



# 1

## SECTION 1:

- 1** Introduction, General Comments and Calibration Factors:  
includes the following:  
Location (Calibration) Factors - International values compared to USA Gulf Coast. (Base of 1.00). Calibrations in this application are used to adjust the benchmark prices depicted in the following SECTIONS (1 thru 700).  
25 # Country Calibration Factors.  
General Conversion Values - Imperial to Metric Units.  
Import Duties General Sales Tax / Value. Added Tax / Consumption Tax.  
Detailed Design / Engineering / Architectural and CM Fees 51 # Facility Types.  
Union Labor Costs / Inflation Cost Indexes.  
USA and Canada State & Province Sales Tax / GST.

# 10

## SECTION 10:

- 17** Major Equipment / Production Equipment

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## SECTION 20:

- 41** Site, Civil, Piling, Concrete, Masonry and Buildings

# 30

## SECTION 30:

- 47** Structural Steel

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## SECTION 40:

- 49** Piping / (ISBL and OSBL)

|     |  |
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| 65  | <b>50</b><br><b>SECTION 50:</b><br>Electrical and Instrumentation        |
| 75  | <b>60</b><br><b>SECTION 60:</b><br>Insulation                            |
| 79  | <b>70</b><br><b>SECTION 70:</b><br>Painting and Coatings                 |
| 83  | <b>80</b><br><b>SECTION 80:</b><br>Refractory                            |
| 83  | <b>90</b><br><b>SECTION 90:</b><br>Scaffolding                           |
| 85  | <b>100</b><br><b>SECTION 100:</b><br>Construction Equipment / Plant Hire |
| 95  | <b>110</b><br><b>SECTION 110:</b><br>Domestic and International Freight  |
| 99  | <b>120</b><br><b>SECTION 120:</b><br>Offshore Data                       |
| 115 | <b>130</b><br><b>SECTION 130:</b><br>Pipelines (Onshore and Offshore)    |

|            |   |
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| <b>131</b> | <b>140</b><br><b>SECTION 140:</b><br>Module Cost and Man hour Benchmarks  |
| <b>139</b> | <b>150</b><br><b>SECTION 150:</b><br>Wind Turbines (Onshore and Offshore) Benchmarks  |
| <b>145</b> | <b>160</b><br><b>SECTION 160:</b><br>Mining Benchmarks  |
| <b>153</b> | <b>200</b><br><b>SECTION 200:</b><br>Home Office Engineering and Support Costs  |
| <b>157</b> | <b>300</b><br><b>SECTION 300:</b><br>Construction Management Cost Data  |
| <b>159</b> | <b>400</b><br><b>SECTION 400:</b><br>Temporary Site Facilities  |
| <b>159</b> | <b>500</b><br><b>SECTION 500:</b><br>All-in hourly labor rates  |
| <b>165</b> | <b>600</b><br><b>SECTION 600:</b><br>Insurance Data   |
| <b>167</b> | <b>700</b><br><b>SECTION 700:</b><br>Miscellaneous items, Bonds, Spare Parts, Camp Costs, Construction Consumables, Start up issues, Transmission Line Benchmarks and Camp Costs. |
| <b>191</b> | <b>ABOUT THE FIRM</b>   |

**Table 6**  
**PILES / CAISSONS**

| SIZE / DIAMETER  | \$ COST MINIMUM PER LF | \$ COST MAXIMUM PER SF        | \$ COST MINIMUM PER M | \$ COST MAXIMUM PER M |
|--|------------------------|-------------------------------|-----------------------|-----------------------|
| <b>STEEL H SECTION</b>   |                        |                               |                       |                       |
| 10" X 10"  | 50.31                  | 61.48                         | 165.00                | 201.64                |
| 12" X 12"  | 69.94                  | 85.47                         | 229.39                | 280.33                |
| 14" X 14"  | 94.47                  | 115.46                        | 309.87                | 378.72                |
| <b>PRE-STRESSED CONCRETE PILES</b>   |                        |                               |                       |                       |
| 14"  | 32.80                  | 39.81                         | 107.60                | 130.57                |
| 16"  | 48.00                  | 58.24                         | 157.43                | 191.02                |
| 18"  | 62.40                  | 75.71                         | 204.66                | 248.33                |
| <b>CONCRETE FILLED ROUND STEEL PILES</b>                                       |                        |                               |                       |                       |
| 10"  | 31.10                  | 37.74                         | 102.02                | 123.80                |
| 12"  | 35.06                  | 42.56                         | 115.00                | 139.60                |
| 14"  | 39.81                  | 48.34                         | 130.59                | 158.54                |
| 16"  | 47.38                  | 57.51                         | 155.39                | 188.62                |
| 18"  | 59.58                  | 72.31                         | 195.41                | 237.18                |
| <b>CAISSONS</b>  |                        |                               |                       |                       |
| 18"  | 12.24                  | 16.25                         | 40.15                 | 53.31                 |
| 24"  | 19.59                  | 24.00                         | 64.24                 | 78.72                 |
| 30"  | 31.81                  | 39.01                         | 104.35                | 127.96                |
| 36"  | 56.30                  | 69.01                         | 184.65                | 226.35                |
| <b>RAIL TRACK</b>  |                        | <b>\$ COST MAXIMUM PER LF</b> |                       |                       |
| Rail Track<br>standard width<br>4' 8-1/2" c/w<br>ballast / sleepers<br>& rails | 187.94                 | 228.48                        | 616.45                | 749.40                |

**Table 7**  
**INSTALLATION MAN HOURS**

| EXCAVATION   | UNIT | MIN. MAN-HOURS | MAX. MAN-HOURS |
|--|------|----------------|----------------|
| Cut & chip trees up to 6" diameter                                       | Acre | 10.00          | 20.00          |
| Cut & chip trees between 6" & 12" diameter                               | Acre | 12.00          | 24.00          |
| Cut & chip trees between 12" & 18" diameter                              | Acre | 14.00          | 28.00          |
| Cut & chip trees between 18" & 24" diameter                              | Acre | 16.00          | 32.00          |
| Cut & chip trees between 24" & 36" diameter                              | Acre | 18.00          | 36.00          |
| Grub up and remove tree stumps up to 6" diameter                         | Each | 4.00           | 6.00           |
| Ditto between 6" & 12" diameter  | Each | 6.00           | 8.00           |
| Ditto between 12" & 18" diameter   | Each | 8.00           | 10.00          |
| Ditto between 18" & 24" diameter   | Each | 10.00          | 12.00          |
| Excavate continuous foundations n/e 5' deep w. 0.5 CY backhoe / bucket   | CY   | 0.55           | 0.75           |
| Excavate continuous foundations n/e 10' deep w. 0.75 CY backhoe / bucket | CY   | 0.60           | 0.70           |
| Excavate continuous foundations n/e 15' deep w. 1.00 CY backhoe / bucket | CY   | 0.45           | 0.55           |

**OSBL PIPING 10" DIAMETER A 53 CS SCH 40****Union Installation**

- \$ Cost per LF \$235
- \$ Cost per M \$770
- For height 12' - 25' Add between 2.5% and 5% to Labor and Construction Equipment
- For height 25' - 50' Add between 5% and 8% to Labor and Construction Equipment
- For height 50' - 100' Add between 8% and 15% to Labor and Construction Equipment

**ISBL PIPING 12" DIAMETER A 53 CS SCH 40****Union Installation**

- \$ Cost per LF \$480
- \$ Cost per M \$1,573
- For height 12' - 25' Add between 2.5% and 5% to Labor and Construction Equipment
- For height 25' - 50' Add between 5% and 8% to Labor and Construction Equipment
- For height 50' - 100' Add between 8% and 15% to Labor and Construction Equipment

**OSBL PIPING 12" DIAMETER A 53 CS SCH 40****Union Installation**

- \$ Cost per LF \$291
- \$ Cost per M \$955
- For height 12' - 25' Add between 2.5% and 5% to Labor and Construction Equipment
- For height 25' - 50' Add between 5% and 8% to Labor and Construction Equipment
- For height 50' - 100' Add between 8% and 15% to Labor and Construction Equipment

**ISBL PIPING 18" DIAMETER A 53 CS SCH 40****Union Installation**

- \$ Cost per LF \$733
- \$ Cost per M \$2,404
- For height 12' - 25' Add between 2.5% and 5% to Labor and Construction Equipment
- For height 25' - 50' Add between 5% and 8% to Labor and Construction Equipment
- For height 50' - 100' Add between 8% and 15% to Labor and Construction Equipment

**OSBL PIPING 18" DIAMETER A 53 CS****Union Installation**

- \$ Cost per LF \$458
- \$ Cost per M \$1,502
- For height 12' - 25' Add between 2.5% and 5% to Labor and Construction Equipment
- For height 25' - 50' Add between 5% and 8% to Labor and Construction Equipment
- For height 50' - 100' Add between 8% and 15% to Labor and Construction Equipment

**ISBL PIPING 24" DIAMETER A 53 CS****Union Installation**

- \$ Cost per LF \$1,029
- \$ Cost per M \$3,375
- For height 12' - 25' Add between 2.5% and 5% to Labor and Construction Equipment
- For height 25' - 50' Add between 5% and 8% to Labor and Construction Equipment
- For height 50' - 100' Add between 8% and 15% to Labor and Construction Equipment

**OSBL PIPING 24" DIAMETER A 53 CS****Union Installation**

- \$ Cost per LF \$632
- \$ Cost per M \$2,074
- For height 12' - 25' Add between 2.5% and 5% to Labor and Construction Equipment
- For height 25' - 50' Add between 5% and 8% to Labor and Construction Equipment
- For height 50' - 100' Add between 8% and 15% to Labor and Construction Equipment

**ISBL PIPING 2" DIAMETER CS TEFLON LINED****Union Installation**

- \$ Cost per LF \$322
- \$ Cost per M \$1,056
- For height 12' - 25' Add between 2.5% and 5% to Labor and Construction Equipment
- For height 25' - 50' Add between 5% and 8% to Labor and Construction Equipment
- For height 50' - 100' Add between 8% and 15% to Labor and Construction Equipment

| #                | CONSTRUCTION EQUIPMENT / PLANT HIRE<br>(EXCLUDES FUELING & MAINTENANCE)      | UNIT |           | \$ COST |
|------------------|--|------|-----------|---------|
| <b>CONTINUED</b> |  |      |           |         |
| 38               | Asphalt kettle / seal coater for road work, 250 gallon, propane, towed unit. | HOUR | Excl Oper | 12.45   |
| 39               | Asphalt truck spreader / profiler, 500 ton, 12' wide 4"-10" application      | HOUR | Excl Oper | 230.44  |
| 40               | Auger horizontal 10" - 24" dia 35 HP gasoline                                | HOUR | Excl Oper | 27.16   |
| 41               | Auger horizontal 18" - 30" dia 50 HP gasoline                                | HOUR | Excl Oper | 37.83   |
| 42               | Auger vertical drill, 6" - 8" diameter, n/e 200' total depth                 | HOUR | Excl Oper | 68.60   |
| 43               | Backhoe / JCB 0.50 CY  | HOUR | Excl Oper | 106.33  |
| 44               | Backhoe / JCB 1 CY   | HOUR | Excl Oper | 164.97  |
| 45               | Backhoe Kubota 20 HP   | HOUR | Excl Oper | 29.83   |
| 46               | Barge 250 Ton & 100 HP 3 man pusher boat                                     | HOUR | Excl Oper | 82.22   |
| 47               | Barge 500 Ton ditto  | HOUR | Excl Oper | 96.10   |
| 48               | Belt stone / soil loader, 20' x 48" wide 2 - 1 slope, gasoline               | HOUR | Excl Oper | 14.78   |
| 49               | Belt stone / soil loader, 36' x 24" wide 2 - 1 slope 300 TPH, gasoline       | HOUR | Excl Oper | 16.59   |
| 50               | Belt loader bin feeder / hopper 25 Ton                                       | HOUR | Excl Oper | 7.24    |
| 51               | Block, snatch and chain come along 25 Ton                                    | HOUR | Excl Oper | 8.26    |
| 52               | Bobcat F E loader 35 HP  | HOUR | Excl Oper | 29.83   |
| 53               | Brush / tree chipper, up to 6" diameter tree, towed unit, gasoline powered   | HOUR | Excl Oper | 27.73   |
| 54               | Bulldozer 80 HP  | HOUR | Excl Oper | 100.04  |
| 55               | Bulldozer 150 HP   | HOUR | Excl Oper | 223.16  |
| 56               | Bulldozer 350 HP   | HOUR | Excl Oper | 371.69  |
| 57               | Centrifugal pump 2", 150 GPM with discharge hose, gasoline / 2-stroke        | HOUR | Excl Oper | 10.92   |
| 58               | Centrifugal pump 4", 250 GPM with discharge hose, gasoline                   | HOUR | Excl Oper | 16.00   |
| 59               | Centrifugal pump 6", 350 GPM with discharge hose, gasoline                   | HOUR | Excl Oper | 19.77   |
| 60               | Chain trencher 2" - 3" wide to a depth of 3', 15 HP gasoline                 | HOUR | Excl Oper | 11.90   |
| 61               | Chain trencher 4" - 6" wide to a depth of 4' 25 HP gasoline                  | HOUR | Excl Oper | 22.53   |
| 62               | Chain trencher 6" - 9" wide to a depth of 6' 35 HP gasoline                  | HOUR | Excl Oper | 43.69   |
| 63               | Chainsaw 18" gasoline / 2 - stroke   | HOUR | Excl Oper | 8.59    |
| 64               | Chainsaw 30" gasoline / 2 - stroke   | HOUR | Excl Oper | 11.26   |
| 65               | Mulch / Seed / Chip spreader 84" wide, motorized, gasoline                   | HOUR | Excl Oper | 34.26   |
| 66               | Mulch / Seed / Chip spreader 84" wide, towed unit                            | HOUR | Excl Oper | 2.85    |
| 67               | Chain rigging hoist 5 ton c/w 20' cables                                     | HOUR | Excl Oper | 6.45    |
| 68               | Chain rigging hoist 20 ton c/w 20' cables                                    | HOUR | Excl Oper | 11.77   |
| 69               | Compactor / rammer / jumper, 18" x 18", gasoline / 2 - stroke                | HOUR | Excl Oper | 3.42    |
| 70               | Concrete Ready - Mix truck 8 CY  | HOUR | Excl Oper | 87.20   |
| 71               | Concrete Ready - Mix truck 10 CY   | HOUR | Excl Oper | 99.91   |
| 72               | Concrete Ready - Mix truck 12 CY   | HOUR | Excl Oper | 112.63  |
| 73               | Concrete Ready - Mix truck 14 CY   | HOUR | Excl Oper | 125.35  |
| 74               | Concrete delivery bucket 0.50 CY   | HOUR | Excl Oper | 4.11    |
| 75               | Concrete delivery bucket 1 CY  | HOUR | Excl Oper | 4.65    |
| 76               | Concrete delivery bucket 1.50 CY   | HOUR | Excl Oper | 5.02    |
| 77               | Concrete delivery bucket 2.50 CY   | HOUR | Excl Oper | 7.29    |
| 78               | Concrete conveyor rubber belt, 16" wide x 36' long, gasoline                 | HOUR | Excl Oper | 118.98  |
| 79               | Concrete conveyor rubber belt, 18" wide x 42' long, gasoline                 | HOUR | Excl Oper | 131.70  |
| 80               | Concrete finisher 42" 3 blade gasoline / 2 - stroke                          | HOUR | Excl Oper | 4.89    |
| 81               | Concrete grinder 24" dia 5 HP gasoline / 2 - stroke                          | HOUR | Excl Oper | 11.00   |
| 82               | Concrete / mortar mixer, 5 CF, 5 HP gasoline / 2 - stroke                    | HOUR | Excl Oper | 12.16   |

| #                | CONSTRUCTION EQUIPMENT DESCRIPTION   | \$ HOURLY BILL OUT RATE |
|------------------|--|-------------------------|
| <b>CONTINUED</b> |  |                         |
| 24               | John Deere 125 HP 0.5 CY backhoe, with 16' dig depth<br>c/w 1.25 CY Front End Loader | 46.36                   |
| 25               | Massey Ferguson 1552 Tractor and trailer   | 32.76                   |
| 26               | Pipe bending rig 6" to 18" diameter pipe   | 132.31                  |
| 27               | Pipe bending rig 18" to 30" diameter pipe  | 190.14                  |
| 28               | Horizontal drill rig   | 295.27                  |
| 29               | Vertical drill rig   | 158.75                  |
| 30               | Welding rig  | 61.60                   |
| 31               | 10 Passenger / work van  | 8.73                    |
| 32               | School type transportation bus   | 9.24                    |
| 33               | Come along 2.5 Ton   | 3.07                    |
| 34               | 600 CFM compressor   | 36.96                   |
| 35               | 1,000 CFM compressor   | 53.50                   |
| 36               | Pipe cutter 6" to 18" diameter   | 3.84                    |
| 37               | Pipe cutter 18" to 30" diameter  | 7.80                    |
| 38               | Pipe bevellers 6" to 18" diameter  | 5.13                    |
| 39               | Pipe bevellers 18" to 30" diameter   | 7.95                    |
| 40               | Dynapac Compactor – walk behind 26" wide   | 11.98                   |
| 41               | Roller 25 ton towed  | 59.48                   |
| 42               | Brush chipper North Star 35 HP Briggs & Stratton                                     | 21.94                   |
| 43               | Truck 8 CY   | 50.59                   |
| 44               | Truck 12 CY  | 77.99                   |
| 45               | Water pump 4" diameter   | 17.92                   |
| 46               | Chain type trencher 6' deep  | 155.95                  |
| 47               | Welding machine 300 amp  | 16.22                   |
| 48               | Sandblaster pot / Equipment  | 4.93                    |
| 49               | Cutting Torch & gases  | 9.68                    |
| 50               | Group pump 40 CF / hour  | 12.97                   |
| 51               | Tractor 100 HP c/w winch   | 20.68                   |

## USA Mid-West Pipeline

27 MILE 12 " / 18" DIA PIPELINE MID-WEST USA 16 MILES 12" DIA - 11 MILES 18" DIA.

2019 COST BASIS:

| #  | DESCRIPTION                                     | \$ COST           | COMMENTS     |
|----|---|-------------------|--------------|
| 1  | ROW (Clearing)                                  | 687,970           |              |
| 2  | Material (Pipe / Stone / Concrete)              | 4,178,670         |              |
| 3  | Construction (Labor)                            | 3,295,760         |              |
| 4  | Construction (Construction Equipment)           | 3,015,761         |              |
| 5  | Construction (General Conditions)               | 654,334           |              |
| 6  | Supervision / Construction Mgmt                 | 945,500           |              |
| 7  | Road Crossing (3)                               | 93,667            | 3 #          |
| 8  | Railroad crossing (1)                           | 76,665            | 1 #          |
| 9  | Engineering                                     | 1,314,600         | 12,700 hours |
| 10 | Freight   | 614,660           |              |
| 11 | Inspection                                      | 605,000           | 6,250 hours  |
| 13 | <b>TOTAL COST</b>                               | <b>15,482,587</b> |              |
| 12 | <b>COST PER MILE</b>                            | <b>573,429</b>    |              |
| 13 | <b>TYPICAL COST RANGE PER MILE (LOW) - 15%</b>  | <b>487,500</b>    |              |
| 14 | <b>TYPICAL COST RANGE PER MILE (HIGH) + 15%</b> | <b>659,500</b>    |              |