 TORUS		· Owner DETAILED COST ESTIMATE			Document No.	EST-EST-002	
					Revision / Date	A · September 29, 2026	
					Issue purpose	Issued for Review	
ESTIMATE · DETAILED COST ESTIMATE							
Rev.	Date	Revision description		Prepared	Reviewed	Approved	
A	2026-09-29	Issued for Review					

NOTES

1. All prices are 2026 Mid-Continent market values from TORUS’s judgment pending vendor quotations (HOLD H-15). Basis: EST-EST-001, Basis of Estimate.
2. Man-hours include the site productivity factor of 1.158; labor is priced at crew composite rates of open-shop wages on a 10 h x 5 d week.
3. Equipment is permanent (Owner-furnished) equipment; material is bulk material; construction equipment is the contractor’s plant.
4. Codes 82 and 85 are allowances (HOLD H-01, H-04, H-10). Contingency is from EST-EST-003, Risk Register and Contingency Analysis.
5. Lines carried at zero value (priced in another line or by others) appear only in the workbook, with their reason.

ESTIMATE SUMMARY

Table 1-1: Estimate Identification

Field	Entry	Field	Entry
Estimate number	EST-EST-002	Estimate class	AACE Class 3
Project	, 120 MMSCFD	Location	County,
Base date	September 2026	Currency	USD, escalated to spend
Estimator		Date	
Reviewer		Date	
Approver		Date	
Labor rate basis	open shop 2026, 10 h x 5 d, all-in \$68.16 per MH piping crew composite	Productivity factor	1.158 on Gulf Coast norm
Basis of estimate	EST-EST-001	Workbook	EST-EST-002 (live formulas)

Table 1-2: Direct Cost Summary by Area Code (USD)

Code	Area	Subcontract	Equipment	Material	Man-hours	Labor	Constr. equipment	Total
10	Sitework, Earthwork, Roads and Fencing	62,077	0	169,624	1,457	90,142	82,229	404,072
20	Concrete Foundations and Structural Steel	7,344	0	231,516	3,940	246,913	114,449	600,222
30	Major Mechanical Equipment	0	1,945,111	0	623	42,753	16,199	2,004,064
40	Station Piping	103,234	718,500	607,140	6,552	483,727	146,720	2,059,320
50	Measurement and Analyzers	68,000	608,100	104,037	350	24,850	1,751	806,738
60	Electrical and Control Building	18,000	398,500	292,563	3,076	204,599	49,255	962,917
65	Cathodic Protection	28,403	0	20,135	162	11,175	1,939	61,652
70	Instrumentation, Controls and Telecom	442,000	586,000	370,928	4,310	300,200	26,576	1,725,703
80	Specialty Subcontracts and Pre-commissioning	275,758	0	4,000	1,645	112,517	43,589	435,865
82	Receiving Pipeline Operator Reimbursables	428,000	0	0	0	0	0	428,000
85	Utility Service	165,280	0	0	0	0	0	165,280
	Total direct line items	1,598,097	4,256,211	1,799,943	22,114	1,516,876	482,706	9,653,833



Table 1-3: Estimate Roll-up (USD)

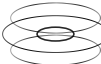
Line	Amount
Direct line items	9,653,833
Freight on Owner-furnished material	240,952
Sales and use tax on contractor-furnished material (HOLD H-EST-01)	79,913
Total direct cost	9,974,698
90 Contractor general conditions	1,305,705
90 Contractor overhead, profit, markups, bonds and insurance	915,097
95 Owner costs (including tax on Owner-furnished material)	2,940,676
97 Escalation	512,558
Base estimate	15,648,734
99 Contingency to P50	1,923,780
Total installed cost, P50	17,572,514
99 Contingency, P50 to P80	671,752
Total installed cost, P80	18,244,266
Construction contract value (engineer's estimate)	6,172,086

DETAIL BY AREA CODE

Code 10, Sitework, Earthwork, Roads and Fencing

Table 1-4: Area 10, Sitework, Earthwork, Roads and Fencing (USD)

Code	Description	Quantity	Subcontract	Equipment	Material	Man-hours	Labor	Constr. equip.	Total
10.001	Clearing and grubbing (pasture), disturbed area	2.96 AC	-	-	-	48.0	2,970	4,080	7,049
10.002	Topsoil strip 6 in and stockpile	2,377 CY	-	-	-	96.3	5,962	4,625	10,586
10.003	Topsoil respread 4 to 6 in on slopes, ditches and disturbed areas	973 CY	-	-	-	33.8	2,092	1,623	3,714
10.004	Excess topsoil, load and haul off site	1,404 CY	-	-	-	65.0	4,025	13,652	17,676
10.005	Common excavation (pad cut, road undercut)	1,402 CY	-	-	-	64.9	4,019	3,117	7,136
10.006	Ditch excavation (D-1 to D-7), used as fill	1,154 CY	-	-	-	80.2	4,962	3,849	8,811
10.007	Embankment / general fill, compacted 95 % ASTM D698	3,193 CY	-	-	1,916	129.4	8,009	6,212	16,136
10.008	Import general fill (borrow)	1,669 CY	-	-	23,366	58.0	3,588	2,783	29,737
10.009	Select fill, non-expansive, under mats, slabs, buildings and containment	289 CY	-	-	6,358	26.8	1,657	1,285	9,300
10.010	Subgrade scarify and moisture condition 12 in (0 to +4 % OMC), pad and roads	8,221 SY	-	-	-	76.2	4,713	3,656	8,369
10.011	Foundation excavation, shallow (mats, slabs, containment, incl. select-fill ov	486 CY	-	-	-	67.5	4,179	3,242	7,421
10.012	Culvert structural backfill	50 CY	-	-	900	17.4	1,075	834	2,809
10.013	Aggregate surfacing, access road (12 in on geotextile)	1,053 TON	-	-	29,484	73.2	4,528	3,512	37,524
10.014	Aggregate surfacing, internal roads (12 in on geotextile)	952 TON	-	-	26,656	66.1	4,093	3,175	33,924
10.015	Aggregate surfacing, station pad (6 in)	1,512 TON	-	-	42,336	105.1	6,501	5,043	53,880
10.016	Woven stabilization geotextile, access road	1,988 SY	-	-	3,181	23.0	1,425	1,105	5,711
10.017	Woven stabilization geotextile, internal roads	1,662 SY	-	-	2,659	19.2	1,191	924	4,774
10.018	Culvert CUL-1 under access road entrance	96 LF	-	-	9,120	55.6	3,440	2,668	15,228

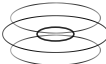
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Code	Description	Quantity	Subcontract	Equipment	Material	Man-hours	Labor	Constr. equip.	Total	
10.019	Riprap, CUL-1 inlet toe apron	1.6 TON	-	-	88	-	29	22	139	
10.020	Riprap, CUL-1 outlet apron	43 TON	-	-	2,365	12.4	770	598	3,733	
10.021	Riprap, SE outfall apron (D-4)	5.9 TON	-	-	324	1.7	106	82	512	
10.022	Grass-lined ditches D-1 to D-7 (shaping)	2,202 LF	-	-	-	51.0	3,156	2,448	5,604	
10.023	Level spreader at SE outfall	35 LF	-	-	875	12.2	752	584	2,211	
10.024	Chain-link fence 7 ft with 3-strand barbed wire	844 LF	27,008	-	-	-	-	-	27,008	
10.025	Vehicle gate, double swing	2 EA	9,600	-	-	-	-	-	9,600	
10.026	Personnel gate, single swing, panic hardware on B-102 gate	2 EA	3,400	-	-	-	-	-	3,400	
10.027	Cattle guard on concrete sills	1 EA	14,500	-	-	-	-	-	14,500	
10.028	Pasture bypass gate beside cattle guard	1 EA	900	-	-	-	-	-	900	
10.029	Pasture wing fence at cattle guard	32 LF	256	-	-	-	-	-	256	
10.030	Silt fence	1,620 LF	-	-	1,944	56.3	3,483	2,702	8,128	
10.031	Rock construction entrance	1 EA	-	-	1,900	18.5	1,147	889	3,936	
10.032	Rock check dams in ditches	23 EA	-	-	4,140	40.0	2,472	1,918	8,530	
10.033	Erosion control blanket (straw / coconut)	4,359 SY	-	-	10,462	151.4	9,371	7,269	27,102	
10.034	Permanent seeding and mulch (Bermuda / native mix)	1.21 AC	4,235	-	-	-	-	-	4,235	
10.035	Temporary seeding	1.21 AC	2,178	-	-	-	-	-	2,178	
10.036	Concrete washout	1 EA	-	-	1,200	4.6	287	222	1,709	
10.037	Culvert inlet protection	1 EA	-	-	350	2.3	143	111	604	
	Subtotal 10		62,077	0	169,624	1,457	90,142	82,229	404,072	

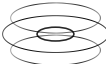
Code 20, Concrete Foundations and Structural Steel

Table 1-5: Area 20, Concrete Foundations and Structural Steel (USD)

Code	Description	Quantity	Subcontract	Equipment	Material	Man-hours	Labor	Constr. equip.	Total
20.001	Culvert end treatment, CUL-1	2 EA	-	-	1,800	55.6	3,460	778	6,038
20.002	Concrete V-101 filter separator mat with saddle pedestals	15.2 CY	-	-	2,888	105.6	6,574	1,752	11,215
20.003	Rebar V-101 filter separator mat with saddle pedestals	1,402 LB	-	-	1,472	16.2	1,011	227	2,710
20.004	Concrete H-101 line heater mat	39.1 CY	-	-	7,429	271.7	16,912	4,507	28,848
20.005	Rebar H-101 line heater mat	2,810 LB	-	-	2,950	32.5	2,026	456	5,432
20.006	Concrete PR-101 support drilled piers (sliding, fixed, pig tray)	6.1 CY	-	-	1,159	17.7	1,099	357	2,615
20.007	Rebar PR-101 support drilled piers (sliding, fixed, pig tray)	677 LB	-	-	711	7.8	488	110	1,309
20.008	Concrete SK-110 skid drilled piers	13.7 CY	-	-	2,603	39.7	2,469	802	5,874
20.009	Rebar SK-110 skid drilled piers	1,642 LB	-	-	1,724	19.0	1,184	266	3,174
20.010	Concrete Canopy column drilled piers	21.4 CY	-	-	4,066	62.0	3,857	1,253	9,175
20.011	Rebar Canopy column drilled piers	2,388 LB	-	-	2,507	27.7	1,721	387	4,616
20.012	Concrete VS-101 vent stack drilled pier	2.7 CY	-	-	513	7.8	487	158	1,158
20.013	Rebar VS-101 vent stack drilled pier	298 LB	-	-	313	3.5	215	48	576
20.014	Concrete T-101 containment slab, walls, loadout drip pad	29.1 CY	-	-	5,529	337.0	20,977	5,242	31,748
20.015	Rebar T-101 containment slab, walls, loadout drip pad	3,430 LB	-	-	3,602	39.7	2,473	556	6,630
20.016	Concrete B-101 analyzer shelter slab	6.9 CY	-	-	1,311	40.0	2,487	684	4,482



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Code	Description	Quantity	Subcontract	Equipment	Material	Man-hours	Labor	Constr. equip.	Total	
20.017	Rebar B-101 analyzer shelter slab	778 LB	-	-	817	9.0	561	126	1,504	
20.018	Concrete B-102 control building slab	13.3 CY	-	-	2,527	77.0	4,794	1,318	8,638	
20.019	Rebar B-102 control building slab	1,500 LB	-	-	1,575	17.4	1,081	243	2,900	
20.020	Concrete G-101 generator slab	3.2 CY	-	-	608	18.5	1,153	317	2,078	
20.021	Rebar G-101 generator slab	394 LB	-	-	414	4.6	284	64	762	
20.022	Concrete XF-101 transformer pad (utility standard)	0.9 CY	-	-	171	8.3	519	133	823	
20.023	Rebar XF-101 transformer pad (utility standard)	110 LB	-	-	116	1.3	79	18	213	
20.024	Concrete FG-101 fuel gas skid slab	3.1 CY	-	-	589	18.0	1,117	307	2,013	
20.025	Rebar FG-101 fuel gas skid slab	375 LB	-	-	394	4.3	270	61	725	
20.026	Concrete ANT-201 antenna mast drilled pier	3.8 CY	-	-	722	11.0	685	222	1,629	
20.027	Rebar ANT-201 antenna mast drilled pier	398 LB	-	-	418	4.6	287	65	769	
20.028	Concrete JB-W01 panel post pier	0.4 CY	-	-	76	1.2	72	23	172	
20.029	Rebar JB-W01 panel post pier	75 LB	-	-	79	0.9	54	12	145	
20.030	Concrete DW-101 wellhead pad and AJB-101 pedestal	0.6 CY	-	-	114	5.6	346	89	549	
20.031	Rebar DW-101 wellhead pad and AJB-101 pedestal	40 LB	-	-	42	-	29	6	77	
20.032	Concrete Pipe support foundations PF-1 (SR-1)	27 CY	-	-	5,130	78.2	4,866	1,580	11,576	
20.033	Rebar Pipe support foundations PF-1 (SR-1)	4,632 LB	-	-	4,864	53.6	3,339	751	8,954	
20.034	Concrete Pipe support foundations PF-2 (SG-1)	39.3 CY	-	-	7,467	113.8	7,083	2,300	16,850	
20.035	Rebar Pipe support foundations PF-2 (SG-1)	4,920 LB	-	-	5,166	57.0	3,547	798	9,510	
20.036	Concrete Pipe support foundations PF-3 (SL-1/SL-2)	3.2 CY	-	-	608	9.3	577	187	1,372	
20.037	Rebar Pipe support foundations PF-3 (SL-1/SL-2)	545 LB	-	-	572	6.3	393	88	1,053	
20.038	Concrete Pipe support foundations PF-4 (SV-1)	19.9 CY	-	-	3,781	57.6	3,586	1,165	8,532	
20.039	Rebar Pipe support foundations PF-4 (SV-1)	2,879 LB	-	-	3,023	33.3	2,075	467	5,565	
20.040	Concrete Pipe support foundations PF-6 (ST-1)	9.8 CY	-	-	1,862	28.4	1,766	574	4,202	
20.041	Rebar Pipe support foundations PF-6 (ST-1)	1,559 LB	-	-	1,637	18.1	1,124	253	3,014	
20.042	Concrete Pipe support foundations PF-7 (SH-1)	6 CY	-	-	1,140	17.4	1,081	351	2,573	
20.043	Rebar Pipe support foundations PF-7 (SH-1)	1,493 LB	-	-	1,568	17.3	1,076	242	2,886	
20.044	Concrete Pipe support foundations PF-8 (SS-1/SS-2)	21 CY	-	-	3,990	60.8	3,785	1,229	9,004	
20.045	Rebar Pipe support foundations PF-8 (SS-1/SS-2)	5,275 LB	-	-	5,539	61.1	3,803	855	10,197	
20.046	Concrete combined pipe support footings / pier caps CF-01 to CF-29 (incl. 11 c	85.3 CY	-	-	16,207	691.5	43,043	11,216	70,466	
20.047	Rebar combined footings / pier caps	8,142 LB	-	-	8,549	94.3	5,869	1,320	15,739	
20.048	Adhesive anchors for pipe support posts bearing on mats / slabs	92 EA	-	-	3,220	53.3	3,316	746	7,282	
20.049	Precast concrete grade blocks for SS-3 supports	2 EA	-	-	240	1.2	72	16	328	
20.050	Bollard footings 18 in dia x 4 ft	6.9 CY	-	-	1,311	24.0	1,492	460	3,263	
20.051	Drilled shaft excavation 12 in dia	897 LF	-	-	-	124.7	7,759	17,891	25,651	
20.052	Drilled shaft excavation 18 in dia	156 LF	-	-	-	27.1	1,687	4,123	5,810	
20.053	Drilled shaft excavation 24 in dia	372 LF	-	-	-	86.2	5,363	13,110	18,474	
20.054	Drilled shaft excavation 30 in dia	230 LF	-	-	-	66.6	4,145	10,592	14,737	
20.055	Drilled shaft excavation 36 in dia	170 LF	-	-	-	63.0	3,922	10,232	14,154	
20.056	Void form / bond breaker over top 8 ft of drilled piers (sonotube or 2 layers	1,112 LF	-	-	6,672	128.8	8,016	1,803	16,491	

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Code	Description	Quantity	Subcontract	Equipment	Material	Man-hours	Labor	Constr. equip.	Total	
20.057	Headed anchor rod with heavy hex nut, plate washer	76 EA	-	-	4,180	52.8	3,287	739	8,206	
20.058	Headed anchor rod with heavy hex nut, plate washer	24 EA	-	-	1,320	16.7	1,038	233	2,592	
20.059	Headed anchor rod with heavy hex nut, plate washer	368 EA	-	-	11,776	170.5	10,611	2,387	24,774	
20.060	Headed anchor rod with heavy hex nut	288 EA	-	-	6,336	100.1	6,228	1,401	13,965	
20.061	Canopy purlins W8x10	1.96 TON	-	-	9,408	45.4	3,101	908	13,417	
20.062	Canopy rafters W10x22	1.06 TON	-	-	5,088	24.6	1,677	491	7,256	
20.063	Canopy columns HSS6x6x3/8	1.59 TON	-	-	7,632	36.8	2,516	737	10,884	
20.064	Canopy base plates, fly braces, bridging, connections	0.81 TON	-	-	4,536	26.3	1,794	525	6,856	
20.066	Roof deck 26 ga R-panel	1,411 SF	-	-	4,515	49.0	3,349	980	8,845	
20.067	Pipe support stanchions, shoes, guides, stops, valve stands (MEC types), skid	5.485 TON	-	-	35,102	76.2	5,207	1,524	41,834	
20.069	Bollards 6 in Sch 40, concrete filled, 8 ft	25 EA	-	-	7,000	57.9	3,604	811	11,415	
20.072	T-101 tank anchor chairs	4 EA	-	-	720	9.3	633	185	1,538	
20.073	PVC waterstop 6 in ribbed, wall-slab joint	96 LF	-	-	768	11.1	692	156	1,616	
20.074	Chemical-resistant epoxy lining, containment interior	816 SF	7,344	-	-	-	-	-	7,344	
20.075	Locked manual drain valve and sump	1 EA	-	-	850	6.9	474	167	1,490	
20.076	Non-shrink grout under base plates and skids	7.8 CF	-	-	429	18.1	1,125	253	1,806	
20.077	DW-101 deep anode well access: aggregate pad 10 x 10 ft x 6 in outside the fen	2.6 TON	-	-	73	-	19	14	106	
	Subtotal 20		7,344	0	231,516	3,940	246,913	114,449	600,222	

Code 30, Major Mechanical Equipment

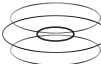
Table 1-6: Area 30, Major Mechanical Equipment (USD)

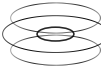
Code	Description	Quantity	Subcontract	Equipment	Material	Man-hours	Labor	Constr. equip.	Total
30.025	PR-101: Inlet pig receiver, NPS 12 x NPS 16 barrel, 16 in QOC with pressure wa	1 ea	-	118,000	-	46.3	3,179	1,204	122,383
30.026	V-101: Horizontal two-barrel filter separator, coalescing elements + vane pack	1 ea	-	520,000	-	92.6	6,357	2,409	528,766
30.027	SK-110: Meter skid: MR-110, MR-120 (NPS 10 AGA 9 meter tubes, FE-111/121, FC-1	1 ea	-	-	-	139.0	9,536	3,613	13,149
30.028	H-101: Indirect water-bath line heater, API 12K, 6.0 MMBtu/h firebox, NPS 6 co	1 ea	-	595,700	-	196.9	13,509	5,119	614,328
30.029	FG-101: Fuel gas skid: filter, E-161 electric preheater, PCV-161/162, PSV-161,	1 ea	-	148,000	-	46.3	3,179	1,204	152,383
30.030	E-161: Fuel gas electric preheater on FG-101, 5 kW rated, outlet setpoint 105	1 ea	-	26,000	-	18.5	1,271	482	27,753
30.031	VS-101: Vent stack NPS 8, 25 ft above grade, open vertical discharge	1 ea	-	36,000	-	37.1	2,543	964	39,506
30.032	T-101: Liquids tank, vertical cone roof, API 12F, PVRV-193 / FA-193 NPS 6, EV-	1 ea	-	45,000	-	46.3	3,179	1,204	49,383
30.038	SK-110 meter skid: fabrication, headers, crossover, MOV bodies, skid steel, sh	1 ls	-	456,411	-	-	-	-	456,411
	Subtotal 30		0	1,945,111	0	623	42,753	16,199	2,004,064

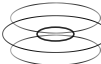
Code 40, Station Piping

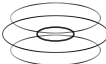
Table 1-7: Area 40, Station Piping (USD)

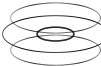
Code	Description	Quantity	Subcontract	Equipment	Material	Man-hours	Labor	Constr. equip.	Total
40.001	Pipe 12 in STD (0.375 in), API 5L X52 PSL2, PSL2, CVN at -20 F, SMLS or ERW, B	490 ft	-	-	35,977	283.7	19,339	6,809	62,125
40.002	Pipe 12 in XS (0.500 in), API 5L X52 PSL2, PSL2, CVN at -20 F, SMLS or ERW, BE	3 ft	-	-	291	1.7	118	42	451
40.003	Pipe 12 in XS (0.500 in), API 5L X52 PSL2, PSL2, CVN at -20 F, SMLS or ERW, BE	99 ft	-	-	10,980	120.4	8,205	2,889	22,074

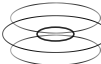
 TORUS		· Owner DETAILED COST ESTIMATE				Document No.		EST-EST-002			
						Revision / Date		A · September 29, 2026			
						Issue purpose		Issued for Review			
ESTIMATE · DETAILED COST ESTIMATE											
Code	Description	Quantity	Subcontract	Equipment	Material	Man-hours	Labor	Constr. equip.	Total		
40.004	Pipe 8 in Sch 80 (0.500 in), API 5L X52 PSL2, PSL2, CVN at -20 F, SMLS or ERW,	36 ft	-	-	2,314	15.8	1,080	380	3,774		
40.005	Pipe 8 in Sch 40S (0.322 in), ASTM A312 TP304/304L, dual certified, SMLS or we	303 ft	-	-	59,752	166.7	11,360	4,000	75,113		
40.006	Pipe 4 in Sch 80 (0.337 in), ASTM A106 Gr B, SMLS, BE, DRL, bare (field paint)	122 ft	-	-	4,392	31.1	2,119	746	7,257		
40.007	Pipe 4 in Sch 40S (0.237 in), ASTM A312 TP304/304L, dual certified, SMLS or we	73 ft	-	-	5,440	23.2	1,585	558	7,582		
40.008	Pipe 3 in Sch 80 (0.300 in), ASTM A106 Gr B, SMLS, BE, SRL, bare (field paint)	12 ft	-	-	295	2.5	170	60	526		
40.009	Pipe 3 in Sch 40S (0.216 in), ASTM A312 TP304/304L, dual certified, SMLS or we	40 ft	-	-	2,092	10.4	710	250	3,053		
40.010	Pipe 2 in Sch 80 (0.218 in), ASTM A106 Gr B, SMLS, BE, SRL, bare (field paint)	2 ft	-	-	24	-	22	8	54		
40.011	Pipe 2 in Sch 80 (0.218 in), ASTM A106 Gr B, SMLS, BE, SRL, FBE 14-16 mil + AR	226 ft	-	-	3,632	102.1	6,957	2,450	13,039		
40.012	Pipe 2 in Sch 80 (0.218 in), ASTM A106 Gr B, SMLS, BE, SRL, bare (field paint)	52 ft	-	-	628	8.4	575	202	1,405		
40.013	Pipe 2 in Sch 80 (0.218 in), ASTM A106 Gr B, SMLS, BE, SRL, bare (field paint)	58 ft	-	-	700	9.4	641	226	1,567		
40.014	Pipe 2 in Sch 40S (0.154 in), ASTM A312 TP304/304L, dual certified, SMLS or we	217 ft	-	-	5,480	44.0	2,997	1,055	9,533		
40.015	Pipe 1 in Sch 80 (0.179 in), ASTM A106 Gr B, SMLS, PE, SRL, bare (field paint)	1 ft	-	-	5	-	9	3	18		
40.016	Pipe 1 in Sch 80 (0.179 in), ASTM A106 Gr B, SMLS, PE, SRL, FBE 14-16 mil + AR	128 ft	-	-	1,115	50.4	3,435	1,210	5,759		
40.017	Pipe 1 in Sch 80 (0.179 in), ASTM A106 Gr B, SMLS, PE, SRL, bare (field paint)	22 ft	-	-	115	3.1	208	73	396		
40.018	Pipe 1 in Sch 80S (0.179 in), ASTM A312 TP304/304L, dual certified, SMLS or we	89 ft	-	-	1,333	15.5	1,054	371	2,757		
40.019	Pipe 3/4 in Sch 80S (0.154 in), ASTM A312 TP304/304L, dual certified, SMLS or	4 ft	-	-	41	0.6	43	15	100		
40.020	Tubing 3/8 in OD x 0.049 in, ASTM A269 TP316 SMLS, with compression fittings,	12 ft	-	-	72	3.5	247	17	336		
40.021	Stud bolt set, 12 in Class 600 (20 studs 1.25 in dia x 8.75 in), A193 B7 with	42 set	-	-	18,342	185.3	12,629	4,447	35,418		
40.022	Stud bolt set, 8 in Class 150 (8 studs 0.75 in dia x 4.25 in), A193 B8M Cl 2 w	2 set	-	-	237	2.3	158	56	450		
40.023	Stud bolt set, 8 in Class 600 (12 studs 1.125 in dia x 7.5 in), A193 B7 with 2	8 set	-	-	1,505	24.3	1,658	584	3,746		
40.024	Stud bolt set, 4 in Class 150 (8 studs 0.625 in dia x 3.5 in), A193 B7 with 2	6 set	-	-	129	6.9	474	167	769		
40.025	Stud bolt set, 4 in Class 150 (8 studs 0.625 in dia x 3.5 in), A193 B8M Cl 2 w	3 set	-	-	215	2.8	189	67	471		
40.026	Stud bolt set, 3 in Class 150 (4 studs 0.625 in dia x 3.5 in), A193 B7 with 2	6 set	-	-	64	5.8	395	139	598		
40.027	Stud bolt set, 3 in Class 150 (4 studs 0.625 in dia x 3.5 in), A193 B8M Cl 2 w	2 set	-	-	72	1.2	79	28	178		
40.028	Stud bolt set, 2 in Class 150 (4 studs 0.625 in dia x 3.25 in), A193 B7 with 2	12 set	-	-	125	10.2	695	245	1,064		
40.029	Stud bolt set, 2 in Class 150 (4 studs 0.625 in dia x 3.25 in), A193 B8M Cl 2	6 set	-	-	208	4.6	316	111	635		
40.030	Stud bolt set, 2 in Class 600 (8 studs 0.625 in dia x 4.25 in), A193 B7 with 2	42 set	-	-	980	55.6	3,789	1,334	6,103		
40.031	Stud bolt set, 1 in Class 150 (4 studs 0.5 in dia x 2.5 in), A193 B7 with 2 A1	5 set	-	-	40	2.8	189	67	296		
40.032	Stud bolt set, 1 in Class 150 (4 studs 0.5 in dia x 2.5 in), A193 B8M Cl 2 wit	3 set	-	-	55	1.4	95	33	183		
40.033	Stud bolt set, 3/4 in Class 150 (4 studs 0.5 in dia x 2.5 in), A193 B8M Cl 2 w	2 set	-	-	36	0.6	39	14	90		
40.034	Barred tee (flow bars, pig guide), straight, B16.9 / MSS SP-75 WPHY-52, STD (0	1 ea	-	-	2,562	-	-	-	2,562		
40.035	Cap, B16.9, WPHY-52, 0.375 in	3 ea	-	-	638	-	-	-	638		
40.036	Elbow 45 LR, B16.9, MSS SP-75 WPHY-52, STD (0.375 in)	2 ea	-	-	1,043	-	-	-	1,043		
40.037	Elbow 90 3R (pig path), B16.9, MSS SP-75 WPHY-52, STD (0.375 in)	3 ea	-	-	6,259	-	-	-	6,259		
40.038	Elbow 90 3R (pig path), B16.9, MSS SP-75 WPHY-52, STD (0.500 in)	2 ea	-	-	5,508	-	-	-	5,508		
40.039	Elbow 90 LR, B16.9, MSS SP-75 WPHY-52, STD (0.375 in)	13 ea	-	-	13,562	-	-	-	13,562		
40.040	Reducer concentric 12x8, B16.9 / MSS SP-75 WPHY-52, 0.375 x 0.500 in	4 ea	-	-	1,190	-	-	-	1,190		
40.041	Tee reducing 12x8, B16.9 / MSS SP-75 WPHY-52, STD (0.375 in)	1 ea	-	-	1,423	-	-	-	1,423		
40.042	Tee straight, B16.9 / MSS SP-75 WPHY-52, STD (0.375 in)	9 ea	-	-	12,808	-	-	-	12,808		
40.043	Cap, B16.9, WP304/304L, 0.322 in	2 ea	-	-	1,200	-	-	-	1,200		

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Code	Description	Quantity	Subcontract	Equipment	Material	Man-hours	Labor	Constr. equip.	Total	
40.044	Elbow 90 LR, B16.9, MSS SP-75 WPHY-52, Sch 80 (0.500 in)	3 ea	-	-	1,827	-	-	-	1,827	
40.045	Tee straight, B16.9 / A403 WP304/304L-S, Sch 40S (0.322 in)	1 ea	-	-	1,620	-	-	-	1,620	
40.046	Elbow 90 LR, B16.9, A234 WPB, Sch 80 (0.337 in)	4 ea	-	-	322	-	-	-	322	
40.047	Elbow 90 LR, B16.9, A403 WP304/304L-S, Sch 40S (0.237 in)	4 ea	-	-	855	-	-	-	855	
40.048	Reducer concentric 4x2, B16.9 / MSS SP-75 WPHY-52, 0.337 x 0.218 in	1 ea	-	-	102	-	-	-	102	
40.049	Tee reducing 4x2, B16.9 / MSS SP-75 WPHY-52, Sch 80 (0.337 in)	2 ea	-	-	355	-	-	-	355	
40.050	Weldolet, MSS SP-97, A182 F304/304L, 4 in x 8 in run (header branch)	2 ea	-	-	640	-	-	-	640	
40.051	Elbow 45 LR, B16.9, A403 WP304/304L-S, Sch 40S (0.216 in)	1 ea	-	-	56	-	-	-	56	
40.052	Elbow 90 LR, B16.9, A234 WPB, Sch 80 (0.300 in)	3 ea	-	-	124	-	-	-	124	
40.053	Elbow 90 LR, B16.9, A403 WP304/304L-S, Sch 40S (0.216 in)	1 ea	-	-	113	-	-	-	113	
40.054	Weldolet, MSS SP-97, A182 F304/304L, 3 in x 8 in run (header branch)	1 ea	-	-	250	-	-	-	250	
40.055	Cap, B16.9, WPB, 0.218 in	1 ea	-	-	25	-	-	-	25	
40.056	Elbow 90 LR, B16.9, A234 WPB, Sch 80 (0.218 in)	9 ea	-	-	225	-	-	-	225	
40.057	Elbow 90 LR, B16.9, A234 WPB, Sch 80 (0.218 in)	6 ea	-	-	150	-	-	-	150	
40.058	Elbow 90 LR, B16.9, A234 WPB, Sch 80 (0.218 in)	7 ea	-	-	175	-	-	-	175	
40.059	Elbow 90 LR, B16.9, A403 WP304/304L-S, Sch 40S (0.154 in)	7 ea	-	-	280	-	-	-	280	
40.060	Tee straight, B16.9 / A403 WP304/304L-S, Sch 40S (0.154 in)	1 ea	-	-	74	-	-	-	74	
40.061	Tee straight, B16.9 / MSS SP-75 WPHY-52, Sch 80 (0.218 in)	2 ea	-	-	120	-	-	-	120	
40.062	Weldolet, MSS SP-97, A105, 2 in x run	7 ea	-	-	455	-	-	-	455	
40.063	Weldolet, MSS SP-97, A105, 2 in x run (SP-141 probe nozzle)	1 ea	-	-	65	-	-	-	65	
40.064	Weldolet, MSS SP-97, A182 F304/304L, 2 in x run	4 ea	-	-	560	-	-	-	560	
40.065	Weldolet, MSS SP-97, A105, 1-1/2 in x run, bore to suit Class 600 WN	4 ea	-	-	220	-	-	-	220	
40.066	Elbow 90 socket weld Class 3000, A105	5 ea	-	-	90	-	-	-	90	
40.067	Elbow 90 socket weld Class 3000, A182 F304/304L	2 ea	-	-	90	-	-	-	90	
40.068	Elbow 90 socket weld Class 6000, A105	6 ea	-	-	108	-	-	-	108	
40.069	Sockolet, MSS SP-97, A105, Class 6000, 1 in	1 ea	-	-	45	-	-	-	45	
40.070	Sockolet, MSS SP-97, A105N, Class 6000, 1 in x run (A6 branch)	6 ea	-	-	270	-	-	-	270	
40.071	Sockolet, MSS SP-97, A182 F304/304L, Class 3000, 1 in x run (header branch)	2 ea	-	-	180	-	-	-	180	
40.072	Elbow 90 socket weld Class 3000, A182 F304/304L	1 ea	-	-	45	-	-	-	45	
40.073	Nipolet, MSS SP-97, A105, Class 6000, 3/4 in	1 ea	-	-	45	-	-	-	45	
40.074	Nipolet, MSS SP-97, ASTM A105, Class 6000, 3/4 in	9 ea	-	-	405	-	-	-	405	
40.075	Sockolet, MSS SP-97, A105, Class 6000, 3/4 in	28 ea	-	-	1,260	-	-	-	1,260	
40.076	Sockolet, MSS SP-97, A105, Class 6000, 3/4 in	3 ea	-	-	135	-	-	-	135	
40.077	Sockolet, MSS SP-97, A182 F304/304L, Class 3000, 3/4 in	1 ea	-	-	90	-	-	-	90	
40.078	Sockolet, MSS SP-97, A182 F304/304L, Class 3000, 3/4 in x run (branch)	1 ea	-	-	90	-	-	-	90	
40.079	WN flange, 12 in Class 600 RF, A105N (CVN at -20 F), bore to match 0.375 in wa	39 ea	-	-	69,966	-	-	-	69,966	
40.080	WN flange, 12 in Class 600 RF, A105N (CVN at -20 F), bore to match 0.500 in wa	1 ea	-	-	1,884	-	-	-	1,884	
40.081	WN flange, 8 in Class 150 RF, A182 F304/304L, bore to match 0.322 in wall	1 ea	-	-	798	-	-	-	798	
40.082	WN flange, 8 in Class 600 RF, A105N (CVN at -20 F), bore to match 0.500 in wal	7 ea	-	-	6,825	-	-	-	6,825	
40.083	WN flange, 4 in Class 150 RF, A105N (CVN at -20 F), bore to match 0.337 in wal	6 ea	-	-	796	-	-	-	796	

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Code	Description	Quantity	Subcontract	Equipment	Material	Man-hours	Labor	Constr. equip.	Total	
40.084	WN flange, 4 in Class 150 RF, A182 F304/304L, bore to match 0.237 in wall	2 ea	-	-	646	-	-	-	646	
40.085	WN flange, 3 in Class 150 RF, A105N (CVN at -20 F), bore to match 0.300 in wal	4 ea	-	-	406	-	-	-	406	
40.086	WN flange, 3 in Class 150 RF, A182 F304/304L, bore to match 0.216 in wall	1 ea	-	-	247	-	-	-	247	
40.087	WN flange, 2 in Class 150 RF, A105N (CVN at -20 F), bore to match 0.218 in wal	11 ea	-	-	772	-	-	-	772	
40.088	WN flange, 2 in Class 150 RF, A182 F304/304L, bore to match 0.154 in wall	5 ea	-	-	855	-	-	-	855	
40.089	WN flange, 2 in Class 600 RF, A105N (CVN at -20 F)	15 ea	-	-	1,638	-	-	-	1,638	
40.090	WN flange, 2 in Class 600 RF, A105N (CVN at -20 F), bore to match 0.218 in wal	34 ea	-	-	3,713	-	-	-	3,713	
40.091	WN flange, 1-1/2 in Class 600 RF, A105N (CVN at -20 F)	4 ea	-	-	312	-	-	-	312	
40.092	WN flange, 1 in Class 150 RF, A105N (CVN at -20 F), bore to match 0.179 in wal	4 ea	-	-	180	-	-	-	180	
40.093	WN flange, 1 in Class 150 RF, A182 F304/304L, bore to match 0.179 in wall	3 ea	-	-	180	-	-	-	180	
40.094	WN flange, 3/4 in Class 150 RF, A182 F304/304L, bore to match 0.154 in wall	1 ea	-	-	60	-	-	-	60	
40.095	Spiral-wound gasket, 12 in Class 600, 316 / flexible graphite, CS outer ring,	80 ea	-	-	7,600	-	-	-	7,600	
40.096	Flexible graphite sheet gasket with tanged 316 insert, 1/8 in, 8 in Class 150	2 ea	-	-	96	-	-	-	96	
40.097	Spiral-wound gasket, 8 in Class 600, 316 / flexible graphite, CS outer ring, 3	14 ea	-	-	868	-	-	-	868	
40.098	Flexible graphite sheet gasket with tanged 316 insert, 1/8 in, 4 in Class 150	14 ea	-	-	364	-	-	-	364	
40.099	Flexible graphite sheet gasket with tanged 316 insert, 1/8 in, 3 in Class 150	12 ea	-	-	264	-	-	-	264	
40.100	Flexible graphite sheet gasket with tanged 316 insert, 1/8 in, 2 in Class 150	32 ea	-	-	512	-	-	-	512	
40.101	Spiral-wound gasket, 2 in Class 600, 316 / flexible graphite, CS outer ring, 3	80 ea	-	-	1,760	-	-	-	1,760	
40.102	Flexible graphite sheet gasket with tanged 316 insert, 1/8 in, 1 in Class 150	12 ea	-	-	144	-	-	-	144	
40.103	Flexible graphite sheet gasket with tanged 316 insert, 1/8 in, 3/4 in Class 15	2 ea	-	-	20	-	-	-	20	
40.104	Pipe 2 in Sch 80 A106 B nozzle, 6 in	2 ft	-	-	24	-	22	8	54	
40.105	Nipple, 3/4 in Sch 160, A106 B, PBE x 4 in	28 ea	-	-	336	-	-	-	336	
40.106	Nipple, 3/4 in Sch 160, A106 B, PBE x 4 in	3 ea	-	-	36	-	-	-	36	
40.107	Nipple, 3/4 in Sch 160, A312 TP304/304L, PBE x 4 in	1 ea	-	-	30	-	-	-	30	
40.108	IJ-101 monolithic insulating joint, NPS 12, 1,440 psig design, BW X52 pups 0.3	1 ea	-	9,500	-	9.3	631	222	10,354	
40.109	IJ-102 monolithic insulating joint, NPS 12, 1,440 psig design, BW X52 pups 0.3	1 ea	-	9,500	-	9.3	631	222	10,354	
40.110	Gate valve, 3/4 in, Class 800, A105, SW x NPT (instrument root)	8 ea	-	-	1,080	13.9	947	334	2,361	
40.111	Gate valve, 3/4 in, Class 800, A105, SW x NPT, with hex plug (DBB bleed)	1 ea	-	-	135	1.7	118	42	295	
40.112	Gate valve, 3/4 in, Class 800, A105, SW x NPT, with hex plug (HPV)	10 ea	-	-	1,350	17.4	1,184	417	2,951	
40.113	Gate valve, 3/4 in, Class 800, A105, SW x NPT, with hex plug (LPD)	12 ea	-	-	1,620	20.8	1,421	500	3,541	
40.114	Gate valve, 3/4 in, Class 800, A105, SW x NPT, with hex plug (LPD)	3 ea	-	-	405	5.2	355	125	885	
40.115	Gate valve, 3/4 in, Class 800, A105, SW x NPT, with hex plug (drain)	3 ea	-	-	405	5.2	355	125	885	
40.116	Gate valve, 3/4 in, Class 800, A105, SW x NPT, with hex plug (vent)	2 ea	-	-	270	3.5	237	83	590	
40.117	Gate valve, 3/4 in, Class 800, A105, SW x NPT, with plug (test connection)	1 ea	-	-	135	1.7	118	42	295	
40.118	Gate valve, 3/4 in, Class 800, A182 F304/304L, SW x NPT, with hex plug (HPV)	1 ea	-	-	290	1.7	118	42	450	
40.119	Ball, trunnion, full bore, API 6D, Class 600 RF flanged, Manual, gear operator	13 ea	-	383,500	-	210.8	14,366	5,058	402,924	
40.120	Ball, trunnion, full bore, API 6D, Class 600 RF flanged, Electro-hydraulic spr	3 ea	-	102,000	-	62.5	4,262	1,501	107,763	
40.121	Check, axial nozzle, full-bore body (not piggable, DS-007), API 6D, Class 600	1 ea	-	46,000	-	16.2	1,105	389	47,494	
40.122	Ball, trunnion, full bore, API 6D, Class 600 RF flanged, Manual, gear operator	1 ea	-	15,500	-	10.4	710	250	16,461	
40.123	Globe, control, ISA-75 / B16.34, Class 600 RF flanged, Electric modulating, ha	2 ea	-	136,000	-	27.8	1,894	667	138,561	

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40.124	Ball, floating, full bore, API 6D / B16.34, Class 150 RF flanged, Manual, leve	2 ea	-	-	1,900	6.9	474	167	2,540	
40.125	Ball, floating, full bore, API 6D / B16.34, Class 150 RF flanged, Manual, leve	2 ea	-	-	1,440	5.8	395	139	1,974	
40.126	Ball, floating, 304/304L S1, with plug, API 6D / B16.34, Class 150 RF flanged,	1 ea	-	-	980	2.3	158	56	1,193	
40.127	Ball, floating, full bore, API 6D / B16.34, Class 600 RF flanged, Manual, gear	6 ea	-	-	11,100	17.4	1,184	417	12,701	
40.128	Ball, floating, full bore, API 6D / B16.34, Class 600 RF flanged, Manual, gear	5 ea	-	-	9,250	14.5	987	347	10,584	
40.129	Ball, floating, full bore, API 6D / B16.34, Class 150 RF flanged, Manual, leve	3 ea	-	-	1,260	6.9	474	167	1,900	
40.130	Ball, floating, full bore, API 6D / B16.34, Class 600 RF flanged, Electric / e	1 ea	-	-	2,300	2.9	197	69	2,567	
40.131	Ball, floating, full bore, API 6D / B16.34, Class 150 RF flanged, Electric / e	1 ea	-	-	650	2.3	158	56	863	
40.132	Globe, B16.34, Class 600 RF flanged, Manual, gear operator with handwheel (DS-	4 ea	-	-	10,400	11.6	789	278	11,467	
40.133	Globe, control, ISA-75 / B16.34, Class 600 RF flanged, Electric modulating, ha	1 ea	-	-	7,800	4.6	316	111	8,227	
40.134	Ball, floating (plugged), API 6D / B16.34, Class 150 RF flanged, Manual, lever	1 ea	-	-	320	1.7	118	42	480	
40.135	Ball, floating, B16.34, Class 800 SW, Manual, lever	1 ea	-	-	180	1.7	118	42	340	
40.136	Ball, floating, B16.34, Class 150 RF flanged, Manual, lever	1 ea	-	-	260	1.7	118	42	420	
40.137	Globe, forged, API 602 Class 800 SW , Class 800 SW, Manual, handwheel	3 ea	-	-	540	5.2	355	125	1,020	
40.138	PSV-101 conventional spring PSV, API 526 (V-101 fire), set 1,440 psig, carbon	1 ea	-	8,200	-	6.9	474	167	8,840	
40.139	PSV-157 conventional spring PSV, API 526 (H-101 coil), set 1,440 psig, carbon	1 ea	-	5,200	-	6.9	474	167	5,840	
40.140	TSV-136 conventional spring PSV, API 526 (thermal), set 1,440 psig, carbon ste	1 ea	-	3,100	-	6.9	474	167	3,740	
40.141	RO-102: Restriction orifice plate 3/16 in bore downstream of BDV-102 , C	1 ea	-	-	1,400	2.3	158	56	1,613	
40.142	RO-104: Restriction orifice in Class 600 orifice flanges on 1060 downstream of	1 ea	-	-	2,600	3.5	237	83	2,920	
40.143	HV-180A pan: Portable drain collection pan under drain valve HV-180A at VS-101	1 ea	-	-	650	1.2	79	28	757	
40.144	RO-181: Restriction orifice plate in Class 600 orifice flanges (bore per PRO-C	1 ea	-	-	2,600	3.5	237	83	2,920	
40.145	RO-182: Restriction orifice, as RO-181	1 ea	-	-	2,600	3.5	237	83	2,920	
40.146	RO-183: Restriction orifice, as RO-181	1 ea	-	-	2,600	3.5	237	83	2,920	
40.147	RO-172B: Restriction orifice, as RO-181	1 ea	-	-	2,600	3.5	237	83	2,920	
40.148	DB-1191: Dry-break loadout coupling with dust cap, 3 in, and static grounding	1 ea	-	-	1,450	3.5	237	83	1,770	
40.149	SB-TEST: Test blinds / spectacle blinds for hydrotest isolation at V-101 N1 /	7 ea	-	-	12,600	32.4	2,210	778	15,588	
40.150	SPOOL-USM: Temporary test spools replacing FE-111 / FE-121 (30 in F2F) during	2 ea	-	-	9,000	13.9	947	334	10,281	
40.151	SPOOL-FCV: Temporary test spools replacing FCV-131 / FCV-132 (24 in F2F)	2 ea	-	-	7,600	11.6	789	278	8,667	
40.152	STR-T: Temporary conical start-up strainers, 100 mesh, at SK-110 inlet flange	3 ea	-	-	4,800	13.9	947	334	6,081	
40.153	ISO-PAD: Pipe-to-support isolation pads (SPC-004, item 8-06)	225 ea	-	-	8,550	52.1	3,552	1,251	13,353	
40.154	VS-TIP: Vent stack tip with drain hole, no rain cap flapper (P&ID DWG-109)	1 ea	-	-	900	2.3	158	56	1,113	
40.156	SG-1: Guided pipe shoe with bolted guide angles, isolation pad	13 ea	-	-	3,120	60.2	4,105	1,445	8,670	
40.157	SG-1: Guided pipe shoe with bolted guide angles, isolation pad	6 ea	-	-	720	27.8	1,894	667	3,281	
40.158	SH-1: Vent header T-post support with guide clamp and pad	18 ea	-	-	8,064	125.1	8,525	3,002	19,590	
40.159	SL-1: Axial line stop (shoe with stop lugs both sides), isolation pad	3 ea	-	-	1,056	17.4	1,184	417	2,657	
40.160	SL-2: SL-2	1 ea	-	-	160	4.6	316	111	587	
40.161	SR-1: Resting pipe shoe (T-section, welded) on concrete sleeper / pier, with i	42 ea	-	-	7,392	145.9	9,946	3,502	20,840	
40.162	SR-1: Resting pipe shoe (T-section, welded) on concrete sleeper / pier, with i	7 ea	-	-	616	24.3	1,658	584	2,857	
40.163	SS-1: Small-bore support, low post with U-bolt and isolation sleeve	1 ea	-	-	58	1.7	118	42	218	
40.164	SS-1: Small-bore support, low post with U-bolt and isolation sleeve	32 ea	-	-	1,843	55.6	3,789	1,334	6,966	

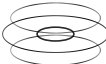
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ESTIMATE · DETAILED COST ESTIMATE										
Code	Description	Quantity	Subcontract	Equipment	Material	Man-hours	Labor	Constr. equip.	Total	
40.165	SS-1: Small-bore support, low post with U-bolt and isolation sleeve	13 ea	-	-	749	22.6	1,539	542	2,830	
40.166	SS-2: Small-bore support, tall post / bracket with U-bolt and isolation sleeve	8 ea	-	-	1,792	27.8	1,894	667	4,353	
40.167	SS-2: Small-bore support, tall post / bracket with U-bolt and isolation sleeve	32 ea	-	-	7,168	111.2	7,578	2,668	17,414	
40.168	SS-2: Small-bore support, tall post / bracket with U-bolt and isolation sleeve	11 ea	-	-	2,464	38.2	2,605	917	5,986	
40.169	SS-2: Small-bore support, tall post / bracket with U-bolt and isolation sleeve	2 ea	-	-	448	6.9	474	167	1,088	
40.170	SS-3: SS-3	2 ea	-	-	160	4.6	316	111	587	
40.171	ST-1: Tall steel post / frame support with U-bolt and pad	4 ea	-	-	4,864	37.1	2,526	889	8,279	
40.172	ST-1: Tall steel post / frame support with U-bolt and pad	14 ea	-	-	8,512	129.7	8,840	3,113	20,465	
40.173	ST-2: Pipe support bracket on V-101 shell (vessel vendor clip), shoe and pad	4 ea	-	-	2,816	27.8	1,894	667	5,377	
40.174	SV-1: Adjustable valve / flange pipe stand under heavy valve, isolation pad	12 ea	-	-	6,144	69.5	4,736	1,668	12,548	
40.176	Above-grade painting, 3-coat (zinc-rich epoxy / epoxy / polyurethane), piping	3,195 sq ft	-	-	4,313	277.5	16,974	2,498	23,784	
40.178	Stainless S1 piping: no paint; pickling / passivation of welds and chloride-fr	924 sq ft	-	-	554	32.1	1,964	289	2,807	
40.179	Acoustic insulation jacket, removable, for NPS 8 Class 600 globe control valve	2 ea	-	-	7,600	13.9	850	125	8,575	
40.180	Acoustic pipe insulation, NPS 12 downstream of each FCV (12 x 8 expander and l	20 ft	-	-	76,000	139.0	8,500	1,251	85,751	
40.182	Field joint coating kits (two-part epoxy or FBE) for buried girth welds	34 ea	-	-	4,080	70.9	4,335	638	9,053	
40.183	Soil-to-air transition wrap systems (IJ-102 riser, 1051 x 2, 1052 x 2 risers)	5 ea	-	-	1,900	17.4	1,063	156	3,119	
40.184	Butt weld (BW) 12 in, field	28 ea	-	-	1,344	446.5	30,430	10,715	42,489	
40.185	Butt weld (BW) 12 in, shop (spool)	106 ea	-	-	5,088	955.3	93,618	-	98,706	
40.186	Butt weld (BW) 8 in, field	10 ea	-	-	678	146.7	9,998	3,521	14,197	
40.187	Butt weld (BW) 8 in, shop (spool)	12 ea	-	-	813	99.5	9,750	-	10,563	
40.188	Butt weld (BW) 4 in, field	7 ea	-	-	164	41.7	2,841	1,000	4,005	
40.189	Butt weld (BW) 4 in, shop (spool)	29 ea	-	-	681	97.6	9,564	-	10,245	
40.190	Butt weld (BW) 3 in, field	1 ea	-	-	24	5.7	386	136	545	
40.191	Butt weld (BW) 3 in, shop (spool)	15 ea	-	-	353	48.0	4,702	-	5,055	
40.192	Butt weld (BW) 2 in, field	38 ea	-	-	452	125.2	8,531	3,004	11,987	
40.193	Butt weld (BW) 2 in, shop (spool)	94 ea	-	-	1,118	175.0	17,150	-	18,268	
40.194	Socket weld (SW) 1 in, field	47 ea	-	-	141	70.8	4,823	1,698	6,662	
40.195	Socket weld (SW) 3/4 in, field	3 ea	-	-	9	3.8	260	92	361	
40.196	Butt weld (BW) 1-1/2 in on branch nozzles (olet-to-pipe / pipe-to-WN), field	4 ea	-	-	24	8.4	573	202	799	
40.197	Butt weld (BW) 2 in on branch nozzles (olet-to-pipe / pipe-to-WN), field	22 ea	-	-	262	72.5	4,939	1,739	6,940	
40.198	Butt weld (BW) 3 in on branch nozzles (olet-to-pipe / pipe-to-WN), field	1 ea	-	-	24	5.7	386	136	545	
40.199	Branch connection weld (olet to run, groove + fillet), field	71 ea	-	-	426	180.9	12,329	4,341	17,097	
40.200	Socket weld (SW) small-bore nipple / valve connections, field	84 ea	-	-	252	111.9	7,625	2,685	10,562	
40.201	Radiography (RT) or AUT, 100 % of butt welds (field and spool welds, 367 of 42	367 welds	72,940	-	-	-	-	-	72,940	
40.202	MT / PT, 100 % of socket, fillet and branch welds (excl. 34 skid welds)	205 welds	11,275	-	-	-	-	-	11,275	
40.203	MT of tie-in and golden welds (TI-01 and 1042 field welds), after 12 h delay	9 welds	1,260	-	-	-	-	-	1,260	
40.204	Holiday detection of buried coating	430 ft	-	-	-	6.0	366	54	419	
40.205	NDE crew mobilizations and radiation safety set-up (6 trips)	6 ea	9,000	-	-	-	-	-	9,000	
40.206	Hydrotest TS-01A: fill, pressurize, 8 h hold, dewater, dry, reinstate (1705 ga	1 section	-	-	150	139.0	9,472	9,335	18,957	
40.207	Hydrotest TS-01B: fill, pressurize, 8 h hold, dewater, dry, reinstate (1949 ga	1 section	-	-	150	162.1	11,051	9,891	21,092	

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Code	Description	Quantity	Subcontract	Equipment	Material	Man-hours	Labor	Constr. equip.	Total
40.208	Hydrotest TS-02: fill, pressurize, 8 h hold, dewater, dry, reinstate (1033 gal	1 section	-	-	150	104.2	7,104	8,501	15,755
40.209	Hydrotest TS-03: fill, pressurize, 8 h hold, dewater, dry, reinstate (39 gal)	1 section	-	-	150	46.3	3,157	5,412	8,719
40.210	Hydrotest TS-04: fill, pressurize, 8 h hold, dewater, dry, reinstate (861 gal)	1 section	-	-	150	81.1	5,525	6,246	11,921
40.211	Hydrotest TS-05: fill, pressurize, 8 h hold, dewater, dry, reinstate (90 gal)	1 section	-	-	150	46.3	3,157	5,412	8,719
40.214	Test water purchase and haul (6,244 gal incl. 10 % flush / make-up)	6,244 gal	749	-	-	-	-	-	749
40.215	Test water sampling, analysis, haul and disposal at a permitted facility	6,244 gal	2,810	-	-	-	-	-	2,810
40.216	Hydrotest trucking (2 loads in, 2 loads out) and frac tank rental	1 ls	5,200	-	-	-	-	-	5,200
40.217	Class 900 WN companion flanges 12 in, spiral-wound gaskets, B7 bolting and 2 C	1 ls	-	-	12,100	11.6	789	278	13,167
	Subtotal 40		103,234	718,500	607,140	6,552	483,727	146,720	2,059,320

Code 50, Measurement and Analyzers

Table 1-8: Area 50, Measurement and Analyzers (USD)

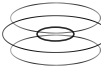
Code	Description	Quantity	Subcontract	Equipment	Material	Man-hours	Labor	Constr. equip.	Total		
50.003	Multipath ultrasonic meter FE-111 / FE-121 with electronics FT-111 / FT-121, 4	2 ea	-	196,000	-	37.1	2,630	185	198,815		
50.004	Flow calibration of FE-111 / FE-121 with own meter tube and conditioner, >= 7	2 ea	68,000	-	-	-	-	-	68,000		
50.005	Perforated-plate flow conditioner FC-111 / FC-121, AGA 9 installation-effects	2 ea	-	9,600	-	-	-	-	9,600		
50.006	Meter tube spool pipe U1, U2, DS (6 spools x 47.75 in)	26.3 ft	-	-	5,523	-	-	-	5,523		
50.007	Weld neck flange bored to meter bore, with 2 dowel pin holes	12 ea	-	-	22,800	-	-	-	22,800		
50.008	Dowel pin set for calibrated flange joints	16 ea	-	-	720	-	-	-	720		
50.009	Spiral-wound gasket with inner and outer rings	16 ea	-	-	1,280	-	-	-	1,280		
50.010	Stud bolt with 2 heavy hex nuts	128 ea	-	-	4,864	-	-	-	4,864		
50.011	Weldolet for thermowell nozzle	4 ea	-	-	240	-	-	-	240		
50.012	Weld neck flange for thermowell nozzle	4 ea	-	-	480	-	-	-	480		
50.013	Flanged tapered thermowell TW-111, TW-112, TW-121, TW-122 (A 1.25, B 0.875, bo	4 ea	-	-	3,800	9.3	658	46	4,504		
50.014	Temperature element and transmitter TT-111 / TT-121, 4-wire Pt100 Class A, CVD	2 ea	-	-	4,800	9.3	658	46	5,504		
50.015	Absolute pressure transmitter PT-111 / PT-121, 0-1500 psia , 0.025 % spa	2 ea	-	-	7,200	13.9	986	69	8,256		
50.016	Clamp-type pipe support saddle S1 to S5 (no welding to calibrated spool)	10 ea	-	-	4,500	-	-	-	4,500		
50.017	Meter tube insulation, 2 in mineral wool with aluminium jacket	32 ft	-	-	1,216	22.2	1,578	111	2,905		
50.018	Removable insulation cover for flange joint	10 ea	-	-	6,500	17.4	1,233	87	7,820		
50.019	Removable insulation blanket for meter body (transducer access)	2 ea	-	-	2,800	4.6	329	23	3,152		
50.020	Pressure-reducing insertion sample probe SP-141, heated regulator (140 F), 1.0	1 ea	-	-	6,800	6.9	493	35	7,328		
50.021	Weldolet and WN flange for SP-141 nozzle	1 set	-	-	350	-	-	-	350		
50.022	Pre-insulated heat-traced tubing bundle, 1 x 3/8 OD x 0.035 316 SS tube + self	25 ft	-	-	1,200	11.6	822	58	2,080		
50.023	Pre-insulated heat-traced tubing bundle, 1 x 1/4 OD x 0.035 316 SS tube + self	25 ft	-	-	1,050	11.6	822	58	1,930		
50.024	Heat trace power connection kit, end seal, line-sensing thermostat set 120 F	2 set	-	-	900	9.3	658	46	1,604		
50.025	Seamless 316 SS tubing: header 1/4"-G-1136-T1, carrier 1137, cal 1138 (heat tr	80 ft	-	-	336	23.2	1,644	116	2,096		
50.026	Seamless 316 SS tubing, conditioning panel 3/8 in runs	15 ft	-	-	90	4.3	308	22	420		
50.027	Seamless 316 SS vent tubing, lines 1/2"-V-1130 to 1135-T1 plus PSV-141G vent,	112 ft	-	-	1,064	25.9	1,841	130	3,035		
50.028	Vent rain cap and bug screen for 1/2 in vent tube	7 ea	-	-	315	2.4	173	12	500		
50.029	Compression fittings, tube supports, bulkheads (allowance)	1 lot	-	-	4,500	27.8	1,973	139	6,612		

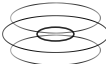
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Code	Description	Quantity	Subcontract	Equipment	Material	Man-hours	Labor	Constr. equip.	Total	
50.030	Sample conditioning panel AE-141: HV-141A, membrane separator, speed loop HV-1	1 ea	-	18,500	-	-	-	-	18,500	
50.031	Composite sampler SMP-146, electric pump type, 0.5 cm3 bite	1 ea	-	16,500	-	-	-	-	16,500	
50.032	Constant-pressure floating-piston sample cylinder, 500 cm3, MAWP 1,800 psig mi	2 ea	-	-	7,600	-	-	-	7,600	
50.033	Gas chromatograph AE/AT-141, C6+ BTU, with stream selector and controller	1 ea	-	72,000	-	-	-	-	72,000	
50.034	Water vapor analyzer AT-142, TDL, 0-20 lb/MMscf	1 ea	-	46,000	-	-	-	-	46,000	
50.035	H2S analyzer AT-143, lead-acetate tape, 0-16 ppmv	1 ea	-	26,000	-	-	-	-	26,000	
50.036	O2 analyzer AT-144, electrochemical, 0-100 ppmv	1 ea	-	14,500	-	-	-	-	14,500	
50.037	Dual-run flow computer FQI-110 (API 21.1), panel mounted in B-102, with softwa	1 ea	-	19,500	-	6.9	493	35	20,028	
50.038	Cylinder regulators: He changeover manifold PCV-141K with PSL-141L, cal PCV-14	6 ea	-	-	5,100	10.4	740	52	5,892	
50.039	Heated blanket for calibration standard cylinder	1 ea	-	-	650	1.2	82	6	738	
50.040	Analyzer shelter B-101, 12 x 10 ft fiberglass, insulated, with XP heater, exha	1 ea	-	189,500	-	69.5	4,931	347	194,779	
50.041	Outdoor cylinder rack with sunshade roof and chains, 7 positions (4 fixed + 3	1 ea	-	-	6,500	18.5	1,315	93	7,908	
50.042	Relief valve PSV-141B on the SP-141 probe regulator outlet (3/8"-G-1080-T1), s	1 ea	-	-	650	1.7	123	9	782	
50.043	316 SS relief outlet tubing 1/2"-V-1121-T1, PSV-141B to MOV bleed header 1"-V-	22 ft	-	-	209	5.1	362	25	596	
	Subtotal 50		68,000	608,100	104,037	350	24,850	1,751	806,738	

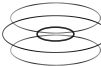
Code 60, Electrical and Control Building

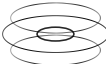
Table 1-9: Area 60, Electrical and Control Building (USD)

Code	Description	Quantity	Subcontract	Equipment	Material	Man-hours	Labor	Constr. equip.	Total
60.001	B-102: Control and electrical building, prefabricated steel	1 ea	-	285,000	-	92.6	6,357	2,409	293,766
60.003	Service-entrance breaker enclosure MCB-101, NEMA 3R, SUSE	1 ea	-	-	4,800	13.9	935	83	5,818
60.004	Utility meter base UM-101, self-contained	1 ea	-	-	450	6.9	467	42	959
60.005	Automatic transfer switch ATS-101, open transition, UL 1008, NEMA 1	1 ea	-	9,500	-	18.5	1,246	111	10,858
60.006	Standby generator G-101, natural gas, weatherproof sound enclosure, 110 A elec	1 ea	-	64,000	-	46.3	3,116	2,078	69,194
60.007	Distribution panelboard DP-101, two 42-circuit sections, bolt-on MCCBs per LST	1 ea	-	14,500	-	27.8	1,870	167	16,536
60.008	Dry-type transformer XF-102, 150 C rise	1 ea	-	-	2,600	11.6	779	69	3,448
60.009	Panelboard LP-101, 42 circuit, main breaker	1 ea	-	-	3,200	13.9	935	83	4,218
60.010	Lighting contactor LC-101 with HOA and photocell PC-101	1 ea	-	-	1,400	6.9	467	42	1,909
60.011	UPS-101 on-line double conversion with static bypass	1 ea	-	4,500	-	6.9	467	42	5,009
60.012	UPS maintenance bypass switch, wall mounted	1 ea	-	-	900	4.6	312	28	1,239
60.013	UPS battery cabinet UBC-101, 24 x 2 V VRLA 200 Ah	1 ea	-	9,800	-	18.5	1,246	111	11,158
60.014	UPS distribution panel UP-101, 12 circuit	1 ea	-	-	1,100	6.9	467	42	1,609
60.015	Battery charger BC-101A / BC-101B, temperature compensated	2 ea	-	-	16,800	18.5	1,246	111	18,158
60.016	Station battery BT-101, 12 x 2 V VRLA cells 400 Ah, 2-tier seismic rack, batte	1 set	-	11,200	-	20.8	1,402	125	12,727
60.017	DC distribution panel DCP-101, DC-rated breakers, ground detector, voltage mon	1 ea	-	-	3,800	9.3	623	56	4,479
60.023	Main gate swing operators GO-101A/B with safety edges, loop detectors	2 ea	-	-	13,000	37.1	2,493	222	15,715
60.024	Local disconnect switch, non-fused, lockable, Ex d, Class I Div 1/2 Group D	17 ea	-	-	24,650	118.1	7,946	709	33,305
60.025	Local disconnect switch, non-fused, lockable, NEMA 4X	3 ea	-	-	1,140	13.9	935	83	2,158
60.026	Receptacle 30 A 480 V 3P4W, interlocked switch, Class I Div 2 (RCP-101) with p	1 ea	-	-	1,900	6.9	467	42	2,409
60.027	Duplex GFCI receptacle, factory sealed, Class I Div 2, weatherproof cover	6 ea	-	-	2,520	20.8	1,402	125	4,047

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60.028	Duplex receptacle, specification grade, GFCI where required, B-102	6 ea	-	-	270	10.4	701	63	1,034	
60.029	Self-regulating heat tracing cable 8 W/ft at 50 F, T3 rated, braid + overjacke	44 ft	-	-	1,232	7.6	514	46	1,792	
60.030	Heat tracing controllers HTC-1080 and HTC-1139 (one per circuit HT-1080 / HT-1	2 ea	-	-	6,800	18.5	1,246	111	8,158	
60.031	Heat tracing power connection, end seal and splice kit set, Class I Div 2	1 set	-	-	450	4.6	312	28	789	
60.032	DC terminal box JB-140D (B-101) and JB-110D (SK-110), fused terminals, Ex e or	2 ea	-	-	3,200	13.9	935	83	4,218	
60.033	Canopy lighting junction box JB-110L, Class I Div 2	1 ea	-	-	350	3.5	234	21	605	
60.034	Arc-flash / available fault labels per NFPA 70E 130.5(H) and NEC 110.24	10 ea	-	-	250	3.5	234	21	505	
60.035	Equipment nameplates, engraved, and cable markers (2 per cable)	180 ea	-	-	1,080	20.8	1,402	125	2,607	
60.036	Power cable 2/C #10 + #10 G, Type TC-ER, 600 V, Cu XHHW-2, PVC jacket, direct	550 ft	-	-	852	10.2	686	61	1,599	
60.037	Power cable 2/C #12 + #12 G, Type TC-ER, 600 V, Cu XHHW-2, PVC jacket, direct	5,930 ft	-	-	6,819	109.9	7,391	659	14,870	
60.038	Power cable 2/C #4 + #4 G, Type TC-ER, 600 V, Cu XHHW-2, PVC jacket, direct bu	260 ft	-	-	1,352	7.5	506	45	1,904	
60.039	Power cable 3/C #10 + #10 G, Type TC-ER, 600 V, Cu XHHW-2, PVC jacket, direct	250 ft	-	-	525	5.2	351	31	907	
60.040	Power cable 3/C #12 + #12 G, Type TC-ER, 600 V, Cu XHHW-2, PVC jacket, direct	3,500 ft	-	-	5,075	68.9	4,635	413	10,124	
60.041	Single conductor #1 XHHW-2 Cu 600 V	50 ft	-	-	155	0.8	55	5	214	
60.042	Single conductor #1/0 XHHW-2 Cu 600 V	870 ft	-	-	3,306	16.1	1,084	97	4,487	
60.043	Single conductor #10 XHHW-2 Cu 600 V	140 ft	-	-	45	1.1	76	7	128	
60.044	Single conductor #10 XHHW-2 Cu 600 V (green, EGC)	50 ft	-	-	16	-	27	2	46	
60.045	Single conductor #12 XHHW-2 Cu 600 V (green, EGC)	30 ft	-	-	7	-	16	1	24	
60.046	Single conductor #6 XHHW-2 Cu 600 V	90 ft	-	-	86	0.9	63	6	154	
60.047	Single conductor #6 XHHW-2 Cu 600 V (green, EGC)	190 ft	-	-	180	2.0	133	12	326	
60.048	Single conductor #8 XHHW-2 Cu 600 V (green, EGC)	90 ft	-	-	56	0.9	63	6	125	
60.049	Control cable 12/C #14, Type TC-ER, 600 V, Cu	60 ft	-	-	156	1.5	103	9	268	
60.050	Control cable 3/C #14, Type TC-ER, 600 V, Cu	50 ft	-	-	42	0.8	55	5	102	
60.051	Control cable 7/C #14, Type TC-ER, 600 V, Cu	250 ft	-	-	388	5.2	351	31	769	
60.052	Rigid PVC conduit Schedule 40, UL 651, direct buried / encased, with couplings	2,610 ft	-	-	2,480	151.1	10,166	907	13,552	
60.053	Rigid PVC conduit Schedule 40, UL 651, direct buried / encased, with couplings	460 ft	-	-	575	29.3	1,971	176	2,722	
60.054	Rigid PVC conduit Schedule 40, UL 651, direct buried / encased, with couplings	800 ft	-	-	1,360	55.6	3,739	334	5,433	
60.055	Rigid PVC conduit Schedule 40, UL 651, direct buried / encased, with couplings	320 ft	-	-	640	24.1	1,620	145	2,405	
60.056	Rigid PVC conduit Schedule 40, UL 651, direct buried / encased, with couplings	200 ft	-	-	520	17.4	1,169	104	1,793	
60.057	PVC-coated rigid metal conduit (40 mil), risers from 24 in below grade to equi	220 ft	-	-	2,420	40.8	2,742	245	5,407	
60.058	PVC-coated RMC 90 deg elbow (riser)	32 ea	-	-	1,216	18.5	1,246	111	2,574	
60.059	PVC-coated rigid metal conduit (40 mil), risers from 24 in below grade to equi	70 ft	-	-	980	14.6	982	88	2,049	
60.060	PVC-coated RMC 90 deg elbow (riser)	10 ea	-	-	480	5.8	390	35	904	
60.061	PVC-coated rigid metal conduit (40 mil), risers from 24 in below grade to equi	60 ft	-	-	1,140	14.6	982	88	2,209	
60.062	PVC-coated RMC 90 deg elbow (riser)	8 ea	-	-	560	4.6	312	28	899	
60.063	PVC-coated rigid metal conduit (40 mil), risers from 24 in below grade to equi	60 ft	-	-	1,320	16.7	1,122	100	2,542	
60.064	PVC-coated RMC 90 deg elbow (riser)	8 ea	-	-	680	4.6	312	28	1,019	
60.065	PVC-coated rigid metal conduit (40 mil), risers from 24 in below grade to equi	20 ft	-	-	580	6.5	436	39	1,055	
60.066	PVC-coated RMC 90 deg elbow (riser)	2 ea	-	-	230	1.2	78	7	315	
60.067	PVC Schedule 40 long-radius sweep 90 deg (24 in radius min)	73 ea	-	-	438	16.9	1,137	101	1,677	

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Code	Description	Quantity	Subcontract	Equipment	Material	Man-hours	Labor	Constr. equip.	Total	
60.068	PVC Schedule 40 long-radius sweep 90 deg (24 in radius min)	13 ea	-	-	104	3.0	203	18	325	
60.069	PVC Schedule 40 long-radius sweep 90 deg (24 in radius min)	16 ea	-	-	192	3.7	249	22	464	
60.070	PVC Schedule 40 long-radius sweep 90 deg (24 in radius min)	9 ea	-	-	135	2.1	140	13	288	
60.071	PVC Schedule 40 long-radius sweep 90 deg (24 in radius min)	4 ea	-	-	80	0.9	62	6	148	
60.072	EMT with compression fittings and supports, inside B-102	730 ft	-	-	1,168	50.7	3,412	304	4,884	
60.073	EMT with compression fittings and supports, inside B-102	30 ft	-	-	75	2.4	164	15	253	
60.074	EMT with compression fittings and supports, inside B-102	90 ft	-	-	378	8.3	561	50	989	
60.075	EMT with compression fittings and supports, inside B-102	80 ft	-	-	400	8.3	561	50	1,011	
60.076	Explosionproof sealing fitting EYS (vertical/horizontal) with fiber dam and se	2 ea	-	-	96	2.3	156	14	266	
60.077	Explosionproof sealing fitting EYS (vertical/horizontal) with fiber dam and se	1 ea	-	-	95	1.2	78	7	180	
60.078	Explosionproof sealing fitting EYS (vertical/horizontal) with fiber dam and se	4 ea	-	-	288	4.6	312	28	627	
60.079	Explosionproof sealing fitting EYS (vertical/horizontal) with fiber dam and se	1 ea	-	-	135	1.7	117	10	262	
60.080	Explosionproof sealing fitting EYS (vertical/horizontal) with fiber dam and se	11 ea	-	-	418	12.7	857	76	1,351	
60.081	Sealing compound and fiber, kits	19 kit	-	-	418	-	-	-	418	
60.082	Cable gland, Ex d barrier type for TC-ER-HL/TC-ER cable, with sealing, Class I	34 ea	-	-	2,890	23.6	1,589	142	4,621	
60.083	Liquidtight / cable connector, unclassified terminations (B-102 and unclassifi	116 ea	-	-	1,044	40.3	2,711	242	3,997	
60.084	Duct seal compound for B-102 floor / wall conduit entries	30 lb	-	-	180	3.5	234	21	435	
60.085	Strut channel, clamps and hardware for risers and equipment racks	132 ft	-	-	726	18.3	1,234	110	2,070	
60.086	Precast polymer concrete handhole with bolted cover 'ELECTRIC', Tier 15, open	17 ea	-	-	28,050	118.1	7,946	3,259	39,255	
60.087	Precast concrete pull box, heavy duty (road adjacent)	3 ea	-	-	9,600	34.7	2,337	1,558	13,495	
60.088	Cable trench excavation and backfill, 36 in deep, 18 in wide, native backfill	4 ft	-	-	-	-	29	30	59	
60.089	Sand bedding and shading, 6 in below and 6 in over conduits, 18 in trench	0.2 cy	-	-	8	-	7	6	20	
60.090	Cable trench excavation and backfill, 36 in deep, 24 in wide, native backfill	315 ft	-	-	-	43.8	2,709	2,857	5,566	
60.091	Sand bedding and shading, 6 in below and 6 in over conduits, 24 in trench	24.4 cy	-	-	927	14.1	874	678	2,480	
60.092	Cable trench excavation and backfill, 36 in deep, 30 in wide, native backfill	192 ft	-	-	-	31.1	1,926	2,032	3,958	
60.093	Sand bedding and shading, 6 in below and 6 in over conduits, 30 in trench	18.6 cy	-	-	707	10.8	666	517	1,890	
60.094	Cable trench excavation and backfill, 36 in deep, 36 in wide, native backfill	129 ft	-	-	-	23.9	1,479	1,560	3,039	
60.095	Sand bedding and shading, 6 in below and 6 in over conduits, 36 in trench	15 cy	-	-	570	8.7	537	417	1,524	
60.096	Cable trench excavation and backfill, 36 in deep, 48 in wide, native backfill	275 ft	-	-	-	63.7	3,941	4,157	8,099	
60.097	Sand bedding and shading, 6 in below and 6 in over conduits, 48 in trench	42.6 cy	-	-	1,619	24.7	1,526	1,184	4,329	
60.098	Warning tape, red, 'CAUTION ELECTRIC LINE BURIED BELOW', 6 in wide, detectable	1,915 ft	-	-	345	11.1	746	67	1,157	
60.099	Concrete encasement at road crossings, 3,000 psi, red-dyed top, 48 in cover	19.7 cy	-	-	3,644	68.4	4,260	958	8,863	
60.100	Bare copper conductor 4/0 AWG, 19-strand soft-drawn, ASTM B8	2,952 ft	-	-	15,350	170.9	11,498	1,026	27,874	
60.101	Bare copper conductor 2/0 AWG, 19-strand soft-drawn	591 ft	-	-	1,950	34.2	2,302	205	4,458	
60.102	Bare copper conductor #2 AWG, 7-strand, tinned	572 ft	-	-	772	26.5	1,782	159	2,714	
60.103	Ground rod, copper-clad steel, 10 mil cladding	49 ea	-	-	1,862	56.7	3,817	340	6,020	
60.104	Ground rod test well, 12 in dia polymer concrete, traffic cover marked GROUND	6 ea	-	-	1,080	13.9	935	83	2,098	
60.105	Exothermic connection, cable-to-cable (tee / cross / parallel), mold + weld me	131 ea	-	-	4,192	121.4	8,164	728	13,084	
60.106	Exothermic connection, cable-to-ground rod	49 ea	-	-	1,274	34.0	2,290	204	3,769	
60.107	Exothermic connection, cable-to-steel (column, skid, support, base plate)	25 ea	-	-	750	23.2	1,558	139	2,447	

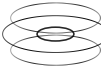
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Code	Description	Quantity	Subcontract	Equipment	Material	Man-hours	Labor	Constr. equip.	Total		
60.108	Two-hole long-barrel compression lug with SS hardware and anti-oxidant	26 ea	-	-	728	15.1	1,013	90	1,831		
60.109	Pipe grounding clamp, bronze, for piping / riser	6 ea	-	-	270	3.5	234	21	525		
60.110	Fence post grounding clamp, bronze	23 ea	-	-	322	8.0	538	48	907		
60.111	Flexible tinned copper braid jumper, gate leaf to post	6 ea	-	-	270	3.5	234	21	525		
60.112	Flexible bonding jumper across non-conductive flange gaskets / lined spools	10 ea	-	-	380	5.8	390	35	804		
60.113	Copper bonding conductor for barbed wire / tension wire	60 ft	-	-	57	1.4	93	8	159		
60.114	Main ground bus bar with insulators, B-102	1 ea	-	-	320	3.5	234	21	575		
60.115	Isolated instrument reference bar and telecom ground bar	2 ea	-	-	360	4.6	312	28	699		
60.116	Insulated green grounding conductor, instrument reference bar to MGB, XF-102 G	40 ft	-	-	140	1.4	93	8	242		
60.117	Static ground monitor, self-testing, with clamp and 2/0 lead, interlock to loa	1 ea	-	-	4,800	9.3	623	56	5,479		
60.118	Air terminal, solid copper, with base	16 ea	-	-	1,360	27.8	1,870	167	3,396		
60.119	Main conductor, copper, Class I (57,400 cmil)	341 ft	-	-	1,534	31.6	2,125	190	3,849		
60.120	Conductor fasteners / roof clips, bronze	114 ea	-	-	684	19.8	1,332	119	2,135		
60.121	Down conductor PVC guard	4 ea	-	-	120	2.3	156	14	290		
60.122	Bonding plate / connector to structural steel	4 ea	-	-	180	3.2	218	19	418		
60.123	Surge protective device Type 1, 480Y/277 V 3-phase 4-wire, ln 20 kA	1 ea	-	-	1,800	4.6	312	28	2,139		
60.124	Surge protective device Type 2, 480Y/277 V	1 ea	-	-	1,200	3.5	234	21	1,455		
60.125	Surge protective device Type 2, 208Y/120 V	1 ea	-	-	900	3.5	234	21	1,155		
60.126	Surge protective device Type 2, 120 V 1-phase	1 ea	-	-	450	2.3	156	14	620		
60.127	Coaxial RF surge protector, bulkhead, N-type	2 ea	-	-	360	2.3	156	14	530		
60.128	Data line SPD, RS-485 2-pair, DIN rail	1 ea	-	-	140	0.6	39	3	182		
60.129	Clean crushed rock surfacing, washed, no fines, 3,000 ohm-m wet min	38.8 cy	-	-	2,250	18.0	1,112	1,096	4,458		
60.130	PVC sleeve on grounding conductor at buried pipe crossings, 10 ft each	70 ft	-	-	168	8.1	545	49	762		
60.131	Antenna mast air terminal with mast clamp, above highest antenna	1 ea	-	-	220	3.5	234	21	475		
60.132	Joint compound / anti-oxidant, exothermic molds, handles, starter material	1 lot	-	-	1,800	-	-	-	1,800		
60.133	Sign “DANGER - HAZARDOUS AREA CLASS I DIV 2 - NO IGNITION SOURCES”, UV-stable,	9 ea	-	-	765	5.2	351	31	1,147		
60.134	Sign “CLASS I DIV 1 - VENT / CLOSURE AREA”	3 ea	-	-	285	1.7	117	10	412		
60.135	LED area luminaire 150 W, 19,500 lm, 4000 K, Class I Div 2 Groups C D, T4, 120	15 ea	-	-	24,750	52.1	3,506	313	28,568		
60.136	LED canopy / low-bay luminaire 60 W, 7,800 lm, Class I Div 2, T4, 120-277 V	6 ea	-	-	5,880	20.8	1,402	125	7,407		
60.137	LED wall pack 30 W, 3,600 lm, Class I Div 2 rated, photocell group	4 ea	-	-	2,880	11.6	779	69	3,728		
60.138	LED 4 ft enclosed linear 40 W, 5,000 lm	6 ea	-	-	1,080	10.4	701	63	1,844		
60.139	LED 4 ft linear 40 W, 4,600 lm, Class I Div 2 T4	2 ea	-	-	1,300	4.6	312	28	1,639		
60.140	Emergency lighting unit, LED twin head, 90 min battery, self-test	2 ea	-	-	440	3.5	234	21	695		
60.141	LED exit sign with 90 min battery, self-test	2 ea	-	-	320	3.5	234	21	575		
60.142	Lighting pole 25 ft, round tapered galvanized steel, anchor base, integral han	8 ea	-	-	18,400	74.1	4,986	3,245	26,630		
60.143	Twin tenon / arm bracket, 2 heads at 180 deg	7 ea	-	-	1,820	8.1	545	49	2,414		
60.144	Single arm bracket, 1 head	1 ea	-	-	150	1.2	78	7	235		
60.145	Anchor bolt set, 4 x 1 in x 36 in with nuts, washers and template	8 set	-	-	1,440	9.3	623	56	2,119		
60.146	Pole drilled pier 24 in dia x 8 ft deep, 4,000 psi concrete with cage, detail	7.45 cy	-	-	1,378	34.5	2,148	1,154	4,680		
60.147	Pier reinforcing cage 6 #6 vertical with #3 ties at 12 in	8 ea	-	-	1,760	18.5	1,153	259	3,173		

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Code	Description	Quantity	Subcontract	Equipment	Material	Man-hours	Labor	Constr. equip.	Total		
60.148	In-line breakaway fuse holder with 5 A fuse, pole base, per head	15 ea	-	-	570	8.7	584	52	1,206		
60.149	Photocell PC-101, 120-277 V twist-lock with wall mount, B-102 north wall	1 ea	-	-	60	1.2	78	7	145		
60.150	Vacancy sensor wall switch, B-102 interior	1 ea	-	-	85	1.2	78	7	170		
60.151	Switch, factory sealed, Class I Div 2, B-101 lighting	1 ea	-	-	260	1.7	117	10	387		
60.152	Canopy luminaire mounting kit (beam clamp / pendant hanger)	6 ea	-	-	33	0.8	56	5	94		
60.153	Trench and backfill for 4/0 perimeter ground loop 3 ft outside the fence (cond	924 LF	-	-	-	96.3	5,959	6,286	12,245		
60.154	Electrical testing (insulation resistance, grounding fall-of-potential, ATS/UP	1 ls	18,000	-	-	139.0	9,348	834	28,182		
	Subtotal 60		18,000	398,500	292,563	3,076	204,599	49,255	962,917		

Code 65, Cathodic Protection

Table 1-10: Area 65, Cathodic Protection (USD)

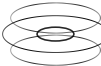
Code	Description	Quantity	Subcontract	Equipment	Material	Man-hours	Labor	Constr. equip.	Total
65.001	Rectifier RECT-101, air cooled, 24 V / 8 A DC, 120 V 1-phase input, interrupte	1 ea	-	-	4,800	18.5	1,282	222	6,304
65.002	Negative junction box NJB-101, 2 circuits with 0.001 ohm 50 A shunts, NEMA 4X	1 ea	-	-	750	6.9	481	83	1,314
65.003	Anode junction box AJB-101, 5 circuits with 0.01 ohm shunts and slide resistor	1 ea	-	-	1,400	9.3	641	111	2,152
65.004	MMO tubular anode 1 in x 39 in, factory lead #8 HMWPE/Halar, centralizer	5 ea	3,250	-	-	-	-	-	3,250
65.005	Calcined petroleum coke breeze, deep well grade, bulk	3,058 lb	2,599	-	-	-	-	-	2,599
65.006	Deep anode well drilling 10 in dia to 175 ft incl. mobilization	175 ft	20,650	-	-	-	-	-	20,650
65.007	PVC surface casing 12 in SDR 21	20 ft	440	-	-	-	-	-	440
65.008	Perforated PVC vent pipe 1 in Sch 80, full depth with cap	180 ft	540	-	-	-	-	-	540
65.009	Magnesium anode 48 lb (48D5) high potential, packaged in gypsum-bentonite-sodi	2 ea	-	-	420	6.9	481	83	984
65.010	Magnesium anode 17 lb (17D3) high potential, packaged, 10 ft #10 lead	1 ea	-	-	95	2.3	160	28	283
65.011	Anode header cable #2 AWG HMWPE/Halar dual insulation, 600 V	162 ft	-	-	583	1.9	130	23	735
65.012	Anode lead #8 AWG HMWPE/Halar (factory on anode, total length)	770 ft	924	-	-	-	-	-	924
65.013	Negative drain cable #2 AWG HMWPE 600 V	334 ft	-	-	902	3.9	268	46	1,216
65.014	Test lead #12 AWG HMWPE 600 V, colour coded	280 ft	-	-	98	3.2	224	39	361
65.015	Current-span lead #8 AWG HMWPE 600 V	66 ft	-	-	46	0.8	53	9	108
65.016	Reference electrode lead #14 AWG HMWPE	33 ft	-	-	10	-	26	5	41
65.017	Mg anode lead extension #10 AWG HMWPE	46 ft	-	-	21	0.5	37	6	64
65.018	Above-grade test station, polymer post 5 ft, terminal board, lockable	7 ea	-	-	1,820	24.3	1,682	292	3,794
65.019	Shunt 0.01 ohm 8 A (anode) for test stations	3 ea	-	-	105	1.0	72	13	190
65.020	Adjustable resistor 0-25 ohm, 1 A, test-station mount	2 ea	-	-	190	1.2	80	14	284
65.021	Cable splice kit, epoxy encapsulated, direct burial	9 ea	-	-	765	10.4	721	125	1,611
65.022	Exothermic weld, cable to pipe, with mould and charges (#8 to #2)	22 ea	-	-	836	25.5	1,762	306	2,904
65.023	Epoxy / elastomeric weld-cap repair patch for exothermic connection	22 ea	-	-	396	7.6	529	92	1,016
65.024	Solid-state decoupler, -2/+2 V, 3.7 kA 30 cycles AC fault, 100 kA lightning, C	2 ea	-	-	4,800	13.9	961	167	5,928
65.025	Decoupler lead #6 AWG stranded Cu THHN/THWN-2 with mechanical/exothermic lugs	13 ft	-	-	14	0.8	52	9	75
65.026	CP coupon 10 cm2 steel with lead, and 1 cm2 AC coupon	4 ea	-	-	640	4.6	320	56	1,016
65.027	Permanent Cu/CuSO4 reference electrode, 20-year, direct burial	2 ea	-	-	840	4.6	320	56	1,216
65.028	Pipe support insulating kit (pad, sleeves) for first support beyond IJ	2 ea	-	-	300	4.6	320	56	676

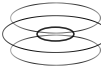
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Code	Description	Quantity	Subcontract	Equipment	Material	Man-hours	Labor	Constr. equip.	Total		
65.029	Rigid PVC Sch 80 sleeve for CP cables at road crossing and wall entries	61 ft	-	-	214	5.7	391	68	672		
65.030	Detectable warning tape ‘CAUTION CP CABLE’	452 ft	-	-	90	2.6	181	31	303		
	Subtotal 65		28,403	0	20,135	162	11,175	1,939	61,652		

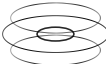
Code 70, Instrumentation, Controls and Telecom

Table 1-11: Area 70, Instrumentation, Controls and Telecom (USD)

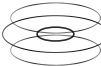
Code	Description	Quantity	Subcontract	Equipment	Material	Man-hours	Labor	Constr. equip.	Total
70.004	PT-101: Pressure transmitter; Station inlet pressure, upstream of SDV-101	1 ea	-	-	2,300	9.3	658	46	3,004
70.005	TT-101: RTD Pt100 + head transmitter; Station inlet temperature (TW-101)	1 ea	-	-	1,350	4.6	329	23	1,702
70.006	TW-101: Thermowell, 1-1/2 in RF flanged, 316 SS; Thermowell for TT-101	1 ea	-	-	650	2.3	164	12	826
70.007	PI-101: Pressure gauge 4-1/2 in, liquid filled; Inlet local pressure gauge	1 ea	-	-	180	1.7	123	9	312
70.008	SDV-101: NPS 12 Cl 600 ball, electro-hydraulic spring-return FC; Station inlet	1 ea	-	32,000	-	27.8	1,973	139	34,112
70.011	HS-101: Local control station, Ex d; SDV-101 local station (close / reset-open	1 ea	-	-	1,200	4.6	329	23	1,552
70.012	XI-102: Intrusive pig signaler, flag + switch; Pig passage signaler at PR-101	1 ea	-	-	3,800	6.9	493	35	4,328
70.013	PI-102: Pressure gauge 4-1/2 in; PR-101 barrel pressure gauge	1 ea	-	-	180	1.7	123	9	312
70.015	PT-102A: Pressure transmitter; PR-101 barrel pressure (closure warning, SCADA	1 ea	-	-	2,300	9.3	658	46	3,004
70.016	PDIT-103: DP transmitter with 5-valve manifold; V-101 filter section different	1 ea	-	-	2,900	10.4	740	52	3,692
70.017	PDI-103A: DP gauge, 4-1/2 in; V-101 filter DP local gauge (teed off PDIT-103 i	1 ea	-	-	650	2.3	164	12	826
70.018	PI-103: Pressure gauge 4-1/2 in; V-101 local pressure gauge	1 ea	-	-	180	1.7	123	9	312
70.019	LT-104: Guided-wave radar, external cage; V-101 sump level	1 ea	-	6,800	-	11.6	822	58	7,680
70.020	LCV-104: NPS 1 Cl 600 globe, electric modulating actuator, fail as-is; V-101 s	1 ea	-	5,800	-	9.3	658	46	6,504
70.022	LG-104: Magnetic level gauge, external chamber; V-101 sump level gauge	1 ea	-	-	3,400	6.9	493	35	3,928
70.023	LSHH-105: Vibrating fork level switch, NAMUR/relay DPDT; V-101 high-high level	1 ea	-	-	1,900	5.8	411	29	2,340
70.024	LSSL-106: Vibrating fork level switch; V-101 low-low level (closes LCV-104 and	1 ea	-	-	1,900	5.8	411	29	2,340
70.025	SDV-106: NPS 2 Cl 600 ball, electric spring-return FC actuator; V-101 liquid o	1 ea	-	8,500	-	11.6	822	58	9,380
70.027	HS-106: Local control station; SDV-106 local reset station	1 ea	-	-	1,200	4.6	329	23	1,552
70.030	ZSO-103C: Proximity switch; HV-103C not-closed position switch to RTU (added,	1 ea	-	-	450	3.5	247	17	714
70.040	MOV-111: NPS 10 Cl 600 DBB ball, electric MOV, fail as-is; Run 1 inlet isolati	1 ea	-	11,500	-	13.9	986	69	12,556
70.041	MOV-112: NPS 10 Cl 600 DBB ball, electric MOV; Run 1 outlet isolation, DBB	1 ea	-	11,500	-	13.9	986	69	12,556
70.049	MOV-121: NPS 10 Cl 600 DBB ball, electric MOV; Run 2 inlet isolation, DBB	1 ea	-	11,500	-	13.9	986	69	12,556
70.050	MOV-122: NPS 10 Cl 600 DBB ball, electric MOV; Run 2 outlet isolation, DBB	1 ea	-	11,500	-	13.9	986	69	12,556
70.051	MOV-115: NPS 10 Cl 600 DBB ball, electric MOV; Series-verification crossover (	1 ea	-	11,500	-	13.9	986	69	12,556
70.052	PI-115A: Pressure gauge 4-1/2 in; MOV-115 body-cavity bleed pressure gauge (se	1 ea	-	-	180	1.7	123	9	312
70.053	PI-113: Pressure gauge 4-1/2 in; Meter inlet header local gauge	1 ea	-	-	180	1.7	123	9	312
70.075	SDV-141: 3/8 in tubing solenoid valve 316 SS, NC, Ex d; Analyzer sample inlet	1 ea	-	-	1,200	4.6	329	23	1,552
70.076	TT-151: RTD + transmitter; H-101 bath temperature	1 ea	-	-	1,350	4.6	329	23	1,702
70.077	TCV-152: NPS 1 globe, electric modulating actuator, fail as-is (min-fire stop)	1 ea	-	9,500	-	9.3	658	46	10,204
70.078	ZSL-152: Actuator limit switch; TCV-152 low-fire position switch to BMS-150 (a	1 ea	-	-	450	3.5	247	17	714
70.087	LSL-154: Float or vibrating level switch; H-101 low bath level (burner trip)	1 ea	-	-	1,300	5.8	411	29	1,740
70.088	LSH-154B: Float or vibrating level switch; H-101 bath / expansion tank high le	1 ea	-	-	1,300	5.8	411	29	1,740

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Code	Description	Quantity	Subcontract	Equipment	Material	Man-hours	Labor	Constr. equip.	Total	
70.090	TSHH-155: Temperature switch, manual reset; H-101 high-high bath temperature (	1 ea	-	-	950	4.6	329	23	1,302	
70.091	TT-156: RTD + transmitter; H-101 gas outlet temperature (TW-156), PV of TIC-15	1 ea	-	-	1,350	4.6	329	23	1,702	
70.092	TW-156: Thermowell; Thermowell for TT-156	1 ea	-	-	650	2.3	164	12	826	
70.093	TI-151A: Bimetal dial thermometer 5 in; H-101 bath local thermometer	1 ea	-	-	150	1.2	82	6	238	
70.094	PI-156A: Pressure gauge 4-1/2 in; H-101 gas outlet local gauge	1 ea	-	-	180	1.7	123	9	312	
70.101	ZSO-158C: Proximity switch; HV-158C bypass open position switch (added, heater	1 ea	-	-	450	3.5	247	17	714	
70.102	ZSC-158C: Proximity switch; HV-158C bypass closed position switch	1 ea	-	-	450	3.5	247	17	714	
70.103	PSL-164A: Pressure switch, manual reset; Burner fuel low pressure (BMS trip)	1 ea	-	-	650	4.6	329	23	1,002	
70.104	PSH-164B: Pressure switch, manual reset; Burner fuel high pressure (BMS trip)	1 ea	-	-	650	4.6	329	23	1,002	
70.109	PT-164: Pressure transmitter; Fuel gas pressure downstream of PCV-162	1 ea	-	-	2,300	9.3	658	46	3,004	
70.110	PI-161A: Pressure gauge 4-1/2 in; Fuel gas intermediate pressure gauge (downst	1 ea	-	-	180	1.7	123	9	312	
70.111	PI-162A: Pressure gauge 4-1/2 in; Fuel gas supply pressure gauge (downstream P	1 ea	-	-	180	1.7	123	9	312	
70.112	PDI-161A: DP gauge (FG-101 skid supply); FG-101 filter DP gauge	1 ea	-	-	650	2.3	164	12	826	
70.113	SDV-165: NPS 2 CI 600 ball, electro-hydraulic spring-return FC; Fuel gas shuto	1 ea	-	7,200	-	11.6	822	58	8,080	
70.114	ZSC-165: Limit switch; SDV-165 closed limit switch	1 ea	-	-	450	3.5	247	17	714	
70.115	HS-165: Local control station; SDV-165 local reset station	1 ea	-	-	1,200	4.6	329	23	1,552	
70.120	TI-161C: Bimetal dial thermometer 5 in; Fuel gas temperature downstream of PCV	1 ea	-	-	150	1.2	82	6	238	
70.121	TW-161C: Thermowell; Thermowell for TI-161C (P&ID)	1 ea	-	-	650	2.3	164	12	826	
70.131	FCV-131: NPS 8 CI 600, electric modulating actuator, handwheel; Flow control v	1 ea	-	16,500	-	16.2	1,151	81	17,732	
70.132	FCV-132: NPS 8 CI 600, electric modulating actuator, handwheel; Flow control v	1 ea	-	16,500	-	16.2	1,151	81	17,732	
70.139	ZSO-131A: Proximity switch; HV-131A open position switch (added, FCV switchove	1 ea	-	-	450	3.5	247	17	714	
70.140	ZSO-131B: Proximity switch; HV-131B open position switch (added, FCV switchove	1 ea	-	-	450	3.5	247	17	714	
70.141	ZSO-132A: Proximity switch; HV-132A open position switch (added, FCV switchove	1 ea	-	-	450	3.5	247	17	714	
70.142	ZSO-132B: Proximity switch; HV-132B open position switch (added, FCV switchove	1 ea	-	-	450	3.5	247	17	714	
70.143	PT-133A: Pressure transmitter, SIL 2 capable (IEC 61508 cert.); OPSS pressure	1 ea	-	-	3,400	9.3	658	46	4,104	
70.144	PT-133B: Pressure transmitter, SIL 2 capable (IEC 61508 cert.); OPSS pressure	1 ea	-	-	3,400	9.3	658	46	4,104	
70.145	PT-133C: Pressure transmitter, SIL 2 capable (IEC 61508 cert.); OPSS pressure	1 ea	-	-	3,400	9.3	658	46	4,104	
70.146	SDV-102: NPS 12 CI 600 ball, electro-hydraulic spring-return FC, mandatory qua	1 ea	-	47,000	-	32.4	2,301	162	49,463	
70.149	HS-102: Local control station, key-operated reset; SDV-102 local station (clos	1 ea	-	-	1,200	4.6	329	23	1,552	
70.150	PT-134: Pressure transmitter; Outlet pressure, PIC-134 override	1 ea	-	-	2,300	9.3	658	46	3,004	
70.151	TT-135: RTD + transmitter; Control valve outlet temperature (TW-135), hydrate	1 ea	-	-	1,350	4.6	329	23	1,702	
70.152	TW-135: Thermowell; Thermowell for TT-135	1 ea	-	-	650	2.3	164	12	826	
70.154	PI-138: Pressure gauge 4-1/2 in; Gauge between SDV-102 and SDV-103	1 ea	-	-	180	1.7	123	9	312	
70.158	PI-137: Pressure gauge 4-1/2 in; Control valve outlet local gauge	1 ea	-	-	180	1.7	123	9	312	
70.160	SDV-103: NPS 12 CI 600 ball, electro-hydraulic spring-return FC; Station outle	1 ea	-	32,000	-	27.8	1,973	139	34,112	
70.163	HS-103: Local control station; SDV-103 local station (close / reset)	1 ea	-	-	1,200	4.6	329	23	1,552	
70.164	PT-172: Pressure transmitter; Station outlet pressure downstream of SDV-103	1 ea	-	-	2,300	9.3	658	46	3,004	
70.165	TT-173: RTD + transmitter; Station outlet (delivery) temperature (TW-173)	1 ea	-	-	1,350	4.6	329	23	1,702	
70.166	TW-173: Thermowell; Thermowell for TT-173	1 ea	-	-	650	2.3	164	12	826	
70.167	PI-174: Pressure gauge 4-1/2 in; Outlet local gauge	1 ea	-	-	180	1.7	123	9	312	

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Code	Description	Quantity	Subcontract	Equipment	Material	Man-hours	Labor	Constr. equip.	Total	
70.180	LT-191: Non-contact 80 GHz radar; T-101 level (non-contact radar)	1 ea	-	-	4,200	9.3	658	46	4,904	
70.181	LSHH-192: Vibrating fork level switch, top mounted; T-101 high-high level (clo	1 ea	-	-	1,900	5.8	411	29	2,340	
70.186	HS-201: ESD pushbutton, mushroom latching, NC; Station ESD pushbutton, main ga	1 ea	-	-	750	4.6	329	23	1,102	
70.187	HS-202: ESD pushbutton; Station ESD pushbutton, B-102	1 ea	-	-	750	4.6	329	23	1,102	
70.188	HS-203: ESD pushbutton; Station ESD pushbutton, meter skid (west end, egress s	1 ea	-	-	750	4.6	329	23	1,102	
70.189	HS-204: ESD pushbutton; Station ESD pushbutton, heater	1 ea	-	-	750	4.6	329	23	1,102	
70.190	HS-200: Key-operated reset; ESD reset pushbutton on SIS panel CP-102B	1 ea	-	-	250	1.2	82	6	338	
70.191	GD-205: IR point detector, 0-100 % LEL; Combustible gas detector B-101 (1 of 2	1 ea	-	-	3,600	6.9	493	35	4,128	
70.192	GD-206: IR point detector; Combustible gas detector B-101 (2 of 2)	1 ea	-	-	3,600	6.9	493	35	4,128	
70.193	GD-207: IR point detector; Combustible gas detector B-102 HVAC intake	1 ea	-	-	3,600	6.9	493	35	4,128	
70.194	FSL-208: Airflow switch (duct); B-101 ventilation fan failure (SIS, drives B-1	1 ea	-	-	600	3.5	247	17	864	
70.195	TT-208A: RTD + transmitter; B-101 shelter temperature	1 ea	-	-	1,350	4.6	329	23	1,702	
70.198	ZS-211: Magnetic door / gate switches; Gate / building intrusion switches (A B	1 ea	-	-	1,100	6.9	493	35	1,628	
70.199	XS-212: Photoelectric smoke detector, 4-wire; B-102 smoke detector	1 ea	-	-	350	2.3	164	12	526	
70.200	BE-213: UV/IR flame detector, Ex d; H-101 burner area fire detector UV/IR (det	1 ea	-	5,200	-	6.9	493	35	5,728	
70.201	HS-215: Interposing relay contact; remote shutdown command (from Will	1 ea	-	-	150	1.2	82	6	238	
70.202	XY-214: Beacon + horn, Ex d; B-101 and B-102 area beacon / horn	1 ea	-	-	1,800	4.6	329	23	2,152	
70.235	CP-102A BPCS RTU/PLC panel, free-standing 90 x 36 x 24 in, NEMA 12, front/rear	1 ea	-	115,000	-	27.8	1,973	139	117,112	
70.245	CP-102B safety PLC panel, 90 x 36 x 24 in, NEMA 12, IEC 61508 SIL 3 certified	1 ea	-	185,000	-	27.8	1,973	139	187,112	
70.246	CP-102C measurement panel, sealable, houses FQI-110 dual-run flow computer (FQ	1 ea	-	32,000	-	27.8	1,973	139	34,112	
70.247	TR-102 telecom rack 42U, 19 in, with shelves, cable management, PDU (24 VDC)	1 ea	-	9,500	-	27.8	1,973	139	11,612	
70.249	JB-101 BPCS JB, inlet / pig receiver / V-101 / fuel gas / T-101; stainless ste	1 ea	-	-	3,200	11.6	822	58	4,080	
70.250	JB-101S SIS JB, SDV-101, V-101 level trips, SDV-106, SDV-165, LSHH-192; stainl	1 ea	-	-	2,600	11.6	822	58	3,480	
70.251	JB-110 BPCS JB, meter run MOVs; stainless steel 316 NEMA 4X, Class I Div 2 sui	1 ea	-	-	3,200	11.6	822	58	4,080	
70.252	JB-110M Measurement JB (sealable), PT/TT-111/121, USM pulse outputs; stainless	1 ea	-	-	2,600	11.6	822	58	3,480	
70.253	JB-130 BPCS JB, control valve station, PT-134, TT-135; stainless steel 316 NEM	1 ea	-	-	2,600	11.6	822	58	3,480	
70.254	JB-130S SIS JB, OPSS PT-133A/B/C, SDV-102, SDV-103; stainless steel 316 NEMA 4	1 ea	-	-	2,600	11.6	822	58	3,480	
70.255	JB-140 BPCS JB at B-101, analyzers, sampler, shelter HVAC; stainless steel 316	1 ea	-	-	2,600	11.6	822	58	3,480	
70.256	JB-140S SIS JB at B-101, GD-205/206, SDV-141; stainless steel 316 NEMA 4X, Cla	1 ea	-	-	2,600	11.6	822	58	3,480	
70.257	JB-150 BPCS JB, H-101 temperatures and TCV-152; stainless steel 316 NEMA 4X, C	1 ea	-	-	2,600	11.6	822	58	3,480	
70.258	JB-170 BPCS JB, outlet PT-172 / TT-173; stainless steel 316 NEMA 4X, Class I D	1 ea	-	-	2,600	11.6	822	58	3,480	
70.259	JB-W01 demarcation panel at north fence (HOLD H-14); stainless steel	1 ea	-	-	3,800	11.6	822	58	4,680	
70.260	Interposing relay, 24 VDC coil, DPDT, plug-in with base and LED (RTU DOs to MO	18 ea	-	-	1,170	10.4	740	52	1,962	
70.261	SIL 3 safety relay, force-guided, for SIS DO to non-24 V loads and co	10 ea	-	-	4,200	11.6	822	58	5,080	
70.262	Loop isolator 4-20 mA, 2-channel (AO repeats PT-172R, FQI-110R)	1 ea	-	-	450	1.2	82	6	538	
70.263	RS-485 isolator / repeater (Modbus ports RTU-WIL, FQI-110S1)	2 ea	-	-	760	2.3	164	12	936	
70.278	Control cable 2/c #14 AWG, 600 V, TC-ER-HL	2,400 ft	-	-	1,800	52.7	3,738	263	5,801	
70.279	Control cable 4/c #14 AWG, 600 V, TC-ER-HL	420 ft	-	-	504	16.4	1,162	82	1,748	
70.280	Control cable 7/c #14 AWG, 600 V, TC-ER-HL	160 ft	-	-	288	10.1	720	51	1,059	
70.281	Data cable 2 pair #22 AWG, individually shielded, 120 ohm, RS-485, TC-ER	1,150 ft	-	-	1,840	24.5	1,737	122	3,700	

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Code	Description	Quantity	Subcontract	Equipment	Material	Man-hours	Labor	Constr. equip.	Total	
70.282	Fibre optic cable 6 strand OM3 50/125 multimode, armoured, outdoor, gel-free	230 ft	-	-	644	20.6	1,459	103	2,206	
70.283	Instrument cable 1 pair #16 AWG, twisted, overall shield + drain, 600 V, TC-ER	1,430 ft	-	-	1,216	40.5	2,874	202	4,292	
70.284	Instrument cable 1 triad #16 AWG, overall shield, 600 V, TC-ER-HL	260 ft	-	-	286	6.8	483	34	803	
70.285	Multiconductor 12/c #14 AWG, overall shield, TC-ER-HL	1,030 ft	-	-	2,987	48.1	3,413	240	6,640	
70.286	Multiconductor 19/c #14 AWG, overall shield, TC-ER-HL	460 ft	-	-	1,932	22.1	1,571	111	3,614	
70.287	Multiconductor 37/c #14 AWG, overall shield, TC-ER-HL	880 ft	-	-	6,864	72.8	5,166	364	12,394	
70.288	Multipair 6 pair #16 AWG, individual + overall shield, TC-ER-HL	1,090 ft	-	-	3,488	45.5	3,227	227	6,942	
70.289	Multipair 12 pair #16 AWG, individual + overall shield, TC-ER-HL	390 ft	-	-	2,184	23.5	1,665	117	3,966	
70.290	Multipair 24 pair #16 AWG, individual + overall shield, TC-ER-HL	190 ft	-	-	1,995	18.5	1,313	93	3,401	
70.291	Rigid galvanized steel conduit 3/4 in with couplings, field device to JB (one	4,570 ft	-	-	28,334	740.9	49,841	4,446	82,620	
70.292	Conduit 2 in homerun, PVC-coated RGS above grade / Sch 80 PVC in trench, JB to	2,230 ft	-	-	40,140	568.1	38,218	3,409	81,767	
70.293	Explosion-proof conduit sealing fitting (EYS) 3/4 in, with sealing compound	102 ea	-	-	3,876	118.1	7,946	709	12,531	
70.294	Explosion-proof conduit sealing fitting 2 in, with compound	24 ea	-	-	3,240	41.7	2,804	250	6,295	
70.295	Cable gland for TC-ER cable, Ex d / Ex e rated, nickel-plated brass, sized per	300 ea	-	-	25,500	139.0	9,863	695	36,058	
70.296	Flexible liquid-tight conduit 3/4 in x 36 in, Class I Div 2 listed, at vibrati	102 ea	-	-	4,590	59.1	3,973	354	8,917	
70.297	Conduit support: strut channel, pipe clamps, beam clamps (per 8 ft of conduit)	655 set	-	-	18,340	455.1	32,301	2,276	52,916	
70.298	CND-FLX: Flexible conduit 3/4 in, 36 in	16 ea	-	-	720	9.3	658	46	1,424	
70.299	FTG-CONN: Tube connector 1/2 in OD x 1/2 in NPT, 316 SS	49 ea	-	-	1,078	14.2	1,007	71	2,156	
70.300	FTG-CPL: Process connection adaptor / coupling (per vessel nozzle), 316 SS	6 ea	-	-	240	2.1	148	10	398	
70.301	FTG-ELB: Tube elbow 1/2 in OD, 316 SS	17 ea	-	-	476	3.9	279	20	775	
70.302	FTG-NOZ: Nozzle adapter flange for 80 GHz radar, Class 150, 316 SS	2 ea	-	-	760	3.5	247	17	1,024	
70.303	FTG-SNB: Pressure snubber / siphon 1/2 in, 316 SS	16 ea	-	-	1,360	5.6	395	28	1,782	
70.304	FTG-TEE: Tube tee 1/2 in OD	3 ea	-	-	114	1.0	74	5	193	
70.305	FTG-UNN: Union-nipple-union 1/2 in NPT, 316 SS	9 ea	-	-	495	3.1	222	16	733	
70.306	SUP-CLMP: Tube clamp / channel set	38 ea	-	-	456	8.8	625	44	1,125	
70.307	SUP-STD: Instrument stand, 2 in pipe	13 ea	-	-	2,340	45.2	3,205	226	5,771	
70.308	TAG-SIS: SIS device identification tag (yellow), stainless	4 ea	-	-	60	-	33	2	95	
70.309	TUB-050: Tubing 1/2 in OD x 0.049 in wall, 316 SS SMLS	178 ft	-	-	1,691	41.2	2,926	206	4,823	
70.310	VLV-5V: 5-valve manifold, 316 SS, 6000 psi	2 ea	-	-	1,900	4.6	329	23	2,252	
70.311	VLV-GV: Gauge valve (block + bleed) 1/2 in NPT, 316 SS	16 ea	-	-	2,880	18.5	1,315	93	4,288	
70.312	VLV-NDL: Needle valve 1/2 in NPT, 316 SS (cage vent / drain)	5 ea	-	-	600	4.6	329	23	952	
70.313	VLV-NDL-2V: 2-valve manifold, 316 SS	11 ea	-	-	4,620	15.3	1,085	76	5,781	
70.314	VLV-ROOT: Root valve NPS 3/4 Cl 600, independent tap per transmitter	14 ea	-	-	2,940	24.3	1,726	122	4,788	
70.315	Stainless steel instrument tag plates with wire, engraved (SIS tags yellow)	110 ea	-	-	1,320	12.7	904	64	2,288	
70.316	Firewall appliance, industrial, DIN/rack, 24 VDC, IEC 62443-4-2 certified clas	1 ea	-	-	3,800	3.5	247	17	4,064	
70.317	LTE router, dual SIM, private APN, IPsec VPN, 24 VDC (CR-102)	1 ea	-	-	1,900	2.3	164	12	2,076	
70.318	Licensed 900 MHz data radio, 2 W, with licence application (RD-102), option A	1 ea	-	-	4,200	4.6	329	23	4,552	
70.319	Satellite terminal (LEO or L-band) with mount (SAT-102), option B secondary pa	1 ea	-	-	5,500	6.9	493	35	6,028	
70.320	GPS-disciplined NTP time server with antenna (GPS-102)	1 ea	-	-	3,200	3.5	247	17	3,464	
70.321	Managed industrial Ethernet switch, 8 port, 24 VDC (SW-102A/C/D)	3 ea	-	-	4,200	6.9	493	35	4,728	

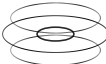


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Code	Description	Quantity	Subcontract	Equipment	Material	Man-hours	Labor	Constr. equip.	Total	
70.322	Fibre media converter, multimode, 24 VDC (MC-102 and B-101 end)	4 ea	-	-	1,800	4.6	329	23	2,152	
70.323	Yagi antenna 900 MHz, 13 dBi, with mount	1 ea	-	-	380	3.5	247	17	644	
70.324	LTE MIMO antenna 7 dBi, with mount	1 ea	-	-	320	3.5	247	17	584	
70.325	Antenna mast ANT-201, 50 ft engineered breakpoint monopole at (150, 22), galva	1 ea	-	-	28,000	27.8	1,973	3,639	33,612	
70.326	Coax 7/8 in foam-dielectric hardline, radio feeder (50 ft on ANT-201 + 150 ft	200 ft	-	-	1,700	13.9	986	69	2,756	
70.327	Coax 7/8 in foam-dielectric hardline, LTE feeders (2 x 200 ft)	400 ft	-	-	3,400	27.8	1,973	139	5,512	
70.328	Coax, GPS antenna lead	40 ft	-	-	80	1.4	99	7	186	
70.329	Coax lightning arrestor, bulkhead	4 ea	-	-	720	4.6	329	23	1,072	
70.330	Coax ground kit	6 ea	-	-	270	3.5	247	17	534	
70.331	Isolated RS-485 repeater (spare to JB-W01 isolators)	4 ea	-	-	1,520	4.6	329	23	1,872	
70.332	Patch cords, fibre jumpers, rack 24 VDC PDU, cable management	1 lot	-	-	1,800	9.3	658	46	2,504	
70.333	Portable fire extinguisher, 20 lb ABC dry chemical, with cabinet/bracket	6 ea	-	-	1,320	3.5	247	17	1,584	
70.334	Portable fire extinguisher, 10 lb CO2 (B-102)	1 ea	-	-	320	0.6	41	3	364	
70.335	Windsock with mast	2 ea	-	-	1,300	9.3	658	46	2,004	
70.336	Safety signage lot: 2 gate warning, 4 emergency number, 4 ESD pushbutton, 2 mu	1 lot	-	-	2,200	13.9	986	69	3,256	
70.337	Weatherproof ERP / site plan document box	3 ea	-	-	540	3.5	247	17	804	
70.338	RTU application programming (FIC-131 / PIC-134 low select FY-131, duty/standby	1 lot	52,800	-	-	-	-	-	52,800	
70.339	Safety PLC application programming per SAF-SRS-001 (SIF-01 to SIF-07, sta	1 lot	49,000	-	-	-	-	-	49,000	
70.340	SCADA host integration: DNP3 SAv5 point database, HMI displays, alarm database	1 lot	39,600	-	-	-	-	-	39,600	
70.341	Flow computer FQI-110 configuration support and RTU / Modbus mapping	1 lot	13,200	-	-	-	-	-	13,200	
70.342	BMS-150 interface integration and heater vendor coordination (Modbus map, hard	1 lot	9,900	-	-	-	-	-	9,900	
70.343	interface: point list agreement (HOLD H-14), JB-W01 wiring and end-to	1 lot	15,000	-	-	-	-	-	15,000	
70.344	Integrated factory acceptance test (RTU, safety PLC, FC, telecom) with Owner w	1 lot	22,000	-	-	-	-	-	22,000	
70.345	Site acceptance test and loop checks, 192 I/O points, including C&E function t	1 lot	35,000	-	-	-	-	-	35,000	
70.346	SIS validation (IEC 61511-1 Clause 15) and functional safety assessment stage	1 lot	58,000	-	-	-	-	-	58,000	
70.347	Cybersecurity risk assessment (IEC 62443-3-2), hardening, cyber FAT/SAT, TSA /	1 lot	42,000	-	-	-	-	-	42,000	
70.348	Alarm rationalization workshop and alarm database finalization (ISA-18.2)	1 lot	12,000	-	-	-	-	-	12,000	
70.349	Final HAZOP on IFC P&IDs, LOPA revalidation and final SIL verification with ve	1 lot	38,000	-	-	-	-	-	38,000	
70.350	900 MHz radio path survey and FCC licence application; cellular site survey	1 lot	9,500	-	-	-	-	-	9,500	
70.351	Commissioning support, operator and technician training (control, SIS, F&G, BM	1 lot	28,000	-	-	-	-	-	28,000	
70.352	As-built instrument documentation (index, loop diagrams, C&E, SIS safety manua	1 lot	18,000	-	-	-	-	-	18,000	
70.353	Contractor calibration and loop checks, 192 I/O points x 2.5 MH (pay item 14.0	192 I/O	-	-	-	555.9	39,451	2,779	42,231	
	Subtotal 70		442,000	586,000	370,928	4,310	300,200	26,576	1,725,703	

Code 80, Specialty Subcontracts and Pre-commissioning

Table 1-12: Area 80, Specialty Subcontracts and Pre-commissioning (USD)

Code	Description	Quantity	Subcontract	Equipment	Material	Man-hours	Labor	Constr. equip.	Total
80.001	Pre-commissioning and mechanical completion support (pay item 18.01): flushing	1 ls	-	-	2,500	741.2	50,517	17,788	70,805
80.002	Commissioning, startup and performance test support crew (pay item 18.02), 4 c	1 ls	-	-	-	800.0	54,897	20,800	75,697
80.003	Final connection to the tap valve flange, leak test of final joints, N2 purge	1 ls	-	-	1,500	104.2	7,104	5,001	13,605

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Code	Description	Quantity	Subcontract	Equipment	Material	Man-hours	Labor	Constr. equip.	Total	
80.004	Standby crew during hot tap / receiving-operator delay (pay item 12.02), 40 h	40 h	22,358	-	-	-	-	-	22,358	
80.005	Construction survey: control, staking, as-built survey and plats (pay item 01.	1 ls	36,000	-	-	-	-	-	36,000	
80.006	Geotechnical investigation: 10 borings to 20-30 ft, lab testing, swell, corros	1 ls	38,000	-	-	-	-	-	38,000	
80.007	Soil resistivity (Wenner) and AC interference survey (HOLD H-08)	1 ls	14,000	-	-	-	-	-	14,000	
80.008	Topographic and boundary survey, ALTA plat, easement exhibits (HOLD H-02, H-03	1 ls	24,000	-	-	-	-	-	24,000	
80.009	200 US ton class AT crane for the H-101, V-101 and SK-110 critical lifts (	1 ls	92,500	-	-	-	-	-	92,500	
80.010	Contractor QC coating inspector (AMPP CIP 2), 14 days x 1,350	1 ls	18,900	-	-	-	-	-	18,900	
80.011	Concrete and compaction testing laboratory	1 ls	14,000	-	-	-	-	-	14,000	
80.012	CP commissioning survey after 30 days polarization (pay item 15.02)	1 ls	12,500	-	-	-	-	-	12,500	
80.013	Meter tube and piping insulation subcontract mobilization (small scope)	1 ls	3,500	-	-	-	-	-	3,500	
	Subtotal 80		275,758	0	4,000	1,645	112,517	43,589	435,865	

Code 82, Receiving Pipeline Operator Reimbursables

Table 1-13: Area 82, Receiving Pipeline Operator Reimbursables (USD)

Code	Description	Quantity	Subcontract	Equipment	Material	Man-hours	Labor	Constr. equip.	Total		
82.002	12 in x 24 in full-encirclement hot tap split tee, Class 600 (receiving operat	1 ls	38,000	-	-	-	-	-	38,000		
82.003	12 in Class 600 tap valve, full bore, with actuator provisions	1 ls	30,000	-	-	-	-	-	30,000		
82.004	Hot tap execution: tapping machine, crew, in-service welding, NDE and fitting	1 ls	85,000	-	-	-	-	-	85,000		
82.005	Excavation, shoring and restoration at the tap in the receiving operator ROW	1 ls	35,000	-	-	-	-	-	35,000		
82.006	Receiving operator engineering review, project management and interconnect agr	1 ls	60,000	-	-	-	-	-	60,000		
82.007	Receiving operator inspection: tie-in, gas-in, meter calibration witness and F	1 ls	45,000	-	-	-	-	-	45,000		
82.008	Receiving operator RTU, communications and remote shutoff at the tap, installe	1 ls	120,000	-	-	-	-	-	120,000		
82.009	Receiving operator measurement witness travel (flow calibration, first verific	1 ls	15,000	-	-	-	-	-	15,000		
	Subtotal 82		428,000	0	0	0	0	0	428,000		

Code 85, Utility Service

Table 1-14: Area 85, Utility Service (USD)

Code	Description	Quantity	Subcontract	Equipment	Material	Man-hours	Labor	Constr. equip.	Total		
85.003	Cooperative line extension, 3-phase overhead, assumed 2,640 ft x 52 \$/ft (cont	2,640 ft	137,280	-	-	-	-	-	137,280		
85.004	Transformer XF-101, metering and service connection charges (CIAC portion)	1 ls	18,000	-	-	-	-	-	18,000		
85.005	Utility easement, ROW clearing and engineering deposit	1 ls	10,000	-	-	-	-	-	10,000		
	Subtotal 85		165,280	0	0	0	0	0	165,280		

GENERAL CONDITIONS, OWNER COSTS AND ESCALATION

Table 1-15: Code 90, Contractor General Conditions (31.4 weeks on site)

Item	Share of duration	Rate (\$/h)	Cost (USD)
Construction superintendent	1.00	118.00	185,260
Project manager (contractor)	0.35	135.00	74,182

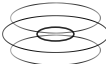
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Item		Share of duration	Rate (\$/h)	Cost (USD)	
QA/QC manager		1.00	98.00	153,860	
HSE coordinator		1.00	90.00	141,300	
Field engineer / scheduler		0.60	92.00	86,664	
Materials coordinator / warehouse		0.60	70.00	65,940	
Document control / field clerk		0.50	55.00	43,175	
Welding QC inspector (contractor CWI)		0.45	100.00	70,650	
Temporary facilities				98,432	
General construction equipment				184,777	
Small tools and consumables (6 % of craft labor)				82,925	
Mobilization and demobilization (3 % of contractor direct)				118,539	
Total 90, general conditions				1,305,705	

Table 1-16: Code 90, Contractor Markups

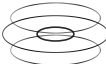
Markup	Cost (USD)
Contractor home office overhead (8 %)	264,423
Contractor profit (10 %)	356,971
Handling and margin on CFM (10 %)	153,289
Markup on contractor subcontracts (7 %)	29,317
Bonds and insurance (1.8 % of contract)	111,098
Total	915,097

Table 1-17: Code 95, Owner Costs

Cost	Cost (USD)
Engineering (IFR to IFC, construction support, as-builts)	663,920
Procurement, expediting and shop inspection	219,100
Construction management and inspection	497,935
Permitting (fees and consultants)	63,500
Land, lease and easements	76,650
Commissioning and startup	389,500
Spare parts, first fills and operating tools	275,776
Owner’s project team	501,120
Sales/use tax on Owner-furnished material (HOLD H-EST-01)	253,175
Total 95, Owner costs	2,940,676

Table 1-18: Code 97, Escalation by Cash-flow Category

Category	Unescalated (USD)	Escalation (USD)
Owner-furnished equipment and materials	4,603,182	120,163
Contractor labor	1,516,876	64,924
Contractor construction equipment	482,706	20,159
Contractor materials	1,452,972	67,565

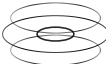
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Category		Unescalated (USD)	Escalation (USD)
Contractor subcontracts		418,817	16,578
Owner-direct services and subcontracts		586,000	15,963
reimbursables		428,000	12,206
Utility service (HOLD H-10)		165,280	4,135
Freight and sales/use tax		574,040	17,788
Contractor indirects		1,305,705	55,350
Contractor markups, bonds and insurance		915,097	37,084
Owner costs		2,687,501	80,642
Total 97, escalation		15,136,176	512,558

ENGINEER’S ESTIMATE BY BID PAY ITEM

Table 1-19: Contractor Scope by Pay Item of CON-RPT-002 (USD, Including Overhead, Profit and Bonds)

Pay item		Description	Engineer's estimate
	01.01	Mobilization and demobilization	140,824
	01.02	Bonds and insurance	111,098
	01.03	Supervision, field office, QA/QC, HSE	1,347,041
	01.04	Construction survey and staking	38,520
	02.01	Clearing and grubbing	8,586
	02.02	Topsoil strip and stockpile	34,288
	02.03	Unclassified excavation and embankment	111,481
	02.06	Stormwater BMPs	29,820
	02.07	Final grading, seeding, restoration	44,934
03.01a		Foundation V-101	16,963
03.01b		Foundation H-101	41,789
03.01c		Foundation SK-110 and canopy piers	27,491
03.01d		Foundation PR-101	4,723
03.01e		Foundation FG-101	3,325
03.01f		T-101 containment and loadout pad	56,725
03.01g		Foundation G-101	3,448
03.01h		Foundation VS-101	2,087
	03.02	Pipe support foundations, shafts, anchors, misc	447,031
03.03a		Building foundation B-101	8,035
03.03b		Building foundation B-102	14,013
	04.01	Meter skid canopy	56,172
	04.02	Pipe supports	223,841
	05.01	Access road	58,866
	05.02	Internal road and yard surfacing	114,292
	05.03	Culverts	25,456
	05.04	Chain-link fence	29,172



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Pay item		Description			Engineer's estimate
	05.05	Gates			14,873
	05.06	Driveway approach and cattle guard			15,515
	06.01	Above-grade station piping (incl. welding, bolt-up)			775,424
	06.02	Below-grade station piping			22,943
	06.03	Outlet lateral 12"-G-1042-A6			13,765
	08.01	NDE			101,088
	09.01	Field joint coating			11,476
	10.01	Painting			146,961
	11.01	Hydrostatic testing			151,629
	11.02	Test water			9,372
	12.01	Tie-in and purging support			16,628
	12.02	Standby crew (40 h allowance)			23,923
	13.01	Power, control, hazardous-area electrical			443,999
	13.02	Grounding and lightning protection			112,831
	13.03	Lighting			101,357
	14.01	Instrument installation			670,733
	14.02	Calibration and loop checks			52,982
	15.01	Cathodic protection installation			70,133
	15.02	CP survey			13,375
	16.01	B-101 setting and connection			6,623
	16.02	B-102 setting and connection			10,867
	17.01	Set V-101			109,842
	17.02	Set H-101			23,093
	17.03	Set SK-110			16,301
	17.04	Set T-101			5,434
	17.05	Set PR-101			5,434
	17.06	Set FG-101, E-161, G-101, VS-101			11,954
	18.01	Pre-commissioning and mechanical completion			119,671
	18.02	Commissioning support			93,841
		Total, equal to the construction contract value			6,172,086

Note 1: Owner-furnished material is excluded from the pay items; the contractor installs it.

Note 2: General conditions are in 01.03 and mobilization in 01.01; small tools, markups and bonds are spread over the items.