



0

1 DIVISION 0

Introduction and Calibration Factors: includes the following:
 Location (Calibration) Factors - International values compared to Washington D.C. (Base of 1.00). Calibrations in this application are used to adjust the unit prices / schedule of rates depicted in the following Divisions 1 – 17.
 188 # International Cities Location / Calibration Factors.
 General Conversion Values - Imperial to Metric Units.
 Import Duties General Sales Tax / Value. Added Tax / Consumption Tax.
 284 # USA Location (Calibration) Factors.
 Detailed Design / Engineering / Architectural and CM Fees 51 # Facility Types.
 Union Labor Costs.
 USA and Canada State & Province Sales Tax / GST.
 Inflation Cost Indexes.

00

27 DIVISION 00

Cost Models / Cost Benchmarks (17 Number) includes cost and quantity data on the following:
 Power Station Cost Model.
 Crude Oil Distillation Complex.
 High Rise Apartment Building Cost Model.
 Waste Water Treatment Cost Model.
 EPCM Home Office Billing Rate Sheet.
 Consumer Products Facility.
 Steel Production Cost Model.
 Beverage Production Facility Cost Model.
 Petro – Chemical Cost Model.
 78 # Engineering / Construction Cost Benchmarks.
 Class A Office Building
 UK Pharmaceutical Facility
 Clean Warehouse
 Regional Airport
 Shopping Mall

01

- 61** **DIVISION 01**
General Requirements / General Conditions / Preliminaries:
includes cost data on the following:
Rules of thumb
Insurance Costs
Protection of Completed Work
Scaffolding
Temporary Utilities, Structures & Fences
Permits
Testing / Inspection
Surveys
Bonds
Site Staff / Field Personnel
Construction Equipment Costs / Rental
Temporary Construction Items

02

- 83** **DIVISION 02**
Site Construction: includes schedule of rates for:
Demolition (including asbestos)
Excavation
Rock removal
Hardcore / Stone
Shoring
Planking & Strutting / Sheet Piling
Foundation Piling
Utilities
Miscellaneous Site Improvements
Paving
Concrete Curbing
Fencing
Site Lighting
Marine Work
Underground Storage Tanks

03

- 103** **DIVISION 03**
Concrete Work: includes schedule of rates for:
Concrete
Formwork
Reinforcement
Precast Concrete
Grouting

04

- 129** **DIVISION 04**
Masonry: includes schedule of rates for:
Brickwork
Masonry
Refractory

05

- 139** **DIVISION 05**
Metals: includes schedule of rates for:
Structural Steel
Metal Joists
Metal Framing
Miscellaneous Iron
Metal Decking

06

- 157** **DIVISION 06**
Wood and Plastics: includes schedule of rates for:
Rough Carpentry
Finish Carpentry
Carpentry Specialties

07

167

DIVISION 07

Thermal and Moisture Protection: includes schedule of rates for:
Damp proofing and Waterproofing
Thermal Protection
Roofing Systems
Caulking & Sealants

08

181

DIVISION 08

Doors and Windows: includes schedule of rates for:
Wood and Plastic Doors
Metal Doors and Frames
Windows
Glazing / Glazed Curtain Walls
Hardware

09

189

DIVISION 09

Finishes: includes schedule of rates for:
Plaster and Gypsum Board
Tile
Terrazzo
Ceilings
Flooring
Wall Finishes
Acoustical Treatment
Painting and Coatings

201

10

DIVISION 10

Specialties: includes schedule of rates for:
Visual Display Boards
Compartments and Cubicles
Louvers and Vents
Wall and Corner Guards
Miscellaneous Facility Specialties

11

- 209** **DIVISION 11**
Equipment: includes schedule of rates for:
Maintenance Equipment
Loading Dock Equipment
Industrial and Process Equipment
Laboratory Equipment
Material Handling Equipment

12

- 221** **DIVISION 12**
Furnishings: includes schedule of rates for:
Furniture
Manufactured Casework

13

- 227** **DIVISION 13**
Special Construction: includes schedule of rates for:
Pre-Engineered Buildings & Structures
Radiation Protection
Storage Tanks
Security Access and Surveillance

14

- 235** **DIVISION 14**
Conveying Systems: includes schedule of rates for:
Elevators
Escalators and Moving Walks
Hoists and Cranes

15

- 243** **DIVISION 15**
Mechanical Work: includes schedule of rates for:
Building Services Piping
Plumbing Fixtures
Process Piping
Fire Protection Piping
Heating, Ventilating & Air Conditioning Equipment
Ductwork
Insulation

16

- 313** **DIVISION 16**
Electrical Work: includes schedule of rates for:
Electrical Equipment / Transformers
Cable / Control wire
Conduit
Cable tray
Communications
Instrumentation and Controls

17

- 345** **DIVISION 17**
Process Equipment / Major Equipment: includes schedule of rates for:
Agitators
Air Handlers
Boilers
Chillers
Compressors
Condensers
Conveyors
Cooling Towers
Ductwork
Heat Exchangers
Pumps
Tanks

- 383** **ABOUT THE FIRM**

all in rate.

- Excludes construction equipment / fueling and maintenance.

- Excludes general conditions / Division 1 / Preliminaries (trailers and scaffold etc.) / Excludes consumables (gases, rags and grease).

TRADE	BASE WAGE	"A" ALL-IN RATE
Bricklayer	52.07	96.34
Carpenter	50.59	93.55
Electrician	60.17	111.12
Laborer, General	37.40	69.26
Operating Engineer, General	52.73	97.65
Painter, General	45.75	84.73
Plumber / Pipe fitter	60.22	111.08
Roofer	45.39	84.21
Sheet Metal Worker, General	59.50	109.64
Structural Iron Worker	57.03	105.31
AVERAGE RATE	52.09	96.29

USA & Canada State and Province Sales Tax / GST: Sales tax on materials is indicated following. Typically labor is not taxed. Some businesses may be able to obtain sales tax / exemption forms (certificate) that allow them to claim the sales tax back

STATE	TAX (%)
Alabama	4
Alaska	0
Arizona	5.6
Arkansas	6.50
California	7.50
Colorado	2.9
Connecticut	6.35
Delaware	0
District of Columbia	5.75
Florida	6
Georgia	4
Hawaii	4.166
Idaho	6
Illinois	6.25
Indiana	7
Iowa	6
Kansas	6.15
Kentucky	6

STATE	TAX (%)
Louisiana	4
Maine	5.5
Maryland	6
Massachusetts	6.25
Michigan	6
Minnesota	6.875
Mississippi	7
Missouri	4.225
Montana	0
Nebraska	5.5
Nevada	6.85
New Hampshire	0
New Jersey	7
New Mexico	5.125
New York	4
North Carolina	4.75
North Dakota	5
Ohio	5.75
Oklahoma	4.5
Oregon	0
Pennsylvania	6
Rhode Island	7
South Carolina	6
South Dakota	4
Tennessee	7
Texas	6.25
Utah	5.95
Vermont	6
Virginia	5.30
Washington	6.5
West Virginia	6
Wisconsin	5
Wyoming	4

Canada Provinces impose QST/GST/PST & HST tax
Average - Check with each Province

Alberta	5
British Columbia	12
Manitoba	13
New Brunswick	15
Newfoundland	15
Northwest Territories	5
Nova Scotia	15
Nunavut	5
Ontario	13
PEI	14
Quebec	14.975
Saskatchewan	10
Yukon	5

(2) ESTIMATING ASSESSMENT SHEET:

The following capital cost estimate review sheet sets the ranges minimum and maximum for various activities. This data can be used as a data source to calibrate / compare specific key elements of a pro-

cess related project, this data applies to new / green field construction applications.

- (I.S.B.L.): inside battery limits (M.E.) major equipment (T.I.C.) total installed cost
- (D.L.): direct labor

NO.	RATIOS & PERCENTAGES	NORMAL RANGE
1	Site Works as a percentage of M.E. (I.S.B.L)	2 – 5%
2	Buildings / Structures as a percentage of M.E. (I.S.B.L)	5 – 12%
3	Piping material as percent M.E. (I.S.B.L)	20-50%
4	Labor as percent of T.I.C.	20-30%
5	Piping labor as percent of pipe material	40-125%
6	Indirect cost as percent D.L.	70-125%
7	Piping labor as percent D.L.	10-55%
8	Typical M.E. Multiplier to T.I.C.	3.0 – 5.50 (Typical average 4.00) Refer to Benchmark Data.
9	Instrument material as percent M.E. (I.S.B.L.)	15-20%
10	Electrical work as a percentage of M.E. (I.S.B.L)	7 – 12%
11	Electrical labor as a percentage of M.E. (I.S.B.L)	10 – 20%
12	Insulation work as a percentage of M.E. (I.S.B.L)	3 – 5%
13	Field Establishment as a percentage of field in-directs	4 – 9%
14	Small tools / consumables as percent of D.L.	0.15 – 2.25%
15	Scaffolding as percent of D.L.	0.5 – 2%
16	Spare Parts	5% to 7.5% of major equipment on complex process facilities
17	Spare parts as percent of D.L.	0.1 – 1.5%
18	Freight	3% to 5% of major equipment cost.
19	Operator Training	0.5% to 2.5% of major equipment
20	Operator Training	2.5% to 5% of major equipment on complex process facilities
21	Royalties as a percentage of M.E. (I.S.B.L)	0.25 – 3.5%
22	Vendor assistance as percent of D.L.	0.1 – 0.25%
23	Home office engineering as percent T.I.C.	8-17%
24	Field supervision as percent D.L.	5-15%
25	Construction equipment as percent D.L.	12-20%
26	Construction fee as percent D.L.	3 - 9%
27	Construction fee as percent T.I.C.	1.25 - 4.0%
28	CM cost as percentage of T.I.C.	5 - 7.5%
29	Off sites, needs to be considered as a separate issue.	If limited / or no scope or data is available use 15-70% of the (I.S.B.L.) value. If multiplier is smaller / or greater than 3.0 – 5.50 a more in depth review should take place:
30	Overtime / shift work as a percentage of D.L	0 – 10%
31	Construction Management Fee	2 – 6% on pass through value:
32	Fabricate pipe offsite	20 – 40 hours / ton
33	Erect piping (2" and above)	100 – 200 hours / ton
34	Average cost per ton to fabricate and erect piping system	Average cost \$17,000 \$25,000 per ton, average \$21,000 per ton

	2020 - Division 3 - Concrete - Union Site	Unit	Material	Labor	Construction Equipment	Total
122	Elevated Pan / Waffle Concrete work with 150 - 250 pounds of rebar per CY (Maximum)	CY	454.02	509.97	88.40	1,052.39
123	Elevated Pan / Waffle Concrete work with 150 - 250 pounds of rebar per CY (Minimum)	CY	301.43	361.11	62.59	725.13
124	Hi rise bulding elevator walls (Maximum)	CY	372.23	432.05	74.89	879.17
125	Hi rise bulding elevator walls (Minimum)	CY	247.35	332.67	57.66	637.69
126	Reinforced concrete in roads / bridges (Maximum)	CY	356.96	471.69	81.76	910.42
127	Reinforced concrete in roads / bridges (Minimum)	CY	228.22	218.56	37.88	484.66
128	Curved concrete walls to cooling tower (Maximum)	CY	414.16	427.16	74.04	915.36
129	Curved concrete walls to cooling tower (Minimum)	CY	339.41	285.07	49.41	673.90
130	Slab on grade 4" thick with 4" stone, polythene and mesh reinforcement	SF	2.53	2.23	0.39	5.15
131	Slab on grade 5" thick with 6" stone, polythene and mesh reinforcement	SF	3.03	2.42	0.42	5.87
132	Slab on grade 6" thick with 6" stone, polythene and mesh reinforcement	SF	3.68	2.61	0.45	6.74
133	Slab on grade 6" thick with 6" stone, polythene and rebar reinforcement	SF	3.97	2.89	0.50	7.36
134	Slab on grade 8" thick with 6" stone, polythene and mesh reinforcement	SF	4.12	2.89	0.50	7.51
135	Slab on grade 8" thick with 6" stone, polythene and rebar reinforcement	SF	4.53	3.15	0.55	8.23
136	Dome / Waffle construction (Minimum)	CY	211.15	211.40	36.64	459.19
137	Dome / Waffle construction (Maximum)	CY	332.17	293.90	50.94	677.01
138	18" dia columns (Minimum)	CY	233.64	223.83	38.80	496.27
139	18" dia columns (Maximum)	CY	345.04	306.79	53.18	705.01
140	Elevated spandrel beams 16" X 30" with 280 - 350 pounds of rebar per CY (Maximum)	CY	479.42	480.52	94.00	1,053.93
141	Elevated spandrel beams 16" X 30" with 280 - 350 pounds of rebar per CY (Minimum)	CY	356.60	357.29	69.89	783.79

	2020 Division 15 - Mechanical Work - Union	Unit of Measure	Material	Labor	Construction Equipment	Total
392	Ditto 6" dia x 30" long 50 - 100 GPM	EACH	2,245.48	179.68	13.31	2,438.47
393	Ditto 8" dia x 30" long 100 - 200 GPM	EACH	3,361.88	268.26	19.87	3,650.01
394	Ditto 10" dia x 30" long 200 - 400 GPM	EACH	4,998.41	397.33	29.43	5,425.17
395	Ditto 12" dia x 36" long 250 - 500 GPM	EACH	7,104.35	566.89	41.98	7,713.22
396	Ditto 18" dia x 36" long 500 - 1,000 GPM	EACH	15,020.62	1,194.52	88.46	16,303.60
397	Ditto 24" dia x 36" long 1,000 - 2,500 GPM	EACH	28,480.72	2,252.39	166.81	30,899.91
398	Air conditioning 2.5 Ton 30,000 BTU's - direct expansion - condenser c/w controls	EACH	945.13	263.20	19.49	1,227.82
399	Ditto 5 Ton 60,000 BTU's	EACH	1,375.98	303.69	22.49	1,702.16
400	Ditto 10 Ton 120,000 BTU's	EACH	3,653.66	607.38	44.98	4,306.03
401	Ditto 25 Ton 300,000 BTU's	EACH	7,662.54	1,771.54	131.20	9,565.28
402	Duct heater - electric 2.5 KW c/w controls and hook up	EACH	602.60	91.11	7.65	701.36
403	Ditto 5 KW	EACH	1,060.58	106.29	8.92	1,175.79
404	Ditto 10 KW	EACH	1,807.80	136.66	11.47	1,955.93
405	Ditto 25 KW	EACH	3,634.63	161.97	13.59	3,810.20
406	Coils - flanged - copper tube 3/8" dia c/w aluminum fins 2 tubes - fin is 4" high x 12" long	EACH	542.68	28.04	2.08	572.80
407	Ditto 4" x 18"	EACH	570.88	28.04	2.08	601.00
408	Ditto 4" x 24"	EACH	596.26	28.04	2.08	626.38
409	Ditto 4" x 30"	EACH	621.63	35.69	2.64	659.96
410	Ditto 4" x 36"	EACH	647.00	40.79	3.02	690.81
411	Ditto 4" x 42"	EACH	678.72	40.79	3.02	722.53
412	Ditto 4" x 48"	EACH	710.43	48.44	3.59	762.46
413	Ditto 6" x 18"	EACH	761.18	48.44	3.59	813.21
414	Ditto 6" x 26"	EACH	786.55	48.44	3.59	838.58
415	Ditto 6" x 30"	EACH	818.27	48.44	3.59	870.29
416	Ditto 6" x 36"	EACH	888.04	56.09	4.15	948.28
417	Ditto 6" x 42"	EACH	926.10	56.09	4.15	986.34
418	Ditto 6" x 48"	EACH	951.47	56.09	4.15	1,011.71
419	Ditto 12" x 48"	EACH	1,116.40	73.93	5.48	1,195.80
420	Ditto 12" x 60"	EACH	1,174.01	73.93	5.48	1,253.42
421	Ditto 12" x 72"	EACH	1,224.23	84.13	6.23	1,314.59
422	Coils - flanged - copper tube 1" dia c/w aluminum fins 1 row - fin is 12" high x 12" long	EACH	912.27	53.54	3.96	969.77
423	Ditto 12" x 24"	EACH	989.53	53.54	3.96	1,047.04
424	Ditto 12" x 36"	EACH	1,065.65	84.13	6.23	1,156.01
425	Ditto 12" x 48"	EACH	1,141.77	99.43	7.36	1,248.56