

**RESOLUTION NO. R16-102**

**A RESOLUTION AUTHORIZING THE MAYOR TO SIGN  
CHANGE ORDER NO. 2 WITH WILSON BROTHERS CONSTRUCTION  
FOR THE WATER TREATMENT PLANT INTAKE PROJECT  
CONSTITUTING AN INCREASE OF \$205,850.00.**

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, the City Council previously approved Change Order No. 1 to the contract with Wilson Brothers Construction to decrease the cost of the project by \$3,217.12; and

WHEREAS, the contract was modified to install a gravity bypass for raw water coming from the new intake as described in the attached Change Order; and

WHEREAS, Great West Engineering and City Staff reviewed Change Order No. 2 and determined that it was 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. 2, a copy of which is attached, to increase the contract amount by \$205,850.00.

Introduced at a regular meeting of the City Council on September 20, 2016, by Council Member Stokes.

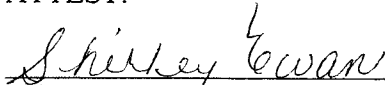
PASSED and APPROVED by the City Council of the City of Laurel this 20<sup>th</sup> day of September, 2016.

APPROVED by the Mayor this 20<sup>th</sup> day of September, 2016.

CITY OF LAUREL

  
\_\_\_\_\_  
Mark A. Mace, Mayor

ATTEST:

  
\_\_\_\_\_  
Shirley Ewan, Clerk/Treasurer

Approved as to form:

  
\_\_\_\_\_  
Sam S. Painter, Civil City Attorney

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Date of Issuance: September 6, 2016	Effective Date: September 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.: N/A
Engineer: Great West Engineering, Inc.	Engineer's Project No.: 2-07128-TO26
Project: Water Treatment Plant Intake	Contract Name: N/A

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

**Description:**

This Change Order is for work associated with the installation of a gravity bypass for raw water coming from the new intake. The bypass will allow raw water enter the flocculation basins without passing through the existing raw water pumps. The work is further described on the attached Schedule of Work Items and Construction Plans, as listed.

Attachments: Schedule of Work Items; Revised Plans, sheets (P17, P25 and CO2)

CHANGE IN CONTRACT PRICE	CHANGE IN CONTRACT TIMES <i>[note changes in Milestones if applicable]</i>
Original Contract Price: \$8,560,901.00	Original Contract Times: Substantial Completion: 240 Ready for Final Payment: 270 days
Decrease from previously approved Change Orders No. 1 to No. 1: \$ 3,217.12	Increase from previously approved Change Orders No. 1 to No. 1: Substantial Completion: 0 Ready for Final Payment: 0 days
Contract Price prior to this Change Order: \$ 8,557,683.88	Contract Times prior to this Change Order: Substantial Completion: 240 Ready for Final Payment: 270 days
Increase of this Change Order: \$ 205,850.00	Increase of this Change Order: Substantial Completion: 0 Ready for Final Payment: 0 days
Contract Price incorporating this Change Order: \$ 8,763,533.88	Contract Times with all approved Change Orders: Substantial Completion: 240 Ready for Final Payment: 270 days

RECOMMENDED:  
 By: *Jonathan Weaver*  
 Engineer

ACCEPTED:  
 By: *Mark A. Moore*  
 Owner (Authorized  
 Signature)

ACCEPTED:  
 By: *Nick Wilson*  
 Contractor (Authorized  
 Signature)

Title: Project Engineer  
 Date: 8/25/2016

Title: *Moore*  
 Date: 8-20-16

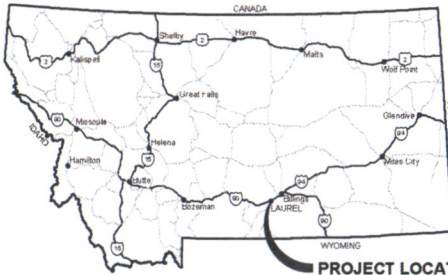
Title: Operations Manager  
 Date: 8/25/16

Approved by Funding Agency (if  
 applicable)

By: \_\_\_\_\_ Date: \_\_\_\_\_  
 Title: \_\_\_\_\_

**Schedule of Work Items for Change Order No. 2: Intake Pump Bypass**

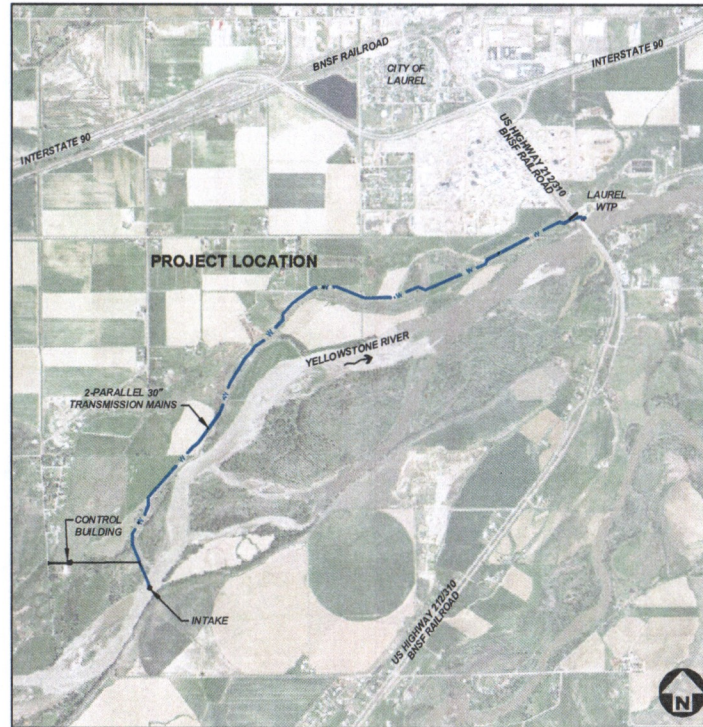
PROJECT		PROJECT NO.			
CITY OF LAUREL, WATER TREATMENT PLANT		FEMA: 1996-DR-MT-PW 01679			
		SRF: EQ 16-1684			
ITEM NO.	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL PRICE
215	Deduct of Item No. 215 (42" Blind Flange)	1	EA	\$(16,000.00)	\$ (16,000.00)
CO2-101	24" PVC DR25	20	LF	\$185.00	\$3,700.00
CO2-102	36" PVC DR25	80	LF	\$280.00	\$22,400.00
CO2-103	42" x 36" Reducer	1	EA	\$30,000.00	\$30,000.00
CO2-104	36" 90° Bend	1	EA	\$22,000.00	\$22,000.00
CO2-105	36" 45° Bend	1	EA	\$20,000.00	\$20,000.00
CO2-106	36" Butterfly Valve	1	EA	\$38,000.00	\$38,000.00
CO2-107	36" x 24" Tee	1	EA	\$22,000.00	\$22,000.00
CO2-108	36" x 24" Reducer	1	EA	\$17,000.00	\$17,000.00
CO2-109	24" Coupling	2	EA	\$8,000.00	\$16,000.00
CO2-110	24" Butterfly Valve	1	EA	\$22,000.00	\$22,000.00
CO2-111	WTP Site Restoration	1	LS	\$5,250.00	\$5,250.00
CO2-112	Concrete Curb Restoration	1	LS	\$3,500.00	\$3,500.00
	<b>TOTAL</b>				<b>\$ 205,850.00</b>



PROJECT LOCATION

# CITY OF LAUREL, MONTANA WATER TREATMENT PLANT INTAKE CONSTRUCTION PLANS

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



NOT TO SCALE

**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.



**SHEET INDEX**

PROJECT: 2-07128\_TO\_36  
DATE: MAY 10, 2016

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SHEET 7	C2	CONTROL BUILDING SITE GRADING PLAN
SHEET 8	C3	WATER TREATMENT PLANT PIPING DEMOLITION PLAN
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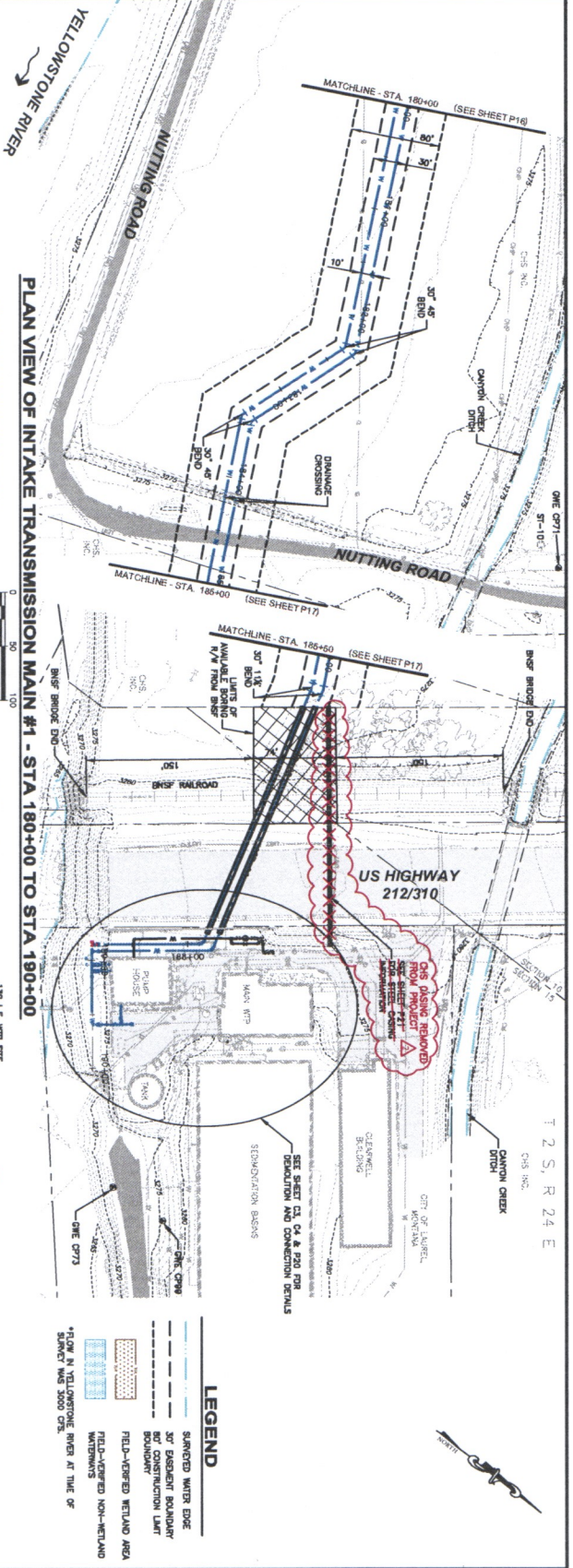
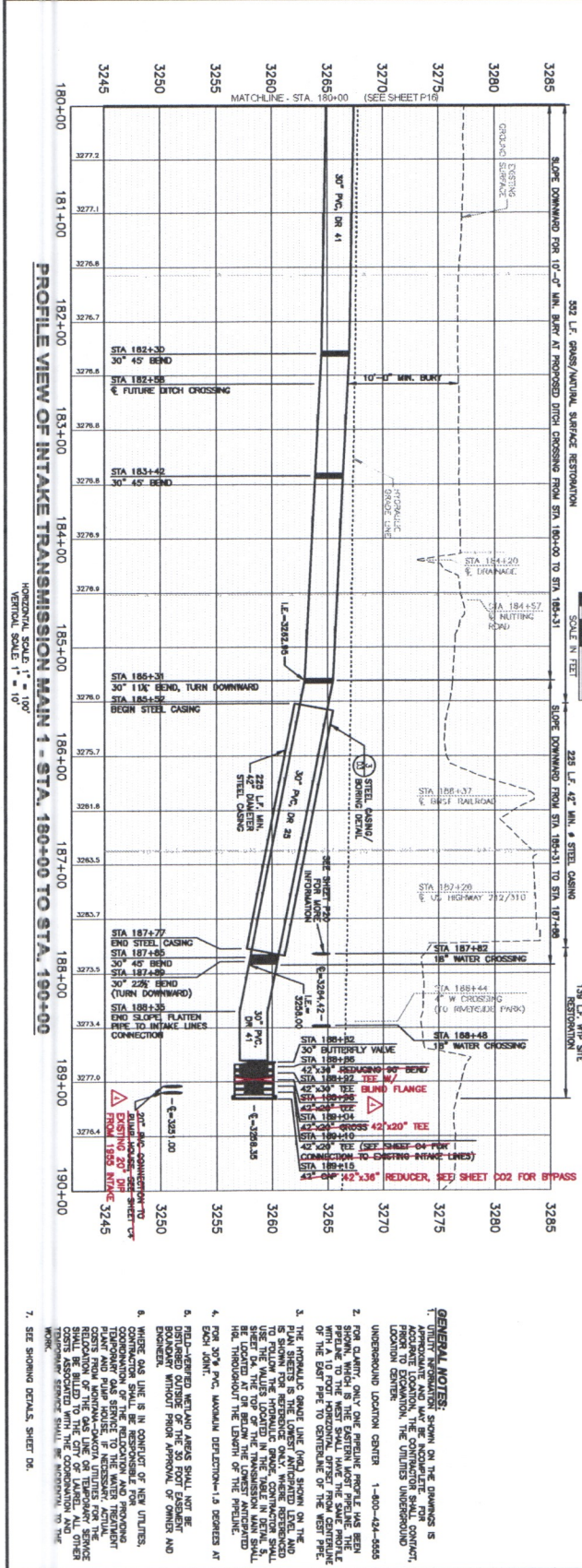
NO.	REVISION DESCRIPTION	BY	DATE	SET NO.
▲	ADDENDUM NO. 1 BEDDING AND AIR RELEASE VAULT REVISIONS	LMW	5-20-16	
▲	ADDENDUM NO. 2 MISCELLANEOUS REVISIONS	LMW	6-2-16	
▲	CHANGE ORDER NO. 1: CONTROL BUILDING RELOCATION	LMW	6-29-16	
▲	CHANGE ORDER NO. 2: WTP BYPASS LINE CLARIFICATIONS SHEET #17	LMW	7-31-16	
▲				
▲				

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

SHEET NO.  
**G1**  
1 OF 74

F:\2-07128-Laurel-Dr-COA\1D\_26 - New WTP Intake Study\COAD\_2-07128-1026\Sheet\3-07128-1026-01-COVER.dwg  
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**GENERAL NOTES:**

1. UTILITY INFORMATION SHOWN ON THE DRAWINGS IS FOR INFORMATION ONLY. THE CONTRACTOR SHALL VERIFY THE LOCATION AND DEPTH OF ALL UTILITIES PRIOR TO CONSTRUCTION.
2. FOR CLIMATE, ONE (1) FEET OF SETTLEMENT SHALL BE ALLOWED FOR THE INTAKE TRANSMISSION MAIN (ITM) AND SHALL BE COMPENSATED FOR IN THE CONSTRUCTION OF THE PIPE.
3. THE HORIZONTAL CURVE LINE (HCL) SHOWN ON THE PLAN SHEETS IS THE LOWER ANTICIPATED LEVEL, AND IS SHOWN FOR REFERENCE ONLY. WHERE REPRESENTED BY A DASHED LINE, THE CONTRACTOR SHALL VERIFY THE EXISTING HCL LOCATED IN THE TABLE IN DETAIL. SHEET P17 OF THIS TRANSMISSION MAIN SHALL BE THROUGHOUT THE LENGTH OF THE PIPELINE.
4. FOR 30\"/>

7. SEE SHOWN DETAILS, SHEET 06.

**CITY OF LAUREL, MONTANA**  
**WATER TREATMENT PLANT INTAKE**  
 INTAKE TRANSMISSION MAIN #1 PLAN & PROFILE  
 STA 180+00 TO STA 190+00

**LEGEND**

- SUBMITTED WATER EDGE
- 30\"/>

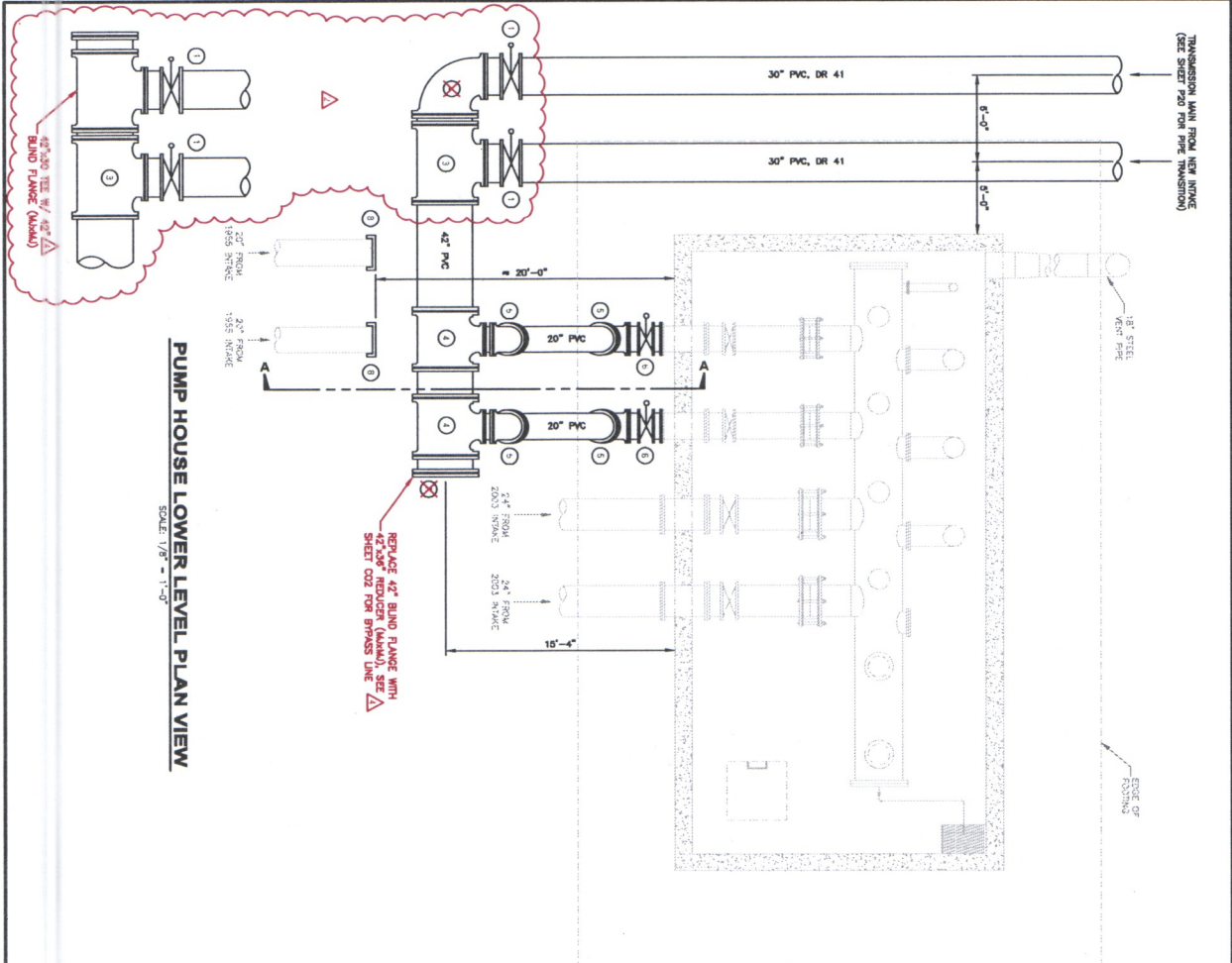
**REVISIONS**

NO.	REVISION DESCRIPTION	BY	DATE
1	ADDENDUM NO. 2	MMW	6-3-16
2	CHANGE ORDER NO. 2	MMW	7-21-16

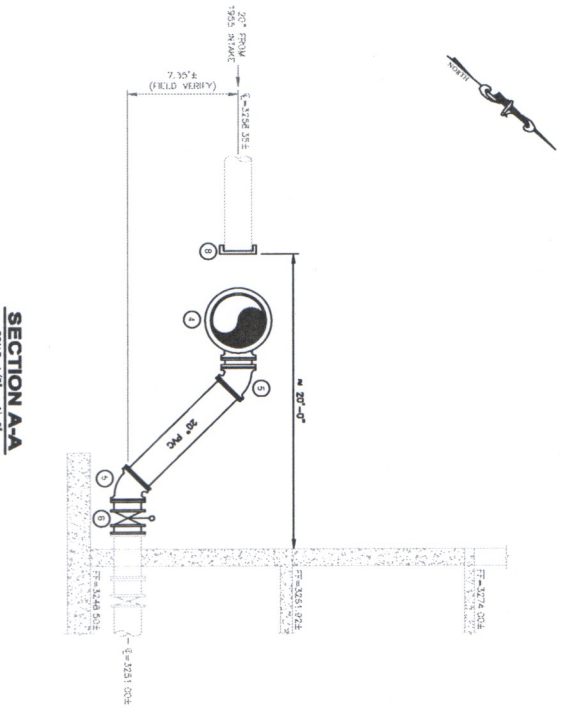
PROJECT: 2-07128, T026  
 DESIGNED: JRW, SKH, CEB, JFY  
 DRAWN: MMW, LUK, JUM, JM  
 CHECKED: JJT & CEB  
 APPROVED: JJT & CEB  
 DATE: MAY 10, 2016







**PUMP HOUSE LOWER LEVEL PLAN VIEW**  
SCALE: 1/8" = 1'-0"



**SECTION A-A**  
SCALE: 1/8" = 1'-0"

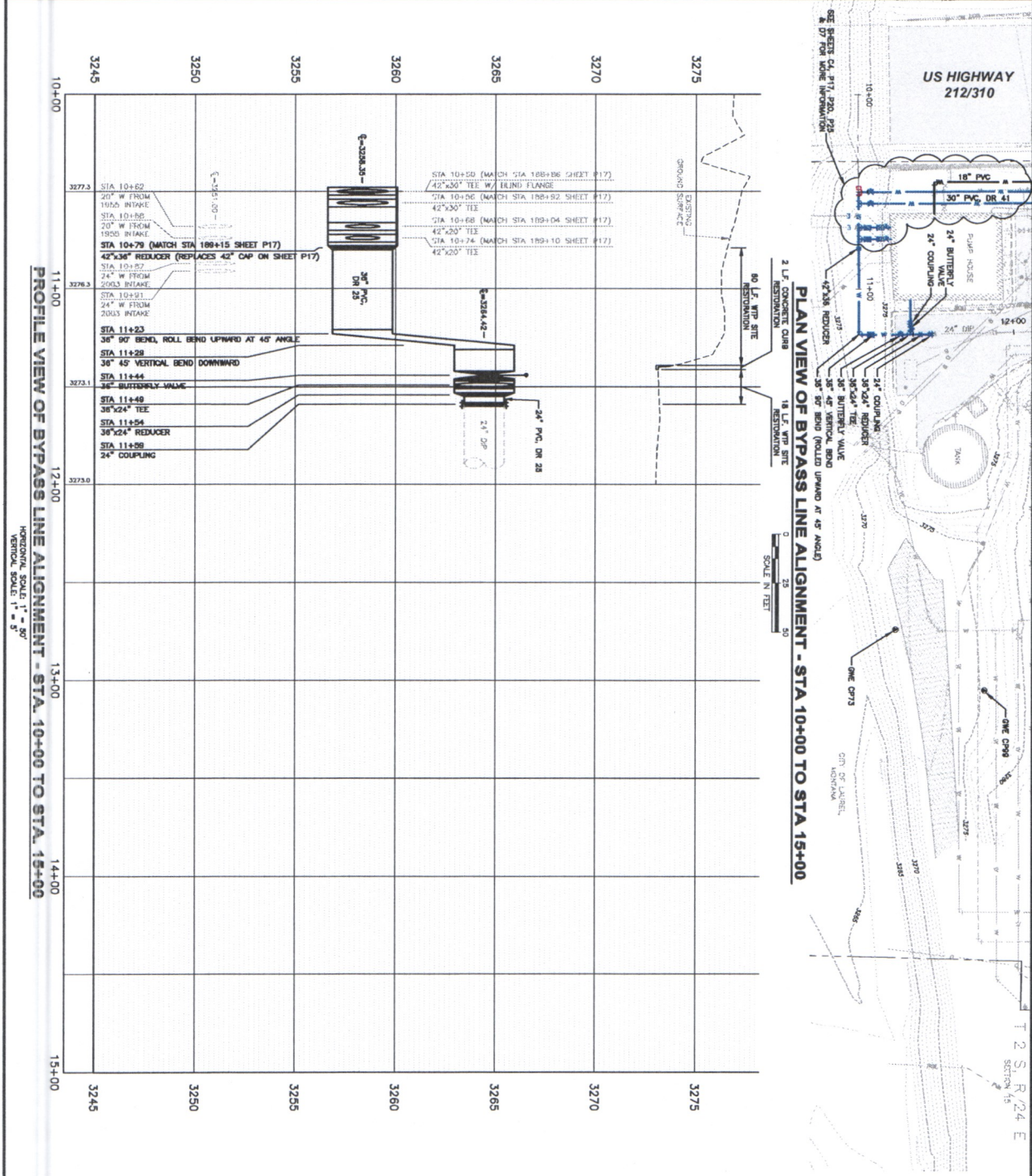
- GENERAL NOTES:**
1. ALL DIMENSIONS ARE UNLESS OTHERWISE NOTED. ALL DIMENSIONS ARE TO FACE UNLESS NOTED OTHERWISE.
  2. THE CITY DOES NOT HAVE THE MEANS TO SQUARE THE PUMP HOUSE. ALL SET SHEET TO BE SHOWN, SEE SPECIAL REQUIREMENT PLAN FOR DETAILS ON THE CONNECTION AND SHUTDOWN.
- MATERIAL AND EQUIPMENT LIST, SHEET P26:**
- 1. 42" SCH. 40S PIPE - 40' - BEND - 10'
  - 2. 42" SCH. 40S TEEL. M.L.
  - 3. 20" SCH. 40S TEEL. M.L.
  - 4. 20" SCH. 40S BATTERY VALVE
  - 5. 20" SCH. 40S BATTERY VALVE
  - 6. 20" SCH. 40S BATTERY VALVE
  - 7. 42" SCH. 40S BATTERY VALVE
  - 8. 20" SCH. 40S BATTERY VALVE
  - 9. 20" SCH. 40S BATTERY VALVE
  - 10. 20" SCH. 40S BATTERY VALVE
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  - 49. 20" SCH. 40S BATTERY VALVE
  - 50. 20" SCH. 40S BATTERY VALVE

<p><b>CITY OF LAUREL, MONTANA</b></p> <p><b>WATER TREATMENT PLANT INTAKE</b></p> <p>WATER TREATMENT PLANT CONNECTION DETAIL</p>	 <p>115 N. BROADWAY, SUITE 500 BILLINGS, MT 59101 (406) 593-5000</p>		PROJECT: 2-07126, T026	NO.	REVISION DESCRIPTION	BY	DATE
			DESIGNED: JRW, SKH, CEB, KFY	ADDENDUM NO. 2	LMW	6-2-16	
UNKNOWN: LMW, LUK, JUM, JM	CHANGE ORDER NO. 2	LMW	7-21-16				
CHECKED: JTT & CEH							
APPROVED: JTT & CEH							
DATE: MAY 10, 2016							

P225

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**GENERAL NOTES:**

1. UNLESS OTHERWISE SHOWN ON THE DRAWINGS, ALL MATERIALS SHALL BE APPROXIMATE AND SHALL BE NON-CORROSIVE FOR EXPOSED TO THE ELEMENTS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE APPROPRIATE AGENCIES AND LOCAL GOVERNMENT AUTHORITIES.
2. THE 30" PVC MANHOLE DEPTH SHALL BE 12' UNLESS OTHERWISE NOTED.

**VERTICAL SCALE: 1" = 5'**

**HORIZONTAL SCALE: 1" = 50'**

**ALL WORK THIS SHEET  
CHANGE ORDER NO. 2**

**CO2**  
75 OF 74

**CITY OF LAUREL, MONTANA**  
**WATER TREATMENT PLANT INTAKE**  
WTP BYPASS LINE ALIGNMENT PLAN & PROFILE  
STA 10+00 TO STA 15+00



PROJECT:	2-07128, TO 26	NO.	REVISION DESCRIPTION	BY	DATE
DESIGNED:	JRW, SKH, CEB, KFY	1	CHANGE ORDER NO 2	LMW	7-21-16
DRAWN:	LMW, LUK, JUM, JM	2			
CHECKED:	JJT & CEH	3			
APPROVED:	JJT & CEH	4			
DATE:	MAY 10, 2016	5			





## MEMORANDUM

**Date:** August 25, 2016

**To:** Kurt Markegard, City of Laurel

**From:** Crystal Bennett  
Susan Hayes

**Subject:** Secondary Option for Intake Pump Bypass

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### ***Background***

The memorandum related to the change order for the intake bypass dated August 25, 2016 clearly identifies the need for a bypass or some kind of pressure control in order for both the new intake and the old intake to function properly. Adding the new sedimentation basins with a different hydraulic grade further adds to the complexity of the water treatment plant hydraulics.

Bypassing was not considered feasible until the final design flows were determined and the elevation of the sedimentation basin was lowered. The option for the bypass that was initially proposed (Option A) would be what we would consider the cleanest and simplest approach for bypassing the intake pumps. The piping being located outside of the building has much less impact on the existing infrastructure and frees up space inside the building for future expansions. This was originally proposed with the hope that that FEMA would help pay for a portion of the costs, making the alternative much more economical to the City.

Option B described in the memorandum assumes the City will continue to utilize the intake pumps and eliminates the need for the bypass piping. Unfortunately, the City does not realize the economic benefits of the reduced intake pumping with this scenario resulting in a higher life cycle cost and will still need a few extra control valves to regulate pressure.

Since it is unclear whether or not FEMA will pay for the costs, we have considered other ways that the City could still bypass the intake pumps (Option C) which provides a slightly less economic burden on the City but may further improve operations.

### ***Option C: Bypass Piping Inside Building***

Option C would provide pressure reduction on the intake lines, bypass the intake pumps inside the building utilizing the existing stubs for new pumps, and flow directly to the Parshall flume (or pre-sedimentation basins once the WTP construction is complete).

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Advantages to this would be added flexibility in plant operations. Water from the new intake could be supplied to the water treatment plant either via the bypass line or the intake pumps at any time (versus Option A where water from the new intake can be supplied to the water treatment plant via the bypass line outside the building at any time, but the intake pumps can only be used when the incoming pressure from the new transmission mains is within the operating range of the intake pumps and there is insufficient pressure for bypassing).

The major disadvantage is that the locations for “future pumps” would be utilized for the bypass piping. Thus, the City could not easily add intake pumps and any improvements to the intake pump station would need to be done by replacing pumps rather than adding pumps.

The costs associated with Option C are as follows:

Option C:

1. Bypass the pumps
  - a. \$11,500 annual cost savings in electric supply and distribution charges (based on 3 years of pump run times)
  - b. \$21,500 annual cost savings in electric demand charges (maximum possible savings based on number of months pumps were in operation over last 3 years)
2. Bypass line and valves for reducing the pressure
  - a. \$216,000 estimated for pipe, fittings, valves
3. O&M cost to replace pumps in 20 years (versus 10 years if they were in continual use)
  - a. \$7,750 annually

A life cycle cost comparison of all three of the options is presented in the following table.

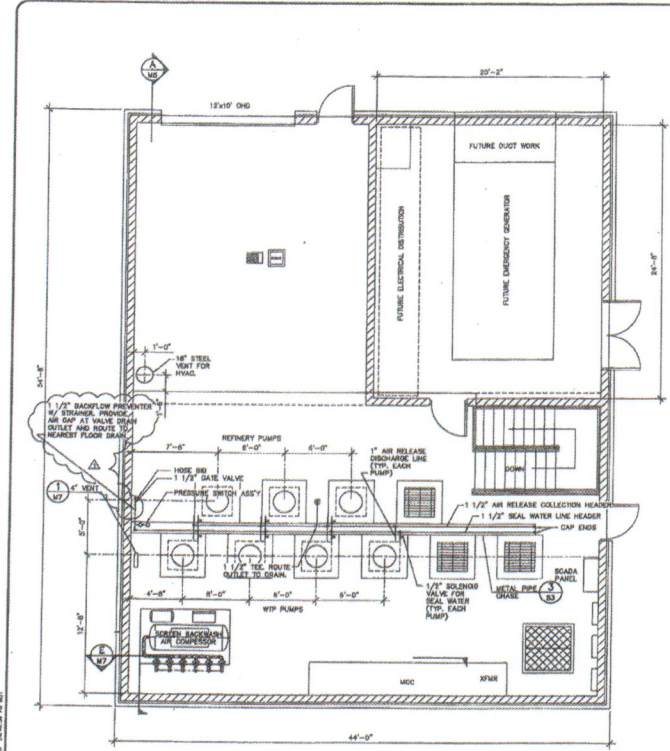
**PRESENT WORTH ANALYSIS  
CITY OF LAUREL WTP PROJECT  
BYPASS OF INTAKE PUMPS VS. CONTINUED USE OF INTAKE PUMPS**

Option	Annual O&M	Additional Capital Cost	Present Worth of O&M <sup>2</sup>	Total 20 year Life-Cycle Cost
<b>A - Bypass Outside Building</b>	<b>\$ (25,250)</b>	<b>\$ 225,850</b>	<b>\$ (429,265)</b>	<b>\$ (203,415)</b>
NW Energy Supply & Distribution	\$ (11,500)			
NW Energy Demand Charges	\$ (21,500)			
Pump Replacement <sup>1</sup>	\$ 7,750			
Bypass Line/Valves		\$ 205,850		
Bypass Line Actuator		\$ 20,000		
<b>B - No Bypass</b>	<b>\$ 12,500</b>	<b>\$ 120,000</b>	<b>\$ 212,507</b>	<b>\$ 332,507</b>
Supply & Distribution	\$ -			
Demand Charges	\$ -			
Pump Replacement <sup>1</sup>	\$ 12,500			
Valves & Actuators		\$ 70,000		
New Pumps		\$ 50,000		
<b>C - Bypass Inside Building</b>	<b>\$ (25,250)</b>	<b>\$ 216,000</b>	<b>\$ (429,265)</b>	<b>\$ (213,265)</b>
Supply & Distribution	\$ (11,500)			
Demand Charges	\$ (21,500)			
Pump Replacement <sup>1</sup>	\$ 7,750			
Bypass Lines/Valves/Actuators		\$ 216,000		

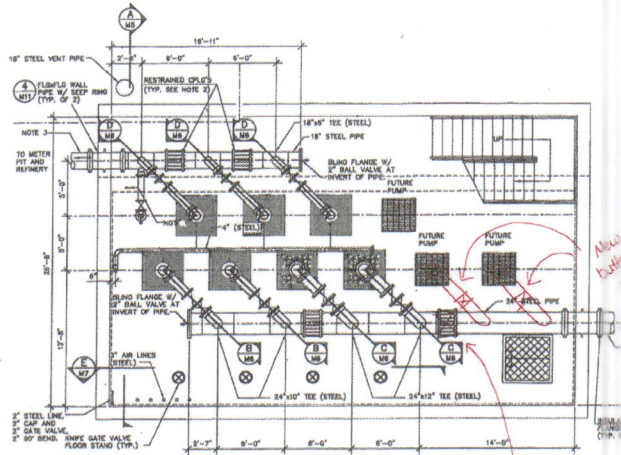
**Notes:**

<sup>1</sup> Equivalent Annual O&M calculated using discount rate based upon estimated inflation and interest.

<sup>2</sup> Present worth based upon a 20 year life cycle using calculated discount rate of 1.6%



MAIN FLOOR  
PLAN VIEW  
SCALE 1/4"=1'-0"



PIPE GALLERY  
PLAN VIEW  
SCALE 1/4"=1'-0"

*New 24" Butterfly Valve*

*New 24" Butterfly Valve*

RECORD DWG. APR. 2004

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Proj. No.	1000000000
Rev.	1
Date	11/11/03
Drawn By	JAC
Checked By	JAC
Scale	AS SHOWN
Sheet No.	1000000000
Total Sheets	1000000000

LAUREL INTAKE AND PUMP STATION  
LAUREL, MONTANA  
PUMP STATION AND PIPING GALLERY PLAN VIEWS



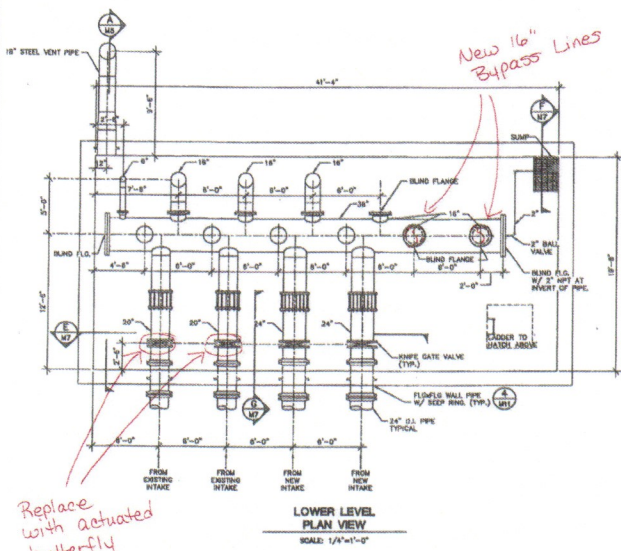
H&M Engineering Inc.  
Greenville Lower Building  
1000000000  
P.O. Box 31318  
Billings, MT 59107-1318  
(406) 656-6399; FAX (406) 656-6398



Sheet No. **M4**

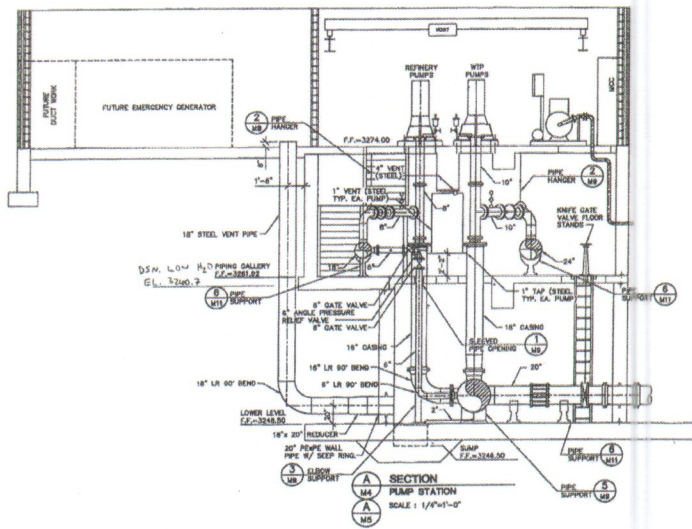






Replace with actuated butterfly valves

New 16\"/>



RECORD DWG. APR. 2004

Project No. 0304145 • Date: APR. 2004 • Engineer: B.S. • Designer: B.S. • Checker: P.S. • Printed On: 11/11/04  
 Scale: 1/8"=1'-0"  
 Drawing No. 11/11/04  
 Revision: 11/11/04  
 Title: LAUREL INTAKE AND PUMP STATION  
 Location: LAUREL, MONTANA  
 Client: MONTANA DEPARTMENT OF ENVIRONMENTAL QUALITY  
 Project: LAUREL INTAKE AND PUMP STATION  
 Drawing: LOWER LEVEL PLAN VIEW AND SECTION  
 Scale: 1/8"=1'-0"  
 Sheet No. M5  
 of 0

HEM Engineering Inc.  
 Granite Tower Building  
 222 N. 32nd St., Suite 700  
 Billings, MT 59102-1318  
 (406) 654-6399; FAX (406) 654-6398  
 HEM ENGINEERING

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