

TEKLA BASECAMP

Estimating for Concrete

AUG. 27 - 29

2
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1
9

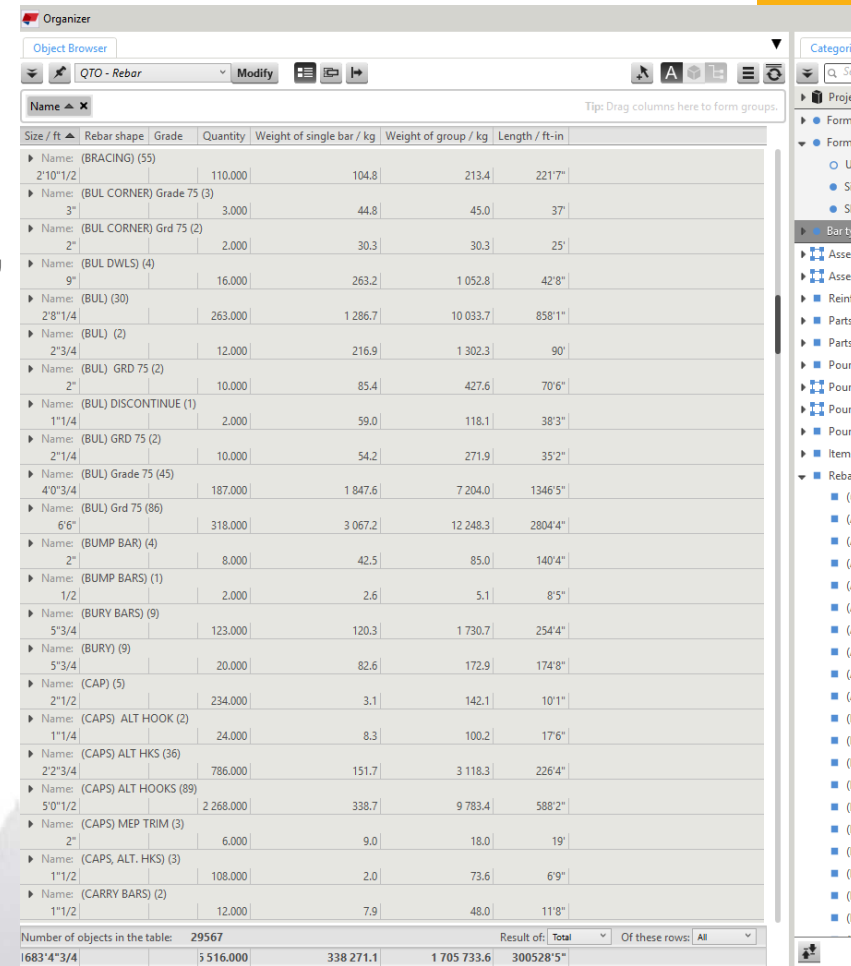


Estimating for Concrete: Techniques and workflow tools affecting estimating and winning jobs

- General 'Tips' for setup/estimating/QC
- Reporting tools
 - Template Editor
 - Organizer
- Supplemental tools for 'winning' jobs
 - Visualizer
 - Construction Sequencer
 - Design-to-cost Tool

Tips for Success

- Definition document of 'standards'
- Personalize setup for company
- Consider downstream effect
- Information management
- Keep refining 'number of clicks'
- FIRM
 - [2019i updates](#)



The screenshot shows the Organizer software interface with a table of rebar specifications. The table has columns for Name, Size / ft, Rebar shape, Grade, Quantity, Weight of single bar / kg, Weight of group / kg, and Length / ft-in. The table lists various rebar types and their quantities, weights, and lengths.

Name	Size / ft	Rebar shape	Grade	Quantity	Weight of single bar / kg	Weight of group / kg	Length / ft-in
▶ Name: (BRACING) (55)	2'10"1/2			110.000	104.8	213.4	2217"
▶ Name: (BUL CORNER) Grade 75 (3)	3"			3.000	44.8	45.0	37"
▶ Name: (BUL CORNER) Grd 75 (2)	2"			2.000	30.3	30.3	25"
▶ Name: (BUL DWLS) (4)	9"			16.000	263.2	1 052.8	428"
▶ Name: (BUL) (30)	2'8"1/4			263.000	1 286.7	10 033.7	8581"
▶ Name: (BUL) (2)	2'3/4			12.000	216.9	1 302.3	90"
▶ Name: (BUL) GRD 75 (2)	2"			10.000	85.4	427.6	706"
▶ Name: (BUL) DISCONTINUE (1)	1"1/4			2.000	59.0	118.1	383"
▶ Name: (BUL) GRD 75 (2)	2"1/4			10.000	54.2	271.9	352"
▶ Name: (BUL) Grade 75 (45)	4'0"3/4			187.000	1 847.6	7 204.0	13465"
▶ Name: (BUL) Grd 75 (86)	6'6"			318.000	3 067.2	12 248.3	28044"
▶ Name: (BUMP BAR) (4)	2"			8.000	42.5	85.0	1404"
▶ Name: (BUMP BARS) (1)	1/2			2.000	2.6	5.1	85"
▶ Name: (BURY BARS) (9)	5'3/4			123.000	120.3	1 730.7	2544"
▶ Name: (BURY) (9)	5'3/4			20.000	82.6	172.9	1748"
▶ Name: (CAP) (5)	2"1/2			234.000	3.1	142.1	101"
▶ Name: (CAPS) ALT HOOK (2)	1"1/4			24.000	8.3	100.2	176"
▶ Name: (CAPS) ALT HKS (36)	2'2"3/4			786.000	151.7	3 118.3	2264"
▶ Name: (CAPS) ALT HOOKS (89)	5'0"1/2			2 268.000	338.7	9 783.4	5882"
▶ Name: (CAPS) MEP TRIM (3)	2"			6.000	9.0	18.0	19"
▶ Name: (CAPS, ALT. HKS) (3)	1"1/2			108.000	2.0	73.6	69"
▶ Name: (CARRY BARS) (2)	1"1/2			12.000	7.9	48.0	118"
Number of objects in the table:				29567	Result of: Total		Of these rows: All
1683'4"3/4				5 516.000	338 271.1	1 705 733.6	300528'5"

Tool	Save As	Ext	Profile	Name	Class	CU Type	CU Prefix	CU Start No
Concrete Column	standard	.ccl	32**32"	CORNER COLUMN	13	Precast	CN	100
Concrete Column	Precast Exterior Column	.ccl	24**32"	EXTERIOR COLUMN	27	Precast	CX	100
Concrete Column	Precast Interior Column	.ccl	24**24"	INTERIOR COLUMN	41	Precast	CI	100
Concrete Column	Cip Column	.ccl	24**24"	COLUMN	8	Cast in Place	GC	1
Concrete Column	Cip Pier	.ccl	36**36"	PIER	3	Cast in Place	GP	1
Concrete Column	Cip Circular	.ccl	D36"	COLUMN	8	Cast in Place	GC	1
Concrete Beam	standard	.cbm	32**X20"	RECTANGULAR BEAM	9	Precast	BR	100
Concrete Beam	Precast ItBeam	.cbm	ITBEAM24**12**12**12**12**36**0"	IT BEAM	7	Precast	BT	100
Concrete Beam	Precast LedgeBeam	.cbm	LSPAN84**8**8**12**0"	LEDGE BEAM	18	Precast	BL	100
Concrete Beam	Precast DoubleTee	.cbm	XDT3*3/4*1**2**1/4*60**28**30**30"	DOUBLE TEE	10	Precast	DT	100
Concrete Beam	Precast LB Spandrel	.cbm	LSPAN84**8**8**12**0"	SPANDREL	11	Precast	LS	100
Concrete Beam	Precast NLB Spandrel	.cbm	RSPAN84**8"	SPANDREL	25	Precast	NS	100
Concrete Beam	Precast Stair	.cbm	2**12"	STAIR	14	Precast	Z	100
Concrete Beam	Precast Corbel	.cbm	CORBEL20**8**8**1*3/4*3/4	CORBEL	900	Precast	CBL	1
Concrete Beam	Precast Haunch	.cbm	12**8"	HAUNCH	901	Precast	HNC	1
Concrete Beam	Precast Ridge	.cbm	2**12"	RIDGE	22	Precast	SD	1
Concrete Beam	Precast Stringer	.cbm	2**12"	STRINGER	23	Precast	SR	1
Concrete Beam	Cip Beam	.cbm	32**20"	BEAM	6	Cast in Place	CB	1
Concrete Slab	standard	.csl	8"	FLAT SLAB	5	Precast	FS	100
Concrete Slab	Precast Stair	.csl	8"	STAIR	14	Precast	Z	100
Concrete Slab	Precast Corbel	.csl	24"	CORBEL	900	Precast	CBL	1
Concrete Slab	Precast Haunch	.csl	8"	HAUNCH	901	Precast	HNC	1
Concrete Slab	Precast Landing	.csl	8"	LANDING	21	Precast	LP	1
Concrete Slab	Precast Ridge	.csl	4"	RIDGE	22	Precast	SD	1
Concrete Slab	Precast Stringer	.csl	4"	STRINGER	23	Precast	SR	1
Concrete Slab	Cip Wash	.csl	8"	WASH	15	Cast in Place	FW	1
Concrete Slab	Cip Topping	.csl	8"	TOPPING	16	Cast in Place	FT	1
Concrete Slab	Cip Slab	.csl	8"	SLAB	4	Cast in Place	FC	1
Concrete Panel	standard	.cpn	120**X12"	HORIZONTAL WALL	2	Precast	WH	100
Concrete Panel	Precast VerticalWall	.cpn	510**8"	VERTICAL WALL	36	Precast	WV	100
Concrete Panel	Precast RampWall	.cpn	420**10"	RAMP WALL	55	Precast	WR	100
Concrete Panel	Precast ShearWall	.cpn	150**8"	SHEAR WALL	47	Precast	WS	100
Concrete Panel	Precast SandwichWall	.cpn	78*4	SANDWICH WALL	51	Precast	WW	100
Concrete Panel	Cip Wall	.cpn	135*10	WALL	38	Cast in Place	RC	1
Concrete Panel	Cip RetainingWall	.cpn	120**X12"	RETAINING WALL	52	Cast in Place	RW	1
Concrete Panel	Cip ShearWall	.cpn	120**X12"	SHEAR WALL	66	Cast in Place	RS	1
Concrete Panel	Insulation	.cpn	78*2	INSULATION	42	Insulation	SW	1
Concrete Spiralbeam	standard	.csb	28**20"	BEAM	37	Precast	BS	100
Strip Footing	standard	.csf	12**24"	STRIP FOOTING	1	Cast in Place	SF	1
Pad Footing	standard	.cpf	70**70"	PAD FOOTING	1	Cast in Place	FT	1

Definition Document of standards

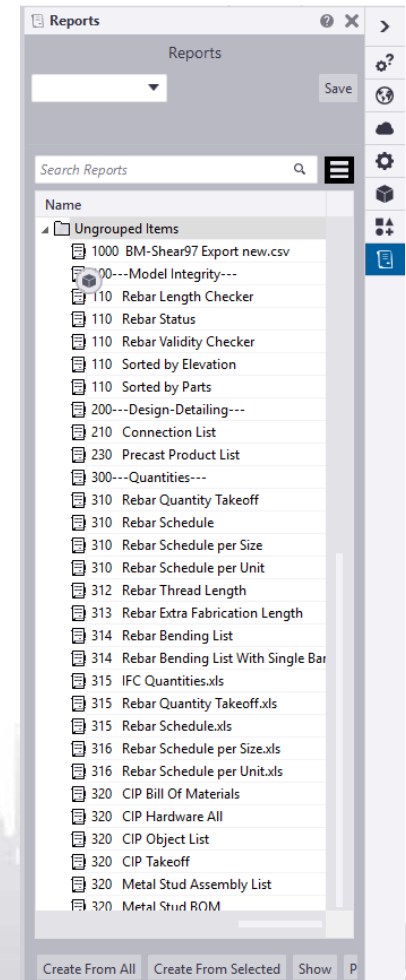
Clearly define presets and settings that affect numbering, filters, reports, drawings...

'Tips' for using

Reporting tools: Template editor

Template Editor Tips: Comparison with Organizer

- Much greater control than Organizer for:
 - Format of data (sorting, combining, calculations)
 - File type export (PDF, csv, txt...)
- Handles rebar information much better
 - Not limited to groups like organizer
 - Can identify bars within groups
- Combine existing properties
- **Warehouse tool: Reports side pane**
- Online training offering



Template Editor + Organizer

- Use Organizer to write information versus creating multiple rows/formulas/rules in Template Editor
- (Live example Later)

Count	NAME	AREA_FORM	AREA_FORM_BOTTOM / R2	AREA_FORM_SIDE / R2	
764					
1	BSMT SOG				7.0
68	PILE	0.0	0.0		206.0
2	PILE	0.0	0.0		190.8
26	PILE	0.0	0.0		205.4
11	PILE	0.0	0.0		205.7
1	PILE	0.0	0.0		206.8
1	L3 SUSP. SLAB	0.0	0.0		27.1
1	BSMT SOG	0.0	0.0		36.4
1	L1_SOG	0.0	0.0		20.1
1	BSMT SOG	0.0	0.0		37.5
2	BSMT SOG	0.0	0.0		10.1
1	BEAM	0.0	0.0		7.0
1	BEAM	0.0	0.0		223.4
1	BEAM	0.0	0.0		30.5
1	BSMT SOG	0.0	0.0		113.0
5	L1_SOG	0.0	0.0		30.2
1	L1_SOG	0.0	0.0		31.3
1	L1_SOG	0.0	0.0		28.3
4	L1_SOG	0.0	0.0		29.6
2	L1_SOG	0.0	0.0		29.9
1	L1_SOG	0.0	0.0		26.1
1	L1_SOG	0.0	0.0		26.5
4	L1_SOG	0.0	0.0		8.2
2	L1_SOG	0.0	0.0		26.3
2	L1_SOG	0.0	0.0		33.5
1	L1_SOG	0.0	0.0		191.1
1	L1_SOG	0.0	0.0		765.4
1	L1_SOG	0.0	0.0		72.0
1	L1_SOG	0.0	0.0		76.7
1	BSMT SOG	0.0	0.0		191.6
1	BSMT SOG	0.0	0.0		63.2
1	BSMT SOG	0.0	0.0		108.1

Quick recap of the organizer functionalities

Reporting tools: Organizer



The Object Browser

- Collates information based on model selection/category selection
- Shows object information based on attributes in the template
- Grouping by Template headers
- Counts, Export to Excel and filter

Object Browser

Quantity Takeoff Modify [Icons]

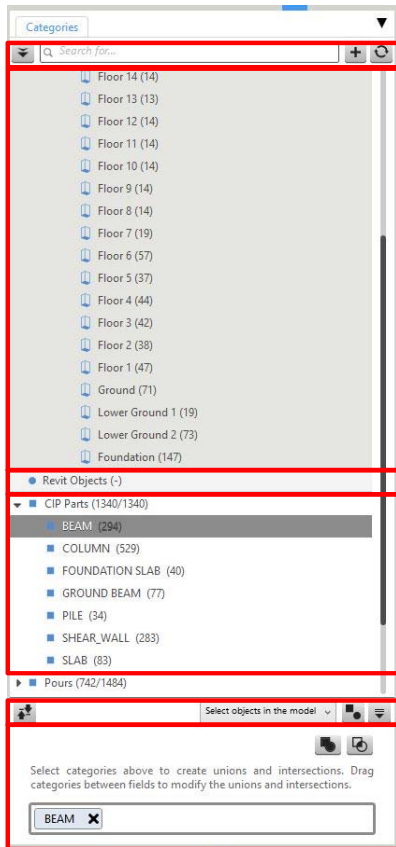
Automated [Icons]

Tip: Drag columns here to form groups.

Count	Name	Material	Profile	Height / ft-in	Length / ft-in	Width / ft-in	Weight / lb	Volume / yd3
12	BEAM	5000	19"X12"	1"	19'5"	1'7"	4 611.5	1.1
4	BEAM	5000	19"X12"	1"	29'4"3/4	1'7"	6 968.0	1.7
12	BEAM	5000	19"X12"	1"	27'11"1/2	1'7"	6 640.1	1.6
4	BEAM	5000	19"X12"	1"	18'5"	1'7"	4 374.0	1.1
4	BEAM	5000	19"X12"	1"	28'5"1/4	1'7"	6 743.7	1.7
6	BEAM	5000	19"X36"	3"	26'5"1/2	1'7"	18 851.5	4.7
2	BEAM	5000	19"X36"	3"	23'4"	1'7"	16 625.0	4.1
2	BEAM	5000	19"X36"	3"	31'9"1/2	1'7"	22 651.5	5.6
1	BEAM	5000	19"X36"	3"	24'6"	1'7"	17 456.2	4.3
2	BEAM	5000	19"X36"	3"	25'3"	1'7"	17 990.6	4.4
1	BEAM	5000	19"X36"	3"	25'6"	1'7"	18 168.7	4.5
1	BEAM	5000	19"X36"	3"	19'5"	1'7"	13 834.4	3.4
3	BEAM	5000	19"X36"	3"	16'6"	1'7"	11 756.2	2.9
1	BEAM	5000	19"X36"	3"	24'6"	1'7"	17 456.2	4.3
Number of objects in the table: 294					8454'10"1/2		5 124 497.5	1 265.3

Result of: Total Of these rows: All

Categories



- Floor breakdown of structure
- Custom breakdown of objects
- Ability to breakdown IFC data
- Combine filters for data export
- Select or highlight objects in the model
- Search for objects in the categories

Boundary Boxes for Locations



Location definition for "Tekla Models > Site > Trimble House"

Unit: FT-IN (ft-in)

Building Sections Floors Settings

Floor system: Main Building

+ Floors based on grid

+ Floor: 0"

Trimble House

Select buildings or sections to apply this floor system to them

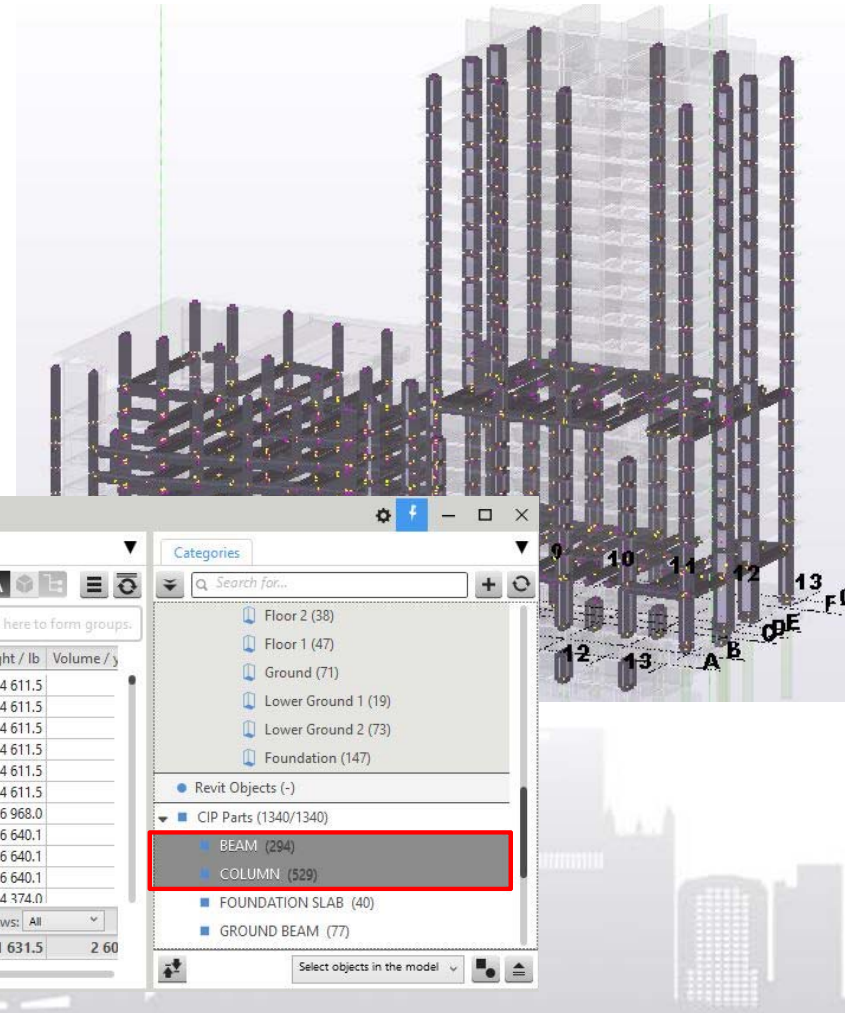
Floor 6	13'2"	76'2"
Floor 5	10'2"	66'
Floor 4	10'2"	55'10"
Floor 3	10'2"	45'8"
Floor 2	10'2"	35'6"
Floor 1	10'2"	25'4"
Ground	20'4"	5'
Lower Ground 1	5'	0"
Lower Ground 2	16'6"	-16'6"
Foundation		Local building bottom

Modify Close

- Multi-Project
- Building
- Sections
- Floor
- Grid Based Automation
- Multiple floor systems

Custom Selections

- Use ctrl to multi select categories to output
- Select objects live in the model
- Group objects ready for export



Organizer

Object Browser

Cast Unit List

Automated

Tip: Drag columns here to form groups.

Name	Cast Unit Type	Position Number	Material Type	Material	Profile	Top Level / ft-in	Height / ft-in	Length / ft-in	Width / ft-in	Weight / lb	Volume / y
BEAM		CB0(?)	CONCRETE	5000	19"X12"		1'	19'5"	1'7"	4 611.5	
BEAM		CB0(?)	CONCRETE	5000	19"X12"		1'	19'5"	1'7"	4 611.5	
BEAM		CB0(?)	CONCRETE	5000	19"X12"		1'	19'5"	1'7"	4 611.5	
BEAM		CB0(?)	CONCRETE	5000	19"X12"		1'	19'5"	1'7"	4 611.5	
BEAM		CB0(?)	CONCRETE	5000	19"X12"		1'	19'5"	1'7"	4 611.5	
BEAM		CB0(?)	CONCRETE	5000	19"X12"		1'	19'5"	1'7"	4 611.5	
BEAM		CB0(?)	CONCRETE	5000	19"X12"		1'	19'5"	1'7"	4 611.5	
BEAM		CB0(?)	CONCRETE	5000	19"X12"		1'	29'4"3/4	1'7"	6 968.0	
BEAM		CB0(?)	CONCRETE	5000	19"X12"		1'	27'11"1/2	1'7"	6 640.1	
BEAM		CB0(?)	CONCRETE	5000	19"X12"		1'	27'11"1/2	1'7"	6 640.1	
BEAM		CB0(?)	CONCRETE	5000	19"X12"		1'	27'11"1/2	1'7"	6 640.1	
RFAM		CR0(?)	CONCRETF	5000	19"X12"		1'	18'5"	1'7"	4 374.0	

Number of objects in the table: 823

Result of: Total Of these rows: All

13809'6"3/4 0 561 631.5 2 60

Categories

Search for...

- Floor 2 (38)
- Floor 1 (47)
- Ground (71)
- Lower Ground 1 (19)
- Lower Ground 2 (73)
- Foundation (147)

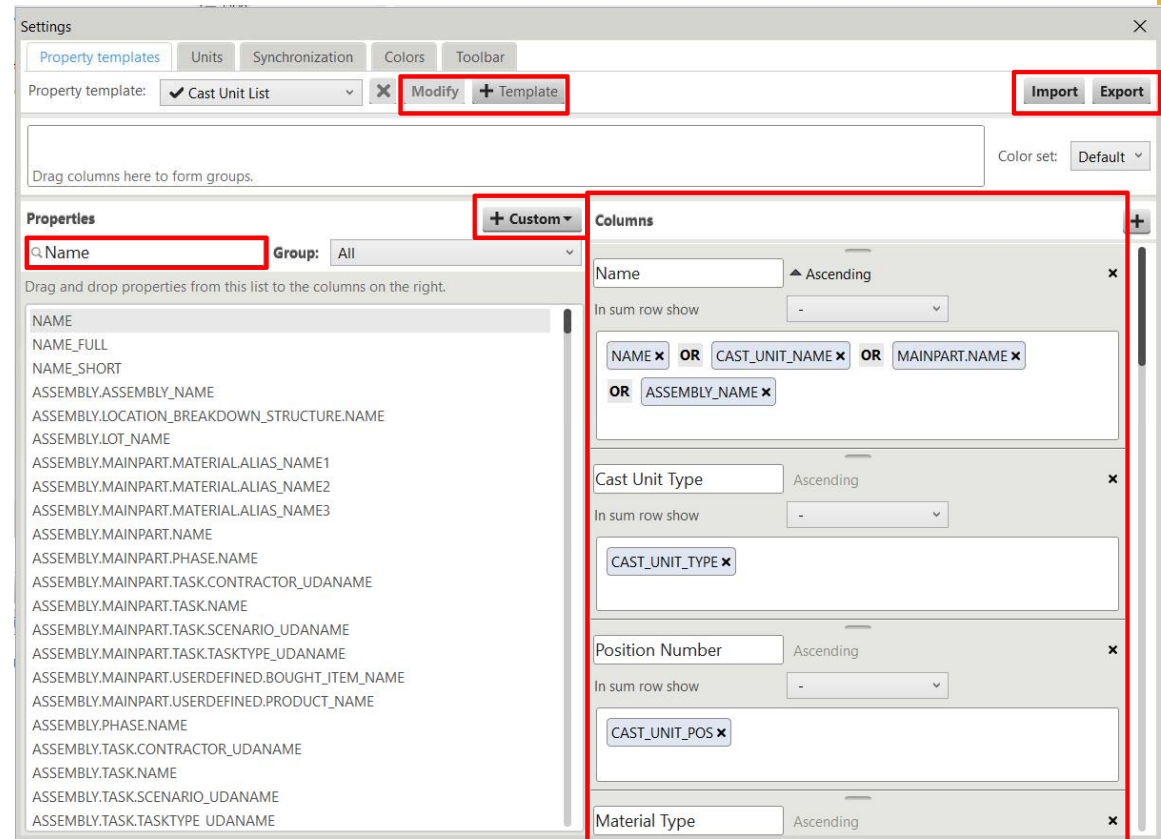
Revit Objects (-)

- CIP Parts (1340/1340)
 - BEAM (294)
 - COLUMN (529)
 - FOUNDATION SLAB (40)
 - GROUND BEAM (77)

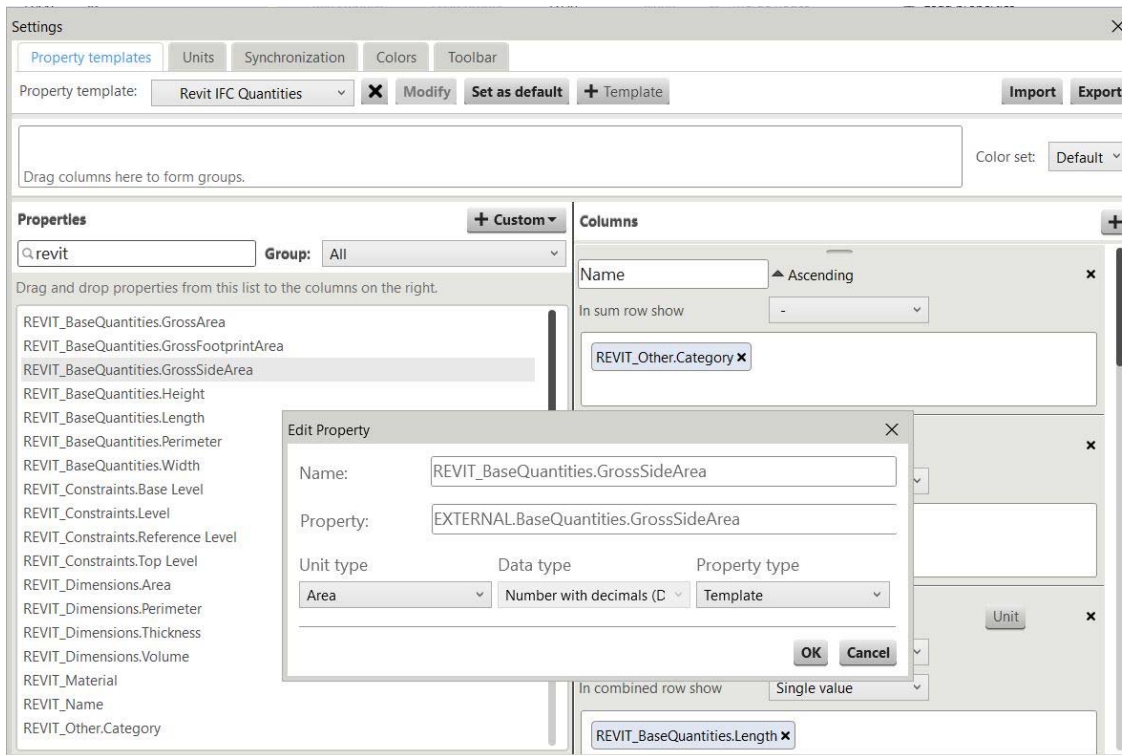
Select objects in the model

Report Templates

- Customize export templates
- Type any property to see all the values
- Create new based on old
- Import/Export templates
- Add custom properties
- Add custom formula

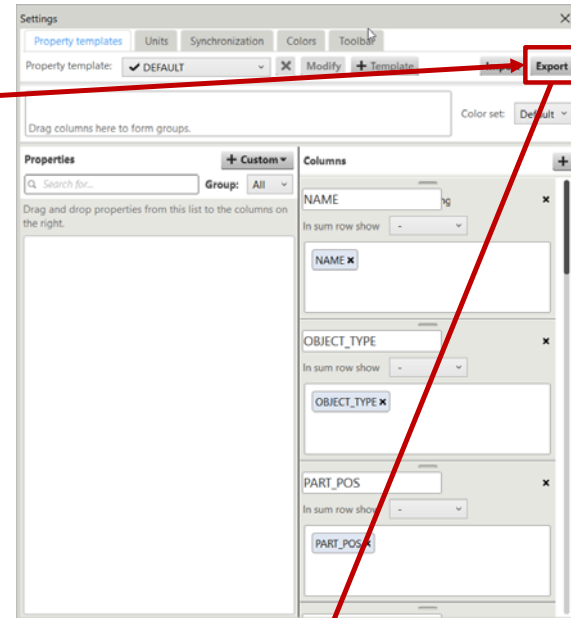
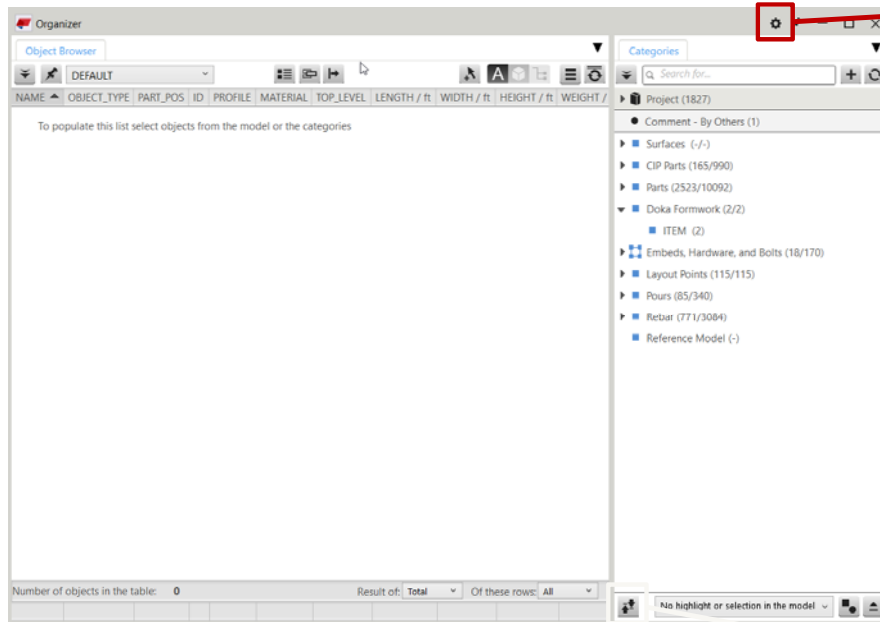


Custom Properties



- Create properties from company objects.inp/ components/new developments
- External reference files

Save to your Firm!



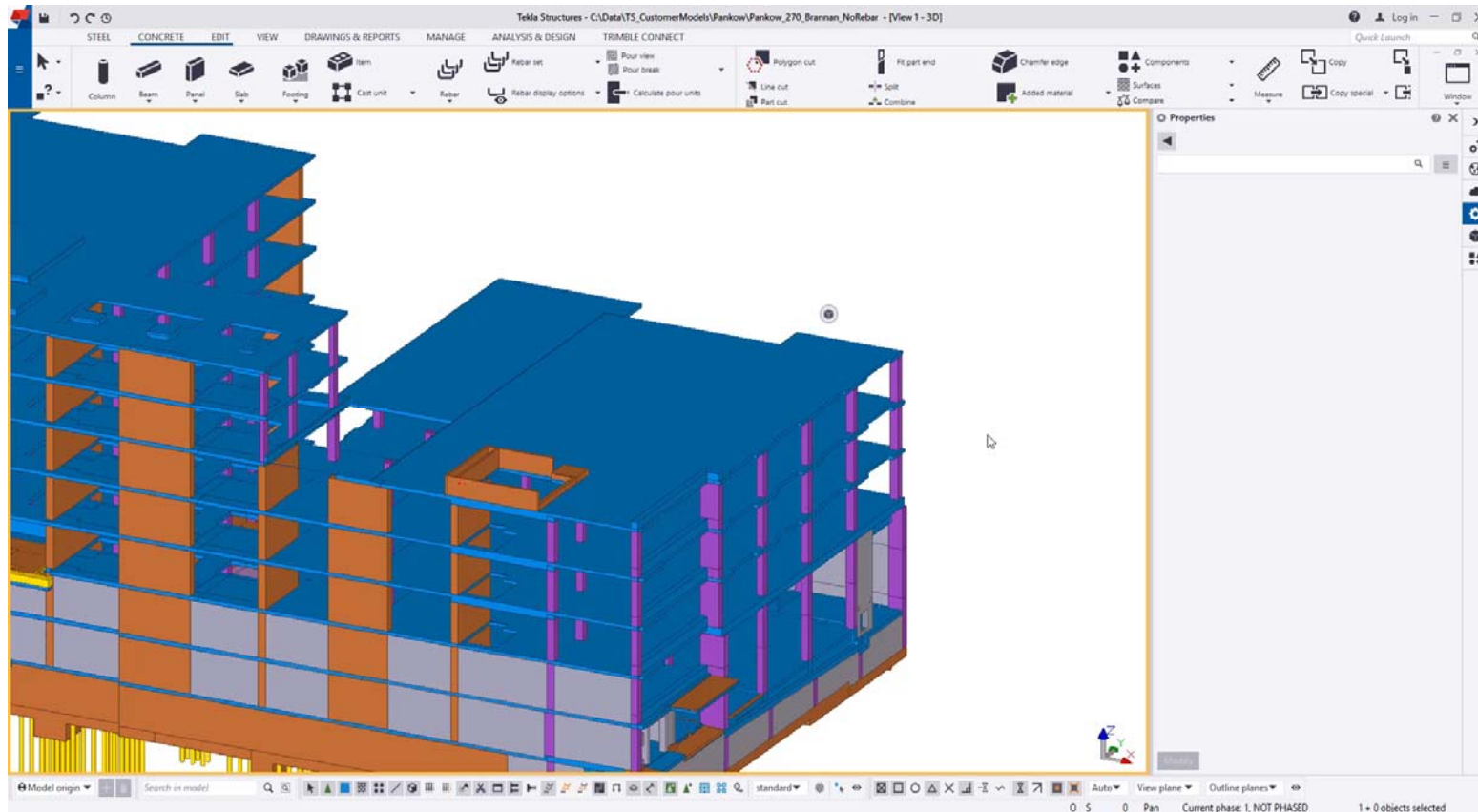
- ✓ Firm
- ✓ ProjectOrganizerData
 - DefaultCategoryTrees
 - ExcelTemplates
 - PropertyTemplates

Organize model info, assign properties, and report

Organizer & Template Reports (Live)

Customize Tekla based on your needs

Setup and Customization



Customize UI

- Add common or custom attributes to property pane
- Localization changes in 2019i
- Instructions for Project/Firm:

https://teklastructures.support.tekla.com/2019/en/cus_add_custom_property_panes_using_firm_folder

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Custom attributes (objects.inp files)

- Review and utilize existing UDAs
- Specify custom attributes for each objects type
 - Beam, Concrete Column, Items...
- Value Types
 - String, number, length, option...
- Example

Tekla Structures Concrete column (1)

Finish Information	Concrete Breaks	Concrete Inspection	Shop/Site Status		
RFI Management	Concrete Management	Buyout Management	Clash Management		
Parameters	Estimate Information	Rebar set	Change Orders	IFC export	Design/Detailing Status

Estimate Properties

Est Category

Est Subcategory:

Description:

Unit Type:

Placement type: none

OK Apply Modify Get / Cancel

```

1 part(0,"Part")
2 {
3   tab_page("ESTIMATE_17")
4   {
5     attribute("LABEL1", "Estimate Properties", label, "%s", no, none, "0.0", "0.0")
6     attribute("ESTI_CAT", "Est Category", string, "%s", no, none, "0.0", "0.0")
7     {
8       value("", 0)
9     }
10    attribute("ESTI_SUBCAT", "Est Subcategory:", string, "%s", no, none, "0.0", "0.0")
11    {
12      value("", 0)
13    }
14    attribute("ESTI_DESC", "Description:", string, "%s", no, none, "0.0", "0.0")
15    {
16      value("", 0)
17    }
18    attribute("ESTI_UNIT", "Unit Type:", string, "%s", no, none, "0.0", "0.0")
19    {
20      value("", 0)
21    }
22    attribute("ESTI_CONCEPLACE", "Placement type:", option,"%s", no, none, "0.0", "0.0")
23    {
24      value("none", 2)
25      value("Concrete Direct Chute", 0)
26      value("Power Buggies", 0)
27      value("Line Pump", 0)
28      value("24 meter Boom", 0)
29      value("28 meter Boom", 0)
30      value("32 meter Boom", 0)
31      value("36 meter Boom", 0)
32    }
33  }
34
35  tab_page("ESTIMATE_17","Estimate Information",17)
36  modify(1)
37  }
38
39
40  /******
41  /* Beam attributes */
42  /******

```

Tekla Structures Concrete column (1)

Finish Information	Concrete Breaks	Concrete Inspection	Shop/Site Status
RFI Management	Concrete Management	Buyout Management	Clash Management
Parameters	Estimate Information	Rebar set	Change Orders
		IFC export	Design/Detailing Status

Estimate Properties

Est Category

Est Subcategory:

Description:

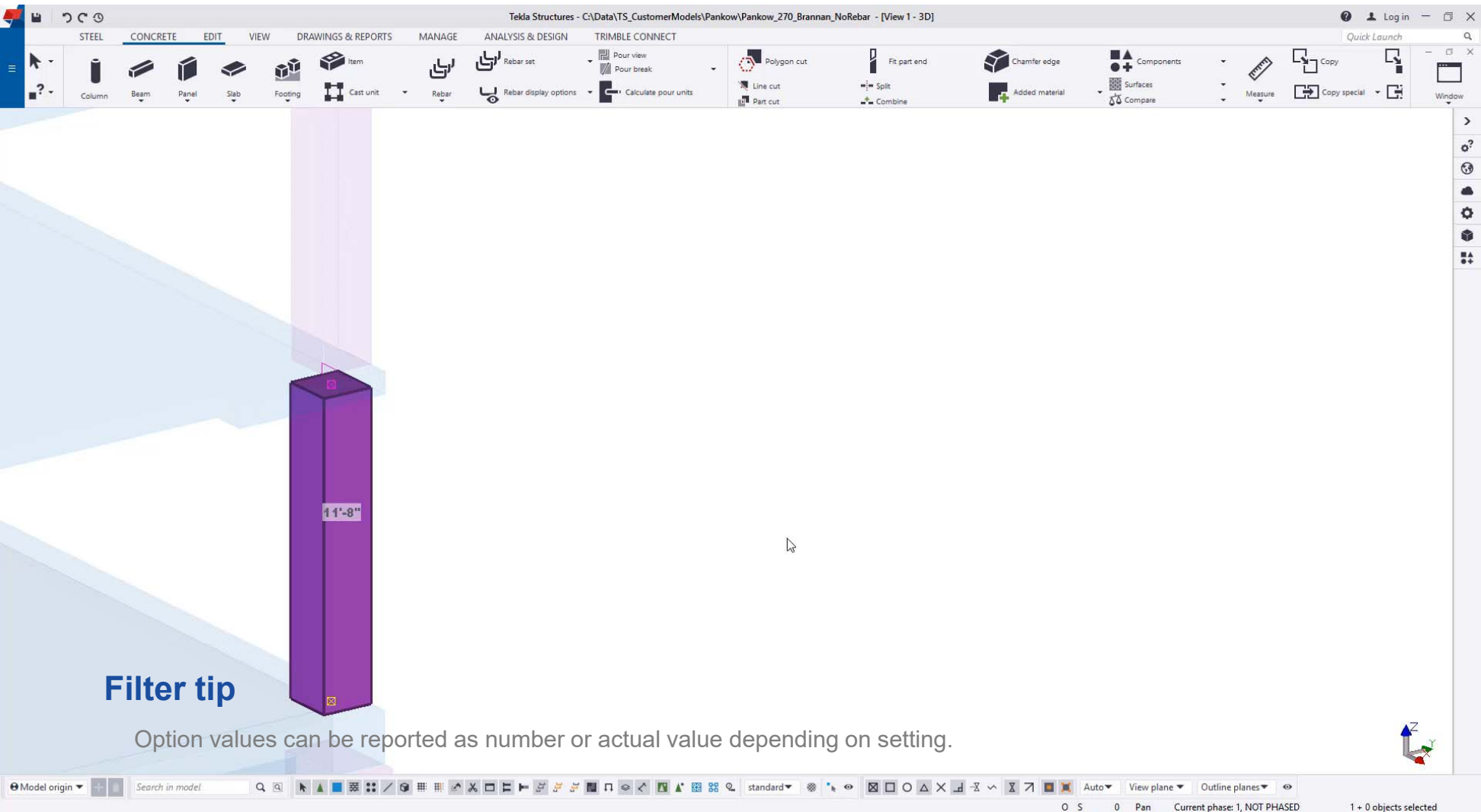
Unit Type:

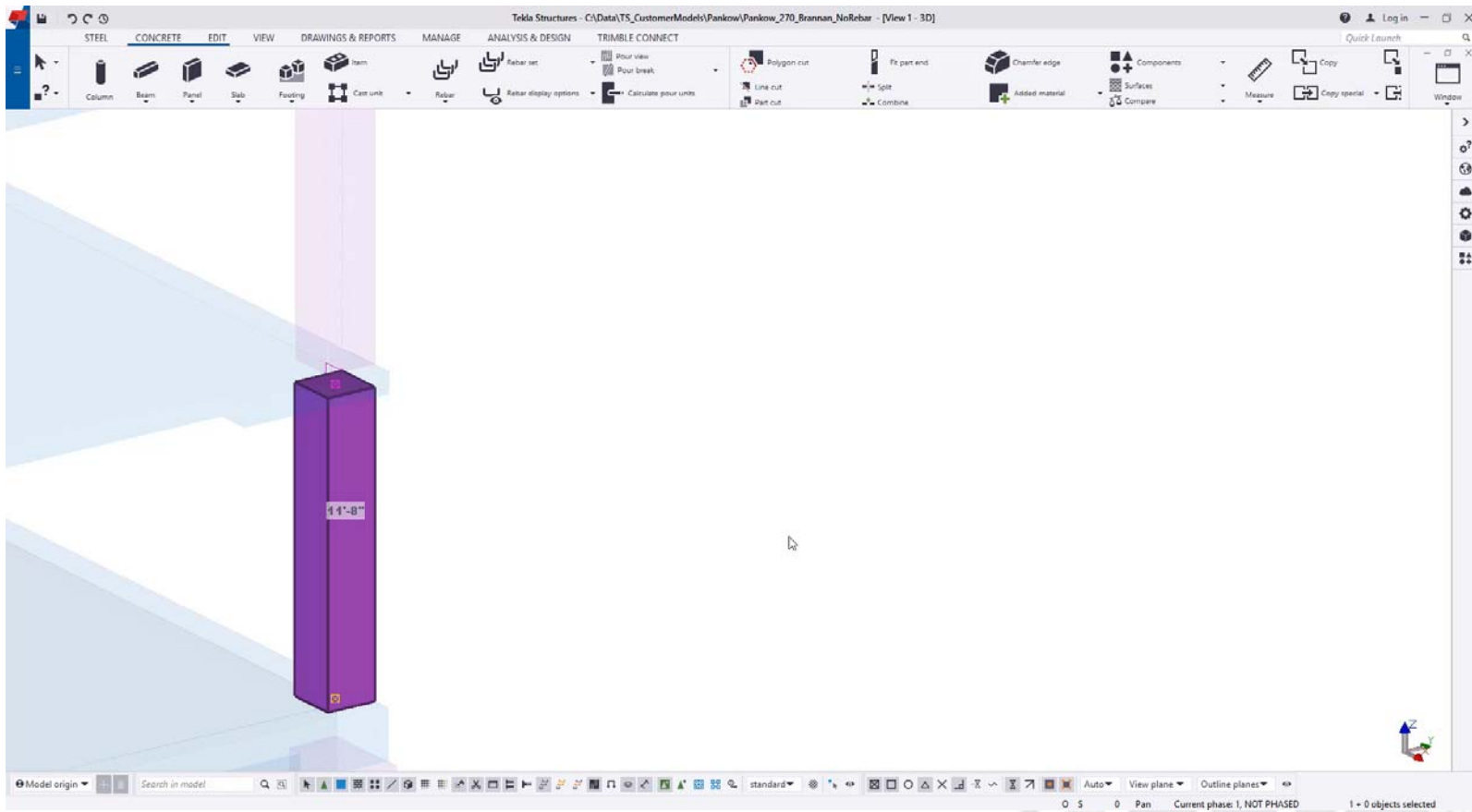
Placement type: none

OK Apply Modify Get / Cancel

Tips for custom objects.inp files

- Utilize notepad++ for editing *.inp files
- TUA: https://teklastructures.support.tekla.com/2019/en/sys_example_creating_and Updating_uda





Using in Organizer

If template attribute file is not modified, you need to create an additional property.

Tools and techniques for detailing fast and efficiently

Estimate and Model Fast (Live)



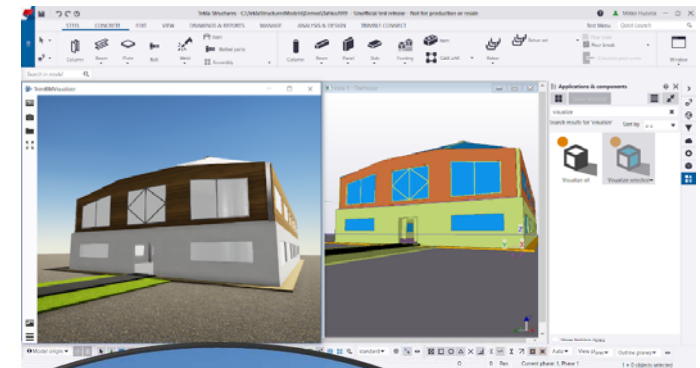
Tools that go along with an estimate 'package'

Benefits for sales

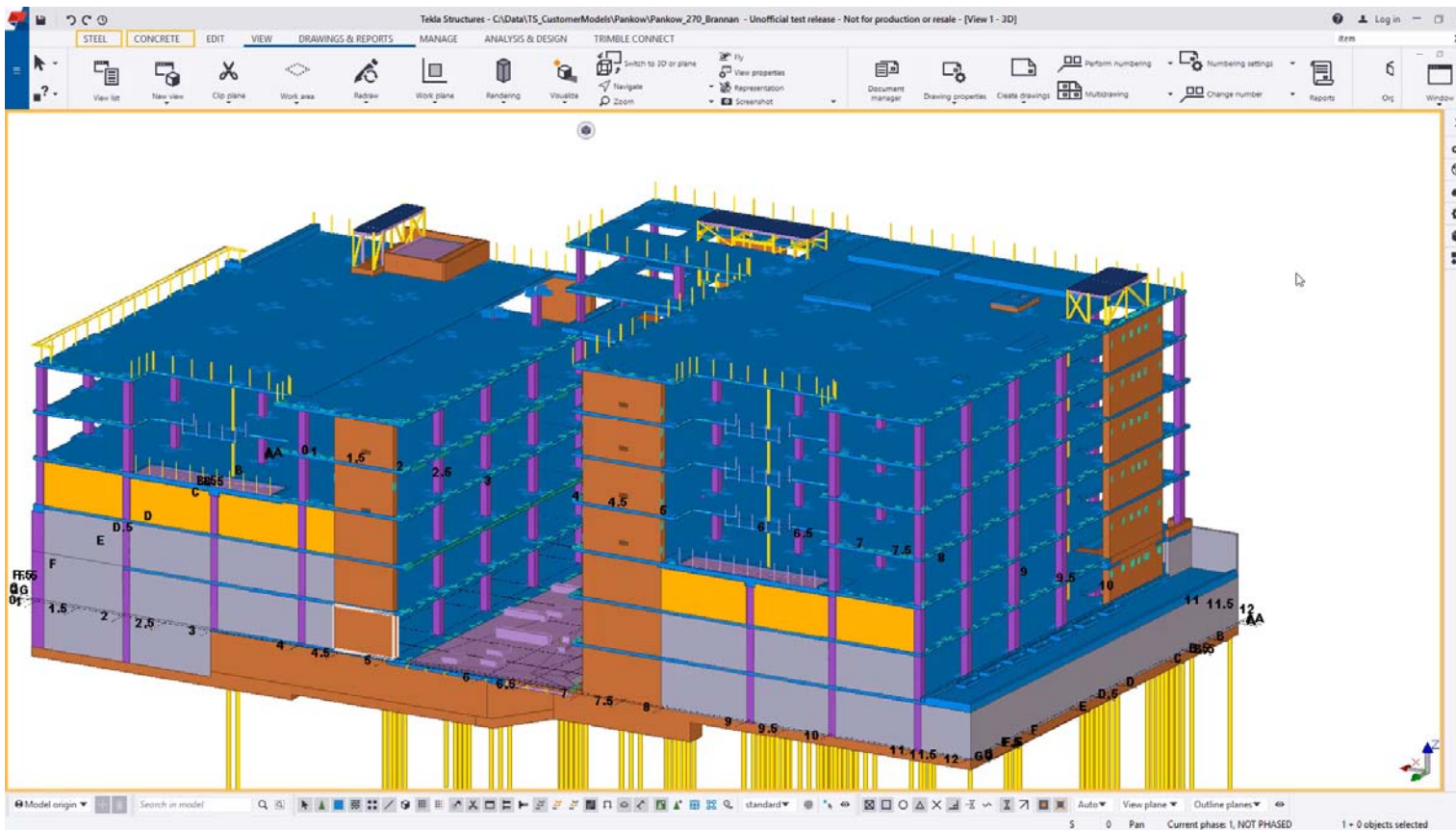


Visualizer

- Create rendered images to show your delivery
- How to get it
 - 2019 (Warehouse extension)
 - 2019i (Model Ribbon, view tab)
 - Trimble Connect (download)



Visualizer

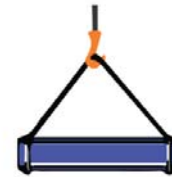


2019

Construction Sequencer

- Warehouse Extension
- Assist with planning and executing onsite activities
- [TUA](#)

Construction Sequencer



[Log in to download](#)

***If you have Tekla Structures installed on your computer then you should download the Construction Sequencer installation. If you do not have Tekla Structures on your computer/mobile device then you should install the Construction Sequencer LITE version. The Construction Sequencer is intended to

[Show more](#)

Construction Sequencer

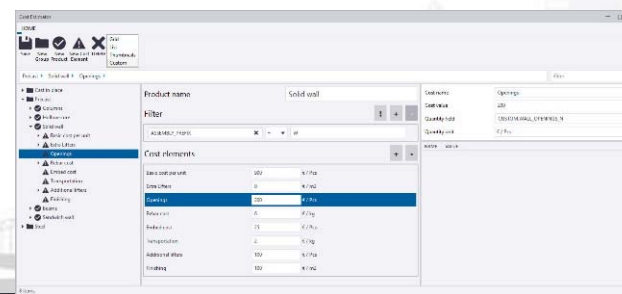
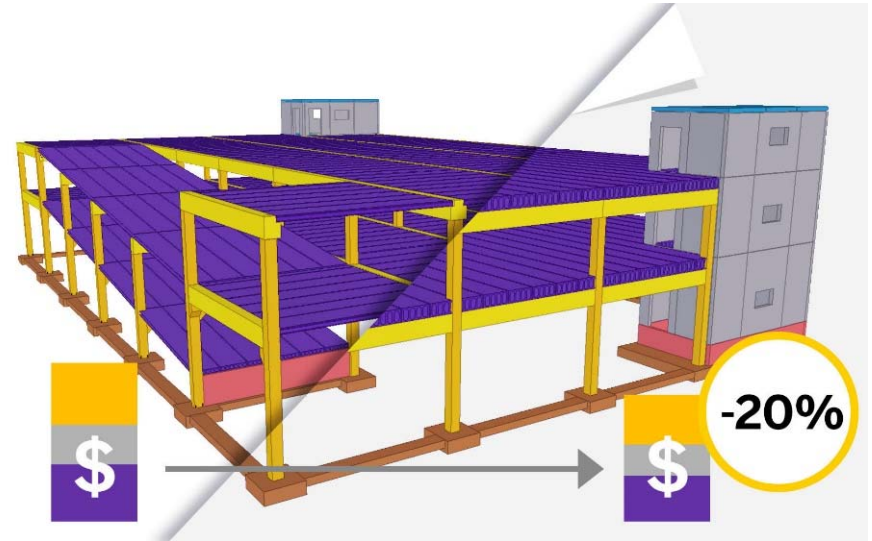
The screenshot displays the Tekla Structures software interface. On the left, a 3D model of a concrete structure is shown in green. On the right, the Construction Sequencer window is open, displaying a table of construction phases. The table has the following columns: Name, ObjectType, Phase, User Phase, Class, Material, User Lot, Order, and SubOrder. The first row is highlighted in pink.

Name	ObjectType	Phase	User Phase	Class	Material	User Lot	Order	SubOrder
MISC	POUROBJECT				110			1
MISC	POUROBJECT				110			2
MISC	POUROBJECT				110			3
MISC	POUROBJECT				110			4
MISC	POUROBJECT				110			5
FOOTING	POUROBJECT				110			6
FOOTING	POUROBJECT				110			7
PILE	POUROBJECT				110			8
PILE	POUROBJECT				110			9
PILE	POUROBJECT				110			10
PILE	POUROBJECT				110			11
PILE	POUROBJECT				110			12
PILE	POUROBJECT				110			13
PILE	POUROBJECT				110			14
PILE	POUROBJECT				110			15
PILE	POUROBJECT				110			16
PILE	POUROBJECT				110			17
PILE	POUROBJECT				110			18
PILE	POUROBJECT				110			19
PILE	POUROBJECT				110			20
PILE	POUROBJECT				110			21
PILE	POUROBJECT				110			22
PILE	POUROBJECT				110			23
PILE	POUROBJECT				110			24

New order: 182

Benefits for sales: Design-to-cost –tool

- Calculate unit costs dynamically in the model
 - Modeler can make more economical decisions
- Calculated cost can be used as any property in:
 - Report, IFC property, model label, drawings, etc.



Q&A

Thank you!

