



IV PREFACE

V ACKNOWLEDGEMENTS

01

INTRODUCTION TO INTERNATIONAL CONSTRUCTION

01	Introduction to Global Construction
10	43 # N.A. / Global Benchmarks
74	General Comments on Global Engineering, Procurement and Construction Issues

02

2020 COST DATA RELATED TO (101) SPECIFIC COUNTRIES

89	Reference Maps
92	General Notes
93	Afghanistan
94	Albania
95	Algeria
96	Angola
97	Argentina
101	Armenia
102	Australia
115	Austria
122	Azerbaijan
117	Bahrain
120	Bangladesh
121	Belarus
122	Belgium
123	Belize
124	Benin
125	Bolivia
127	Bosnia
128	Brazil
132	Bulgaria
135	Burkina Faso
134	Canada

148	Chad
149	Chile
151	China
168	Colombia
169	Cyprus
170	Czech Republic
173	Denmark
177	Ecuador
179	Egypt
192	Equatorial Guinea
192	Estonia
193	Finland
194	France
209	Georgia
210	Germany
225	Ghana
226	Greece
228	Guinea
229	Hong Kong
231	Hungary
235	India
240	Indonesia
252	Iraq
253	Ireland
265	Israel
266	Italy
279	Japan
293	Jordan
294	Kazakhstan
295	Kenya
296	Kuwait
300	Kyrgyzstan
301	Laos
302	Latvia
303	Lebanon
304	Liberia
305	Lithuania
306	Madagascar
307	Malaysia
311	Mexico
325	Mongolia
326	Morocco
327	Netherlands (The)
340	New Zealand
342	Nigeria

354	Norway
366	Oman
367	Pakistan
369	Panama
370	Peru
372	Philippines
374	Poland
385	Portugal
389	Qatar
391	Romania
392	Russia
396	Saudi Arabia
411	Serbia
412	Singapore
414	South Africa
426	South Korea
439	Spain
452	Sri Lanka
453	Sweden
466	Switzerland
470	Taiwan
471	Tajikistan
472	Tanzania
473	Thailand
474	Trinidad
474	Turkey
488	UAE
489	Uganda
490	United Kingdom
506	Ukraine
508	Uruguay
509	United States of America
537	Uzbekistan
538	Venezuela
539	Vietnam
541	Miscellaneous / S.E. Asia 2020 Cost Comparison Data
542	International Office Rental Rates
548	Abbreviations and Conversion Values and Factors

03

THE 2020 MISCELLANEOUS GLOBAL CONSTRUCTION REFERENCE DATA

549	General information and where to find global cost data
558	Metric considerations
559	U.S. Government / General Information Sources
561	About the firm

Table 9
INDUSTRIAL / CHEMICAL TYPE FACILITIES

TYPE OF PLANT	LOW RANGE M.E. MULTIPLIER	MEDIAN M.E. MULTIPLIER	HIGH RANGE M.E. MULTIPLIER
Chemical - Liquids	3.75	5.00	6.25
Chemical - Liquids / Solids (Hybrid)	3.25	4.50	5.75
Chemical - Solids	2.50	3.75	5.25
Ethanol Facility (corn / sugar cane)	2.75	3.25	3.75
Pharmaceutical	1.75	2.50	4.50
Power	2.00	3.30	4.00
Steel	1.50	2.00	2.50

• *Low Range: Typically is an open structure, has a high level of carbon steel piping, an unsophisticated instrumentation / control system, open shop construction workforce and a normal construction schedule. Solids has a limited amount of piping, the major equipment is usually material handling - conveyors, crushers and grinders.*

• *Median Range: Typically is a combination of enclosed / open structure, has an assortment of carbon steel and stainless steel piping (60% C.S. and the balance S.S. or better), a reasonably sophisticated instrumentation / control system, open shop or a combination of union construction workforce and a normal construction schedule.*

• *High Range: Characteristically the major equipment is housed in an enclosed structure / building, has an assortment of carbon steel and a high content of stainless steel piping (30% C.S. and the balance 70% S.S. or better), has a state of the art instrumentation / control system – TDC 3000 or equal, open shop or a combination of union construction workforce and a fast track construction schedule, is a hazardous process, is based on new technology.*

Table 10
GENERAL BENCHMARKS

REF	DESCRIPTION	RANGE	COST OF FACILITY	COST OF ACTIVITY
1	Off sites (OSBL)	5%-50% of Inside Battery Limits (ISBL)		
2	Fringes (vacations, holidays, sick days)	22%-30% of base wage rate		
3	Worker Compensation Insurance	10%-17.5% of base wage rate		
4	Inspections / QA-QC services	1.5% of TIC		
5	Front End Studies / Scoping study / BOD	0.5-2.5% of TIC of facility	\$1 - \$100 + million	
6	Builders all risk insurance (BAR)	0.15%-0.60%	\$1 - \$100 + million	
7	Contractors O/H (Supporting construction / field activities)	4.00%-15.00%		
	COMMENTS: The larger the TIC value of the project, the lower the % typically is.			

Table 39
**NORTHERN EUROPEAN (SWEDEN / NORWAY) & SOUTHERN EUROPEAN (ITALY / SPAIN)
HYDROGEN FACILITIES: 2018 COST BASIS:**

SIZE	LOW COST PER MMSCFD IN MILLIONS OF EUROS	% OF TOTAL	HIGH COST PER MMSCFD IN MILLIONS OF EUROS	% OF TOTAL	REMARKS
Hydrogen Plant 25 mmscfd Northern Europe (Aver of Sweden & Norway)					Average of Swedish / Norway Facilities
Engineering	4.2	0.60%	5.2	10.70%	Average Eng Rate = Euro 100 to 145 per hr
Procurement	18.2	46.10%	21.8	44.90%	
Construction	15.2	38.50%	18.7	38.60%	Average Construction Rate = Euro 50 to 65 per hr (split 65% Direct & 35% In-Direct man-hours)
Construction Management	1.9	4.80%	2.8	5.80%	Average CM Rate = Euro 90 to 155 per hr
TOTAL	39.5	100%	48.5	100%	
Cost per mmscfd	1.58		1.94		
Hydrogen Plant 50 mmscfd Southern Europe					Average of Italy / Spanish Facilities
Engineering	8	10.50%	9.9	10.50%	Average Engineering Rate = Euro 100 to 145 per hr
Procurement	35.1	46.20%	42.9	45.60%	
Construction	29.1	38.30%	35.5	37.80%	Average Construction Rate = Euro 50 to 60 per hour (split 65% Direct & 35% In-Direct man-hours)
Construction Management	3.7	4.90%	5.7	6.10%	Average CM Rate = Euro 90 to 155 per hr
TOTAL	75.9	100%	94	100%	
Cost per mmscfd	1.52		1.88		
Hydrogen Plant 100 mmscfd Southern Europe (Aver of Italy & Spain)					
Engineering	15.7	10.60%	19.1	10.50%	Average Engineering Rate = Euro 90 to 135 per hr
Procurement	68.9	46.50%	83.6	46.00%	
Construction	56.5	38.10%	68.8	37.80%	Average Construction Rate = Euro 40 to 55 per hour (split 65% Direct & 35% In-Direct man-hours)
Construction Management	7.1	4.80%	10.4	5.70%	Average CM Rate = Euro 85 to 140 per hr
TOTAL	148.2	100%	181.9	100%	
Cost per mmscfd	1.48		1.82		

Chile

FACILITY COSTS

FACILITY TYPE / UNIT PRICES SANTIAGO	UNIT	\$ LOW	\$ HIGH
Office 5 Floors \$/M2	M2	1,237	1,560
Office 5 Floors \$/SF	SF	115	145
Warehouse / Logistics Center \$/M2	M2	463	688
Warehouse / Logistics Center \$/SF	SF	43	64
Excavate by hand in trench n/e 1.5 M	M3	5.00	7.00
M/C excavation in trench n/e 1.5 M	M3	6.50	9.50
3,500 PSI plain concrete	M3	100	100
Rebar	LB	0.60	0.70
Formwork	SF	0.88	1.20
All in cost for Reinforced Conc. 3,500 PSI	CY	235	370
All in cost for Reinforced Conc. 3,500 PSI	M3	305	480
1/2" thick plasterboard	SF	1.05	2.35
Structural Steel in columns / beams	LB	1.00	1.45
Structural Steel in columns / beams	TON	2,100	2,900

Chile

REMOTE SITE ALL-IN BILLING RATE

#	SKILL	A	B	C	D	E	F	G	H	I	J	K
1	Site Work	10.95	3.75	2.45	4.25	2.05	23.45	11.15	12.75	47.35	7.10	54.45
2	Concrete	10.35	3.75	2.45	4.25	2.05	22.85	11.15	12.75	46.75	7.01	53.76
3	Structural Steel	11.71	3.75	2.45	4.25	2.05	24.21	11.15	12.75	48.11	7.22	55.33
4	Equipment Erection	11.65	3.75	2.45	4.25	2.05	24.15	11.15	12.75	48.05	7.21	55.26
5	Pipe (ISBL / OSBL)	11.87	3.75	2.45	4.25	2.05	24.37	11.15	12.75	48.27	7.24	55.51
6	Electrical / Instrumentation	11.95	3.75	2.45	4.25	2.05	24.45	11.15	12.75	48.35	7.25	55.60
7	Insulation / Painting	10.66	3.75	2.45	4.25	2.05	23.16	11.15	12.75	47.06	7.06	54.12
8	Scaffolding	10.42	3.75	2.45	4.25	2.05	22.92	11.15	12.75	46.82	7.02	53.84

A = Hourly Rate / Basis of Take Home Pay

B = Social Cost / Insurance \$3.45 to \$4.45 (use \$3.75)

C = Small Tool / Consumables \$2.20 to \$2.85 use (\$2.45)

D = Camp Cost / Meals \$3.75 to \$4.75 (use \$4.25)

E = Transport / Buses / Field Logistics \$1.75 to \$2.65 (use \$2.05)

F = Direct Cost per Hour

G = Supervision \$2.15 + Site Establishment \$2.50 + In-direct Site Labor \$6.50 = \$11.15

H = Construction Equipment / Scaffolding \$12.75

I = Sub Total

J = Overhead & Profit 15%

K = Total Hourly Rate in US \$'s

own standard forms of contract modified to local conditions.

- Negotiated contracts:
- Reimbursable contract (cost plus):

Like all other developed countries, France has a comprehensive set of government procurement procedures that need to be adhered to. Government procurement procedures can usually be reviewed at France's embassies or can be obtained from the relevant government agency.

To undertake construction work, either private or public in France, an organization must be able to obtain and provide insurance coverage that includes the 10-year insurance liability program. The ability to obtain this insurance coverage in some ways acts as a prequalification for bidding on construction projects.

ARCHITECTURAL/ENGINEERING DATA

The following table shows typical percentage fees related to architectural and engineering services on new building/facilities located in France. The percentages shown are appropriate for conceptual estimating assignments and should be used only as a guide. The values shown are appropriate for a building or facility with total installed cost of US\$10 - \$50 million.

FEE STRUCTURE	UNCOMPLICATED BLDG/FACILITY	COMPLICATED SOPHISTICATED BLDG/FACILITY
Architectural Fee	3.00%	7.00%
Structural eng. Fee	0.50%	1.50%
Mechanical/electrical Eng. Fee	1.50%	3.50%
Inspection services fee*	0.50%	1.50%
Construction economist*	0.35%	0.65%
Other specialist consultants	0.65%	0.85%
Total architectural/ engineering and other consulting fees, as a percentage of final cost of facility	6.50%	15.00%

NOTE:

Contractor completion or finalization of detailed design is not included in above percentage, but is typically incorporated into bid price. *A maitre d'oeuvre often performs these activities.

The above fee percentages are dependent upon building or facility type, scope of work, sophistication of specifications, durations of engineering effort, complexity of building control systems, market conditions, and HVAC requirements, quality of materials and building/facility equipment, and owner involvement with the design effort. It should be understood that French design and procedure methods typically have the architectural and the other engineering professionals completing the detailed engineering effort at what appears to be the 50% - 75% of the drawings are issued to contractors for lump-sum bids. It is usual practice for the successful bidder together with his or her selected trade contractors to finalize and complete the detailed engineering/ design effort.

The hourly rates that follow are "all in" job rates or selling rates for various construction professionals. The rates are appropriate for 2020. The hourly rates include employee salaries, workers compensation insurance, social security payments, health insurance premiums, unemployment insurance, vacation payments, overhead costs, office facilities, utilities, supervision, and profit. The rates shown are appropriate for the Paris area and apply to individuals with a minimum of 10 years experience. The rates do not include temporary living expenses or travel costs.

• France: in Euros US\$ 0.90 / Euro August 22, 2019

French professional workers typically work 37.5 – 39 hours per week and receive 5 – 6 weeks paid vacation, they are also entitled to 9 – 11 public holidays, hours worked per year = 1,600 – 1,650.

SKILL	EURO LOW	EURO HIGH
Senior Project Manager (25 years experience)	140	185
Project Manager (10 years experience)	117	165
Mechanical Engineer (15 years experience)	110	138
Chemical Engineer (15 years experience)	110	138
C/S/A Engineer (ditto)	100	136
E&H Engineer (ditto)	125	150
Estimator / Q.S. (ditto)	85	125
Planner (5 years experience)	75	110
CAD Operator	55	70
Purchasing Agent (10 years experience)	63	100
Contracts Manager / S/C Administrator	95	125
Admin / Document Control	40	60
Construction Manager (20 years experience)	105	130
Architect (10 years experience)	110	138

ENGINEERING PRODUCTIVITY DESIGN WORK:

The following figures show a range of productivity values: (1) Washington, DC (2) Houston Texas, and (3) Paris, France. The productivity factors are compared against a U.S. basis of 1.00 – Washington DC, engineering labor working on producing the necessary design deliverables for a midsize petro-chemical / manufacturing facility (say \$10 – \$50 million).

REF. #	LOCATION	PRODUCTIVITY VALUE
1	Washington, DC	1.00
2	Houston, TX	0.95
3	Paris, France	1.05

CONSTRUCTION LABOR HOURLY RATES

The rates shown below are 2020 “all in” selling rates for skilled and unskilled construction workers. The rates indicated are the hourly billing rates that a contractor would charge an owner or end user for work carried out on either a time and material basis or the “all in” grossed up labor rates contained in his or her bid.

Construction Labor

“ALL IN” SELLING RATES FOR SKILLED AND UNSKILLED CONSTRUCTION WORKERS

CATEGORY	LOW	HIGH	AVERAGE
Workers compensation insurance			
Federal /state unemployment			
FICA (social security / OAP)			
Vacation / Holidays			
BAR / Liability Insurance			
Home office support (admin, payroll, procurement / buy-out assistance, management support, estimating, rent / utilities to maintain H.O.)			
Field supervision / timekeepers / warehouse men			
Temporary facilities / trailers / porta johns / office supplies			
Small tools			
Consumables, gas, welding rods etc			
Construction equipment / scaffolding (excludes heavy lift cranes)			
Maintenance of CE / fuel oil / repairs to CE			
PROFIT			
TOTAL (ADJUSTED)	85%	125%	90% - 110% RANGE

Construction Material Costs

MID-SIZED COMMERCIAL OR INDUSTRIAL CONSTRUCTION PROJECT

#	BULK MATERIAL	QTY	SI UNIT	LOCAL COUNTRY UNIT COST IN US \$	TOTAL IN US \$	USA UNIT COST IN US \$ SI UNIT	TOTAL IN US \$
1	Blocks (Concrete 8" x 16" x 4")	5,000	Each	1.85	9,233	1.80	8,997
2	Bricks (Common) 1,000	15	1000	616	9,238	468	7,014
3	Bricks (Facing) 1,000	10	1000	706	7,061	643	6,432
4	Cement in bags	150	Ton(M)	294	44,167	289	43,395
5	Conduit 2" / 50 mm rigid galv steel	1,000	M	23.16	23,164	23.65	23,648
6	Instruments 4 # 2" / 4" CV (8 #), 12 # (F/P/T) Devices	20	Each	4,972	99,443	4,618	92,368
7	Copper pipe 0.50" / 12 mm L	1,000	M	6.56	6,559	7.07	7,074
8	R M Concrete 3500 PSI / 25 MPa	350	M3	160	56,102	157	55,003
9	Sand / Stone 1.5" diameter / Imported fill / Hardcore (Average)	2,500	Ton(M)	40.52	101,302	25.31	63,267
10	Stainless steel 304 pipe 1" / 25 mm	1,000	M	14.57	14,573	17.55	17,549
11	Steel pipe A-53 1" / 25 mm diameter	1,000	M	12.91	12,908	12.79	12,789
12	Steel Reinforcement (not installed)	50	Ton(M)	1,727	86,369	1,290	64,523
13	Structural Steel (Fabricated not installed)	50	Ton(M)	2,112	105,607	2,607	130,335
14	Valves (Ball) 4" diameter 150 #	25	Each	830	20,754	761	19,020
TOTAL					596,480		551,413
NOTE: Metric Ton = 2,205 lb • Long Ton = 2,240 lb (L) • Short Ton = 2,000 lb (S) • Metric Tonne = 1,000 kg /2,205 lb							

SKILL	EURO (LOW)	EURO (HIGH)
Carpenter	32.50	43.00
Mason	32.50	43.00
Pipefitter	33.50	44.00
Electrician	33.50	44.50
Unskilled Work	21.00	31.50

CONSTRUCTION MATERIAL COSTS

The values indicated on the following page are a sampling of construction material costs applicable to a midsize commercial or industrial project. The data are from a number of projects in the Paris metropolitan area. The values include delivery to site. They exclude TVA or VAT tax and do not include any overhead or profit add-ons to the installing contractor. The values shown are approximate and should be utilized on that basis. Premiums of 10-20% should be added to the prices indicated for small quantities. Similar discounts can be had for sizable quantities. Costs are valid for year 2020.

French bulk materials on average are 3% - 5% more expensive than their US equivalent. Engineered bulk items such as motor controlled valves, instrumentation devices etc; tend to be 5% - 8% more expensive in France than in the USA as of January 2020.

APPROXIMATE COSTS OF BUILDINGS / FACILITIES

The cost values shown on the next page include all material, labor, construction equipment, overhead, and profit. The values exclude land purchase; value added tax, parking areas, extensive landscaping, design fees, owner-provided equipment, furniture, and fixtures. The values were obtained by dividing the cost of the completed facility by the gross square meters of the buildings and facilities. They are approximate and should only be used for budget

or conceptual estimates. The high values should be used for projects located in downtown areas of major cities and for projects that utilize high-quality specifications, materials, and installation methods. The values have been adjusted to reflect 2020 pricing levels and are based on projects in the Paris area.

- **French SF / M2 Facility Unit Costs in US \$'s** (indicated in chart below)

LOCATION FACTOR

The factors shown below are used to quantify the cost differences for specific construction methods in different locations. Use of the factors involves either (1) estimating the proposed project on a U.S. basis (2) knowing the cost of a particular U.S. facility (often a Gulf Coast project is the model). The U.S. estimate is expressed as a base index of 1.00. Location factors typically reflect disparities in con-

Costs of Building Facilities

FRENCH SF / M2 FACILITY UNIT COSTS IN US \$'S

#	TYPE OF FACILITY	SF / LOW	SF/ HIGH	M2 / LOW	M2 / HIGH
1	Airport Terminal 2 – 3 Floors 400,000 - 700,000 SF	167	272	1,798	2,931
2	Apartments (Class B/C) 3 – 6 floors not public housing	178	319	1,920	3,434
3	Apartment public housing 3 – 6 floors	134	189	1,439	2,030
4	Food Production / Dairy Facility 70,000 SF	129	192	1,389	2,063
5	Hotel 3-6 floors 100,000 SF- 2 - 3 star - suburban location*	195	300	2,100	3,225
6	Manufacturing / Facility / Factory 2 Floors 75,000 SF	78	146	836	1,572
7	Office 3 Floors 45,000 SF suburban location*	184	275	1,979	2,956
8	R & D Facility (College – Basic Research) 2 Floors 65,000 SF	190	287	2,042	3,090
9	W-House Refrigerated 80% / Admin 20% / 80,000 SF	92	169	993	1,818
10	W-House/ Logistics Center 80% / Admin 20% 40,000 SF **	75	114	806	1,226

* 5 - 15 miles from city center

** excludes racking / bar coding / warehouse equipment

- Chemical/process/manufacturing plant (utilizing some imported equipment): **0.92**
- Building/facility/civil project (utilizing local materials): **0.86**

For example, if a recently completed process project was built in the U.S. for US\$50,000,000, then the cost of a similar facility in Indonesia would be $US\$50,000,000 \times 0.92 = US\$46,000,000$. A building, i.e. warehouse to be constructed in Indonesia estimated on a U.S. basis with an estimated cost of US\$10,000,000 would be budgeted at US\$8,600,000.

If the above project is for a “first of its kind” building / facility (first construction effort will initially experience a steep learning curve as it navigates through governmental / local issues) add 0.03 – 0.05 points to above location factors. If company has built or has operating facilities already in country, use above indicated location factors:

LABOR PRODUCTIVITY

The following figures shown are a range of productivity values: (1) good, (2) average, and (3) poor. The productivity factors for Indonesia are measured against a U.S. value of 1.00, based on open-shop (i.e., nonunion) labor working at a midsize petrochemical facility on the Texas Gulf Coast.

PRODUCTIVITY RANGE

- **Good:** 2.20
- **Average:** 2.50
- **Poor:** 3.00

For example, if a task took 5,000 man-hours to complete in the U.S., then, using the average value of 2.50, it would take 12,500 man-hours to perform in Indonesia.

Factors that can contribute to good productivity typically include good access to the work areas, an experienced workforce, adequate supervision, moderate weather conditions, specifications that are

Building / Facilities Costs

INDONESIAN SF / M2 FACILITY UNIT COSTS IN US \$'S

#	TYPE OF FACILITY	SF / LOW	SF/ HIGH	M2 / LOW	M2 / HIGH
1	Airport Terminal 2 – 3 Floors 400,000 - 700,000 SF	95	141	1,020	1,515
2	Apartments (Class B/C) 3 – 6 floors not public housing	82	148	887	1,594
3	Apartment public housing 3 – 6 floors	48	80	521	864
4	Food Production / Dairy Facility 70,000 SF	53	92	565	988
5	Hotel 3-6 floors 100,000 SF-2 - 3 star - suburban location*	103	169	1,108	1,818
6	Manufacturing / Facility / Factory 2 Floors 75,000 SF	48	93	521	999
7	Office 3 Floors 45,000 SF suburban location*	106	150	1,142	1,616
8	R & D Facility (College – Basic Research) 2 Floors 65,000 SF	109	161	1,175	1,728
9	W-House Refrigerated 80% / Admin 20% / 80,000 SF	46	87	499	931
10	W-House/ Logistics Center 80% / Admin 20% 40,000 SF **	38	63	410	673
	* 5-15 miles from city center				
	** excludes racking / bar coding / warehouse equipment				

ing-type construction or where the design effort is very preliminary)

- The FIDIC form of contract
- Major Fortune 500 companies doing work in

Poland will often use their own standard form of contract, modified to suit local conditions.

ARCHITECTURAL / ENGINEERING DATA

The previous table shows typical fees for architectural and engineering services on new buildings/ facilities in Poland. The fees are based on construction projects valued at \$5 - 50 million and are expressed as a percentage of the final cost of the building or facility (excluding VAT). These fees can vary, depending on location, type and sophistication of building and market conditions.

The hourly rates below are “all in” job rates or selling rates for various construction profession-

SKILL	US \$ LOW	US \$ HIGH
Senior Project Manager (25 years experience)	60	85
Project Manager (10 years experience)	45	70
Chemical Engineer (15 years experience)	37	66
C/S/A Engineer (ditto)	35	62
Mechanical Engineer (15 years experience)	36	63
E&I Engineer (ditto)	40	63
CAD Operator	18	30
Cost Engineer (5 years experience)	33	48
Senior Estimator (10 years experience)	35	54
Quantity Surveyor (10 years experience)	33	50
Planner (5 years experience)	28	45
Purchasing Agent (15 years experience)	30	44
S/C Manager (15 years experience)	33	45
Document Control / Secretary	14	22
Construction Manager (20 years experience)	35	50
Field Engineer	30	43
Safety Engineer	24	37
Construction Inspector	24	37
Architect (10 Years Experience)	43	63

als. They are appropriate for 2020. The rates include employees’ salaries, workers’ compensation insurance, social security payments, health insurance premiums, unemployment insurance, vacation and holiday payments, establishment charges, overhead mark-ups, and profit. The rates shown are for the Warsaw area and reflect individuals with a minimum of 10 years experience.

• Poland: US\$ / Zloty 3.93 – August 22, 2019

• Polish professional workers typically work 38.5 – 42.5 hours per week and receive 3 – 4 weeks paid vacation, in addition approximately 8 - 12 public holidays are observed, billable hours per year = 1,780 – 1,860 = 1,840 billable hours.

The following hourly rates reflect work in the commercial, industrial and energy construction sector.

ENGINEERING PRODUCTIVITY DESIGN WORK

The following figures show a range of productivity values: (1) Washington, DC (2) Houston Texas, and (3) Warsaw, Poland. The productivity factors are compared against a U.S. basis of 1.00 – Washington DC, engineering labor working on producing the necessary design deliverables for a midsize petro-chemical / manufacturing facility (say \$10 – \$50 million).

REF. #	LOCATION	PRODUCTIVITY VALUE
1	Washington, DC	1.00
2	Houston, TX	0.95
3	Warsaw, Poland	1.15 – 1.35

CONSTRUCTION LABOR HOURLY RATES

The table below lists “all in” hourly selling rates for skilled and unskilled construction workers. These are the billing rates that a contractor would charge an owner or end user for work that is either carried out on a time and material basis or included in the “all in” grossed-up labor rates contained in his or her bid. These rates include base wage, insurance, fringes, burdens, holidays, small tools, and training levies, plus all applicable overhead and profit. They have been adjusted to reflect 2020 and are appropriate for the Warsaw area.

• Poland: US\$ / Zloty 3.93 – August 22, 2019

REGION	US \$ SQUARE FOOT PER YEAR AVERAGE COST	US \$ SQUARE FOOT PER YEAR COST (RANGE – LOW)	US \$ SQUARE FOOT PER YEAR COST (RANGE – HIGH)	ADDITIONAL AVERAGE COSTS PER YEAR (UTILITIES 9.3% & CLEANING SERVICES 8.2%) TOTAL 17.5% IN US \$
ASIA, AUSTRALIA & NEW ZEALAND (CONTINUED)				
Hong Kong.	137.78	106.67	168.90	24.11
Macao.	114.46	88.35	140.57	20.03
India Chennai.	16.79	12.91	20.67	2.94
India Hyderabad / Secunderbad / Nampally.	14.09	10.76	17.42	2.47
India Kolkata.	28.71	22.60	34.82	5.02
India Mumbai. Prime Location.	62.86	48.44	77.28	11.00
India Mumbai - 5 miles from city center.	46.06	35.53	56.59	8.06
India New Delhi, Prime Location.	143.59	110.87	176.32	25.13
India New Delhi - 5 miles from city center.	86.15	66.74	105.57	15.08
India Pune.	16.79	12.91	20.67	2.94
Indonesia Jakarta.	16.79	12.91	20.67	2.94
Japan Tokyo, Prime Location.	148.69	114.83	182.54	26.02
Japan Tokyo - 5 miles from city center.	91.91	70.83	113.00	16.08
Japan Osaka.	85.96	66.54	105.39	15.04
Japan Yokohama.	83.26	64.39	102.13	14.57
Malaysia Kuala.	22.76	17.23	28.30	3.98
New Zealand Auckland.	40.10	31.22	48.98	7.02
New Zealand Wellington.	34.67	26.91	42.44	6.07
Philippines Manila, Prime Location.	30.89	23.68	38.09	5.41
Philippines Manila - 5 miles from city center.	16.79	12.91	20.67	2.94
Singapore City.	101.33	78.58	124.07	17.73
South Korea Seoul.	51.48	39.83	63.13	9.01
South Korea Pusan.	22.76	17.23	28.30	3.98
South Korea Taegu.	19.50	15.06	23.94	3.41
Taiwan Taipei.	57.44	44.13	70.75	10.05
Thailand Bangkok.	37.93	29.06	46.79	6.64
Vietnam Ho Chi Minh City.	57.44	44.13	70.75	10.05
Vietnam Hanoi.	46.06	35.53	56.59	8.06
NORTH AND SOUTH AMERICA				
Argentina Buenos Aires.	34.67	26.91	42.44	6.07
Brazil Brasilia.	46.06	35.53	56.59	8.06
Brazil Sao Paulo.	62.86	48.44	77.28	11.00
Brazil Recife,	28.71	22.60	34.82	5.02
Brazil Rio de Janeiro,	148.46	115.17	181.75	25.98