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## MEMORANDUM

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TO: Brian True, PE and Mike Wegley, PE, MCWD      DATE: January 11, 2021  
FROM: Andrew Sterbenz, PE      JOB #: MCWD.47.19  
SUBJECT: A1/A2 Reservoirs and B/C Zone Booster Pump Station, 100% Design Cost Estimate

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The purpose of this memorandum is to provide the Engineer's Opinion of Probable Construction Cost for the 100% design of the subject project.

Based upon the project design as presented in the final plans and specifications, the estimated construction cost for the project is \$20,423,600. The proposed bid tab breakout is provided at Attachment 1, followed by detailed breakouts for each bid item. Prices in the estimate have been escalated to December 2020, and then increased by 20% to cover contingency (15%) and escalation to the mid-point of the construction (5%). Inspection and testing is not included in the estimate. The estimate for the electrical, instrumentation and controls was updated to include integration and programming.

The allowance for permitting is based upon obtaining a City of Marina encroachment permit for pipeline work in Imjin Parkway and 5<sup>th</sup> Avenue. The allowance for SCADA integration is a placeholder value pending an actual estimate from Calcon. There may be some duplication between this allowance and the estimate for Bid Item 8.

This estimate removes items moving to the separate intermediate Reservoir Recoating project.

Attachment:

1. 100% Cost Estimate, with summary and bid-item breakout

Attachment 1:

**Engineer's Opinion of Probable Cost  
A1/A2 Reservoirs and B/C Booster Pump Station  
MCWD Project GW-0112**

Design Level: 100%  
Date: 1/11/2021

Item No.	Description	Unit	Quantity	Unit Price	Bid Price
1	Mobilization	LS	1	10% of Bid	\$1,326,000
2	Sheeting, Shoring and Bracing	LS	1	\$10,700	\$10,700
3	Traffic Control	LS	1	\$40,200	\$40,200
4	Yard Piping, Sitework, Paving and Fencing	LS	1	\$1,520,200	\$1,520,200
5	1.6 MG Steel Water Tank	EA	1	\$5,526,100	\$5,526,100
6	Booster Pump Station Building	LS	1	\$968,400	\$968,400
7	Booster Pump Station Mechanical	LS	1	\$539,900	\$539,900
8	Booster Pump Station Electrical	LS	1	\$1,332,000	\$1,332,000
9	75 HP Pump and Motor	EA	3	\$105,500	\$316,500
10	150 HP Pump and Motor	EA	3	\$135,200	\$405,600
11	Relocate and Install Generator	LS	1	\$6,000	\$6,000
12	24-in DIP, Imjin Parkway	LS	1	\$698,800	\$698,800
13	24-inch DIP, BPS to 6th Ave (A-Zone)	LS	1	\$411,000	\$411,000
14	18-inch DIP, BPS to 6th Ave (C-Zone)	LS	1	\$270,800	\$270,800
15	16-in DIP, BPS to B-Zone Tie-in	LS	1	\$215,600	\$215,600
16	28-in HDPE Sanitary Sewer	LS	1	\$263,700	\$263,700
17	15-in HDPE Storm Sewer	LS	1	\$143,000	\$143,000
18	Wellfield Flow Meter	LS	1	\$68,400	\$68,400
19	Chlorination System Modification	LS	1	\$217,800	\$217,800
20	Replace 300KW Generator at Int. Reservoir	LS	1	\$218,100	\$218,100
21	SCADA Integration Allowance	ALW	1	\$75,000	\$75,000
22	Permit Allowance	ALW	1	\$10,000	\$10,000
<b>Base Bid:</b>					<b>\$14,583,800</b>
A1	12-in DIP, BPS to B-Zone Tie-In in 5th Ave	LS	1	\$181,600	\$181,600
A2	1.6 MG Steel Water Tank	EA	1	\$5,526,100	\$5,526,100
	Landscape for CSU	LS	1	\$132,100	\$132,100

**Base Bid Plus Alternates: \$20,291,500**

**Base Bid Plus Alternates and Landscaping: \$20,423,600**

This estimate of construction cost is a professional opinion, based upon the engineer's experience with the design and construction of similar projects. It is prepared only as a guide and is subject to change. Schaaf & Wheeler and its subconsultants make no warranty, whether expressed or implied, that the actual costs will not vary from these estimated costs, and assumes no liability for such variances. This estimate specifically excludes any costs associated with designing for handling and disposal of hazardous wastes and contaminated materials. Costs associated with land, right-of-way, or easement purchase are not included in this estimate.

All costs scaled to November 2020

<b>Item of Work</b>	<b>Unit</b>	<b>Unit Cost</b>	<b>Quantity</b>	<b>Extension</b>	<b>Subtotal</b>
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***Bid Item 2: Sheeting, Shoring and Bracing***

Trench Box	LS	\$8,847	1	\$8,847	
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				Subtotal	<b>\$8,847</b>
				Construction Contingency/Escalation	20% \$1,769
				<b>Bid Item Total</b>	<b>\$10,700</b>

<b>Item of Work</b>	<b>Unit</b>	<b>Unit Cost</b>	<b>Quantity</b>	<b>Extension</b>	<b>Subtotal</b>
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***Bid Item 3: Traffic Control***

2 Flagmen	HR	\$91	176	\$16,058	
Signage	LS	\$214	1	\$214	
Pedestrian Bypass	LS	\$12,146	1	\$12,146	
Traffic Control Plan	LS	\$600	1	\$600	

	Subtotal				<b>\$33,500</b>
	Construction Contingency/Escalation		20%		\$6,700
	<b>Bid Item Total</b>				<b>\$40,200</b>

<b>Item of Work</b>	<b>Unit</b>	<b>Unit Cost</b>	<b>Quantity</b>	<b>Extension</b>	<b>Subtotal</b>
<b>Bid Item 4: Yard Piping, Sitework, Paving and Fencing</b>					
SWPPP Controls	LS	\$12,000	1	\$12,000	
Clearing and Grubbing	LS	\$13,479	2	\$26,958	
Demo existing AC Pavement	SY	\$11	6,667	\$76,063	
Paving, 4" AC over 6" AB	SF	\$4	46,872	\$198,872	
Concrete Curb & Gutter	LF	\$52	800	\$41,665	
Bollards	EA	\$1,085	20	\$21,700	
Furnish & Install Highlines	LS	\$32,997	1	\$32,997	
Demo Existing Yard Piping	LS	\$40,290	1	\$40,290	
Test and Chlorinate all Pipelines	LS	\$19,530	1	\$19,530	
Install Gates and Fencing, Security Grade 10' high	LF	\$266	1,150	\$306,120	
15" SD HDPE DR 26	LF	\$51	295	\$15,100	
SD Manhole, 4' Diameter, 8-ft deep	EA	\$6,418	4	\$25,671	
SD Catch Basin	EA	\$3,714	4	\$14,856	
Cast Around SDMH, 5' ID, 10' deep	EA	\$22,863	1	\$22,863	
Remove Portion of Existing 30" RCP SD	LF	\$43	5	\$214	
20" DIP	LF	\$254	265	\$67,399	
20" Flex-Tend	EA	\$17,827	2	\$35,654	
Flow Meter and Vault	LS	\$24,341	1	\$24,341	
20" BFV	EA	\$9,211	5	\$46,054	
20" 45-degree bend	EA	\$3,922	4	\$15,688	
30" DIP	LF	\$720	65	\$46,814	
30" x 20" or 30" x 24" Reducer	EA	\$12,479	2	\$24,958	
30" Tee	EA	\$15,599	3	\$46,797	
6" DIP	LF	\$43	165	\$7,060	
6" Gate Valve	EA	\$1,902	1	\$1,902	
18" x 6" Reducer	EA	\$1,664	1	\$1,664	
Clean existing SD by jetting	LS	\$9,000	1	\$9,000	
Demo Oil-Water Separator	LS	\$10,000	1	\$10,000	
Tree Removal, aerial lift truck, 48" diameter	EA	\$2,199	5	\$10,993	
Tree Removal, chain saw, chipper and stump removal	EA	\$1,036	45	\$46,636	
Pave driveway west, 4" Ac over 6" AB	SF	\$4	4,000	\$16,972	
Subtotal					<b>\$1,266,832</b>
Construction Contingency/Escalation			20%		\$253,366
Bid Item Total					<b>\$1,520,200</b>

Reference sheets C-101, C-103, C-104, C-106

<b>Item of Work</b>	<b>Unit</b>	<b>Unit Cost</b>	<b>Quantity</b>	<b>Extension</b>	<b>Subtotal</b>
<b>Bid Item 5: 1.6 MG Steel Water Tank</b>					
<b>Bid Item A2: 1.6 MG Steel Water Tank</b>					
Provide and Install Welded Steel A1/A2 Reservoirs (1.6 MG)	EA	\$4,550,174	1	\$4,550,174	
Earthwork - Overexcavation and Backfill	CY	\$16	2847.4074	\$44,882	
Allowance for Additional Excavation and/or Backfill	LS	\$10,000	1	\$10,000	
Subtotal					<b>\$4,605,055</b>
Construction Contingency/Escalation					20%
					\$921,011
Bid Item Total					<b>\$5,526,100</b>

Unit rates based on gross tank volume and bid price for MCWD Blackhorse Reservoir.

Item of Work	Unit	Unit Cost	Quantity	Extension	Subtotal
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**Bid Item 6: Booster Pump Station Building**

Foundation B/C BPS	LS	\$161,454	1	\$161,454	
CMU Block B/C	LS	\$148,136	1	\$148,136	
Mechanical, Louvers, Misc. Sheet Metal	LS	\$40,978	1	\$40,978	
Structural Steel	LS	\$99,347	1	\$99,347	
Doors	LS	\$62,925	1	\$62,925	
Roofing	LS	\$136,363	1	\$136,363	
Earthwork	LS	\$107,757	1	\$107,757	
HVAC	LS	\$50,000	1	\$50,000	

Subtotal					<b>\$806,961</b>
Construction Contingency/Escalation			20%		\$161,392
Bid Item Total					<b>\$968,400</b>

Item of Work	Unit	Unit Cost	Quantity	Extension	Subtotal
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**Bid Item 7: Booster Pump Station Mechanical**

Furnish and Install Suction Manifold (30"/18")	LS	\$55,669	1	\$55,669	
Furnish & Install 16" Pump Suction Piping	LF	\$295	301	\$88,814	
Furnish & Install 16" BFV	EA	\$5,272	7	\$36,902	
Furnish & Install 12" Pump Suction Piping	LF	\$204	86	\$17,525	
Furnish & Install 12" BFV	EA	\$2,255	2	\$4,511	
Furnish & Install Pump Discharge Piping and Valves (10-inch)					
10" 90-degree Elbow	EA	\$1,168	6	\$7,011	
10" Dismantling Joint	EA	\$1,168	6	\$7,011	
10" Check Valve	EA	\$5,312	6	\$31,875	
10" BFV	EA	\$2,147	6	\$12,880	
2" combo ARV	EA	\$1,168	6	\$7,011	
10"x16" Tee	EA	\$4,511	7	\$31,576	
10" DIP Spool ( 5.5 FT)	EA	\$1,304	6	\$7,826	
10" Blind flange (future pump)	EA	\$522	1	\$522	
24" Blind Flange (future pump)	EA	\$2,283	1	\$2,283	
Furnish & Install Pressure Relief/Pressure Reducing Stations					
12" 90 Degree Elbow	EA	\$1,413	2	\$2,826	
12" DIP Spool (2-ft)	EA	\$408	2	\$815	
12" DIP Spool (8-ft)	EA	\$1,630	2	\$3,261	
12" x 8" or 12" x 6" Tee	EA	\$2,935	8	\$23,478	
8" DIP Spool	EA	\$462	2	\$924	
6" DIP Spool	EA	\$380	2	\$761	
8" Dismantling Joint	EA	\$810	2	\$1,620	
6" Dismantling Joint	EA	\$511	2	\$1,022	
8" Hytrol Press. Relief or Press. Reducing Valve	EA	\$9,022	2	\$18,043	
6" Hytrol Press. Relief or Press. Reducing Valve	EA	\$7,174	2	\$14,348	
8" BFV	EA	\$1,413	4	\$5,652	
6" BFV	EA	\$1,204	4	\$4,815	
12" Blind Flange	EA	\$522	4	\$2,087	
2" Combo ARV	EA	\$1,168	4	\$4,674	
16" x 12" Tee	EA	\$4,511	2	\$9,022	
Furnish & Install 16-inch Discharge Manifold					
16" DIP Spools	LF	\$176	70	\$12,326	
16" Dismantling Joint	EA	\$2,609	4	\$10,435	
16" Blind Flange	EA	\$522	1	\$522	
16" BFV	EA	\$5,272	2	\$10,543	
Manifold Trench Grate	SF	\$35	320	\$11,304	

Subtotal					<b>\$449,892</b>
Construction Contingency/Escalation			20%		\$89,978
<b>Bid Item Total</b>					<b>\$539,900</b>

Flow meter under pump station electrical



**ENGINEER'S OPINION OF PROBABLE COSTS  
BI ITEM 8, BOOSTER PUMP STATION ELECTRICAL**

Client: S&W/MCWD

Project: A1/A2 Tanks B/C Booster Pump Station  
TJCAA Project No.: 119038

By: H. Tran, P. Giorsetto  
Date: 1/8/2021

Conceptual

ESTIMATING LEVEL  
Preliminary

Design (Final)

Division: ICE

Assumed Average Labor Rate: \$ 110.00 /Hour

Item	Item Description	Qty	Units	Material Unit Cost	Material Extension	Labor Unit (Hours)	Labor Unit Cost	Labor Extension	Subs Unit Cost	Subs Extension	Line Item Unit Cost	Total Extension
<b>1 B/C BPS: Major Electrical Equipment</b>												
	SWBD	1	Lot	15000	\$15,000	40	\$4,400	\$4,400		\$0	\$ 19,400.00	\$19,400
	MCC	1	Lot	175000	\$175,000	80	\$8,800	\$8,800	0	\$0	\$ 183,800.00	\$183,800
	Distribution XFMR	1	Ea	1000	\$1,000	8	\$880	\$880		\$0	\$ 1,880.00	\$1,880
	Standby Generator (Existing Relocated)	1	Ea	0	\$0	80	\$8,800	\$8,800		\$0	\$ 8,800.00	\$8,800
	RVSS (product with MCC)	7	Ea		\$0	8	\$880	\$6,160		\$0	\$ 880.00	\$6,160
	Lighting Panel	1	Ea	1500	\$1,500	24	\$2,640	\$2,640		\$0	\$ 4,140.00	\$4,140
	ATS (Existing Relocated)	1	Ea	0	\$0	16	\$1,760	\$1,760		\$0	\$ 1,760.00	\$1,760
<b>2 B/C BPS: Miscellaneous Electrical</b>												
	Lighting (Interior)	4	Ea	150	\$600	8	\$880	\$3,520		\$0	\$ 1,030.00	\$4,120
	Lighting (Exterior)	8	Ea	150	\$1,200	8	\$880	\$7,040		\$0	\$ 1,030.00	\$8,240
	Handhole	4	Ea	500	\$2,000	8	\$880	\$3,520		\$0	\$ 1,380.00	\$5,520
	Grounding	1	Lot	1000	\$1,000	16	\$1,760	\$1,760		\$0	\$ 2,760.00	\$2,760
	PG&E Transformer Pad	1	Lot	2500	\$2,500	24	\$2,640	\$2,640		\$0	\$ 5,140.00	\$5,140
	PG&E Vaults	2	Lot	2500	\$5,000	24	\$2,640	\$5,280		\$0	\$ 5,140.00	\$10,280
	Trenching and backfill	1000	LF	5	\$5,000	1	\$110	\$110,000		\$0	\$ 115.00	\$115,000
	PG&E Primary Service Conduits	1	Lot	7500	\$7,500	120	\$13,200	\$13,200		\$0	\$ 20,700.00	\$20,700
	PVC 40 Conduit: 5" - Secondary	500	LF	8.35	\$4,175	0.229	\$25	\$12,595		\$0	\$ 33.54	\$16,770
	PG&E Pole Risers	1	Lot	1000	\$1,000	16	\$1,760	\$1,760		\$0	\$ 2,760.00	\$2,760
	Concrete Cap	1	Lot	5000	\$5,000	40	\$4,400	\$4,400		\$0	\$ 9,400.00	\$9,400
	PG&E Service Allowance and Coordination	1	lot		\$0	40	\$4,400	\$4,400	25000	\$25,000	\$ 29,400.00	\$29,400
	Liftmaster SL585 Slide Gate Elect Install	1	ea	500	\$500	20	\$2,200	\$2,200		\$0	\$ 2,700.00	\$2,700
	CCTV (HW & SW)	1	Lot	0	\$0	40	\$4,400	\$4,400	40000	\$40,000	\$ 44,400.00	\$44,400
<b>3 B/C BPS: Instrumentation and Control</b>												
	Magnetic Flowmeter	2	Ea	7000	\$14,000	16	\$1,760	\$3,520		\$0	\$ 8,760.00	\$17,520
	Pressure Transmitter	2	Ea	1500	\$3,000	8	\$880	\$1,760		\$0	\$ 2,380.00	\$4,760
	Intrusion Switch	3	Ea	200	\$600	4	\$440	\$1,320		\$0	\$ 640.00	\$1,920
	Tank Level Sensors	2	Ea	2000	\$4,000	16	\$1,760	\$3,520		\$0	\$ 3,760.00	\$7,520
	Pressure Switch	8	Ea	150	\$1,200	4	\$440	\$3,520		\$0	\$ 590.00	\$4,720
	Misc Inst	1	Lot	2500	\$2,500	16	\$1,760	\$1,760		\$0	\$ 4,260.00	\$4,260
	Chlorine Analyzer	1	EA	5000	\$5,000	40	\$4,400	\$4,400		\$0	\$ 9,400.00	\$9,400
	Building Room Temperature	1	Ea	1500	\$1,500	8	\$880	\$880		\$0	\$ 2,380.00	\$2,380
	SCADA HMI OIT (Wonderware)	1	EA	5000	\$5,000		\$0	\$0		\$0	\$ 5,000.00	\$5,000
	PAC Programming	1	Lot		\$0		\$0	\$0	15000	\$15,000	\$ 15,000.00	\$15,000
	HMI Programming	1	Lot		\$0		\$0	\$0	10000	\$10,000	\$ 10,000.00	\$10,000
	PAC Panel Design	1	Lot		\$0		\$0	\$0	5500	\$5,500	\$ 5,500.00	\$5,500
	PAC Panel Build and Components	1	Lot		\$0		\$0	\$0	25000	\$25,000	\$ 25,000.00	\$25,000
	Site Antennae - mast and foundation	1	Lot		\$0		\$0	\$0	7500	\$7,500	\$ 7,500.00	\$7,500
	Unwitness FAT (Hardware)	1	Lot		\$0		\$0	\$0	5000	\$5,000	\$ 5,000.00	\$5,000
	Unwitness FAT (Software)	1	Lot		\$0		\$0	\$0	10000	\$10,000	\$ 10,000.00	\$10,000
	Witness FAT (Hardware)	1	Lot		\$0		\$0	\$0	2000	\$2,000	\$ 2,000.00	\$2,000
	Witness FAT (Software)	1	Lot		\$0		\$0	\$0	5000	\$5,000	\$ 5,000.00	\$5,000
	Startup and Commissioning Activities - Comm	1	Lot		\$0		\$0	\$0	5000	\$5,000	\$ 5,000.00	\$5,000
					\$0		\$0	\$0		\$0	\$ -	\$0
<b>4 B/C BPS: Conduits and Wires - Buried</b>												
	PVC 40 Conduit: 3"	600	LF	4.84	\$2,904	0.145	\$16	\$9,570		\$0	\$ 20.79	\$12,474
	PVC 40 Conduit: 3/4"	5000	LF	1.03	\$5,150	0.055	\$6	\$30,250		\$0	\$ 7.08	\$35,400
					\$0		\$0	\$0		\$0	\$ -	\$0
	XHHW: #600 Stranded Cu	2	CLF	1025	\$2,050	7.273	\$800	\$1,600		\$0	\$ 2,850.03	\$3,650
	XHHW: #1/0 Stranded Cu	6	CLF	197	\$1,182	2.424	\$267	\$1,600		\$0	\$ 463.64	\$2,782
	XHHW: #4/0 Stranded Cu	3	CLF	385	\$1,155	3.636	\$400	\$1,200		\$0	\$ 784.96	\$2,355
	XHHW: #2 Stranded Cu	1	CLF	120	\$120	3.636	\$400	\$400		\$0	\$ 519.96	\$520
	XHHW: #1 Stranded Cu	5	CLF	159	\$795	3.636	\$400	\$2,000		\$0	\$ 558.96	\$2,795
	XHHW: #6 Stranded Cu	2	CLF	54.5	\$109	1	\$110	\$220		\$0	\$ 164.50	\$329
	XHHW: #8 Stranded Cu	2	CLF	61.5	\$123	1	\$110	\$220		\$0	\$ 171.50	\$343
	Control Cable: TSP	10	CLF	39	\$390	1	\$110	\$1,100		\$0	\$ 149.00	\$1,490
	Control Cable: CAT6, 4 pair solid, PVC jacket	15	CLF	16.65	\$250	1.143	\$126	\$1,886		\$0	\$ 142.38	\$2,136
	Pull Rope	300	LF	0.17	\$51	0.008	\$1	\$264		\$0	\$ 1.05	\$315
<b>4 B/C BPS: Conduits - Concealed</b>												
	PVC 40 Conduit: 2"	200	LF	1.59	\$318	0.067	\$7	\$1,474		\$0	\$ 8.96	\$1,792
	PVC 40 Conduit: 1 1/4"	400	LF	1.5	\$600	0.047	\$5	\$2,068		\$0	\$ 6.67	\$2,668
	PVC 40 Conduit: 1"	800	LF	0.78	\$624	0.04	\$4	\$3,520		\$0	\$ 5.18	\$4,144
<b>5 B/C BPS: Conduits and Wires - Exposed</b>												
	GRS Conduit: 3/4"	1000	LF	7.1	\$7,100	0.123	\$14	\$13,530		\$0	\$ 20.63	\$20,630
					\$0		\$0	\$0		\$0	\$ -	\$0
<b>6 B/C BPS: Conduits and Wires - Lighting Circuits</b>												
	Aux equipment and lighting conduit and wire	1	Lot	5000	\$5,000	120	\$13,200	\$13,200		\$0	\$ 18,200.00	\$18,200
<b>7 B/C BPS: Testing and Startup</b>												
		1	Lot		\$0	80	\$8,800	\$8,800		\$0	\$ 8,800.00	\$8,800
<b>8 B/C BPS: Programming</b>												
	Network/Comms	1	Lot	0	\$0		\$0	\$0	3000	\$3,000	\$ 3,000.00	\$3,000
	PLC Programming	1	Lot	0	\$0		\$0	\$0	15000	\$15,000	\$ 15,000.00	\$15,000
	SCADA/HMI	1	Lot	0	\$0		\$0	\$0	10000	\$10,000	\$ 10,000.00	\$10,000
	Radio Path Survey	1	Lot	0	\$0		\$0	\$0		\$0	\$ -	\$0
	Validation - Witnessed	1	Lot	0	\$0		\$0	\$0	5000	\$5,000	\$ 5,000.00	\$5,000
	Validation - Unwitnessed	1	Lot	0	\$0		\$0	\$0	3000	\$3,000	\$ 3,000.00	\$3,000

<b>Item of Work</b>	<b>Unit</b>	<b>Unit Cost</b>	<b>Quantity</b>	<b>Extension</b>	<b>Subtotal</b>
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**Bid Item 9: 75 HP Pump and Motor**

Furnish Zone B Vertical Turbine Pumps (includes pump can, column pipe, motor etc.)	EA	\$79,902	1	\$79,902	
Install Pumps	EA	\$7,233	1	\$7,233	
Concrete Pump Pedestal	EA	\$777	1	\$777	

				Subtotal	<b>\$87,913</b>
			20%	Construction Contingency/Escalation	\$17,583
				<b>Bid Item Total</b>	<b>\$105,500</b>

<b>Item of Work</b>	<b>Unit</b>	<b>Unit Cost</b>	<b>Quantity</b>	<b>Extension</b>	<b>Subtotal</b>
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**Bid Item 10: 150 HP Pump and Motor**

Furnish Zone C Vertical Turbine Pumps (includes pump can, column pipe, motor etc.)	EA	\$104,393	1	\$104,393	
Install Pumps	EA	\$7,233	1	\$7,233	
Concrete Pump Pedestal	EA	\$777	1.333	\$1,036	

				Subtotal	<b>\$112,663</b>
			20%	Construction Contingency/Escalation	\$22,533
				<b>Bid Item Total</b>	<b>\$135,200</b>

Item of Work	Unit	Unit Cost	Quantity	Extension	Subtotal
<b>Bid Item 11: Relocate and Install 600 KW Generator</b>					
CMU Block Wall (omitted)	LS	\$ 3,502	0	\$ -	
Crew A-3G Labor with Trailer Truck, Crane	LS	\$ 2,392	1	\$ 2,392	
Slab/Pedestal	LS	\$ 2,567	1	\$ 2,567	

	Subtotal				<b>\$4,959</b>
	Construction Contingency/Escalation		20%		\$992
	Bid Item Total				<b>\$6,000</b>

Item of Work	Unit	Unit Cost	Quantity	Extension	Subtotal
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**Bid Item 12: 24-inch DIP in Imjin Parkway (A-Zone)**

Furnish and Install 24" DIP, repave trench	LF	\$498	1000	\$497,637	
24" BFV	EA	\$14,186	3	\$42,558	
24" TEE	EA	\$12,836	1	\$12,836	
24" Transistion Couplings	EA	\$3,337	2	\$6,675	
24" 45deg bend	EA	\$5,408	3	\$16,223	
24" MJ plug	EA	\$2,496	2	\$4,992	
Thrust Blocks	EA	\$701	2	\$1,402	

	Subtotal				<b>\$582,322</b>
	Construction Contingency/Escalation		20%		\$116,464
	Bid Item Total				<b>\$698,800</b>

Reference sheet C-015

Item of Work	Unit	Unit Cost	Quantity	Extension	Subtotal
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**Bid Item 13: 24-inch DIP BPS to 6th Ave (A- and C-Zone)**

Furnish and Install 24" DIP	LF	\$263	850	\$223,506	
24" BFV	EA	\$14,186	5	\$70,930	
24" TEE	EA	\$12,159	2	\$24,319	
24" Transition Couplings	EA	\$3,161	2	\$6,323	
24" 90deg	EA	\$7,012	1	\$7,012	
24" 22.5 deg	EA	\$5,408	1	\$5,408	
Thrust Blocks	EA	\$701	2	\$1,402	
Replace sidewalk, 4-ft wide	LF	\$33	20	\$651	
Replace sidewalk, 12-ft wide	LF	\$98	30	\$2,931	

				Subtotal	<b>\$342,482</b>
			20%	Construction Contingency/Escalation	\$68,496
				<b>Bid Item Total</b>	<b>\$411,000</b>

Reference sheets C001 and C103

Includes valves at A-zone meter vault. Vault under yard piping

<b>Item of Work</b>	<b>Unit</b>	<b>Unit Cost</b>	<b>Quantity</b>	<b>Extension</b>	<b>Subtotal</b>
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**Bid Item 14: 18-inch DIP BPS to 6th Ave (C-Zone)**

Furnish and Install 18" DIP	LF	\$220	880	\$193,600	
18" BFV	EA	\$6,800	2	\$13,600	
18" TEE	EA	\$6,600	1	\$6,600	
18" 90deg	EA	\$3,800	1	\$3,800	
18" 22.5 deg	EA	\$4,000	2	\$8,000	
Thrust Blocks	EA	\$710	0	\$0	

	Subtotal				<b>\$225,600</b>
	Construction Contingency/Escalation		20%		\$45,120
	Bid Item Total				<b>\$270,800</b>

Reference sheets C001 and C103

<b>Item of Work</b>	<b>Unit</b>	<b>Unit Cost</b>	<b>Quantity</b>	<b>Extension</b>	<b>Subtotal</b>
<b>Bid Item 15: 16-inch DIP, BPS to B-Zone Tie-in</b>					
Furnish and Install 16" DIP, repave trench	LF	\$306	410	\$125,309	
Furnish and Install 16" DIP	LF	\$205	90	\$18,447	
16" BFV	EA	\$5,460	4	\$21,842	
16" TEE	EA	\$4,250	2	\$8,500	
16" 90deg	EA	\$2,702	1	\$2,702	
16" Transistion Couplings	EA	\$1,105	2	\$2,210	
Thrust Blocks	EA	\$321	2	\$642	

	Subtotal				<b>\$179,652</b>
	Construction Contingency/Escalation		20%		\$35,930
	Bid Item Total				<b>\$215,600</b>

Reference sheets C001 and C103



Item of Work	Unit	Unit Cost	Quantity	Extension	Subtotal
<b>Bid Item 16: 28-inch HDPE Sanitary Sewer</b>					
28" HDPE DR 17	LF	\$472	270		\$127,491
SSMH	EA	\$23,045	4		\$92,182
Lateral Connection	EA	\$1,370	0		\$0
Abandon Pipe by Grouting	CY	\$186	0		\$0
Abandon SSMH	EA	\$2,737	0		\$0

Subtotal					<b>\$219,673</b>
Construction Contingency/Escalation			20%		\$43,935
Bid Item Total					<b>\$263,700</b>

Reference sheet C-105

Item of Work	Unit	Unit Cost	Quantity	Extension	Subtotal
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**Bid Item 17: 15-in HDPE Storm Sewer in 5th Ave.**

15" HDPE DR26, repave trench	LF	\$120	680	\$81,441	
SDMH	EA	\$5,919	2	\$11,837	
15" concrete flared end section	EA	\$1,206	1	\$1,206	
Slurry Seal	SY	\$1.25	756	\$943	
Cast Around SDMH, 5' ID, 18' deep	EA	\$23,502	1	\$23,502	
Remove Portion of Existing 30" RCP SD	LF	\$44	5	\$220	

	Subtotal				<b>\$119,150</b>
	Construction Contingency/Escalation		20%		\$23,830
	Bid Item Total				<b>\$143,000</b>

Reference sheet C-107

<b>Item of Work</b>	<b>Unit</b>	<b>Unit Cost</b>	<b>Quantity</b>	<b>Extension</b>	<b>Subtotal</b>
<b><i>Bid Item 18: Wellfield Flow Meter</i></b>					
24" Ultrasonic Flow Meter	EA	\$9,408	1	\$9,408	
Concrete Vault with Traffic Rated Lid (72" x 72")	EA	\$6,267	1	\$6,267	
24" BFV	EA	\$13,696	2	\$27,391	
Thrust Blocks	EA	\$701	2	\$1,402	
24" Dismantling Joint	EA	\$6,019	1	\$6,019	
Excavation for BFV, Vault and BFV	LF	\$66	40	\$2,648	
Chlorine sample line, 1/2" PE	LF	\$16	200	\$3,214	
1/2" tap on 24" main	EA	\$600	1	\$600	

				<b>Subtotal</b>	<b>\$56,948</b>
			20%	Construction Contingency/Escalation	\$11,390
				<b>Bid Item Total</b>	<b>\$68,400</b>

Reference sheets C140 and C-141

**ENGINEER'S OPINION OF PROBABLE COSTS  
 BID ITEM 19, CHLORINATION SYSTEM MODIFICATIONS**

Client: S&W/MCWD

Project: A1/A2 Tanks B/C Booster Pump Station

TJCAA Project No.: 119038

Division: ICE

By: H. Tran, P. Giorsetto

Date: 1/8/21

ESTIMATING LEVEL

Design (100%)

Assumed Average Labor Rate: \$ 110.00 \$/Hour

Item	Item Description	Qty	Units	Material Unit Cost	Material Extension	Labor Unit (Hours)	Labor Unit Cost	Labor Extension	Subs Unit Cost	Subs Extension	Line Item Unit Cost	Total Extension		
9	<b>Chlorination System/I.R. Modifications</b>													
	PLC Modifications to F-Booster RTU	1	Lot		\$0	0	\$0	\$0	5000	\$5,000	\$ 5,000.00	\$5,000		
	PAC Programming	1	Lot		\$0		\$0	\$0	10000	\$10,000	\$ 10,000.00	\$10,000		
	HMI Programming	1	Lot		\$0		\$0	\$0	6000	\$6,000	\$ 6,000.00	\$6,000		
	PAC Panel Design	1	Lot		\$0		\$0	\$0	3500	\$3,500	\$ 3,500.00	\$3,500		
	PAC Panel Build and Components (LCP7A)	1	Lot		\$0		\$0	\$0	20000	\$20,000	\$ 20,000.00	\$20,000		
	Site Antennae - mast and foundation	1	Lot		\$0		\$0	\$0	7500	\$7,500	\$ 7,500.00	\$7,500		
	Unwitness FAT (Hardware)	1	Lot		\$0		\$0	\$0	2000	\$2,000	\$ 2,000.00	\$2,000		
	Unwitness FAT (Software)	1	Lot		\$0		\$0	\$0	4000	\$4,000	\$ 4,000.00	\$4,000		
	Witness FAT (Hardware)	1	Lot		\$0		\$0	\$0	1000	\$1,000	\$ 1,000.00	\$1,000		
	Witness FAT (Software)	1	Lot		\$0		\$0	\$0	2500	\$2,500	\$ 2,500.00	\$2,500		
	Startup and Commissioning Activities - Comm	1	Lot		\$0		\$0	\$0	5000	\$5,000	\$ 5,000.00	\$5,000		
	Chlorine Dosing Pumps (under process)	0	Ea	3000	\$0		\$0	\$0		\$0	\$ 3,000.00	\$0		
	Chlorine Dosing Pump VFD (under process)	0	Ea	625	\$0		\$0	\$0		\$0	\$ 625.00	\$0		
	Standby Generator (under 20)	0	Ea	100000	\$0	80	\$8,800	\$0		\$0	#####	\$0		
	Magnetic Flowmeter and Vault (under 18)	0	Ea	7000	\$0	16	\$1,760	\$0		\$0	\$ 8,760.00	\$0		
	Chlorine Analyzer (Existing - Reconnect)	1	Ea	0	\$0		\$0	\$0	1000	\$1,000	\$ 1,000.00	\$1,000		
	Hypo Tank Level Sensor	1	Ea	2000	\$2,000	16	\$1,760	\$1,760		\$0	\$ 3,760.00	\$3,760		
	Trenching and backfill	200	LF	5	\$1,000	1	\$110	\$22,000		\$0	\$ 115.00	\$23,000		
	Conduit and Wire	1	Lot	8000	\$8,000	160	\$17,600	\$17,600		\$0	\$ 25,600.00	\$25,600		
	Chlor Bldg Miniloader Center	1	Ea	2500	\$2,500	80	\$8,800	\$8,800		\$0	\$ 11,300.00	\$11,300		
	Site Demolition	1	Ea	0	\$0	40	\$4,400	\$4,400		\$0	\$ 4,400.00	\$4,400		
	<b>PRORATES</b>													
	Material Subtotal				\$13,500									
	Sales Tax on Materials	9.25 %			\$1,249									
	Subcontractor's Subtotal									\$67,500				
	Subcontractor's OH&P	20 %								\$13,500				
	<b>Subtotals</b>				\$14,749			\$54,560		\$81,000		\$150,309		
	Electrical Sub OH&P	20 %										\$30,062		
	<b>Subtotals</b>											\$180,371		
	G&A, Bonding, etc	0 %										\$0		
	<b>Subtotals</b>											\$180,371		
	Contingency	15 %										\$27,056		
												<b>TOTAL</b>	<b>\$207,426</b>	
													MARKET FACTORS: ESCALATION, PROJECT LOCATION, PROJECT COMPLEXITY, BID CLIMATE	<b>1.05</b>
													<b>ENGINEERS OPINION OF PROBABLE COST</b>	<b>\$217,797</b>

**NOTES:**

<b>Item of Work</b>	<b>Unit</b>	<b>Unit Cost</b>	<b>Quantity</b>	<b>Extension</b>	<b>Subtotal</b>
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**Bid Item 20: Replace 300KW Generator at Intermediate Reservoir**

300 KW Genset (material)	EA	\$116,451	1	\$116,451	
Installation	LS	\$61,823	1	\$61,823	
Demo 10' x 15' concrete pad	SF	\$23	150	\$3,456	

					<b>Subtotal</b>	<b>\$181,730</b>
				20%	Construction Contingency/Escalation	\$36,346
					<b>Bid Item Total</b>	<b>\$218,100</b>

Pricing based on 2019 bids by Quinn and Don Chapin Co.  
Assumes new equipment pad is required.

<b>Item of Work</b>	<b>Unit</b>	<b>Unit Cost</b>	<b>Quantity</b>	<b>Extension</b>	<b>Subtotal</b>
<b>Bid Item A1: 12-inch DIP, BPS to 5th Ave (B-Zone)</b>					
Furnish and Install 12" DIP, repave trench	LF	\$220	450	\$99,000	
Furnish and Install 12" DIP, unpaved	LF	\$130	200	\$25,985	
12" Gate Valves	EA	\$7,200	2	\$14,400	
1" ARV	EA	\$7,900	1	\$7,900	
Tapping Sleeve	EA	\$4,000	1	\$4,000	
Subtotal					<b>\$151,285</b>
Construction Contingency/Escalation			20%		\$30,257
Bid Item Total					<b>\$181,600</b>

Reference sheet C-014