



MADISON WATER UTILITY

UNIT WELL 26 BOOSTER PUMP #1 UPGRADE

NOVEMBER 18, 2019

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IMPROVEMENT APPROVED BY:

WISCONSIN

★

★

ALAN L. LARSON

E-34727

MADISON

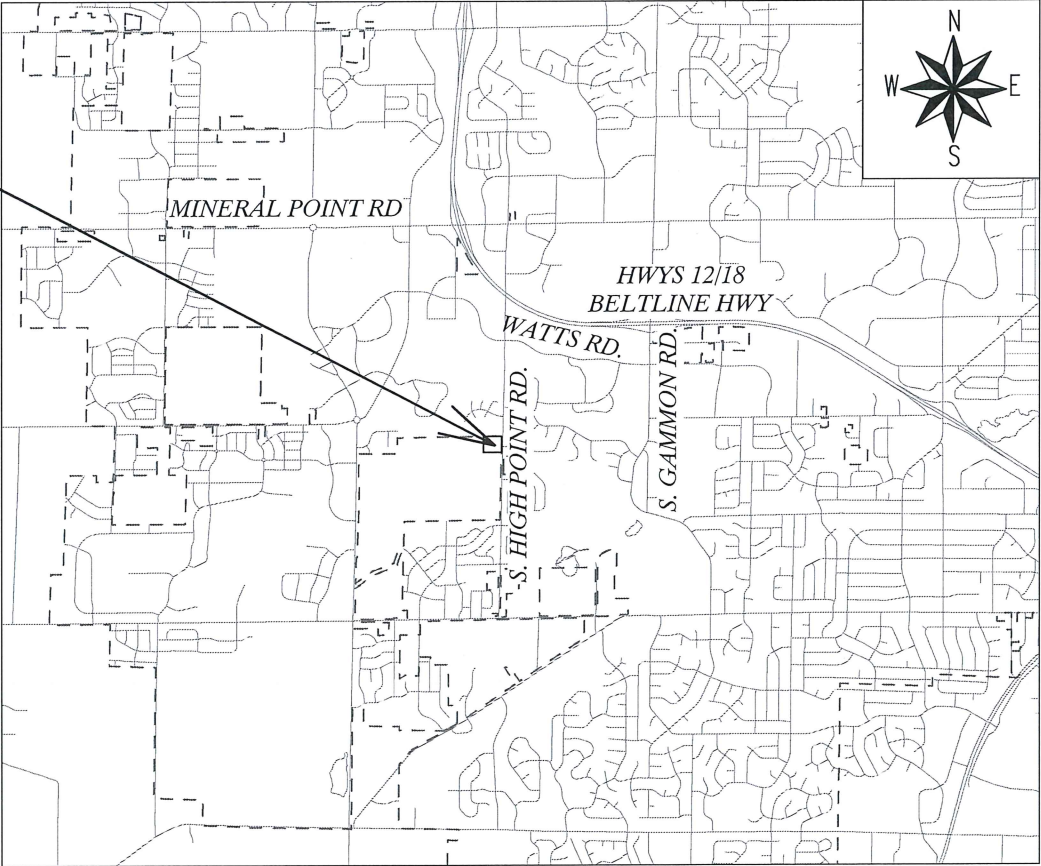
WIS.

PROFESSIONAL ENGINEER

11-26-19

ALAN L. LARSON, PE, BCEE
CHIEF ENGINEER
& ASSISTANT GENERAL MANAGER
MADISON WATER UTILITY

PROJECT
LOCATION
910 S. HIGH POINT RD.



GENERAL NOTES

- UNLESS OTHERWISE SPECIFIED, ALL CONSTRUCTION SHALL CONFORM TO CITY OF MADISON STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION 2019 EDITION. SEE [HTTPS://WWW.CITYOFMADISON.COM/BUSINESS/PW/SPECS.CFM](https://www.cityofmadison.com/business/pw/specs.cfm)
- PIPE MATERIAL SHALL BE CLASS 52 DUCTILE IRON PIPE.
- SEE SEQUENCE OF DEMOLITION AND CONSTRUCTION ON SHEET W-5. WELL 26 SHALL NOT BE OFFLINE (DOWN) FOR MORE THAN SIX HOURS WITHOUT MADISON WATER UTILITY (MWU) APPROVAL.
- REMOVAL OF THE OLD PUMP AND INSTALLATION OF A NEW PUMP IS PART OF THIS CONTRACT. THE PUMP AND ELECTRICAL WIRING IS PROVIDED BY MWU. SEE SUGGESTED SEQUENCE OF DEMOLITION AND CONSTRUCTION ON SHEET W-5 FOR ADDITIONAL NOTES.
- ALL REQUIRED PERMITS ARE THE RESPONSIBILITY OF THE CONTRACTOR.
- CONTRACTOR IS REQUIRED TO MAINTAIN A SAFE WORKSPACE THROUGHOUT THE PROJECT.
- WORK SHALL COMMENCE NO MORE THAN 30 DAYS AFTER EXECUTION OF THE STANDARD CITY OF MADISON PURCHASE ORDER AND NOTICE OF PUMP DELIVERY TO MWU.
- PROJECT DURATION IS 30 CALENDAR DAYS FROM START OF WORK.

PLOT SCALE: 1" = 40'

PLOT NAME: _____

REV. DATE: ---

ORIGINATOR CITY_OF_MADISON_WATER_UTILITY

MADISON WATER UTILITY UNIT WELL 26 BOOSTER PUMP #1 UPGRADE 12661		SHEET NO. W-1/9
APURTENANCE SCHEDULE		
INSPECTOR: MWU		DRAWN BY: D.A.R.
CHECKED BY: A.L.L.		DATE: 11/26/2019

NUMBER	SIZE	TYPE	DISPOSITION	NORMAL POSITION	FUNCTION	NOTES
V-1	12"	BUTTERFLY	EXISTING	OPEN	DEEP WELL ISOLATION	
V-2	12"	BUTTERFLY	REPLACE	OPEN	RESERVOIR BYPASS	REPLACE WITH 12" FLANGED BUTTERFLY VALVE
V-3	12"	BUTTERFLY	EXISTING	OPEN	RESERVOIR ISOLATION	
V-4	24"	BUTTERFLY	EXISTING	OPEN	RESERVOIR ISOLATION	
V-5	24"	BUTTERFLY	EXISTING	OPEN	SYSTEM ISOLATION	
V-6	10"	GATE	REPLACE	OPEN	PUMP ISOLATION	REPLACE WITH 10" FLANGED GATE VALVE
V-7	8"	BUTTERFLY	REMOVE	OPEN	PUMP ISOLATION	
V-8	14"	GATE	EXISTING	OPEN	PUMP ISOLATION	
V-9	10"	BUTTERFLY	EXISTING	OPEN	PUMP ISOLATION	
V-10	12"	BUTTERFLY	NEW	OPEN	PUMP ISOLATION	
V-11	12"	BUTTERFLY	EXISTING	OPEN	SYSTEM ISOLATION	
V-12	12"	BUTTERFLY	NEW	OPEN	RESERVOIR ISOLATION/PUMP SUCTION	
CV-1	12"	CHECK VALVE	EXISTING	-	BACKFLOW AT DEEP WELL PUMP	
CV-2	8"	CHECK VALVE	REPLACE	-	PREVENT BACKFLOW AT BOOSTER PUMP #1	REPLACE WITH 6" CHECK VALVE
CV-3	10"	CHECK VALVE	EXISTING	-	PREVENT BACKFLOW AT BOOSTER PUMP #2	
M-1	12"	METER	EXISTING	-	METERS DEEP WELL PUMP DISCHARGE	
M-2	12"	METER	EXSITING	-	METERS FLOW TO ELEVATED RESERVOIR	

GENERAL NOTES

- CHECK VALVES SHALL BE A FLANGED SWING CHECK VALVE WITH OUTSIDE LEVER AND WEIGHT EQUIPPED WITH AN AIR-CUSHION CHAMBER TO CUSHION THE CLOSING OF THE VALVE DISC. THE VALVE SHALL BE MANUFACTURED IN ACCORDANCE WITH AWWA C508. CHECK VALVES SHALL BE MANUFACTURED BY GA INDUSTRIES OR APPROVED EQUIVALENT.
- BUTTERFLY VALVES SHALL BE AWWA C504, FLANGED SHORT BODY, CLASS 150B, EQUIPPED WITH STAINLESS STEEL SHAFT, TOP-MOUNTED HANDWHEEL OPERATORS AND CAST IRON VALVE DISK, BUTTERFLY VALVES SHALL BE MANUFACTURED BY BY KENNEDY OR MUELLER.
- GATE VALVES SHALL BE RESILIENT WEDGE DESIGN PER AWWA C504, FLANGED AND EQUIPPED WITH HANDWHEEL OPERATOR. GATE VALVES SHALL BE MANUFACTURED BY KENNEDY, MUELLER OR CLOW.

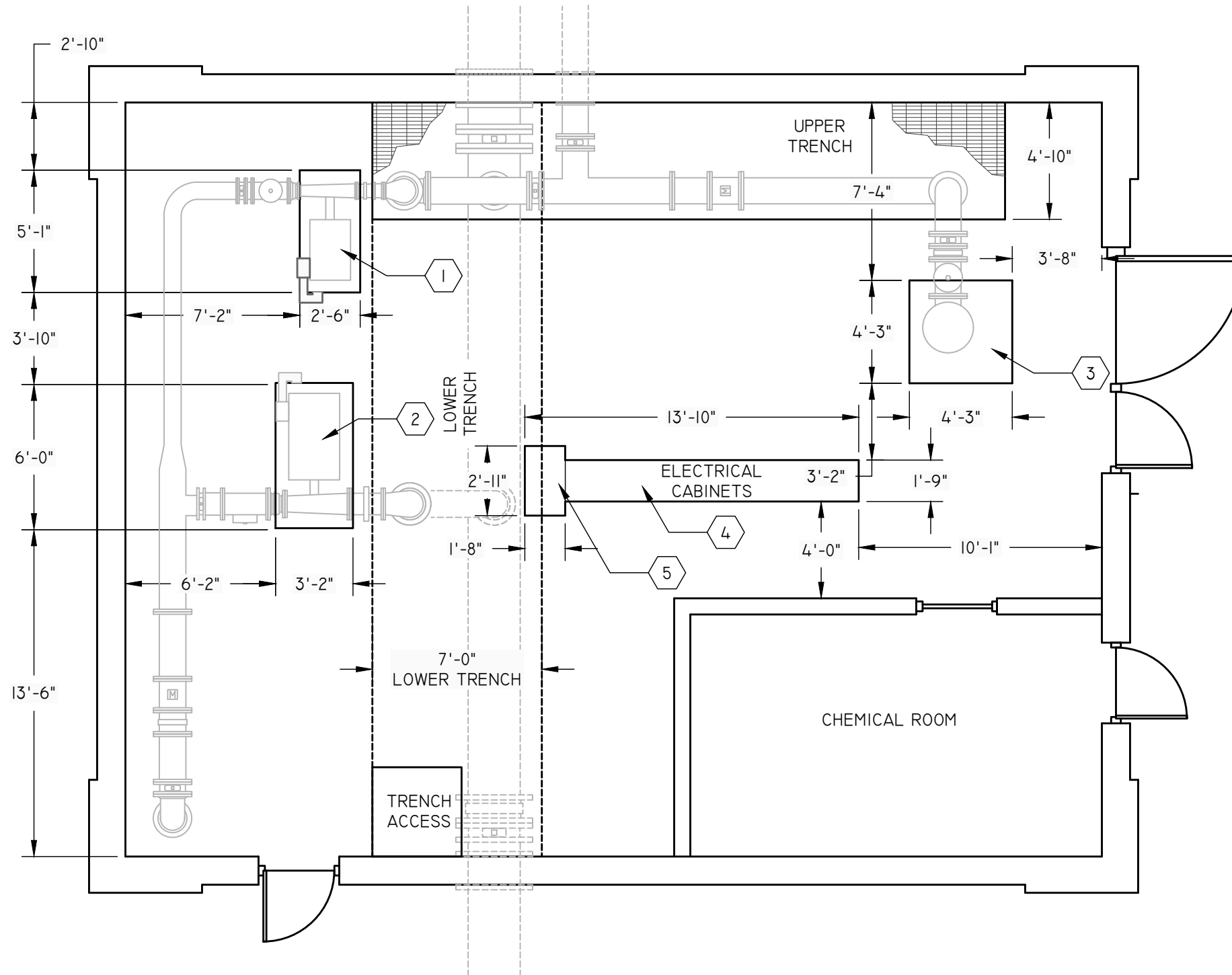
PLOT SCALE: 1" = 40'

PLOT NAME: _____

REV. DATE: ---

ORIGINATOR CITY_OF_MADISON_WATER_UTILITY

MADISON WATER UTILITY UNIT WELL 26 BOOSTER PUMP #1 UPGRADE 12661		SHEET NO. W-2/9
EXISTING FLOOR PLAN		
INSPECTOR: MWU	DRAWN BY: D.A.R.	
CHECKED BY: A.L.L.	DATE: 11/26/2019	



KEYED NOTES

1. CONCRETE BASE FOR BOOSTER PUMP #1, 2'-5" HEIGHT ABOVE FLOOR
2. CONCRETE BASE FOR BOOSTER PUMP #2, 2'-2" HEIGHT ABOVE FLOOR
3. CONCRETE BASE FOR DEEP WELL PUMP, 1'-0"± HEIGHT ABOVE FLOOR
4. ELECTRICAL CABINET 7'-8" HEIGHT ABOVE FLOOR
5. ELECTRICAL CABINET, 6'-2" HEIGHT ABOVE FLOOR

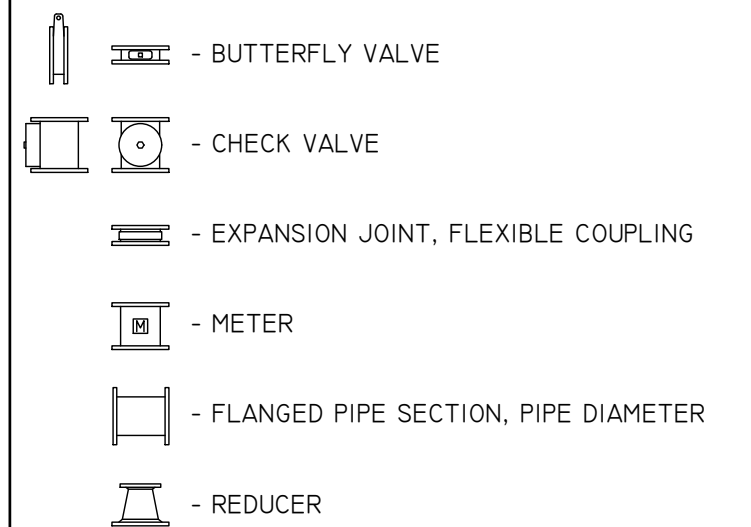
MADISON WATER UTILITY UNIT WELL 26 BOOSTER PUMP #1 UPGRADE 12661		SHEET NO. W-3/9
EXISTING PIPING PLAN		
INSPECTOR: MWU	DRAWN BY: D.A.R.	
CHECKED BY: A.L.L.	DATE: 11/26/2019	

KEYED NOTES

1. 12-IN X 12-IN VERTICAL TEE (BRANCH DOWN)
2. 6-IN X 10-IN FLANGED 90° REDUCING BEND (VERTICAL DOWN)
3. 10-IN X 14-IN FLANGED 90° REDUCING BEND (VERTICAL DOWN)
4. 12-IN X 12-IN VERTICAL BEND
5. DEEP WELL PUMP



LEGEND



V-4 - VALVE NUMBER, REFER TO SEQUENCE OF DEMOLITION AND CONSTRUCTION, SHEET W-4

NOTES

1. PIPES & FITTINGS WRAPPED IN INSULATION WHEN MEASURED. DIMENSIONS SHOWN MAY VARY BY 1"-2". VERIFY ALL DIMENSIONS FOR FABRICATED PIPING.
2. PUMPS SHOWN SCHEMATICALLY FOR INFORMATION PURPOSES.
3. FOR FURTHER, OR CLARIFIED INFORMATION, CONTACT THE MADISON WATER UTILITY.
4. EXISTING PIPE IS FABRICATED WELDED STEEL.
5. SEE PHOTOS ON SHEET 7/8 FOR ADDITIONAL DETAIL.

PLOT SCALE: 1" = 40'

PLOT NAME: _____

REV. DATE: ---

ORIGINATOR CITY OF MADISON WATER UTILITY

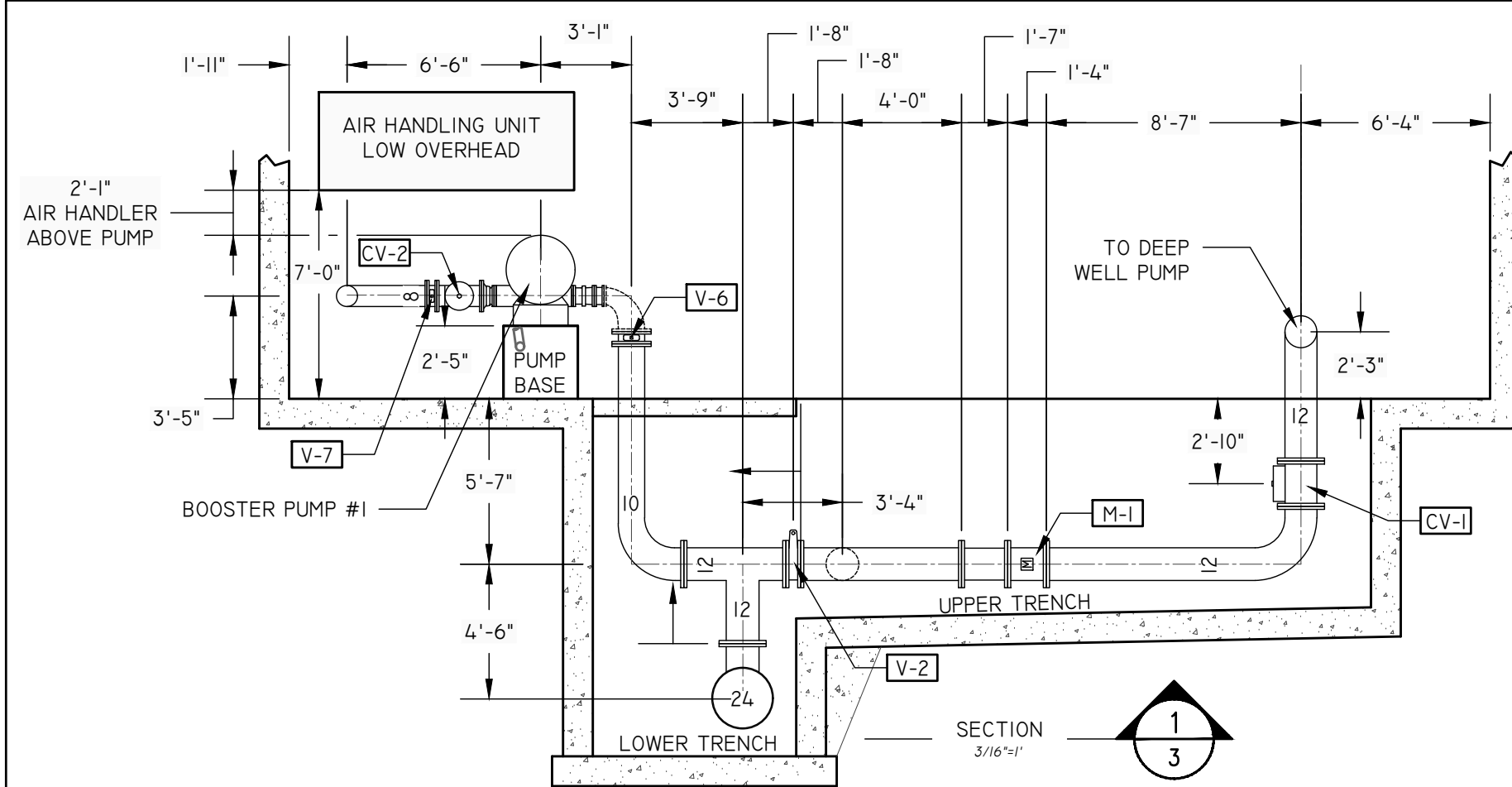
PLOT SCALE: 1" = 40'

PLOT NAME: _____

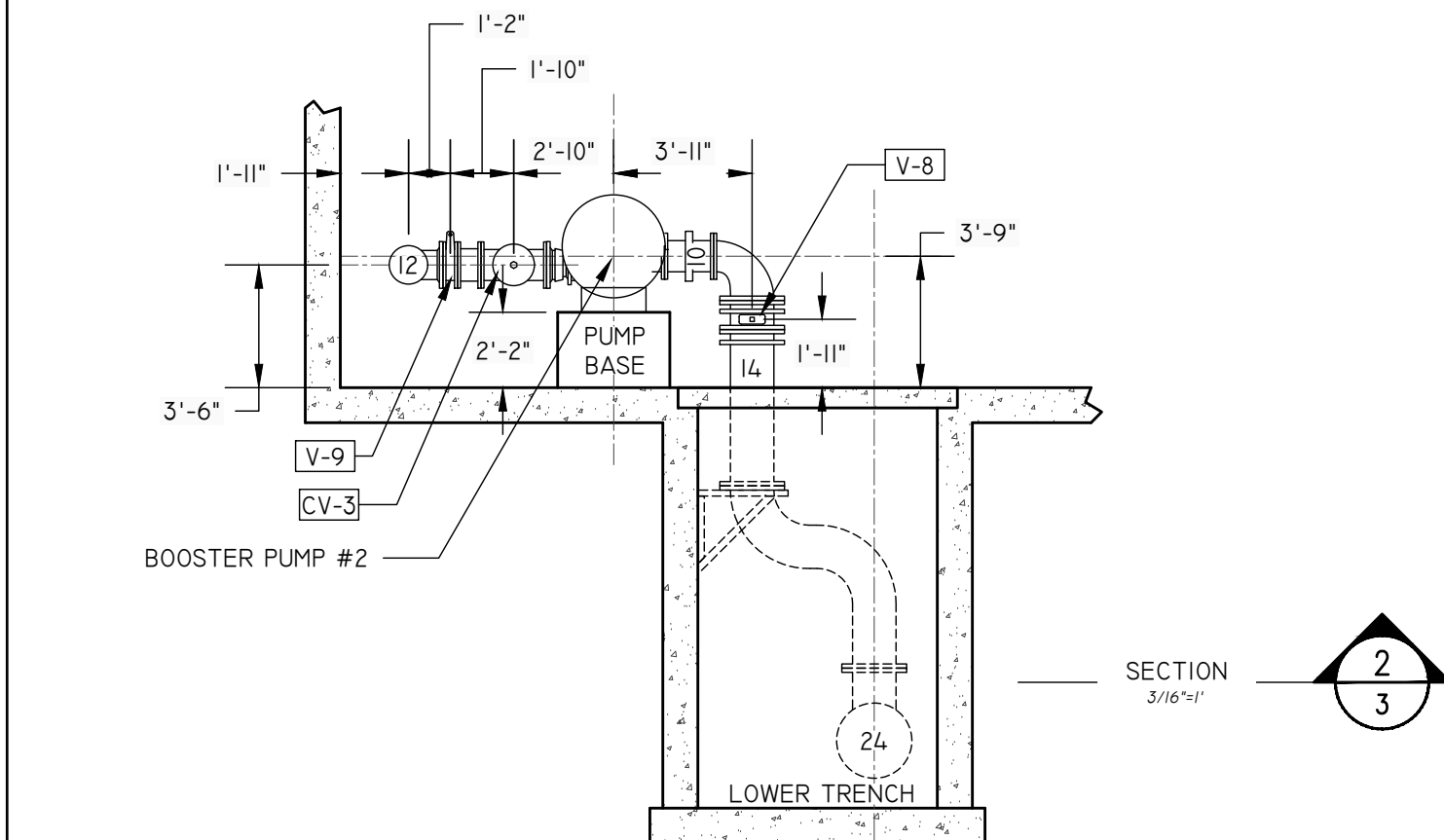
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ORIGINATOR CITY OF MADISON_WATER_UTILITY

MADISON WATER UTILITY UNIT WELL 26 BOOSTER PUMP #1 UPGRADE 12661		SHEET NO. W-4/9
EXISTING PIPING SECTION		
INSPECTOR: MWU	DRAWN BY: D.A.R.	
CHECKED BY: A.L.L.	DATE: 11/26/2019	



SECTION
3/16"=1'



LEGEND

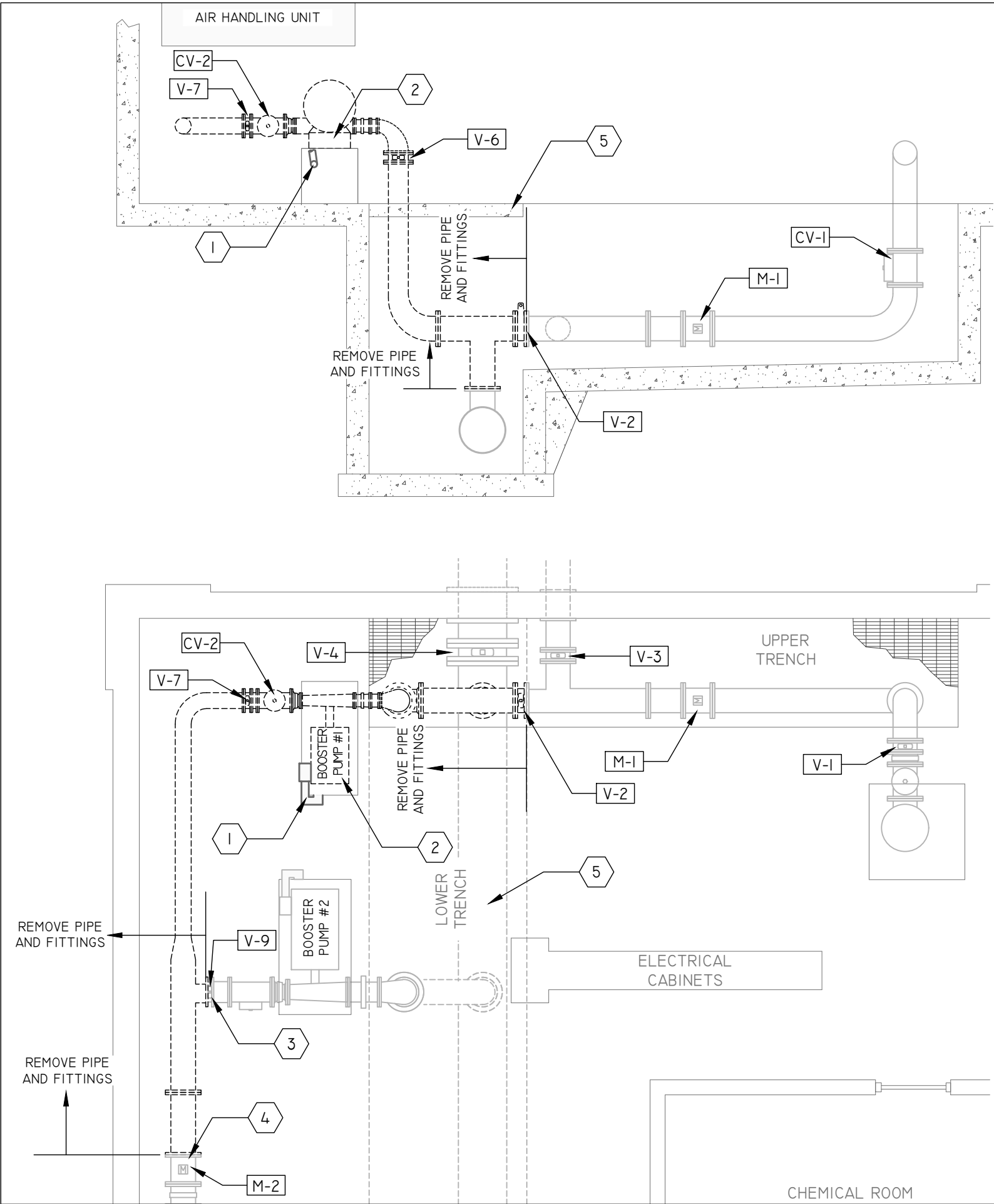
- BUTTERFLY VALVE
- CHECK VALVE
- EXPANSION JOINT, FLEXIBLE COUPLING
- METER
- FLANGED PIPE SECTION, PIPE DIAMETER
- REDUCER
- V-4** - VALVE NUMBER, REFER TO SEQUENCE OF DEMOLITION AND CONSTRUCTION, SHEET W-4

PLOT SCALE: 1" = 40'

PLOT NAME: _____

REV. DATE: ---

ORIGINATOR CITY OF MADISON WATER UTILITY



SECTION
3/16"=1'

PLAN
3/16"=1'

MADISON WATER UTILITY UNIT WELL 26 BOOSTER PUMP #1 UPGRADE 12661		SHEET NO. W-5/9
DEMOLITION & SEQUENCING PLAN		
INSPECTOR: MWU	DRAWN BY: D.A.R.	
CHECKED BY: A.L.L.	DATE: 11/26/2019	

GENERAL DEMOLITION AND CONSTRUCTION NOTES

1. PLANNED SHUTDOWN SHALL NOT EXCEED 6 HRS. - DURING THE HOURS FROM 6:00 A.M. TO 6:00 P.M. LONGER SHUTDOWNS MAY BE POSSIBLE DURING THE HOURS FROM 6:00 P.M. TO 6:00 A.M. - COORDINATE WITH MWU.
2. CONTRACTOR TO REVIEW AND PLAN WORK TO ENSURE WORKER SAFETY WHILE KEEPING THE PUMP STATION IN OPERATION
3. PRESENT PROPOSED DEMOLITION PLAN AND CONSTRUCTION SEQUENCE FOR REVIEW BY MWU.
4. REFER TO VALVE SCHEDULE, SHEET W-1, EXISTING FLOOR PLAN, SHEET W-2, PROPOSED PIPING PLAN, SHEET W-6 AND PROPOSED PIPING SECTION, SHEET W-7.
5. WORK SHALL NOT START WITHOUT AN AGREED UPON SEQUENCE OF DEMOLITION AND CONSTRUCTION.

SUGGESTED SEQUENCE OF DEMOLITION AND CONSTRUCTION

1. COORDINATE WITH MWU A MINIMUM OF 48 HOURS PRIOR TO SHUT DOWN THE FACILITY.
2. THE ELEVATED TANK SHALL REMAIN IN SERVICE AT ALL TIMES.
3. MWU SHALL CLOSE VALVES V-1, V-3, V-4, V-5 & V-11 AND ANY APPROPRIATE YARD VALVES.
4. DEMOLISH AND REMOVE EXISTING SUCTION AND DISCHARGE PIPING PER DEMOLITION PLAN (W-4)..
5. INSTALL VALVES V-2, V-10, & V-12. ALL VALVES TO REMAIN CLOSED. NOTIFY MWU TO RE-OPEN VALVES V-4, V-5 & V-11 AND ANY APPROPRIATE YARD VALVES.
6. REMOVE BOOSTER PUMP #1 AND INSTALL NEW PUMP AND REMAINING PIPING PER PROPOSED PIPING SHEETS (W-6 & W-7).
7. PRESSURE TEST ALL NEW PIPING AND NEW PUMP.
8. DISINFECT ALL NEW PIPING AND PUMP.
9. FOLLOWING INSTALLATION OF THE PUMP, MWU WILL INSTALL WIRING AND CONTROLS
10. COORDINATE TESTING AND STARTUP OF THE PUMP WITH MWU. MWU WILL PROVIDE PUMP VENDOR INSPECTION OF THE INSTALLATION PRIOR TO STARTUP.
- II. PUMP OPERATION, INCLUDING, BUT NOT LIMITED TO, PUMPING CAPACITY, VIBRATION, AND VFD OPERATION WILL BE TESTED PRIOR TO ACCEPTANCE OF THE WORK.

KEYED NOTES

1. ELECTRIC POWER SUPPLY CONDUIT TO REMAIN.
2. REMOVE PUMP, MOTOR AND MOUNTING BRACKETS. MODIFY AND/OR RECONSTRUCT CONCRETE BASE AS REQUIRED FOR NEW PUMP.
3. CONNECT NEW PIPING TO 10-IN VALVE (V-9) - PROVIDE SPACERS AS NECESSARY.
4. CONNECT NEW PIPING TO 12-IN METER (M-2).
5. REINFORCED CONCRETE SLAB OVER LOWER TRENCH, EXCEPT IN GRATE AREA.

PLOT SCALE: 1" = 40'

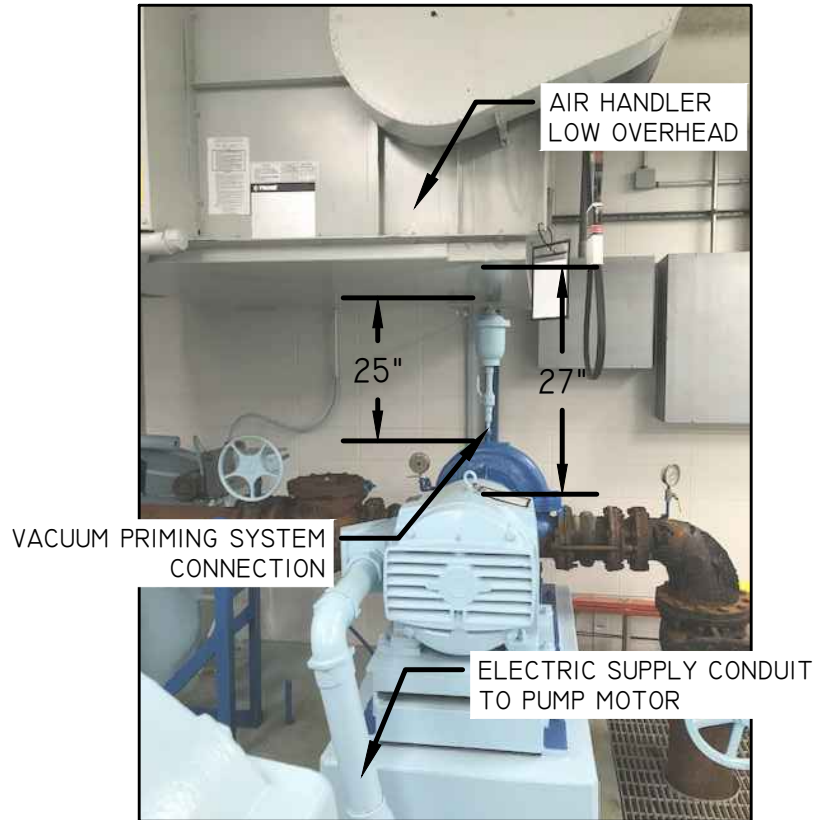
PLOT NAME: _____

REV. DATE: ---

ORIGINATOR CITY OF MADISON WATER UTILITY



BOOSTER PUMP #1
SIDE VIEW



BOOSTER PUMP #1
END VIEW OF MOTOR & PUMP



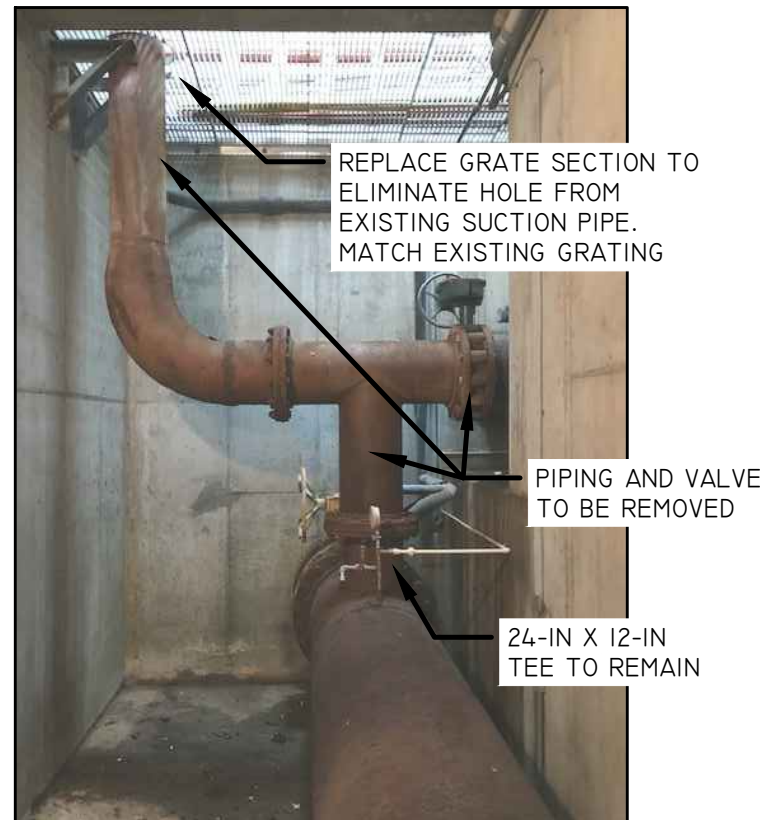
BOOSTER PUMP #1
SUCTION PIPE



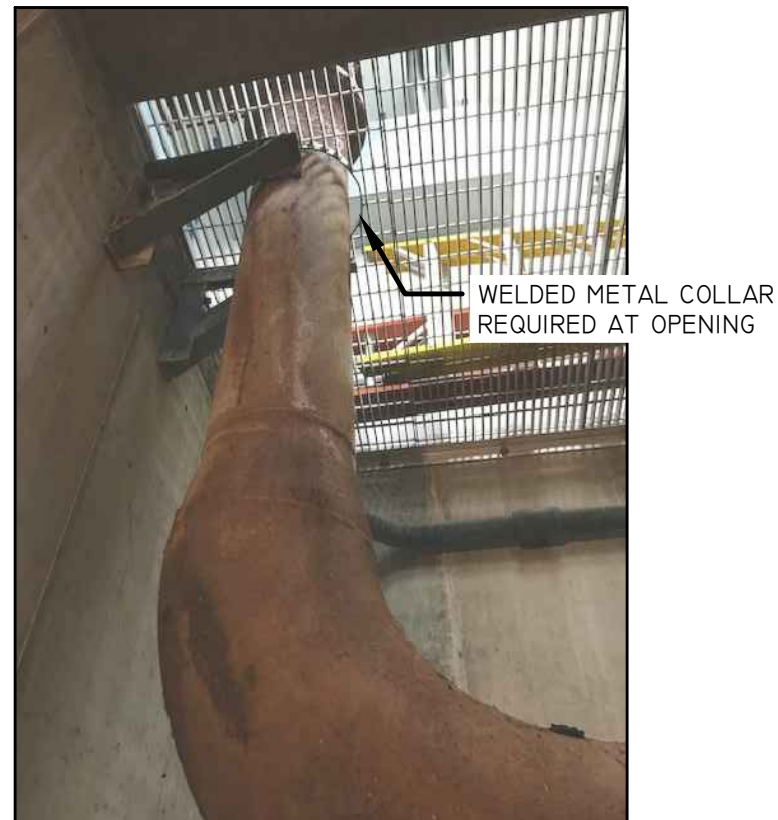
ELECTRIC SUPPLY CONDUIT



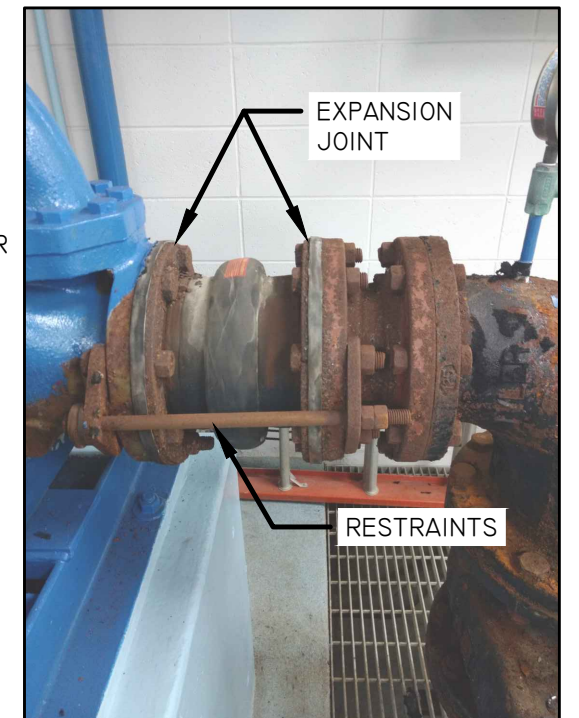
BOOSTER PUMP #1 DISCHARGE PIPE



24-IN PIPE WITH VERTICAL TEE



PIPE OPENING THROUGH GRATING



RESTRAINED EXPANSION JOINT

MADISON WATER UTILITY UNIT WELL 26 BOOSTER PUMP #1 UPGRADE 12661		SHEET NO. W-8/9
PHOTOS		
INSPECTOR: MWU	DRAWN BY: D.A.R.	
CHECKED BY: A.L.L.	DATE: 11/26/2019	

PLOT SCALE: 1" = 40'

PLOT NAME:

REV. DATE: --

ORIGINATOR CITY OF MADISON WATER UTILITY

PHOTOS & DETAILS

INSPECTOR: MWU
CHECKED BY: A.L.L.

DRAWN BY: D.A.R.
DATE: 11/26/2019



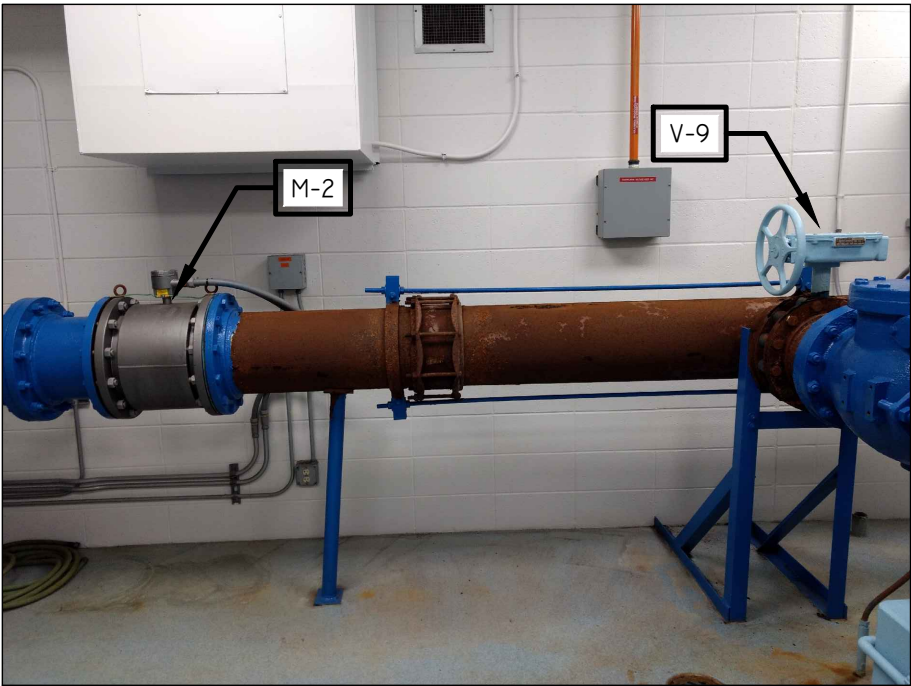
DETAIL 9-1: TYPICAL MANUFACTURED PIPE
SUPPORT COMPONENT

MANUFACTURED PIPE SUPPORT SYSTEM REQUIRED TO PREVENT
LATERAL AND VERTICAL PIPE MOVEMENT (AS APPROPRIATE).
SUBMIT SHOP DRAWINGS OF PIPE SUPPORT SYSTEMS TO MWU FOR
REVIEW AND APPROVAL PRIOR TO INSTALLATION.



DETAIL 9-2: EXISTING STEEL GRATING

1-1/2" X 3/16" STEEL BEARING BAR @ 1-1/4" SPACING WITH SWAGE LOCKED CROSS
BARS @ 4" SPACING AND 1-1/2" X 3/16" STEEL BAR BANDING. PANEL SIZE 24" X 59".
EQUIVALENT GRATING REQUIRED WHERE GRATING IS TO BE REPLACED. GRATING
SHALL BE REMOVABLE. PIPE OPENINGS SHALL USE 1-1/2" X 3/16" STEEL BAR FOR
COLLAR OR BANDING. VERIFY ALL DIMENSIONS AND SPECIFICATIONS OF
EXISTING GRATING.



ELEVATED RESERVOIR SUPPLY PIPE
DOWNSTREAM OF BOOSTER PUMP #2
DISCHARGE PIPE



ELECTRICAL CABINET
TOWARD DEEP WELL (OBSCURED)



ELECTRICAL CABINET
FROM ACCESS DOOR.



ELECTRICAL CABINET