

Ross Griffin - 04 February 2020

HOW MODERN METHODS OF CONSTRUCTION CAN DELIVER GREATER COST CERTAINTY & OVERALL VALUE

A Quantity Surveyors Contribution

KOSMOS



Whether it is on-site or off-site construction, without good quality, unambiguous, clearly defined design material there is...

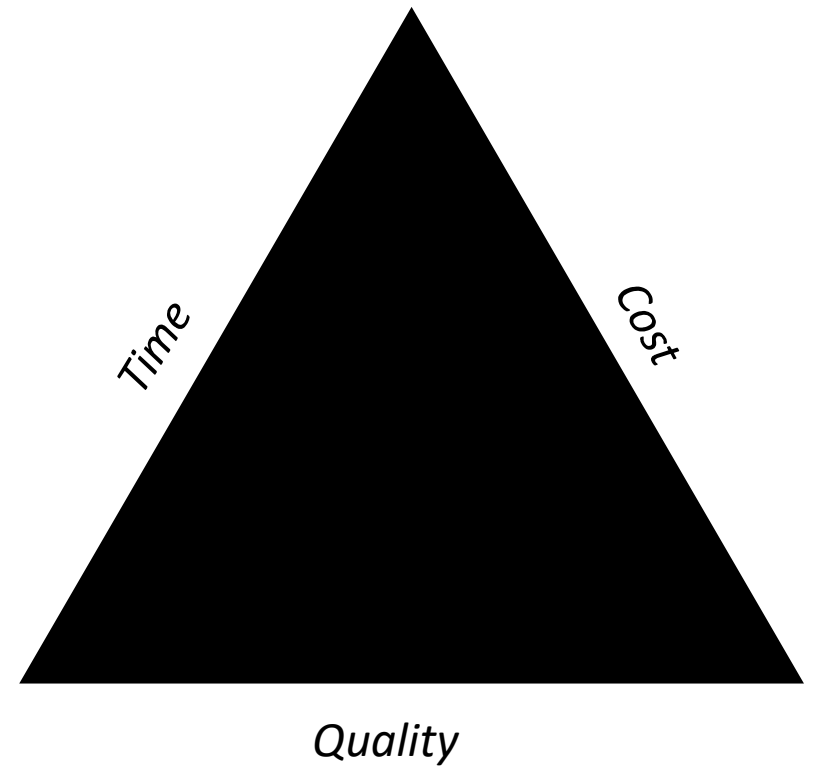
No Cost Certainty or Overall Value Creation

Modern methods through digitalisation

Digitalisation can increase speed and accuracy from a cost perspective....

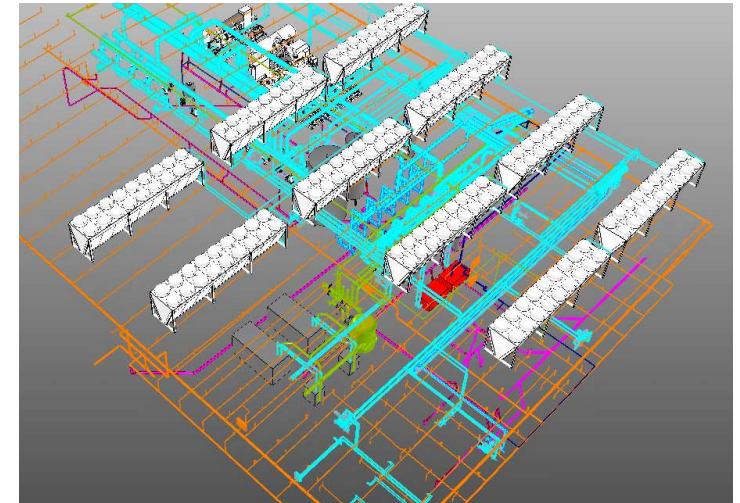
(if the information is good quality)

- Quality is everyone's responsibility



- The QS now needs to understand the digital design process

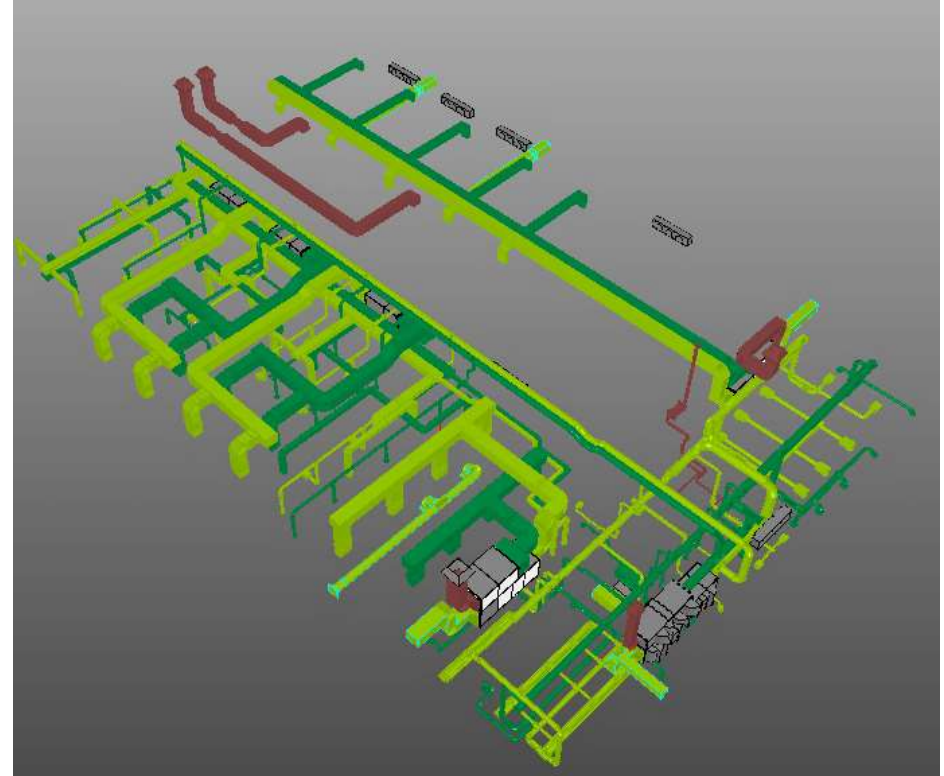
(modelling, Revit, ArchiCad, Tekla, Solebri, Navisworks)



09-10 Energy Center			
5	Services		
5.7	Ventilation		
5.7.1	Central Ventilation		
A:Code	B:Description	C:Quantity	D:Unit
	All equipment to be priced including valves, filters, accessories and the like shown in the diagrams as part of the equipment units and not listed as separate elements in the list below.		
	Chiller Central		
	<u>MX_09-10_2.02_M_AH01</u>		
	Primary Equipment		
	AHUs		
	I _MX_09-10_2.02_M_AH01	1	no
	Ventilation Ducts		
	Rectangular		
	Ducts		
	5712001_Rectangular_Duct (750x300)	46	m
	5712001_Rectangular_Duct (750x750)	118	m
	5712001_Rectangular_Duct (1545x855)	0.2	m
	5712001_Rectangular_Duct (1545x1160)	0.2	m
	Ducts Fittings		
	5712002_Duct_Rect_Bend (300x750-300x750)	10	no
	5712002_Duct_Rect_Bend (750x750-750x750)	10	no
	5712009_Duct_Rect_Tap (750x300-750x300)	10	no
	5712010_Duct_Rect_Reducer (800x800-750x750)	1	no
	5712010_Duct_Rect_Reducer (1545x855-750x750)	2	no
	5712010_Duct_Rect_Reducer (1545x1160-750x750)	2	no
	Duct ancillaries		

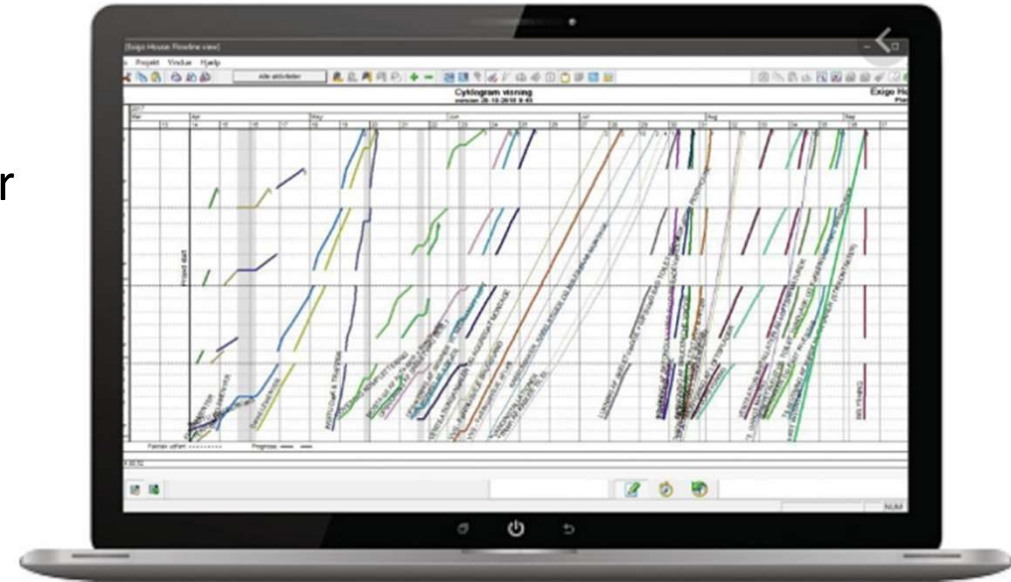
- 3D, 4D & 5D software solutions can offer endless possibilities

- **3D**, 4D & 5D software solutions can offer endless possibilities



- 3D, **4D** & 5D software solutions can offer endless possibilities

Location based scheduling/planning



- 3D, 4D & 5D software solutions can offer endless possibilities

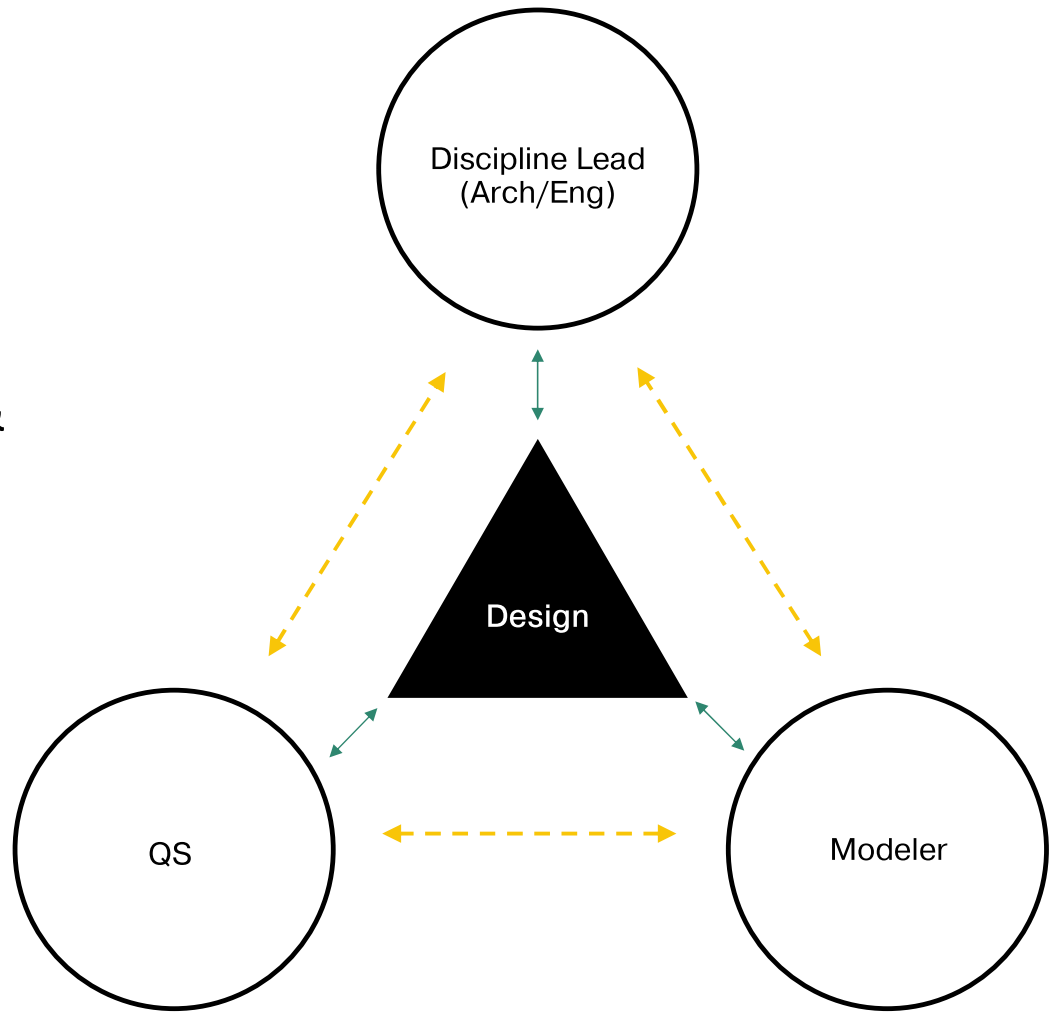
Code	Description	Quantity	Unit	Rate	Sub-Total	Factor	Total
P22	Cell =						
09-10	Energy Center						
5	Services						
5.7	Ventilation						
5.7.1	Central Ventilation						
A.Code	B.Description	C.Quantity	D.Unit	E.Rate	F.Subtotal	G.Total	H.Total
1	All equipment to be priced including valves, filters, accessories and the like shown in the diagrams as part of the equipment units and not listed as separate elements in the list below.						
2	Chiller Central						
3	MX_09-10_2.02_M_AH01						
4	Primary Equipment						
5	AHUs						
6	MX_09-10_2.02_M_AH01	1	no	800,000.00	800,000	800,000	800,000
7	Ventilation Ducts						
8	Rectangular						
9	Ducts						
10	5712001_Rectangular_Duct(750x300)	46	m	600.00	27,498	27,498	27,498
11	5712001_Rectangular_Duct(750x750)	118	m	630.00	74,353	74,353	74,353
12	5712001_Rectangular_Duct(1545x855)	0.2	m	661.50	132	132	132
13	5712001_Rectangular_Duct(1545x1160)	0.2	m	694.50	139	139	139
14	Ducts Fittings						
15	5712002_Duct_Rect_Bend(300x750-300x750)	10	no	450.00	4,500	4,500	4,500
16	5712002_Duct_Rect_Bend(750x750-750x750)	10	no	800.00	8,000	8,000	8,000
17	5712009_Duct_Rect_Tap(750x300-750x300)	10	no	840.00	8,400	8,400	8,400
18	5712010_Duct_Rect_Reducer(800x800-750x750)	1	no	882.00	882	882	882
19	5712010_Duct_Rect_Reducer(1545x855-750x750)	2	no	1,500.00	3,000	3,000	3,000
20	5712010_Duct_Rect_Reducer(1545x1160-750x750)	2	no	1,575.00	3,150	3,150	3,150
21	Duct ancillaries						
22	Shape?			N/A			
23	Damper						
24	5733008_Rect_Duct_Fire_Damper_750x750(750x750-750x750)	2	no	3,500.00	7,000	7,000	7,000
25	Inlet / Outlet Devices						
26	5771011_Exhaust_Hood_Rect_800x800(800x800)	1	no	5,000.00	5,000	5,000	5,000
27	5775012_AirTerminal_Grille_750x750(750x750)	1	no	5,000.00	5,000	5,000	5,000
28	Insulation and fire protection						

Greater cost certainty through data collection & automation

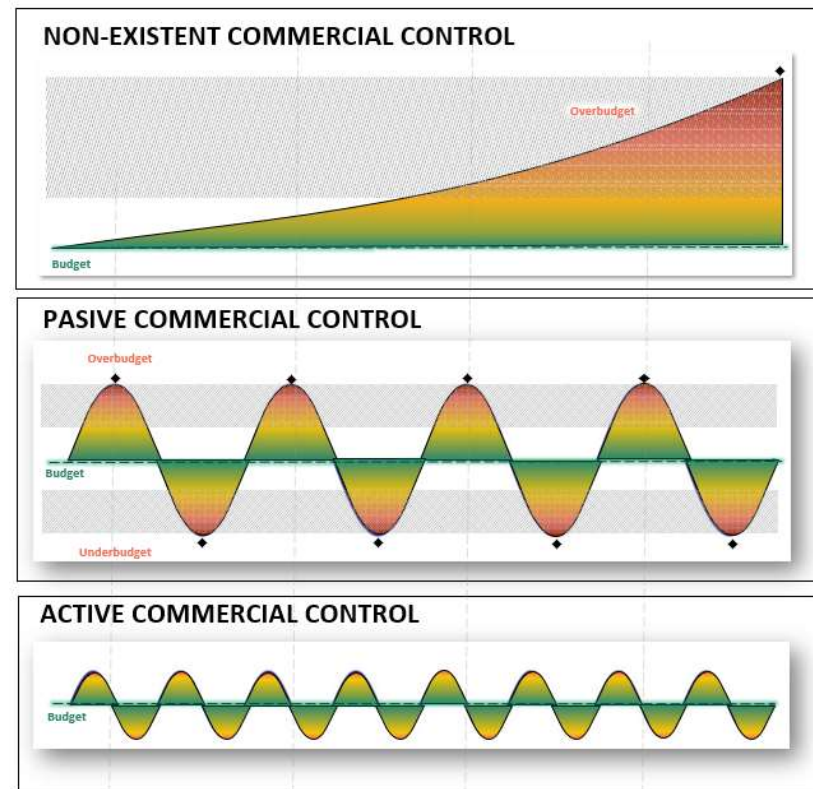
Early cost analysis using accurate Data

(Data collected in a standard format (ICMS, NRM1, SFB) digitally)

- Integrated 3D design where the QS & design team design together



- Continuous cost follow-up
(focusing on major cost drivers, risk items and impact of change on the design)



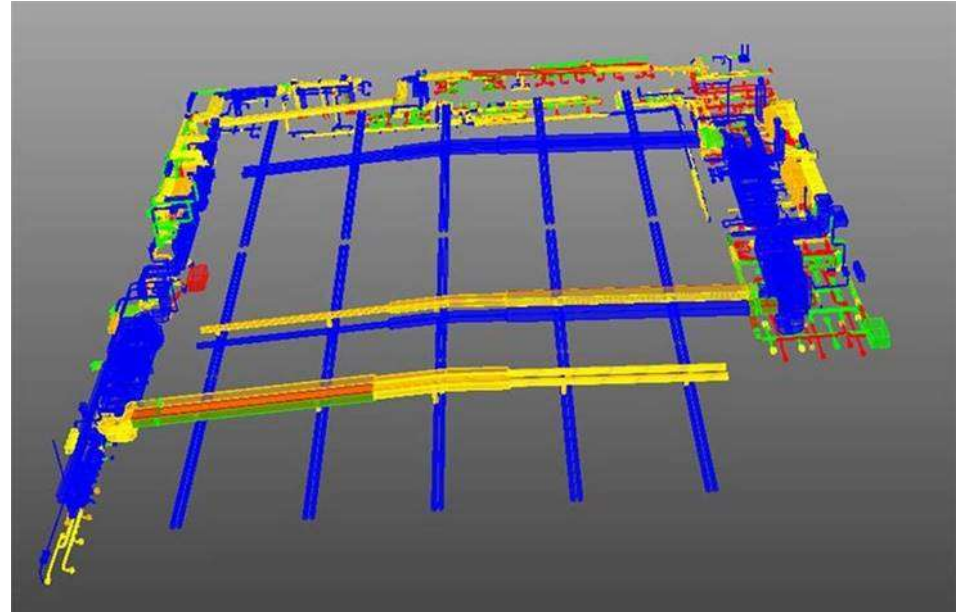
- Quick identification of change & cost impact technology

/ Blue matches the previous version.

/ Yellow is an element moved.

/ All the rest of the colours highlight changes

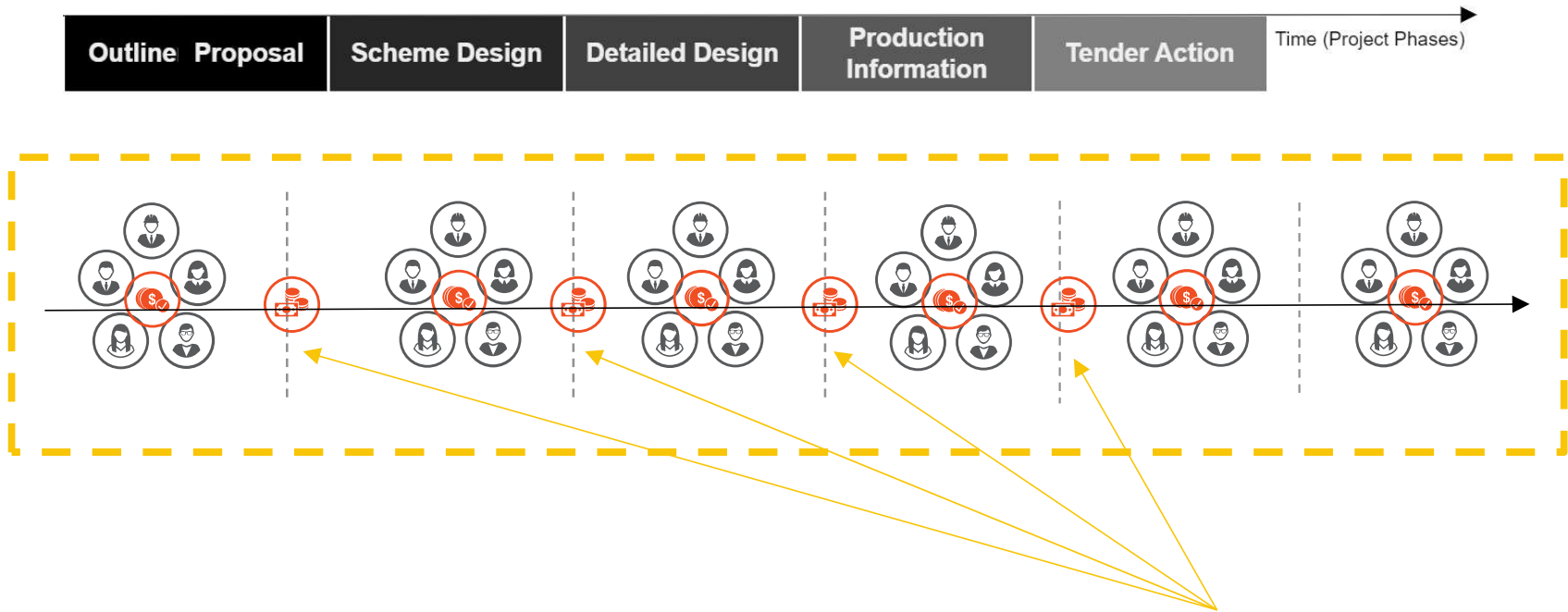
(red=removed; Green=added)



Greater overall value through collaboration

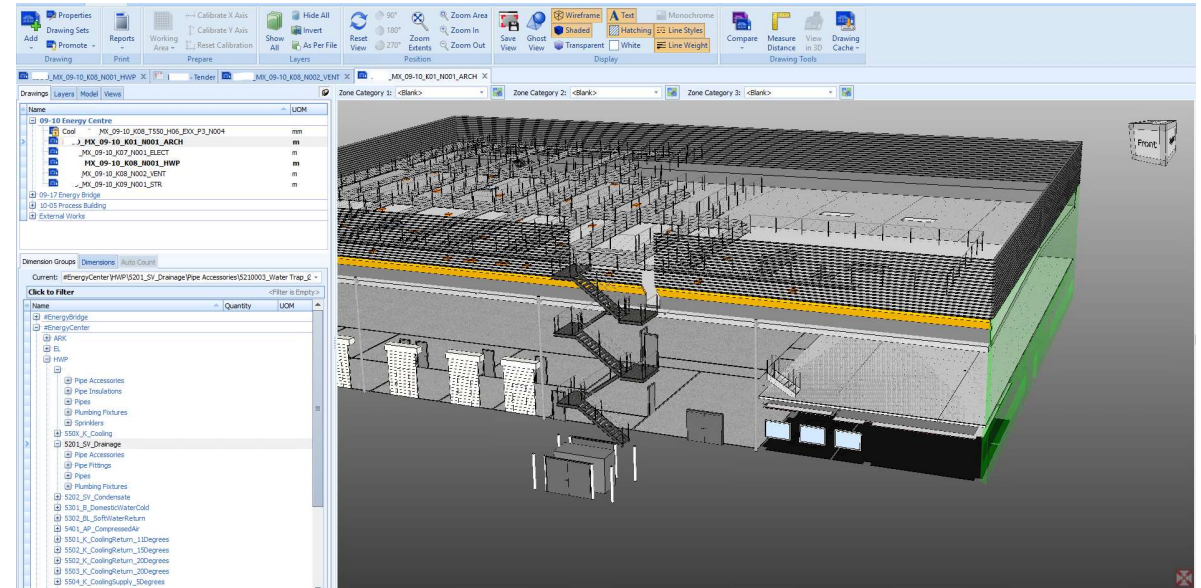
The QS is the final quality assurer of the design

Greater overall value through collaboration



QS are last to review design material before it is released

- The QS evaluates the quality of the models & its information



- The design team/disciplines review the cost estimates & BoQ

Collaborative delivery offers overall greater value, through higher quality

_MX_XX-XX_K00_C03_N001

BRIDGES (13-02 & 13-03)

Superstructure

Schedule of Works (SoW)

Code	Description	Spec.	Model Code	Quantity	Unit	Rate	Total (dkk)
2.3.4	Roof Drainage						1.375.708
	<u>Drainage system, gutters, overflow protection, downpipes</u>	K01_C08_N1001					
2.3.4.1	521001 200 mm Downpipes		521001	291,0	m	300	87.300
2.3.4.2	521002 Gutter incl. secondary steel		521002	585,6	m	2.200	1.288.408
2.3.5	Rooflights, Skylights and openings						181.000
	<u>Skylights</u>						
	<u>Smoke vents</u>						
2.3.5.1	Smoke vent system: The opening area of the smoke vents must be equal to 0,5% of the floor area			23,0	no	7.000	161.000
	<u>Sealing and caulking</u>						
2.3.5.2	Lump Sum			1,0	sum	20.000	20.000
2.3.6	Roof Features						250.000
	<u>Roof</u>						
	<u>Fall safety system</u>	K01_C08_N1001					
2.3.6.1	Complete fall safety system to roof			1,0	sum	250.000	250.000
2.5	External Walls						18.018.759
2.5.1	External Walls above ground						11.816.793
	<u>Façade</u>						
	<u>Trimo panel walls</u>	K01_C08_N1001					
2.5.1.1	Panels to 216003 - Light Outer Wall - 200 mm			5.934,0	m²	1.300	7.714.200
	<u>Flashing</u>						
2.5.1.2	Lump Sum			1,0	sum	70.000	70.000
	<u>Parapets</u>						
2.5.1.3	210001 Light parapet wall - 200 mm		210001	536,6	m²	1.300	697.519
2.5.1.4	Wall capping, to full extension of external wall			1.192,3	m	1.100	1.311.574
	<u>Sealing and connections</u>						
2.5.1.5	Lump Sum			1,0	sum	50.000	50.000
	<u>Façade ancillaries</u>						
	Cutting of openings for installations, ventilation ducting, drainage, including supporting structures, flashings, sealings and connections						

Rev. 0.1

17/12/2019

what are these? Are they not covered in trimo panels?

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Future

The Digital Quantity Surveyor will be driving cost certainty and value using technology in integrated and collaborative working teams

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