Conseil Européen des Economistes de la Construction
The European Council of Construction Economists
CEEC

An approach to control Construction Cost during Project Process

9 may 2025 – CEEC Spring Meeting – Madrid

Toni Floriach, Technical Architect

Member of:

gpcat gestió i direcció tècnica d'obres

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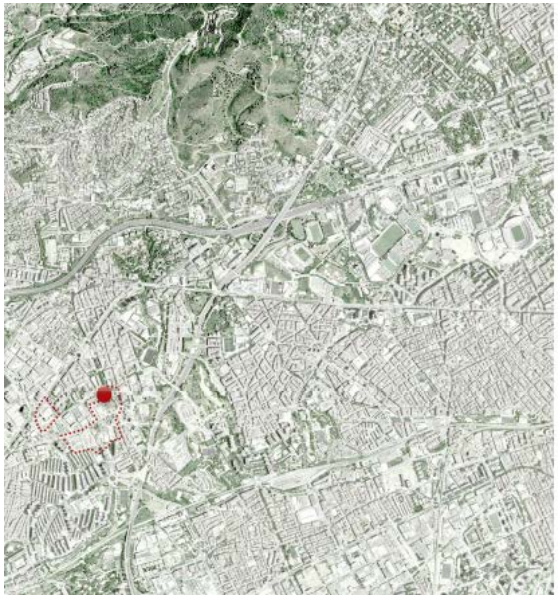
Framework of presentation

How can we assure a Cost Control from first steps of studying a Real State operation to final result



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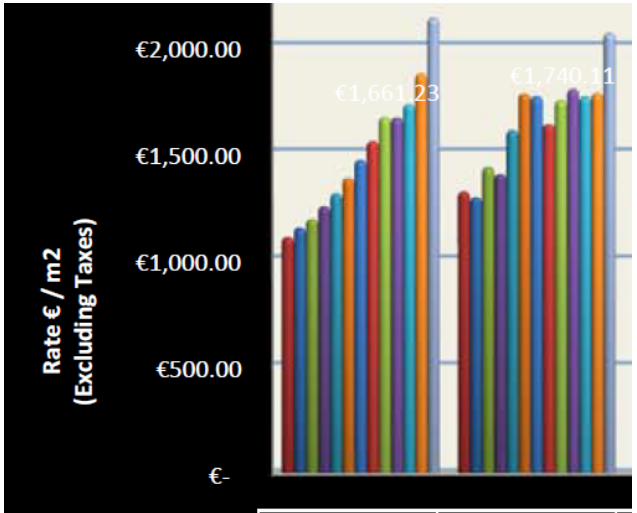
First Studies (I)

Step 1:

1. With actual cost models (ex: CEEC office Cost) and information from databases, we can have a first approach to the cost of a construction project, in initial phases (pre-project) **with 3 important precautions:**

- We must Update the cost with market updating
- We must use the adequate ratios of €/m2 with the correct type of Building we are going to construct
- We must correct the cost with the area and place of the Building we are going to construct

Ratio €/m2	m2	€
1.400,00	10.787,00	15.101.800,00 €



	Ireland	UK
2010 €/m2 Figures	€1,099.67	€1,312.44
2011 €/m2 Figures	€1,144.77	€1,285.92
2012 €/m2 Figures	€1,184.85	€1,427.96
2013 €/m2 Figures	€1,242.51	€1,394.96
2014 €/m2 Figures	€1,303.88	€1,599.68
2015 €/m2 Figures	€1,376.06	€1,772.65
2016 €/m2 Figures	€1,461.04	€1,759.22
2017 €/m2 Figures	€1,549.58	€1,629.25
2018 €/m2 Figures	€1,661.23	€1,740.11
2019 €/m2 Figures	€1,659.34	€1,792.82
2020 €/m2 Figures	€1,721.28	€1,757.57
2021 €/m2 Figures	€1,865.87	€1,775.15
2022 €/m2 figures	€2,126.68	€2,055.34

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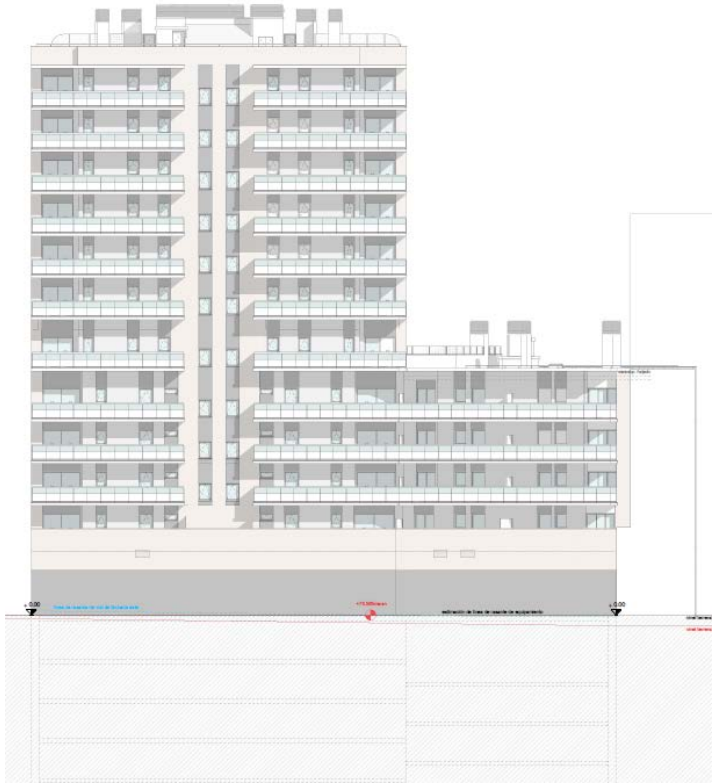
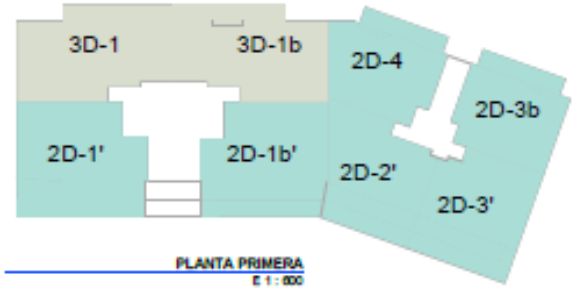
First Studies (II)

Second Step:

We can adjust the number once we know the first studies and use of spaces





	Ratio €/m2	m2	€
Underground	600,00	3.950,00	2.370.000,00 €
Overground	1.500,00	6.837,00	10.255.500,00 €
			12.625.500,00 €

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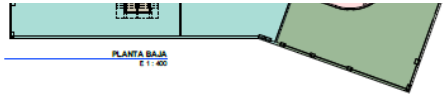
First Studies (III)

Third Step:

We can adjust more the number once we have a more accurate distribution of use and typology of spaces

	Ratio €/m2	m2	€
Housing	1.300,00	5.300,00	6.890.000,00 €
CommonSpaces	700,00	1.100,00	770.000,00 €
Commercial	450,00	425,00	191.250,00 €
Car Park	500,00	2.765,00	1.382.500,00 €
Common under	600,00	395,00	237.000,00 €
Other uses under	600,00	790,00	474.000,00 €
		10.775,00	**9.944.750,00 €**



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First Studies (IV)

Fourth step: Again, with a cost model, we can make a distribution of construction chapters, having a model of distribution of costs, and entering our third big number

	BUDGET BY CHAPTERS	REFERENCE		MY PROJECT	
01.00	EARTH WORKS	16.476,86 €	0,57%	57.051,72 €	0,57%
02.00	BASEMENTS	284.653,11 €	9,91%	985.621,55 €	9,91%
03.00	STRUCTURE	454.453,24 €	15,82%	1.573.560,56 €	15,82%
04.00	ROOF	74.627,87 €	2,60%	258.401,66 €	2,60%
05.00	WALLS AND FINISHINGS	592.599,13 €	20,63%	2.051.895,64 €	20,63%
06.00	CARPENTRY AND STEEL	244.243,37 €	8,50%	845.701,39 €	8,50%
07.00	GLASS	49.457,54 €	1,72%	171.248,50 €	1,72%
08.00	TILES AND FINISHINGS	128.992,68 €	4,49%	446.641,76 €	4,49%
09.00	PIPES	169.202,88 €	5,89%	585.871,01 €	5,89%
10.00	AIR CONDITIONING	318.948,90 €	11,11%	1.104.371,95 €	11,11%
11.00	ELECTRICITY	308.979,28 €	10,76%	1.069.851,78 €	10,76%
12.00	FIRE PROTECTION	15.088,59 €	0,53%	52.244,78 €	0,53%
13.00	ESPECIAL INSTALLATIONS	42.946,00 €	1,50%	148.702,06 €	1,50%
14.00	FURNITURE	152.311,09 €	5,30%	527.382,59 €	5,30%
15.00	EXTERIORS	19.119,82 €	0,67%	66.203,06 €	0,67%
		2.872.100,36 €	**100,00%**	**9.944.750,00 €**	**100,00%**

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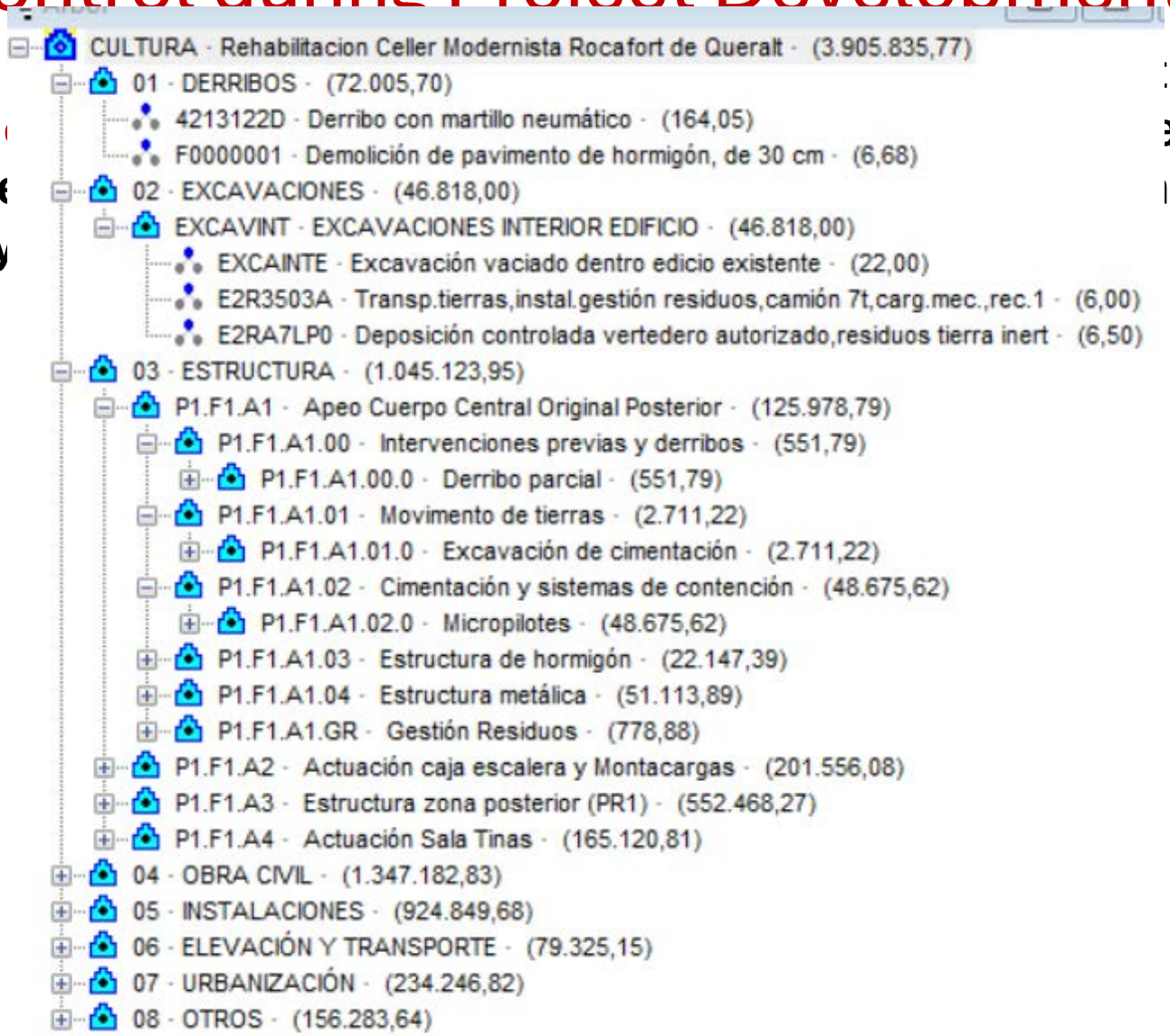
Control during Project Development

With **:hat at the final** **e budget, as we** **t (of every**



- CULTURA · Rehabilitacion Celler Modernista Rocafort de Queralt · (3.905.835,77)
  - 01 · DERRIBOS · (72.005,70)
    - 4213122D · Derribo con martillo neumático · (164,05)
    - F0000001 · Demolición de pavimento de hormigón, de 30 cm · (6,68)
  - 02 · EXCAVACIONES · (46.818,00)
    - EXCAVINT · EXCAVACIONES INTERIOR EDIFICIO · (46.818,00)
      - EXCAINTE · Excavación vaciado dentro edicio existente · (22,00)
      - E2R3503A · Transp.tierras,instal.gestión residuos,camión 7t,carg.mec.,rec.1 · (6,00)
      - E2RA7LP0 · Deposición controlada vertedero autorizado,residuos tierra inert · (6,50)
  - 03 · ESTRUCTURA · (1.045.123,95)
    - P1.F1.A1 · Apeo Cuerpo Central Original Posterior · (125.978,79)
      - P1.F1.A1.00 · Intervenciones previas y derribos · (551,79)
        - P1.F1.A1.00.0 · Derribo parcial · (551,79)
      - P1.F1.A1.01 · Movimento de tierras · (2.711,22)
        - P1.F1.A1.01.0 · Excavación de cimentación · (2.711,22)
      - P1.F1.A1.02 · Cimentación y sistemas de contención · (48.675,62)
        - P1.F1.A1.02.0 · Micropilotes · (48.675,62)
      - P1.F1.A1.03 · Estructura de hormigón · (22.147,39)
      - P1.F1.A1.04 · Estructura metálica · (51.113,89)
      - P1.F1.A1.GR · Gestión Residuos · (778,88)
    - P1.F1.A2 · Actuación caja escalera y Montacargas · (201.556,08)
    - P1.F1.A3 · Estructura zona posterior (PR1) · (552.468,27)
    - P1.F1.A4 · Actuación Sala Tinas · (165.120,81)
  - 04 · OBRA CIVIL · (1.347.182,83)
  - 05 · INSTALACIONES · (924.849,68)
  - 06 · ELEVACIÓN Y TRANSPORTE · (79.325,15)
  - 07 · URBANIZACIÓN · (234.246,82)
  - 08 · OTROS · (156.283,64)

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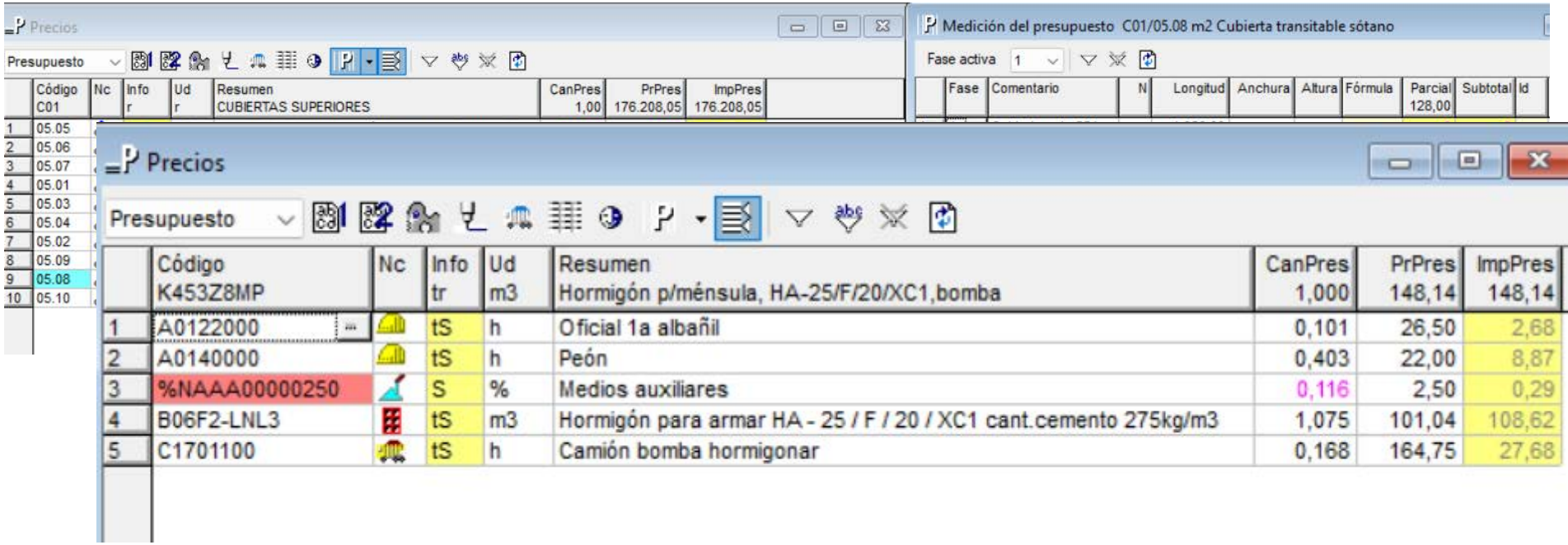
Control during Project Development

With actual software tools and methods, we can agree that at the final of the process we can have a good approach to the budget , as we can have detailed measurements of every element (of every ?), and apply simple or more accurate prices



But this is at the at the final of the process

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Control during Project Development

The proposal is to begin with big EASY measurements or subsystems to initiate the control of the adaptation of the design (THE RENDER) to the chapters of the budget, in early steps. The first step of the process is to obtain chapter ratios

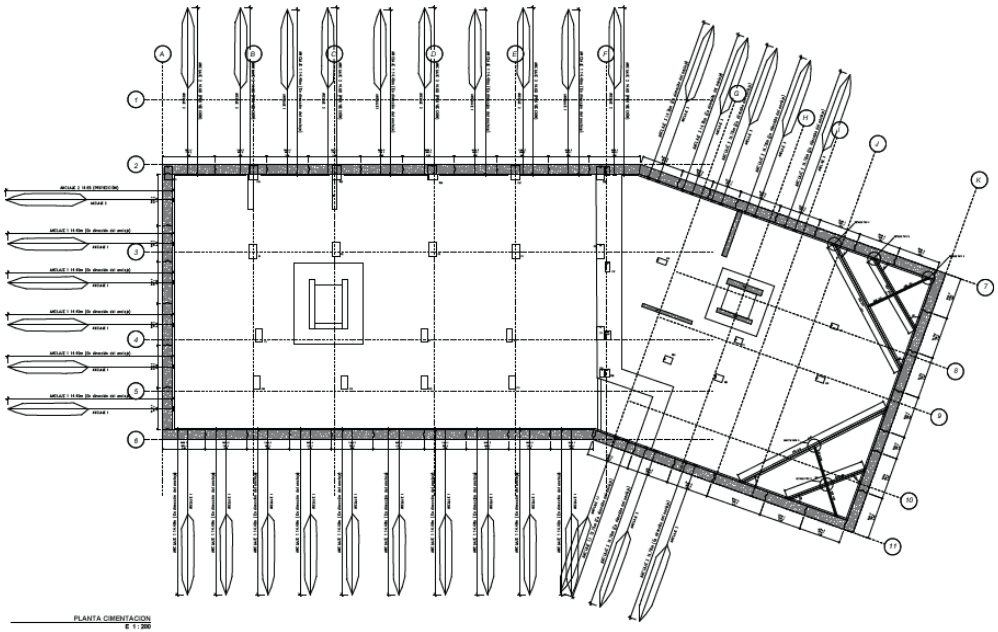
Control during Project Development

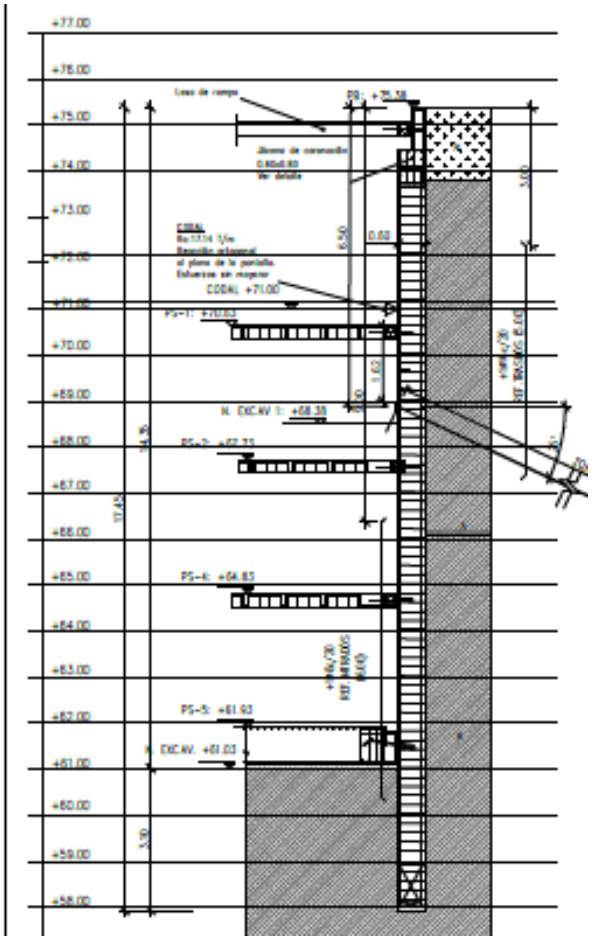
	REFERENCE			PROJECT		
	€	%	€/m2	€	%	€/m2
EARTH WORKS	744.396,06	11,04	186,10	745.856,25	7,50	114,75
STRUCTURES						
BASEMENTS AND EXTERNAL WALLS	1.121.676,01	16,63	280,42	1.342.541,25	13,50	206,54
STRUCTURE - SLABS	976.666,94	14,48	244,17	1.591.160,00	16,00	244,79
ROOFS AND WATERPROFFING	219.484,37	3,25	54,87	397.790,00	4,00	61,20
FAÇADES	739.104,42	10,96	184,78	1.089.944,60	10,96	167,68
WALL FINISHINGS	301.540,18	4,47				
PAVEMENTS	395.065,33	5,86				
CARPENTRY						
WOOD DOORS	86.752,89	1,29				
WARDROBES	7.819,47	0,12				
ALUMINIUM WINDOWS	137.269,69	2,04				
SUN ALUMINIUM PROTECNTIONS	84.788,18	1,26				
STEEL WORK	62.138,44	0,92				
PAINTINGS	140.416,39	2,08				
GLASS	66.377,41	0,98				
INSTALLATIONS						
CAR PARK INSTALLATIONS	509.371,19	7,55	127,34	750.828,63	7,55	115,51
GAS	9.577,67	0,14	2,39	13.922,65	0,14	2,14
ELECTRICITY	215.815,01	3,20	53,95	397.790,00	4,00	61,20
COMMUNICATIONS AND DATA	30.259,84	0,45	7,56	49.723,75	0,50	7,65
WATER PIPES	121.268,32	1,80	30,32	198.895,00	2,00	30,60
PIPES	93.561,22	1,39	23,39	139.226,50	1,40	21,42
VENTILATION	79.215,16	1,17	19,80	119.337,00	1,20	18,36
AIR CONDITIONING	234.421,67	3,48	58,61	355.027,58	3,57	54,62
EQUIPMENTS						
SANITARY ELEMENTS	40.989,31	0,61	10,25	60.662,98	0,61	9,33
EQUIPEMENTS	120.231,73	1,78	30,06	177.016,55	1,78	27,23
LIFTD	55.178,98	0,82	13,79	81.546,95	0,82	12,55
OTHER	51.391,08	0,76	12,85	75.580,10	0,76	11,63
ON SITE SAFETY	98.909,63	1,47	24,73	146.187,83	1,47	22,49
TOTAL ESTIMATION BUDGET	**6.743.686,60**	**100,00**	**1.685,92**	**9.944.750,00**	**100,00**	**1.529,96**

1.342.541,25 13,50 206,54
1.591.160,00 16,00 244,79
397.790,00 4,00 61,20
1.089.944,60 10,96 167,68
596.685,00 6,00 91,80
646.408,75 6,50 99,45

Control during Project Development

UNDERGROUND STRUCTURE			
Item	**Measure**	**Unit Price**	**Ammount**
External wall	1.200,00	350,00 €	420.000,00 €
m3 concrete basement	2.500,00	380,00 €	950.000,00 €
Waterproffing			
External wall	1.200,00	20,00 €	24.000,00 €
perimeter	117,00	18,00 €	2.106,00 €
		Total subsystem	**1.396.106,00 €**
Ratio €/m2	**186,70 €**		
Refference Ratio	**206,54 €**		





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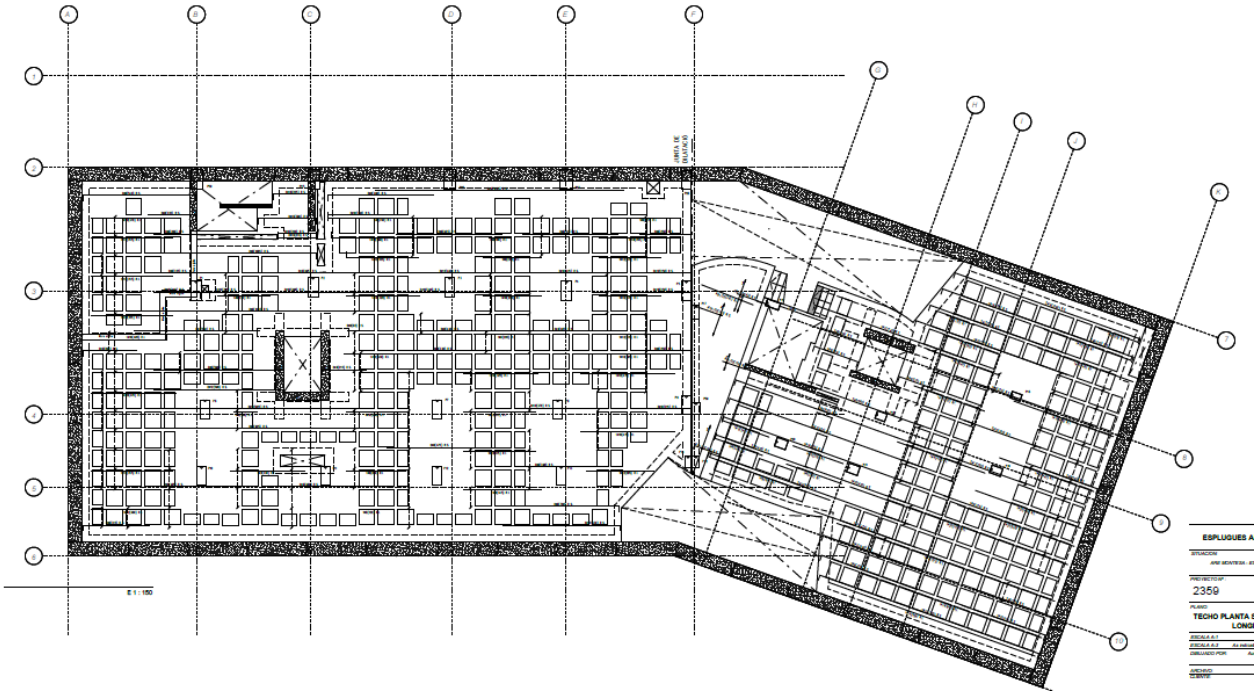
Control during Project Development

STRUCTURE			
Item	**Measure**	**Unit Price**	**Ammount**
Slab 1	1.100,00	190,00	209.000,00
Slab 5	790,00	250,00	197.500,00
Slab 2-11	4.910,00	180,00	883.800,00
		Total subsystem	**1.290.300,00**
Ratio €/m2	**189,75 €**		
Refference Ratio	**244,79 €**		



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FAÇADES			
Item	**Measure**	**Unit Price**	**Ammount**
Ventilated System	1500	180,00	270.000,00
External insulation system	1300	60,00	78.000,00
			348.000,00
Ratio €/m2	**96,43 €**		
Refference Ratio	**62,05 €**		

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Control during Project Development

As the project progresses, we can have a comparative table that evolves with the development of it

	PROJECT REF.		€/m2 BUDGET	€/m2 CHECKED			Ràtio/m2 checke	
Partida/Capitol	**€**	**€/m2**			**€**	**Unit price**		**Item**
EARTH WORKS	**744.396,06**	**186,10**	**114,75**	**40,50**	**187.200,00**			**EARTH WORKS**
STRUCTURES	**2.098.342,95**	**524,59**	**451,34**	**376,45**	**2.686.406,00**			**STRUCTURES**
BASEMENTS AND EXTERNAL WALLS	1.121.676,01			186,70	1.396.106,00			BASEMENTS AND EXTERNAL WALLS
STRUCTURE - SLABS	976.666,94			189,75	1.290.300,00			STRUCTURE - SLABS
ROOFS	**219.484,37**	**54,87**	**61,20**	**51,91**				**ROOFS**
Roof finishing	53.047,54	13,26		1,15	7.497,00			Balconys
				18,28	118.841,52	100	1.784,000	Roof
				18,28	118.841,52			Roof finish
				1,40	9.117,72			gravel finisdh
				4,99	32.432,00	8,00	4.054,00	Façades insulation
				7,80	50.710,00			Solar panels
Walls	**739.104,42**	**184,78**	**167,68**	**117,09**				**WALLS**
				41,54	270.000,00			Ventilated Façade
				52,24	339.584,85	45,00	7.546,330	main brick walls
				23,31	151.497,00	25,00	6.059,880	gypsum bord walls
FINISHINGS	**301.540,18**	**75,39**	**91,80**	**62,02**				**REVESTIMENTS**
				11,16	72.564,80	28,00	2.591,60	gypsum bord walls
				22,11	143.685,00	25,00	5.747,400	Ceilings
				20,15	130.944,00	40,00	3.273,600	Toilette tiles
				5,07		3,00	1,690	wall paintings
				3,54		3,00	1,180	ceiling paintings

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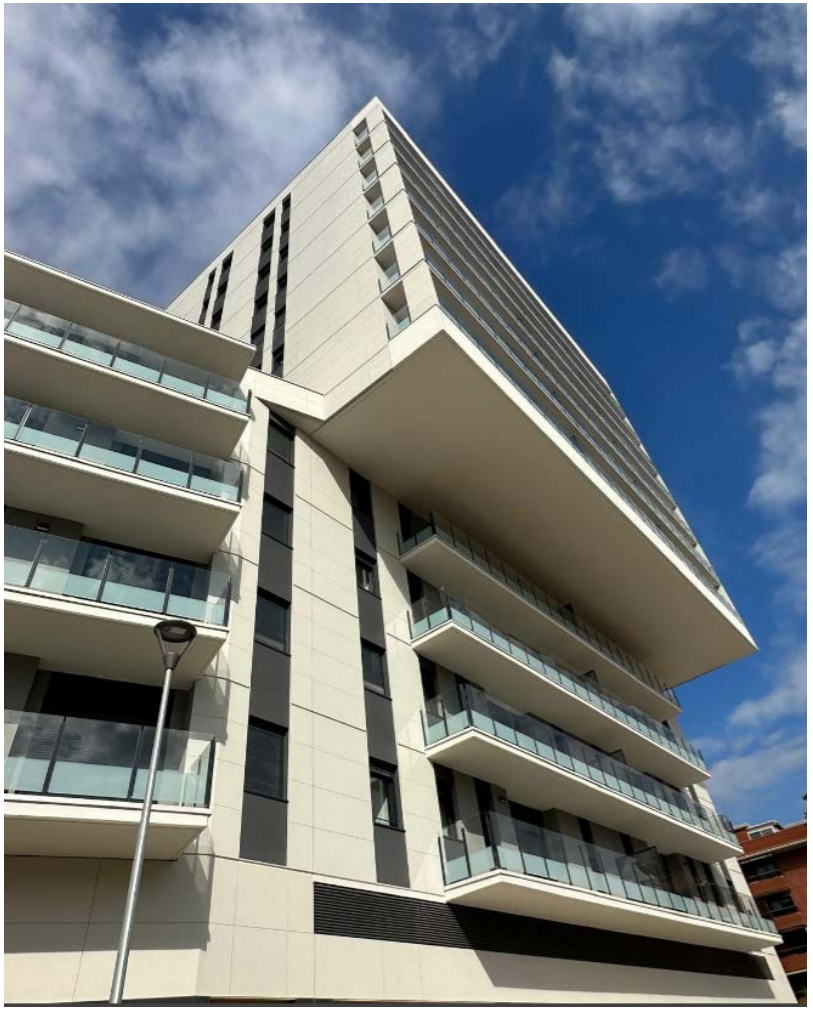
Conclusion

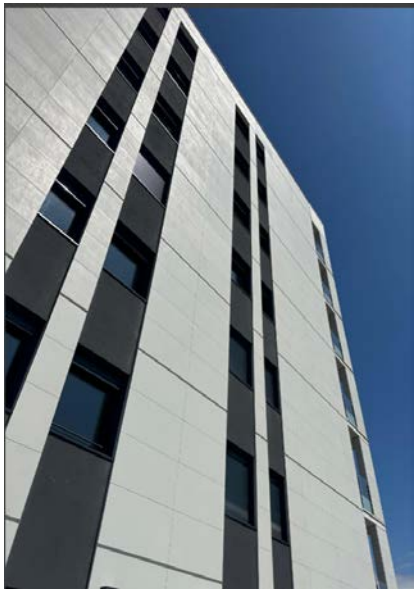
- **we can approximate the final cost in the first steps**
- **Partial ratios are useful for adjusting the project during its development**
- **Having a good cost model, as close to the project as possible, is of great importance. At this point, your own ratios are key to the process.**



The future

BIM MODELS WILL HELP?

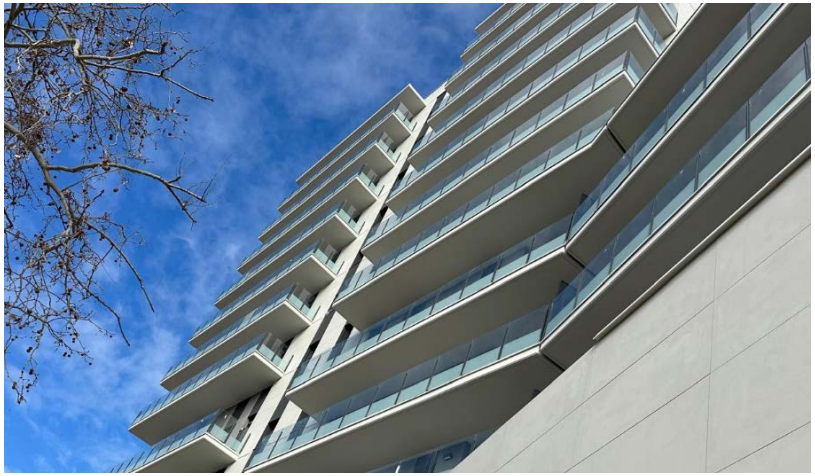
- **We can have measurments sooner in the process**
- **What is not modelled, is not measured**



AND WHAT ABOUT AI ?

- **Again, we need models and ratios to feed it**

IN THIS POINT, THE IMPORTANCE OF AN EXPERIENCED QS MAKES THE DIFFERENCE



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Thank You for you attention

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