

RESOLUTION NO. R16-117

A RESOLUTION AUTHORIZING THE MAYOR TO SIGN
CHANGE ORDER NO. 7 WITH WILSON BROTHERS CONSTRUCTION
FOR THE WATER TREATMENT PLANT INTAKE PROJECT *JW NW TMM*
CONSTITUTING AN INCREASE OF ~~\$76,549.70~~ \$75,591.75

WHEREAS, the City Council of the City of Laurel previously authorized the Mayor to approve a contract with Wilson Brothers Construction for the Water Treatment Plant Intake Project through Resolution No. R16-45 on June 21, 2016; and

WHEREAS, the original contract price was \$8,560,901.00 to complete the project; and

WHEREAS, additional work and compensation is required to finish the project as described in the attached Change Order; and

WHEREAS, Great West Engineering and City Staff reviewed Change Order No. 7 and determined that it is correct, reasonable and necessary to complete the project and recommend the Council's approval of the same.

NOW, THEREFORE, BE IT RESOLVED by the City Council of the City of Laurel, Montana, that the Mayor is authorized to sign Change Order No. 7, a copy of which is attached, to increase the contract amount by ~~\$76,549.70~~ \$75,591.75 *JW NW*

Introduced at a regular meeting of the City Council on December 6, 2016, by Council Member Poehls.


PASSED and APPROVED by the City Council of the City of Laurel this 6th day of December, 2016.

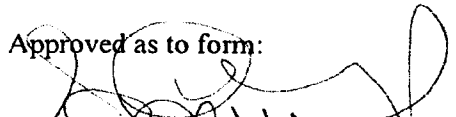
APPROVED by the Mayor this 6th day of December, 2016.

CITY OF LAUREL


Mark A. Mace, Mayor

ATTEST:


Bethany Keeler, Clerk/Treasurer

Approved as to form:

Sam S. Painter, Civil City Attorney

Date of Issuance: December 6, 2016	Effective Date:	December 6, 2016
Owner: City of Laurel, Montana	Owner's Contract No.:	FEMA: 1996-DR-MT-PW 01679
		SRF: EQ 16-1684
Contractor: Wilson Bros. Construction, Inc.	Contractor's Project No.:	MT16-04
Engineer: Great West Engineering, Inc.	Engineer's Project No.:	2-07128-TO26
Project: Water Treatment Plant Intake	Contract Name:	N/A

The Contract is modified as follows upon execution of this Change Order:

Description:

This Change Order is for work associated with installing an alternate water supply for the hot water flush system for the intake, which is used for frazil ice mitigation. The hot water flush system was designed to be supplied with a groundwater well. However, when a well was drilled near the control building, bedrock was encountered at a depth of ten feet, and the well yield was insufficient to supply the hot water flush system. The alternate system will pump water from one of the transmission mains to a storage tank located at the control building. The water will then be pumped from the tank to the boiler and then out to the intake. The details of the alternate system are shown in the attached plans, specifications and itemized cost breakdown from the Contractor.

This work is not eligible for reimbursement from FEMA under PW 01679.

- Decrease the contract quantity for *Item No. 503 – Well Pitless Unit, Drop Pipe and Check Valve* from 1 LS to 0 LS. Decrease in cost = (\$8,625.00).
- Decrease the contract quantity for *Item No. 504 – Well Pump, Motor and Electrical* from 1 LS to 0 LS. Decrease in cost = (\$12,500.00).
- Decrease the contract unit price for *Item No. 506 – Blowoff Hydrant* from \$2,500/LS to ~~\$957.95/LS~~ ^{\$0.00/LS}. Decrease in cost = ~~(\$1,542.05)~~ ^(\$2,500.00). ~~This item cannot be deleted from the contract entirely, because the Contractor is obligated to pay a re-stocking fee, as the materials have already been purchased.~~ JW
NW
- Add Item Nos. CO7-101 to CO7-114, as shown on the itemized cost breakdown. Increase in cost = \$99,216.75.

Attachments:

- Itemized cost breakdown from Wilson Bros. Construction.
- Revised Construction Plans, sheets G1, P1, M2, M3, CO7A, CO7B, CO7C, E3 and E5.
- Specification Section 11210 – Centrifugal Pump and Motor.
- Specification Section 11211 – Submersible Booster Pump and Motor.

CHANGE IN CONTRACT PRICE	CHANGE IN CONTRACT TIMES <i>[note changes in Milestones if applicable]</i>
Original Contract Price: <u>\$8,560,901.00</u>	Original Contract Times: Substantial Completion: <u>240</u> Ready for Final Payment: <u>270</u> days
Increase from previously approved Change Orders No. <u>1</u> to No. <u>6</u> : <u>\$217,093.43</u>	Increase from previously approved Change Orders No. <u>1</u> to No. <u>6</u> : Substantial Completion: <u>0</u> Ready for Final Payment: <u>0</u> days
Contract Price prior to this Change Order: <u>\$8,777,994.43</u>	Contract Times prior to this Change Order: Substantial Completion: <u>240</u> Ready for Final Payment: <u>270</u> days
Increase of this Change Order: \$76,549.70 <u>\$75,591.75</u> JW MAN BJ NW	Increase of this Change Order: Substantial Completion: <u>0</u> Ready for Final Payment: <u>0</u> days
Contract Price incorporating this Change Order: \$8,854,544.13 <u>\$8,853,586.18</u> JW NW	Contract Times with all approved Change Orders: Substantial Completion: <u>240</u> Ready for Final Payment: <u>270</u> Days

RECOMMENDED:	ACCEPTED:	ACCEPTED:
By: <u>Jamethon Weaver</u>	By: <u>Mark A. Man</u>	By: <u>Nick Wilson</u>
Engineer	Owner (Authorized Signature)	Contractor (Authorized Signature)
Title: <u>Project Engineer</u>	Title: <u>Mayor</u>	Title: <u>Ops Manager</u>
Date: <u>11/22/2016</u>	Date: <u>12/16/2016</u>	Date: <u>11/22/16</u>
Approved by Funding Agency (if applicable)		
By: _____	Date: _____	
Title: _____		

Schedule of Work Items for Change Order No. 7: Hot Water Flush Tank/Pump

PROJECT		PROJECT NO.			
CITY OF LAUREL, WATER TREATMENT PLANT		FEMA: 1996-DR-MT-PW 01679		Wilson Brother's	
		SRF: EQ 16-1684			
ITEM NO.	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL PRICE
503	Deduct of Item 503 - Well Pitless Unit	1	EA	(\$8,625.00)	(\$8,625.00)
504	Deduct of Item 504 - Well Pump Motor & Electrical	1	EA	(\$12,500.00)	(\$12,500.00)
506	Deduct of Item 506 - Blowoff Hydrant	1	EA	\$0.00 (\$1,542.05)	(\$1,542.05)
CO7-101	2-Inch 3408 HDPE DR11	2100	LF	\$2.00	\$4,200.00
CO7-102	17,000 Gallon Tank (Tank, Anchor System, Connections, Drain Line/Overflow, Appurtenant Items Shown On Plans)	1	LS	\$27,600.00	\$27,600.00
CO7-103	Tank and Appurtenances Installation	1	LS	\$9,101.75	\$9,101.75
CO7-104	Ultrasonic Tank Level Sensor, Alarms	1	EA	\$1,800.00	\$1,800.00
CO7-105	Pump 2 - Centrifugal Inside Control Building	1	EA	\$1,950.00	\$1,950.00
CO7-106	Pump Foot Valve - 2-inch	1	EA	\$350.00	\$350.00
CO7-107	Pump Controller	2	EA	\$2,170.00	\$4,340.00
CO7-108	Pump 1 - Submersible in Wet Well at Transmission Main	1	EA	\$5,850.00	\$5,850.00
CO7-109	Wet Well at Transmission Main	1	EA	\$5,750.00	\$5,750.00
CO7-110	8x30-inch Tap onto Transmission main	1	EA	\$12,375.00	\$12,375.00
CO7-111	8-inch Butterfly Valve - VALVE NOT INCLUDED	1	EA	\$2,850.00	\$2,850.00
CO7-112	Pump Isolation Gate Valves 2-inch	2	EA	\$225.00	\$450.00
CO7-113	Three Phase Power to Tank/Pump Site - Jacketed Cable	2100	LF	\$8.50	\$17,850.00
CO7-114	Electrical/SCADA Changes	1	LS	\$4,750.00	\$4,750.00
	TOTAL				\$76,540.70

JW NW
\$0.00 *Man*

JW NW
Man

\$75,591.75

SHEET INDEX

PROJECT: 2.07128.T0.35
DATE: MAY 10, 2016

- SHEET 1 G1 COVER
- SHEET 2 G2 GENERAL NOTES, ABBREVIATIONS AND LEGEND
- SHEET 3 G3 OVERALL SITE PLAN, CONTROL AND GEOTECHNICAL BORINGS
- SHEET 4 G4 PROCESSES AND INSTRUMENTATION DIAGRAM
- SHEET 5 G6 TEMPORARY BYPASS PUMPING AT WATER TREATMENT PLANT

CIVIL SHEETS

- SHEET 6 C1 INTAKE SITE & DEWATERING PLAN
- SHEET 7 C2 CONTROL BUILDING SITE GRADING PLAN
- SHEET 8 C3 WATER TREATMENT PLANT PIPING DEMOLITION PLAN
- SHEET 9 C4 WATER TREATMENT PLANT PIPING CONNECTION PLAN

PIPELINE SHEETS

- SHEET 10 P1 INTAKE CONNECTION MAIN PLAN & PROFILE, STA 23+00 TO STA 30+00
- SHEET 11 P2 INTAKE TRANSMISSION MAIN #1 PLAN & PROFILE, STA 30+00 TO STA 40+00
- SHEET 12 P3 INTAKE TRANSMISSION MAIN #1 PLAN & PROFILE, STA 40+00 TO STA 50+00
- SHEET 13 P4 INTAKE TRANSMISSION MAIN #1 PLAN & PROFILE, STA 50+00 TO STA 60+00
- SHEET 14 P5 INTAKE TRANSMISSION MAIN #1 PLAN & PROFILE, STA 60+00 TO STA 70+00
- SHEET 15 P6 INTAKE TRANSMISSION MAIN #1 PLAN & PROFILE, STA 70+00 TO STA 80+00
- SHEET 16 P7 INTAKE TRANSMISSION MAIN #1 PLAN & PROFILE, STA 80+00 TO STA 90+00
- SHEET 17 P8 INTAKE TRANSMISSION MAIN #1 PLAN & PROFILE, STA 90+00 TO STA 100+00
- SHEET 18 P9 INTAKE TRANSMISSION MAIN #1 PLAN & PROFILE, STA 100+00 TO STA 110+00
- SHEET 19 P10 INTAKE TRANSMISSION MAIN #1 PLAN & PROFILE, STA 110+00 TO STA 120+00
- SHEET 20 P11 INTAKE TRANSMISSION MAIN #1 PLAN & PROFILE, STA 120+00 TO STA 130+00
- SHEET 21 P12 INTAKE TRANSMISSION MAIN #1 PLAN & PROFILE, STA 130+00 TO STA 140+00
- SHEET 22 P13 INTAKE TRANSMISSION MAIN #1 PLAN & PROFILE, STA 140+00 TO STA 150+00
- SHEET 23 P14 INTAKE TRANSMISSION MAIN #1 PLAN & PROFILE, STA 150+00 TO STA 160+00
- SHEET 24 P15 INTAKE TRANSMISSION MAIN #1 PLAN & PROFILE, STA 160+00 TO STA 170+00
- SHEET 25 P16 INTAKE TRANSMISSION MAIN #1 PLAN & PROFILE, STA 170+00 TO STA 180+00
- SHEET 26 P17 INTAKE TRANSMISSION MAIN #1 PLAN & PROFILE, STA 180+00 TO STA 190+00
- SHEET 27 P18 AIR & HOT WATER TRENCH PLAN & PROFILE, STA 200+00 TO STA 210+00
- SHEET 28 P19 AIR & HOT WATER TRENCH PLAN & PROFILE, STA 210+00 TO STA 220+00
- SHEET 29 P20 WTP RELOCATING AND CONNECTION PLAN & PROFILE, STA 0+00 TO STA 5+00

- ~~SHEET 31 P22 INTAKE STRUCTURE PIPING SCREEN CONFIGURATION PLAN & PROFILE, STA 0+00 TO STA 100+00~~
- SHEET 32 P23 INTAKE STRUCTURE AIR & HOT WATER LINES CONFIGURATION DETAIL
- SHEET 33 P24 WATER TREATMENT PLANT DEMOLITION PLAN
- SHEET 34 P25 WATER TREATMENT PLANT CONNECTION DETAIL

MECHANICAL SHEETS

- SHEET 35 M1 INTAKE LOW PROFILE HALF SCREEN DETAILS
- SHEET 36 M2 CONTROL BUILDING HVAC AND PLUMBING PLAN
- SHEET 37 M3 CONTROL BUILDING BOILER SYSTEM HYDRONIC PIPING FLOW DIAGRAM AND SCHEDULES

STRUCTURAL SHEETS

- SHEET 38 S1 INTAKE ISOMETRIC VIEWS
- SHEET 39 S2 INTAKE FOUNDATION PLAN AND DETAILS
- SHEET 40 S3 INTAKE SHAFT DETAILS
- SHEET 41 S4 INTAKE FOOTING REINFORCEMENT
- SHEET 42 S5 INTAKE BASE & CIP LID REINFORCEMENT
- SHEET 43 S6 INTAKE WALL REINFORCEMENT
- SHEET 44 S7 INTAKE ROOF PANEL DETAILS AND NOTES
- SHEET 45 S8 INTAKE ROOF PANEL DETAILS AND NOTES
- SHEET 46 S9 CONTROL BUILDING FOUNDATION PLAN
- SHEET 47 S10 CONTROL BUILDING STRUCTURAL NOTES
- SHEET 48 S11 STRUCTURAL DETAILS

ARCHITECTURAL SHEETS

- SHEET 49 A1 CONTROL BUILDING FLOOR PLAN
- SHEET 50 A2 CONTROL BUILDING ELEVATIONS
- SHEET 51 A3 CONTROL BUILDING SECTIONS
- SHEET 52 A4 CONTROL BUILDING ROOF FRAMING PLAN AND DETAILS
- SHEET 53 A5 CONTROL BUILDING SCHEDULES & TYPICAL DETAILS

DETAIL SHEETS

- SHEET 54 D1 STANDARD DETAILS
- SHEET 55 D2 STANDARD DETAILS
- SHEET 56 D3 STANDARD DETAILS
- SHEET 57 D4 STANDARD DETAILS
- SHEET 58 D5 STANDARD DETAILS
- SHEET 59 D6 SHORING DETAILS
- SHEET 60 D7 REMOVAL OF EXISTING 1955 INTAKE

ELECTRICAL SHEETS

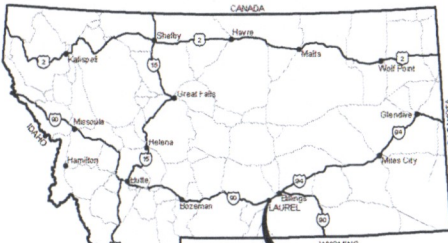
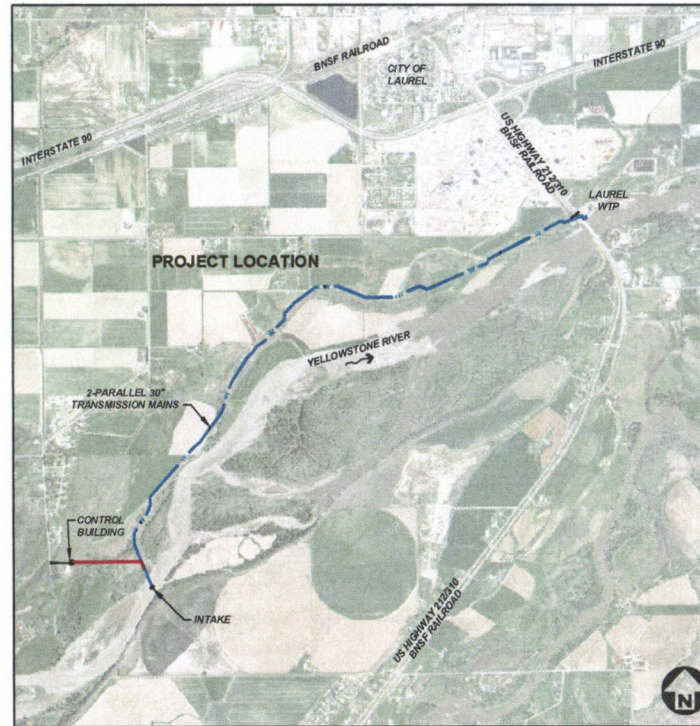
- SHEET 61 E1 ELECTRICAL SITE PLAN - CONTROL BUILDING
- SHEET 62 E2 ELECTRICAL SITE PLAN - INTAKE STRUCTURE
- SHEET 63 E1 CONTROL BUILDING LIGHTING PLAN
- SHEET 64 E2 CONTROL BUILDING POWER PLAN
- SHEET 65 E3 ONE LINE DIAGRAM - CONTROL BUILDING
- SHEET 66 E4 HYDROBURST FIELD WIRING DIAGRAM
- SHEET 67 E5 SCADA SYSTEM NETWORK AND I/O DIAGRAM
- SHEET 68 E6 MOTOR CONTROL SCHEMATICS - MCC PHASE MONITOR
- SHEET 69 E7 MOTOR CONTROL SCHEMATICS - BOILER PUMP AND WELL PUMP
- SHEET 70 E8 EQUIPMENT SCHEDULE
- SHEET 71 E9 MOTOR CONTROL CENTER SCHEDULE AND EMERGENCY GENERATOR SCHEDULE
- SHEET 72 E10 ELECTRICAL SCHEDULES
- SHEET 73 E11 PLOU LIST
- SHEET 74 E12 ELECTRICAL DETAILS AND LEGEND

- ~~SHEET 75 G02 WTP BYPASS LINE ALIGNMENT PLAN & PROFILE - STA 1400 TO STA 1900~~
- ~~SHEET 76 G03A BURIED WATER STORAGE TANK SITE PLAN~~
- ~~SHEET 77 G03B BURIED WATER STORAGE TANK DETAILS AND SECTIONS~~
- ~~SHEET 78 G03C DOOSER PUMP AT TRANSMISSION MAIN~~

NO	REVISION DESCRIPTION	BY	DATE	NO	REVISION DESCRIPTION	BY	DATE	SET NO
△	CHANGE ORDER NO. 7 WATER STORAGE TANK AT CONTROL BUILDING	LMW	11-11-16	△	ADDENDUM NO. 1 BEDDING AND AIR RELEASE VAULT REVISIONS	LMW	5-20-16	SHEET NO
△	CHANGE ORDER NO. 8 8" (42) UNLINED SHAF-1 HIGH REVISIONS	LMW	11-14-16	△	ADDENDUM NO. 2 MISCELLANEOUS REVISIONS	LMW	6-2-16	
△				△	CHANGE ORDER NO. 1 CONTROL BUILDING RELOCATION	LMW	6-28-16	G1
△				△	CHANGE ORDER NO. 2 WTP BYPASS LINE CLARIFICATIONS SHEET #P1	LSM	7-21-16	
△	REQUEST FOR INFORMATION - 003					JEM	7-22-16	1 OF 74

CITY OF LAUREL, MONTANA WATER TREATMENT PLANT INTAKE CONSTRUCTION PLANS

SECTIONS 15, 16, 20, 21, 29 & 30, TOWNSHIP 2 SOUTH, AND RANGE 24 EAST



PROJECT LOCATION

PLANS PREPARED FOR:

KURT MARKEGARD, DIRECTOR
OF PUBLIC WORKS
CITY OF LAUREL, MONTANA



APPROVED BY:

JEREMIAH THEYS, P.E.
GREAT WEST ENGINEERING



QA/QC BY:

CHAD E. HANSON, P.E.
GREAT WEST ENGINEERING



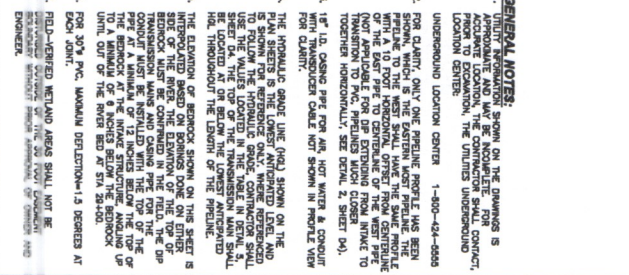
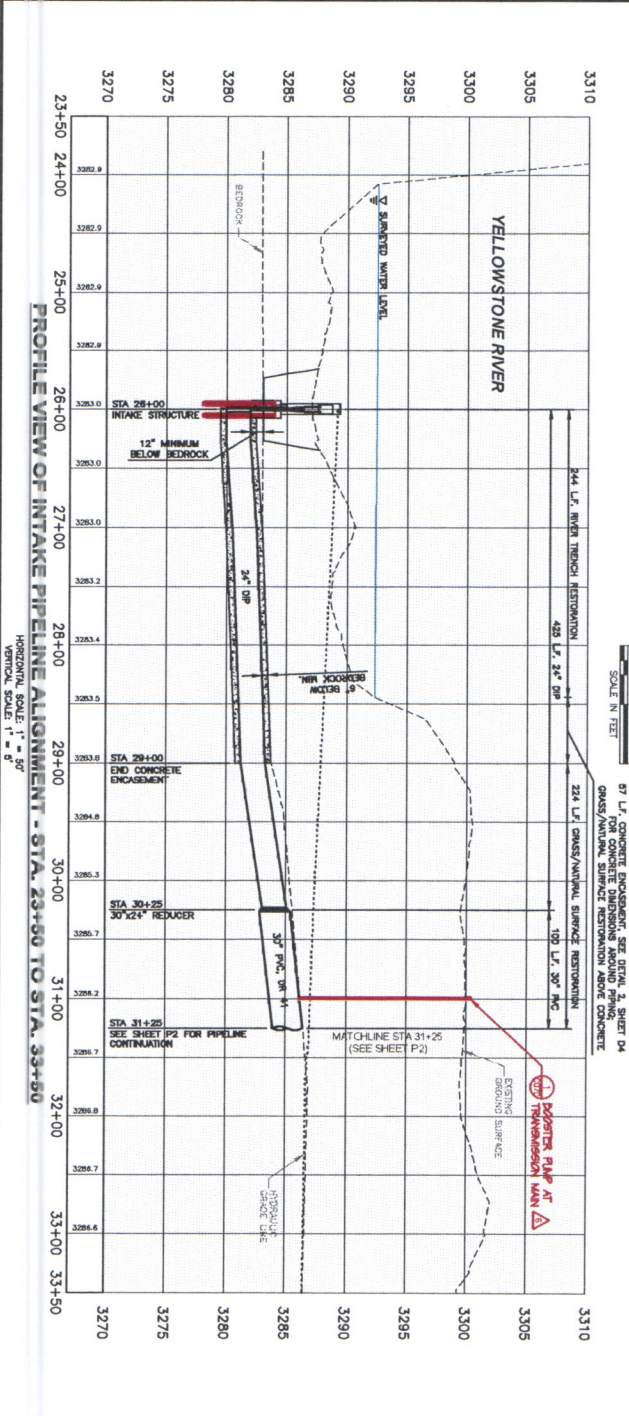
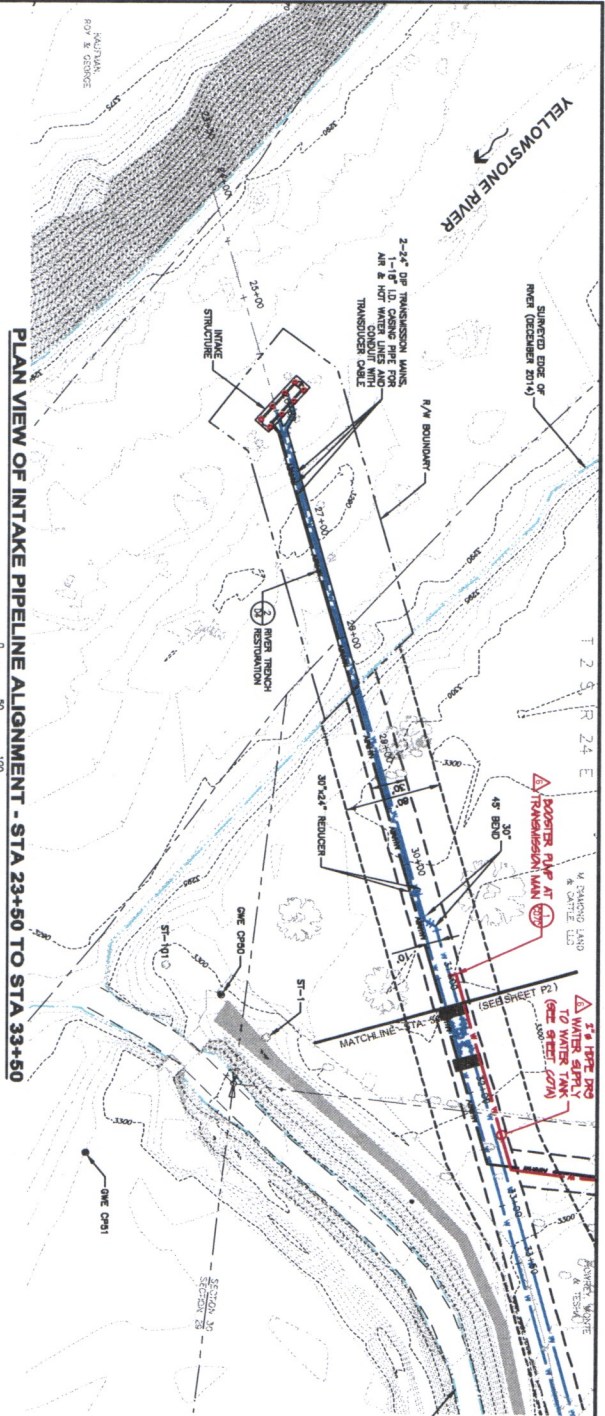
PLANS PREPARED BY:

LISA WALTON
JIM MCGOWAN
DANIEL KARLIN, P.E.
JEREMY MORRIS
JONATHAN WEAVER, P.E.



115 N. BROADWAY, SUITE 200
BILLINGS, MT 59101
(406) 692-5000

FEMA Project #. 1996-DR-MT-PW-01679
SRF Project #. E.Q. #16-1684



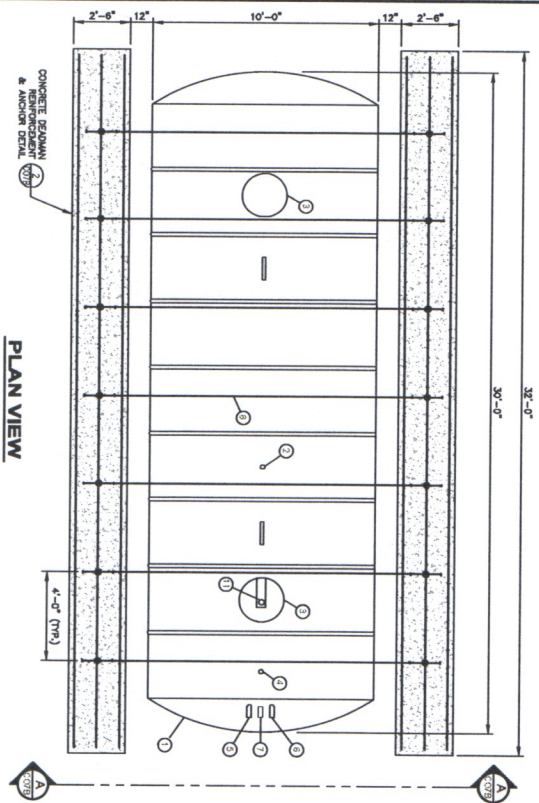
GENERAL NOTES:

1. UTILITY INFORMATION SHOWN ON THE DRAWINGS IS ACCORDING TO RECORD DRAWINGS. THE CONTRACTOR SHALL VERIFY THE LOCATION AND DEPTH OF ALL UTILITIES PRIOR TO CONSTRUCTION.
2. FOR CLARITY, ONLY ONE PROFILE PROFILE HAS BEEN SHOWN. THE CONTRACTOR SHALL VERIFY THE LOCATION AND DEPTH OF ALL UTILITIES PRIOR TO CONSTRUCTION.
3. 12\"/>

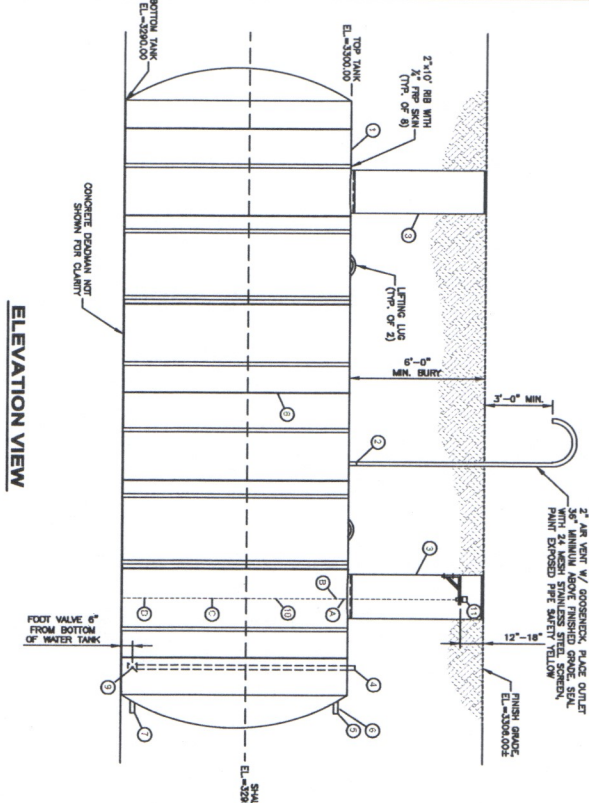
LEGEND

- SANDWICH WATER EXIST
- 30\"/>

PROJECT: 2-07128, TO 26
DESIGNED: JRW, SHH, CEB, KEY
DRAWN: LMK, LUK, JLM, JM
CHECKED: JTT & CEB
APPROVED: JTT & CEB
DATE: MAY 10, 2016

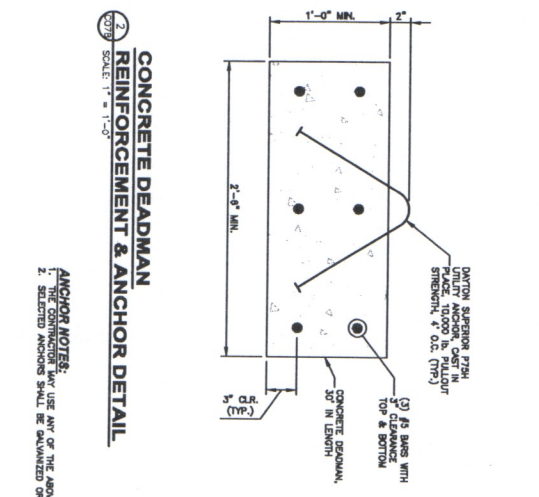


PLAN VIEW

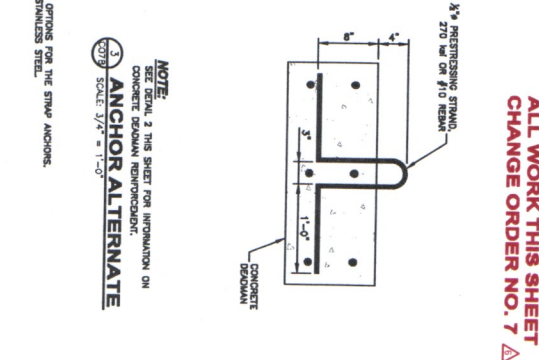


ELEVATION VIEW

BURIED WATER STORAGE TANK DETAILS AND SECTIONS
SCALE 3/8" = 1'-0"

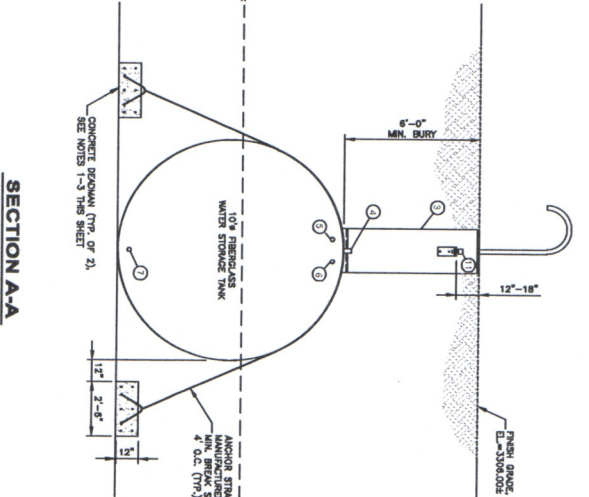


CONCRETE DEADMAN REINFORCEMENT & ANCHOR DETAIL
SCALE 1" = 1'-0"



ANCHOR ALTERNATE
SCALE 3/4" = 1'-0"

ALL WORK THIS SHEET CHANGE ORDER NO. 7



SECTION A-A

ANCHOR NOTES:
1. THE CONTRACTOR MAY USE ANY OF THE ABOVE OPTIONS FOR THE STRAP ANCHORS.
2. STRAP ANCHORS SHALL BE GALVANIZED OR STAINLESS STEEL.

NOTE:
SEE DETAIL 2 THIS SHEET FOR INFORMATION ON CONCRETE DEADMAN REINFORCEMENT.

CONCRETE DEADMAN REINFORCEMENT:
1. 2x10" RIBS WITH 3/4" REBAR SKIN (TYP. OF 8) TOP & BOTTOM
2. 1/2" REBAR SKIN (TYP. OF 2)
3. 3/4" AIR VENT WITH GOOSE-NECK, 3/4" PIPE, 3/4" STAINLESS STEEL SCREEN, 3/4" MESH ABOVE FINISHED GRADE SURF.
4. 6" FOOT VALVE AT BOTTOM OF WATER TANK.

CONCRETE DEADMAN NOT SHOWN FOR CLARITY.

SECTION A-A:
1. 10" FIBERGLASS WATER STORAGE TANK
2. 3/4" AIR VENT WITH GOOSE-NECK, 3/4" PIPE, 3/4" STAINLESS STEEL SCREEN, 3/4" MESH ABOVE FINISHED GRADE SURF.
3. 6" FOOT VALVE AT BOTTOM OF WATER TANK.

GENERAL NOTES:
1. PROVIDE TWO (2) 3/4" PREPACKAGED ANCHORS FOR EACH CONCRETE DEADMAN (FOUR TOTAL) WITH ADDRESS TO EACH ANCHOR STRAP AND CONCRETE ANCHOR.
2. COMPRESSIVE STRENGTH SHALL BE 4,000 PSI FOR NON-CORROSION ANCHORS.
3. STRAPS TO BE 4" O.C. UNIFORM AND ON ENGLISH SIDE.
4. MINIMUM EXCAVATION LIMITS FOR TANK INSTALLATION MUST BE THE TANK LENGTH AND DIAMETER PLUS 2 FEET ABSOLUTE. EXCAVATION MUST BE PROVIDED FOR APPROVED TANK AND TO BE ACCORD UNDER THE DIRECTION OF THE PROJECT MANAGER.
5. THE DEPTH OF THE EXCAVATION MUST ALLOW FOR THE PROTECT BENCHING THE TANK.
6. A PERMITS MANAGER MUST BE PRESENT AT THE EXCAVATION SITE.
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS.
8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS.
9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS.
10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS.
11. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS.

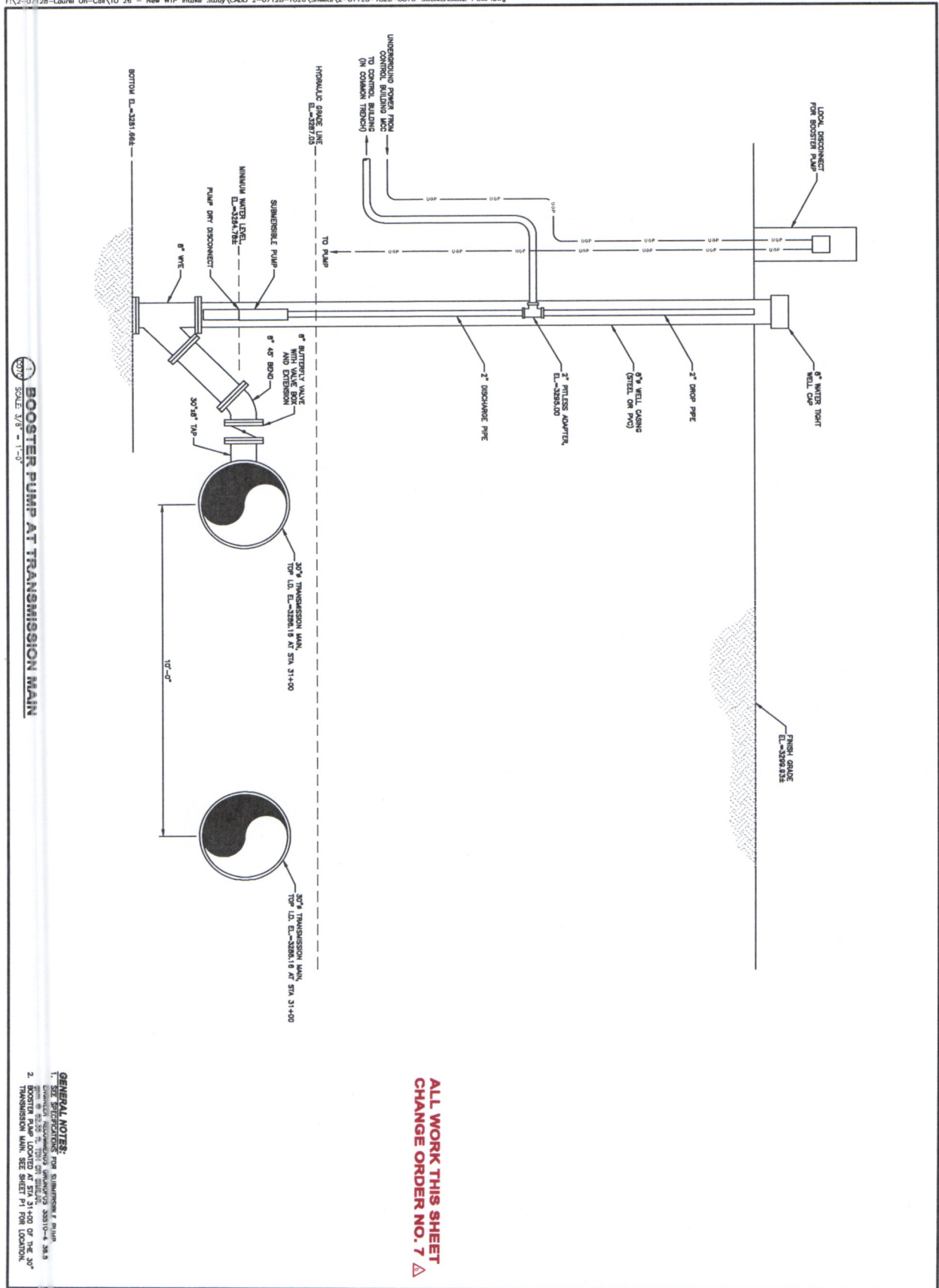
CITY OF LAUREL, MONTANA
WATER TREATMENT PLANT INTAKE
BURIED WATER STORAGE TANK
DETAILS AND SECTIONS

GreatWest engineering
115 N. BRADSHAW ST. SUITE 200
BILLINGS, MONTANA 59101
(406) 253-9999

PROJECT: 2-07128, TO 26
DESIGNED: JRW, SKH, CEB, KFT
DRAWN: LMY, LUK, JUM, JM
CHECKED: JJI & CCH
APPROVED: JJI & CEB
DATE: MAY 10, 2016

NO.	REVISION DESCRIPTION	BY	DATE
1	CHANGE ORDER NO. 7	JJI	MAY 11, 2016
2			
3			
4			

SHEET NO. **C07B**
77 OF 74



**ALL WORK THIS SHEET
CHANGE ORDER NO. 7**

BOOSTER PUMP AT TRANSMISSION MAIN

GENERAL NOTES:
 1. SEE SHEET C07C FOR SUBMERSIBLE PUMP
 2. BOOSTER PUMP LOCATED AT STA 31+00 OF THE 30\"/>

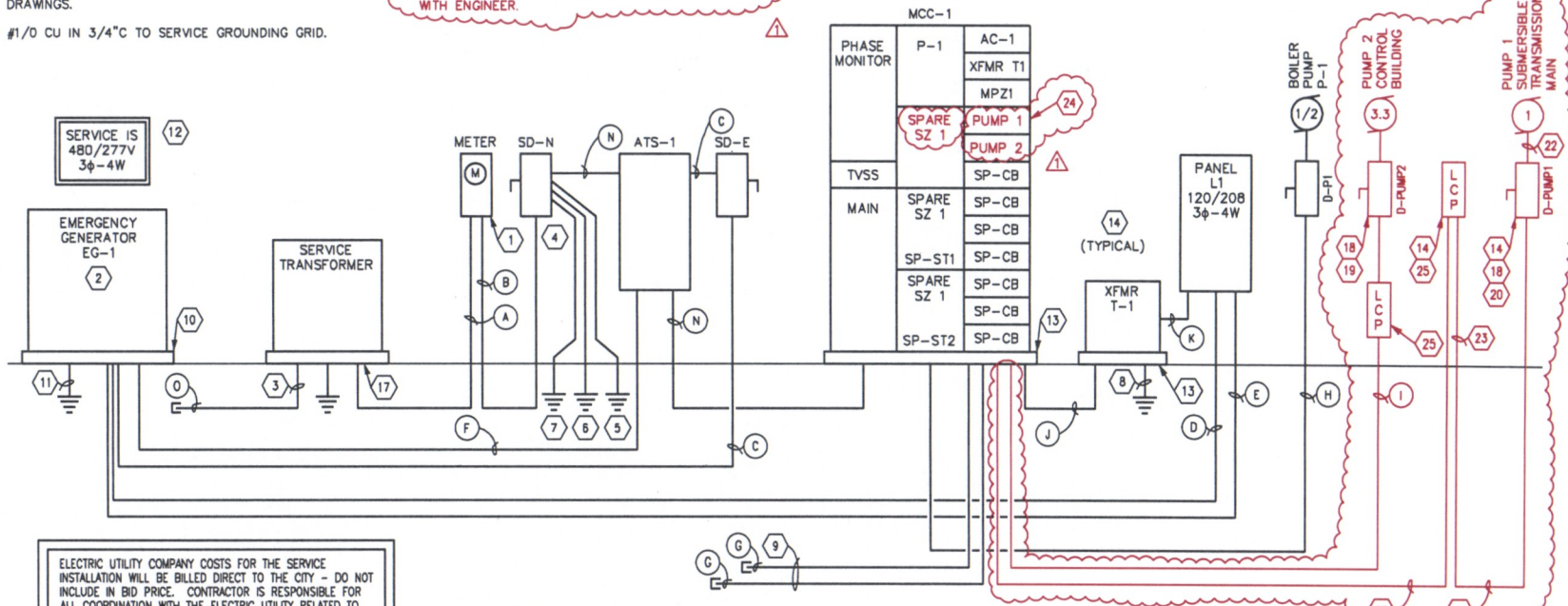
<p>CITY OF LAUREL, MONTANA WATER TREATMENT PLANT INTAKE BOOSTER PUMP AT TRANSMISSION MAIN</p>	<p>115 N. BROADWAY SUITE 500 BILLINGS, MT 59101 (406)853-9000</p>		PROJECT: 2-07128, TO 26 DESIGNED: JRW, SKH, CEB, KFY DRAWN: LMY, LUK, JUM, JM CHECKED: JJI & UH APPROVED: JUT & CBI DATE: MAY 10, 2016	NO. 7 REVISION DESCRIPTION CHANGE ORDER NO 7	BY: JUT DATE: MAY 11, 2016
			<p>C07C SHEET NO. 78 OF 74</p>		

ELECTRICAL NOTES FOR THIS SHEET:

- 1 200A, 480/277V, 3P-4W, SELF CONTAINED METER BASE, 22KAIC FULLY RATED, FOR UNDERGROUND SUPPLY. RINGLESS WITH LEVER BYPASS. METER BASE SHALL BE IN ACCORDANCE WITH ALL ELECTRIC UTILITY STANDARDS AND REQUIREMENTS. CAREFULLY COORDINATE ALL REQUIREMENTS WITH ELECTRIC UTILITY, AND PROVIDE IN ACCORDANCE WITH ALL ELECTRIC UTILITY REQUIREMENTS.
- 2 GROUND GENERATOR PER NEC. DO NOT BOND NEUTRAL TO GROUND AT GENERATOR.
- 3 CAREFULLY COORDINATE ALL DETAILS WITH ELECTRIC UTILITY PRIOR TO CONSTRUCTION.
- 4 BOND AND GROUND SERVICE PER NEC
- 5 #1/0 CU IN 3/4" C TO METALLIC WATER PIPE.
- 6 #1/0 CU IN 3/4" C TO REBAR IN BUILDING FOUNDATION.
- 7 #1/0 CU IN 3/4" C TO THREE (3) 10'-0" GROUND RODS INSTALLED AT 10'-0" ON CENTER
- 8 BOND AND GROUND TRANSFORMER PER NEC
- 9 STUB CONDUIT OUT 10'-FEET BEYOND BUILDING LINE, IN DIRECTION AS DEFINED BY CIVIL ENGINEER, AND CAP FOR FUTURE USE.
- 10 CONCRETE PAD FOR GENERATOR. SEE STRUCTURAL DRAWINGS.
- 11 #1/0 CU IN 3/4" C TO SERVICE GROUNDING GRID.
- 12 ELECTRIC UTILITY COSTS FOR THE NEW SERVICE SHALL BE BILLED DIRECT TO OWNER, DO NOT INCLUDE IN BID PRICE. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING AND SCHEDULING ALL ELECTRIC UTILITY COMPANY WORK.
- 13 PROVIDE 4" CONCRETE PAD FOR GROUND MOUNTED ELECTRICAL EQUIPMENT.
- 14 PROVIDE EQUIPMENT LUG SIZES AS REQUIRED FOR THE CONDUCTOR SIZES SHOWN.
- 15 NOT USED
- 16 NOT USED
- 17 PROVIDE TRANSFORMER PAD. PAD SHALL BE IN ACCORDANCE WITH PAD DETAIL THAT WILL BE PROVIDED BY YVEC. CAREFULLY COORDINATE ALL DETAILS WITH YVEC PRIOR TO CONSTRUCTION. CONTACT YVEC PRIOR TO POURING PAD. YVEC MUST INSPECT AND APPROVE THE PAD BEFORE IT IS POURED.
- 18 HEAVY DUTY, 30 AMP, 480 VOLT, 3-POLE, NON FUSIBLE, NEMA 3R, SAFETY SWITCH. LOCAL MAINTENANCE DISCONNECT FOR PUMP.
- 19 LOCATE DISCONNECT ADJACENT TO PUMP. CONFIRM EXACT LOCATION WITH ENGINEER.
- 20 LOCATE DISCONNECT ABOVE GRADE AT PUMP LOCATION. CONSTRUCT HEAVY DUTY UNISTRUT RACK FOR DISCONNECT. CONFIRM EXACT DISCONNECT LOCATION WITH ENGINEER.

- 21 4-4-4-6 (THREE CONDUCTOR WITH GROUND) STABLY JACKETED METAL CLAD CABLE. ALUMINUM CONDUCTORS, ARMORED, DIRECT BURIAL WITH PVC JACKET, RATED AMPACITY 65 AMPS AT 75C. THE RUN SHALL BE CONTINUOUS FROM THE CONTROL BUILDING TO THE PUMP LOCATION WITHOUT SPLICES. ENOUGH EXCESS CABLE SHALL BE ORDERED TO ENSURE THAT SPLICES WILL NOT BE REQUIRED. INSTALL CABLE WITH ADEQUATE HORIZONTAL SEPARATION FROM PIPING TO ENSURE THAT THE CABLE WILL NOT BE DAMAGED IF A PIPE BREAK REQUIRES REPAIR.
- 22 3 #10 AND 1 #10 GRD IN 3/4" C
- 23 INSTALL JACKETED METAL CLAD CABLE IN 2-INCH CONDUIT, FROM THE PUMP MOTOR CONTROLLER IN THE CONTROL BUILDING TO APPROXIMATELY 10'-FEET PAST THE CONTROL BUILDING WALL. RGS CONDUIT SHALL BE USED WHERE EXPOSED IN THE BUILDING. SCHEDULE 80 PVC CONDUIT CAN BE USED FOR THE BELOW GRADE SECTION. INTENT IS TO PROVIDE A SLEEVE FOR THE CABLE ENTRANCE INTO THE BUILDING.
- 24 USE TWO (2) OF THE SPARE 20A/3P CIRCUIT BREAKERS IN MCC-1 TO FEED THE TWO NEW PUMPS, PUMP 1 AND PUMP 2.
- 25 MOTOR CONTROLLER IS PROVIDED WITH PUMP. INSTALL MOTOR CONTROLLER IN CONTROL BUILDING, IN LOCATION AS DEFINED BY ENGINEER.

FEEDER SCHEDULE ONE LINE DIAGRAM		
TAG	CONDUCTORS	CONDUIT
A	CONDUCTORS BY ELECTRIC UTILITY * PROVIDE 48-INCH SWEEP ELBOWS	3-INCH
B	4 #4/0 AND 1 #10 GRD	3-INCH
C	4 #4/0 AND 1 #10 GRD	3-INCH
D	8 #10 AND 1 #10 GRD	1.5-INCH
E	EMPTY CONDUIT WITH PULL ROPE	1.5-INCH
F	8 #12 AND 1 #12 GRD	2-INCH
G	EMPTY CONDUIT WITH PULL ROPE	2-INCH
H	3 #10 AND 1 #10 GRD	3/4-INCH
I	3 #10 AND 1 #10 GRD	3/4-INCH
J	3 #6 AND 1 #6 GRD	2-INCH
K	4 #2 AND 1 #2 GRD	2-INCH
L	NOT USED	
M	NOT USED	
N	4 #4/0 AND 1 #10 GRD	3-INCH
O	CONDUCTORS BY ELECTRIC UTILITY * PROVIDE 48-INCH SWEEP ELBOWS	THREE (3) 2-INCH



ELECTRIC UTILITY COMPANY COSTS FOR THE SERVICE INSTALLATION WILL BE BILLED DIRECT TO THE CITY - DO NOT INCLUDE IN BID PRICE. CONTRACTOR IS RESPONSIBLE FOR ALL COORDINATION WITH THE ELECTRIC UTILITY RELATED TO THE SERVICE INSTALLATION. CONTRACTOR IS ALSO RESPONSIBLE FOR SCHEDULING ALL OF THE ELECTRIC UTILITY COMPANY WORK RELATED TO THE SERVICE INSTALLATION.

1 ONE-LINE DIAGRAM
E.3 CONTROL BUILDING N.T.S.

CITY OF LAUREL, MONTANA
WATER TREATMENT PLANT INTAKE
ONE LINE DIAGRAM
CONTROL BUILDING

BY DATE: [] [] [] []
REVISION DESCRIPTION: [] [] [] []
CHANGE ORDER NO. 7
PROJECT: WATER TO 28
DESIGNED BY: []
DRAWN BY: []
CHECKED BY: []
APPROVED BY: []
DATE: APRIL 26, 2016

GreatWest
engineering
1114 W. WASHINGTON ST. SUITE 200
LAUREL, MONTANA 59044
(701) 682-0000

SHEET NO.
E3
85 OF 74

SECTION 11210

CENTRIFUGAL PUMP AND MOTOR

PART 1 - GENERAL

1.1 DESCRIPTION

- A. This work includes furnishing and installing a new centrifugal pump and motor as part of the system to supply water to the boiler and the intake screens at the new control building.

1.2 REFERENCES

ASTM A36	Carbon Structural Steel
ASTM A48	Gray Iron Castings
ASTM A108	Steel Bar, Carbon and Alloy, Cold-Finished
ASTM B584	Copper Alloy Sand Castings for General Applications

1.3 SUBMITTALS

- A. Comply with Section 01300: SUBMITTALS, as may be modified by these documents.
- B. Product Data: Submit certified performance curves and rated capacities of selected well pumps and furnished specialties and accessories for each type and size of well pump indicated. Engineer will review for general compliance only. Engineer will not review for dimensioning.
- C. Provide certification that the manufacturer of the pumps has at least 5 years of manufacturing experience in the type of pump specified.
- D. Operation and maintenance manuals.
- E. Delivery and installation dates.

PART 2 - PRODUCTS

2.1 CENTRIFUGAL PUMP

- A. Basis-of-Design Product: Subject to compliance with requirements, provide a Grundfos, Model CM10-2 pump with a 3.3 HP motor, or an Engineer approved comparable product meeting the operating conditions specified.

- B. Furnish one pump designed in accordance with the following criteria.

		Tank-Boiler-Intake Screens Centrifugal Pump
1	Design Flow	35 gpm
2	Anticipated Total Dynamic Head (TDH)	140 ft
3	Discharge Size	2" NPT
4	Speed	3480 rpm
5	Motor Horsepower	3.3 HP
6	Pressure Rating	145 psi
7	Volts	480
8	Phases	3
9	Hertz	60

- C. Refer to Section 16000: ELECTRICAL and coordinate all pump work with the installation of the new motor.
- D. Pump manufacturer shall be responsible for supplying complete pumping units. Pump manufacturer shall cooperate to full extent with Prime contractor coordinating with prime contractor concerning any electrical subcontractor.
- E. Pumps and motors shall be designed for use at elevations up to 3,000 ft msl.
- F. Assure pumps are designed for continuous operation over a range of 40 to 60 degrees Fahrenheit (4.4° to 15.6° C).

2.2 CHECK VALVES

- A. A foot valve shall be installed on the suction line within the tank. It shall be a Danfoss Flomatic Model 63 foot valve or an Engineer approved comparable product.

2.3 MOTORS

- A. **Motor Sizes:** Motor sizes shall be coordinated with the pump by the manufacturer. Minimum motor size shall be as indicated. If not indicated, large enough so driven load will not require motor to operate in service factor range above 1.0.
- B. **Controllers, Electrical Devices, and Wiring:** Electrical devices and connections are specified in Division 16 Sections.
- C. Motor shall be provided by the same supplier as the pump.

2.4 PUMP CONTROLLER

- A. The pump controller shall be a Franklin IPS Intelligent Pump Starter IPS3R-S1/J, or an Engineer approved comparable product
- B. Provide a dry contact output that indicates 'HOA Switch is in Auto Position'. This contact will be an input to a separate SCADA system, and will be used for remote monitoring of the HOA switch Position.

2.5 EQUIPMENT LABELS

- A. Provide all mechanical equipment (pumps, motors, etc.) with an attached, permanent label constructed of brass, aluminum, fiberglass, or an approved equivalent.
- B. Assure labels that are a minimum of 2 by 4 inches (50x100 mm) with lettering etched into the label and that conform with all applicable OSHA requirements.
- C. Where colored valve tags are used, provide separate colors for separate control loops and separate vessels.
- D. Provide a label and flow arrow at each connection to pumps.

PART 3 - EXECUTION

3.1 3.1 GENERAL

- A. Install pumps and motors to standards set forth in MPWSS, industry standards, and in strict accordance with manufacturer's recommendations.

3.2 ACCEPTANCE TESTS

- A. After the installation of any pump and appurtenant equipment, the pump must be field tested under the design conditions. Conduct the field test, whether by the Contractor or a representative of the manufacturer, in the presence of the Engineer.
- B. Correct or replace all defects or defective equipment revealed by the test promptly at no additional expense to the Owner, and if necessary, repeat the test until acceptable results are obtained.
- C. Pump shall be operated under field conditions and performance shall be shown to be substantially similar to the factory performance test curve

3.3 CONNECTIONS

- A. Piping installation requirements are specified in other Division 2 Sections. Drawings indicate general arrangement of piping, fittings, and specialties.
- B. Ground equipment according to Division 16 Sections.
- C. Connect wiring according to Division 16 Sections.

PART 4 - MEASUREMENT AND PAYMENT

See Section 01275: MEASUREMENT AND PAYMENT.

END OF SECTION

SECTION 11211

SUBMERSIBLE BOOSTER PUMP AND MOTOR

PART 1 - GENERAL

1.1 DESCRIPTION

- A. This work includes furnishing and installing a new submersible booster pump and motor as part of the system to supply water to the tank at the new control building.

1.2 REFERENCES

ASTM A36	Carbon Structural Steel
ASTM A48	Gray Iron Castings
ASTM A108	Steel Bar, Carbon and Alloy, Cold-Finished
ASTM B584	Copper Alloy Sand Castings for General Applications

1.3 SUBMITTALS

- A. Comply with Section 01300: SUBMITTALS, as may be modified by these documents.
- B. Product Data: Submit certified performance curves and rated capacities of selected well pumps and furnished specialties and accessories for each type and size of well pump indicated. Engineer will review for general compliance only. Engineer will not review for dimensioning.
- C. Provide certification that the manufacturer of the pumps has at least 5 years of manufacturing experience in the type of pump specified.
- D. Operation and maintenance manuals.
- E. Delivery and installation dates.

PART 2 - PRODUCTS

2.1 SUBMERSIBLE PUMP

- A. Basis-of-Design Product: Subject to compliance with requirements, provide a Grundfos, Model 35S10-4 submersible pump with a 1 HP motor, or an Engineer approved comparable product meeting the operating conditions specified.

- B. Furnish one pump designed in accordance with the following criteria.

		Tank-Boiler-Intake Screens Centrifugal Pump
1	Design Flow	36.5 gpm
2	Anticipated Total Dynamic Head (TDH)	82 ft
3	Discharge Size	1-1/2" NPT
4	Speed	3450 rpm
5	Motor Horsepower	1 HP
6	Pressure Rating	218 psi
7	Volts	480
8	Phases	3
9	Hertz	60

- C. Refer to Section 16000: ELECTRICAL and coordinate all pump work with the installation of the new motor.
- D. Pump manufacturer shall be responsible for supplying complete pumping units. Pump manufacturer shall cooperate to full extent with Prime contractor coordinating with prime contractor concerning any electrical subcontractor.
- E. Pumps and motors shall be designed for use at elevations up to 3,000 ft msl.
- F. Assure pumps are designed for continuous operation over a range of 40 to 60 degrees Fahrenheit (4.4° to 15.6° C).

2.2 CHECK VALVES

- A. The pump must be fitted with a built in non-return valve.

2.3 MOTORS

- A. **Motor Sizes:** Motor sizes shall be coordinated with the pump by the manufacturer. Minimum motor size shall be as indicated. If not indicated, large enough so driven load will not require motor to operate in service factor range above 1.0.
- B. **Controllers, Electrical Devices, and Wiring:** Electrical devices and connections are specified in Division 16 Sections.
- C. Motor shall be provided by the same supplier as the pump.

2.4 PUMP CONTROLLER

- A. The pump controller shall be a Franklin IPS Intelligent Pump Starter IPS3R-S1/J, or an Engineer approved comparable product
- B. Provide a dry contact output that indicates 'HOA Switch is in Auto Position'. This contact will be an input to a separate SCADA system, and will be used for remote monitoring of the HOA switch Position.

2.5 EQUIPMENT LABELS

- A. Provide all mechanical equipment (pumps, motors, etc.) with an attached, permanent label constructed of brass, aluminum, fiberglass, or an approved equivalent.
- B. Assure labels that are a minimum of 2 by 4 inches (50x100 mm) with lettering etched into the label and that conform with all applicable OSHA requirements.
- C. Where colored valve tags are use, provide separate colors for separate control loops and separate vessels.

PART 3 - EXECUTION

3.1 3.1 GENERAL

- A. Install pumps and motors to standards set forth in MPWSS, industry standards, and in strict accordance with manufacturer's recommendations.

3.2 ACCEPTANCE TESTS

- A. After the installation of any pump and appurtenant equipment, the pump must be field tested under the design conditions. Conduct the field test, whether by the Contractor or a representative of the manufacturer, in the presence of the Engineer.

- B. Correct or replace all defects or defective equipment revealed by the test promptly at no additional expense to the Owner, and if necessary, repeat the test until acceptable results are obtained.
- C. Pump shall be operated under field conditions and performance shall be shown to be substantially similar to the factory performance test curve

3.3 CONNECTIONS

- A. Piping installation requirements are specified in other Division 2 Sections. Drawings indicate general arrangement of piping, fittings, and specialties.
- B. Ground equipment according to Division 16 Sections.
- C. Connect wiring according to Division 16 Sections.

PART 4 - MEASUREMENT AND PAYMENT

See Section 01275: MEASUREMENT AND PAYMENT.

END OF SECTION