

KAYENTA WWTP

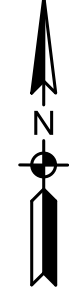
CONTINUOUS FEED-INTERMITTENT DISCHARGE (CFID) POND SYSTEM

NAVAJO TRIBAL UTILITY AUTHORITY

KAYENTA, ARIZONA



SITE LOCATION
NTS



VICINITY MAP
NTS



DATE OF PREPARATION:
ORIGINAL ISSUE: 07/14/2023
REVISION 1: 01/22/2024
REVISION 2: 02/13/2024

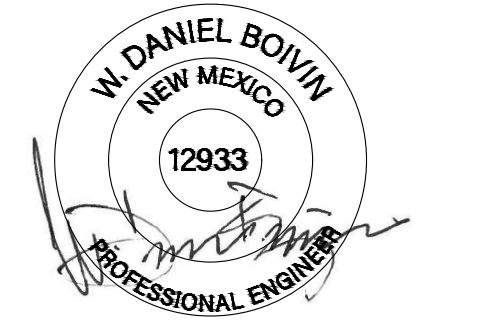
ENGINEER AND GEOTECHNICAL CONSULTANT:
WSP
43221 BALLOON PARK RD NE
ALBUQUERQUE, NM 87109
(505) 821-1801

THIS PLAN SET IS BASED ON AERIAL PHOTOGRAPHY. THE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT THE EXISTING INFORMATION SHOWN ON THESE PLANS IS NOT TO BE RELIED ON AS BEING EXACT OR COMPLETE. THE CONTRACTOR WILL BE RESPONSIBLE FOR FIELD VERIFYING LOCATIONS AND DEPTHS OF EXISTING UTILITIES BEFORE COMMENCING CONSTRUCTION. THE CONTRACTOR MUST ALSO CALL 811 AND NAVAJO TRIBAL UTILITY AUTHORITY, P.O. BOX 170, FORT DEFIANCE, AZ, 86504 AT 928-729-5721 AT LEAST 3 WORKING DAYS BEFORE ANY EXCAVATION TO REQUEST EXACT FIELD LOCATION OF UTILITIES.

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**KAYENTA WWTP
CFID
POND SYSTEM
FINAL DESIGN**



**NAVAJO TRIBAL UTILITY
AUTHORITY**
PO BOX 170
FT. DEFIANCE, AZ 86504
WSP PROJECT No:
2151700011

REVISIONS			
NO.	DATE	BY	APPROVED
1	1/22/2024	A. ORRANTIA	S. TANDUKAR
2	2/13/2024	A. ORRANTIA	S. TANDUKAR

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SHEET TITLE:
COVER SHEET

SHEET NUMBER:	REV. #
G-001	
SHEET 1	OF 55 SHEETS

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GENERAL NOTES:

QUALITY CONTROL

- 1.0 UNLESS OTHERWISE STATED, INDIAN HEALTH SERVICE (IHS)/NAVAJO ENGINEERING AND CONSTRUCTION AUTHORITY (NECA) SPECIFICATIONS (REV 1.5) AND INDIAN HEALTH SERVICE STANDARD DETAILS FOR WATER (REV 3.2) AND SEWER (REV 1.9) SHALL CONTROL THE MATERIALS AND WORKMANSHIP OF THIS PROJECT WHETHER SPECIFICALLY CALLED OUT OR NOT. THE IHS/NECA SPECIFICATIONS ARE A SEPARATE VOLUME AND NOT ISSUED AS PART OF THE CONSTRUCTION SET. SPECIFICATION SECTIONS AND STANDARD DRAWINGS, WHEN NOTED HEREIN, REFER TO CORRESPONDING PARTS OF THESE DOCUMENTS.
- 2.0 IF DURING THE COURSE OF WORK THE CONTRACTOR BECOMES AWARE OF A CONTRADICTION IN THE REQUIREMENTS BETWEEN THE STANDARD SPECIFICATIONS AND DRAWINGS AND THESE PLANS, THE CONTRACTOR SHALL NOTIFY THE ENGINEER.

SAFETY

- 3.0 THE CONTRACTOR IS SOLELY RESPONSIBLE FOR JOBSITE SAFETY AND FOR KNOWLEDGE AND COMPLIANCE WITH APPLICABLE O.S.H.A. STANDARDS AND OTHER FEDERAL, STATE, TRIBAL AND LOCAL SAFETY AND WORKPLACE COMPLIANCE REQUIREMENTS.

EXISTING CONDITIONS

- 4.0 THE LOCATION OF EXISTING UTILITIES, AS SHOWN ON THE DRAWINGS, ARE APPROXIMATE. THE CONTRACTOR IS RESPONSIBLE FOR THE ACCURATE LOCATION IN THE FIELD.
- 5.0 IF EVIDENCE OF SUBSURFACE ARCHAEOLOGICAL OR HISTORIC FEATURES ARE OBSERVED DURING CONSTRUCTION, THE CONTRACTOR SHALL IMMEDIATELY HALT CONSTRUCTION IN THE AREA, PROTECT THE SITE, AND NOTIFY THE ENGINEER. NO CONSTRUCTION ACTIVITY SHALL OCCUR WITHIN THE 50 FOOT BUFFER AROUND THE EXISTING ARCHAEOLOGICAL SITE UNTIL APPROVED.

PROJECT CONTROL

- 6.0 PROJECT CONTROL SHOWN HEREON WAS ESTABLISHED REAL TIME KINEMATIC OBSERVATIONS FROM NATIONAL GEODETIC SURVEY CONTROL POINTS .
HORIZONTAL DATUM: AZSPCS EAST ZONE MODIFIED,
C.S.F= 1.000364 TO BE UTILIZED AS "GROUND" COORDINATES.
VERTICAL DATUM: NAVD88 (2011)
BRASS CAP CONTROL POINTS THAT HAVE BEEN INSTALLED ONSITE ARE THE BASIS OF HORIZONTAL CONTROL. THE CONTROL POINTS SHALL BE MAINTAINED AND REMAIN UNDISTURBED DURING CONSTRUCTION AND WILL SERVE AS HORIZONTAL CONTROL POINTS FOR THE PROJECT.

CONTROL POINTS				
PONT ID	NORTHING	EASTING	ELEVATION	DESCRIPTION
POINT #31	2086500.524	677621.233	5617.04	NGS DESIGNATION C 31 (PID GP0017) BENCHMARK DISK SET IN ROCK OUTCROP
POINT #14	2083176.851	673769.838	5684.56	NGS DESIGNATION K 513 (PID GP0401) FLANGED ENCASED STEEL ROD
POINT #99	2087492.206	679800.167	5596.96	SET 1/2" REBAR W/RED CONTROL CAP

- 7.0 SCALES IN THESE PLANS ARE VALID WHEN PLOTTED ON 22"x34" (ANSI).

WORK AREA

- 8.0 THE CONTRACTOR SHALL CONFINE WORK TO WITHIN THE PRESCRIBED CONSTRUCTION LIMITS, EASEMENT, RIGHT-OF-WAY OR PROPERTY.
- 9.0 THE CONTRACTOR SHALL COORDINATE ACTIVITIES WITH THE OWNER AND ENGINEER TO MINIMIZE ACCESS TO ADJACENT PROPERTIES AND TRAFFIC DISRUPTIONS.
- 10.0 THE CONTRACTOR SHALL ACQUIRE THE NECESSARY LICENSES OR PERMITS WHEN WORKING WITHIN OR NEAR A RIGHT-OF-WAY, STREET, ROAD OR HIGHWAY, SIDEWALK, TRAIL, OR OTHER PUBLIC THOROUGHFARE AND SHALL INCORPORATE THE REQUIREMENTS OF SAID LICENSE/PERMIT.
- 11.0 WHEN WORKING IN OR NEAR TRAFFIC THE CONTRACTOR SHALL (AT A MINIMUM) PROVIDE, ADEQUATE SIGNS, BARRICADES, WARNING LIGHTS, AND FLAGGERS TO ENSURE THE SAFETY/PROTECTION OF THE PUBLIC, EMPLOYEES, AND THE WORK IN ACCORDANCE WITH THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" (MUTCD), LATEST EDITION.
- 12.0 IT WILL BE THE CONTRACTOR'S RESPONSIBILITY TO MAINTAIN ACCESS TO EXISTING RESIDENCES, BUSINESSES, TURNOUTS AND INTERSECTING ROADS AT ALL TIMES DURING CONSTRUCTION.
- 13.0 IF A FENCED/SECURE STORAGE AREA FOR MATERIALS AND EQUIPMENT IS DESIRED, THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING AN AREA OFF THE PROJECT SITE. USING THE AREA FOR STORAGE SHALL COMPLY WITH LOCAL ZONING OR OTHER ORDINANCES AND SHALL BE PERMITTED, IF REQUIRED.
- 14.0 OVERNIGHT PARKING OF CONTRACTOR'S EQUIPMENT SHALL NOT OBSTRUCT ACCESS OR DESIGNATED TRAFFIC LANES. THE CONTRACTOR SHALL PARK OR STORE EQUIPMENT AT SAFE DISTANCES FROM THE TRAVELED WAY.
- 15.0 THE CONTRACTOR IS RESPONSIBLE FOR SOIL EROSION, DRAINAGE CONTROL AND DUST DURING CONSTRUCTION AND MUST, WHEN APPLICABLE, PREPARE AND ADHERE TO A STORM WATER POLLUTION PREVENTION PLAN (SWPPP) PREPARED ACCORDING TO THE U.S. ENVIRONMENTAL PROTECTION AGENCY'S CONSTRUCTION GENERAL PERMIT(CGP).

OTHER UTILITIES

- 16.0 THE CARE AND PROTECTION OF OTHER UTILITIES, STREET APPURTENANCES, DRAINAGE STRUCTURES AND OTHER INFRASTRUCTURE, WHETHER PUBLIC OR PRIVATE, THAT ARE NOT PART OF THE INTENDED WORK ARE THE RESPONSIBILITY OF THE CONTRACTOR.
- 17.0 WHERE TRENCHING AROUND OR BENEATH EXISTING UTILITY LINES OCCURS, THE CONTRACTOR WILL BE RESPONSIBLE FOR COORDINATING WITH THE UTILITY OWNER AND FOR SUPPORTING THE UTILITY LINE, AS REQUIRED BY THE UTILITY OWNER, DURING CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ASSURING THE UTILITY IS ADEQUATELY SUPPORTED BY COMPACTED BACKFILL OR OTHER MEANS AT THE COMPLETION OF CONSTRUCTION AS REQUIRED BY THE UTILITY OWNER. IF THE TECHNIQUES REQUIRED FOR STABILIZING OTHER UTILITIES CONFLICT WITH THE REQUIREMENTS OF THIS PROJECT THE CONTRACTOR SHALL NOTIFY THE ENGINEER.

EXCESS MATERIAL & DEBRIS

- 18.0 ANY EXTRA NATURAL SOIL (CLEAN OF OIL AND CHEMICALS) REMAINING AFTER BACKFILL AND COMPACTION MAY BE DISPOSED AT A SITE APPROVED BY THE OWNER. CONTRACTOR SHALL HAUL DEBRIS AND NON-NATURAL SOILS TO A CERTIFIED LANDFILL.

RECORD DRAWINGS

- 19.0 THE CONTRACTOR SHALL PREPARE AND MAINTAIN AN UP-TO-DATE SET OF RECORD DRAWINGS FOR THE PROJECT. THESE PLANS SHALL BE KEPT CURRENT DAILY AND SHALL BE MADE AVAILABLE FOR REVIEW AS REQUESTED BY THE ENGINEER. THE COST OF PREPARING AND MAINTAINING A RECORD DRAWING SET SHALL BE INCIDENTAL TO THE PROJECT.

STRUCTURAL NOTES:

FOUNDATIONS:

BELOW GRADE FOUNDATIONS SHALL BEAR ON A MINIMUM OF THREE (3) FEET OF GRANULAR NON-EXPANSIVE ENGINEERED FILL UNDERLAIN BY A REINFORCING GEOGRID.

SLABS SHOULD BEAR ON THREE (3) FEET OF NON-EXPANSIVE LOW PERMEABILITY ENGINEERED FILL.

FILL MATERIALS ARE TO CONFORM TO GRADATION AS FOLLOWS.

SIEVE SIZE	PERCENT PASSING
1"	100
NO. 4	50-100
NO.40	35 MAX.

ENGINEERED FILL OR OTHER APPROVED GRANULAR SOILS SHOULD BE PLACED IN A MAXIMUM LIFT NOT TO EXCEED 8", MATERIAL IS TO BE COMPACTED TO 95% ASTM D698 PER GETOECHNICAL REPORT.

THE GEOGRID SHOULD BE PER TESAR TRIAX TX 160 OR EQUIVALENT AS APPROVED BY THE ENGINEER.

ALL EARTH WORK, FOOTING DEPTHS, AND EXCAVATIONS FOR FOUNDATIONS SHALL BE INSPECTED BY THE ENGINEER TO VERIFY ASSUMED ALLOWABLE SOIL BEARING AND LOW SETTLEMENT AND SWELL POTENTIAL, AND TO MAKE ANY ADDITIONAL RECOMMENDATIONS.

CONCRETE:

SHALL MEET ALL THE REQUIREMENTS OF THE CURRENT ISSUE OF THE ACI MANUAL OF CONCRETE PRACTICE, WITH TYPE 1-11 CEMENT. MINIMUM 28 DAY STRENGTH, 3000 PSI, EXCEPT AS FOLLOWS:

FOUNDATIONS, GRADE BEAMS, OR ANY OTHER CONCRETE IN CONTACT WITH EARTH.....3000 PSI (MAX W/C = 0.45)

CAST IN PLACE SLABS NOT ON GRADE.....4000 PSI

MAXIMUM SLUMP FOR ALL CONCRETE......5"

CONTRACTOR SHALL SUBMIT FOR APPROVAL CONCRETE MIX DESIGNS FOR EACH CLASS OF CONCRETE. THE MIX SUBMITTAL SHALL INDICATE WHICH OF THE FOLLOWING ACI 318 METHODS THE CONCRETE SUPPLIER ALONG WITH THE TESTING LAB METHOD HE/SHE INTENDS TO USE FOR CONCRETE PROPORTIONING - THE FIELD EXPERIENCE METHOD, THE LABORATORY TRIAL MIXTURE METHOD OR A COMBINATION OF BOTH. IF CONSECUTIVE TESTS (15 TO 30) ARE BEING RELIED UPON PER ACI 318, SECTION 5.3 THOSE TESTS SHALL BE SUBMITTED ALONG WITH THE MIX DESIGNS. MIX DESIGNS SHALL BEAR THE STAMP OF A LICENSED ENGINEER.

NO ADMIXTURES SHALL BE USED WITHOUT APPROVAL. NO AIR ENTRAINMENT SHALL BE ALLOWED IN FLAT SLABS. ADMIXTURES CONTAINING CHLORIDES SHALL NOT BE USED. CONCRETE SHALL NOT BE IN CONTACT WITH ALUMINUM. MECHANICALLY VIBRATE ALL CONCRETE WHEN PLACED. EXCEPT THAT SLABS ON GRADE NEED BE VIBRATED ONLY AROUND EMBEDDED ITEMS. DO NOT TAMP SLABS. USE ROLLER BUG, VIBRATING SCREED OR BULL FLOAT TO FINISH. SEE SPECIFICATIONS FOR CURING.

MINIMUM STRENGTH FOR REMOVAL OF FORMS AND SHORING SHALL BE 75% OF SPECIFIED STRENGTH AT 28 DAYS.

LEGEND:

EXISTING	PROPOSED
TOPOGRAPHIC CONTOUR	TOPOGRAPHIC CONTOUR
FENCE	FENCE
SANITARY SEWER LINE	SANITARY SEWER LINE
MANHOLE	MANHOLE
POWER POLE	GATE VALVE
OVERHEAD ELECTRIC LINE	BIOLIC DIFFUSER
UNDERGROUND ELECTRIC LINE	AERATOR
WATERLINE	DIRECTION OF FLOW

FLY ASH (POZZOLAN) IF PERMITTED PER SPECIFICATIONS SHALL NOT EXCEED 25% REPLACEMENT OF TOTAL CEMENT CONTENT USING A 1:1 REPLACEMENT FACTOR.

REINFORCING:

LATEST ACI CODE AND DETAILING MANUAL APPLY. ALL REINFORCING BARS DEFORMED EXCEPT #2 BARS AND WIRE MESH.

ALL REINFORCING SHALL BE ASTM A-615 GRADE 60 EXCEPT AS FOLLOWS:

SPIRALS.....GRADE 60 OR COLD DRAWN A-82
#2 AND #3 BARS.....GRADE 40
WIRE MESH.....A-185
WELDED ANCHORS.....GRADE 40 CHEMICAL ANALYSIS LIMITED PER AWS SPECIFICATIONS FOR WELD WITHOUT PREHEAT.
WELDED ANCHORS #5 AND LARGER.....ASTM A-706

CLEAR CONCRETE COVER TO REINFORCING ARE AS FOLLOWS:

CAST-IN-PLACE CONCRETE (NONPRESTRESSED):
CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH.....3"

EXPOSED TO EARTH OR WEATHER:
#6 THROUGH #18.....2"
#5 AND SMALLER.....1 1/2"

NOT EXPOSED TO WEATHER OR IN CONTACT WITH GROUND:
SLABS, WALLS: #11 AND SMALLER.....1 1/2"

LAP SPLICES IN CONCRETE SHALL BE CLASS B TENSION LAPS 70 BAR Ø MIN.

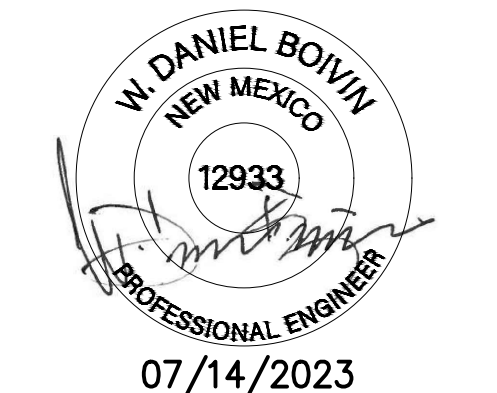
WHERE BARS ARE SHOWN SPLICED, THEY MAY RUN CONTINUOUS AT CONTRACTORS OPTION.

PROVIDE SHOP DRAWING AND FABRICATE AFTER THE CONTRACTORS REVIEW. ALL SPLICE LOCATIONS ARE SUBJECT TO APPROVAL, PLACE REBAR PER CRSI STANDARDS.

REBAR SPACING GIVEN IS MAXIMUM ON CENTER AND ALL REBAR IS CONTINUOUS UNLESS OTHERWISE NOTED. PROVIDE BENT CORNER REBAR TO MATCH AND LAP WITH HORIZONTAL REBAR AT CORNERS AND INTERSECTIONS OF WALLS. DOWEL ALL VERTICAL WALL REBAR TO FOUNDATIONS. SECURELY TIE ALL REBAR, INCLUDING DOWELS, IN LOCATION BEFORE PLACING CONCRETE OR GROUT.



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FINAL

PROJECT:
**KAYENTA WWTP
CFID
POND SYSTEM
FINAL DESIGN**



**NAVAJO TRIBAL UTILITY
AUTHORITY**
PO BOX 170
FT. DEFIANCE, AZ 86504
WSP PROJECT No:
2151700011

REVISIONS			
NO.	DATE	BY	APPROVED
1	1/22/2024	A. ORRANTIA	S. TANDUKAR
2	2/13/2024	A. ORRANTIA	S. TANDUKAR

DESIGNED BY:	WSP - BM
DRAWN BY:	WSP - AO
CHECKED BY:	WSP - BM
APPROVED BY:	WSP - BM
DATE:	07/14/2023

SHEET TITLE:
**GENERAL NOTES
& LEGEND**

SHEET NUMBER:	REV. #
G-002	
SHEET 2 OF 55 SHEETS	



SITE NOTES:

- ① CELL 1: ACTIVE WASTE WATER TREATMENT POND
- ② CELL 2: ACTIVE WASTE WATER TREATMENT POND
- ③ CELL 3: ACTIVE WASTE WATER TREATMENT POND
- ④ CELL 4: CELL TO BE CLEANED AND LINED WITH HDPE. THE GEOMETRY OF CELL 4 IS: L= 553', W=282', D=11', VOL.= 10.7 Mgal
- ⑤ CELL 5: OFFLINE TO BE USED FOR FILL MATERIAL, SEE SHEET C-200
- ⑥ CELL 6: ACTIVE WASTE WATER TREATMENT POND
- ⑦ 18" OUTFALL PIPE
- ⑧ PLANT DISCHARGE CHANNEL
- ⑨ TRANSFORMER AND EMERGENCY POWER GENERATOR
- ⑩ TAILWORKS
- ⑪ HEADWORKS

DEMOLITION NOTES:

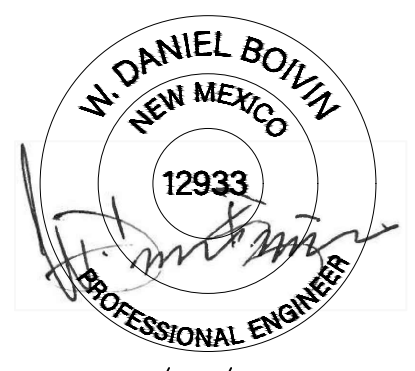
- ⑫ ITEMS TO BE DEMOLISHED AND REMOVED FROM SITE. CAP EXISTING PIPING 4' TO 6' BELOW GRADE TO ACTIVE CELLS 1, 3, AND 6.
- ⑬ LINER IN CELL 5 TO BE REMOVED AND DISPOSED OF BY CONTRACTOR IN A LOCATION APPROVED BY THE OWNER.

SHEET GENERAL NOTES:

- 1. UTILITIES ILLUSTRATED ON PLAN ARE PRESENTED FOR CONTRACTOR INFORMATION, IF APPLICABLE. SUBSURFACE UTILITY LOCATES HAVE NOT BEEN FIELD VERIFIED, ACTUAL UTILITIES ARE SUBJECT TO CHANGE AND UNMARKED. UNKNOWN UTILITIES SHOULD BE MITIGATED IN THE FIELD PRIOR TO GROUND DISTURBANCES. COORDINATE WITH NAVAJO TRIBAL UTILITY AUTHORITY (NTUA) IN KAYENTA, AZ, AND ARIZONA ONE-CALL UTILITY LOCATE.



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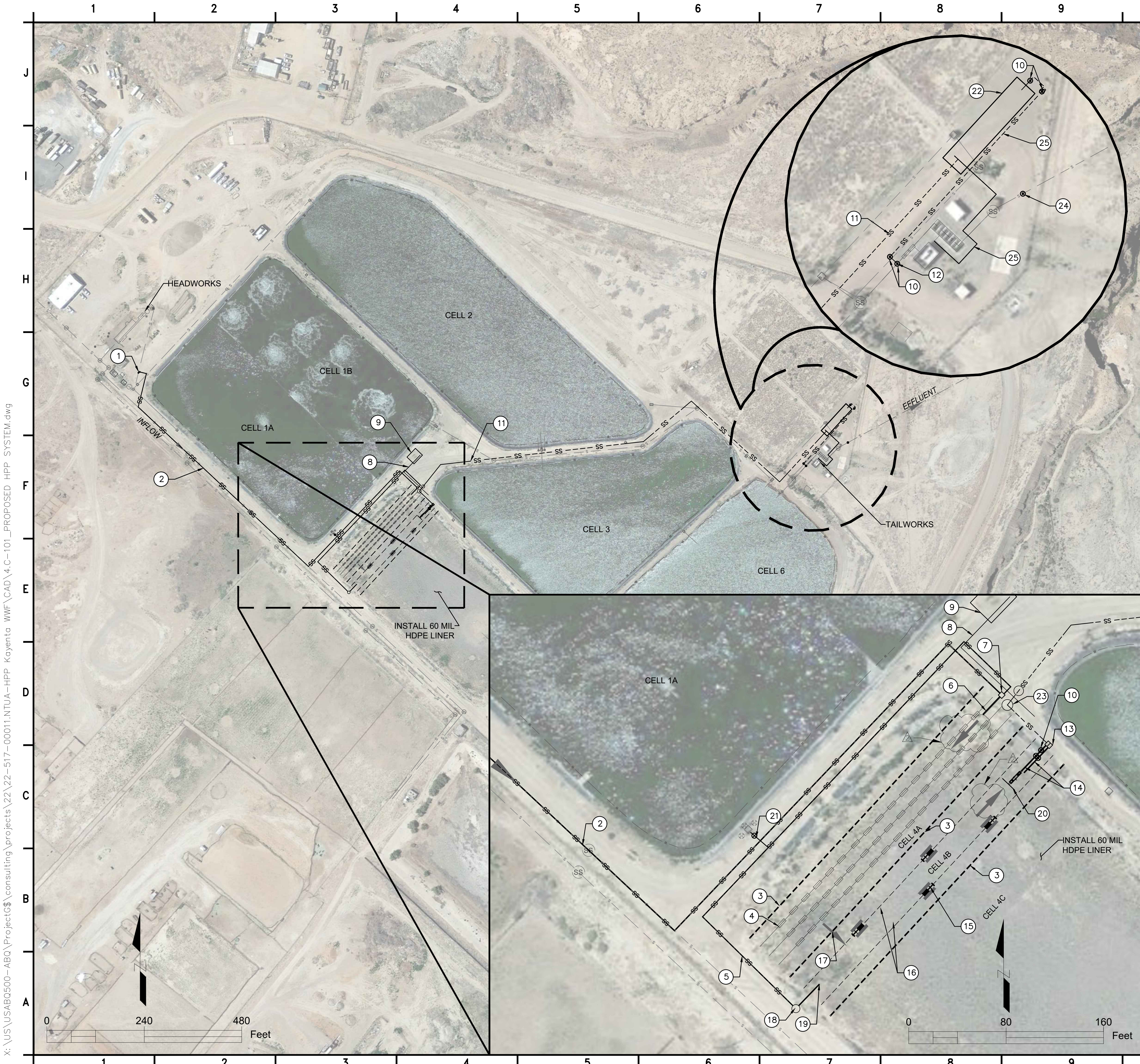
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SHEET TITLE:
**EXISTING SITE
CONDITIONS &
DEMOLITION
PLAN**

SHEET NUMBER:	REV. #
C-100	
SHEET 3 OF 55 SHEETS	

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CONSTRUCTION NOTES:

- 1 CONNECT TO EXISTING 10" PVC FORCE MAIN
- 2 NEW 8" HDPE FORCE MAIN AND FLOW PATH
- 3 BAFFLES 3 EA. (FLOATING SYNTHETIC), SEE SHEET C-313
- 4 BIOLAC AERATION SYSTEM, SEE SHEET C-400
- 5 6" SCH 40 PVC MLSS PIPING
- 6 12" DI SANITARY SEWER INLET
- 7 DIVERSION STRUCTURE, SEE SHEET C-308
- 8 10" DI AIR PIPING
- 9 AERATION BLOWERS WITH CONCRETE PAD, SEE SHEET C-401
- 10 NEW MANHOLE
- 11 12" DUCTILE IRON PIPE FORCE MAIN, 2x CERAMIC EPOXY LINING
- 12 CONNECT TO EXISTING SEWER LINE, SEE SHEET C-311
- 13 OUTLET STRUCTURE. SEE DISCHARGE STRUCTURE DETAILS SHEET C-301
- 14 12" DIP SANITARY SEWER WITH MJ GATE VALVE (RMJ x RMJ)
- 15 INSTALL 4 -15 HP AIRE-O2 ASPIRATING AERATOR BY AERATION INDUSTRIES INTERNATIONAL, LLC. INCLUDES AERATOR, ELECTRICAL CABLES, MOORING CABLES, ETC.
- 16 AERATOR MOORING CABLES, SEE SHEET C-310
- 17 4' x 3' WINDOW IN SYNTHETIC BAFFLE, SEE SHEET C-313
- 18 MLSS PUMP STATION. SEE SHEET C-304
- 19 8" DIP WITH MJ GATE VALVE (RMJ x RMJ)
- 20 FLOATING DECANTER, SEE SHEET C-312
- 21 3" PVC MLSS LINE, SEE SHEET C-309
- 22 NEW DISINFECTION EXTENDED CONTACT CHAMBER, SEE SHEET C-309
- 23 NEW EFFLUENT LIFT STATION, SHEET C-306
- 24 NEW METERING MANHOLE, SEE SHEET C-311
- 25 NEW 15" SDR 35 PVC SEWER LINE, MINIMUM 0.4% SLOPE
- 25 NEW 1" HDPE CHLORINE INJECTION LINE, SEE SHEET C-309

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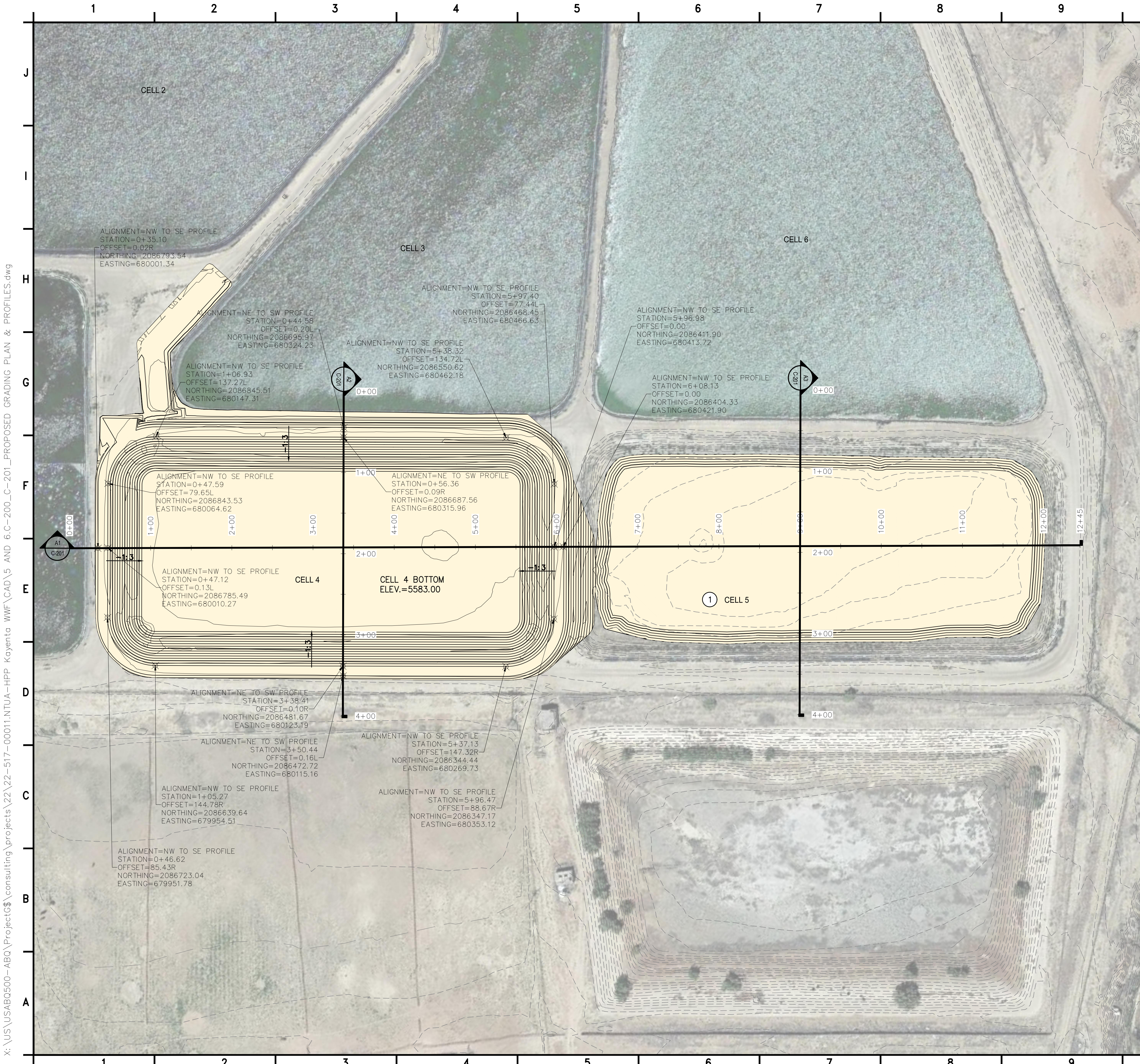
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**CFID
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C-101	
SHEET 4 OF 55 SHEETS	

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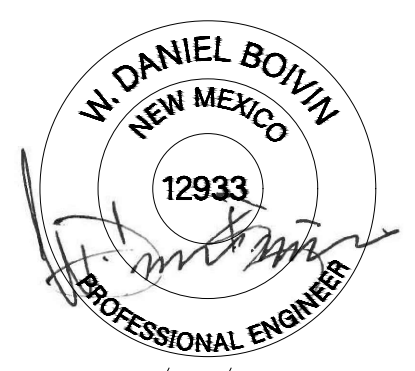


GRADING NOTES:

- ① FILL MATERIAL TO COME FROM THIS CELL



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FINAL

SHEET GENERAL NOTES:

- UTILITIES ILLUSTRATED ON PLAN ARE PRESENTED FOR CONTRACTOR INFORMATION, IF APPLICABLE. SUBSURFACE UTILITY LOCATES HAVE NOT BEEN FIELD VERIFIED, ACTUAL UTILITIES ARE SUBJECT TO CHANGE AND UNMARKED, UNKNOWN UTILITIES SHOULD BE MITIGATED IN THE FIELD PRIOR TO GROUND DISTURBANCES. COORDINATE WITH NAVAJO TRIBAL UTILITY AUTHORITY (NTUA) IN KAYENTA, AZ, AND ARIZONA ONE-CALL UTILITY LOCATE.

LEGEND

- EXISTING GROUND TOPOGRAPHIC CONTOUR
- PROPOSED GRADING TOPOGRAPHIC CONTOUR

PROJECT:
**KAYENTA WWTP
CFID
POND SYSTEM
FINAL DESIGN**



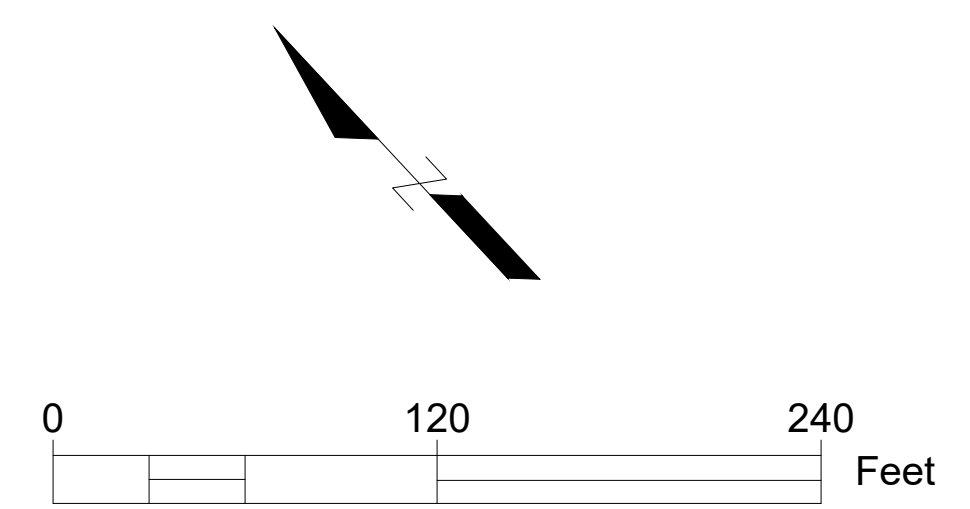
**NAVAJO TRIBAL UTILITY
AUTHORITY**
PO BOX 170
FT. DEFIANCE, AZ 86504
WSP PROJECT No:
2151700011

REVISIONS			
NO.	DATE	BY	APPROVED

DESIGNED BY:	WSP - BM
DRAWN BY:	WSP - AO
CHECKED BY:	WSP - BM
APPROVED BY:	WSP - BM
DATE:	07/14/2023

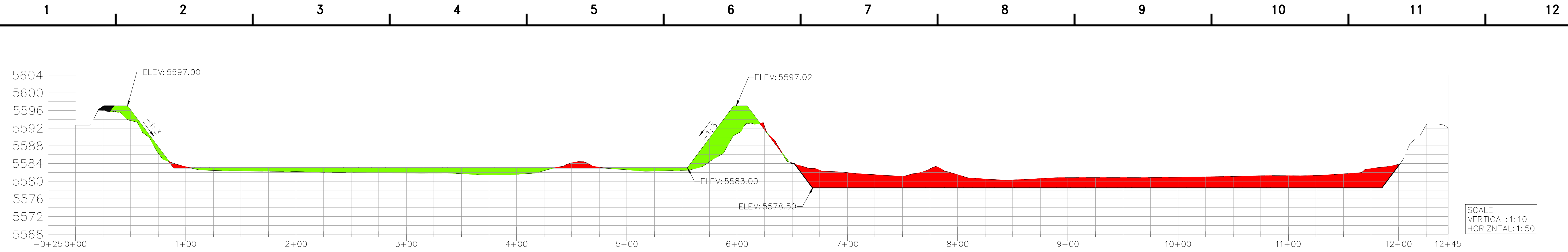
SHEET TITLE:
GRADING SITE PLAN

SHEET NUMBER:	REV. #
C-200	
SHEET 5 OF 55 SHEETS	

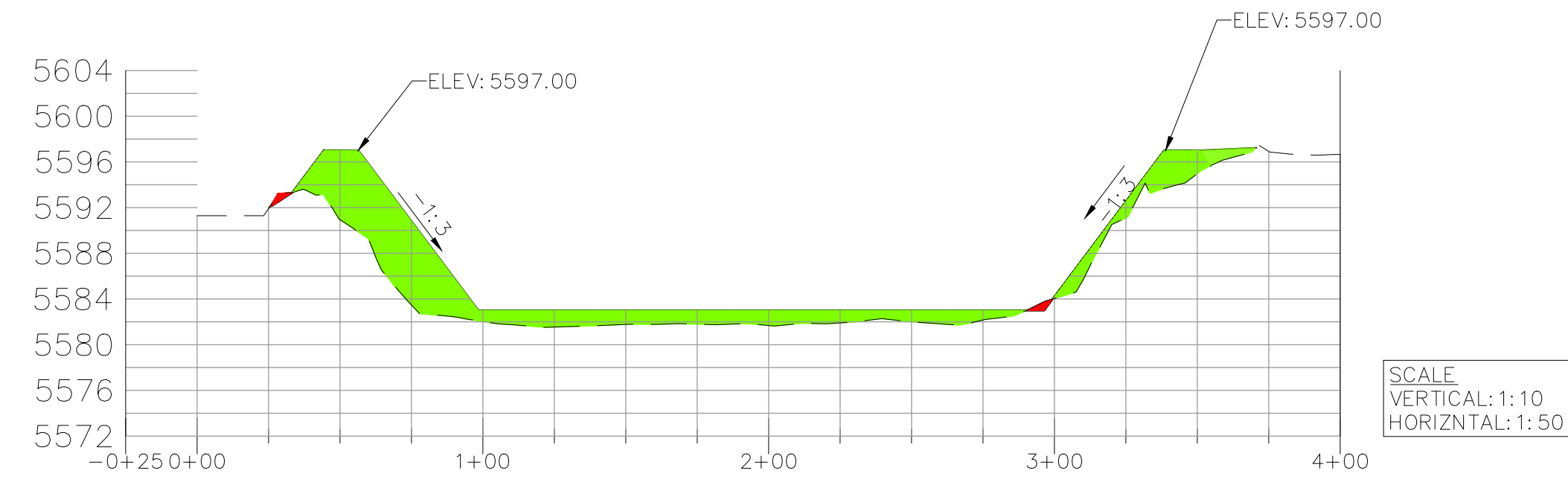


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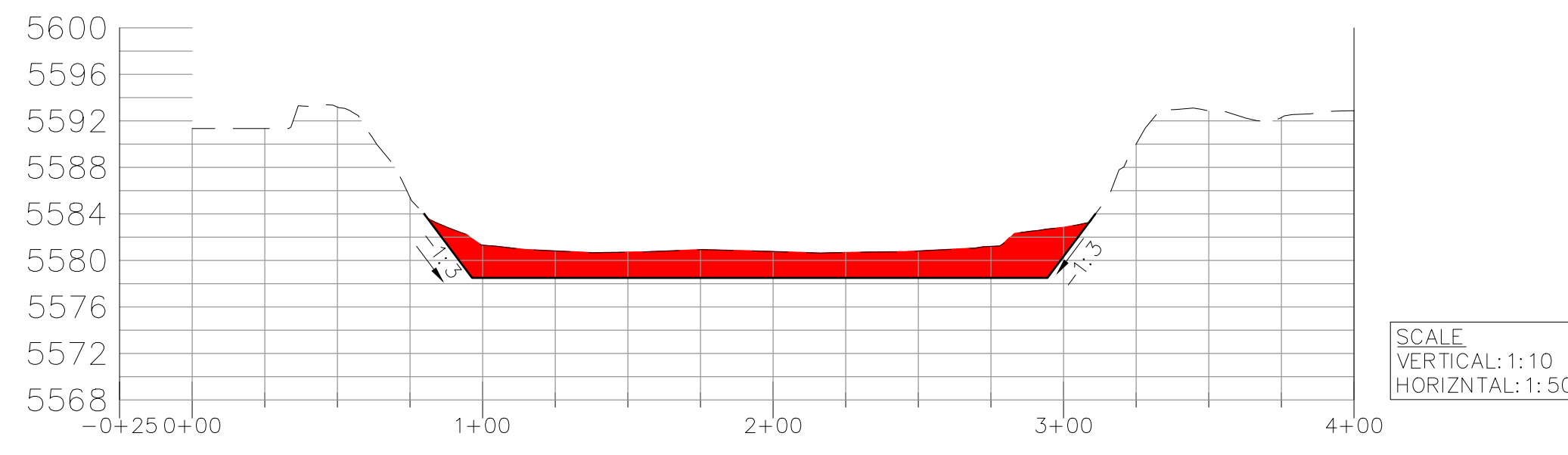
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A1
C-200
NW to SE PROFILE



A2
C-200
NE to SW PROFILE



A3
C-200
NE to SW PROFILE 2

LEGEND

- EXISTING GROUND TOPOGRAPHIC CONTOUR
- PROPOSED GRADING TOPOGRAPHIC CONTOUR
- PROPOSED FILL
- PROPOSED CUT

NOTES:

1. FOR POND LINER INFORMATION SEE HDPE LINER DETAILS, SHEET C-402.

CUT/FILL REPORT

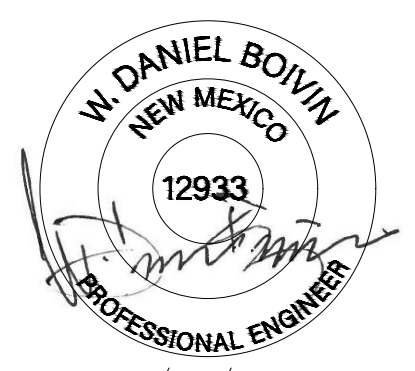
Volume Summary							
Name	Type	Cut Factor	Fill Factor	2d Area (Sq. Ft.)	Cut (Cu. Yd.)	Fill (Cu. Yd.)	Net (Cu. Yd.)
Cell 5 Grading	full	1.000	1.000	122975.99	12639.07	0.69	12638.38<Cut>
Cell 4 Grading	full	1.000	1.000	200783.35	602.67	13305.06	12702.39<Fill>

Totals				
	2d Area (Sq. Ft.)	Cut (Cu. Yd.)	Fill (Cu. Yd.)	Net (Cu. Yd.)
Total	323759.34	13241.74	13305.74	64.01<Fill>

* Value adjusted by cut or fill factor other than 1.0



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PROJECT:
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POND SYSTEM
FINAL DESIGN



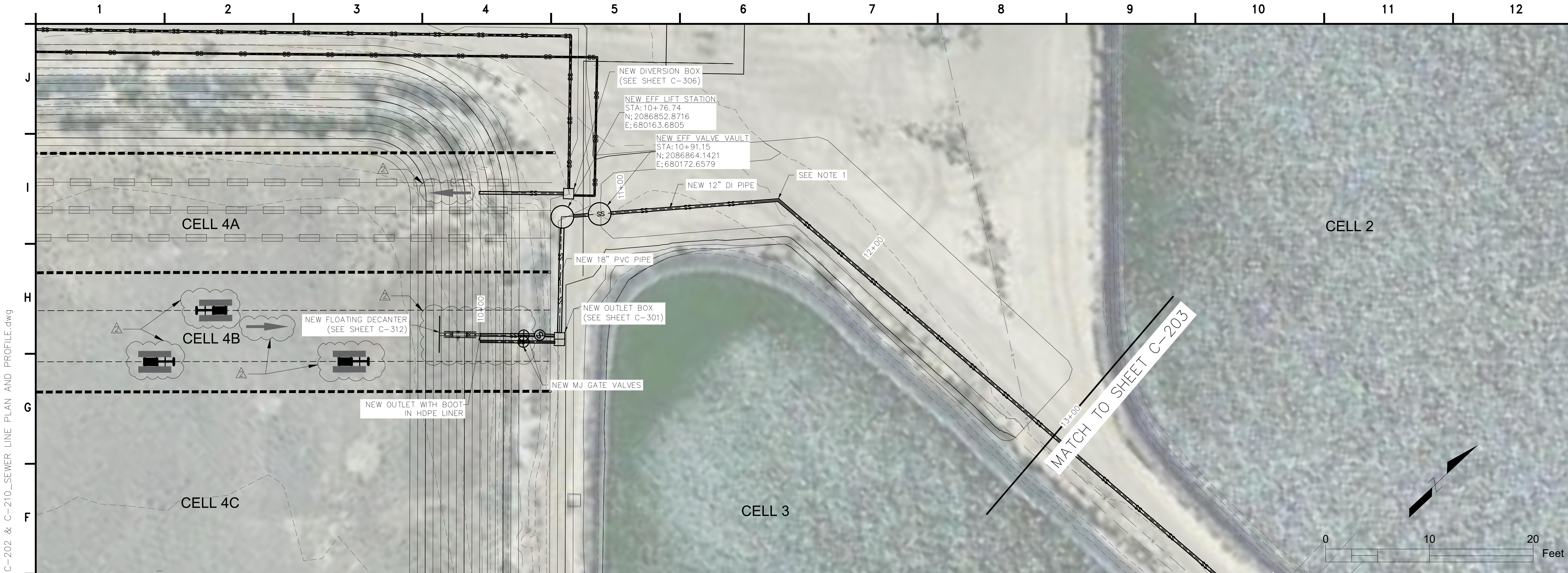
NAVAJO TRIBAL UTILITY
AUTHORITY
PO BOX 170
FT. DEFIANCE, AZ 86504
WSP PROJECT No:
2151700011

REVISIONS			
NO.	DATE	BY	APPROVED

DESIGNED BY:	WSP - BM
DRAWN BY:	WSP - AO
CHECKED BY:	WSP - BM
APPROVED BY:	WSP - BM
DATE:	07/14/2023

SHEET TITLE:
GRADING PROFILES

SHEET NUMBER:	REV. #
C-201	
SHEET 6 OF 55 SHEETS	



wsp

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W. DANIEL BOVIN
NEW MEXICO
12933
PROFESSIONAL ENGINEER
07/14/2023

FINAL

PROJECT:
**KAYENTA WWTP
CFID
POND SYSTEM
FINAL DESIGN**

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AUTHORITY
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FT. DEFIANCE, AZ 86504
WSP PROJECT No:
2151700011

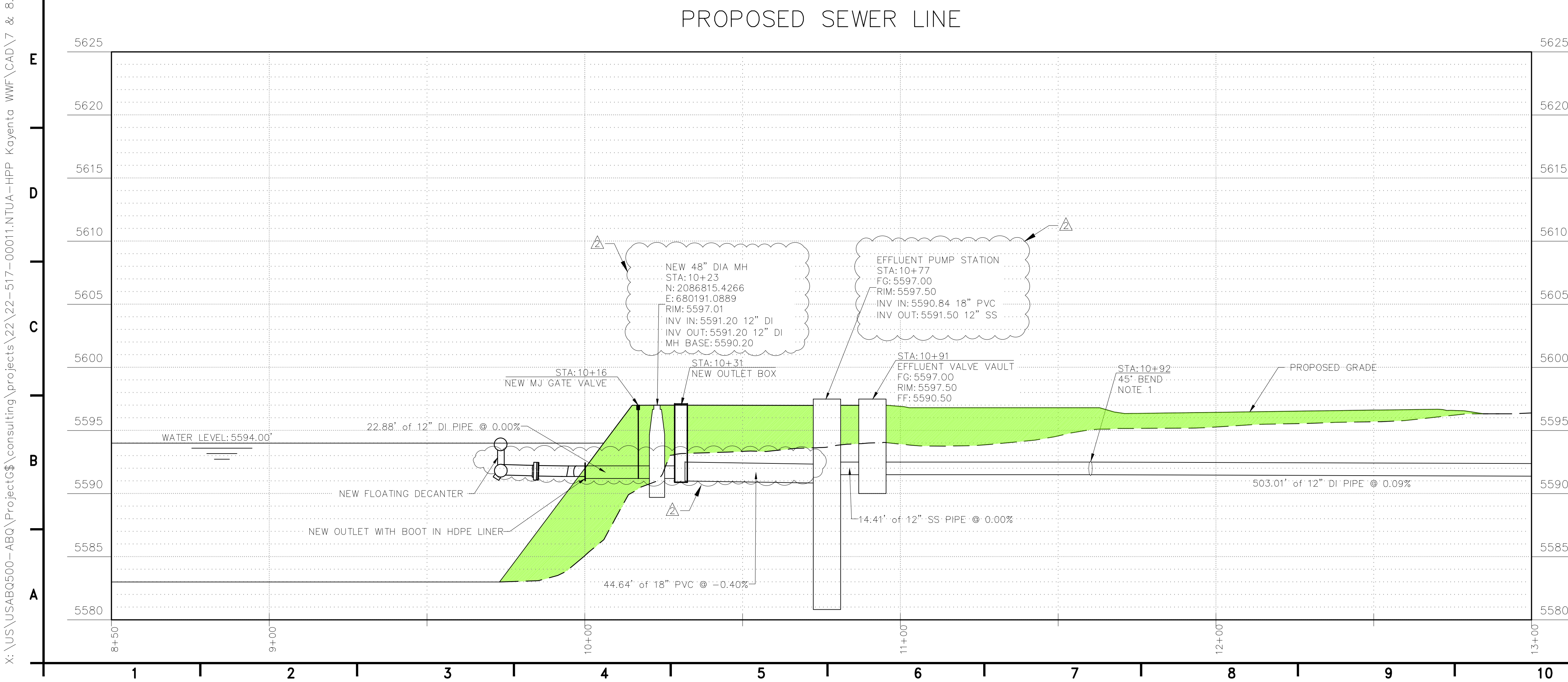
REVISIONS

NO.	DATE	BY	APPROVED
1	1/22/2024	A. ORRANTIA	S. TANDUKAR
2	2/13/2024	A. ORRANTIA	S. TANDUKAR

DESIGNED BY: WSP - BM
DRAWN BY: WSP - AO
CHECKED BY: WSP - BM
APPROVED BY: WSP - BM
DATE: 07/14/2023

SHEET TITLE:
**SEWER LINE
PLAN AND PROFILE**

SHEET NUMBER: **C-202** REV. #
SHEET 7 OF 55 SHEETS



LEGEND

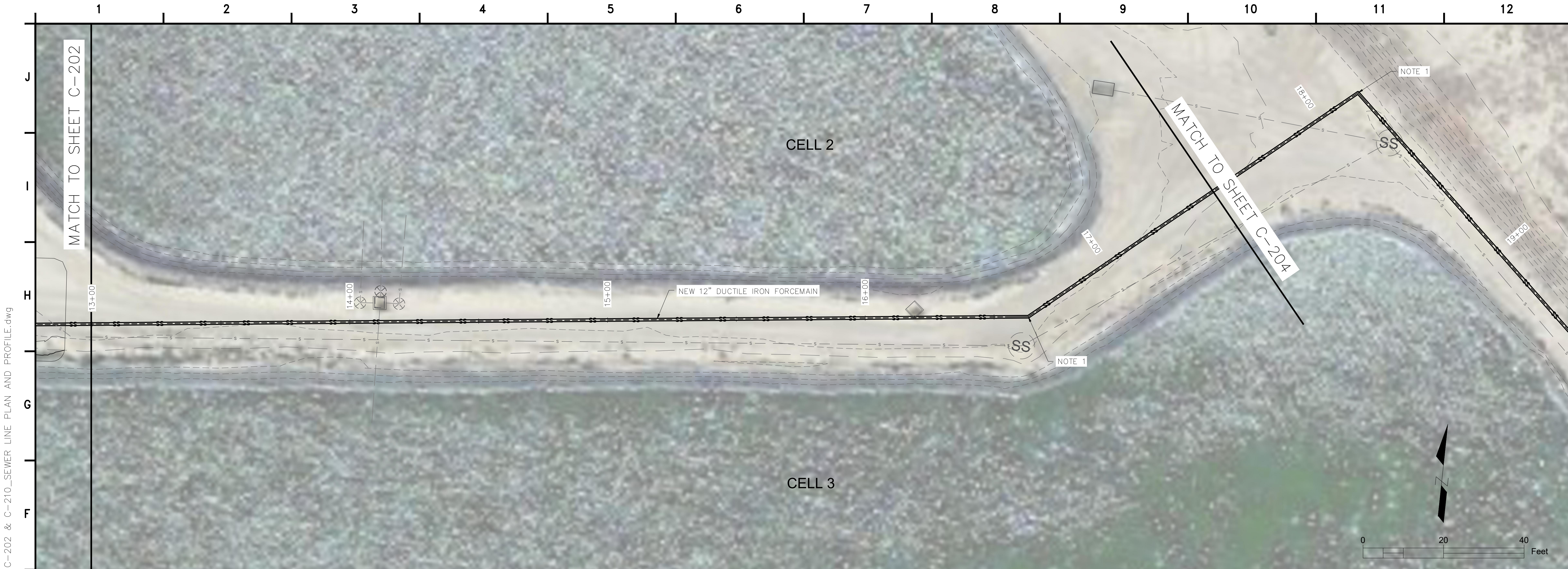
- EXISTING GROUND TOPOGRAPHIC CONTOUR
- PROPOSED GRADING TOPOGRAPHIC CONTOUR
- PROPOSED FILL
- PROPOSED CUT

SHEET GENERAL NOTES:

- CONTRACTOR SHALL PROVIDE JOINT RESTRAINER PER REQUIRED LENGTH OF PIPE, TYP.

VERTICAL SCALE: 1:5
HORIZONTAL SCALE: 1:20

X:\US\ABQ0500-ABQ\Project6\consulting\projects\22-517-00011\NTUA-HPP Kayenta WWF\CAD\7 & 8. C-202 & C-210_SEWER LINE PLAN AND PROFILE.dwg





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07/14/2023
FINAL

PROJECT:
**KAYENTA WWTP
CFID
POND SYSTEM
FINAL DESIGN**



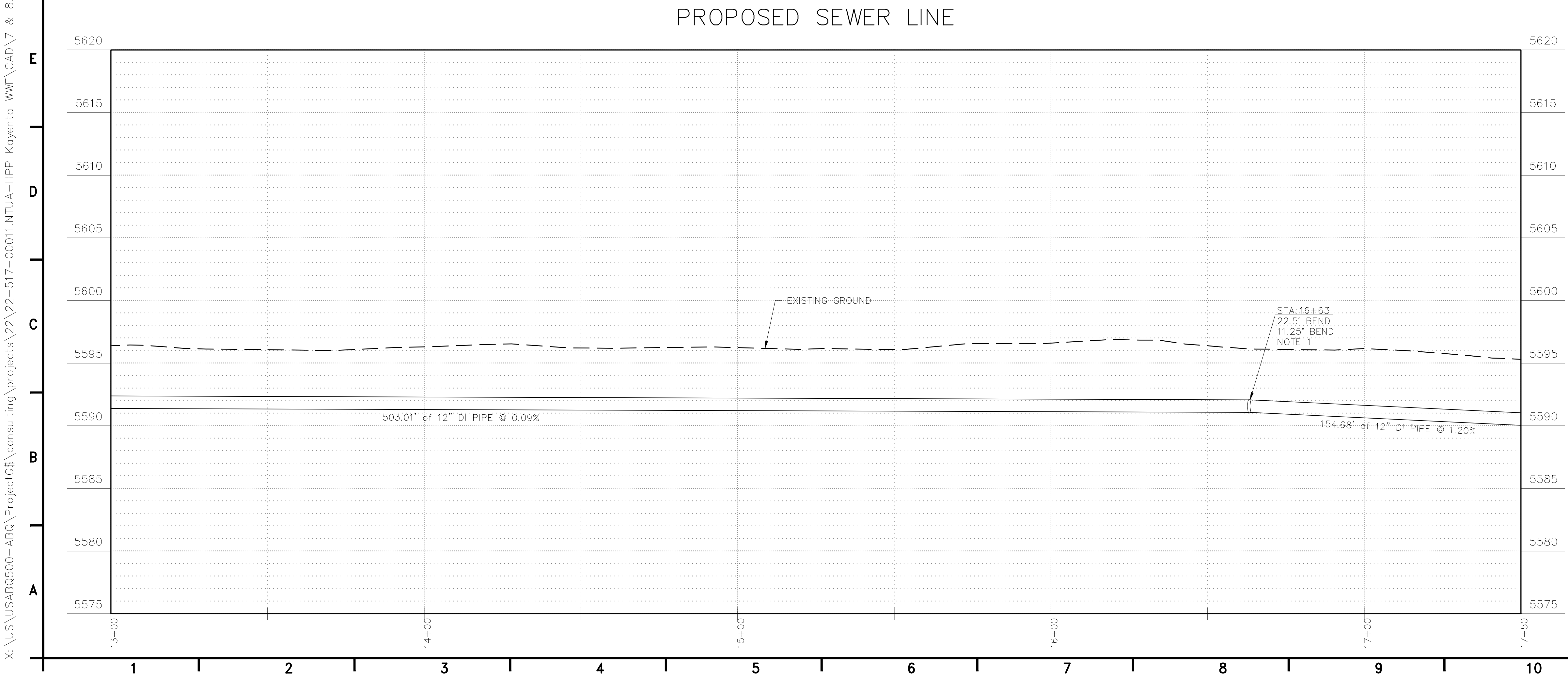
**NAVAJO TRIBAL UTILITY
AUTHORITY**
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FT. DEFIANCE, AZ 86504
WSP PROJECT No:
2151700011

REVISIONS			
NO.	DATE	BY	APPROVED

DESIGNED BY:	WSP - BM
DRAWN BY:	WSP - AO
CHECKED BY:	WSP - BM
APPROVED BY:	WSP - BM
DATE:	07/14/2023

SHEET TITLE:
**SEWER LINE
PLAN AND PROFILE**

SHEET NUMBER:	REV. #
C-203	
SHEET 8 OF 55 SHEETS	



LEGEND

- EXISTING GROUND TOPOGRAPHIC CONTOUR
- PROPOSED GRADING TOPOGRAPHIC CONTOUR
- PROPOSED FILL
- PROPOSED CUT

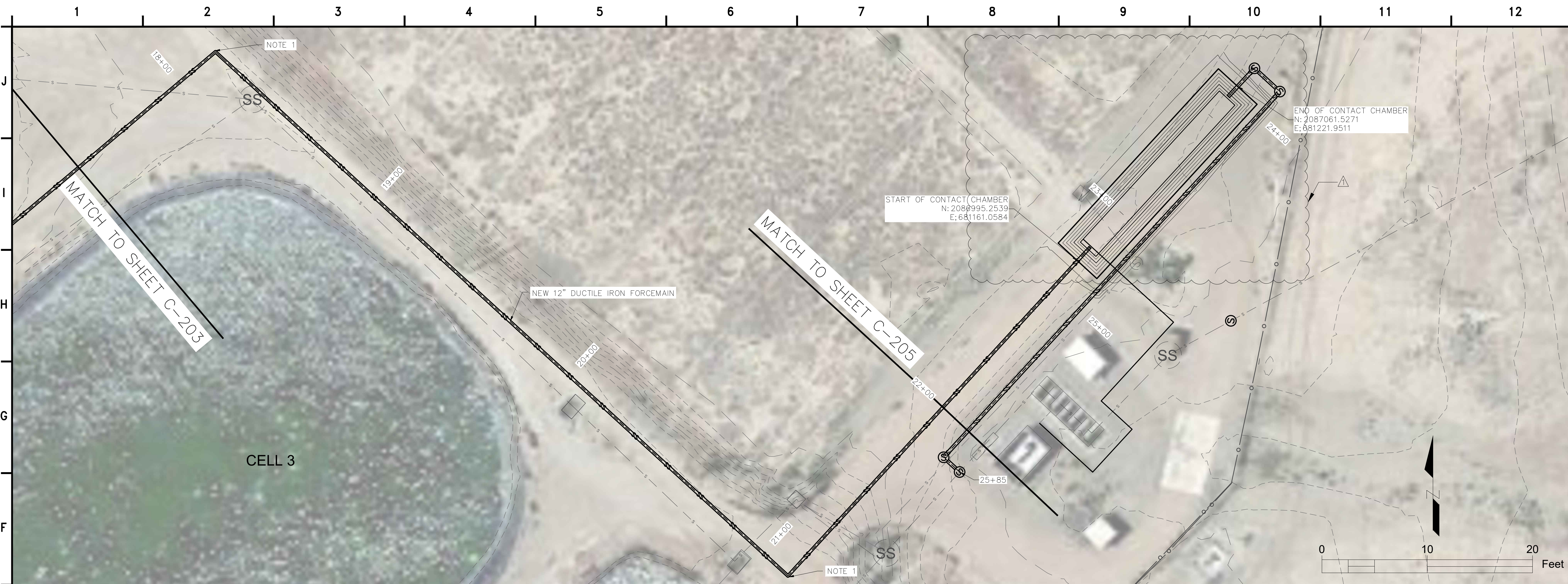
SHEET GENERAL NOTES:

- CONTRACTOR SHALL PROVIDE JOINT RESTRAINER PER REQUIRED LENGTH OF PIPE, TYP.

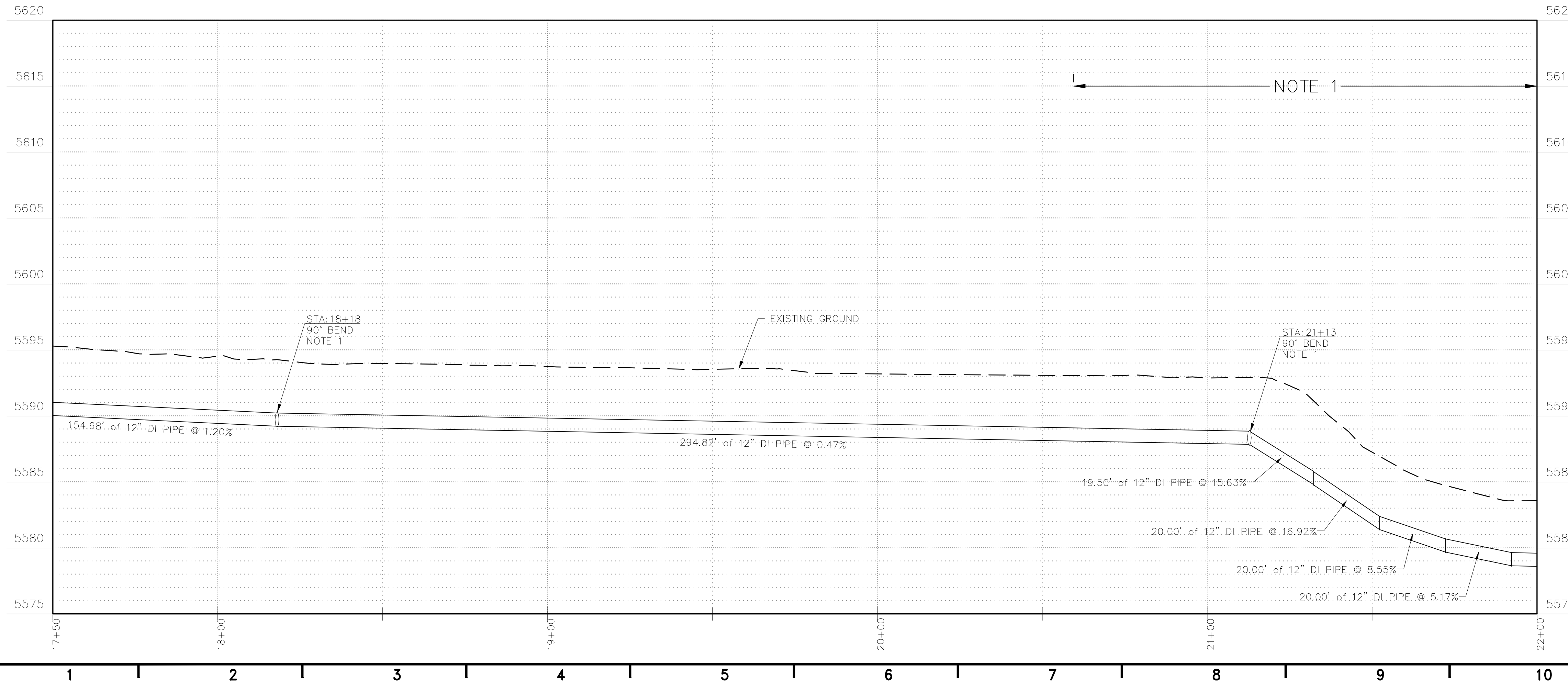
VERTICAL SCALE: 1:5
HORIZONTAL SCALE: 1:20

X:\USAB0500-ABQ\Project6\consulting\projects\22-517-00011.NTUA-HPP Kayenta WWF\CAD\7 & 8. C-202 & C-210_SEWER LINE PLAN AND PROFILE.dwg

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PROPOSED SEWER LINE



LEGEND

- EXISTING GROUND TOPOGRAPHIC CONTOUR
- PROPOSED GRADING TOPOGRAPHIC CONTOUR
- PROPOSED FILL
- PROPOSED CUT

SHEET GENERAL NOTES:

- CONTRACTOR SHALL PROVIDE JOINT RESTRAINER PER REQUIRED LENGTH OF PIPE, TYP.

WSP

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PROJECT:
**KAYENTA WWTP
CFID
POND SYSTEM
FINAL DESIGN**

**NAVAJO TRIBAL UTILITY
AUTHORITY
PO BOX 170
FT. DEFIANCE, AZ 86504**

WSP PROJECT No:
2151700011

REVISIONS

NO.	DATE	BY	APPROVED
1	1/22/2024	A. ORRANTIA	S. TANDUKAR

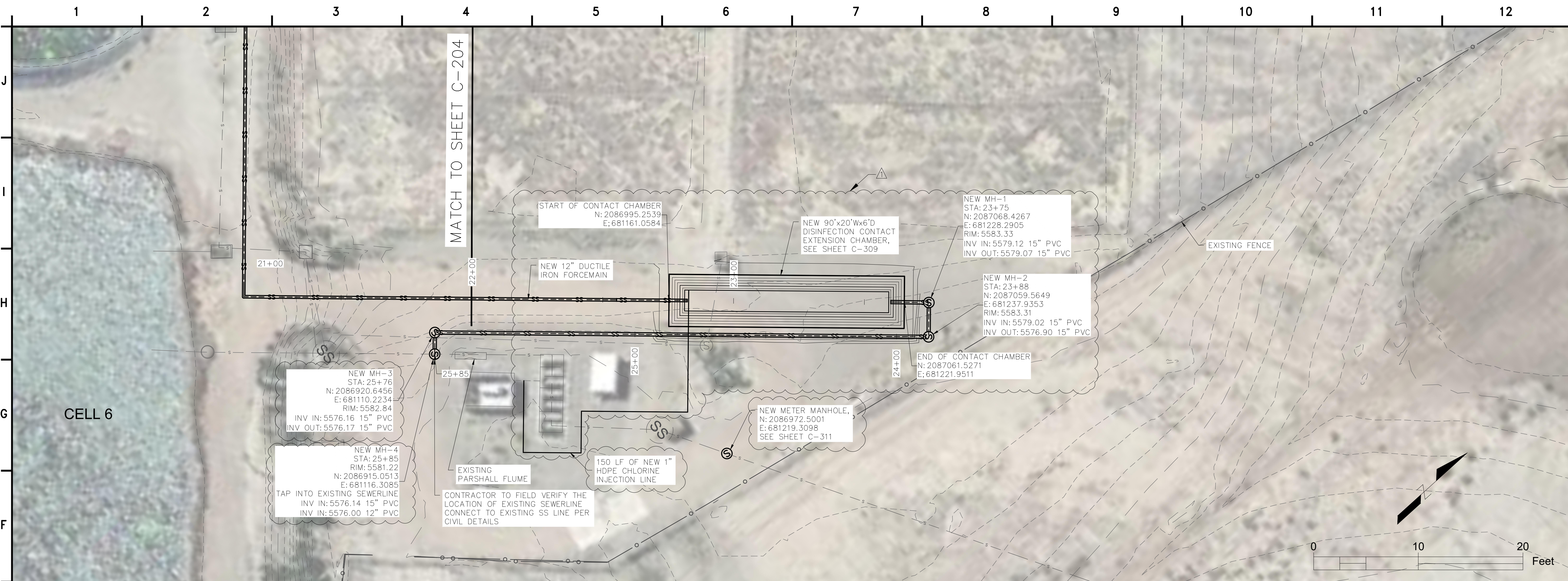
DESIGNED BY:	WSP - BM
DRAWN BY:	WSP - AO
CHECKED BY:	WSP - BM
APPROVED BY:	WSP - BM
DATE:	07/14/2023

SHEET TITLE:
**SEWER LINE
PLAN AND PROFILE**

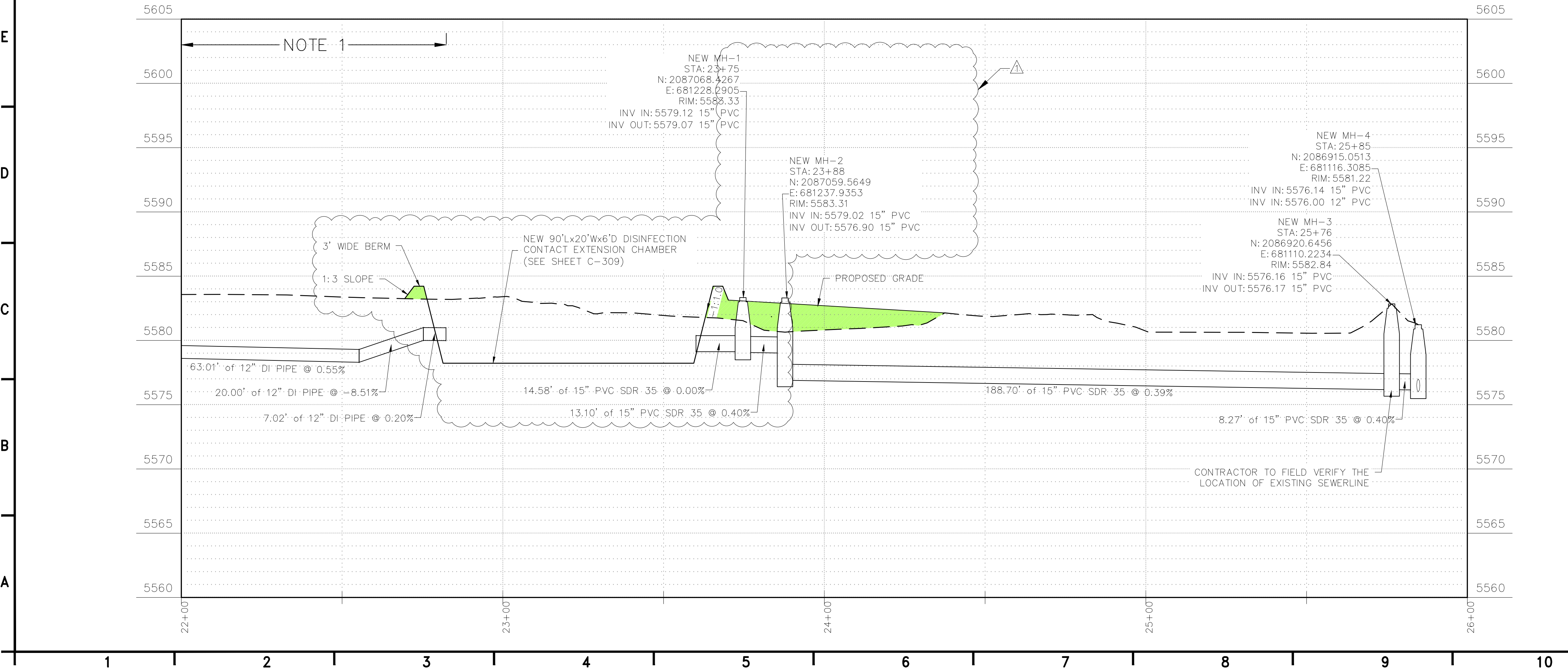
SHEET NUMBER:	REV. #
C-204	
SHEET 9 OF 55 SHEETS	

VERTICAL SCALE: 1:5
HORIZONTAL SCALE: 1:20

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PROPOSED SEWER LINE



LEGEND

- EXISTING GROUND TOPOGRAPHIC CONTOUR
- PROPOSED GRADING TOPOGRAPHIC CONTOUR
- PROPOSED FILL
- PROPOSED CUT

SHEET GENERAL NOTES:

- CONTRACTOR SHALL PROVIDE JOINT RESTRAINER PER REQUIRED LENGTH OF PIPE, TYP.

WSP

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12933
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07/14/2023

FINAL

PROJECT:
**KAYENTA WWTP
CFID
POND SYSTEM
FINAL DESIGN**

**NAVAJO TRIBAL UTILITY
AUTHORITY**
PO BOX 170
FT. DEFIANCE, AZ 86504

WSP PROJECT No:
2151700011

REVISIONS			
NO.	DATE	BY	APPROVED
1	1/22/2024	A. ORRANTIA	S. TANDUKAR

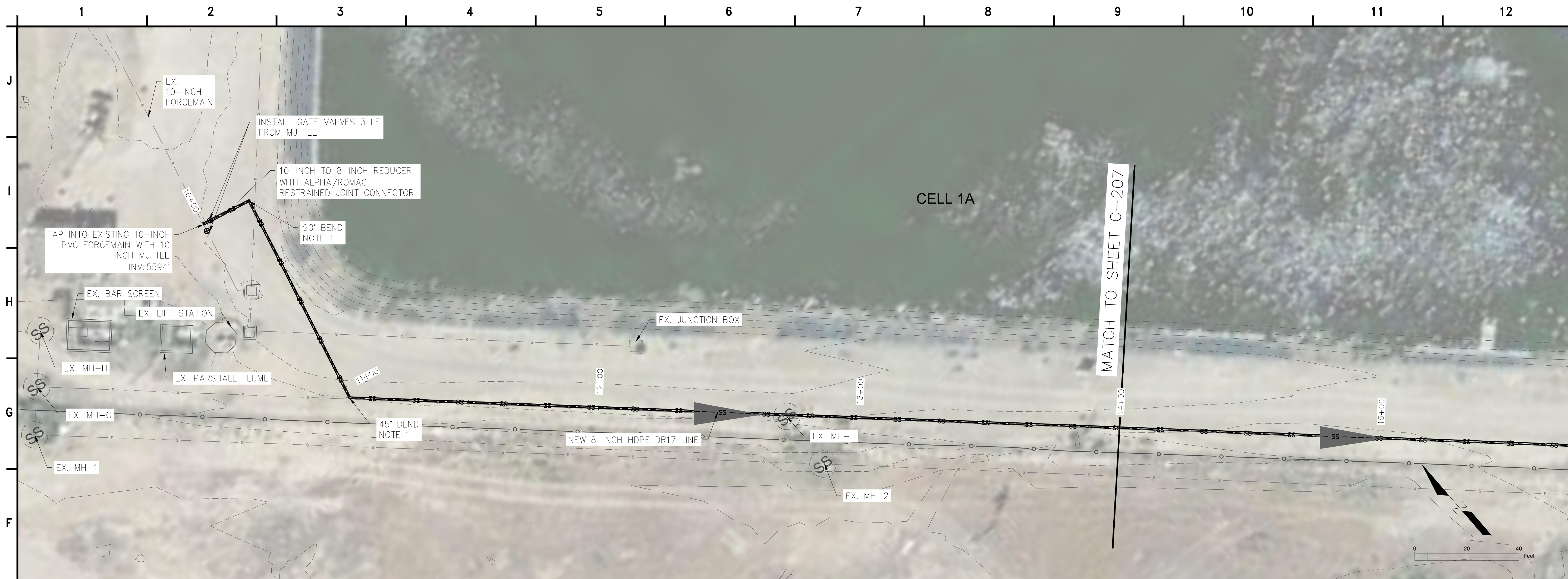
DESIGNED BY:	WSP - BM
DRAWN BY:	WSP - AO
CHECKED BY:	WSP - BM
APPROVED BY:	WSP - BM
DATE:	07/14/2023

SHEET TITLE:
**SEWER LINE
PLAN AND PROFILE**

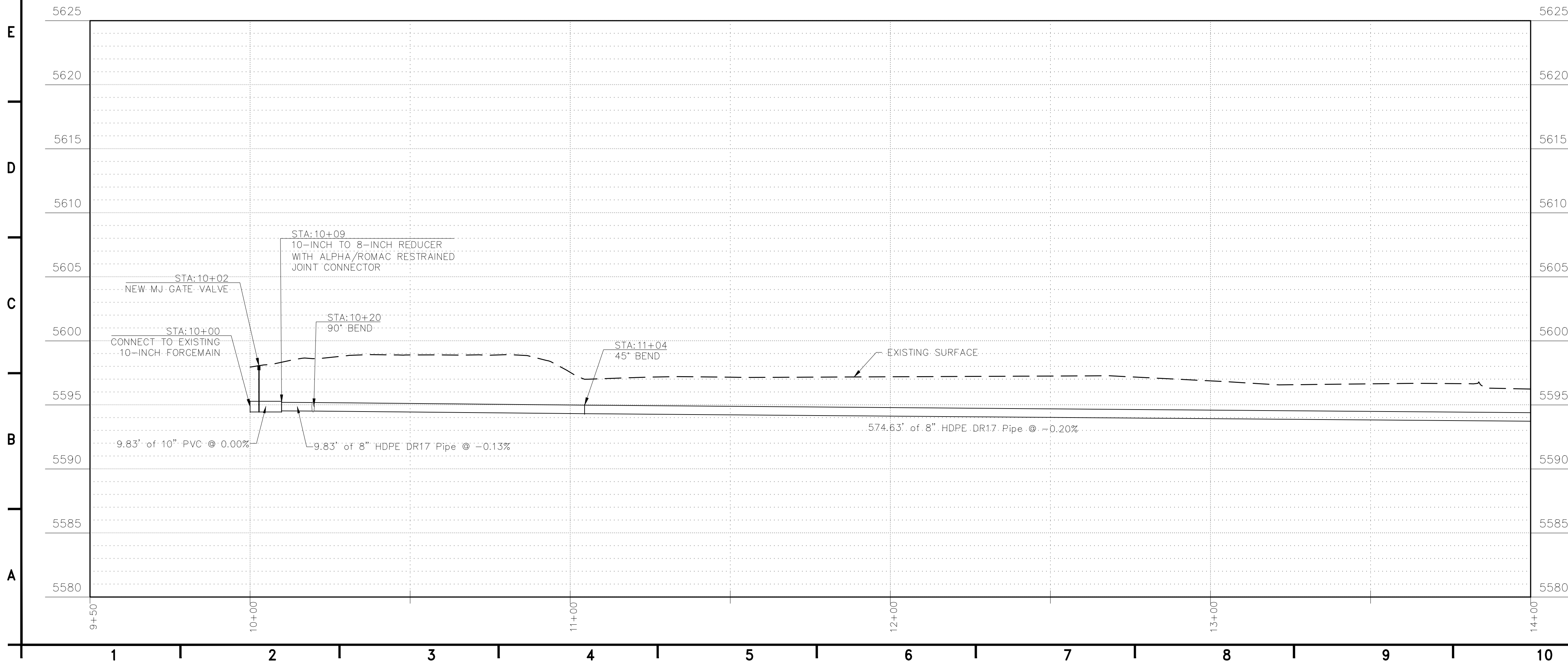
SHEET NUMBER:	REV. #
C-205	
SHEET 10 OF 55 SHEETS	

VERTICAL SCALE: 1:5
HORIZONTAL SCALE: 1:20

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NEW 8-INCH HDPE



LEGEND

- EXISTING GROUND TOPOGRAPHIC CONTOUR
- PROPOSED GRADING TOPOGRAPHIC CONTOUR
- PROPOSED FILL
- PROPOSED CUT

SHEET GENERAL NOTES:

1. CONTRACTOR SHALL PROVIDE JOINT RESTRAINER PER REQUIRED LENGTH OF PIPE, TYP.
2. CONTRACTOR TO REGRADE GROUND ALONG NEW SEWER LINE ALIGNMENT TO A MINIMUM OF 4' BURY DEPTH FROM TOP OF NEW PIPE

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12933
PROFESSIONAL ENGINEER
07/14/2023
FINAL

PROJECT:
**KAYENTA WWTP
CFID
POND SYSTEM
FINAL DESIGN**

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AUTHORITY**
PO BOX 170
FT. DEFIANCE, AZ 86504
WSP PROJECT No:
2151700011

REVISIONS			
NO.	DATE	BY	APPROVED

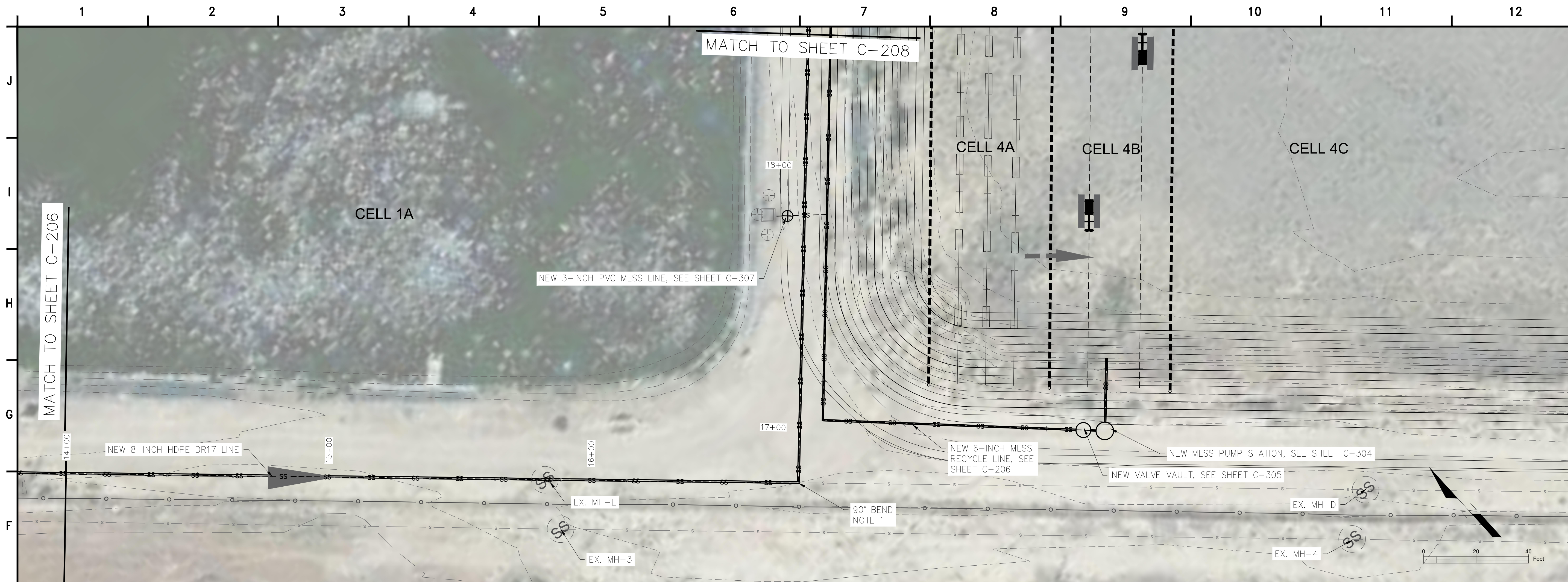
DESIGNED BY:	WSP - BM
DRAWN BY:	WSP - AO
CHECKED BY:	WSP - BM
APPROVED BY:	WSP - BM
DATE:	07/14/2023

SHEET TITLE:
**SEWER LINE
PLAN AND PROFILE**

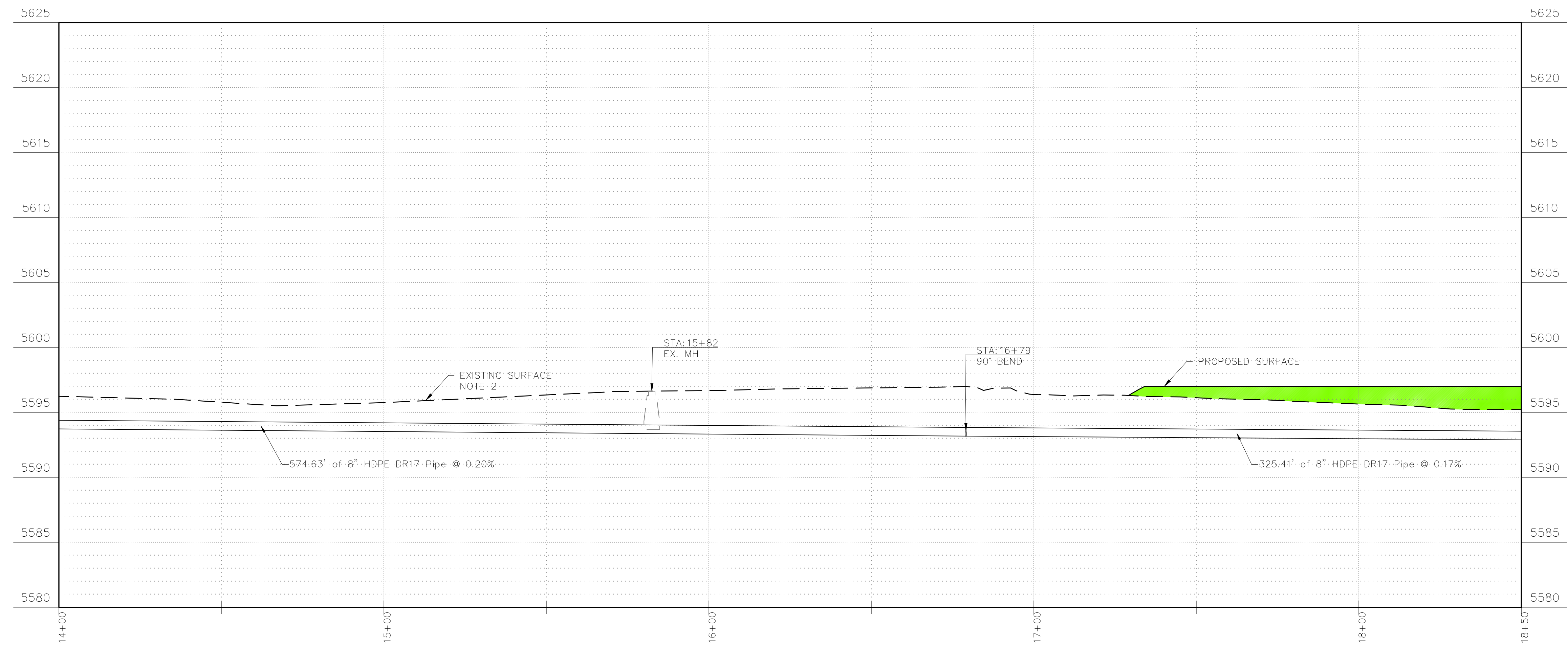
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C-206	
SHEET 11 OF 55 SHEETS	

VERTICAL SCALE: 1:5
HORIZONTAL SCALE: 1:20

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NEW 8-INCH HDPE



LEGEND

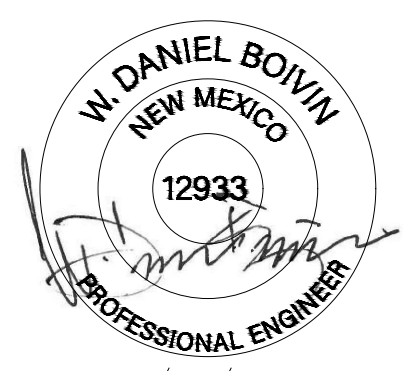
- EXISTING GROUND TOPOGRAPHIC CONTOUR
- PROPOSED GRADING TOPOGRAPHIC CONTOUR
- PROPOSED FILL
- PROPOSED CUT

SHEET GENERAL NOTES:

1. CONTRACTOR SHALL PROVIDE JOINT RESTRAINER PER REQUIRED LENGTH OF PIPE, TYP.
2. CONTRACTOR TO REGRADE GROUND ALONG NEW SEWER LINE ALIGNMENT TO A MINIMUM OF 4' BURY DEPTH FROM TOP OF NEW PIPE



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PROJECT:
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FINAL DESIGN**



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AUTHORITY**
PO BOX 170
FT. DEFIANCE, AZ 86504
WSP PROJECT No:
2151700011

REVISIONS			
NO.	DATE	BY	APPROVED

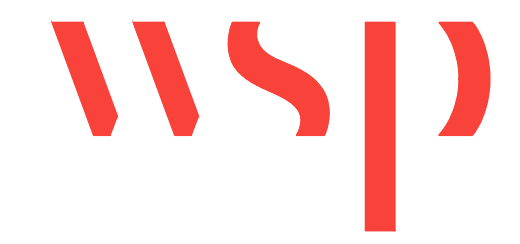
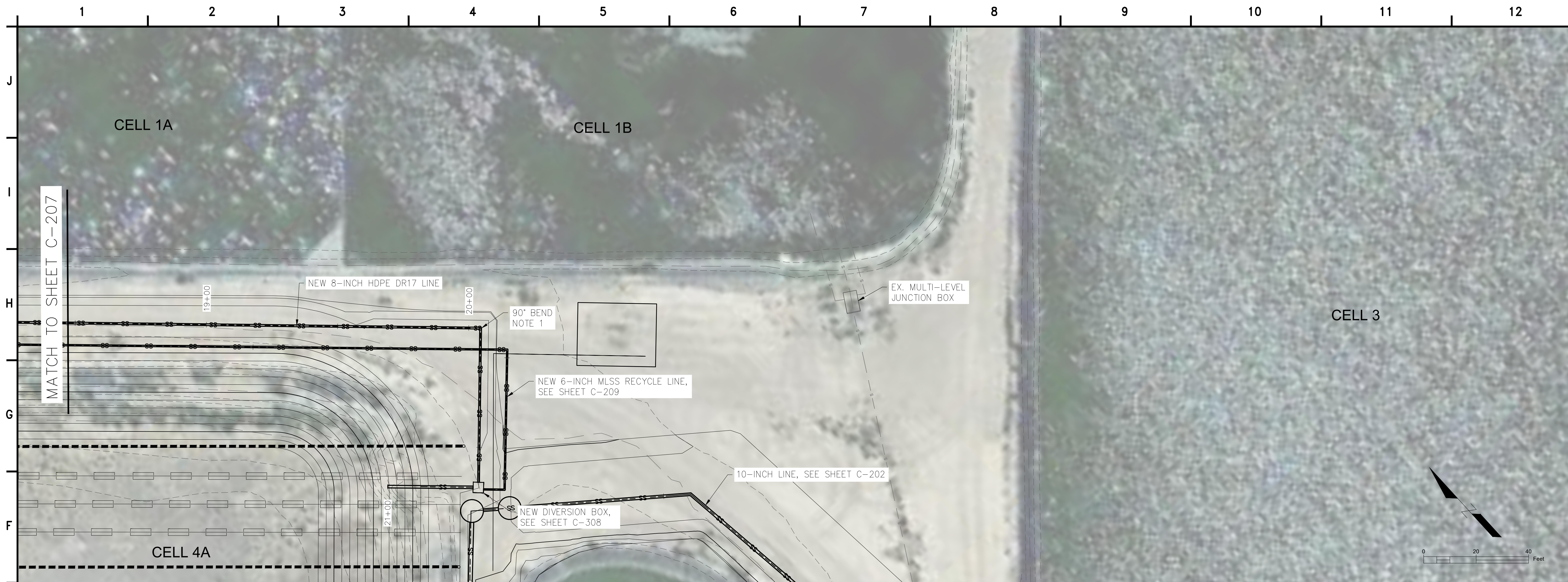
DESIGNED BY:	WSP - BM
DRAWN BY:	WSP - AO
CHECKED BY:	WSP - BM
APPROVED BY:	WSP - BM
DATE:	07/14/2023

SHEET TITLE:
**SEWER LINE
PLAN AND PROFILE**

SHEET NUMBER:	REV. #
C-207	
SHEET 12 OF 55 SHEETS	

VERTICAL SCALE: 1:5
HORIZONTAL SCALE: 1:20

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PROJECT:
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FINAL DESIGN**



**NAVAJO TRIBAL UTILITY
AUTHORITY**
PO BOX 170
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WSP PROJECT No:
2151700011

REVISIONS			
NO.	DATE	BY	APPROVED

DESIGNED BY:	WSP - BM
DRAWN BY:	WSP - AO
CHECKED BY:	WSP - BM
APPROVED BY:	WSP - BM
DATE:	07/14/2023

SHEET TITLE:
**SEWER LINE
PLAN AND PROFILE**

SHEET NUMBER:	REV. #
C-208	
SHEET 13 OF 55 SHEETS	

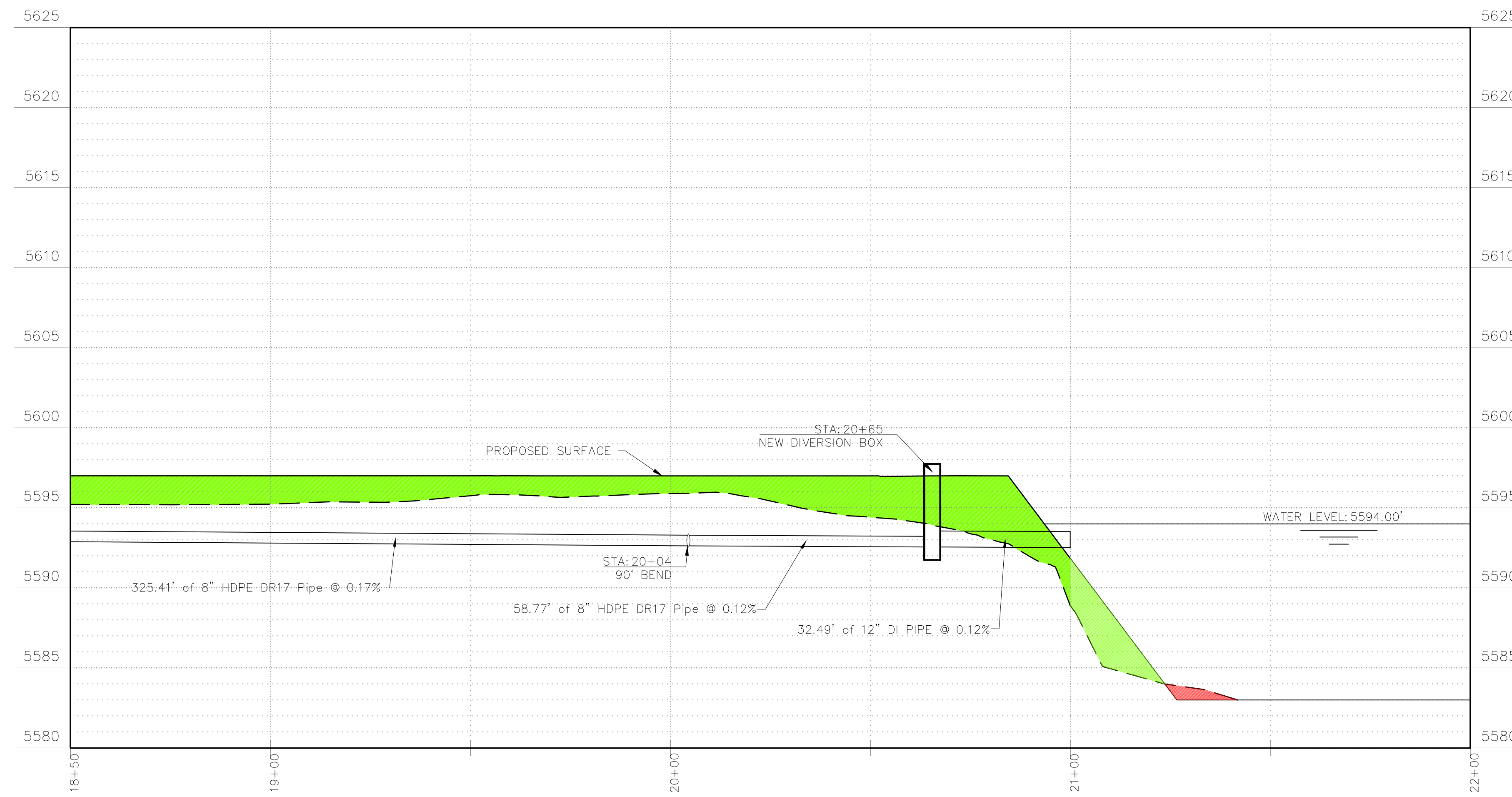
NEW 8-INCH HDPE

SHEET GENERAL NOTES:

- CONTRACTOR SHALL PROVIDE JOINT RESTRAINER PER REQUIRED LENGTH OF PIPE, TYP.

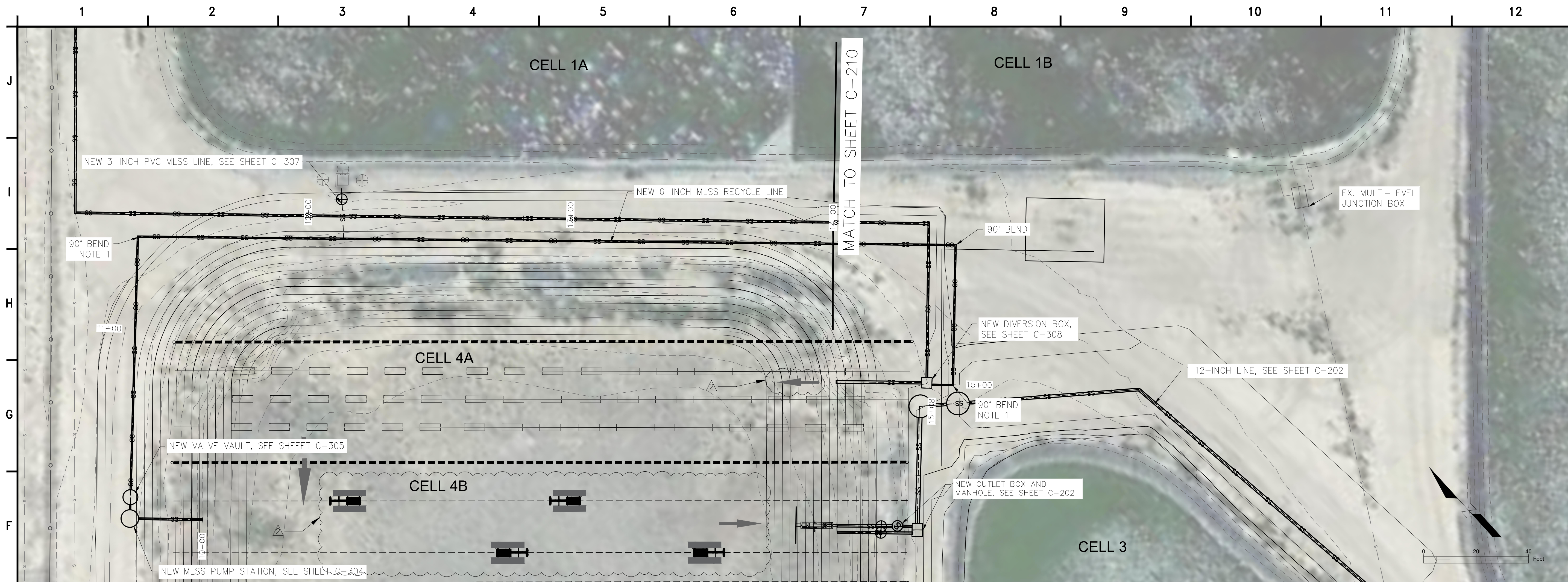
LEGEND

- EXISTING GROUND TOPOGRAPHIC CONTOUR
- PROPOSED GRADING TOPOGRAPHIC CONTOUR
- PROPOSED FILL
- PROPOSED CUT

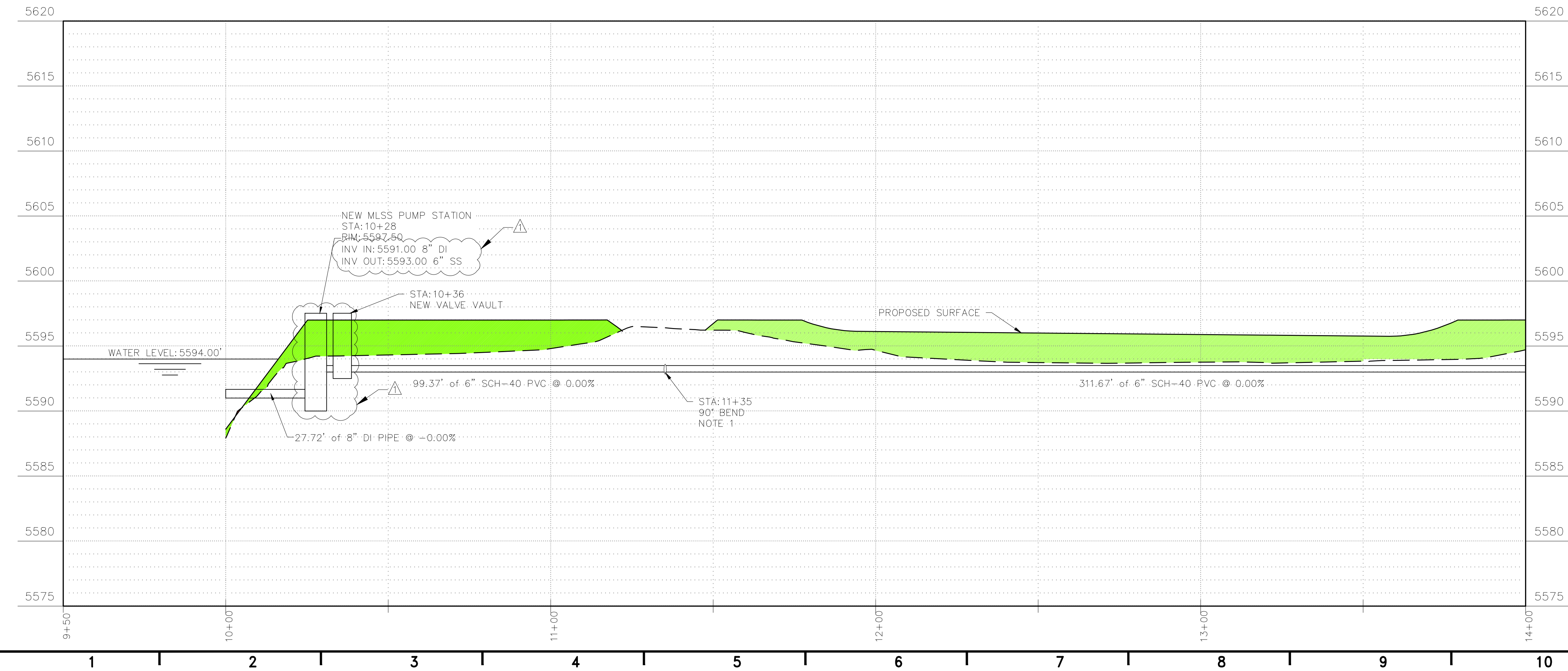


VERTICAL SCALE: 1:5
HORIZONTAL SCALE: 1:20

X:\US\AB0500-ABQ\Project6\consulting\projects\22-517-00011.NTUA-HPP Kayenta WWF\CAD\7 & 8. C-202 & C-210_SEWER LINE PLAN AND PROFILE.dwg



MLSS RECYCLE LINE



LEGEND

- EXISTING GROUND TOPOGRAPHIC CONTOUR
- PROPOSED GRADING TOPOGRAPHIC CONTOUR
- PROPOSED FILL
- PROPOSED CUT

SHEET GENERAL NOTES:

- CONTRACTOR SHALL PROVIDE JOINT RESTRAINER PER REQUIRED LENGTH OF PIPE, TYP.

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PROJECT:
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FINAL DESIGN**

**NAVAJO TRIBAL UTILITY
AUTHORITY
PO BOX 170
FT. DEFIANCE, AZ 86504**
WSP PROJECT No:
2151700011

REVISIONS			
NO.	DATE	BY	APPROVED
1	2/13/2024	A. ORRANTIA	S. TANDUKAR

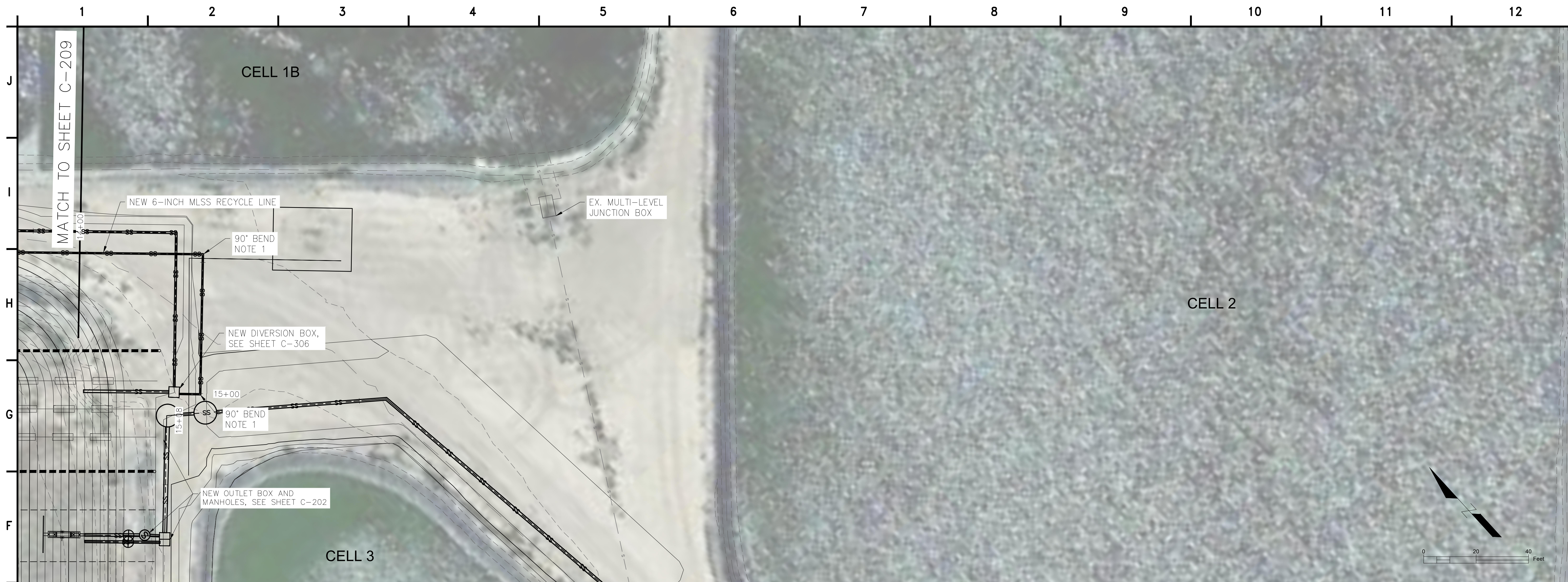
DESIGNED BY:	WSP - BM
DRAWN BY:	WSP - AO
CHECKED BY:	WSP - BM
APPROVED BY:	WSP - BM
DATE:	07/14/2023

SHEET TITLE:
**SEWER LINE
PLAN AND PROFILE**

SHEET NUMBER:	REV. #
C-209	
SHEET 14 OF 55 SHEETS	

VERTICAL SCALE: 1:5
HORIZONTAL SCALE: 1:20

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TEL: (505) 821-1801**



07/14/2023
FINAL

PROJECT:
**KAYENTA WWTP
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POND SYSTEM
FINAL DESIGN**



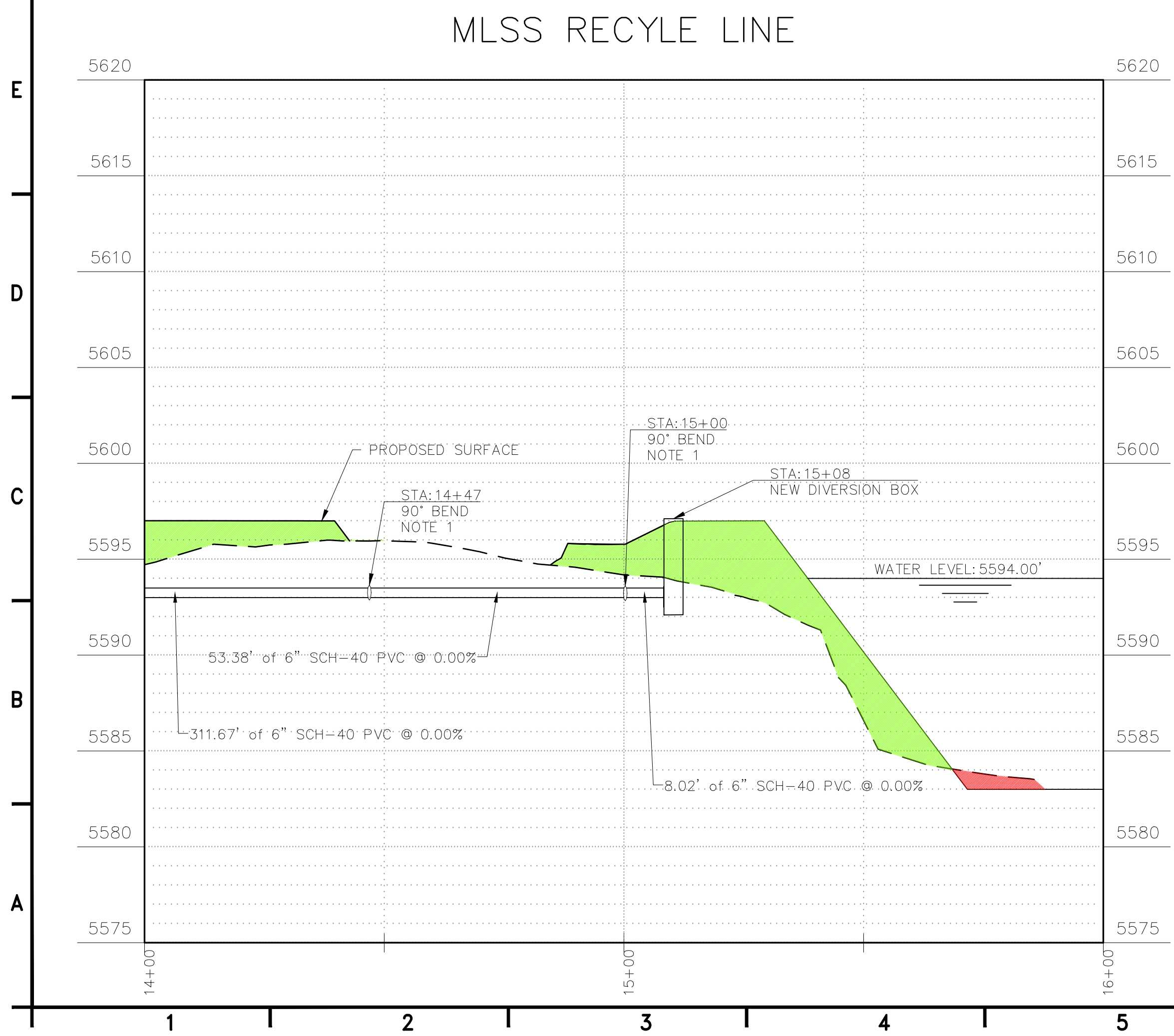
**NAVAJO TRIBAL UTILITY
AUTHORITY**
PO BOX 170
FT. DEFIANC, AZ 86504
WSP PROJECT No:
2151700011

REVISIONS			
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DESIGNED BY:	WSP - BM
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APPROVED BY:	WSP - BM
DATE:	07/14/2023

SHEET TITLE:
**SEWER LINE
PLAN AND PROFILE**


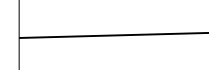


SHEET NUMBER:	REV. #
C-210	
SHEET 15 OF 55 SHEETS	



SHEET GENERAL NOTES:

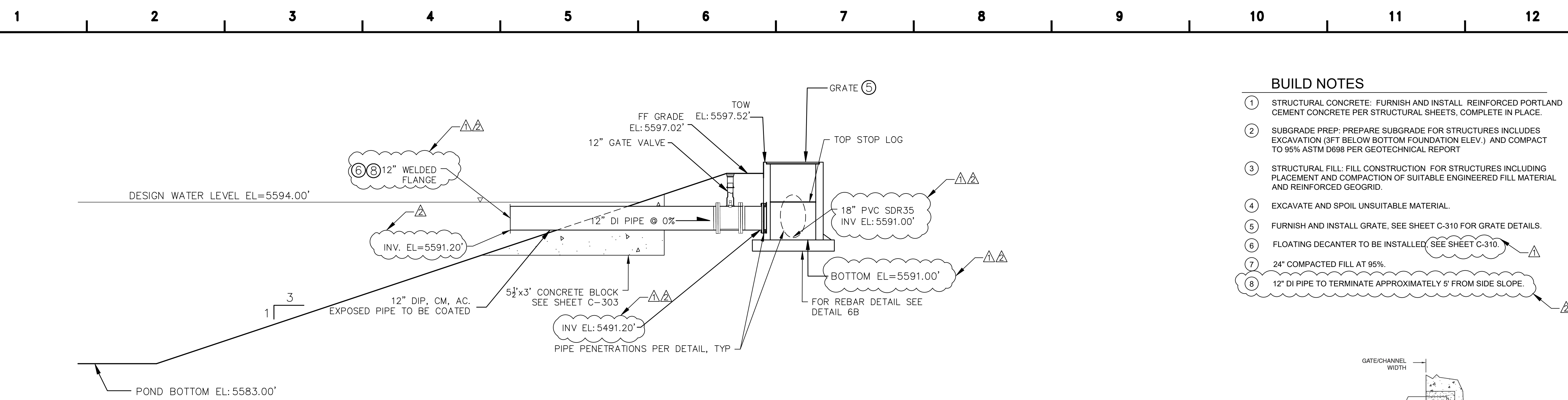
- CONTRACTOR SHALL PROVIDE JOINT RESTRAINER PER REQUIRED LENGTH OF PIPE, TYP.

LEGEND

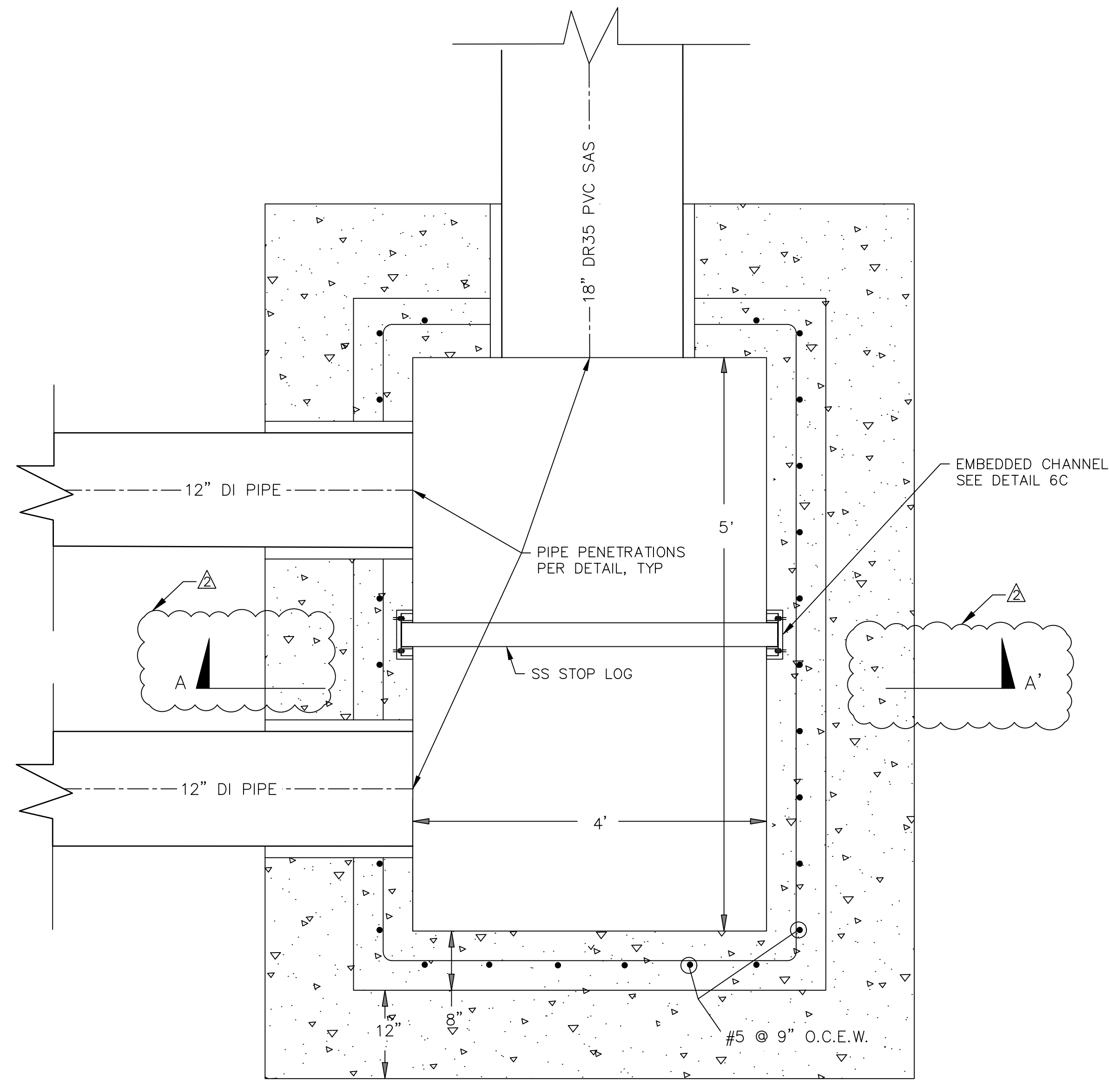
-  EXISTING GROUND TOPOGRAPHIC CONTOUR
-  PROPOSED GRADING TOPOGRAPHIC CONTOUR
-  PROPOSED FILL
-  PROPOSED CUT

VERTICAL SCALE: 1:5
HORIZONTAL SCALE: 1:20

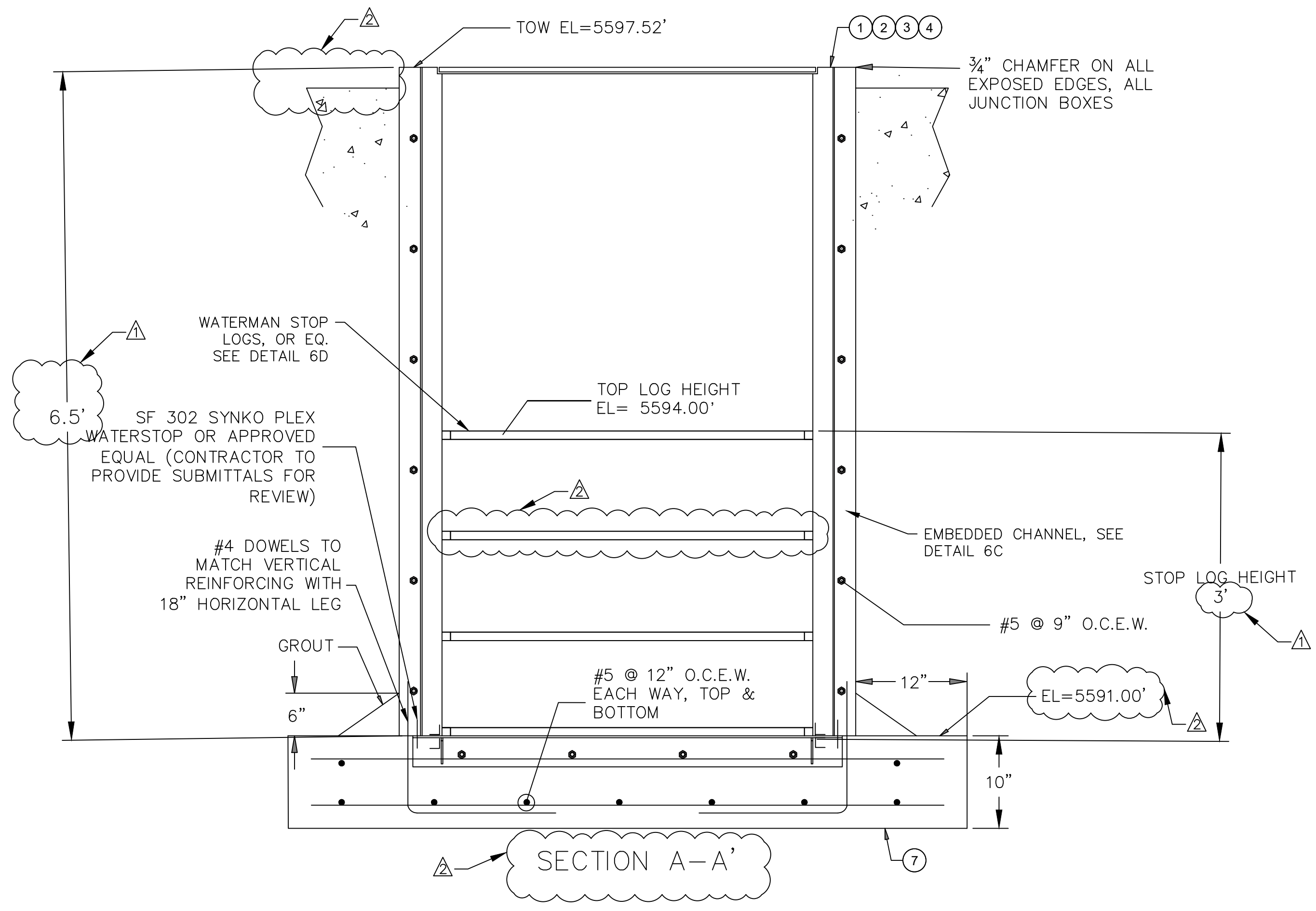
X:\US\AB0500-ABQ\Project\consulting\projects\22-517-0001\NTUA-HPP Kayenta WWF\CAD\C-301_DISCHARGE STRUCTURE PLAN, PROFILE, AND DETAILS.dwg



6 DISCHARGE STRUCTURE PROFILE
NOT TO SCALE



6A DISCHARGE STRUCTURE STRUCTURAL DETAILS (PLAN)
NOT TO SCALE

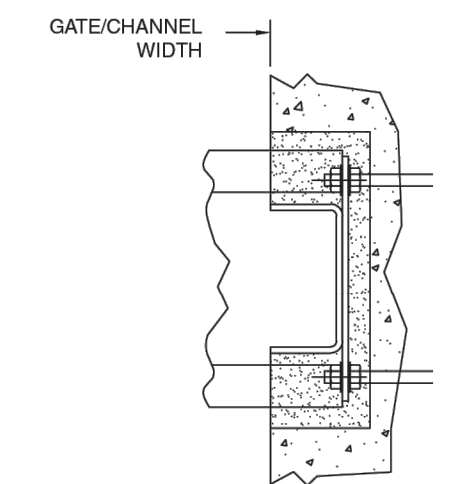


6B DISCHARGE STRUCTURE STRUCTURAL DETAILS (PROFILE)
NOT TO SCALE

- BUILD NOTES**
- 1 STRUCTURAL CONCRETE: FURNISH AND INSTALL REINFORCED PORTLAND CEMENT CONCRETE PER STRUCTURAL SHEETS, COMPLETE IN PLACE.
 - 2 SUBGRADE PREP: PREPARE SUBGRADE FOR STRUCTURES INCLUDES EXCAVATION (3FT BELOW BOTTOM FOUNDATION ELEV.) AND COMPACT TO 95% ASTM D698 PER GEOTECHNICAL REPORT
 - 3 STRUCTURAL FILL: FILL CONSTRUCTION FOR STRUCTURES INCLUDING PLACEMENT AND COMPACTION OF SUITABLE ENGINEERED FILL MATERIAL AND REINFORCED GEOGRID.
 - 4 EXCAVATE AND SPOIL UNSUITABLE MATERIAL.
 - 5 FURNISH AND INSTALL GRATE, SEE SHEET C-310 FOR GRATE DETAILS.
 - 6 FLOATING DECANTER TO BE INSTALLED, SEE SHEET C-310.
 - 7 24" COMPACTED FILL AT 95%.
 - 8 12" DI PIPE TO TERMINATE APPROXIMATELY 5' FROM SIDE SLOPE.




6D STOP LOG
NOT TO SCALE



6C EMBEDDED CHANNEL
NOT TO SCALE




**4221 BALLOON PARK RD NE
ALBUQUERQUE, NM 87109
TEL: (505) 821-1801**



FINAL

PROJECT:
**KAYENTA WWTP
CFID
POND SYSTEM
FINAL DESIGN**



**NAVAJO TRIBAL UTILITY
AUTHORITY**
PO BOX 170
FT. DEFIANCE, AZ 86504
WSP PROJECT No:
2151700011

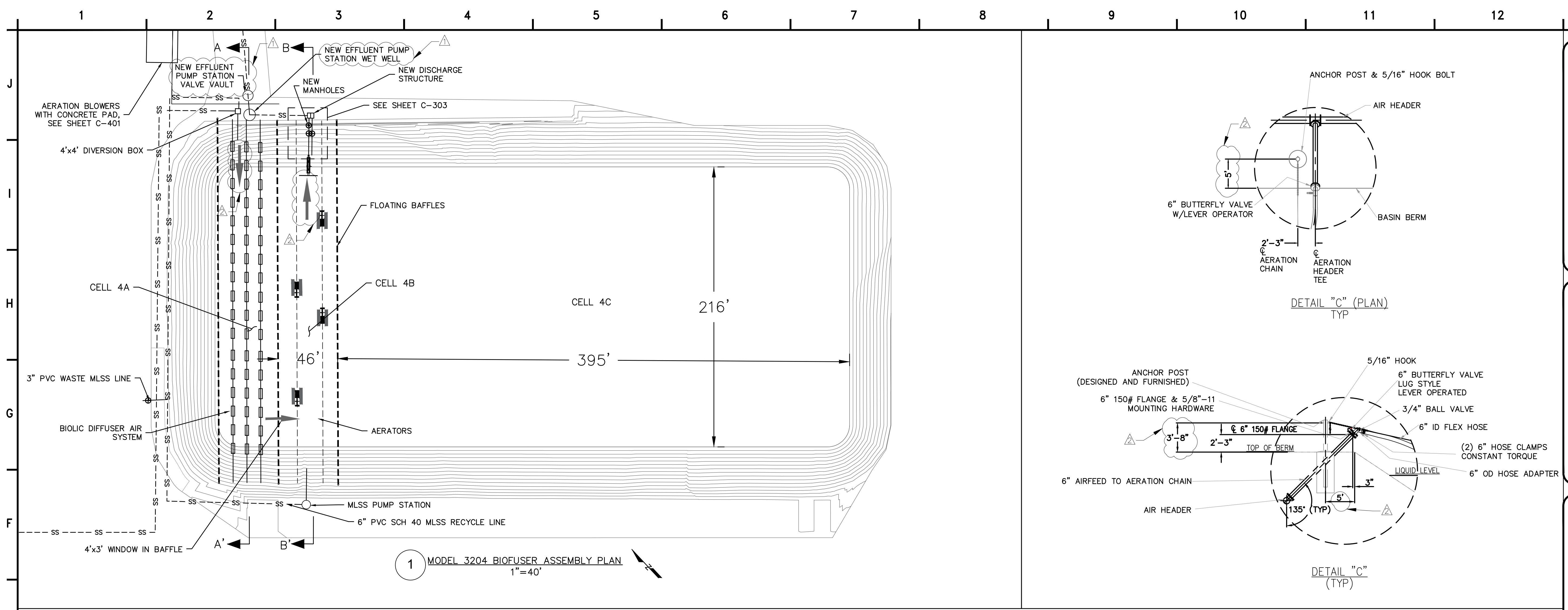
REVISIONS			
NO.	DATE	BY	APPROVED
1	1/22/2024	A.ORRANTIA	S.STANDUKAR
2	2/13/2024	A.ORRANTIA	S.STANDUKAR

DESIGNED BY:	WSP - BM
DRAWN BY:	WSP - AO
CHECKED BY:	WSP - BM
APPROVED BY:	WSP - BM
DATE:	07/14/2023

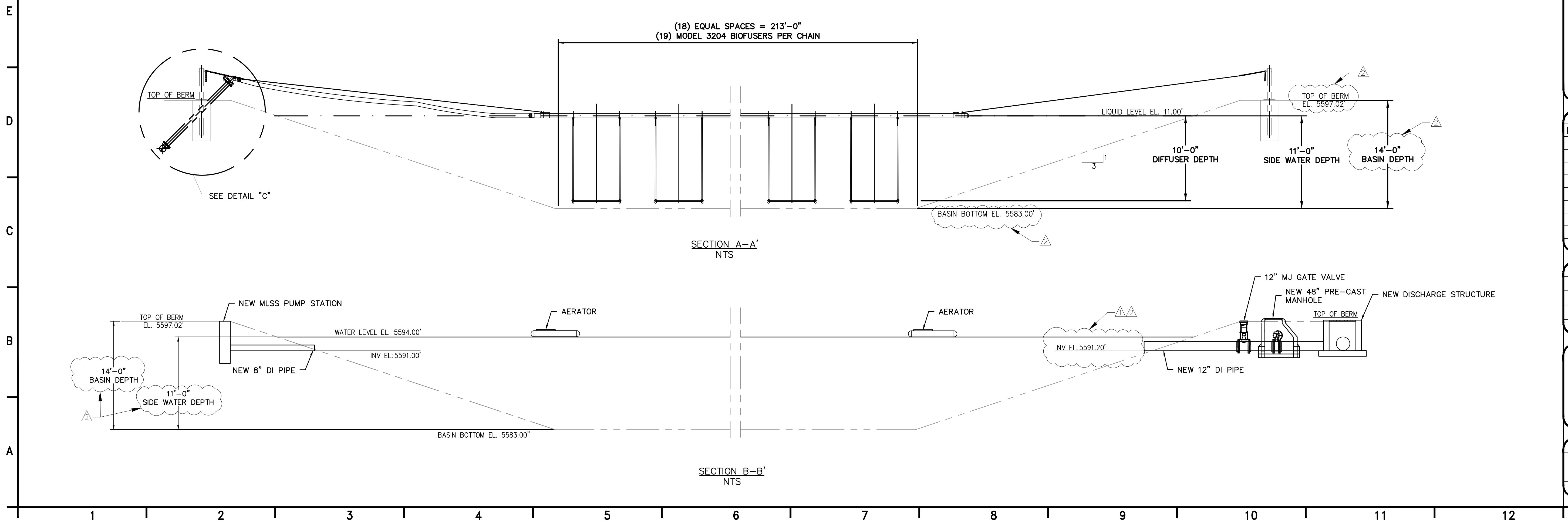
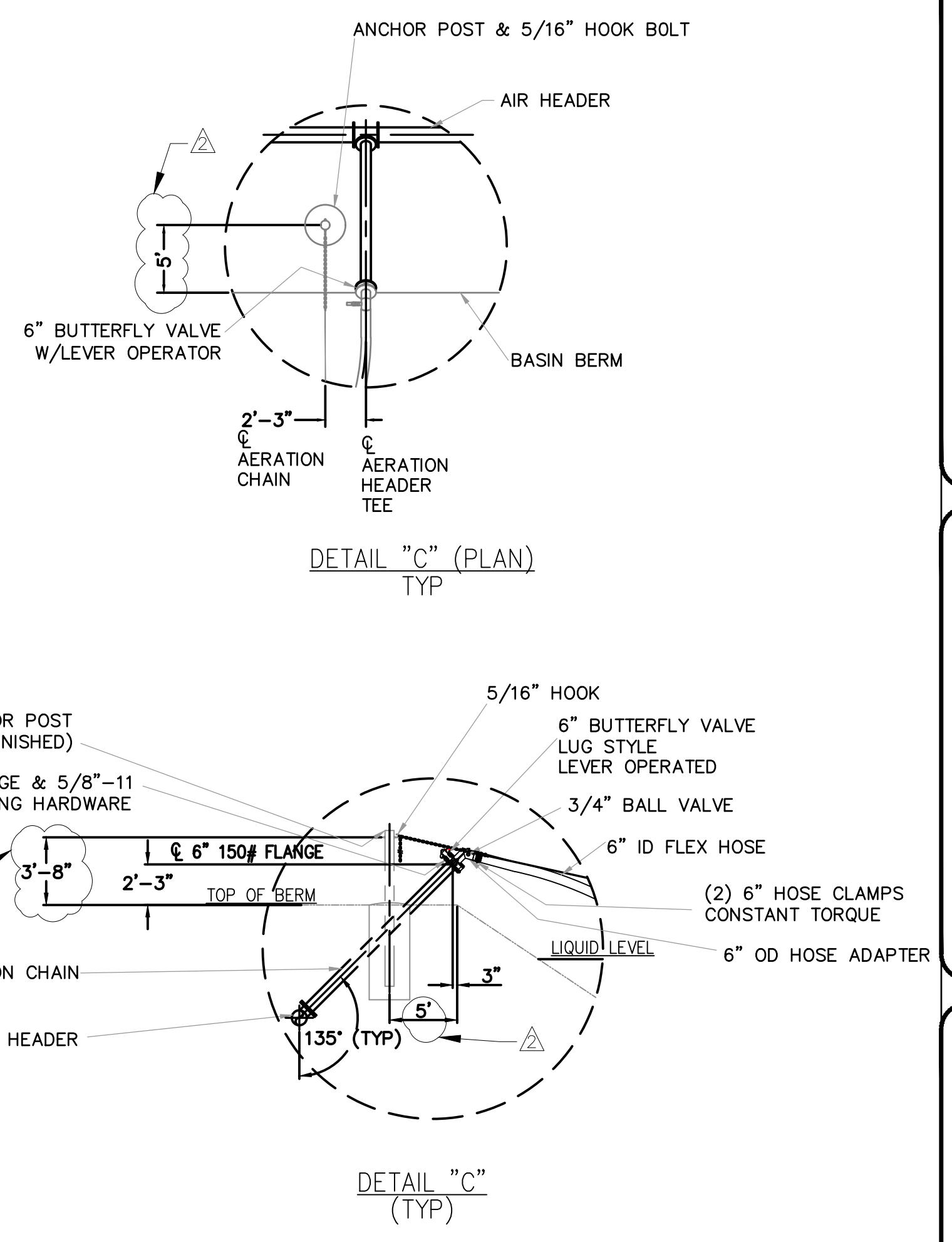
SHEET TITLE:
**DISCHARGE
STRUCTURE PLAN,
PROFILE AND DETAILS**

SHEET NUMBER:	REV. #
C-301	
SHEET 16 OF 55 SHEETS	

X:\USAB0500-ABQ\Project05\consulting\projects\22-517-00011.NTUA-HPP Kayenta WWF\CAD\C-302_DIFUSER DETAILS.dwg



1 MODEL 3204 BIOFUSER ASSEMBLY PLAN
1" = 40'



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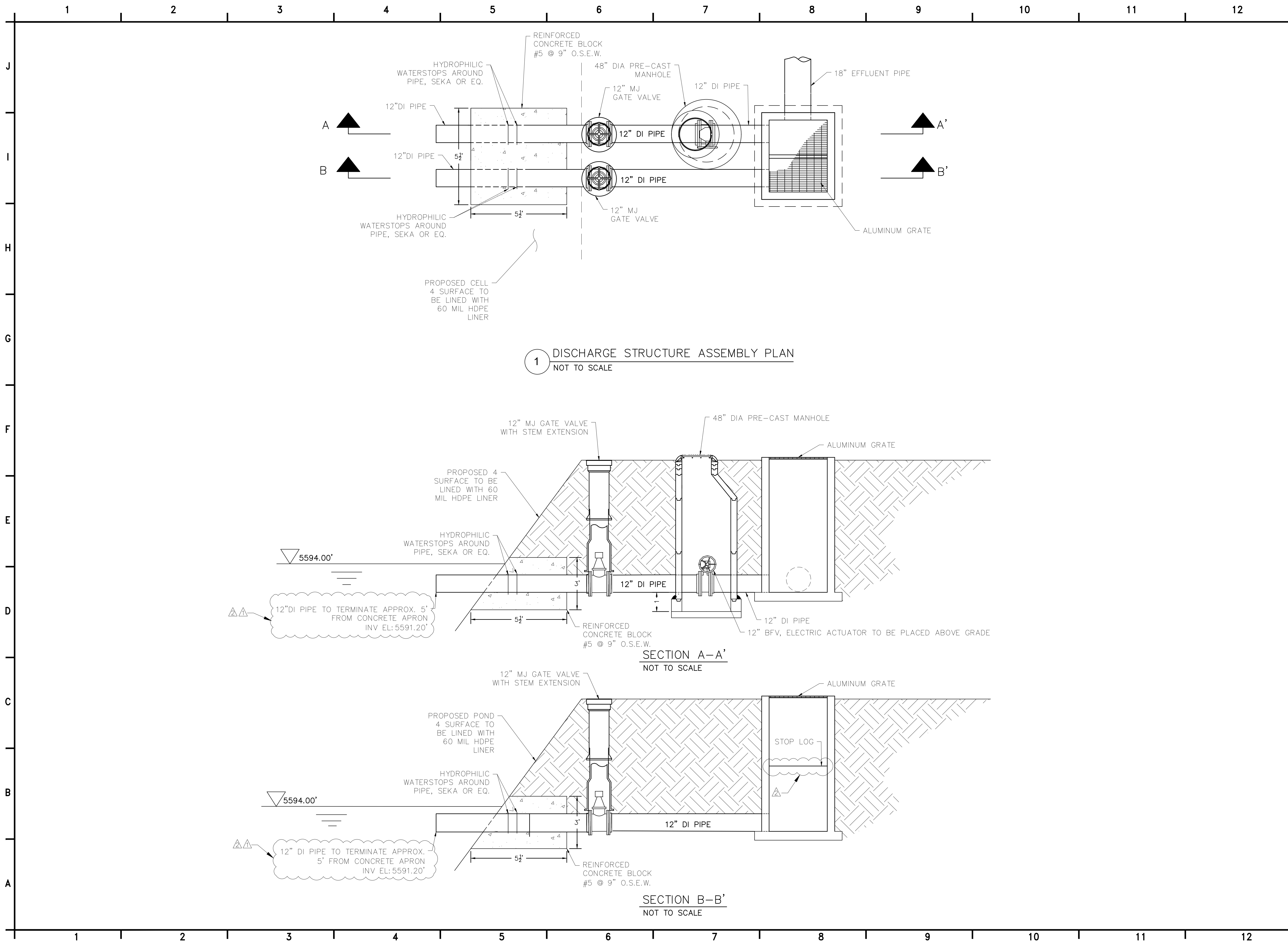
REVISIONS			
NO.	DATE	BY	APPROVED
1	1/22/2024	A. ORRANTIA	S. STANDUKAR
2	2/13/2024	A. ORRANTIA	S. STANDUKAR

DESIGNED BY: WSP - BM
DRAWN BY: WSP - AO
CHECKED BY: WSP - BM
APPROVED BY: WSP - BM
DATE: 07/14/2023

SHEET TITLE:
**DIFUSER
DETAILS**

SHEET NUMBER: **C-302**
REV. #
SHEET 17 OF 55 SHEETS

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1 DISCHARGE STRUCTURE ASSEMBLY PLAN
NOT TO SCALE

SECTION A-A'
NOT TO SCALE

SECTION B-B'
NOT TO SCALE



4221 BALLOON PARK RD NE
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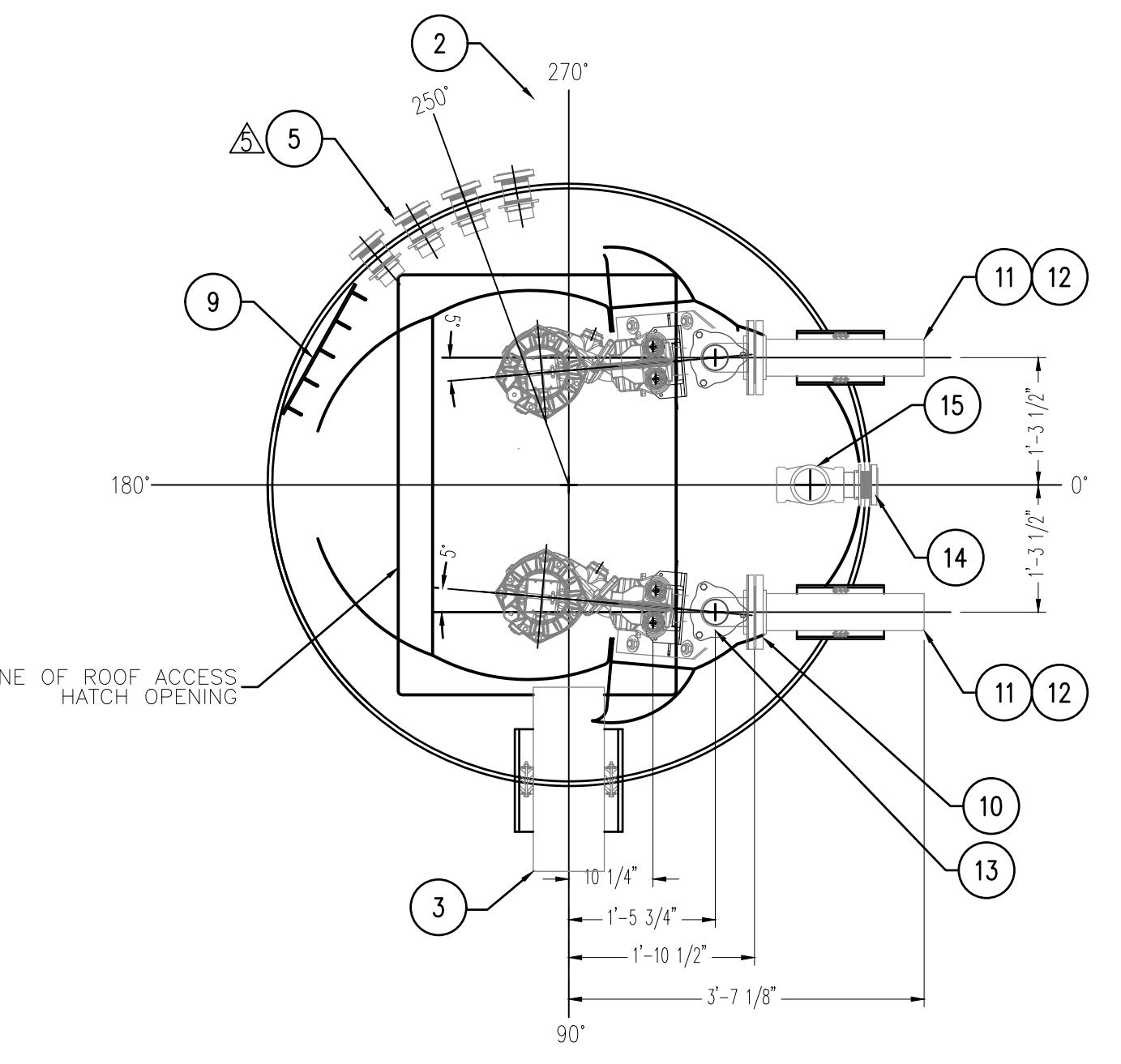
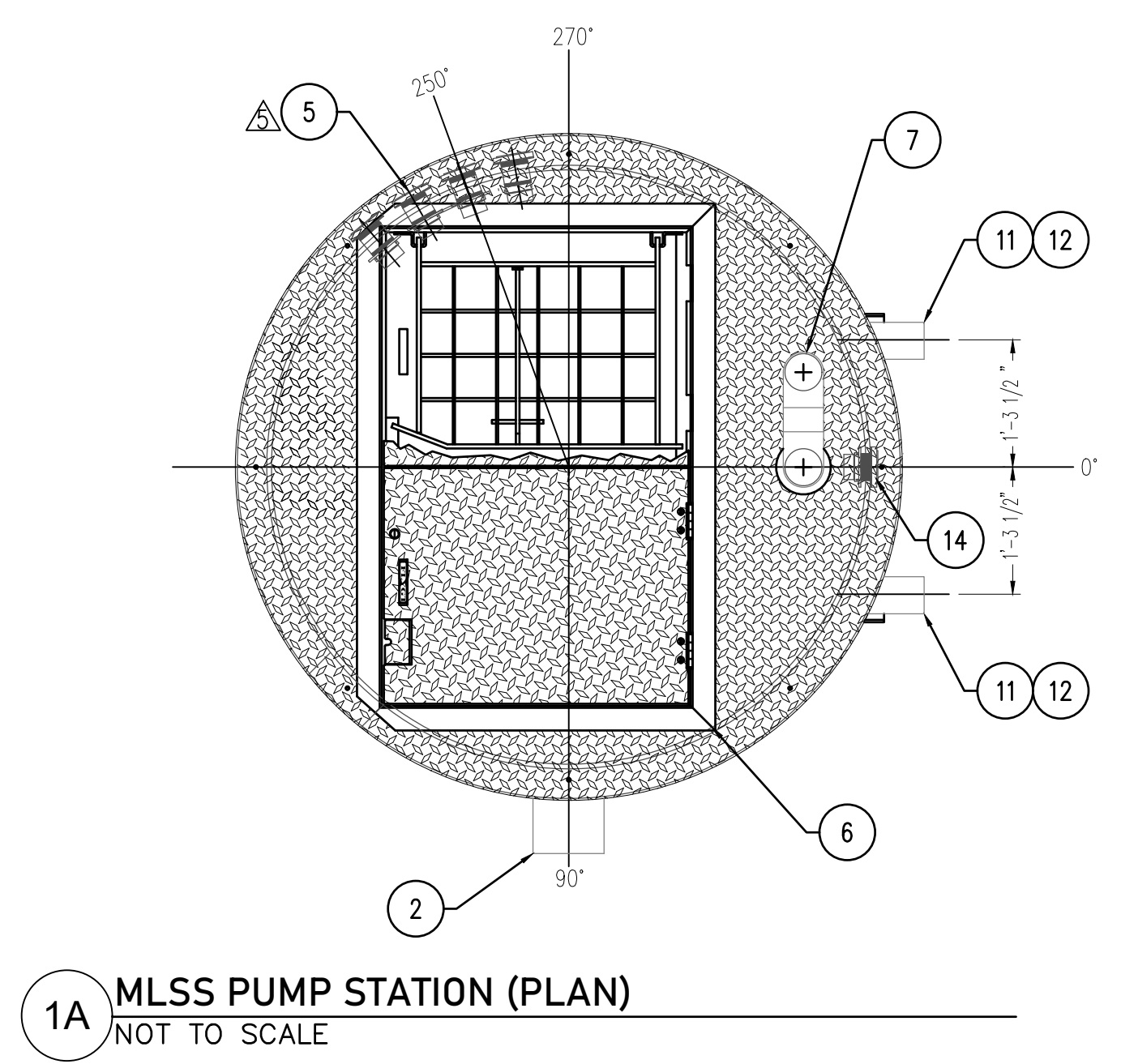
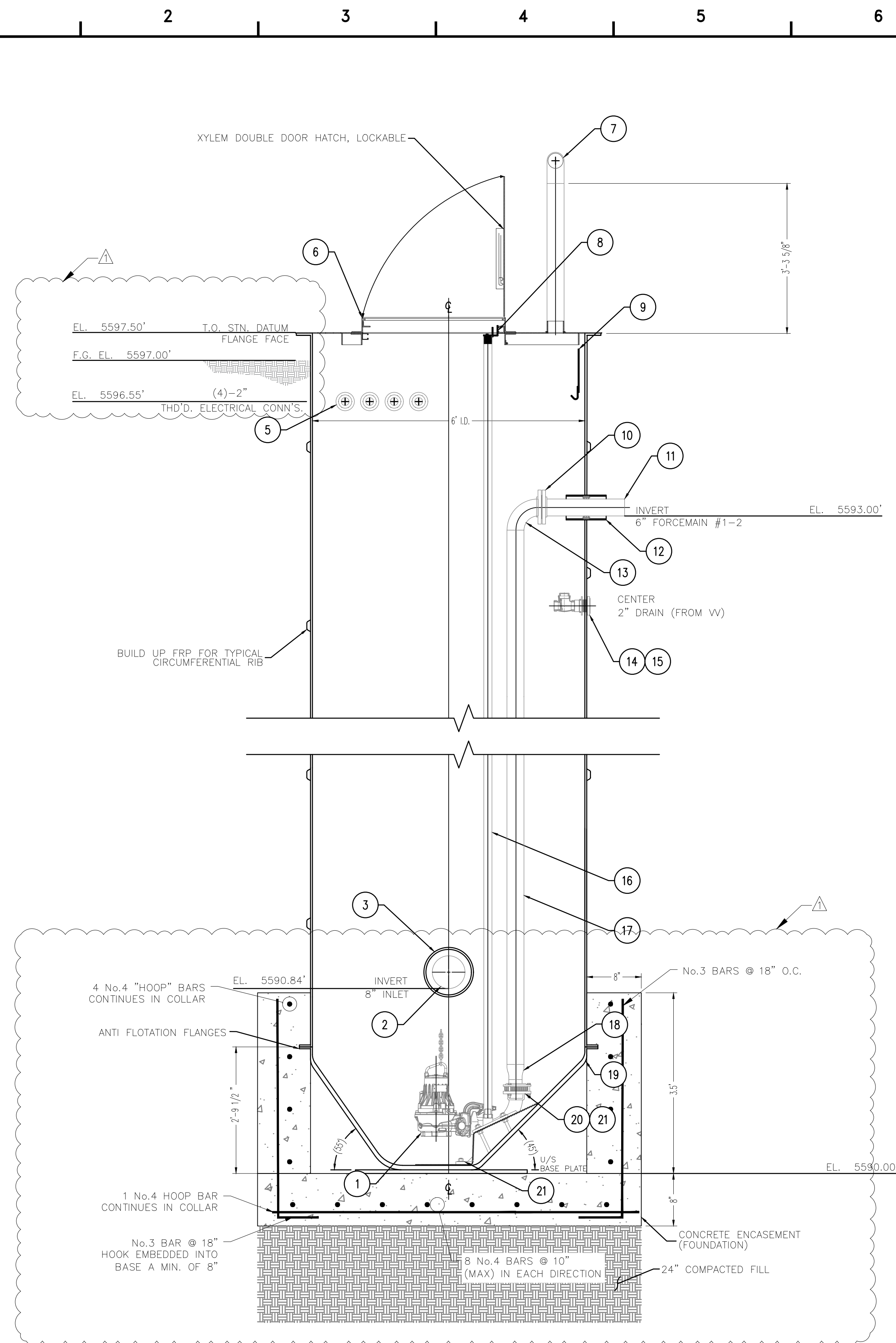
REVISIONS			
NO.	DATE	BY	APPROVED
1	1/22/2024	A. ORRANTIA	S. STANDUKAR
2	2/13/2024	A. ORRANTIA	S. STANDUKAR

DESIGNED BY:	WSP - BM
DRAWN BY:	WSP - AO
CHECKED BY:	WSP - BM
APPROVED BY:	WSP - BM
DATE:	07/14/2023

SHEET TITLE:
**DISCHARGE
STRUCTURE DETAILS**

SHEET NUMBER:	REV. #
C-303	
SHEET 18 OF 55 SHEETS	

X:\US\AB0500-ABQ\Project\22-517-00011.NTUA-HPP Kayenta WWF\CAD\C-304_C-305_MLSS PUMP STATION DETAILS.dwg



BILL OF MATERIALS

ITEM	DESCRIPTION	QTY.
1	FLYGT PUMPS NP-3085 SH, DN80 [3"]	2
2	8" INLET (SSR 35 HOPE PIPE)	1
3	10" I.D. FRP SLEEVE c/w WRAP-IT LINK WL-475, 12 LINK	2
4	*ITEM REMOVED*	-
5	2" THREADED PVC ELECTRICAL CONNECTION	4
6	FRB-AOSH 33.75x51" ALUMINUM E.J. SAFE HATCH, PEDESTRAIN RATED, DOUBLE DOOR, COVER STAY, SS HARDWARE, SLAM LOCK, HANDLE, c/w (1)-4" VENT CONN. (MODEL FRB-33.75x51AOSH-72)	1
7	4" GOOSENECK VENT, SCH.10, 316 SS c/w 180° RETURN BEND & SST BRASSSCREEN	1
8	2" UPPER GUIDE BAR SUPPORT BRACKET, 316 SS	2
9	CABLE HANGER, 316 SS	1
10	6"-150# RT FLANGE, 316 SS	4
11	6" FORCEMAIN #1 & #2, SCH.10 316 SS	2
12	8" I.D. FRP SLEEVE c/w WRAP-IT LINK WL-300, 10 LINK	2
13	6" SR 90 ELBOW, SCH.10 316 SS	2
14	2" BULKHEAD FITTING, FRP (DRAIN FROM VALVE VAULT)	1
15	2" CHECK VALVE (DRAIN FROM VALVE VAULT), SST	1
16	2" GUIDE BARS, SCH.40, 316 SS	4
17	6 RISERS, SCH.10, 316 SS	2
18	6x3" CONCENTRIC REDUCER, SCH.10, 316 SS	2
19	FLYGT I.O.P. STYLE BASE c/w FRP REINFORCED BOTTOM & INTEGRAL ANTI-FLOTATION FLANGE	1
20	TOP DISCHARGE ELBOW - 619 99 10-R DN80 [3"]	1
21	TOP DISCHARGE ELBOW - 620 00 10-R DN80 [3"]	1
22	3/4" PUMP BASE BOLTS, 316 SS	8

- FABRICATION DESIGN STANDARDS**
- XYLEM SPECIFICATION CE-1008-04, REVISION MAY 2002
 - AMEC 45-10.01 MANUFACTURE AND INSTALLATION FOR FRP STRUCTURES
 - AMEC 45-10.02 FRP PRESSURE PIPE, FITTINGS AND FLANGES
- GENERAL NOTES**
- WINDING ANGLE - 75°
 - TANK WALL - VARIES WITH ELEVATION
 - LINER - C-GLASS VEIL AND (2)-1 1/2 oz. MATT
 - RESIN - ISOPHTHALIC
 - INTERIOR FINISH - WHITE ISOPHTHALIC NPG GELCOAT
 - EXTERIOR (ABOVE GRADE) TO HAVE DARK GREEN GELCOAT
 - DIMENSIONS ARE IN MILLIMETERS U.N.O.
 - APPROX. SHIPPING WEIGHT: 3,200 lbs
- INSTALLATION PROCEDURES**
- USE THE LIFTING LUGS PROVIDED FOR VERTICAL HANDLING.
 - USE SLINGS AROUND THE MAIN TANK FOR HORIZONTAL HANDLING.
 - ENSURE UNIT IS STANDING VERTICAL ON CONCRETE PAD.
 - BOLT UNIT FIRMLY AND SQUARELY IN PLACE, SHIM WHERE NECESSARY.
 - ENCASE BOTTOM RIB IN CONCRETE TO A MIN. HEIGHT OF 150mm ABOVE RIB TO PROVIDE ANCHORAGE. REBAR TO CONNECT SECOND POUR TO THE CONCRETE BASE PAD.
 - WHEN EXTERNAL VALVES ARE MOUNTED, SUPPORT PIPING CONNECTIONS DIRECT TO CONCRETE PAD.
 - MAINTAIN A DRY SITE UNTIL BACKFILLING OPERATIONS COMMENCE.
 - USE A GOOD QUALITY SCREENING OR SAND AS BACKFILL MATERIAL TO REACH 90% COMPACTION.
 - PLACE THE BACKFILL IN EQUAL INCREMENTS NOT EXCEEDING 300mm THICK AROUND THE STATION TO PREVENT UNBALANCED LOADS BEING IMPOSED DURING BACKFILLING OPERATIONS. PROGRESSIVELY TAMP BACKFILL AROUND STATION TO FULL HEIGHT TO REDUCE SETTLEMENT TO AN ABSOLUTE MINIMUM.

- FOUNDATION NOTES:**
- ALL REBAR SHALL HAVE A MINIMUM CLEAR COVER OF 3".
 - MINIMUM REBAR SPLICE LENGTH SHALL BE 18".
 - REBAR LAPS SHALL BE CONTINUOUSLY OFFSET.

**4221 BALLOON PARK RD NE
ALBUQUERQUE, NM 87109
TEL: (505) 821-1801**

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**PROJECT:
KAYENTA WWTP
CFID
POND SYSTEM
FINAL DESIGN**

**NAVAJO TRIBAL UTILITY
AUTHORITY
PO BOX 170
FT. DEFIANCE, AZ 86504
WSP PROJECT No:
2151700011**

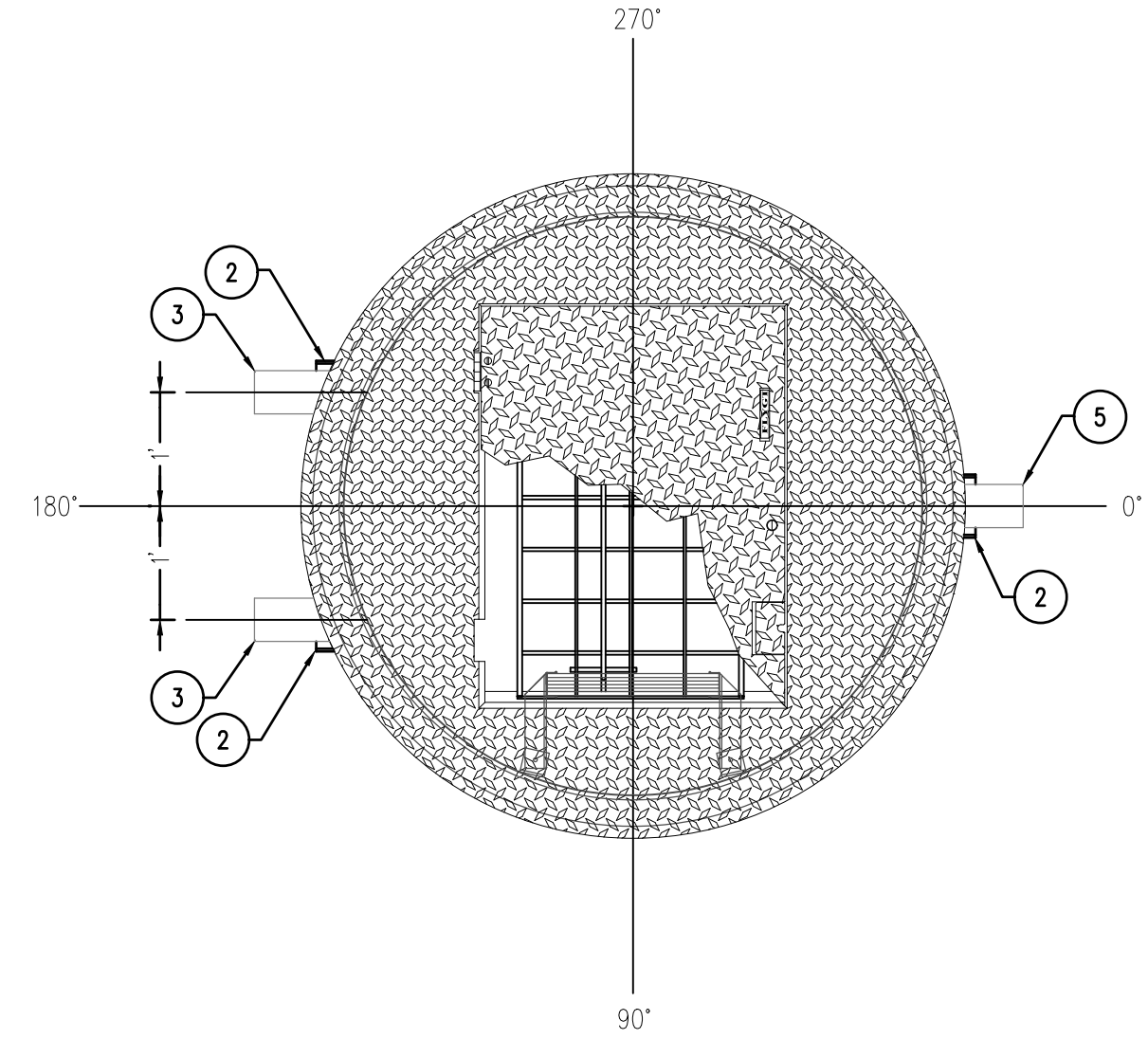
REVISIONS			
NO.	DATE	BY	APPROVED
1	1/22/2024	A.ORRANTIA	S.STANDUKAR

DESIGNED BY:	WSP - BM
DRAWN BY:	WSP - AO
CHECKED BY:	WSP - BM
APPROVED BY:	WSP - BM
DATE:	07/14/2023

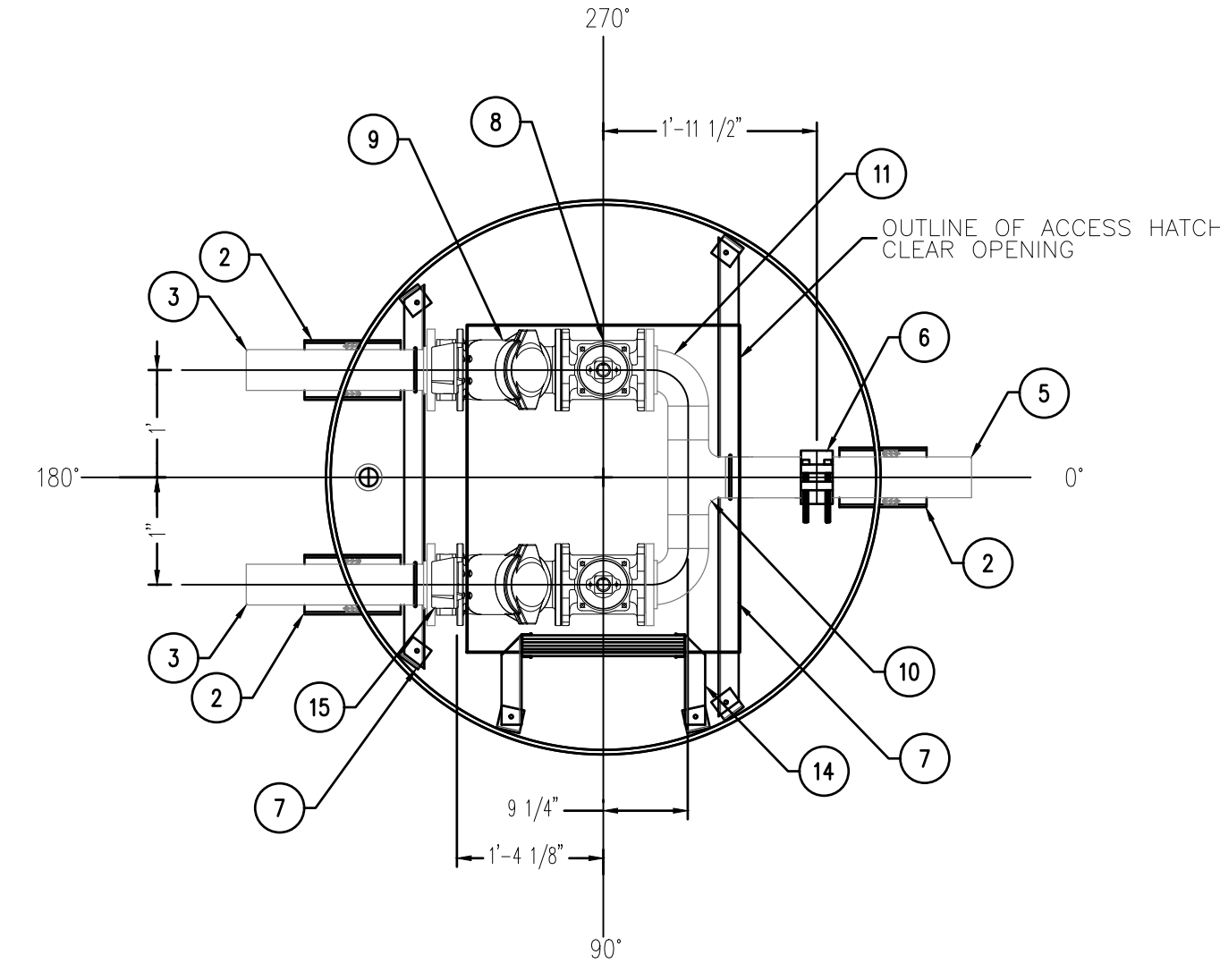
SHEET TITLE:
**MLSS PUMP STATION
DETAILS**

SHEET NUMBER:	REV. #
C-304	
SHEET 19 OF 55 SHEETS	

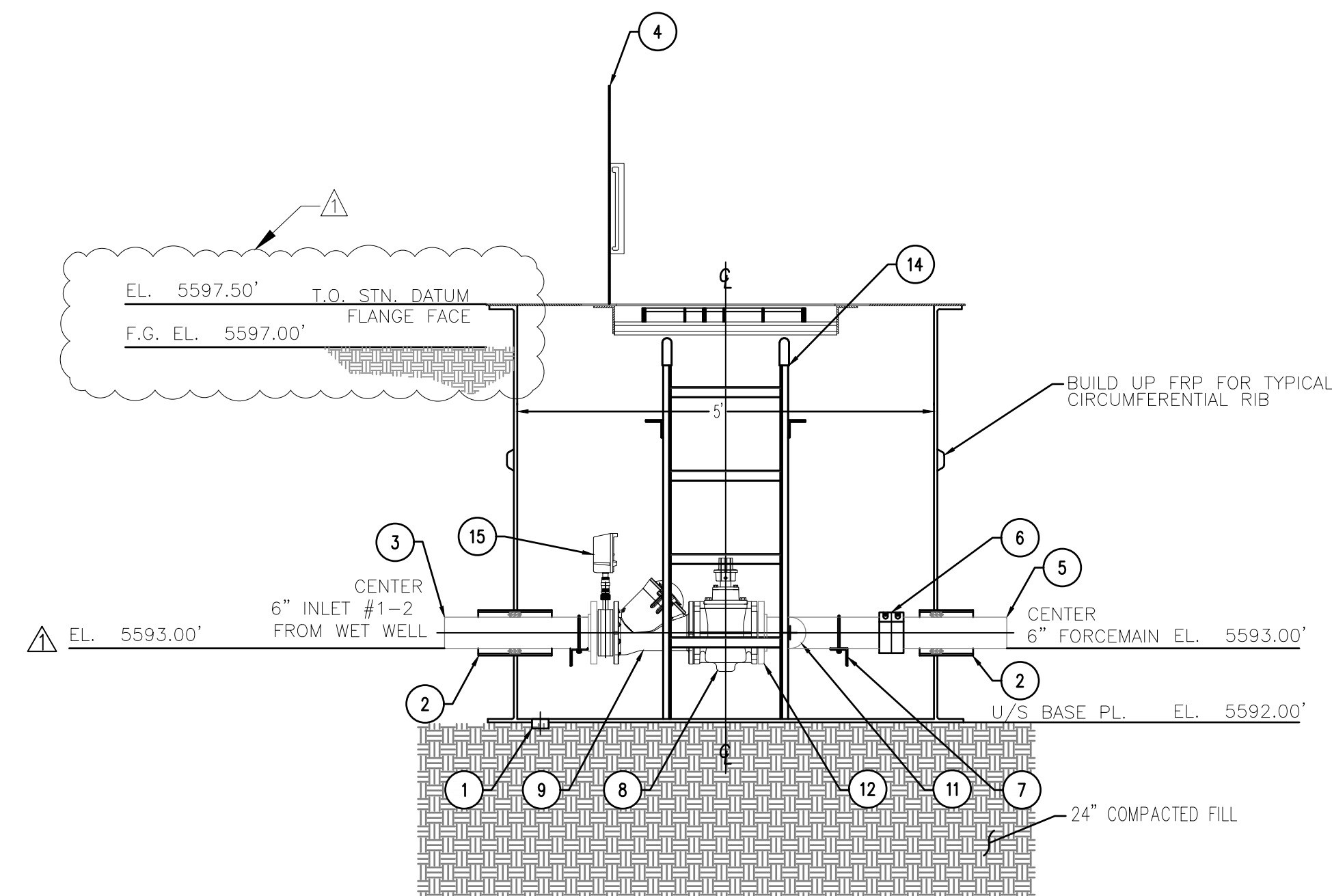
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1B MLSS VALVE VAULT LAYOUT (PLAN)
NOT TO SCALE



1A MLSS VALVE VAULT PIPING LAYOUT
NOT TO SCALE



1 MLSS VALVE BOX (PROFILE)
NOT TO SCALE

BILL OF MATERIALS

ITEM	DESCRIPTION	QTY.
1	2" NPT DRAIN, FRP (PIPING TO MET WELL)	1
2	8" FRP SLEEVE c/w WRAP-IT LINK, MODEL ML-300/10 LINK (FIELD INSTALL)	3
3	6" INLET #1-2, SCH10, 316 SS	2
4	69" O.D. ALUMINUM COVER c/w EJ SAFE HATCH, PEDESTAL RATED, SINGLE DOOR, COVER STAY, SS HARDWARE, SLAM LOCK, HANDLE, (MODEL FBC-30X36AGSH-60R)	1
5	6" FORCEMAIN, SCH10, 316 SS, TRANSITION TO 6" SCH 40 PVC	1
6	6" AXILOCK COUPLER, SST	1
7	HEADER SUPPORT (2.5x2.5x1/4"), ALUMINUM c/w PIPE CLAMPS	2
8	6" PLUG VALVE (AS COMPLIANT), DEZURIK	2
9	6" CHECK VALVE, HDL 5087	2
10	6" STRAIGHT TEE, SCH10, 316 SS	1
11	6" SR 90° ELBOW, SCH10, 316 SS	2
12	6" -150# FLANGE, 316 SS	6
13	6" HVMX COUPLERS, NOT SHOWN ON DRAWING (SHIPPED LOOSE)	2
14	ALUMINUM LADDER, FULL LENGTH	1
15	6" ONYX PRESSURE ISOLATOR VALVE WITH GAUGE	2

FABRICATION DESIGN STANDARDS

- XYLEM SPECIFICATION GE-1008-04, REVISION MAY 2002
- AMEC 45-10.01 MANUFACTURE AND INSTALLATION FOR FRP STRUCTURES
- AMEC 45-10.02 FRP PRESSURE PIPE, FITTINGS AND FLANGES

GENERAL NOTES

- WINDING ANGLE - 75°
 - TANK WALL - VARIES WITH ELEVATION
 - LINER - C-GLASS VEIL AND (2)-1 1/2 oz. MATT
 - RESIN - ISOPHTHALIC
 - INTERIOR FINISH - WHITE ISOPHTHALIC NPG GELCOAT
 - EXTERIOR (ABOVE GRADE) TO HAVE DARK GREEN GELCOAT
 - DIMENSIONS ARE IN MILLIMETERS U.N.O.
 - APPROX. SHIPPING WEIGHT: 1,250 lbs
- INSTALLATION PROCEDURES**
- USE THE LIFTING LUGS PROVIDED FOR VERTICAL HANDLING.
 - USE SLINGS AROUND THE MAIN TANK FOR HORIZONTAL HANDLING.
 - ENSURE UNIT IS STANDING VERTICAL ON CONCRETE PAD.
 - BOLT UNIT FIRMLY AND SQUARELY IN PLACE. SHIM WHERE NECESSARY.
 - ENCASE BOTTOM RIB IN CONCRETE TO A MIN. HEIGHT OF 150mm ABOVE RIB TO PROVIDE ANCHORAGE. REBAR TO CONNECT SECOND POUR TO THE CONCRETE BASE PAD.
 - WHEN EXTERNAL VALVES ARE MOUNTED, SUPPORT PIPING CONNECTIONS DIRECT TO CONCRETE PAD.
 - MAINTAIN A DRY SITE UNTIL BACKFILLING OPERATIONS COMMENCE.
 - USE A GOOD QUALITY SCREENING OR SAND AS BACKFILL MATERIAL TO REACH 90% COMPACTION.
 - PLACE THE BACKFILL IN EQUAL INCREMENTS NOT EXCEEDING 8" THICK AROUND THE STATION TO PREVENT UNBALANCED LOADS BEING IMPOSED DURING BACKFILLING OPERATIONS. PROGRESSIVELY TAMP BACKFILL AROUND STATION TO FULL HEIGHT TO REDUCE SETTLEMENT TO AN ABSOLUTE MINIMUM.



**4221 BALLOON PARK RD NE
ALBUQUERQUE, NM 87109
TEL: (505) 821-1801**



07/14/2023

FINAL

**PROJECT:
KAYENTA WWTP
CFID
POND SYSTEM
FINAL DESIGN**



**NAVAJO TRIBAL UTILITY
AUTHORITY
PO BOX 170
FT. DEFIANCE, AZ 86504
WSP PROJECT No:
2151700011**

REVISIONS			
NO.	DATE	BY	APPROVED
1	1/22/2024	A. ORRANTIA	S. STANDUKAR

DESIGNED BY:	WSP - BM
DRAWN BY:	WSP - AO
CHECKED BY:	WSP - BM
APPROVED BY:	WSP - BM
DATE:	07/14/2023

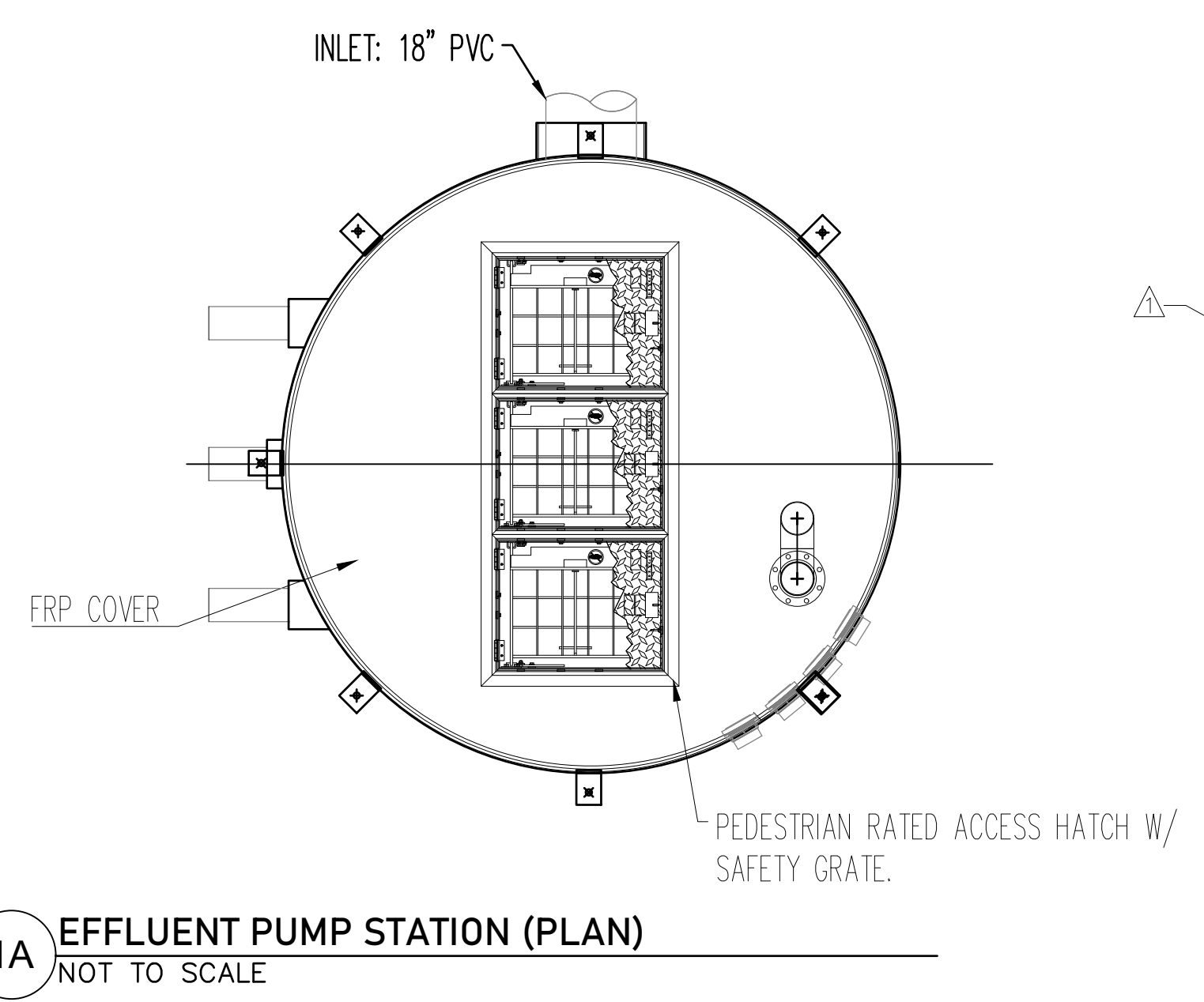
SHEET TITLE:
**MLSS VALVE VAULT
DETAILS**

SHEET NUMBER:	REV. #
C-305	
SHEET 20 OF 55 SHEETS	

X:\US\ASAB0500-ABQ\Project05\consulting\projects\22-517-0001\NTUA-HPP Kayenta WWF\CAD\C-306_C-307_EFFLUENT PUMP STATION & VALVE VAULT DETAIL.dwg

1 2 3 4 5 6 7 8 9 10 11 12

J
I
H
G
F
E
D
C
B
A



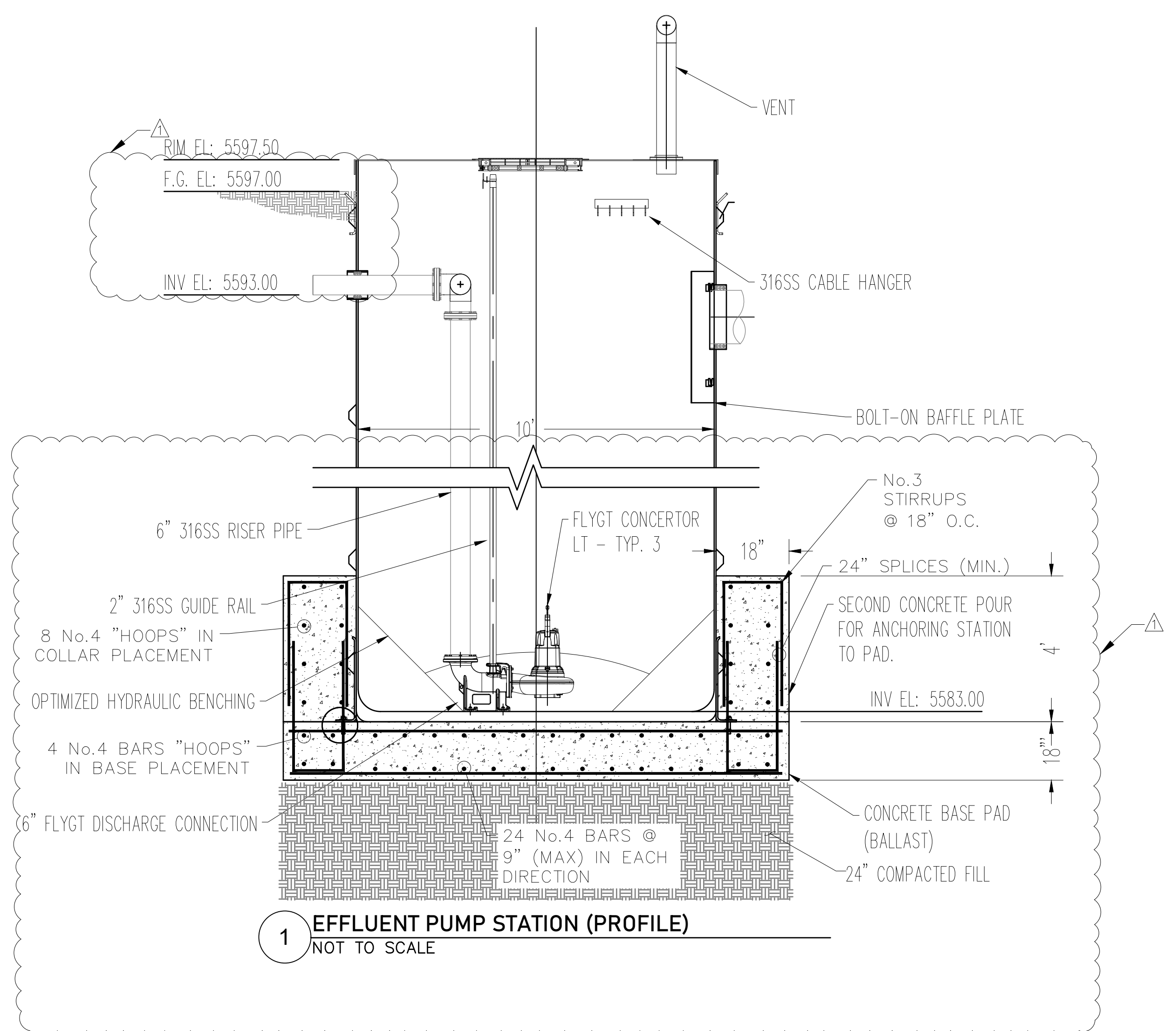
1A EFFLUENT PUMP STATION (PLAN)
NOT TO SCALE

- NOTES:
- 1) STATION TO SHIP COMPLETE WITH PIPING PRE-INSTALLED.
 - 2) STATION TO FEATURE 4:1 SAFETY FACTOR AGAINST WORST CASE LOADING CONDITIONS WITH WATER TABLE TO GRADE.
 - 3) BASE PAD TO BE DESIGNED TO PROVIDE ADEQUATE BALLAST TO RESIST UPLIFT WITH WATER TABLE TO GRADE.
 - 4) STATION TO SHIP COMPLETE WITH OPTIMIZED HYDRAULIC BENCHING.
 - 5) STATION TO BE OFFERED WITH 25 YEAR WARRANTY ON THE STRUCTURE.

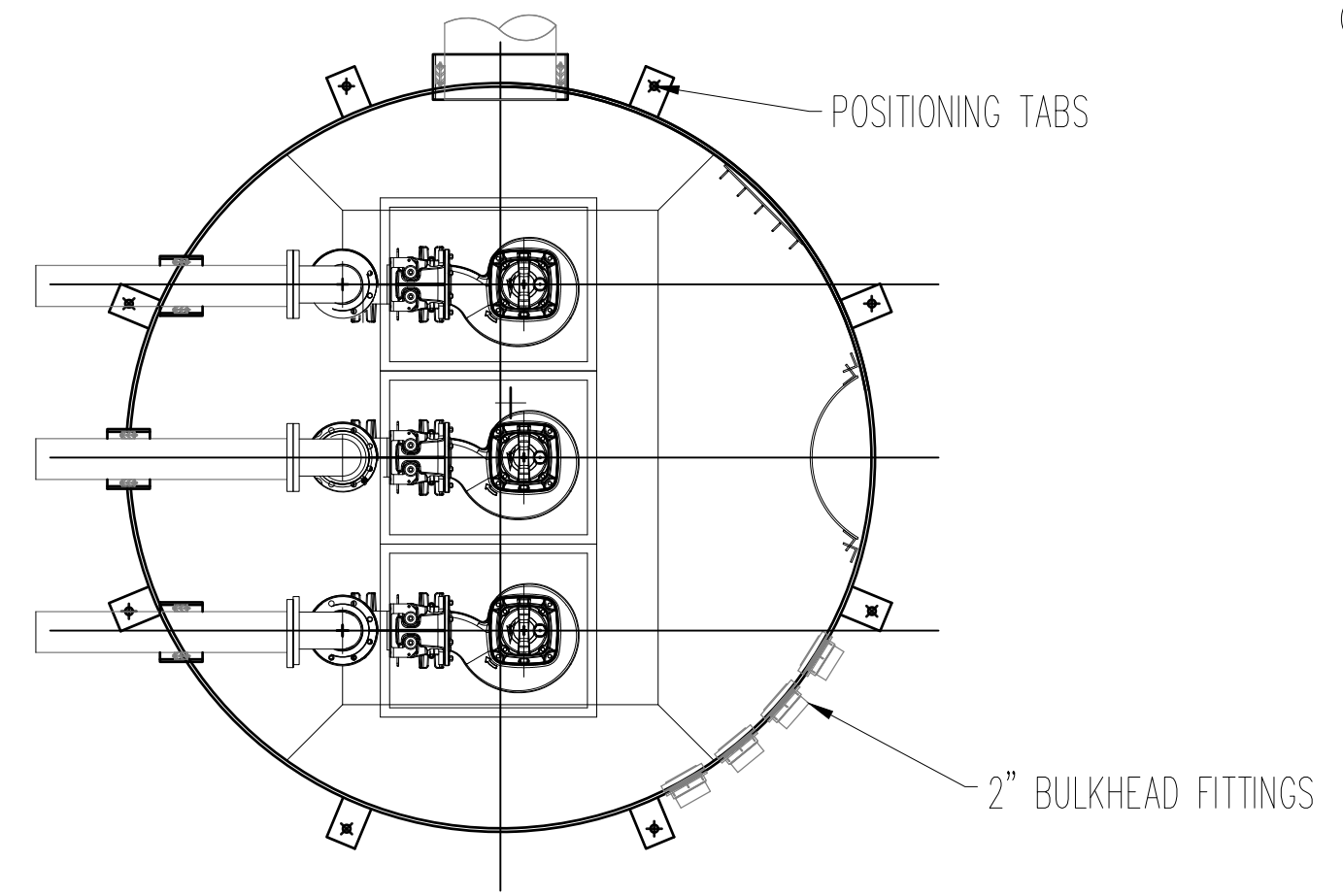
ONE (1) FLYGT FIBERGLASS PREFABRICATED LIFT STATION
10' DIAMETER X 10'-6" DEEP (TO BE DETERMINED DURING CONSTRUCTION)
6" 316SS INTERNAL PIPING
2" 316SS GUIDE RAIL SYSTEM
CUSTOM BENCHED SELF-CLEANING BOTTOM
VENT PIPING THREADS
WALL PENETRATION SEALS PROVIDED (ELECTRICAL CONNECTIONS, GRAVITY INLET, DISCHARGE STUBOUT)
FRP COVER
ALUMINUM ACCESS HATCH WITH SAFETY GRATE, 300 PSF RATED
INCLUDES REQUIRED LIFT STATION ACCESSORIES:
• SS LIFTING CHAIN
• SS GUIDE BRACKETS
• SS CABLE HANGER
• FLYGT GRIP EYE LIFTING DEVICE

ONE (1) TRIPLEX PUMP CONTROL PANEL
NEMA 3R PAINTED GALVANIZED ENCLOSURE WITH GASKETED DOOR
FVNR STARTERS
TIME BASED OPERATION (1 HOUR RUN, 3 HOUR STANDBY)
HIGH LEVEL ALARM BEACON AND HORN, SEAL FAIL/ LEAK DETECTION MONITORING
POWER MONITOR AND SURGE PROTECTION ON SUPPLY
ANTI-CONDENSATION HEATER
ENABLE AND HIGH LEVEL FLOAT

- FOUNDATION NOTES:
1. ALL REBAR SHALL HAVE A MINIMUM CLEAR COVER OF 3".
 2. MINIMUM REBAR SPLICE LENGTH SHALL BE 18".
 3. REBAR LAPS SHALL BE CONTINUOUSLY OFFSET.



1 EFFLUENT PUMP STATION (PROFILE)
NOT TO SCALE



1B PUMPS LAYOUT
NOT TO SCALE



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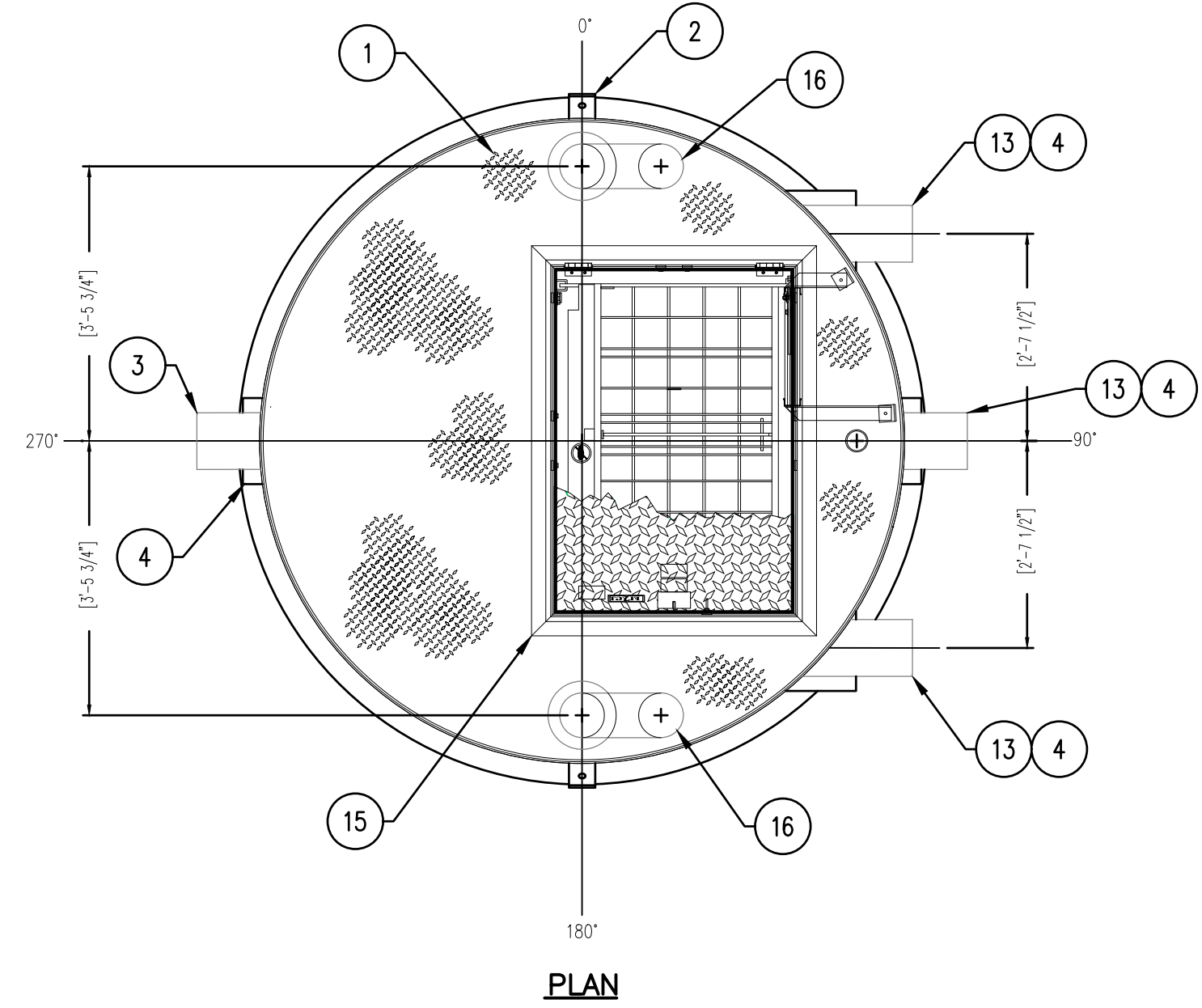
DESIGNED BY: WSP - BM
DRAWN BY: WSP - AO
CHECKED BY: WSP - BM
APPROVED BY: WSP - BM
DATE: 07/14/2023

SHEET TITLE:
**EFFLUENT PUMP
STATION DETAILS**

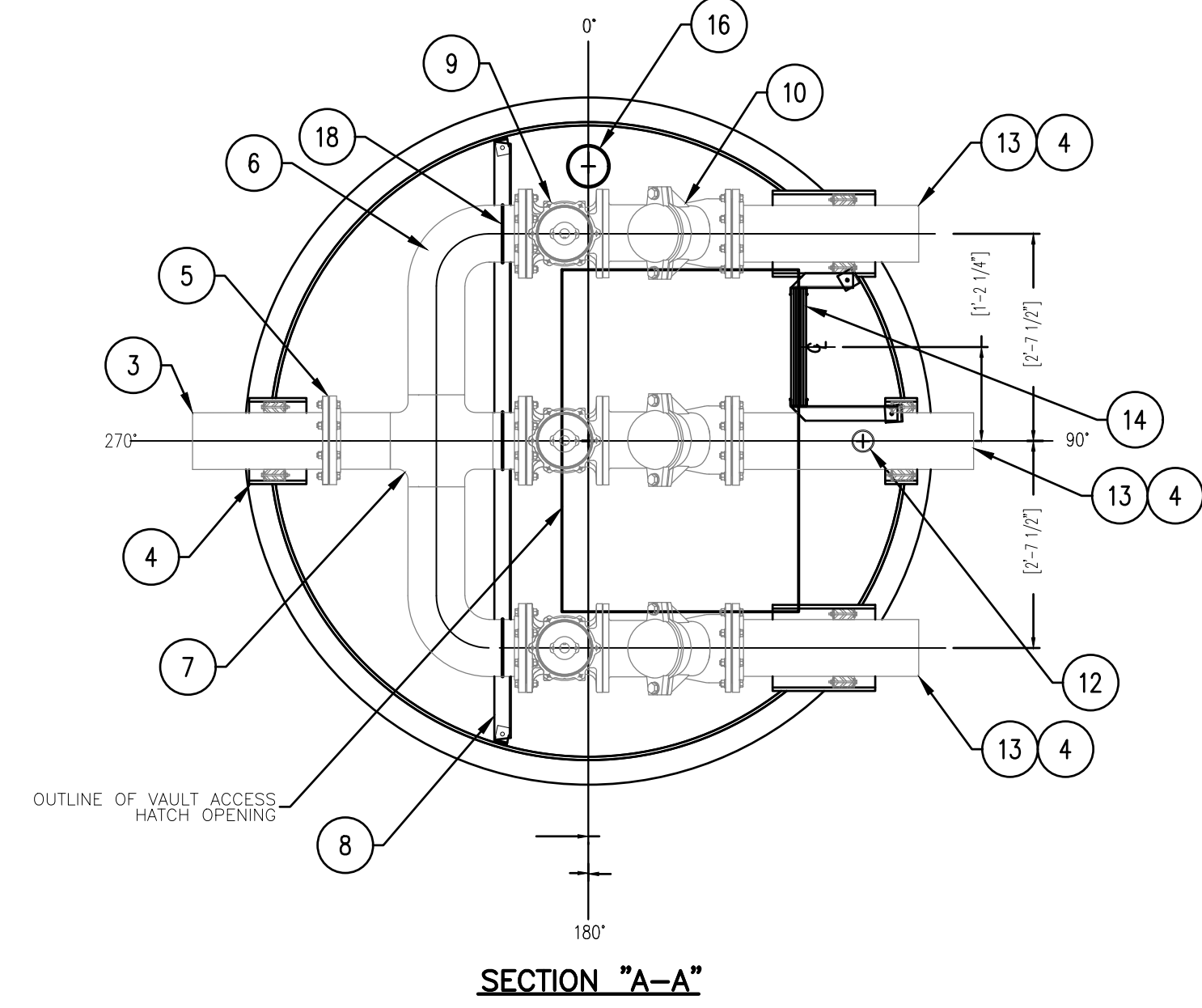
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REV. #
SHEET 21 OF 55 SHEETS

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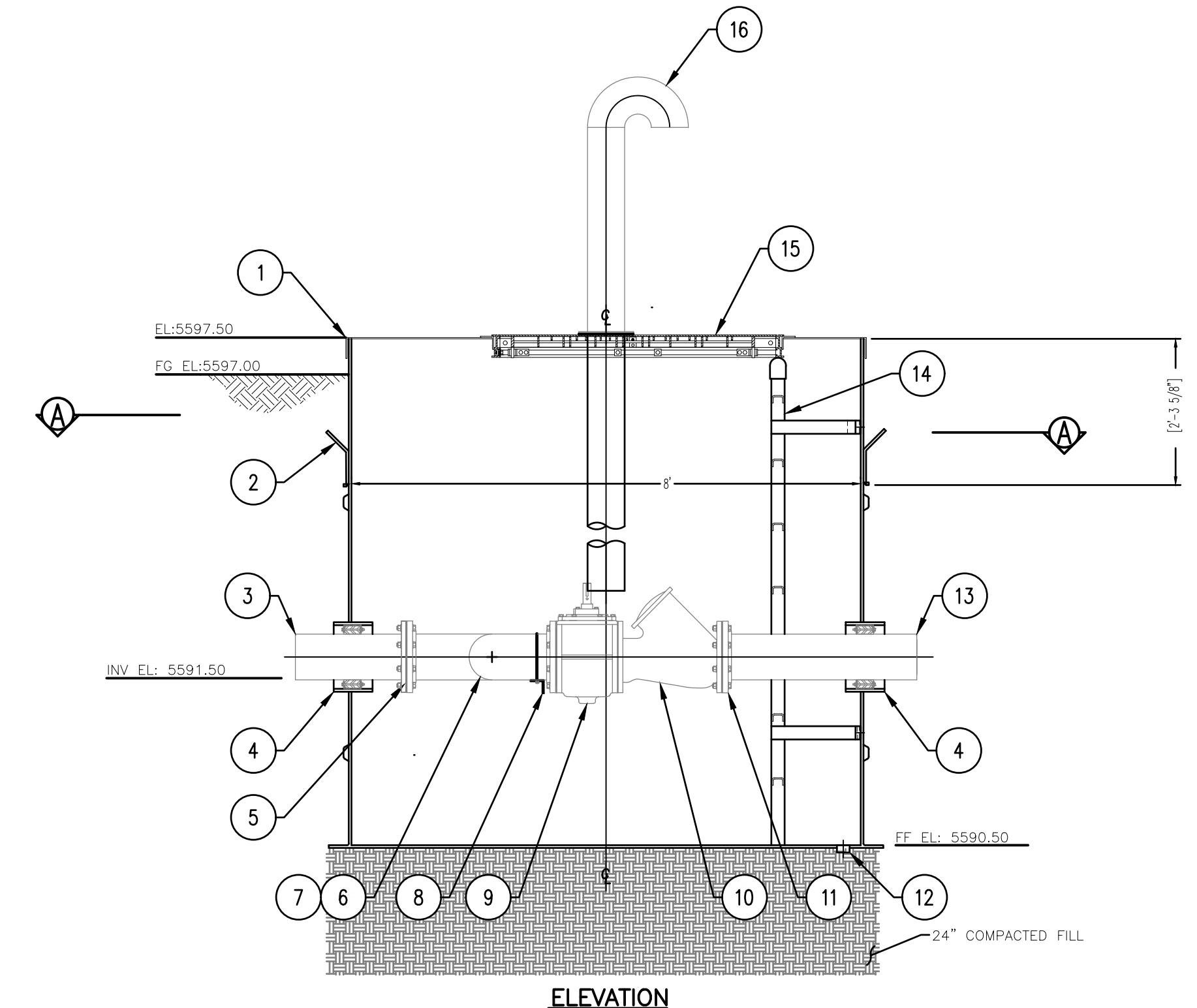
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1B EFFLUENT VALVE VAULT LAYOUT (PLAN)
NOT TO SCALE

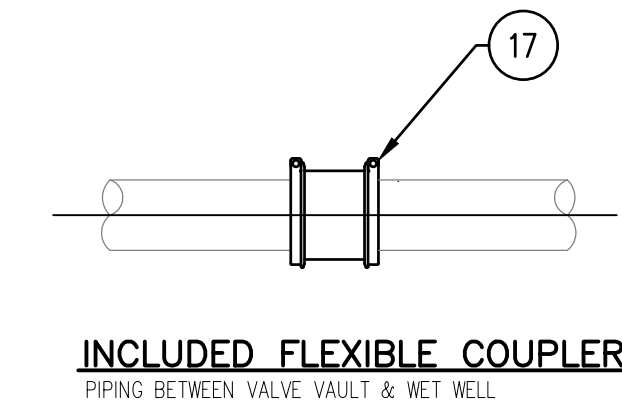


1A EFFLUENT VALVE VAULT PIPING LAYOUT
NOT TO SCALE



1 EFFLUENT VALVE BOX (PROFILE)
NOT TO SCALE

NOTES:
SEE PLAN VIEW FOR TRUE ORIENTATION.
CONCRETE SHOWN FOR ILLUSTRATIVE PURPOSE ONLY.
FOUNDATION TO BE DESIGNED & SUPPLIED BY OTHERS.



INCLUDED FLEXIBLE COUPLER
PIPING BETWEEN VALVE VAULT & MET WELL

BILL OF MATERIALS		
QTY	DESCRIPTION	
1	BARKSI ALUMINUM CHECKER PLATE TOP c/w XYLEM (SAFE-HATCH), ALUM, PEDESTAL RATED	1
2	LIFTING LOSS (BOLT ON), MS, EPOXY COATED	2
3	12" FORKMAN, DP	1
4	12" I.D. FRP SLEEVE c/w WRAP-IT, 12 LINK, WS-475 SEAL	4
5	12" SSP TO DP FLANGE ADAPTER AND CONNECTION	2
6	12" SR 90° ELBOW, SCH10, 316 SS	1
7	12" CROSS, SCH10, 316 SS	1
8	HEADER SUPPORT (2.5x2.5x1/4"), ALUMINUM c/w PIPE CLAMPS	1
9	6" PLUG VALVE, VALMATIC, MODEL 5808RN	3
10	6" CHECK VALVE, HDL, MODEL 5087	3
11	6" FLANGE, 316 SS	6
12	2" THREADED HALF COUPLING (DRAIN), FRP	1
13	6" INLET #1-3, SCH10, 316 SS	3
14	MARINE GRADE SAFETY LADDER, FULL LENGTH, ALUMINUM	1
15	XYLEM (SAFE-HATCH), ALUM./STEEL, PEDESTAL RATED, MODEL 13-43 00 83	1
16	6" COSENECK VENT, 316 SS c/w 150mm-150q FLANGE, BROSGREEN & FRP DROP PIPE	2
17	6" FLEXIBLE COUPLER FOR CONNECTION TO MET WELL (NOT SHOWN/SHIPPED LOOSE)	3
18	12" W" REDUCER, SCH10, 316 SS	3
ONE (1) PREFABRICATED FIBERGLASS VAULT		
VAULT		
8" DIAMETER X 7' DEEP		
6" THICK INTERNAL PIPING		
3EA 6" FLYGT CHECK VALVES		
3EA 6" CAST IRON PLUG ISOLATION VALVES		
1EA 2" FRP VALVE ARV		
WALL PENETRATION SEALS		
ALUMINUM LADDER		
FRP COVER		
ACCESS HATCH, 300 PSF RATED		

- FABRICATION DESIGN STANDARDS**
- FLYGT SPECIFICATION GE-1008-04, REVISION MAY 2002
 - AMEC 45-10.01 MANUFACTURE AND INSTALLATION FOR FRP STRUCTURES
 - AMEC 45-10.02 FRP PRESSURE PIPE, FITTINGS AND FLANGES

- GENERAL NOTES**
- WINDING ANGLE - 75°
 - TANK WALL - VARIES WITH ELEVATION
 - LINER - C-GLASS VEIL AND (2)-1 1/2 oz. MATT
 - RESIN - ISOPHTHALIC
 - INTERIOR FINISH - WHITE ISOPHTHALIC NPG GELCOAT
 - EXTERIOR (ABOVE GRADE) TO HAVE DARK GREEN GELCOAT
 - DIMENSIONS ARE IN MILLIMETERS U.N.O.
 - APPROX. SHIPPING WEIGHT: 2,900 lbs

- INSTALLATION PROCEDURES**
- THE FOLLOWING RECOMMENDATIONS ARE IN NO WAY MEANT TO REPLACE THE ENGINEERS INSTRUCTIONS OR SPECIFICATIONS AND MUST BE USED IN CONJUNCTION WITH THE EXISTING AND ANTICIPATED CONDITIONS AT THE JOBSITE.
- USE SLINGS FOR VERTICAL AND HORIZONTAL HANDLING.
 - ENSURE UNIT IS STANDING VERTICAL ON CONCRETE PAD OR HARD PACKED GROUND.
 - LEVEL THE STATION.
 - MAINTAIN A DRY SITE UNTIL BACKFILLING OPERATIONS COMMENCE.
 - USE A GOOD QUALITY SCREENING OR SAND AS BACKFILL MATERIAL TO 90% COMPACTION.
 - PLACE THE BACKFILL IN EQUAL INCREMENTS NOT EXCEEDING 300mm THICK AROUND THE STATION TO PREVENT UNBALANCED LOADS BEING IMPOSED DURING BACKFILLING OPERATIONS. PROGRESSIVELY TAMP BACKFILL AROUND STATION TO FULL HEIGHT TO REDUCE SETTLEMENT TO AN ABSOLUTE MINIMUM.



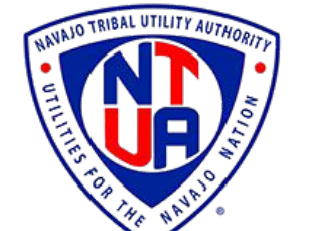
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07/14/2023

FINAL

PROJECT:
**KAYENTA WWTP
CFID
POND SYSTEM
FINAL DESIGN**



**NAVAJO TRIBAL UTILITY
AUTHORITY
PO BOX 170
FT. DEFIANCE, AZ 86504**
WSP PROJECT No:
2151700011

REVISIONS				
NO.	DATE	BY	APPROVED	
1	1/22/2024	A. ORRANTIA	S. STANDUKAR	
2	2/13/2024	A. ORRANTIA	S. STANDUKAR	

DESIGNED BY:	WSP - BM
DRAWN BY:	WSP - AO
CHECKED BY:	WSP - BM
APPROVED BY:	WSP - BM
DATE:	07/14/2023

SHEET TITLE:
**EFFLUENT VALVE
VAULT DETAILS**

SHEET NUMBER:	REV. #
C-307	
SHEET 22 OF 55 SHEETS	

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1 2 3 4 5 6 7 8 9 10 11 12

J
I
H
G
F
E
D
C
B
A

- BUILD NOTES**
- ① PREPARE SUBGRADE FOR STRUCTURE INCLUDES EXCAVATION (3-FT BELOW BOTTOM FOUNDATION ELEV.)
 - ② FILL CONSTRUCTION FOR STRUCTURES INCLUDING PLACEMENT AND COMPACTION OF SUITABLE ENGINEERED FILL MATERIAL.
 - ③ EXCAVATE AND SPOIL UNSUITABLE MATERIAL.



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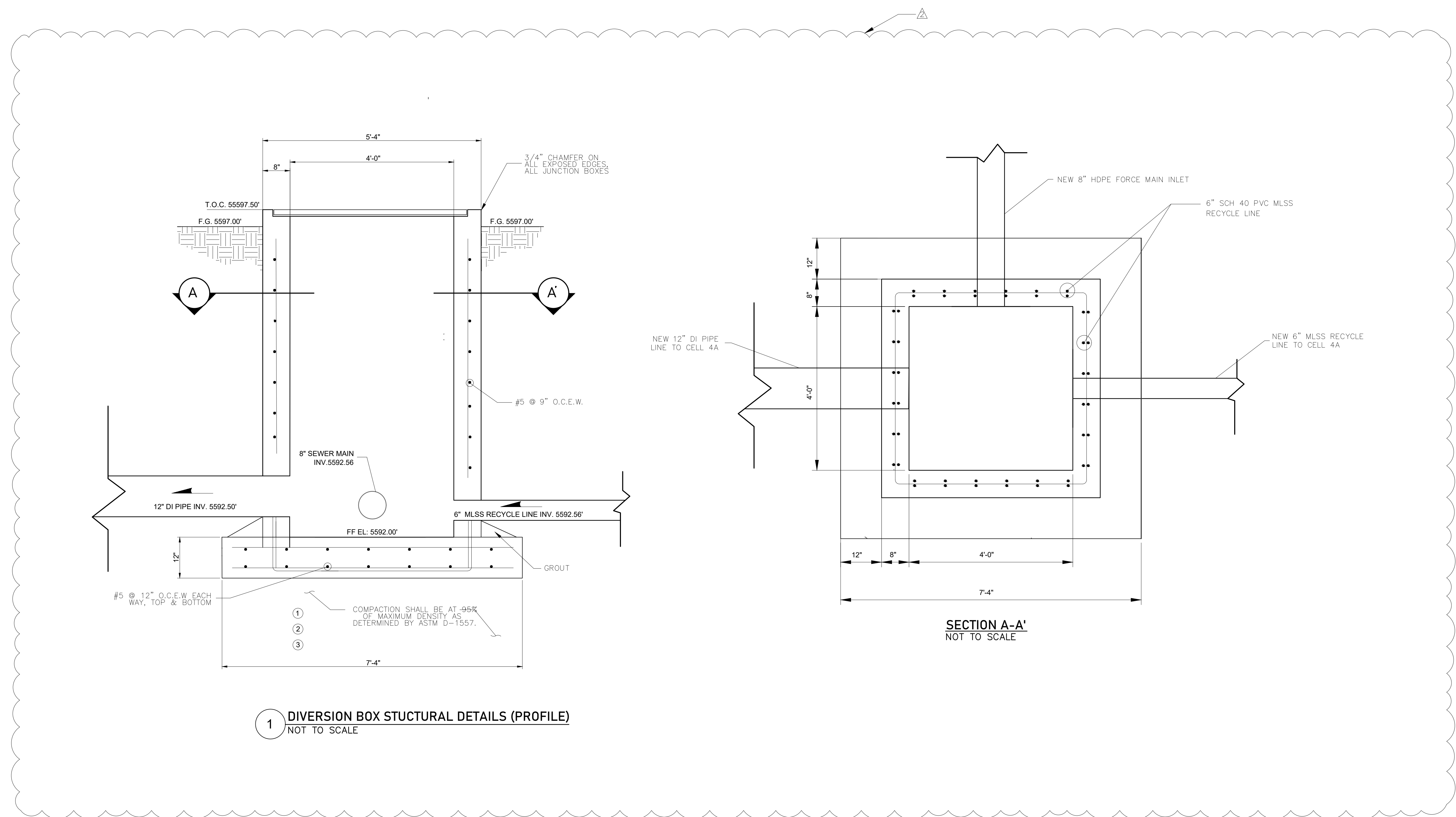
**NAVAJO TRIBAL UTILITY
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SHEET TITLE:
**DIVERSION BOX
DETAILS**

SHEET NUMBER:	REV. #
C-308	
SHEET 23 OF 55 SHEETS	

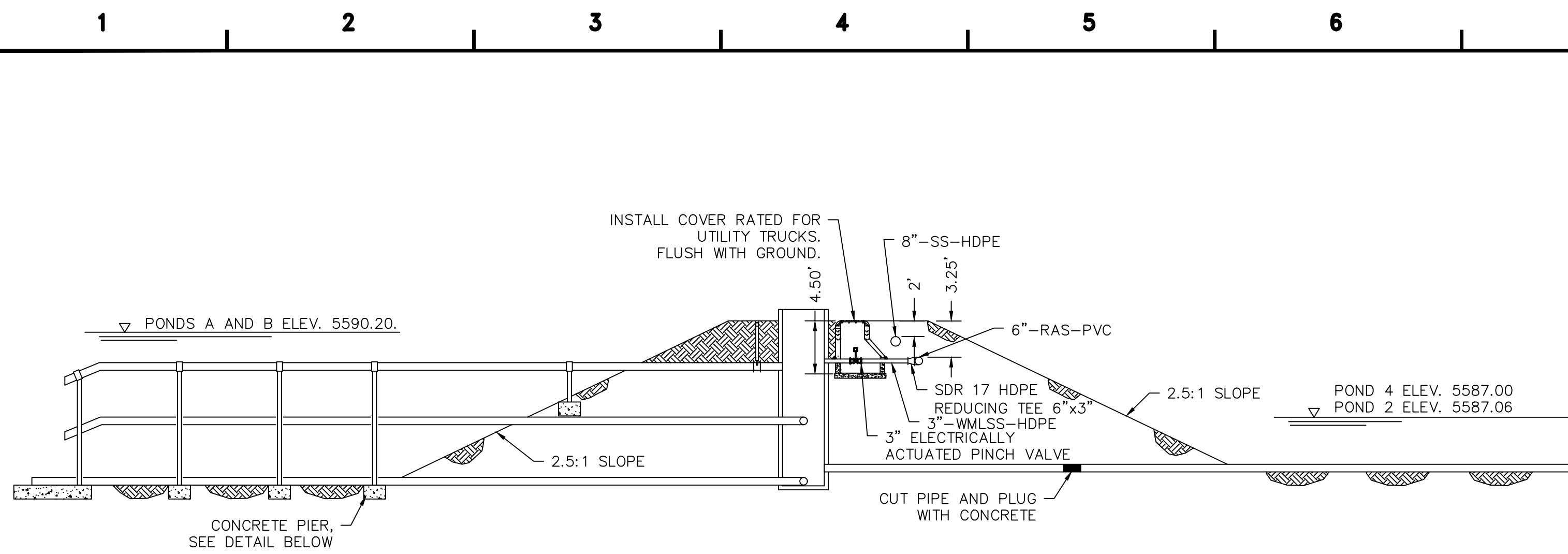


① **DIVERSION BOX STUCTURAL DETAILS (PROFILE)**
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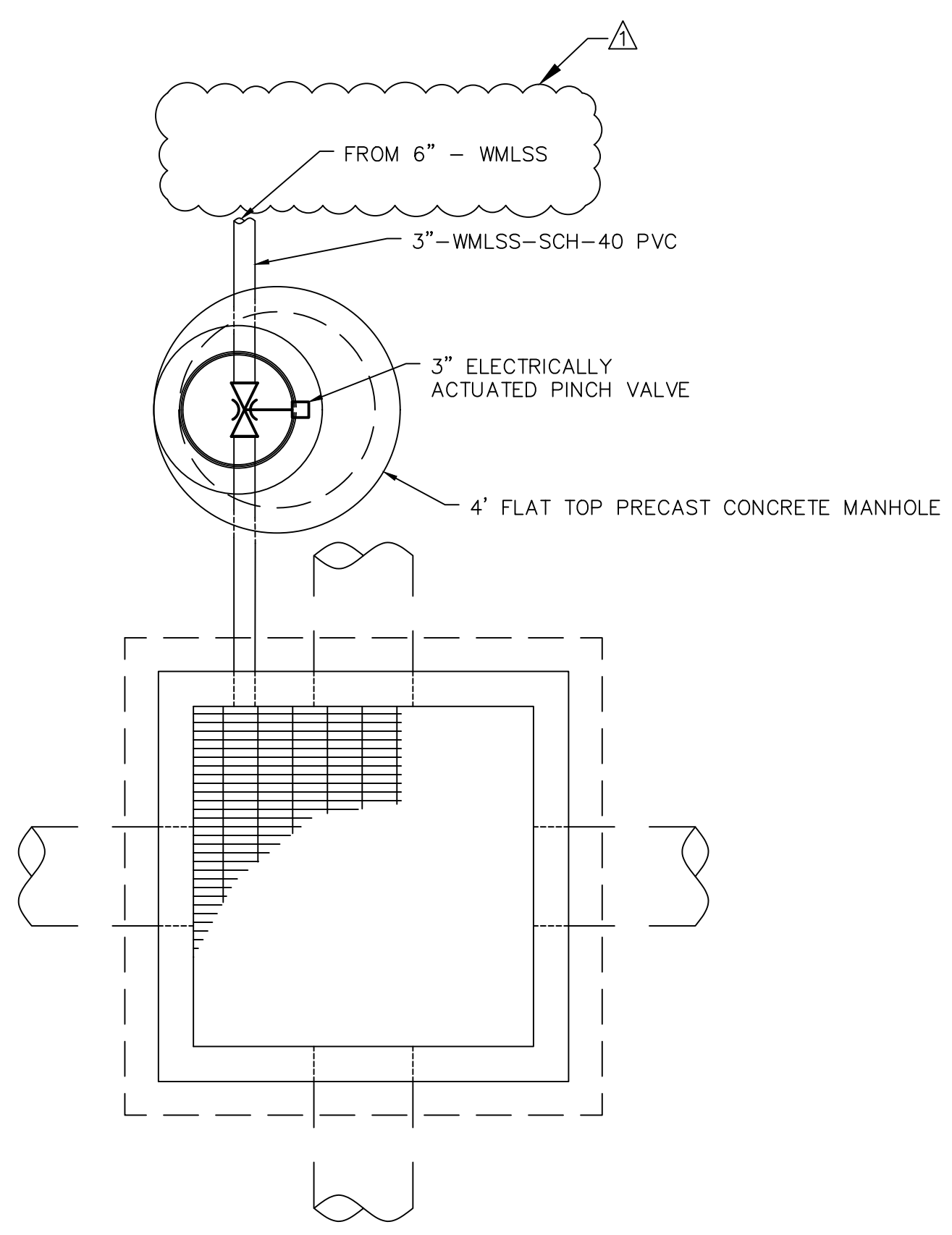
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NOT TO SCALE

1 2 3 4 5 6 7 8 9 10 11 12

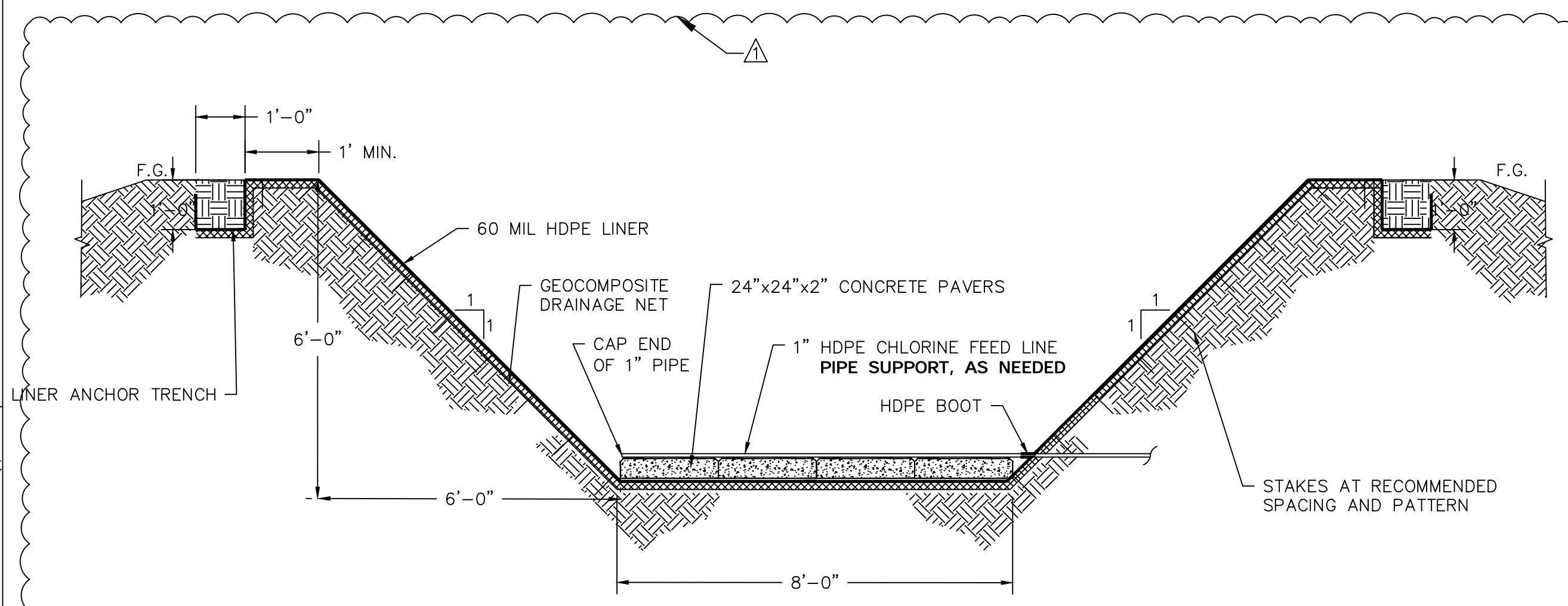
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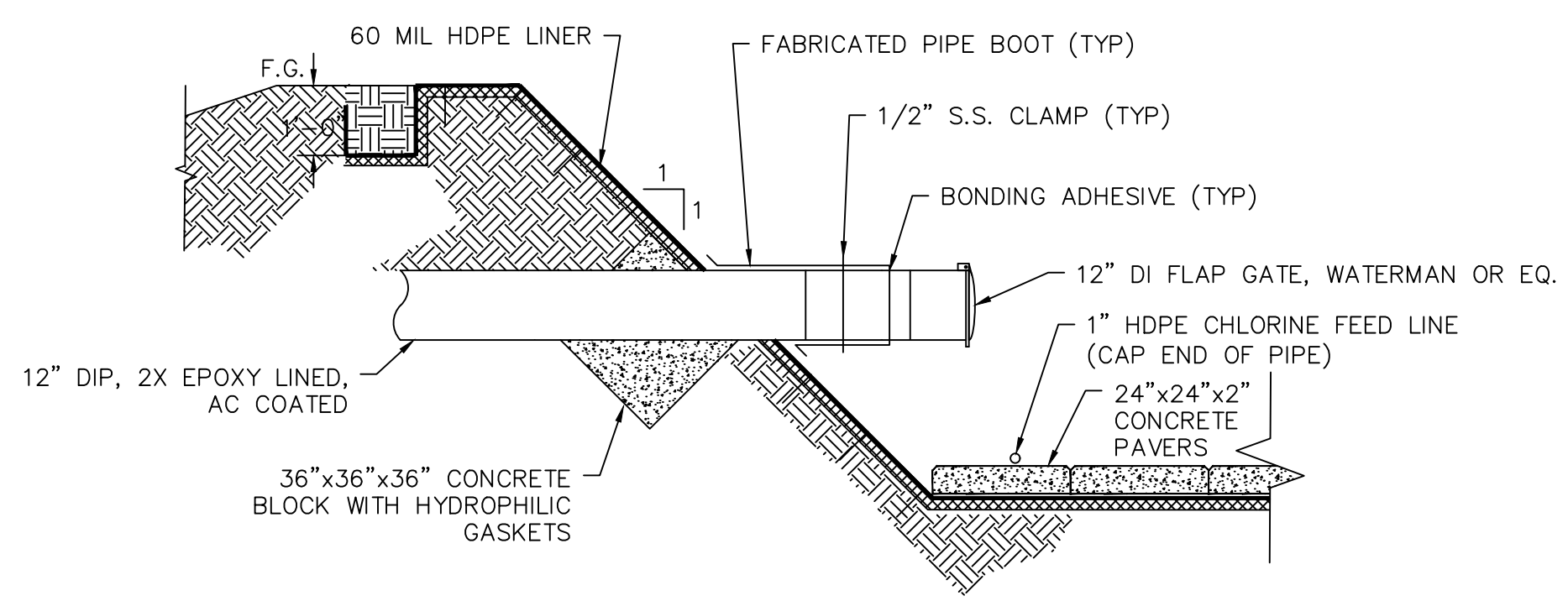
1 TYPICAL INTERIOR DIKE PONDS B TO 4 & PONDS A TO 2
NOT TO SCALE



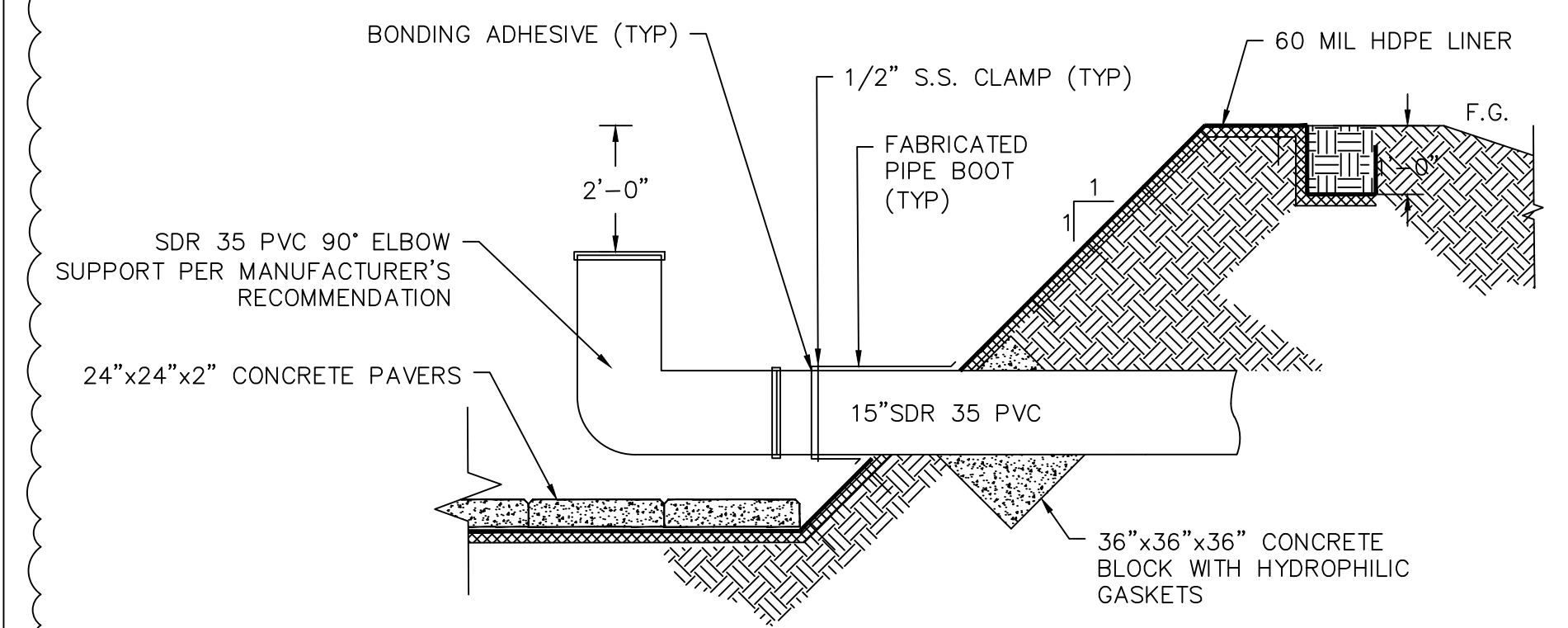
3 PLAN VIEW JUNCTION BOX
NOT TO SCALE



2 DISINFECTION EXTENSION CHAMBER DETAIL
NOT TO SCALE



2A INLET PIPE DETAIL
NOT TO SCALE



2B OUTLET PIPE DETAIL
NOT TO SCALE



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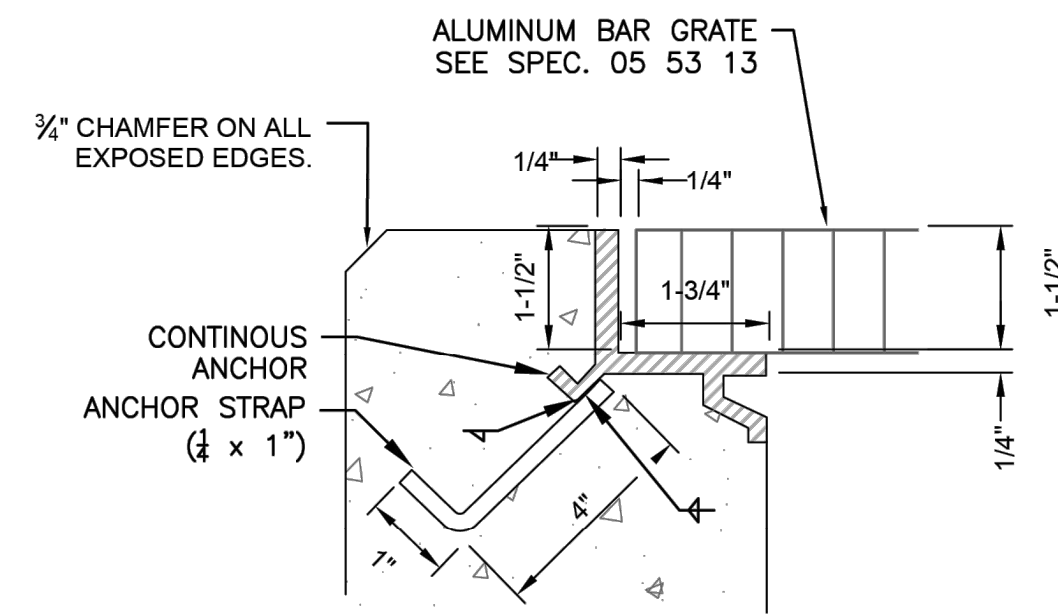
REVISIONS			
NO.	DATE	BY	APPROVED
1	1/22/2024	A.ORRANTIA	S.STANDUKAR

DESIGNED BY:	WSP - BM
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DATE:	07/14/2023

SHEET TITLE:
DETAILS

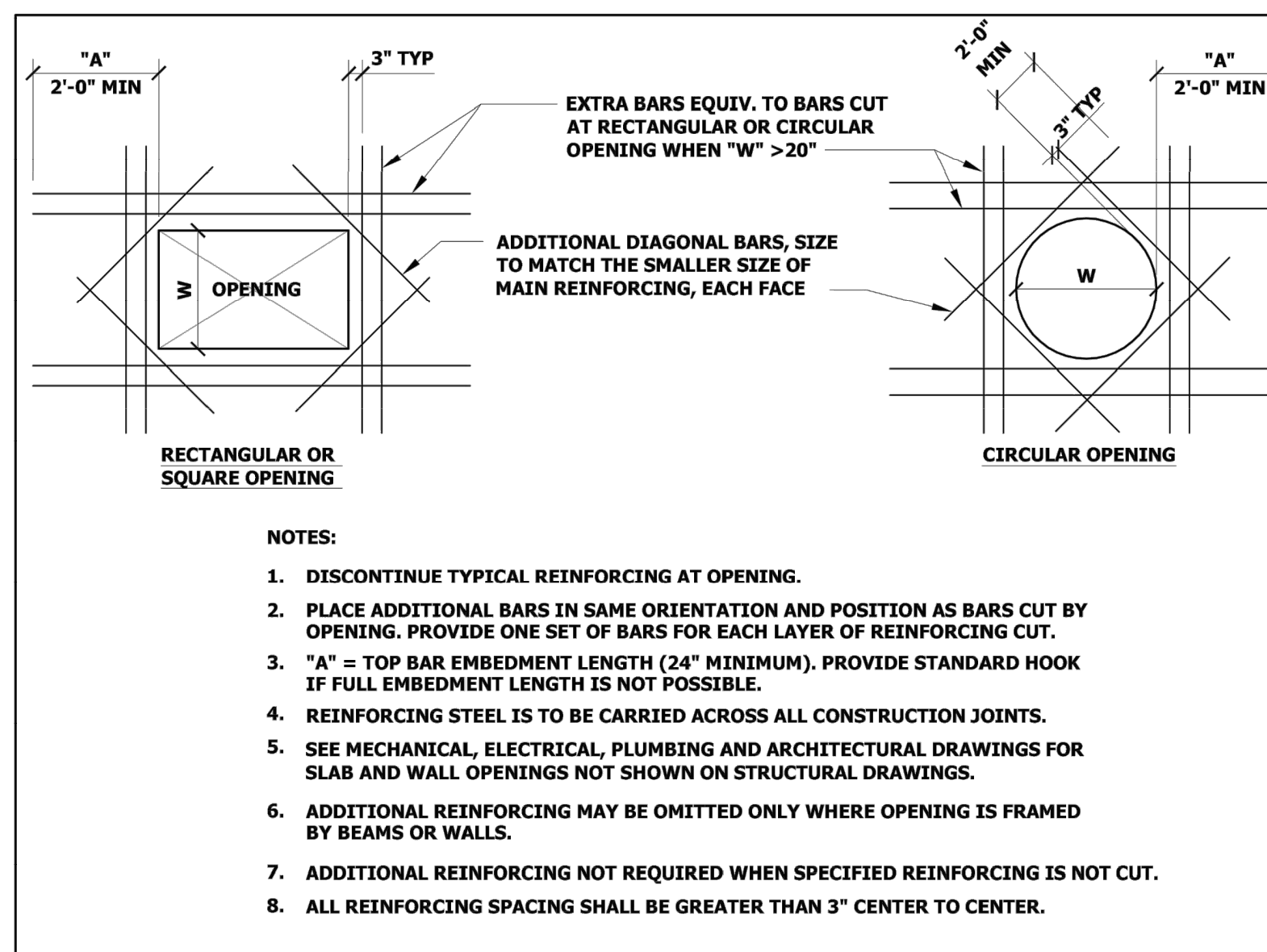
SHEET NUMBER:	REV. #
C-309	
SHEET 24 OF 55 SHEETS	

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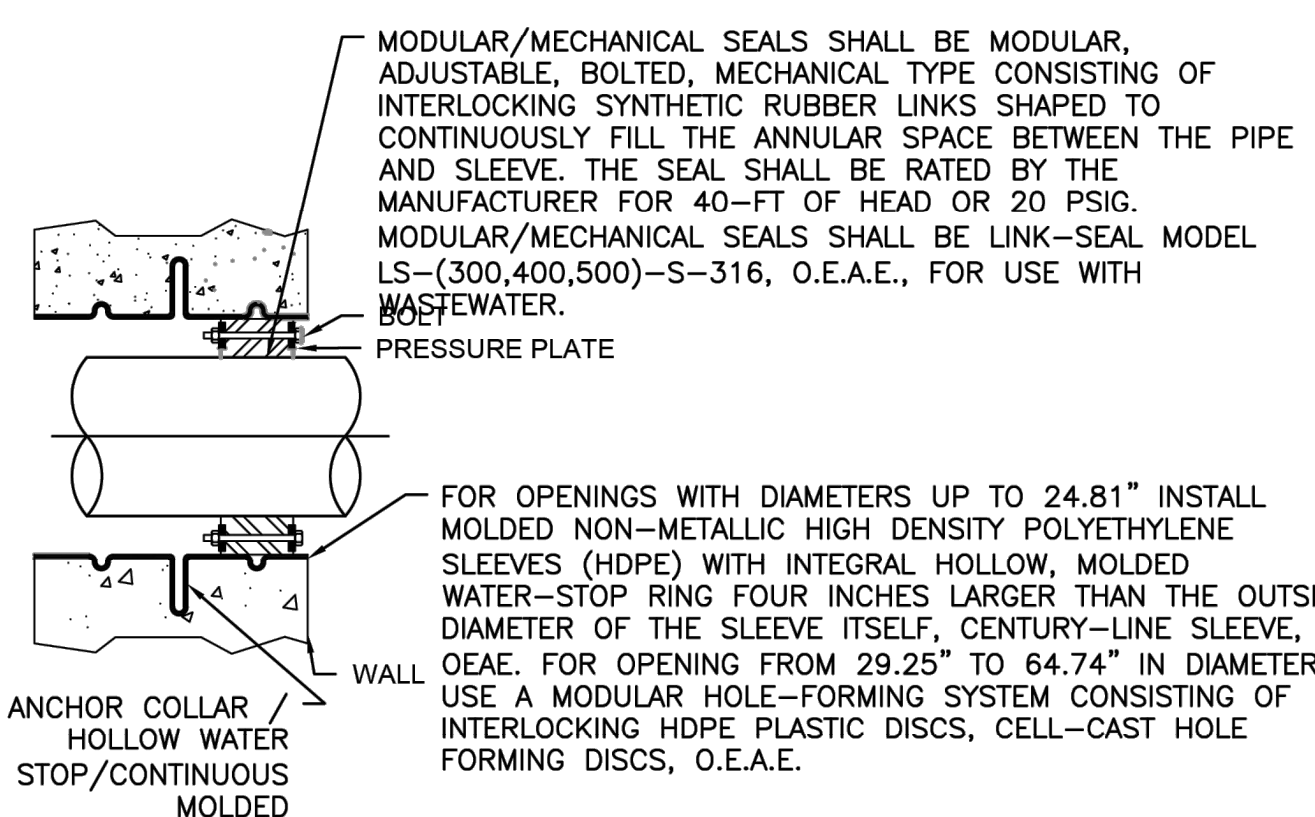


1 TYPICAL GRATE INSET (NEW STRUCTURES)
NOT TO SCALE

- NOTES:**
1. ALL NEW STRUCTURES WITH GRATING SHALL USE EMBEDDED GRATING FRAMES.
 2. FRAMES SHALL HAVE MITRED CORNERS AND WELDED JOINTS AND SHALL BE SIZED TO MATCH GRATING DEPTHS. VERTICAL AND HORIZONTAL LEGS OF THE FRAME SHAPE SHALL HAVE 1/4-INCH WALL THICKNESS. FRAME SHALL BE DESIGNED TO PROVIDE CONTINUOUS SLOT TO ACCOMMODATE FASTENERS, AND SHALL HAVE A CONTINUOUS EXTRUDED ANCHOR SURFACES COMING INTO CONTACT WITH CONCRETE SHALL BE PAINTED WITH ONE COAT OF BITUMINOUS PAINT.
 - 3.
 - 4.

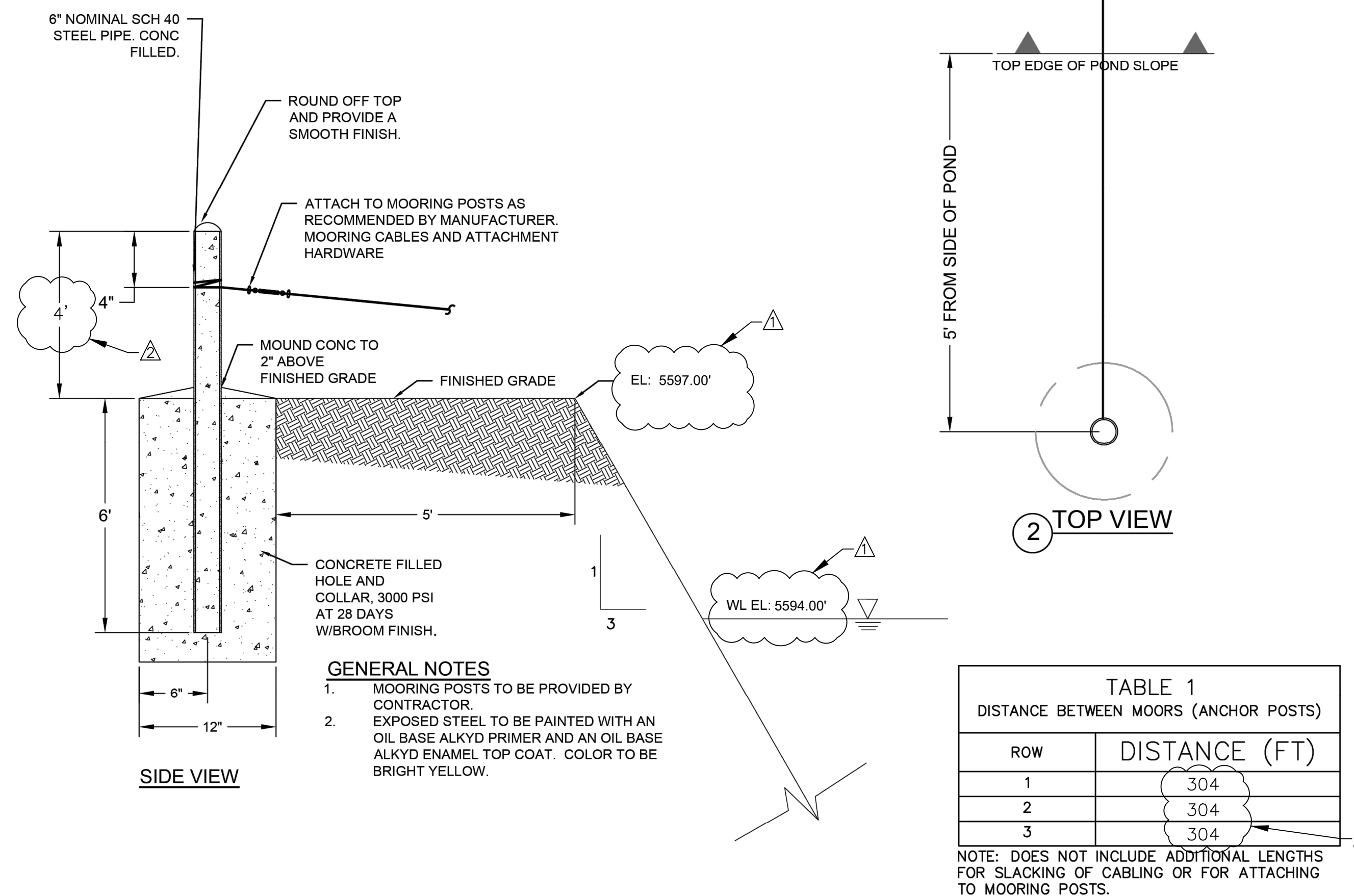


4 CONCRETE PIPE PENETRATION (OPENINGS 12" TO 48")
NOT TO SCALE



3 PIPE PENETRATION NEW WALLS OR FLOORS
NOT TO SCALE

NOTE:
THE ABOVE DETAIL APPLIES TO ALL NEW WALL AND FLOOR PIPE PENETRATIONS OTHER THAN THOSE IDENTIFIED IN THE "PVC INSERT LOCATION CHART" ON SHEET 177-BNR-718.



5 ANCHOR POST FOR DIFFUSERS, AERATORS, AND BAFFLES
NOT TO SCALE

ROW	DISTANCE (FT)
1	304
2	304
3	304

NOTE: DOES NOT INCLUDE ADDITIONAL LENGTHS FOR SLACKING OF CABLING OR FOR ATTACHING TO MOORING POSTS.



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2	2/13/2024	A. ORRANTIA	S. STANDUKAR

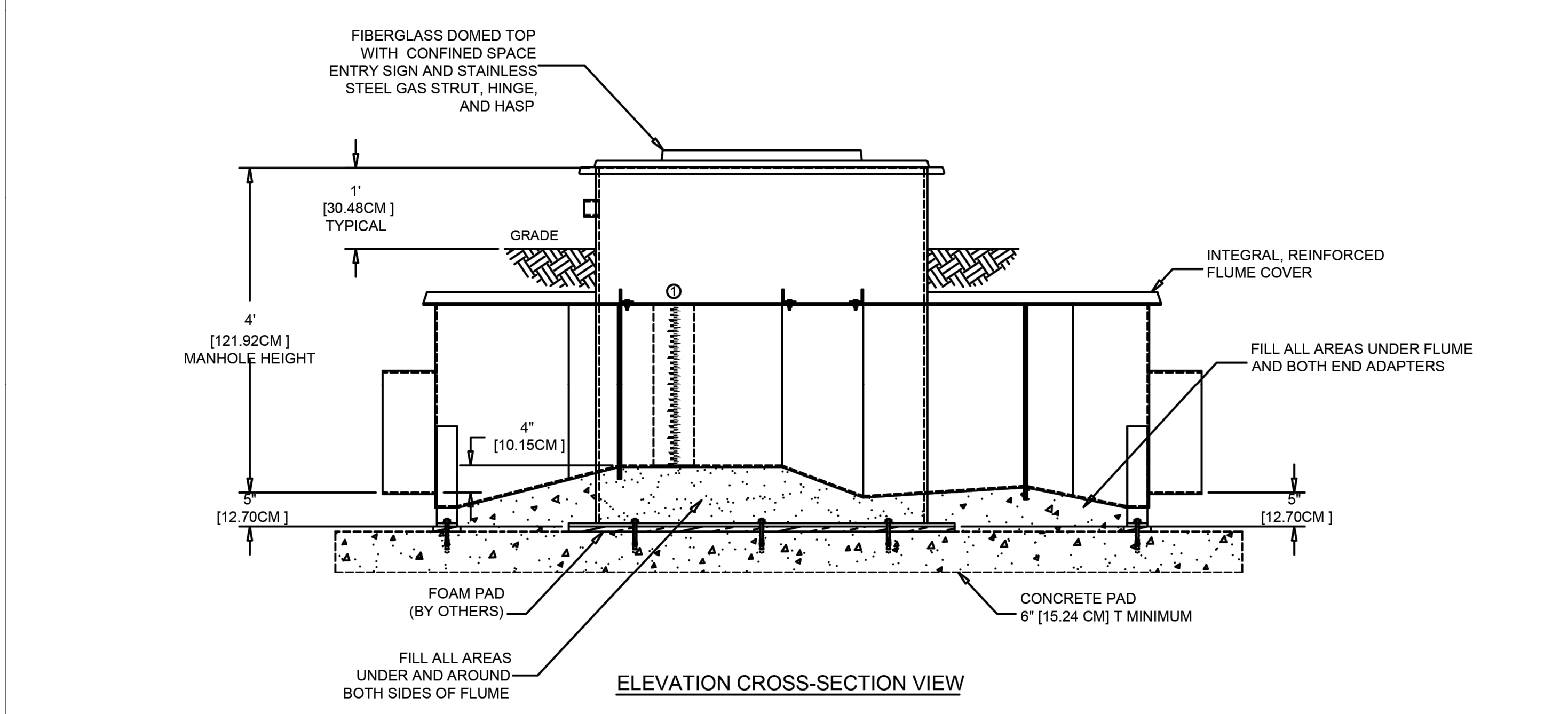
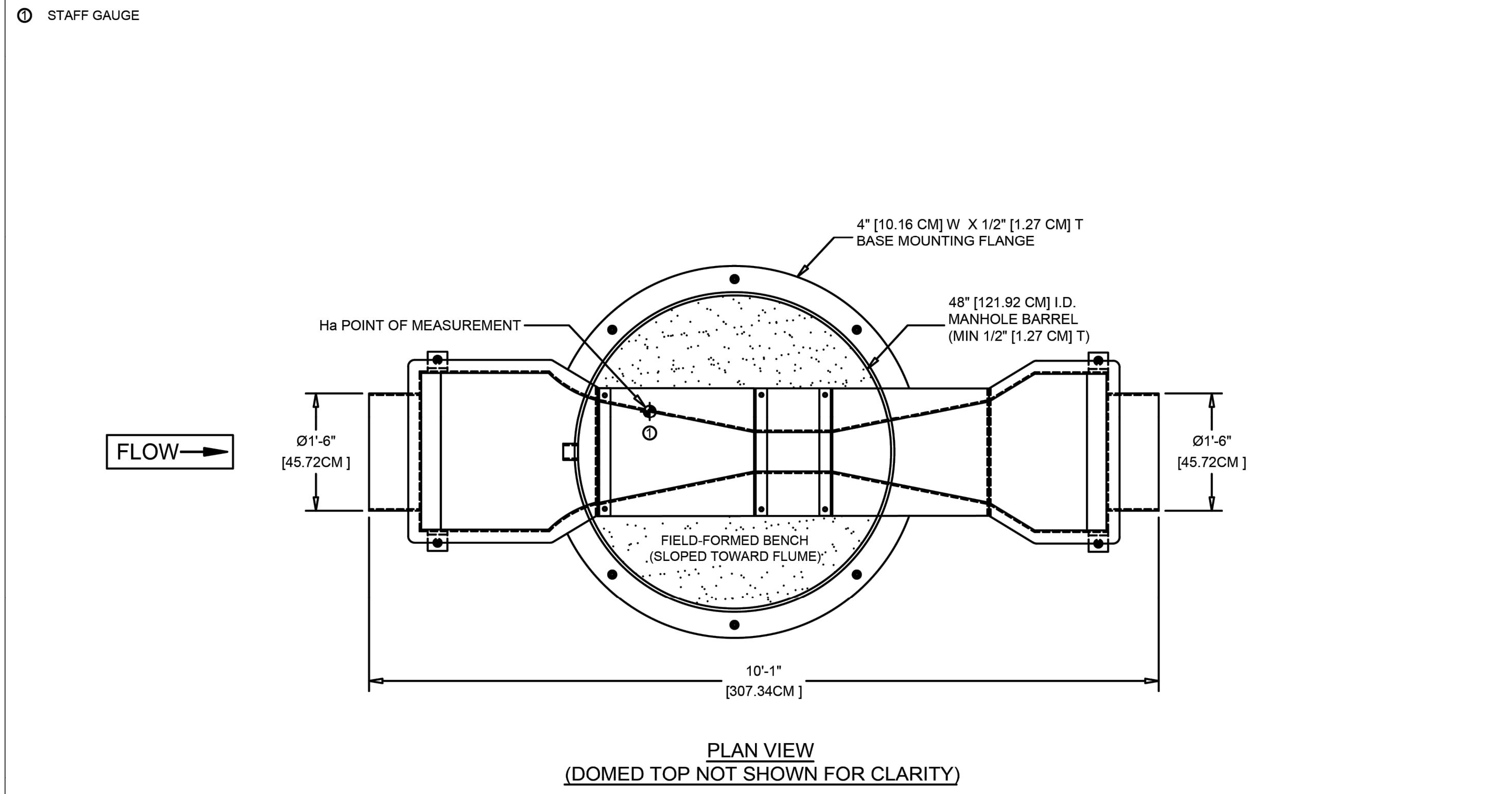
DESIGNED BY: WSP - BM
DRAWN BY: WSP - AO
CHECKED BY: WSP - BM
APPROVED BY: WSP - BM
DATE: 07/14/2023

SHEET TITLE:
DETAILS

SHEET NUMBER: **C-310**
REV. #
SHEET 25 OF 55 SHEETS

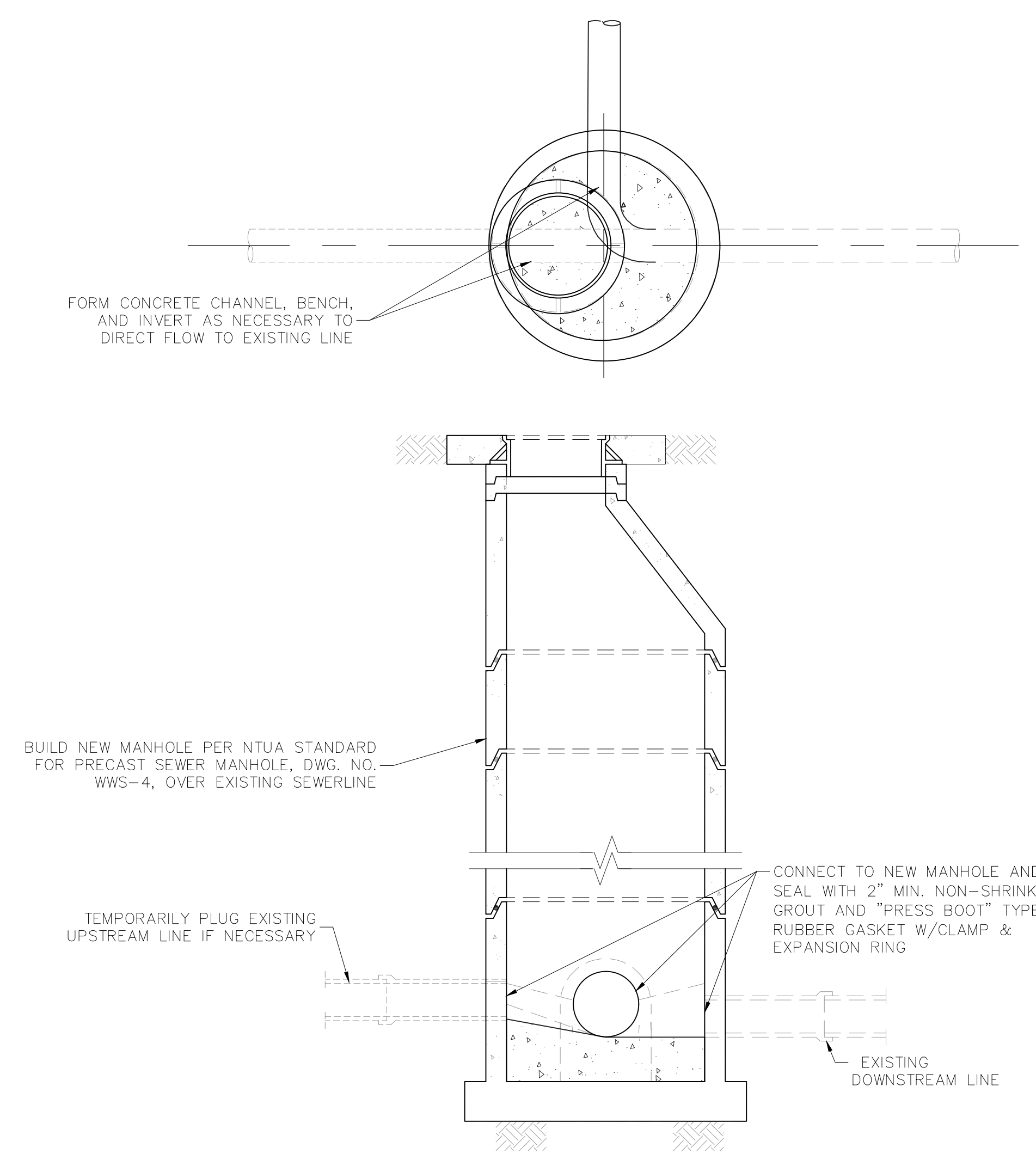
X:\USAB0500-ABQ\Project\consulting\projects\22-517-0001.NTUA-HPP Kayenta WWF\CAD\C-311_METER MANHOLE DETAIL.dwg

FREE-FLOW CAPACITY: 24.32 GPM [1.534 L/S] MINIMUM - 1,754 GPM [110.7 L/S] MAXIMUM



ATM
D 1941
D 3753

NOTES:		OPENCHANNELFLOW BOISE ATLANTA	
1) SIZING AND PROVISION FOR CONCRETE PAD BY OTHERS		DWG NO.	DATE 22.08.29
2) FIELD-FORMED, SLOPPED BENCH TO TOP OF FLUME (CONCRETE OR SAND CAPPED BY CONCRETE), FILLING ALL AREAS UNDER AND AROUND BOTH SIDES OF FLUME, SHORING UP THE FLUME		DOMED TOP MANHOLE, Ø48", W/ 6" PARSHALL, Ø18" STUBS, & GAUGE	
This drawing and the data contained within is the sole, confidential property of OPENCHANNELFLOW (OCF) and may not be copied, reproduced, disclosed to others, in whole or in part, without the prior written consent of OCF. OCF reserves the right to change any dimension, finish, material, or method of construction indicated on this drawing at will and without notice. This drawing is provided in confidence with the understanding it shall be returned to OCF upon demand.			
REV	REVISION DESCRIPTION	BY	DATE



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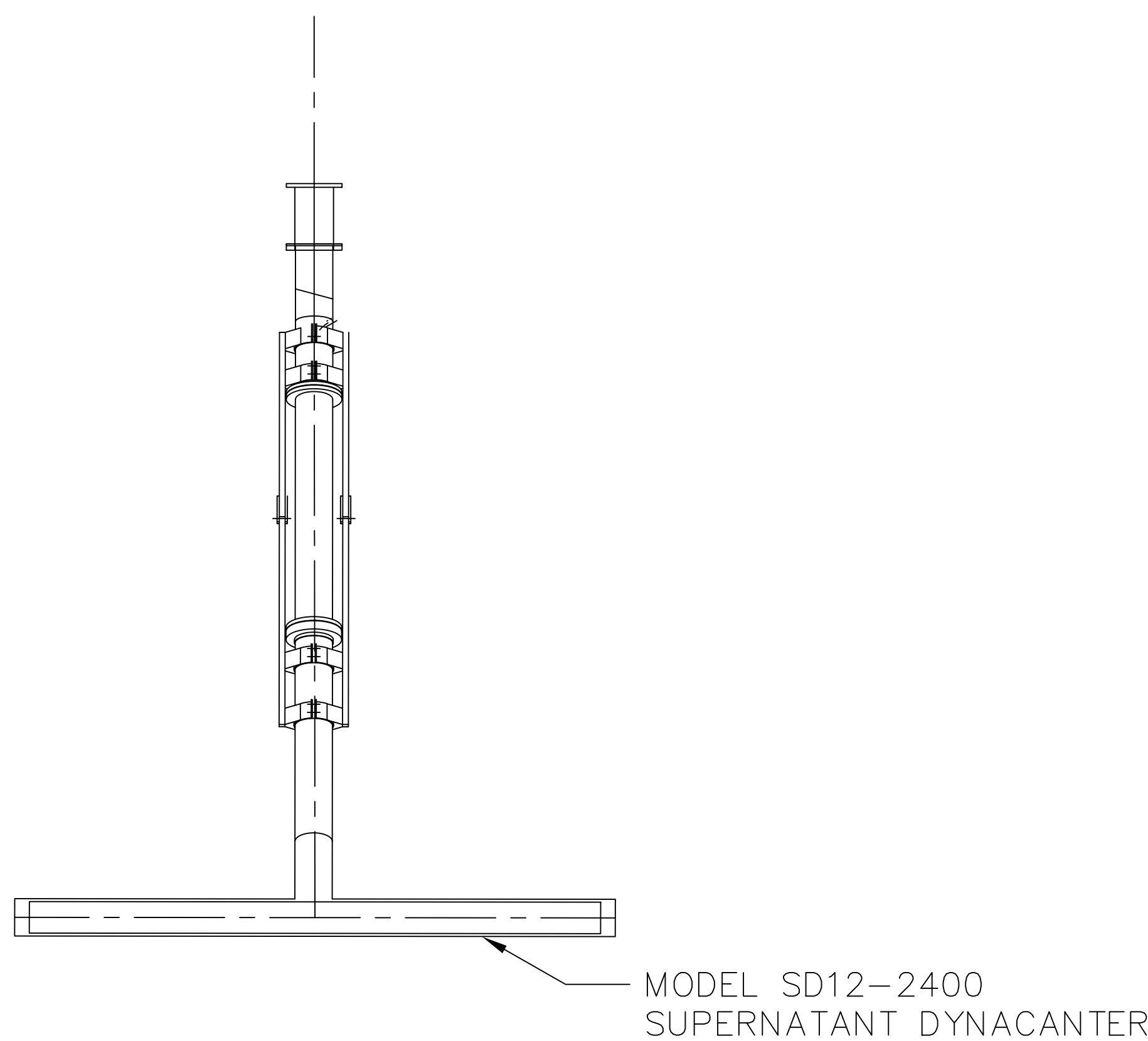
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DATE: 07/14/2023

SHEET TITLE:
MANHOLE DETAILS

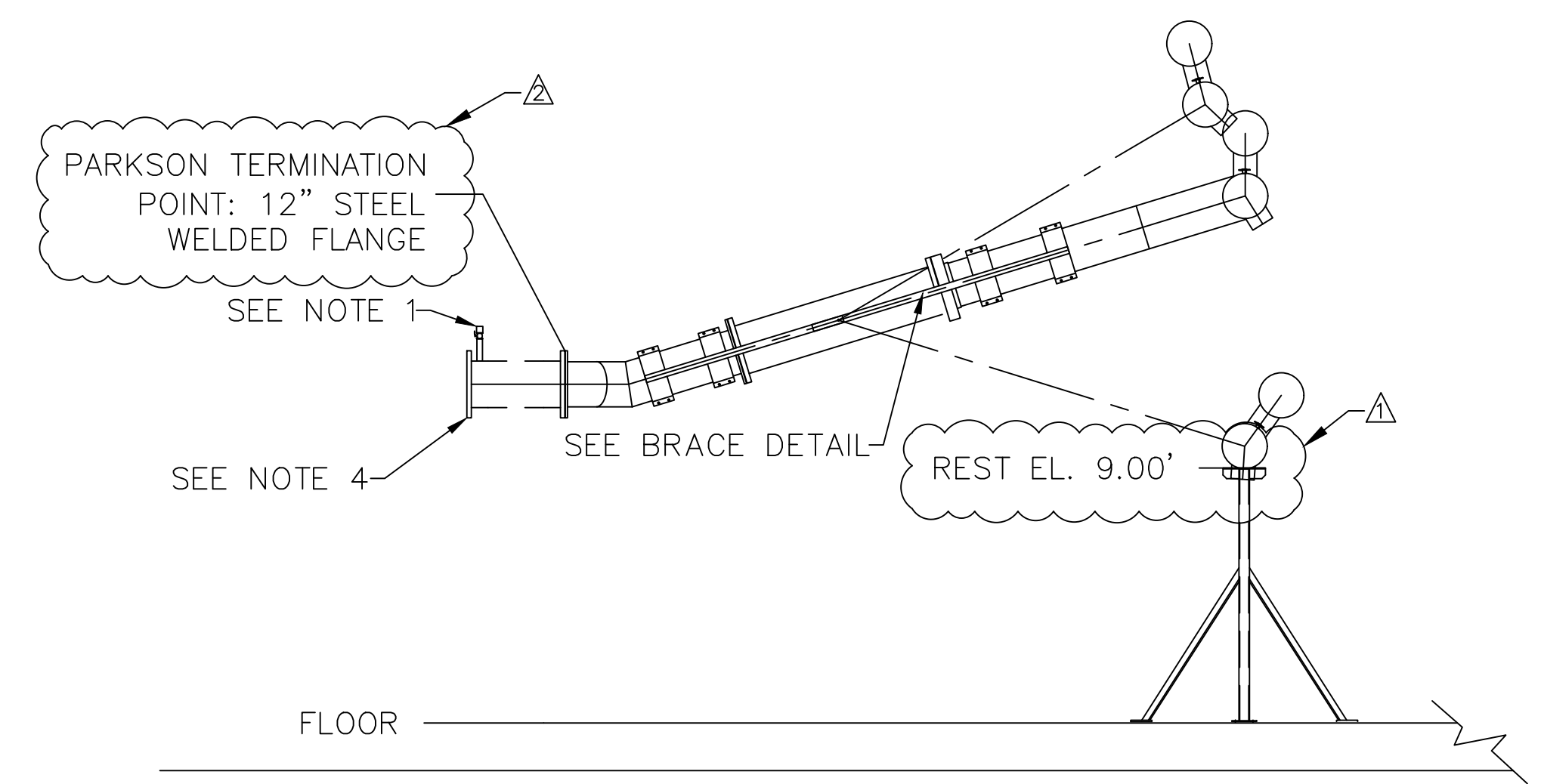
SHEET NUMBER: **C-311**
REV. #
SHEET 26 OF 55 SHEETS

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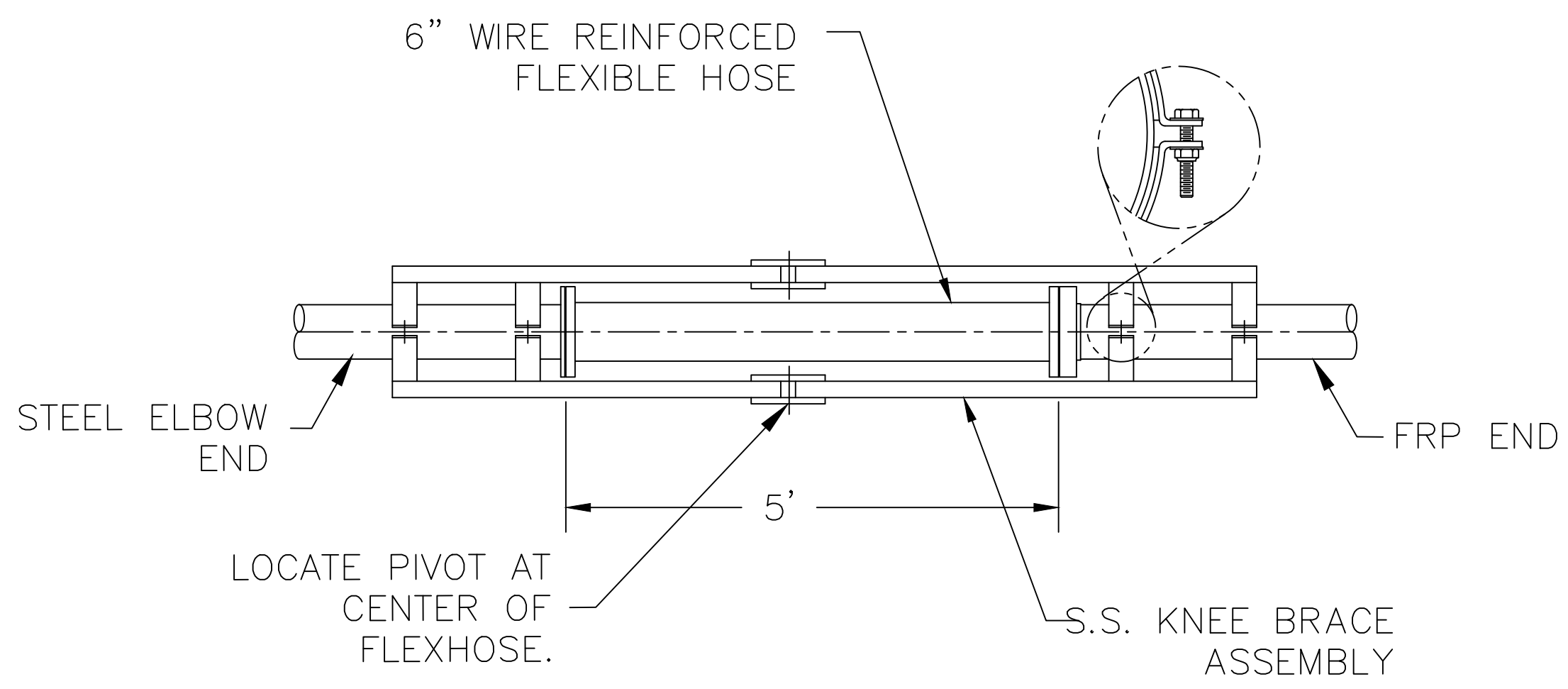


1 FLOATING DECANTER (PLAN)
NOT TO SCALE

- NOTES:**
- 1) ALL FLANGES SHALL MEET OUTSIDE DIAMETER, BOLT CIRCLE DIAMETER, NUMBER AND SIZE OF HOLES PER ANSI B.16.1 125 LB. CAST IRON, AND ANSI B16.5 150 LB. STEEL FLANGE SPECIFICATIONS.
 - 2) CONTRACTOR NEEDS TO PROVIDE A 3/4 " NIPPLE AND GLOBE VALVE BETWEEN OUTSIDE OF DECANTER SPOOL PENETRATION AND EFFLUENT CONTROL VALVE TO SERVE AS A FILL PORT TO SINK DECANTER AT START-UP.
 - 3) DECANTER OUTLET PIPING MUST BE DESIGNED WITH A SUBMERGED OUTLET OR TRAPS TO PREVENT AIR FROM ENTERING THE DECANTER.
 - 4) CONTRACTOR TO SUPPLY ALL INTERCONNECTING HARDWARE AND GASKETS.
 - 5) DECANTER REST ASSEMBLY SHALL BE PROVIDED AND INSTALLED IN ACCORDANCE TO MANUFACTURER'S RECOMMENDATIONS.



2 FLOATING DECANTER (PROFILE)
NOT TO SCALE



3 BRACE DETAIL
NOT TO SCALE



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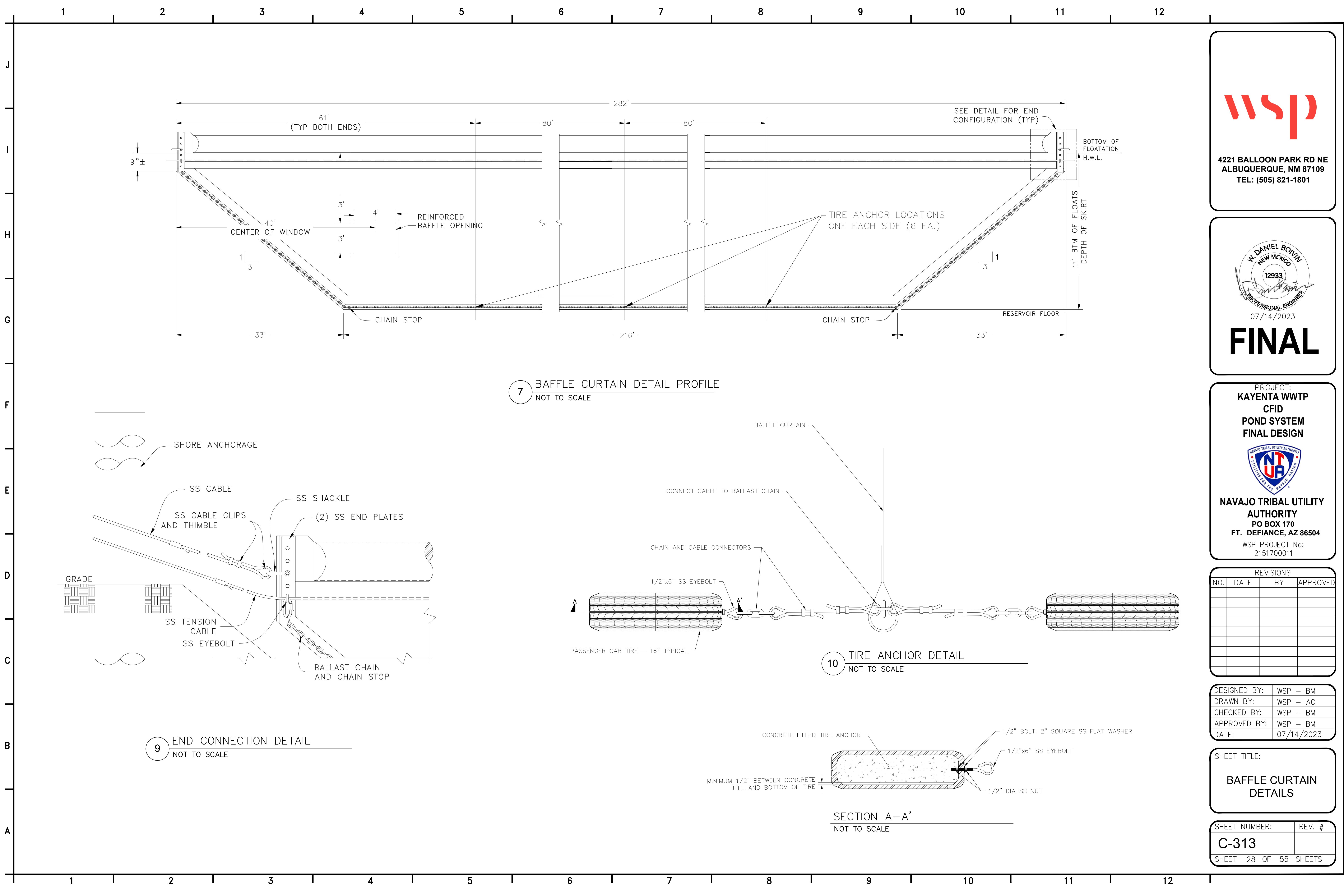
REVISIONS			
NO.	DATE	BY	APPROVED
1	1/22/2024	A.ORRANTIA	S.TANDUKAR
2	2/13/2024	A.ORRANTIA	S.TANDUKAR

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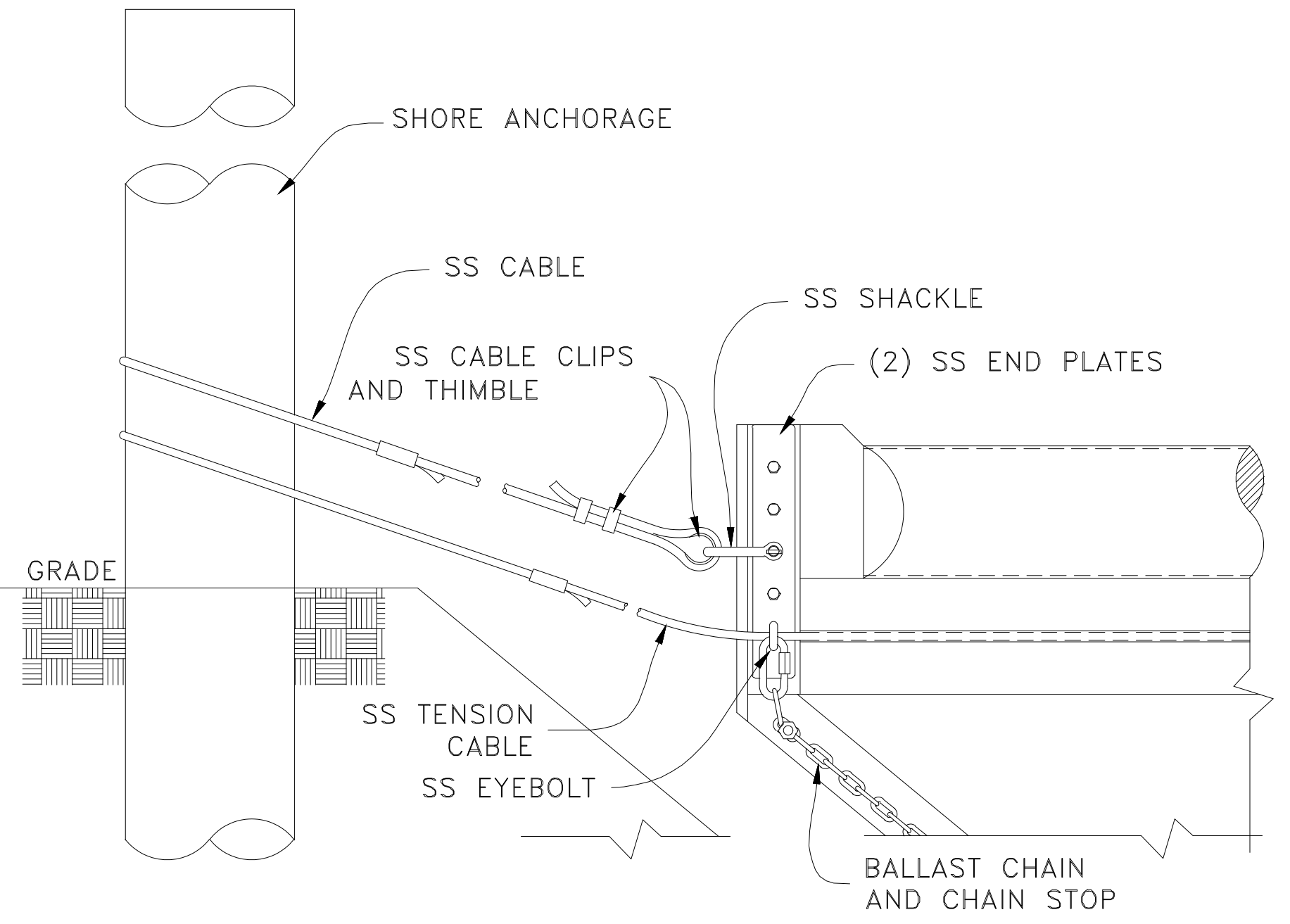
SHEET TITLE:
**FLOATING DECANTER
DETAILS**

SHEET NUMBER:	REV. #
C-312	
SHEET 27 OF 55 SHEETS	

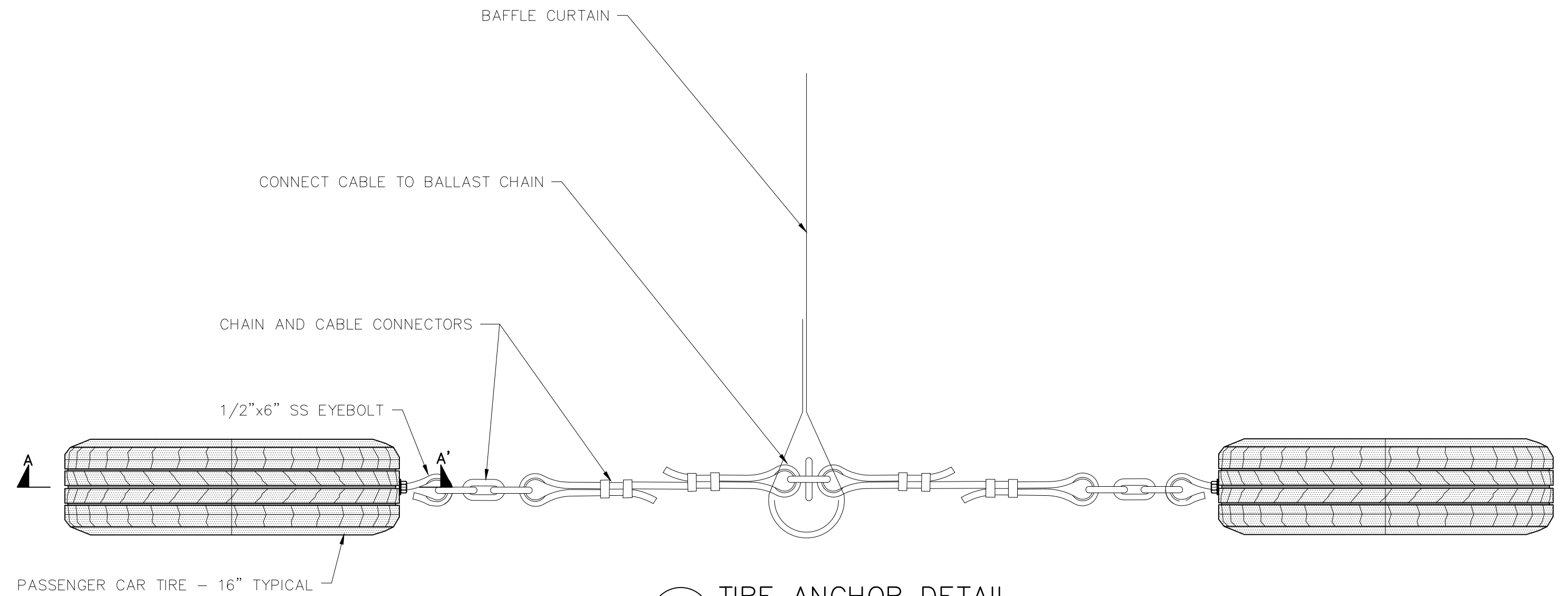
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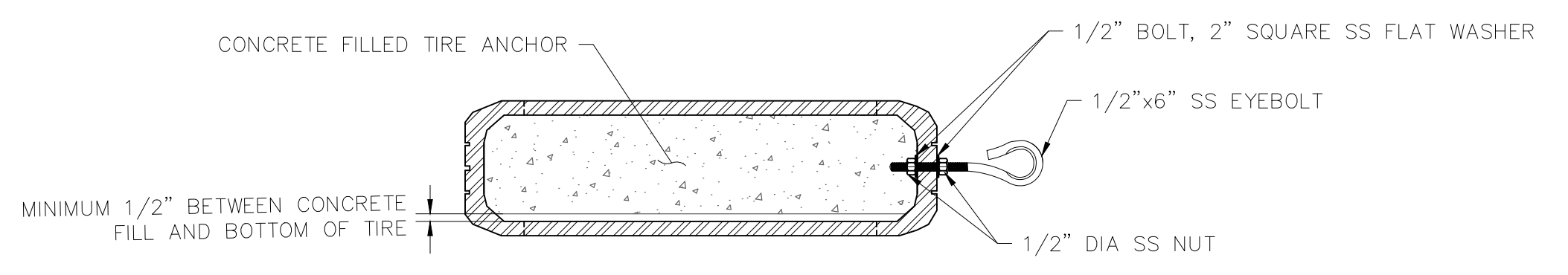
7 BAFFLE CURTAIN DETAIL PROFILE
NOT TO SCALE



9 END CONNECTION DETAIL
NOT TO SCALE



10 TIRE ANCHOR DETAIL
NOT TO SCALE



SECTION A-A'
NOT TO SCALE

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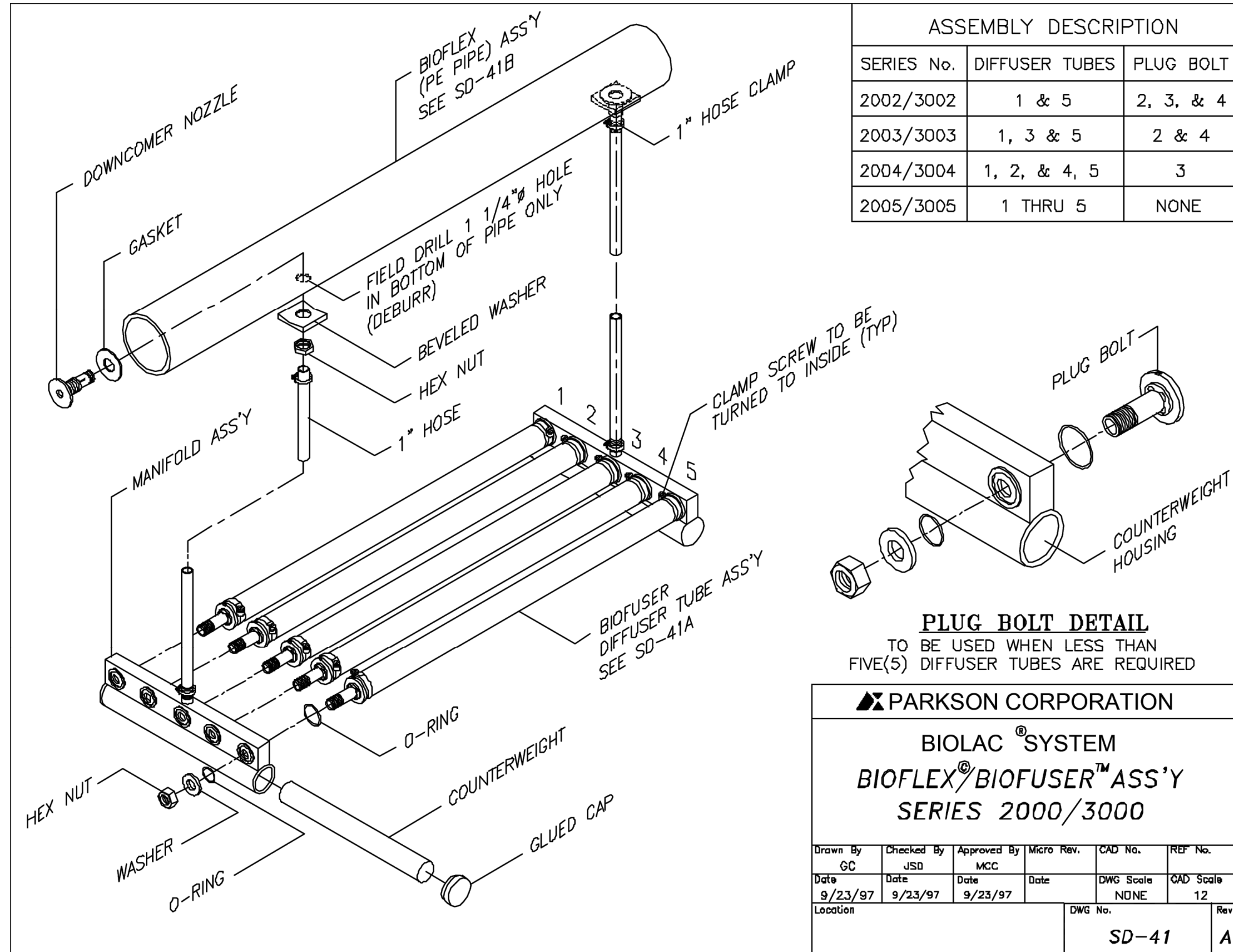
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SHEET TITLE:
**BAFFLE CURTAIN
DETAILS**

SHEET NUMBER:	REV. #
C-313	
SHEET 28 OF 55 SHEETS	

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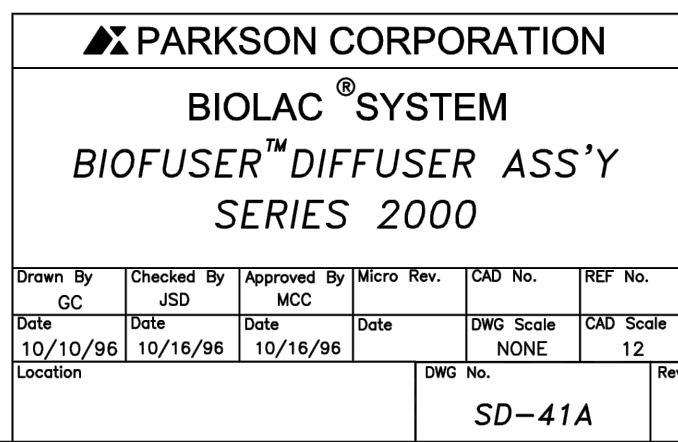


BIOFUSER™ ASSEMBLY

THE BIOFUSER DIFFUSER ASSEMBLY IS SHIPPED LOOSE AND ASSEMBLED IN THE FIELD BY CONTRACTOR. THE BIOFUSER ASSEMBLY SHOULD BE ASSEMBLED BEFORE THE PE PIPE IS WELDED TOGETHER. THE COUNTERWEIGHT CAN BE INSTALLED AT THIS TIME, OR FOR HANDLING PURPOSES, INSTALLED JUST BEFORE THE DOWNCOMER HOSES ARE CONNECTED.

TO ASSEMBLE USE THIS WITH S.D. DRAWING SD-41

- A. TO ASSEMBLE THE DIFFUSER TUBES INTO THE MANIFOLD, SELECT A FLAT SURFACE (TABLE). MAKE SURE THE TABLE IS SMOOTH AND NO SHARP EDGES THAT COULD CUT THE DIFFUSER SHEATHS.
- B. PLACE TWO MANIFOLDS ON THE TABLE ONE AT EACH END AND AS MANY DIFFUSER TUBES AS REQUIRED PER APPROPRIATE DRAWING. PLACE TWO WOODEN 2x4"s UNDER AND PERPENDICULAR TO THE TUBES TO RAISE THE TUBES OFF THE TABLE.
- C. SLIDE THE LARGE O-RING OVER THE BOSS ON THE END OF THE DIFFUSER TUBE. THEN INSERT ONE END OF THE DIFFUSER TUBE INTO THE MANIFOLD. MAKE SURE THE O-RING IS PROPERLY SEATED AND THE SCREW ON THE CLAMP IS FACING TO THE INSIDE. NEXT, INSTALL THE OUTSIDE (SMALL) O-RING AND PROPERLY SEAT INTO THE O-RING GROOVE IN THE MANIFOLD. THEN SLIDE THE WASHER OVER THE BOLT AND AGAINST THE O-RING. START THE NUT ONTO THE BOLT, APPLY MAX. TWO(2) DROPS LOCTITE #425 ON THE BOLT THREADS, OUTSIDE THE WASHER.
- MAKE SURE THAT THE LOCATING GROOVES ON THE TUBES LINE UP WITH THE LOCATING PINS ON THE MANIFOLD. THEN SCREW THE NUT UNTIL HAND TIGHT.
- INSTALL ALL THE DIFFUSER TUBES, AND PLUG BOLTS IF REQUIRED, INTO ONE MANIFOLD THEN INSTALL THE MANIFOLD ONTO THE OTHER END USING THE SAME PROCEDURE. AFTER THE TUBES ARE ASSEMBLED TO THE MANIFOLDS HAND TIGHT, TORQUE ALL NUTS TO 135 IN-LBS.
- CAUTION:** AFTER THE BIOFUSERS ARE ASSEMBLED, DO NOT STACK THE ASSEMBLIES ON TOP OF ONE ANOTHER, AS THIS CAN DAMAGE THE SHEATHS. LAY THE ASSEMBLIES ON THEIR SIDE, MAKING SURE THAT NOTHING MAKES CONTACT AGAINST THE DIFFUSER SHEATHS.

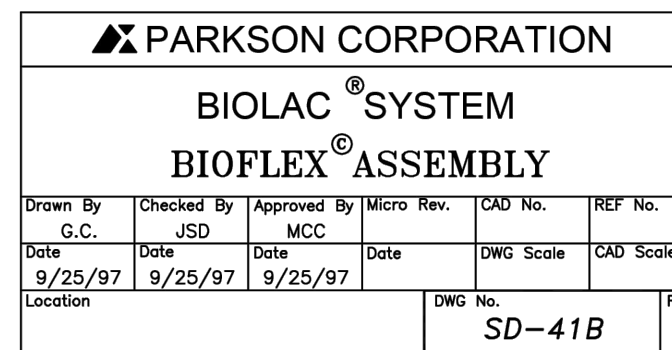
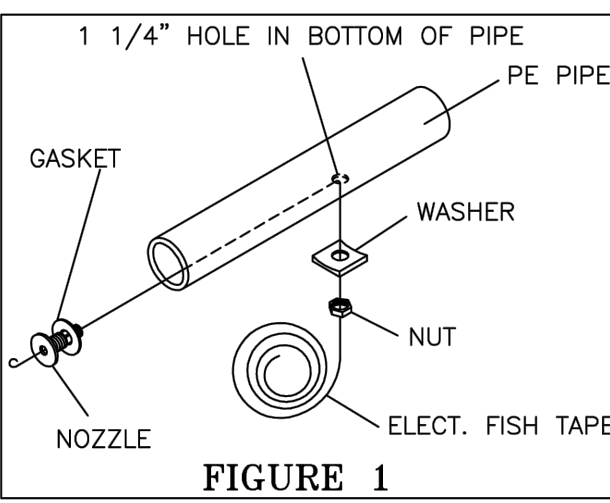


BIOFLEX® (PE PIPE) ASSEMBLY

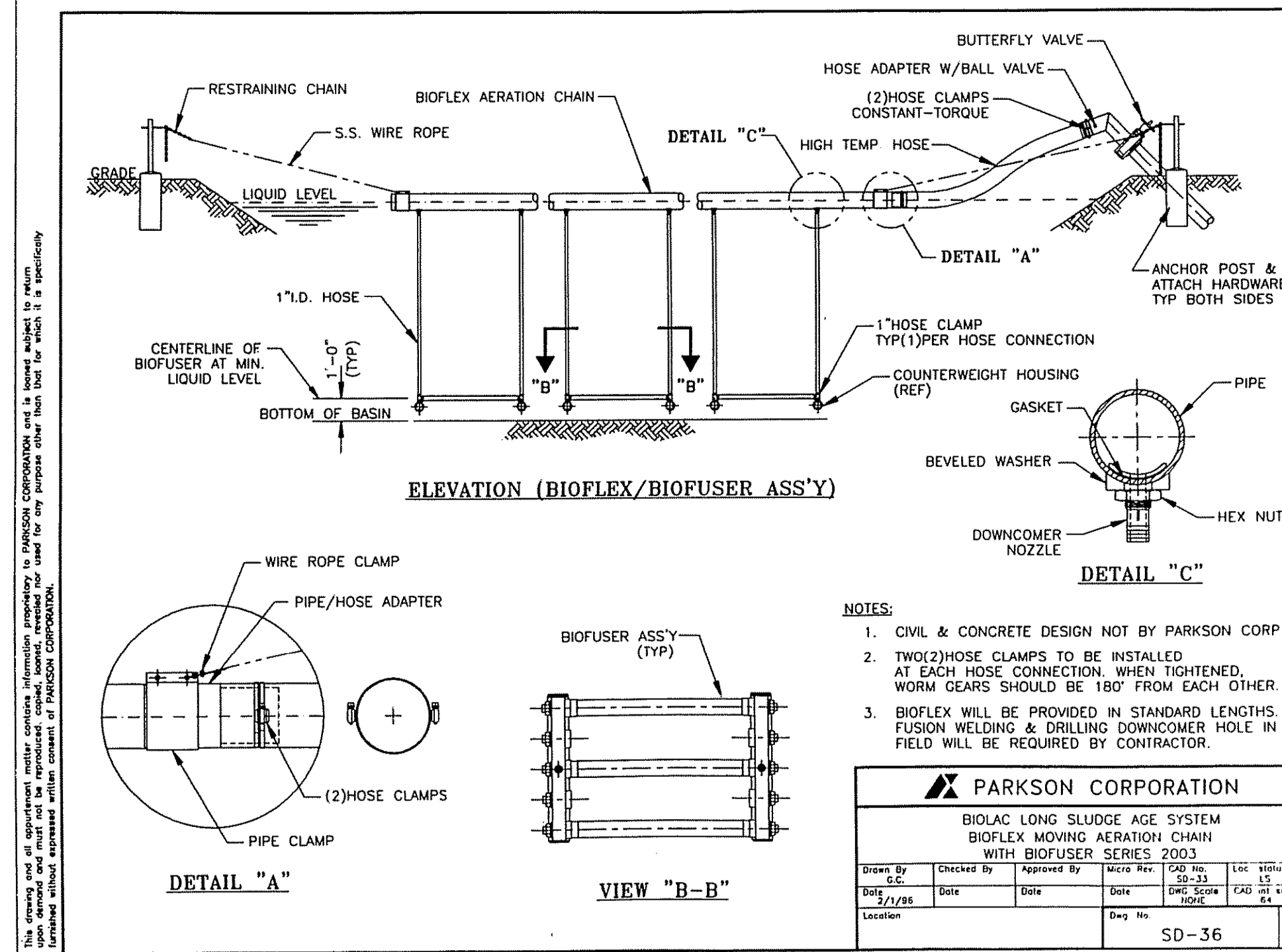
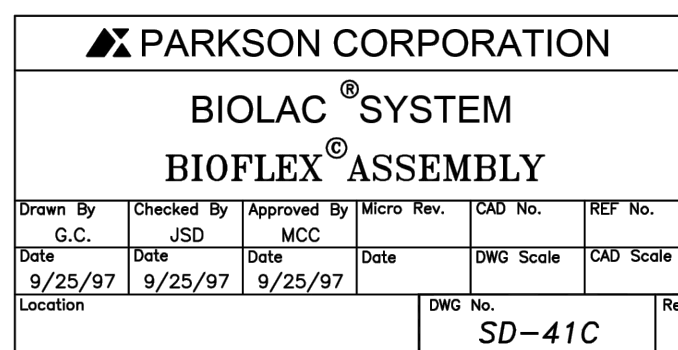
The floating lateral consists of HDPE pipe, end fittings and downcomer fittings. The pipe will be shipped in 20 ft or 40 ft length (normally 40 ft), and must be field welded (fusion welded) together by installation contractor.

In order to inspect the integrity of the fusion welds, the following procedure should be followed: Each welder will be required to make one test sample weld at the start and end of each days welding. An additional test sample should be made for every twenty(20) welds. The samples should be at least 6" long overall. Each weld sample should have three straps, 1" wide, cut lengthwise. Each strap is bent 90°. If there are any voids or gaps, the weld is unacceptable. These samples should then be sent back to Parkson for inspection.

- A. Field drill and match mark the PE pipe as per the pipe hole layout drawings furnished. Most of the pipe will have lettering in line full length of the pipe. This can be used as a hole centerline, as it is important that all the drilled holes be in line. Layout and drill the holes (1 1/4") using a hole saw. After drilling, deburr the hole inside and outside the pipe to provide a good seal. The downcomer fittings can be installed as they are drilled or as the pipe is being welded.
- B. To install the downcomer fittings use an electrician's steel fish tape or heavy wire of sufficient length to extend the full length of the unwelded pipe (max. 40 ft). Slide the nut and beveled washer onto the fish tape, then insert the fish tape into the hole in the pipe until it is accessible from the end of the pipe. Slide the downcomer fitting with rubber washer over the end of the fish tape and secure with a wire hook so the fitting will not slide off the fish tape. Pull the fish tape back through the hole until the downcomer fitting is pulled through the hole.
- C. The pipe should be welded together at the edge of the basin, starting with the closed end so it can be floated into the basin as it is welded together. Note a special hose adapter is to be welded to the open of the pipe. When the PE pipe has been completely welded together cut the Hi-temp hose to length as shown on drawings. Attach one end of hose to the PE pipe adapter and other end to hose adapter at the air header on shore. Assemble and attach the restraining cable/chain to both ends of the PE pipe as shown on the assembly drawing.
- D. The downcomer hose can be attached to the pipe downcomer fitting as the pipe is being welded together and before it enters the basin. Plug the end of the hose to prevent waste from entering the hose. Coil the hose and tie the hose to the PE pipe with twine. The diffuser assemblies can be attached to the downcomer hoses from a boat or could be attached to the downcomer hose then tied to the PE pipe on shore before it enters the basin. It is absolutely critical that the downcomer hoses are straight and free of twists and kinks. If it is attached on shore, special care must be taken so that the diffuser sheath does not drag on the ground and get damaged.



- E. Pull the entire aeration chain into position in the basin by pulling the restraining chain. Make sure that you also pull and position the aeration chain hose. Attach the restraining chain to the hooks located on the sides of the basin. Repeat the above until all the aeration chains are
- F. Once the aeration chains are secured into position and the hose attached to the air header, they are ready to be tested for air leaks. Fully open all butterfly valves at each aeration chain connection. Turn on blowers, (refer to Part II Section 2 prior to starting blowers) and start checking for air bubbles and/or hissing sounds. The leak will be fairly easy to detect as bubbling at the leaks. Also check that all the diffuser assemblies have identical bubble patterns.
- G. If the basin has been dewatered, or if new construction, the chains can be assembled in the bottom of the basin. If the basin has a liner, special care must be taken so as not to damage or cut the liner. The PE pipe can be drilled and welded together in the bottom of the basin, but not recommended if basin is lined.
- Connect the downcomer hoses to the PE pipe then stretch the hose and connect to the diffuser assembly, making sure there are no twists or kinks in the hose. The diffuser assemblies should then be placed near the PE pipe.
- Connect one end of the air feed hose to the PE pipe. Plug the other end of the hose so it cannot fill with water. Attach a rope to the end of the hose and secure to shore.
- Attach the restraining chains to the PE pipe. Tie a rope to the end of the chain and secure to the anchor post on shore. As the basin is being filled with water occasionally retie the ropes to shore.
- When the water has reached the required side water (S.W.D.) per drawing, adjust and secure the restraining chains to the anchor post. Attach the air feed hose to the air adapter at shore. Adjust and cut hose if necessary at startup per Parkson Representative instruction.



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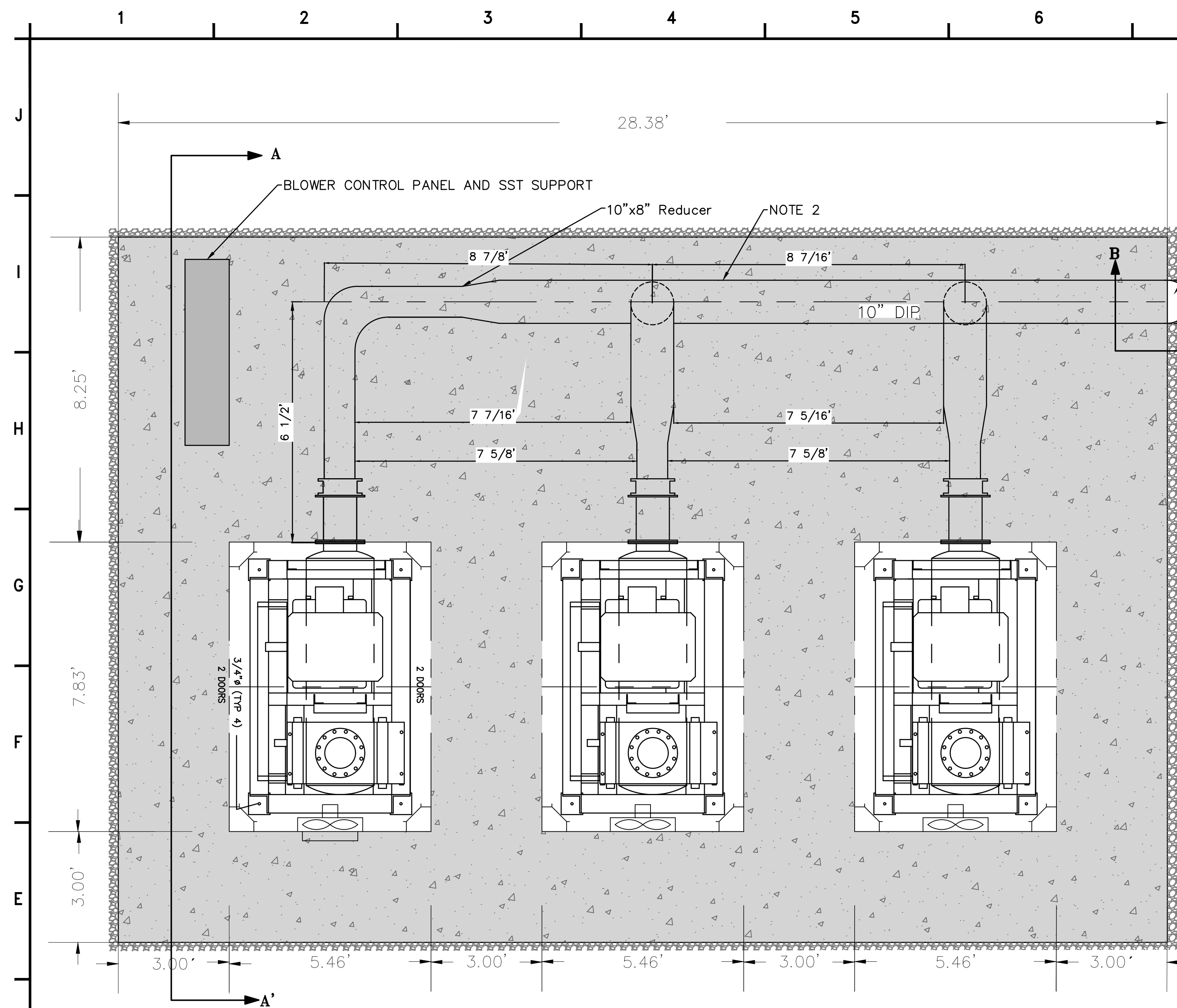
REVISIONS			
NO.	DATE	BY	APPROVED

DESIGNED BY: WSP - BM
DRAWN BY: WSP - AO
CHECKED BY: WSP - BM
APPROVED BY: WSP - BM
DATE: 07/14/2023

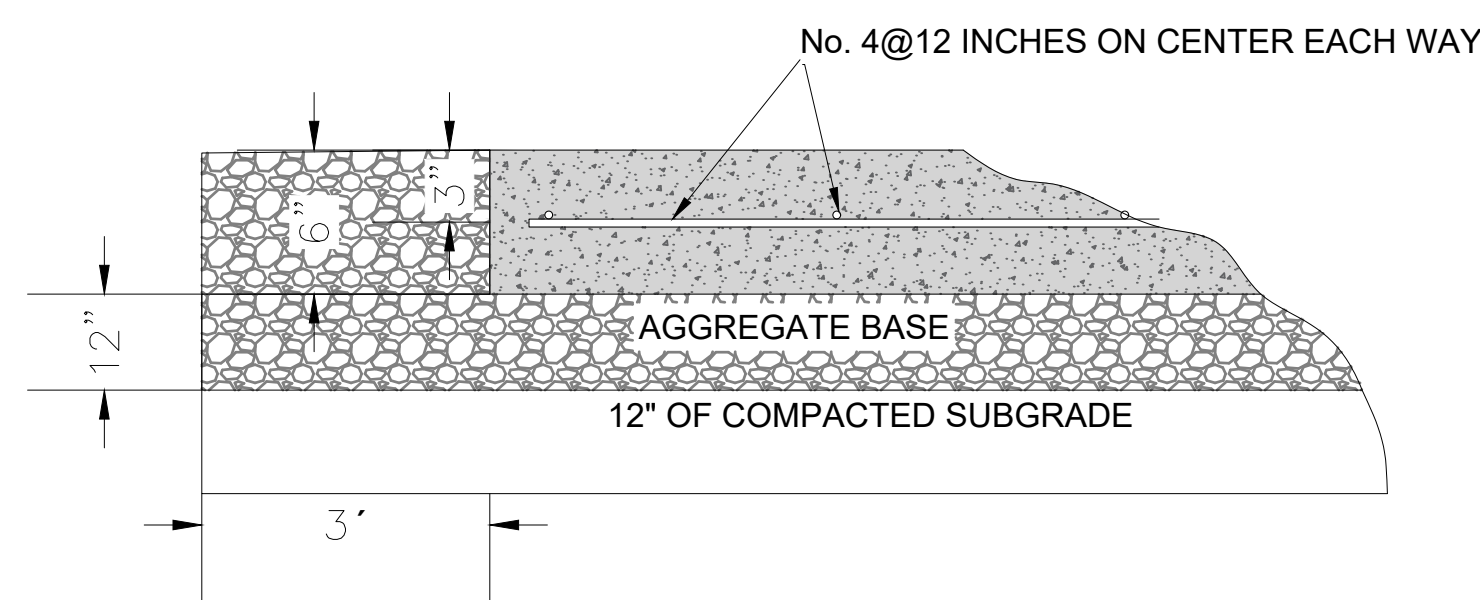
SHEET TITLE:
**BIOFUSER
DETAILS**

SHEET NUMBER: C-400
REV. #
SHEET 29 OF 55 SHEETS

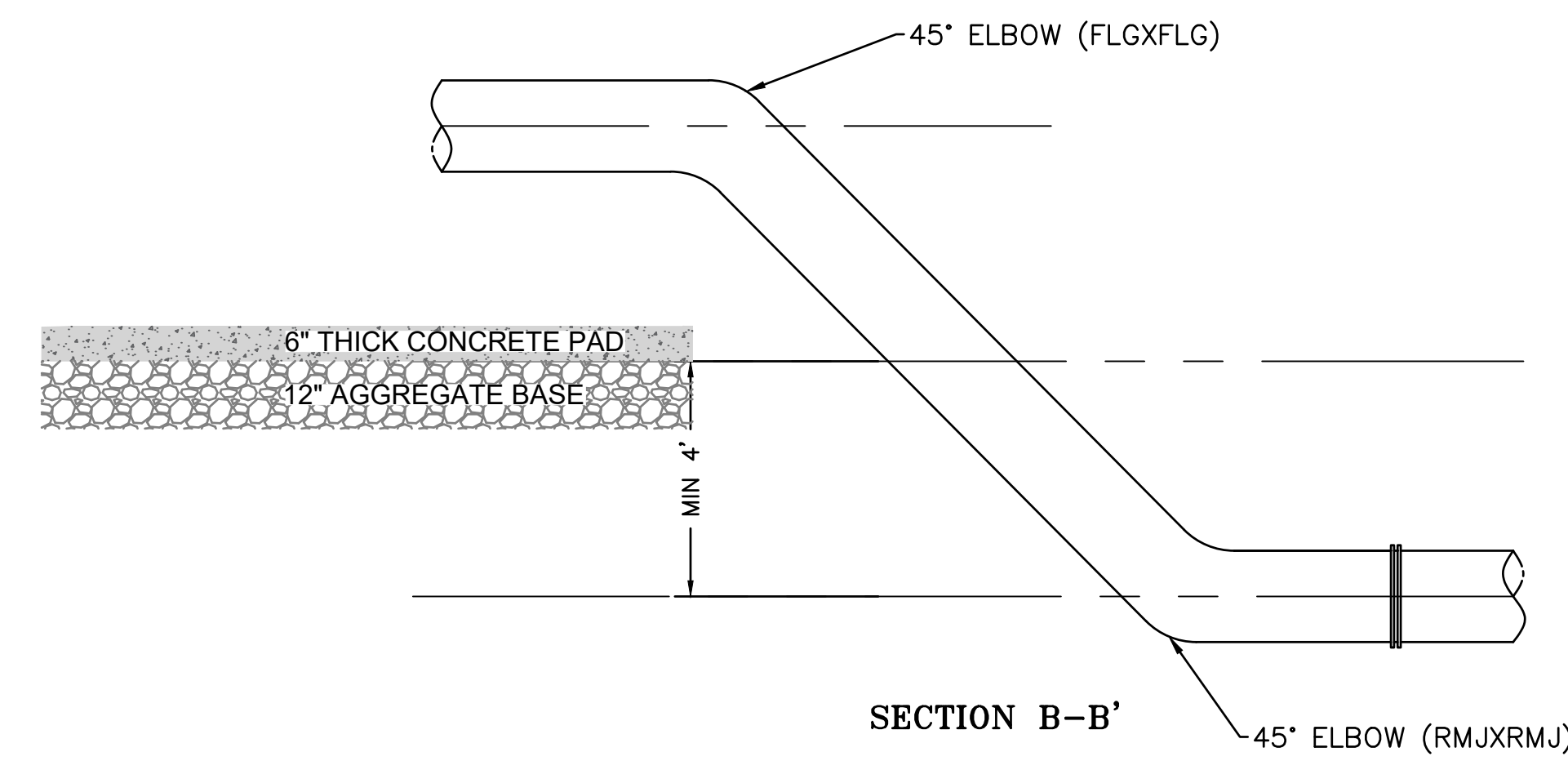
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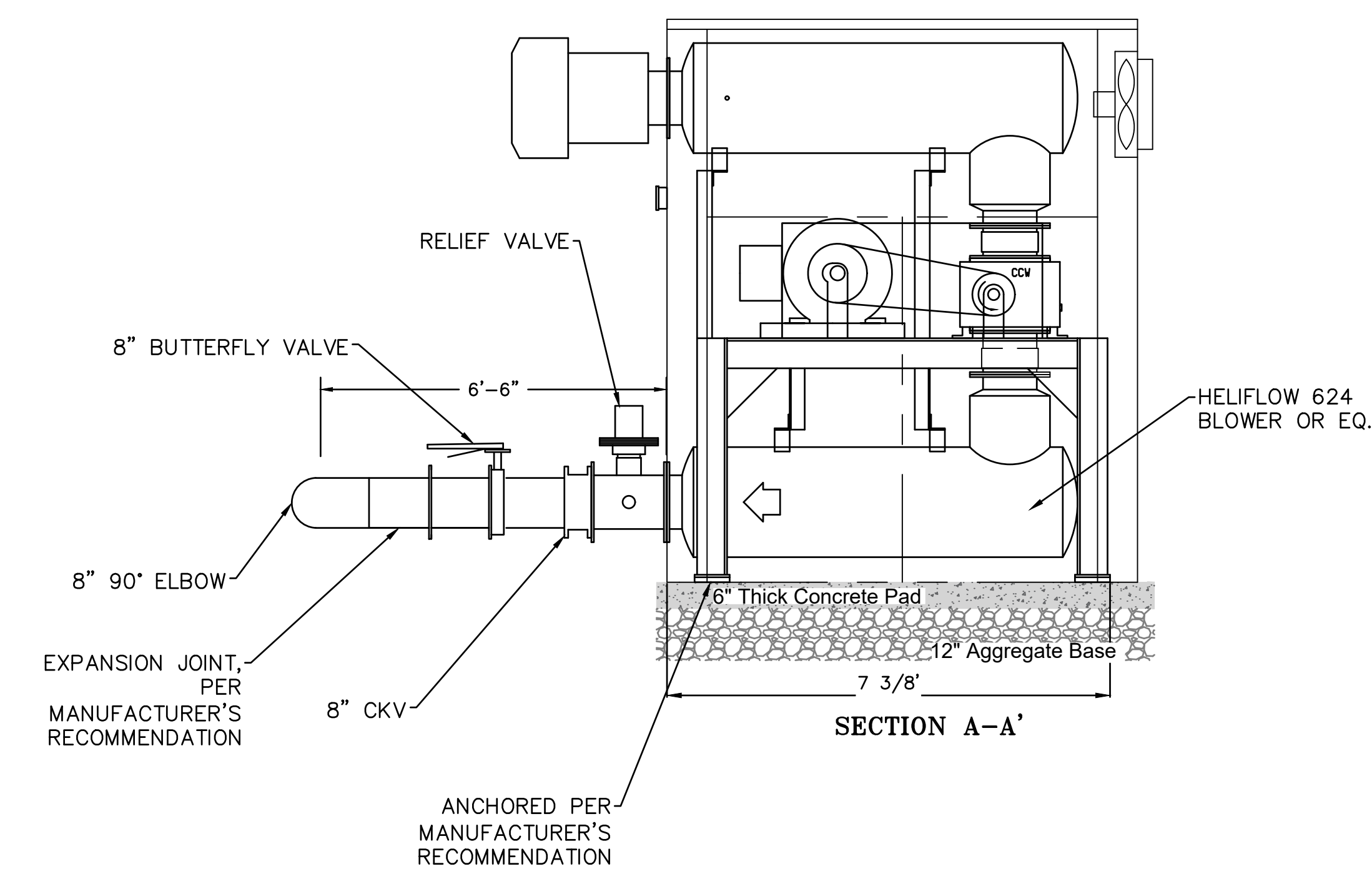
PLAN VIEW



BLOWER PAD SLAB ON GRADE DETAIL



SECTION B-B'



SECTION A-A'

NOTES:

1. CONTRACTOR TO FIELD MEASURE AND CUT LENGTHS OF SPOOL PIECES NEEDED BETWEEN THE FLANGE AT BLOWER AND THE CENTERLINE OF AIR HEADER AS SHOWN IN THE PLANS.
2. CONTRACTOR SHALL DESIGN, SUPPLY AND INSTALL PIPE SUPPORT SYSTEM USING MANUFACTURER'S STANDARD AVAILABLE PIPE SUPPORT HARDWARE, COMPLYING WITH ANSI/MSS SP-69.
3. ALL EXPOSED PIPING AND SUPPORT ASSEMBLIES SHALL BE COATED PER MANUFACTURER'S RECOMMENDATIONS.
4. ALL EXPOSED AIR PIPING SHALL BE FLANGED CONNECTION.
5. BLOWER MAKE/MODEL: GARDNER DENVER "HELIFLOW" 624-A-10x8E SERIES BY PARKSON CORPORATION OR EQUAL WITH WEATHER PROOF ENCLOSURE AND COOLING FAN.
6. INSTALL SIGNAGE OF CAUTION FOR EXTREMELY HOT AIR PIPING.



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FINAL

PROJECT:
**KAYENTA WWTP
CFID
POND SYSTEM
FINAL DESIGN**



**NAVAJO TRIBAL UTILITY
AUTHORITY**
PO BOX 170
FT. DEFIANC, AZ 86504
WSP PROJECT No:
2151700011

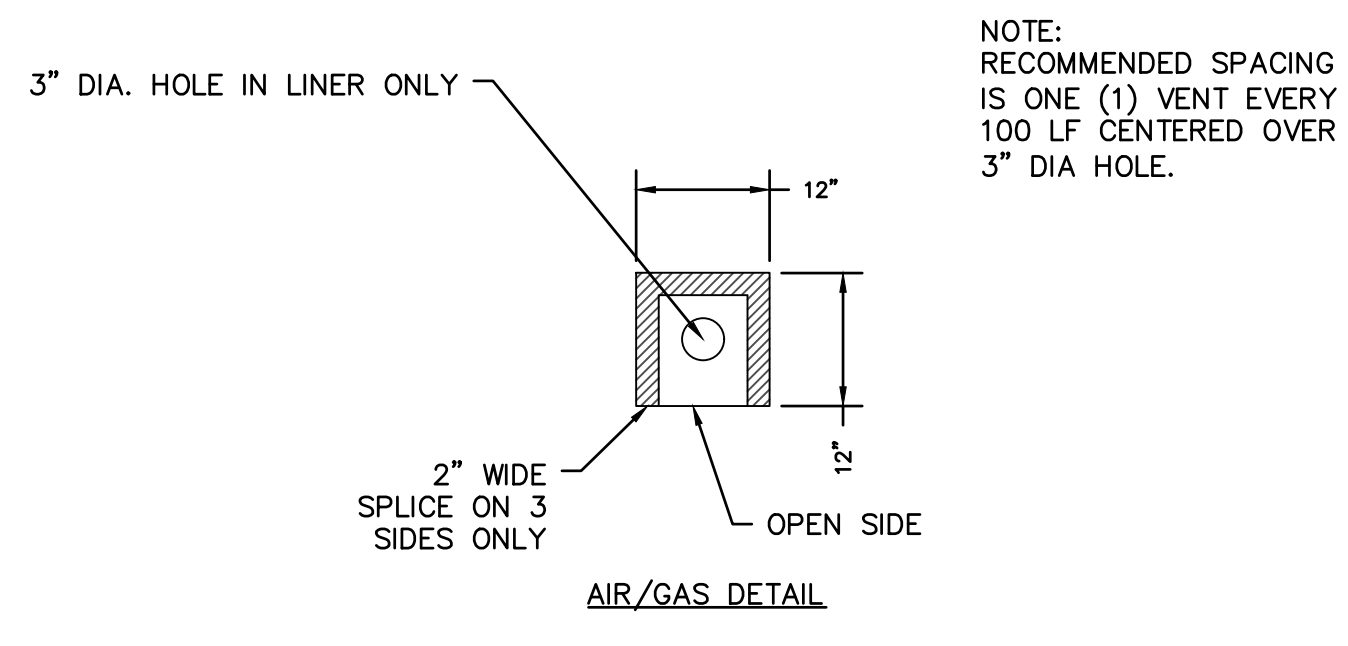
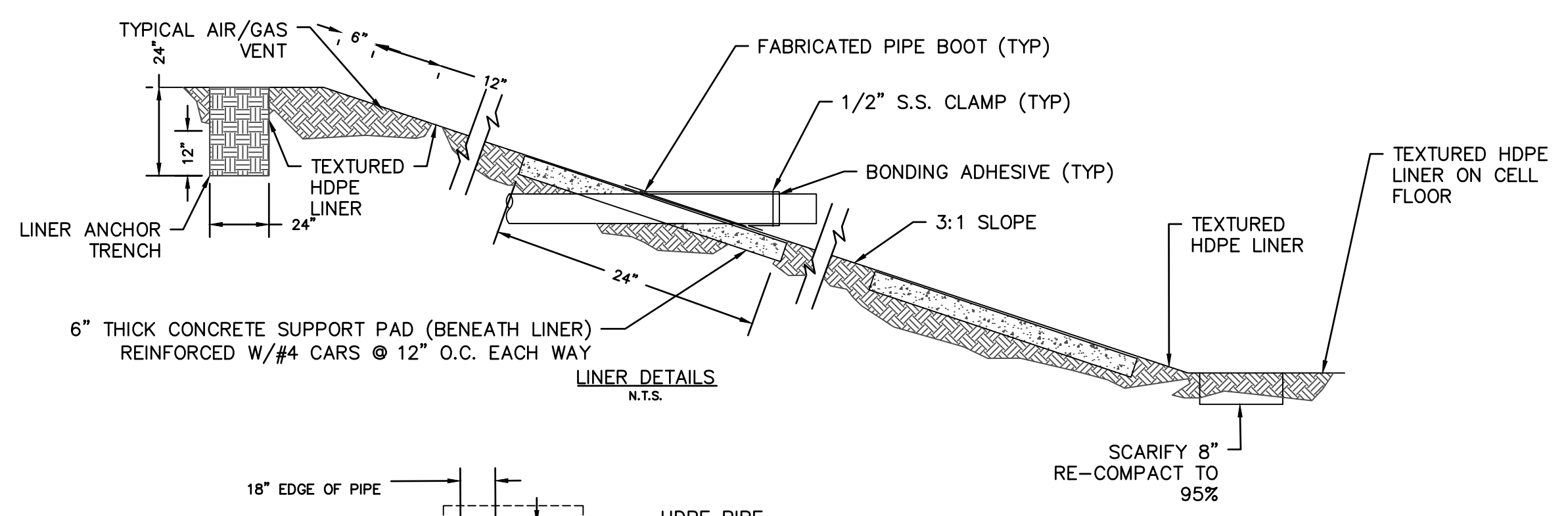
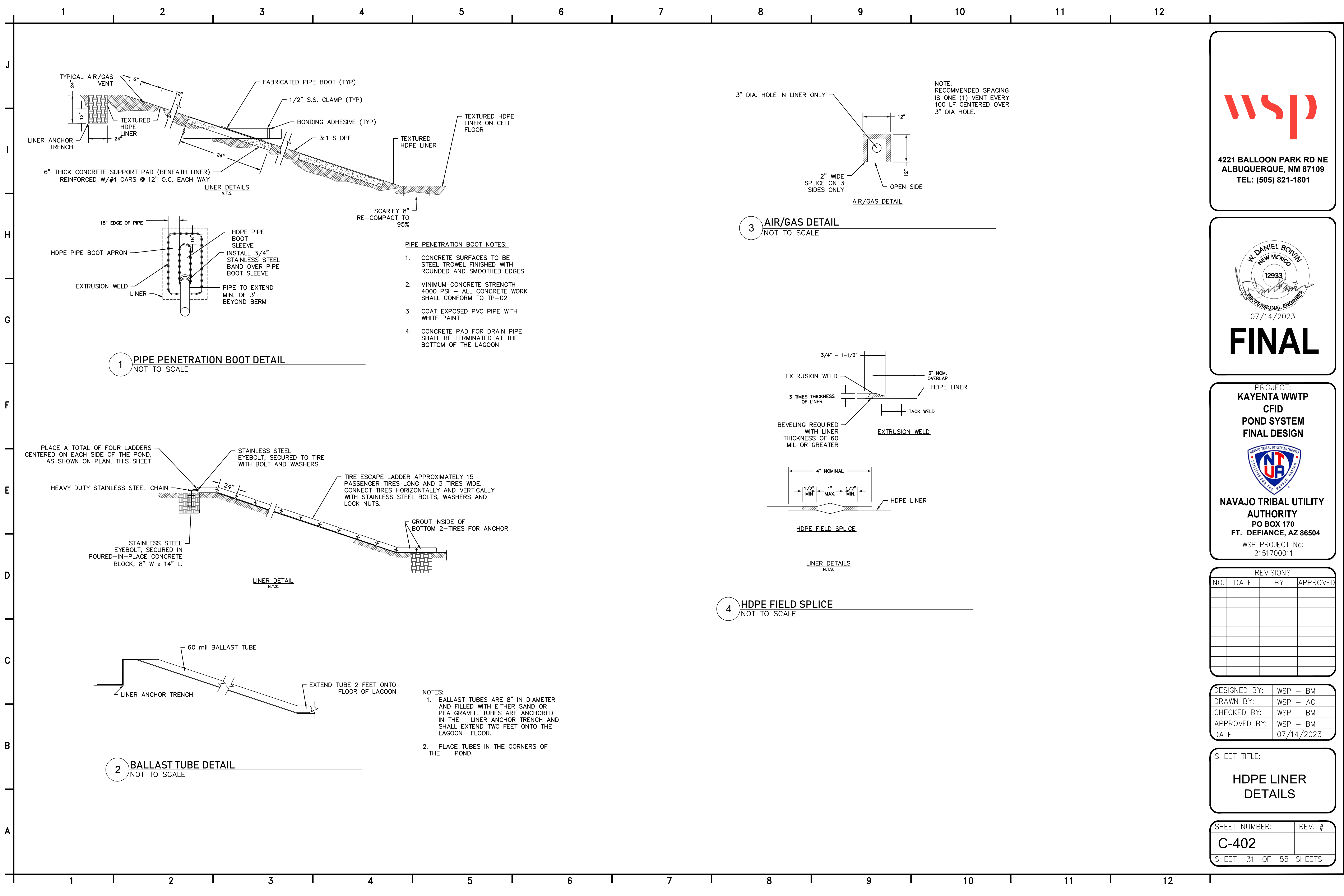
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NO.	DATE	BY	APPROVED

DESIGNED BY:	WSP - BM
DRAWN BY:	WSP - AO
CHECKED BY:	WSP - BM
APPROVED BY:	WSP - BM
DATE:	07/14/2023

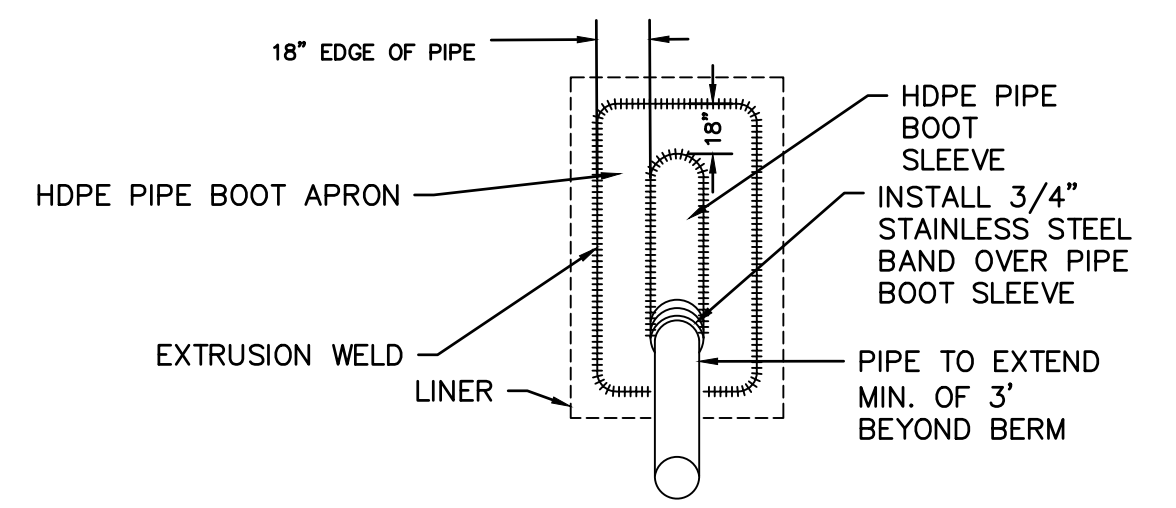
SHEET TITLE:
BLOWER SYSTEM

SHEET NUMBER:	REV. #
C-401	
SHEET 30 OF 55 SHEETS	

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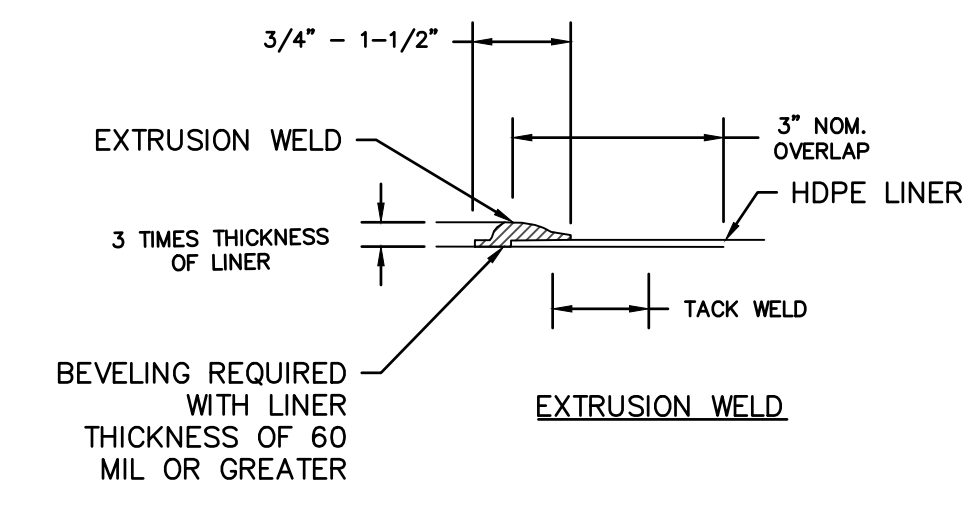


3 AIR/GAS DETAIL
NOT TO SCALE

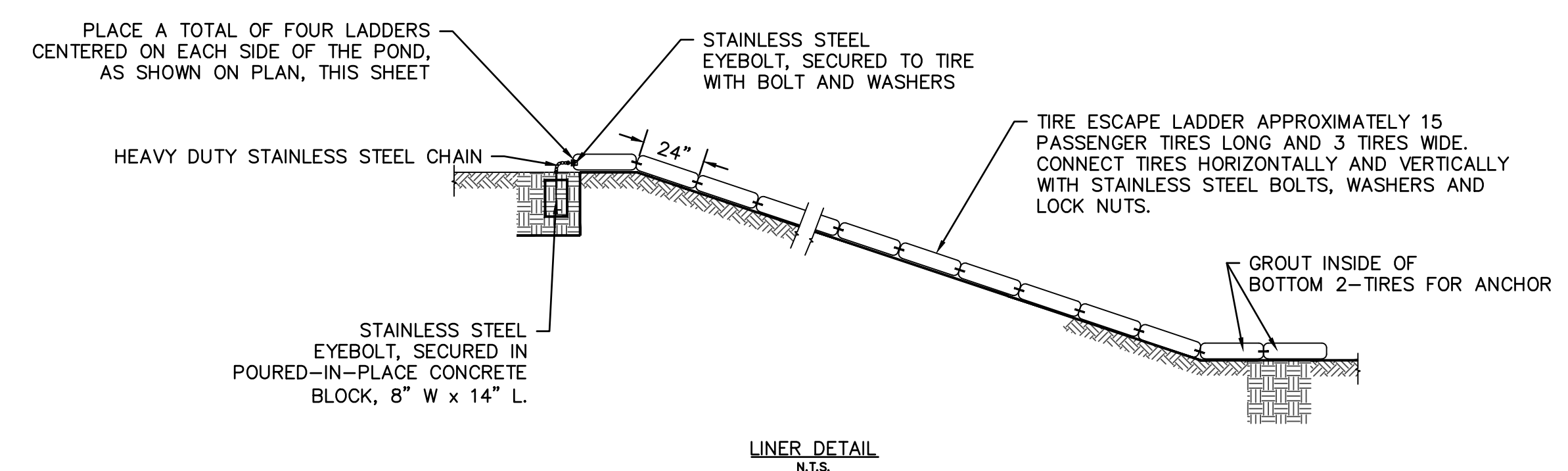


- PIPE PENETRATION BOOT NOTES:**
1. CONCRETE SURFACES TO BE STEEL TROWEL FINISHED WITH ROUNDED AND SMOOTHED EDGES
 2. MINIMUM CONCRETE STRENGTH 4000 PSI - ALL CONCRETE WORK SHALL CONFORM TO TP-02
 3. COAT EXPOSED PVC PIPE WITH WHITE PAINT
 4. CONCRETE PAD FOR DRAIN PIPE SHALL BE TERMINATED AT THE BOTTOM OF THE LAGOON

1 PIPE PENETRATION BOOT DETAIL
NOT TO SCALE



4 HDPE FIELD SPLICE
NOT TO SCALE



2 BALLAST TUBE DETAIL
NOT TO SCALE

- NOTES:**
1. BALLAST TUBES ARE 8\"/>
 2. PLACE TUBES IN THE CORNERS OF THE POND.

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PROJECT:
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FINAL DESIGN**

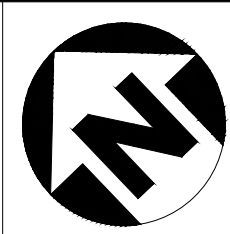
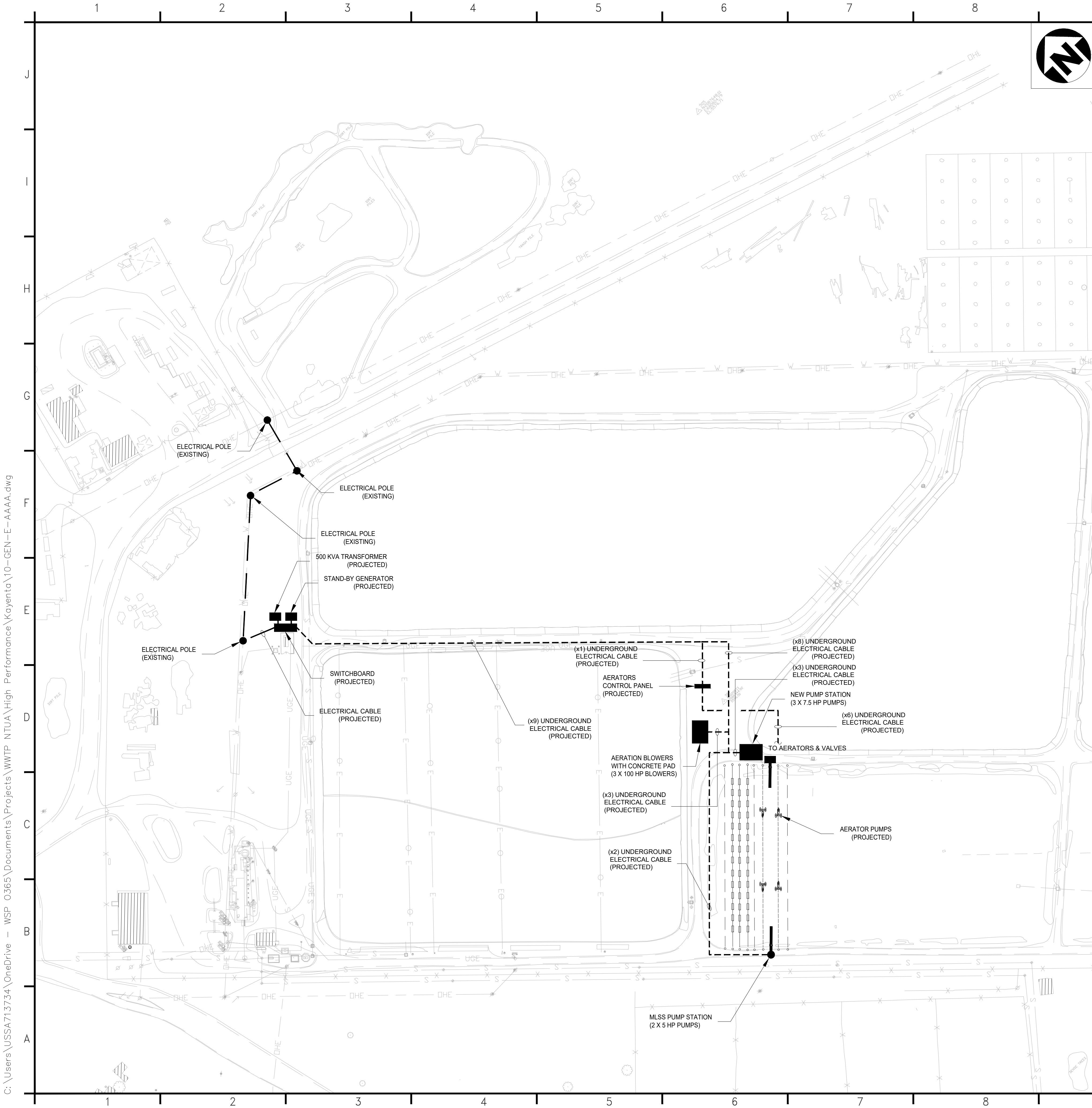
**NAVAJO TRIBAL UTILITY
AUTHORITY
PO BOX 170
FT. DEFIANCE, AZ 86504**
WSP PROJECT No:
2151700011

REVISIONS			
NO.	DATE	BY	APPROVED

DESIGNED BY:	WSP - BM
DRAWN BY:	WSP - AO
CHECKED BY:	WSP - BM
APPROVED BY:	WSP - BM
DATE:	07/14/2023

SHEET TITLE:
**HDPE LINER
DETAILS**

SHEET NUMBER:	REV. #
C-402	
SHEET 31 OF 55 SHEETS	

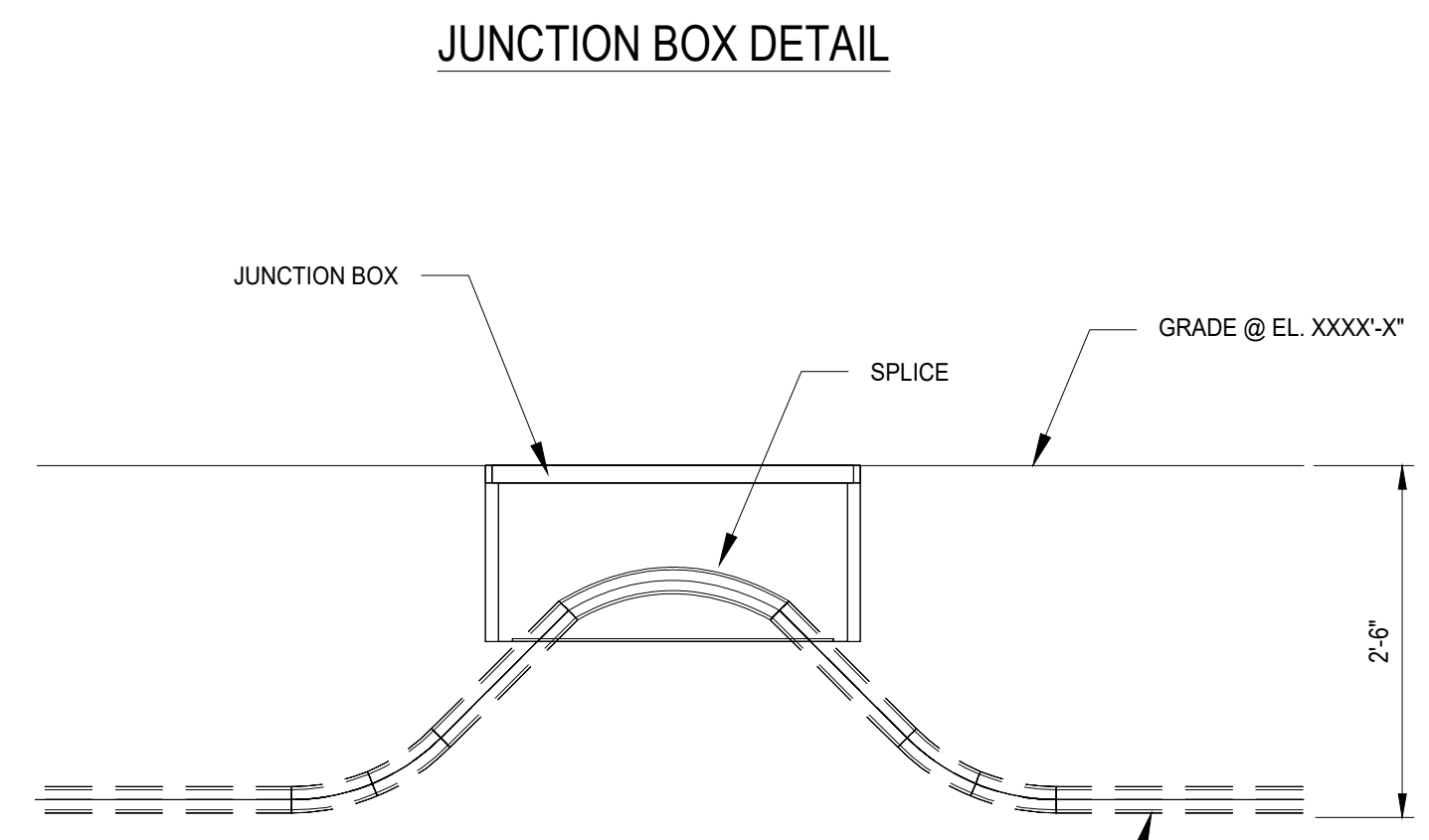
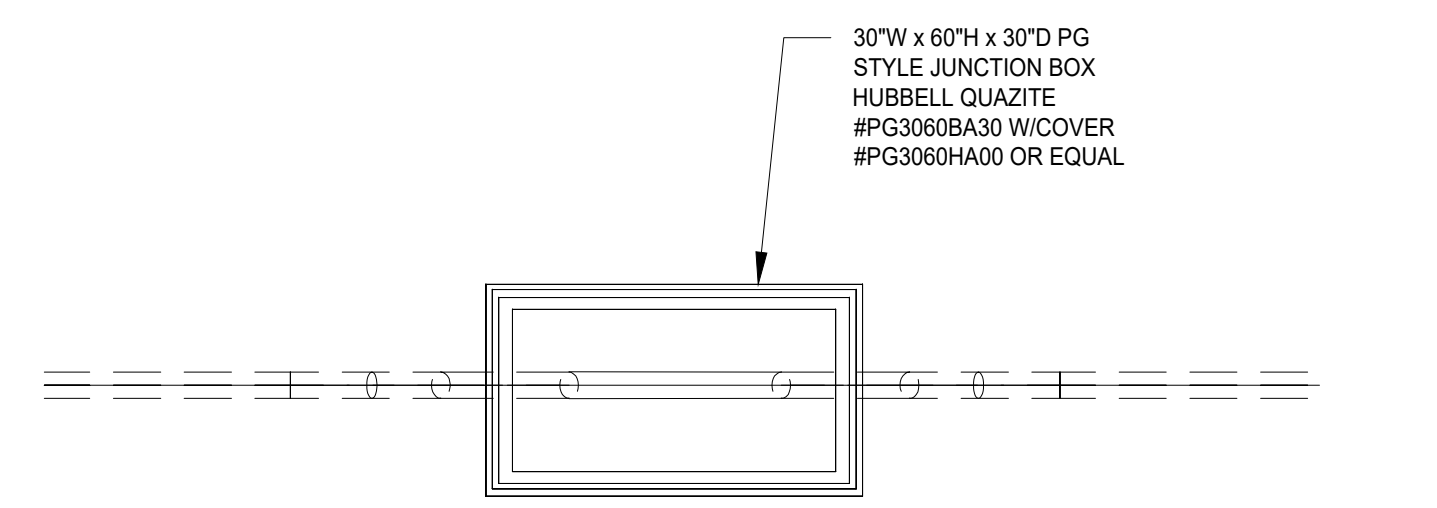


GENERAL NOTES:

- 1- IN THE EVENT THAT THE DISTANCE BETWEEN TWO PIECES OF ELECTRICAL EQUIPMENT IS LONGER THAN THE LENGTH OF CABLE PURCHASED FOR THAT RUN, IT WILL BE REQUIRED THAT AN UNDERGROUND, TRAFFIC-BEARING JUNCTION BOX BE INSTALLED TO HOUSE THE SPLICE OR JUNCTION BARS INSTEAD OF UTILIZING A BURIED SPLICE.

CONSTRUCTION NOTES:

- 1- CONTRACTOR TO VERIFY ALL CABLE ROUTING FOR CLEARANCE AND OBSTRUCTIONS WITH MECHANICAL, STRUCTURAL AND PIPING CONTRACTORS.



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**NAVAJO TRIBAL
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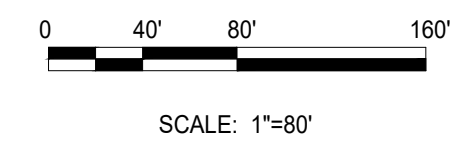
PO BOX 170
FT. DEFIANCIE, AZ 86504
WSP PROJECT No:
2151700051

REVISIONS		
NO.	DATE	DESCRIPTION
1	1/19/24	JUNCTION BOX

DESIGNED BY:	SA
DRAWN BY:	SA
CHECKED BY:	JJ
DATE:	26MAY2023

SHEET TITLE:
**ELECTRICAL
SITE LAYOUT
DRAWING**

SHEET NUMBER:	REV. #
E-100	1
SHEET 32 OF 55	



LOAD DESCRIPTION	NON MOTOR LOAD KVA	NON MOTOR LOAD AMPS	MOTOR HP	MOTOR AMPS	DEMAND FACTOR	DEMAND SERVICE ENTRANCE AMPS	CONNECTED SERVICE ENTRANCE AMPS	POWER SOURCE
Blower #1			100	124.00	1.00	124.00	124.00	SB-001
Blower #2			100	124.00	1.00	124.00	124.00	SB-001
Blower #3			100	124.00	1.00	124.00	124.00	SB-001
MLSS Pump #1			5	7.60	1.00	7.60	7.60	SB-001
MLSS Pump #2			5	7.60	1.00	7.60	7.60	SB-001
New Pump #1			7.5	11.00	1.00	11.00	11.00	SB-001
New Pump #2			7.5	11.00	1.00	11.00	11.00	SB-001
New Pump #3			7.5	11.00	1.00	11.00	11.00	SB-001
XFMR-101	1.5	1.80			1.00	1.80	1.80	SB-001
Aerators Control Panel	78.5	94.42			1.00	94.42	94.42	SB-001
SERVICE ENTRANCE						516	516	
25% OF LARGEST MOTOR AMPS						31	31	
NEC SERVICE ENTRANCE AMPS						547	547	
UTILITY SERVICE ENTRANCE AMPS REQUESTED						600	600	



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PROJECT:
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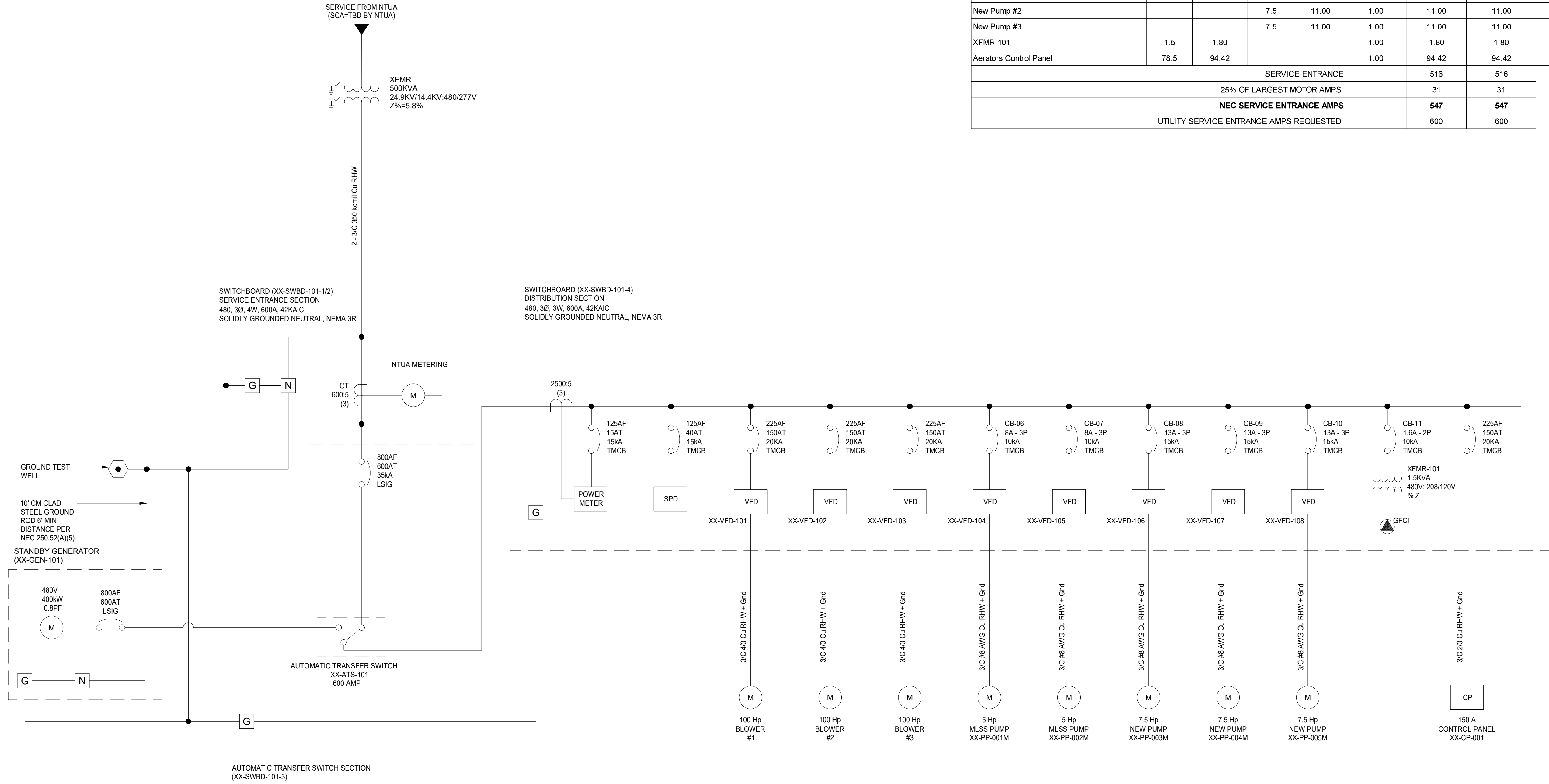
NAVAJO TRIBAL
UTILITY AUTHORITY
PO BOX 170
FT. DEFIANCE, AZ 86504
WSP PROJECT No:
2151700051

REVISIONS		
NO.	DATE	DESCRIPTION

DESIGNED BY:	SA
DRAWN BY:	JJ
CHECKED BY:	JJ
DATE:	26MAY2023

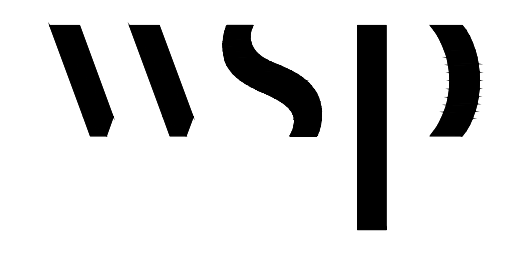
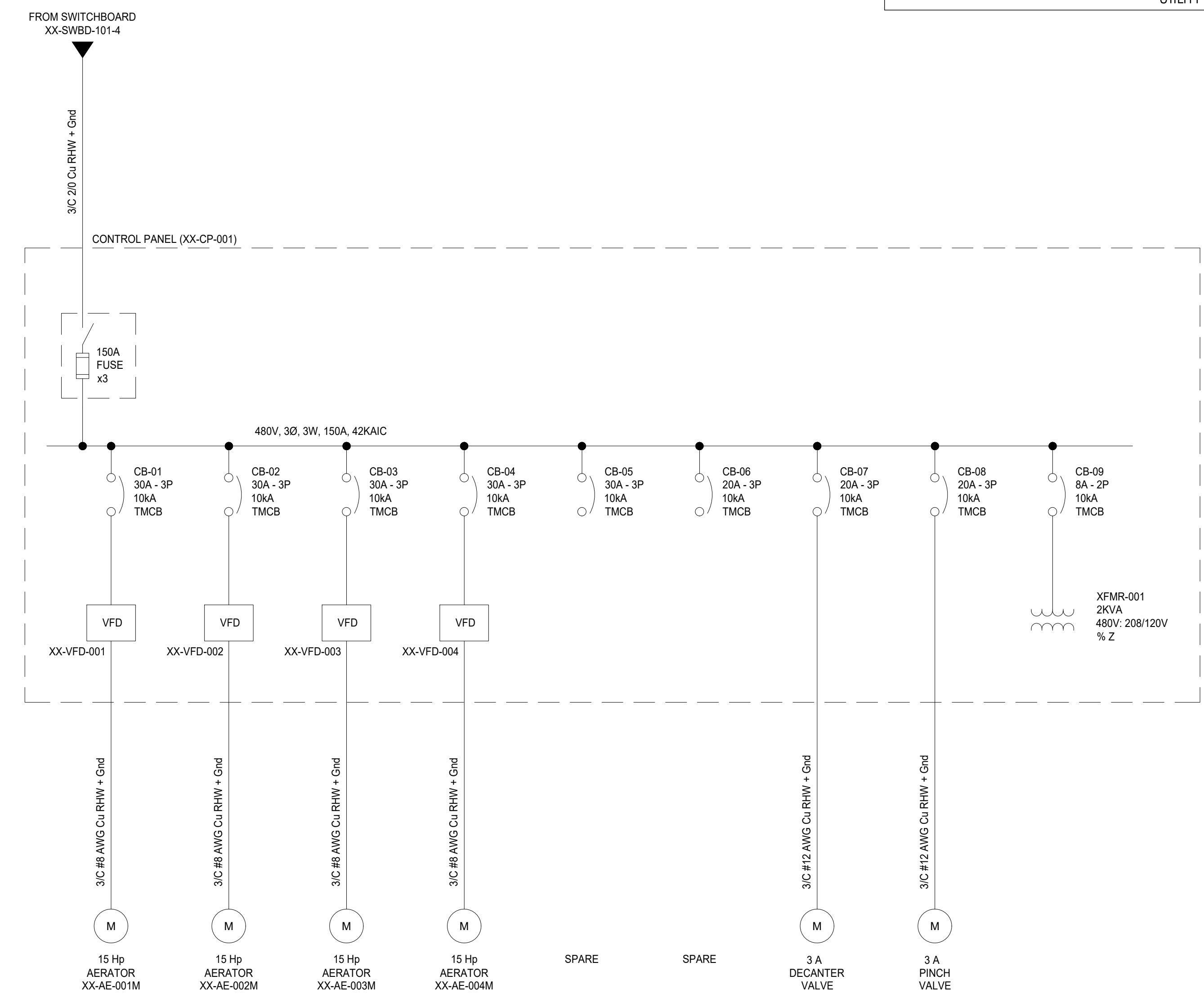
SHEET TITLE:
SWITCHBOARD
SINGLE LINE
DIAGRAM

SHEET NUMBER:	REV. #
E-101	
SHEET 33 OF 55	



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LOAD DESCRIPTION	NON MOTOR LOAD KVA	NON MOTOR LOAD AMPS	MOTOR HP	MOTOR AMPS	DEMAND FACTOR	DEMAND SERVICE ENTRANCE AMPS	CONNECTED SERVICE ENTRANCE AMPS	POWER SOURCE
Aerator #1			15	21.00	1.00	21.00	21.00	PP-001
Aerator #2			15	21.00	1.00	21.00	21.00	PP-001
Aerator #3			15	21.00	1.00	21.00	21.00	PP-001
Aerator #4			15	21.00	1.00	21.00	21.00	PP-001
Decanter Valve	3	3.61			1.00	3.61	3.61	PP-001
Pinch Valve	3	3.61			1.00	3.61	3.61	PP-001
XFMR-001	2	2.41			1.00	2.41	2.41	PP-001
SERVICE ENTRANCE						94	94	
25% OF LARGEST MOTOR AMPS						5	5	
NEC SERVICE ENTRANCE AMPS						99	99	
UTILITY SERVICE ENTRANCE AMPS REQUESTED						100	100	



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PROJECT:
KAYENTA WWTP
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WSP PROJECT No:
2151700051

REVISIONS		
NO.	DATE	DESCRIPTION

DESIGNED BY:	SA
DRAWN BY:	JJ
CHECKED BY:	JJ
DATE:	26MAY2023

SHEET TITLE:
CONTROL PANEL
SINGLE LINE
DIAGRAM

SHEET NUMBER:	REV. #
E-102	
SHEET 34 OF 55	

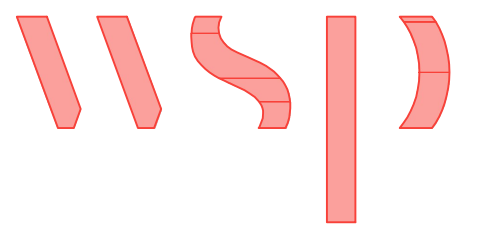
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NAVAJO TRIVAL UTILITY AUTHORITY HIGH-PERFORMANCE POND SYSTEM - KAYENTA

FOR: N.T.U.A.
LOCATION: KAYENTA, AZ
PROJECT No.: 2151700011
DRAWING PKG No.: 23-046_KYNTA

TABLE OF CONTENTS

DRAWING NO.	SEC	DRAWING TITLE
K-A01	A	TITLE PAGE
K-A02	A	PROCESS FLOW SYMBOLS & NOTES PG. 1 - P & ID
K-A03	A	PROCESS FLOW SYMBOLS & NOTES PG. 2 - P & ID
K-A04	A	PROCESS FLOW SYMBOLS & NOTES PG. 3 - P & ID
K-A05	A	PROCESS FLOW SYMBOLS & NOTES PG. 4 - P & ID
K-C01	C	AREA MAP AND CONSTRUCTION NOTES
K-C02	C	AERATOR PUMP PLACEMENT DIAGRAM
K-D01	D	NETWORK AND CONDUIT DIAGRAM: PANEL AND FIELD
K-E00	E	480VAC THREE-LINE DIAGRAM
K-E01	E	480VAC THREE-LINE DIAGRAM
K-E02	E	480VAC THREE-LINE DIAGRAM
K-F01	F	120VAC SCHEMATIC
K-G01	G	24VDC SCHEMATIC
K-H00	H	PLC POWER AND COMMUNICATION - RACK 1 MODULE 00
K-H01	H	I/O SCHEMATIC PLC RACK 1 MODULES 01 & 02
K-H02	H	I/O SCHEMATIC PLC RACK 1 MODULE 03
K-H03	H	I/O SCHEMATIC PLC RACK 1 MODULE 04
K-H04	H	I/O SCHEMATIC PLC RACK 1 MODULE 05
K-M01	M	ASSEMBLY DRAWING ENCLOSURE
K-M02	M	ASSEMBLY DRAWING BACKPLATE
K-M03	M	BILL OF MATERIALS



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PROJECT:
**KAYENTA WWTP
HIGH-PERFORMANCE
POND SYSTEM
FINAL DESIGN**



**NAVAJO TRIBAL UTILITY
AUTHORITY**
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FT. DEFIANCE, AZ 86504
WSP PROJECT No:
2151700011

REVISIONS			
NO.	DATE	BY	APPROVED
RCA	20230324	RSB	PP

DESIGNED BY:	RSB
DRAWN BY:	RSB
CHECKED BY:	PP
APPROVED BY:	PP
DATE:	20230324

SHEET TITLE:
TITLE PAGE

K-A01

SHEET NUMBER:	REV. #
K-A01	RCA
SHEET 35 OF 55 SHEETS	

C:\I&C Solutions\2023 CAD\23-031 to 23-060\23-045 NTUA\KAYENTA\K-A01.dwg

ELECTRICAL SYMBOLS LEGEND

Table with columns: SYMBOL, DESCRIPTION, SYMBOL, DESCRIPTION, SYMBOL, DESCRIPTION. Contains symbols for various electrical components like switches, breakers, transformers, and lighting units.

GENERAL ELECTRICAL NOTES

(NOT ALL SYMBOLS & NOTES WILL APPLY TO THIS PROJECT)

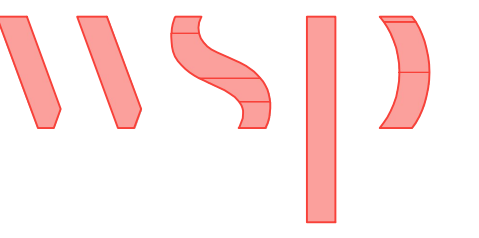
- 1. PERFORM INSTALLATION IN ACCORDANCE WITH THE CURRENT EDITION OF THE NATIONAL ELECTRICAL CODE (NEC)... 2. PROVIDE AND MAINTAIN A CLEAR WORKING SPACE ABOUT ELECTRIC EQUIPMENT... 12. USE THE FOLLOWING CONDUCTOR COLOR CODES: 208Y/120 VOLT 480Y/277 VOLT

DRAWING NOTES

- 1. DRAWINGS ARE MEANT TO BE A REPRESENTATION ONLY, DEVICES MAY LOOK DIFFERENT THAN WHAT WE HAVE SHOWN. 2. REFER TO PRODUCT SPECIFICATIONS FOR EXACT DIMENSIONS OF ENCLOSURE, BACK PANEL & ALL DEVICES DRAWN IN THESE DRAWINGS.

NOTING SYMBOLS & DESIGNATIONS

- # CORRESPONDS TO A BILL OF MATERIALS # (55) CORRESPONDS TO A KEYED NOTE # (X/X) TITLE NOTATION & SEE DETAIL SYMBOL (INDICATES SHEET NUMBER)



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PROJECT: KAYENTA WWTP HIGH-PERFORMANCE POND SYSTEM FINAL DESIGN



NAVAJO TRIBAL UTILITY AUTHORITY PO BOX 170 FT. DEFIANCE, AZ 86504 WSP PROJECT No: 2151700011

REVISIONS table with columns: NO., DATE, BY, APPROVED. Entry: RCA 20230324 RSB PP

DESIGNED BY: RSB, DRAWN BY: RSB, CHECKED BY: PP, APPROVED BY: PP, DATE: 20230324

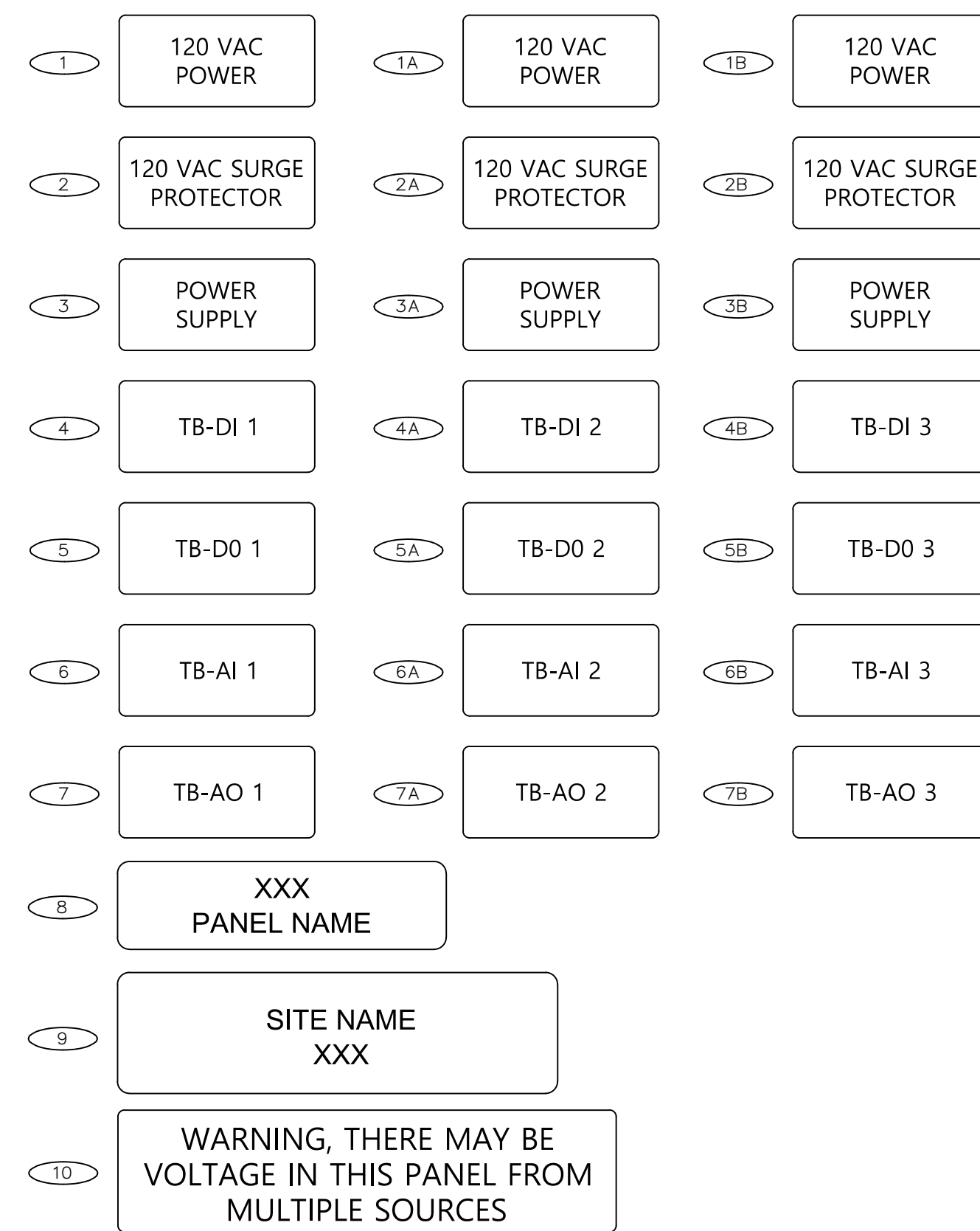
SHEET TITLE: PROCESS FLOW SYMBOLS & NOTES PG. 1 - P & ID

K-A02

SHEET NUMBER: K-A02, SHEET 36 OF 55 SHEETS, REV. #: RCA

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SIGNAGE & LABELS KEY



LINE TYPES

SYMBOL	LINE TYPE	DESCRIPTION
————	CONTINUOUS	PRIMARY PROCESS FLOW LINE
————	CONTINUOUS	SECONDARY PROCESS FLOW LINE
————	CONTINUOUS	INSTRUMENT SUPPLY OR CONNECTION TO PROCESS
———/———	CONTINUOUS	UNDEFINED SIGNAL
———/———	CONTINUOUS	PNEUMATIC SIGNAL *
-----	HIDDENX2	ELECTRIC SIGNAL
——— ———	CONTINUOUS	HYDRAULIC SIGNAL
———x———	CONTINUOUS	CAPILLARY TUBE
———~———	CONTINUOUS	ELECTROMAGNETIC OR SONIC SIGNAL** (GUIDED)
———~———	CONTINUOUS	ELECTROMAGNETIC OR SONIC SIGNAL** (NOT GUIDED)
———o———	CONTINUOUS	INTERNAL SYSTEM LINK (SOFTWARE OR DATA LINK)
———o———	CONTINUOUS	MECHANICAL LINK
———x———	CONTINUOUS	PNEUMATIC BINARY SIGNAL
———x———	DASHED2	ELECTRIC BINARY SIGNAL
———E———	CONTINUOUS	ELECTRICAL HEAT TRACING
———S———	CONTINUOUS/DASHED2	STEAM HEAT TRACING
———S———	DASHED2	BURIED LINES
———S———	PHANTOM	EXISTING
———XX———	CENTER	FP - FLOOR PENETRATION RP - ROOF PENETRATION WP - WALL PENETRATION SB - SYSTEM BREAK

NOTES:
 "OR" MEANS USER CHOICE. CONSISTENCY IS RECOMMENDED.

* THE PNEUMATIC SIGNAL SYMBOL APPLIES TO A SIGNAL USING ANY GAS AS THE * SIGNAL MEDIUM. IF GAS OTHER THAN AIR IS USED, THE GAS MAY BE IDENTIFIED BY A NOTE ON THE SIGNAL SYMBOL OR OTHERWISE.

* ELECTROMECHANIC PHENOMENA INCLUDE HEAT, RADIO WAVES, NUCLEAR RADIATION, ** AND LIGHT.

PROCESS FLOW DIAGRAMS AND P&ID SYMBOLS

(GENERAL INSTRUMENT OR FUNCTION SYMBOLS) (NOT ALL SYMBOLS & NOTES WILL APPLY TO THIS PROJECT)

ACRONYMS

EQUIPMENT

AHU - AIR HANDLING UNIT
 ASV - AIR SWITCH VALVE
 CA - AIR COMPRESSOR
 CAE - COOLER, AIR EVAPORATIVE
 D - DAMPER
 DAD - DESICCANT AIR DRYER
 DAMD - DUCT AIR MONITOR DEVICE
 ES - EXHAUST STACK
 FAB - FILTER AIR BOX
 FANE - FAN EVALUATOR
 FAR - FILTER AIR REPLACEABLE
 FC - FAN CIRCULATING
 FD - FIRE DAMPER
 FE - FAN EXHAUST
 FRA - FAN, RETURN AIR
 FRL - FILTER AIR ROLL
 FS - FAN SUPPLY
 HEPA - HIGH EFFICIENCY PARTICULATE AIR FILTER
 HX - HEAT EXCHANGER
 MT - MOISTURE TRAP
 OIM - OPERATOR INTERFACE MODULE
 SST - SYSTEM STATIC TOTALIZER
 TCA - TANK COMPRESSED AIR
 TK - TANK
 T - TRAP
 V - VALVE
 VFD - VARIABLE FREQUENCY DRIVE/MOTOR CONTROLLER
 YS - PLC CONTROL OUTPUT

MINOR EQUIPMENT

OPEN DRAIN ANNOTATIONS

RD - RADIOACTIVE DRAIN TO DRAIN HEADER
 ND - NONRADIOACTIVE DRAIN
 AW - ACID WASTE
 NW - NORMAL WASTE
 OW - OIL WASTE
 SW - SANITARY WASTE

P

TYPICAL VALVE ANNOTATIONS

FO - FAIL OPEN
 FC - FAIL CLOSED
 FL - FAIL LOCKED (POSITION DOES NOT CHANGE)
 FI - FAIL INDETERMINATE
 FAI - FAIL AS IS
 NO - NORMALLY OPEN
 NC - NORMALLY CLOSED
 LO - LOCKED OPEN
 LC - LOCKED CLOSED

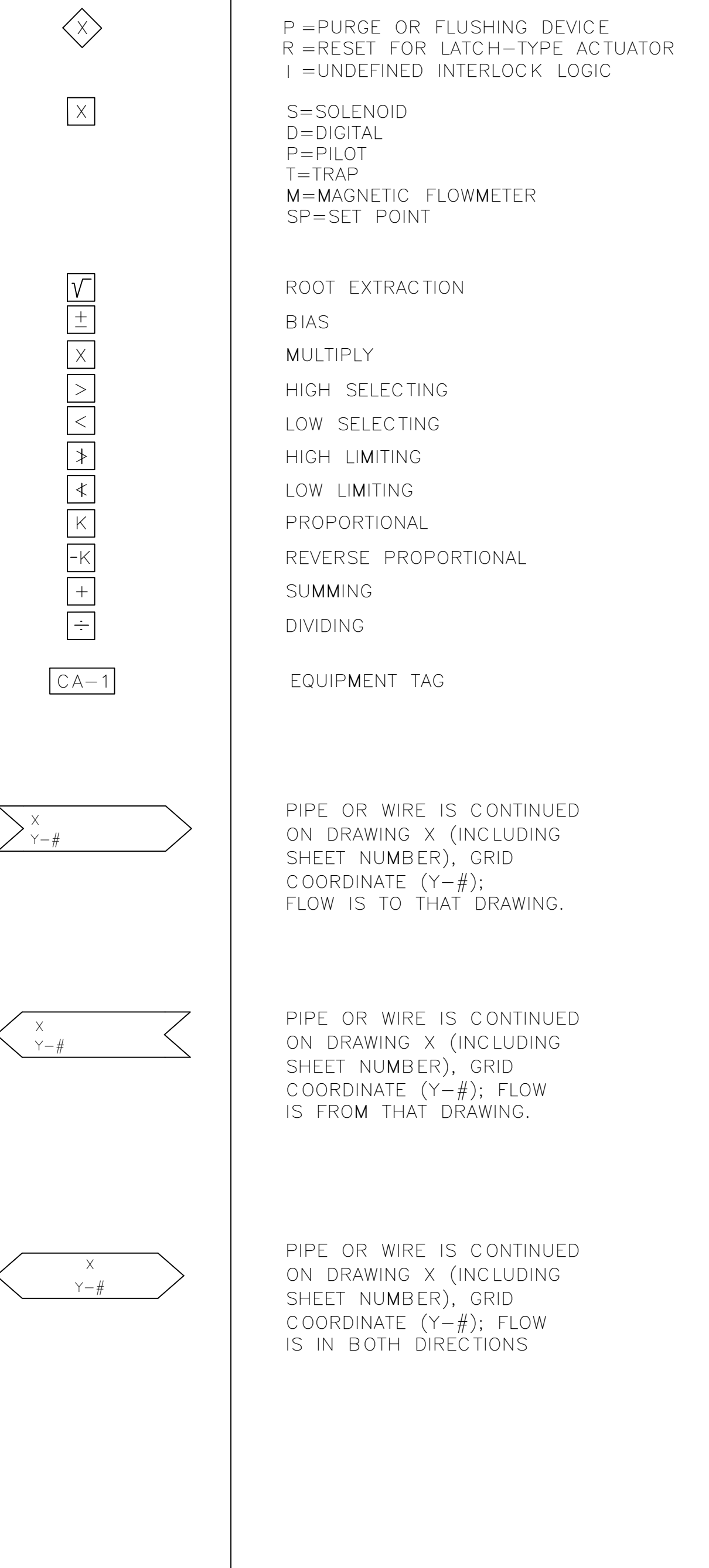
MISCELLANEOUS ACRONYMS

WP - WALL PENETRATION
 FP - FLOOR PENETRATION
 RP - ROOF PENETRATION
 AO - ANALOG OUTPUT
 AI - ANALOG INPUT
 DI - DIGITAL INPUT
 RO - RELAY OUTPUT

GENERAL NOTES

xx

SYMBOL



INSTRUMENT/FUNCTION SYMBOLS

	PRIMARY LOCATION NORMALLY ACCESSIBLE TO OPERATOR	FIELD MOUNTED	AUXILIARY LOCATION NORMALLY ACCESSIBLE TO OPERATOR	AUXILIARY LOCATION NORMALLY INACCESSIBLE TO OPERATOR
DISCRETE INSTRUMENTS	J1 J2 J2A	J1 J2 J2A	J1 J2 J2A	J1 J2 J2A
SHARED DISPLAY, SHARED CONTROL	J1 J2 J2A	J1 J2 J2A	J1 J2 J2A	J1 J2 J2A
COMPUTER FUNCTION	J1 J2 J2A	J1 J2 J2A	J1 J2 J2A	J1 J2 J2A
PROGRAMMABLE LOGIC CONTROL	J1 J2 J2A	J1 J2 J2A	J1 J2 J2A	J1 J2 J2A

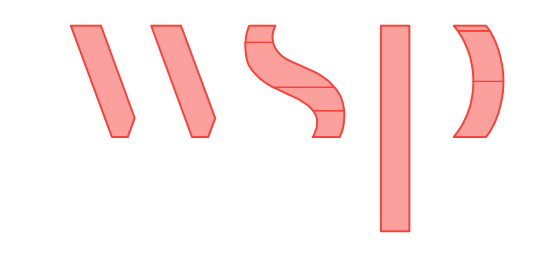
SYMBOL	DESCRIPTION
▶	FLOW INDICATOR TO BE USED IN CONJUNCTION WITH P016
J1 J2 J2A	INSTRUMENTS SHARING COMMON HOUSING
J1 J2 J2A	PANEL MOUNTED PATCHBOARD POINT 12

INSTRUMENTATION IDENTIFICATION

TABLE

J-#	DESCRIPTION
J-1	COMPONENT FUNCTION NUMBER
J-2	COMPONENT SEQUENCE NUMBER
J-2A	COMPONENT SEQUENCE # CONT'D
J-3	VENDOR DESIGNATION
J-4	PANEL NUMBER
J-5	APPLICABLE NOTES
J-6	SYSTEM ACRONYM
J-7	ASME TEST SYMBOL FOR TEST ONLY OR TEST PLUS NORMAL USE
J-8	SET-POINT(S)
J-9	FUNCTION (SEE INSTRUMENT/FUNCTION SYMBOLS)

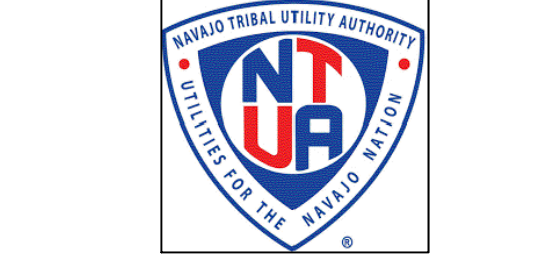
NOTE:
 INSTRUMENTATION FUNCTION IDENTIFIERS (J-1) AND FUNCTION SYMBOLS PER ANSI/ISA 55.1.



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PROJECT:
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 HIGH-PERFORMANCE
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 FINAL DESIGN**



**NAVAJO TRIBAL UTILITY
 AUTHORITY**
 PO BOX 170
 FT. DEFIANC, AZ 86504
 WSP PROJECT No:
 2151700011

REVISIONS			
NO.	DATE	BY	APPROVED
RCA	20230324	RSB	PP

DESIGNED BY:	RSB
DRAWN BY:	RSB
CHECKED BY:	PP
APPROVED BY:	PP
DATE:	20230324

SHEET TITLE:
 PROCESS FLOW SYMBOLS &
 NOTES PG. 2 - P & ID

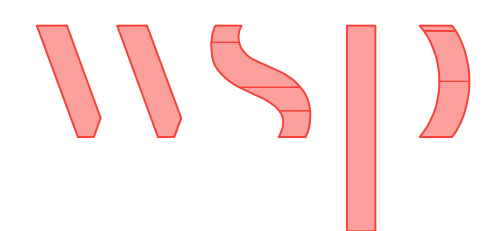
K-A03

SHEET NUMBER:	REV. #
K-A03	RCA
SHEET 37 OF 55 SHEETS	

PROCESS FLOW DIAGRAMS AND P&ID SYMBOLS (GENERAL INSTRUMENT OR FUNCTION SYMBOLS)

(NOT ALL SYMBOLS & NOTES WILL APPLY TO THIS PROJECT)

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	GENERAL NOTES
	ANGLE VALVE		RUPTURE DISK OR SAFETY HEAD FOR PRESSURE RELIEF		IN-LINE FILTER		AXIAL FAN		SINGLE DUCT VARIABLE VOLUME BOX	XX		
	BUTTERFLY VALVE		PILOT LIGHT X=COLOR R=RED G=GREEN		ATMOSPHERIC FILTER		AXIAL FAN WITH VARIABLE INLET VANES		WING TYPE FACE AND BYPASS DAMPER (A) HW HEATING WATER DX DIRECT EXPANSION CH CHILLED WATER STM STEAM (B) HCL HEATING COIL CCL COOLING COIL			
	ROTARY VALVE		FLEX CONNECTION (RUBBER)		DOUBLE BASKET STRAINER		2-STAGE RECIPROCATING AIR COMPRESSOR		COLLECTION BIN			
	3-WAY VALVE		FLEX CONNECTION (STEEL BRAIDED)		HOSE REEL		SINGLE STAGE RECIPROCATING AIR COMPRESSOR		CYCLONE SEPARATOR			
	4-WAY VALVE		SINGLE PITOT TUBE OR PITOT VENTURI TUBE		OPEN DRAIN (SHOWN)		RECIPROCATING PUMP		FLUID RECOVERY PUMP			
	OS & Y VALVE		FLOW METER		XX- DRAIN SYSTEM ANNOTATIONS DRAIN (PLAN VIEW)		PRESSURE VESSELS, VERTICAL (SHOWN) OR HORIZONTAL (TANKS, RECEIVERS, SEPARATORS, SUMPS ETC.)		DUAL SERVICE HEAT EXCHANGER			
	DIAPHRAGM VALVE		FLOW NOZZLE OR VENTURI		CLEANOUT (PLAN VIEW)		TANK		MULTI BLADE DAMPER			
	PRESSURE RELIEF		REDUCER		SANITARY VENT		HVAC COIL (A) HW HEATING WATER DX DIRECT EXPANSION CH CHILLED WATER STM STEAM (B) HCL HEATING COIL CCL COOLING COIL		SINGLE BLADE DAMPER			
	DIAPHRAGM ACTUATOR		SCREWED CAP		SILENCER/MUFFLER		UNIT HEATER (A) HW HEATING WATER DX DIRECT EXPANSION STM STEAM (B) HCL HEATING COIL		MOTOR			
	TWO-WAY VALVE, FAIL CLOSED		PIPE CAP		SPACE PENETRATIONS		TEST PORT		PILOT LIGHT			
	TWO-WAY VALVE, FAIL OPEN		HOSE CONNECTION		FIXED LOUVERS		SEPARATOR		MIST ELIMINATOR			
	3-WAY VALVE W/DIAPHRAM ACTUATOR		FLANGED CONNECTION (PIPING OR EQUIP)		TRAP XX ANNOTATES FUNCTION		HUMIDIFIER		HEPA FILTER			
	4-WAY VALVE W/DIAPHRAM ACTUATOR		FLOW ORIFICE FIXED		LUBRICATOR		MANUAL BALANCE DAMPER		CARBON ABSORBER FILTER			
	SPRING-OPERATED SINGLE-ACTING ACTUATOR		STRAINER WITH VALVE		55 GALLON DRUM		MULTI POINT PITOT TUBE ARRAY		FILTER			
	SPRING-OPERATED DOUBLE-ACTING ACTUATOR		Y-STRAINER		THERMOSTATIC VENT		DAMPERS (NORMALLY OPEN) OR NORMALLY CLOSED		SUCTION DIFFUSER			
	ELECTROHYDRAULIC ACTUATOR		COMPRESSED AIR		SPRINKLER ALARM (WATER MOTOR GONG)		EVAPORATIVE AIR COOLER		OPPOSED BLADE DAMPER FOR HVAC EQUIPMENT			
	HAND ACTUATOR OR HANDWHEEL		DUCTED AIR FLOW FROM SPACE		FLOW ALARM VALVE		BACKDRAFT DAMPER					
	RESTRICTION ORIFICE IN PROCESS LINE		CAPPED AIR DUCT		COOLING TOWER							
	RESTRICTION ORIFICE DRILLED IN VALVE		GATE VALVE (OPEN)		CHILLER							
	FLOW STRAIGHTENING VANE		GATE VALVE (CLOSED)		HORIZONTAL CENTRIFUGAL PUMP							
	DIAPHRAGM PRESSURE-BALANCED		GLOBE VALVE (OPEN)		CENTRIFUGAL FAN WITH VARIABLE INLET VANES							
	PRESSURE-REDUCING REGULATOR, SELF-CONTAINED, WITH HANDWHEEL ADJUSTABLE SET POINT		GLOBE VALVE (CLOSED)		BLOWER/CENTRIFUGAL FAN							
	PRESSURE REDUCING REGULATOR WITH EXTERNAL PRESSURE TAP		NEEDLE VALVE (OPEN)		ROTARY PUMP							
	DIFFERENTIAL-PRESSURE-REDUCING REGULATOR WITH INTERNAL AND EXTERNAL TAPS		NEEDLE VALVE (CLOSED)		VERTICAL WET PIT PUMP							
	BACKPRESSURE REGULATOR, SELF-CONTAINED		PLUG VALVE (OPEN)		PROGRESSIVE CAVITY PUMP							
	BACKPRESSURE REGULATOR WITH EXTERNAL PRESSURE TAP		PLUG VALVE (CLOSED)		VERTICAL SUMP PUMP							
	PRESSURE-REDUCING REGULATOR WITH INTEGRAL OUTLET PRESSURE RELIEF VALVE, AND OPTIONAL PRESSURE INDICATOR		BALL VALVE (OPEN)		HEATER							
	PRESSURE INDICATOR		BALL VALVE (CLOSED)		HEAT EXCHANGER							
	FLOW DIRECTION		CHECK VALVE									
	PRESSURE RELIEF OR SAFETY VALVE		SPRING CHECK VALVE									
	VACUUM RELIEF VALVE		ANGLE VALVE (OPEN)									
	PRESSURE RELIEF OR SAFETY VALVE, STRAIGHT-THROUGH PATTERN, SPRING- OR WEIGHT-LOADED, OR WITH INTEGRAL PILOT		ANGLE VALVE (CLOSED)									
	RUPTURE DISK OR SAFETY HEAD FOR VACUUM RELIEF		SAFETY OR RELIEF VALVE (INLET PORT SHOWN CLOSED)									
			THREE-WAY VALVE (CLOSED PORT DARKENED)									
			FOUR-WAY VALVE (ARROWS INDICATE FLOW DIRECTION)									
			BALL-CHECK VALVE									
			DUAL PURGE VALVE									
			ALARM VALVE									
			AIR INTAKE FILTER									
			ALARM									
			BUBBLE GAUGE									



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PROJECT:
**KAYENTA WWTP
HIGH-PERFORMANCE
POND SYSTEM
FINAL DESIGN**

**NAVAJO TRIBAL UTILITY
AUTHORITY**
PO BOX 170
FT. DEFIANCE, AZ 86504
WSP PROJECT No:
2151700011

REVISIONS			
NO.	DATE	BY	APPROVED
RCA	20230324	RSB	PP

DESIGNED BY:	RSB
DRAWN BY:	RSB
CHECKED BY:	PP
APPROVED BY:	PP
DATE:	20230324

SHEET TITLE:
**PROCESS FLOW SYMBOLS &
NOTES PG. 3 - P & ID**

K-A04

SHEET NUMBER:	REV. #
K-A04	RCA
SHEET 38 OF 55 SHEETS	

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VALVE & INSTRUMENTATION FUNCTION IDENTIFIERS (SELECTED)

FIRST-LETTERS	INDICATING MEASURED OR CONTROLLED VARIABLE	CONTROLLERS			VALVES	READOUT DEVICE		SWITCHES AND * ALARM DEVICES			TRANSMITTERS			SOLENOIDS RELAYS COMPUTING DEVICES	PRIMARY ELEMENT	TEST POINT	WELL OR PROBE	VIEWING DEVICE GLASS	SAFETY DEVICE	FINAL ELEMENT
		RECORDING	INDICATING	BLIND		RECORDING	INDICATING	HIGH**	LOW	COMB	RECORDING	INDICATING	BLIND							
A	ANALYSIS	ARC	AIC	AC		AR	AI	ASH	ASL	ASHL	ART	AIT	AT	AY	AE	AP	AW		AV	
B	BURNER/ COMBUSTION	BRC	BIC	BC		BR	BI	BSH	BSL	BSHL	BRT	BIT	BT	BY	BE		BW	BG	BZ	
C	CONDUCTIVITY		CIC	CC											CE					
D	USER'S CHOICE																			
E	VOLTAGE	ERC	EIC	EC		ER	EI	ESH	ESL	ESHL	ERT	EIT	ET	EY	EE				EZ	
F	FLOW RATE	FRC	FIC	FC	FCV FICV	FR	FI	FSH	FSL	FSHL	FRT	FIT	FT	FY	FE	FP		FG	FV	
G	FLOW QUANTITY	FQRC	FQIC			FQR	FQI	FQSH	FQSL			FQIT	FQT	FQY	FQE				FQV	
H	FLOW RATIO	FFRC	FFIC	FFC		FFR	FFI	FFSH	FFSL						FE				FFV	
I	USER'S CHOICE																			
J	HAND		HIC	HC	HV					HS									HV	
K	CURRENT	IRC	IIC			IR	II	ISH	ISL	ISHL	IRT	IIT	IT	IY	IE				IZ	
L	POWER	JRC	JIC	ARC		JR	JI	JSH	JSL	JSHL	JRT	JIT	JT	JY	JE				JV	
M	TIME	KRC	KIC	KC	KCV	KR	KI	KSH	KSL	KSHL	KRT	KIT	KT	KY	KE				KV	
N	LEVEL	LRC	LIC	LC	LCV	LR	LI	LSH	LSL	LSHL	LRT	LIT	LT	LY	LE		LW	LG	LV	
O	NOISTURE/ HUMIDITY						MI						MT							
P	USER'S CHOICE																			
Q	USER'S CHOICE																			
R	PRESSURE VACUUM	PRC	PIC	PC	PCV	PR	PI	PSH	PSL	PSHL	PRT	PIT	PT	PY	PE	PTP		PSV PSE	PV	
S	PRESSURE DIFFERENTIAL	PDRC	PDIC	PDC	PDCV	PDR	PDI	PDSH	PDSL		PDRT	PDIT	PDT	PDY	PE	PTP			PDV	
T	QUALITY	QRC	QIC			QR	QI	QSH	QSL	QSHL	QRT	QIT	QT	QY	QE				QZ	
U	RADIATION	RRC	RIC	RC		RR	RI	RSH	RSL	RSHL	RRT	RIT	RT	RY	RE		RW		RZ	
V	SPEED	SRC	SIC	SC	SCV	SR	SI	SSH	SSL	SSHL	SRT	SIT	ST	SY	SE				SV	
W	TEMPERATURE	TRC	TIC	TC	TCV	TR	TI	TSH	TSL	TSHL	TRT	TIT	TT	TY	TE	TP	TW		TV	
X	TEMPERATURE DIFFERENTIAL	TDRC	TDIC	TDC	TDCV	TDR	TDI	TDSH	TDSL		TDRT	TDIT	TDT	TDY	TDE	TDP TP	TDW TW		TSE TV	
Y	MULTIVARIABLE					UR	UI							UY					UV	
Z	MACHINERY VIBRATION ANALYSIS					VR	VI	VSH	VSL	VSHL	VRT	VIT	VT	VY	VE				VZ	
AA	WEIGHT FORCE	WRC	WIC	WC	WCV	WR	WI	WSH	WSL	WSHL	WRT	WIT	WT	WY	WE				WZ	
AB	WEIGHT FORCE DIFFERENTIAL	WDRC	WDIC	WDC	WDCV	WDR	WDI	WDSH	WDSL		WDRT	WDIT	WDT	WDY	WE				WDZ	
AC	USER'S CHOICE																			
AD	EVENT STATE PRESENCE		YIC	YC		YR	YI	YSH	YSL				YT	YY	YE				YZ	
AE	POSITION DIMENSION	ZRC	ZIC	ZC	ZCV	ZR	ZI	ZSH	ZSL	ZSHL	ZRT	ZIT	ZT	ZY	ZE				ZV	
AF	GAUGING DEVIATION	ZDRC	ZDIC	ZDC	ZDCV	ZDR	ZDI	ZDSH	ZDSL		ZDRT	ZDIT	ZDT	ZDY	ZDE				ZDV	


GENERAL NOTES

xx
 THIS TABLE IS NOT ALL-INCLUSIVE, SEE ANSI/ISA STANDARD ISA-S5.1-1984 (R 1992)
 *A, ALARM, THE ANNUNCIATING DEVICE, MAY BE USED IN THE SAME FASHION AS, SWITCH, THE ACTING DEVICE.
 ** THE LETTERS H AND L MAY BE OMITTED IN THE UNDEFINED CASE.


OTHER POSSIBLE COMBINATIONS:
 FO (RESTRICTION ORIFICE) PFR (RATIO)
 FRK, HIK (CONTROL STATIONS) KQI (RUNNING TIME INDICATOR)
 FX (ACCESSORIES) QQI (INDICATING COUNTER)
 TJR (SCANNING RECORDER) WKIC (RATE-OF-WEIGHT-LOSS CONTROLLER)
 LLH (PILOT LIGHT) HMS (HAND MOMENTARY SWITCH)



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PROJECT:
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**NAVAJO TRIBAL UTILITY
 AUTHORITY**
 PO BOX 170
 FT. DEFIANCE, AZ 86504
 WSP PROJECT No:
 2151700011

REVISIONS			
NO.	DATE	BY	APPROVED
RCA	20230324	RSB	PP

DESIGNED BY:	RSB
DRAWN BY:	RSB
CHECKED BY:	PP
APPROVED BY:	PP
DATE:	20230324

SHEET TITLE:
**PROCESS FLOW SYMBOLS &
 NOTES PG. 4 - P & ID**

K-A05

SHEET NUMBER:	REV. #
K-A05	RCA
SHEET 39 OF 55 SHEETS	



CONSTRUCTION NOTES:


- ① TAP EXISTING 10" PVC FORCE MAIN
- ② TRANSFORMER AND EMERGENCY POWER GENERATOR
- ③ POWER EXTENSION
- ④ NEW 8" HDPE FORCE MAIN AND FLOW PATH
- ⑤ BAFFLES (FLOATING SYNTHETIC)
- ⑥ BIOLAC AERATION SYSTEM
- ⑦ 6" SCH 40 PVC MLSS PIPING
- ⑧ 20' SECTION 12" DI SANITARY SEWER INLET
- ⑨ INLET STRUCTURE
- ⑩ 12" DI AIR PIPING
- ⑪ AERATION BLOWERS WITH CONCRETE PAD
- ⑫ NEW MANHOLE
- ⑬ 12" PVC SDR 35 SEWER
- ⑭ TAP EXISTING SEWER MANHOLE
- ⑮ OUTLET STRUCTURE. SEE DISCHARGE STRUCTURE DETAILS SHEET C-XXX
- ⑯ ANCHOR MOORING POST FOR BAFFLES, AERATORS, AND DIFFUSERS
- ⑰ 20' SECTION 10" DI SANITARY SEWER OUTLET
- ⑱ INSTALL 6-15 HP AIRE-O2 ASPIRATING AERATOR BY AERATION INDUSTRIES INTERNATIONAL, LLC. INCLUDES AERATOR, ELECTRICAL CABLES, MOORING CABLES, ETC.
- ⑲ AERATOR MOORING CABLES
- ⑳ 4' X 3' WINDOW IN SYNTHETIC BAFFLE
- ㉑ MLSS PUMP STATION

SHEET GENERAL NOTES:

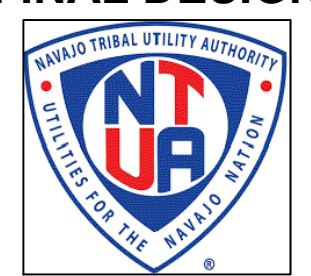
- 1. UTILITIES ILLUSTRATED ON PLAN ARE PRESENTED FOR CONTRACTOR INFORMATION, IF APPLICABLE. SUBSURFACE UTILITY LOCATES HAVE NOT BEEN FIELD VERIFIED, ACTUAL UTILITIES ARE SUBJECT TO CHANGE AND UNMARKED, UNKNOWN UTILITIES SHOULD BE MITIGATED IN THE FIELD PRIOR TO GROUND DISTURBANCES. COORDINATE WITH NAVAJO TRIBAL UTILITY AUTHORITY (NTUA) IN CHINLE, AZ, AND ARIZONA ONE-CALL UTILITY LOCATE.



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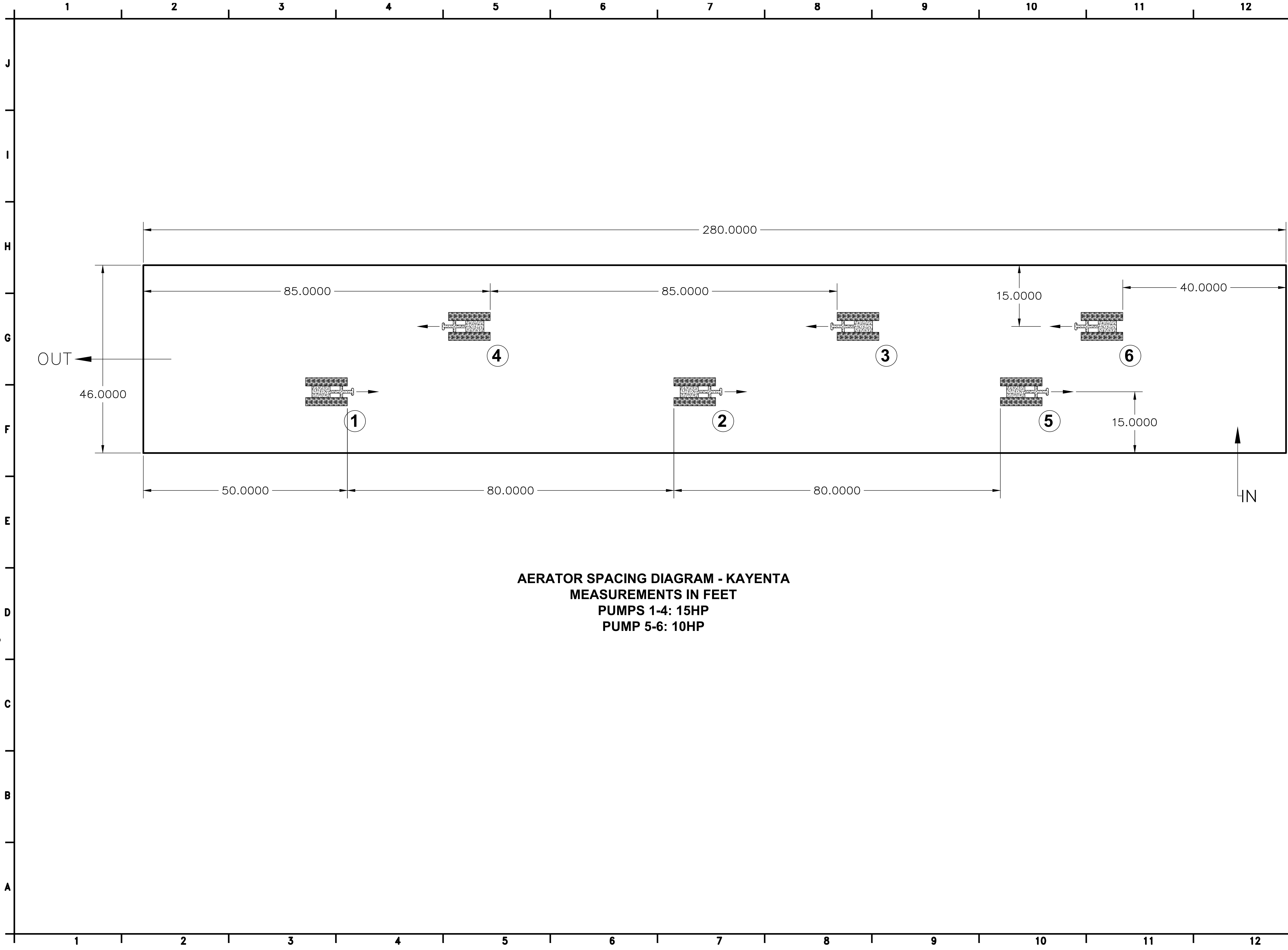
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AREA MAP AND
CONSTRUCTION
NOTES

K-C01

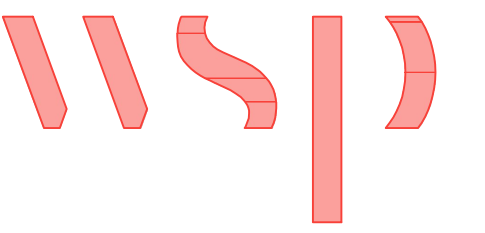
SHEET NUMBER:	REV. #
K-C01	RCA
SHEET 40 OF 55 SHEETS	

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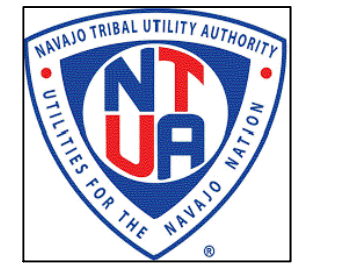
AERATOR SPACING DIAGRAM - KAYENTA
MEASUREMENTS IN FEET
PUMPS 1-4: 15HP
PUMP 5-6: 10HP



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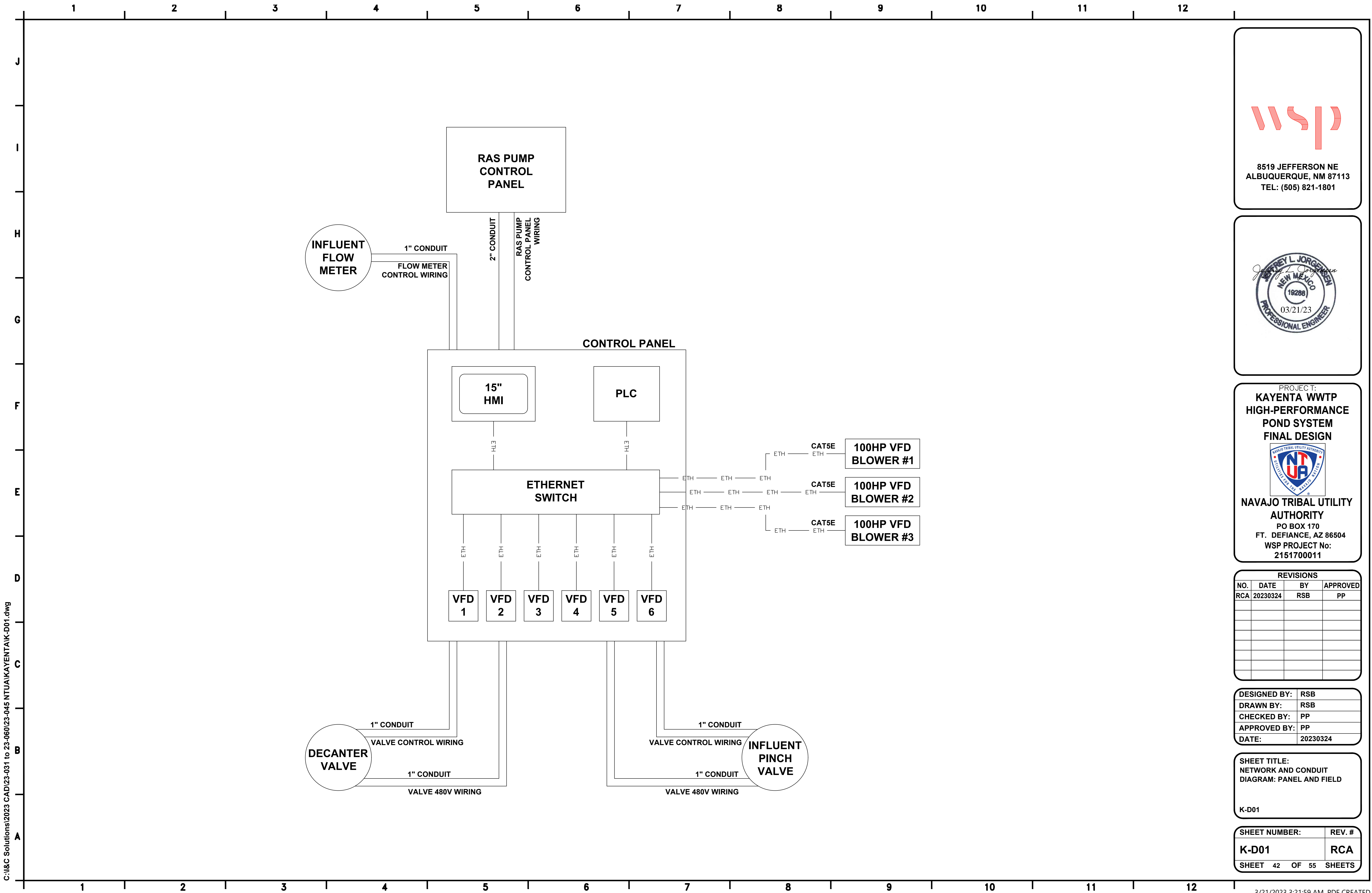
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APPROVED BY:	PP
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SHEET TITLE:
 AERATOR PUMP
 PLACEMENT DIAGRAM
 K-C02

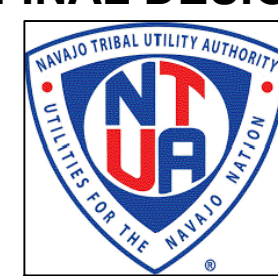
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K-C02	RCA
SHEET 41 OF 55 SHEETS	




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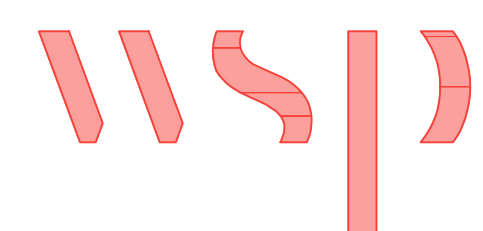
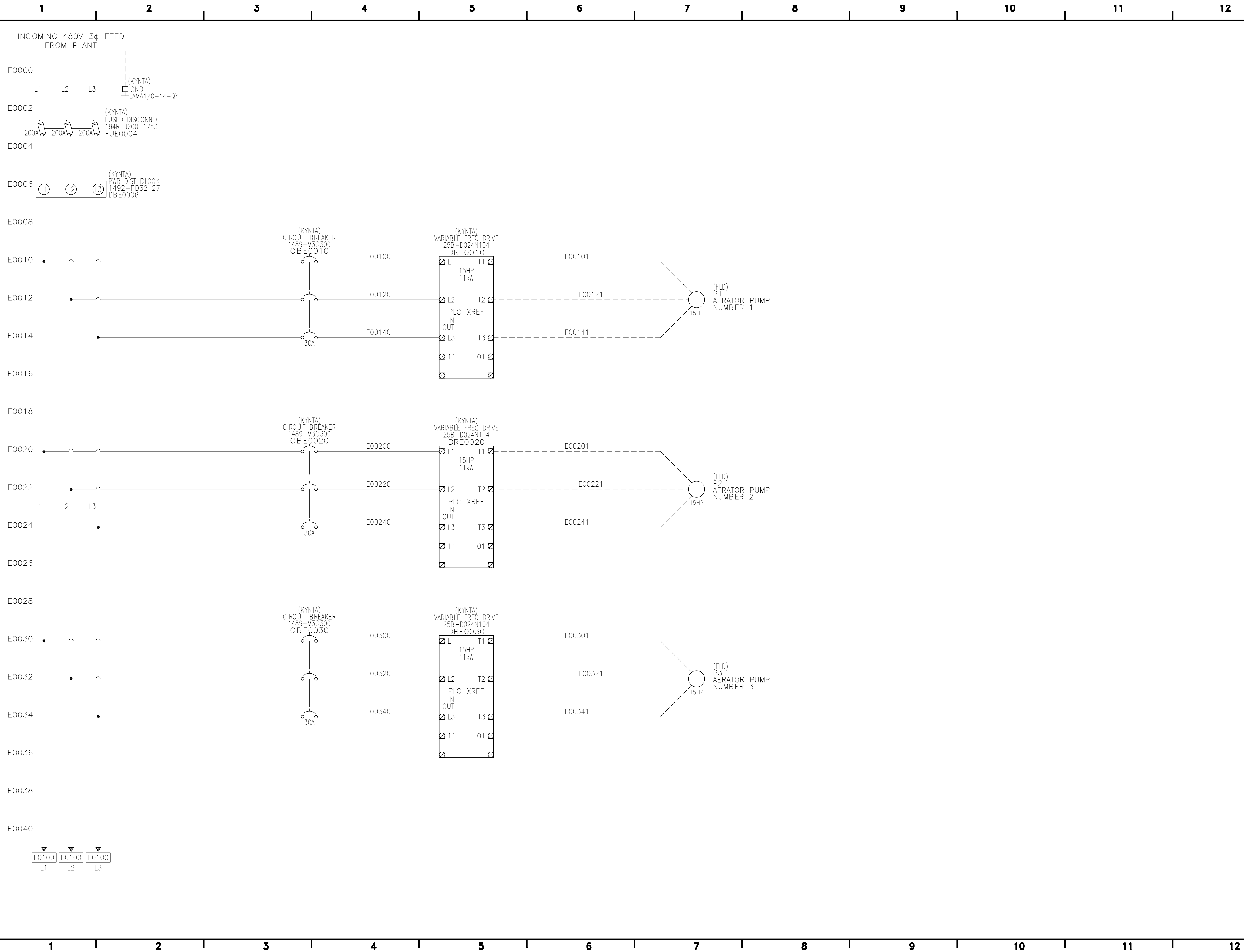
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NETWORK AND CONDUIT
DIAGRAM: PANEL AND FIELD

K-D01

SHEET NUMBER:	REV. #
K-D01	RCA
SHEET 42 OF 55 SHEETS	

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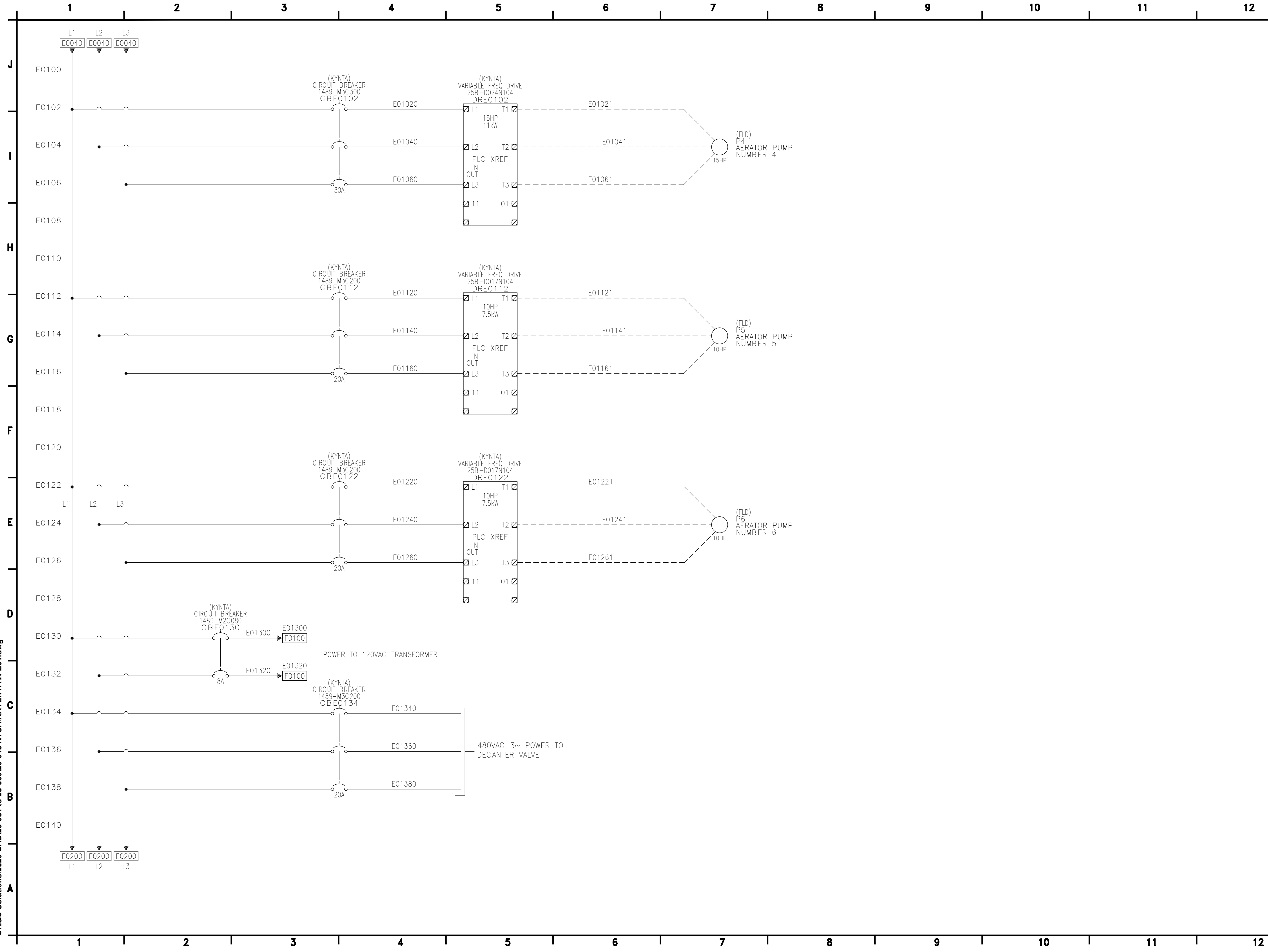
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DRAWN BY:	RSB
CHECKED BY:	PP
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DATE:	20230324

SHEET TITLE:
480VAC
THREE-LINE
SCHEMATIC


K-E00

SHEET NUMBER:	REV. #
K-E00	RCA
SHEET 43 OF 55 SHEETS	

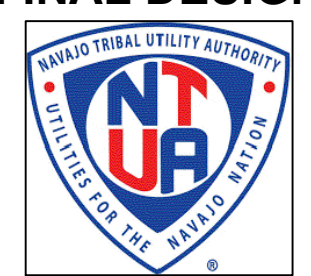
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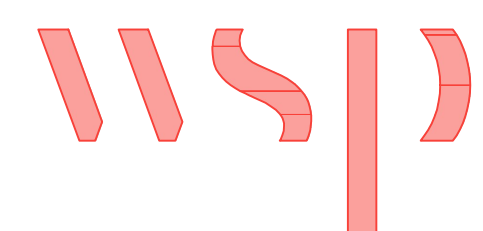
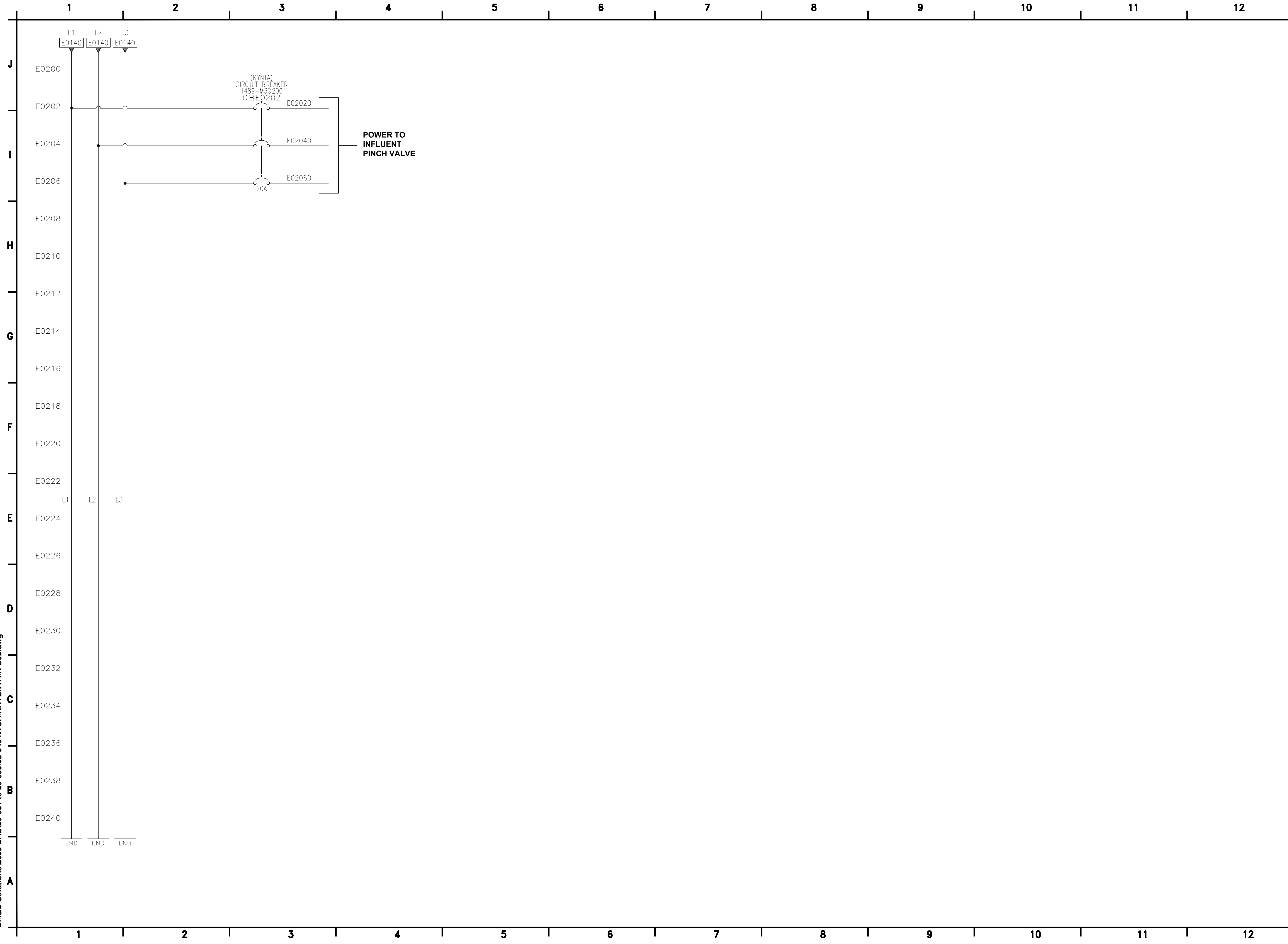
DESIGNED BY:	RSB
DRAWN BY:	RSB
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APPROVED BY:	PP
DATE:	20230324

SHEET TITLE:
480VAC
THREE-LINE
SCHEMATIC

K-E01

SHEET NUMBER:	REV. #
K-E01	RCA
SHEET 44 OF 55 SHEETS	


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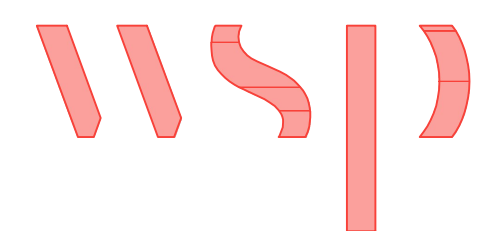
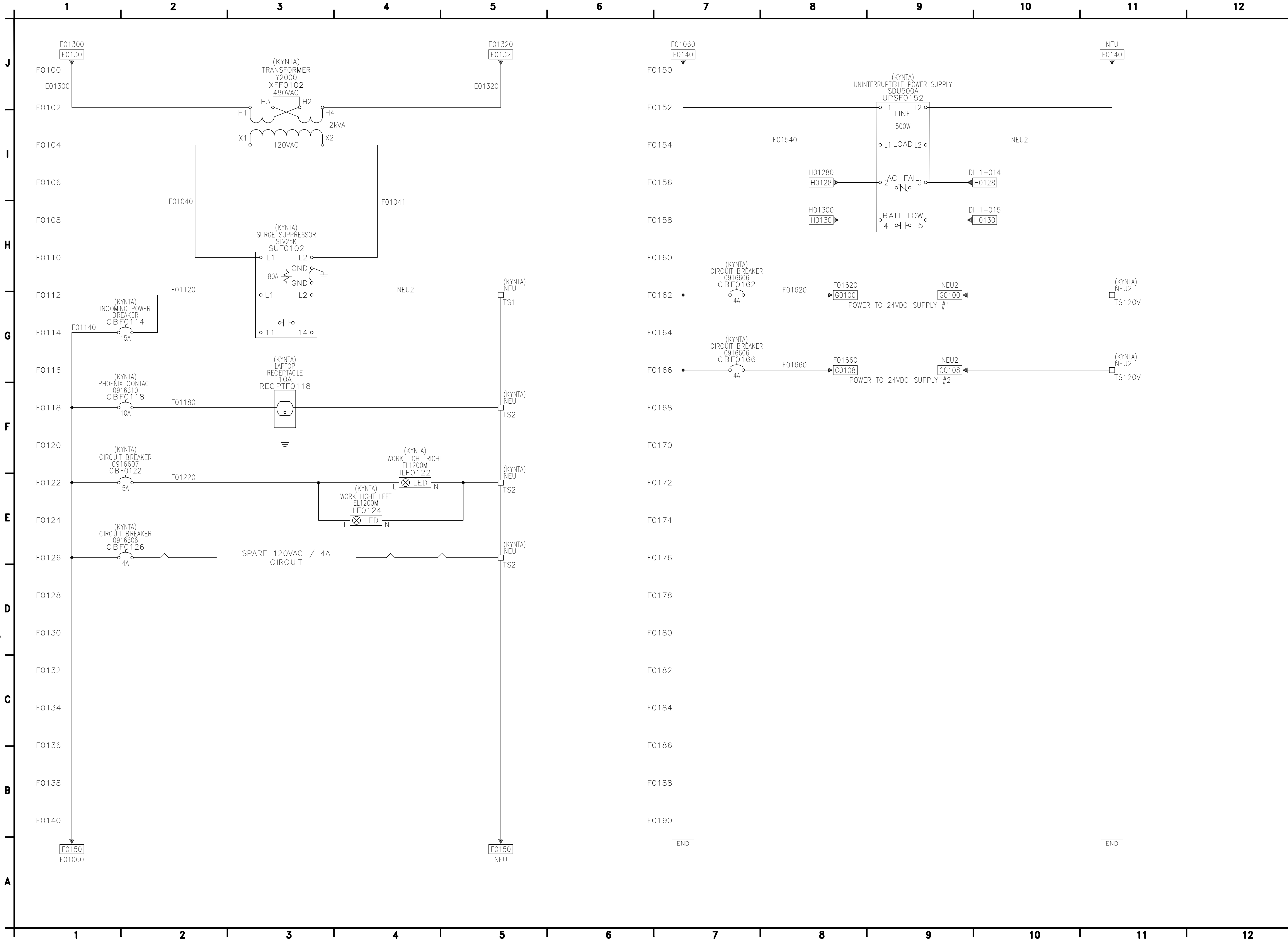
DESIGNED BY:	RSB
DRAWN BY:	RSB
CHECKED BY:	PP
APPROVED BY:	PP
DATE:	20230324

SHEET TITLE:
480VAC
THREE-LINE
SCHEMATIC

K-E02

SHEET NUMBER:	REV. #
K-E02	RCA
SHEET 45 OF 55 SHEETS	

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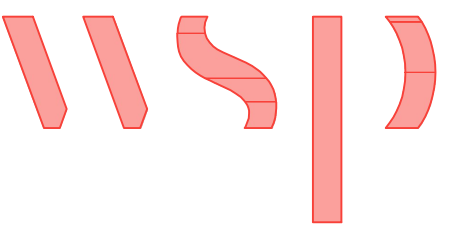
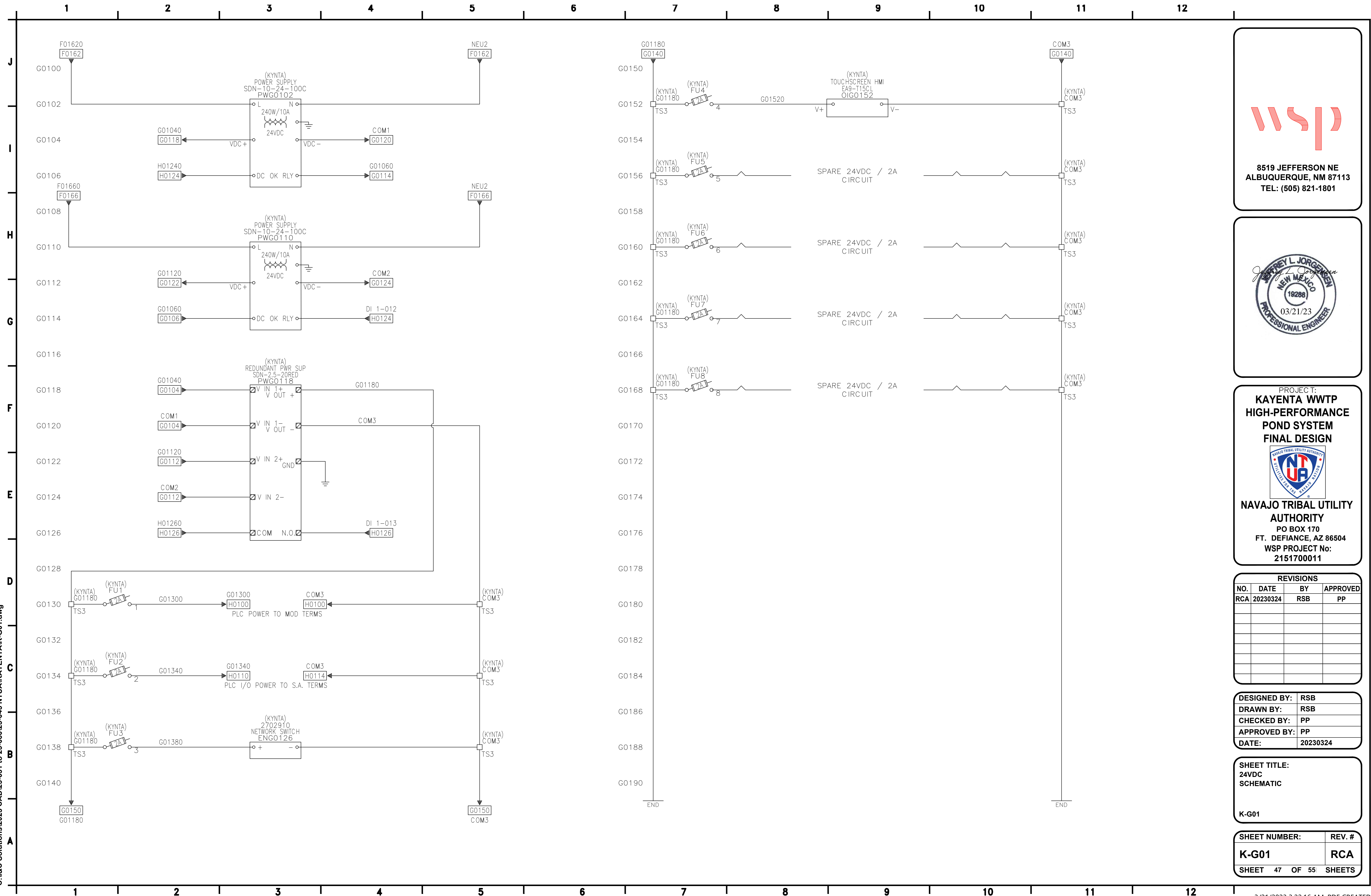
DESIGNED BY:	RSB
DRAWN BY:	RSB
CHECKED BY:	PP
APPROVED BY:	PP
DATE:	20230324

SHEET TITLE:
120VAC
SCHEMATIC

K-F01

SHEET NUMBER:	REV. #
K-F01	RCA
SHEET 46 OF 55 SHEETS	

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**NAVAJO TRIBAL UTILITY
AUTHORITY**
PO BOX 170
FT. DEFIANC, AZ 86504
WSP PROJECT No:
2151700011

REVISIONS			
NO.	DATE	BY	APPROVED
RCA	20230324	RSB	PP

DESIGNED BY:	RSB
DRAWN BY:	RSB
CHECKED BY:	PP
APPROVED BY:	PP
DATE:	20230324

SHEET TITLE:
24VDC
SCHEMATIC

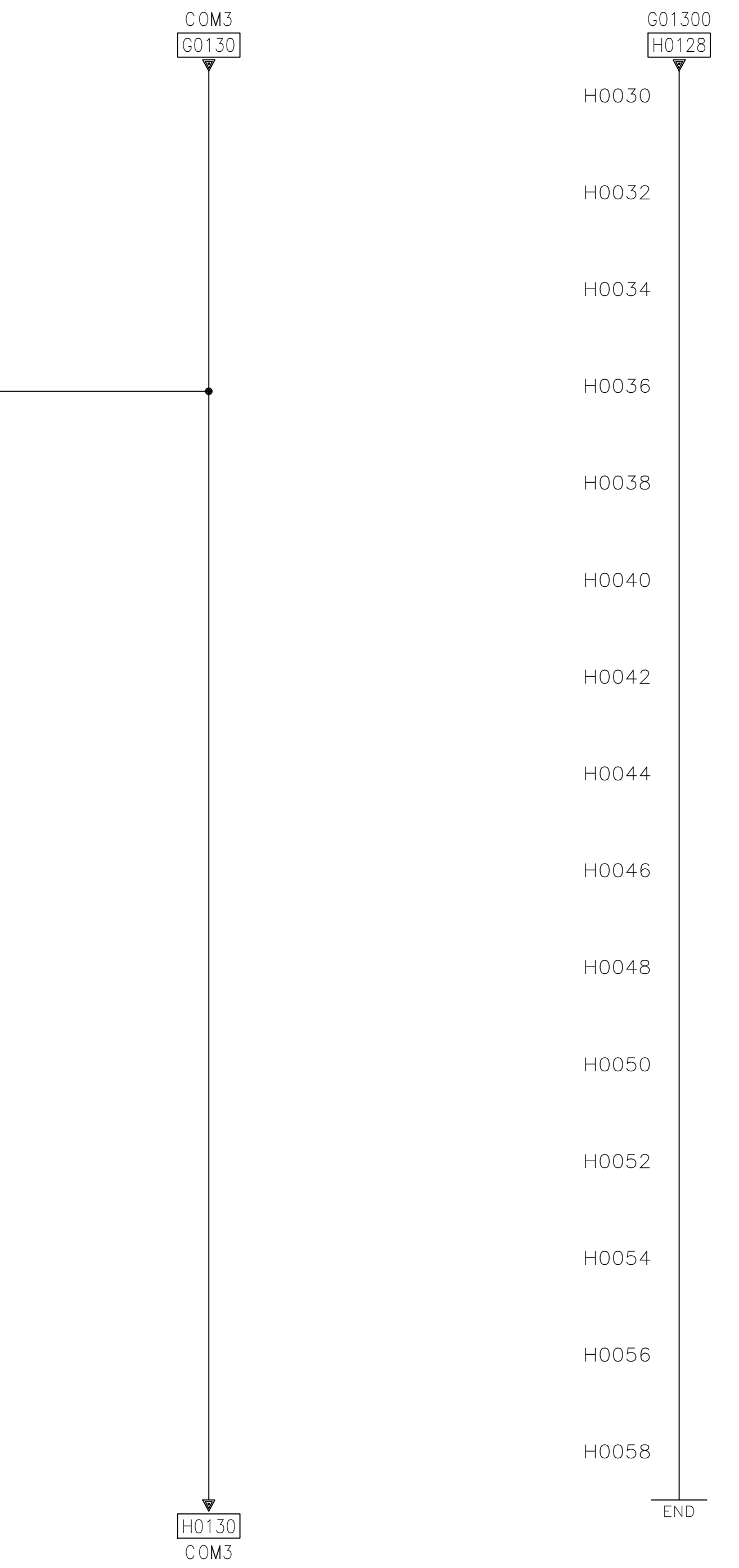
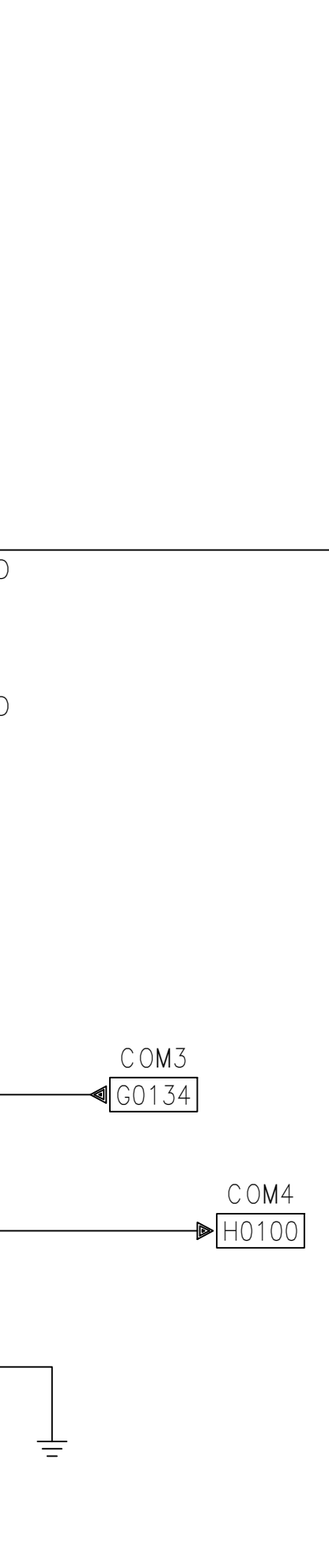
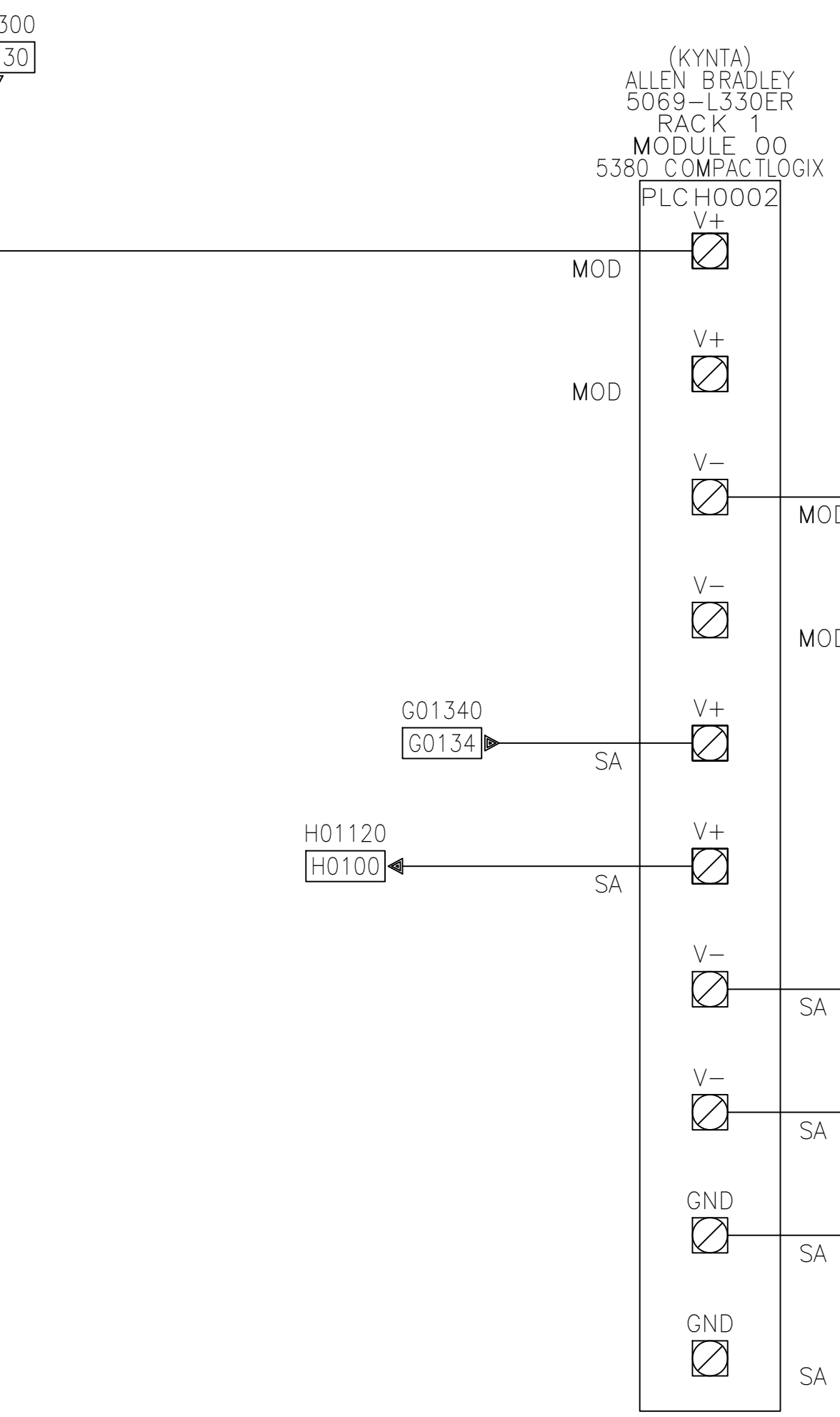
K-G01

SHEET NUMBER:	REV. #
K-G01	RCA
SHEET 47 OF 55	SHEETS

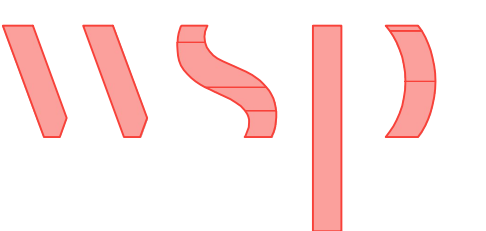
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PLC MODULE LAYOUT - RACK 1


MODULE 00 PROCESSOR	MODULE 01 D.I.	MODULE 02 D.I.	MODULE 03 D.O.	MODULE 04 A.I.	MODULE 05 A.O.
5069-L330ER	5069-IB16	5069-IB16	5069-OB16	5069-IF8	5069-OF8
H00	H01	H01	H02	H03	H04




- LEGEND & NOTES:**
- PANEL WIRING
 - - - FIELD WIRING
 - FUTURE WIRING
 - JUMPER WIRING
1. WIRE SIZE IS 16 AWG UNLESS OTHERWISE SPECIFIED.
 2. GROUND WIRE SIZE IS 16AWG UNLESS OTHERWISE SPECIFIED.
 3. AN ASTERISK (*) DENOTES MOTORS ABLE TO RUN CONCURRENTLY.
 4. COLOR SCHEME (INTERNAL, EXTERNAL, GROUND, LINK).
 5. ALL WIRING SHOULD BE SPECIFIED TO THE FOLLOWING COLOR CODE, UNLESS OTHERWISE STATED ON THE SPECIFIED DRAWING SHEET
- | | |
|-----------------------------|----------|
| 480VAC POWER | -BLK |
| SINGLE PHASE 120VAC HOT | -RED |
| SINGLE PHASE 120VAC NEUTRAL | -WHT |
| DC POSITIVE (24V+) | -BLU |
| DC NEGATIVE (0V,COM) | -BLU/WHT |
| 24VAC POSITIVE | -TAN/WHT |
| GROUNDING | -GRN/YLW |
| INTERCONNECTIONS | -YLW |



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HIGH-PERFORMANCE
POND SYSTEM
FINAL DESIGN**



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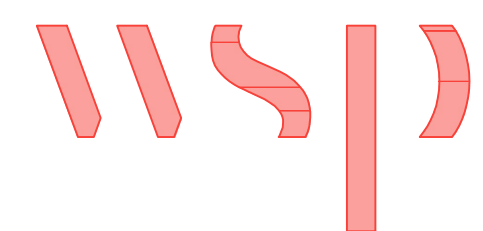
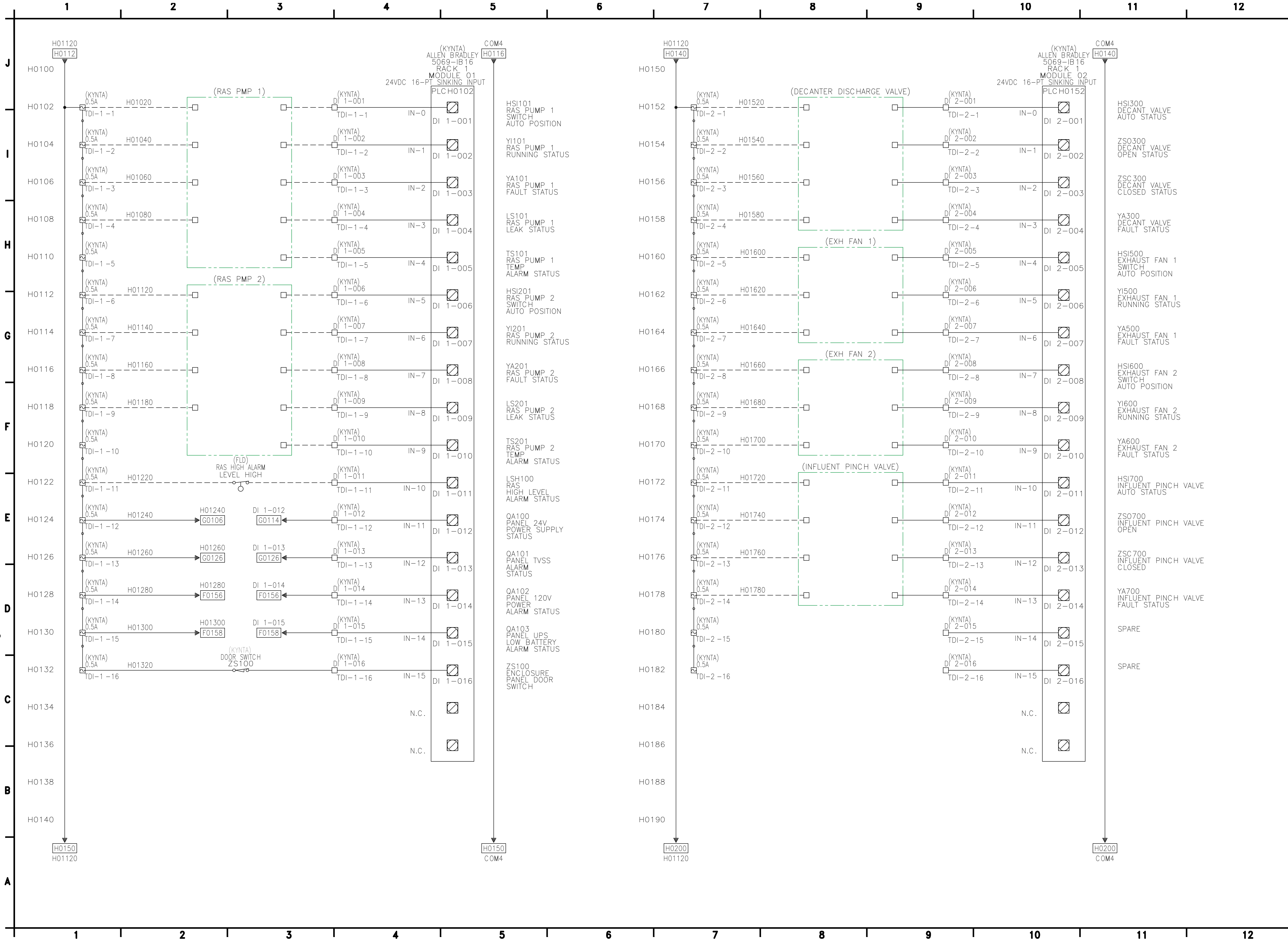
DESIGNED BY:	RSB
DRAWN BY:	RSB
CHECKED BY:	PP
APPROVED BY:	PP
DATE:	20230324

SHEET TITLE:
PLC POWER AND
COMMUNICATION - RACK 1
MODULE 00

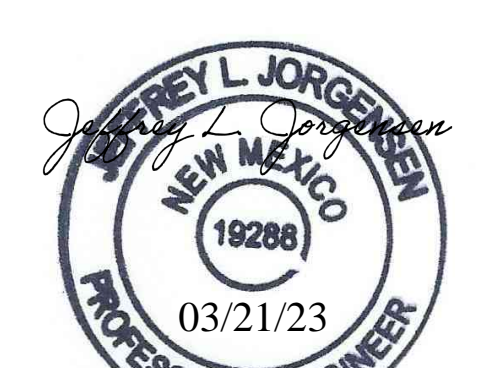
K-H00

SHEET NUMBER:	REV. #
K-H00	RCA
SHEET 48 OF 55 SHEETS	

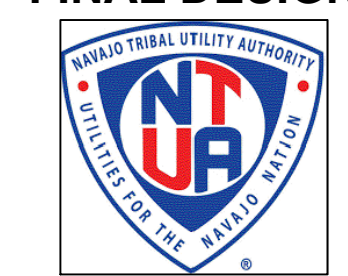
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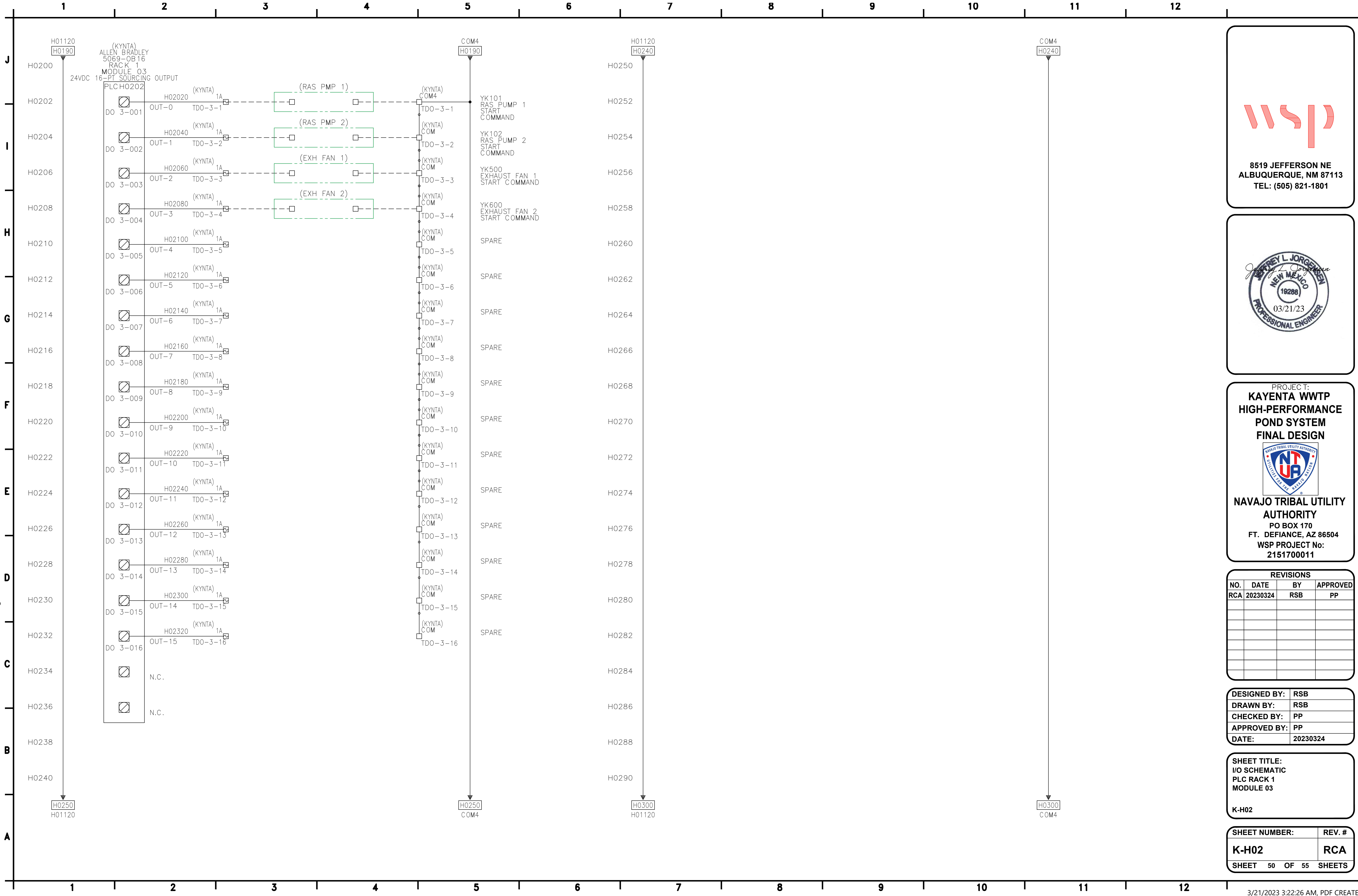
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RCA	20230324	RSB	PP

DESIGNED BY:	RSB
DRAWN BY:	RSB
CHECKED BY:	PP
APPROVED BY:	PP
DATE:	20230324


SHEET TITLE:
I/O SCHEMATIC
PLC RACK 1
MODULES 01 & 02

K-H01


SHEET NUMBER:	REV. #
K-H01	RCA
SHEET 49 OF 55 SHEETS	




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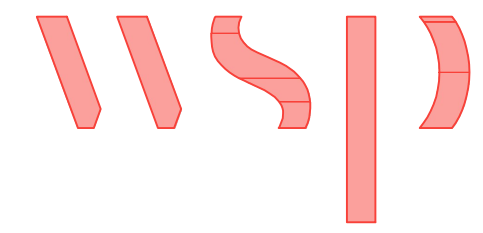
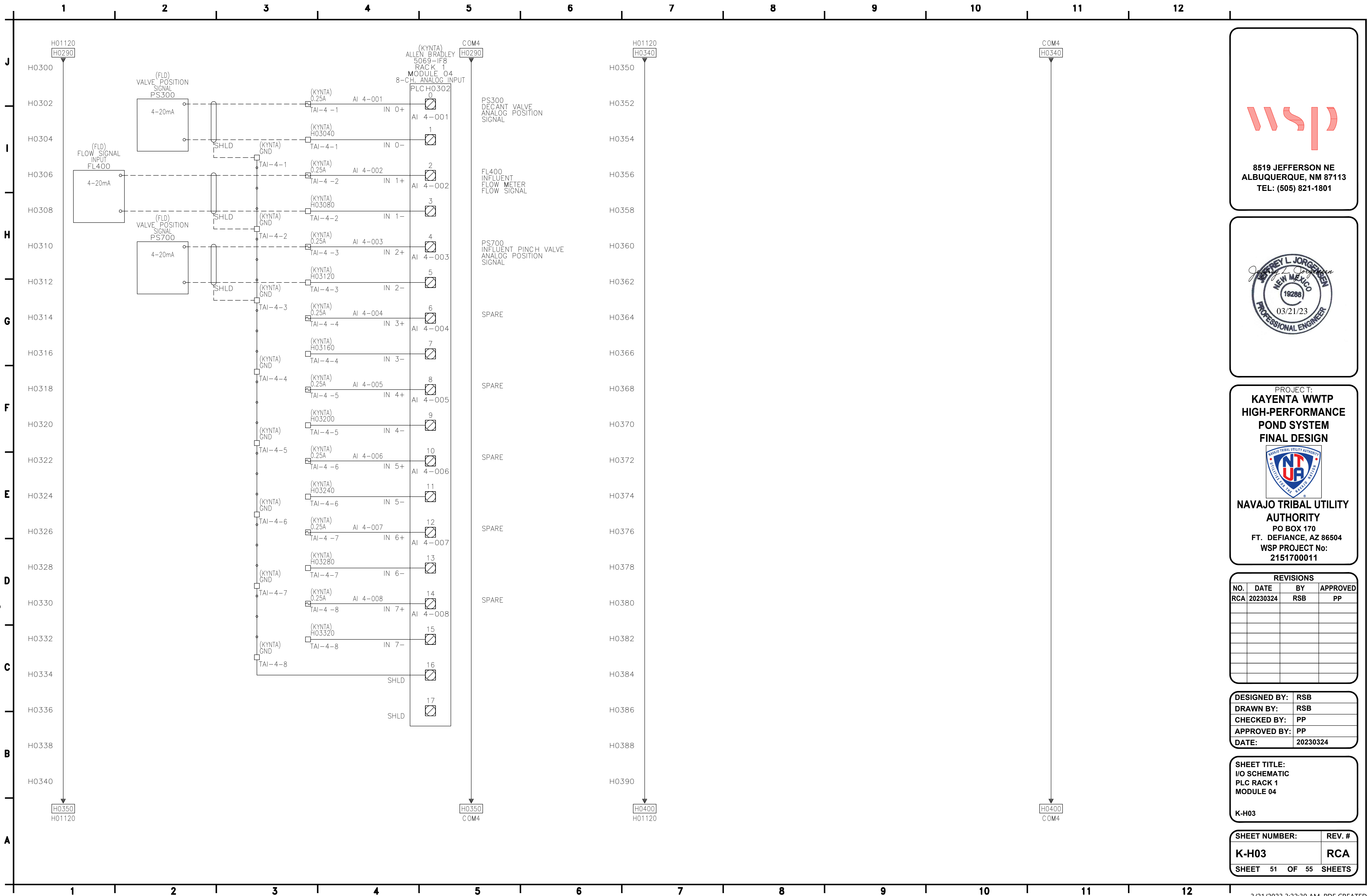
DESIGNED BY:	RSB
DRAWN BY:	RSB
CHECKED BY:	PP
APPROVED BY:	PP
DATE:	20230324

SHEET TITLE:
I/O SCHEMATIC
PLC RACK 1
MODULE 03

K-H02

SHEET NUMBER:	REV. #
K-H02	RCA
SHEET 50 OF 55 SHEETS	

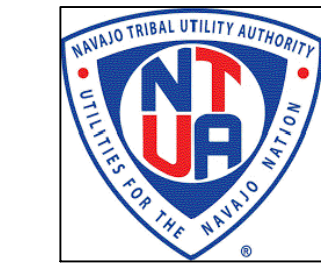
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PROJECT:
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WSP PROJECT No:
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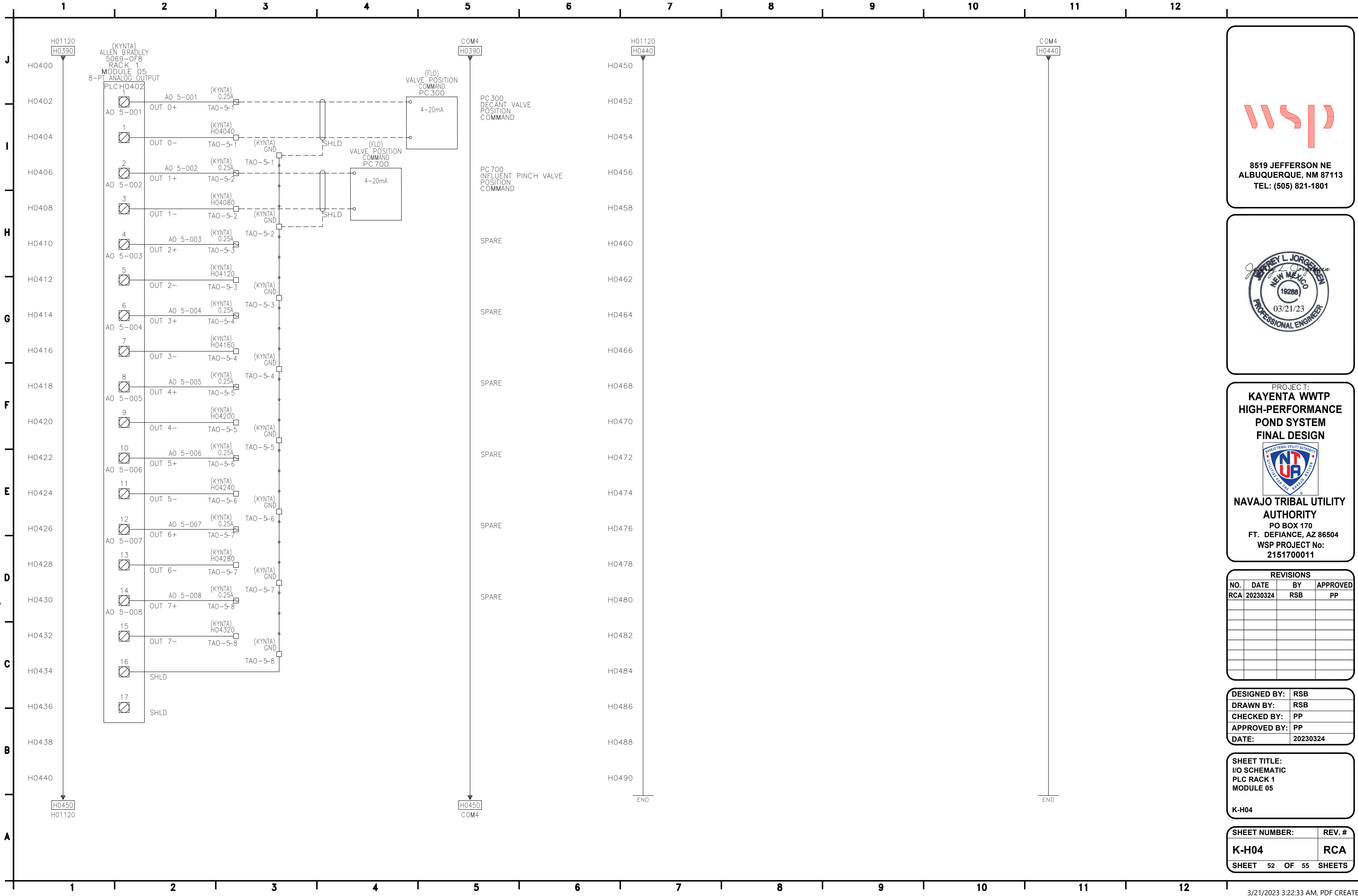
REVISIONS			
NO.	DATE	BY	APPROVED
RCA	20230324	RSB	PP

DESIGNED BY:	RSB
DRAWN BY:	RSB
CHECKED BY:	PP
APPROVED BY:	PP
DATE:	20230324


SHEET TITLE:
I/O SCHEMATIC
PLC RACK 1
MODULE 04

K-H03


SHEET NUMBER:	REV. #
K-H03	RCA
SHEET 51 OF 55 SHEETS	




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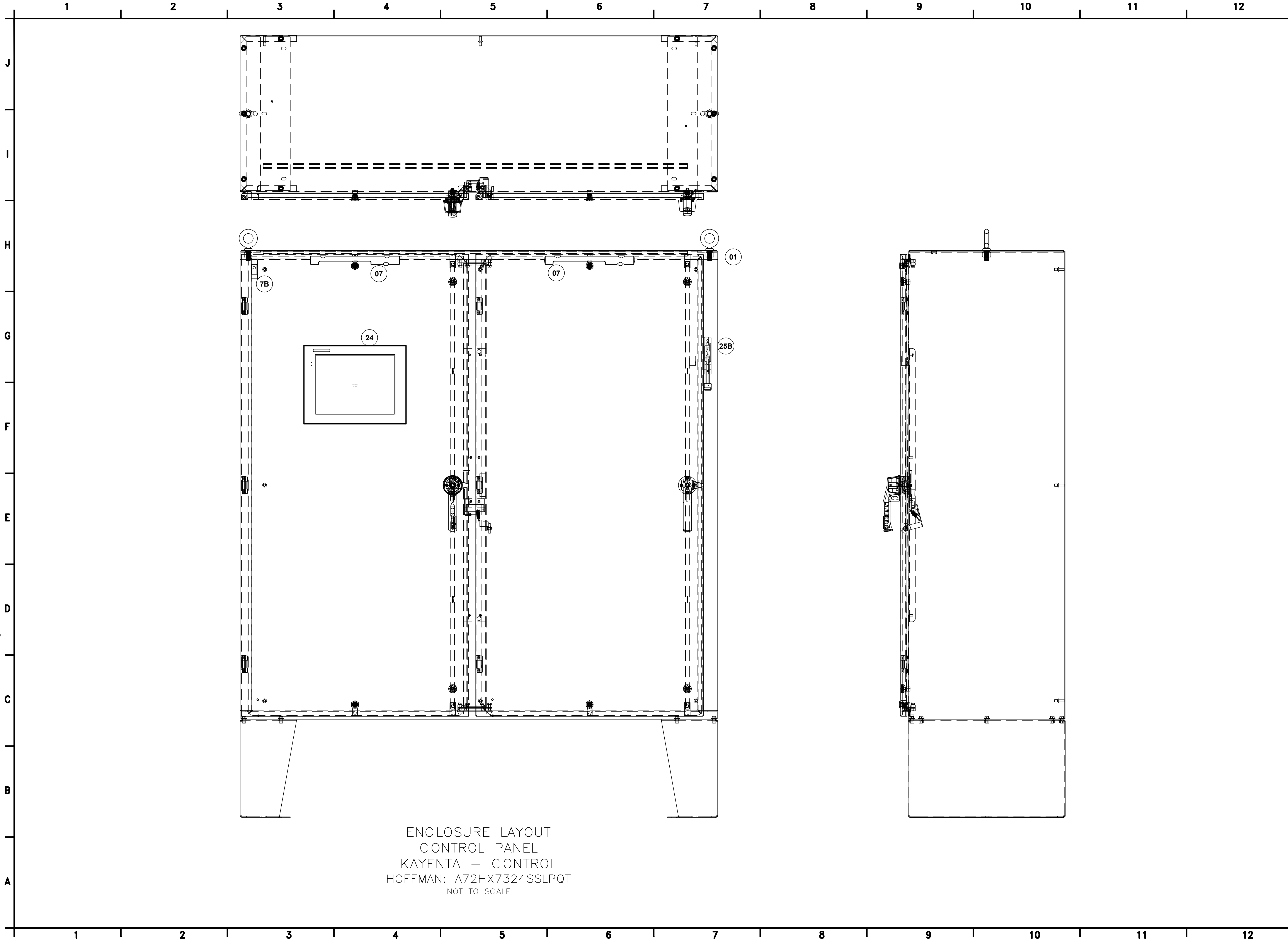
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RCA	20230324	RSB	PP

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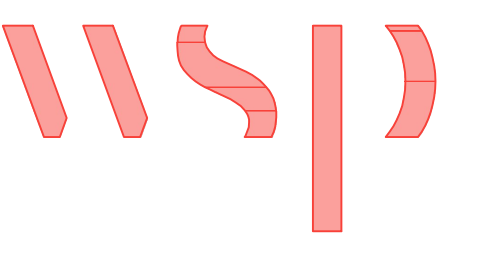
SHEET TITLE:
 I/O SCHEMATIC
 PLC RACK 1
 MODULE 05
 K-H04

SHEET NUMBER:	REV. #
K-H04	RCA
SHEET 52 OF 55 SHEETS	

C:\I&C Solutions\2023 CAD\23-031 to 23-060\23-045 NTUA\KAYENTA\K-M01.dwg



ENCLOSURE LAYOUT
 CONTROL PANEL
 KAYENTA - CONTROL
 HOFFMAN: A72HX7324SSLPQT
 NOT TO SCALE



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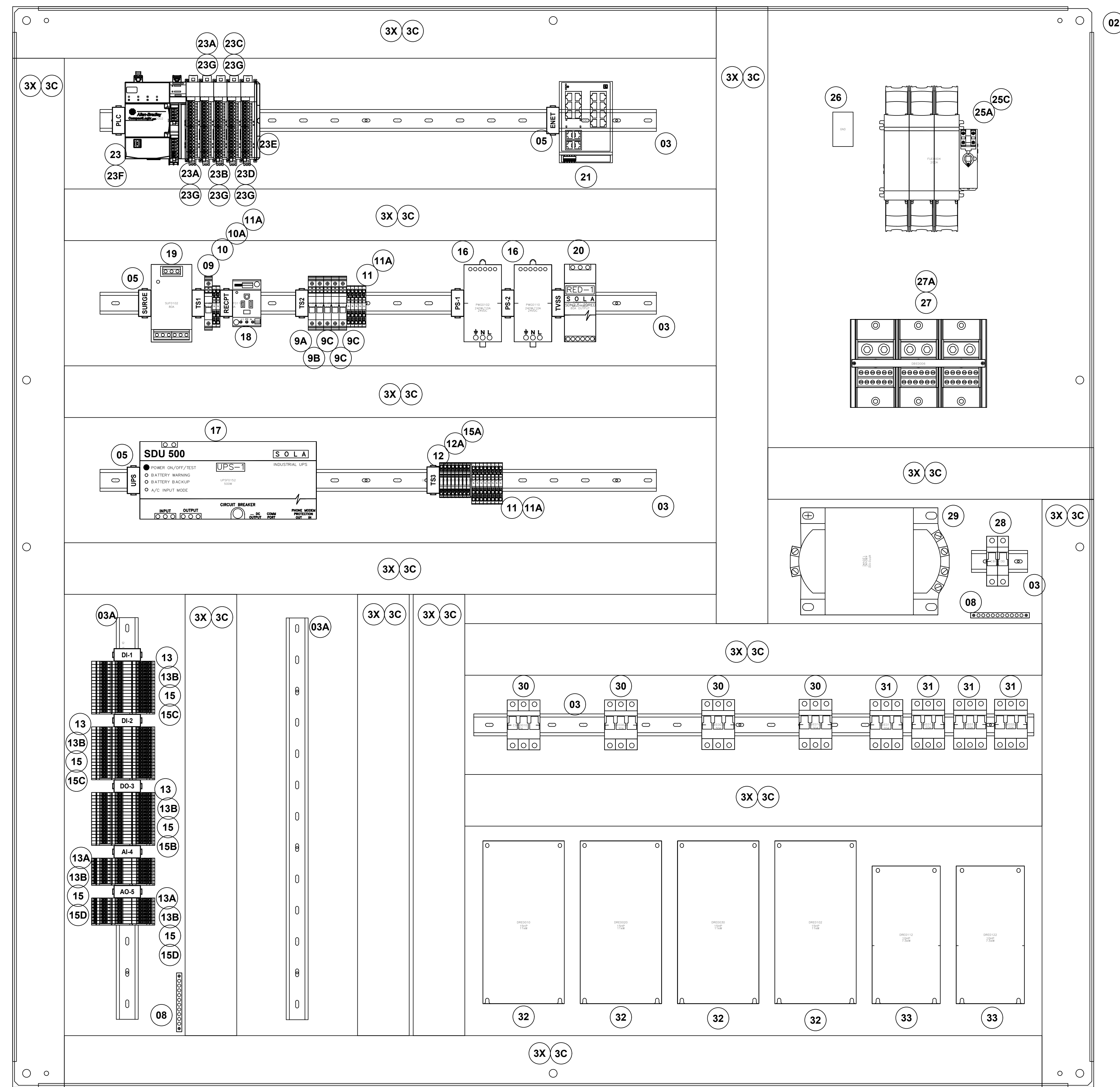
DESIGNED BY:	RSB
DRAWN BY:	RSB
CHECKED BY:	PP
APPROVED BY:	PP
DATE:	20230324

SHEET TITLE:
 ASSEMBLY DRAWING
 ENCLOSURE

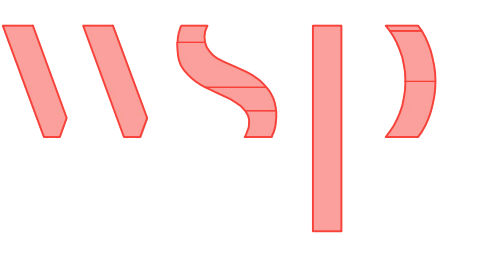
 K-M01

SHEET NUMBER:	REV. #
K-M01	RCA
SHEET 53 OF 55 SHEETS	

C:\I&C Solutions\2023 CAD\23-031 to 23-060\23-045 NTUA\KAYENTA\K-M02.dwg



BACKPLATE LAYOUT
 CONTROL PANEL
 KAYENTA — CONTROL
 HOFFMAN: A72P72
 NOT TO SCALE



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PROJECT:
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DATE:	20230324

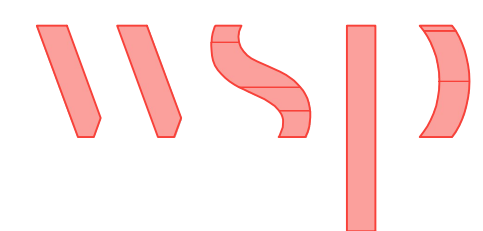
SHEET TITLE:
 ASSEMBLY DRAWING
 BACKPLATE

K-M02

SHEET NUMBER:	REV. #
K-M02	RCA
SHEET 54 OF 55 SHEETS	

C:\I&C Solutions\2023 CAD\23-031 to 23-060\23-045 NTUA\KAYENTA\K-M03.dwg

ITEM	QTY	CATALOG	MFG	DESC	TAGS
01	1	A72HX7324SSLPQT	HOFFMAN	FLOOR-MOUNT DISCONNECT, 2-DOOR ENCLOSURE, 3-PT LATCH, TYPE 4X, 72x74x24, BRUSHED, SS304	
02	1	A72P72	HOFFMAN	BACKPLATE, 68x68, MILD STEEL, PAINTED	
03	A/R	0801733	PHOENIX CONTACT	DIN RAIL (35mm X 7.5mm X 1m)	
03A	A/R	XUS001736	ENTRELEC	DIN RAIL, RAISED, (35mm X 50mm X 1m)	
04	A/R	3022276	PHOENIX CONTACT	DIN RAIL ANCHOR, CLIP-FIX 35-5	(not shown)
05	A/R	0800307	PHOENIX CONTACT	DIN RAIL MARKER, UBE-D	
07	2	EL1200M	HOFFMAN	ENCLOSURE LAMP KIT, LED, MOTION SENSOR	ILF0122,ILF0124
7B	1	ALFSWD	HOFFMAN	DOOR SWITCH, ENCLOSURE	ZS100
08	2	PK15GTA	SCHNEIDER ELECTRIC	GROUND BAR KIT, 10 POSITION, #14-#4AWG	
09	1	0916612	PHOENIX CONTACT	120VAC CIRCUIT BREAKER 15A RATED (UT 6-TMC M 15A)	CBF0114
9A	1	0916610	PHOENIX CONTACT	120VAC CIRCUIT BREAKER 10A RATED (UT 6-TMC M 10A)	CBF0118
9B	1	0916607	PHOENIX CONTACT	120VAC CIRCUIT BREAKER 5A RATED (UT 6-TMC M 5A)	CBF0122
9C	3	0916606	PHOENIX CONTACT	120VAC CIRCUIT BREAKER 4A RATED (UT 6-TMC M 4A)	CBF0126,CBF0162,CBF0166
10	1	3211775	PHOENIX CONTACT	FEED THRU TERMINAL BLOCK, 32A, BLUE (PT4-TWIN-BU)	TS1
10A	1	3211780	PHOENIX CONTACT	FEED THRU TERMINAL BLOCK, 32A, GND (PT4-TWIN-PE)	TS1
11	11	3211771	PHOENIX CONTACT	FEED THRU TERMINAL BLOCK, 32A, GRAY (PT4-TWIN)	TS2,TS3
12	8	3211903	PHOENIX CONTACT	FUSE MODULAR TERMINAL BLOCK, LED (PT4-HESILED 24)	TS3
13	48	3213961	PHOENIX CONTACT	DI/DO TERMINAL BLOCK	TDI-1,TDI-2,TDO-3
13A	16	3213960	PHOENIX CONTACT	AI/AO TERMINAL BLOCK	TAI-4,TAO-5
13B	5	3213976	PHOENIX CONTACT	END PLATE FOR I/O TERMINAL BLOCK	TDI-1,TDI-2,TDO-3,TAI-4,TAO-5
15	64	3209248	PHOENIX CONTACT	5x20 24VDC FUSE HOLDER (P-FU 5X20 LED 24-5)	TDI-1,TDI-2,TDO-3,TAI-4,TAO-5
15A	8	GMA-2-R	BUSSMAN	2A FUSE, 5mm X 20mm	TS3
15B	16	GMA-1-R	BUSSMAN	1A FUSE, 5mm X 20mm	TDO-3
15C	32	GMA-500-R	BUSSMAN	500mA FUSE, 5mm X 20mm	TDI-1,TDI-2
15D	16	GMA-250-R	BUSSMAN	250mA FUSE, 5mm X 20mm	TAI-4,TAO-5
16	2	SDN-10-24-100C	SOLA	24VDC POWER SUPPLY, 10A/240W RATED	PWG0102,PWG0110
17	1	SDU500A	SOLA	UNINTERRUPTIBLE POWER SUPPLY, 500W	UPSF0152
18	1	0804155	PHOENIX CONTACT	120VAC DIN RAIL MOUNT RECEPTACLE	RECPTF0118
19	1	STV25K	SOLA	SURGE PROTECTION DEVICE	SUF0102
20	1	SDN-2.5-20RED	SOLA	TVSS DEVICE	PWG0118
21	1	2702910	PHOENIX CONTACT	ETHERNET SWITCH, 10x RJ45	ENG0126
23	1	5069-L330ER	ALLEN BRADLEY	COMPACTLOGIX 5380 SERIES PLC, 60 NODE, 3MB MEM, 3 IO RACK	PLCH0002
23A	2	5069-IB16	ALLEN BRADLEY	COMPACT 5000 I/O DIGITAL 16-POINT SINKING INPUT MODULE 24VDC	PLCH0102,PLCH0152
23B	1	5069-OB16	ALLEN BRADLEY	COMPACT 5000 I/O DIGITAL 16-POINT OUTPUT MODULE 24VDC	PLCH0202
23C	1	5069-IF8	ALLEN BRADLEY	COMPACT 5000 I/O ANALOG 8-POINT INPUT MODULE	PLCH0302
23D	1	5069-OF8	ALLEN BRADLEY	COMPACT 5000 I/O ANALOG 8-POINT OUTPUT MODULE	PLCH0402
23E	1	5069-ECR	ALLEN BRADLEY	COMPACT 5000 I/O END CAP, RIGHT	
23F	1	5069-RTB64-SPRING	ALLEN BRADLEY	COMPACT 5000, 4&6 POS, SPRING TERMINAL	PLCH0002
23G	5	5069-RTB18-SPRING	ALLEN BRADLEY	COMPACT 5000, 18 POS, SPRING TERMINAL	PLCH0102,PLCH0152,PLCH0202,PLCH0302,PLCH0402
24	1	EA9-T15CL	AUTOMATION DIRECT	15" TOUCHSCREEN HMI	OIG0152
25A	1	194R-J200-1753	ALLEN BRADLEY	3PH FUSED DISCONNECT, 200A RATED	FUE0004
25B	1	194R-HM4	ALLEN BRADLEY	DISCONNECT HANDLE KIT, WITH CABLE	FUE0004
25C	3	JTD200ID	LITTELFUSE	J-SERIES FUSE, 200A RATED	FUE0004
26	1	LAMA1/0-14-QY	PANDUIT	GROUND LUG, #14-1/0AWG	
27	1	1492-PD32127	ALLEN BRADLEY	POWER DISTRIBUTION BLOCK, 3PH, 760A RATED, AL, (2) 1/0AWG LINE, (14)#14-#4AWG LOAD	DBE0006
27A	1	1492-PBC3	ALLEN BRADLEY	COVER KIT FOR 1492-PD32127	DBE0006
28	1	1489-M2C080	ALLEN BRADLEY	CIRCUIT BREAKER, MINIATURE, 2-POLE, 8A, 480/277VAC, C-TRIP, NO NEUTRAL	CBE0130
29	1	Y2000	SOLA	CONTROL XFMR, 240X480V PRI, 120V SEC, 2KVA, SBE SERIES, OPEN STYLE, COPPER WOUND	XFF0102
30	4	1489-M3C300	ALLEN BRADLEY	CIRCUIT BREAKER, MINIATURE, 3-POLE, 30A, 480/277VAC, C-TRIP, NO NEUTRAL	CBE0010,CBE0020,CBE0030,CBE0102
31	4	1489-M3C200	ALLEN BRADLEY	CIRCUIT BREAKER, MINIATURE, 3-POLE, 20A, 480/277VAC, C-TRIP, NO NEUTRAL	CBE0112,CBE0122,CBE0134,CBE0202
32	4	25B-D024N104	ALLEN BRADLEY	POWERFLEX 525, 480VAC, 3PH, EMBEDDED ETHERNET/IP, FRAME D, 11KW, 15HP	DRE0010,DRE0020,DRE0030,DRE0102
33	2	25B-D017N104	ALLEN BRADLEY	POWERFLEX 525, 480VAC, 3PH, EMBEDDED ETHERNET/IP, FRAME C, 7.5KW, 10HP	DRE0112,DRE0122



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SHEET TITLE:
BILL OF
MATERIALS

K-M03

SHEET NUMBER:	REV. #
K-M03	RCA
SHEET 55 OF 55 SHEETS	