So first issue is that in the cost item definition template (csv file), you can only choose 1 property when assigning and that property has to be an existing one within the standard Qto Pset. For example while using a filter query for all vertical elements (RC columns and Walls) the Qto Pset use different properties naming for the surface and as such cannot be used in the template. Ofcourse you could have a workaround to break these into discrete cost items but I was looking into a feature that would allow you to define multiple Pset_Name.Property and to have the algorithm loop over and match the corresponding value according to the Pset_Name.Property found (yikes too much of a resource hog???)

Hierarchy	Identification	Name	Quantity	Unit	Contract	Rate	Material Rate	Labor Rate	Subtotal	Property	Query
1	DB	Design and build									
2	2 DB.2.4	STRUCTURA									
1		Placa peste Parter GBA= 9.180 mp (+6.00)									
4		Execu?ie stalpi/ Columns execution									
5		Turnare beton C50/60- XC1- 0-16 mm- ciment conform plan- in stalpi/ Pouring concrete C50/60- XC1- 0-16 mm- plan according cement		m3		149,09				NetVolume	IfcColumn, IfcWall, location=Parter
5	5	Armatura BST 500 Clasa C in stalpi/ Steel Reinforcement BST500 class C in columns		m3		1,20				NetVolume	IfcColumn, IfcWall, location=Parter
5	5	Cofraje stalpi/ Verticla elements formwork -i		m2		33,60				OuterSurfaceArea, NetSideArea	IfcColumn, IfcWall, location=Parter
4		Execu?ie grinzi/ Frame beams execution									
5		Cofraje grinzi/ Beams formwork -inclusi		m2		33,60					
5	5	Turnare beton C35/45- XC1- 0-16 mm- ciment conform plan- in grinzi/ Pouring concrete C35/45- XC1- 0-16 mm- plan according cemen		m3		126,82					
5		Armatura BST 500 Clasa C/ Steel Reinforcement BST500 class C in beams		kgr		1,2					
4		Execu?ie pere?i nuclee si grinzi de cuplare/ Cores walls and beams execution							/		
5		Cofraje pereti / Walls formwork -inclusi		m2		33,60					
5		Turnare beton C50/60- XC1- 0-16 mm- ciment conform plan- in pere?i/ Pouring concrete C50/60- XC1- 0-16 mm- plan according cement		m3		149,09					
5	5	Armatura BST 500 Clasa C/ Steel Reinforcement BST500 class C in walls		kgr		1,2			/		
4		Execu?ie placi- scari ?i atice/ Slabs and staircases execution							/		
5	5	Cofraje placi/ Slabs formwork -inclusiv procurare ?		m2		33,60		/			
5		Turnare beton C35/45- XC1- 0-16 mm- ciment conform plan- in placa/ Pouring concrete C35/45- XC1- 0-16 mm- plan according cement-		m3		126,82					
5		Armatura BST 500 Clasa C/ Steel Reinforcement BST500 class C in slabs		kgr		1,2					
5		Armatura pretensionata sau postensionata TPB ST1860 in placa/Pretensioned or postensioned Reinforcement TPB ST1860 in slabs		kgr		5,00					

Figure 1 Multiple Properties in the property field

We cannot use multiple properties where the naming of the property differs from class to class. I.e. for IfcWall its "NetsideArea" whereas for IfcColumn its "OuterSurfaceArea" that need to be used to describe the quantity to be taken into account when Calculating formwork quantities for the Vertical Elements formworks cost item.

7	v Quantity Sets Costem Ote Occurrence Quantities: f Gi Cro, ColumnitaseQuantose GressRafesArea GressVelume	Ø 5eerch 28.4919928995085 7.11599445672528	~ *		Contraction Contraction Contraction Contraction Contraction Contraction Contraction Contraction Contraction	True (Ne.W) Ø starth	~ #
	Longh MetSuficeArea NetVolume Guorsianteobrea > Classification References > Milio	58300 28.019229955085 7.11599445672528 26.0919943943421			G Oro, Walfbackbundtes CrossSidotres CrossSidotres Lengts Lengts NetSidotres Wees	40.42008425794 354.558074832264 59300 4449.92894313039 403.42068423794 845580748282184 900.0	N×
▼ DB D ▼ DB.2.4	esign and build STRUCTURA			-		- 2 635. - 2 635.	42 RON 42 RON

	boligh and balla				
▼ DB.2.4	STRUCTURA				2 635.42 RON
▼ XXX	Placa peste Parter GBA= 9.180 mp (+6.00)				2 635.42 RON
▼ XXX	Execu?ie stalpi/ Columns execution				2 635.42 RON
• XXX	Turnare beton C50/60- XC1- 0-16 mm- cim/60- XC1- 0-16 m	m - plan according cement	2196.19 m3		0.00 RON
• xxx	Armatura BST 500 Clasa C in stalpi/ Steel Rei class C in columns		2196.19 m3	1.20 RON	2 635.42 RON
• XXX	Cofraje stalpi/ Columns formwork	-i	0.00 m2	-	0.00 RON
11					

Figure 2: Resulting Quantities and assignments after importing the csv file with multiple properties

The workaround is to break the cost item in instances (see following capture) according to the elements and properties to be captured by the query, however this approach increases complexity in an already cumbersome Cost Breakdown structure.

Hiorarch	u Idontification	Name	Quantitu	Linit	Contract	Pate	Motorial Rate	Labor Pato	Subtotal	Bronortu	0.000
merarci	y identification		Quantity	Onit	contract	nate	Material Nate	Labor Rate	Subtotal	riopeity	Query
	1 DB	Design and build	-								
	2 DB.2.4	STRUCTURA									
	3	Placa peste Parter GBA= 9.180 mp (+6.00)									
	4	Execu?ie stalpi/ Columns execution									
	5	Turnare beton C50/60- XC1- 0-16 mm- ciment conform plan-in stalpi/ Pouring concrete C50/60- XC1- 0-16 mm- plan according cement		m3		"149.09	9"			NetVolume	IfcColumn, IfcWall, location=Parter
	5	Armatura BST 500 Clasa C in stalpi/ Steel Reinforcement BST500 class C in columns		m3		"1.2"				NetVolume	IfcColumn, IfcWall, location=Parter
	5	Cofraje stalpi/ Columns formwork -i		m2		"33.6"				OuterSurfaceArea	IfcColumn, location=Parter
	5	Cofraje stalpi/ Walls formwork -i		m2		"33.6"				NetSideArea	IfcWall, location=Parter
	4	Execu?ie grinzi/ Frame beams execution									
	5	Cofraje grinzi/ Beams formwork -inclusi		m2		"33.6"					
	5	Turnare beton C35/45- XC1- 0-16 mm- ciment conform plan- in grinzi/ Pouring concrete C35/45- XC1- 0-16 mm- plan according cemen		m3		"126.82					
	5	Armatura BST 500 Clasa C/ Steel Reinforcement BST500 class C in beams		kgr		"1.2"					
	4	Execu?ie pere?i nuclee si grinzi de cuplare/ Cores walls and beams execution									
	5	Cofraje pereti / Walls formwork -inclusi		m2		"33.6"					
	5	Turnare beton C50/60- XC1- 0-16 mm- ciment conform plan- in pere?i/ Pouring concrete C50/60- XC1- 0-16 mm- plan according cement		m3		"149.09	9"				
	5	Armatura BST 500 Clasa C/ Steel Reinforcement BST500 class C in walls		kgr		"1.2"					
	4	Execu?ie placi- scari ?i atice/ Slabs and staircases execution									
	5	Cofraje placi/ Slabs formwork -inclusiv procurare ?		m2		"33.6"					
	5	Turnare beton C35/45- XC1- 0-16 mm- ciment conform plan- in placa/ Pouring concrete C35/45- XC1- 0-16 mm- plan according cement-		m3		126.82					
	5	Armatura BST 500 Clasa C/ Steel Reinforcement BST500 class C in slabs		kgr		"1.2"					
	5	Armatura pretensionata sau postensionata TPB ST1860 in placa/Pretensioned or postensioned Reinforcement TPB ST1860 in slabs		kgr		"5"					

Figure 3 Breaking cost item in instances according to the element class to be captured

What could be suggested is to use an algorithm that queries the element for the presence of these properties (not only in the QSet) and register the corresponding value, i.e.

Name	Quantity	Unit	Contract	Rate	Material Rate	Labor Rate	Subtotal	Property	Query
Design and build									
STRUCTURA									
Placa peste Parter GBA= 9.180 mp (+6.00)									
Execu?ie stalpi/ Columns execution									
Turnare beton C50/60- XC1- 0-16 mm- ciment conform plan- in stalpi/ Pouring concrete C50/60- XC1- 0-16 mm- plan according cement		m3		149,09				NetVolume	IfcColumn, IfcWall, location=Parter
Armatura BST 500 Clasa C in stalpi/ Steel Reinforcement BST500 class C in columns		m3		1,20				NetVolume	IfcColumn, IfcWall, location=Parter
Cofraie stalpi / Verticla elements formwork		m2		33.60				Oto ColumnBaseQuantities OuterSurfaceArea Oto WallBaseQuantities NetSideArea	IfcColumn IfcWall Incation=Parter

Figure 4: Property query with Pset Description

There could be a loop all around elements described in the query (selection) and an inner loop trying to match the property with the element property if it exists (resource hog!)

The second issue is that I could not use functions to describe the property quantity which could also rely in another Pset not a Qto one. I.e. In most of the cases we do not have time to model the rebar and for estimation purposes we rely on indices Kgr of rebar / m3 of concrete according to elements. This property can be introduced in Pset_ConcreteElementGeneral.ReinforcementVolumeRatio and using the NetVolume from the Qto Pset we could derive indirectly the rebar quantity.

So as the quote above mentions the use of "equations" is not available for the derivation of quantities indirectly from properties.

ConstructionMethod	In-Situ	
ExposureClass	XC1	
ReinforcementStrengthClass	BST500S C	
ReinforcementVolumeRatio	160.0	
StrengthClass	"C50/60"	
✓ Quantity Sets		
Custom Qto		~ +
ccurrence Quantities:		
▼ 🔂 Qto_ColumnBaseQuantities		
GrossSurfaceArea	20.096	
GrossVolume	3.7632	
Length	5880.0	
NetSurfaceArea	20.096	
NetVolume	3.7632	
OuterSurfaceArea	18.816	

Figure 5: Properties that can be used for the calculation of Rebar Quantities

▼ DB.2.4	STRUCTURA			438 413.39 RON
▼ XXX	Placa peste Parter GBA= 9.180 mp (+6.00)			438 413.39 RON
▼ XXX	Execu?ie stalpi/ Columns execution			438 413.39 RON
• XXX	Turnare beton C50/60- XC1- 0-16 mm- ci60- XC1- 0-16 mm- plan according cement	2196.19 m3	149.09 RON	327 429.46 RON
• XXX	Armatura BST 500 Clasa C in stalpi/ Steel Rclass C in columns	2196.19 m3	1.20 RON	2 635.42 RON 🔀
• XXX	Cofraje stalpi/ Columns formwork -i	3224.66 m2	33.60 RON	108 348.51 RON
• XXX	Cofraje stalpi/ Walls formwork -i	921.44 m2		0.00 RON
▼ XXX	Execu?ie grinzi/ Frame beams execution			0.00 RON
• XXX	Cofraje grinzi/ Beams formwork -inclusi			0.00 RON
• XXX	Turnare beton C35/45- XC1- 0-16 mm - ci/45- XC1- 0-16 mm - plan according cemen			0.00 RON
• XXX	Armatura BST 500 Clasa C/ Steel Reinforcem C in beams			0.00 RON
▼ XXX	Execu?ie pere?i nuclee si grinzi de cuplare/ Cores walls and beams execution			0.00 RON
• XXX	Cofraje pereti/ Walls formwork -inclusi			0.00 RON
• XXX	Turnare beton C50/60- XC1- 0-16 mm- ci60- XC1- 0-16 mm- plan according cement			0.00 RON
• XXX	Armatura BST 500 Clasa C/ Steel Reinforcems C in walls			0.00 RON
▼ XXX	Execu?ie placi - scari ?i atice/ Slabs and staircases execution			0.00 RON
• XXX	Cofraje placi/ Slabs formwork -inclusiv procur			0.00 RON
•				
IfcQuantityVolume				
NetVolume	8.54			~ Ø
Name:	NetVolume			
Description:				0
VolumeValue				8.54
Formula:	=Qto_ColumnBaseQuantities.NetVolume*PSet_ConcreteElementGeneral.Reinforcement	tVolumeRatio		

Figure 6: Use Of formula consisting of properties for the calculation of quantities

I have seen the analysis of using the material approach (through material density), but this approach falls short as types of elements contain different ratios of Rebar, i.e. Columns are around 150-160 Kgr/ m3, Slabs 100-120 Kgr/ m3, Beams 160-180 Kgr/m3 etc (depending always on the specifics of the analysis)

The third one is that It is still not clear to me of how I could implement the local Norms with resources in BONSAI, The workflow used is somewhat different. I.e a recipe contains all the resources and coefficients of use in order to produce 1 Unit of Measurement of the final product but from what I saw from @SigmaDimensions examples resource resources themselves are used and not the "Crew" or the "Subcontract" which I presume is what I am referring to with respect to recipes (line items).

So, the local Norms is a way of calculation where you have a certain type of work result that includes the detail breakdown of resources (labor, equipment, material, etc) for creating/generating / producing 1 unit of measurement (U.M.) of the described final product. I.e. if the Installation of the rebar (U.M. in Kgr) is the product, then the description of the Norm would be something like:

CC01A1			Installation of concrete steel reinforcements	kgr	
			d<18mm in foundations with plastic spacers		
	3803128	Material	Ordinary soft wire D = 1.12 OL 32 s 889	kgr	0.010
	6719093	Material	Concrete m.plasti.pt poz.arm.in spacer for beams	Pcs	0.150
	11131	Labor	Concrete – Steel Fixer cat.3	hr	0.015
	19931	Labor	Assembly Construction service worker cat.3	hr	0.003
	11111	Labor	Concrete – Steel Fixer cat.1	hr	0.015

Would that mean that I have to generate something like the following picture in BONSAI?

✓ Resource	irces							
6 R	esources Found							8
III.					<u> 1</u> 2			
		έY		*		•	2	
								0 🗄 🛯 🗡 🗙
v <u>2</u> 3	Installation of concrete steel reinford	cements d<18mm ir	foundations with plastic s	pacers				
•	Ordinary soft wire D = 1.12 OL 32	2 s 889						
•	Concrete m.plasti.pt poz.arm.in s	spacer for beams						
•	* Concrete – Steel Fixer cat.3							
· ·	* Assembly Construction service v	vorker cat.3						<u> </u>
•	* Concrete – Steel Fixer cat.1							♦
•								
								🕜 Resource Tools
Schedu	e Work	0	None h*		A Construction			
Schedul	e Usage	Ě			0 7			
10 cm	rent Broductivity Bate: 1.0. / 0:00:E4							
~ 0	Tent Productivity Rate: 1.0 / 0.00.54							

And then assign the "Installation of concrete steel reinforcements d<18mm in foundations with plastic spacers" as a resource to the cost item?

🔻 💁 Installation of concrete st	teel reinforcements d<18mm in foundations with plastic spacers				\$
🔻 🍨 Ordinary soft wire D =	1.12 OL 32 s 889				
🔹 📑 Concrete m.plasti.pt p	ooz.arm.in spacer for beams				
• 🛣 Concrete – Steel Fixer	cat.3				
• 🛣 Assembly Construction	on service worker cat.3				
🔹 🛣 Concrete – Steel Fixer	· cat.1				
•					
					D Resource Tools
•					W Resource roots
Resource type cannot have pre	oductivity data				
> Resource Quantity Sets					
> Resource Property Sets					
/ Cost					
Currently editing: CSV Import	[NOTDEFINED]	8	Disable E		
Schedule tools		Settings			
	↑ Export spreadsheet			Project Currency	B ^B Schedule Columns
	Assigned Inas	signed			
Cost Item Tools					
				✓ Edit + Ado	d + Copy × Delete
					D Az 🖳 🗞 🌶
	Tumare beton CE0/60 - XC1 - 0 - 16 mm - ci60 - XC1 - 0 - 16 mm -	plan according coment	2196.19 m3	149.09 RON	327 429 46 DON
• XXX	Armatura BST 500 Clasa C in stalpi/ Steel Re class C in columns		2196.19 m3	-	0.00 RON
• XXX	Cotraje stalpi/ Columns formwork		3224.66 m2	33.60 RON	108 348.51 RON
• ***	Corraje stalpi/ wails formwork		921.44 m2		0.00 RON
• ***	Execution	inclusi			0.00 RON
• ***	Turpara batan CZE/45 - XC1 - 0 - 14 mm - ci - /45 - XC1 - 0 - 14 mm	- Inclusi			0.00 RON
• XXX	Armatura BST 500 Class C/ Steel Peinforcem C in hears	plan according cemen			0.00 RON
• XXX	Executive perezi nuclee si grinzi de cuplare/ Cores walls and beams ever	cution			0.00 RON
• XXX	Cofraie pereti/ Walls formwork	-inclusi			0.00 RON
• XXX	Turnare beton C50/60- XC1- 0-16 mm- ci60- XC1- 0-16 mm-	plan according cement			0.00 RON
• XXX	Armatura BST 500 Clasa C/ Steel Reinforcems C in walls				0.00 RON
▼ XXX	Execu?ie placi- scari ?i atice/ Slabs and staircases execution				0.00 RON
• XXX	Cofraje placi/ Slabs formwork	-inclusiv procur			0.00 RON
• XXX	Turnare beton C35/45 - XC1 - 0 - 16 mm - ci5 - XC1 - 0 - 16 mm - p	lan according cement -			0.00 RON
• xxx	Armatura BST 500 Clasa C/ Steel Reinforcems C in slabs				0.00 RON
• xxx	Armatura pretensionata sau postensionata Tsioned Reinforcemen	t TPB ST1860 in slabs			0.00 RON
•					
✓ Cost Item Quantities					
a dost from quantities					
lements (198)	🍞 Tasks (0)		Resources (1)		S +
Show nested	Show nested		Show nested		
Vinnamed Element>.238	10.02m3 ×		Tinstallation of co	ncrete steel rundations with	n plastic spacers 0.00 🗙
Unnamed Element>.723	3.80m3 ×				
Vunnamed Element>.223	8.54m3 ×				
Netherson and Elements 70/	0.5/				