

# WASTEWATER TREATMENT FACILITY IMPROVEMENTS

## MALVERN WATER WORKS MALVERN, ARKANSAS

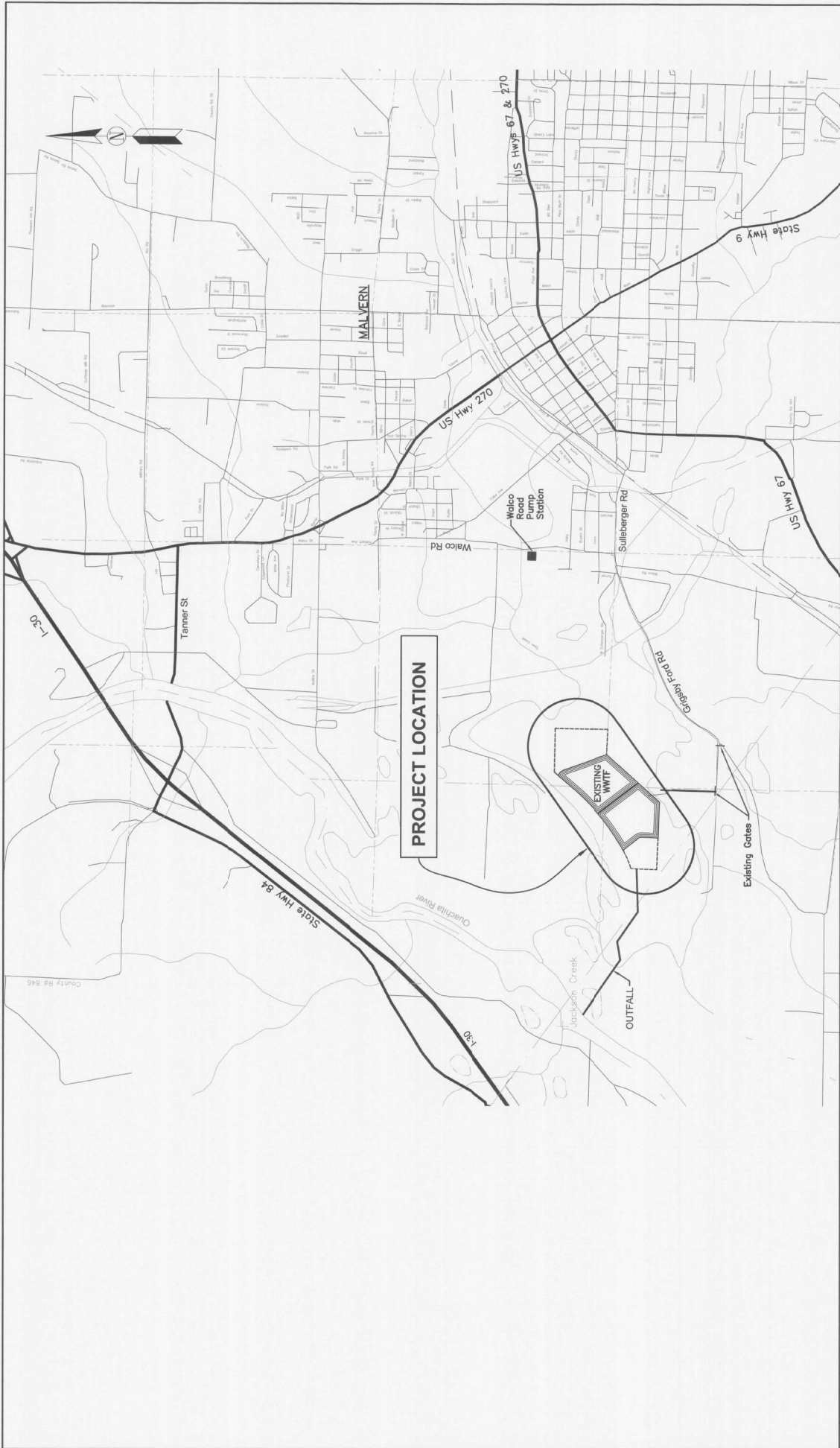
JULY 2019  
1820






CRIST ENGINEERS, INC.  
CONSULTING ENGINEERS  
LITTLE ROCK, ARKANSAS

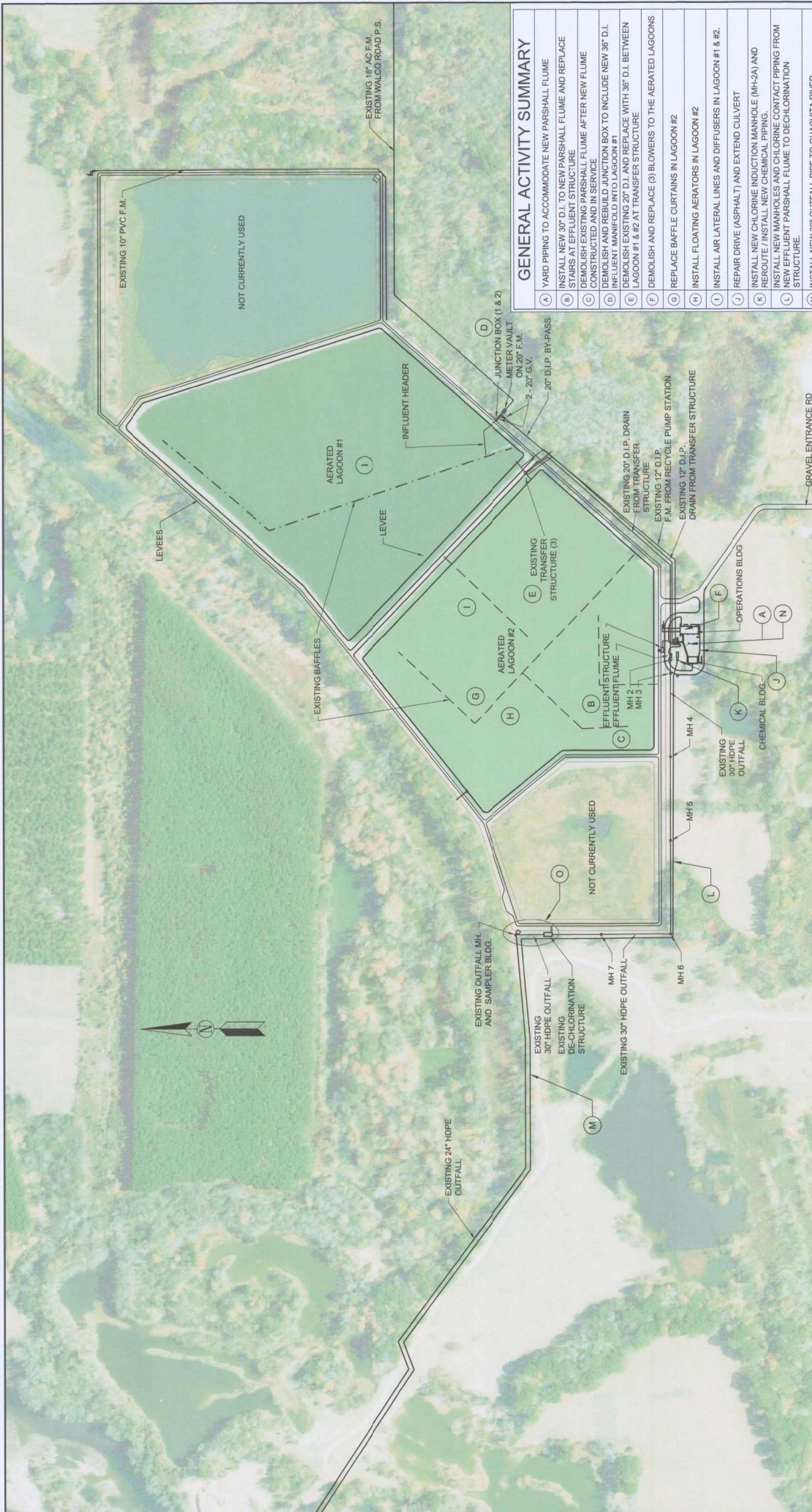






JOB NO. 1920		SHEET NO. 02	
MALVERN, ARKANSAS <b>WASTEWATER TREATMENT FACILITY IMPROVEMENTS</b> MALVERN WATER WORKS			
<b>CRIST ENGINEERS, INC.</b> CONSULTING ENGINEERS 205 EXECUTIVE COURT TULSA, OKLA. 74106-4406 TEL: (918) 484-4406 FAX: (918) 484-8579 WWW.CRISTENGINEERS.COM		 DESIGNED: LBP DRAFTED: RDW CHECKED: LBP DATE: JUL 2019	
 KRISTIN B. PROFF REGISTERED PROFESSIONAL ENGINEER No. 0115 State of Arkansas		 ROBERT J. PROFF REGISTERED PROFESSIONAL ENGINEER No. 0115 State of Arkansas	
REVISIONS		REMARKS	
REV. NO.	DATE	DRAWN	CHKD.





### GENERAL ACTIVITY SUMMARY

A	YARD PIPING TO ACCOMMODATE NEW PARSHALL FLUME
B	INSTALL NEW 30" D.I. TO NEW PARSHALL FLUME AND REPLACE STAKES AT EFFLUENT STRUCTURE
C	DEMOLISH AND REBUILD JUNCTION BOX AFTER NEW FLUME CONSTRUCTED AND IN SERVICE
D	DEMOLISH AND REBUILD JUNCTION BOX TO INCLUDE NEW 36" D.I. INFLUENT MANIFOLD INTO LAGOON #1
E	DEMOLISH EXISTING 20" D.I. AND REPLACE WITH 36" D.I. BETWEEN LAGOON #1 & #2 AT TRANSFER STRUCTURE
F	DEMOLISH AND REPLACE (3) BLOWERS TO THE AERATED LAGOONS
G	REPLACE BAFFLE CURTAINS IN LAGOON #2
H	INSTALL FLOATING AERATORS IN LAGOON #2
I	INSTALL AIR LATERAL LINES AND DIFFUSERS IN LAGOON #1 & #2.
J	REPAIR DRIVE (ASPHALT) AND EXTEND CULVERT
K	INSTALL NEW CHLORINE INDUCTION MANHOLE (MH-2A) AND REROUTE / INSTALL NEW CHEMICAL PIPING.
L	INSTALL NEW MANHOLES AND CHLORINE CONTACT PIPING FROM NEW EFFLUENT PARSHALL FLUME TO DECHLORINATION STRUCTURE.
M	INSTALL NEW 36" OUTFALL PIPE TO OUAUCHITA RIVER.
N	MODIFY CHLORINE LINE (APPROX. 50FT) AND CHLORINE INJECTION STRUCTURE AS DETAILED. RELOCATE / REPLACE S02 LINE, AS DICTATED BY SITE CONSTRUCTION
O	MODIFICATIONS AT DE-CHLORINATION STRUCTURE

MALVERN, ARKANSAS  
**WASTEWATER TREATMENT FACILITY IMPROVEMENTS**  
**MALVERN WATER WORKS**  
 OVERALL SITE PLAN & SUMMARY

JOB NO. 1820  
 SHEET NO. 03

**CRIST ENGINEERS, INC.**  
 CONSULTING ENGINEERS  
 205 EXECUTIVE COURT  
 LITTLE ROCK, ARKANSAS 72205  
 TELEPHONE: (501) 664-1822  
 WWW.CRISTENGINEERS.COM



DESIGNED: LBP
DRAFTED: MAB
CHECKED: LBP
DATE: JUL 2019

Scale: 1" = 200'

THIS LINE MEASURES 1" WHEN PLOTTED FULL SIZE

Professional Engineer Seal: STATE OF ARKANSAS, REGISTERED PROFESSIONAL ENGINEER, No. 8115, JOSIE B. CRIST

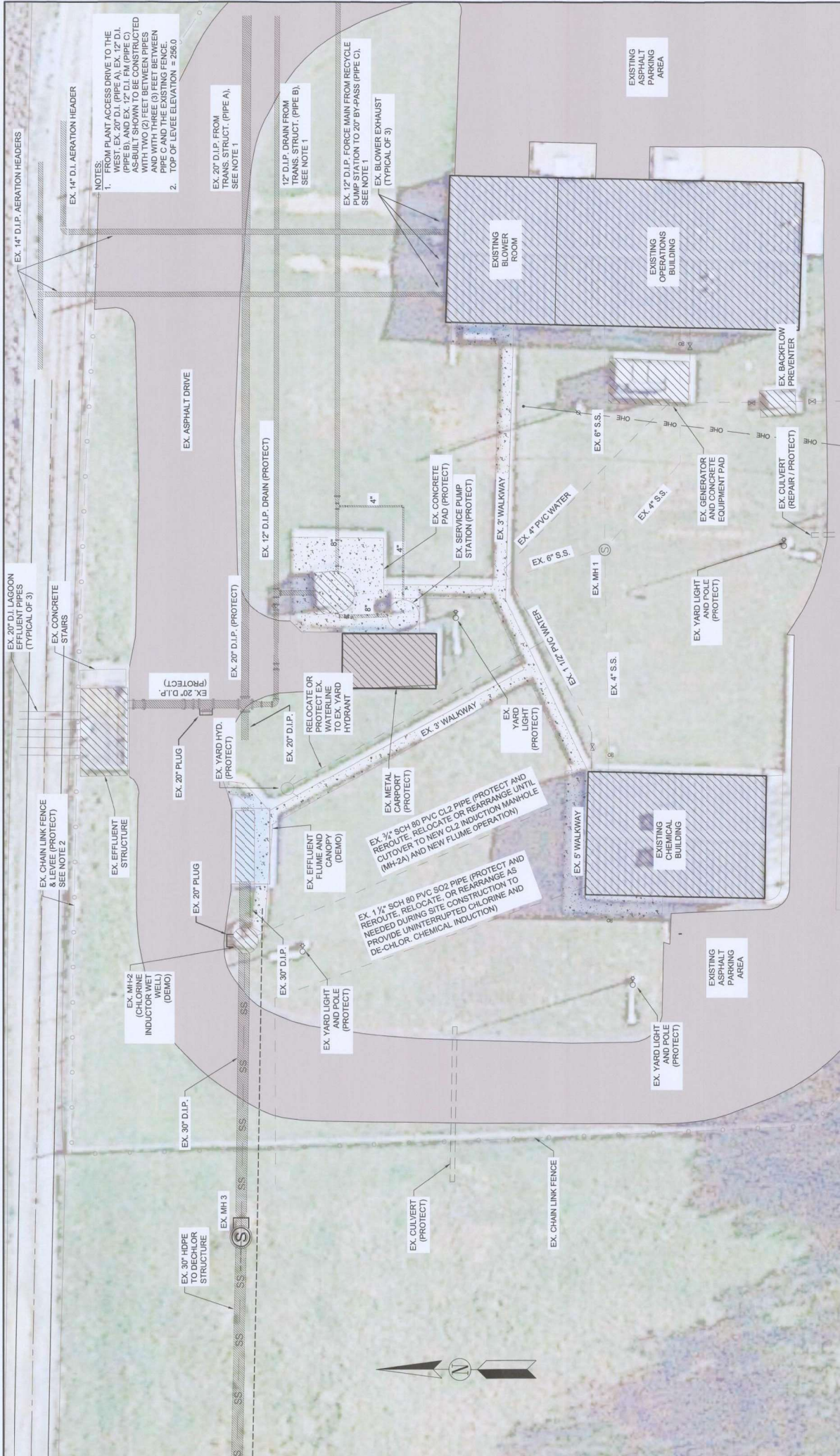
Professional Engineer Seal: STATE OF ARKANSAS, REGISTERED PROFESSIONAL ENGINEER, No. 8115, CRIST ENGINEERS, INC.

REV. NO.	DATE	BY	CHKD	REMARKS









NOTES:  
 1. FROM PLANT ACCESS DRIVE TO THE WEST, EX. 20\"/>

JOB NO. 1820  
 SHEET NO. 05  
 MALVERN, ARKANSAS  
**WASTEWATER TREATMENT FACILITY IMPROVEMENTS**  
**MALVERN WATER WORKS**  
 OPERATIONS AREA  
 EXISTING - SITE AND YARD PIPING PLAN

**CRIST ENGINEERS, INC.**  
 CONSULTING ENGINEERS  
 205 EAST WINE COURT  
 LITTLE ROCK, ARKANSAS 72205  
 TELEPHONE: (501) 664-1822  
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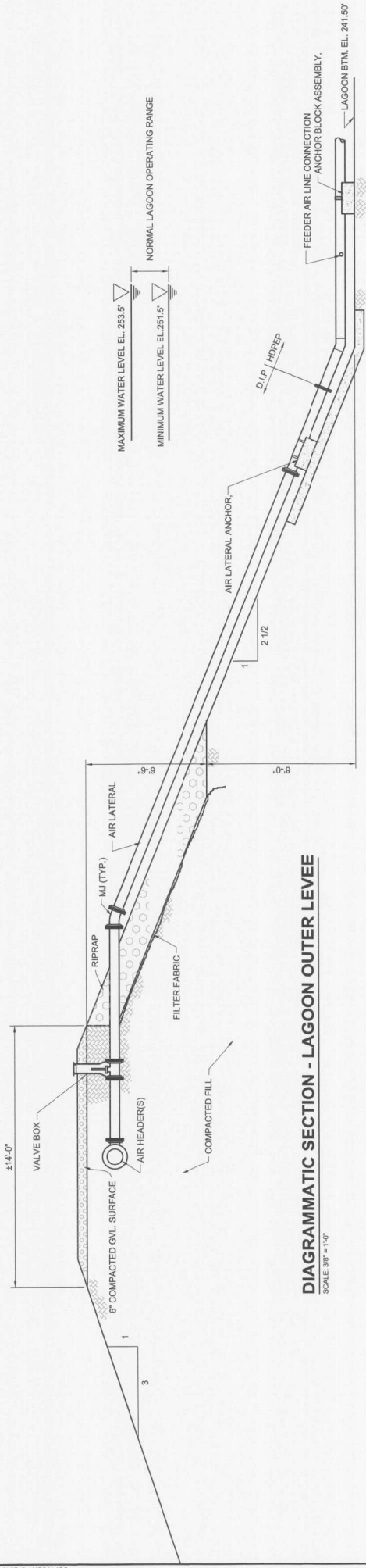
DESIGNED: SMR  
 DRAFTED: MAB  
 CHECKED: SMR  
 DATE: JUL 2019

SCALE: 1\"/>

STATE OF ARKANSAS  
 REGISTERED PROFESSIONAL ENGINEER  
 No. 9715  
 LEWIS B. CRIST

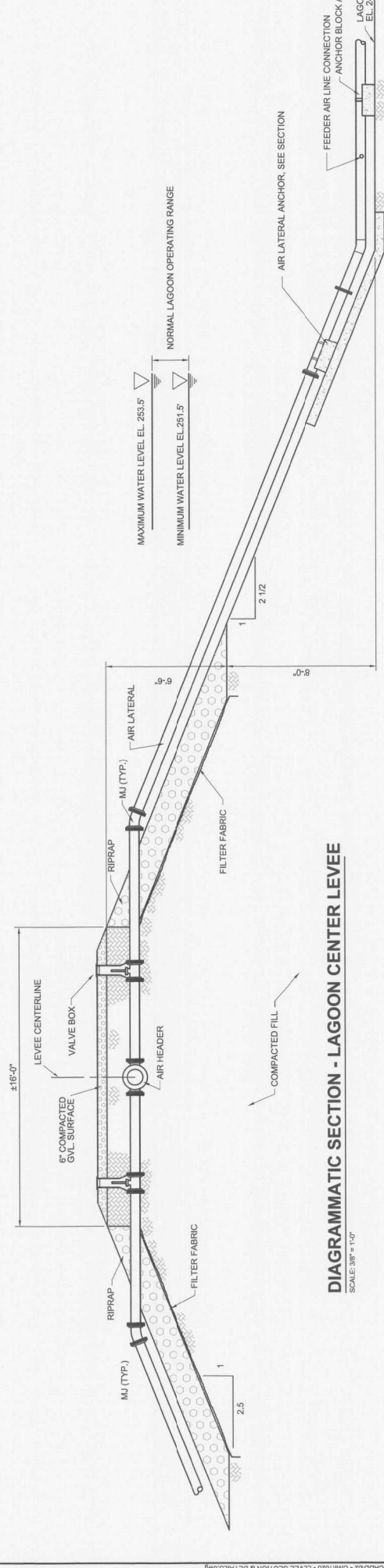
REGISTRATION  
 CRIST ENGINEERS, INC.  
 No. 9715

REV. NO.	DATE	BY	CHKD	REMARKS



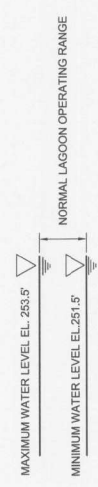
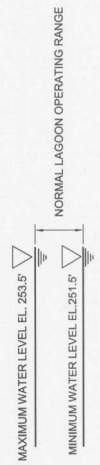
**DIAGRAMMATIC SECTION - LAGOON OUTER LEVEE**

SCALE: 3/8" = 1'-0"



**DIAGRAMMATIC SECTION - LAGOON CENTER LEVEE**

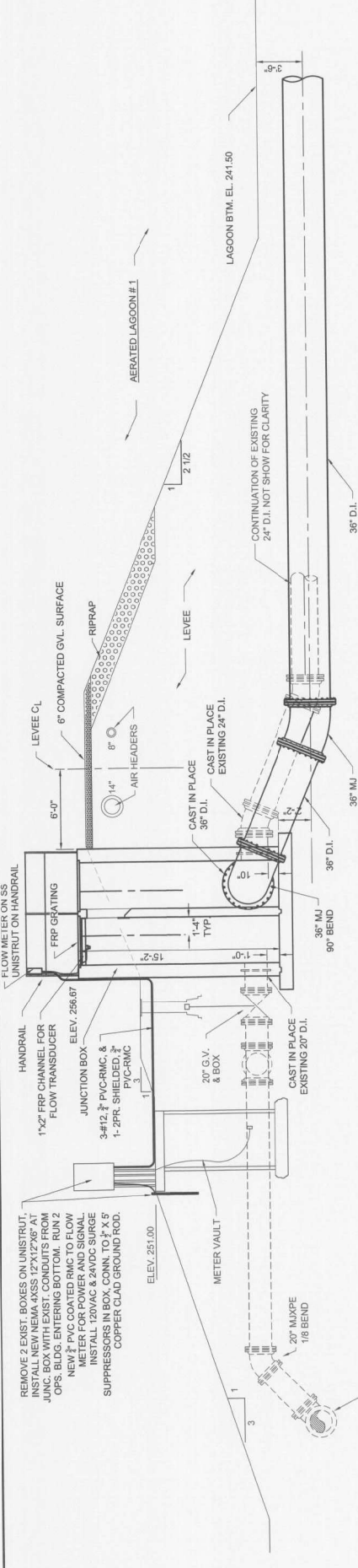
SCALE: 3/8" = 1'-0"



JOB NO. 1820		SHEET NO. 06	
<b>WASTEWATER TREATMENT FACILITY IMPROVEMENTS</b> <b>MALVERN WATER WORKS</b>			
<b>CRIST ENGINEERS, INC.</b> CONSULTING ENGINEERS 285 EXECUTIVE COURT LITTLE ROCK, ARKANSAS 72055 TELEPHONE: (501) 664-1622 WWW.CRISTENGINEERS.COM		EXISTING LEVEL SECTIONS	
DESIGNED: LBP	DRAFTED: MAB	CHECKED: LBP	DATE: JUL 2019
THIS LINE MEASURES 1" WHEN PLOTTED FULL SIZE			
REMARKS			
REV. NO.	DATE	BY	CHKD

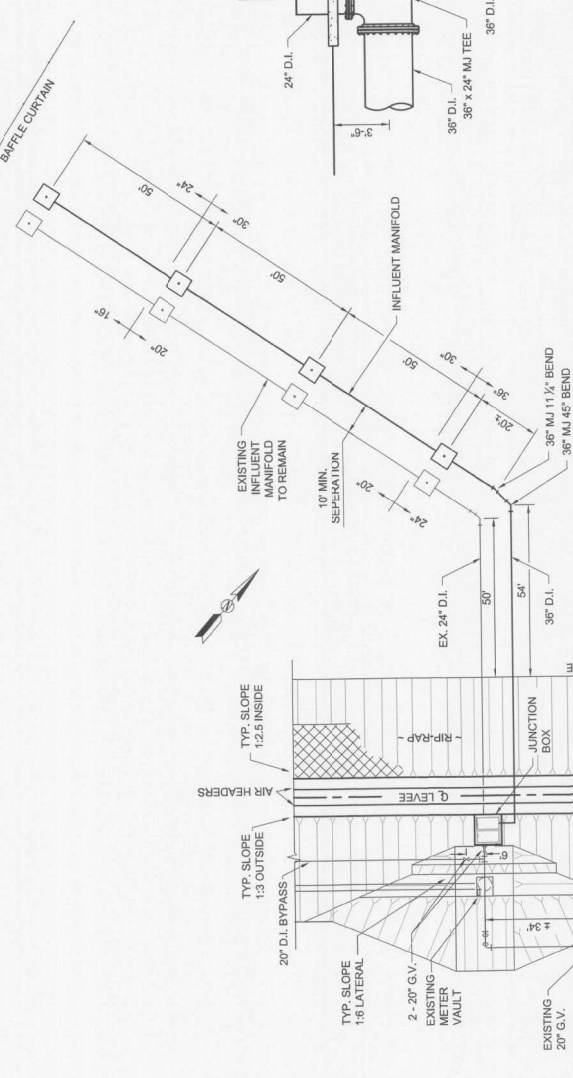




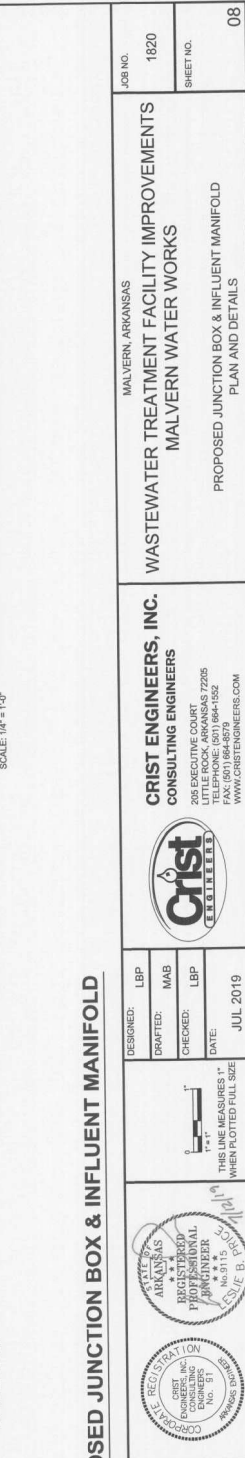


**SECTIONAL ELEVATION - PROPOSED JUNCTION BOX & INFLUENT MANIFOLD**  
SCALE: 1/4" = 1'-0"

- NOTES:**
- EXISTING 20" D.I. F.M. AND EXISTING 24" D.I. INFLUENT LINE TO BE CAST IN PLACE INTO NEW JUNCTION BOX CONSTRUCTION AT SAME LOCATION AND ELEVATION AS DEMOLISHED JUNCTION BOX.
  - CAST IN PLACE NEW 36" D.I. INFLUENT LINE AS SHOWN ON THIS SHEET.
  - MEGALUGS REQUIRED ON ALL MJ FITTINGS.



**SECTIONAL ELEVATION - PROPOSED INFLUENT MANIFOLD**  
SCALE: 1/4" = 1'-0"

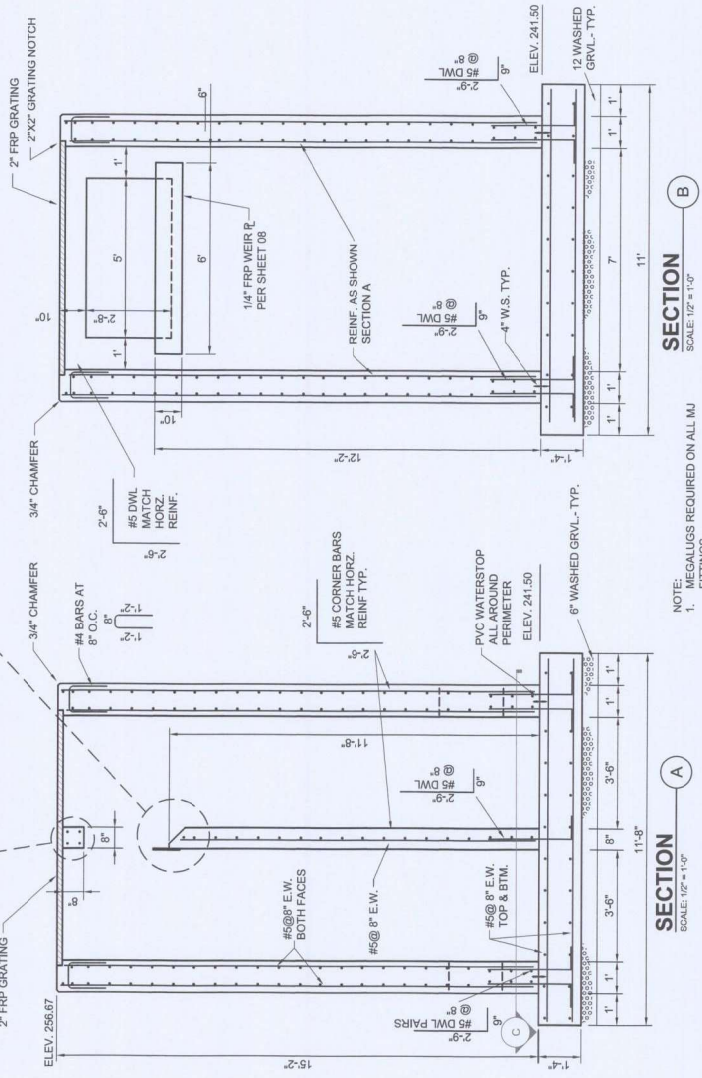
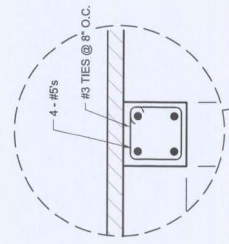
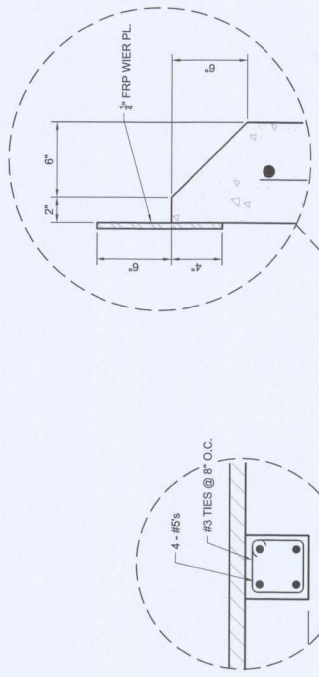
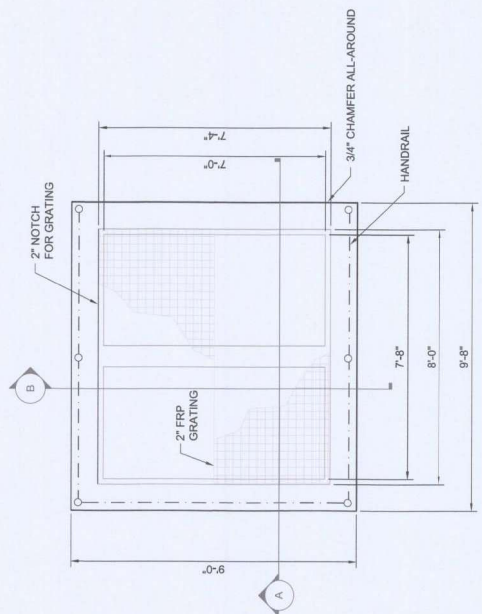
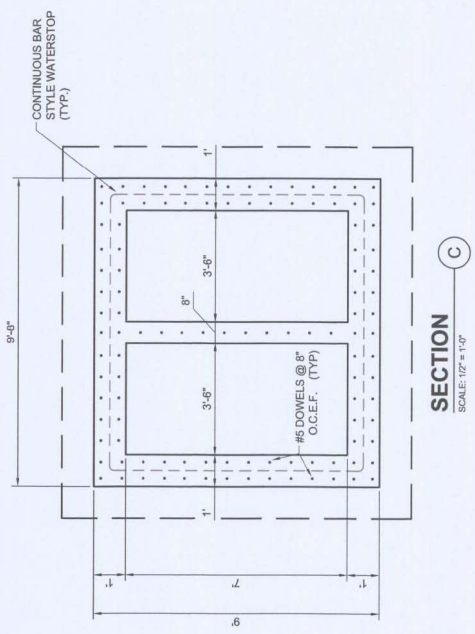


**PLAN - PROPOSED JUNCTION BOX & INFLUENT MANIFOLD**  
SCALE: 1" = 20'-0"

<p>REMOVE 2 EXIST. BOXES ON UNISTRUT. INSTALL NEW NEMA 4XSS 12X12X6\"/&gt; </p>		<p>DESIGNED: LBP DRAFTED: MAB CHECKED: LBP DATE: JUL 2019</p>	<p>CRIST ENGINEERS, INC. CONSULTING ENGINEERS 209 EXECUTIVE COURT LITTLE ROCK, ARKANSAS 72206 PH: (501) 664-8752 FAX: (501) 664-8759 WWW.CRISTENGINEERS.COM</p>	<p>MALVERN, ARKANSAS WASTEWATER TREATMENT FACILITY IMPROVEMENTS MALVERN WATER WORKS PROPOSED JUNCTION BOX &amp; INFLUENT MANIFOLD PLAN AND DETAILS</p>	<p>JOB NO. 1820 SHEET NO. 08</p>
<p>REMARKS</p>					







**PLAN - GRATING DETAIL**  
SCALE: 1/2" = 1'-0"

**SECTION**  
SCALE: 1/2" = 1'-0"

NOTE: 1. MEGALUGS REQUIRED ON ALL MJ FITTINGS

DESIGNED: MER  
DRAFTED: MAB  
CHECKED: LBP  
DATE: JUL 2019



REV.	DATE	DRWN	CHKD

REMARKS

JOB NO. 1820  
SHEET NO. 10

WASTEWATER TREATMENT FACILITY IMPROVEMENTS  
MALVERN WATER WORKS

PROPOSED JUNCTION BOX  
STRUCTURE DETAILS

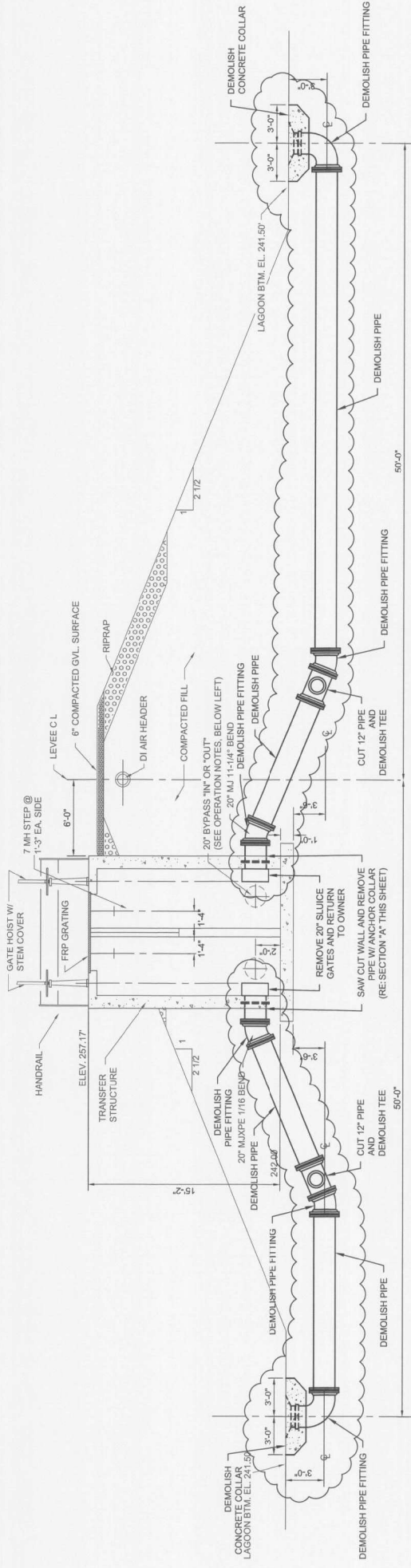
CRIST ENGINEERS, INC.  
CONSULTING ENGINEERS  
205 EXECUTIVE COURT  
LITTLE ROCK, ARKANSAS 72205  
PHONE: (501) 684-1522  
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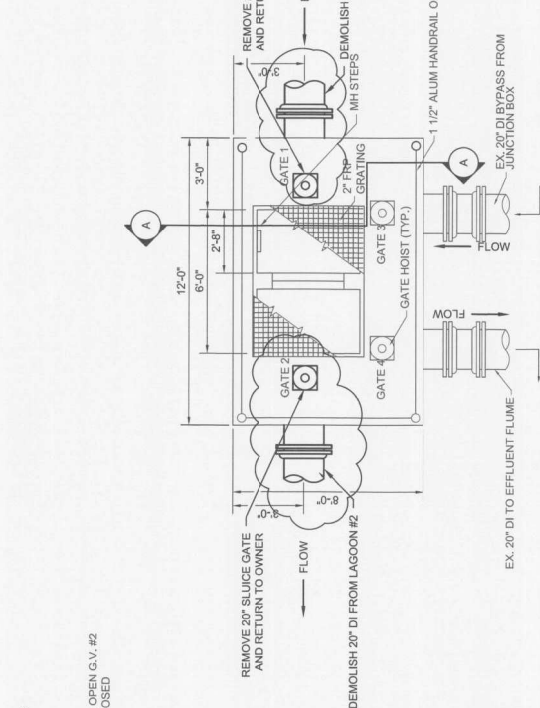


REV. NO.	DATE	BY	CHKD	REMARKS

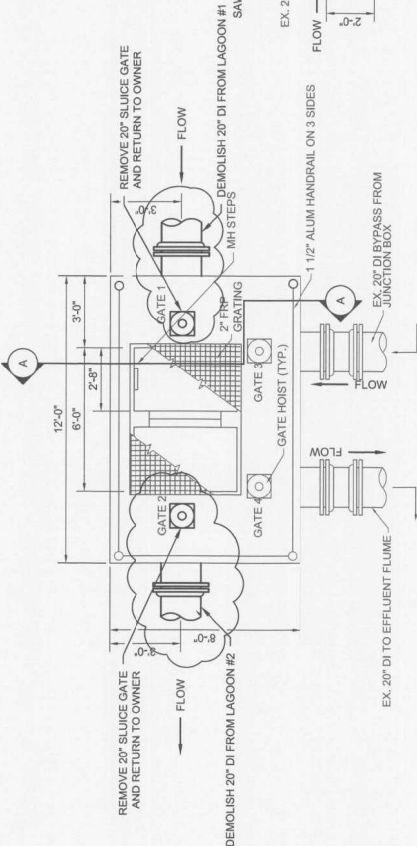


**SECTIONAL ELEVATION - EXISTING TRANSFER STRUCTURE & PIPE**  
SCALE: 1/4" = 1'-0"

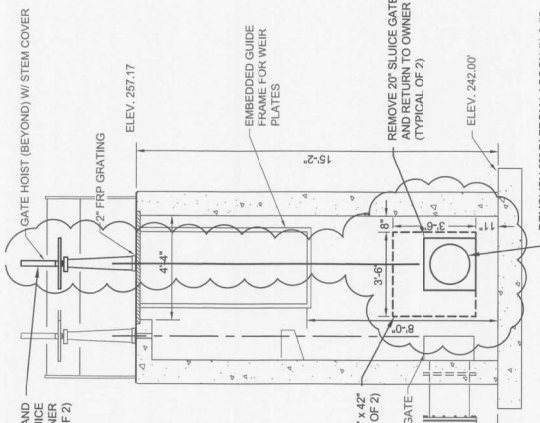
**OPERATION NOTES**  
NORMAL OPERATION:  
1. GATE 1 & 2 OPEN, GATE 3 & 4 CLOSED  
TO USE AERATED LAGOON #1 TO LAGOON #2  
CLOSE GATE 2, OPEN GATE 4  
TO USE AERATED LAGOON #2 ONLY:  
1. GATE 1 & 2 OPEN, GATE 3 & 4 CLOSED  
2. GATES 2 & 3 OPEN, GATES 1 & 4 CLOSED

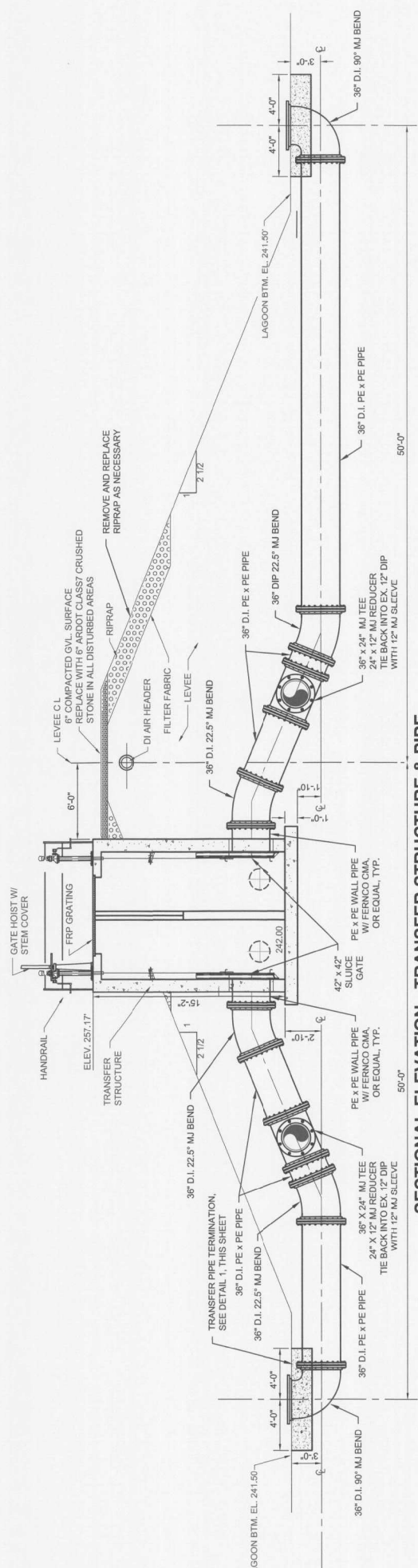


**PLAN - EXISTING TRANSFER STRUCTURE**  
SCALE: 3/8" = 1'-0"



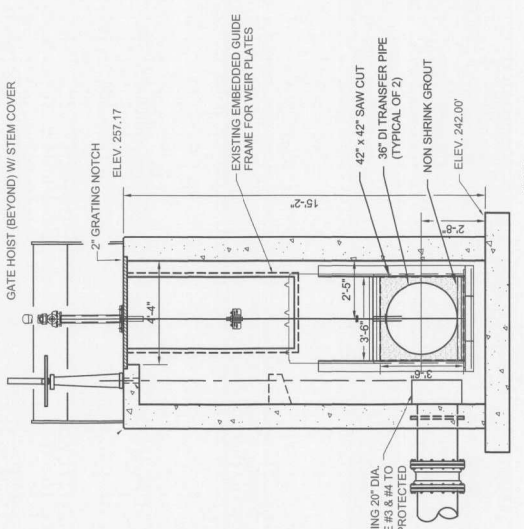
**SECTION A**  
SCALE: 3/8" = 1'-0"



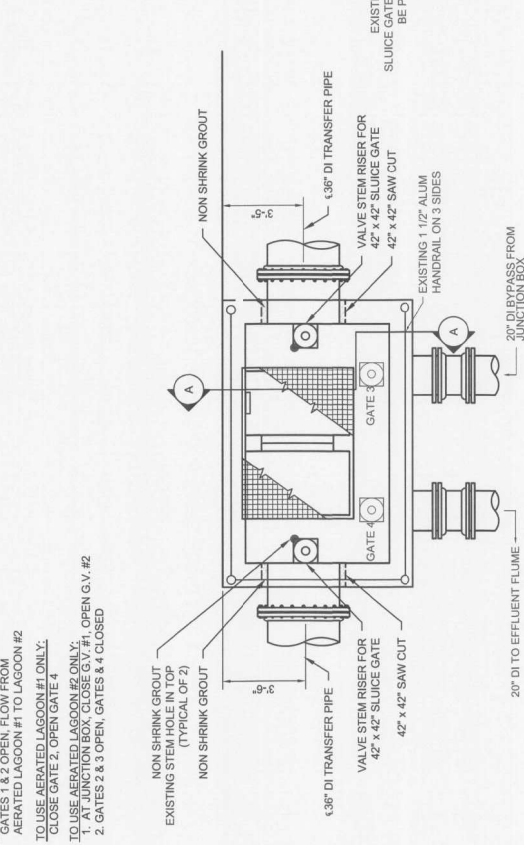


**SECTIONAL ELEVATION - TRANSFER STRUCTURE & PIPE**  
SCALE: 1/4" = 1'-0"

**OPERATION NOTES**  
NORMAL OPERATION:  
GATES 1 & 2 OPEN, FLOW FROM AERATED LAGOON #1 TO LAGOON #2  
TO USE AERATED LAGOON #1 ONLY:  
CLOSE GATE 2, OPEN GATE 4  
TO USE AERATED LAGOON #2 ONLY:  
1. AT JUNCTION BOX, CLOSE G.V. #1, OPEN G.V. #2  
2. GATES 2 & 3 OPEN, GATES 4 & 4 CLOSED



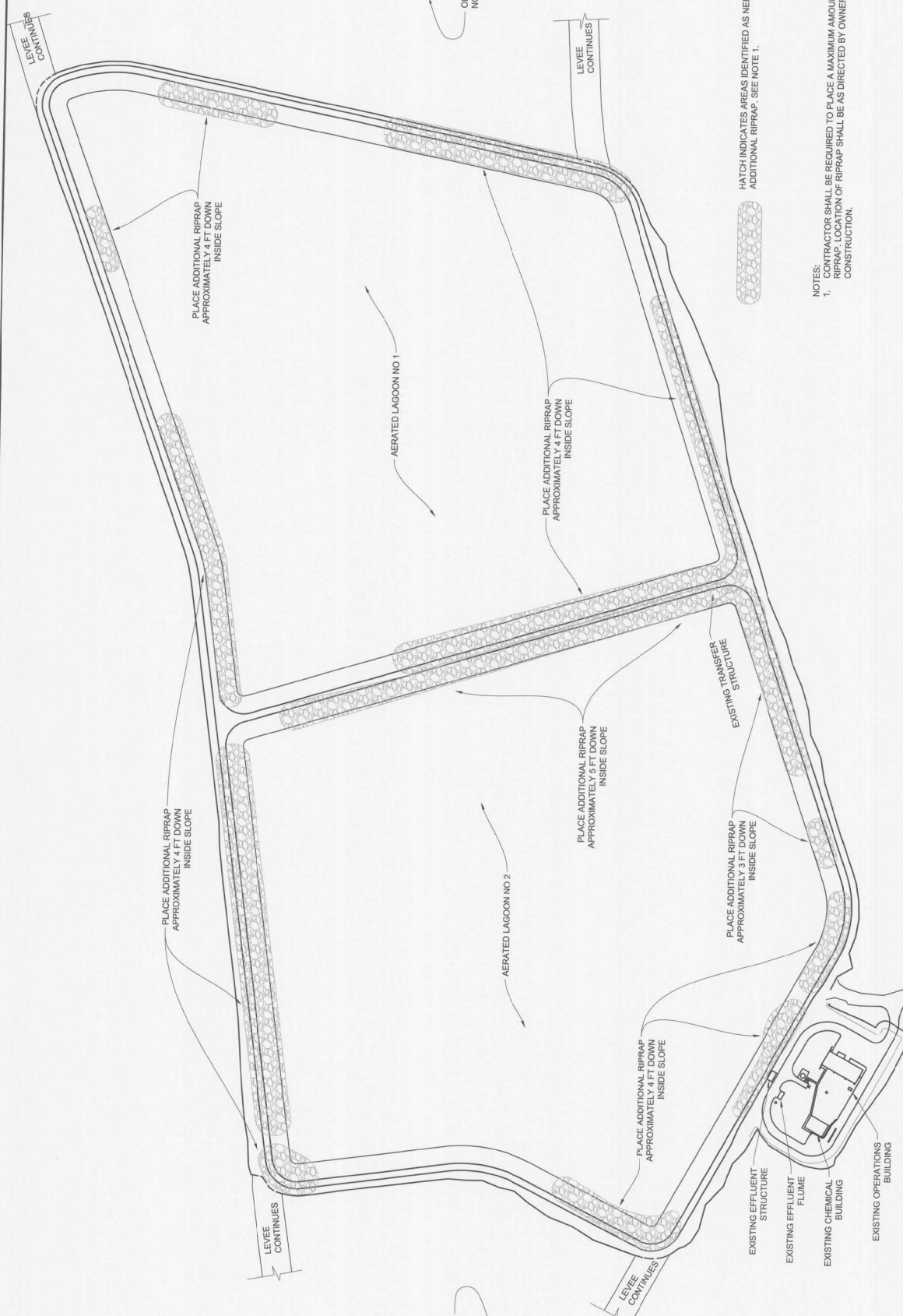
**DETAIL 1**  
SCALE: 1/2" = 1'-0"



**PLAN - TRANSFER STRUCTURE**  
SCALE: 3/8" = 1'-0"

NOTE:  
1. MEGALUGS REQUIRED ON ALL MJ FITTINGS





HATCH INDICATES AREAS IDENTIFIED AS NEEDING ADDITIONAL RIPRAP. SEE NOTE 1.

NOTES:  
 1. CONTRACTOR SHALL BE REQUIRED TO PLACE A MAXIMUM AMOUNT OF 1700 TONS OF RIPRAP. LOCATION OF RIPRAP SHALL BE AS DIRECTED BY OWNER/ENGINEER DURING CONSTRUCTION.

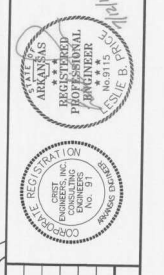
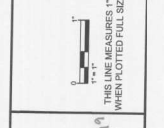
JOB NO. 1820  
 SHEET NO. 13

WASTEWATER TREATMENT FACILITY IMPROVEMENTS  
 MALVERN WATER WORKS  
 RIP-RAP REPLACEMENT PLAN

CRIST ENGINEERS, INC.  
 CONSULTING ENGINEERS  
 205 EXECUTIVE COURT  
 LITTLE ROCK, ARKANSAS 72205  
 PHONE: (501) 654-1522  
 FAX: (501) 654-1521  
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REV.	DATE	DRWN	CHKD	REMARKS








JOB NO. 1820  
 SHEET NO. 15

WASTEWATER TREATMENT FACILITY IMPROVEMENTS  
 MALVERN WATER WORKS  
 AERATED LAGOONS  
 LAGOON NO 2 BAFFLE CURTAIN REPLACEMENT  
 PLAN

**CRIST ENGINEERS, INC.**  
 CONSULTING ENGINEERS  
 202 EXECUTIVE COURT  
 LITTLE ROCK, ARKANSAS 72205  
 TELEPHONE: (501) 694-1822  
 WWW.CRISTENGINEERS.COM



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 DATE: JUL 2019

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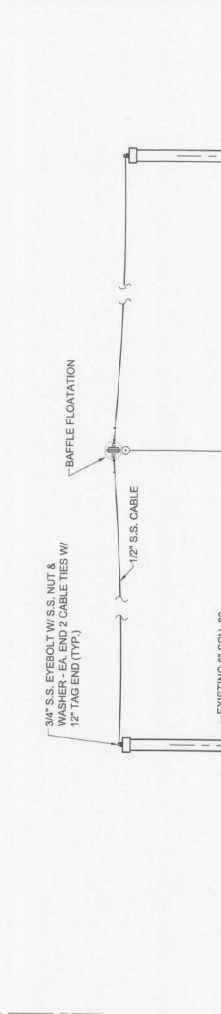


NOTE: ANCHOR LOCATIONS ARE SHOWN ON SHEET 18.

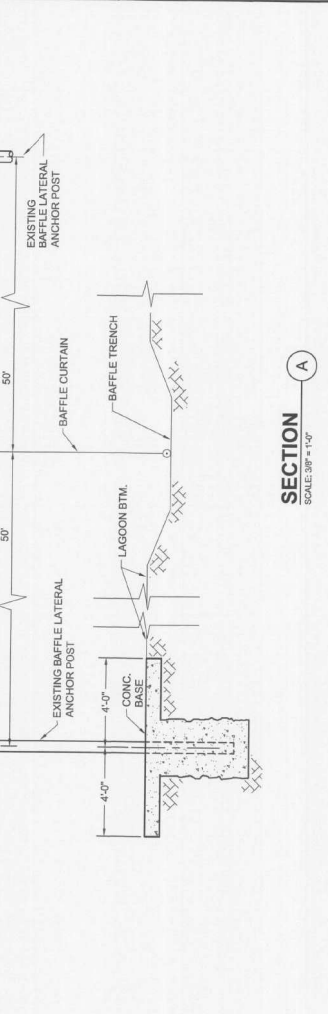
NOTE: CONTRACTOR MAY USE EXISTING CABLE HARDWARE IF IN GOOD CONDITION.



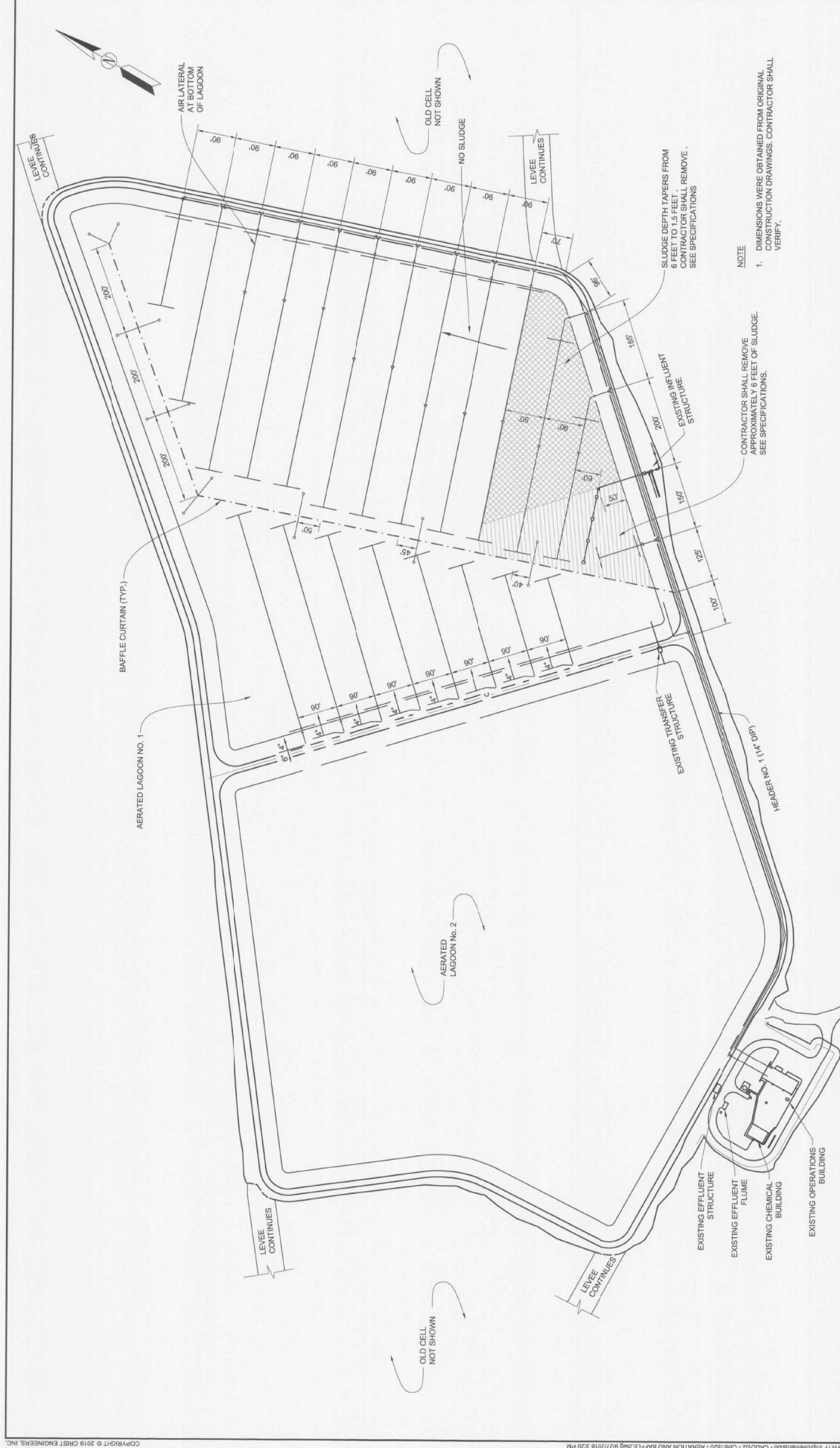
DETAIL - BAFFLE LATERAL CONNECTION  
N.T.S.



PLAN - BAFFLE LATERAL ANCHOR SYSTEM  
SCALE: 3/8" = 1'-0"



SECTION A  
SCALE: 3/8" = 1'-0"



NOTE  
 1. DIMENSIONS WERE OBTAINED FROM ORIGINAL CONSTRUCTION DRAWINGS. CONTRACTOR SHALL VERIFY.

CONTRACTOR SHALL REMOVE APPROXIMATELY 6 FEET OF SLUDGE. SEE SPECIFICATIONS.

SLUDGE DEPTH TAPERS FROM 6 FEET TO 1.5 FEET. CONTRACTOR SHALL REMOVE. SEE SPECIFICATIONS.

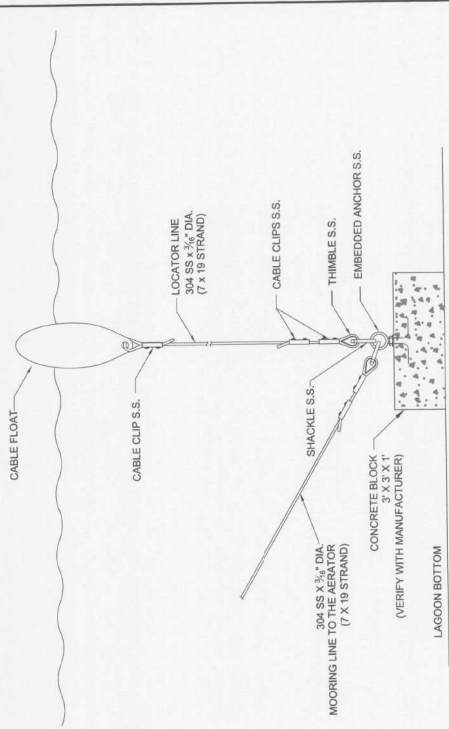
JOB NO. 1820		SHEET NO. 18	
MALVERN, ARKANSAS <b>WASTEWATER TREATMENT FACILITY IMPROVEMENTS</b> <b>MALVERN WATER WORKS</b>			
<b>CRIST ENGINEERS, INC.</b> CONSULTING ENGINEERS 205 EXECUTIVE COURT MALVERN, ARKANSAS 72055 TELEPHONE: (501) 664-4522 FAX: (501) 664-8579 WWW.CRISTENGINEERS.COM		AERATED LAGOONS LAGOON NO. 1 SLUDGE REMOVAL	
DESIGNED: LBP	DRAWN: MAB	CHECKED: LBP	DATE: JUL 2019
REV. NO.	DATE	BY	REMARKS



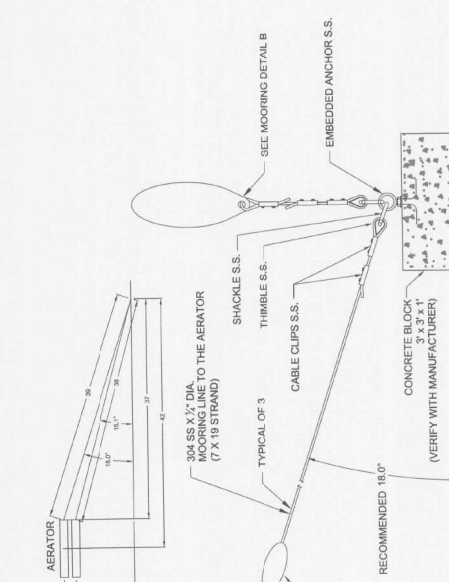


Copyright © 2019 CRST Engineers, Inc. P:\2019 Projects\1820 - Malvern WWTP Improvements - CAD\07 - CHM\1820 - AERATION AND BAFFLE DWG 07/27/2018 3:20 PM

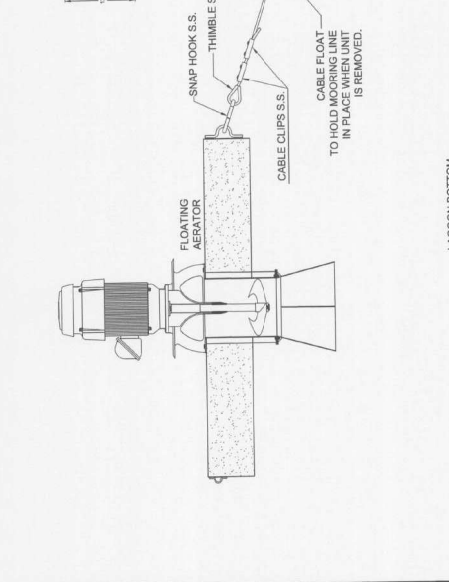
JOB NO. 1820	SHEET NO. 19	<b>WASTEWATER TREATMENT FACILITY IMPROVEMENTS</b> <b>MALVERN WATER WORKS</b> AERATED LAGOONS LAGOON NO 2 FLOTTING AERATORS PLAN
DESIGNED: LBP	DRAFTED: MAS	CHECKED: LBP
DATE: JUL 2019		DATE: JUL 2019
1" = 100'-0" 1" = 100'-0" THIS IS A 1/4" SCALE DRAWING WHEN PLOTTED FULL SIZE		REGISTERED PROFESSIONAL ENGINEER STATE OF ARKANSAS No. 3115 CRIST, B. J.
REGISTERED CONSULTING ENGINEER STATE OF ARKANSAS No. 911 CRIST, B. J.		REMARKS
REV. NO.	DATE	BY / DRAWN / CHECKED



**DETAIL 1 - FLOATING AERATOR MOORING**  
SCALE = N.T.S.



**DETAIL 2 - FLOATING AERATOR MOORING**  
SCALE = N.T.S.



**DETAIL 3 - FLOATING AERATOR**  
SCALE = N.T.S.

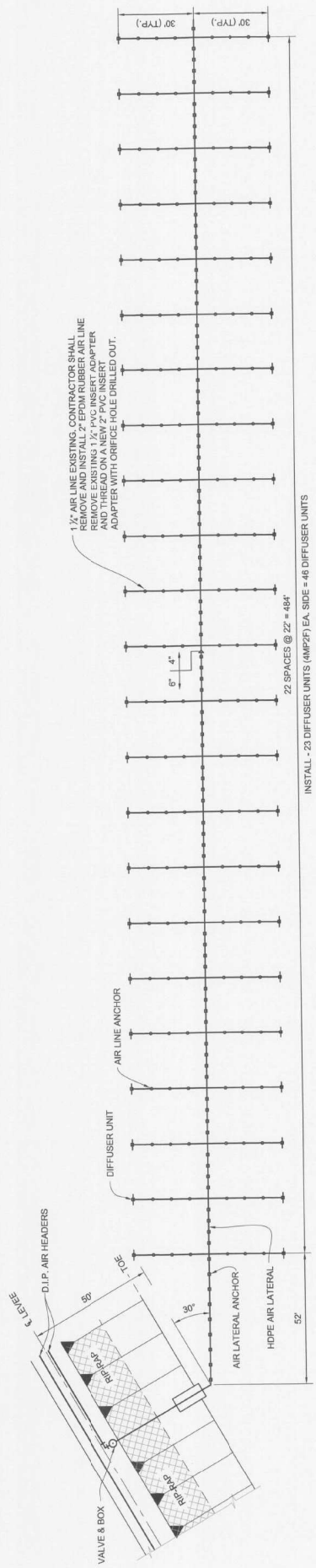
ITEM	QTY.	DESCRIPTION	MATERIAL
1	1	MOORING	1842 STN. STL.
2	4	BOLT AND LOCKWASHER	304 STN. STL.
3	1	DISCHARGE CONE	304 STN. STL.
4	4	BOLT AND LOCKWASHER	1842 STN. STL.
5	1	ANTH-DEFLECTION INSERT	DELRIN
6	1	ANTH-DEFLECTION INSERT	DELRIN
7	2	SET SCREW	1842 STN. STL.
8	1	FLUID CONNECTOR	304 STN. STL.
9	1	FLUID CONNECTOR	304 STN. STL.
10	1	PROPELLER	316L-5 STN. STL.
11	1	LOCKING NUT	304 STN. STL.
12	1	FLUID CONNECTOR	304 STN. STL.
13	1	FLUID ASSEMBLY	304 STN. STL.
14	1	HOSE CLAMP	STN. STL.

NOTES:  
 1. THESE FASTENERS CAN BE SAFETY WIRED IN PLACE.  
 2. FLOAT IS FILLED WITH TWO COMPONENT POLYURETHANE FOAM.  
 3. SPARE POWER SECTION INCLUDES ITEMS: 1, 2, 3, 5, 6, 7, 8, 10, 11, 12, 14.  
 4. MOORING EAR OF 304 STN. STL., QUANTITY OF 6, APPLICABLE FOR 3 OR 4 POINT MOORING.

JOB NO. 1820		SHEET NO.		20	
MALVERN, ARKANSAS WASTEWATER TREATMENT FACILITY IMPROVEMENTS MALVERN WATER WORKS					
AERATED LAGOONS LAGOON NO. 2 FLOATING AERATORS MISCELLANEOUS DETAILS					
<b>CRIST ENGINEERS, INC.</b> CONSULTING ENGINEERS		DESIGNED: LBP DRAFTED: MAB CHECKED: LBP DATE: JUL 2019		20% EXECUTIVE COURT LITTLE ROCK, ARKANSAS 72205 PHONE: 501-666-1552 FAX: 501-664-8079 WWW.CRISTENGINEERS.COM	
THIS LINE MEASURES 1" WHEN PLOTTED FULL SIZE		THIS LINE MEASURES 1" WHEN PLOTTED FULL SIZE		REMARKS	
REV.	DATE	DRWN	CHD		

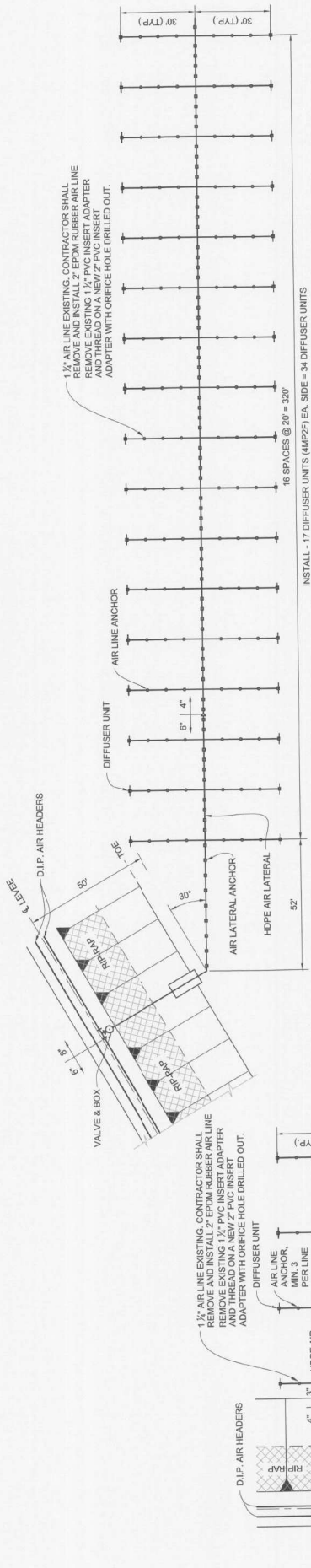






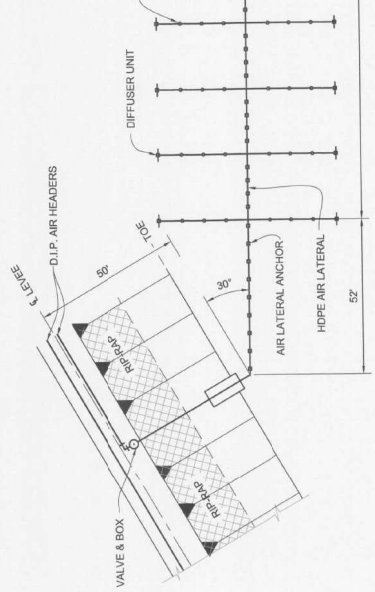
**PLAN - AIR LATERAL 3**  
SCALE: 1" = 20'

INSTALL - 23 DIFFUSER UNITS (AMP2F) EA. SIDE = 46 DIFFUSER UNITS



**PLAN - AIR LATERAL 2**  
SCALE: 1" = 20'

INSTALL - 17 DIFFUSER UNITS (AMP2F) EA. SIDE = 34 DIFFUSER UNITS



**PLAN - AIR LATERAL 1**  
SCALE: 1" = 20'

INSTALL - 4 DIFFUSER UNITS (AMP2F) EA. SIDE = 8 DIFFUSER UNITS

REV. NO.	DATE	BY	CHKD	REMARKS

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**CRIST ENGINEERS, INC.**  
CONSULTING ENGINEERS  
305 EXECUTIVE COURT  
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PHONE: (501) 984-1552  
FAX: (501) 984-8579  
WWW.CRISTENGINEERS.COM

WASTEWATER TREATMENT FACILITY IMPROVEMENTS  
MALVERN WATER WORKS  
AERATED LAGOONS  
PROPOSED AIR LATERAL PLAN  
LATERALS 1, 2 & 3

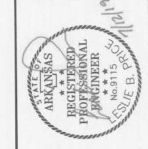
JOB NO. 1820

SHEET NO. 22

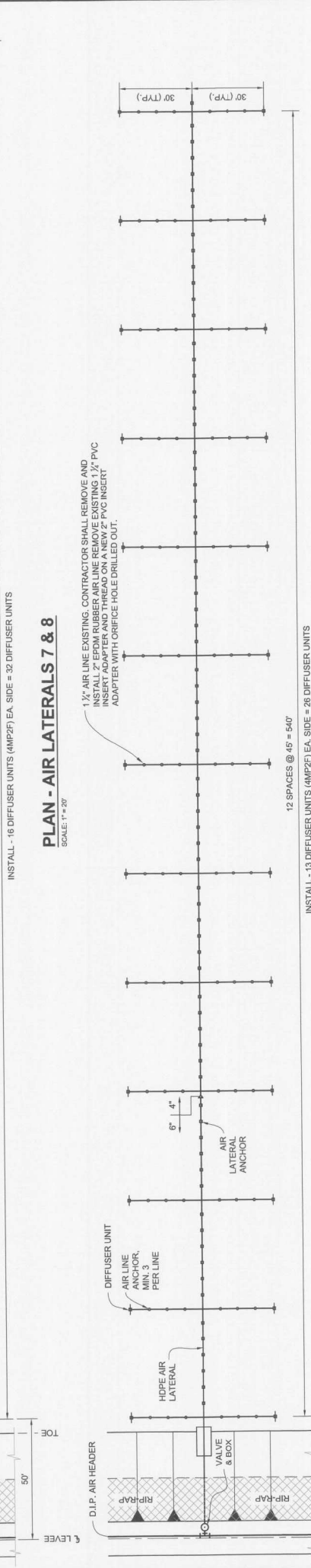
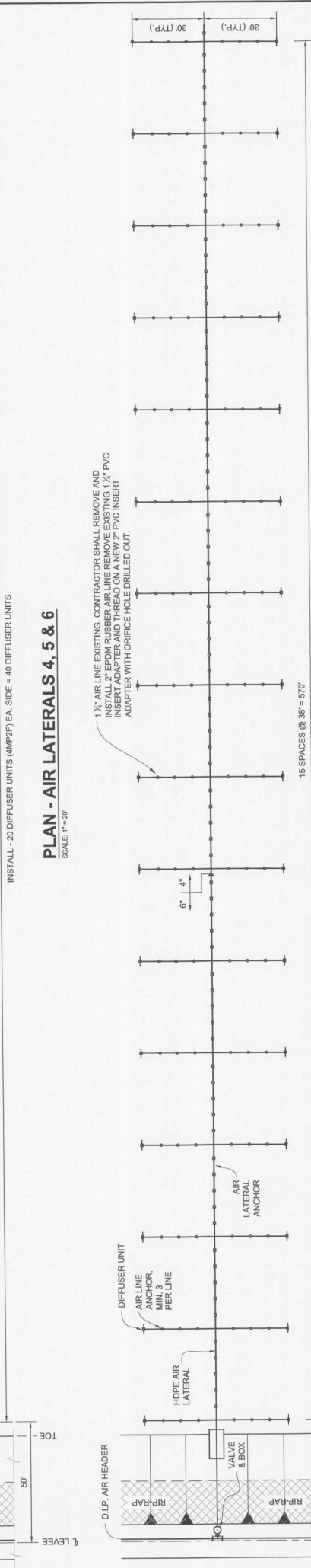
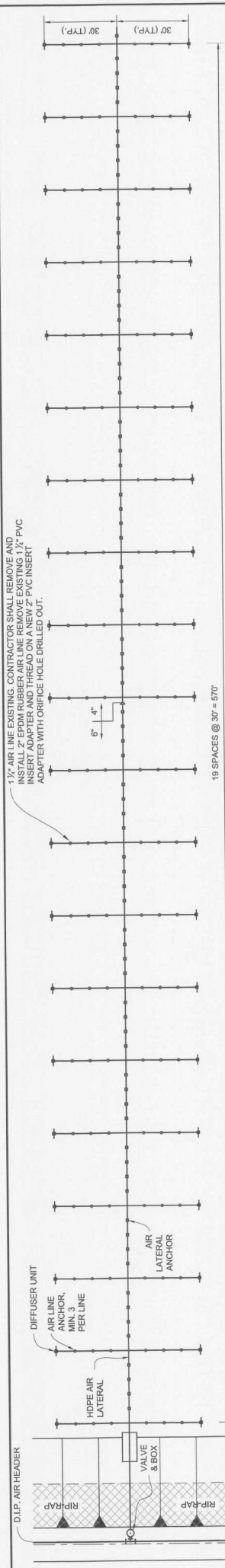


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DATE: JUL 2019

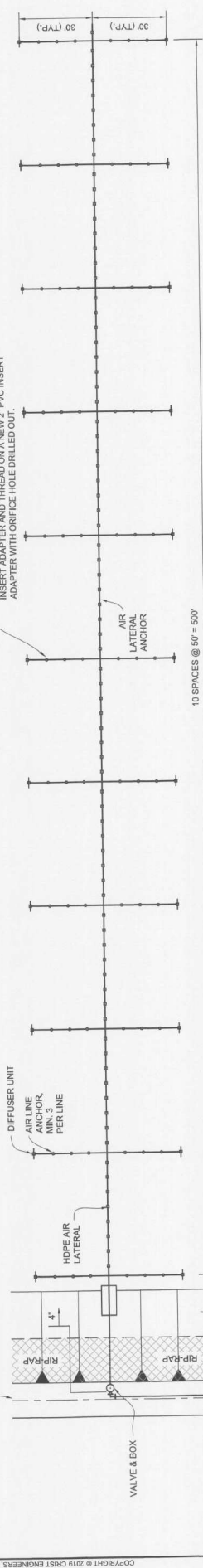
1" = 20'-0"  
1" = 4'-0" MEASURES 4"  
WHEN PLOTTED FULL SIZE



REV. NO.	DATE	BY	CHKD	REMARKS



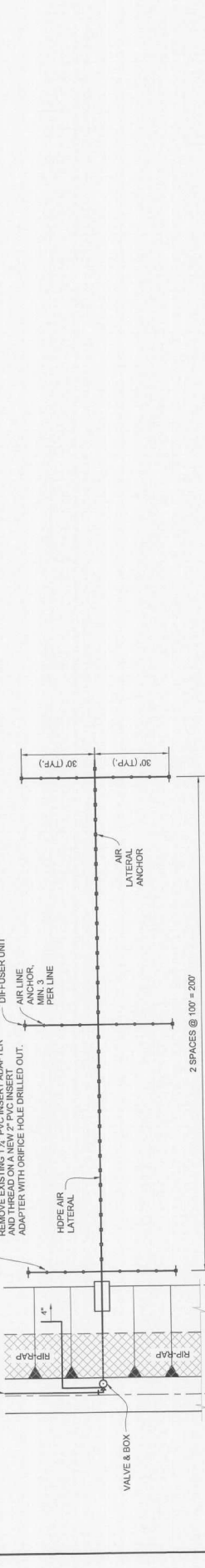
1 1/2" AIR LINE EXISTING. CONTRACTOR SHALL REMOVE AND INSTALL 2" EPDM RUBBER AIR LINE REMOVE EXISTING 1 1/2" PVC INSERT ADAPTER AND THREAD ON A NEW 2" PVC INSERT ADAPTER WITH ORIFICE HOLE DRILLED OUT.



PLAN - AIR LATERAL 14  
SCALE: 1" = 20'

INSTALL - 11 DIFFUSER UNITS (AMP2F) EA. SIDE = 22 DIFFUSER UNITS  
AIR LATERAL 15: 8 SPACES @ 50' = 400'; 10 DIFFUSER UNITS (AMP2F) EACH SIDE = 20 DIFFUSER UNITS  
AIR LATERAL 16: 7 SPACES @ 50' = 350'; 9 DIFFUSER UNITS (AMP2F) EACH SIDE = 18 DIFFUSER UNITS  
AIR LATERAL 17: 7 SPACES @ 50' = 350'; 8 DIFFUSER UNITS (AMP2F) EACH SIDE = 16 DIFFUSER UNITS  
AIR LATERAL 18: 6 SPACES @ 50' = 300'; 7 DIFFUSER UNITS (AMP2F) EACH SIDE = 14 DIFFUSER UNITS  
AIR LATERAL 19: 5 SPACES @ 50' = 250'; 6 DIFFUSER UNITS (AMP2F) EACH SIDE = 12 DIFFUSER UNITS

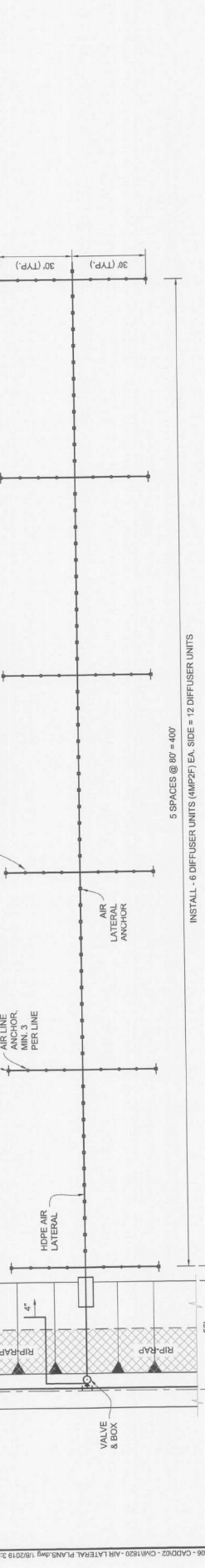
1 1/2" AIR LINE EXISTING. CONTRACTOR SHALL REMOVE EXISTING 1 1/2" PVC INSERT ADAPTER AND THREAD ON A NEW 2" PVC INSERT ADAPTER WITH ORIFICE HOLE DRILLED OUT.



PLAN - AIR LATERAL 13  
SCALE: 1" = 20'

INSTALL - 3 DIFFUSER UNITS (AMP2F) EA. SIDE = 6 DIFFUSER UNITS  
AIR LATERAL 20: 4 SPACES @ 100' = 400'; 4 DIFFUSER UNITS (AMP2F) EACH SIDE = 8 DIFFUSER UNITS  
AIR LATERAL 21: 3 SPACES @ 100' = 300'; 3 DIFFUSER UNITS (AMP2F) EACH SIDE = 6 DIFFUSER UNITS

1 1/2" AIR LINE EXISTING. CONTRACTOR SHALL REMOVE EXISTING 1 1/2" PVC INSERT ADAPTER AND THREAD ON A NEW 2" PVC INSERT ADAPTER WITH ORIFICE HOLE DRILLED OUT.



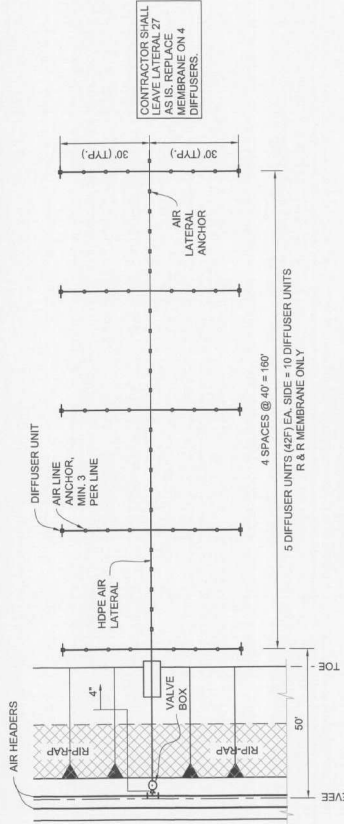
PLAN - AIR LATERAL 12  
SCALE: 1" = 20'

INSTALL - 6 DIFFUSER UNITS (AMP2F) EA. SIDE = 12 DIFFUSER UNITS  
AIR LATERAL 22: 5 SPACES @ 80' = 400'; 6 DIFFUSER UNITS (AMP2F) EACH SIDE = 12 DIFFUSER UNITS

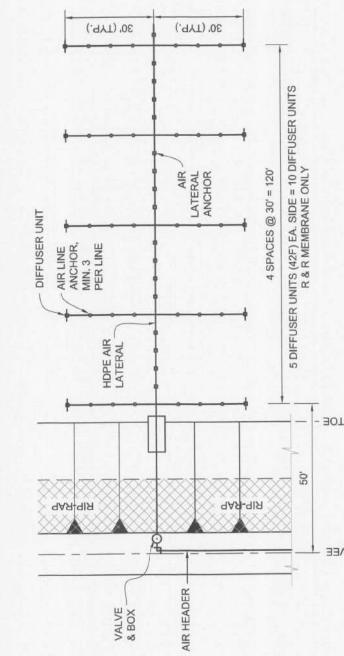
JOB NO. 1820		SHEET NO. 24	
<b>WASTEWATER TREATMENT FACILITY IMPROVEMENTS</b> <b>MALVERN WATER WORKS</b> AERATED LAGOONS PROPOSED AIR LATERAL PLAN LATERALS 12, 13, 14, 15, 16, 17, 18 & 19			
<b>CRIST ENGINEERS, INC.</b> CONSULTING ENGINEERS 200 EXECUTIVE COURT MALVERN, AR 72056 TELEPHONE: (501) 584-1552 FAX: (501) 584-1552 WWW.CRISTENGINEERS.COM		DESIGNED: LBP DRAFTED: ROW CHECKED: LBP DATE: JUL 2019	
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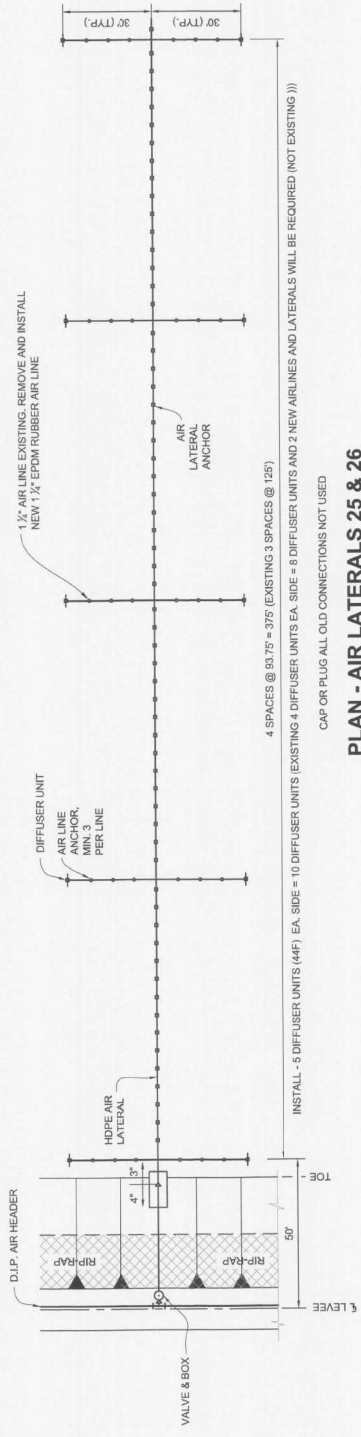




**PLAN - AIR LATERAL 27**  
SCALE: 1" = 20'

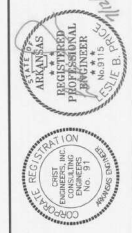


**PLAN - AIR LATERAL 28**  
SCALE: 1" = 20'



**PLAN - AIR LATERALS 25 & 26**  
SCALE: 1" = 20'

CAP OR PLUG ALL OLD CONNECTIONS NOT USED



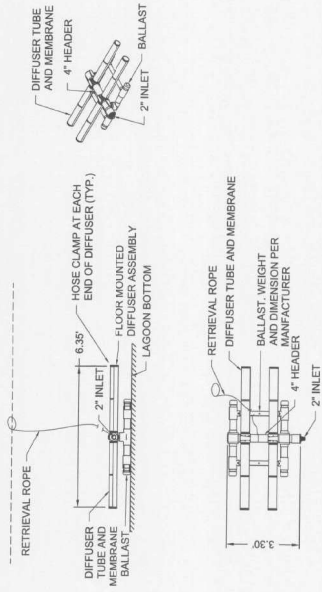
DESIGNED:	LBP
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DATE:	JUL 2019

THIS LINE MEASURES 1" WHEN PLOTTED FULL SIZE  
SCALE: 1" = 20'

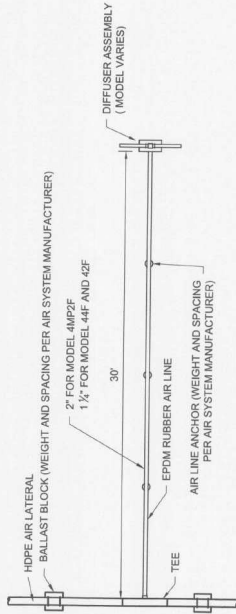
REV.	DATE	BY	CHKD	REMARKS

**Crist ENGINEERS, INC.**  
CONSULTING ENGINEERS  
205 EXECUTIVE COURT  
MALVERN, ARKANSAS 72066  
TELEPHONE: (501) 684-1522  
FAX: (501) 684-1522  
WWW.CRISTENGINEERS.COM

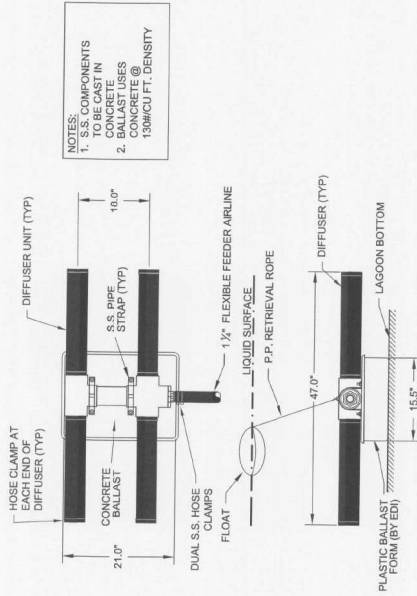
MALVERN, ARKANSAS  
**WASTEWATER TREATMENT FACILITY IMPROVEMENTS**  
MALVERN WATER WORKS  
AERATED LAGOONS  
PROPOSED AIR LATERAL PLAN  
LATERALS 25, 26, 27, 28



**PLAN AND ELEVATION - 4MP2F DIFFUSER ASSEMBLY (UNIT)**  
N.T.S.

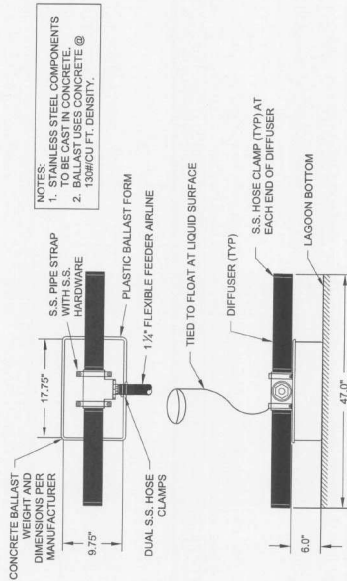


**DETAIL - DIFFUSER ASSEMBLY / AIRLINE**  
N.T.S.



**NOTES:**  
1. S.S. COMPONENTS TO BE CAST IN CONCRETE @ 130#/CU FT. DENSITY  
2. BALLAST USES CONCRETE @ 130#/CU FT. DENSITY

**PLAN AND ELEVATION - 44F-18 DIFFUSER ASSEMBLY (UNIT)**  
N.T.S.



**NOTES:**  
1. STAINLESS STEEL COMPONENTS TO BE CAST IN CONCRETE @ 130#/CU FT. DENSITY.  
2. BALLAST USES CONCRETE @ 130#/CU FT. DENSITY.

**PLAN AND ELEVATION - 42F DIFFUSER ASSEMBLY (UNIT)**  
N.T.S.

REV. NO.	DATE	DRWN	CHD	REMARKS

REGISTERED PROFESSIONAL ENGINEER  
STATE OF ARKANSAS  
No. 9115  
JUL 15 2019

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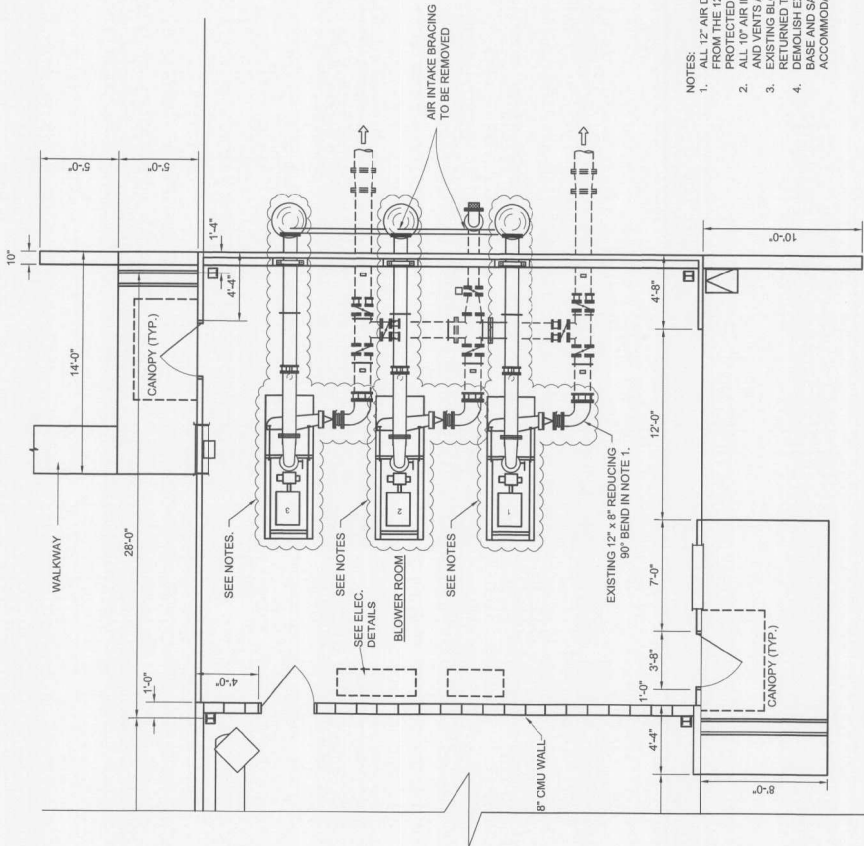
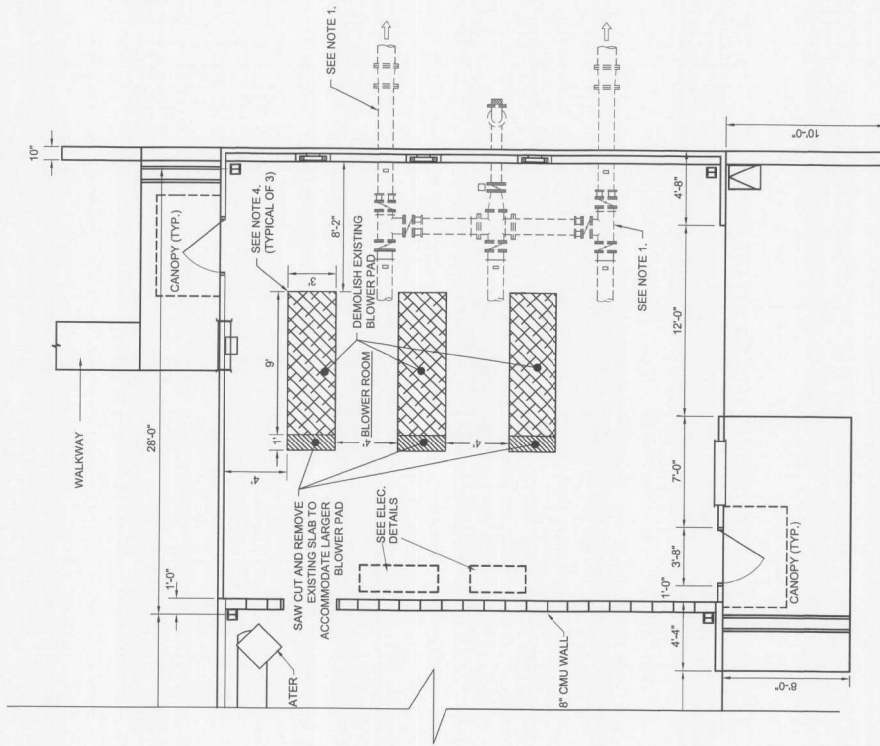
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CHECKED: LBP  
DATE: JUL 2019



**CRIST ENGINEERS, INC.**  
CONSULTING ENGINEERS  
202 EXECUTIVE COURT  
MILVERN, ARKANSAS 72560  
PHONE: (501) 664-1522  
FAX: (501) 664-8578  
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MILVERN, ARKANSAS  
**WASTEWATER TREATMENT FACILITY IMPROVEMENTS**  
MALVERN WATER WORKS  
AERATED LAGOONS  
AIRLINES & DIFFUSER ASSEMBLY DETAILS









- NOTES:
1. ALL 12" AIR DISCHARGE PIPING DOWNSTREAM FROM THE 12"x8" 90° REDUCING BEND IS TO BE PROTECTED AND REUSED.
  2. ALL 10" AIR INTAKE PIPING, SUPPORT BRACES, AND BRACING SHALL BE DEMOLISHED AND RETURNED TO THE OWNER.
  3. ALL EXISTING CONCRETE EQUIPMENT BASE AND SAW CUT ADDITIONAL 12" OF SLAB TO ACCOMMODATE THE LARGER BLOWERS.

**PLAN - AERATION BLOWER EQUIPMENT BASE DEMO**  
SCALE: 1/4" = 1'-0"

**PLAN - AERATION BLOWER EQUIPMENT DEMO**  
SCALE: 1/4" = 1'-0"

JOB NO. 1820	SHEET NO. 28	MALVERN, ARKANSAS <b>WASTEWATER TREATMENT FACILITY IMPROVEMENTS</b> MALVERN WATER WORKS OPERATIONS BUILDING MODIFICATIONS AERATION BLOWERS DEMOLITION PLAN	 <b>CRIST ENGINEERS, INC.</b> CONSULTING ENGINEERS 205 EXECUTIVE COURT LITTLE ROCK, ARKANSAS 72205 TELEPHONE: (501) 664-1522 WWW.CRISTENGINEERS.COM	DESIGNED: LBP	DATE: JUL 2019
				DRAFTED: MAB	CHECKED: LBP
					
REV. NO.	DATE	DRWN	CHKD	REMARKS	







CONTRACTOR SHALL VERIFY ALL DIMENSIONS BEFORE STARTING WORK AND SHALL IMMEDIATELY NOTIFY THE ENGINEER OF ANY DISCREPANCIES. CONTRACTOR SHALL BE RESPONSIBLE FOR FIELD VERIFYING ALL EXISTING CONDITIONS INCLUDING LOCATION AND DIMENSIONS OF ALL EXISTING UTILITIES AND STRUCTURES OR OTHERWISE INDICATED ON THE DRAWINGS. TYPICAL DETAILS SHALL APPLY EVEN THOUGH NOT REFERENCED AT SPECIFIC LOCATIONS ON DRAWINGS.

- CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE LOCATION OF ALL EXISTING PIPING AND UTILITIES IN THE CONSTRUCTION AREA. THE CONTRACTOR SHALL PROPERLY RELOCATE CONFLICTING EXISTING UTILITIES FROM THE WORK AREA TO AVOID CONFLICT. AT NO ADDITIONAL COST TO THE OWNER.
- ALL PIPE 12" AND LARGER SHALL HAVE A MINIMUM COVER OF 30" UNLESS OTHERWISE SHOWN ON THE DRAWINGS. ALL PIPE SMALLER THAN 12" SHALL HAVE A MINIMUM COVER UNLESS OTHERWISE NOTED OTHERWISE. PROPOSED EXISTING PIPING SHALL BE PROTECTED AND NOT REMOVED UNLESS MINOR REVISIONS ARE NECESSARY TO MISS EXISTING PIPES, STRUCTURES, ETC. CONTRACTOR SHALL BE RESPONSIBLE FOR FURNISHING ALL FITTINGS AND ADAPTERS REQUIRED TO MAKE THE ROUTING CHANGES AT NO ADDITIONAL COST TO OWNER.
- EXISTING FACILITY AND UTILITY INFORMATION SHOWN ON THE DRAWINGS IS FOR INFORMATION ONLY. THE CONTRACTOR SHALL VERIFY THE LOCATION, DEPTH, AND TYPE OF ALL UTILITIES AND UTILITIES NOT SHOWN OR NOT IN THE LOCATION SHOWN.
- THE CONTRACTOR SHALL TAKE ALL PRECAUTIONARY MEASURES NECESSARY TO PROTECT FROM DAMAGING ANY EXISTING FACILITIES AND UTILITIES. ANY FACILITIES OR UTILITIES DAMAGED BY THE CONTRACTOR'S OPERATIONS, EMPLOYEES, OR SUB-CONTRACTORS SHALL BE EXPEDITIOUSLY REPAIRED, REPLACED, OR RECONSTRUCTED TO THE ORIGINAL OR BETTER CONDITION AT THE CONTRACTOR'S EXPENSE WITHOUT ADDITIONAL COMPENSATION.
- CONNECTIONS TO EXISTING PIPES, EQUIPMENT, FITTINGS, UTILITIES, ETC. AS REQUIRED AND SHALL PROVIDE ALL CONNECTIONS, PROVIDE ALL SUPPORTS OR RESTRAINTS REQUIRED FOR A RIGIDLY SUPPORTED AND COMPLETE WORKING SYSTEM.
- ADJUST ALL VALVE BOXES, PULL BOXES, AND MANHOLES TO MATCH EXISTING CONDITIONS. ALL PIPING SHALL BE ABANDONED OR AS ABANDONED PREVIOUSLY, IF NOT LONGER IN SERVICE. LINES, REQUIRED UTILITIES, AND EQUIPMENT (EX) SHALL BE MAINTAINED AND IN OPERATION UNTIL NO LONGER REQUIRED.
- ALL EXISTING PIPES TO BE ABANDONED IN-PLACE OR REMOVED MAY NOT BE REUSED FOR OTHER PURPOSES. ALL EXISTING PIPING SHALL BE REMOVED UNTIL COMPLETION OF OTHER PHASES OF WORK AND BE CONFIDENT WITH NEW PIPING. TEMPORARILY RELOCATE PIPING AS REQUIRED TO MAINTAIN SERVICE BY THE PLANT. THE RELOCATE PIPING SHALL BE THE FIRST 3 FT. OF ALL PIPE OPEN ENDS WAIVED FLOWABLE FILL. THEN PLUG TO BE WATERTIGHT, UNLESS DIRECTED OTHERWISE.
- CONTRACTOR SHALL VERIFY THE EXISTING PIPING IS REQUIRED TO MISS THE PROPOSED STRUCTURE. ALL EXISTING PIPING SHALL BE PLACED INTO SERVICE IN-SERVICE UNTIL NEW PIPING IS READY TO BE PLACED INTO SERVICE. DOWNTIME SHALL BE A MAXIMUM OF 2 HOURS, UNLESS OTHERWISE DIRECTED.
- ALL SIDEWALK TO BE CONCRETE AND 3'-0" WIDE, UNLESS SHOWN OTHERWISE.
- REPAIR, PLUMBING, AND ELECTRICAL EQUIPMENT SUPPORTS, ANCHORAGE, OPENINGS, RECESSES, AND LEVELS NOT SHOWN ON THE DRAWINGS, THAT ARE REQUIRED BY THE CONTRACT TO COMPLETE THE WORK, SHALL BE PROVIDED PRIOR TO CASTING CONCRETE.

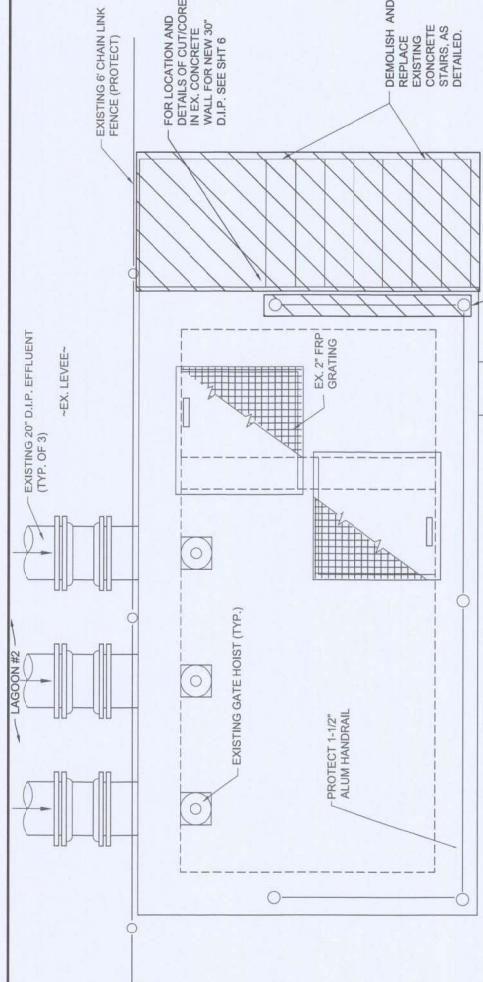
DEMOLITION NOTES:

- GENERAL DEMOLITION NOTES APPLY TO ALL DEMOLITION WORK WITHIN THE DRAWINGS.
- WHERE DEMOLITION REQUIRES THE REMOVAL OF CONCRETE AND / OR MISCELLANEOUS MATERIALS 1 FT. BELOW THE PROPOSED FINISHED GRADE, CONTRACTOR SHALL BACKFILL AND COMPACT WITH SELECT FILL TO:

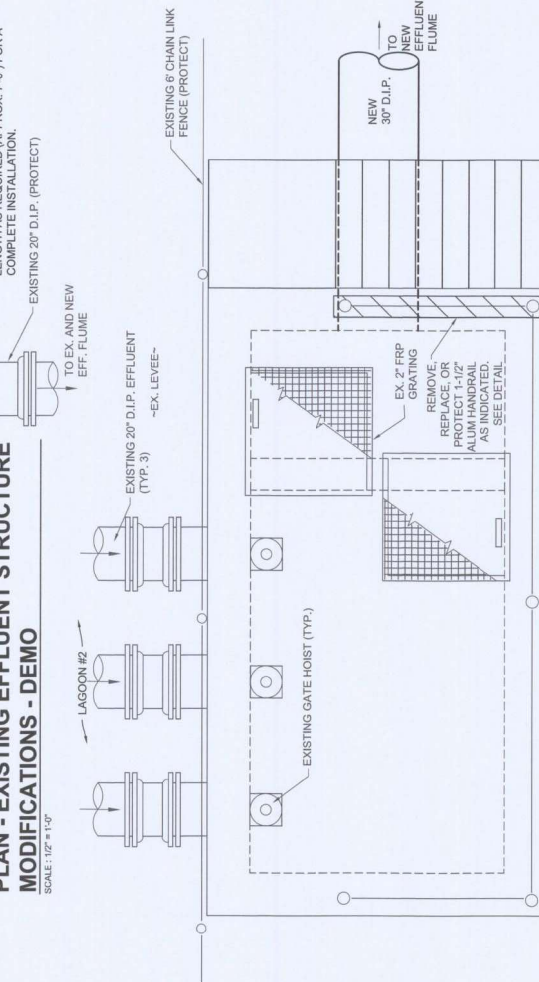
- AREA WITH PROPOSED STRUCTURE TO PROPOSED GRADE UNLESS OTHERWISE NOTED.
- GRADE WITH PROPOSED STRUCTURE WITHIN 6 INCHES OF FINAL GRADE AND FINISHED PER CIVIL DRAWINGS.

CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVING, HULLING, CONTAINMENT, DISPOSAL, AND ANY ASSOCIATED FEES FOR THE PROPER DISPOSAL OF THE DEMOLISHED STRUCTURES AND FACILITIES. ALL BROKEN MATERIALS SHALL BE REMOVED FROM THE SITE AND SHALL NOT BE USED AS BACKFILL.

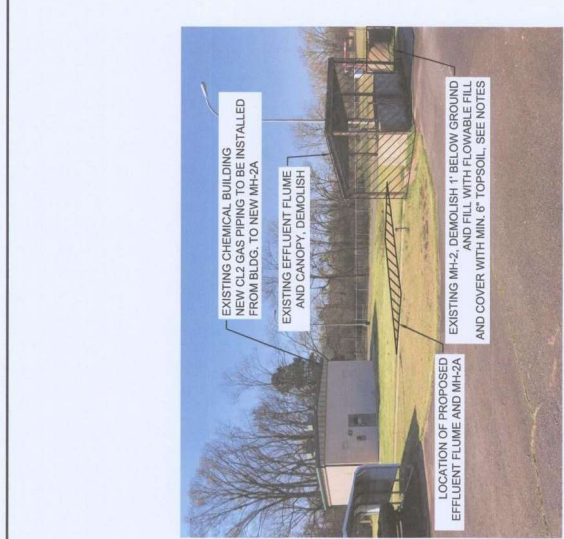
CONTRACTOR SHALL COORDINATE THE SHUTDOWN OF ALL OR ANY EQUIPMENT, POWER, PROCESS FLOW, OR ELECTRICAL EQUIPMENT WITH THE OWNER AND ENGINEER.



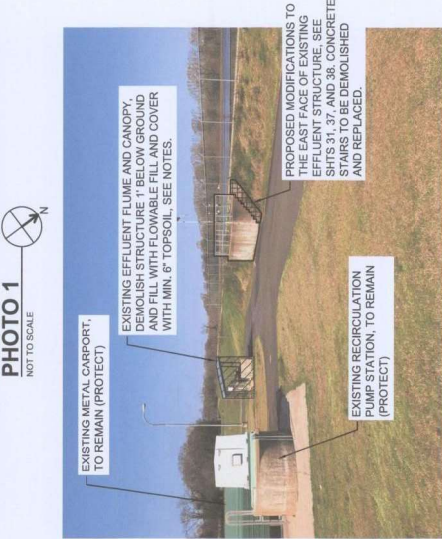
**PLAN - EXISTING EFFLUENT STRUCTURE MODIFICATIONS - DEMO**  
SCALE: 1/2" = 1'-0"



**PLAN - EXISTING EFFLUENT STRUCTURE MODIFICATIONS - DECK**  
SCALE: 1/2" = 1'-0"



**PHOTO 1**  
NOT TO SCALE



**PHOTO 2**  
NOT TO SCALE

REV. NO.	DATE	BY	CHKD	REMARKS

**CRIST ENGINEERS, INC.**  
CONSULTING ENGINEERS  
206 EXECUTIVE COURT  
LITTLE ROCK, ARKANSAS 72205  
TELEPHONE: (501) 664-1828  
WWW.CRISTENGINEERS.COM

**CRIST ENGINEERS**

DESIGNED: SMR	DATE: JUL 2019
DRAFTED: MMB	
CHECKED: LBP	

THIS LINE MEASURES 1" WHEN PLOTTED FULL SIZE

ARIZONA REGISTERED PROFESSIONAL ENGINEER  
No. 9115  
DATE: 12/15/2015

ARIZONA REGISTERED PROFESSIONAL ENGINEER  
No. 91  
DATE: 07/15/2019





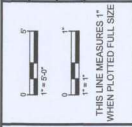


**WASTEWATER TREATMENT FACILITY IMPROVEMENTS**  
**MALVERN WATER WORKS**  
EFFLUENT FLUME AND EFFLUENT STRUCTURE MODIFICATIONS  
ENLARGED SITE AND YARD PIPING PLAN

**CRIST ENGINEERS, INC.**  
CONSULTING ENGINEERS  
205 EXECUTIVE COURT  
LITTLE ROCK, ARKANSAS 72205  
TELEPHONE: (501) 664-1522  
WWW.CRISTENGINEERS.COM

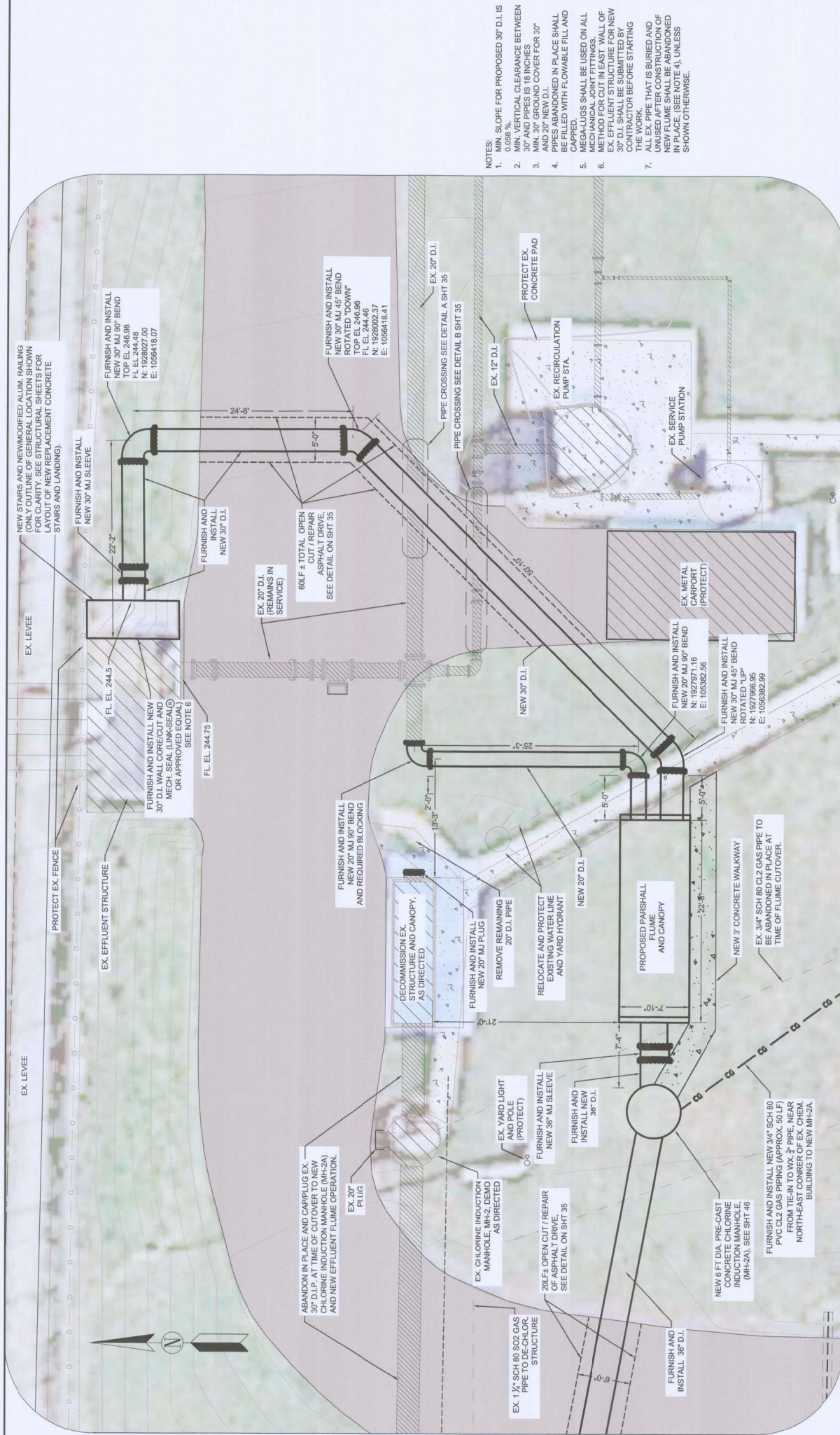


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DATE: JUL 2019

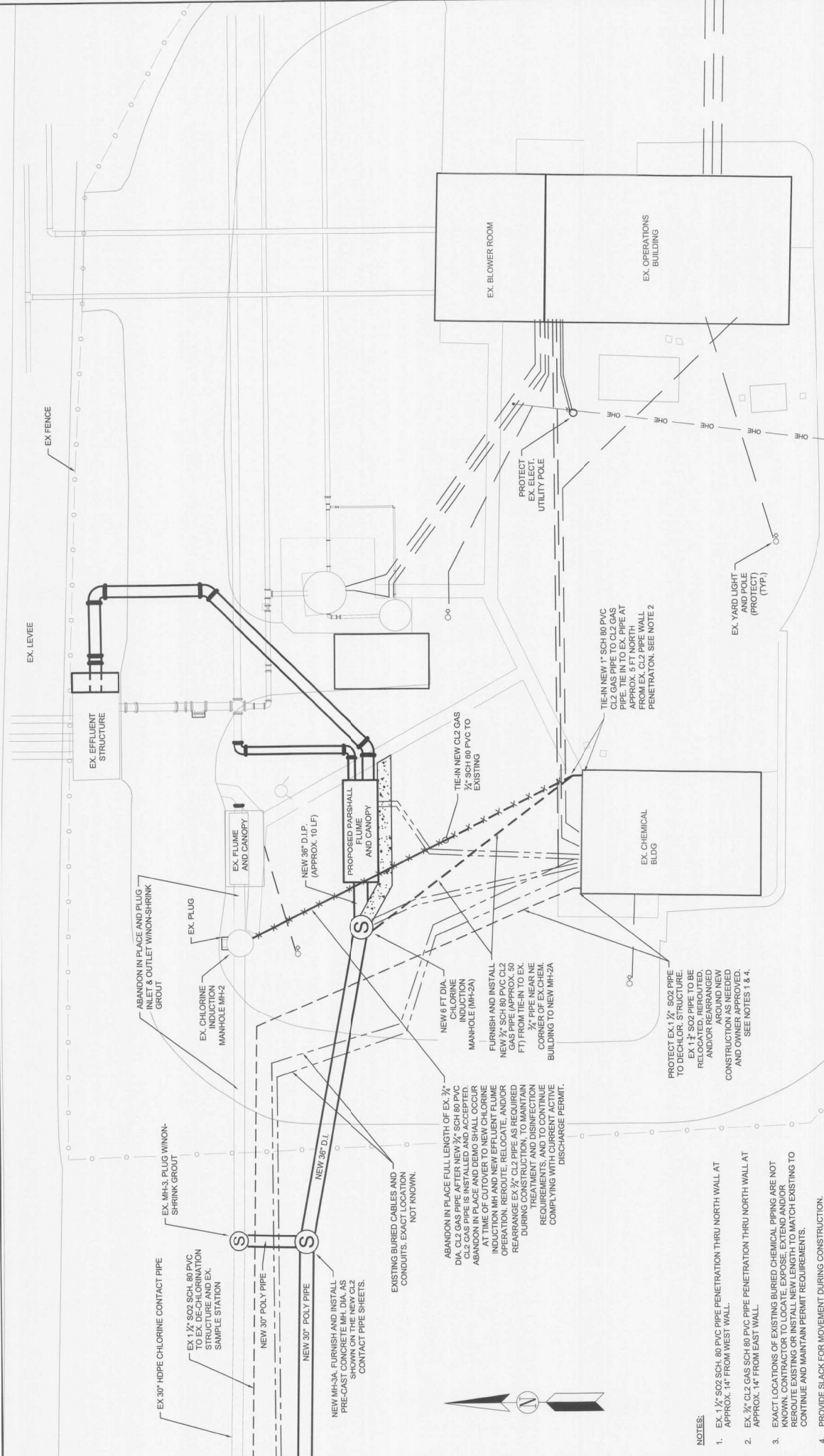


REV. NO.	DATE	DRWN/CHD	REMARKS

REV. NO.	DATE	DRWN/CHD	REMARKS



- NOTES:
- MIN. SLOPE FOR PROPOSED 30" D.I. IS 1/8" PER FOOT.
  - MIN. VERTICAL CLEARANCE BETWEEN 30" AND PIPES IS 18 INCHES.
  - MIN. 30" GROUND COVER FOR 30" AND 20" NEW D.I.
  - PIPES ABANDONED IN PLACE SHALL BE CAPPED WITH FLOWABLE FILL AND MEAGALLUGS SHALL BE USED ON ALL MECHANICAL JOINT FITTINGS.
  - METHOD FOR CUT IN EAST WALL OF EX. EFFLUENT STRUCTURE FOR NEW EX. EFFLUENT FLUME SHALL BE ABANDONED AFTER CONSTRUCTION OF NEW FLUME SHALL BE ABANDONED TO CONTRACTOR BEFORE STARTING THE WORK.
  - ALL EX. PIPE THAT IS BURIED AND UNUSED AFTER CONSTRUCTION OF NEW FLUME SHALL BE ABANDONED TO CONTRACTOR BEFORE STARTING THE WORK OTHERWISE.



**CRIST ENGINEERS, INC.**  
CONSULTING ENGINEERS

**CRIST ENGINEERS**

MALVERN, ARKANSAS  
WASTEWATER TREATMENT FACILITY IMPROVEMENTS  
MALVERN WATER WORKS

EFFLUENT FLUME & EFFLUENT STRUCTURE MODIFICATIONS  
CHEMICAL DISINFECTION YARD PIPING PLAN - PROPOSED

JOB NO. 1820  
SHEET NO. 34

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REGISTERED PROFESSIONAL ENGINEER  
STATE OF ARKANSAS  
No. 4226  
RICHARD W. CRIST

CRIST ENGINEERS, INC.  
LITTLE ROCK, ARKANSAS 72205  
PHONE: (501) 664-1522  
FAX: (501) 664-6871  
WWW.CRISTENGINEERS.COM

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- NOTES:**
- EX. 1 1/2" SO2 SCH. 80 PVC PIPE PENETRATION THRU NORTH WALL AT APPROX. 14' FROM WEST WALL.
  - EX. 3/4" CL2 GAS SCH 80 PVC PIPE PENETRATION THRU NORTH WALL AT APPROX. 14' FROM EAST WALL.
  - EXACT LOCATIONS OF EXISTING BURIED CHEMICAL PIPING ARE NOT KNOWN. CONTRACTOR TO VERIFY EXISTING PIPE LENGTH TO MATCH EXISTING TO CONTINUE AND MAINTAIN PERMIT REQUIREMENTS.
  - PROVIDE SLACK FOR MOVEMENT DURING CONSTRUCTION.
  - EXISTING AND NEW CL2 GAS AND SO2 GAS LINES ARE ALL SCH 80 PVC.

ABANDON IN PLACE FULL LENGTH OF EX. 3/4" DIA. CL2 GAS PIPE AFTER NEW 3/4" SCH 80 PVC CL2 GAS PIPE IS INSTALLED AND SHALL OCCUR AT TIME OF CUTOVER TO NEW CHLORINE INDUCTION MH AND NEW EFFLUENT FLUME OPERATION. REROUTE, RELOCATE, AND/OR REARRANGE EX. 3/4" CL2 PIPE AS REQUIRED DURING CONSTRUCTION, TO MAINTAIN PERMIT REQUIREMENTS, AND TO CONTINUE COMPLYING WITH CURRENT ACTIVE DISCHARGE PERMIT.

PROTECT EX. 1 1/2" SO2 PIPE TO EFFLUENT STRUCTURE EX. 1 1/2" SO2 PIPE TO BE RELOCATED, REROUTED, AND/OR REARRANGED AROUND NEW CONSTRUCTION AS NEEDED AND O.D. SEE NOTES 1 & 4.

FURNISH AND INSTALL NEW 3/4" SCH 80 PVC CL2 GAS PIPE (NEAR EX. 3/4" PIPE NEAR CORNER OF EX. CHEM. BLDG.) TO NEW MH-2A

NEW 6 FT DIA. DUCTILE IRON CHLORINE INDUCTION MANHOLE (MH-2A)

PROPOSED PARSHALL FLUME AND CANOPY

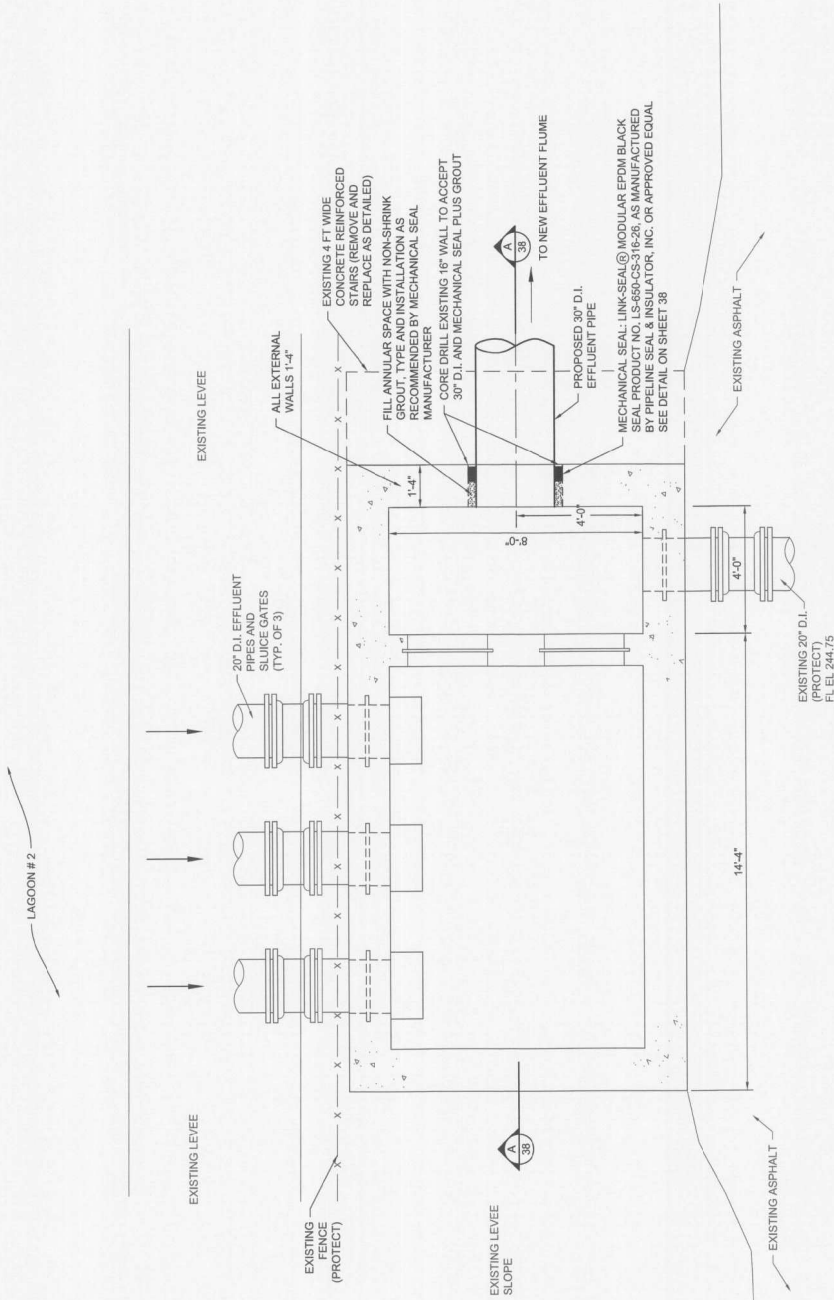
EX. CHLORINE INDUCTION MANHOLE MH-2

EX. EFFLUENT STRUCTURE









**PLAN - EXISTING EFFLUENT STRUCTURE MODIFICATIONS - PROPOSED**

SCALE: 1/2" = 1'-0"

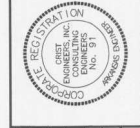
- NOTES:
1. REPAIR ANY CONCRETE OR ASPHALT (PER DETAILS) THAT ARE DAMAGED BY THE CONTRACTOR DURING CONSTRUCTION. AT NO TIME SHALL THE CONTRACTOR BE RESPONSIBLE FOR REPAIRING EX CONCRETE STAIRS (TO BE REPLACED) NOT SHOWN IN DETAIL FOR CLARITY. SEE STRUCTURAL SHEETS.
  - 2.

JOB NO. 1820  
SHEET NO.

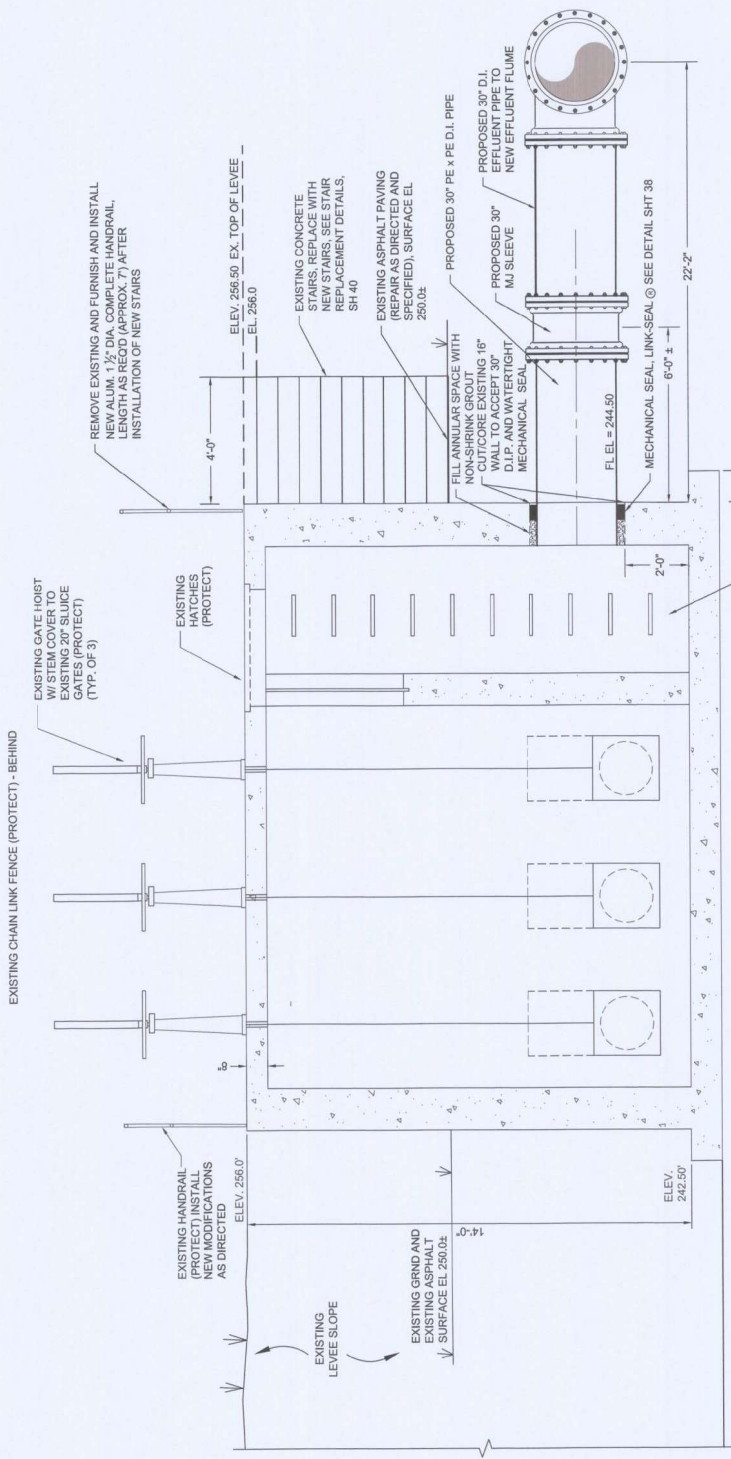
MALVERN, ARKANSAS  
**WASTEWATER TREATMENT FACILITY IMPROVEMENTS**  
**MALVERN WATER WORKS**  
EXISTING EFFLUENT STRUCTURE MODIFICATIONS  
MODIFICATION DETAILS

**CRIST ENGINEERS, INC.**  
CONSULTING ENGINEERS  
  
205 EXECUTIVE COURT  
LITTLE ROCK, ARKANSAS 72095  
TEL: (501) 664-1522  
FAX: (501) 664-8278  
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REV. NO.	DATE	BY	CHKD	REMARKS



**SECTION - EXISTING EFFLUENT STRUCTURE MODIFICATIONS - PROPOSED**

SCALE: 1/2" = 1'-0"

- NOTES:
- CORING/CUTTING PLAN FOR EX. 16" THICK CONCRETE WALL SHALL BE AT CONTRACTORS DISCRETION AND MAY BE A CIRCULAR OR SQUARE CUT. METHOD AND WATER TIGHT REPAIRS SHALL BE SUBMITTED TO THE ENGINEER PRIOR TO START OF WORK.
  - EXISTING ASPHALT SURFACE SHALL BE REMOVED TO CORE DRILL AND INSTALL NEW 30" D.I.P.

REV. NO.	DATE	BY	CHKD	REMARKS

DESIGNED: SMR  
 DRAFTED: MAB  
 CHECKED: LBP  
 DATE: JUL 2019

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1" = 1'

STATE OF ARKANSAS  
 REGISTERED PROFESSIONAL ENGINEER  
 No. 5119  
 JEFFREY B. BROWN

CRIST ENGINEERS, INC.  
 REGISTERED PROFESSIONAL ENGINEERING FIRM  
 No. 91

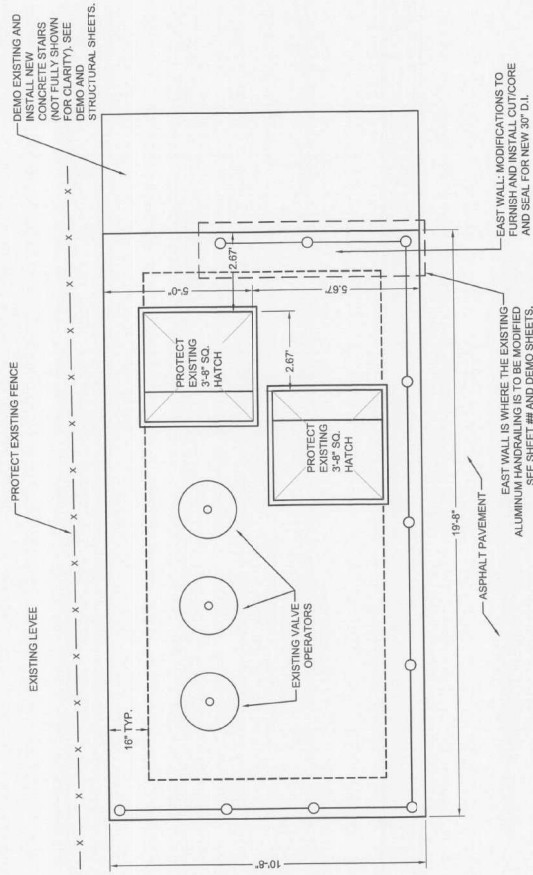
**CRIST ENGINEERS, INC.**  
 CONSULTING ENGINEERS

**Crist ENGINEERS**

266 EXECUTIVE COURT  
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 PHONE: (501) 664-1652  
 FAX: (501) 664-5031  
 WWW.CRISTENGINEERS.COM

MALVERN, ARKANSAS  
**WASTEWATER TREATMENT FACILITY IMPROVEMENTS**  
**MALVERN WATER WORKS**  
 EXISTING EFFLUENT STRUCTURE MODIFICATIONS  
 MODIFICATION DETAILS





**PLAN - EXISTING EFFLUENT STRUCTURE DECK**

SCALE: 1/2" = 1'-0"

REV. NO.	DATE	BY	CHKD.	REMARKS

**CRIST ENGINEERS, INC.**  
CONSULTING ENGINEERS  
205 EXECUTIVE COURT  
LITTLE ROCK, ARKANSAS 72205  
TEL: 501.684.1522  
FAX: 501.684.1523  
WWW.CRISTENGINEERS.COM

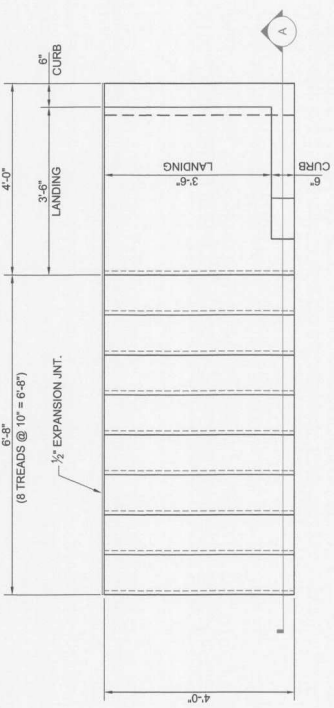


DESIGNED:	MER
DRAFTED:	GAC
CHECKED:	LBP
DATE:	JUL 2019

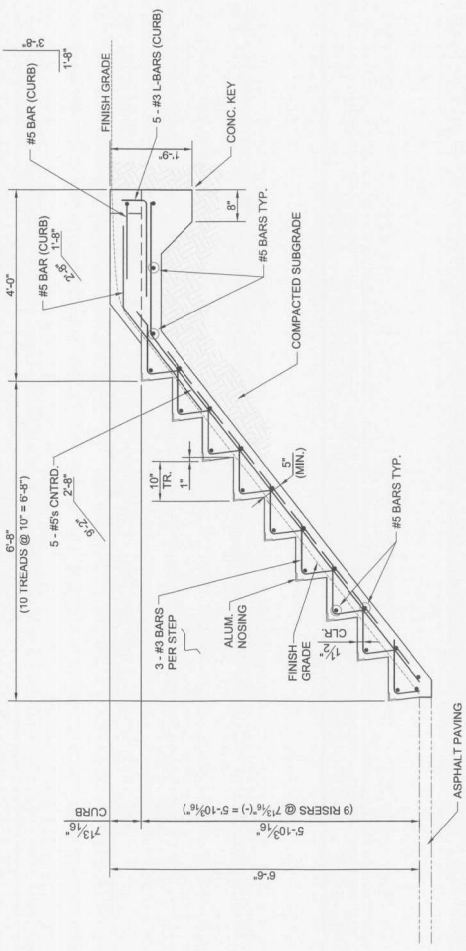
THIS LINE MEASURES 1" = 1'-0"  
WHEN PLOTTED FULL SIZE



REV. NO.	DATE	DRWN/CHKD	REMARKS

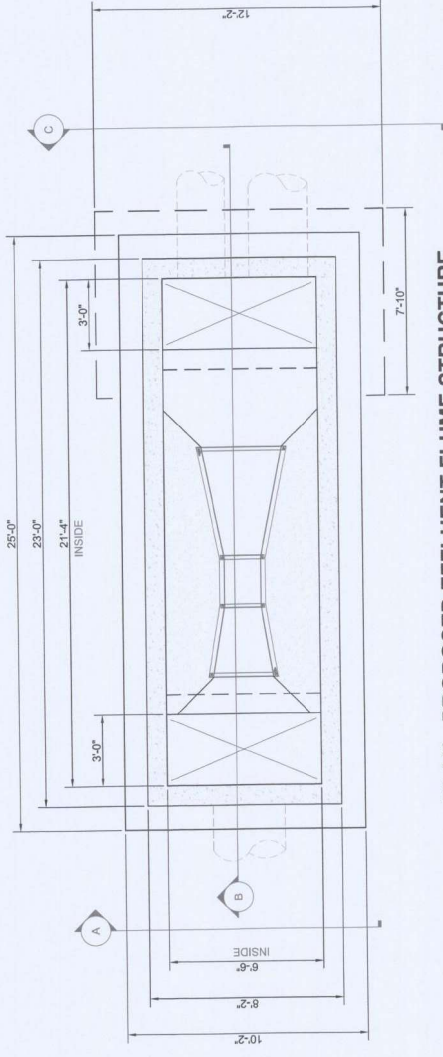


**REPLACEMENT STAIR PLAN**  
3/4" = 1'-0"



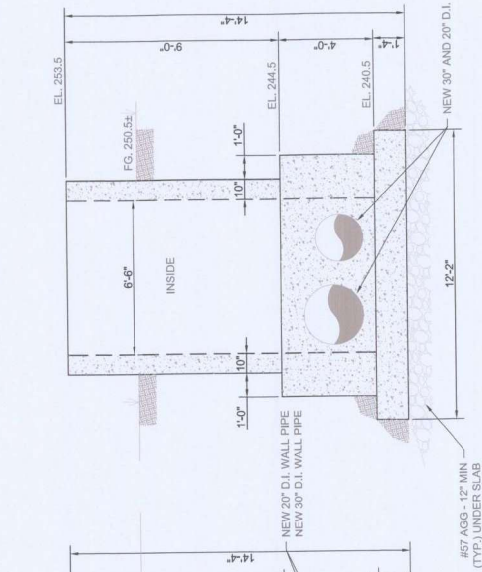
**SECTION THRU REPLACEMENT STAIR**  
3/4" = 1'-0"



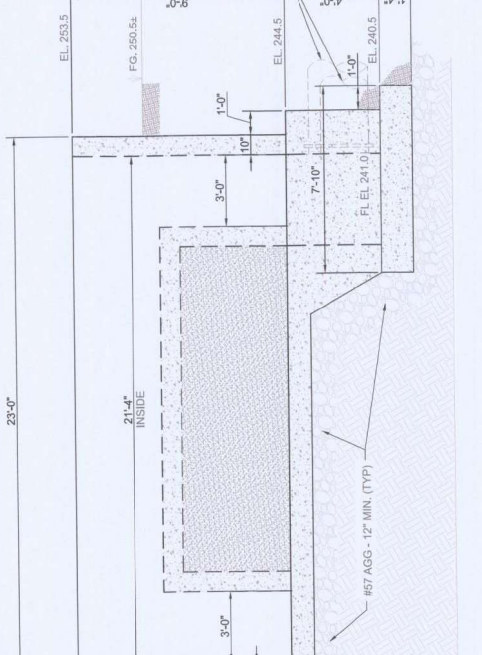


**PLAN - PROPOSED EFFLUENT FLUME STRUCTURE**  
3/8" = 1'-0"

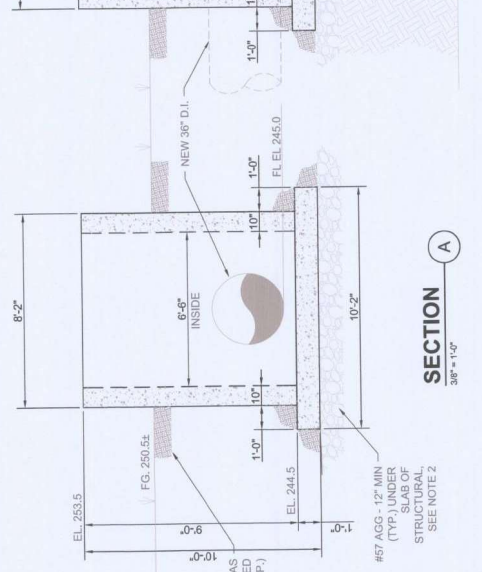
NOTES:  
1. WOOD CANOPY (NEW) TO BE BUILT OVER NEW EFFLUENT FLUME. SEE STRUCTURAL SHEETS FOR CANOPY DESIGN DETAILS.



**SECTION A**  
3/8" = 1'-0"



**SECTION B**  
3/8" = 1'-0"



**SECTION C**  
3/8" = 1'-0"

JOB NO. 1820  
SHEET NO. 42

MALVERN, ARKANSAS  
**WASTEWATER TREATMENT FACILITY IMPROVEMENTS**  
MALVERN WATER WORKS  
PROPOSED EFFLUENT FLUME  
STRUCTURAL GENERAL ARRANGEMENTS

**CRIST ENGINEERS, INC.**  
CONSULTING ENGINEERS  
208 EXECUTIVE COURT  
LITTLE ROCK, AR 72206  
TEL: (501) 664-6562  
FAX: (501) 664-6579  
WWW.CRISTENGINEERS.COM



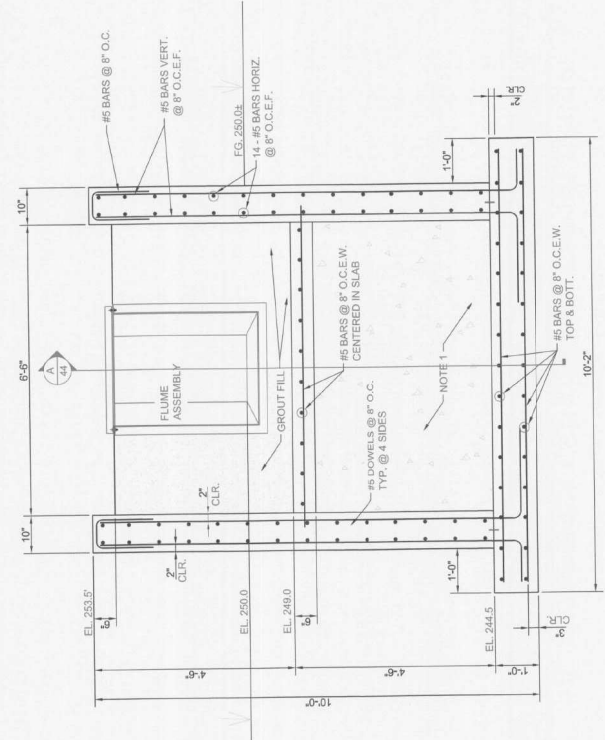
DESIGNED: LBP  
DRAFTED: MAB  
CHECKED: LBP  
DATE: JUL 2019

THIS LINE MEASURES 1" = 1'-0" WHEN PLOTTED FULL SIZE



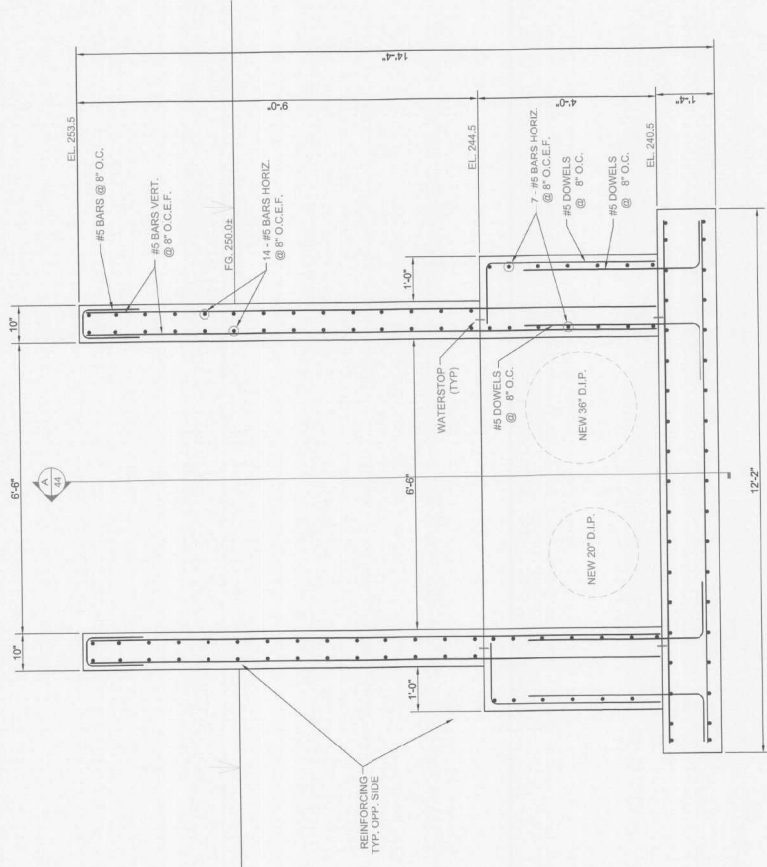
REV.	DATE	DRWN	CHKD	REMARKS





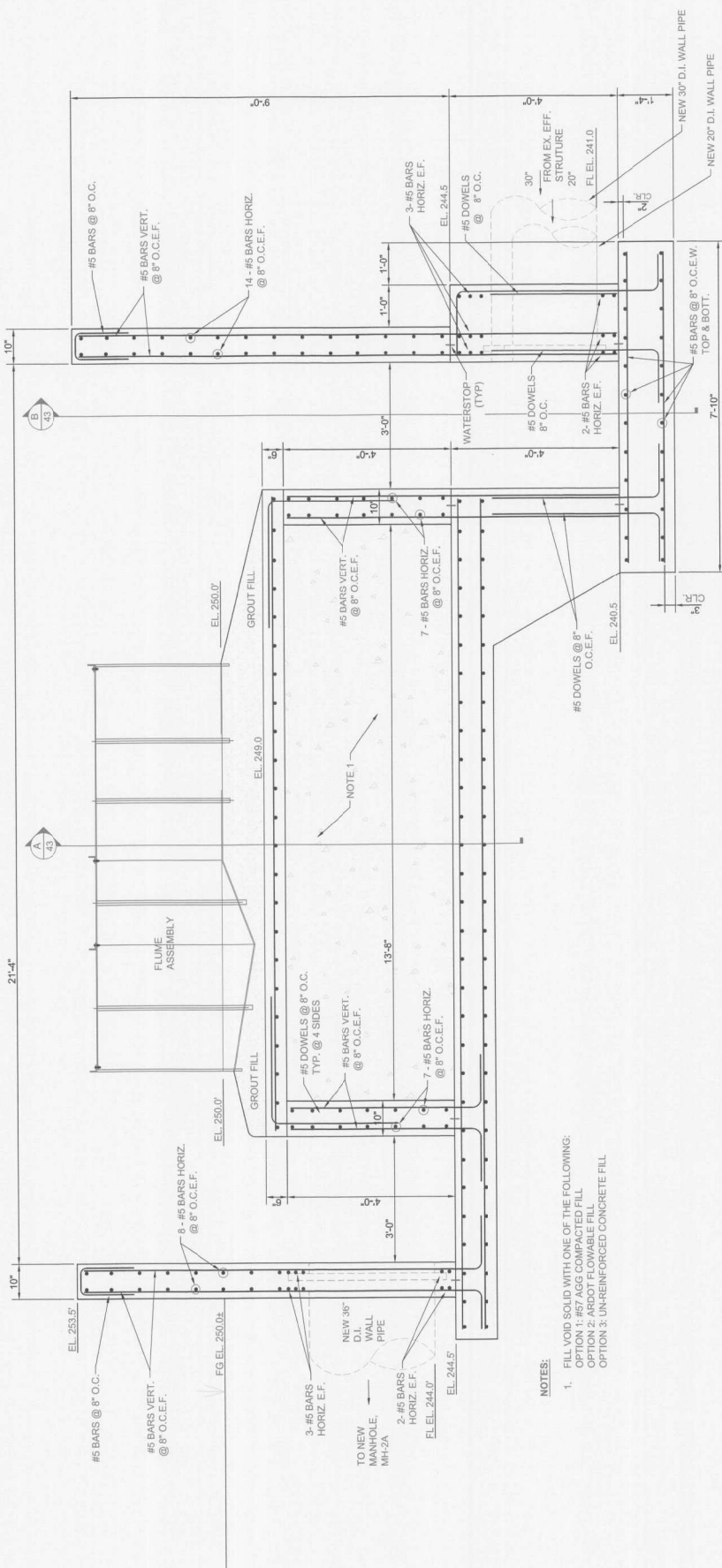
**SECTION - PROPOSED EFFLUENT FLUME STRUCTURAL REBAR (WEST END)** A  
3/8" = 1'-0"

- NOTES:  
 1. FILL VOID SOLID WITH ONE OF THE FOLLOWING:  
 OPTION 1: UNREINFORCED CONCRETE FILL  
 OPTION 2: GROUT FLOWABLE FILL  
 OPTION 3: UNREINFORCED CONCRETE FILL



**SECTION - PROPOSED EFFLUENT FLUME STRUCTURAL REBAR (EAST END)** B  
3/8" = 1'-0"

JOB NO. 1820		MALVERN, ARKANSAS	
SHEET NO. 43		WASTEWATER TREATMENT FACILITY IMPROVEMENTS MALVERN WATER WORKS	
DESIGNED: MER		CRIST ENGINEERS, INC.	
DRAWN: MAB		CONSULTING ENGINEERS	
CHECKED: LBP		1000 E. BROADWAY, SUITE 200 MALVERN, ARKANSAS 72065 TELEPHONE: (801) 864-1522 WWW.CRISTENGINEERS.COM	
DATE: JUL 2019			
REMARKS		PROPOSED EFFLUENT FLUME STRUCTURAL REBAR SECTIONS 1 OF 2	
REV.	DATE	DRAWN	CHKD



- NOTES:**
- FILL VOID SOLID WITH ONE OF THE FOLLOWING:  
 OPTION 1: #57 AGG COMPACTED FILL  
 OPTION 2: ARDOTT FLOWABLE FILL  
 OPTION 3: UN-REINFORCED CONCRETE FILL

**SECTION - PROPOSED EFFLUENT FLUME - STRUCTURAL REBAR**

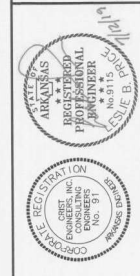
WASTEWATER TREATMENT FACILITY IMPROVEMENTS  
MALVERN WATER WORKS

CRIST ENGINEERS, INC.  
CONSULTING ENGINEERS  
208 EXECUTIVE COURT  
LITTLE ROCK, ARKANSAS 7206  
TEL: (501) 684-1622  
FAX: (501) 684-5001  
WWW.CRISTENGINEERS.COM

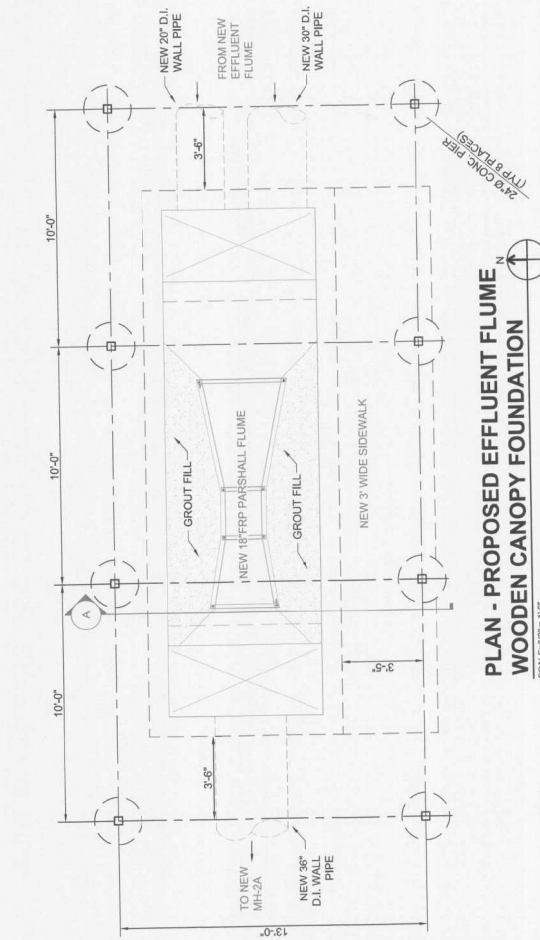


DESIGNED:	MER
DRAFTED:	MAB
CHECKED:	LBP
DATE:	JUL 2019

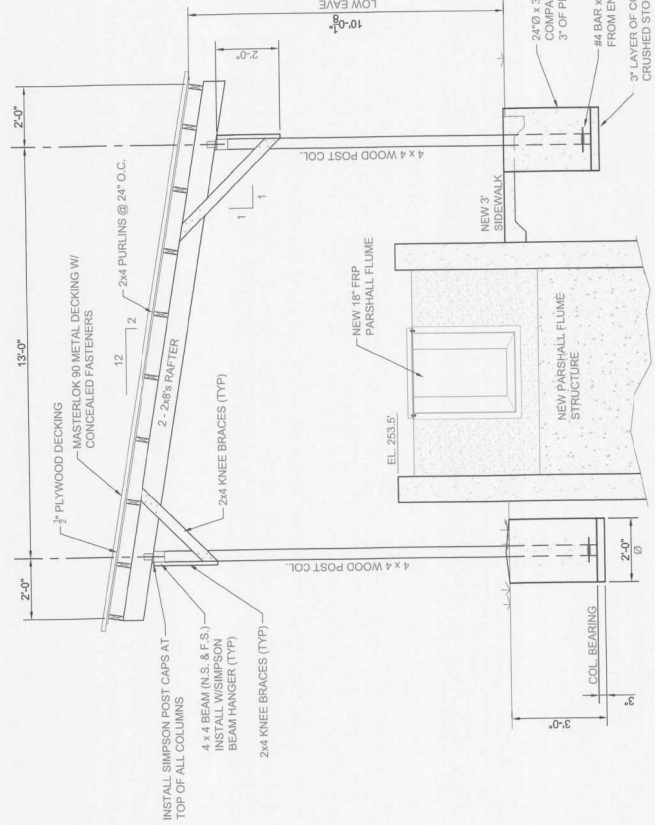
THIS LINE MEASURES 1" WHEN PLOTTED FULL SIZE



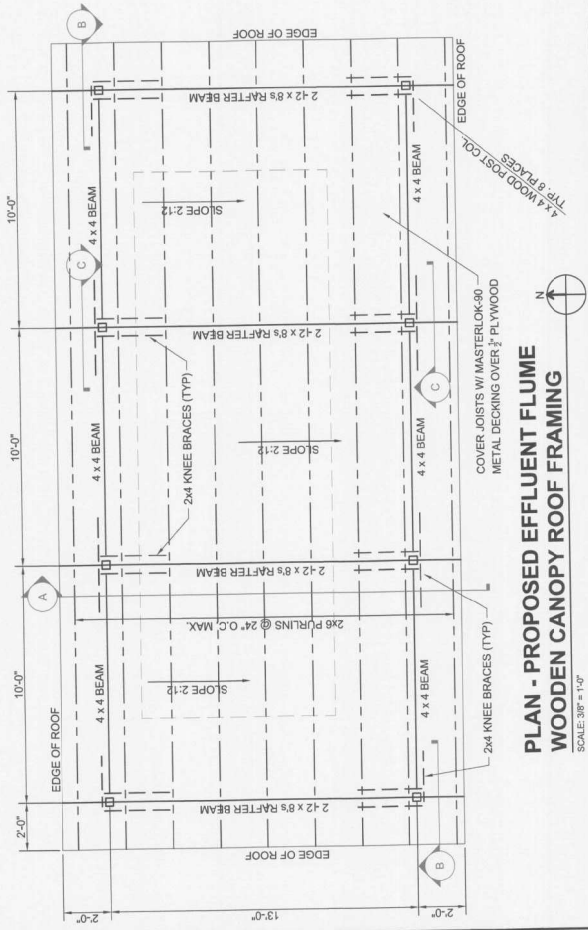
REV. NO.	DATE	DRAWN	CHKD	REMARKS



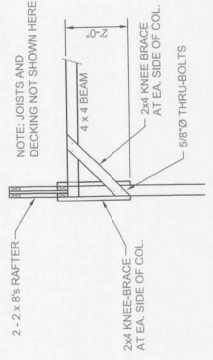
**PLAN - PROPOSED EFFLUENT FLUME WOODEN CANOPY FOUNDATION**  
SCALE: 3/8" = 1'-0"



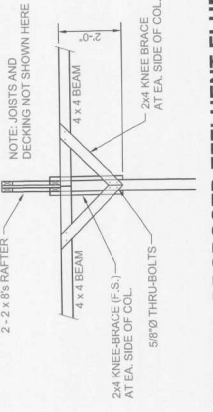
**SECTION - PROPOSED EFFLUENT FLUME WOODEN CANOPY**  
SCALE: 3/8" = 1'-0"



**PLAN - PROPOSED EFFLUENT FLUME WOODEN CANOPY ROOF FRAMING**  
SCALE: 3/8" = 1'-0"



**SECTION - PROPOSED EFFLUENT FLUME WOODEN CANOPY END POSTS**  
SCALE: 3/8" = 1'-0"

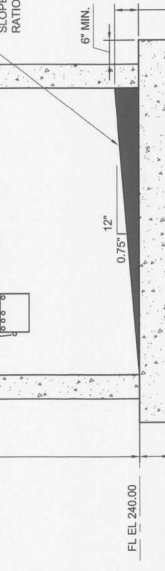
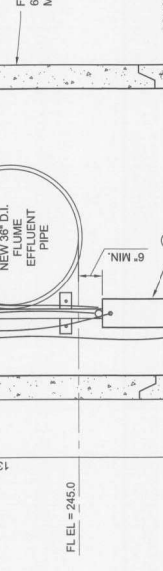
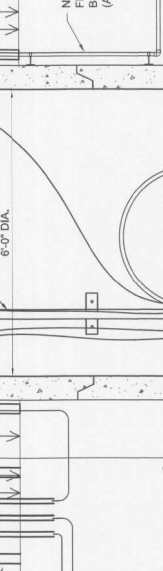
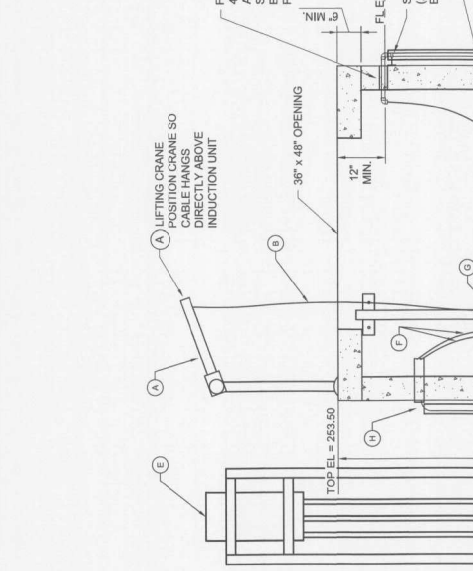


**SECTION - PROPOSED EFFLUENT FLUME WOODEN CANOPY INSIDE POSTS**  
SCALE: 3/8" = 1'-0"

	DESIGNED: MER DRAFTED: MAB CHECKED: LBP DATE: JUL 2019		<b>CRIST ENGINEERS, INC.</b> CONSULTING ENGINEERS 205 EXECUTIVE COURT, SUITE 2206 TITLE TOWER, 6011 66th AVE FAYETTEVILLE, AR 72701 TEL: (501) 664-4150 FAX: (501) 664-4679 WWW.CRISTENGINEERS.COM	MALVERN, ARKANSAS <b>WASTEWATER TREATMENT FACILITY IMPROVEMENTS</b> MALVERN WATER WORKS PROPOSED EFFLUENT FLUME NEW WOODEN CANOPY OVER FLUME	JOB NO. 1820
	REV. NO. DATE DRWN CHGD				SHEET NO. 1820

- NOTES:**
- EXISTING ELECTRICAL CONDUITS, WIRES, AND CABLES IN THE VICINITY OF THE NEW CONSTRUCTION, INCLUDE THE FOLLOWING:
    - REROUTE TO REUSE (SEE "BLDG. DIRECT BURY" (PROTECT AND REROUTE TO REUSE))
    - 3/4" C FROM 12" B.G. TO ENCLOSURE (PROTECT AND REROUTE TO REUSE)
    - 4 - #12, 3/4" C FROM CHEM. BLDG. - 480 FEEDER (PROTECT AND REROUTE TO REUSE)
  - MANHOLE WALL PENETRATIONS(S) FOR WIRES, CABLES, AND PIPING (2" DIA. AND SMALLER) SHALL BE SCH. 40 PVC APPROVED, WATERTIGHT WALL SLEEVE(S), GROUDED AROUND AS NEEDED WITH NON-SHRINK GROUT TO FILL ALL VOIDS AS REQUIRED.

- FURNISH AND INSTALL NEW 500 LBS. DAVIT STATIONARY LIFTING CRANE, FIRST MATE SERIES MODEL 5122 M1 POWDER COATED WITH HAND WINCH (PROD. NO. M4022 PB-4) AND FEDESTALSOCKET WALL MOUNT BASE (PROD. NO. 522W) BY THERN OR APPROVED EQUAL. POSITION CRANE SO CABLE HANGS DIRECTLY ABOVE INDUCTION UNIT.
- FURNISH AND INSTALL NEW 3/4" DIA. 304 S.S. WIRE ROPE WITH S.S. SWIVEL HOOK AND SWAGED BALL FITTING, 48 FT. MODEL NO. W519-45N8 BY THERN OR APPROVED EQUAL.
- FURNISH AND INSTALL WALL MOUNT BASE WITH INSTALLATION HARDWARE THAT SHALL BE A TORQUE CONTROLLED EXPANSION ANCHOR CONSISTS OF: 4 S.S. ANCHOR BODY, NUT, AND WASHER WITH TYPE 316 S.S. EXPANSION SLEEVE. SIZE 1/2" X 5-1/2". PROVIDE CAN/AS WINCH COVER FOR CRANE WINCH FOR PROTECTION FROM THE ELEMENTS.
- FURNISH AND INSTALL NEW SUBMERSIBLE CHLORINE GAS INDUCTOR, AS SPECIFIED. TOP ELEV. OF INDUCTOR SHALL BE A MINIMUM OF 6" BELOW THE OUTLET FLOWLINE ELEVATION OF THE NEW 36" D.I. (TOP OF INDUCTOR ELEV. = 246.35).
- FURNISH AND INSTALL NEW NEMA 4 COMB. CB MOTOR STARTER WITH LOCAL-REMOTE SWITCH AND RUN TIME AND NEW METER FOR INDUCTOR MOUNTED ON EX. GALV. UNISTRUT SUPPORTS.
- INSTALL NEW 3/4" CL2 GAS FLEXIBLE PIPE (SCH. 80 PVC OR APPROVED EQUAL) AND NEW ELECTRICAL CABLES AS SPECIFIED AND APPROVED. SEE CHEM. DISINFECTION SITE/PIPING PLAN AND MODIFIED ELECTRICAL SITE PLAN.
- FURNISH AND INSTALL NEW 304 S.S. GUIDE BAR, MOUNT TO INSIDE OF MH-2A ON THE SE QUADRANT OF THE MANHOLE (SEE MH-2A QUADRANT PLAN). THE GUIDE BAR SHALL BE 6" FROM THE TOP SUPPORT SHALL BE PLACED NO MORE THAN 6" FROM BOTTOM AND TOP OF MOUNTING BAR.
- FURNISH AND INSTALL SCH 40 PVC PROTECTIVE SLEEVE (ENCLOSING WIRING, CABLES AND TUBING) ALONG THE OUTSIDE WALL OF MH-2A. MOUNT WITH S.S. HARDWARE ONLY.



**MANHOLE NOTES:**

- SEE SPECIFICATIONS FOR WALL GASKETS.
- FOR NEW CL2 INDUCTION MANHOLE (MH-2A), SEE 6" DIA. PRE-CAST MANHOLE DETAIL.

6" MIN. QUADRANT (SEE DETAIL 1 THIS SHEET FOR QUADRANT DELINEATION)

**SECTION A**  
SCALE: 3/4" = 1'-0"

**DETAIL 1 - PROPOSED CHLORINE INDUCTION (MH-2A) - QUADRANT DELINEATION**  
N.T.S.

**PLAN - PROPOSED CHLORINE INDUCTION MANHOLE (MH-2A)**  
SCALE = 3/4" = 1'-0"

REV. NO.	DATE	DRAWN (CHKD)	REMARKS

DESIGNED: SMR  
 DRAFTED: MAB  
 CHECKED: LBP  
 DATE: JUL 2019

THIS LINE MEASURES 1" WHEN PLOTTED FULL SIZE

**CRIST ENGINEERS, INC.**  
 CONSULTING ENGINEERS

206 EXECUTIVE COURT  
 LITTLE ROCK, ARKANSAS 72205  
 TELEPHONE: (501) 694-1852  
 WWW.CRISTENGINEERS.COM

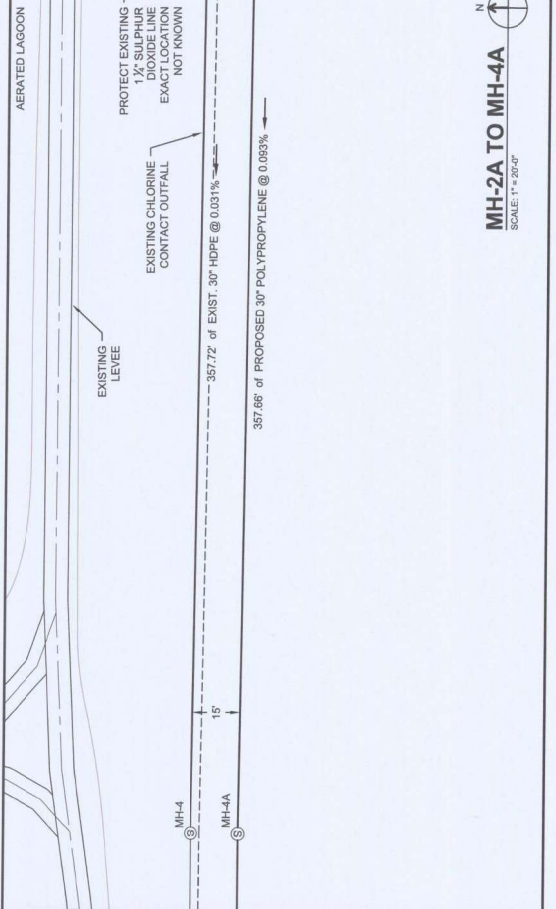
WASTEWATER TREATMENT FACILITY IMPROVEMENTS  
 MALVERN WATER WORKS

MALVERN, ARKANSAS

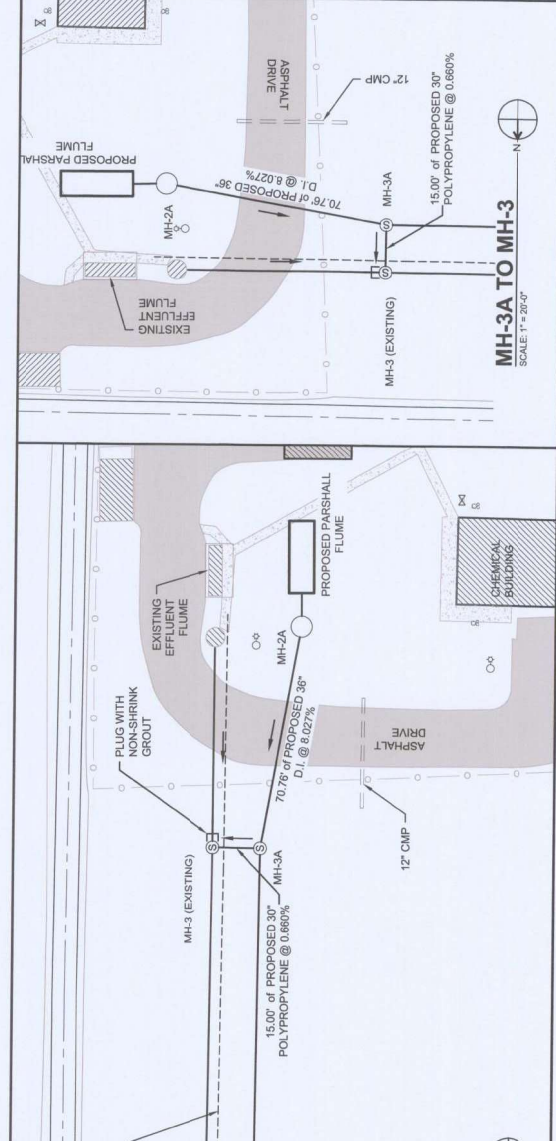
PROPOSED CHLORINE INDUCTION MANHOLE (MH-2A)  
 PLAN, SECTION, AND DETAILS

JOB NO. 1820  
 SHEET NO. 46

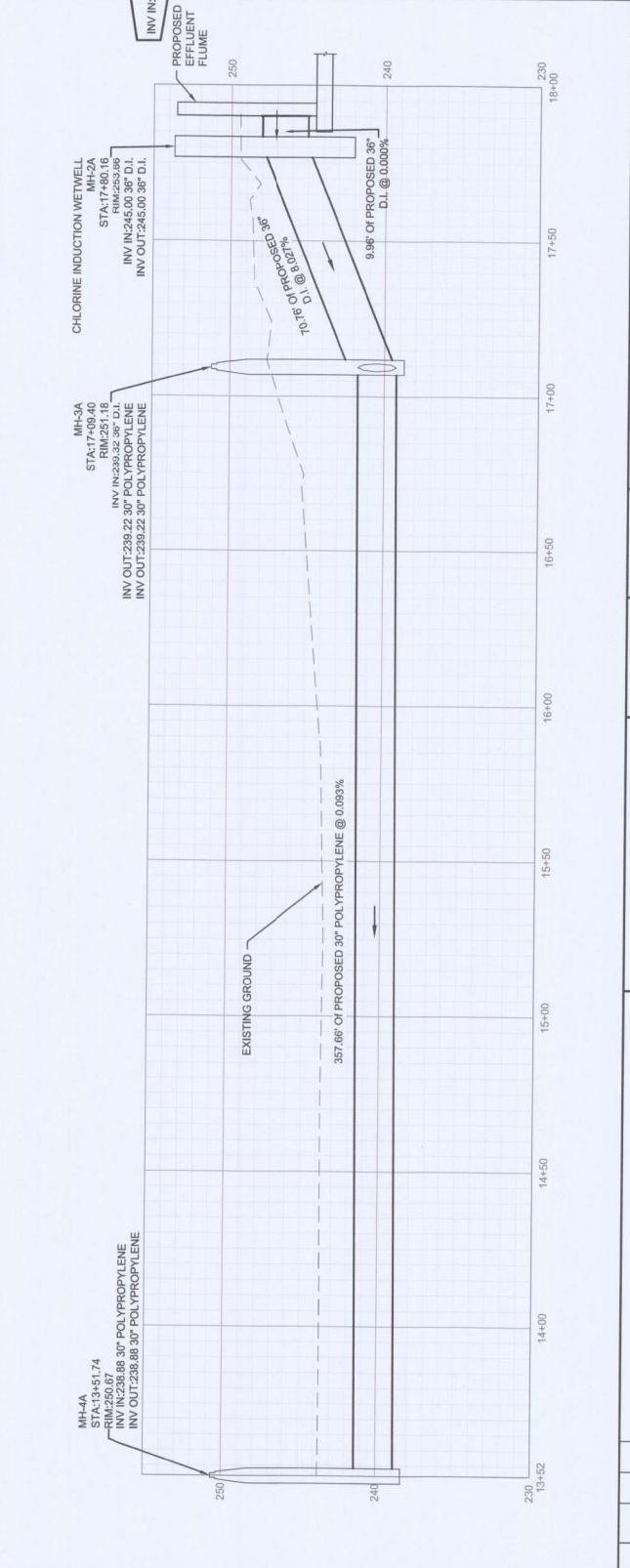




**MH-2A TO MH-4A**  
SCALE: 1" = 20'-0"



**MH-3A TO MH-3**  
SCALE: 1" = 20'-0"



REV.	DATE	DRWN	CHKD	REMARKS

**CRIST ENGINEERS, INC.**  
CONSULTING ENGINEERS  
206 EXECUTIVE COURT  
LITTLE ROCK, ARKANSAS 72205  
FAX: (501) 984-9071  
WWW.CRISTENGINEERS.COM



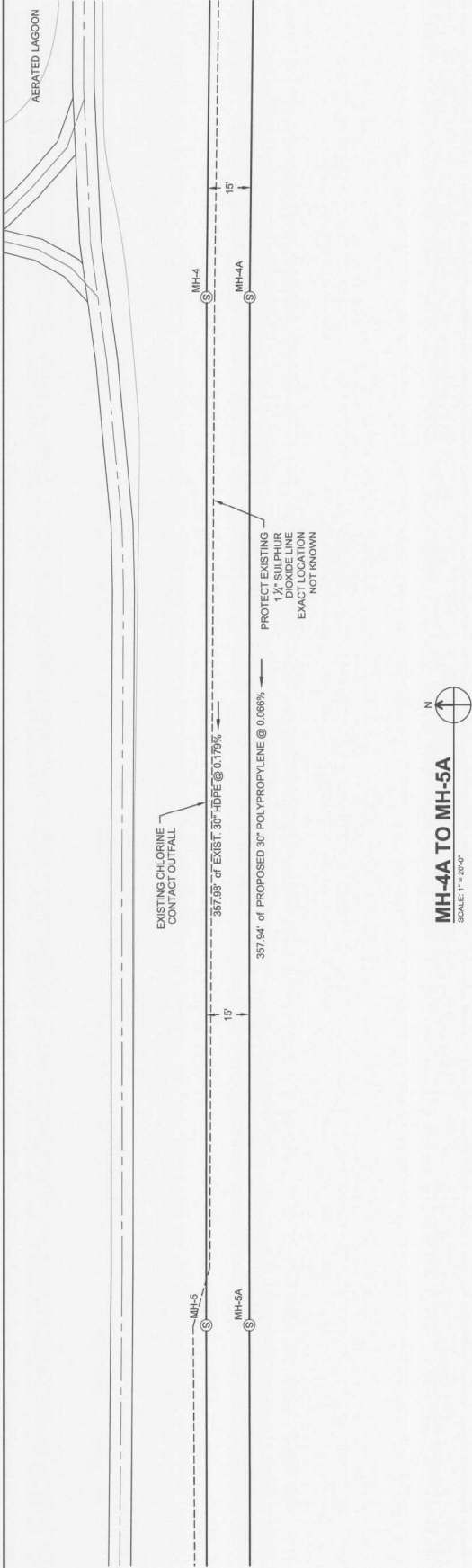
DESIGNED: LBP  
DRAFTED: MAB  
CHECKED: LBP  
DATE: JUL 2019

THIS LINE MEASURES 1" WHEN PLOTTED FULL SIZE

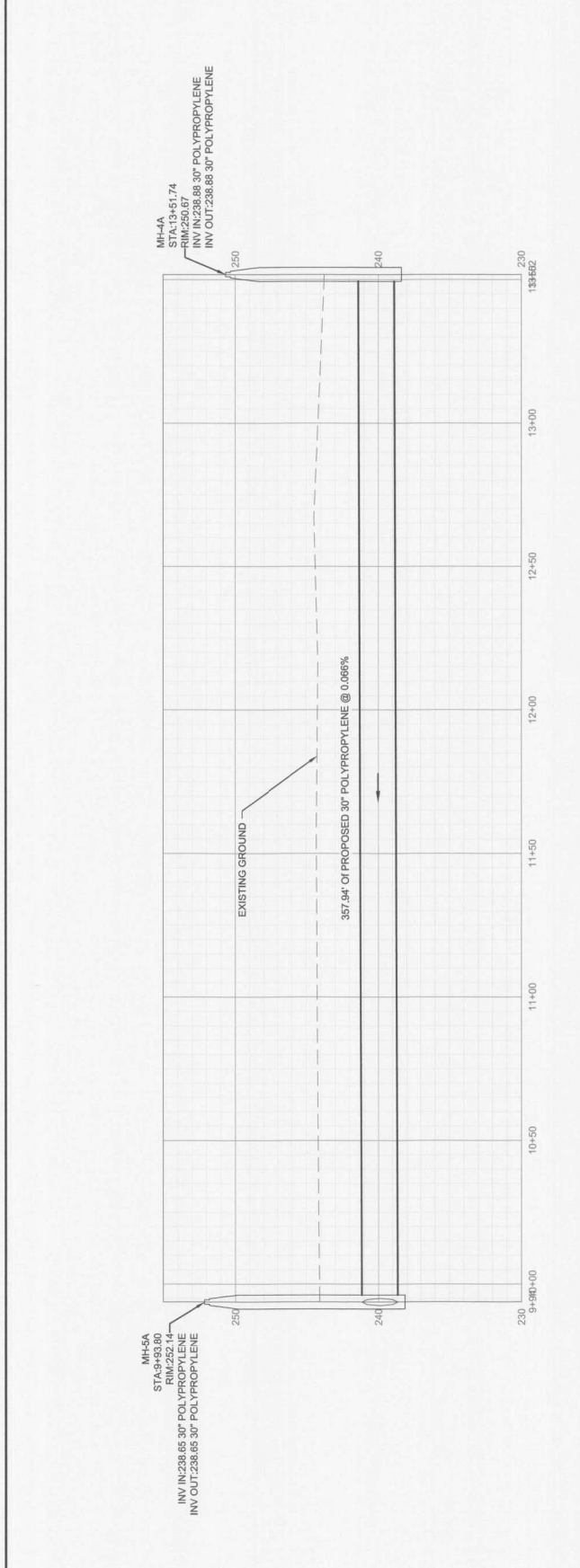


MALVERN, ARKANSAS  
**WASTEWATER TREATMENT FACILITY IMPROVEMENTS**  
MALVERN WATER WORKS  
CHLORINATION / DECHLORINATION MODIFICATIONS  
MH-2A TO MH-4A & MH-3A TO MH-3

JOB NO. 1820  
SHEET NO. 47



**MH-4A TO MH-5A**  
SCALE: 1" = 20'0"



REV. NO.	DATE	BY	CHKD.	REMARKS

DESIGNED: LBP  
DRAFTED: MAB  
CHECKED: LBP  
DATE: JUL 2019

JOB NO. 1820  
SHEET NO.

**CRIST ENGINEERS, INC.**  
CONSULTING ENGINEERS  
205 EXECUTIVE COURT  
LITTLE ROCK, ARKANSAS 72005  
TELEPHONE: (501) 664-1652  
WWW.CRISTENGINEERS.COM

STATE OF ARKANSAS  
REGISTERED PROFESSIONAL ENGINEER  
No. 9115  
KYLE B. BROWN

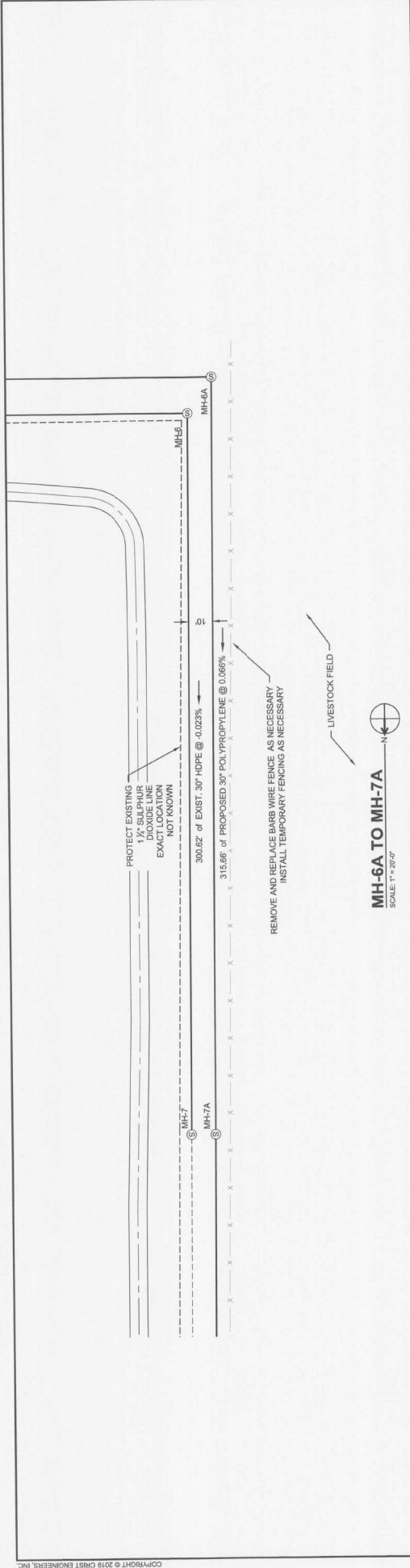
COMPANY REGISTRATION  
CRIST ENGINEERS, INC.  
CONSULTING ENGINEERS  
No. 31  
ISSUED 07/2019

THIS LINE MEASURES 1" = 1' WHEN PLOTTED FULL SIZE

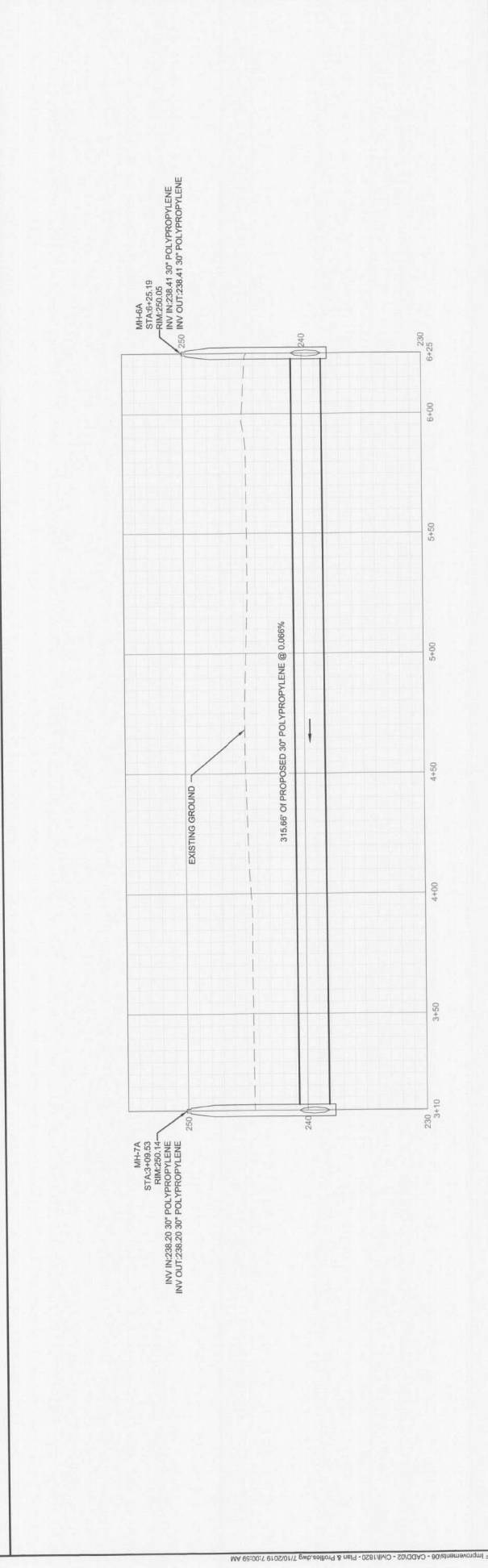
WASTEWATER TREATMENT FACILITY IMPROVEMENTS  
MALVERN WATER WORKS  
CHLORINATION / DECHLORINATION MODIFICATIONS  
CHLORINE CONTACT OUTFALL  
MH-4A TO MH-5A

MALVERN, ARKANSAS  
JOB NO. 1820  
SHEET NO.





**MH-6A TO MH-7A**  
SCALE: 1" = 20.0'



MALVERN, ARKANSAS  
**WASTEWATER TREATMENT FACILITY IMPROVEMENTS**  
**MALVERN WATER WORKS**  
 CHLORINATION / DECHLORINATION MODIFICATIONS  
 CHLORINE CONTACT OUTFALL  
 MH-6A TO MH-7A

**CRIST ENGINEERS, INC.**  
 CONSULTING ENGINEERS  
 206 EXECUTIVE COURSE, SUITE 2206  
 TELEPHONE: (501) 864-1522  
 FAX: (501) 864-6789  
 WWW.CRISTENGINEERS.COM

DESIGNED: LBP  
 DRAFTED: MAB  
 CHECKED: LBP  
 DATE: JUL 2019

REGISTERED PROFESSIONAL ENGINEER  
 STATE OF ARKANSAS  
 No. 5178  
 EXPIRES: 12/31/2021  
 CRIST ENGINEERS, INC.

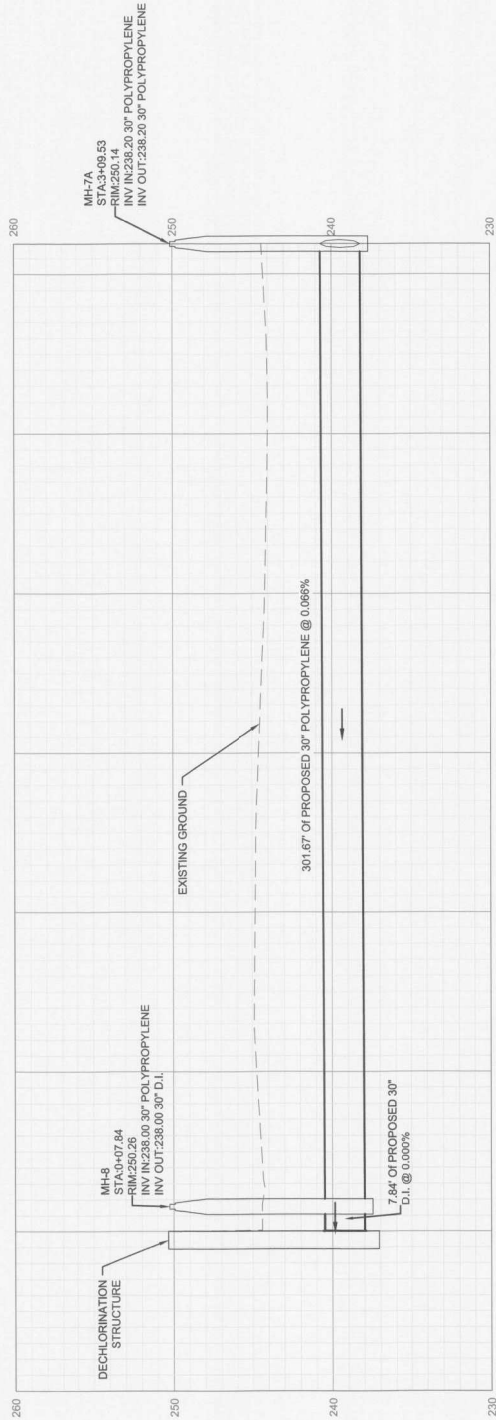
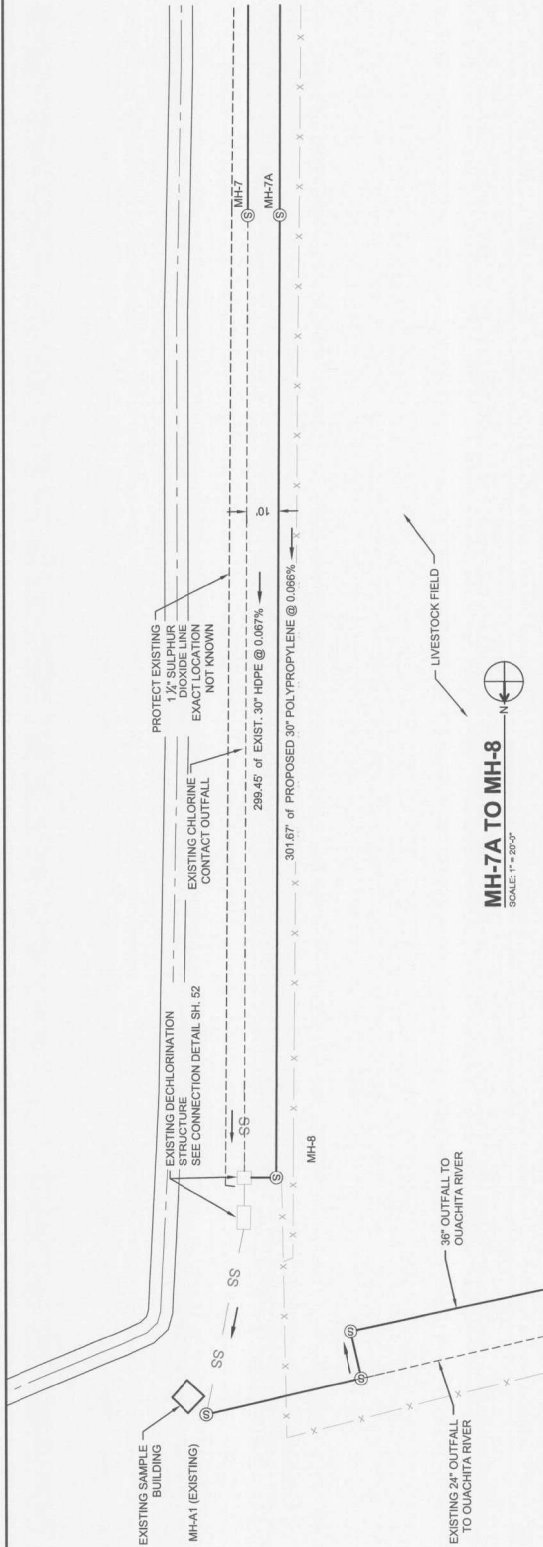
REGISTERED PROFESSIONAL ENGINEER  
 STATE OF ARKANSAS  
 No. 9178  
 EXPIRES: 12/31/2021  
 CRIST ENGINEERS, INC.

THIS LINE MEASURES 1" WHEN PLOTTED FULL SIZE

REV.	DATE	DRAWN	CHECKED

REMARKS





JOB NO. 1820  
SHEET NO. 51

MALVERN, ARKANSAS  
**WASTEWATER TREATMENT FACILITY IMPROVEMENTS**  
MALVERN WATER WORKS  
CHLORINATION / DECHLORINATION MODIFICATIONS  
MH-7A TO MH-8

**CRIST ENGINEERS, INC.**  
CONSULTING ENGINEERS  
206 EXECUTIVE COURT  
LITTLE ROCK, ARKANSAS 72205  
TEL: (501) 684-1822  
FAX: (501) 684-1822  
WWW.CRISTENGINEERS.COM

DESIGNED: LBP  
DRAFTED: MAB  
CHECKED: LBP  
DATE: JUL 2019

THIS LINE MEASURES 1" WHEN PLOTTED FULL SIZE

STATE OF ARKANSAS  
REGISTERED PROFESSIONAL ENGINEER  
No. 5115  
KYLE B. B. B. B.

COMPANY REGISTRATION  
CRIST ENGINEERS, INC.  
No. 51  
ISSUED 07/19/2019

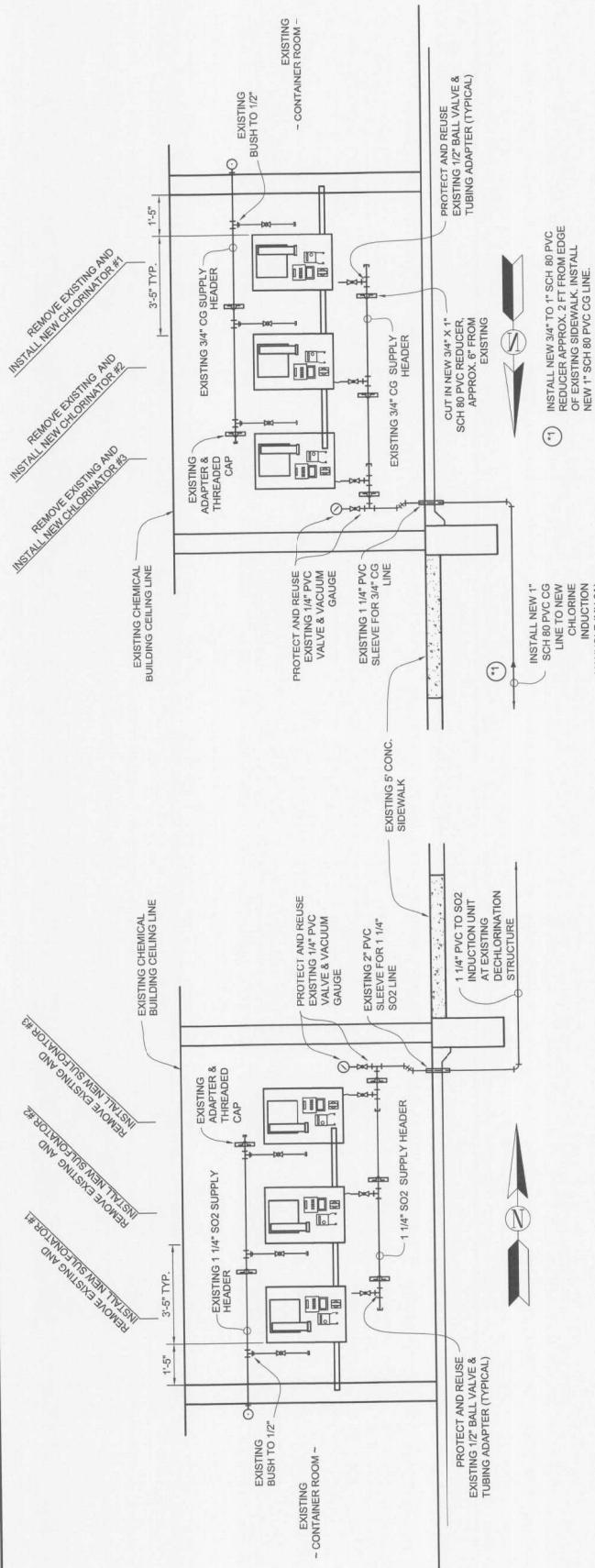
REV. NO.	DATE	DRWN	CHKD	REMARKS











**DETAIL - CHLORINATOR INSTRUMENTATION MODIFICATIONS** (B)  
SCALE: 1/2" = 1'-0"



**DETAIL - SULFONATOR INSTRUMENTATION MODIFICATIONS** (A)  
SCALE: 1/2" = 1'-0"

- PVC BALL VALVE
- UNION
- TEE WISCREWED PLUG
- PRESSURE GAUGE (W/COCK)
- CG CHLORINE GAS (PIPE)
- FD FLOOR DRAIN
- HF HOSE BIB-EXT. TO BE FREEZE-PROOF
- SF SUPPLY FAN (ON ROOF)
- SS STAINLESS STEEL

**CRIST ENGINEERS, INC.**  
CONSULTING ENGINEERS  
208 EXECUTIVE COURT  
LITTLE ROCK, ARKANSAS 72065  
PH: (501) 664-1522  
FAX: (501) 664-8979  
WWW.CRISTENGINEERS.COM



DESIGNED:	SMR
DRAFTED:	MAB
CHECKED:	LBP
DATE:	JUL 2019

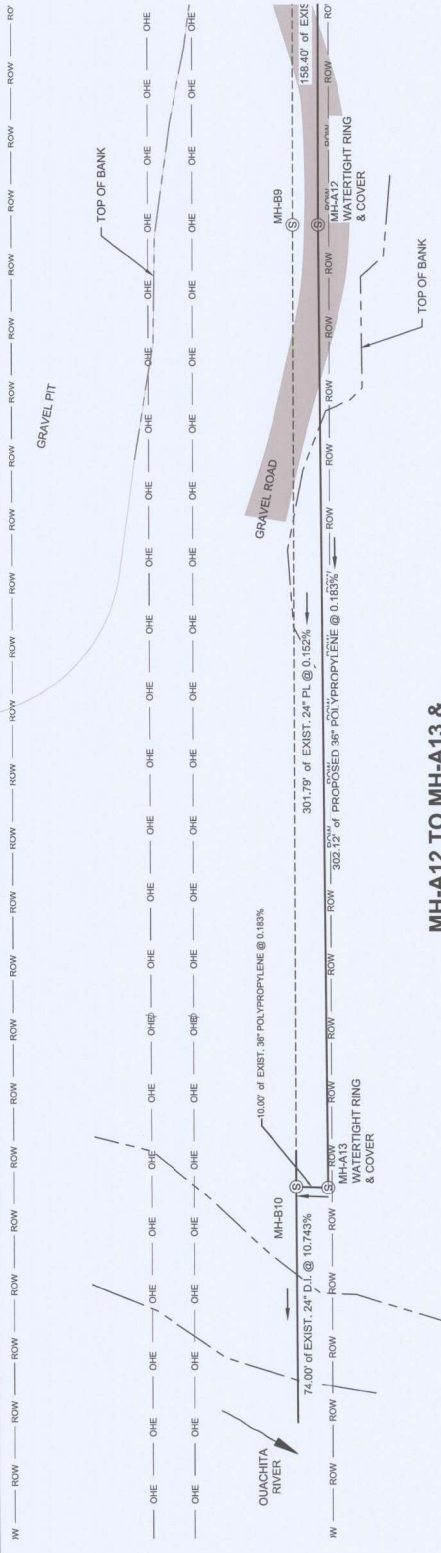




REV. NO.	DATE	DRWN/CHRD	REMARKS

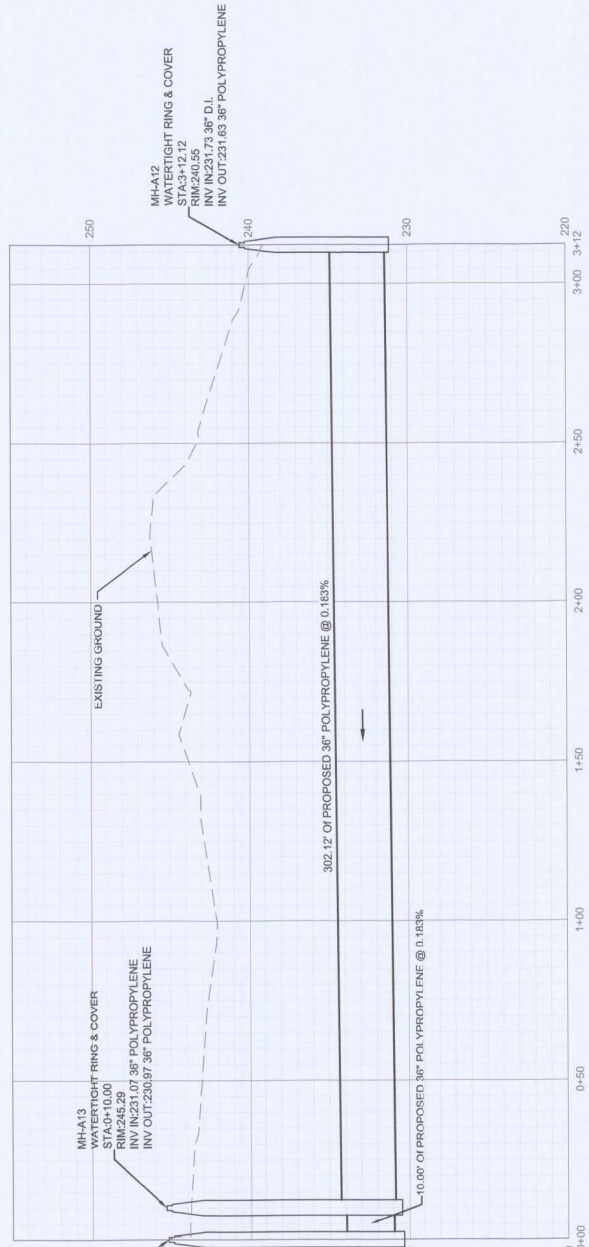








**MH-A12 TO MH-A13 &  
MH-A13 TO MH-B10**  
SCALE: 1" = 20'0"



**CRIST ENGINEERS, INC.**  
CONSULTING ENGINEERS  
206 EXECUTIVE COURT  
LITTLE ROCK, ARKANSAS 72205  
TEL: (501) 664-1522  
FAX: (501) 664-8571  
WWW.CRISTENGINEERS.COM

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CHECKED: LBP
DATE: JUL 2019

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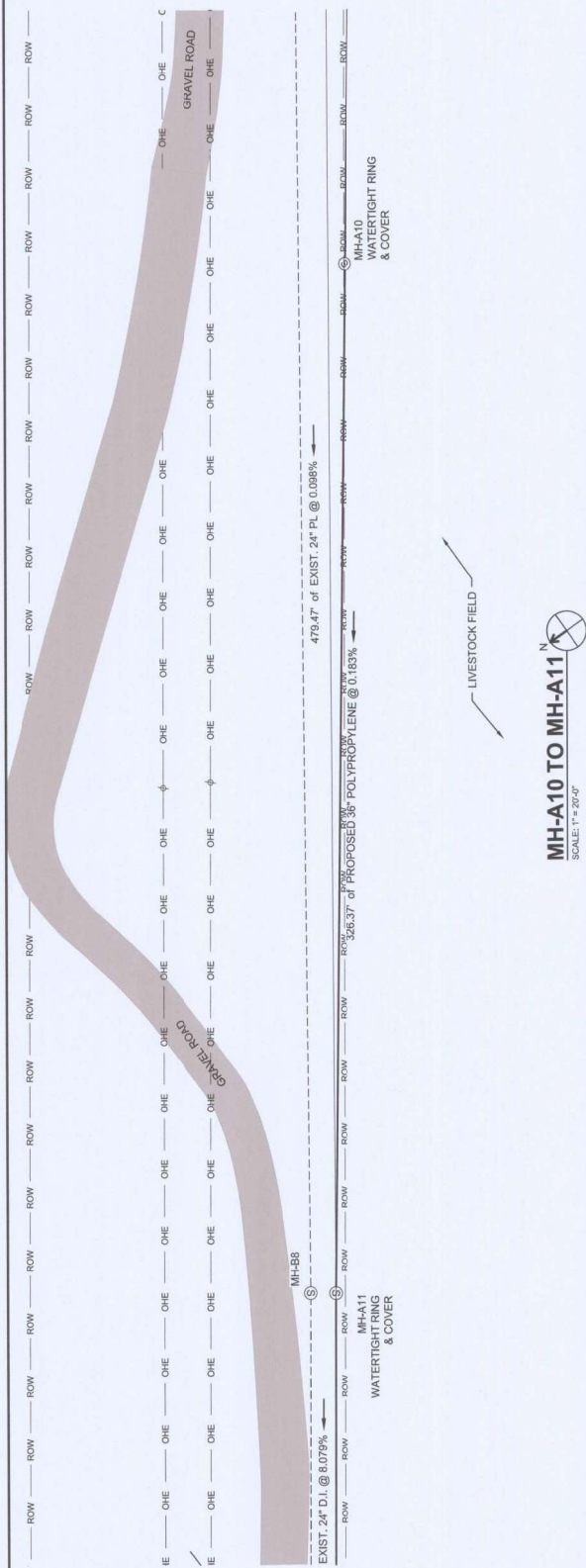
1" = 1'

ARIZONA REGISTERED PROFESSIONAL ENGINEER  
No. 9115  
DATE: 10/13/10  
STATE OF ARIZONA

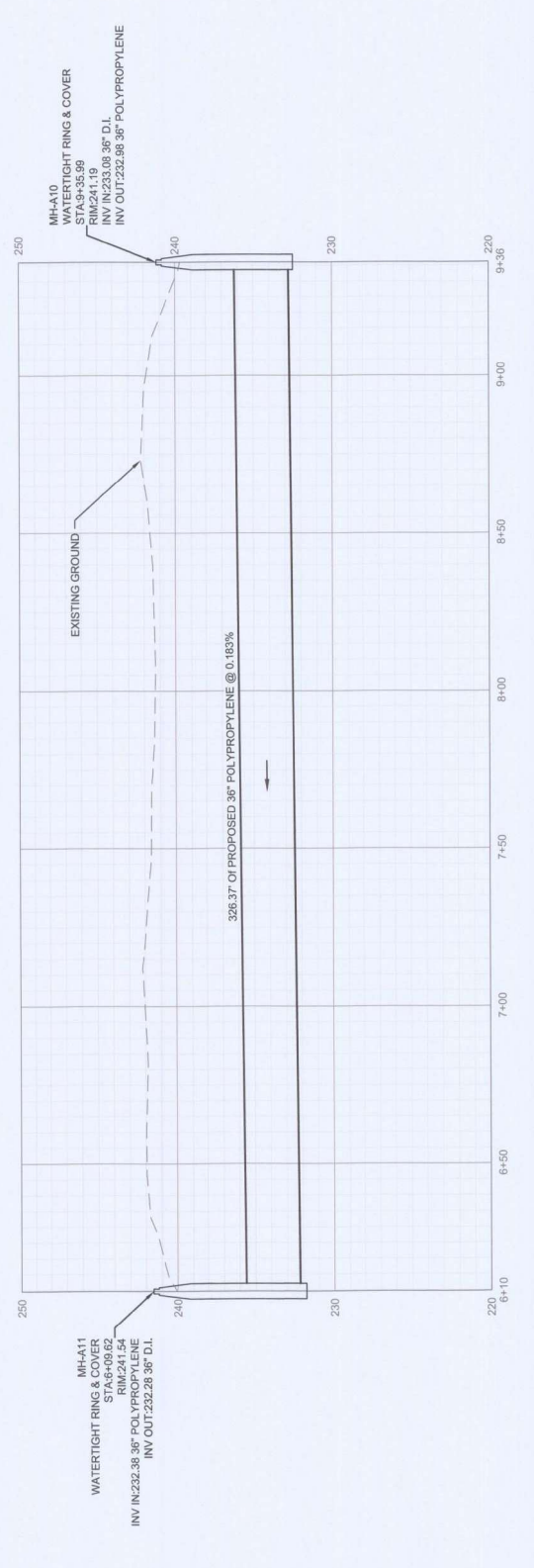
CRIST ENGINEERS, INC. CONSULTING ENGINEERS  
No. 91  
REGISTERED PROFESSIONAL ENGINEER  
DATE: 07/15/19

REV. NO.	DATE	BY	CHKD	REMARKS





**MH-A10 TO MH-A11**  
SCALE: 1" = 20'-0"

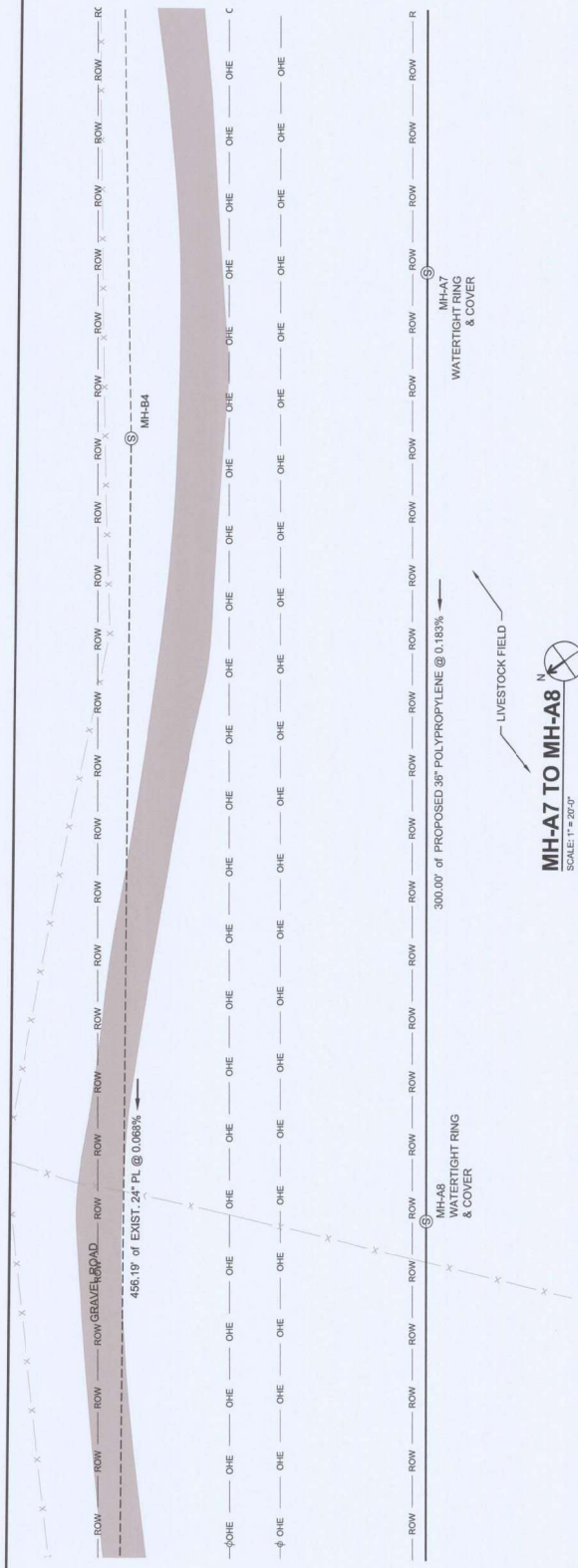


JOB NO. 1820		SHEET NO. 60	
<b>WASTEWATER TREATMENT FACILITY IMPROVEMENTS MALVERN WATER WORKS</b>			
<b>CRIST ENGINEERS, INC.</b> CONSULTING ENGINEERS 205 EXECUTIVE COURT LITTLE ROCK, ARKANSAS 72205 PHONE: (501) 664-8579 FAX: (501) 664-8579 WWW.CRISTENGINEERS.COM		DESIGNED: LBP DRAFTED: MAB CHECKED: LBP DATE: JUL 2019	
		THESE MEASUREMENTS WAS TAKEN AS SHOWN WHEN PLOTTED FULL SIZE	
REV. NO.	DATE	DRAWN	CHKD
REMARKS			
PROPOSED 36" OUTFALL MH-A10 TO MH-A11			

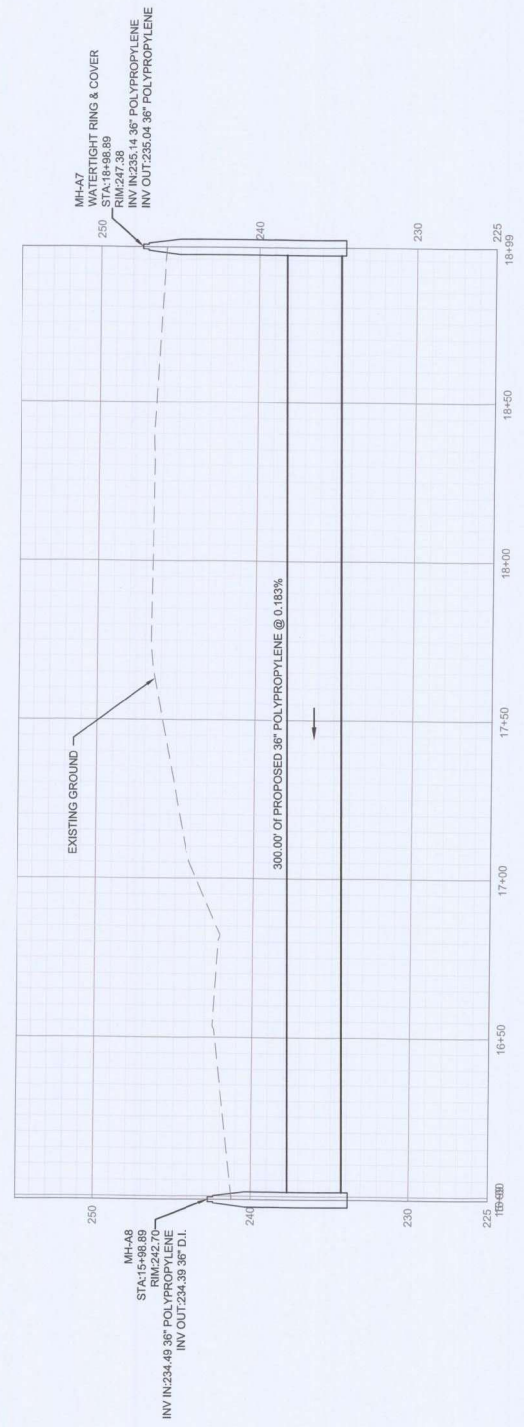









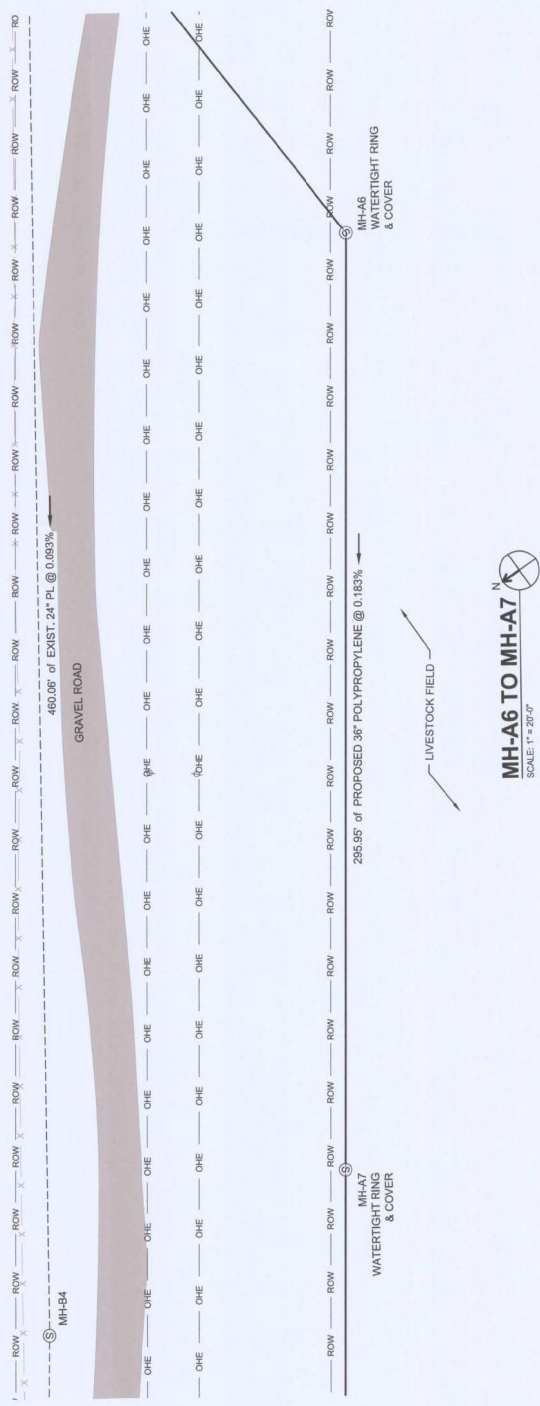


**MH-A7 TO MH-A8**  
SCALE: 1" = 20'-0"

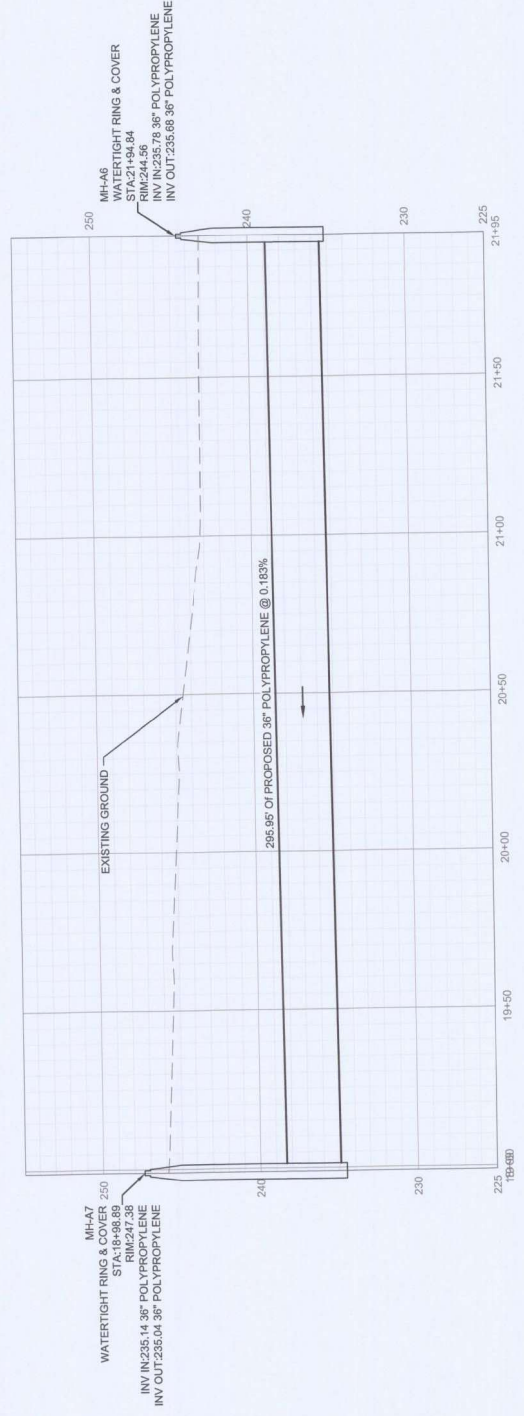


JOB NO. 1820		SHEET NO. 63	
<b>WASTEWATER TREATMENT FACILITY IMPROVEMENTS</b> <b>MALVERN WATER WORKS</b>			
 <b>CRIST ENGINEERS, INC.</b> CONSULTING ENGINEERS 205 EXECUTIVE COURT LITTLE ROCK, ARKANSAS 72205 FAX: (501) 684-1552 WWW.CRISTENGINEERS.COM		MALVERN, ARKANSAS <b>PROPOSED 36" OUTFALL</b> MH-A7 TO MH-A8	
DESIGNED: LBP	DRAFTED: MAB	CHECKED: LBP	DATE: JUL 2019
 REGISTERED PROFESSIONAL ENGINEER STATE OF ARKANSAS No. 01152		 REGISTERED PROFESSIONAL ENGINEER STATE OF ARKANSAS No. 01152	
THIS LINE MEASURES 1" WHEN PLOTTED FULL SIZE			
REV. NO.	DATE	DRAWN/CHD	REMARKS

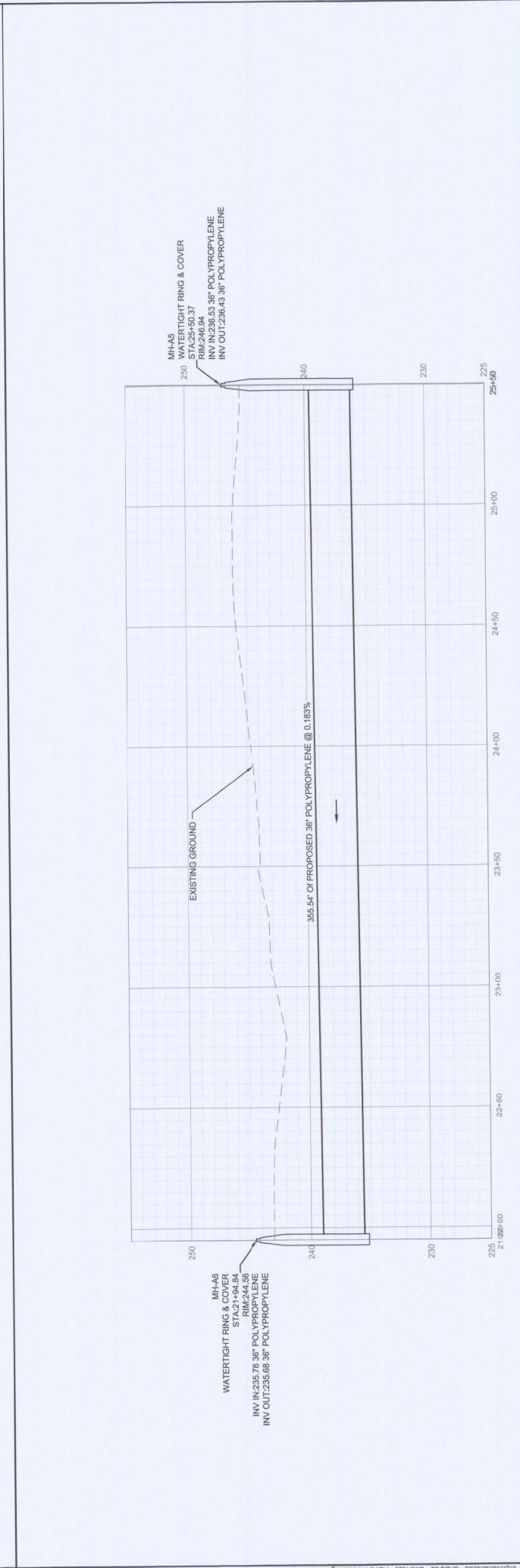
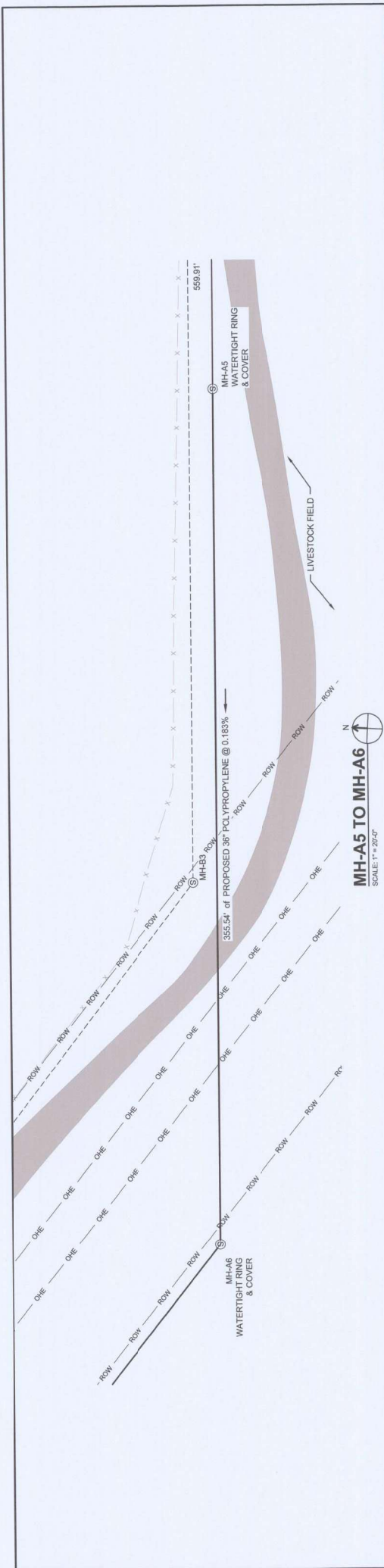



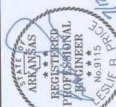



**MH-A6 TO MH-A7**  
SCALE: 1" = 20.0'



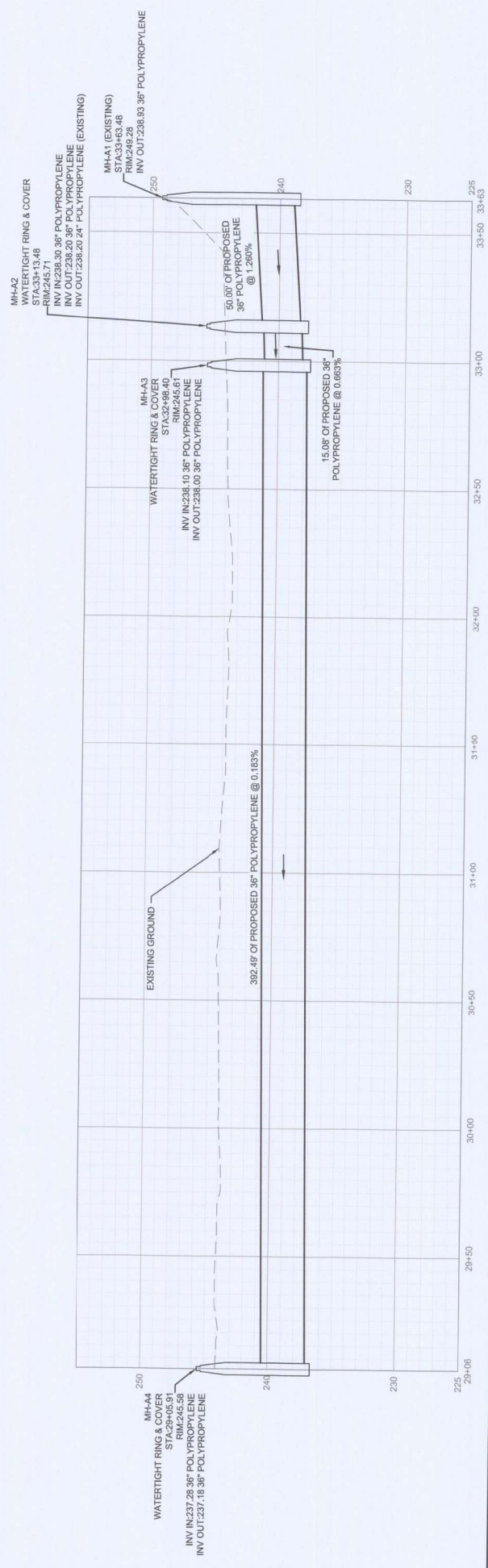
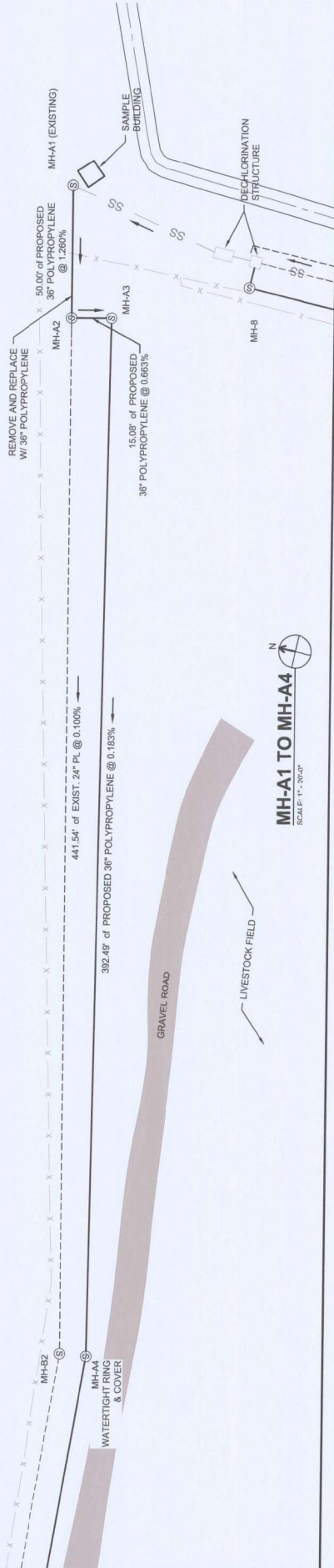
JOB NO.	1820	<b>CRIST ENGINEERS, INC.</b> CONSULTING ENGINEERS 295 EXECUTIVE COURTS, SUITE 7205 MALVERN, ARKANSAS 72055 TELEPHONE: (501) 884-1552 FAX: (501) 884-6579 WWW.CRISTENGINEERS.COM	DESIGNED: LBP	DRAFTED: MAB	CHECKED: LBP	DATE: JUL 2019
SHEET NO.	64		THIS DRAWING IS TO BE USED IN CONJUNCTION WITH THE FULL SIZE PLOTTED DRAWING.			
MALVERN, ARKANSAS <b>WASTEWATER TREATMENT FACILITY IMPROVEMENTS</b> <b>MALVERN WATER WORKS</b>						REMARKS:
REV.	DATE	DRWN	CHKD	PROPOSED 36" OUTFALL MH-A6 TO MH-A7		



JOB NO. 1820 SHEET NO.	<b>WASTEWATER TREATMENT FACILITY IMPROVEMENTS</b> <b>MALVERN WATER WORKS</b>	MALVERN ARKANSAS PROPOSED 36" OUTFALL MH-A5 TO MH-A6
<b>CRIST ENGINEERS, INC.</b> CONSULTING ENGINEERS 208 EXECUTIVE COURT LITTLE ROCK, ARKANSAS 72206 TELEPHONE: (501) 964-1502 WWW.CRISTENGINEERS.COM		
DESIGNED: LBP DRAFTED: MAB CHECKED: LBP DATE: JUL 2019	  	THIS LINE MEASURES 1" WHEN PLOTTED FULL SIZE 1" = 40'
REV. NO. DATE DRWN. CHKD.	REMARKS	





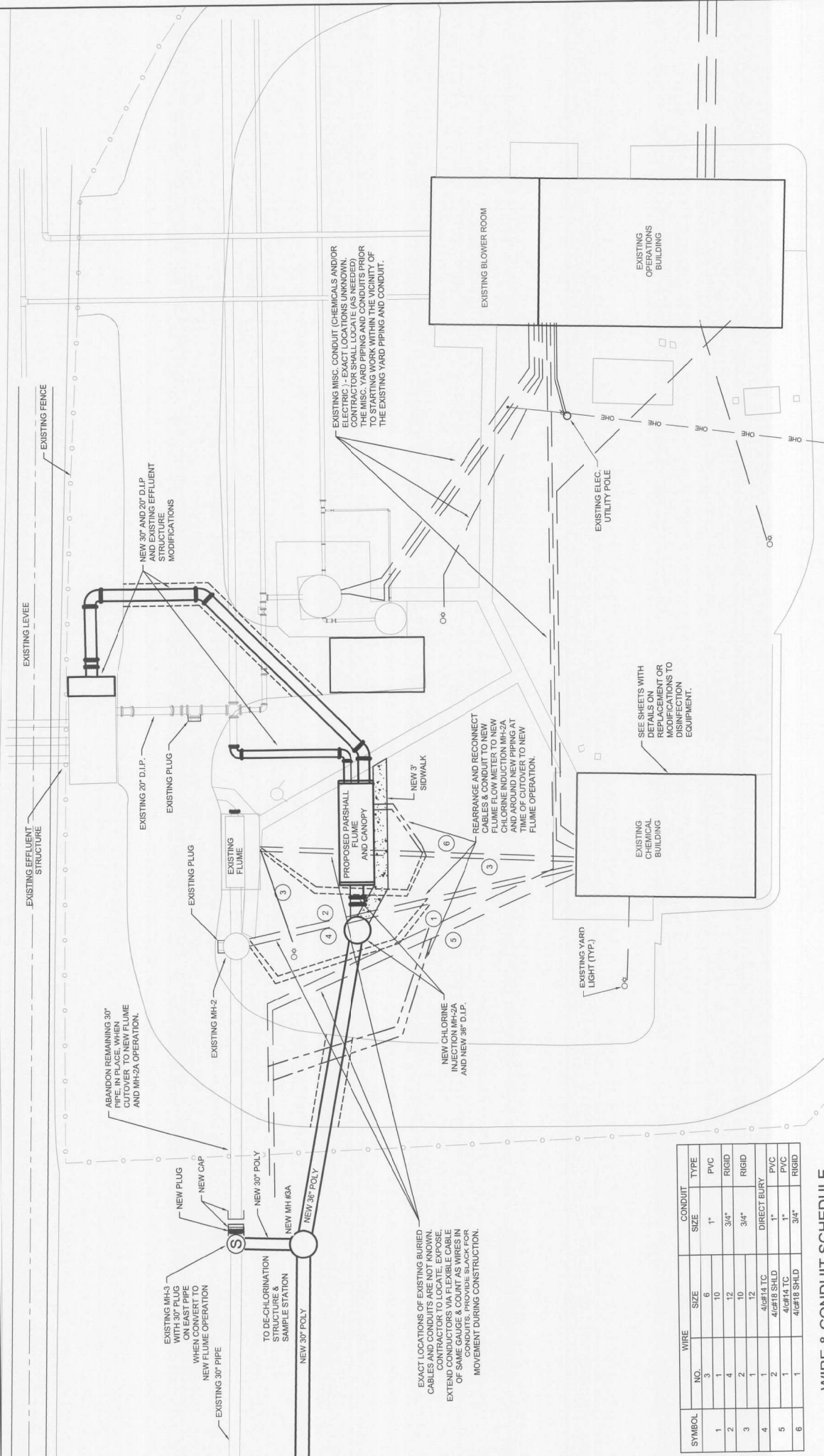


REV. NO.	DATE	BY	CHKD	REMARKS

DESIGNED:	LBP
DRAFTED:	MAB
CHECKED:	LBP
DATE:	JUL 2019

**CRIST ENGINEERS, INC.**  
 CONSULTING ENGINEERS  
 206 EXECUTIVE COURT  
 LITTLE ROCK, ARKANSAS 72205  
 TEL: (501) 664-5500  
 FAX: (501) 664-5579  
 WWW.CRISTENGINEERS.COM





EXISTING MISC. CONDUIT (CHEMICALS AND/OR ELECTRIC) - EXACT LOCATIONS UNKNOWN. CONTRACTOR SHALL LOCATE (AS NEEDED) PRIOR TO STARTING WORK WITHIN THE VICINITY OF THE EXISTING YARD PIPING AND CONDUIT.

REARRANGE AND RECONNECT CABLES & CONDUIT TO NEW FLOW METER TO NEW CHLORINE INDUCTION MH-2A AND AROUND NEW PIPING AT TIME OF CUTOVER TO NEW FLOW METER.

SEE SHEETS WITH DETAILS ON REPLACEMENT OR MODIFICATIONS TO DISINFECTION EQUIPMENT.

EXACT LOCATIONS OF EXISTING BURIED CABLES & CONDUITS ARE NOT KNOWN. CONTRACTORS TO LOCATE, EXPOSE, EXTEND CONDUITORS VIA FLEXIBLE CABLE OF SAME GAUGE & COUNT AS WIRES IN CONDUITS. PROVIDE SLACK FOR MOVEMENT DURING CONSTRUCTION.

SYMBOL	NO.	WIRE	SIZE	CONDUIT	TYPE
1	1	6	1"	PVC	RIGID
2	4	12	3/4"	RIGID	RIGID
3	2	12	3/4"	RIGID	RIGID
4	1	4#14 TC	DIRECT BURY	PVC	RIGID
5	2	4#18 SHLD	1"	PVC	RIGID
6	1	4#18 SHLD	3/4"	PVC	RIGID

**WIRE & CONDUIT SCHEDULE**

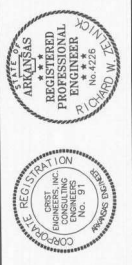
DESIGNED: RWZ  
 DRAWN: MAB  
 CHECKED: LBP  
 DATE: JUL 2019

THIS LINE MEASURES 1" WHEN PLOTTED FULL SIZE

CRIST ENGINEERS, INC.  
 CONSULTING ENGINEERS  
 206 E. COWLEY BLVD.  
 MALVERN, ARKANSAS 72066  
 PHONE: (501) 884-1522  
 FAX: (501) 884-1522  
 WWW.CRISTENGINEERS.COM

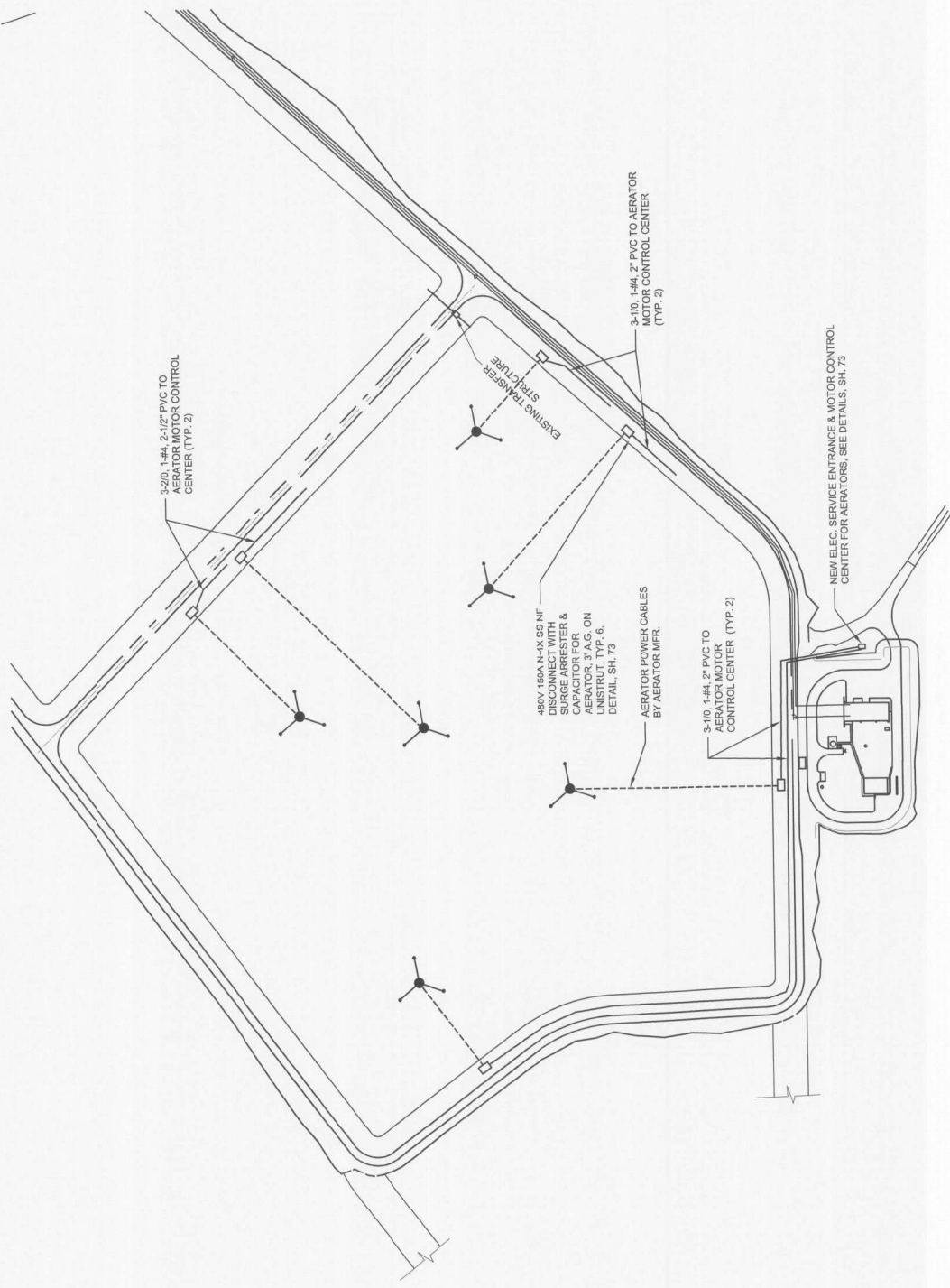
MALVERN, ARKANSAS  
**WASTEWATER TREATMENT FACILITY IMPROVEMENTS**  
**MALVERN WATER WORKS**  
 EFFLUENT FLUME & DISINFECTION MODIFICATIONS  
 ELECTRICAL SITE PLAN - PROPOSED

JOB NO. 1820  
 SHEET NO. 69



REV. NO.	DATE	BY	CHKD	REMARKS





JOB NO. 1820  
 SHEET NO. 70

MALVERN, ARKANSAS  
**WASTEWATER TREATMENT FACILITY IMPROVEMENTS**  
 MALVERN WATER WORKS  
 AERATED LAGOONS  
 ELECTRICAL PLAN  
 LAGOON NO. 2 FLOATING AERATORS

**CRIST ENGINEERS, INC.**  
 CONSULTING ENGINEERS

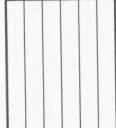
205 EXECUTIVE COURT  
 MALVERN, ARKANSAS 72055  
 TELEPHONE: (501) 664-1522  
 FAX: (501) 664-8679  
 WWW.CRISTENGINEERS.COM



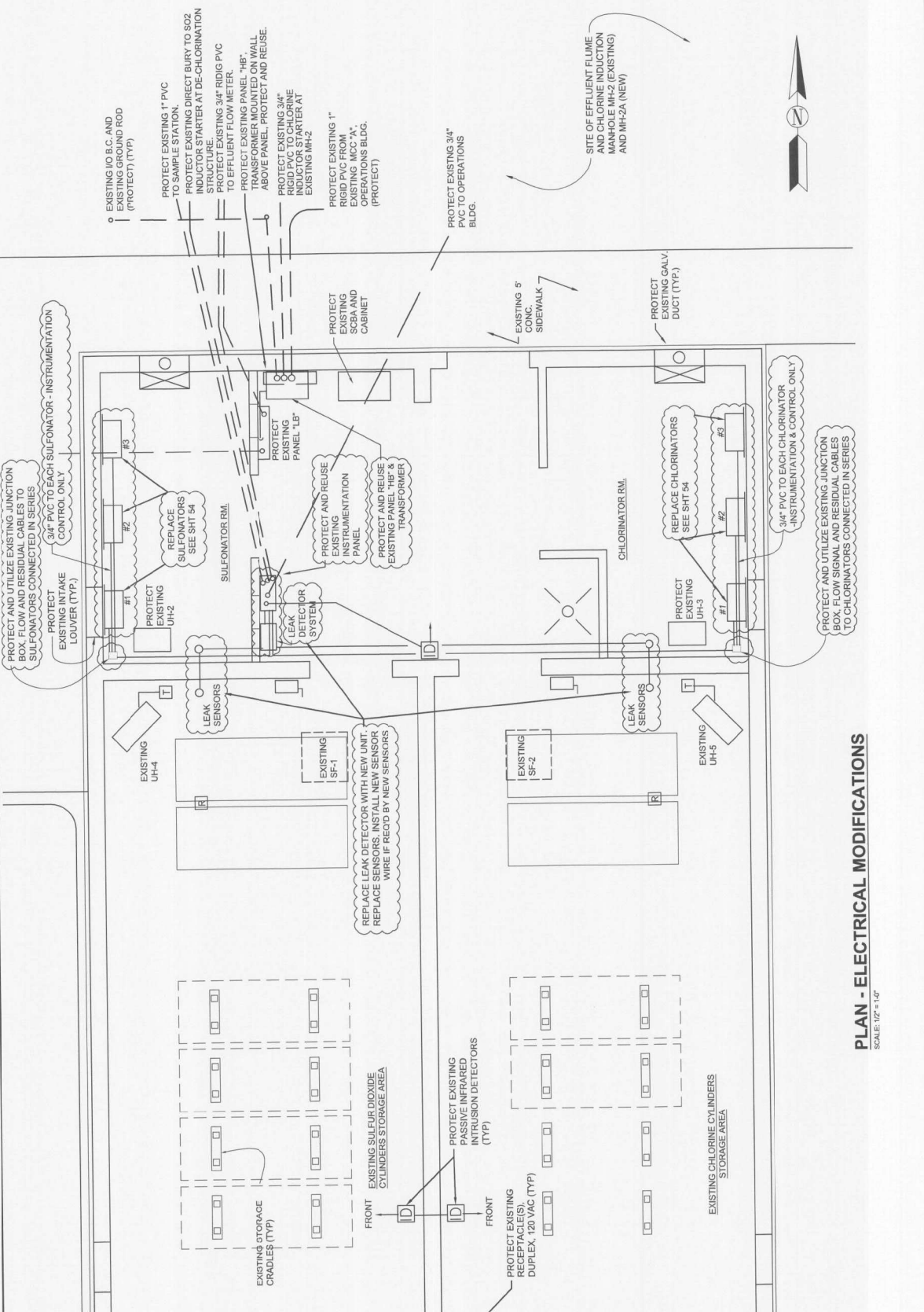
DESIGNED: LBP  
 DRAFTED: MAB  
 CHECKED: LBP  
 DATE: JUL 2019



THIS DRAWING IS TO BE USED IN FULL SIZE UNLESS OTHERWISE NOTED.



REV.	DATE	BY	CHKD.	REMARKS



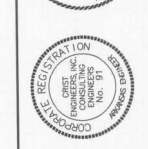
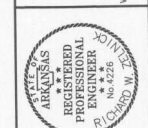
**PLAN - ELECTRICAL MODIFICATIONS**  
SCALE: 1/2" = 1'-0"

MALVERN, ARKANSAS  
**WASTEWATER TREATMENT FACILITY IMPROVEMENTS**  
MALVERN WATER WORKS  
CHLORINATION/DECHLORINATION MODIFICATIONS  
CHEMICAL BUILDING MODIFICATIONS  
ELECTRICAL PLAN

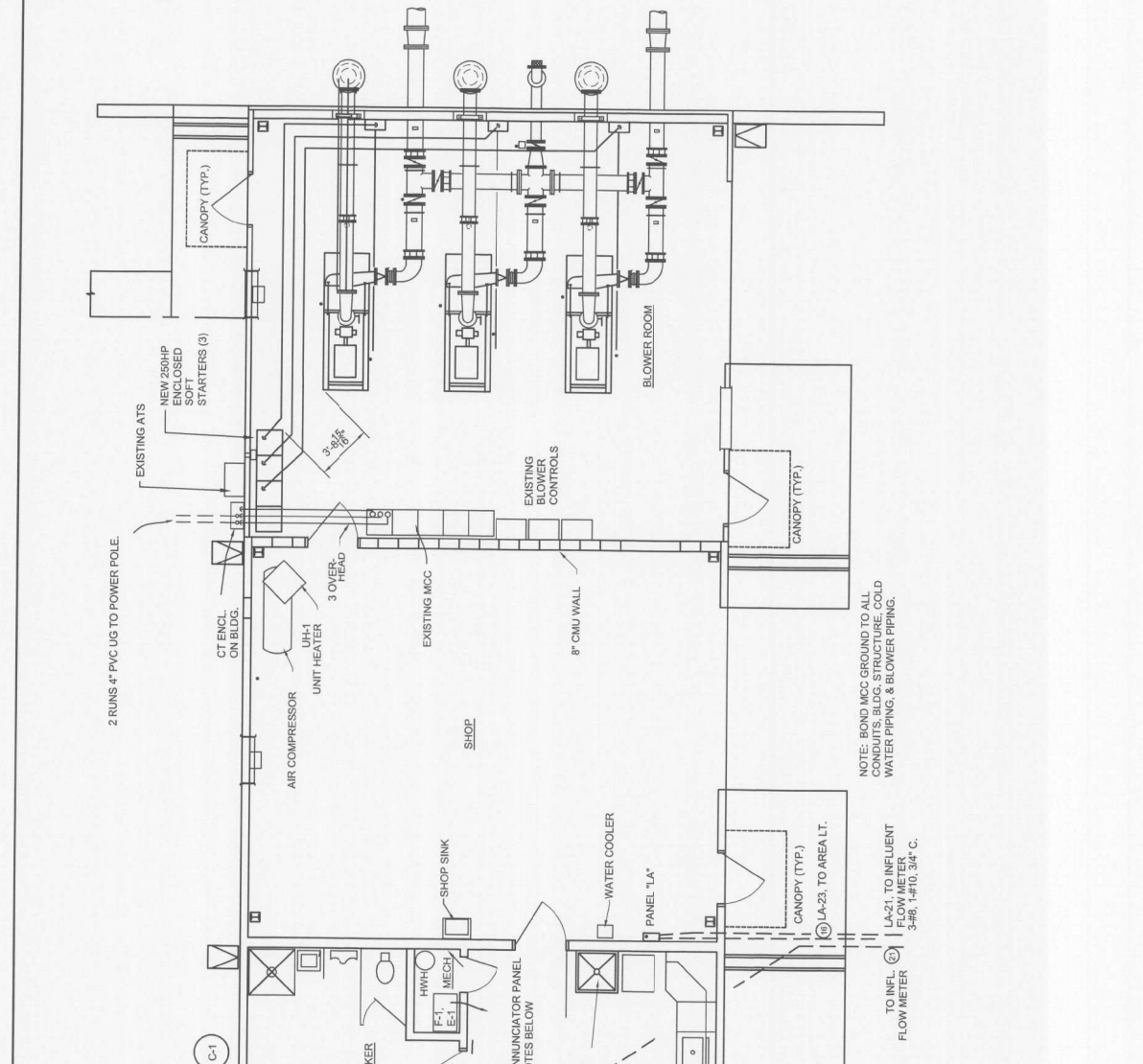
**CRIST ENGINEERS, INC.**  
CONSULTING ENGINEERS  
205 EXECUTIVE COURT  
LITTLE ROCK, ARKANSAS 72205  
TEL: (501) 964-1552  
FAX: (501) 964-9373  
WWW.CRISTENGINEERS.COM



DESIGNED:	RMWZ
DRAWN:	MAG
CHECKED:	LBP
DATE:	JUL 2019



REV. NO.	DATE	DRWN/CHD	REMARKS

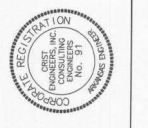
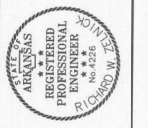
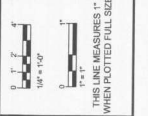


MALVERN, ARKANSAS  
**WASTEWATER TREATMENT FACILITY IMPROVEMENTS**  
MALVERN WATER WORKS  
OPERATIONS BUILDING MODIFICATIONS  
ELECTRICAL POWER PLAN

**CRIST ENGINEERS, INC.**  
CONSULTING ENGINEERS  
205 EXECUTIVE COURT  
LITTLE ROCK, ARKANSAS 72065  
PHONE: (501) 984-1552  
WWW.CRISTENGINEERS.COM



DESIGNED:	LBP
DRAFTED:	MAB
CHECKED:	LBP
DATE:	JUL 2019

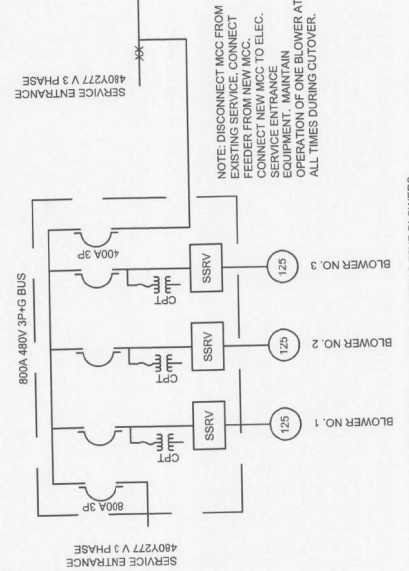


REV. NO.	DATE	BY	CHKD.	REMARKS

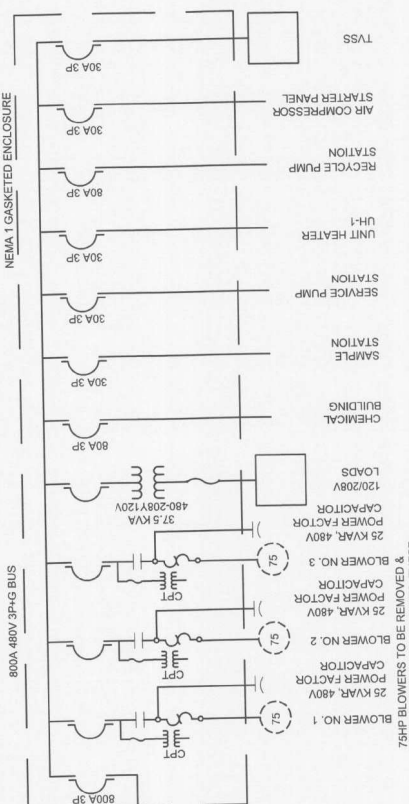
- NOTES:  
1. LOCATE & REPAIR THE CAUSE OF FLICKERING INDICATOR LIGHTS - ONE PANEL.

NOTE: BOND MCC GROUND TO ALL CONDUITS, BLDG. STRUCTURE, COLD WATER PIPING, & BLOWER PIPING.





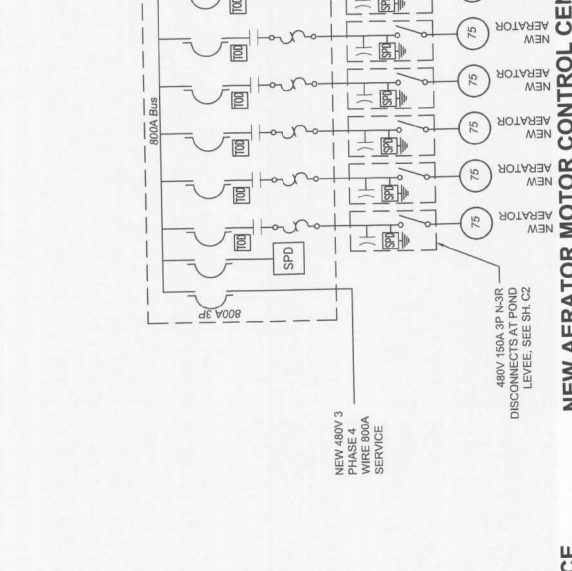
NEW BLOWERS IN PLACE OF EXISTING 75HP BLOWERS



75HP BLOWERS TO BE REMOVED & REPLACED WITH 125HP UNITS. THE STARTERS TO BE LEFT IN PLACE UNUSED.

**OPERATIONS BUILDING - NEW MOTOR CONTROL CENTER DIAGRAM**

**OPERATIONS BUILDING EXISTING MOTOR CONTROL CENTER DIAGRAM**

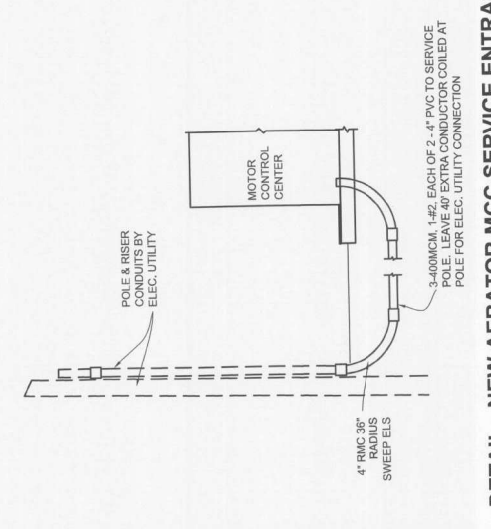


75A Breakers to be replaced with 125HP units

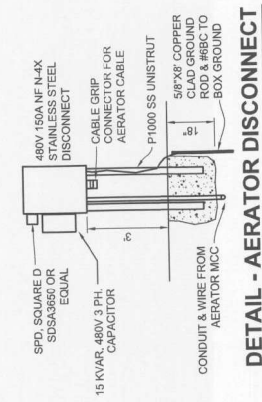
**NEW AERATOR MOTOR CONTROL CENTER**

A	BLANK	SERVICE P.S.	UNIT HTL.	UNIT HTL.	MAIN 800A
B	BLANK	RECYCLE P.S.	RECYCLE P.S.	RECYCLE P.S.	RECYCLE P.S.
C	BLANK	BLANK	BLANK	BLANK	BLANK
D	BLANK	BLANK	BLANK	BLANK	BLANK
E	BLANK	BLANK	BLANK	BLANK	BLANK
F	BLOWER FEEDER	BLANK	BLANK	BLANK	BLANK
G	BLOWER FEEDER	BLANK	BLANK	BLANK	BLANK
H	BLOWER FEEDER	BLANK	BLANK	BLANK	BLANK
J	BLOWER FEEDER	BLANK	BLANK	BLANK	BLANK
K	BLOWER FEEDER	BLANK	BLANK	BLANK	BLANK
L	BLOWER FEEDER	BLANK	BLANK	BLANK	BLANK
M	BLOWER FEEDER	BLANK	BLANK	BLANK	BLANK

**OPERATIONS BUILDING EXISTING MCC LAYOUT**



**DETAIL - NEW AERATOR MCC SERVICE ENTRANCE**



**DETAIL - AERATOR DISCONNECT**

DESIGNED: LBP  
 DRAFTED: MAB  
 CHECKED: LBP  
 DATE: JUL 2019

THIS LINE HAS SIZES AT WHICH PLUTED FULL SIZE

CRIST ENGINEERS, INC. REGISTERED PROFESSIONAL ENGINEER  
 No. 4225

CRIST ENGINEERS, INC. REGISTERED PROFESSIONAL ENGINEER  
 No. 91

REV.	DATE	DRWN	CHKD	REMARKS

