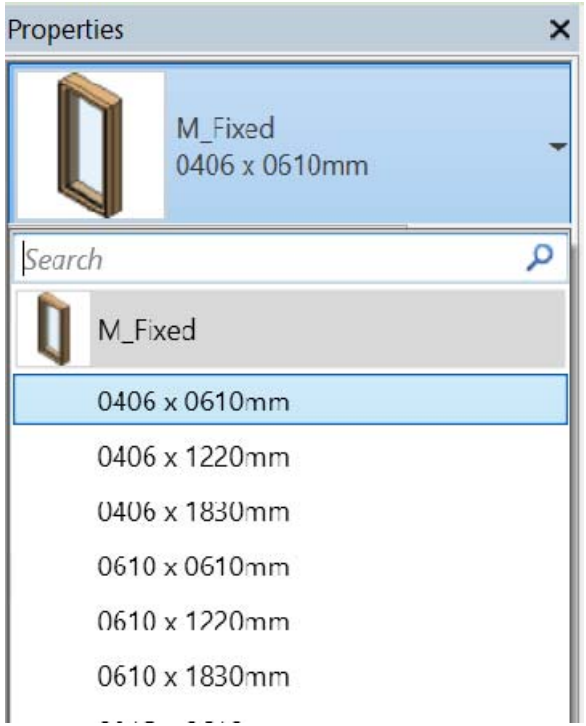
CODING AND WHY?

Information to be described in a concise, precise and consistent manner

Revit Family and Type descriptions


Properties
Floor
Generic 150mm
Search
Generic 150mm
Generic 150mm - Filled
Generic 300mm
Insitu Concrete 225mm
Standard Timber-Wood Finish


Properties
Basic Wall
Retaining - 300mm Concrete
Search
Basic Wall
Exterior - Block on Mtl. Stud
Exterior - Brick on Mtl. Stud
Exterior - Render on Brick on Block
Foundation - 300mm Concrete

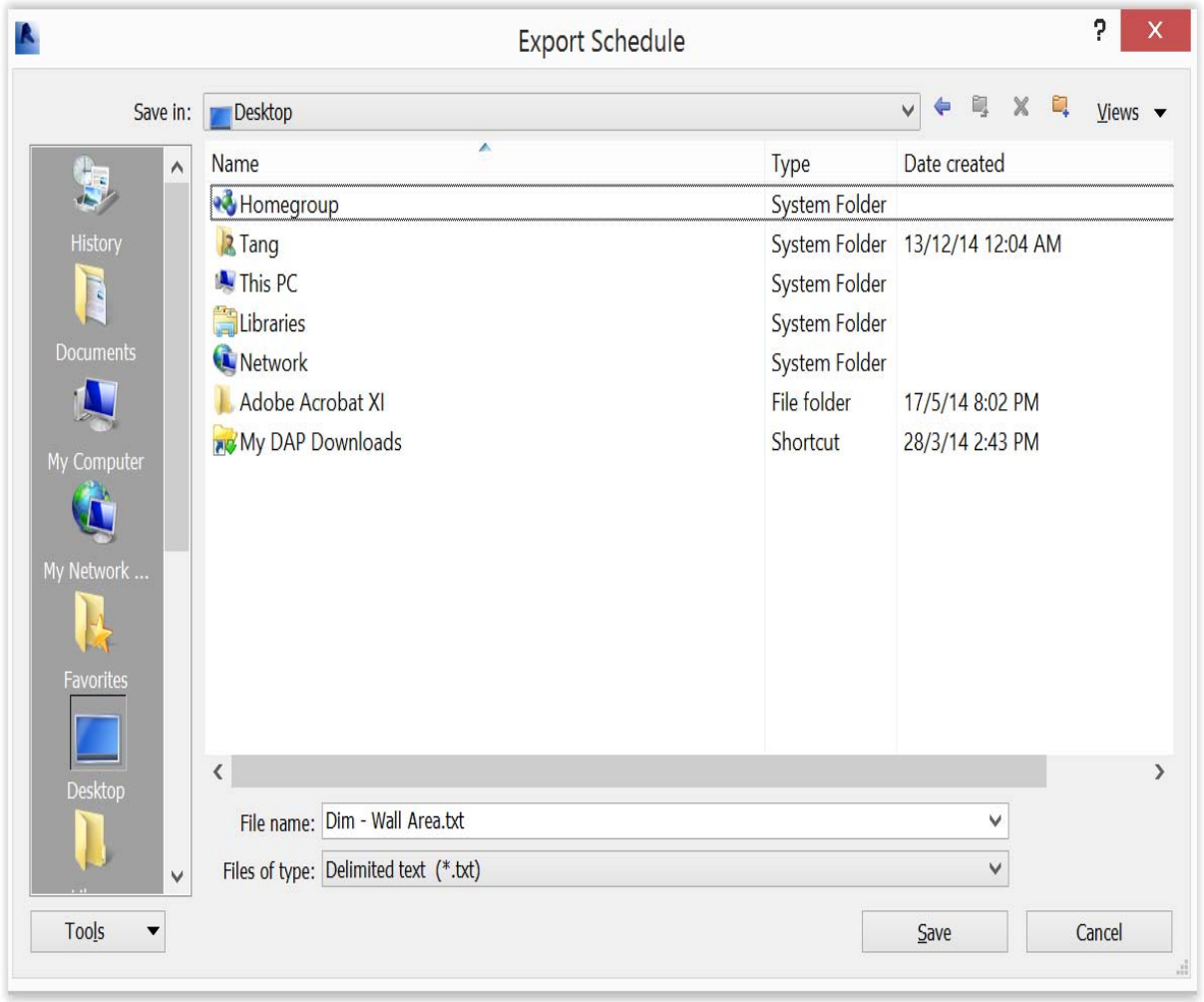


Separate from Architects' or Engineers' descriptions of Families and Types

Coding ("*QS Desc*") sufficient, self-explanatory enough yet short and simple

- WA-C40-100
- CL-C40-500x600
- BM-C30-300x500 : 120SL
- SL-C30-120

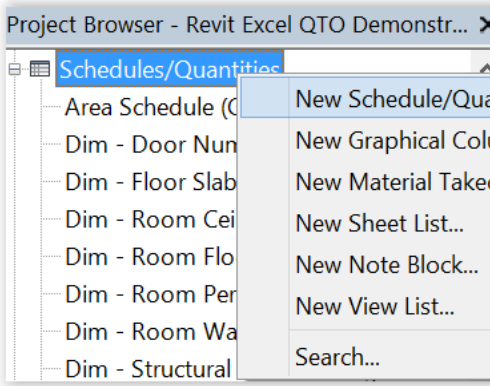
- RM-F-A
- RM-P-A
- WD-W1-1200x1500 : IWConc100-RoomA
- DR-D1-920x2200 : IWBrick125-RoomA

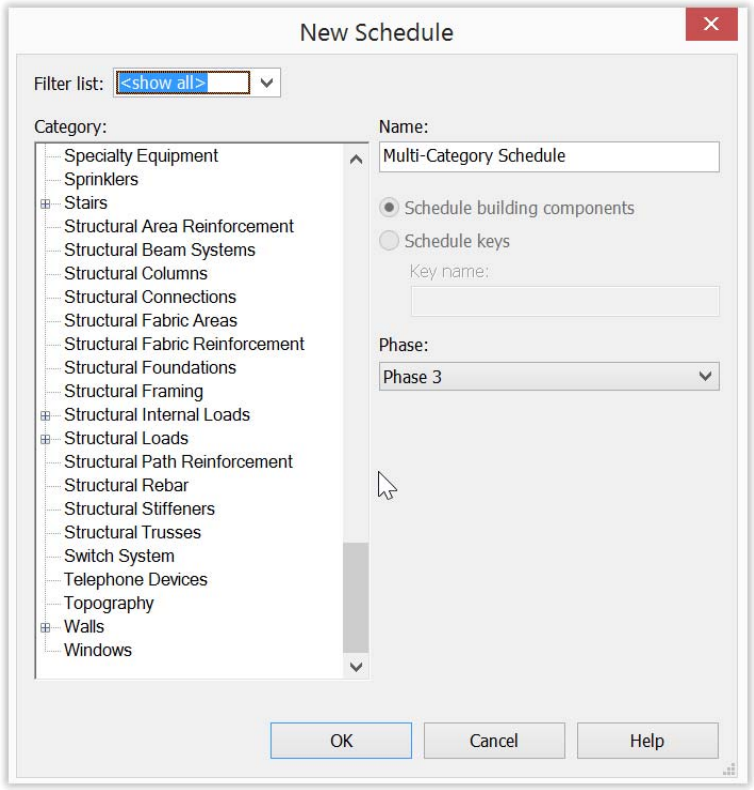


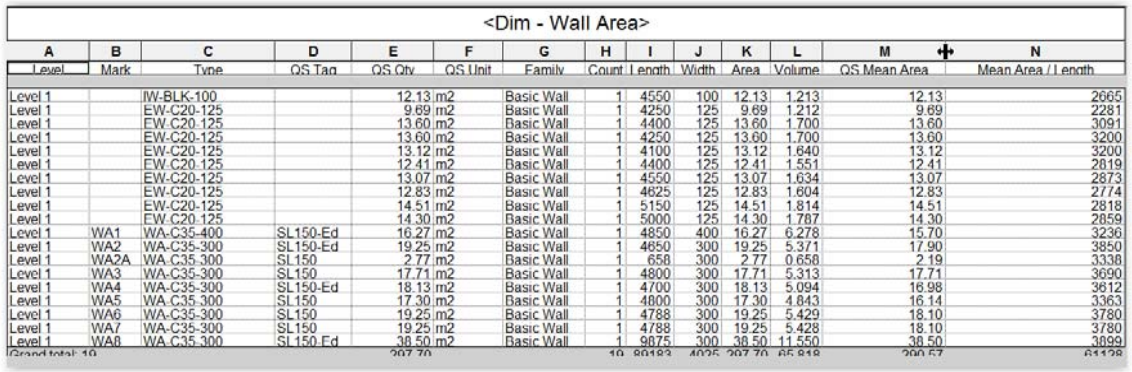
Intuitive and understandable vs cryptic

SCHEDULES / QUANTITIES

Revit schedules




New Schedule
Filter list:
<show all>
Category:
Specialty Equipment
Sprinklers
Stairs
Structural Area Reinforcement
Structural Beam Systems
Structural Columns
Structural Connections
Structural Fabric Areas
Structural Fabric Reinforcement
Structural Foundations
Structural Framing
Structural Internal Loads
Structural Loads
Structural Path Reinforcement
Structural Rebar
Structural Stiffeners
Structural Trusses
Switch System
Telephone Devices
Topography
Walls
Windows
Name:
Multi-Category Schedule
Schedule building components
Schedule keys
Key name:
Phase:
Phase 3
OK
Cancel
Help



<Dim - Wall Area>

A	B	C	D	E	F	G	H	I	J	K	L	M	N
Level	Mark	Type	QS Tag	QS Qty	QS Unit	Family	Count	Length	Width	Area	Volume	QS Mean Area	Mean Area / Length
Level 1		IW-BLK-100		12.13	m2	Basic Wall	1	4550	100	12.13	1.213	12.13	2665
Level 1		EW-C20-125		9.69	m2	Basic Wall	1	4250	125	9.69	1.212	9.69	2281
Level 1		EW-C20-125		13.60	m2	Basic Wall	1	4400	125	13.60	1.700	13.60	3091
Level 1		EW-C20-125		13.60	m2	Basic Wall	1	4250	125	13.60	1.700	13.60	3200
Level 1		EW-C20-125		13.12	m2	Basic Wall	1	4100	125	13.12	1.640	13.12	3200
Level 1		EW-C20-125		12.41	m2	Basic Wall	1	4400	125	12.41	1.551	12.41	2819
Level 1		EW-C20-125		13.07	m2	Basic Wall	1	4550	125	13.07	1.634	13.07	2873
Level 1		EW-C20-125		12.83	m2	Basic Wall	1	4625	125	12.83	1.604	12.83	2774
Level 1		EW-C20-125		14.51	m2	Basic Wall	1	5150	125	14.51	1.814	14.51	2818
Level 1		EW-C20-125		14.30	m2	Basic Wall	1	5000	125	14.30	1.787	14.30	2859
Level 1	WA1	WA-C35-400	SL150-Ed	16.27	m2	Basic Wall	1	4850	400	16.27	6.278	15.70	3236
Level 1	WA2	WA-C35-300	SL150-Ed	19.25	m2	Basic Wall	1	4650	300	19.25	5.371	17.90	3850
Level 1	WA2A	WA-C35-300	SL150	2.77	m2	Basic Wall	1	658	300	2.77	0.658	2.19	3338
Level 1	WA3	WA-C35-300	SL150	17.71	m2	Basic Wall	1	4800	300	17.71	5.313	17.71	3690
Level 1	WA4	WA-C35-300	SL150-Ed	18.13	m2	Basic Wall	1	4700	300	18.13	5.094	16.98	3612
Level 1	WA5	WA-C35-300	SL150	17.30	m2	Basic Wall	1	4800	300	17.30	4.843	16.14	3363
Level 1	WA6	WA-C35-300	SL150	19.25	m2	Basic Wall	1	4788	300	19.25	5.429	18.10	3780
Level 1	WA7	WA-C35-300	SL150	19.25	m2	Basic Wall	1	4788	300	19.25	5.428	18.10	3780
Level 1	WA8	WA-C35-300	SL150-Ed	38.50	m2	Basic Wall	1	9875	300	38.50	11.550	38.50	3899
(Grand total: 19				297.70			19	80193	4025	297.70	65.818	299.57	61128

So many schedules

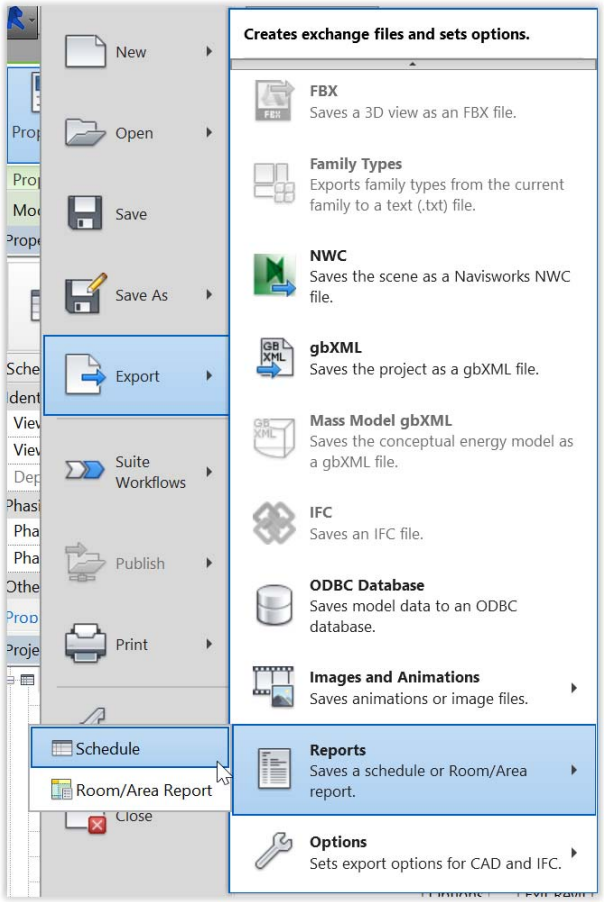
Choices of columns must be well co-ordinated

Not practical to transfer the individual total quantity manually one by one

Schedule design

- Consistent left 6 columns
- Level and Mark for locational identification, for traceability
- Only Type, QS Tag, QS Qty and QS Unit are really essential for billing
- Other columns for calculating QS Qty or cross-checking, and can vary

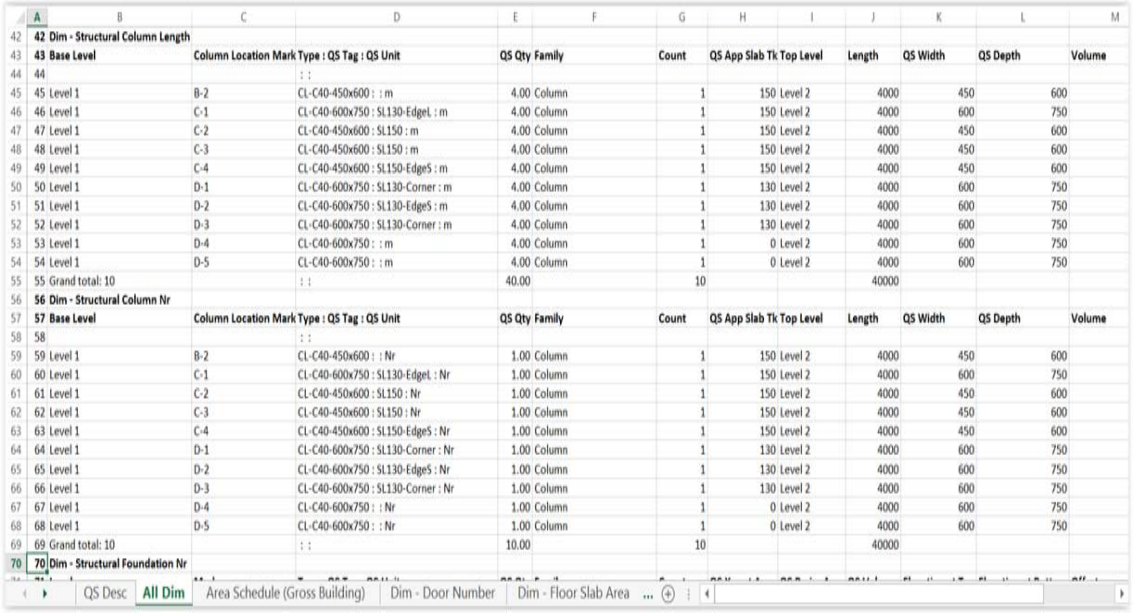
Revit schedules to txt file to Excel worksheet



But only handle one schedule at a time

Macro:

- All schedules exported to ne Excel file
- 3 columns of Type, QS Tag and QS Unit combined into a single “QS Desc” column in the style of “Type : QS Tag : QS Unit”
- “All Dim” worksheet



	A	B	C	D	E	F	G	H	I	J	K	L	M
42	42	Dim - Structural Column Length											
43	43	Base Level	Column Location Mark	Type : QS Tag : QS Unit	QS Qty	Family	Count	QS App Slab Tk	Top Level	Length	QS Width	QS Depth	Volume
44	44			: :									
45	45	Level 1	B-2	CL-C40-450x600 : : m	4.00	Column	1	150	Level 2	4000	450	600	
46	46	Level 1	C-1	CL-C40-600x750 : SL130-EdgeL : m	4.00	Column	1	150	Level 2	4000	600	750	
47	47	Level 1	C-2	CL-C40-450x600 : SL150 : m	4.00	Column	1	150	Level 2	4000	450	600	
48	48	Level 1	C-3	CL-C40-450x600 : SL150 : m	4.00	Column	1	150	Level 2	4000	450	600	
49	49	Level 1	C-4	CL-C40-450x600 : SL150-EdgeS : m	4.00	Column	1	150	Level 2	4000	450	600	
50	50	Level 1	D-1	CL-C40-600x750 : SL130-Corner : m	4.00	Column	1	130	Level 2	4000	600	750	
51	51	Level 1	D-2	CL-C40-600x750 : SL130-EdgeS : m	4.00	Column	1	130	Level 2	4000	600	750	
52	52	Level 1	D-3	CL-C40-600x750 : SL130-Corner : m	4.00	Column	1	130	Level 2	4000	600	750	
53	53	Level 1	D-4	CL-C40-600x750 : : m	4.00	Column	1	0	Level 2	4000	600	750	
54	54	Level 1	D-5	CL-C40-600x750 : : m	4.00	Column	1	0	Level 2	4000	600	750	
55	55	Grand total: 10		: :	40.00		10			40000			
56	56	Dim - Structural Column Nr											
57	57	Base Level	Column Location Mark	Type : QS Tag : QS Unit	QS Qty	Family	Count	QS App Slab Tk	Top Level	Length	QS Width	QS Depth	Volume
58	58			: :									
59	59	Level 1	B-2	CL-C40-450x600 : : Nr	1.00	Column	1	150	Level 2	4000	450	600	
60	60	Level 1	C-1	CL-C40-600x750 : SL130-EdgeL : Nr	1.00	Column	1	150	Level 2	4000	600	750	
61	61	Level 1	C-2	CL-C40-450x600 : SL150 : Nr	1.00	Column	1	150	Level 2	4000	450	600	
62	62	Level 1	C-3	CL-C40-450x600 : SL150 : Nr	1.00	Column	1	150	Level 2	4000	450	600	
63	63	Level 1	C-4	CL-C40-450x600 : SL150-EdgeS : Nr	1.00	Column	1	150	Level 2	4000	450	600	
64	64	Level 1	D-1	CL-C40-600x750 : SL130-Corner : Nr	1.00	Column	1	130	Level 2	4000	600	750	
65	65	Level 1	D-2	CL-C40-600x750 : SL130-EdgeS : Nr	1.00	Column	1	130	Level 2	4000	600	750	
66	66	Level 1	D-3	CL-C40-600x750 : SL130-Corner : Nr	1.00	Column	1	130	Level 2	4000	600	750	
67	67	Level 1	D-4	CL-C40-600x750 : : Nr	1.00	Column	1	0	Level 2	4000	600	750	
68	68	Level 1	D-5	CL-C40-600x750 : : Nr	1.00	Column	1	0	Level 2	4000	600	750	
69	69	Grand total: 10		: :	10.00		10			40000			
70	70	Dim - Structural Foundation Nr											

QS Desc | All Dim | Area Schedule (Gross Building) | Dim - Door Number | Dim - Floor Slab Area

- “QS Desc” worksheet

	A	B
1	Type : QS Tag : QS Unit	QS Qty
2	BM-C30-250x350 : SL150 : m	18.10
3	BM-C30-300x600 : SL150 : m	3.76
4	BM-C30-400x800 : l : m	17.00
5	BM-C30-400x800 : SL130 : m	12.75
6	BM-C30-400x800 : SL130-Edge : m	8.50
7	BM-C30-400x800 : SL150 : m	40.28
8	BM-C30-400x800 : SL150-Edge : m	18.50
9	CE-Plaster-Emulsion : : m2	228.22
10	CL-C40-450x600 : : m	4.00
11	CL-C40-450x600 : : Nr	1.00
12	CL-C40-450x600 : SL150 : m	8.00
13	CL-C40-450x600 : SL150 : Nr	2.00
14	CL-C40-450x600 : SL150-EdgeS : m	4.00
15	CL-C40-450x600 : SL150-EdgeS : Nr	1.00
16	CL-C40-600x750 : : m	8.00
17	CL-C40-600x750 : : Nr	2.00
18	CL-C40-600x750 : SL130-Corner : m	8.00
19	CL-C40-600x750 : SL130-Corner : Nr	2.00
20	CL-C40-600x750 : SL130-EdgeL : m	4.00
21	CL-C40-600x750 : SL130-EdgeL : Nr	1.00
22	CL-C40-600x750 : SL130-EdgeS : m	4.00
23	CL-C40-600x750 : SL130-EdgeS : Nr	1.00

QS Desc | All Dim | Area Schedule (Gross Bu

- file name time marked

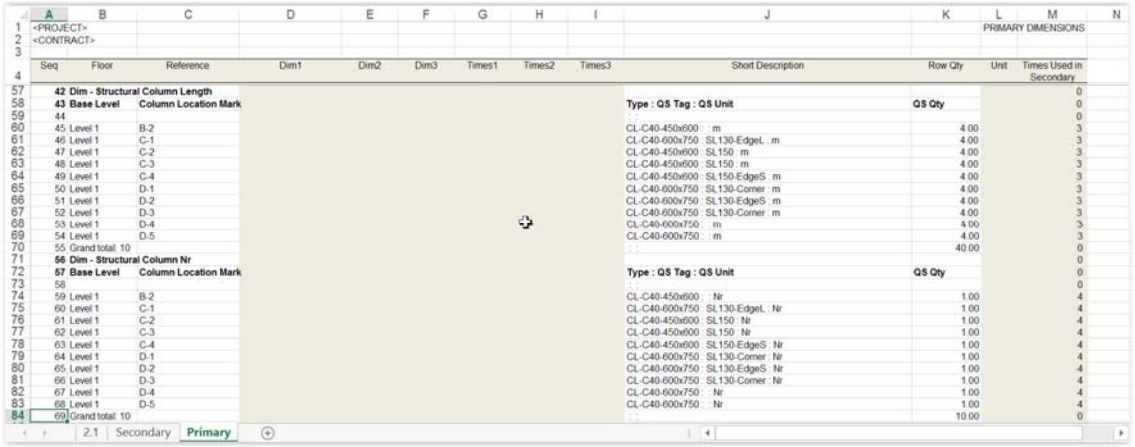
BILLING WORKFLOW

Data
→ (extraction from Revit schedules or direct measurement)

→ Primary Qty
→ (processing)
→ Secondary Qty
→ (processing)
→ Estimate or BQ

PRIMARY WORKSHEET

First 5 columns only of “All Dim” worksheet copied to “Primary worksheet”:



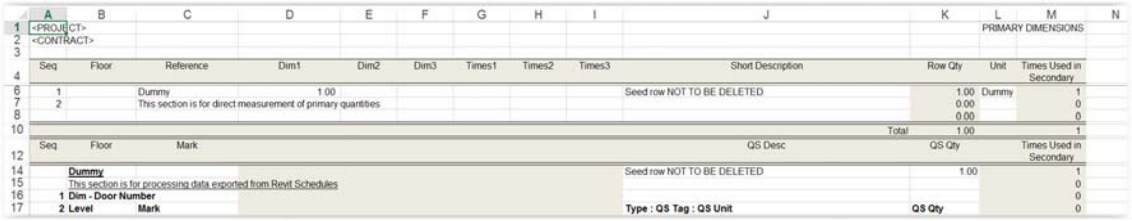
	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	<PROJECT>												PRIMARY DIMENSIONS	
2	<CONTRACT>													
3														
4	Seq	Floor	Reference	Dim1	Dim2	Dim3	Times1	Times2	Times3	Short Description	Row Qty	Unit	Times Used in Secondary	
57	**42**	**Dim - Structural Column Length**											0	
58	**43**	**Base Level**	**Column Location Mark**							**Type : QS Tag : QS Unit**	**QS Qty**		0	
59	44												0	
60	45	Level 1	B-2							CL-C40-450x600 : : m	4.00		3	
61	46	Level 1	C-1							CL-C40-600x750 : SL130-EdgeL : m	4.00		3	
62	47	Level 1	C-2							CL-C40-450x600 : SL150 : m	4.00		3	
63	48	Level 1	C-3							CL-C40-450x600 : SL150 : m	4.00		3	
64	49	Level 1	C-4							CL-C40-450x600 : SL150-EdgeS : m	4.00		3	
65	50	Level 1	D-1							CL-C40-600x750 : SL130-Corner : m	4.00		3	
66	51	Level 1	D-2							CL-C40-600x750 : SL130-EdgeS : m	4.00		3	
67	52	Level 1	D-3							CL-C40-600x750 : SL130-Corner : m	4.00		3	
68	53	Level 1	D-4							CL-C40-600x750 : : m	4.00		3	
69	54	Level 1	D-5							CL-C40-600x750 : : m	4.00		3	
70	55	Grand total: 10									40.00		0	
71	**56**	**Dim - Structural Column Nr**											0	
72	**57**	**Base Level**	**Column Location Mark**							**Type : QS Tag : QS Unit**	**QS Qty**		0	
73	58												0	
74	59	Level 1	B-2							CL-C40-450x600 : : Nr	1.00		4	
75	60	Level 1	C-1							CL-C40-600x750 : SL130-EdgeL : Nr	1.00		4	
76	61	Level 1	C-2							CL-C40-450x600 : SL150 : Nr	1.00		4	
77	62	Level 1	C-3							CL-C40-450x600 : SL150 : Nr	1.00		4	
78	63	Level 1	C-4							CL-C40-450x600 : SL150-EdgeS : Nr	1.00		4	
79	64	Level 1	D-1							CL-C40-600x750 : SL130-Corner : Nr	1.00		4	
80	65	Level 1	D-2							CL-C40-600x750 : SL130-EdgeS : Nr	1.00		4	
81	66	Level 1	D-3							CL-C40-600x750 : SL130-Corner : Nr	1.00		4	
82	67	Level 1	D-4							CL-C40-600x750 : : Nr	1.00		4	
83	68	Level 1	D-5							CL-C40-600x750 : : Nr	1.00		4	
84	69	Grand total: 10									10.00		0	

2.1 | Secondary | Primary

Seq column

Highlighted columns

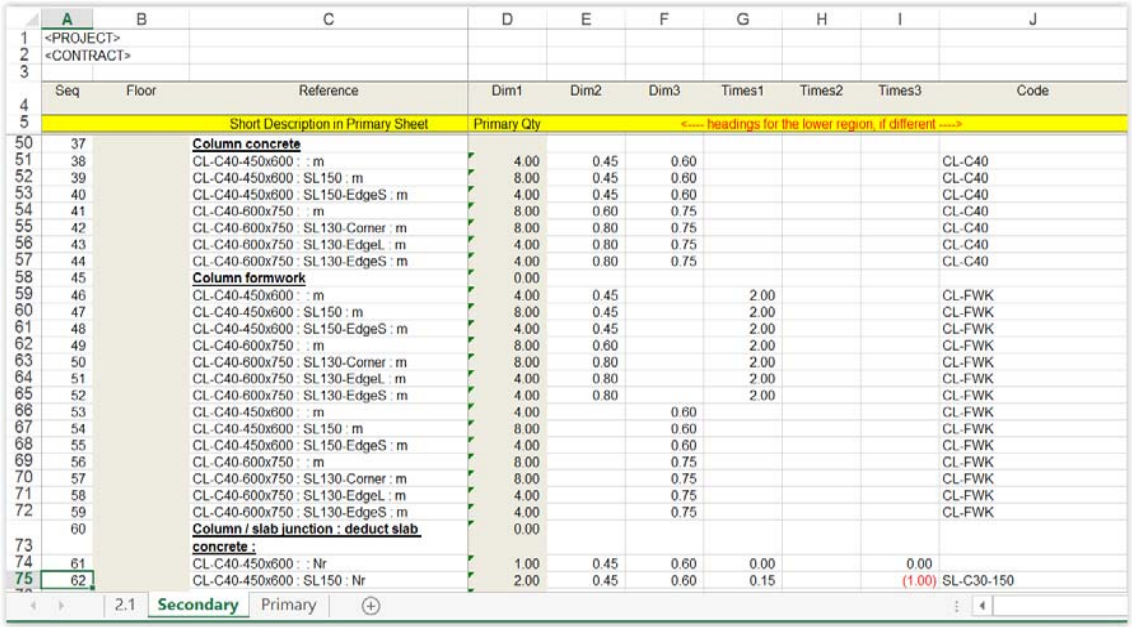
Direct measurement formula used for Row Qty, say at Row 6, is =PRODUCT(E6:J6), meaning product of Dim1 …. Times3.



	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	<PROJECT>												PRIMARY DIMENSIONS	
2	<CONTRACT>													
3														
4	Seq	Floor	Reference	Dim1	Dim2	Dim3	Times1	Times2	Times3	Short Description	Row Qty	Unit	Times Used in Secondary	
6	1		Dummy	1.00						Seed row NOT TO BE DELETED	1.00	Dummy	1	
7	2		This section is for direct measurement of primary quantities								0.00		0	
8											0.00		0	
10											Total 1.00		1	
12	Seq	Floor	Mark							QS Desc	QS Qty		Times Used in Secondary	
14		**Dummy**								Seed row NOT TO BE DELETED	1.00		1	
15		This section is for processing data exported from Revit Schedules											0	
16	**1**	**Dim - Door Number**											0	
17	**2**	**Level**	**Mark**							**Type : QS Tag : QS Unit**	**QS Qty**		0	

SECONDARY WORKSHEET

Column A only of "QS Desc" worksheet copied to "Secondary worksheet":



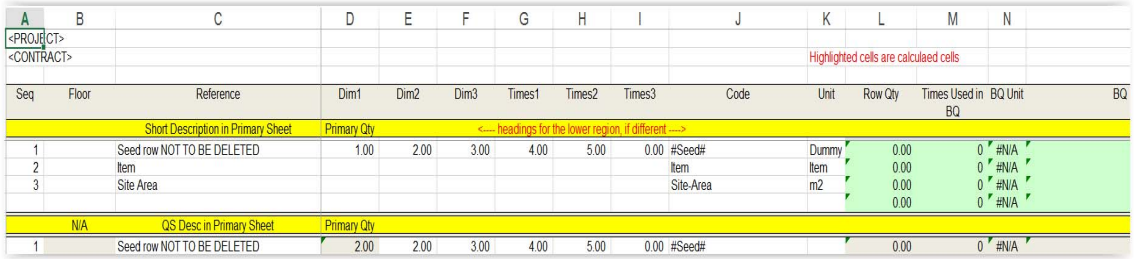
	A	B	C	D	E	F	G	H	I	J
1	<PROJECT>									
2	<CONTRACT>									
3										
4	Seq	Floor	Reference	Dim1	Dim2	Dim3	Times1	Times2	Times3	Code
5			Short Description in Primary Sheet	Primary Qty		<---- headings for the lower region, if different ---->				
50	37		**Column concrete**							
51	38		CL-C40-450x600 : : m	4.00	0.45	0.60				CL-C40
52	39		CL-C40-450x600 : SL150 : m	8.00	0.45	0.60				CL-C40
53	40		CL-C40-450x600 : SL150-EdgeS : m	4.00	0.45	0.60				CL-C40
54	41		CL-C40-600x750 : : m	8.00	0.60	0.75				CL-C40
55	42		CL-C40-600x750 : SL130-Corner : m	8.00	0.80	0.75				CL-C40
56	43		CL-C40-600x750 : SL130-EdgeL : m	4.00	0.80	0.75				CL-C40
57	44		CL-C40-600x750 : SL130-EdgeS : m	4.00	0.80	0.75				CL-C40
58	45		**Column formwork**	0.00						
59	46		CL-C40-450x600 : : m	4.00	0.45		2.00			CL-FWK
60	47		CL-C40-450x600 : SL150 : m	8.00	0.45		2.00			CL-FWK
61	48		CL-C40-450x600 : SL150-EdgeS : m	4.00	0.45		2.00			CL-FWK
62	49		CL-C40-600x750 : : m	8.00	0.60		2.00			CL-FWK
63	50		CL-C40-600x750 : SL130-Corner : m	8.00	0.80		2.00			CL-FWK
64	51		CL-C40-600x750 : SL130-EdgeL : m	4.00	0.80		2.00			CL-FWK
65	52		CL-C40-600x750 : SL130-EdgeS : m	4.00	0.80		2.00			CL-FWK
66	53		CL-C40-450x600 : : m	4.00		0.60				CL-FWK
67	54		CL-C40-450x600 : SL150 : m	8.00		0.60				CL-FWK
68	55		CL-C40-450x600 : SL150-EdgeS : m	4.00		0.60				CL-FWK
69	56		CL-C40-600x750 : : m	8.00		0.75				CL-FWK
70	57		CL-C40-600x750 : SL130-Corner : m	8.00		0.75				CL-FWK
71	58		CL-C40-600x750 : SL130-EdgeL : m	4.00		0.75				CL-FWK
72	59		CL-C40-600x750 : SL130-EdgeS : m	4.00		0.75				CL-FWK
73	60		**Column / slab junction : deduct slab concrete :**	0.00						
74	61		CL-C40-450x600 : : Nr	1.00	0.45	0.60	0.00		0.00	
75	62		CL-C40-450x600 : SL150 : Nr	2.00	0.45	0.60	0.15		(1.00)	SL-C30-150

2.1 **Secondary** Primary

right portion

K	L	M	N	O	Q	R	S
				SECONDARY DIMENSIONS			
Highlighted cells are calculaed cells							
					Floor	Floor	Floor
Unit	Row Qty	Times Used in BQ	BQ Unit	BQ Description		Level 1	Level 2
	0.00	0	#N/A	#N/A	0.00	0.00	0.00
	1.08	1	m3	Column	0.00	1.08	0.00
	2.16	1	m3	Column	0.00	2.16	0.00
	1.08	1	m3	Column	0.00	1.08	0.00
	3.60	1	m3	Column	0.00	3.60	0.00
	4.80	1	m3	Column	0.00	4.80	0.00
	2.40	1	m3	Column	0.00	2.40	0.00
	2.40	1	m3	Column	0.00	2.40	0.00
	0.00	0	#N/A	#N/A	0.00	0.00	0.00
	3.60	1	m2	Side of column	0.00	3.60	0.00
	7.20	1	m2	Side of column	0.00	7.20	0.00
	3.60	1	m2	Side of column	0.00	3.60	0.00
	9.60	1	m2	Side of column	0.00	9.60	0.00
	12.80	1	m2	Side of column	0.00	12.80	0.00
	6.40	1	m2	Side of column	0.00	6.40	0.00
	6.40	1	m2	Side of column	0.00	6.40	0.00
	2.40	1	m2	Side of column	0.00	2.40	0.00
	4.80	1	m2	Side of column	0.00	4.80	0.00
	2.40	1	m2	Side of column	0.00	2.40	0.00
	6.00	1	m2	Side of column	0.00	6.00	0.00
	6.00	1	m2	Side of column	0.00	6.00	0.00
	3.00	1	m2	Side of column	0.00	3.00	0.00
	3.00	1	m2	Side of column	0.00	3.00	0.00
	0.00	0	#N/A	#N/A	0.00	0.00	0.00
	0.00	0	#N/A	#N/A	0.00	0.00	0.00
	(0.08)	1	m3	150 mm Suspended slab	0.00	(0.08)	0.00

Upper region for direct measurement



	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	<PROJECT>													
2	<CONTRACT>										Highlighted cells are calculaed cells			
3														
4	Seq	Floor	Reference	Dim1	Dim2	Dim3	Times1	Times2	Times3	Code	Unit	Row Qty	Times Used in BQ	BQ Unit
5			Short Description in Primary Sheet	Primary Qty			<---- headings for the lower region, if different ---->							
6	1		Seed row NOT TO BE DELETED	1.00	2.00	3.00	4.00	5.00	0.00	#Seed#	Dummy	0.00	0	#N/A
7	2		Item							Item	Item	0.00	0	#N/A
8	3		Site Area							Site-Area	m2	0.00	0	#N/A
9												0.00	0	#N/A
10		N/A	QS Desc in Primary Sheet	Primary Qty										
11	1		Seed row NOT TO BE DELETED	2.00	2.00	3.00	4.00	5.00	0.00	#Seed#		0.00	0	#N/A

Further processing of the Primary Qty is done in the lower region.

Primary Qty here = sum (Primary Qty of same QS Desc in Primary worksheet)

No sorting or grouping required

Formula =SUMIF(Primary!$J$5:$J$181;$C14;Primary!$K$5:$K$181)

If QS Desc in Primary worksheet matches QS Desc in Secondary worksheet, then add in corresponding Row Qty in Primary worksheet

Code = code of Estimate or BQ items

Row Qty = product of all Dims and Times of same row, using “=Product()” function

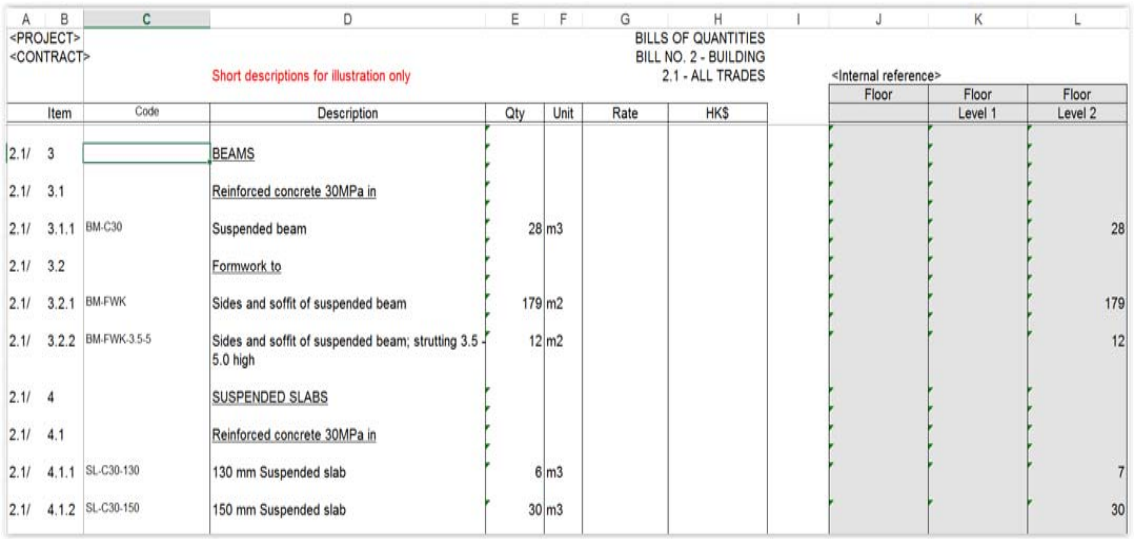
They are also called Secondary Qty

Times Used in BQ, BQ Unit, BQ Descriptions are making reference to Estimate or BQ worksheet for error checking

Floor columns for analysis of quantities by floors

ESTIMATE OR BQ WORKSHEET

Estimate or BQ worksheet



A	B	C	D	E	F	G	H	I	J	K	L
<PROJECT>						BILLS OF QUANTITIES					
<CONTRACT>						BILL NO. 2 - BUILDING					
			Short descriptions for illustration only			2.1 - ALL TRADES			<Internal reference>		
									Floor	Floor	Floor
	Item	Code	Description	Qty	Unit	Rate	HK$			Level 1	Level 2
2.1/	3		BEAMS								
2.1/	3.1		Reinforced concrete 30MPa in								
2.1/	3.1.1	BM-C30	Suspended beam	28	m3						28
2.1/	3.2		Formwork to								
2.1/	3.2.1	BM-FWK	Sides and soffit of suspended beam	179	m2						179
2.1/	3.2.2	BM-FWK-3.5-5	Sides and soffit of suspended beam; strutting 3.5 - 5.0 high	12	m2						12
2.1/	4		SUSPENDED SLABS								
2.1/	4.1		Reinforced concrete 30MPa in								
2.1/	4.1.1	SL-C30-130	130 mm Suspended slab	6	m3						7
2.1/	4.1.2	SL-C30-150	150 mm Suspended slab	30	m3						30

Qty here = total of Secondary Qty of same Code in Secondary worksheet

Formula = ROUND(SUMIF(Secondary!$J$6:$J$176;$C41;Secondary!$L$6:$L$176);0)

If Code in Secondary worksheet matches Code in Estimate or BQ worksheet, then add in corresponding Row Qty in Secondary worksheet

Floor columns for internal references only

Formulae to be changed to values and other internal reference data to be removed when formally issued

PROJECT UNITS

Units against numerical values by default

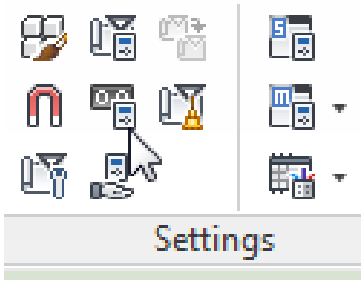
- not convenient for further calculations

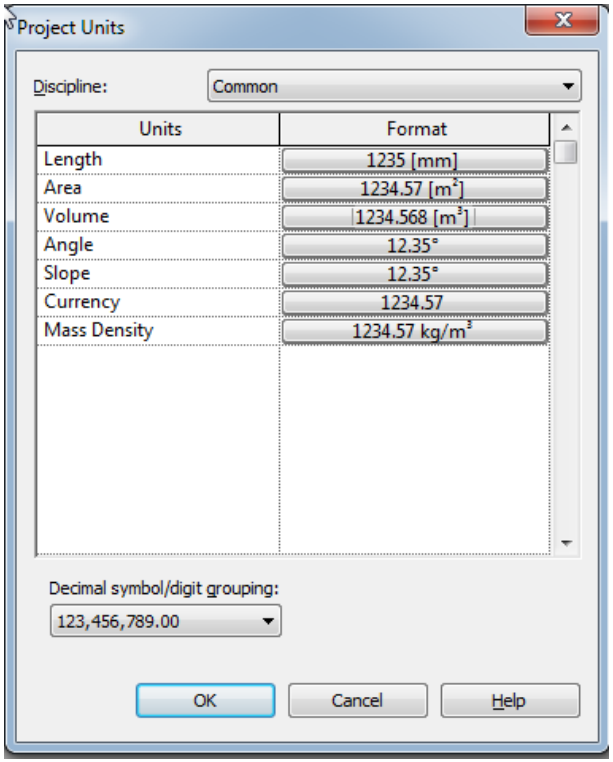
Solution

- 2 decimal places for Area
- 3 decimal places for Volume
- units hidden
- self-explanatory

Define project units

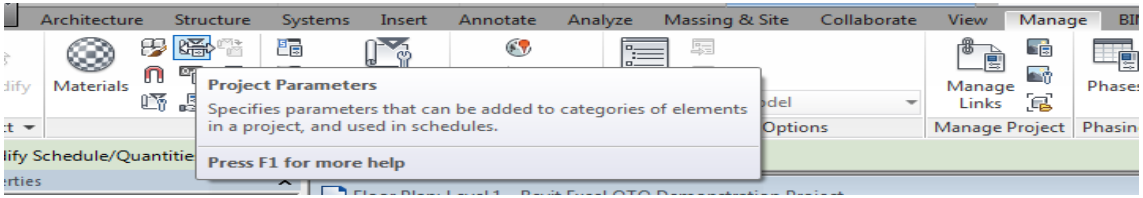
- click Manage > Project Unit icon

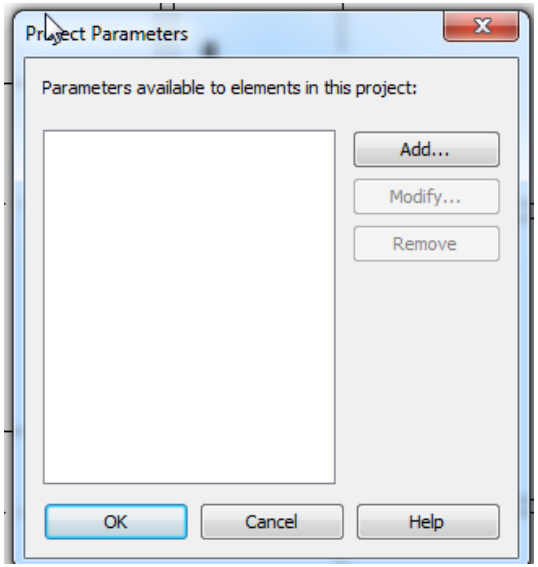


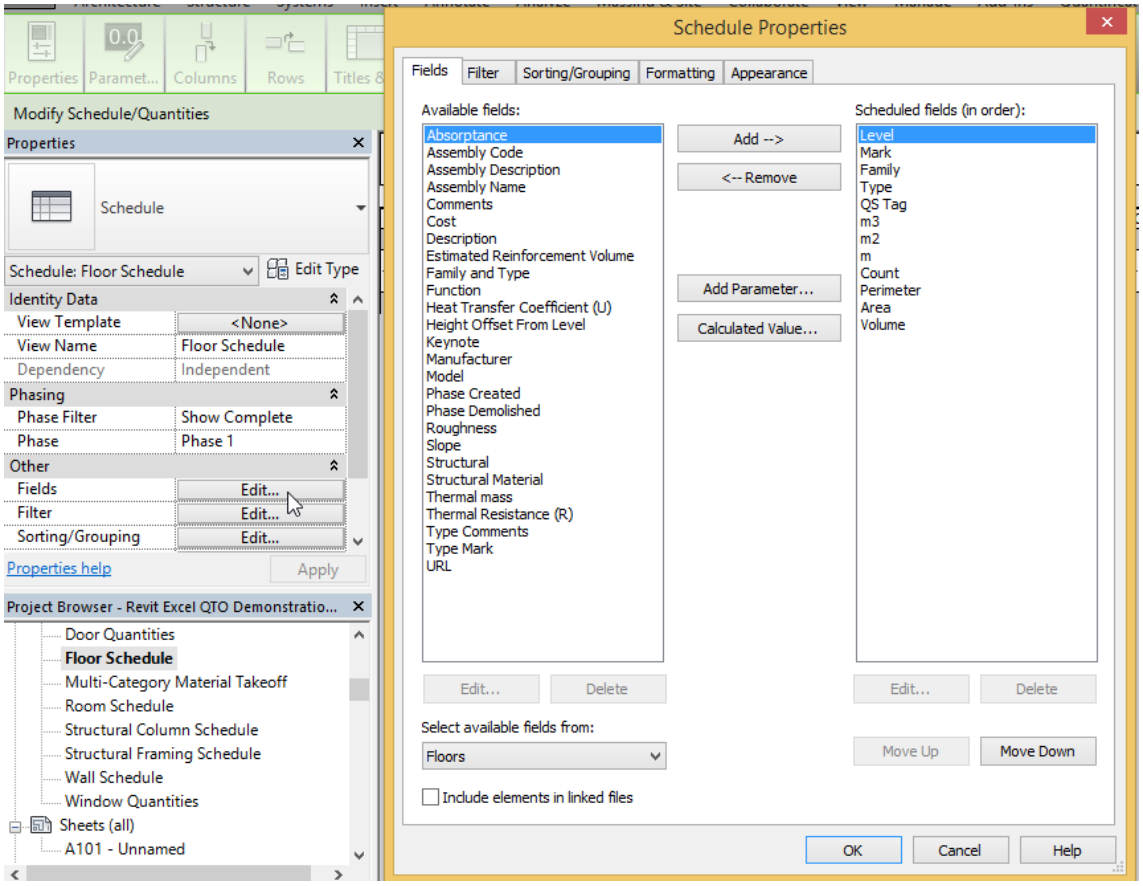


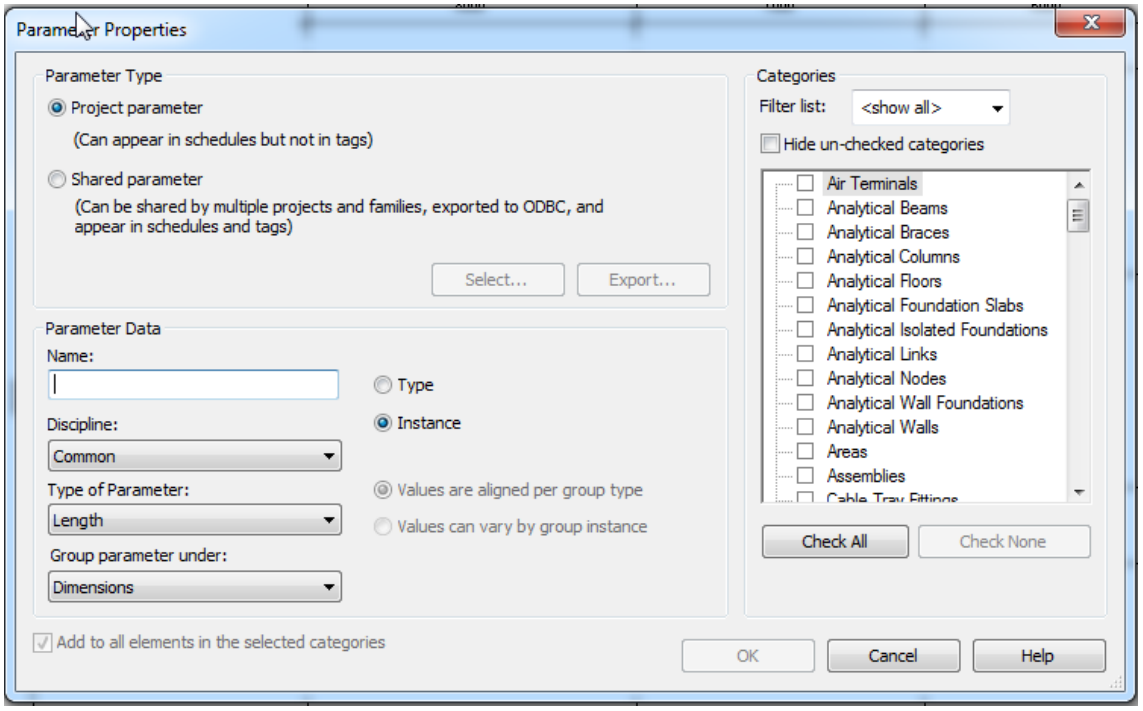
PROJECT PARAMETERS

Select Manage > Settings > Project Parameters


Architecture
Structure
Systems
Insert
Annotate
Analyze
Massing & Site
Collaborate
View
Manage
Materials
Project Parameters
Specifies parameters that can be added to categories of elements in a project, and used in schedules.
Press F1 for more help
Manage Links
Manage Project
Phases

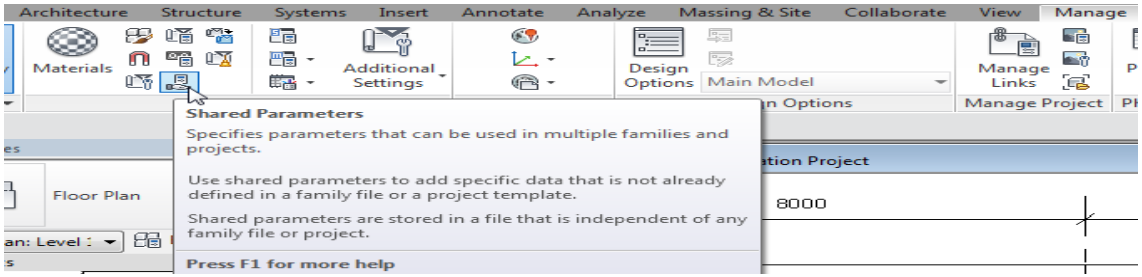

Project Parameters
Parameters available to elements in this project:
Add...
Modify...
Remove
OK
Cancel
Help

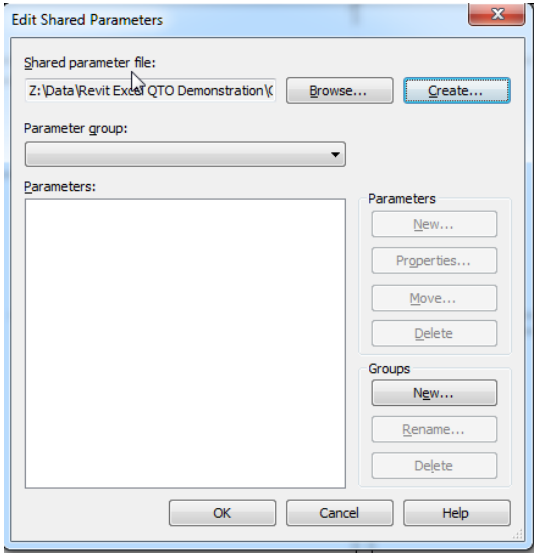

Properties
Paramet...
Columns
Rows
Titles &
Modify Schedule/Quantities
Properties
Schedule
Schedule: Floor Schedule
Edit Type
Identity Data
View Template
<None>
View Name
Floor Schedule
Dependency
Independent
Phasing
Phase Filter
Show Complete
Phase
Phase 1
Other
Fields
Edit...
Filter
Edit...
Sorting/Grouping
Edit...
Properties help
Apply
Project Browser - Revit Excel QTO Demonstratio...
Door Quantities
Floor Schedule
Multi-Category Material Takeoff
Room Schedule
Structural Column Schedule
Structural Framing Schedule
Wall Schedule
Window Quantities
Sheets (all)
A101 - Unnamed
Schedule Properties
Fields
Filter
Sorting/Grouping
Formatting
Appearance
Available fields:
Absorptance
Assembly Code
Assembly Description
Assembly Name
Comments
Cost
Description
Estimated Reinforcement Volume
Family and Type
Function
Heat Transfer Coefficient (U)
Height Offset From Level
Keynote
Manufacturer
Model
Phase Created
Phase Demolished
Roughness
Slope
Structural
Structural Material
Thermal mass
Thermal Resistance (R)
Type Comments
Type Mark
URL
Add -->
<-- Remove
Add Parameter...
Calculated Value...
Scheduled fields (in order):
Level
Mark
Family
Type
QS Tag
m3
m2
m
Count
Perimeter
Area
Volume
Edit...
Delete
Edit...
Delete
Select available fields from:
Floors
Move Up
Move Down
Include elements in linked files
OK
Cancel
Help

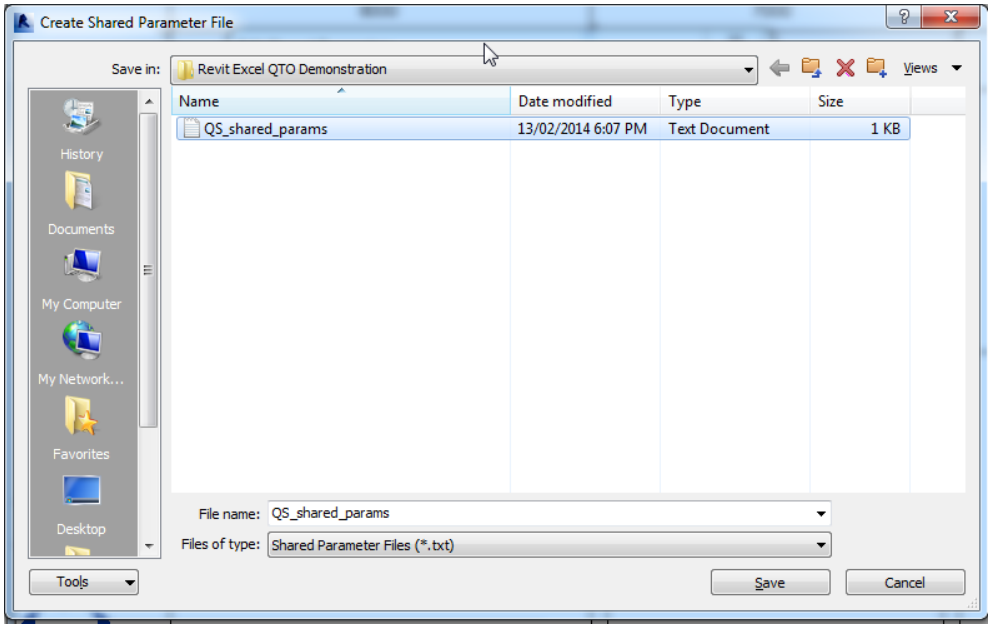


SHARED PARAMETERS

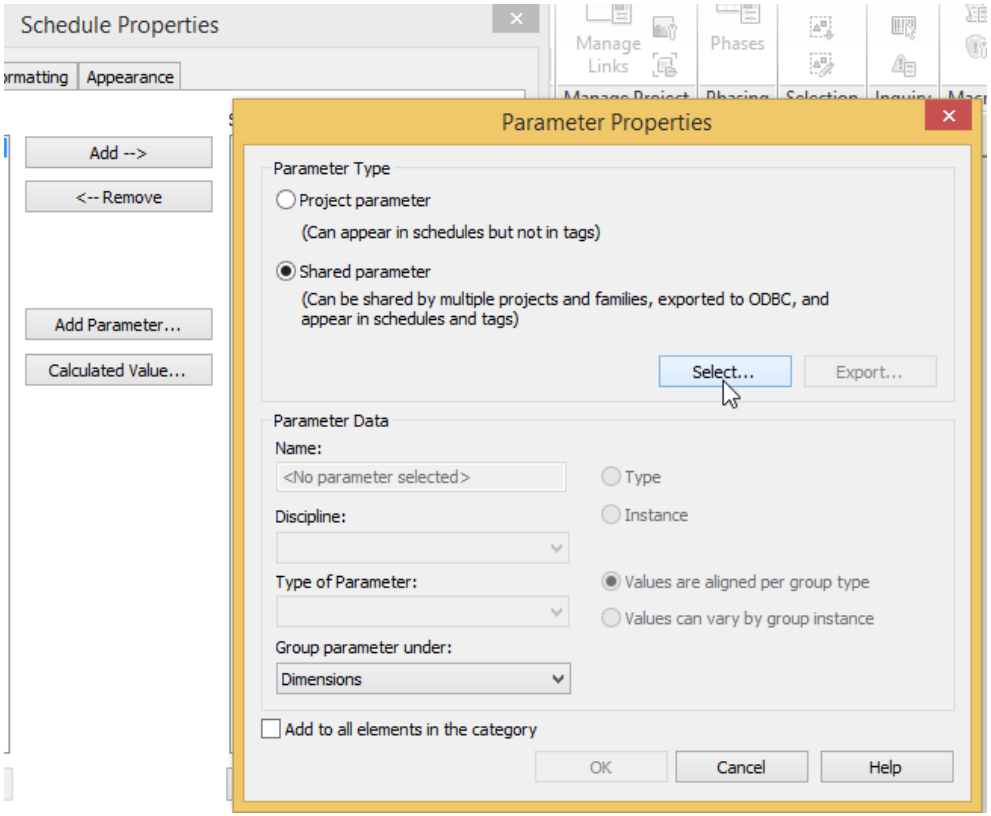
Select Manage > Settings > Shared Parameters

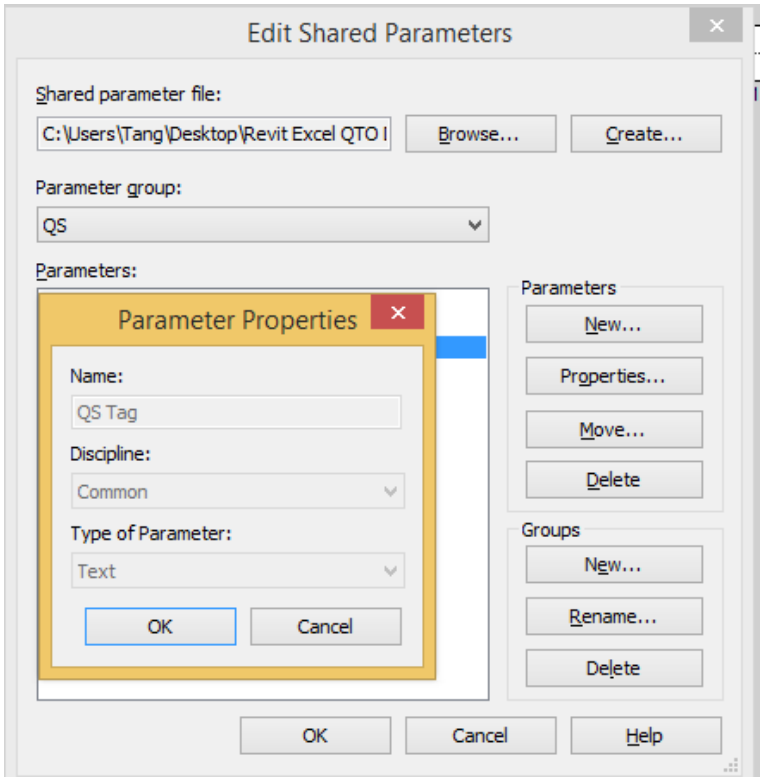

Architecture
Structure
Systems
Insert
Annotate
Analyze
Massing & Site
Collaborate
View
Manage
Materials
Additional Settings
Design Options
Main Model
Manage Links
Manage Project
Shared Parameters
Specifies parameters that can be used in multiple families and projects.
Use shared parameters to add specific data that is not already defined in a family file or a project template.
Shared parameters are stored in a file that is independent of any family file or project.
Press F1 for more help
Floor Plan
8000


Edit Shared Parameters
Shared parameter file:
Z:\Data\Revit Excel QTO Demonstration\(
Browse...
Create...
Parameter group:
Parameters:
Parameters
New...
Properties...
Move...
Delete
Groups
New...
Rename...
Delete
OK
Cancel
Help



DEFINING SCHEDULE COLUMNS


Schedule Properties
rmatting
Appearance
Add -->
<-- Remove
Add Parameter...
Calculated Value...
Manage Links
Phases
Parameter Properties
Parameter Type
Project parameter
(Can appear in schedules but not in tags)
Shared parameter
(Can be shared by multiple projects and families, exported to ODBC, and appear in schedules and tags)
Select...
Export...
Parameter Data
Name:
<No parameter selected>
Type
Discipline:
Instance
Type of Parameter:
Values are aligned per group type
Values can vary by group instance
Group parameter under:
Dimensions
Add to all elements in the category
OK
Cancel
Help



LEVEL AND MARK

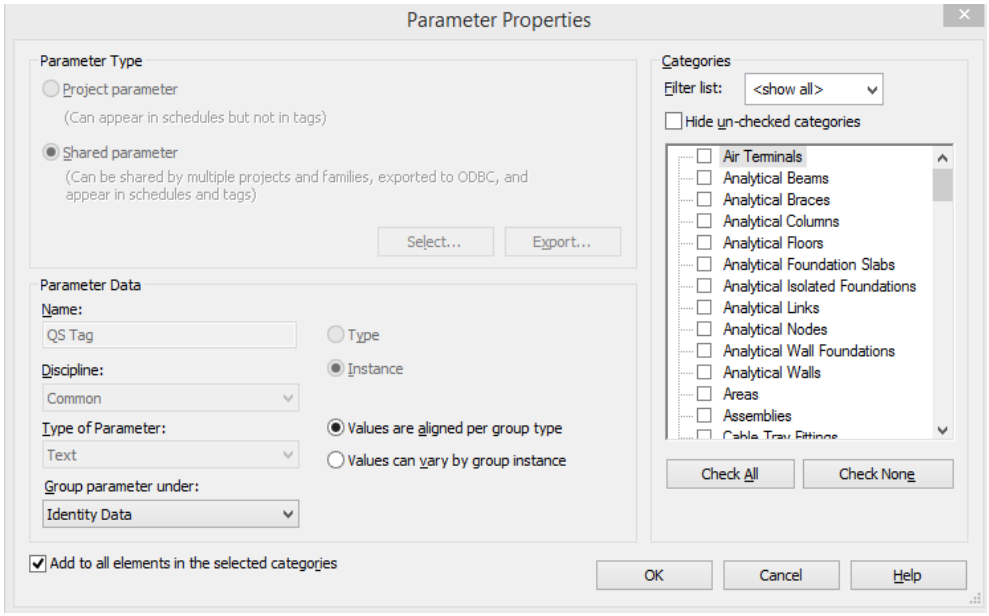
Generally available with elements

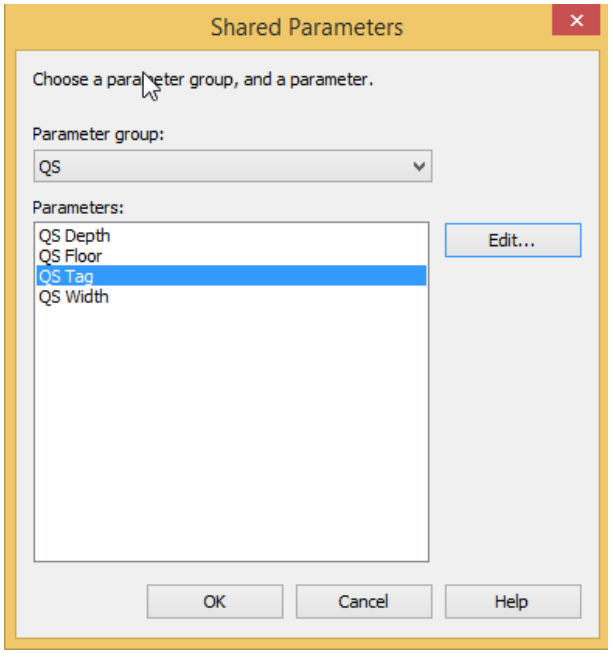
TYPE

To represent both the information of Family and Type

QS TAG

QS Tag to supplement the information of “Type”

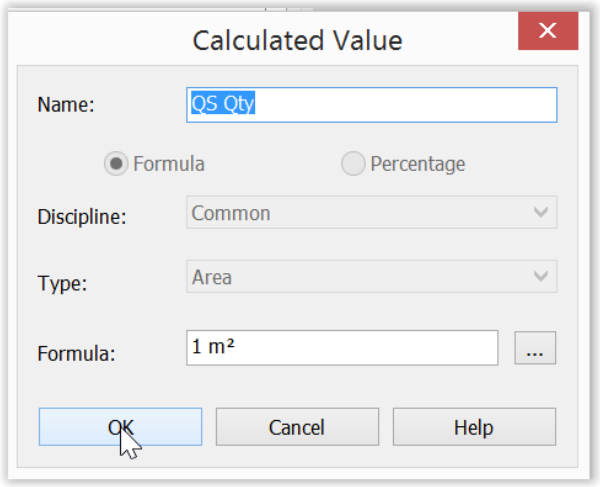


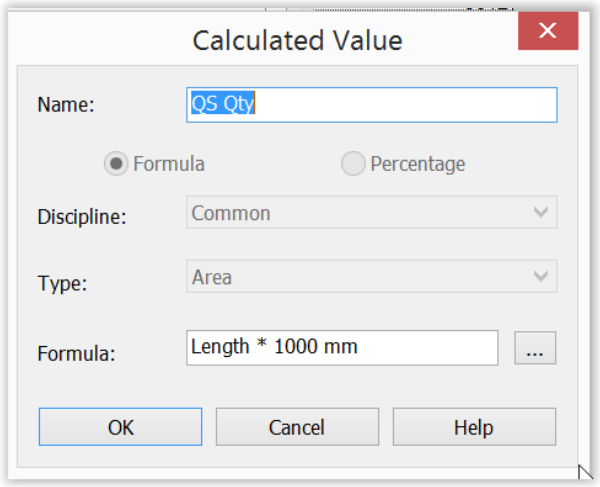


QS QTY AND QS UNIT

QS Qty

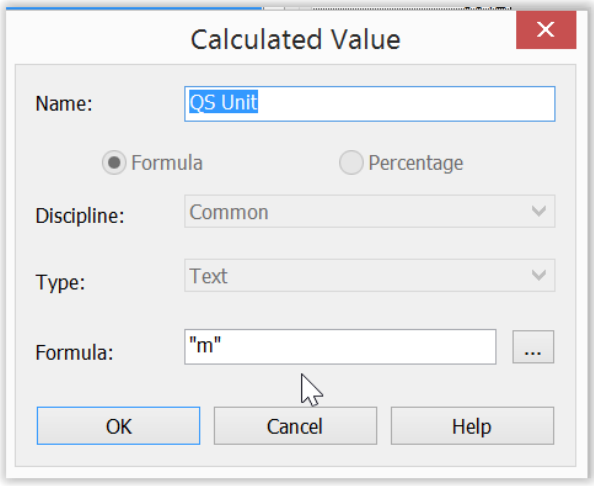
- a calculated field
- its units being a mixture of Nr, m, m2, m3
- mixture not permitted by Revit
- tricks


Calculated Value
Name:
QS Qty
Formula
Percentage
Discipline:
Common
Type:
Area
Formula:
1 m²
...
OK
Cancel
Help


Calculated Value
Name:
QS Qty
Formula
Percentage
Discipline:
Common
Type:
Area
Formula:
Length * 1000 mm
...
OK
Cancel
Help

QS Unit

- a calculated field
- specially used to tell the real unit of QS Qty



WALL SCHEDULES

Wall Area schedule
QS Qty = wall areas

- for generation of concrete volume and formwork area

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	1	Dim - Wall Area											
2	2	Level	Mark	Type : QS Tag : QS Unit	QS Qty	Family	Count	Length	Width	Area	Volume	QS Mean Area	Mean Area / Length
3	3			: :									
4	4	Level 1		IW-BLK-100 : : m2	12.13	Basic Wall	1	4550	100	12.13	1.213	12.13	2665
5	5	Level 1		EW-C20-125 : : m2	9.69	Basic Wall	1	4250	125	9.69	1.212	9.69	2281
6	6	Level 1		EW-C20-125 : : m2	13.60	Basic Wall	1	4400	125	13.60	1.700	13.60	3091
7	7	Level 1		EW-C20-125 : : m2	13.60	Basic Wall	1	4250	125	13.60	1.700	13.60	3200
8	8	Level 1		EW-C20-125 : : m2	13.12	Basic Wall	1	4100	125	13.12	1.640	13.12	3200

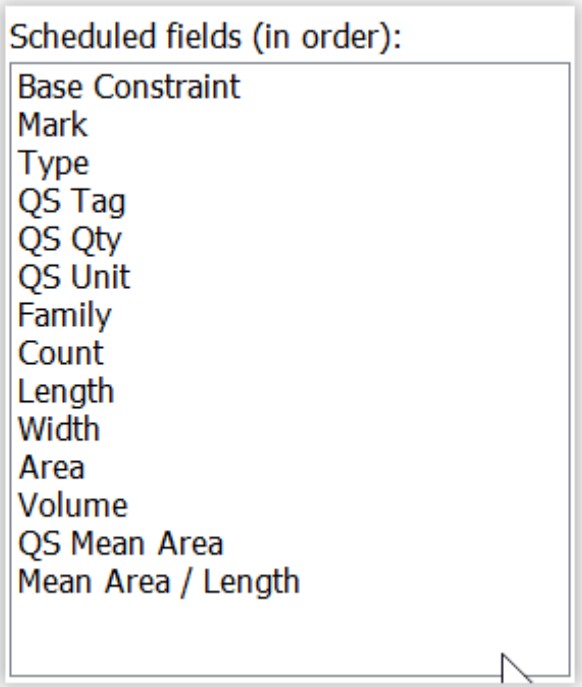
Wall Length schedule
QS Qty = wall lengths

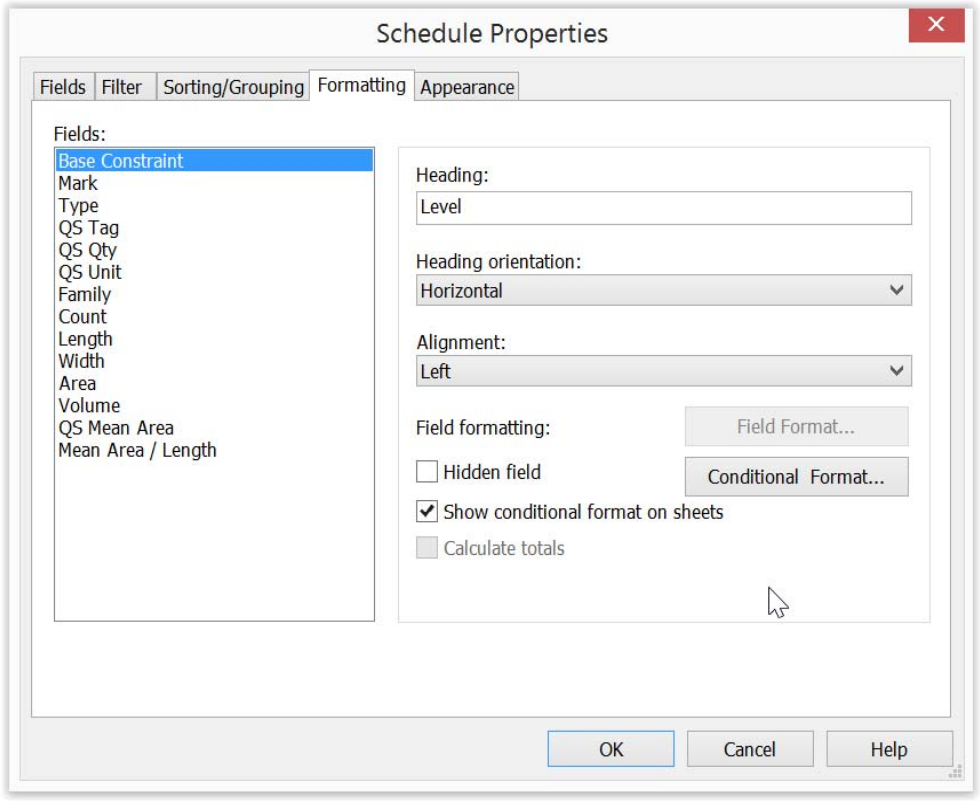
- for the processing of quantities at junctions with slabs

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	1	Dim - Wall Length											
2	2	Level	Mark	Type : QS Tag : QS Unit	QS Qty	Family	Count	Length	Width	Area	Volume	QS Mean Area	Mean Area / Length
3	3			: :									
4	4	Level 1		IW-BLK-100 : : m	4.55	Basic Wall	1	4550	100	12.13	1.213	12.13	2665
5	5	Level 1		EW-C20-125 : : m	4.25	Basic Wall	1	4250	125	9.69	1.212	9.69	2281
6	6	Level 1		EW-C20-125 : : m	4.40	Basic Wall	1	4400	125	13.60	1.700	13.60	3091
7	7	Level 1		EW-C20-125 : : m	4.25	Basic Wall	1	4250	125	13.60	1.700	13.60	3200
8	8	Level 1		EW-C20-125 : : m	4.10	Basic Wall	1	4100	125	13.12	1.640	13.12	3200
9	9	Level 1		EW-C20-125 : : m	4.40	Basic Wall	1	4400	125	12.41	1.551	12.41	2819
10	10	Level 1		EW-C20-125 : : m	4.55	Basic Wall	1	4550	125	13.07	1.634	13.07	2873
11	11	Level 1		EW-C20-125 : : m	4.63	Basic Wall	1	4625	125	12.83	1.604	12.83	2774
12	12	Level 1		EW-C20-125 : : m	5.15	Basic Wall	1	5150	125	14.51	1.814	14.51	2818
13	13	Level 1		EW-C20-125 : : m	5.00	Basic Wall	1	5000	125	14.30	1.787	14.30	2859
14	14	Level 1	WA1	WA-C35-400 : SL150-Edge : m	4.85	Basic Wall	1	4850	400	16.27	6.278	15.70	3236
15	15	Level 1	WA2	WA-C35-300 : SL150-Edge : m	4.65	Basic Wall	1	4650	300	19.25	5.371	17.90	3850
16	16	Level 1	WA2A	WA-C35-300 : SL150 : m	0.66	Basic Wall	1	658	300	2.77	0.658	2.19	3338
17	17	Level 1	WA3	WA-C35-300 : SL150 : m	4.80	Basic Wall	1	4800	300	17.71	5.313	17.71	3690
18	18	Level 1	WA4	WA-C35-300 : SL150-Edge : m	4.70	Basic Wall	1	4700	300	18.13	5.094	16.98	3612
19	19	Level 1	WA5	WA-C35-300 : SL150 : m	4.80	Basic Wall	1	4800	300	17.30	4.843	16.14	3363
20	20	Level 1	WA6	WA-C35-300 : SL150 : m	4.79	Basic Wall	1	4788	300	19.25	5.429	18.10	3780
21	21	Level 1	WA7	WA-C35-300 : SL150 : m	4.79	Basic Wall	1	4788	300	19.25	5.428	18.10	3780
22	22	Level 1	WA8	WA-C35-300 : SL150-Edge : m	9.88	Basic Wall	1	9875	300	38.50	11.550	38.50	3899

Level = base constraint renamed in schedule heading

- not absolutely necessary for billing purposes


Scheduled fields (in order):
Base Constraint
Mark
Type
QS Tag
QS Qty
QS Unit
Family
Count
Length
Width
Area
Volume
QS Mean Area
Mean Area / Length



QS Tag for entering information like

- slab thickness
- whether the wall is at slab edge
- to facilitate adjustment for slab and wall junctions

Length, Width (i.e. thickness), Area and Volume are system parameters

Area not always equal to the elevation areas along the centre line

Wall height not available probably because the height can vary for a wall

Lengths at wall ends not available

Lengths around openings not available

QS Mean Area = Volume / Width

Mean Area / Length = QS Mean Area / Length

REPRESENTATION OF WALL LENGTH, AREA AND VOLUME

	Wall length given	Area given	Volume given
Straight wall e.g. 12 m long x 4 m high x 300 mm thick	Centre line of wall = 12 m	Elevation area on one face = 12 x 4 m = 48 m2	Area along centre line x wall thickness = 12 x 4 x 0.3 m = 14.4 m3
Wall L-shaped on plan with **mitre** joint e.g. 8 m x 400 mm wall + 5 m x 300 mm wall both x 4 m high	Centre line of wall with the corner shared between the two wings = 7.85 + 4.80 m = 12.65 m	Elevation area based on the **extreme** length of each wing = 8 x 4 + 5 x 4 m = 32 + 20 m2 = 52 m2	Area along centre line **with the corner shared** x wall thickness = 7.85 x 4 x 0.4 + 4.80 x 4 x 0.3 = 12.56 + 5.76 m3

	Wall length given	Area given	Volume given
			= 18.32 m3
Wall L-shaped on plan with **butt** joint e.g. 8 m x 400 mm wall + 4.6 m x 300 mm wall both x 4 m high	Same as above	Elevation area based on the **self** length of each wing = 8 x 4 + 4.6 x 4 m = 32 + 18.4 m2 = 50.4 m2	Area based on **self** length x wall thickness = 8 x 4 x 0.4 + 4.6 x 4 x 0.3 = 32 x 0.4 + 18.4 x 0.3 = 12.80 + 5.52 m3 = 18.32 m3
Wall L-shaped on plan with **butt** joint e.g. 7.7 m x 400 mm wall + 5 m x 300 mm wall, both x 4 m high	Same as above	Elevation area based on the **self** length of each wing = 7.7 x 4 + 5 x 4 m = 30.8 + 20 m2 = 50.8 m2	Area based on **self** length x wall thickness = 7.7 x 4 x 0.4 + 5 x 4 x 0.3 = 30.8 x 0.4 + 20 x 0.3 = 12.32 + 6 m3 = 18.32 m3
Wall T-off from another wall e.g. 4.6 x 300 mm wall T-off from 400 mm wall	Centre line of T-off wall measured to centre line of main wall = 4.6 + 0.2 = 4.8 m	Elevation area based on the **self** length of T-off wall = 4.6 x 4 m = 18.4 m2	Area based on **self** length x wall thickness = 4.6 x 4 x 0.3 = 5.52 m3

Area and Volume do not make deduction at junction with floor slab

Whether L-shaped wall is mitre or butt jointed

- not make any difference to Volume
- but Areas are different for the three cases

Area of formwork to sides of wall

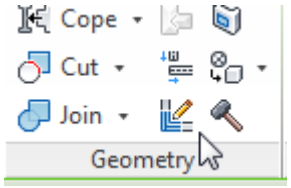
- should be = elevation area along the centre line x height x 2
- = (7.85 + 4.8) x 4 x 2 = 50.6 m2 x 2
- Areas given by Revit for the three cases of L-shaped wall are useless for this purpose

Wall junctions on plan:

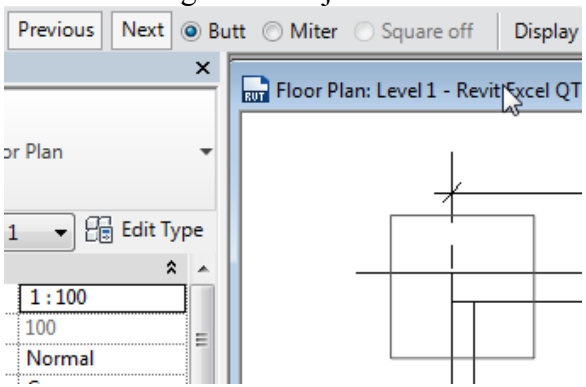
- preferred to use mitre joints at corner junction of walls

To change type of wall junctions on plan

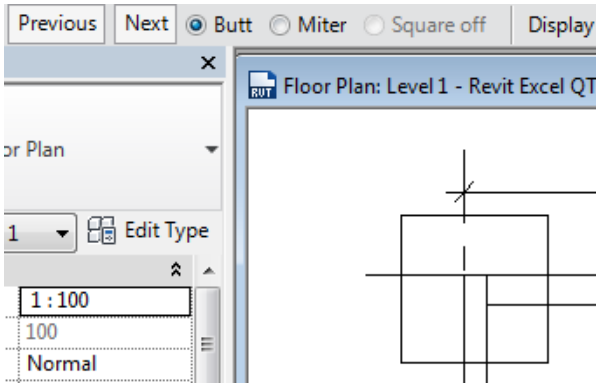
- select a wall > Wall Joins



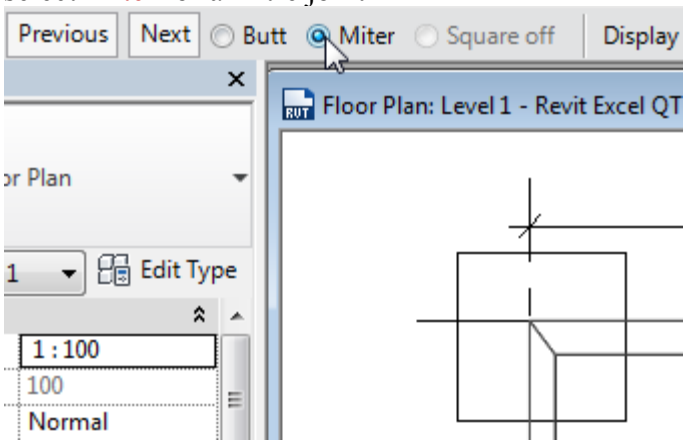
- select Butt to give a butt joint



- select Previous or Next to change direction of joint



- select Miter for a mitre joint



Volume

- a more reliable value to use than Area

QS Qty using Wall Area for Estimate and BQ purposes

- = value of Volume / Width, i.e. the QS Mean Area

QS Qty using Wall Length

- to be used for adjustments for the wall and slab junction
- not accurate enough but close enough
- tolerated for the time being

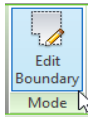
ARCHITECTURAL WALLS

Up to beam or ceiling soffit only and not floor level

No feature in Revit to let architectural walls automatically go up and stop there

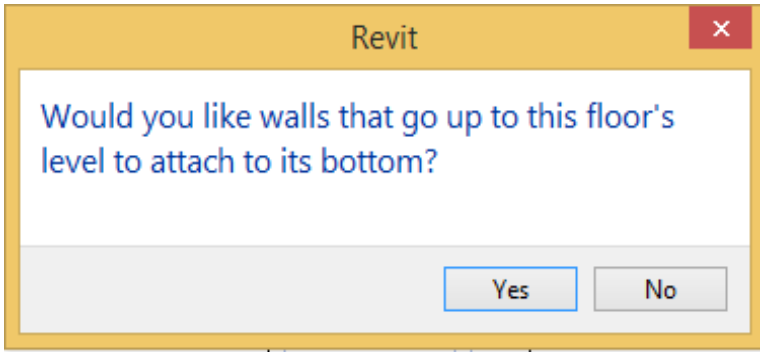
To be modelled one by one to ensure correct height
a time consuming process
prone to errors

FLOOR SLAB AND STRUCTURAL WALL JUNCTIONS

When modelling, after selecting a floor slab > 

> 

> Yes
The following dialogue will appear
will only appear if there are structural walls underneath the slab:



If “Yes” selected

- volume of structural walls below measured to underside of slab
- as shown for the wall on the left below

If “No” is selected

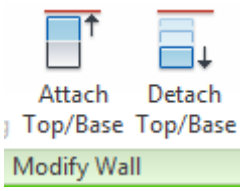
- volume of structural walls below measured to top of slab
- as shown for the wall on the right below
- **but** the reported volume of slab will not be reduced

Reported height of structural walls when defined to be to the top of the slab

- will not be chan ged in both cases

In theory, when a structural wall is attached to the bottom of a floor slab

- wall top will move when floor slab is moved up or down
- furthermore, the Modify Wall menu also has the following choices



- However, the behaviour after attaching or detaching walls using the above slab or wall commands
- not quite definite every time

Since slab and wall junctions

- need to be adjusted in any case
- when encountering the above dialogue when editing slab boundary
- better to answer “No” to retain the default treatment

STRUCTURAL COLUMN SCHEDULES

Structural Column Length schedule
QS Qty = column lengths

- for generation of concrete volume and formwork area

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	1	Dim - Structural Column Length												
2	2	Base Level	Column Location Mark	Type : QS Tag : QS Unit	QS Qty	Family	Count	QS App Slab Tk	Top Level	Length	QS Width	QS Depth	Volume	Vol / (Wi x Dp)
3	3			: :										
4	4	Level 1	B-2	CL-C40-450x600 : : m	4.00	Column	1	150	Level 2	4000	450	600	1.040	3850
5	5	Level 1	C-1	CL-C40-600x750 : SL130-EdgeL : m	4.00	Column	1	150	Level 2	4000	600	750	1.733	3850
6	6	Level 1	C-2	CL-C40-450x600 : SL150 : m	4.00	Column	1	150	Level 2	4000	450	600	1.040	3850
7	7	Level 1	C-3	CL-C40-450x600 : SL150 : m	4.00	Column	1	150	Level 2	4000	450	600	1.040	3850
8	8	Level 1	C-4	CL-C40-450x600 : SL150-EdgeS : m	4.00	Column	1	150	Level 2	4000	450	600	1.040	3850

Structural Column Number schedule
QS Qty = column count

- for processing of quantities at junctions with slabs

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	1	Dim - Structural Column Nr												
2	2	Base Level	Column Location Mark	Type : QS Tag : QS Unit	QS Qty	Family	Count	QS App Slab Tk	Top Level	Length	QS Width	QS Depth	Volume	Vol / (Wi x Dp)
3	3			: :										
4	4	Level 1	B-2	CL-C40-450x600 : : Nr	1.00	Column	1	150	Level 2	4000	450	600	1.040	3850
5	5	Level 1	C-1	CL-C40-600x750 : SL130-EdgeL : Nr	1.00	Column	1	150	Level 2	4000	600	750	1.733	3850
6	6	Level 1	C-2	CL-C40-450x600 : SL150 : Nr	1.00	Column	1	150	Level 2	4000	450	600	1.040	3850
7	7	Level 1	C-3	CL-C40-450x600 : SL150 : Nr	1.00	Column	1	150	Level 2	4000	450	600	1.040	3850
8	8	Level 1	C-4	CL-C40-450x600 : SL150-EdgeS : Nr	1.00	Column	1	150	Level 2	4000	450	600	1.040	3850

Column Location Mark

- a system parameter which gives the grid line references
- used here instead of the usual Mark

QS Tag for entering information like

- slab thickness
- whether the column is an edge or corner column
- to facilitate adjustment for slab and column junctions

For a column defined to be of floor to floor height

- Volume is a system parameter which gives
- volume of concrete below slab

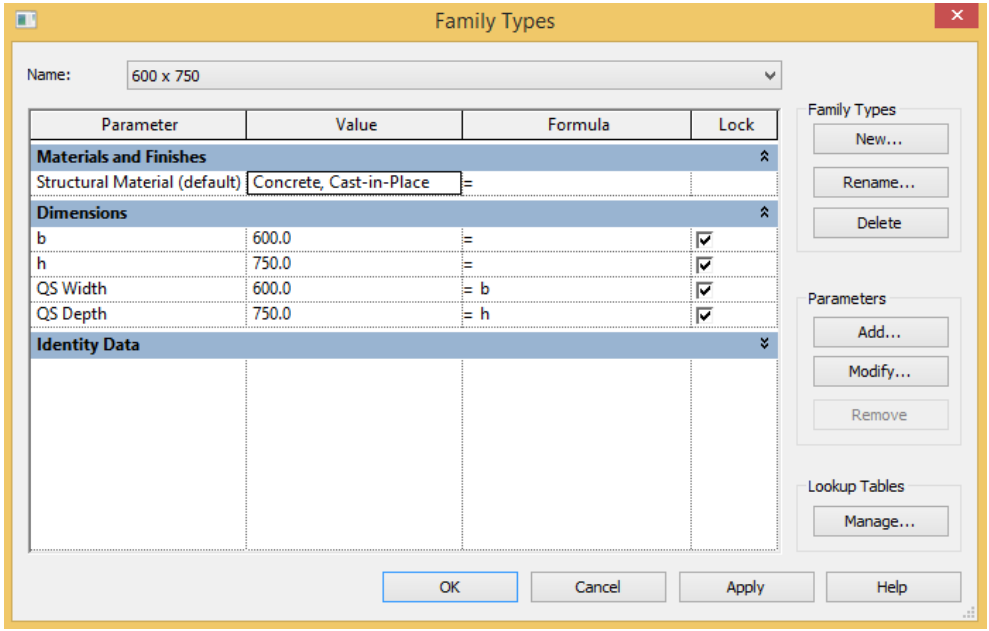
- Length is a system parameter which gives
- floor to floor height

Since floor to floor height is needed

- QS Qty takes the value of Length for Column Length schedule

Built-in column width (b) and depth (h)

- not available to properties window and schedules
- therefore, two shared parameters QS Width and QS Depth
- added to the Family Type parameters
- make them available to schedules to facilitate error checking



QS App Slab Tk

- = Length - Volume / (QS Width * QS Depth)
- useful for indicating the approximate slab thickness
- for counter-checking any errors in positioning the columns

Vol / (Wi x Dp)

- = Volume / (QS Width * QS Depth)
- gives the length of column below slab

STRUCTURAL FRAMING LENGTH SCHEDULE

Structural Framing Length schedule

- basically a beam length schedule

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	1	Dim - Structural Framing Length											
2	2	Reference Level	Mark	Type : QS Tag : QS Unit	QS Qty	Family	Count	Approx SL Tk	Length	Cut Length	QS Width	QS Depth	Volume
3	3			: :									
4	4	Level 2	2B1	BM-C30-400x800 : SL130 : m	4.10	Beam	1	130	5000	4100	400	800	1.099
5	5	Level 2	2B2	BM-C30-400x800 : SL130 : m	4.40	Beam	1	130	5000	4400	400	800	1.179
6	6	Level 2	2B3	BM-C30-400x800 : I : m	4.40	Beam	1	0	5000	4400	400	800	1.408
7	7	Level 2	2B4	BM-C30-400x800 : I : m	4.10	Beam	1	0	5000	4100	400	800	1.312
8	8	Level 2	2B5	BM-C30-400x800 : SL150 : m	4.18	Beam	1	150	5000	4175	400	800	1.086

Beams

Length

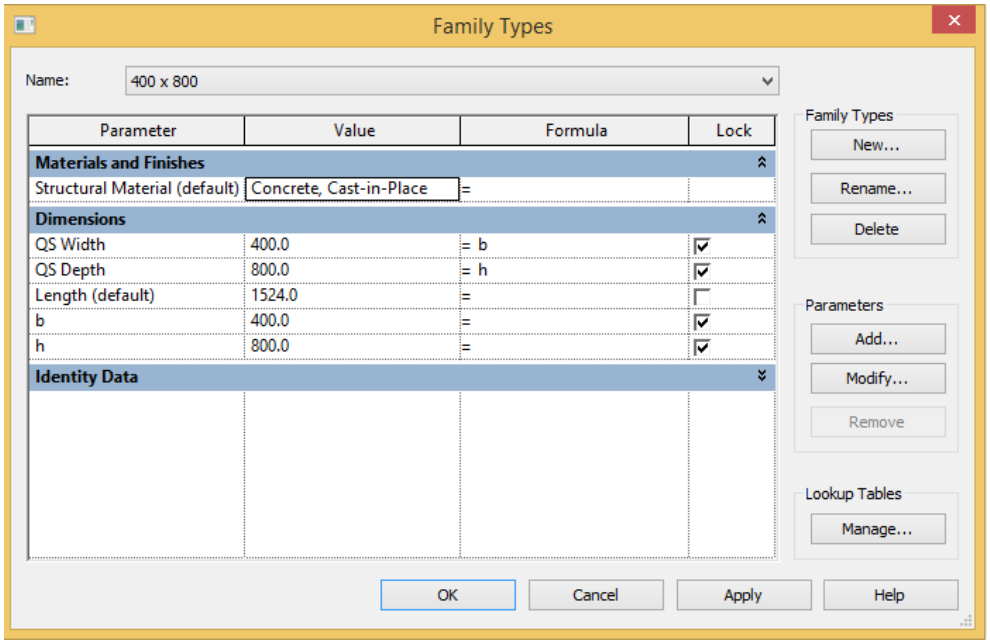
- Cut Length - length between supporting columns or walls

QS Qty for Beam Length

- = Cut Length

Beam width (b) and depth (h)

- not available to the properties window and schedules
- therefore, two shared parameters QS Width and QS Depth
- added to the Family Type parameters
- to make them available to schedules to facilitate error checking



FLOOR SLAB AREA SCHEDULE

Floor Slab Area schedule

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	1	Dim - Floor Slab Area												
2	2	Level	Mark	Type : QS Tag : QS Unit	QS Qty	Family	Type Mark	Count	Perimeter	Area	Volume			
3	3			: :										
4	4	Level 2	2S1	SL-C30-150 : H3.5-5 : m2	200.00	Floor		1	60000	200.00	30.000			
5	5	Level 2	2S2	SL-C30-130 : H3.5-5 : m2	51.50	Floor		1	30600	51.50	6.695			
6	6	Grand total: 2		: :	251.50			2	90600	251.50	36.695			
7														

QS Tag for the entry of information about

- strutting height

QS Qty = Area

DOOR AND WINDOW SCHEDULES

Door Number schedule

	A	B	C	D	E	F	G	H	I	J	K
1	1	Dim - Door Number									
2	2	Level	Mark	Type : QS Tag : QS Unit	QS Qty	Family	Door Type	Count	Width	Height	Thickness
3	3			: :							
4	4	Level 1	1	DR-D1-Double-1830x2134 : EW-CON-125 : Nr	1.00	M_Double-Glass 1	D1	1	1830	2134	51
5	5	Level 1	2	DR-D2-Single-915x2134 : IW-BLK-100 : Nr	1.00	M_Single-Flush	D2	1	915	2134	51
6	6	Level 1	3	DR-D2-Single-915x2134 : WA-CON-300 : Nr	1.00	M_Single-Flush	D2	1	915	2134	51
7	7	Grand total: 3		: :	3.00			3			

Window Number schedule

	A	B	C	D	E	F	G	H	I	J	K
1	1	Dim - Window Number									
2	2	Level	Mark	Type : QS Tag : QS Unit	QS Qty	Family	Type Mark	Count	Width	Height	Sill Height
3	3			: :							
4	4	Level 1	1	WD-W1-1220x1220 : WA-CONC-400 : Nr	1.00	M_Casement Dbl with Trim		1	1220	1220	11
5	5	Level 1	2	WD-W1-1220x1220 : WA-CONC-400 : Nr	1.00	M_Casement Dbl with Trim		1	1220	1220	1100
6	6	Level 1	3	WD-W1-1220x1220 : EW-CONC-125 : Nr	1.00	M_Casement Dbl with Trim		1	1220	1220	1100
7	7	Level 1	4	WD-FL2-0610x1830 : WA-CONC-300 : Nr	1.00	M_Fixed		1	610	1830	1100
8	8	Level 1	5	WD-FL3-0406x1830 : EW-CONC-125 : Nr	1.00	M_Fixed		1	406	1830	1100

QS Tag

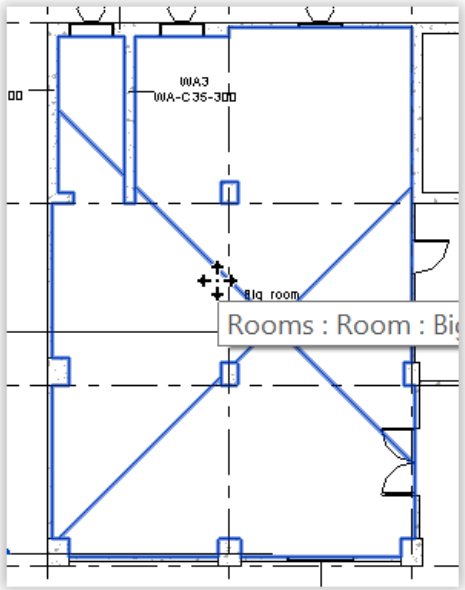
- for entry of information about
- walls housing doors and windows
- to facilitate future measurement of formwork to jambs and soffit, boxing and lintels

ROOM SCHEDULES

Default room schedules provided by Revit

- can give Floor Area and Perimeter
- but not Nett Ceiling and Beam surface areas
- nor wall and column surface areas

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	1	Room Schedule											
2	2	Level	Name	Floor Finish	Ceiling Finish	Wall Finish	Count	Area	Perimeter	Base Offset	Upper Limit	Limit Offset	Unbounded Height
3	3												
4	4	Level 1	Big room	FL-Ceramic Tile-Screed-50	CE-Plaster-Emulsion	WL-Plaster-Emulsion	1	139.42	61576	0	Level 2	-150	3850
5	5	Level 1	Middle room	FL-Ceramic Tile-Screed-50	CE-Plaster-Emulsion	WL-Ceramic Tile-Screed	1	69.44	39650	0	Level 2	-150	3850
6	6	Level 1	Small room	FL-Ceramic Tile-Screed-50	CE-Plaster-Emulsion	WL-Plaster-Emulsion	1	19.36	17600	0	Level 2	-150	3850
7	7	Grand total: 3					3	228.22	118826				
8													



If

- Upper Limit = floor level above a room
- Limit Offset = slab thickness in negative value

then

- Unbounded Height = floor to ceiling height
- good for generating the wall and column surface areas

Adjustment required for

- beam surfaces and end junctions
- window and door openings

- may be taken care of when processing window and door quantities

To provide QS Qty for floor, wall, ceiling and skirting

- 4 separate schedules adapted from the Room Schedule

Room Floor Finishes Area schedule

1	Dim - Room Floor Finishes Area						
2	Level	Name	Type : QS Tag : QS Unit	QS Qty	Floor Finish	Count	Area
3			: :				
4	Level 1	Big room	FL-Ceramic Tile-Screed-50 : : m2	139.42	FL-Ceramic Tile-Screed-50	1	139.42
5	Level 1	Middle room	FL-Ceramic Tile-Screed-50 : : m2	69.44	FL-Ceramic Tile-Screed-50	1	69.44
6	Level 1	Small room	FL-Ceramic Tile-Screed-50 : : m2	19.36	FL-Ceramic Tile-Screed-50	1	19.36
7	Grand total: 3		: :	228.22		3	228.22

Room Ceiling Finishes Area schedule

1	Dim - Room Ceilg Finishes Area						
2	Level	Name	Type : QS Tag : QS Unit	QS Qty	Ceiling Finish	Count	Area
3			: :				
4	Level 1	Big room	CE-Plaster-Emulsion : : m2	139.42	CE-Plaster-Emulsion	1	139.42
5	Level 1	Middle room	CE-Plaster-Emulsion : : m2	69.44	CE-Plaster-Emulsion	1	69.44
6	Level 1	Small room	CE-Plaster-Emulsion : : m2	19.36	CE-Plaster-Emulsion	1	19.36
7	Grand total: 3		: :	228.22			228.22

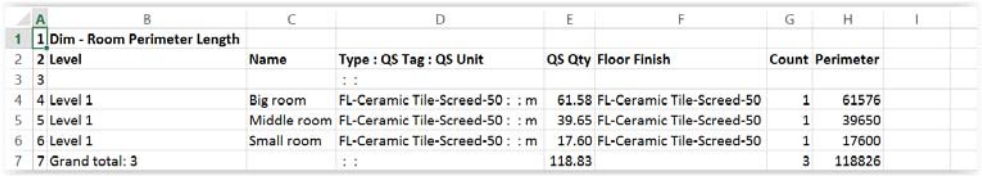
Room Wall Finishes Area schedule

- skirting area to be deducted from wall area

1	Dim - Room Wall Finishes Area										
2	Level	Name	Type : QS Tag : QS Unit	QS Qty	Wall Finish	Count	Perimeter	Base Offset	Upper Limit	Limit Offset	Unbounded Height
3			: :								
4	Level 1	Big room	WL-Plaster-Emulsion : : m2	237.07	WL-Plaster-Emulsion	1	61576	0	Level 2	-150	3850
5	Level 1	Middle room	WL-Ceramic Tile-Screed : : m2	152.65	WL-Ceramic Tile-Screed	1	39650	0	Level 2	-150	3850
6	Level 1	Small room	WL-Plaster-Emulsion : : m2	67.76	WL-Plaster-Emulsion	1	17600	0	Level 2	-150	3850
7	Grand total: 3		: :	457.48		3	118826				

Room Perimeter Length schedule

- for skirting



	A	B	C	D	E	F	G	H	I
1	1	Dim - Room Perimeter Length							
2	2	Level	Name	Type : QS Tag : QS Unit	QS Qty	Floor Finish	Count	Perimeter	
3	3			: :					
4	4	Level 1	Big room	FL-Ceramic Tile-Screed-50 : : m	61.58	FL-Ceramic Tile-Screed-50	1	61576	
5	5	Level 1	Middle room	FL-Ceramic Tile-Screed-50 : : m	39.65	FL-Ceramic Tile-Screed-50	1	39650	
6	6	Level 1	Small room	FL-Ceramic Tile-Screed-50 : : m	17.60	FL-Ceramic Tile-Screed-50	1	17600	
7	7	Grand total: 3		: :	118.83		3	118826	

Room elements do not have a Type parameter

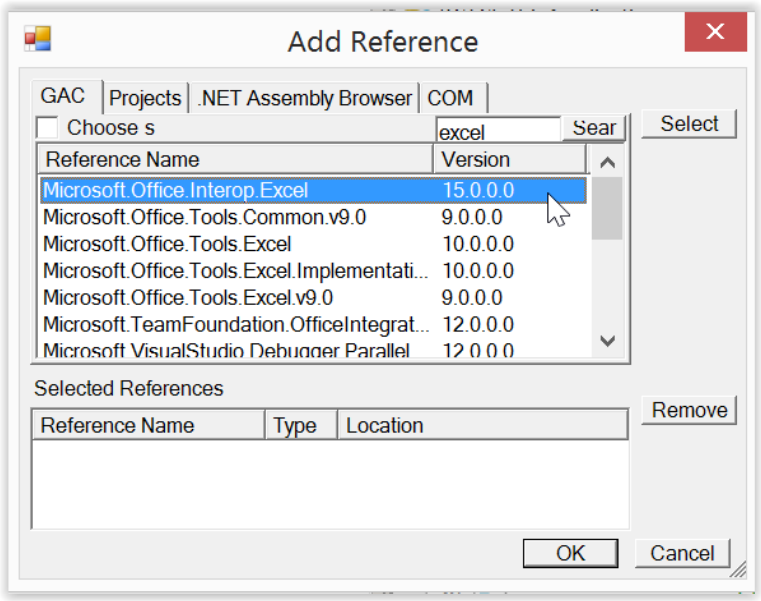
- a calculated field created for Type
- which takes the names of the finishes as its values

EXPORTING SCHEDULES TO EXCEL

To install, select: Manage ribbon > Macros - Macro Manager > Create - Module > enter KCTCL at Module name > OK > Edit to open the SharpDevelop coding screen

Copy the codes to the SharpDevelop coding screen and overwrite the existing codes generated by

Select SharpDevelop's Project > Add Reference. Search for Microsoft Office Interop Excel. Click Select > OK to confirm



Select Build > Build Solution

Go back to Revit's macro manager menu

- select the newly created macro
- select Run

Bug

- System.IO.StreamReader file = new System.IO.StreamReader(folder_name
- + "\\" + filename_no_ext + ".txt");
- System.IO.File.Delete(folder_name + "\\" + filename_no_ext + ".txt");

- xlWorkBook.SaveAs(folder_name + "\\" + filename_no_ext,
- Excel.XlFileFormat.xlWorkbookNormal,
- default_value, default_value, default_value, default_value,
- Excel.XlSaveAsAccessMode.xlExclusive,
- default_value, default_value, default_value, default_value, default_value);

CLOSING

Revit schedules and corresponding Excel worksheets set up once

- can be re-used as a set of templates for other Revit models

Number of chains of QS Desc -> secondary calculations -> Codes

- can be expanded
- as and when they are encountered
- retained in templates to serve future use
- to reduce burden of re-defining every time

Get into modelling

- easy and powerful
- as soon as possible

Understand it

Identify the limitations

Suggest solutions to make it really productive

Increase our user base and join force

- push the software vendors to meet our need

End