

31 January 2025

ADDENDUM NO. 1

RE: Chisholm Creek Utility Authority
Wastewater Treatment Facility Improvements
WCI File: 20-600-514-00

To All Prospective Bidders:

The Contract Documents for the referenced project are hereby amended in the following particulars only, with all other conditions remaining unchanged. Also attached is the sign-in sheet from the Pre-Bid Meeting held on January 30th, 2025.

A. Plans

1. Sheets No. S-106 and S-306
MODIFICATION to the chemical feed room roof elevation to a height of EL. 1345.00.
2. Sheet No. S-106
ADDITION to a new section cut line through the SBR 3 & 4 building referencing section A3 on sheet S-306.
3. Sheet No. D-119
REMOVAL of the flange shown at the discharge of the EQ Basin #2 pipe. REMOVAL of the note to grout fill the bottom of the basin due to existing basin pressure relief valves. Contractor to just grout fill the existing 6" pipe punch in at the bottom of the basin. MODIFICATION to existing surface aerator note to salvage to owner instead of relocate.
4. Sheet No. S-113
ADDITION of sludge storage area depth of slab and rebar note.
5. Sheets No. S-113 and S-114
ADDITION of 8" PVC drain line to existing drain line Southwest of the sludge storage area shown on S-113. ADDITION of Trench Drain detail added to Sheet S-114
6. Sheet No. S-114
ADDITION of Belt Filter Press slab depth and rebar note added to the section view.

7. Sheets No. G-007 and G-007A
MODIFICATION of 20" SBR 3 & 4 decant/effluent piping location on Sheet G-007 to show leaving the correct location of the building as referenced in Sheet D-109. MODIFICATION to Profile C on Sheet G-007A to reflect the alignment & profile modification of SBR 3 & 4 decant pipe.
8. Sheets No. D-309 and D-311
MODIFICATION of 20" SBR 3 & 4 decant/effluent piping profile elevation after pipe leaves the SBR 3 & 4 building. Note also added to insulate the 20" SBR 3 & 4 decant/effluent pipe/fittings as necessary immediately after pipe leaves building and goes below grade.
9. Sheet No. G-007
CLARIFICATION on EQ Basin #1 connection to utilize existing 16" pipe going under the basin. Contractor to connect to existing 16" pipe just outside of the plug valve pit. Pipe going into the EQ Basin is dimmed on revised sheet to reflect that it is existing.
10. Sheet No. G-007
ADDITION of Site Yard Piping Table to clarify size and material of piping throughout the yard.
11. Sheet No. D-313
ADDITION on UV building effluent line to Willowbend golf course adding a 6" x 10" reducer outside of building to increase pipe to 10" as shown on G-007.
12. Sheet No. D-117
ADDITION of Notes #2 and #3 clarifying grinder station band clamp lid and extension as well as existing manhole flowline elevation.
13. Sheet No. E-431
MODIFICATION to show correct North arrow direction as well as UGE (P109) to show correct side of building that underground electric comes in from SBR building 3 & 4.
14. Sheet No. D-508
MODIFICATION to valve schedule sheet to V-407 as a butterfly valve in lieu of a plug valve. ADDITION to show the two telescoping valves (V515 & V516) located in the proposed primary digesters.
15. Sheet No. S-506
ADDITION of detail A1 to clarify the SW sludge storage area slab and footing.
16. Sheet No. D-501
REMOVE existing Sheet D-501 and REPLACE with attached Sheet D-501. New sheet indicates that contractor is to provide TWO new primary digester surface aerators in lieu of relocating one existing and providing one new. Anchoring detail, plan view, and general notes added for reference and clarification.

B. PROJECT MANUAL

1. Section 11270 – Grinder Pump Station:
REMOVE and REPLACE Section 11270 Grinder Pump Station specification with the attached revised specification.
2. Section 02610 – Waste/Sewer Pipes, Fittings, and Appurtenances:
REMOVE and REPLACE Section 02610 Waste/Sewer Pipes, Fittings, and Appurtenances with the attached revised specification which adds air piping, HDPE and C-905 PVC to specification.
3. Section 11295 – Valves and Appurtenances:
REMOVE and REPLACE Section 11295 Valves and Appurtenances with the attached revised specification which deletes altitude valve from specification for clarification as well as modifies butterfly specification to reflect flange end butterfly valves in lieu of wafer style.
4. Section 11300 – Meters; page 11300-2:
REMOVE and REPLACE page 11300-2 with the attached revised page 11300-2 in the Meters specification section.
5. Section 00003 – Table of Contents:
REMOVE and REPLACE Section 00004 Table of Contents with the attached specification section that lists new specification section 11350 Surface Aerators.
6. Section 11350 – Surface Aerators:
ADD to the project manual attached specification Section 11350 Surface Aerators.

This ADDENDUM and PRE-BID SIGN IN SHEET is hereby made a part of the Bidding Documents to the same extent as though contained in the original documents. Work to be included shall not be limited to narrative description contained herein, but shall also include adjustments or revisions to other work not mentioned, in order to accomplish the Work described.

Each Bidder shall acknowledge receipt of this ADDENDUM in the space provided on the Bid Form.

WILSON & COMPANY



Colton Woodard
Project Manager

CHISHOLM CREEK UTILITY AUTHORITY:
WWTF IMPROVEMENTS
JANUARY 30, 2025 @ 10:00 AM
PRE-BID MEETING
ATTENDANCE SHEET
(PLEASE PRINT CLEARLY, FOR THE RECORD)



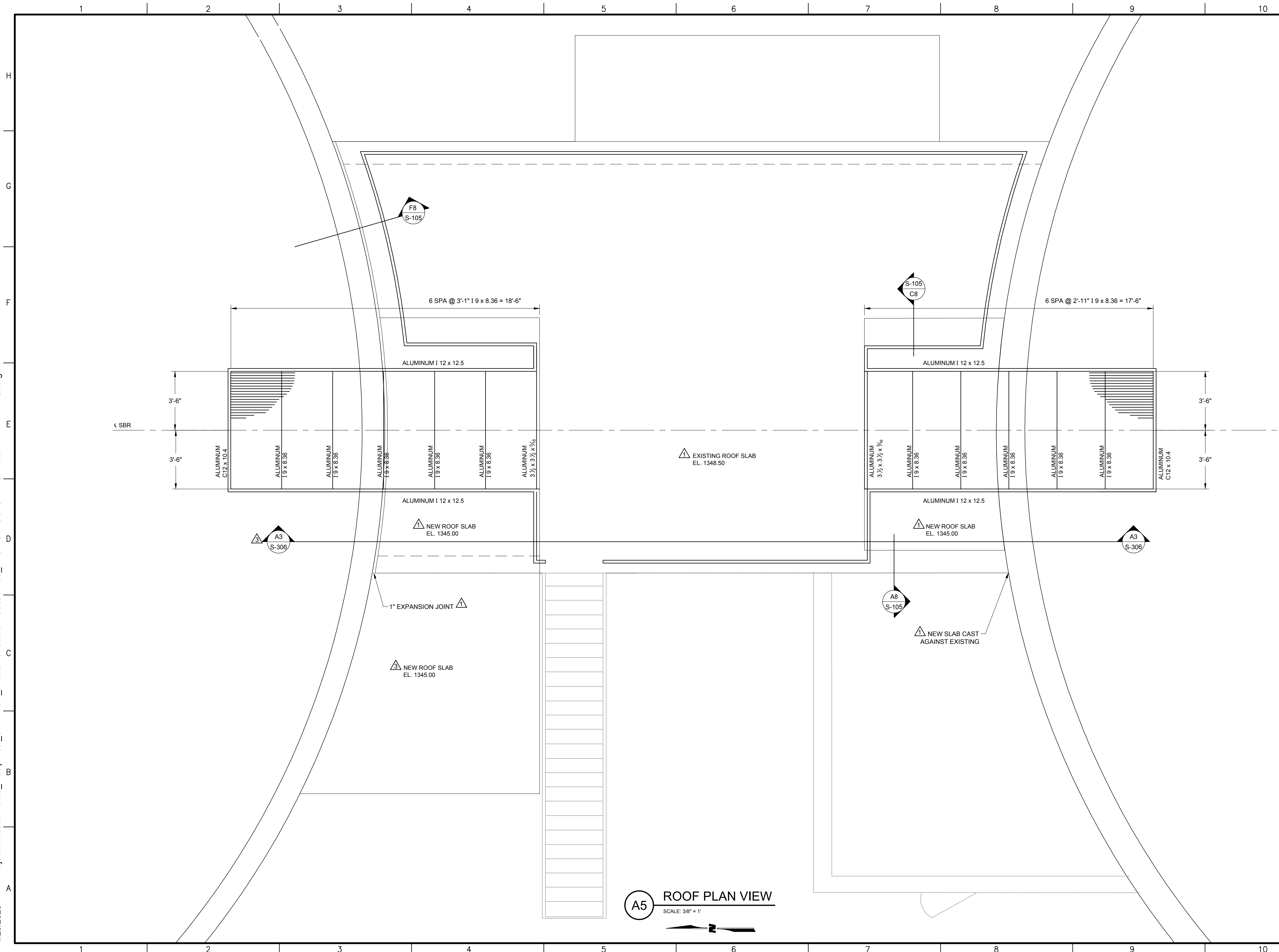
NAME	REPRESENTING	EMAIL ADDRESS	PHONE
1. Tyler Gray	Haynes Equipment	tgray@haynesequip.com	316-633-0266
2. Taylor Starns	Walters-Morgan Construction	tstarns@waltersmorgan.com	785-539-7513
3. Travis Snyder	BRB Contractors	travisnyder@brbcontractors.com	785-285-1199
4. Ryan Sharp	Dandlinger Construction	Rsharp@dandlinger.Build	316-945-0555
5. Chad Zeglmann	Shelley Electric	Chad@shelleyelectric.com	316-990-6225
6. Randy Wertenkemper	Shelley Electric	randy@shelleyelectric.com	316-945-8311
7. KENT SCHLOSSER	HUTTON	KSCHLOSSER@HUTTONBUILD.COM	316-293-7131
8. Tyler Hart	Hutton	THart@huttonbuilds.com	316-795-6041
9. Kevin Gabbert	Parkson	Kgabbert@parkson.com	913-249-0080
10. Schyler Dodd	Mellen & ASSOC	sdodd@melleninc.com	816-400-7969

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 WWTF IMPROVEMENTS
 JANUARY 30, 2025 @ 10:00 AM
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 ATTENDANCE SHEET
 (PLEASE PRINT CLEARLY, FOR THE RECORD)



NAME	REPRESENTING	EMAIL ADDRESS	PHONE
11. Rick Hausard	Central Consolidated	Estimate@Centralconsolidated.NET	316-833-7169
12. ALAN FARRINGTON	WILDCAT CONST. CO.	alan.farrington@wildcat.net	316-945-9408
13. Tom Hudspeth	Wildcat Const Co	tom.hudspeth@wildcat.net	
14. Richard Smith	LETTS VAN KRIC	Richard@LETTSVANKRIC.com	913-216-5303
15. Walter Marcotte	UCI	Wmarcotte@UCICT.COM	316-239-7772
16. Jared Randolph	UCI	jaredr@ucict.com	316-239-9384
17.			
18.			
19.			

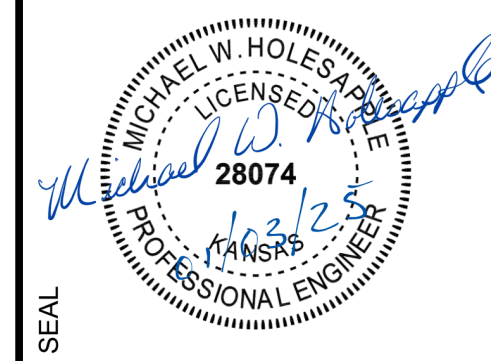
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A5 ROOF PLAN VIEW
SCALE: 3/8" = 1'

WILSON & COMPANY
1700 EAST IRON AVE.
SALINA, KS 67401
PHONE: 785-827-0433
FAX: 785-827-5949
www.wilsonco.com

CONSULTANTS



PROJECT NAME
**CHISHOLM CREEK UTILITY
AUTHORITY
WASTEWATER TREATMENT
FACILITY IMPROVEMENTS**

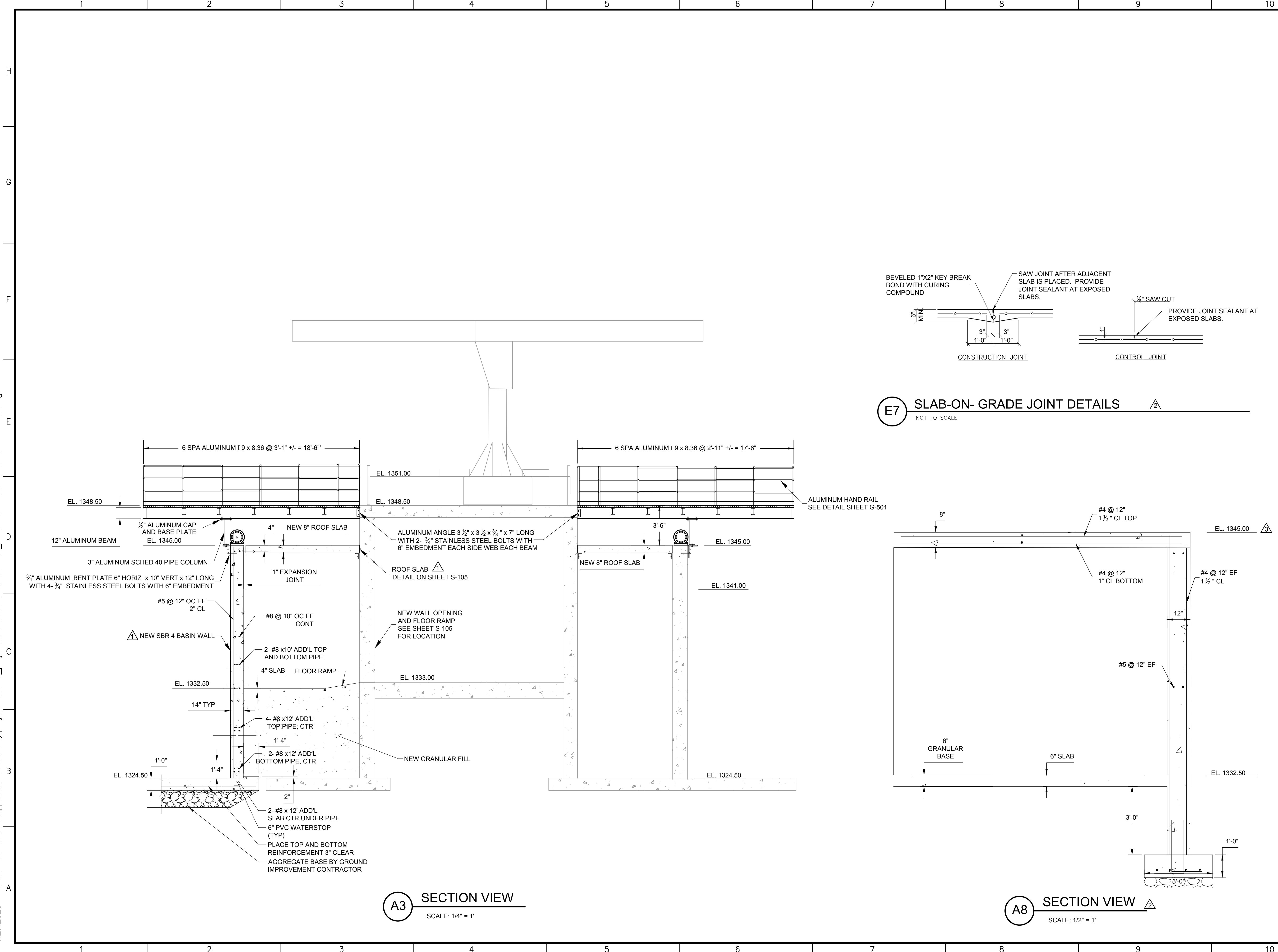
REV.	DATE	ADDENDUM #1	DESCRIPTION	CJW	BY
3	1/28/25				

PROJECT NO: 2060051400
DESIGNED BY: HKB
DRAWN BY: HKB
CHECKED BY: BPS
DATE: MARCH 2021

SHEET TITLE
SBR 3&4 ROOF PLAN

SHEET NO:
S-106

1/27/2025 C:\users\woodard\lappdata\local\entire\project\wci\project\wci\0406932\2060051400_PROP_SBR 3&4_SECTION VIEWS.dwg



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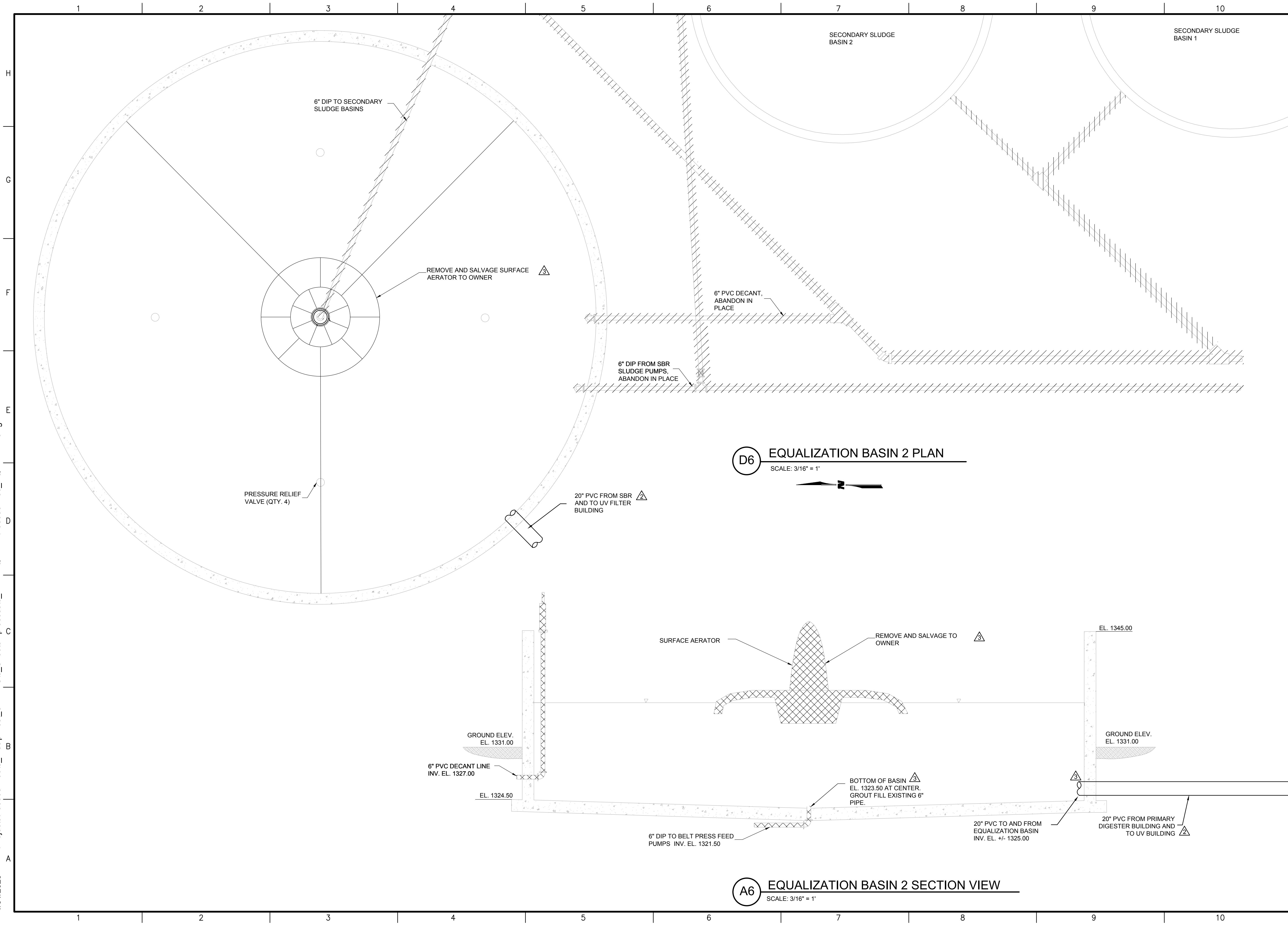
REV.	DATE	DESCRIPTION	CJW	BY
3	1/29/25	ADDENDUM #1	CJW	
2	1/06/25	WCI REVISIONS	CJW	

PROJECT NO: 2060051400
DESIGNED BY: HKB
DRAWN BY: HKB
CHECKED BY: BPS
DATE: OCTOBER 2024

SHEET TITLE
**SBR 3&4 BUILDING
SECTION**

SHEET NO:
S-306

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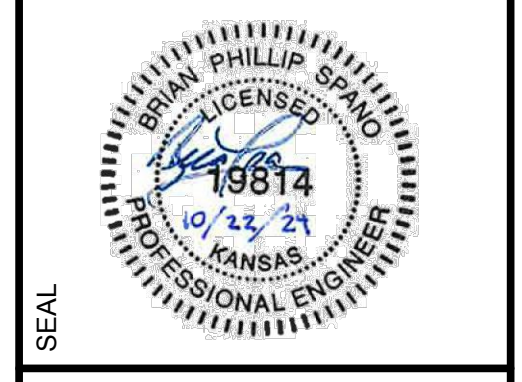


D6 EQUALIZATION BASIN 2 PLAN
SCALE: 3/16" = 1'

A6 EQUALIZATION BASIN 2 SECTION VIEW
SCALE: 3/16" = 1'

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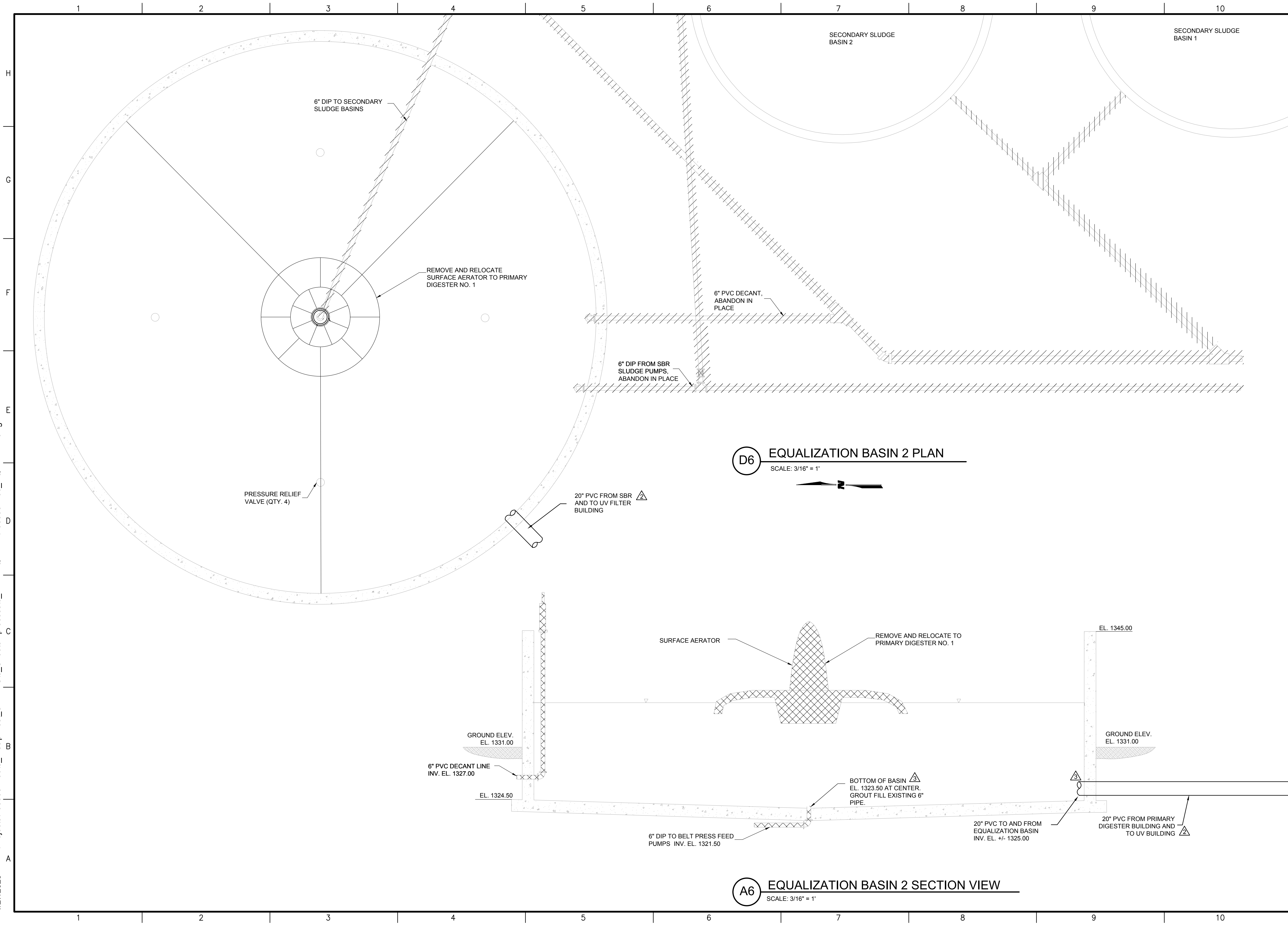
REV.	DATE	DESCRIPTION	BY
3	1/28/25	ADDENDUM #1	CJW
2	1/06/25	WCI REVISIONS	CJW

PROJECT NO: 2060051400
DESIGNED BY: JAD
DRAWN BY: JAD
CHECKED BY: BPS
DATE: MARCH 2021

SHEET TITLE
**EQUALIZATION
BASIN 2
REHABILITATION**

SHEET NO:
D-119

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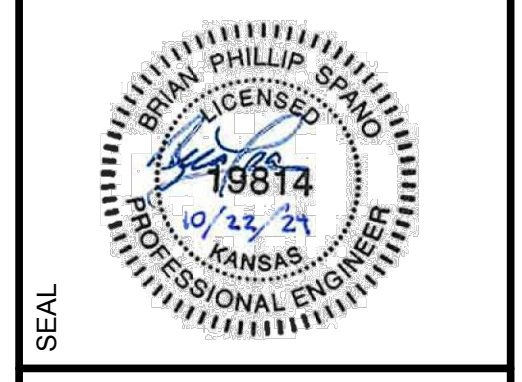


D6 EQUALIZATION BASIN 2 PLAN
SCALE: 3/16" = 1'

A6 EQUALIZATION BASIN 2 SECTION VIEW
SCALE: 3/16" = 1'

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PROJECT NAME
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AUTHORITY
WASTEWATER TREATMENT
FACILITY IMPROVEMENTS**

REV.	DATE	DESCRIPTION	BY
3	1/28/25	ADDENDUM #1	CJW
2	1/06/25	WCI REVISIONS	CJW

PROJECT NO: 2060051400
DESIGNED BY: JAD
DRAWN BY: JAD
CHECKED BY: BPS

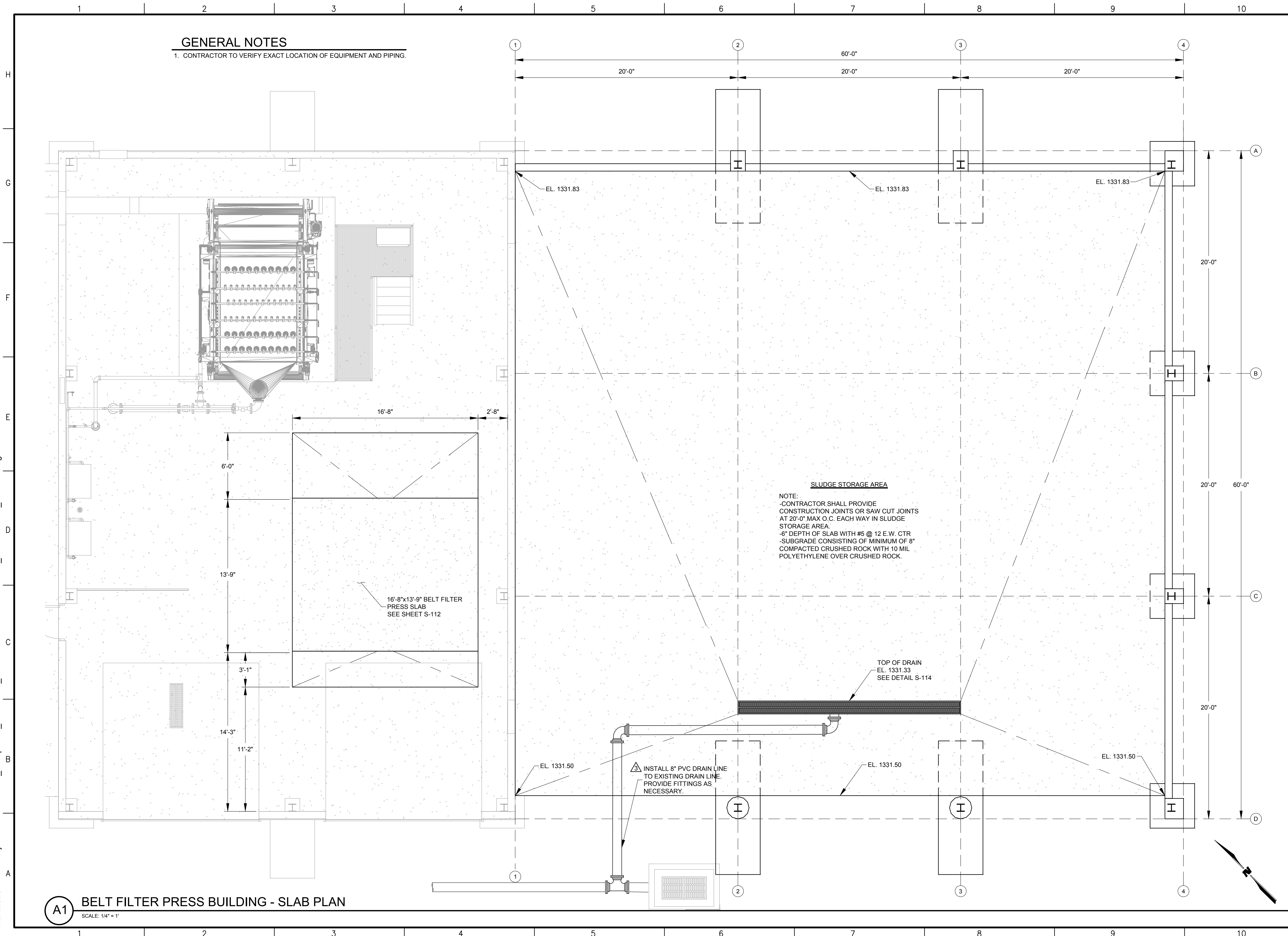
DATE: MARCH 2021
SHEET TITLE
**EQUALIZATION
BASIN 2
REHABILITATION**

SHEET NO:
D-119

1/27/2025 W:\Projects\20600514003_Disciplines\14003_SHEETS4_sheets - structural\2060051400_SLUDGEBLD_STRUC.dwg

GENERAL NOTES

1. CONTRACTOR TO VERIFY EXACT LOCATION OF EQUIPMENT AND PIPING.

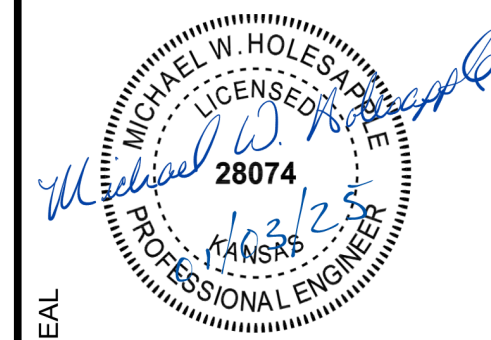


A1 BELT FILTER PRESS BUILDING - SLAB PLAN

SCALE: 1/4" = 1'

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SEAL

PROJECT NAME
 CHISHOLM CREEK UTILITY
 AUTHORITY
 WASTEWATER TREATMENT
 FACILITY IMPROVEMENTS

REV.	DATE	DESCRIPTION	CJW	BY
3	1/28/25			

PROJECT NO: 2060051400
 DESIGNED BY: CJW
 DRAWN BY: RKH
 CHECKED BY: BPS
 DATE: MARCH 2021

SHEET TITLE
 SLUDGE STORAGE
 AND BELT PRESS
 BUILDING
 SLAB PLAN

SHEET NO: **S-113**

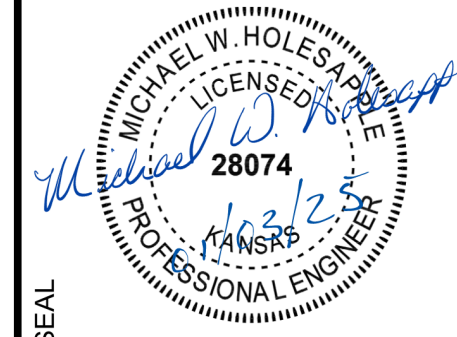
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GENERAL NOTES

- 3/4" DIA. ANCHOR BOLTS TO PROJECT 2-1/4" ABOVE FOUNDATION PLATE.
- TOLERANCE ON ALL ANCHOR BOLT DIMENSIONS IS ± 1/8" MAX.; DIAGONAL MEASUREMENT DIFFERENTIALS IS 1/4".

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SEAL

**CHISHOLM CREEK UTILITY
 AUTHORITY
 WASTEWATER TREATMENT
 FACILITY IMPROVEMENTS**

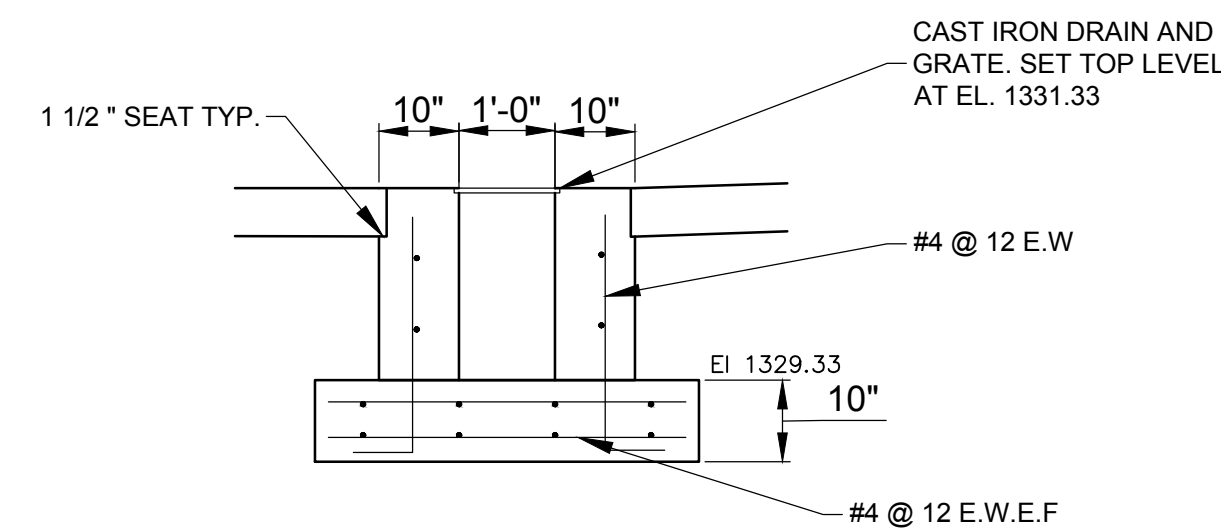
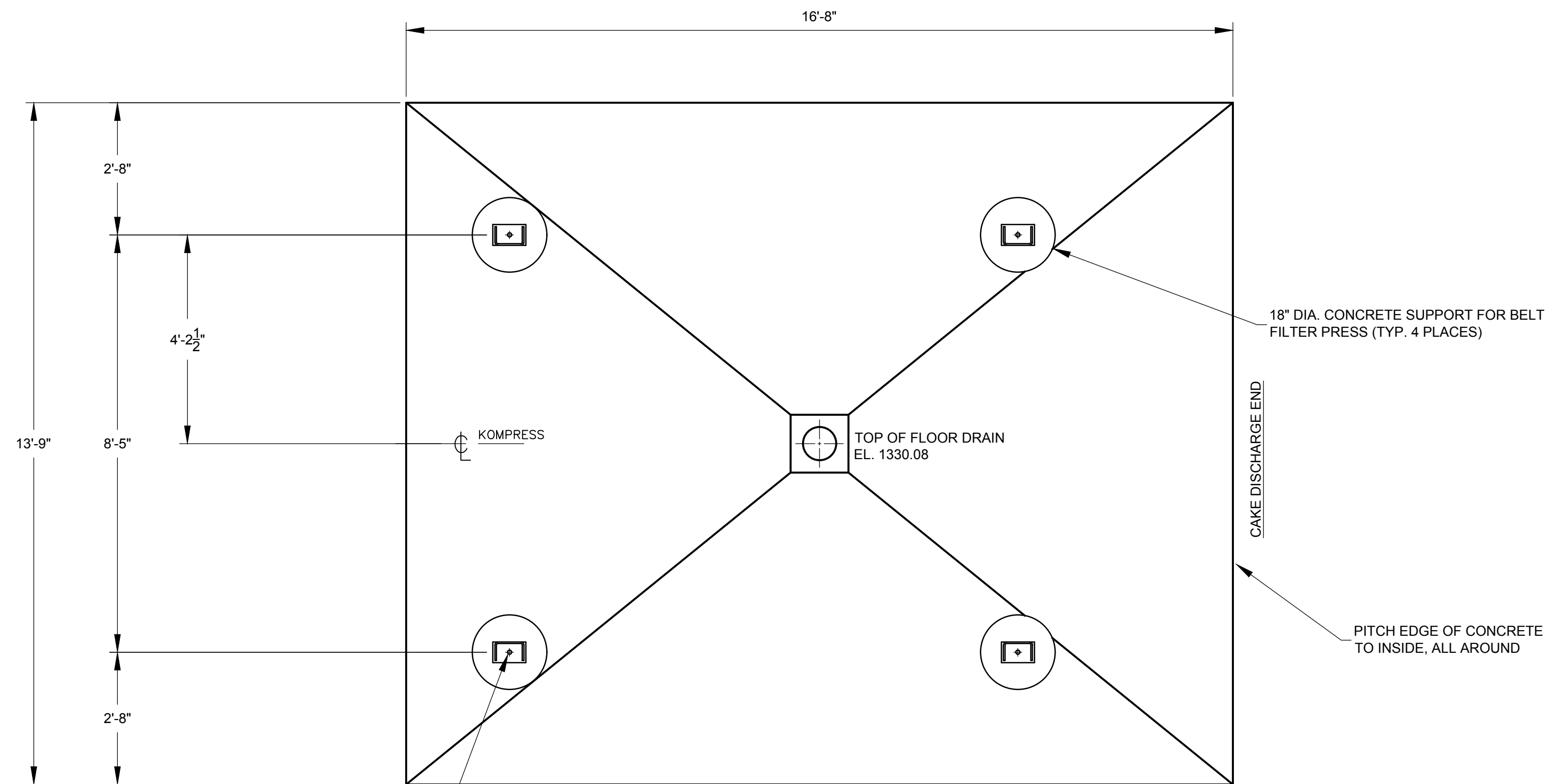
PROJECT NAME

REV.	DATE	DESCRIPTION	CJW	BY
3	1/28/25			
			ADDENDUM #1	

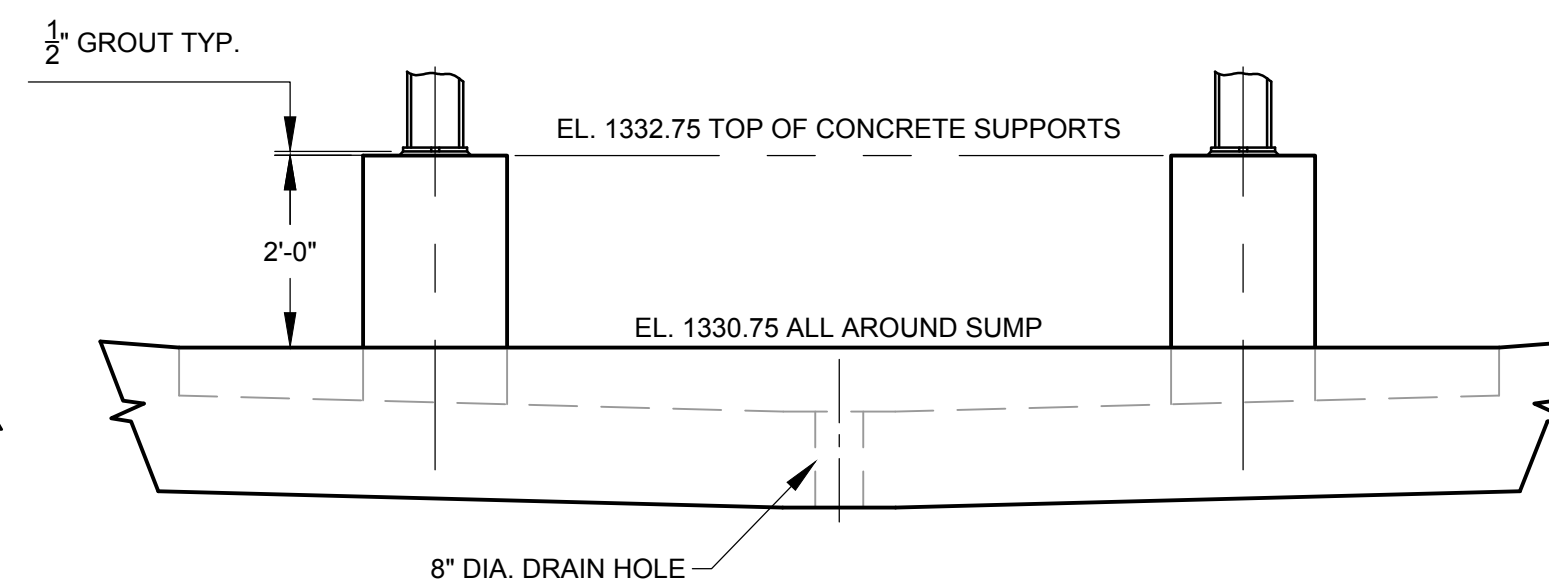
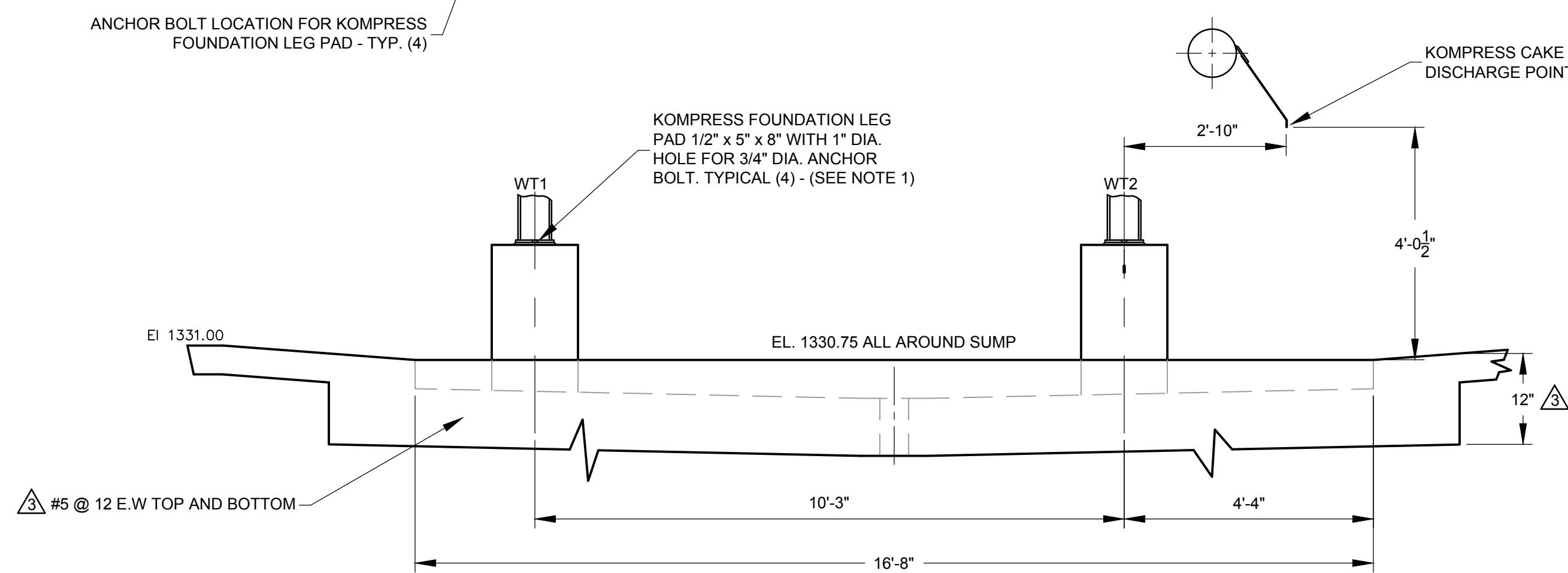
PROJECT NO: 2060051400
 DESIGNED BY: CJW
 DRAWN BY: RKH
 CHECKED BY: BPS
 DATE: MARCH 2021

SHEET TITLE
**SLUDGE STORAGE
 AND BELT PRESS
 SLAB PLAN**

SHEET NO:
S-114



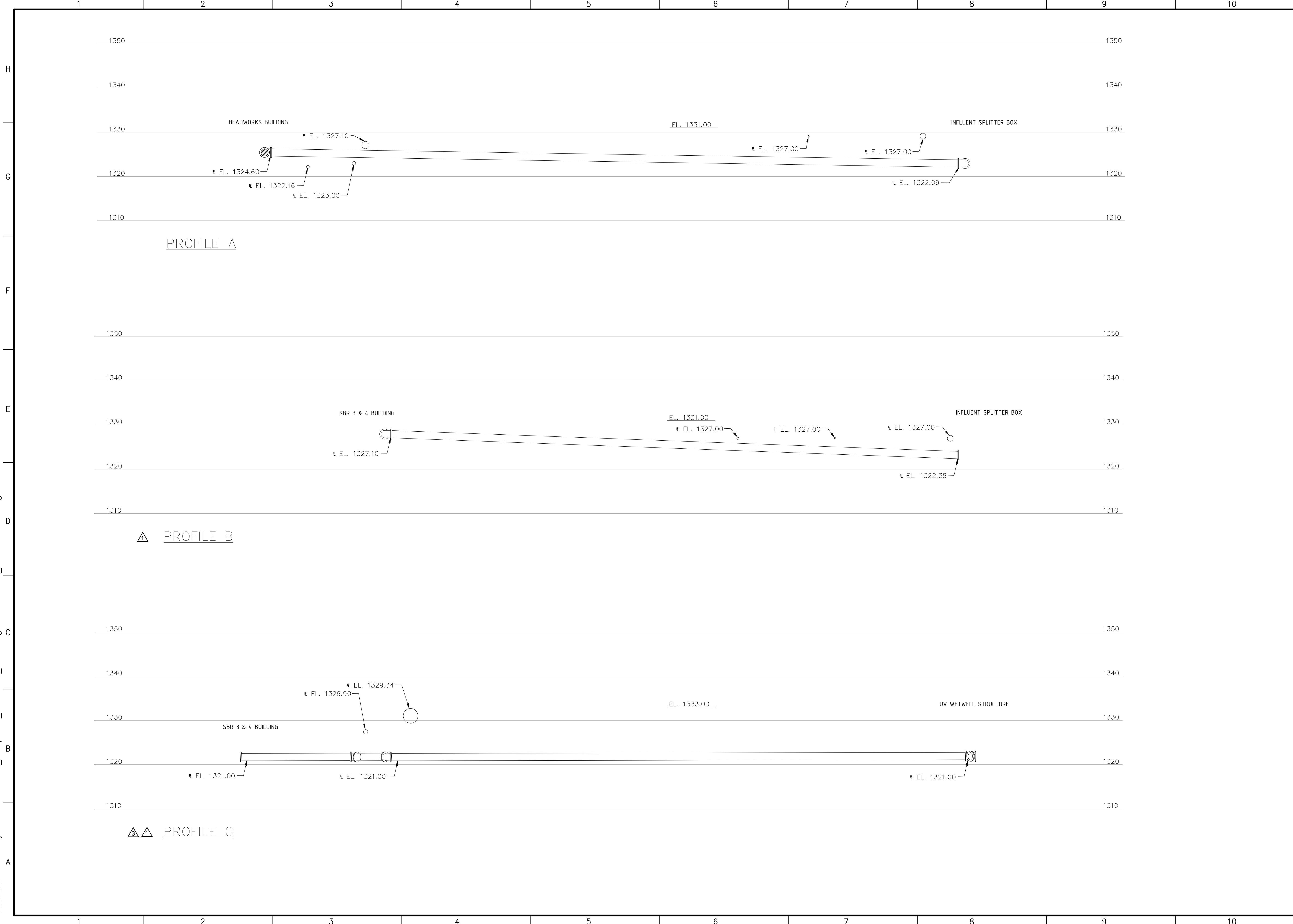
(D7) TRENCH DRAIN DETAIL



(A1) BELT FILTER PRESS SLAB PLAN
 SCALE: 1" = 2'

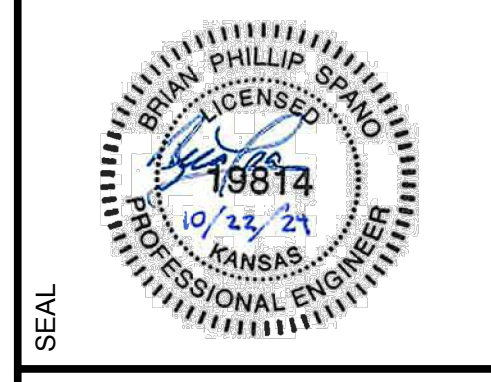


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PROJECT NAME
**CHISHOLM CREEK UTILITY
 AUTHORITY
 WASTEWATER TREATMENT
 FACILITY IMPROVEMENTS**

REV.	DATE	DESCRIPTION	BY
3	1/28/25	ADDENDUM #1	CJW
1	11/25/24	KDHE COMMENTS/REVISIONS	BR

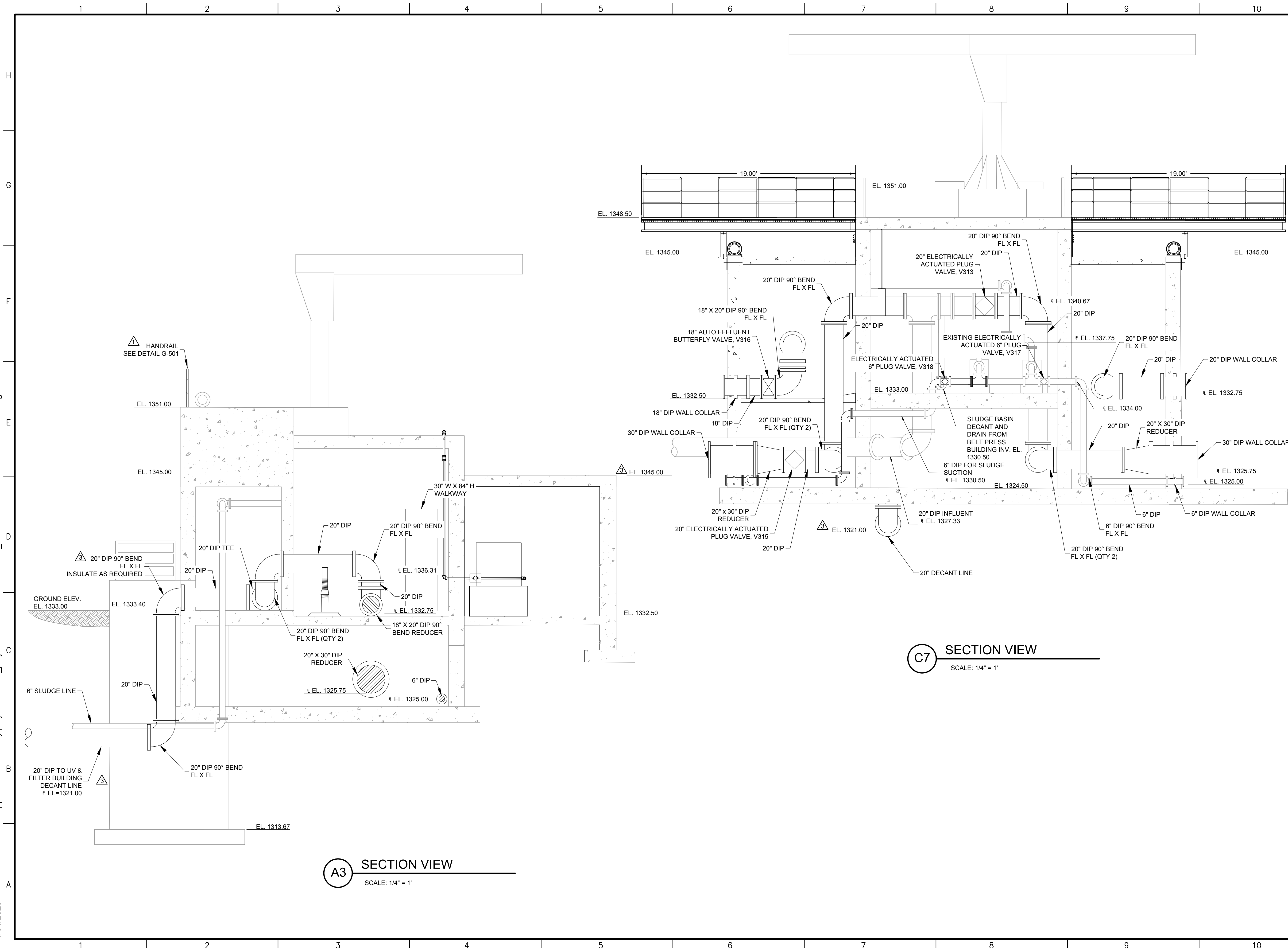
PROJECT NO: 2060051400
 DESIGNED BY: CJW
 DRAWN BY: BR
 CHECKED BY: BPS
 DATE: MARCH 2021

SHEET TITLE
**SITE YARD PIPING
 CROSSING PROFILE**

SHEET NO:
G-007A

C:\users\woodard\lppdata\local\bentley\project\wci\projects\0450763\2060051400_PROP_SBR 3&4_SECTION VIEWS.dwg

1/31/2025



A3 SECTION VIEW
SCALE: 1/4" = 1'

C7 SECTION VIEW
SCALE: 1/4" = 1'

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PROJECT NAME
**CHISHOLM CREEK UTILITY
AUTHORITY
WASTEWATER TREATMENT
FACILITY IMPROVEMENTS**

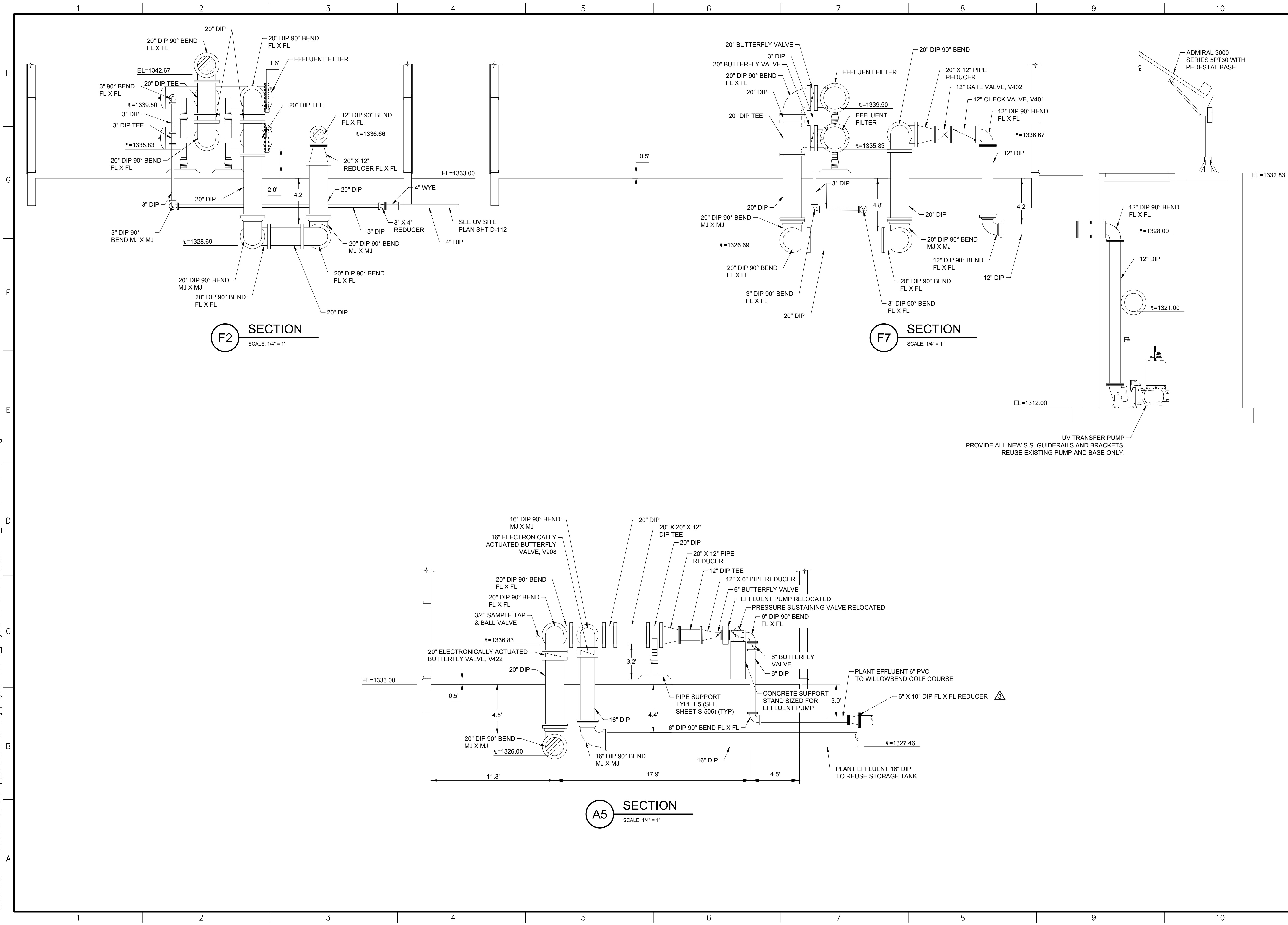
REV.	DATE	ADDENDUM #1	C/J/W	BY
3	1/28/25			

PROJECT NO: 2060051400
DESIGNED BY: HKB
DRAWN BY: HKB
CHECKED BY: BPS
DATE: OCTOBER 2024

SHEET TITLE
SBR 3&4 SECTION

SHEET NO:
D-309

C:\users\woodard\lppdata\local\bentley\project\wci\projects\0450764\2060051400_UV_DISINFECTION.dwg

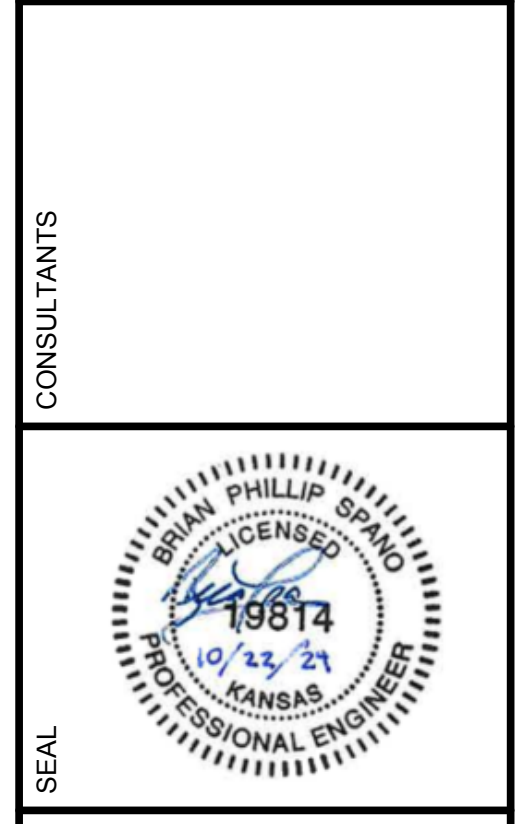


F2 SECTION
SCALE: 1/4" = 1"

F7 SECTION
SCALE: 1/4" = 1"

A5 SECTION
SCALE: 1/4" = 1"

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PROJECT NAME
**CHISHOLM CREEK UTILITY
AUTHORITY
WASTEWATER TREATMENT
FACILITY IMPROVEMENTS**

REV.	DATE	DESCRIPTION	CJW	BY
3	1/28/25			

PROJECT NO: 2060051400
DESIGNED BY: HKB
DRAWN BY: HKB
CHECKED BY: BPS
DATE: OCTOBER 2024

SHEET TITLE
**UV & FILTER
PROCESS PIPING
SECTIONS**

SHEET NO:
D-313

UV TRANSFER PUMP
PROVIDE ALL NEW S.S. GUIDERAILS AND BRACKETS.
REUSE EXISTING PUMP AND BASE ONLY.

PIPE SUPPORT
TYPE E5 (SEE
SHEET S-505) (TYP)

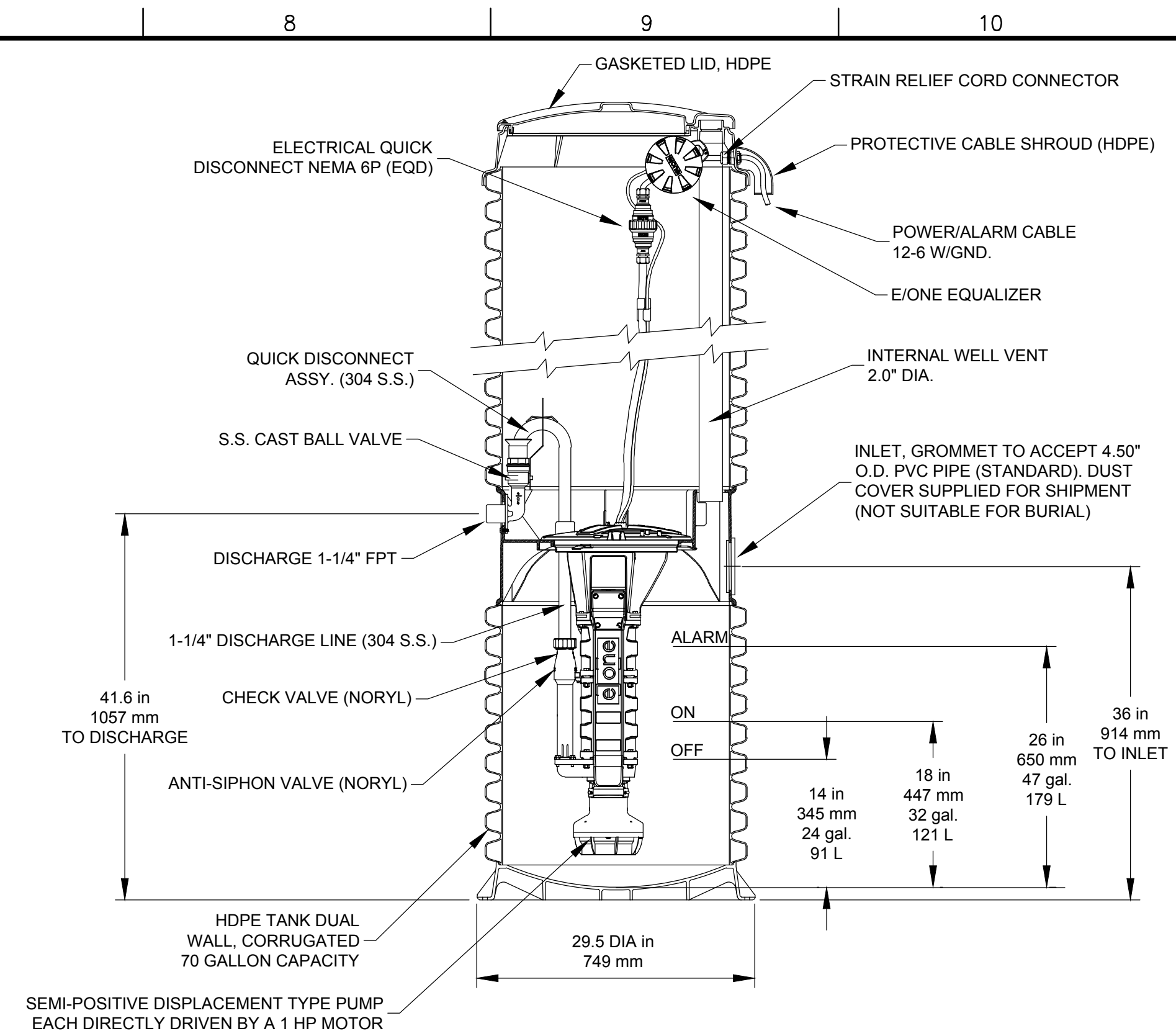
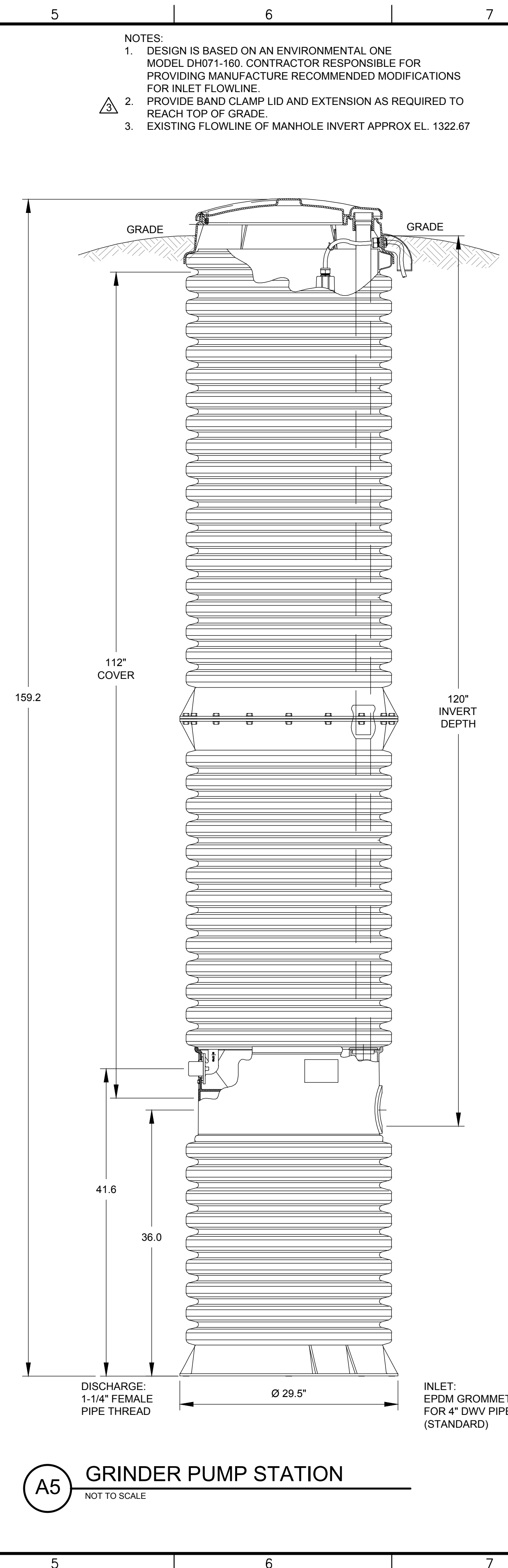
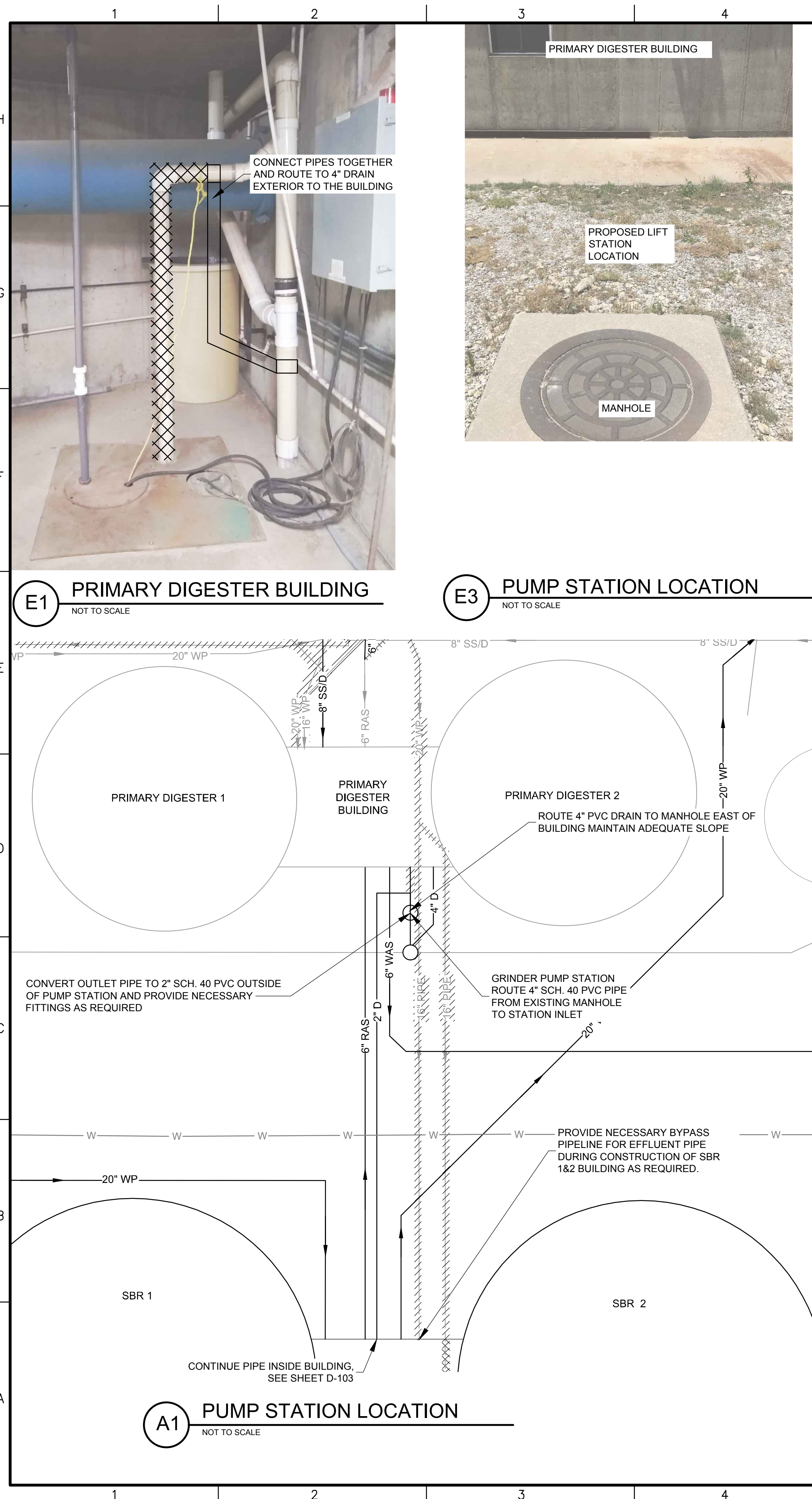
CONCRETE SUPPORT
STAND SIZED FOR
EFFLUENT PUMP

PLANT EFFLUENT 6" PVC
TO WILLOWBEND GOLF COURSE

PLANT EFFLUENT 16" DIP
TO REUSE STORAGE TANK

SEE UV SITE
PLAN SHT D-112

1/28/2025 C:\users\woodard\appdata\local\benl\project\wci\project\wci\0406929\2060051400_PUMP STATION.dwg



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CONSULTANTS

SEAL

BRAND LICENSED
19874
10/23/21
KANSAS
PROFESSIONAL ENGINEER

PROJECT NAME
CHISHOLM CREEK UTILITY AUTHORITY WASTEWATER TREATMENT FACILITY IMPROVEMENTS

REV.	DATE	DESCRIPTION	CJW	BY
3	1/28/25	ADDENDUM #1		

PROJECT NO: 2060051400

DESIGNED BY:

DRAWN BY:

CHECKED BY:

DATE: OCTOBER 2024

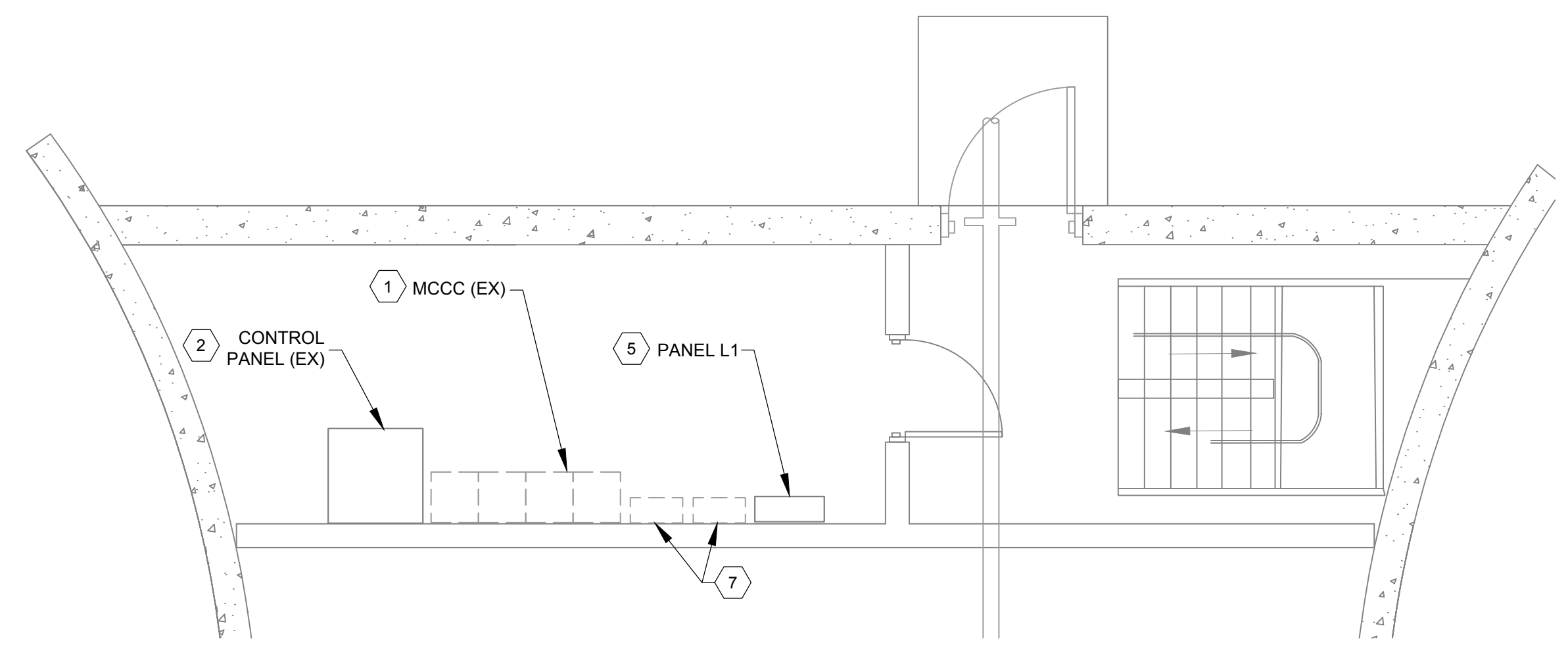
SHEET TITLE
SANITARY SEWER LIFT STATION

SHEET NO:
D-117

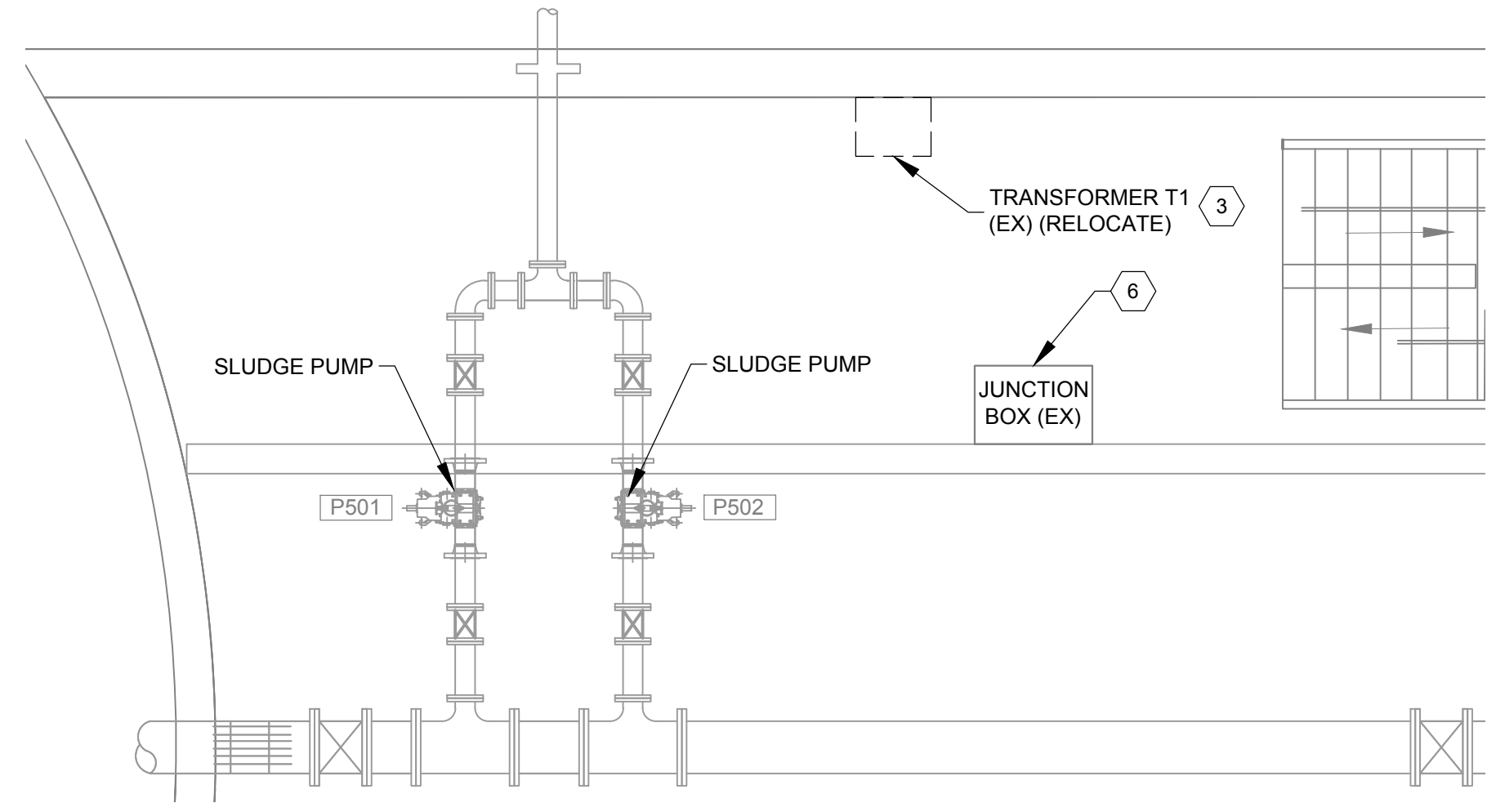
1/29/2025 W:\Projects\20600514003_Disciplines\Sheets\6_sheets - electrical\E-431.dwg

H
G
F
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C
B
A

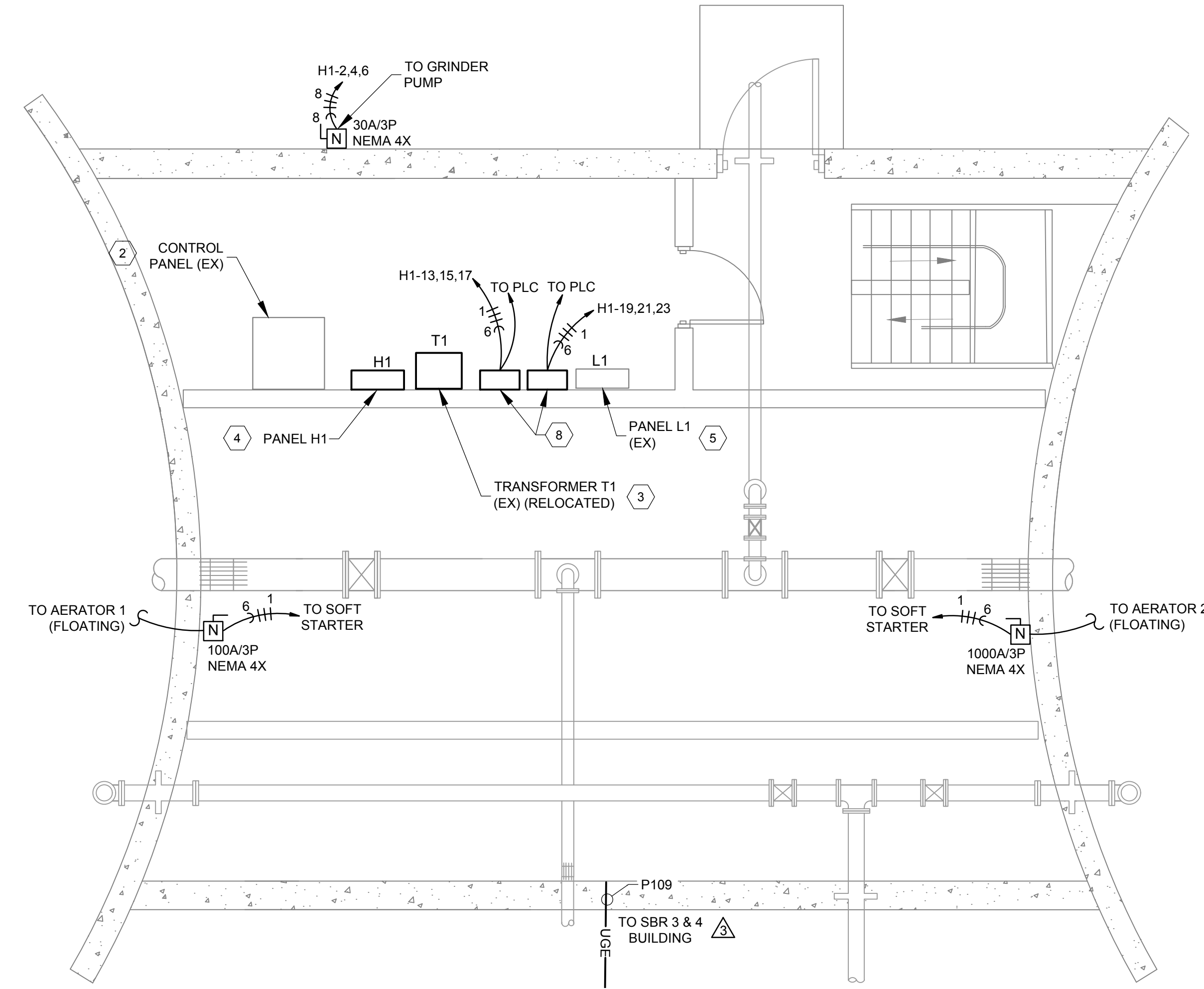
1 2 3 4 5 6 7 8 9 10



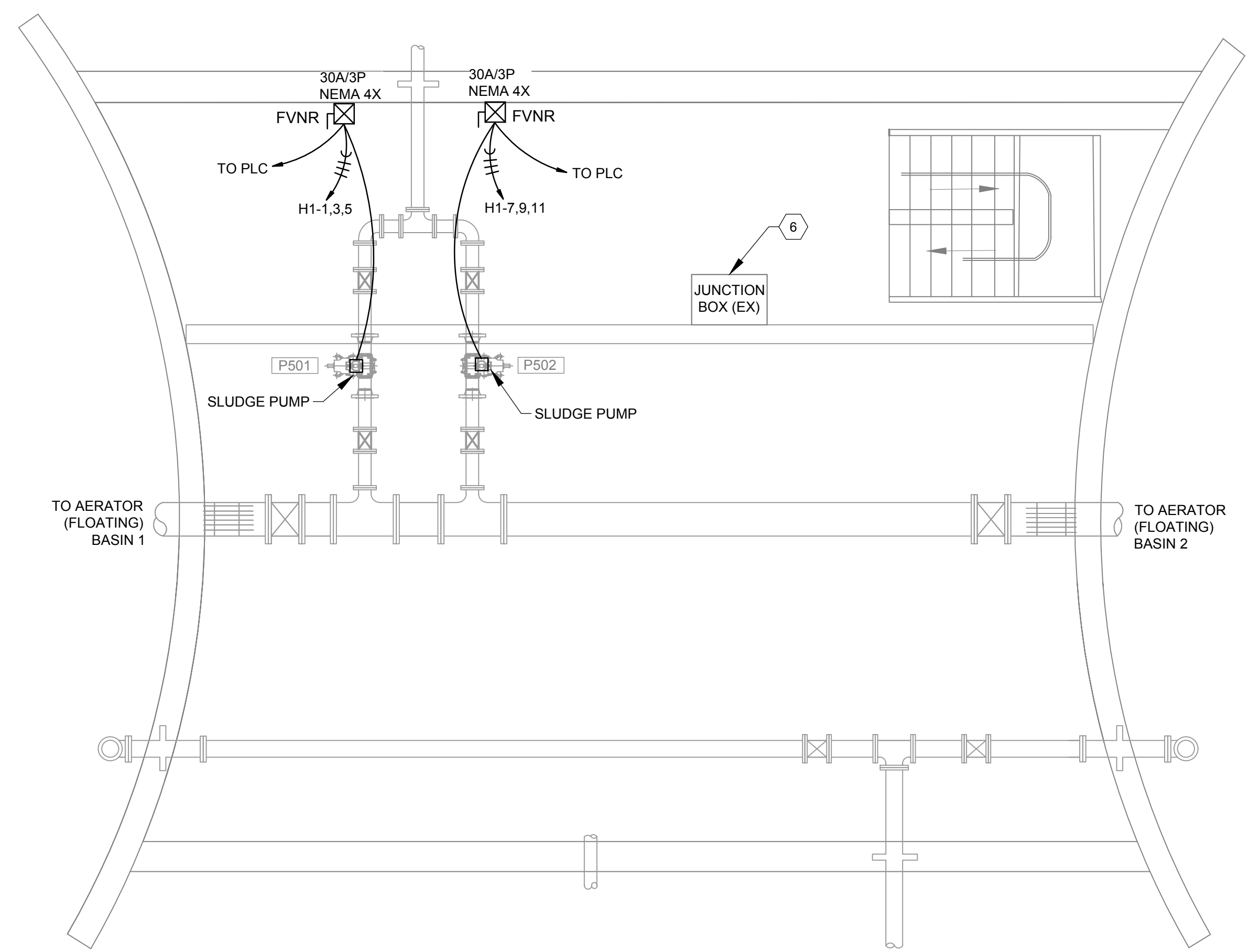
1 ELECTRICAL PRIMARY DIGESTER BUILDING - UPPER - DEMO
SCALE: 1/4" = 1'
PLAN VIEW AT EL. 1333.00



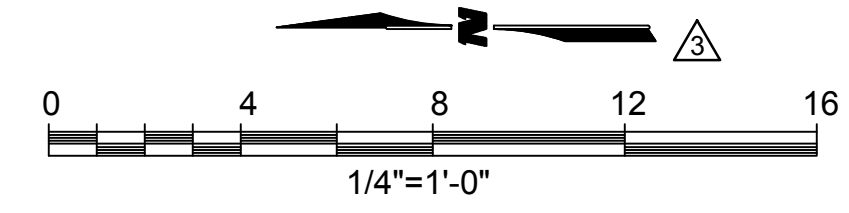
2 ELECTRICAL PRIMARY DIGESTER BUILDING - LOWER - DEMO
SCALE: 1/4" = 1'
PLAN VIEW AT EL. 1326.00



3 ELECTRICAL PRIMARY DIGESTER BUILDING - UPPER
SCALE: 1/4" = 1'
PLAN VIEW AT EL. 1333.00



4 ELECTRICAL PRIMARY DIGESTER BUILDING - LOWER
SCALE: 1/4" = 1'
PLAN VIEW AT EL. 1326.00



GENERAL NOTES:

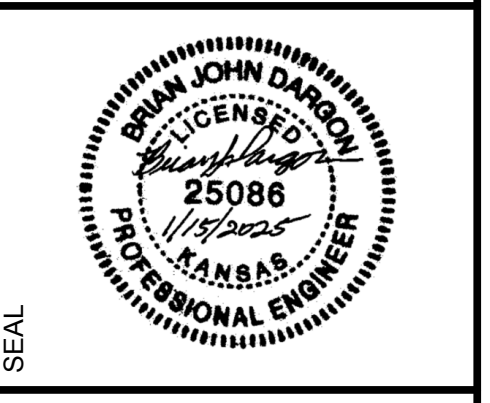
1. THE WATER TREATMENT FACILITY HAS HAZARDOUS LOCATIONS CLASSIFIED BY NFPA 820 STANDARD FOR FIRE PROTECTION IN WATER TREATMENT AND COLLECTION FACILITIES. HEREAFTER REFERRED TO AS THE CODE. SPECIFICALLY, THE HEADWORKS, SBR BASINS AND THE PRIMARY DIGESTER BASINS HAVE CLASSIFIED AREAS AS DEFINED BY THE CODE. THE ELECTRICAL CONTRACTOR SHALL PROVIDE CLASS 1 AND CLASS 1 DIVISION 2 INSTALLATIONS AS REQUIRED BY THE CODE.
2. SEE ENLARGED SITE PLAN FOR ADDITIONAL COORDINATION SHEET E-002.
3. EXISTING FACILITY PROTECT EXISTING INFRASTRUCTURE IN PLACE. UPON COMPLETION ALL SYSTEMS SHALL BE OPERATIONAL.
4. SEE SITE PLAN AND ONE-LINE DIAGRAMS FOR ADDITIONAL INFORMATION.
5. THE CONTRACTOR SHALL PROVIDE CONTROL WIRING AND CONDUIT FOR FIELD DEVICES AND EQUIPMENT. CONDUITS TAGS TO PLC SHALL CONTAIN THE WIRING REQUIRED AND AS INDICATED ON THE PLC INPUT/OUTPUT SCHEDULES. SEE SHEETS E-620 AND E-621. THE CONTRACTOR SHALL COORDINATE ALL FIELD CONTROL WIRING WITH THE SYSTEMS INTEGRATOR.

KEYNOTES (X)

1. EXISTING MCC TO BE REMOVED.
2. EXISTING CONTROL PANEL TO BE REMOVED.
3. EXISTING TRANSFORMER T1 (EX) TO BE RELOCATED FROM LOWER LEVEL TO THE ELECTRICAL ROOM LOCATED IN THE UPPER LEVEL. TO BE FEED FROM PANEL H1.
4. PROVIDE NEW PANEL H1.
5. PANEL L1 (EX) TO REMAIN AND REFEED FROM TRANSFORMER T1. PROTECT IN PLACE.
6. JUNCTION BOX (EX) TO REMAIN, PROTECT IN PLACE.
7. REMOVE EXISTING VARIABLE FREQUENCY DRIVES AND TURN OVER TO THE OWNER. REMOVE CONNECTED POWER AND CONTROL WIRING.
8. PROVIDE SOFT STARTER FOR AERATORS A501 AND A502, SEE ONE-LINE DIAGRAM AND SPECIFICATIONS.

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CONSULTANTS



PROJECT NAME
**CHISHOLM CREEK UTILITY
AUTHORITY
WASTEWATER TREATMENT
FACILITY IMPROVEMENTS**

REV.	DATE	DESCRIPTION	CJW	BY
3	1/29/25			

PROJECT NO: 2060051400
DESIGNED BY: BJD
DRAWN BY: SRB
CHECKED BY: BJD
DATE: MARCH 2021

SHEET TITLE
**ELECTRICAL
PRIMARY DIGESTER
BUILDING**

SHEET NO:
E-431

3 VALVE SCHEDULE

SUPPLIED BY	NEW OR EXISTING	NUMBER	SIZE (in.)	TYPE	LOCATION	SERVICE	OPERATOR
	EXISTING	V101	30"x36"	SLIDE GATE	HEADWORKS	MECHANICAL BAR SCREEN	
	EXISTING	V102	30"x36"	SLIDE GATE	HEADWORKS	MECHANICAL BAR SCREEN	
	EXISTING	V103	30"x36"	SLIDE GATE	HEADWORKS	MECHANICAL BAR SCREEN	
	EXISTING	V104	30"x36"	SLIDE GATE	HEADWORKS	MECHANICAL BAR SCREEN	
	EXISTING	V105	30"x36"	SLIDE GATE	HEADWORKS	FUTURE MECHANICAL BAR SCREEN	
	EXISTING	V106	30"x36"	SLIDE GATE	HEADWORKS	FUTURE MECHANICAL BAR SCREEN	
	EXISTING	V107	8	CHECK	VALVE PIT	INFLUENT PUMP STATION	LEVER
	EXISTING	V108	8	GATE	VALVE PIT	INFLUENT PUMP STATION	HAND WHEEL
	EXISTING	V109	8	CHECK	VALVE PIT	INFLUENT PUMP STATION	LEVER
	EXISTING	V110	8	GATE	VALVE PIT	INFLUENT PUMP STATION	HAND WHEEL
	EXISTING	V111	8	CHECK	VALVE PIT	INFLUENT PUMP STATION	LEVER
	EXISTING	V112	8	GATE	VALVE PIT	INFLUENT PUMP STATION	HAND WHEEL
	EXISTING	V113	8	CHECK	VALVE PIT	INFLUENT PUMP STATION	LEVER
	EXISTING	V114	8	GATE	VALVE PIT	INFLUENT PUMP STATION	HAND WHEEL
	EXISTING	V115	8	GATE	HEADWORKS	WTP BACKWASH WASTE	HAND WHEEL
CONTRACTOR	NEW	V201	36x36	WEIR GATE	INFLUENT SPLITTER BOX	WATER TO SBR 1&2	HAND WHEEL
CONTRACTOR	NEW	V202	36x36	WEIR GATE	INFLUENT SPLITTER BOX	WATER TO SBR 3&4	HAND WHEEL
PARKSON	NEW	V301	20	PLUG	SBR 1&2 BUILDING	SBR 1 INFLUENT	ACTUATED
PARKSON	NEW	V302	18	BUTTERFLY	SBR 1&2 BUILDING	SBR 1 DECANT (EFFLUENT)	ACTUATED
PARKSON	NEW	V303	20	PLUG	SBR 1&2 BUILDING	SBR 2 INFLUENT	ACTUATED
PARKSON	NEW	V304	18	BUTTERFLY	SBR 1&2 BUILDING	SBR 2 DECANT (EFFLUENT)	ACTUATED
CONTRACTOR	NEW	V305	6	GATE	SBR 1&2 BUILDING	SBR 1&2 SLUDGE PUMP ISOLATION	HAND WHEEL
CONTRACTOR	NEW	V306	6	CHECK	SBR 1&2 BUILDING	SBR 1&2 SLUDGE PUMP	LEVER
CONTRACTOR	NEW	V307	6	GATE	SBR 1&2 BUILDING	SBR 1&2 SLUDGE PUMP ISOLATION	HAND WHEEL
CONTRACTOR	NEW	V308	6	GATE	SBR 1&2 BUILDING	SBR 1&2 SLUDGE PUMP ISOLATION	HAND WHEEL
CONTRACTOR	NEW	V309	6	CHECK	SBR 1&2 BUILDING	SBR 1&2 SLUDGE PUMP	LEVER
CONTRACTOR	NEW	V310	6	GATE	SBR 1&2 BUILDING	SBR 1&2 SLUDGE PUMP ISOLATION	HAND WHEEL
PARKSON	NEW	V311	6	PLUG	SBR 1&2 BUILDING	SBR 1 SLUDGE EFFLUENT (RAS)	ACTUATED
PARKSON	NEW	V312	6	PLUG	SBR 1&2 BUILDING	SBR 2 SLUDGE EFFLUENT (RAS)	ACTUATED
PARKSON	NEW	V313	20	PLUG	SBR 3&4 BUILDING	SBR 3 INFLUENT	ACTUATED
PARKSON	EXISTING	V314	18	BUTTERFLY	SBR 3&4 BUILDING	SBR 3 DECANT (EFFLUENT)	ACTUATED
PARKSON	NEW	V315	20	PLUG	SBR 3&4 BUILDING	SBR 4 INFLUENT	ACTUATED
PARKSON	NEW	V316	18	BUTTERFLY	SBR 3&4 BUILDING	SBR 4 DECANT (EFFLUENT)	ACTUATED
PARKSON	EXISTING	V317	6	PLUG	SBR 3&4 BUILDING	SBR 3 SLUDGE EFFLUENT (RAS)	ACTUATED
PARKSON	NEW	V318	6	PLUG	SBR 3&4 BUILDING	SBR 4 SLUDGE EFFLUENT (RAS)	ACTUATED
	EXISTING	V319	6	PLUG	SBR 3&4 BUILDING	SBR 3&4 SLUDGE PUMP ISOLATION	HAND WHEEL
	EXISTING	V320	6	PLUG	SBR 3&4 BUILDING	SBR 3&4 SLUDGE PUMP ISOLATION	HAND WHEEL
	EXISTING	V321	6	PLUG	SBR 3&4 BUILDING	SBR 3&4 SLUDGE PUMP ISOLATION	HAND WHEEL
	EXISTING	V322	6	PLUG	SBR 3&4 BUILDING	SBR 3&4 SLUDGE PUMP ISOLATION	HAND WHEEL
	EXISTING	V323	6	CHECK	SBR 3&4 BUILDING	DECANT PUMP	
	EXISTING	V324	6	GATE	SBR 3&4 BUILDING	DECANT PUMP ISOLATION	HAND WHEEL
	EXISTING	V325	6	CHECK	SBR 3&4 BUILDING	DECANT PUMP	
	EXISTING	V326	6	GATE	SBR 3&4 BUILDING	DECANT PUMP ISOLATION	HAND WHEEL
CONTRACTOR	NEW	V501	16	PLUG	PRIMARY DIGESTER BUILDING	PRIMARY DIGESTER 1 INFLUENT	HAND WHEEL
CONTRACTOR	NEW	V502	16	PLUG	PRIMARY DIGESTER BUILDING	PRIMARY DIGESTER 2 INFLUENT	HAND WHEEL
CONTRACTOR	NEW	V503	16	PLUG	PRIMARY DIGESTER BUILDING	PRIMARY DIGESTER 1 WAS	HAND WHEEL
CONTRACTOR	NEW	V504	16	PLUG	PRIMARY DIGESTER BUILDING	PRIMARY DIGESTER 2 WAS	HAND WHEEL
CONTRACTOR	NEW	V505	6	GATE	PRIMARY DIGESTER BUILDING	WAS PUMP ISOLATION	HAND WHEEL
CONTRACTOR	NEW	V506	6	CHECK	PRIMARY DIGESTER BUILDING	WAS PUMP	LEVER
CONTRACTOR	NEW	V507	6	GATE	PRIMARY DIGESTER BUILDING	WAS PUMP ISOLATION	HAND WHEEL
CONTRACTOR	NEW	V508	6	GATE	PRIMARY DIGESTER BUILDING	WAS PUMP	LEVER
CONTRACTOR	NEW	V509	6	CHECK	PRIMARY DIGESTER BUILDING	WAS PUMP ISOLATION	HAND WHEEL
CONTRACTOR	NEW	V510	6	GATE	PRIMARY DIGESTER BUILDING	WAS PUMP ISOLATION	HAND WHEEL
CONTRACTOR	NEW	V511	8	GATE	PRIMARY DIGESTER BUILDING	PRIMARY DIGESTER 1 ISOLATION	HAND WHEEL
CONTRACTOR	NEW	V512	8	GATE	PRIMARY DIGESTER BUILDING	PRIMARY DIGESTER 2 ISOLATION	HAND WHEEL
CONTRACTOR	NEW	V513	6	GATE	PRIMARY DIGESTER BUILDING	SBR 3&4 2 ISOLATION	HAND WHEEL
CONTRACTOR	NEW	V514	6	GATE	PRIMARY DIGESTER BUILDING	SBR 1&2 2 ISOLATION	HAND WHEEL
CONTRACTOR	NEW	V401	12	CHECK	UV BUILDING	UV PUMP	LEVER
CONTRACTOR	NEW	V402	12	GATE	UV BUILDING	UV PUMP ISOLATION	HAND WHEEL
CONTRACTOR	NEW	V403	12	CHECK	UV BUILDING	UV PUMP	LEVER
CONTRACTOR	NEW	V404	12	GATE	UV BUILDING	UV PUMP ISOLATION	HAND WHEEL
CONTRACTOR	NEW	V405	12	CHECK	UV BUILDING	UV PUMP	LEVER
CONTRACTOR	NEW	V406	12	GATE	UV BUILDING	UV PUMP ISOLATION	HAND WHEEL
CONTRACTOR	NEW	V407	20	BUTTERFLY	UV BUILDING	FILTER BYPASS	HAND WHEEL
CONTRACTOR	NEW	V408	20	BUTTERFLY	UV BUILDING	FILTER ISOLATION	HANDLE
CONTRACTOR	NEW	V409	20	BUTTERFLY	UV BUILDING	FILTER ISOLATION	HANDLE
CONTRACTOR	NEW	V410	3	BALL	UV BUILDING	FILTER DRAIN	ACTUATED
CONTRACTOR	NEW	V411	3	BALL	UV BUILDING	FILTER DRAIN	ACTUATED

SUPPLIED BY	NEW OR EXISTING	NUMBER	SIZE (in.)	TYPE	LOCATION	SERVICE	OPERATOR
CONTRACTOR	NEW	V412	20	BUTTERFLY	UV BUILDING	FILTER ISOLATION	HANDLE
CONTRACTOR	NEW	V413	20	BUTTERFLY	UV BUILDING	FILTER ISOLATION	HANDLE
CONTRACTOR	NEW	V414	12	BUTTERFLY	UV BUILDING	UV ISOLATION	HANDLE
CONTRACTOR	NEW	V415	12	BUTTERFLY	UV BUILDING	UV ISOLATION	HANDLE
CONTRACTOR	NEW	V416	12	BUTTERFLY	UV BUILDING	UV ISOLATION	HANDLE
CONTRACTOR	NEW	V417	12	BUTTERFLY	UV BUILDING	UV ISOLATION	HANDLE
CONTRACTOR	NEW	V418	12	BUTTERFLY	UV BUILDING	UV ISOLATION	HANDLE
CONTRACTOR	NEW	V419	12	BUTTERFLY	UV BUILDING	UV ISOLATION	HANDLE
CONTRACTOR	NEW	V420	6	BUTTERFLY	UV BUILDING	EFFLUENT REUSE PUMP	LEVER
CONTRACTOR	NEW	V421	6	BUTTERFLY	UV BUILDING	EFFLUENT REUSE PUMP ISOLATION	HAND WHEEL
CONTRACTOR	NEW	V422	20	BUTTERFLY	UV BUILDING	UV EFFLUENT ISOLATION	ACTUATED
	EXISTING	V601	20	CHECK	LIME THICKENER SHACK	SLUDGE PUMP	
	EXISTING	V602	20	GATE	LIME THICKENER SHACK	SLUDGE PUMP ISOLATION	
	EXISTING	V603	20	CHECK	LIME THICKENER SHACK	SLUDGE PUMP	
	EXISTING	V604	20	GATE	LIME THICKENER SHACK	SLUDGE PUMP ISOLATION	
	EXISTING	V901	20	GATE	OUTSIDE OF HEADWORKS	HEADWORKS BYPASS	HAND WHEEL
	EXISTING	V902	20	GATE	METER PIT	WTP BACKWASH WASTE	VALVE STEM
CONTRACTOR	NEW	V903	20	PLUG	YARD	WATER FLOW TO INFLUENT SPLITTER BOX	VALVE STEM
CONTRACTOR	NEW	V904	16	PLUG	EQUALIZATION BASIN 1	EQUALIZATION BASIN INFLUENT	VALVE STEM
CONTRACTOR	NEW	V905	16	PLUG	EQUALIZATION BASIN 1	EQUALIZATION BASIN INFLUENT	ACTUATED
CONTRACTOR	NEW	V906	20	PLUG	EQUALIZATION BASIN 2	EQUALIZATION BASIN INFLUENT	VALVE STEM
CONTRACTOR	NEW	V907	20	PLUG	VALVE PIT	UV INFLUENT	ACTUATED
	NEW	V908	16	BUTTERFLY	UV BUILDING	REUSE TANK INFLUENT	ACTUATED
CONTRACTOR	NEW	V909	16	PLUG	REUSE TANK	REUSE TANK INFLUENT	VALVE STEM
	EXISTING	V910	16	DUCK BILL	REUSE PUMP BUILDING	TANK FILL	
	EXISTING	V911	16	GATE	REUSE PUMP BUILDING	REUSE PUMP	LEVER
	EXISTING	V912	16	CHECK	REUSE PUMP BUILDING	REUSE PUMP ISOLATION	HAND WHEEL
	EXISTING	V913	16	GATE	REUSE PUMP BUILDING	REUSE TANK EFFLUENT	LEVER
	EXISTING	V914	16	CHECK	REUSE PUMP BUILDING	REUSE PUMP ISOLATION	LEVER
	EXISTING	V915	16	GATE	REUSE PUMP BUILDING	REUSE PUMP	HAND WHEEL
CONTRACTOR	NEW	V916	20	PLUG	YARD	OUTFALL ISOLATION	HAND WHEEL
CONTRACTOR	NEW	V917	16	TAPPING SLEEVE	YARD	OUTFALL ISOLATION	VALVE STEM
CONTRACTOR	NEW	V918	16	TAPPING SLEEVE	YARD	OUTFALL ISOLATION	VALVE STEM
CONTRACTOR	NEW	V919	6	PLUG	SLUDGE LINE VALVE PIT	BELT FILTER PRESS LINE ISOLATION	ACTUATED
CONTRACTOR	NEW	V920	2	BALL	PRIMARY DIGESTER BUILDING	PRIMARY DIGESTER TO GRINDER PUMP STATION	ACTUATED
CONTRACTOR	NEW	V921	6	PLUG	BELT FILTER PRESS BUILDING	BELT FILTER PRESS LINE ISOLATION	HAND WHEEL
CONTRACTOR	NEW	V922	6	PLUG	BELT FILTER PRESS BUILDING	BELT FILTER PRESS LINE ISOLATION	HAND WHEEL
CONTRACTOR	NEW	V615	6	TELESCOPING	PRIMARY DIGESTER	PRIMARY DIGESTER SUPERNATANT	HAND WHEEL
CONTRACTOR	NEW	V516	6	TELESCOPING	PRIMARY DIGESTER	PRIMARY DIGESTER SUPERNATANT	HAND WHEEL

NOTE:
1. SEE PROCESS & FLOW DIAGRAM SHEETS FOR VALVE LOCATIONS.

SBR AIR VALVE SCHEDULE

SBR AIR PIPING VALVE SCHEDULE*							
SUPPLIED BY	NEW OR EXISTING	NUMBER	SIZE (in.)	TYPE	LOCATION	SERVICE	OPERATOR
CONTRACTOR	NEW	V701	8	BUTTERFLY	SBR 1&2 BASIN	SBR 1&2 AIR	HAND WHEEL
CONTRACTOR	NEW	V702	8	BUTTERFLY	SBR 1&2 BASIN	SBR 1&2 AIR	HAND WHEEL
CONTRACTOR	NEW	V703	8	BUTTERFLY	SBR 1&2 BASIN	SBR 1&2 AIR	HAND WHEEL
CONTRACTOR	NEW	V704	8	BUTTERFLY	SBR 1&2 BASIN	SBR 1&2 AIR	HAND WHEEL
CONTRACTOR	NEW	V705	8	BUTTERFLY	SBR 1&2 BASIN	SBR 1&2 AIR	HAND WHEEL
CONTRACTOR	NEW	V706	10	BUTTERFLY	SBR 1&2 BASIN	SBR 1&2 AIR	HAND WHEEL
CONTRACTOR	NEW	V707	10	BUTTERFLY	SBR 1&2 BASIN	SBR 1&2 AIR	HAND WHEEL
CONTRACTOR	NEW	V708	8	BUTTERFLY	SBR 3&4 BASIN	SBR 3&4 AIR	HAND WHEEL
CONTRACTOR	NEW	V709	8	BUTTERFLY	SBR 3&4 BASIN	SBR 3&4 AIR	HAND WHEEL
CONTRACTOR	NEW	V710	8	BUTTERFLY	SBR 3&4 BASIN	SBR 3&4 AIR	HAND WHEEL
CONTRACTOR	NEW	V711	8	BUTTERFLY	SBR 3&4 BASIN	SBR 3&4 AIR	HAND WHEEL
CONTRACTOR	NEW	V712	8	BUTTERFLY	SBR 3&4 BASIN	SBR 3&4 AIR	HAND WHEEL
CONTRACTOR	NEW	V713	10	BUTTERFLY	SBR 3&4 BASIN	SBR 3&4 AIR	HAND WHEEL
CONTRACTOR	NEW	V714	10	BUTTERFLY	SBR 3&4 BASIN	SBR 3&4 AIR	HAND WHEEL

NOTE:
1. SEE SHEETS D-104 AND D-110 FOR VALVE LOCATIONS.

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CONSULTANTS



SEAL

CHISHOLM CREEK UTILITY
AUTHORITY
WASTEWATER TREATMENT
FACILITY IMPROVEMENTS

PROJECT NAME

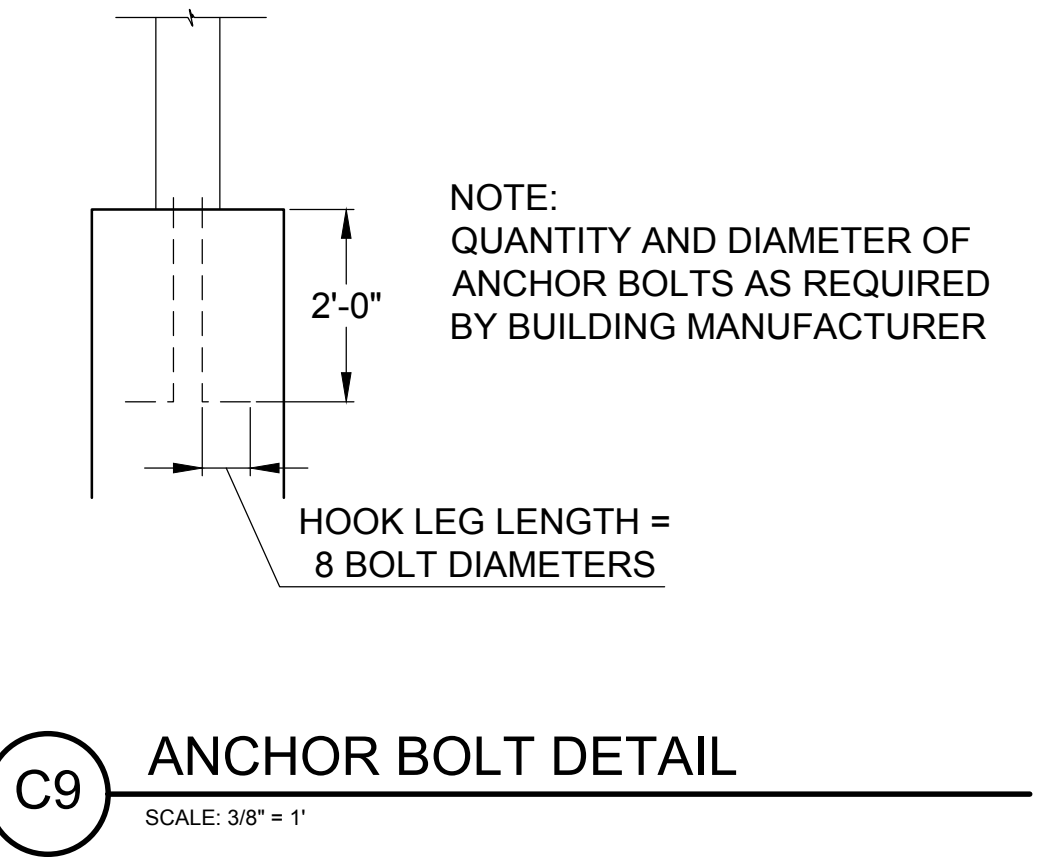
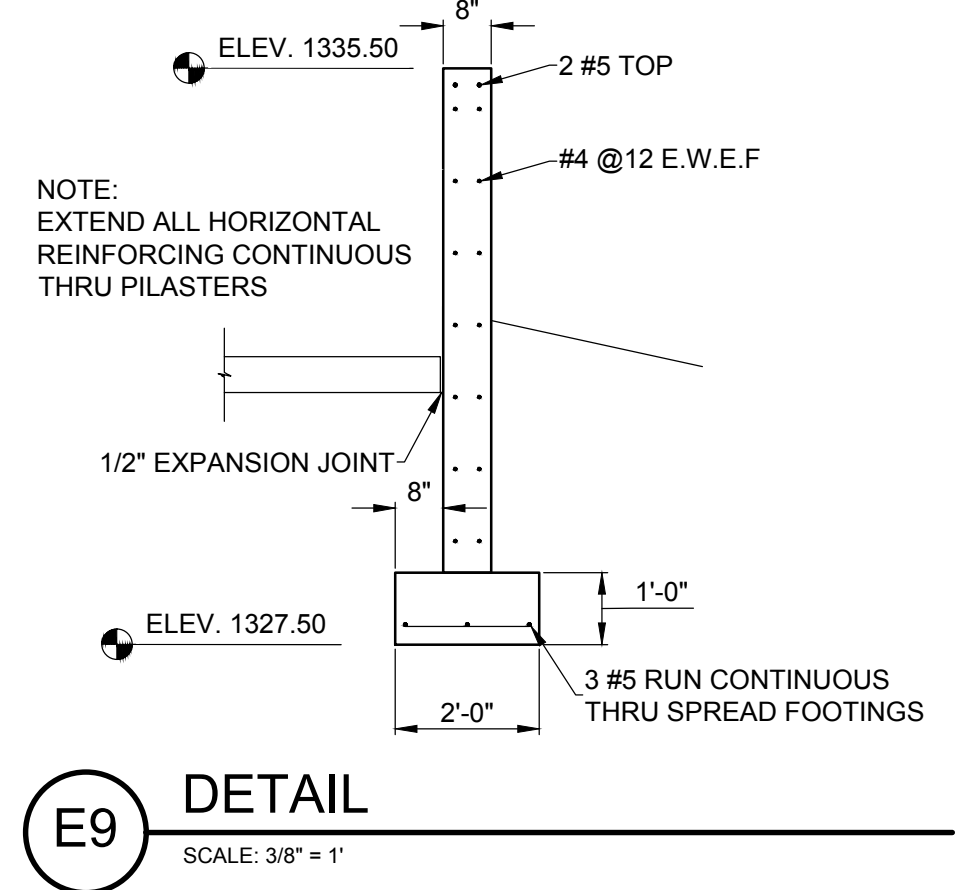
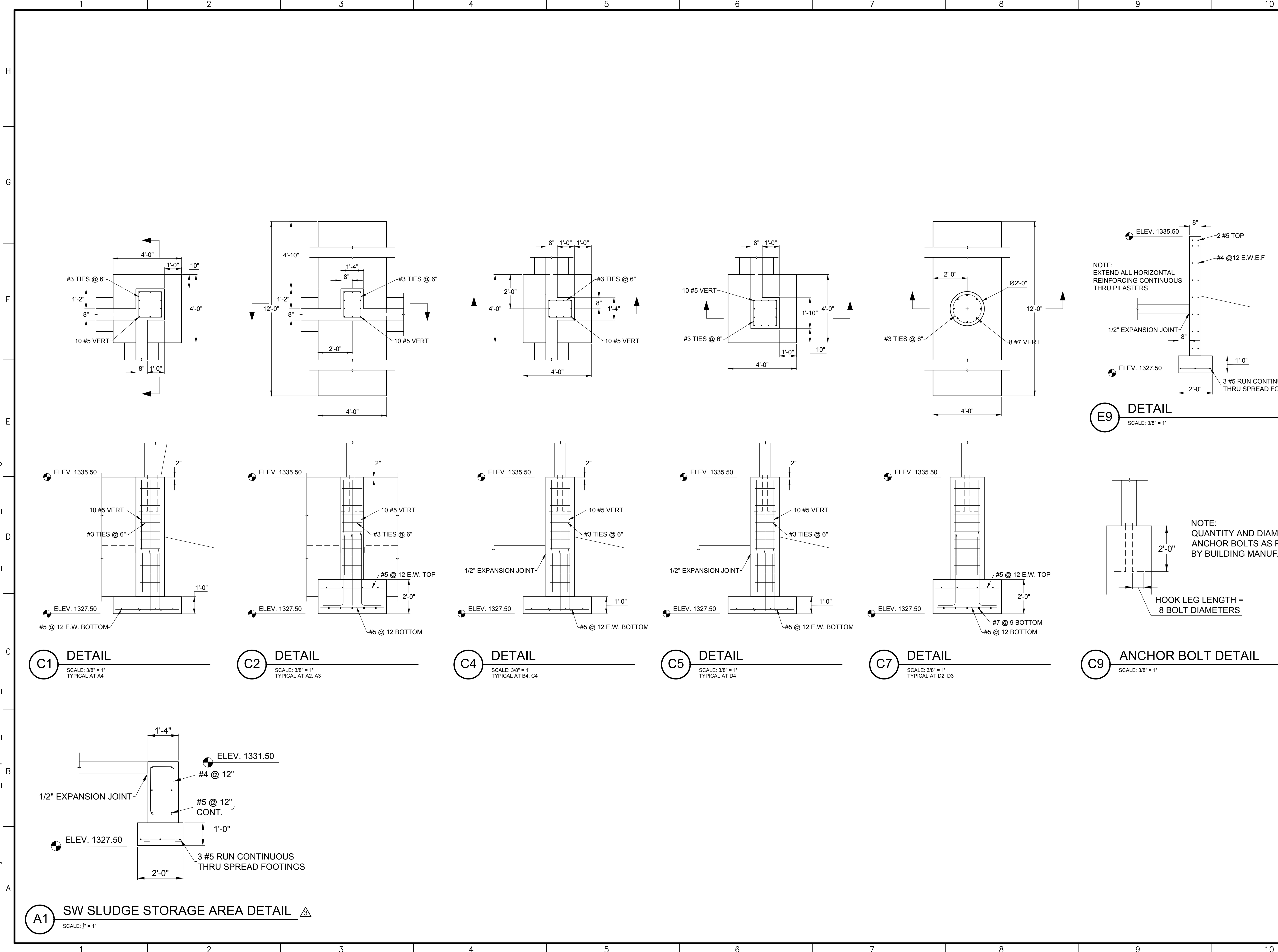
REV.	DATE	DESCRIPTION
3	1/28/25	ADDENDUM #1
2	1/06/25	WCI REVISIONS

PROJECT NO: 2060051400
DESIGNED BY: HKB
DRAWN BY: HKB
CHECKED BY: BPS
DATE: OCTOBER 2024

SHEET TITLE
VALVE SCHEDULE

SHEET NO:
D-508

1/28/2025 W:\Projects\20600514003_Disciplines_SHEETS4_sheets - structural\2060051400_SLUDGE_BLD_STRUC.dwg



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PROJECT NAME
**CHISHOLM CREEK UTILITY
AUTHORITY
WASTEWATER TREATMENT
FACILITY IMPROVEMENTS**

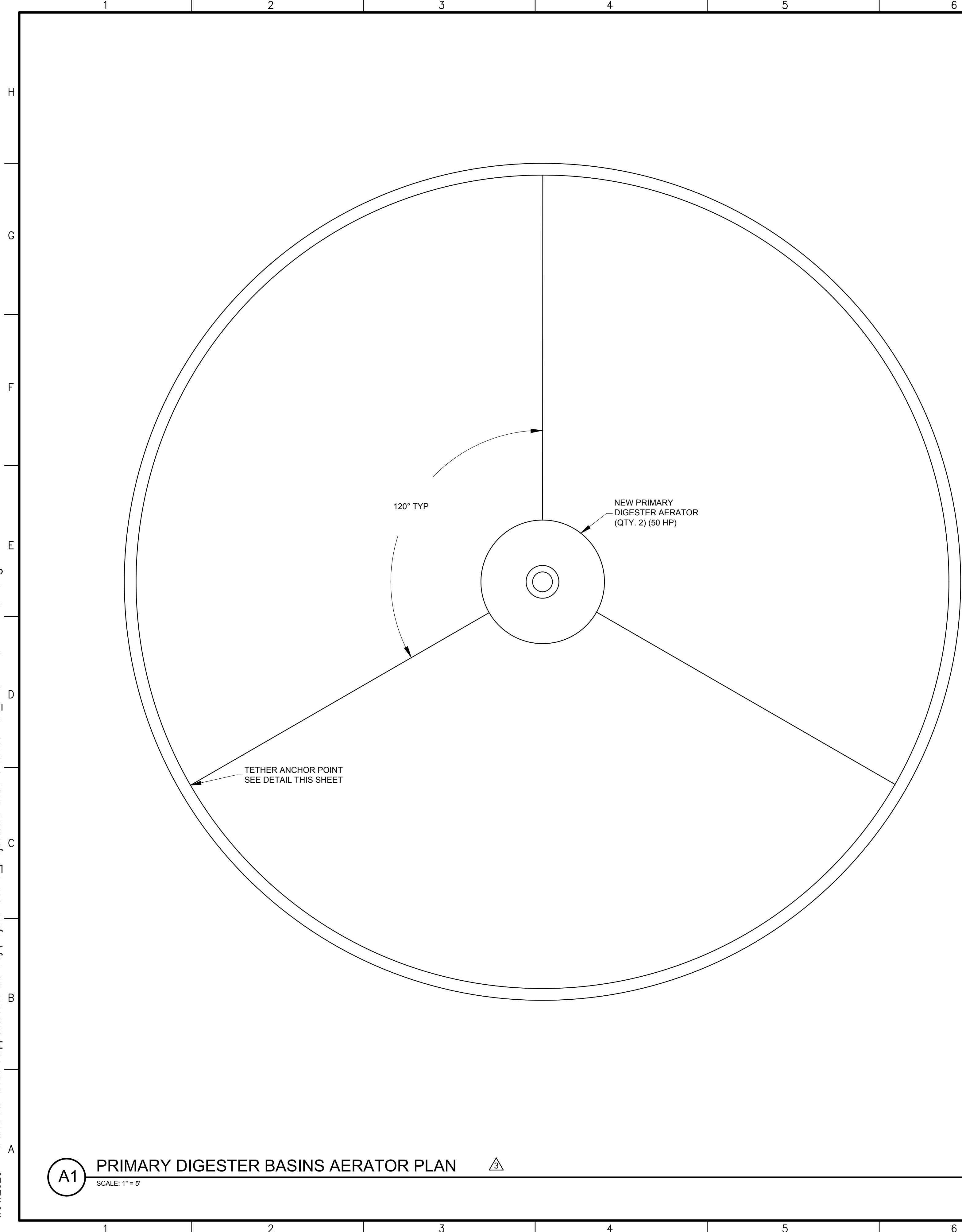
REV.	DATE	DESCRIPTION	CJW	BY
3	1/28/25	ADDENDUM #1		

PROJECT NO: 2060051400
DESIGNED BY: CJW
DRAWN BY: RKH
CHECKED BY: BPS
DATE: MARCH 2021

SHEET TITLE
**SLUDGE STORAGE
AND BELT PRESS
BUILDING DETAILS**

SHEET NO:
S-506

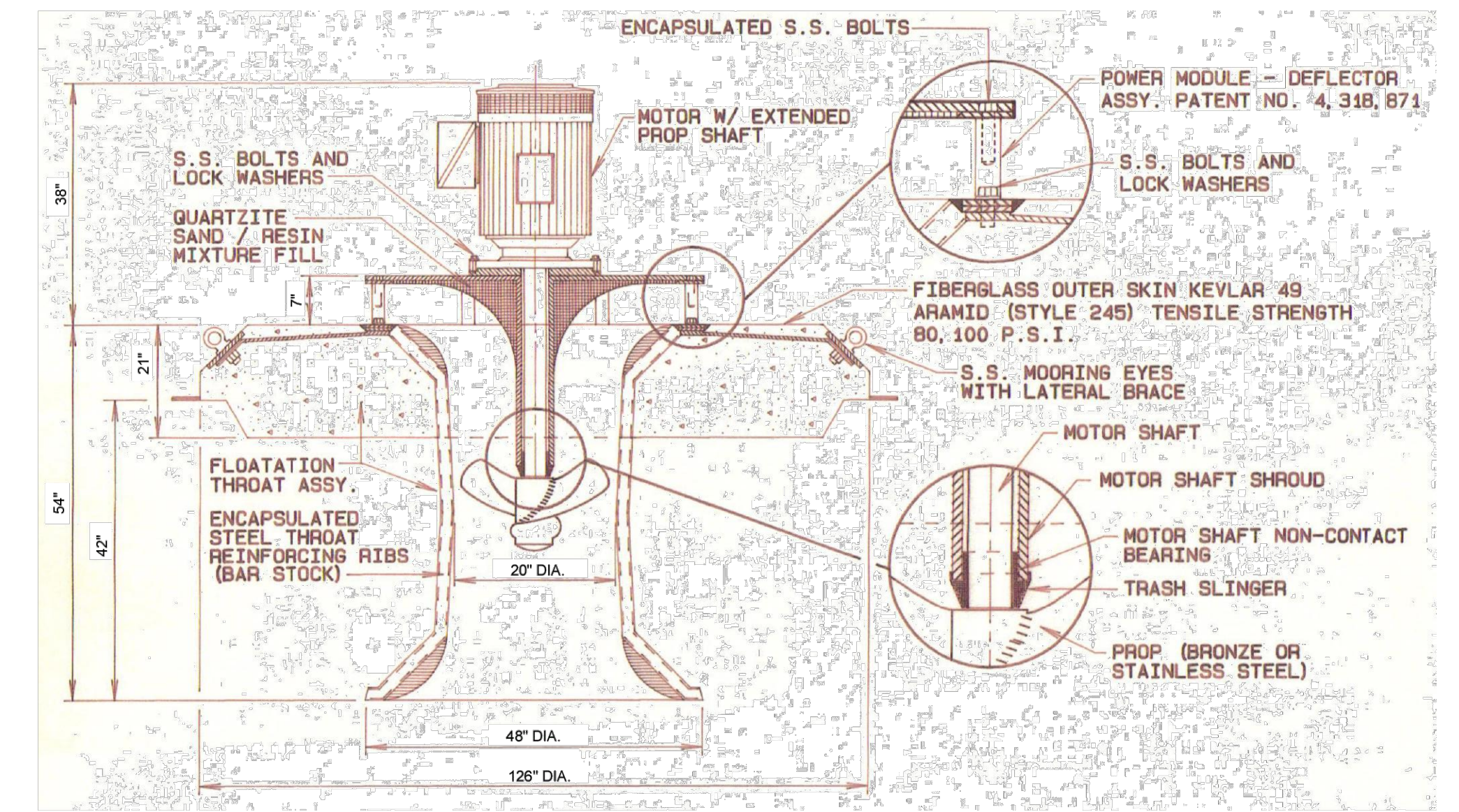
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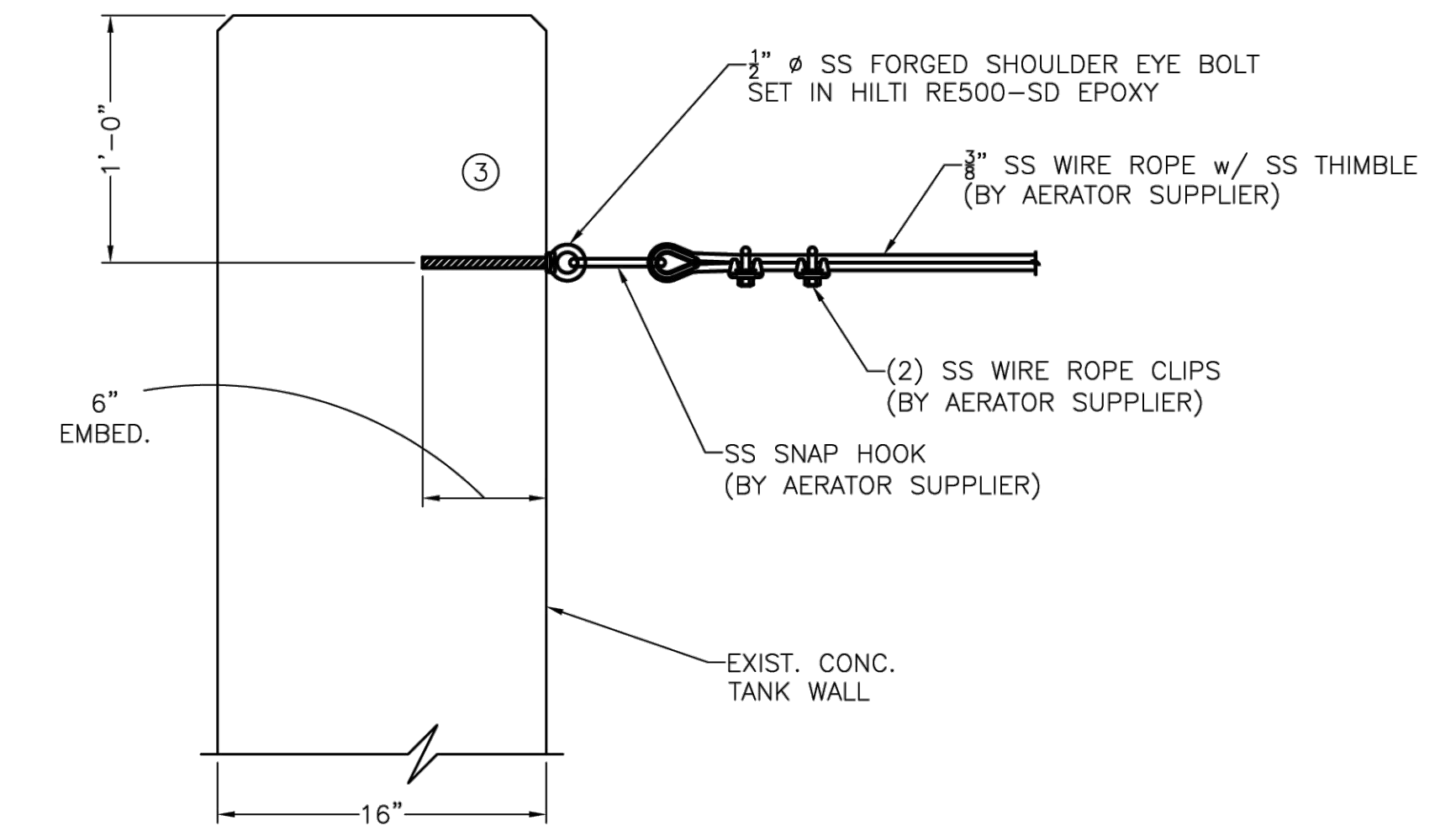
A1 PRIMARY DIGESTER BASINS AERATOR PLAN

GENERAL NOTES

1. CONTRACTOR TO PROVIDE TWO NEW PRIMARY DIGESTER AERATORS (ONE FOR EACH BASIN) REFER TO SPECIFICATIONS.
2. TETHER ANCHORS NOT DESIGNED FOR VERTICAL SUPPORT OF AERATOR. BEFORE LEVEL IN BASIN IS LOWERED BELOW SLACK LENGTH OF TETHERS, ONE TETHER MUST BE DISCONNECTED FROM ANCHOR POINT TO PREVENT DAMAGE TO DIGESTER WALL AND/OR AERATOR.
3. REFER TO SHEET E-431 FOR AERATOR ELECTRICAL DETAILS.



D7 JET AERATOR DETAIL



A7 ANCHOR DETAIL

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CONSULTANTS



SEAL

PROJECT NAME
**CHISHOLM CREEK UTILITY
 AUTHORITY
 WASTEWATER TREATMENT
 FACILITY IMPROVEMENTS**

REV.	DATE	DESCRIPTION	BY
3	1/28/25	ADDENDUM #1	CJW

PROJECT NO: 2060051400
 DESIGNED BY: JAD
 DRAWN BY: JAD
 CHECKED BY: BPS
 DATE: OCTOBER 2024

SHEET TITLE
**JET AERATOR
 DETAILS**

SHEET NO:
D-501

SECTION 11270

GRINDER PUMP STATION

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Sewage Grinder Pump.
- B. Service Lateral Kit.

1.2 GENERAL REQUIREMENTS

- A. Contractor shall provide all materials required to furnish complete factory-built and tested grinder pump unit, consisting of a grinder pump core suitably mounted on an integral stand of stainless steel, tank, pump removal harness, discharge assembly/shut-off valve, anti-siphon valve/check valve assembly, electrical alarm assembly and all necessary internal wiring and controls. The system components shall be supplied by a single supplier so as to ensure suitability and assurance of experience in matching the equipment together and to ensure single source responsibility for the equipment.
- B. Contractor shall provide all materials required to furnish complete service lateral kit consisting of curb stop; check valve; schedule 80 PVC fittings; adapters for schedule 40 PVC; and valve box with wrench. The system components shall be supplied by a single supplier so as to ensure suitability and assurance of experience in matching the equipment together and to ensure single source responsibility for the equipment.

1.3 SUBMITTALS

- A. Submit under provisions of Section 01300.
 - 1. Product Data and shop drawings:
 - a. Sewage Grinder Pump Station:
 - 1) Catalog cut and general bulletins describing complete apparatus including operating principles and fundamentals.
 - 2) Materials of construction.
 - b. Service Lateral Kit:
 - 1) Catalog cut and general bulletins describing complete apparatus including operating principles and fundamentals.
 - 2) Materials of construction.
 - 2. Manufacturer's Instructions: Provide instructions for installation.
- B. Submit under provisions of Section 01400.
 - 1. Manufacturer's Field Reports: As noted within section.

1.4 PROJECT RECORD DOCUMENTS

- A. Submit record documents under provisions of Section 01700.

1.5 OPERATION AND MAINTENANCE DATA

- A. Submit operation and maintenance data under provisions of Section 01700.

1.6 REGULATORY REQUIREMENTS

- A. Conform to applicable plumbing code.

1.7 OPERATION OF SYSTEM

- A. On wet well level rise, the pump switch shall energize and start the pump. With pump operating, wet well level shall lower to low switch turn-off setting and pump shall stop.
- B. If level continues to rise when pump is operating, alarm switch shall energize and signal the high water alarm.

PART 2 - PRODUCTS

2.1 SEWAGE GRINDER PUMP STATION

A. Core Unit

- 1. The grinder pump station shall have an easily removable core assembly containing pump, motor, grinder, check valve, anti-siphon valve, electrical quick disconnect and wiring. The watertight integrity of the core unit shall be established by a 100% factory test at a minimum of 5 PSIG.

B. Pump

- 1. The pump shall be a custom designed, integral, vertical rotor, motor driven, solids handling pump of the progressing cavity type with a single mechanical seal.
- 2. Double radial O-ring seals are required at all casting joints to minimize corrosion and create a protective barrier.
- 3. All pump castings shall be cast iron, fully epoxy coated to 8-10 mil Nominal dry thickness, wet applied.
- 4. The rotor shall be through-hardened, highly polished, precipitation hardened stainless steel.
- 5. The stator shall be of a specifically compounded ethylene propylene synthetic or Buna-N elastomer. This material shall be suitable for domestic wastewater service. Its physical properties shall include high tear and abrasion resistance, grease resistance, water and detergent resistance, temperature stability, excellent aging properties, and outstanding wear resistance.
- 1. The pumps shall be capable of the following capacities and operating characteristics:
 - a. Design Point: 12 GPM at total head of 25 feet.
 - b. Motor Horsepower (max): 1.0 HP.
 - c. Operating Speed: 1725 rpm (max).
 - d. Discharge Size: As provided by manufacturer. Contractor to adapt to 2-inch force main.
 - e. Model: DH071-160 indicated on Drawings and flowline verification by Contractor.
 - f. Provide band-clamp lid for extension as required to raise to final grade.

C. Grinder

- 1. The grinder shall be placed immediately below the pumping elements and shall be direct-driven by a single, one-piece motor shaft.
- 2. The grinder impeller (cutter wheel) assembly shall be securely fastened to the pump motor shaft by means of a threaded connection attaching the grinder impeller to the motor shaft. Attachment by means of pins or keys will not be acceptable.
- 3. The grinder impeller shall be a one-piece, 4140 cutter wheel of the rotating type with inductively hardened cutter teeth. The cutter teeth shall be inductively hardened to Rockwell 50 – 60c for abrasion resistance.
- 4. The shredder ring shall be of the stationary type and the material shall be white cast iron. The teeth shall be ground into the material to achieve effective grinding. The shredder ring shall have a staggered tooth pattern with only one edge engaged at a time, maximizing the cutting torque. These

materials have been chosen for their capacity to perform in the intended environment as they are materials with wear and corrosive resistant properties.

5. This assembly shall be dynamically balanced and operate without objectionable noise or vibration over the entire range of recommended operating pressures. The grinder shall be constructed so as to minimize clogging and jamming under all normal operating conditions including starting. Sufficient vortex action shall be created to scour the tank free of deposits or sludge banks which would impair the operation of the pump. These requirements shall be accomplished by the following, in conjunction with the pump:
 - a. The grinder shall be positioned in such a way that solids are fed in an upward flow direction.
 - b. The maximum flow rate through the cutting mechanism must not exceed 4 feet per second. This is a critical design element to minimize jamming and as such must be adhered to.
 - c. The inlet shroud shall have a diameter of no less than 5 inches. Inlet shrouds that are less than 5 inches in diameter will not be accepted due to their inability to maintain the specified 4 feet per second maximum inlet velocity which by design prevents unnecessary jamming of the cutter mechanism and minimizes blinding of the pump by large objects that block the inlet shroud.
 - d. The impeller mechanism must rotate at a nominal speed of no greater than 1800 rpm.
6. The grinder shall be capable of reducing all components in normal domestic sewage, including a reasonable amount of "foreign objects," such as paper, wood, plastic, glass, wipes, rubber and the like, to finely-divided particles which will pass freely through the passages of the pump and the 1-1/4" diameter stainless steel discharge piping.

D. Electric Motor

1. As a maximum, the motor shall be a 1 HP, 1725 RPM, 120 Volt 60 Hertz, 1 Phase, capacitor start, ball bearing, air-cooled induction type.
2. The motor shall be press-fit into the casting for better heat transfer and longer winding life.
3. Inherent protection against running overloads or locked rotor conditions for the pump motor shall be provided by the use of an automatic-reset, integral thermal overload protector incorporated into the motor. This motor protector combination shall have been specifically investigated and listed by UL Standards & Engagement, for the application.
4. Non-capacitor start motors or permanent split capacitor motors will not be accepted because of their reduced starting torque and consequent diminished grinding capability.
5. The wet portion of the motor armature must be 300 Series stainless.
6. To reduce the potential of environmental concerns, the expense of handling and disposing of oil, and the associated maintenance costs, oil-filled motors will not be accepted.

E. Mechanical Seal

1. The pump/core shall be provided with a mechanical shaft seal to prevent leakage between the motor and pump. The seal shall have a stationary ceramic seat and carbon rotating surface or tungsten carbide with faces precision lapped and held in position by a stainless steel spring.

F. Tank

1. The tank shall be a wetwell/drywell design made of high density polyethylene or fiberglass.
2. If made of high density polyethylene: Corrugated sections are to be made of a double wall construction with the internal wall being generally smooth to promote scouring. Corrugations of the outside wall are to be of a minimum amplitude of 1-1/2" to provide necessary transverse stiffness. Any incidental sections of a single wall construction are to be a minimum .250 inch thick. All seams created during tank construction are to be thermally welded and factory tested for leak tightness.
3. Tank wall and bottom must withstand the pressure exerted by saturated soil loading at maximum burial depth.
4. All station components must function normally when exposed to maximum external soil and hydrostatic pressure.
5. The tank shall be furnished with a factory installed PVC inlet flange to accept inlet pipe.

6. The tank shall include a lockable cover assembly providing low profile mounting and watertight capability. The cover shall be compression-molded fiberglass, green in color, with a load rating of 150 lbs per square foot. The cover assembly shall also include an integral 2-inch vent to prevent sewage gases from accumulating in the tank.
7. The accessway design and construction shall facilitate field adjustment of station height in increments of 4" or less without the use of any adhesives or sealants requiring cure time before installation can be completed.

G. Discharge Hose and Disconnect/Valve

1. All discharge fittings and piping shall be constructed of polypropylene, EPDM or PVC. The discharge hose assembly shall include a shut-off valve rated for 200 psi WOG and a quick disconnect feature to simplify installation and pump removal. The bulkhead penetration shall be factory installed and warranted by the manufacturer to be watertight.

H. Check Valve

1. The pump discharge shall be equipped with a factory installed, gravity operated, flapper-type or ball type integral check valve built into the stainless steel discharge piping.
2. The check valve will provide a full-ported passageway when open, and shall introduce a friction loss of less than 6 inches of water at maximum rated flow.
3. Moving parts will be made of a 300 Series stainless steel and fabric reinforced synthetic elastomer to ensure corrosion resistance, dimensional stability, and fatigue strength.
4. The valve body shall be an injection molded part made of an engineered thermoplastic resin or cast iron. The working pressure of the valve shall be at least 235 psi.

I. Anti-Siphon Valve

1. The pump discharge shall be equipped with a factory-installed, gravity-operated, flapper-type integral anti-siphon valve built into the stainless steel discharge piping.
2. Moving parts will be made of 300 Series stainless steel and fabric-reinforced synthetic elastomer to ensure corrosion resistance, dimensional stability, and fatigue strength. A nonmetallic hinge shall be an integral part of the flapper assembly, providing a maximum degree of freedom to ensure proper operation even at a very low pressure.
3. The valve body shall be injection-molded from an engineered thermoplastic resin.
4. Holes or ports in the discharge piping are not acceptable anti-siphon devices due to their tendency to clog from the solids in the slurry being pumped. The anti-siphon port diameter shall be no less than 60% of the inside diameter of the pump discharge piping.

J. Controls

1. Non-fouling wastewater level controls for controlling pump operation shall be accomplished by monitoring the pressure changes in an integral air column connected to a pressure switch. The use of individual mechanical float switches is also acceptable.
2. The air column shall be integrally molded from a thermoplastic elastomer suitable for use in wastewater and with excellent impact resistance. The air column shall have only a single connection between the water level being monitored and the pressure switch. Any connections are to be sealed radially with redundant O-rings.
3. The level detection device shall have no moving parts in direct contact with the wastewater. Depressing the push to run button must operate the pump even with the level sensor housing removed from the pump.
4. All fasteners throughout the assembly shall be 300 Series stainless steel.
5. Closure of the high-level sensing device will energize an alarm circuit as well as a redundant pump-on circuit. For increased reliability, pump ON/OFF and high-level alarm functions shall not be controlled by the same switch.
6. If using a pressure sensor, each core shall be equipped with a factory installed equalizer diaphragm that compensates for any atmospheric pressure or temperature changes. Tube or piping runs outside of

the station tank or into tank-mounted junction boxes providing pressure switch equalization will not be permitted due to their susceptibility to condensation, kinking, pinching, and insect infestation.

7. The grinder pump will be furnished with a type SJOW cable, pre-wired and watertight to meet UL requirements.

K. Alarm Panel

1. Each grinder pump station shall include a NEMA 4X, UL-listed alarm panel suitable for wall or pole mounting. The NEMA 4X enclosure shall be manufactured of thermoplastic polyester to ensure corrosion resistance. The enclosure shall include a hinged, lockable cover with padlock, preventing access to electrical components, and creating a secured safety front to allow access only to authorized personnel.
2. The alarm panel shall contain one double-pole circuit breaker for the pump core's power circuit and one single-pole circuit breaker for the alarm circuit. The panel shall contain a push-to-run feature, an internal run indicator, and a complete alarm circuit. All circuit boards in the alarm panel are to be protected with a conformal coating on both sides and the AC power circuit shall include an auto resetting fuse.
3. The alarm panel shall include the following features: external audible and visual alarm; push-to-run switch; push-to-silence switch; redundant pump start; and high level alarm capability. The alarm sequence is to be as follows when the pump and alarm breakers are on:
 - a. When liquid level in the sewage wet-well rises above the alarm level, audible and visual alarms are activated, the contacts on the alarm pressure switch activate, and the redundant pump starting system is energized.
 - b. The audible alarm may be silenced by means of the externally mounted, push-to-silence button.
 - c. Visual alarm remains illuminated until the sewage level in the wet-well drops below the "off" setting.
4. The visual alarm lamp shall be inside a red, oblong lens at least 3.75" L x 2.38" W x 1.5" H. Visual alarm shall be mounted to the top of the enclosure in such a manner as to maintain NEMA 4X rating. The audible alarm shall be externally mounted on the enclosure, capable of 93 dB @ 2 feet. The audible alarm shall be capable of being deactivated by depressing a push-type switch that is encapsulated in a weatherproof silicone boot and mounted on the enclosure (push-to-silence button).
5. The entire alarm panel, as manufactured and including any of the following options, shall be listed by UL Standards & Engagement.

L. Serviceability

1. The grinder pump core, shall have two lifting hooks complete with lift-out harness connected to its top housing to facilitate easy core removal when necessary.
2. The level sensor assembly must be easily removed from the pump assembly for service or replacement.
3. All mechanical and electrical connections must provide easy disconnect capability for core unit removal and installation. Each EQD half must include a water-tight cover to protect the internal electrical pins while the EQD is unplugged.
4. A pump push-to-run feature will be provided for field trouble shooting. The push-to-run feature must operate the pump even if the level sensor assembly has been removed from the pump assembly. All motor control components shall be mounted on a readily replaceable bracket for ease of field service.

2.2 Service Lateral Kit

- A. Must contain all components necessary to connect sewage grinder pump to corporation stop/saddle tap on a sewer main, excluding piping.
- B. All fittings designed and tested to 150 psi service pressure.

- C. Factory assembled, integrated ball valve curb stop and check valve assembly.
- D. Contractor to verify curb box size.

2.3 MANUFACTURER

- A. All Manufacturers proposing equipment for this project shall have at least ten (10) years of experience in the design and manufacture of service lateral kits for specific use in low pressure sewage systems and of identical size and performance to the specified units.
- B. All Manufacturers proposing equipment for this project must have no fewer than five hundred (500) successful installations of low pressure sewer systems utilizing service lateral kits such as those specified herein.
- C. E/One; Environment One Corporation.
- D. Substitutions: No Substitutions.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Protect equipment from damage.

3.2 TESTING

- A. Commercial testing shall be required and include the following:
 1. The pump shall be visually inspected to confirm that it is built in accordance with specification as to HP, voltage, phase, and hertz.
 2. The motor and seal housing chambers shall be hi-potted to test for moisture content and/or insulation defect.
 3. Pump shall be allowed to run dry to check for proper rotation.

3.3 FIELD QUALITY CONTROL

- A. Field testing will be performed under the provisions of Section 01400 and should include the following:
 1. Field test all pumps to demonstrate satisfactory operation.
 2. Provide field service report, operation, and maintenance manual under the provisions of Section 01400 and 01650.
 3. Provide adequate training to Owner's personnel in the proper operation and maintenance of the equipment.
 4. Any pump, component, or accessory which fails to meet any of the contract specifications will be modified, repaired, or replaced by the contractor at no additional cost to the Owner.

3.4 ADJUSTING

- A. Adjust Work under the provisions of Section 01650.

3.5 WARRANTY

- A. The grinder pump manufacturer shall provide a parts and labor warranty on the complete station and accessories, including, but not limited to, the panel for a period of 24 months after notice of owner's acceptance, but no greater than 27 months after receipt of shipment. Any manufacturing defects found

during the warranty period will be reported to the manufacturer by the owner and will be corrected by the manufacturer at no cost to the owner.

- B. As a bid certification requirement, each bidder shall provide with their bid schedule a Warranty Performance Certification statement executed by the most senior executive officer of the grinder pump manufacturer, which certifies a minimum of a 24-month warranty. They must further detail any exclusions from the warranty or additional cost items required to maintain the equipment in warrantable condition, including all associated labor and shipping fees, and certify that the manufacturer will bear all costs to correct any original equipment deficiency for the effective period of the warranty. All preventive maintenance type requirements shall be included in this form as exclusions. These requirements include, but are not limited to, unjamming of grinder mechanism, periodic motor maintenance, and periodic cleaning of liquid level controls.

END OF SECTION

SECTION 02610

WASTE/SEWER PIPES, FITTINGS & APPURTENANCES

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Pipe.
- B. Fittings.
- C. Special Use Fittings.
- D. Pipeline Accessories.
- E. Piping systems included:
 - 1. Wastewater process piping.
 - 2. Sludge process piping.
 - 3. Overflow supernatant, filtrate, and process drain piping.
 - 4. Miscellaneous piping not specifically identified elsewhere.

1.2 SUBMITTALS

- A. Submit under provisions of Section 01300.
 - 1. Polyvinyl Chloride (PVC) Pipe and Fittings:
 - a. Catalog cut and general bulletins.
 - b. Materials of construction.
 - c. Certification of NSF Std 14 and ASTM D2846 compliance.
 - 2. Ductile iron pipe and fittings:
 - a. Catalog cut and general bulletins.
 - b. Materials of construction.
 - c. Manufacturers certification or affidavit of compliance in accordance with specified ANSI/AWWA standards.
 - 3. Restraining Gland:
 - a. Catalog cut and general bulletins.
 - b. Materials of construction.
 - 4. Pipe Coupling:
 - a. Catalog cut and general bulletins.
 - b. Materials of construction.
 - 5. Transition coupling:
 - a. Catalog cut and general bulletins.
 - b. Materials of construction.
 - 6. Flange adapter:
 - a. Catalog cut and general bulletins.
 - b. Materials of construction.
 - 7. Polyethylene encasement:
 - a. Catalog cut and general bulletins.
 - b. Materials of construction.
 - 8. Pipe seals:
 - a. Catalog cut and general bulletins.
 - b. Materials of construction.

1.3 REFERENCES

- A. American National Standards Institute (ANSI), Latest Edition.
- B. American Society of Mechanical Engineers (ASME), Latest Edition.
- C. American Society of Testing Materials (ASTM), Latest Edition.
- D. American Water Works Association (AWWA) Standards, Latest Edition.
- E. Building Officials and Code Administrators (BOCA) International, Inc., Latest Edition.
- F. Factory Mutual (FM), Latest Edition.
- G. International Association of Plumbing and Mechanical Officials (IAPMO), Latest Edition.
- H. Kansas Department of Health and Environment (KDHE), Minimum Standards of Design for Water Pollution Control Facilities, Latest Edition.
- I. UL, LLC, Latest Edition

1.4 PROJECT RECORD DOCUMENTS

- A. Submit record documents under provisions of Section 01700.
- B. Accurately record exact location of all buried piping and fittings.
- C. Identify and describe unexpected variations to subsoil conditions or discovery of uncharted utilities.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store and protect products under provisions of Section 01600.

PART 2 - PRODUCTS

2.1 GRAVITY SEWER PIPING

- A. Polyvinyl Chloride (PVC) Pipe:
 - 1. 8 inch and less:
 - a. Conform to ASTM D1784, Class 12454-B.
 - b. Conform to ASTM D1785, Schedule 80.
 - c. Conform to NSF Standard 14.
 - d. SDR 26 Piping:
 - e. Conform to ANSI/ASTM D2241, SDR 26.
 - f. Integral bell, bell and spigot-type rubber gasket joints: Conform to ASTM D1784.
 - g. Gasket: Conform to ASTM F477.
 - h. Fittings: Ductile iron conforming to Section 2.4 below.
- B. Ductile Iron Pipe:
 - 1. Buried Service:
 - a. Conform to the requirements of ANSI/AWWA C151/A21.51 and ANSI/AWWA C150/A21.50. Pressure Class 350 for sizes 24-inch and smaller. Pipelines shall be thickness Class 50.
 - b. Interior Lining: Cement-mortar lined per ANSI/AWWA C104/A21.4.

- c. Joint type: Push-on, mechanical or restrained, as required.
 - d. Gasket material: Rubber
 - e. Exterior coating: Asphaltic coating per AWWA C151, C115, C110, and C153.
2. Service above grade/within structures:
- a. Conform to the requirements of ANSI/AWWA C110/A21.10 and ANSI/AWWA C115/A21.15. Pipelines shall be thickness Class 53.
 - b. Interior lining: Cement-mortar lined per ANSI/AWWA C104/A21.4.
 - c. Joint type: Flanged per ANSI/AWWA C110/A21.10.
 - 1) Bolts: ASTM A307, Grade B.
 - 2) Nuts: ASTM A563, Grade A, heavy hex head.
 - d. Gasket material: Rubber, 0.125-inch thick, full face.
 - e. Exterior coating: Coated with primer and painted in accordance with Section 09900.
 - f. Bolts: Stainless steel.

2.2 FORCE MAIN PIPING

A. Polyvinyl Chloride (PVC) Pipe:

1. C900 PVC Piping:

- a. Conform to ANSI/AWWA C 900.
- b. Pressure class 235 psi; DR 18.
- c. Gaskets meeting ASTM F477 and be NSF 61 product certified.
- d. Pipe shall be made from resin that will provide mechanical and physical properties that meet or exceed ASTM D1784.
- e. Shall be NSF 61 and/or 14 product certified.
- f. Integral elastomeric-gasket bell end only.
- g. Fittings: Ductile iron conforming to Section 2.4 below.

2. C905 PVC Piping:

- a. Conform to ANSI/AWWA C 905.
- b. Pressure class 235 psi; DR 18.
- c. Gaskets meeting ASTM F477.
- d. Pipe shall be made from resin that will provide mechanical and physical properties that meet or exceed ASTM D1784.
- e. Conform to NSF 61 and/or NSF 14.
- f. Integral elastomeric-gasket bell end only.
- g. Fittings: Ductile iron conforming to Section 2.4 below.

B. Ductile Iron Pipe:

1. Ductile Iron Piping:

- a. Conform to the requirements of ANSI/AWWA C151/A21.51 and ANSI/AWWA C150/A21.50. Pressure Class 350 for sizes 24-inch and smaller. Pipelines shall be thickness Class 50.
- b. Interior Lining: Cement-mortar lined per ANSI/AWWA C104/A21.4.
- c. Joint type: Push-on, mechanical or restrained, as required.
- d. Gasket material: Rubber
- e. Exterior coating: Asphaltic coating per AWWA C151, C115, C110, and C153.

C. High Density Polyethylene Tubing

1. 2-inch and smaller

- a. Manufactured from Pressure rated PE4710 polyethylene compounds meeting ASTM D3350.
- b. Material shall be high density PE4710, IPS DR 11
- c. Max. Pressure 200 PSI
- d. Pipe shall be black with green stripe.
- e. Tubing that is bored under structures or road crossings shall be supplied in lengths such that no splicing is necessary.

2.3 AIR PIPING

A. Stainless Steel Pipe:

1. Diameters greater than 1 ½ inches:
 - a. Conform to ASTM A778, A312.
 - b. Material 304L.
 - c. Wall thickness to ANSI B36.19.
 - d. Shall comply with Schedule 10 outside diameter.
 - e. Fittings: Stainless steel conforming to Section 2.2 below.
 - f. Utilize for process air piping from the blowers to the treatment basin.

2.4 FITTINGS

A. Ductile Iron:

1. Buried Service, 3-inch in diameter and larger:
 - a. Conform to the requirements of ANSI/AWWA C153/A21.53 or ANSI/AWWA C110/A21.10 and ANSI/AWWA C111/A21.11.
 - b. Joint type: Mechanical or restrained, as required.
 - c. Interior lining: Cement-mortar lined per ANSI/AWWA C104/A21.4.
 - d. Gasket material: Rubber.
 - e. Exterior coating: Asphaltic coating per AWWA C110, C151, and C153.
 - f. Bolts: Stainless steel.
2. Exposed piping:
 - a. Joint type: ANSI/AWWA C110/A21.10, Flanged
 - b. Interior lining: ANSI/AWWA C104/A21.4, cement-mortar lined.
 - c. Gasket material: Rubber, 0.125 inch thick, full face.
 - d. Exterior coating: Coated with primer and painted in accordance with Section 09900.
 - e. Bolts: Stainless steel.

B. Schedule 80 Polyvinyl Chloride (PVC):

1. ASTM D1784, Class 12454, Schedule 80.
2. Fittings conform to ASTM D2467.
3. Socket Type: ASTM D2467.
4. Solvent Cement and Primer: Cement - ASTM D2564, Primer – IPS P-70. Only to be used on service lines less than 2 inches (< 2 in.) in diameter.
5. Threaded: ASTM D2464 or D2467.
6. Flanged: Match corresponding flange connection.
7. Shall be NSF 61 and/or 14 product certified.

2.5 SPECIAL USE FITTINGS

A. Restraining Devices:

1. Utilize to restrain mechanical joint in lieu of concrete thrust blocking.
 - a. SDR pipe.
 - b. Ductile iron gland per ASTM A536.
 - c. Gripping wedges and follower gland meeting the requirements of ANSI/AWWA C110/A21.10.
 - d. Bolt hole size and spacing to match fitting.
 - e. Twist-off nuts shall be same size as tee-head bolts.
 - f. Appropriate spacers shall be provided with set screws to accommodate pipe on which installed.
 - g. Gland shall have pressure rating equal to that of the pipe on which it is used.

- h. Corrosion resistant.
- i. Joint to be field installable, field removable, and reinstallable.
- j. Sized per SDR PVC and DIP listed above.
- k. Model / Manufacturer:
 - 1) Series 2000PV for PVC and Series 1100 for DIP Megalug by Ebba Iron; Eastland, TX.
 - 2) Substitutions: Under provisions of Section 01600.

B. Pipe Couplings:

- 1. Utilize to allow for connection of plain end pipelines under pressure with relatively close outside dimensions.
- 2. For pipe sizes from 2 inches to 12 inches:
 - a. Sleeve: ASTM A53, ASTM A512 or carbon steel having a minimum yield of 30,000 psi.
 - b. Followers: Ductile iron ASTM A536.
 - c. Gasket: Nitrile (Buna-N)
 - d. Bolts: Stainless steel.
 - e. Finish: Fusion bonded Flexi-Coat Epoxy per AWWA C213.
- 3. For pipe sizes from 14 inches to 60 inches:
 - a. Sleeve: Carbon steel having a minimum yield of 30,000 psi.
 - b. Followers: AISI C1020 steel.
 - c. Gasket: Nitrile (Buna-N)
 - d. Bolts: Stainless steel.
 - e. Finish: Fusion bonded Flexi-Coat Epoxy per AWWA C213.
- 4. Model / Manufacturer:
 - a. 411; Smith-Blair, Inc., Texarkana, Arkansas.
 - b. Substitutions: Under provisions of Section 01600.

C. Transition Couplings:

- 1. Utilize to allow for connection of pipelines under pressure with differing outside diameters.
- 2. Sleeve: Carbon steel per ASTM A53C or having a minimum yield of 30,000 psi.
- 3. Flanges (2 inches to 12 inches):
 - a. Ductile iron ASTM A536 or carbon steel having a minimum yield of 30,000 psi.
- 4. Flanges (14 inches to 60 inches):
 - a. AISI C1020 steel.
- 5. Gasket: Nitrile (Buna-N)
- 6. Bolts: Stainless steel.
- 7. Finish: Fusion bonded Flexi-Coat Epoxy per AWWA C213.
- 8. Model / Manufacturer:
 - a. 415; Smith-Blair, Inc., Texarkana, Arkansas.
 - b. Substitutions: Under provisions of Section 01600.

D. Flange Adapter:

- 1. Utilize where noted on drawings to allow for ease of dismantling piping in the future.
- 2. Manufacturer: Uni-Flange Corp., Jacksonville, Florida.
- 3. Model: Series 400.
- 4. Substitutions: Under provisions of Section 01600.

E. Pipe Seals:

- 1. Utilize where noted on the Drawings to allow for pipeline penetration through walls and floors.
- 2. Manufacturer: Thunderline Link-Seal, Houston, TX
- 3. Model: LS
- 4. Substitutions: Under provisions of Section 01600.

2.6 PIPELINE ACCESSORIES

A. Polyethylene Encasement:

1. Utilize: On all ductile iron pipe and fittings in buried service that are in contact with flowable fill or concrete.
2. Conform to ANSI/AWWA C105/A21.5.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Piping Layout Within Structures:

1. Piping within structures has been designed for flanged fittings.

3.2 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Buried Service:

1. Excavate trench, place bedding and backfill in accordance with Section 02225. Do not displace or damage pipe when compacting.
2. Install pipe, fittings, and accessories in accordance with manufacturer's instructions. Seal joints watertight.
3. Install bed material at sides and over top of pipe.
4. Restrain Fittings:
 - a. Block all tees, caps, plugs, bends and fire hydrants to prevent displacement of fittings.
 - b. Construct concrete blocking to minimum dimensions and general shape shown on Drawings.
 - c. Cast blocking in place.
 - d. Leave joint bolts exposed to allow for possible future disassembly.
 - e. See Section 03300 for concrete specification.
 - f. Restraining glands may be used in lieu of concrete blocking.

C. Structure Penetrations:

1. Wall Sleeves:
 - a. Install where a pipe is shown to be continuous and pass through a structure wall.
 - b. Sleeves in concrete walls are to be supplied with a water stop that is cast integrally with the wall sleeve, or fully welded to it around the pipe circumference, and cast in place
 - c. Provide a pipe seal around pipe inside wall sleeve to insure water/air tight seal.

D. Hardware:

1. All bolts, nuts, etc. not scheduled to be painted must be stainless steel.
2. All bolts, nuts, etc. located in buried service or inside a water containing structure must be stainless steel.

E. Piping Above Grade/Within Structures:

1. Pipe Supports:
 - a. Provide pipe supports for all piping within structures in accordance with manufacturers recommendations and as shown on Drawings.
 - b. See Section 15140.
2. Paint piping in accordance with Section 09900.
3. Inspect all piping within structures for leaks following facility startup.
4. Repair any leak found.

3.3 PREPARATION

- A. Protect elements surrounding the work of this Section from damage or disfiguration.
- B. Hand trim excavations to required elevations. Correct over excavation in accordance with Section 02225.
- C. Remove large stones or other hard matter, which could damage pipeline or impede consistent backfilling or compaction.

3.4 SEPARATION OF WATER LINES AND POLLUTION SOURCES

- A. A minimum distance of 25 feet shall be maintained between all potable water lines and all pollution sources, e.g., septic tanks, septic tank absorption fields, waste stabilization ponds, sewage contamination, wastewater, landfill leachate, and all CAFO facilities.
- B. Under no circumstances shall a water line extend through an area that is a real or potential source of contamination to the water line or water supply
- C. A minimum horizontal distance of 10 feet shall be maintained between parallel water and sewer lines. The laying of potable water lines and sanitary sewers shall be in separate trenches with undisturbed earth between them. If the 10 foot horizontal separation distance between a proposed waterline and sewerline cannot be maintained the engineer shall contact KDHE and additional protection shall be determined on a case by case basis.
- D. When a water pipe and a gravity sanitary sewer cross and the sewer is 2 feet or more (clear space) below the water pipe, no special requirements or limitations are provided herein. At all other crossings, the sanitary sewer is to be constructed of one of the following materials (or approved equal) and pressure tested to assure water tightness pursuant to Chapter VI of the KDHE Minimum Standards of Design of Water Pollution Control Facilities:
 - 1. Utilize PVC pipe conforming to ASTM D3034 with minimum wall thickness of SDR26, ASTM F679 or ASTM F794, with gasketed push-on joints in conformance with ASTM D3212. Joints in the sewer pipe shall be located as far as practical from the intersected water line.
 - 2. Utilize ductile iron pipe Class 150 designed in accordance with ANSI/AWWA C150/A21.50 and manufactured in accordance with ANSI/AWWA C151/A21.51, with gasketed push-on joints or mechanical joints conforming to AWWA C110 or AWWA C111. Joints in the sewer pipe shall be located as far as practical from the intersected water line.
- E. Where a water main is laid across or through an area where there is an existing sanitary sewer, which is not constructed of one of the above specified materials and is 2 feet or less below the water pipe, the existing sewer shall be encased in concrete with a minimum of 6 inch thickness for a 10 foot distance on each side of the crossing.
- F. Under no condition will it be considered that encasement of the water main through an area of real or potential pollution would provide the protection needed to the water supply.
- G. When pressure sewer lines (force mains) run parallel to water lines, the separation distance shall be as far as practical, maintaining a minimum horizontal separation distance of at least 10 ft. There shall be at least 2 ft. vertical separation at crossings with the water main always crossing above the sewer force main.
- H. All separation distances are based on edge to edge measurements at the nearest points.

3.5 FIELD QUALITY CONTROL

A. Buried Gravity Pipeline Testing:

1. Air Pressure Test:
 - a. Test all buried gravity pipeline in presence of Engineer.
 - b. Pipeline shall be tested in accordance with ASTM F1417, see Appendix K.
 - c. Provide all necessary equipment, labor, and materials.
 - d. Repair and retest any pipeline which shows greater leakage than the allowable specified.
2. Testing for Deflection:
 - a. Test on the entire length of the installed gravity pipeline on completion of all work, including the leakage test, backfill, and placement of any fill, grading, paving, concrete or superimposed loads.
 - b. Determine deflection by use of a deflection device or by use of a spherical, spheroidal, or elliptical ball, a cylinder, or circular sections fused to a common shaft.
 - c. Ball, cylinder, or circular sections fused to a common shaft:
 - 1) Provide a diameter, or minor diameter as applicable, of 95% of the normal inside diameter of the pipe. A tolerance of +0.5% will be permitted.
 - 2) Be of a homogeneous material throughout and have a density greater than 1.0 as related to water at 39.2° F.
 - 3) Surface Brinell hardness: not less than 150.
 - 4) Center bore and through bolt with a one-fourth inch minimum diameter steel shaft having a yield strength of 70,000 psi or more, with eyes at each end for attaching pulling cables.
 - 5) The eye shall be suitable backed with flange or heavy washer such that a pull exerted on the opposite end of the shaft shall produce compression throughout the remote end of the ball, cylinder or circular sections.
 - 6) Space circular sections such that the distance from the external faces of the front and back sections is equal or exceeds the diameter of the circular section.
 - 7) Failure of the ball, cylinder, or circular sections to pass freely through a pipe run, either by being pulled through or by being flushed through with water, shall be cause for rejection of that run.
 - d. Deflection device:
 - 1) Obtain approval by the Engineer prior to use.
 - 2) Sensitive to 1.0% of the diameter of the pipe being measured and accurate to 1.0% of the indicated dimension.
 - 3) Retest by a run from the opposite direction, installed pipe showing deflections of 4.5% of the normal diameter of the pipe.
 - 4) If the retest indicates a deflection in excess of the 4.5%, replace the suspect pipe.

3.6 CLEANING

- A. Clean equipment and fixtures to a sanitary condition.
- B. Clean site; sweep paved areas, rake clean landscaped surfaces.
- C. Remove waste and surplus materials, rubbish, and construction facilities from the site.
- D. Clean work under provisions of Section 01700.

3.7 PROTECTION

- A. Protect finished installation under provisions of Section 01500.

END OF SECTION

SECTION 11295

VALVES AND APPURTENANCES

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Valves.
- B. Valve accessories.

1.2 REFERENCES

- A. American National Standards Institute (ANSI), Latest Edition.
- B. American Society of Mechanical Engineers (ASME), Latest Edition.
- C. American Society of Testing Materials (ASTM), Latest Edition.
- D. American Water Works Association (AWWA) Standards, Latest Edition.
- E. Building Officials and Code Administrators (BOCA) International, Inc., Latest Edition.
- F. Factory Mutual (FM), Latest Edition.
- G. International Association of Plumbing and Mechanical Officials (IAPMO), Latest Edition.
- H. Underwriters Laboratories (UL) Incorporated, Latest Edition.

1.3 SUBMITTALS

- A. Submit under provisions of Section 01300.
 - 1. Shop drawings and product data including the following:
 - a. Catalog cut and general bulletins describing complete apparatus including operating principles and fundamentals.
 - b. Materials of construction.
 - c. Operation, Maintenance, and Installation Manual.
 - d. Products to meet NSF 61 and/or NSF 14 and NSF 372, where applicable.
 - e. Items needing submittals include the following but are not limited to:
 - 1) Gate Valves.
 - 2) DIP Check Valves.
 - 3) Plug Valve.
 - 4) Butterfly Valves.
 - 5) Ball Valves.
 - 6) Telescoping Valves
 - 7) Service Saddle.
 - 8) Pressure Gauges.
 - 9) Pressure Snubber.
 - 2. Manufacturer's Instructions: Provide instructions for installation for all valves.
- B. Submit under provisions of Section 01400.
 - 1. Manufacturer's Field Reports: As noted within section.

1.4 PROJECT RECORD DOCUMENTS

- A. Submit record documents under provisions of Section 01700.
- B. Accurately record exact location of all buried valves.

1.5 OPERATION AND MAINTENANCE DATA

- A. Submit operation and maintenance data under provisions of Section 01700.
- B. Submit warranty data for all products under provisions of Section 01700.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Deliver, store and protect products under provisions of Section 01600.

PART 2 - PRODUCTS

2.1 VALVES

A. Gate Valves:

1. General:

- a. Same size as pipe in which installed, unless noted otherwise on drawings.
 - b. Manufacturer's name or initial and working pressure cast on valve body.
 - c. Open when turned counterclockwise.
 - d. Factory tested to double working pressure.
 - e. Hardware: Stainless steel.
 - f. Buried Service:
 - 1) 2-inch and larger: Mechanical joint, resilient wedge-type gate valve (flanged x mechanical joint for connection to tapping sleeves) conforming to ANSI/AWWA C111/A21.11, unless noted otherwise on Drawings.
 - 2) Provide mechanical joint gasket for PVC and DIP where applicable.
 - 3) Operation: 2" square AWWA wrench nut.
 - g. Service above grade/within structure:
 - 1) 3-inch and larger: Flanged faced resilient wedge-type gate valve and drilled to conform to ANSI/AWWA C110/A21.10.
 - 2) Operation: Hand wheel: Cast iron ASTM A126 CL.B.
- 2. Cast iron wedge symmetrical and fully encapsulated with molded rubber with no exposed iron.
 - 3. Non-rising, bronze stem per ASTM B138.
 - 4. Triple rubber O-rings on stem. Top two O-rings can be replaced with valve fully open and under pressure.
 - 5. Suitable for 250 psi maximum working pressure.
 - 6. Manufactured and tested per ANSI/AWWA C509.
 - 7. All internal and external exposed iron surfaces of valve body and bonnet shall have an epoxy coating.
 - 8. Manufacturer:
 - a. Mueller Co., Decatur, IL.
 - b. American AVK Co., Minden, NV.
 - c. Substitutions: Under provisions of Section 01600.
 - 9. To be certified NSF 372, latest revision.

B. DIP Check Valves:

1. Type: Swing Flex Check Valve.
2. Materials of Construction:
 - a. Valve body and cover: ASTM A536 ductile iron.
 - b. Disc: Buna-N, ASTM D2000-BG
3. Full body flanged type domed cover and valve disc being only moving part.
4. Valve body shall have full flow equal to nominal pipe diameter at any point through valve.
5. Top access port shall be full size, allowing removal of the removal of the disc without removing the valve from pipeline.
6. Disc shall be of one-piece construction, precision molded with integral O-ring type sealing surface and contain steel and nylon reinforcements. The flex portion shall be warranted for 25 years.
7. Flanges: Class 150, ANSI B16.5.
8. Finish: The exterior and interior of the valve shall be coated with an NSF/ANSI 61 approved fusion bonded epoxy coating.
9. Manufacturer:
 - a. Val-Matic Valve and Manufacturing Corp.; Elmhurst, IL.
 - b. Henry Pratt Company; Aurora, IL.
 - c. Dezurik, Inc; Sartell, MN.
 - d. Substitutions: Under provisions of Section 01600.
10. To be certified NSF 372, latest revision.

C. Plug Valve:

1. Type: PEC Eccentric Plug Valve.
2. Materials of Construction:
 - a. Valve body: Aluminum.
 - b. Bearings: 316 stainless steel.
 - c. Bonnet: Aluminum.
 - d. Bonnet screws: Stainless steel
 - e. Stem seal: NBR rubber.
 - f. Plug: Aluminum with NBR rubber facing.
3. Conform to ANSI/AWWA C-517.
4. Flanges: Class 150, ANSI B16.5.
5. Operator:
 - a. Electric Modulating Service:
 - 1) Actuator:
 - a) The electric valve actuator shall include the motor, actuator unit gearing, position limit switches, torque switches, declutch lever, and handwheel, as a self-contained unit.
 - 2) Enclosure:
 - a) The actuator motor and all electrical enclosures shall be IP 67 and NEMA 4, 4X, and 6 rated.
 - 3) Motor:
 - a) The motor shall be specifically designed for plug valve actuators. Service and shall be of high starting torque. Motor insulation shall be a minimum NEMA F, with a maximum continuous temperature rating of 155 degrees C (rise plus ambient) for the duty cycle specified. The motor shall be of sufficient size to open or close the valve at the valve manufacturer's maximum stated torque. The motor shall be capable of operating at +/- 10% of specified voltage. The motor shall be equipped to protect against motor overload.
 - 4) Duty cycle:
 - a) Motor shall be sized for a 25 percent duty cycle minimum.
 - 5) Power supply:
 - a) 120 volts, 60 Hz, 1 Phase.

- 6) Manual operation:
 - a) A metallic handwheel shall be provided for manual operation with an arrow to indicate “open” or “closed” rotation.
 - 7) Stem nut:
 - a) The valve actuator shall have a removable stem nut compatible with the valve stem material.
 - 8) Provide valve position sensing and readout. Must be capable of indicating position and readout in manual or automatic mode and with and without power.
 - 9) Position limit switches:
 - a) Position limit switches and the associated gearing shall be an integral part of the valve actuator. Limit switch gearing shall be of the intermittent type, made of bronze or stainless steel, greased lubricated, and totally enclosed to prevent dirt and foreign matter from entering the gear train. Switches shall be adjustable, allowing for trip points from fully open to fully closed position of the valve travel. They shall not be subject to breakage or slippage due to over-travel.
 - 10) Torque sensing:
 - a) Torque shall be sensed electronically from the motor current. A boost function shall be included to prevent torque trip during initial valve unseating. Jammed valve protection sensing shall be included.
 - 11) Modutronic control:
 - a) Control that positions valve in response to an external 4-20 mA command signal.
 - b) Automatic pulsing.
 - c) Parameters include: proportional band, dead band, polarity and action on loss of command signal.
 - 12) Motor Starter
 - a) Provide each actuator with an integral, reversing motor starter.
 - 13) Controls:
 - a) Two control selector switches shall be provided for selecting remote, local or stop control and open or closed control. Two pilot lights shall be provided to indicate full open and full closed respectively.
6. Manufacturer:
 - a. Dezurik, Inc; Sartell, MN.
 - b. Substitutions: Under provisions of Section 01600.
 7. To be certified NSF 372, latest revision.

D. PVC Check Valves:

1. Type: True Union full port ball check valve.
2. Materials of Construction:
 - a. Union nut, ball, body seal carrier, seal carrier ring, and end connector: PVC, ASTM D1784, 12454-B.
 - b. Seat: Teflon.
3. Maximum pressure: 150 psi.
4. End type: Solvent welded socket.
5. Manufacturer:
 - a. Hayward Industrial Products, Clemmons, NC.
 - b. Substitutions: Under provisions of Section 01600.

E. Butterfly Valves

1. 3-inch and larger:
 - a. Type: Flange end butterfly valve.
 - b. Shall be rated to 150 psi.
 - c. Zero leakage bi-directional shutoff.
 - d. Satisfactory for applications involving:
 - 1) Frequent throttling service and/or frequent operation.
 - 2) Operation after long periods of inactivity.
 - e. Comply with: AWWA C504.
 - f. Body & Disc:
 - 1) Material: Ductile iron, ASTM A536.
 - 2) Seat: ASTM A276 Type 316 Stainless Steel.
 - 3) Flange end.
 - 4) Integral stainless steel clamp ring and self-locked screws.
 - g. Shaft: One piece 304 Stainless Steel, ASTM A276.
 - h. Seat Molding Material: EPDM.
 - i. Finish:
 - 1) Epoxy
 - j. Manufacturer:
 - 1) Dezurik, Inc; Sartell, MN.
 - 2) Substitutions: Under provisions of Section 01600.
2. To be certified NSF 372, latest revision.
3. Operator:
 - a. Handwheel
 - b. Electric Modulating Service:
 - 1) Actuator:
 - b) The electric valve actuator shall include the motor, actuator unit gearing, position limit switches, torque switches, declutch lever, and handwheel, as a self-contained unit.
 - 2) Enclosure:
 - b) The actuator motor and all electrical enclosures shall be IP 67 and NEMA 4, 4X, and 6 rated.
 - 3) Motor:
 - b) The motor shall be specifically designed for plug valve actuators. Service and shall be of high starting torque. Motor insulation shall be a minimum NEMA F, with a maximum continuous temperature rating of 155 degrees C (rise plus ambient) for the duty cycle specified. The motor shall be of sufficient size to open or close the valve at the valve manufacturer's maximum stated torque. The motor shall be capable of operating at +/- 10% of specified voltage. The motor shall be equipped to protect against motor overload.
 - 4) Duty cycle:
 - b) Motor shall be sized for a 25 percent duty cycle minimum.
 - 5) Power supply:
 - b) 120 volts, 60 Hz, 1 Phase.
 - 6) Manual operation:
 - b) A metallic handwheel shall be provided for manual operation with an arrow to indicate "open" or "closed" rotation.
 - 7) Stem nut:
 - b) The valve actuator shall have a removable stem nut compatible with the valve stem material.
 - 8) Provide valve position sensing and readout. Must be capable of indicating position and readout in manual or automatic mode and with and without power.

- 9) Position limit switches:
 - b) Position limit switches and the associated gearing shall be an integral part of the valve actuator. Limit switch gearing shall be of the intermittent type, made of bronze or stainless steel, greased lubricated, and totally enclosed to prevent dirt and foreign matter from entering the gear train. Switches shall be adjustable, allowing for trip points from fully open to fully closed position of the valve travel. They shall not be subject to breakage or slippage due to over-travel.
- 10) Torque sensing:
 - b) Torque shall be sensed electronically from the motor current. A boost function shall be included to prevent torque trip during initial valve unseating. Jammed valve protection sensing shall be included.
- 11) Modutronic control:
 - d) Control that positions valve in response to an external 4-20 mA command signal.
 - e) Automatic pulsing.
 - f) Parameters include: proportional band, dead band, polarity and action on loss of command signal.
- 12) Motor Starter
 - b) Provide each actuator with an integral, reversing motor starter.
- 13) Controls:
 - b) Two control selector switches shall be provided for selecting remote, local or stop control and open or closed control. Two pilot lights shall be provided to indicate full open and full closed respectively.

F. Ball Valves:

1. Brass:
 - a. Type: Threaded NPT lead-free ball valve.
 - b. Materials of Construction:
 - 1) Body: Lead free brass
 - 2) Lever and grip: Steel, zinc plated w/PVC.
 - 3) Stem: Brass C36000
 - 4) Stem packing: PTFE.
 - 5) Seat: PTFE.
 - 6) Ball: Lead-free brass chrome plated.
 - c. Manufacturer:
 - 1) Apollo Valves, Matthews, NC.
 - 2) Substitutions: Under provisions of Section 01600.
 - d. To be certified NSF 372, latest revision.
2. PVC:
 - a. Type: True Union full port ball valve.
 - b. Materials of Construction:
 - 1) Handle, stem, union nut, ball, body seal carrier, seal carrier ring, and end connector: PVC, ASTM D1784, 12454-B.
 - 2) Seat: Teflon.
 - c. Maximum pressure: 250 psi.
 - d. End type: Threaded or solvent welded socket.
 - e. Manufacturer:
 - 1) Hayward Industrial Products, Clemmons, NC.
 - 2) Substitutions: Under provisions of Section 01600.

G. Telescoping Valve

1. Type: Rising stem design Series V4R Telescoping Valve
2. Materials of Construction:
 - a. Floor Stand: 4" square stainless steel tube with 1/8" wall and mounted to 1/2" thick stainless steel base plate.
 - b. Handwheel: 16" diameter cast aluminum and work in conjunction with a 1" square stainless steel rash, 2" stainless steel spur gear and oil-impregnated sintered bronze bushings, requiring a maximum of 2 turns for 1' of travel.
 - c. Slip Tube: Minimum of 16 ga. Stainless steel and incorporate a 150 lbs. stainless steel companion flange and 1/4" thick neoprene wipe gasket.
3. Manufacturer: Halliday Products, Orlando, FL
 - a. Warranty: Guaranteed against defects in material and/or workmanship for a period of 3 years.

2.2 VALVE ACCESSORIES

A. Service Saddles:

1. Utilize to tap into piping where shown on Drawings.
2. Shall conform to ANSI/NSF 61.
3. Ferrous pipe: Single bale.
4. Non-ferrous pipe: Double bale.
5. Conform to:
 - a. Ductile iron body per ASTM A536.
 - b. Double bale.
 - c. Saddle to be epoxy coated inside and out.
 - d. Heavy threaded outlet to match fitting/piping connection.
6. Manufacturer:
 - a. Model 313 by Smith-Blair; Texarkana, AR.
 - b. Model 317 by Smith-Blair; Texarkana, AR.
 - c. Substitutions: Under provisions of Section 01600.
7. To be certified NSF 372, latest revision.

B. Pressure Gauges:

1. Size: 2 1/2 inches.
2. 1/4-inch NPT connection located on bottom of gauge.
3. Range: As shown on drawings.
4. Accuracy: +/- 1.0% full scale.
5. No liquid filled.
6. Working Pressure:
 - a. Steady: 3/4 scale value.
 - b. Short time: Full scale value.
7. Materials of Construction:
 - a. Bourdon Tube: 316 Stainless Steel.
 - b. Tube type: C-Tube.
 - c. Socket: Bronze.
 - d. Connection: Lower.
8. Minimum 5-year warranty.
9. Manufacturer: Ashcroft Type 1009 or equal.
10. To be certified NSF 372, latest revision.

C. Pressure Snubber:

1. Utilize in association with pressure gauge assembly.
2. 1/2-inch x 1/4-inch NPT connection (male or female) as required.

3. Materials of Construction: Stainless steel.
4. Manufacturer: Omega Engineering, Stamford, CT or equal.
5. To be certified NSF 372, latest revision.

D. Valve Box Ring and Cover:

1. Valve box shall incorporate extension stems for valves
2. Valve box cover shall be removable cast iron.
3. Valve box cover shall be marked "WATER".
4. Manufacturer:
 - a. Tyler Series 6850 or approved equal.

E. Valve Wrenches:

1. A total of one operating wrenches shall be supplied for each type of valve supplied.
2. Shall be designed to fit opening butts on valves.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer's instructions.

3.2 FIELD QUALITY CONTROL

- A. Field testing will be performed under provisions of Section 01400
- B. Contractor shall operate all valves in the presence of the Engineer and Owner to verify that valves operate correctly.
- C. Manufacturer's Field Services:
 1. Provide the services of a qualified representative of the manufacturer of the pressure reducing valve for a minimum of four (4) hours on site to:
 - a. Verify proper installation of equipment.
 - b. Perform the following:
 - 1) Field testing and start-up.
 - 2) Initial performance testing.
 - 3) Instruct Owner's personnel in the proper operation and maintenance of the equipment.
 - c. Provide field report and O&M manual under provisions of Sections 01400 and 01650.
 2. Provide the services of a qualified representative of the manufacturer of the modulating plug valve for a minimum of four (4) hours on site to:
 - a. Verify proper installation of equipment.
 - b. Perform the following:
 - 1) Field testing and start-up.
 - 2) Initial performance testing.
 - 3) Instruct Owner's personnel in the proper operation and maintenance of the equipment.
 - c. Provide field report and O&M manual under provisions of Sections 01400 and 01650.

3.3 ADJUSTING

- A. Adjust work under provisions of Section 01700.

3.4 PROTECTION

- A. Protect finished installation under provisions of Section 01500.

END OF SECTION

PART 2 - PRODUCTS

2.1 FLOW METER

A. 6-inch and larger:

1. Magnetic flowmeter shall be microprocessor-based and measure flow by application of pulsed dc to a field coil surrounding the flow tube and measuring the resultant voltage generated at the electrodes. It shall indicate, totalize, and transmit flow in pipe.
2. Meter accuracy shall be $\pm 0.5\%$ of the actual throughput. Accuracy shall be verified by calibration in a flow laboratory traceable to the U.S. National Institute of Standards and Technology.
3. Range: Dependent on flow meter size.
4. Materials of Construction:
 - a. Housing: Steel
 - b. Flow Liner: Polyurethane
 - c. Electrodes: 316 Stainless Steel.
 - d. Connection: Flanged, Class 125, ANSI B16.1.
5. When the metered liquid would foul the electrodes, provide self-cleaning electrodes or provide all necessary components to ultrasonic clean or boil away deposits.
6. Flow tube shall be suitable for installation in a wet location and suitable for accidental submergence in 15 feet of water for 48 hours or more.
7. Output Signal: one (1) 4-20 mA output signal proportional to flowrate.
8. The flowmeter shall be suitable for operation at temperatures from -20°F to 140°F.
9. The meter shall be supplied with grounding rings.
10. The meter shall include a low flow cutoff control.
11. Transmitter:
 - a. Shall indicate flow and total flow during operation. Totalizer shall be non-rest, 6-digit, electromechanical or digital type. Digital totalizer shall have battery backup.
 - b. Enclosure shall be rated NEMA 4X and shall be remote mounted.
 - c. Provide all conductors between flow tube and transmitter, length as required.
 - d. An LED or LCD digital display shall be cover mounted and scaled in engineering units as indicated.
 - e. The transmitter shall apply a pulsed dc signal to the field coils.
 - f. Power source shall be 120 volts, 60 Hz.
12. Manufacturer: Sparling or Foxboro.
13. Warranty: Manufacturer shall provide a warranty that all flow meters shall be free from defects in material and workmanship for a period of two (2) years from date of installation.
14. Manufacturer's Field Service
 - a. Manufacturer's authorized representative shall be present at the jobsite to provide equipment start-up, programming, calibration, and to train owner's personnel in the operation, maintenance and troubleshooting of the equipment provided.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Devices shall be mounted in accessible locations. Process sensor connections for liquid systems shall be installed to prevent the entrapment of gases in the device. Process sensor connections for gas systems shall be installed to prevent the collection of liquids in the device, and shall be provided with means for draining any collected liquid.

SECTION 00003

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APPENDICES

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END OF SECTION

SECTION 11350

SURFACE AERATORS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Surface Aerators:
 - 1. Contractor to provide two (2) new surface aerators and install in each primary digester basin.

1.2 GENERAL REQUIREMENTS

- A. Each aerator shall transfer a minimum of 2.5 lbs. of oxygen per hour per brake HP in clear tap water (ASCE test procedure) of zero dissolved oxygen and 20 degrees C. Each aerator shall have a minimum pumping rate of 35,500 GPM and a minimum zone of complete mix of 85' diameter in 20' deep basins..

1.3 SUBMITTALS

- A. Submit under provisions of Section 01300.
 - 1. Shop drawings and product data including the following:
 - a. Catalog cut sheets for equipment.
 - b. Materials of construction for all major components.
 - c. Operation and maintenance data
- B. Manufacturer's instructions: Instructions for installation for all equipment utilized.

1.4 PROJECT RECORD DOCUMENTS

- A. Submit record documents under provisions of Section 01700.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Coordinate delivery, storage, and installation of pre-negotiated equipment with Owner, Engineer, and Aerator Providers.

PART 2 - PRODUCTS – SURFACE AERATORS

2.1 Aerator Drive Motor

1. The motor shall be Reliance, Baldor Electric, or approved equal and deliver 50 HP and shall be wired for 460 VAC.
2. The motor shall be 3 phase, 60 Hz, 1200 RPM, 1.15 service factor, class F insulation and have an up and down thrust rating of not less than 2050 lbs.
3. The motor shall be TEFC and rated for severe chemical duty.
4. A condensate drain shall be located at the lowest point in the lower end-bell housing.
5. A labyrinth seal shall be provided below the bottom bearing to prevent moisture from entering around the motor shaft into the motor.

6. All parting surfaces shall be deep registered and permatex sealed.
7. All through bolts shall be type 18-8 Stainless steel.
8. A stainless steel nameplate shall be provided with each motor and shall be securely fastened thereto. The voltage, speed, insulation class, amperage, service factor, wiring diagram, motor serial number and the manufacture's address shall be permanently marked.
9. The motor housing shall be cast iron with a cast iron junction box. A steel drip cover shall be provided.
10. External surfaces shall be coated with a white corrosion resistant epoxy paint.
11. Motor base shall be 16.5" OD.

2.2 Motor Shaft

1. The motor shaft shall be one continuous piece from the top of the motor bearing through the lower bearing and continue through the propeller. The shaft shall be 17-4 stainless steel heat treated to 1150 condition.
2. The bottom of the motor shaft shall be machined with a step to accept the bore of the impeller.
3. The shafts shall have a keyway and threaded for a 2.25"NC stainless steel nut of opposite thread rotation of the propeller.
4. Tapered motor shaft shall be no less than 2.937" OD.
5. Total TIR at the end of the shaft shall be no more than .003 inches.
6. Minimum yield strength shall be 135,000 PSI.
7. Rigid or flexible coupled shafts shall not be allowed.

2.3 Motor Bearings

1. Motor bearings shall be regreasable. Sealed bearings are not acceptable and bearings shall be shielded on the bottom side only.
2. The top and bottom motor bearings shall be of the combined radial and axial thrust type and shall be packed at the factory with Chevron black pearl SRI grease.
3. The lower motor bearing inner race shall be locked to the motor shaft via a special washer and locking nut arrangement. The motor shaft shall be threaded just below the lower bearing and shall have a keyway cut into the motor shaft. This key shall accept a tab from the ID of the locking washer, and the locking nut shall have recess to accept a tab from the OD of the locking washer to prevent the nut from backing off. Snap ring type retainers will be acceptable.
4. Motors shall be provided with heavy duty bearings with a min B-10 rating of 100,000 hours.

2.4 Deflector, Motor Mount Assembly

1. A combination motor mount, deflector cone assembly shall be mounted on the float at the center of the throat and shall produce a flat, horizontal spray pattern to reduce icing and give velocity mixing zone and the highest oxygen transfer. The spray pattern shall not arch above the base height of the drive motor.
2. There shall be a minimum of 3/8" thick FRP with 3/8" steel and the cone filled #3 quartzite and isophthalic resin. The FRP shall be handcrafted using woven roving Promat style CDM 2415 with a resin content not to exceed 55%.
3. The motor mounting surface of the deflector shall be a full 360-degree machined index surface to accept the index of the motor. Diffusers that allow for point loading by attaching the motor on pads or lugs will not be acceptable.
4. The motor bearing surface of the deflector shall be no less than 68 square inches.

5. The deflector head shall absorb all normal and shock loads encountered by propeller and transmitted to deflector head via the motor shaft and lower motor end bell. The deflector head shall distribute the forces into the float via solid stainless steel rods of 1.5" OD. The bottom flange shall mate with a similar flange that is an integral part of the float, to spread the stresses generated by the propeller uniformly around the float so that no point loading is allowed. The bearing surface shall be no less than 2.035 square feet and weigh no less than 900 lbs.
6. There shall be located at the distance no greater than 1/16" above the hub of the propeller, a trash slinger machined from plastic that will rotate with the motor shaft and eliminate liquids or contaminants into the motor shaft shroud.
7. Units that allow enough distance between the propeller hub and the deflector for the slinger to slip down and allow water into the diffuser will not be acceptable.
8. This trash slinger shall be press fit onto the shaft and have two stainless steel set screws @ 90 degree apart.
9. Nodular iron, cast iron, or grey iron or any corroding material will not be acceptable for this application.
10. Rotating diffuser heads will not be acceptable.

2.5 Propeller

1. The propeller shall be a precision casting of type 316 SS and shall be specifically designed for the application intended.
2. The attachment of the propeller to the motor shall be by means of a SS keyway and 2.25" SS NC thread nut, threaded onto the motor shaft.
3. Tapered motor shafts and propellers that require pin and setscrews will not be acceptable.
4. The propeller shall be SS, left hand rotation, weedless design.
5. Pitch angle and rake angle for each blade shall be within 2% of the other blade.

2.6 Float

1. Each aerator shall be equipped with a one-piece float constructed of heavy duty molded fiberglass. The float shall be handcrafted of woven-roving Promat style CDM2415, with a resin content not to exceed 55%.
2. Chopped strand glass will not be acceptable for this application. Only manufacturers regularly engaged in the manufacture of fiberglass aerators for a total of 15 years minimum and can show a defect free product for this time will be considered.
3. The outer molded surface shall have a minimum of .21 mils of white chemical resistant gel- coat, G series marine grade, UV stabilized with a minimum of 80% NPG and shall meet applicable standards of USAS Z1 24. 1.
4. The outer walls of the float shell shall be of sufficient strength to withstand at least 2.0 times the breaking strength of the mooring attachment.
5. The float shall be foamed full of closed cell polyurethane foam that is unaffected by water and does not shrink in cold weather or expand in hot temperatures.
6. The float shall have no seams, bonds, or joints to come apart.
7. The foam shall be completely encapsulated in fiberglass and not exposed to the elements.
8. Minimum thickness of fiberglass shall be 3/8" in non-stress areas and 5/8" in all stress areas.
9. The float shall be at least 126" diameter and have a safety factor of 1.8.
10. The float shall have 3 stainless steel mooring eyes.

2.7 Volute

1. The volute shall be of heavy-duty fiberglass of "min thickness and shall be an integral part of the flotation unit.
2. There shall be a smooth continuous transition from the propeller that will open up to two propeller diameters at a distance of two propeller diameters in height at the discharge section.
3. The aerator volute shall be designed to eliminate vortexing and shall not incorporate stabilizing crosses or anti-vortexing members or vanes of any type.
4. The aerator volute shall reach a minimum of 84 inches below the water line and shall be of one-piece construction. Bolt on volutes are not acceptable.
5. The volute shall be reinforced with encapsulated steel ribs.

2.8 Workmanship

1. All work shall be done by craftsmen in a professional manner and by manufacturers regularly engaged in the manufacture of floating aerators for a minimum period of five years.

2.9 Factory Testing

1. Each aerator shall be fully assembled and tested at the factory prior to shipment. Testing shall be for dynamic vibration level and shall not exceed .5mils peak to peak measured at the motor bearings and at a frequency equal to the motor speed, prior to installing on the float. After installing on the float, the rotating elements of the power section will be dynamically balanced. Reports shall be certified and sent to the engineer.
2. Aerator assemblies shall be assembled, aligned, test run, and balanced prior to shipment, and then shipped directly to the jobsite. Assemblies shall not be broken down for shipment and later reassembled in the field.

2.10 Mooring Accessories

1. Each aerator shall be moored at 3 places as specified.
2. Mooring cable shall be a minimum of .375 in dia. and shall be stainless steel 7x19 construction.
3. Each mooring connection shall consist of a minimum of:
 - a. One (1) Stainless steel thimbles
 - b. Two (2) Stainless steel U bolt clamps
 - c. One (1) Stainless steel fireman snap hook

2.11 Electrical Cable and Accessories

1. Power cable shall be #Awg 2/4 UL approved for underwater service and shall be one continuous length from the aerator motor to the junction box located on the side of the bank. Splices are not permitted.
2. Cable shall be factory attached using watertight connectors and the manufacturer shall be responsible for the water tightness of this connection.
3. There shall be a stainless steel kelleem grip that attaches to the motor lifting lug with a stainless steel connector that will take any strain or pull off the junction box.
4. There shall be located every 15 feet of cable float to support the power cable.

2.12 Warranty

1. The equipment furnished under this section will be free of defects in material and workmanship, including damages that may be incurred during shipping for a period of 12 months from the date of owner acceptance and engineer certification.

2. The aerator manufacturer shall warrant all non-moving parts of the aerator for a period of 10 years from date of startup.
3. The motor and propeller shall be warranted from a period of two years from startup date.
4. Defective materials in the floatation unit, throat, or volute section shall be repaired or replaced at the jobsite. The customer shall not be liable freight charges that require a special commodity handling.
5. Any failures of any type caused by the negligence of the manufacturer to insure that material and workmanship used in this equipment meets or exceeds the specifications shall be borne entirely by the manufacturer and to include any push or pull charges.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify field measurements are as shown on Shop Drawings.

3.2 PREPARATION

- A. Protect surrounding surfaces and equipment from damage.

3.3 INSTALLATION AND STARTUP

- A. Install equipment in accordance with written manufacturer's instructions and recommendations.

3.4 FIELD QUALITY CONTROL

- A. Manufacturer's Field Services:
 1. Provide O&M manual to Owner.

3.5 ADJUSTING

- A. Adjust work under provisions of Section 01650.

END OF SECTION