



COMPASS
INTERNATIONAL INC.

SAMPLE

**2024
INTERNATIONAL
HI-TECH/
MANUFACTURING/
CLEANROOM**



V ACKNOWLEDGEMENTS

01 Section 1

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FACILITY TYPE	TOTAL INSTALLED \$ COST PER GROSS SF - LOW VALUE	TOTAL INSTALLED \$ COST PER GROSS SF - HIGH VALUE	TOTAL INSTALLED \$ COST PER GROSS M2 - LOW VALUE	TOTAL INSTALLED \$ COST PER GROSS M2 - HIGH VALUE
CONTINUED				
Flavors & Fragrances Blending Facility (UK Facility 33,500 SF)	255	341	2,748	3,664
Fill finish inhalants facility (ISO 8 and non classified areas)	1,021	1,156	10,991	12,442
Food / Drinks / Gum R&D and Production facility	455	549	4,898	5,909
Formulation / fill / lypolizer facility (ISO 7 - 8 and some non classified areas)	1,051	1,246	11,304	13,409
GMP Process Area (ISO - 7 - 8 and some non classified areas)	1,021	1,142	10,991	12,286
GMP Process Area (ISO - 5 - 6 and some non classified areas)	1,135	1,372	12,215	14,765
Heavy construction machinery high bay robotic manufacturing facility	248	349	2,673	3,758
Hospital (5 Floors - 320,000 SF)	319	483	3,435	5,192
H1N1 Vaccine R&D - Production facility (ISO 8 and some non classified areas 220,000 SF)	1,206	1,408	12,977	15,155
Light Fixture Manufacturing Facility (68,450 SF)	262	364	2,822	3,914
Marine / Ocean Research & Development facility (14,700 SF)	631	778	6,794	8,373
Medical Device Facility (ISO - 7 & 8 and some non classified areas) Implants / stents	1,021	1,156	10,991	12,442

Typical Breakout of Cost as an Overall % of Laboratory Facility

COST % BY CONSTRUCTION CATEGORY FOR A NEW LABORATORY / R&D FACILITY

CATEGORY	% RANGE	% AVERAGE
CIVIL / ARCHITECTURAL TRADES		
General Conditions / Preliminaries	4.00 - 6.00	4.90
Excavation / Site Work / Piling / Caissons	1.50 - 3.50	2.90
Concrete Foundations / SOG / Elevated Flatwork	2.00 - 3.50	3.00
Superstructure (Load bearing walls / Structural Steel)	6.50 - 9.50	8.60
Exterior Closure (Curtain walls, Pre-cast Concrete, Facing bricks, Dryvit or a combination of all - note exterior doors are in this value)	5.50 - 8.50	7.80
Roofing system	1.00 - 2.50	1.50
Interior Construction (Drywall, Flooring, Ceilings, Internal Doors, Painting, Carpet, Floor finishes)	8.50 - 13.50	12.30
Elevators	0.50 - 1.50	0.80
Sub Total Civil / Architectural Trades		41.80
MECHANICAL / ELECTRICAL TRADES		
Plumbing / any process related piping	7.50 - 12.50	10.50
Fire Protection	1.00 - 2.50	1.90
HVAC (AHU & Ductwork)	17.00 - 25.00	21.40
Electrical Systems	9.50 - 13.50	11.40
Building Automation / Security / CCTV / Card Readers	1.75 - 3.75	2.80
Sub Total Mechanical / Electrical Trades		48.00
OTHER COSTS		
Equipment (Minor)	0.50 - 2.00	1.30
Casework / Fume Hoods / Cold Boxes	5.50 - 10.50	8.90
Sub Total Other Costs		10.20
TOTAL		100.00

Excludes

- Major site works outside the footprint of the building / facility, including roads and parking areas
- Land purchase
- A / E and CM costs including Owner engineering activities etc
- Demolition / asbestos / lead paint removal
- Any major production equipment
- Note: site indirect costs (construction equipment, supervision etc pro-rated into above percentage values).

The following cost models / facility benchmarks are based on completed or substantially completed projects, additional cost models are to be found in Section 2 of this publication.

- see following pages

(A) Typical Cost distribution by major Construction Category specific to R&D– Pilot Plant Facility (designed to ISO Class 7 - 10,000 - 4,400 SF and ISO Class 8 – 100,000 - 76,500 SF)

- 121,500 SF / 11,290 M2 on 2 Floors 2008 Cost of \$424 SF / \$4,564 M2
- see chart following.

2.0 Agricultural R&D Center

1 FLOOR, 18 FT STORY HEIGHT, 72,600 SQUARE FEET SF (INCLUDES 6,000 SF GREENHOUSE)

EXTERIOR	COST PER SQUARE FOOT - M2
Brick, concrete block back-up steel frame	\$340 - \$3,658
Pre cast panels, steel frame	\$350 - \$3,766
Metal and Glass or Stone Curtain wall	\$370 - \$3,980

Building / Facility Type: Agriculture R&D

DATA TABLE

CSI DIVISION	DESCRIPTION	% RANGE OF COST	REMARKS
1	General Requirements	7 - 9	Gen Conditions / Preliminaries
2	Site Construction	7.5 - 8.25	
3	Concrete	5.5 - 6.25	
4	Masonry	3 - 4	
5	Metals	3 - 4	
6	Wood & Plastics	3 - 5	
7	Thermal & Moisture Protection	6 - 8	
8	Doors & Windows	4 - 6	
9	Finishes	8.5 - 9.5	
10	Specialties	1 - 1.5	
11	Equipment	0.50 - 1	Excludes Production Equipment
12	Furnishings	0.50 - 0.75	
13	Special Construction	0.50 - 0.75	
14	Conveying Systems	1.50 - 2	
15	Mechanical	30 - 35	
16	Electrical	10 - 11	
	TOTAL PERCENTAGE	100.00	
	A / E Fees	7.50 - 15.00	Percentage of Construction Cost
	CM Fees	5.00 - 7.50	Percentage of Construction Cost

Excludes: New utilities outside building footprint, parking areas, roads, gatehouses, fencing, landscaping, and demolition of existing facilities:

18.0 Food Production Facility

2 STORY, 14 FEET STORY HEIGHT, 73,000 SQUARE FEET

EXTERIOR	COST PER SQUARE FOOT - M2
Stone veneer, block back-up, steel frame	\$190 - \$2,044
Brick, concrete block back-up	\$197 - \$2,012
Decorative concrete block, steel frame	\$185 - \$1,990
Insulated metal panel, steel frame	\$188 - \$2,023

Building / Facility Type: Food Production

DATA TABLE

CSI DIVISION	DESCRIPTION	% RANGE OF COST	REMARKS
1	General Requirements	9 - 10	Gen Conditions / Preliminaries
2	Site Construction	8 - 11	
3	Concrete	7 - 8	
4	Masonry	3 - 4	
5	Metals	5 - 6	
6	Wood & Plastics	4 - 6	
7	Thermal & Moisture Protection	6 - 8	
8	Doors & Windows	4 - 5	
9	Finishes	9 - 10	
10	Specialties	1 - 1.5	
11	Equipment	0.50 - 1	Excludes Production Equipment
12	Furnishings	0.50 - 0.75	
13	Special Construction	0.50 - 0.75	
14	Conveying Systems	1.50 - 2	
15	Mechanical	22 - 27	
16	Electrical	10 - 11	
	TOTAL PERCENTAGE	100.00	
	A / E Fees	6.50 - 9.50	Percentage of Construction Cost
	CM Fees	3.00 - 6.50	Percentage of Construction Cost

EXCLUDES: New utilities outside building footprint, parking areas, roads, gatehouses, fencing, landscaping, and demolition of existing facilities:

22.0 Hospital Medical Plaza / Outpatients

2 STORY, 12 FT STORY HEIGHT, 28,000 SQUARE FEET

EXTERIOR	COST PER SQUARE FOOT - M2
Brick, concrete block back-up	\$320 - \$3,443
Pre cast panels, steel frame	\$310 - \$3,336
Decorative concrete block,	\$300 - \$3,228

Building / Facility Type: Hospital / Medical Plaza

DATA TABLE

CSI DIVISION	DESCRIPTION	% RANGE OF COST	REMARKS
1	General Requirements	7 - 9	Gen Conditions / Preliminaries
2	Site Construction	7.5 - 8.25	
3	Concrete	5.5 - 6.25	
4	Masonry	3 - 4	
5	Metals	3 - 4	
6	Wood & Plastics	3 - 5	
7	Thermal & Moisture Protection	6 - 8	
8	Doors & Windows	4 - 6	
9	Finishes	8.5 - 9.5	
10	Specialties	1 - 1.5	
11	Equipment	0.50 - 1	Excludes Medical Equipment
12	Furnishings	0.50 - 0.75	
13	Special Construction	0.50 - 0.75	
14	Conveying Systems	1.50 - 2	
15	Mechanical	30 - 35	
16	Electrical	10 - 11	
	TOTAL PERCENTAGE	100.00	
	A / E Fees	4.50 - 8.00	Percentage of Construction Cost
	CM Fees	3.00 - 5.50	Percentage of Construction Cost

EXCLUDES: New utilities outside building footprint, parking areas, roads, gatehouses, fencing, landscaping and demolition of existing facilities, furniture and bench top equipment:

38.0 Pharmaceutical Development Facility

2 FLOORS, 17 FT STORY HEIGHT, 78,000 SQUARE FEET (10% - 20% ISO # 8 & 9)

EXTERIOR	COST PER SQUARE FOOT - M2
Brick, concrete block back-up steel frame	\$625 - \$6,725
Pre cast panels, steel frame	\$635 - \$6,835
Metal and Glass or Stone Curtain wall	\$655 - \$7,050

Building / Facility Type: Pharmaceutical Development

DATA TABLE

CSI DIVISION	DESCRIPTION	% RANGE OF COST	REMARKS
1	General Requirements	7 - 9	Gen Conditions / Preliminaries
2	Site Construction	7.5 - 8.25	
3	Concrete	5.5 - 6.25	
4	Masonry	3 - 4	
5	Metals	3 - 4	
6	Wood & Plastics	3 - 5	
7	Thermal & Moisture Protection	6 - 8	
8	Doors & Windows	4 - 6	
9	Finishes	8.5 - 9.5	
10	Specialties	1 - 1.5	
11	Equipment	0.50 - 1	Excludes Production Equipment
12	Furnishings	0.50 - 0.75	
13	Special Construction	0.50 - 0.75	
14	Conveying Systems	1.50 - 2	
15	Mechanical	30 - 35	
16	Electrical	10 - 11	
	TOTAL PERCENTAGE	100.00	
	A / E Fees	7.50 - 14.50	Percentage of Construction Cost
	CM Fees	5.00 - 7.50	Percentage of Construction Cost
	Validation	1.00 - 5.00	Percentage of Construction Cost

EXCLUDES: New utilities outside building footprint, parking areas, roads, gatehouses, fencing, landscaping, and demolition of existing facilities:

Piping CONTINUED

DIAMETER	\$ MATERIAL COST PER LF	\$ M-H COST PER LF	\$ COST PER LF	\$ MATERIAL COST PER M	\$ M-H COST PER M	\$ COST PER M
CPVC Straight run / OSBL Piping						
2" / 50 mm	8.11	24.15	32.26	26.59	79.22	105.81
3" / 75 mm	16.23	43.91	60.14	53.23	144.03	197.26
4" / 100 mm	30.42	65.89	96.30	99.76	216.10	315.86
6" / 150 mm	40.56	87.84	128.40	133.04	288.12	421.16
Add 4.5% - 7.5% to labor & material costs for hangars, bolts, gaskets & testing						
SS Tubing - 304 - 10 S / 40 S Complicated / Intricate (ISBL - Inside Facility) Piping - Numerous changes in direction						
1/8" / 3 mm	8.01	9.66	17.67	26.27	31.69	57.96
1/4" / 6 mm	18.82	23.42	42.24	61.72	76.82	138.54
1/2" / 12 mm	27.88	33.60	61.47	91.43	110.20	201.63
3/4" / 18 mm	31.36	40.73	72.09	102.86	133.60	236.46
Add 4.5% - 7.5% to labor & material costs for hangars, bolts, gaskets & testing						
SS Tubing - 304 - 10 S / 40 S Straight run / OSBL Piping						
1/8" / 3 mm	4.00	6.43	10.44	13.13	21.09	34.23
1/4" / 6 mm	9.02	14.64	23.66	29.58	48.01	77.60
1/2" / 12 mm	13.94	22.40	36.34	45.72	73.46	119.18
3/4" / 18 mm	15.69	25.45	41.14	51.45	83.49	134.94
Add 4.5% - 7.5% to labor & material costs for hangars, bolts, gaskets & testing						
FRP - Epoxy Complicated / Intricate (ISBL - Inside Facility) Piping - Numerous changes in direction						
2" / 50 mm	159.09	66.36	225.45	521.82	217.67	739.49
3" / 75 mm	162.48	107.20	269.68	532.93	351.63	884.56
4" / 100 mm	176.02	122.52	298.54	577.33	401.87	979.21
6" / 150 mm	192.94	224.61	417.55	632.85	736.72	1,369.57
8" / 200 mm	220.02	275.67	495.68	721.65	904.19	1,625.85
10" / 250 mm	250.48	336.91	587.39	821.57	1,105.08	1,926.65
12" / 300 mm	297.87	398.17	696.04	977.01	1,306.01	2,283.02
Add 4.5% - 7.5% to labor & material costs for hangars, bolts, gaskets & testing						
FRP - Epoxy Straight run / OSBL Piping						
2" / 50 mm	52.46	25.52	77.98	172.06	83.71	255.77
3" / 75 mm	62.62	28.59	91.21	205.39	93.76	299.15
4" / 100 mm	81.23	34.71	115.94	266.42	113.86	380.28
6" / 150 mm	120.14	74.53	194.67	394.08	244.45	638.53
8" / 200 mm	170.91	112.30	283.21	560.58	368.36	928.94
10" / 250 mm	219.98	134.76	354.74	721.52	442.02	1,163.54
12" / 300 mm	263.96	162.34	426.30	865.80	532.47	1,398.27
Add 4.5% - 7.5% to labor & material costs for hangars, bolts, gaskets & testing						
FRP - Furan Complicated / Intricate (ISBL - Inside Facility) Piping - Numerous changes in direction						
2" / 50 mm	165.87	71.78	237.64	544.04	235.43	779.47
3" / 75 mm	177.48	104.67	282.14	582.12	343.31	925.43
4" / 100 mm	184.12	120.61	304.73	603.90	395.60	999.50
6" / 150 mm	189.08	219.29	408.38	620.20	719.28	1,339.48
8" / 200 mm	223.93	272.14	496.06	734.48	892.61	1,627.08
10" / 250 mm	300.22	321.97	622.20	984.74	1,056.07	2,040.80
12" / 300 mm	371.54	382.77	754.31	1,218.66	1,255.48	2,474.14
Add 4.5% - 7.5% to labor & material costs for hangars, bolts, gaskets & testing						

Table 7
FERMENTATION / CHEMICAL FACILITY

SCOPE ITEM	\$ COST	%	REMARKS
Major Equipment (M.E.) 117 #	14,377,570	30.25%	SS glass lined tanks / reactors / pumps
Freight	504,865	1.06%	
Demolition	151,788	0.32%	
M.E. Installation	721,254	1.52%	Millwright / setting work
Site preparation	285,286	0.60%	
Concrete / civil	391,983	0.82%	
Structural steel	587,835	1.24%	
Pipe	7,486,743	15.75%	60 - 70% SS / glass lined
Electrical	4,836,984	10.18%	
Instrumentation / BMS	2,767,543	5.82%	
Buildings	1,753,882	3.69%	3 # buildings see note A
Utilities / Misc items	638,765	1.34%	Cooling tower / sub station / new boiler, existing piping and some utilities chillers could be utilized
Detailed design	7,052,090	14.84%	114,750 hours see note B
Field Eng support	371,989	0.78%	
Construction Mgmt	1,978,994	4.16%	See note C
Owner Eng Support	1,066,870	2.24%	Design review / CM oversight
Spare parts / V A	665,450	1.40%	
Feasibility studies	480,550	1.01%	
Escalation	976,650	2.05%	
General Conditions	437,879	0.92%	Division 1 items
Total Installed Cost	47,534,970	100.00%	

Table 8
NANOSCALE SCIENCES LABORATORY

SCOPE ITEM	% OF PROJECT	\$ / SF	\$ / M2	LABOR / MATERIAL SPLIT
Gen Conditions / Preliminaries	5.7	15.28	164.37	L = 40% / M = 60%
Site work / Civil / Foundations	6.9	18.49	198.97	L = 35% / M = 65%
Structural / building enclosure / roof / windows / ext doors	4.7	12.60	135.53	L = 40% / M = 60%
Architectural finishes internal walls / floors/ ceilings	11.2	30.02	322.97	L = 55% / M = 35%
Pharmaceutical support items i.e. pass thru, airlocks etc	0.7	1.88	20.19	L = 20% / M = 80%
Process / Manufacturing Equipment (P/ME)	15.3	41.00	441.20	L = 5% / M = 95%
Utility / Support equipment (U/SE)	4.7	12.60	135.53	L = 35% / M = 65%
Install equipment & hook up services (P/ME & U/SE)	1.2	3.22	34.60	L = 60% / M = 40%
Process pipe / services (SS 304 / 316)	7.5	20.10	216.28	L = 55% / M = 45%
Utilities piping (CI, CU, PVC, CS)	2.2	5.90	63.44	L = 55% / M = 45%
HVAC & AHU' s / Ductwork	12.2	32.70	351.81	L = 50% / M = 50%
Plumbing	2.7	7.24	77.86	L = 55% / M = 45%
Fire protection	1.5	4.02	43.26	L = 60% / M = 40%
Facility Electric (excludes s-s)	5.8	15.54	167.25	L = 60% / M = 40%
BMS / Security	1.2	3.22	34.60	L = 50% / M = 50%
Miscellaneous items and vendor assistance	0.5	1.34	14.42	L = 45% / M = 55%
Detailed Design	9.8	26.26	282.60	L = 95% / M = 5%
CM services	4.7	12.60	135.53	L = 90% / M = 10%
Validation	1.5	4.02	43.26	L = 95% / M = 5%
Total	100	268	2883.68	

#	DESCRIPTION	UNIT	MATERIAL	LABOR	TOTAL
(8) CSI DIVISION 15 PLUMBING & FIRE PROTECTION					
PIPING n/e 50' above FFL (Assumes 5 # fittings per 100') CONTINUED					
217	Strainers 2" bronze	EACH	155.66	87.91	243.57
218	CS tee ½"	EACH	13.14	47.09	60.22
219	CS tee ¾"	EACH	16.97	47.09	64.05
220	CS tee 1"	EACH	27.45	47.09	74.54
221	CS tee 2"	EACH	30.78	89.99	120.77
222	CS tee 3"	EACH	38.19	137.07	175.26
223	CS tee 4"	EACH	54.11	126.59	180.70
224	CS tee 6"	EACH	92.19	269.96	362.15
225	Floor cleanout CI 4" dia	EACH	172.64	179.95	352.59
226	Wall cleanout CI 4" dia	EACH	60.33	134.99	195.32
CPVC Schedule 40 with fittings / hangars and installation					
227	1" diameter	LF	4.90	10.80	15.69
228	Ditto 1.5"	LF	7.29	12.51	19.80
229	Ditto 2"	LF	9.96	16.71	26.67
230	Ditto 3"	LF	18.39	20.51	38.90
231	Ditto 4"	LF	24.99	25.17	50.15
232	Ditto 6"	LF	30.63	29.61	60.24
233	Roof mounted Air Handler Units 10,000 CFM	EA	982.06	30,924	31,906
234	Ditto 15,000 CFM	EA	1,304.52	41,570	42,875
235	Ditto 20,000 CFM	EA	1,846.84	56,441	58,288
236	Ditto 25,000 CFM	EA	1,978.77	75,621	77,599
237	Hospital / Operating Room Isolation panel 1.5 KVA	EA	795.30	12,092	12,887
238	Ditto X Ray Panel 15 KVA	EA	1,378.62	29,173	30,551
METRIC VALUES					
239	Supply & install CI ductile pipe in trench 100 mm	M	60.26	47.64	107.90
240	Ditto 150 mm	M	74.93	60.98	135.91
241	Supply & install CI ductile pipe on walls / racks 100 mm	M	61.89	55.26	117.15
242	Ditto 150 mm ditto	M	76.55	74.31	150.86
243	Supply & install copper pipe 15 mm with cap joints on walls / racks	M	21.99	20.72	42.71
244	Ditto 25 mm	M	28.50	30.67	59.17
245	Ditto 50 mm	M	71.01	65.17	136.18
246	Multiply above piping units by 1.35 for fittings / bends for normal applications	M			
247	Ditto for congested / complex application use 1.60	M			
248	Supply & install copper pipe 15 mm with comp joints on walls / racks	M	25.25	22.86	48.11
249	Ditto 25 mm	M	37.82	29.73	67.55
250	Ditto 50 mm	M	80.63	68.80	149.42
251	Multiply above piping units by 1.35 for fittings / bends for normal applications	M			
252	Ditto for congested / complex application use 1.60	M			
253	Supply & install black / galv steel pipe 15 mm with screwed joints on walls / racks	M	3.98	19.60	23.59
254	Ditto 25 mm	M	4.85	20.85	25.70