KELLER ASSOCIATES

ADDENDUM NO. 4
to the
BIDDING DOCUMENTS, SPECIFICATIONS AND DRAWINGS
for
City of Aberdeen
WWTP Improvements

August 9, 2024

All bidders shall acknowledge receipt of this addendum by dating, numbering, and initialing under Article 7, Bid Form.

All changes, corrections, deletions and/or additions to the initial bidding documents enumerated herein shall be included in the Bidder's Proposal. In case of any conflict between the drawings, specifications, and this Addendum, this Addendum shall govern.

SUPPLEMENTAL INFORMATION

Supplemental information is provided for the Bidder's information only. The following items are not part of the Contract Documents and do not change the plans and specifications:

- 1991 record drawings for the aerobic digesters are attached for the Bidder's information.

TECHNICAL SPECIFICATIONS

Section 01 35 13 – Special Project Procedures

- ADD the following to Part 3.3, B., 4., a., 2):

  "d) Contractor shall be responsible for pumping out or emptying sludge tanks by gravity to the geotubes at the sludge drying beds once work has started on the aerobic digesters/valve vault modifications and until gravity flow can be restored to the sludge drying beds, or the new screw press dewatering facilities are operational and accepted by Owner. When performing work to install valves or piping and replace valves in the vault, the Contractor will be responsible for pumping down the aerobic digesters as frequently as needed to provide storage for waste activated sludge generated by the plant while the work is ongoing. Sludge will be pumped by the Contractor into a geotube at the sludge drying beds unless piping has been installed that allows for gravity flow to the sludge drying beds. Owner shall provide direction for these operations to be performed by Contractor.

  The aerobic digesters flow over weir walls to Tank 4. They can only be emptied using the valves in the valve vault; only one valve is operational at this time so the other three tanks must be pumped out until the valves in the outlet vault are replaced and operational while work is ongoing.

  Cleaning tanks will involve pumping down each tank as low as possible, hosing down the floor and walls, and pumping out the washwater to a location onsite as directed by Owner. Each tank shall be emptied and cleaned by Contractor before the Owner performs their inspection on the diffuser sleeves. All wastewater from cleaning operations shall be disposed of to the headworks lift station or the sludge drying beds as directed by Owner to maintain plant operations. Contractor be aware that the piping underneath the tanks will be full of sludge when the valves are removed in the vault. Sequencing plan shall include provisions for this drainage into the vault."

Section 03 64 23 – Epoxy Injection Grouting

- ADD the following to this section:

  "1.2 SUBMITTALS

  A. Submit in accordance with Section 01 33 00 – Submittal Procedures.

  B. Provide product literature and installation instructions for epoxy resin adhesive system.

  C. Provide resume for applicator and certifications for performing this work for review.

Section 22 30 00 – Plumbing Equipment

- Part 2.5, A: DELETE this section and ADD the following in its place:

  "A. Provide premanufactured trench drains as shown on the drawings."

- Part 2.5, B: DELETE this section and ADD the following in its place:

  "B. Trench drains shall be constructed of high density polyethylene or approved equal."

- Part 2.5, C.1: DELETE this section and ADD the following in its place:

  "1. See the Drain and Cleanout Schedule on the drawings for trench drain width."

- Part 2.5, H.2: DELETE this manufacturer. The basis of design is Zurn as listed on the drawings. Equivalent products may be submitted for review during the submittal phase.

Section 33 05 62 – Precast Concrete Manholes and Vaults

- Part 2.1, A: CHANGE the minimum 28-day concrete compressive strength from "4,000" to "5,000."

Section 40 05 23 – Stainless Steel Pipe

- Part 2.2, A: CHANGE "ASTM A409" to "ASTM A312" in the last sentence of this paragraph.

Section 40 62 00 – SCADA Computers and Software

- REPLACE this specification section with the attached.

Section 40 63 43 – PLC-Based Control System Hardware

- REPLACE this specification section and associated schedule (40 63 43.A) with the attached.

Section 40 67 00 – Control Panels

- REPLACE this specification section and associated schedule (40 67 00.A) with the attached.

Section 40 70 00 – Instrumentation and Control, General

- REPLACE this specification section and associated schedule (40 70 00.A) with the attached.

Section 40 70 00.1 – Instrumentation and Controls, References and Definitions

- REPLACE this specification section with the attached.

Section 40 70 00.2 – Instrumentation and Control, System Description

- REPLACE this specification section with the attached.

DRAWINGS

Sheet C-304 – Plant Water Plan – Area 2

- Sheet Keynote 01: DELETE this note and ADD the following in its place:

  "01 INSTALL FITTINGS AND VALVE - 2" CUT-IN TEE, FITTINGS AS REQUIRED, AND 2" GATE VALVE WITH VALVE BOX & LID, RE:C7001"

- Sheet Keynote 02: DELETE this note and ADD the following in its place:

  "02 INSTALL FITTINGS AND VALVE - 2.5" CUT-IN TEE, FITTINGS AS REQUIRED, AND 2.5" GATE VALVE WITH VALVE BOX & LID, RE:C7001"

Sheet C-532 – Digester Outlet Vault Modifications

- ADD the following to General Sheet Note 9:

  "Work includes recoating all existing pipe in vault (i.e., surface preparation, prime and finish coats)."

- ADD the following sentence at the end of General Sheet Note 10:

  "The specified grouting system is not suitable for grouting under flowing or standing water conditions. Contractor to provide an external dewatering system to lower the groundwater below the bottom of the vault so the grouting can be completed without flowing water through the cracks or joints."

Sheet E-121 – Electrical Site Plan – Area 1

- ADD markups shown in "red" on the attached drawing sheet to the project drawings.

Sheet E-122 – Electrical Site Plan – Area 2

- ADD markups shown in "red" on the attached drawing sheet to the project drawings.

Sheet M-501-B1 – IFAS Splitter Box – Mechanical Details

- REFER to Detail A1 Rectangular Weir Details for Aeration Basins Splitter Box: DELETE "3/8" NEOPRENE GASKET ON ENTIRE FLANGE" from plan view of weir. ADD the following the detail notes:
  "3. Apply Vulkem 116 sealant between wall and weir plate flanges before anchoring to seal weirs water-tight."

Sheet S-102-D – Tertiary Treatment – Slab, Wall, Ceiling, Stair and Grating Framing Plan

- REFER to Sheet Keynote 07. DELETE "AND S1307". Reference plumbing design for trench drains.

Sheet EI-701-D – Tertiary Treatment – P&ID

- DELETE this sheet in its entirety and ADD the attached in its place.

Sheet S-104-E – Control & Dewatering Building – Slab, Stair Framing & Wall Plan Area 1

- REFER to Sheet Keynote 03. DELETE the description and add the following in its place: "03 TRENCH DRAIN, RE: PLUMBING"

Sheet S-105-E – Control & Dewatering Building – Slab, Stair Framing & Wall Plan Area 2

- REFER to Sheet Keynote 03. DELETE the description and add the following in its place: "03 TRENCH DRAIN, RE: PLUMBING"

Sheet S-106-E – Control & Dewatering Building – Slab, Stair Framing & Wall Plan Area 3

- REFER to Sheet Keynote 03. DELETE the description and add the following in its place: "03 TRENCH DRAIN, RE: PLUMBING"

Sheet E-601-E – Control & Dewatering Building – One-Line Diagram

- ADD markups shown in "red" on the attached drawing sheet to the project drawings.

Sheet E-602-E – Control & Dewatering Building – Electrical Schedules

- ADD markups shown in "red" on the attached drawing sheet to the project drawings.

Sheet E-603-E – Control & Dewatering Building – Cable & Conduit Schedules

- ADD markups shown in "red" on the attached drawing sheet to the project drawings.

Sheet EI-101-E – Control & Dewatering Building – Enlarged Instrumentation Plan Area #1

- DELETE this sheet in its entirety and ADD the attached in its place.

Sheet EI-102-E – Control & Dewatering Building – Enlarged Instrumentation Plan Area #2

- DELETE this sheet in its entirety and ADD the attached in its place.

Sheet EI-601-E – Control & Dewatering Building – Control Cable & Conduit Schedule

- DELETE this sheet in its entirety and ADD the attached in its place.

Sheet EI-702-E – Control & Dewatering Building – Air Gap System – P&ID

- DELETE this sheet in its entirety and ADD the attached in its place.

Sheet S-503 – Structural Details

- DELETE Detail S1307 Trench Drain in its entirety. Reference plumbing drawings and specifications for trench drains.

Sheet MP-502 – Plumbing Standard Details

- Detail U029 Trench Drain Section: DELETE the dimensions, 4" and 6", for the concrete encasement and ADD the following note:

  "1. CONTRACTOR SHALL SUBMIT MANUFACTURER'S CONCRETE ENCASEMENT CONSTRUCTION DETAILS FOR TRENCH DRAIN SYSTEM FOR REVIEW AND APPROVAL PRIOR TO INSTALLATION. TRENCH DRAIN INSTALLATION SHALL BE RATED FOR A MINIMUM OF H-20 TRAFFIC LOADS."

- Detail U030 Trench Drain Section 2: DELETE Note 1. and ADD the following in its place:

  "1. Reference Section 22 30 00 – Plumbing Equipment for trench drain specifications and Sheet MP-601 for the Drain and Cleanout Schedule."

Sheet E-503 – Electrical Details

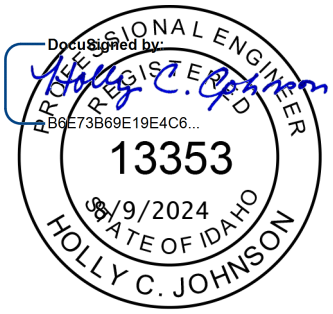
- DELETE this sheet in its entirety and ADD the attached in its place.

Sheet E-504 – Electrical Details

- ADD markups shown in "red" on the attached drawing sheet to the project drawings.

Sheet E-601 – Overall Electrical System Architecture

- ADD markups shown in "red" on the attached drawing sheet to the project drawings.



Prepared by _____

Keller Associates, Inc.

CITY OF ABERDEEN, IDAHO

WASTEWATER TREATMENT PLANT REHABILITATION

1991

PROFESSIONAL ENGINEER-LAND SURVEYOR
REGISTERED
3020
STATE OF IDAHO
JOHN W MILLAR

IDHW NO. 1890-01
FA NO. 90046

FORSGREN ASSOCIATES / P.A.

RECORD DRAWING

GENERAL NOTES:

GENERAL

1. THESE ARE GENERAL NOTES AND APPLY TO THE PROJECT EXCEPT WHERE ARE SPECIFIC INFORMATION IS INDICATED IN DRAWINGS OR SPECIFICATIONS.
2. CONSTRUCTION SHALL CONFORM WITH LATEST EDITION OF THE UNIFORM BUILDING CODE EXCEPT WHERE THE FOLLOWING NOTES OR OTHER APPLICABLE CODES ARE MORE RESTRICTIVE.

CIVIL

1. ALL DISTANCES AND DATA SHALL BE CHECKED BY THE CONTRACTOR PRIOR TO THE START OF CONSTRUCTION. IN CASE OF CONFLICT THE ENGINEER SHALL BE NOTIFIED IMMEDIATELY SO THAT CLARIFICATION MAY BE MADE PRIOR TO THE START OF THE WORK.
2. DIMENSIONS TO/OR COORDINATES FOR MANHOLES, PIPELINES, ETC., ARE TO CENTERLINE UNLESS OTHERWISE NOTED.
3. ELEVATIONS SHOWN ARE TO FINISHED SURFACE OR PIPE INVERT UNLESS OTHERWISE NOTED.
4. THE CONTRACTOR SHALL RETAIN AND PROTECT OR REMOVE AND REPLACE ALL LANDSCAPING, TREES, UTILITIES, AND ALL OTHER MISCELLANEOUS ITEMS. ANY DAMAGE DONE BY THE CONTRACTOR SHALL BE REPAIRED AT HIS EXPENSE.
5. ALL PIPELINES ARE TO BE LOCATED AS SHOWN ON THE PLANS UNLESS RELOCATED IN THE FIELD BY THE ENGINEER TO AVOID UNFORESEEN INTERFERENCE.
6. THRUST BLOCKS SHALL BE PLACED AT ALL DIRECTION CHANGES IN PRESSURE PIPE.
7. IT WILL BE THE RESPONSIBILITY OF THE CONTRACTOR TO MAKE ARRANGEMENTS FOR WATER REQUIRED FOR COMPACTION, DUST PREVENTION AND TESTING.
8. MINIMUM DEPTH OF COVER FOR PIPELINES UNLESS OTHERWISE SHOWN ON THE PLANS SHALL BE FOUR (4) FEET.
9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SECURING SOURCES FOR GRANULAR MATERIAL, WATER FOR CONSTRUCTION, WASTE SITE(S), AND ADDITIONAL MATERIALS THAT MAY BE NECESSARY FOR PROPERLY CONSTRUCTING THE PROJECT.

FOUNDATIONS AND BACKFILL

1. COMPACT STRUCTURAL FILL BENEATH FLOOR SLABS AND FOUNDATIONS TO A MINIMUM DRY DENSITY OF 96% OF MAXIMUM DRY DENSITY AS DETERMINED BY (ASTM, D-698).
2. PLACE 6" INCHES OF GRAVEL FILL BELOW ALL STRUCTURES. GRAVEL BORROW SHALL MEET THE REQUIREMENTS OF SECTION 02222-2.02 SELECT FILL MATERIALS.
3. AVOID USE OF HEAVY COMPACTION EQUIPMENT CLOSER THAN 5 FEET TO WALLS.
4. PROVIDE DOWELS OUT OF FOOTINGS FOR ALL WALL AND COLUMN REINFORCING. DOWELS TO BE SAME SIZE AND SPACING AS WALL AND COLUMN REINFORCING.
5. ALL TRENCH BACKFILL SHALL BE CLASS "A" AS DEFINED BY SECTION 02225 SUBSECTION 3.10.

STRUCTURAL

1. DESIGN LIVE LOADS SHALL BE IN ACCORDANCE WITH APPLICABLE CODES AND SPECIAL PROJECT REQUIREMENTS AS DETERMINED BY THE ENGINEER.
   A. SNOW LOADS 35 LBS. PER SQUARE FOOT.
   B. THIS PROJECT IS IN SEISMIC ZONE 3.
   C. BUILDING FLOOR SLABS ARE DESIGNED FOR 100 LBS. PER SQUARE FOOT.
2. CONSTRUCTION JOINTS SHALL BE LOCATED WHERE SHOWN ON DRAWINGS OR AS APPROVED BY THE ENGINEER. PROVIDE WATERSTOPS IN CONSTRUCTION JOINTS IN WATERTIGHT STRUCTURES AS DETAILED ON DRAWINGS. IN ALL WATER RETAINING STRUCTURES, SLAB JOINTS SHALL HAVE WATERSTOPS AND 3/4" SEALANT GROOVE CONTINUOUS ALL ALONG JOINT.

MATERIALS:

1. PVC PIPE – ALL PVC PIPE IS TO BE AWWA C-900 CLASS 150 WITH DUCTILE IRON FITTING AS REQUIRED.
2. DUCTILE IRON – ALL DUCTILE IRON PIPE IS TO BE AWWA C-151 CLASS 50. ALL DUCTILE IRON PIPE USED FOR AIR PIPING IS TO BE UNLINED. ALL OTHER IS TO BE LINED.

CONCRETE

1. ALL STRUCTURAL CONCRETE SHALL DEVELOP THE COMPRESSIVE STRENGTH AS REQUIRED BY SECTION 03000 OF THE SPECIFICATIONS.
2. REINFORCING STEEL SHALL BE DEFORMED BILLET-STEEL BARS MEETING THE REQUIREMENTS OF SPECIFICATIONS FOR DEFORMED BILLET-STEEL BARS FOR CONCRETE REINFORCEMENT, ASTM A615, GRADE 60 EXCEPT STIRRUPS AND TIES-GRADE 40.
3. FABRICATION AND PLACING OF REINFORCING BARS SHALL CONFORM TO THE MANUAL OF STANDARD PRACTICE FOR DETAILING REINFORCED CONCRETE STRUCTURES ACI-315, LATEST EDITION.
4. SHOP DRAWINGS SHALL BE REQUIRED FOR ALL REINFORCING STEEL, AND SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW BEFORE FABRICATION.
5. REINFORCE ALL CONCRETE WITH A MINIMUM OF 1/4 OF 1% OF CROSS SECTION EACH WAY UNLESS NOTED OTHERWISE.
6. ALL LAP SPLICES SHALL BE 36 BAR DIAMETERS (MINIMUM 24") UNLESS NOTED OTHERWISE.
7. PROVIDE CORNER BARS FOR ALL HORIZONTAL REINFORCING: BARS TO BE THE SAME SIZE AND SPACING AS HORIZONTAL REINFORCING UNLESS OTHERWISE SHOWN.
8. UNLESS INDICATED OTHERWISE ON THE DRAWINGS, MINIMUM CONCRETE COVER OVER REINFORCING BARS SHALL BE:

FOR CONCRETE CAST AGAINST EARTH	3"
FOR SURFACES IN CONTACT WITH EARTH WALLS, BEAMS, COLUMNS	2"
SLABS, WITH NO. 5 BARS & SMALLER	1 1/2"
SLABS, WITH NO. 6 BARS & LARGER	2"
FOR SURFACES IN CONTACT WITH WATER	2"
FOR SURFACES EXPOSED TO WEATHER WITH NO. 5 BARS & SMALLER	1 1/2"
WITH NO. 6 BARS & LARGER	2"
FOR UNDERSIDE OF SLABS OVER WATER IN ENCLOSED CONDUITS, BEAMS & COLUMNS NOT IN CONTACT WITH EARTH OR WATER OR EXPOSED TO WEATHER	1 1/2"
FOR ALL INTERIOR SURFACES NOT IN CONTACT WITH WATER OR EARTH	1"

9. TOLERANCE IN PLACING REINFORCING SHALL BE 1/4" FOR MEMBERS 24" OR LESS IN DEPTH AND 1/2" FOR MEMBERS MORE THAN 24" IN DEPTH.
10. WATERSTOPS, PIPES, WALL PIPES AND OTHER INSTALLED ACCESSORIES OR MATERIALS SHALL BE HELD SECURELY IN PLACE WHILE CONCRETE IS BEING PLACED.
11. UNLESS INDICATED OTHERWISE, ASIDE FROM NORMAL SUPPORTING ACCESSORIES, ADD THE FOLLOWING:
    IN SLABS–NO. 5 RISER BARS AT 36" O.D. MAX. TO SUPPORT TOP REINFORCING.
    IN WALLS WITH 2 CURTAINS–NO. 3 U OR Z SPACERS AT 6'-0" O.C. E.W.
12. CLIPS OR SUPPORTS SHALL NOT BE PLACES IN CONTACT WITH FORMS OR SUBGRADE. CONCRETE BLOCKS OR DOBBIES USED TO SUPPORT BARS SHALL BE PLACED IN SUFFICIENT NUMBERS TO PREVENT SETTLEMENT BUT THEY SHOULD NOT BE CONTINUOUS.
13. DOWELS SHALL BE THE SAME SIZE & SPACING AS BARS WITH WHICH THEY ARE LAPPED, AND THE LAP AND EMBEDMENT SHALL BE 32 DIAMETERS MIN. FOR EACH. DOWELS SHALL BE SECURED IN PLACE AND NOT SHOVED IN FRESHLY PLACED CONCRETE.
14. IN RESTRICTED AREAS WHERE REBARS CANNOT EXTEND AS FAR AS REQUIRED DUE TO ADJACENT STRUCTURES, EXTEND AS FAR AS POSSIBLE AND END IN STANDARD HOOKS.
15. BARS ENDING IN HOOKS OR RIGHT ANGLES SHALL CONFORM TO ACI BUILDING CODE, LATEST EDITION.
16. CHAMFER (3/4") ALL EXPOSED CONCRETE EDGES & CORNERS.
17. PROVIDE 2" MIN. CLEARANCE BETWEEN BARS WITH ACCESSORIES AND PIPES, FLANGES OR METAL PARTS EMBEDDED IN CONCRETE.

TESTING HYDRAULIC STRUCTURES

1. WHILE FILLING HYDRAULIC STRUCTURES FOR REQUIRED TESTING, VARIOUS BASINS OR CHANNELS WITHIN A SPECIFIC STRUCTURE SHOULD BE FILLED SEPARATELY FOR INDIVIDUAL LOADING.

MECHANICAL – GENERAL

1. INSTALL ALL PUMPS WITH A VALVE AND FLEXIBLE OR UNION COUPLING ON THE DISCHARGE AND SUCTION SIDE.
2. ALL PIPING IS TO BE ADEQUATELY SUPPORTED. SEE SPECIFICATIONS FOR FREQUENCY OF PIPE SUPPORTS OR HANGERS.

DESIGN CRITERIA

PARAMETER	DESIGN VALUE
DESIGN POPULATION	1691
AVERAGE DAILY DESIGN FLOW	285,000 GAL./DAY
PEAK FLOW	550,000 GAL./DAY
BOD LOADING	394 LBS./DAY
SUSPENDED SOLID LOADING	450 LBS./DAY
AERATION BASIN VOLUME	41,700 GALLONS
AREATION BASIN DETENTION TIME	3.5 HOURS
AEROBIC DIGESTER CAPACITY 60,400 GAL. EACH	181,200 GALLONS

INDEX

RECORD DRAWING

NO.	REVISIONS	BY	DATE

DRAWN 2/90 JLT DATE — CHECKED ____ DATE
DESIGNED 2-7-91 DATE — JWM PROJECT ENGINEER
APPROVED 2-7-91 DATE — WPD PROJECT MANAGER

CITY OF ABERDEEN, IDAHO

FORSGREN ASSOCIATES / P.A.

WWTP REHABILITATION

GENERAL NOTES, DESIGN CRITERIA & INDEX

PROJECT NO. 90046

SHEET NO. 2

SYMBOLS

PLAN VIEW	EXISTING	PROPOSED
PRESSURE LINE		
GRAVITY LINE		
PROPERTY OR R/W LINE		
EASEMENT LINE		
MONUMENT LINE		
FENCE	BARBED WIRE	CHAINLINK
CONTOUR LINE	4250	4250
CONTOUR ELEVATION	(4250.0)	(4250.0)
BANK SLOPES		
STORM DRAIN LINE	SD	SD
WATER LINE	W	W
GAS LINE	G	G
TELEPHONE CABLE	T	T
ELECTRIC CABLE	E	E
SANITARY SEWER LINE	SS	SS
ASPHALT PAVING		
FIRE HYDRANT		
WATER VALVE		
WATER METER	WM	WM
MANHOLE	MH	MH
CATCH BASIN	CB	CB
CLEAN OUT BOX	COB	COB
OVERHEAD POWERLINE	OP	
POLE & ANCHOR		
STREET LIGHT		
STRUCTURE		

	EXISTING	PROPOSED
CURB & GUTTER		
SIDEWALK		
RAILROAD TRACKS		
GUARD RAIL		
OPEN DITCH		
CANAL		
CULVERT		
SECTION CORNER		
TEST PIT		
MONUMENT		
BENCH MARK	BM	BM NO. 46 ELEV. 4256.50
SIGN		
POWER POLE	PP	PP
TELEPHONE BOX		
DECIDUOUS TREE		
CONIFEROUS TREE		
SHRUBS		
AIR RELEASE VALVE		
THRUST BLOCK		
CONTROL POINT	CP1 HV5	

PROFILE SECTIONS

	EXISTING	PROPOSED
GROUND PROFILE		
CULVERT	ROUND ARCH BOX	ROUND ARCH BOX
UNDISTURBED SOIL		
UNDISTURBED ROCK		
TEST PIT		
FIRE HYDRANT		
MANHOLE		
WATER LINE		

SECTION AND DETAIL IDENTIFICATION

SECTION CALL-OUT

5 / C-2 — SECTION NO. (TYP.) / SHEET ON WHICH SECTION IS SHOWN. (TYP.)

SECTION 3 / C-2

DETAIL CALL-OUT

DETAIL LETTER. (TYP.)
SHEET ON WHICH DETAIL IS SHOWN (TYP.)

DETAIL NAME A / C-2

ABBREVIATIONS

ABUT	ABUTMENT
AC	ASBESTOS CEMENT
ADT	AVERAGE DAILY TRAFFIC
APPROX	APPROXIMATELY
AZ	AZIMUTH
BAL	BALANCE
BCR	BEGIN CURB RETURN
BEG	BEGINNING/BEGIN
BDRY	BOUNDARY
BK	BACK
BKFL	BACKFILL
BLD FLG	BLIND FLANGE
BLDG	BUILDING
BLM	BUREAU OF LAND MANAGEMENT
BM	BENCH MARK
BLK	BLOCK
BOT	BOTTOM
BRG	BEARING
BSMT	BASEMENT
BTWN	BETWEEN
CALC	CALCULATED
CB	CATCH BASIN
CCW	COUNTERCLOCKWISE
C-C	CENTER TO CENTER
C&G	CURB AND GUTTER
CEM	CEMETERY
CFS	CUBIC FEET PER SECOND
CL	CENTERLINE
CIP	CAST IRON PIPE
CMP	CORRUGATED METAL PIPE
CMP-A	CORRUGATED METAL PIPE-ARCH
COB	CLEAN OUT BOX
COL	COLUMN
CONC	CONCRETE
CONST	CONSTRUCT
COR	CORNER
CTR	CENTER
CU FT	CUBIC FEET
CU YD	CUBIC YARD
CULV	CULVERT
CW	CLOCKWISE
D	DEGREE
DET	DETAIL
DIA	DIAMETER
DIP	DUCTILE IRON PIPE
DIST	DISTANCE
DN	DOWN
DWG	DRAWING
E	EAST
ECR	END CURB RETURN
ELEV	ELEVATION
ELEC	ELECTRIC
EMB.	EMBANKMENT
ENGR	ENGINEER
ENT	ENTRANCE
EO	EDGE OF OIL
EQUIP	EQUIPMENT
EST	ESTIMATE
EXC	EXCAVATION
EXIST	EXISTING

FEN COR	FENCE CORNER
FD	FOUND
FDN	FOUNDATION
FIN	FINISH
FL	FLOW LINE
FLR	FLOOR
FLG	FLANGE
FT	FEET
FTG	FOOTING
G	GAS
GALV	GALVANIZED
GEN	GENERAL
GM	GAS METER
GV	GAS VALVE
HDWL	HEADWALL
H&T	HUB AND TACK
HORIZ	HORIZONTAL
HWL	HIGH WATER LEVEL
HWY	HIGHWAY
HYD	HYDRANT
ID	INSIDE DIAMETER
INFO	INFORMATION
IRR	IRRIGATION
INV	INVERT
JCT	JUNCTION
L	LENGTH
LB	POUND
LIC	LICENSE
LIN	LINEAR/LINEAL
LS	LAND SURVEYOR
LT	LEFT
LWL	LOW WATER LEVEL
MAINT	MAINTENANCE
MATL	MATERIAL
MAX	MAXIMUM
MKR	MARKER
MH	MANHOLE
MI	MILE
MISC	MISCELLANEOUS
MON	MONUMENT
MPH	MILES PER HOUR
N	NORTH
NTS	NOT TO SCALE
OD	OUTSIDE DIAMETER
O-O	OUTSIDE TO OUTSIDE
OFF REV	OFFICE REVISION
ORIG	ORIGINAL
PVMT	PAVEMENT
PC	POINT OF CURVATURE
PCC	POINT OF COMPOUND CURVATURE
PERF	PERFORATED
PI	POINT OF INTERSECTION
PL	PROPERTY LINE
POC	POINT ON CURVE
PP	POWER POLE

PCR	POINT OF REVERSE CURVE
PROJ	PROJECT
PROP	PROPERTY
PT	POINT OF TANGENCY
POB	POINT OF BEGINNING
PVC	POLYVINYL CHLORIDE
QTY	QUANTITY
R	RANGE/RADIUS
RCP	REINFORCED CONCRETE PIPE
RCCP	REINFORCED CONCRETE CYLINDER PIPE
RD	ROAD
REF	REFERENCE
REINF	REINFORCED
REQD	REQUIRED
REV	REVISION
RP	REFERENCE POINT
RR	RAILROAD
RT	RIGHT/ROUTE
R/W	RIGHT OF WAY
S	SOUTH
SAN	SANITARY
SCHED	SCHEDULE
SD	STORM SEWER
SEC COR	SECTION CORNER
SHT	SHEET
SPECS	SPECIFICATIONS
SQ	SQUARE
SQ FT	SQUARE FEET
SQ YD	SQUARE YARD
SS	SANITARY SEWER
ST	STREET
STL	STEEL
STN STL	STAINLESS STEEL
STA	STATION
STD	STANDARD
STRUCT	STRUCTURE
T	TOWNSHIP, TELEPHONE
TAN	TANGENT
TBC	TOP BACK CURB
TEMP	TEMPORARY
TELE	TELEPHONE/TELEGRAM
TP	TELEPHONE POLE
TYP	TYPICAL
UG	UNDERGROUND
VC	VERTICAL CURVE
VERT	VERTICAL
VOL	VOLUME
VPI	VERTICAL POINT OF INTERSECTION
VPC	VERTICAL POINT OF CURVE
VPT	VERTICAL POINT OF TANGENCY
W	WEST/WATER
WM	WATER METER
XING	CROSSING
X-SEC	CROSSING SECTION

PROFESSIONAL ENGINEER—WASHINGTON REGISTERED 13020 7-23 STATE OF IDAHO JOHN W. MILLAR

RECORD DRAWING

H:\LEWIS\90046\DWGS\90046ABR-SYM.DWG — 11/16/92 at 10:43 — Plot scale: 1=1.00

NO.	REVISIONS	BY	DATE

DRAWN 3/90 JLT DATE — CHECKED 2/91 KAP DATE
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CITY OF ABERDEEN, IDAHO

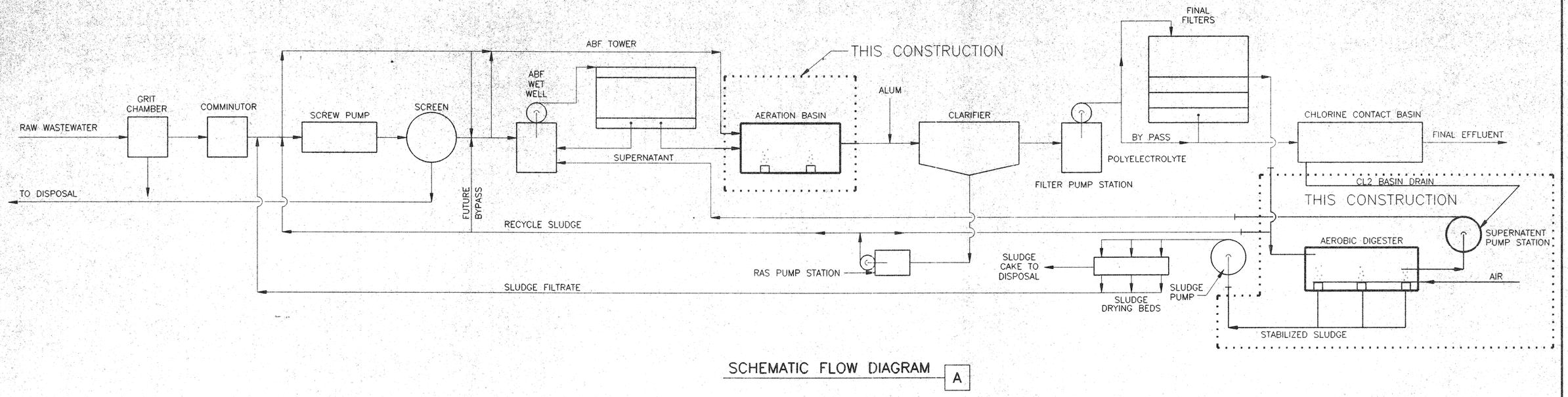
FORSGREN ASSOCIATES / P.A.

WWTP REHABILITATION

SYMBOLS AND ABBREVIATIONS

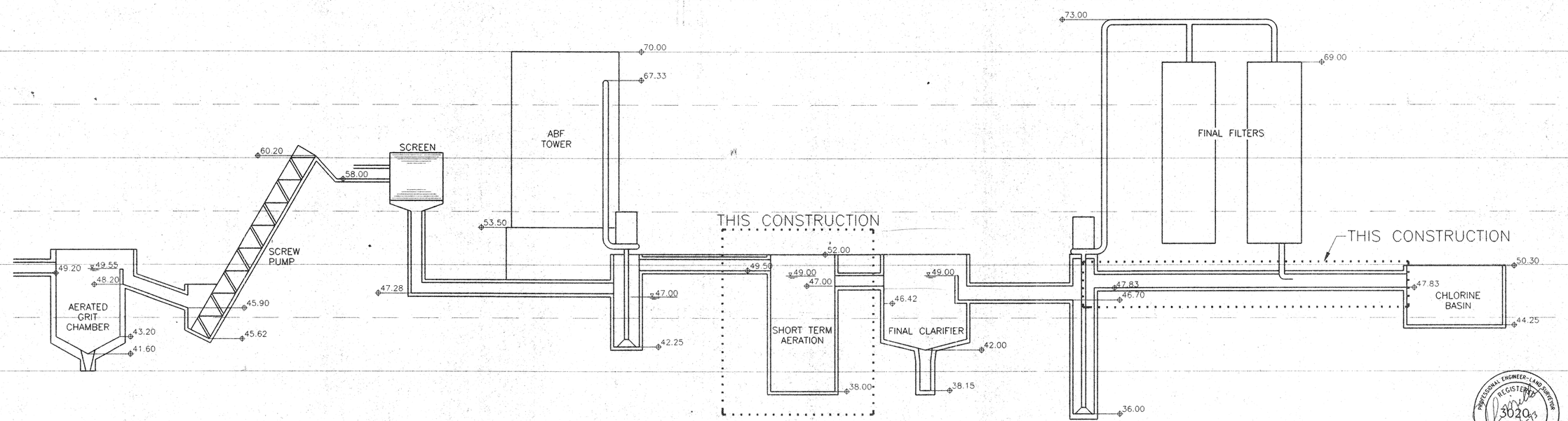
PROJECT NO. 90046

SHEET NO. 3



SCHEMATIC FLOW DIAGRAM — A

NOTE: ALL CONSTRUCTION IS EXISTING UNLESS OTHERWISE NOTED.



HYDRAULIC PROFILE — B

PROFESSIONAL ENGINEER — LAND SURVEYOR — REGISTERED — 3020 — 7-21-93 — STATE OF IDAHO — JOHN W. MILLAR

RECORD DRAWING

NO.	REVISIONS	BY	DATE

DRAWN JLT 4/90 (DATE) CHECKED 2/91 KAP (DATE)
DESIGNED 2/7/91 (DATE) JWM (PROJECT ENGINEER)
APPROVED 2/7/91 (DATE) WRD (PROJECT MANAGER)

CITY OF ABERDEEN, IDAHO

FORSGREN ASSOCIATES / P.A.

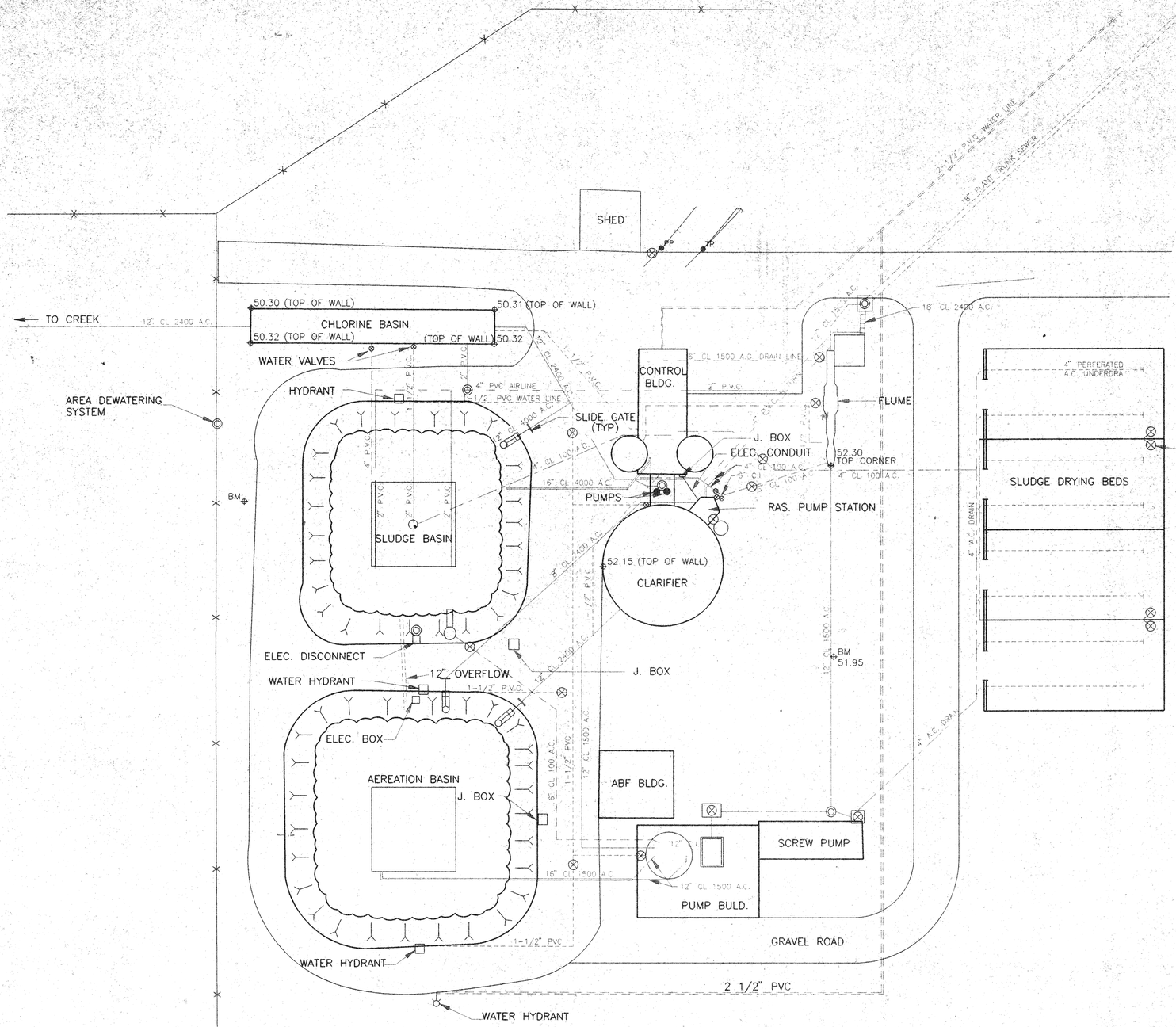
WWTP REHABILITATION

HYDRAULIC PROFILE

PROJECT NO. 90046

SHEET NO. 4

H:\DWGS\90046\ABR-HYDR.DWG — 06/25/93 at 13:47 — Plot scale: 1=1



SCALE: 1" = 20'

LEGEND

- TP TELEPHONE POLE
- PP POWER POLE
- FIRE HYDRANT
- MAN HOLE
- VALVE
- SLIDE GATE
- PUMP
- 18" CLASS 2400 A.C.
- 16" CLASS 1500 & 4000 A.C.
- 12" CLASS 1500,2400 & 4000 A.C.
- 8" CLASS 2400 A.C.
- 4" CLASS 1500 A.C.
- 4" A.C. DRAIN
- 4" CLASS 100 A.C.
- 1-1/2" P.V.C.
- 2" P.V.C.
- FLANGED CAST IRON
- 4" P.V.C.
- 1/2" P.V.C.
- 6" CLASS 100 A.C.
- 2-1/2" P.V.C.

PROFESSIONAL ENGINEER-LAND SURVEYOR REGISTERED 3020 STATE OF IDAHO JOHN W. MILLAR

RECORD DRAWING

NO.	REVISIONS	BY	DATE

DRAWN TTW 4/90 DATE — CHECKED 2/91 KAP DATE

DESIGNED 2/7/91 DATE — JWM PROJECT ENGINEER

APPROVED 2/7/91 DATE — WRD PROJECT MANAGER

CITY OF ABERDEEN, IDAHO

FORSGREN ASSOCIATES / P.A.

WWTP REHABILITATION

EXISTING WASTEWATER TREATMENT FACILITIES

PROJECT NO. 90046

SHEET NO. 5

H:\DWGS\90046\ABERDEEN.DWG -- 06/25/93 at 13:57 Plot scale: 1=20


RETAIN & PROTECT 1 1/2" PVC
SHED
CHLORINE BASIN
REMOVE VALVE AND CAP LINE TO BASIN
REMOVE & CAP
REMOVE MANHOLE
REMOVE HYDRANT
REMOVE SLIDE GATE (TYP) OF 3
REMOVE STATIC TUBE AERATORS
CONSTRUCT 8" TEMPORARY LINE FOR OPERATION DURING CONSTRUCTION
REMOVE PUMP STATION
INSTALL PLUG
CLARIFIER
REMOVE ELEC. DISCONNECTS AND ASSOCIATED WIRING
RETAIN & PROTECT J. BOX
REMOVE WATER HYDRANT
REMOVE 12" OVERFLOW
REMOVE ELEC. BOX AND ASSOCIATED WIRING AFTER NEW SYSTEM IS COMPLETED
AERATION BASIN
RETAIN & PROTECT J. BOX
AERATION BASIN TO BE USED AS AEROBIC DIGESTER DURING CONSTRUCTION. AERATION WILL BE BY EXISTING FLOATING HIGH SPEED UNITS. SCHEDULE WORK SO THAT BASIN CAN REMAIN IN SERVICE UNTIL NEW SYSTEM IS OPERATIONAL.
REMOVE WATER HYDRANT
RETAIN AND PROTECT HYDRANT
SLUDGE DRYING BEDS
GRAVEL ROAD
SCALE: 1" = 20'
LEGEND OF EXISTING FACILITIES
LEGEND FOR NEW WORK
REMOVE PIPE AND CAP
ABANDON PIPE IN PLACE AND CAP AS REQUIRED
JOHN W. MILLAR
RECORD DRAWING

NO.	REVISIONS	BY	DATE

DRAWN TTW 4/90 (DATE) — CHECKED 2/91 KAP (DATE)

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APPROVED 2/7/91 (DATE) — WRD (PROJECT MANAGER)

CITY OF ABERDEEN, IDAHO

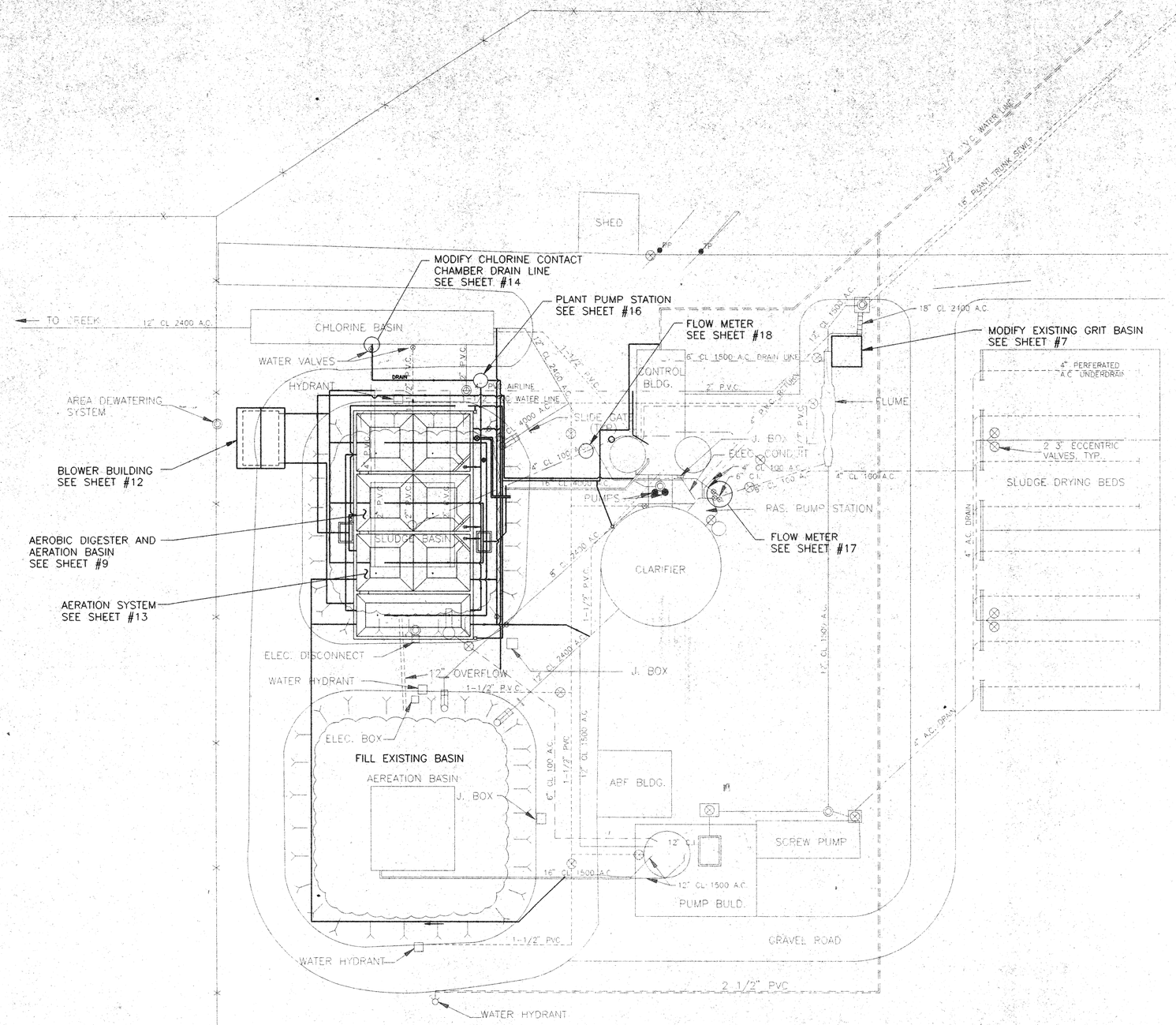
FORSGREN ASSOCIATES / P.A.

WWTP REHABILITATION

DEMOLITION AND OPERATION PLAN

PROJECT NO. 90046

SHEET NO. 6



SCALE: 1" = 20'

LEGEND

- TP TELEPHONE POLE
- PP POWER POLE
- FIRE HYDRANT
- MAN HOLE
- VALVE
- SLIDE GATE
- PUMP
- 18" CLASS 2400 A.C.
- 16" CLASS 1500 & 4000 A.C.
- 8" CLASS 1500,2400 & 4000 A.C.
- 6" CLASS 2400 A.C.
- 4" CLASS 1500 A.C.
- 4" A.C. DRAIN
- 4" CLASS 100 A.C.
- 1-1/2" P.V.C.
- 2" P.V.C.
- FLANGED CAST IRON
- 4" P.V.C.
- 1/2" P.V.C.
- 6" CLASS 100 A.C.
- 2-1/2" P.V.C.
- NEW PIPE LINES

NOTES

1. MAJOR ITEMS OF WORK ONLY ARE SHOWN. SEE REMAINDER OF PLANS AND SPECIFICATIONS FOR COMPLETE DETAIL.
2. SEE SHEETS 19,20, AND 21 FOR MAJOR REQUIRED ELECTRICAL WORK REQUIRED.

PROFESSIONAL ENGINEER-LAND SURVEYOR REGISTERED 3020 STATE OF IDAHO JOHN W. MILLAR

RECORD DRAWING

H:\DWGS\90046\H\DWGS\90046\ABERDEN2.DWG -- 11/16/92 at 13:43 Plot scale: 1=20.00

NO.	REVISIONS	BY	DATE

DRAWN TTW 4/90 DATE — CHECKED 2/91 KAP DATE

DESIGNED 2/7/91 DATE — JWM PROJECT ENGINEER

APPROVED 2/7/91 DATE — WRD PROJECT MANAGER

CITY OF ABERDEEN, IDAHO

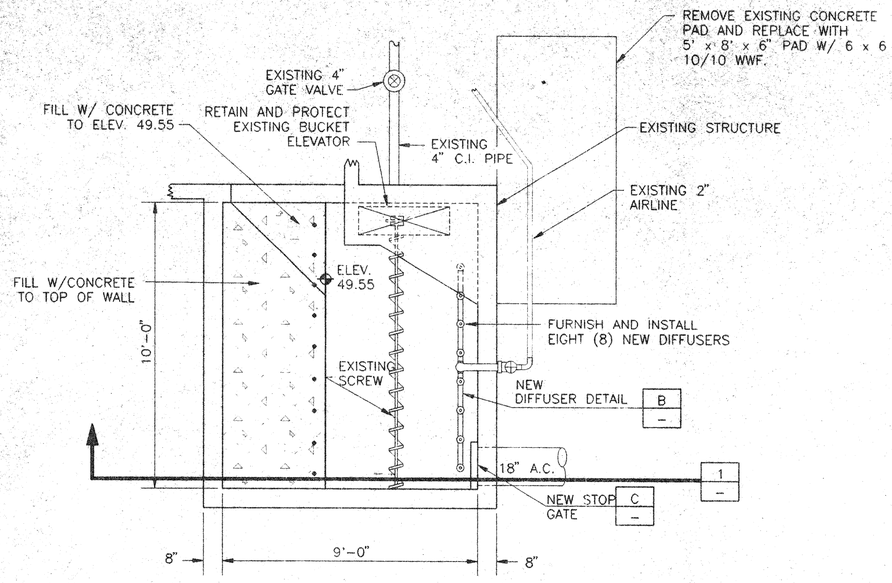
FORSGREN ASSOCIATES / P.A.

WWTP REHABILITATION

OVERALL SITE IMPROVEMENTS

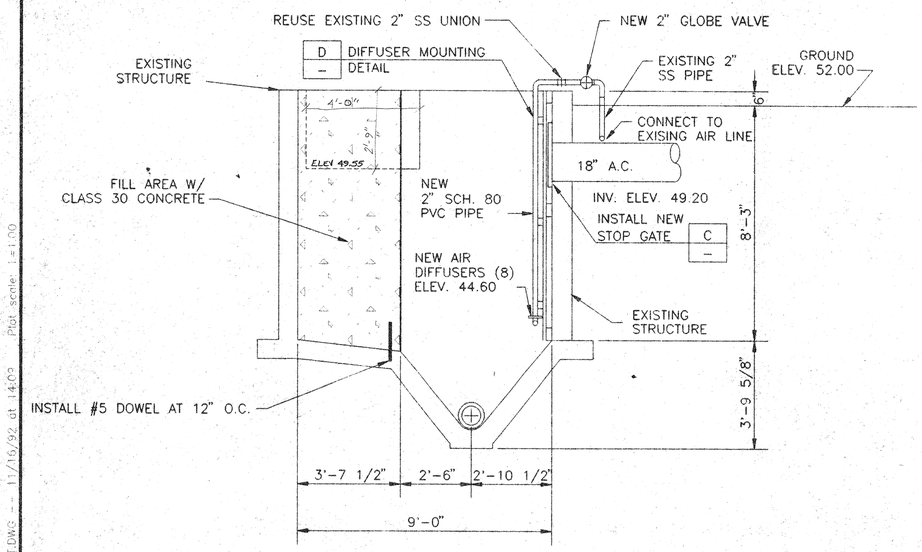
PROJECT NO. 90046

SHEET NO. 6a



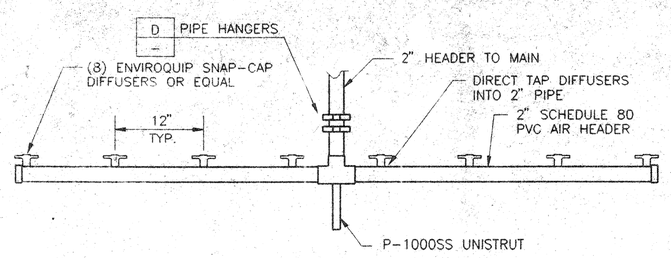
AERATED GRIT CHAMBER MODIFICATIONS — A

SCALE 3/8"=1'



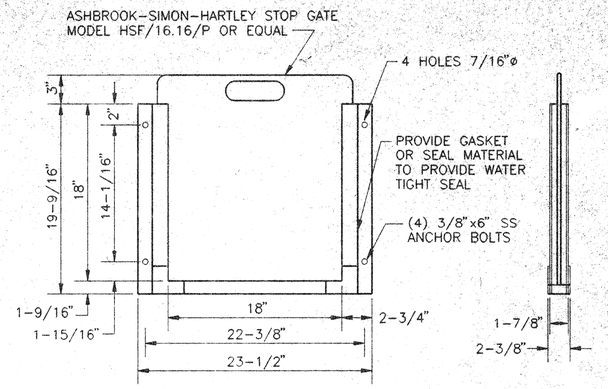
SECTION VIEW — 1

SCALE 3/8"=1'



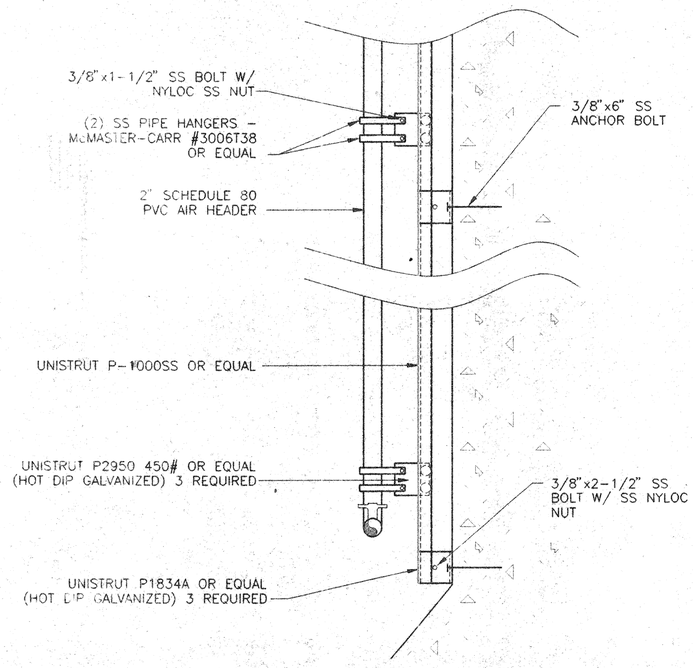
DIFFUSER DETAIL — B

NOT TO SCALE



STOP GATE DETAIL — C

NOT TO SCALE



DIFFUSER MOUNTING DETAIL — D

NOT TO SCALE

PROFESSIONAL ENGINEER-LAND SURVEYOR REGISTERED 3020 7-22-93 STATE OF IDAHO JOHN W. MILLAR

RECORD DRAWING

NO.	REVISIONS	BY	DATE

DRAWN BWM 4/90 DATE — CHECKED 2/91 KAP 2/7/91 DATE

DESIGNED 2/7/91 DATE — JWM PROJECT ENGINEER

APPROVED 2/7/91 DATE — WRD PROJECT MANAGER

CITY OF ABERDEEN, IDAHO

FORSGREN ASSOCIATES / P.A.

WWTP REHABILITATION

AERATED GRIT CHAMBER MODIFICATIONS

PROJECT NO. 90046

SHEET NO. 7

H:\DWGS\90046\H\DWGS\90046\GRIT-DET.DWG -- 11/15/92 at 14:09 Plot scale: 1=1.00

GENERAL NOTES:

1. ALL EXISTING ASPHALT SURFACE THAT IS REMOVED OR DAMAGED DURING CONSTRUCTION IS TO BE PREPARED FOR PAVING. ACTUAL ASPHALT REPLACEMENT WILL BE DONE BY THE OWNER.
2. PREPARE AREA BETWEEN EXISTING ASPHALT SURFACE AND NEW AERATION STRUCTURE WITH CRUSHED AGGREGATE BASE AS SHOWN.

SCALE: 1"=10'

LEGEND

- TP TELEPHONE POLE
- PP POWER POLE
- FIRE HYDRANT
- MAN HOLE
- VALVE
- SLIDE GATE
- PUMP

EXISTING PIPE

- 16" CLASS 1500 & 4000 A.C.
- 12" CLASS 1500, 2400 & 4000 A.C.
- 8" CLASS 2400 A.C.
- 4" CLASS 1500 A.C.
- 4" A.C. DRAIN
- 4" CLASS 100 A.C.
- 1-1/2" PVC
- 2" PVC
- FLANGED CAST IRON
- 4" PVC
- 1/2" PVC
- 6" CLASS 100 A.C.
- 2-1/2" PVC
- ABANDONED PIPE

- PROPOSED PIPE
- "A" GATE VALVE
- "B" GATE VALVE
- "C" BUTTERFLY VALVE
- "D" GATE VALVE
- "E" BUTTERFLY VALVE
- "F" GATE VALVE

PROFESSIONAL ENGINEER-LAND SURVEYOR REGISTERED 3020 STATE OF IDAHO JOHN W. MILLAR

RECORD DRAWING

NO.	REVISIONS	BY	DATE

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DESIGNED 2/7/91 (DATE) JWM (PROJECT ENGINEER)
APPROVED 2/7/91 (DATE) WRD (PROJECT MANAGER)

CITY OF ABERDEEN, IDAHO

FORSGREN ASSOCIATES / P.A.

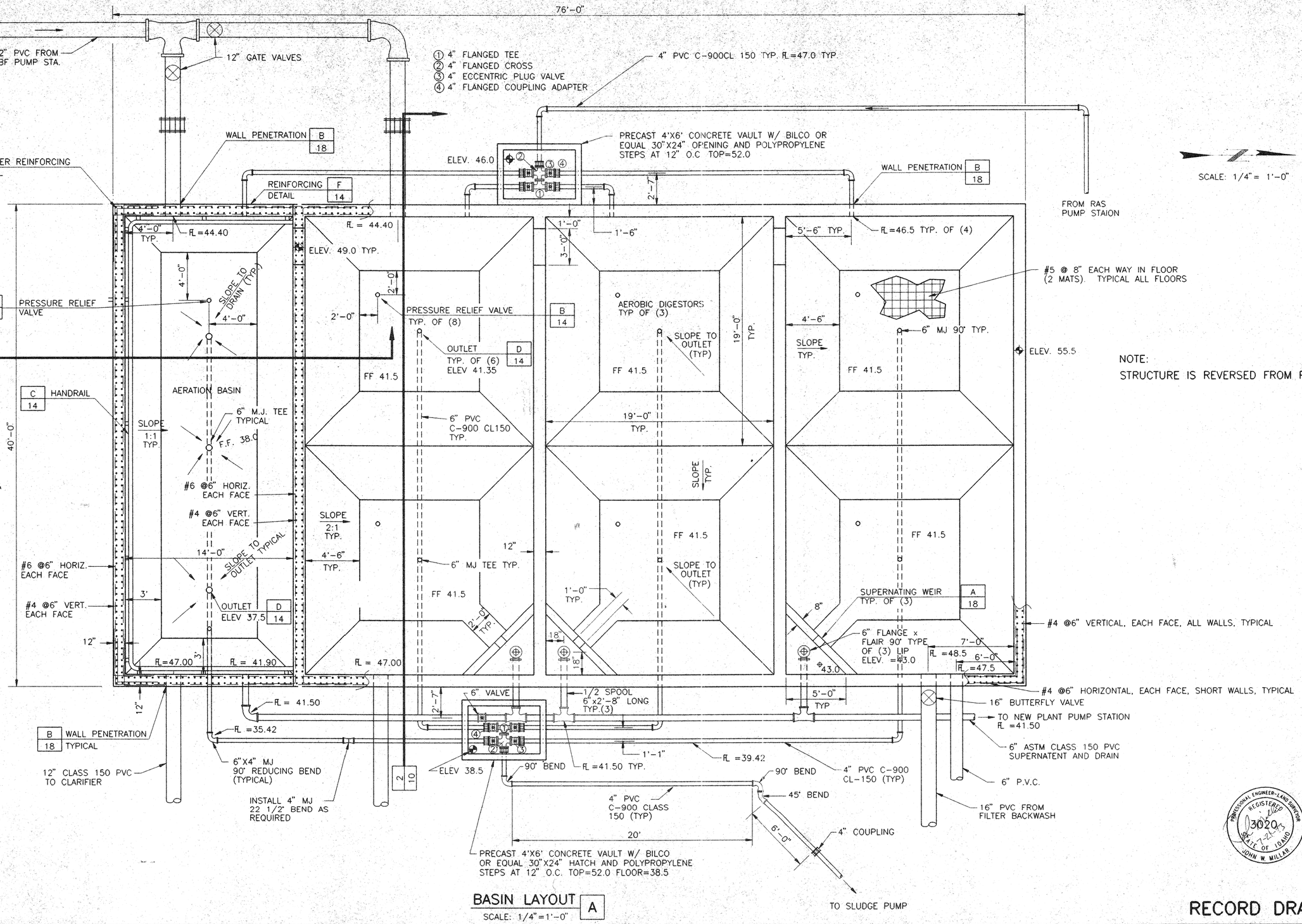
WWTP REHABILITATION

AERATION BASIN SITE PLAN

PROJECT NO. 90046

SHEET NO. 8

H:\DWGS\90046\ABERVIEW.DWG — 06/25/93 at 14:58 Plot scale: 1=10



NOTE:
STRUCTURE IS REVERSED FROM PAGE 8.

BASIN LAYOUT A
SCALE: 1/4"=1'-0"

RECORD DRAWING

PROFESSIONAL ENGINEER-LAND SURVEYOR REGISTERED 3020 STATE OF IDAHO JOHN W. MILLAR 7-22-93

NO.	REVISIONS	BY	DATE

DRAWN BWM 4/90 DATE — CHECKED 2/91 KAP DATE
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APPROVED 2/7/91 DATE — WRD PROJECT MANAGER

CITY OF ABERDEEN, IDAHO

FORSGREN ASSOCIATES / P.A.

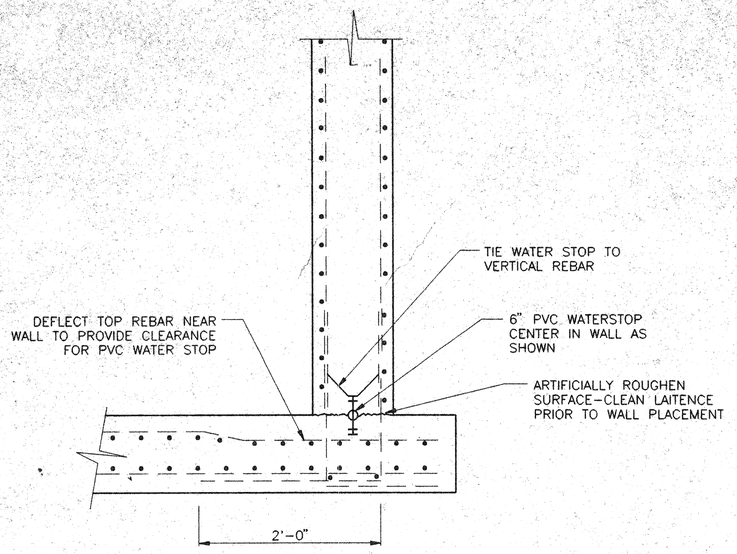
WWTP REHABILITATION

BASIN LAYOUT

PROJECT NO. 90046

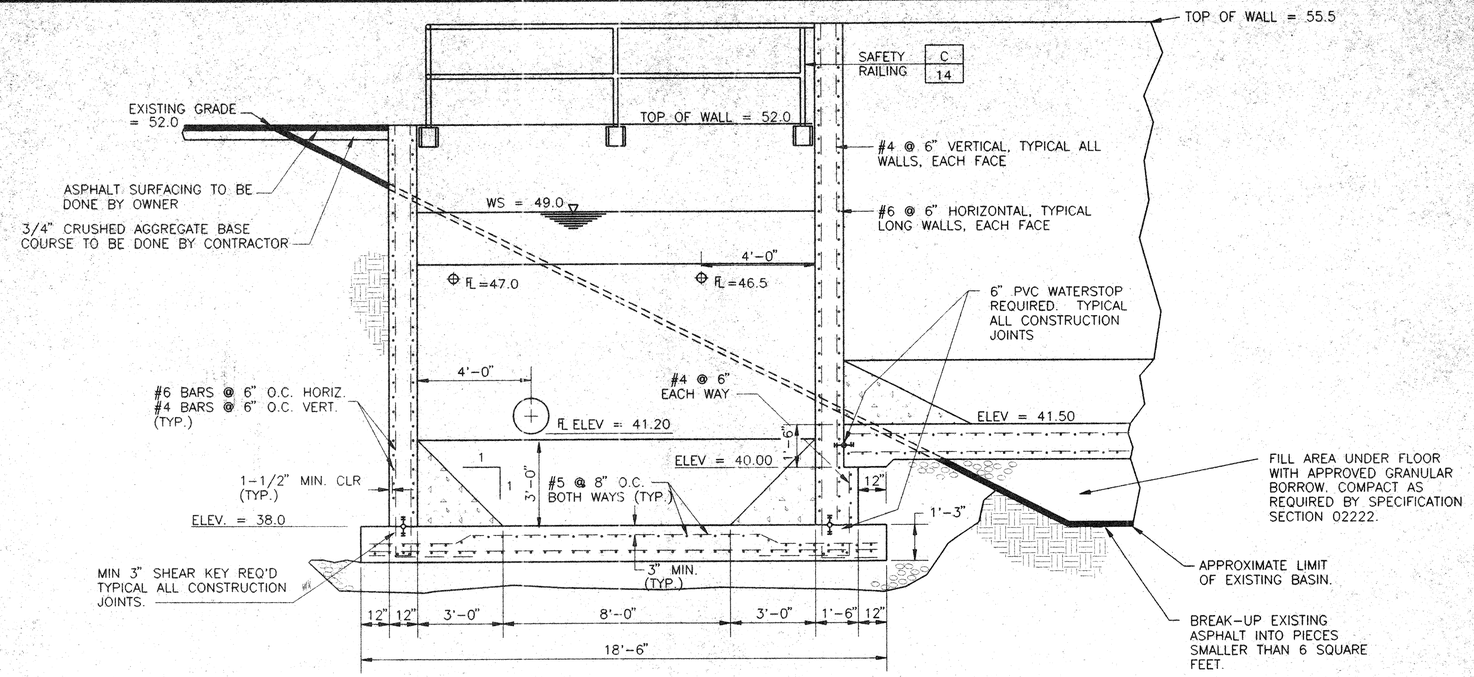
SHEET NO. 9

H:\DWGS\90046\BASIN.DWG — 06/25/93 at 15:03 Plot scale: 1=1



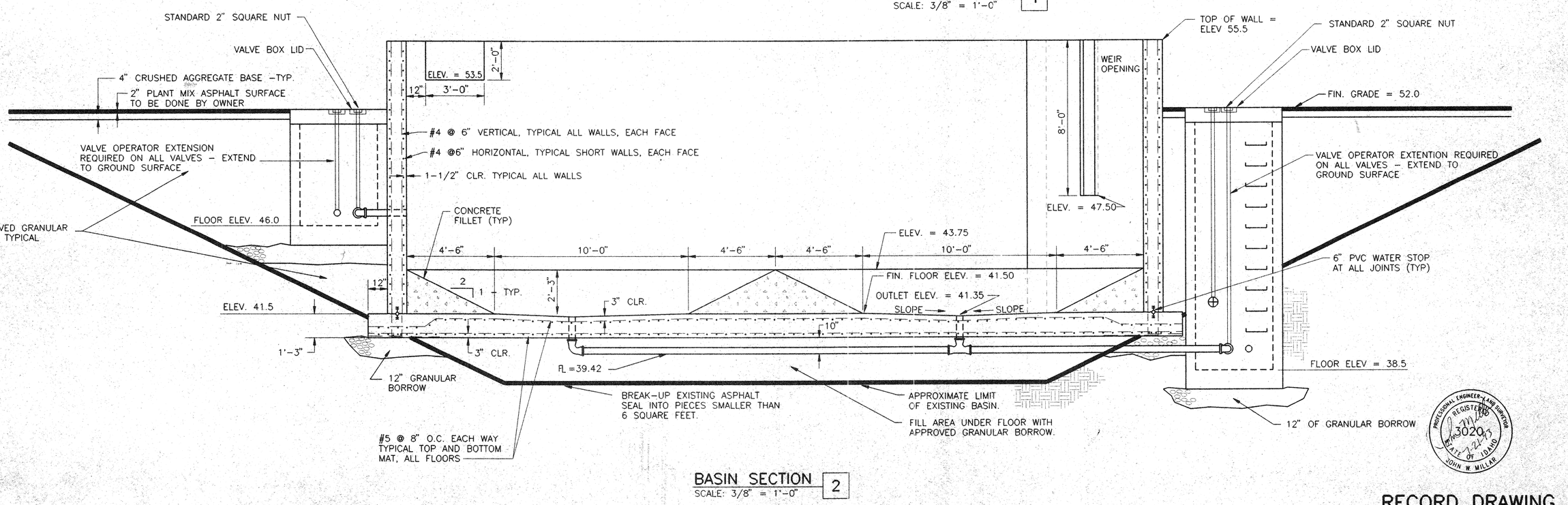
TYPICAL WALL-FLOOR CONNECTION

NOT TO SCALE



BASIN SECTION 1

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



BASIN SECTION 2

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

PROFESSIONAL ENGINEER & LAND SURVEYOR REGISTERED 3020 STATE OF IDAHO JOHN W. MILLAR 2-22-93

RECORD DRAWING

NO.	REVISIONS	BY	DATE

DRAWN BWM 5/90 DATE — CHECKED KAP 2/91 DATE

DESIGNED 2/7/91 DATE — JWM PROJECT ENGINEER

APPROVED 2/7/91 DATE — WRD PROJECT MANAGER

CITY OF ABERDEEN, IDAHO

FORSGREN ASSOCIATES / P.A.

WWTP REHABILITATION

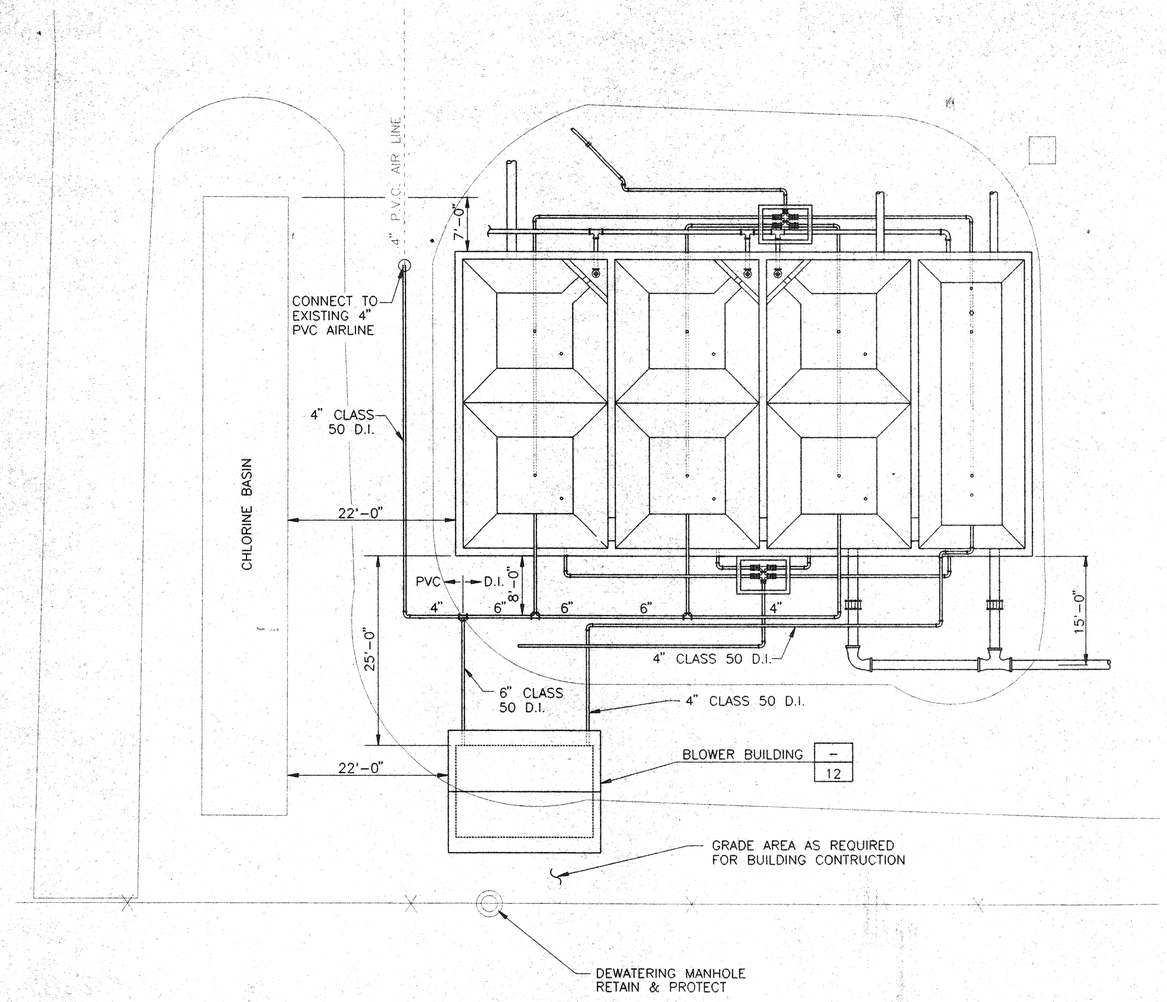
BASIN WALL SECTIONS

PROJECT NO. 90046

SHEET NO. 10

H:\DWGS\90046\BSN-SECT.DWG -- 06/25/93 at 15:06 Plot scale: 1=32

SCALE: 1" = 10'



NOTES:
1. GRADE AREA AS REQUIRED FOR BUILDING.
2. ALL AIR MAIN PIPING IS TO BE UNLINED CLASS 50 D.I. UNLESS OTHERWISE NOTED.
3. ALL AIR PIPING IS TO HAVE 2'-0" MIN. COVER.

PROFESSIONAL ENGINEER – LAND SURVEYOR REGISTERED 3020 7-21-17 STATE OF IDAHO JOHN W. MILLAR

RECORD DRAWING

NO.	REVISIONS	BY	DATE

DRAWN BWM 8/90 DATE — CHECKED 2/91 KAP DATE
DESIGNED 2/7/91 DATE — JWM PROJECT ENGINEER
APPROVED 2/7/91 DATE — WRD PROJECT MANAGER

CITY OF ABERDEEN, IDAHO

FORSGREN ASSOCIATES / P.A.

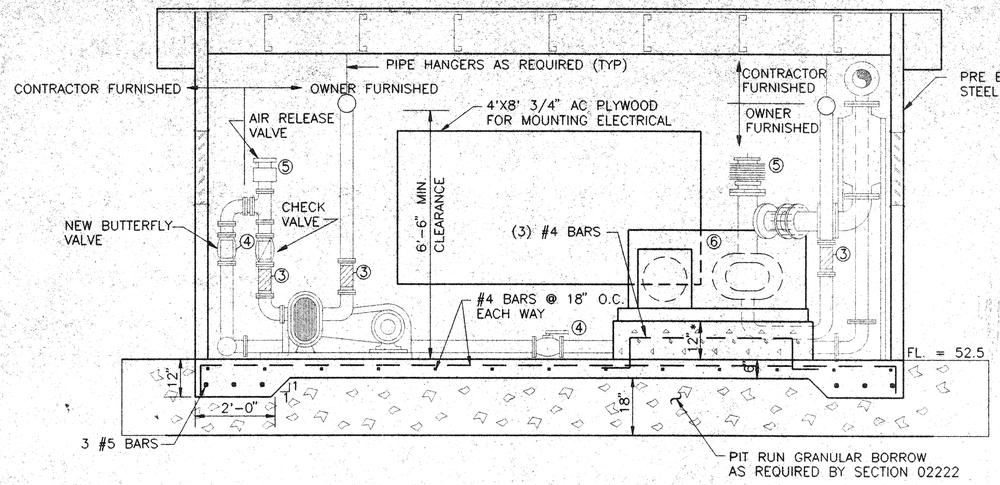
WWTP REHABILITATION

AERATION SYSTEM SITE PLAN

PROJECT NO. 90046

SHEET NO. 11

H:\DWGS\90046\AER-SITE.DWG -- 07/09/93 at 15:41 Plot scale: 1=10



FLOOR SECTION DETAIL

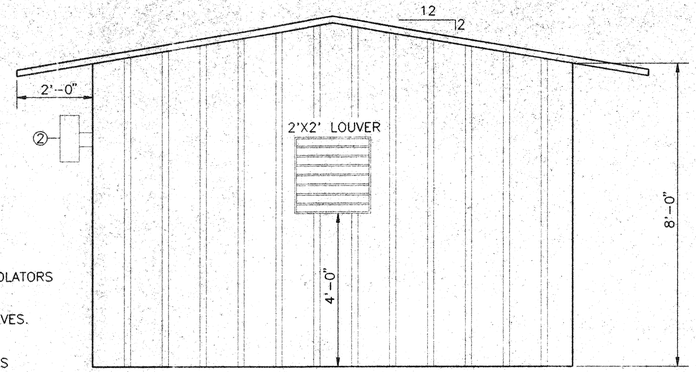
SCALE: 1/2" = 1'

A

* VERIFY DIMENSION

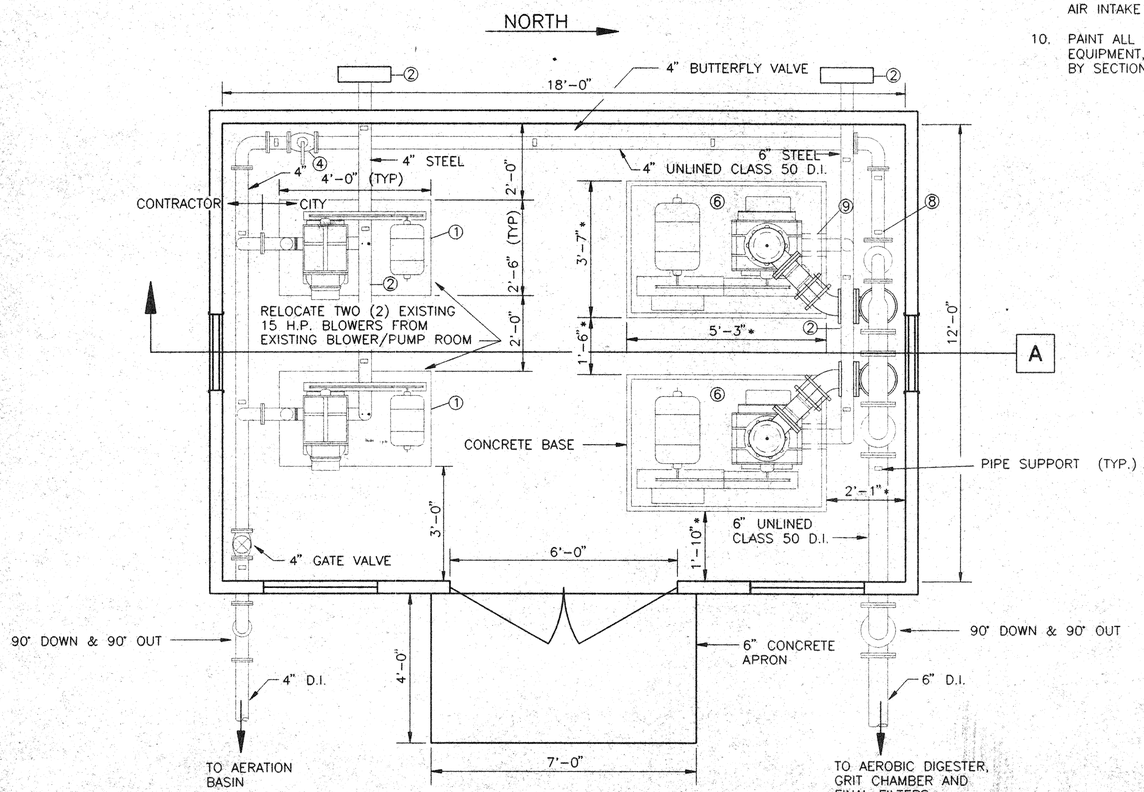
KEYED NOTES:

1. RELOCATE TWO (2) EXISTING 15 HP BLOWERS FROM BLOWER/PUMP ROOM.
2. FURNISH AND INSTALL NEW AIR INTAKE AND FILTER SYSTEM.
3. REPLACE OR PROVIDE NEW VIBRATION ISOLATORS ON BLOWERS.
4. FURNISH AND INSTALL 4" BUTTERFLY VALVES.
5. REUSE EXISTING PRESSURE RELEASE VALVES, CHECK VALVES, FITTINGS, ETC. AS AVAILABLE TO USE
6. INSTALL TWO (2) 25 HP BLOWERS, VALVES, FITTINGS, CHECK VAVLES, ISOLATORS, EXHAUST SILENCERS ETC. TO BE FURNISHED BY OWNER.
7. CONTRACTOR TO VERIFY DIMENSIONS OF EQUIPMENT PRIOR TO INSTALLING ANY PIPING OR EQUIPMENT.
8. PROVIDE PIPE AND EQUIPMENT SUPPORTS AS REQUIRED TO SECURE EQUIPMENT.
9. PROVIDE RECESS IN CONCRETE BASE FOR AIR INTAKE LINE.
10. PAINT ALL NEW OR OWNER FURNISHED EQUIPMENT, PIPING ETC. AS REQUIRED BY SECTION 09900.



SOUTH ELEVATION

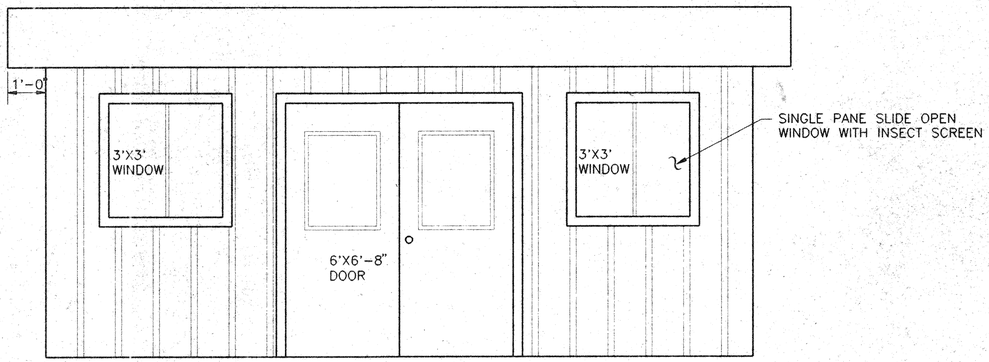
SCALE: 1/2" = 1'



PLAN VIEW

SCALE: 1/2" = 1'

* VERIFY DIMENSION



EAST ELEVATION

SCALE: 1/2" = 1'

PROFESSIONAL ENGINEER—LAND SURVEYOR REGISTERED 3020 STATE OF IDAHO JOHN W. MILLAR

RECORD DRAWING

NO.	REVISIONS	BY	DATE

DRAWN 8/90 TTW DATE — CHECKED 2/91 KAP DATE

DESIGNED 2/7/91 DATE — JWM PROJECT ENGINEER

APPROVED 2/7/91 DATE — WRD PROJECT MANAGER

CITY OF ABERDEEN, IDAHO

FORSGREN ASSOCIATES / P.A.

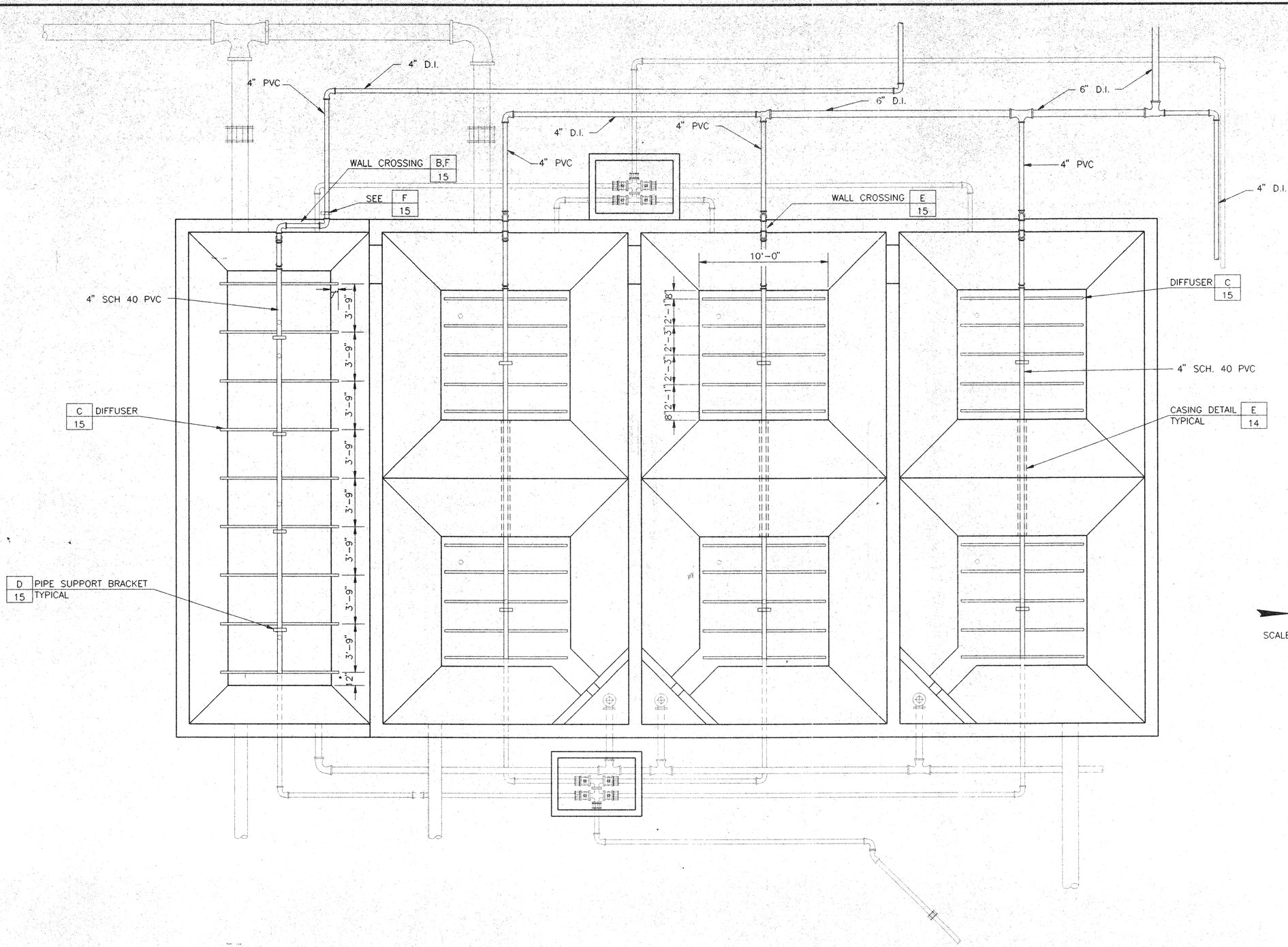
WWTP REHABILITATION

BLOWER BUILDING

PROJECT NO. 90046

SHEET NO. 12

H:\DWGS\90046\ABR-BLOW.DWG — 06/25/93 at 15:12 Plot scale: 1=24



SCALE: 1/4" = 1'-0"

PROFESSIONAL ENGINEER-LAND SURVEYOR REGISTERED JOHN W. MILLAR 3020 7-21-93 STATE OF IDAHO

RECORD DRAWING

NO.	REVISIONS	BY	DATE

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APPROVED 2/7/91 DATE — WRD PROJECT MANAGER

CITY OF ABERDEEN, IDAHO

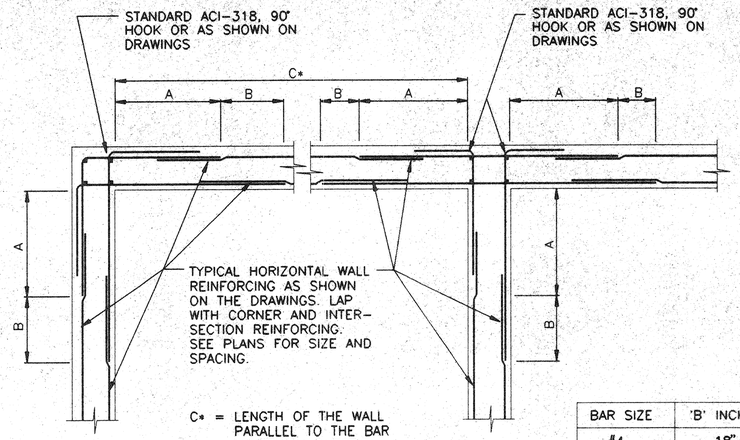
FORSGREN ASSOCIATES / P.A.

WWTP REHABILITATION

BASIN AERATION LAYOUT

PROJECT NO. 90046

SHEET NO. 13

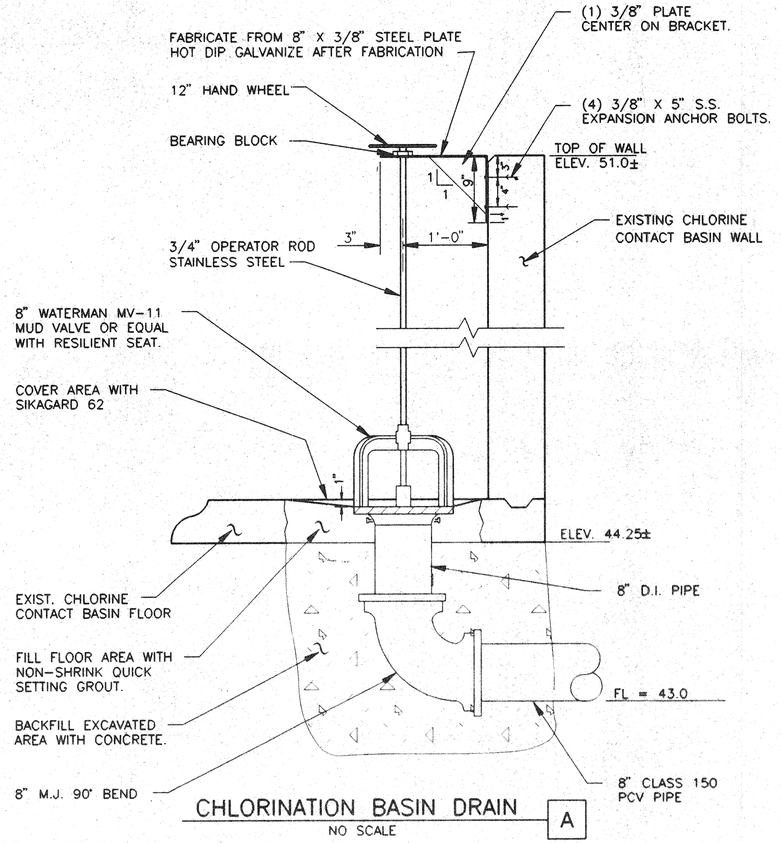


C* = LENGTH OF THE WALL PARALLEL TO THE BAR LENGTH IN QUESTION.
A = THE LESSER OF
-C/4 FEET
-10 FEET
-1.0 TIMES THE WALL HEIGHT, BUT IN NO CASE LESS THAN 2 FEET.

BAR SIZE	'B' INCHES
#4	18"
#5	30"
#6	36"
#7	50"
#8	78"
#9	84"
#10	104"

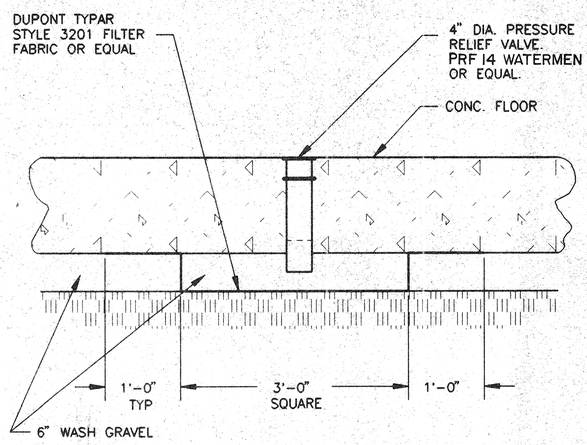
CORNER AND INTERSECTION REINFORCING F

NOT TO SCALE



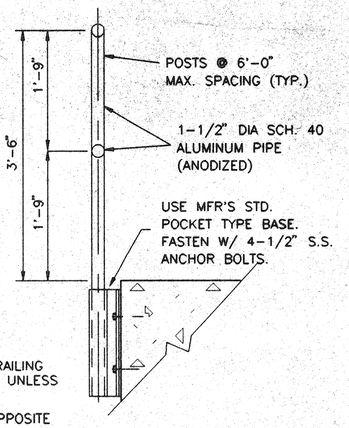
CHLORINATION BASIN DRAIN A

NO SCALE



PRESSURE RELIEF VALVE DETAIL B

NO SCALE



NOTES:

1: PLACE CENTER OF HANDRAILING 4" OFF EDGE OFF CONC. UNLESS OTHERWISE NOTED.

2: PLACE HANDRAIL POST OPPOSITE EACH OTHER ON STRUCTURE.

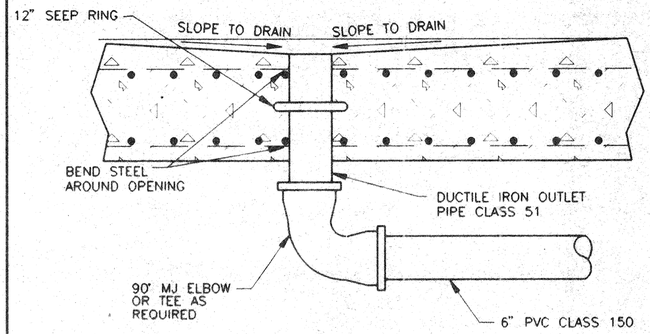
3: COAT ALL SURFACES OF ALUMINUM THAT COME IN CONTACT W/CONC. W/BIT. COMPOUND OR ZINC. CHROMATE PRIMER.

4: ALL HANDRAILS SHALL BE FIXED UNLESS OTHERWISE NOTED.

5: MAX. HANDRAIL POST SPACING SHALL BE 6'-0".

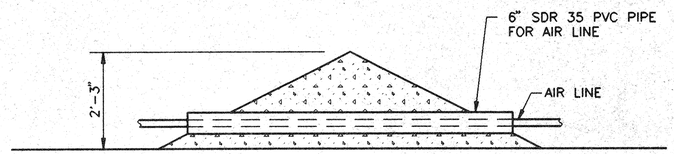
HANDRAIL DETAIL C

NO SCALE



OUTLET DETAIL D

NO SCALE



AIRLINE CASING DETAIL E

NO SCALE

PROFESSIONAL ENGINEER - LAND SURVEYOR REGISTERED 8020 STATE OF IDAHO JOHN W. MILLER

RECORD DRAWING

NO.	REVISIONS	BY	DATE

DRAWN BWM 8/90 DATE CHECKED DATE

DESIGNED 2-7-91 DATE PROJECT ENGINEER

APPROVED 2/4/91 DATE PROJECT MANAGER

CITY OF ABERDEEN, IDAHO

FORSGREN ASSOCIATES / P.A.

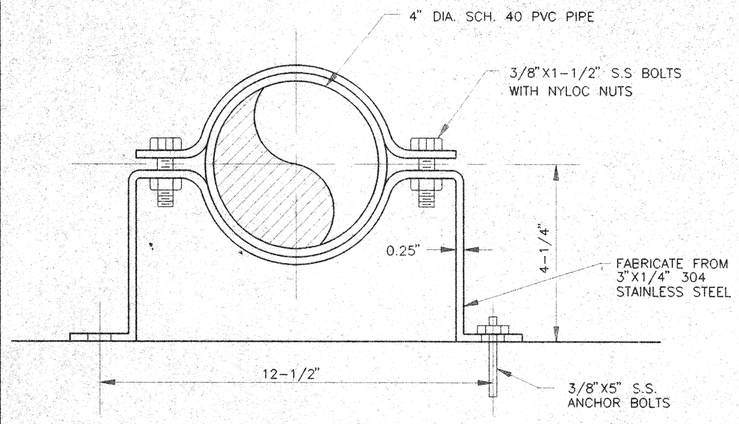
WWTP REHABILITATION

BASIN DETAILS

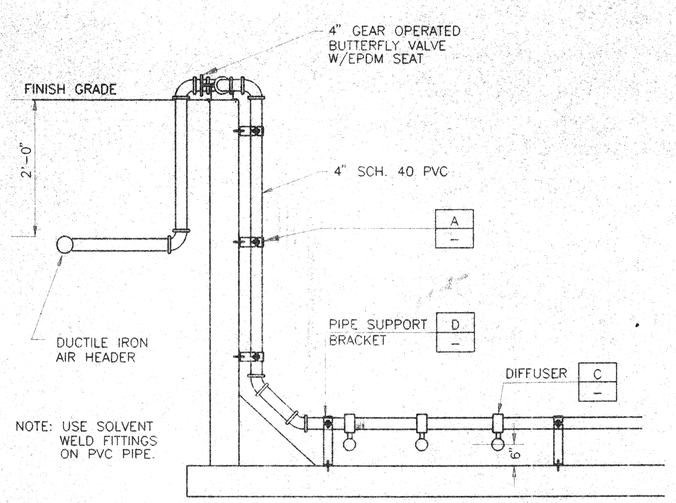
PROJECT NO. 90046

SHEET NO. 14

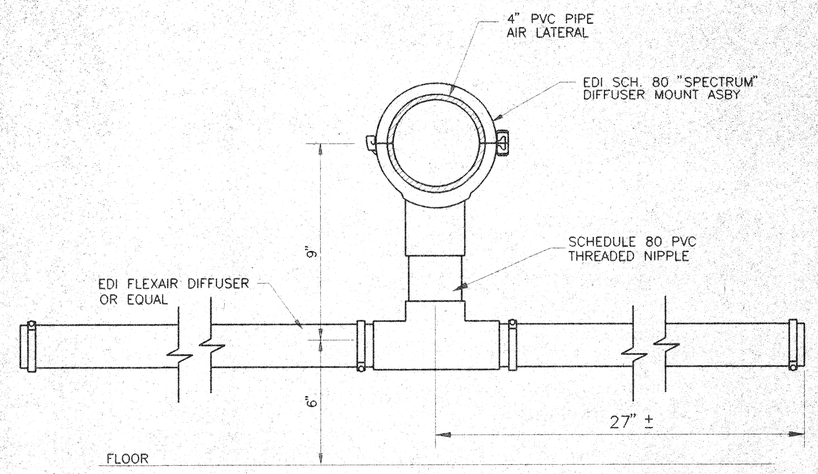
BSN-DET.DWG



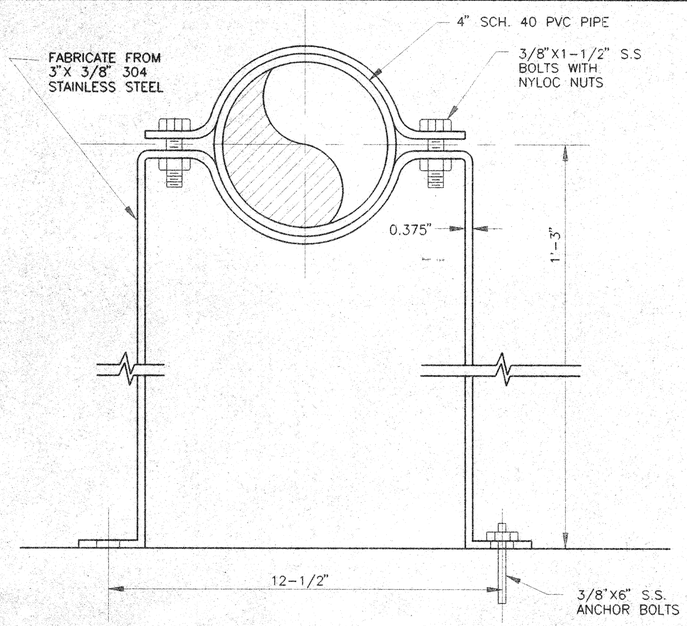
BASIN PIPE SUPPORT BRACKET DETAIL A



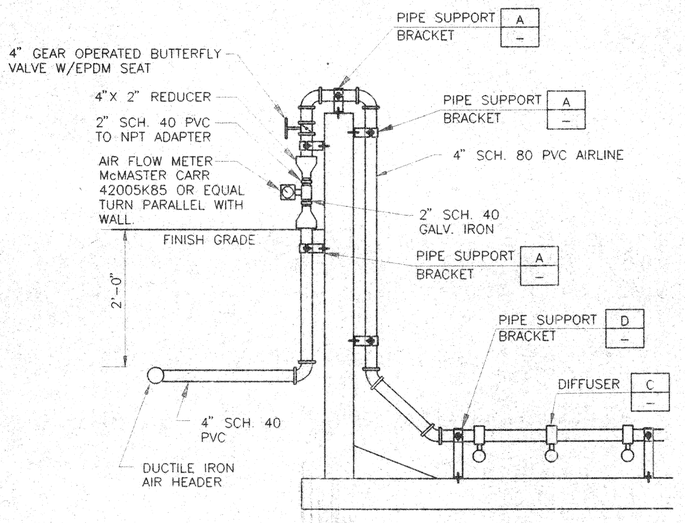
AERATION BASIN WALL CROSSING DETAIL B



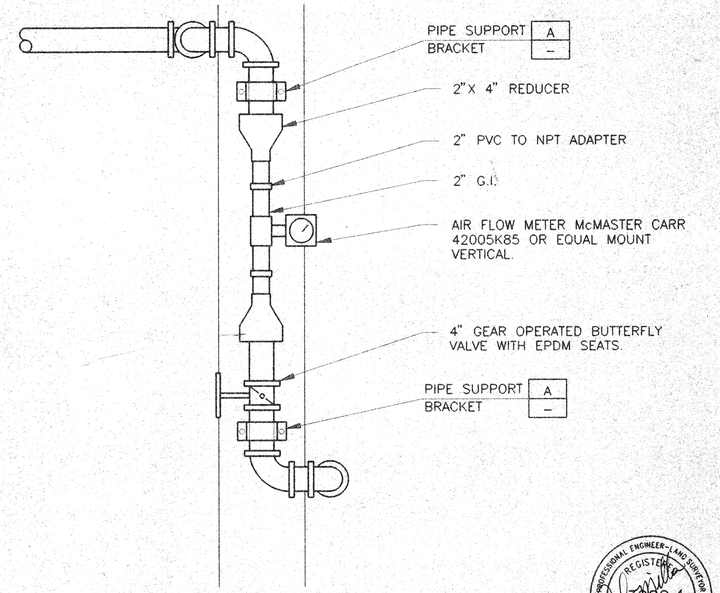
EDI DIFFUSER ASSEMBLY DETAIL C



PIPE SUPPORT BRACKET DETAIL D



AEROBIC DIGESTER WALL CROSSING DETAIL E



WALL CROSSING PLAN VIEW F

PROFESSIONAL ENGINEER — LAND SURVEYOR REGISTERED 7-22-93 STATE OF IDAHO JOHN W. MILLAR

RECORD DRAWING

NO.	REVISIONS	BY.	DATE

DRAWN BWM 8/90 DATE — CHECKED 2/91 KAP DATE

DESIGNED 2/7/91 DATE — JWM PROJECT ENGINEER

APPROVED 2/7/91 DATE — WRD PROJECT MANAGER

CITY OF ABERDEEN, IDAHO

FORSGREN ASSOCIATES / P.A.

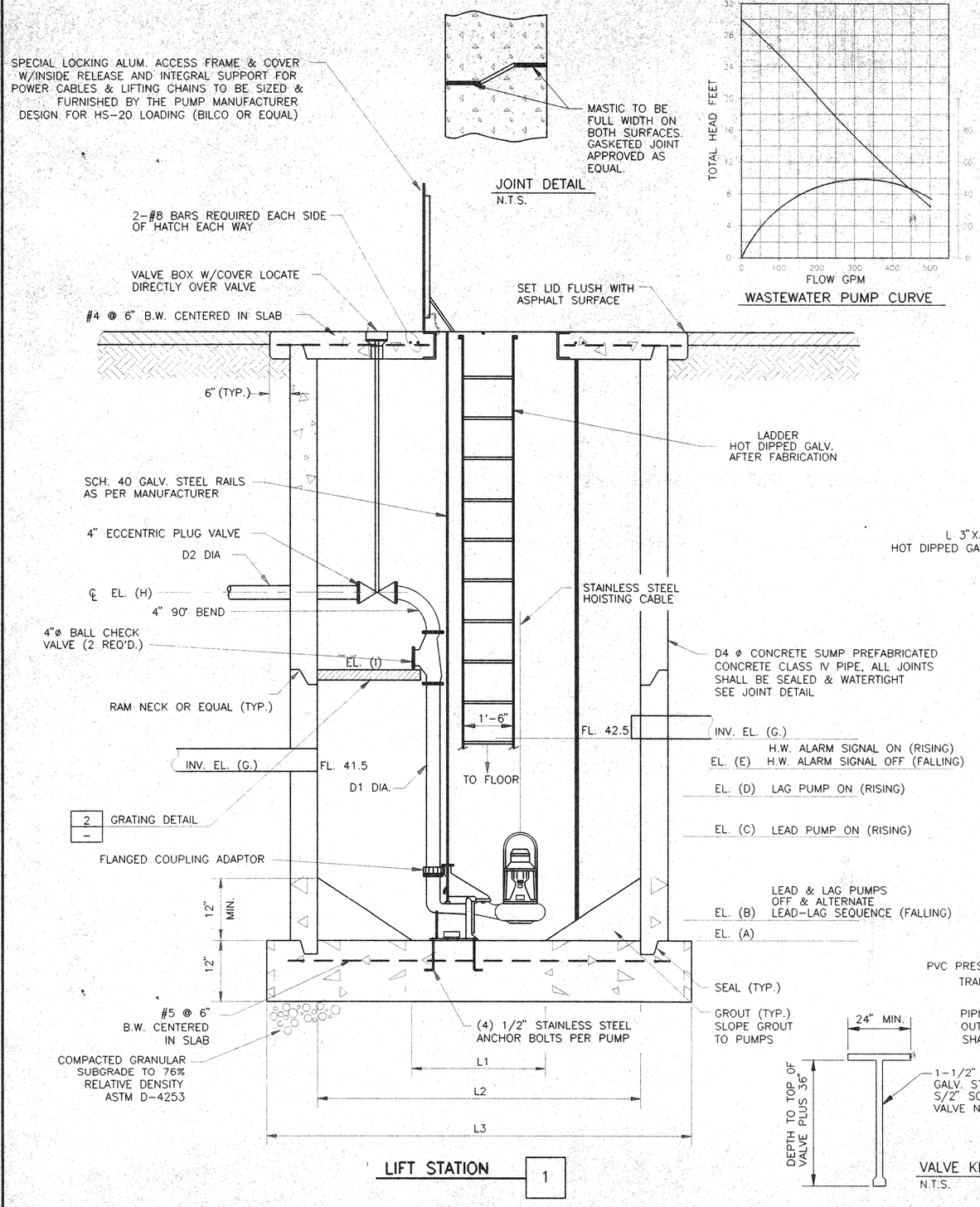
WWTP REHABILITATION

AERATION DETAILS

PROJECT NO. 90046

SHEET NO. 15

H:\DWGS\90046\H_DWGS\90046\AER-DET.DWG — 11/17/92 at 08:27 Plot scale: 1=1.00

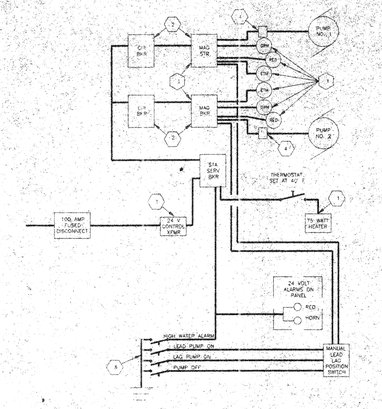


LIFT STATION 1

WASTEWATER PUMP CURVE

JOINT DETAIL
N.T.S.

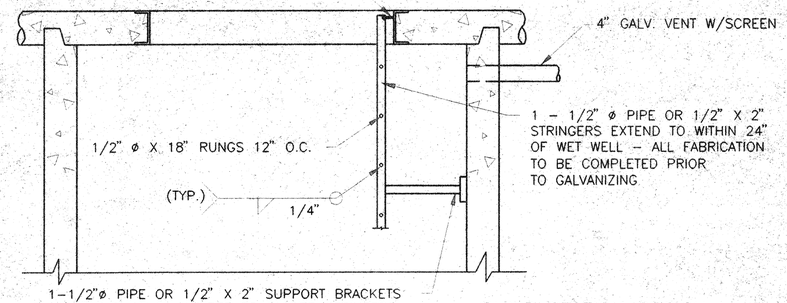
MASTIC TO BE FULL WIDTH ON BOTH SURFACES. GASKETED JOINT APPROVED AS EQUAL.



LIFT STATION ELECTRICAL

KEYED NOTES

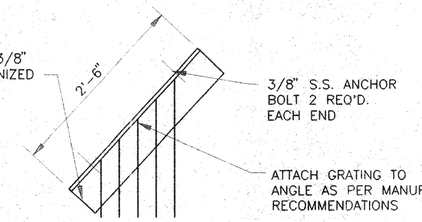
1. MOUNTED IN PANEL
2. MAGNETIC STARTER SIZED PER NEC WITH "HAND-OFF-AUTO" SELECTOR SWITCH.
3. MERCURY FLOAT LIQUID LEVEL CONTROLS
4. NEMA 7 JUNCTION BOXES - MOUNT AS SHOWN



SECTION 2

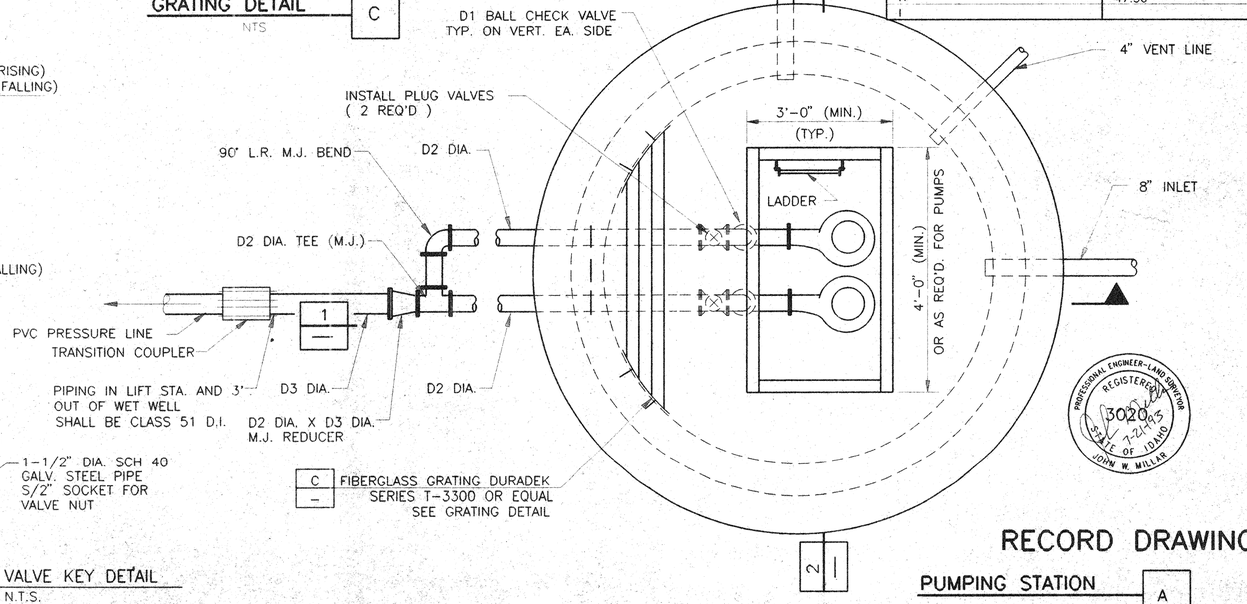
PUMP STATION DESIGN

PARAMETER	VALUE
MAX. H.P.	3.0
PUMP CAPACITY (GPM)	350
TOTAL HEAD (FT.)	13
MIN. SHUTOFF HEAD (FT.)	30
MAX. RPM	1750
ELECTRICAL CHARACTERISTICS (ø/V/Hz)	3 PHASE/480/60HZ
MIN. SPHERE (IN.)	3
D1	4 IN.
D2	4 IN.
D3	6 IN.
D4	6 FT. DIA.
L1	3'-0"
L2	6'-0"
L3	7'-0"
A	38.00
B	38.50
C	41.00
D	41.50
E	42.00
F	
G TWO PIPES	41.50 SMF 42.50
H	47.50
I	



GRATING DETAIL C
NTS

VALVE KEY DETAIL
N.T.S.



RECORD DRAWING

PUMPING STATION A

NO.	REVISIONS	BY	DATE

DRAWN _____ DATE CHECKED 2/91 KAP DATE
DESIGNED 2/7/91 DATE JWM PROJECT ENGINEER
APPROVED 2/7/91 DATE WRD PROJECT MANAGER

CITY OF ABERDEEN, IDAHO

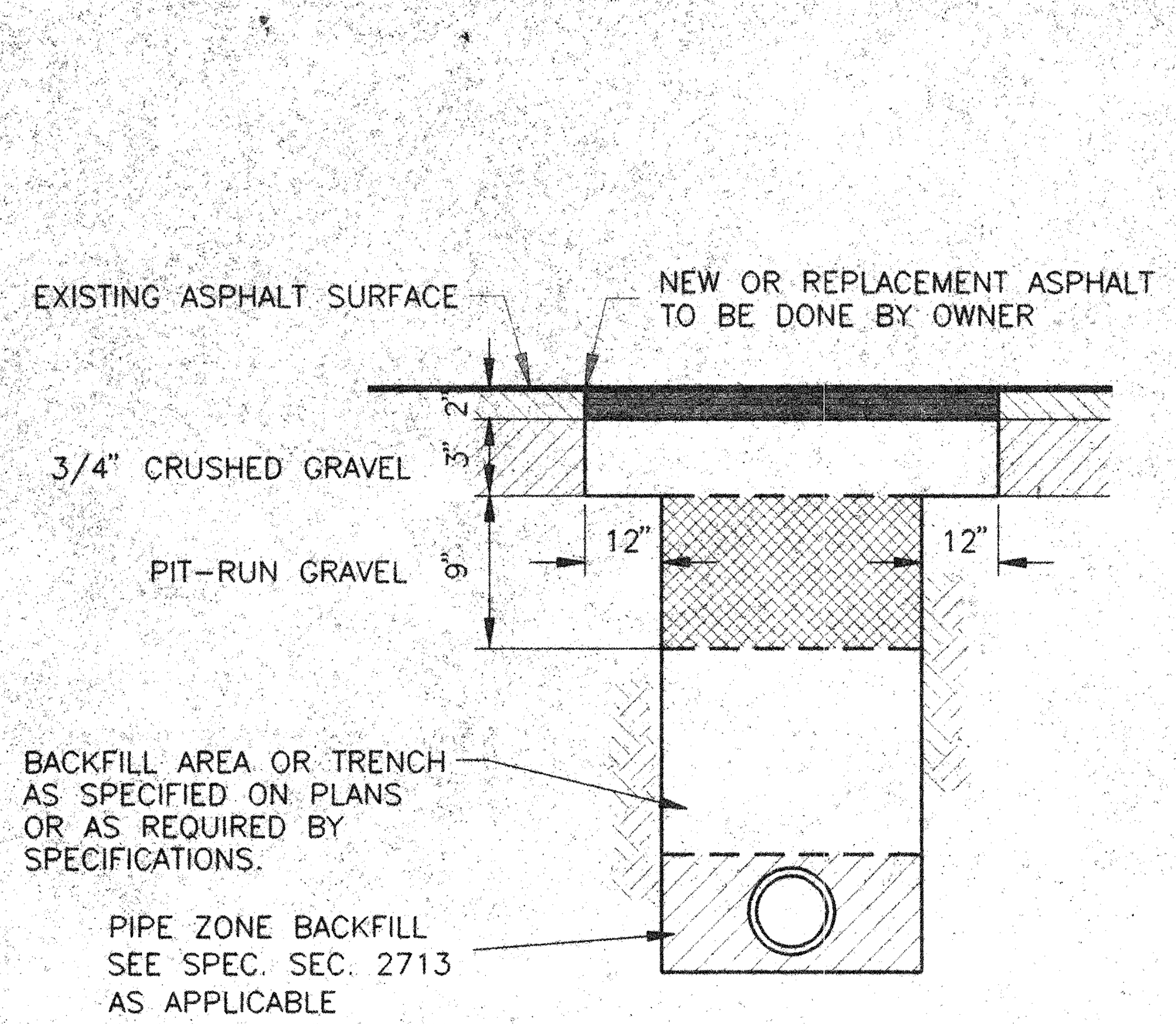
FORSGREN ASSOCIATES / P.A.

WWTP REHABILITATION

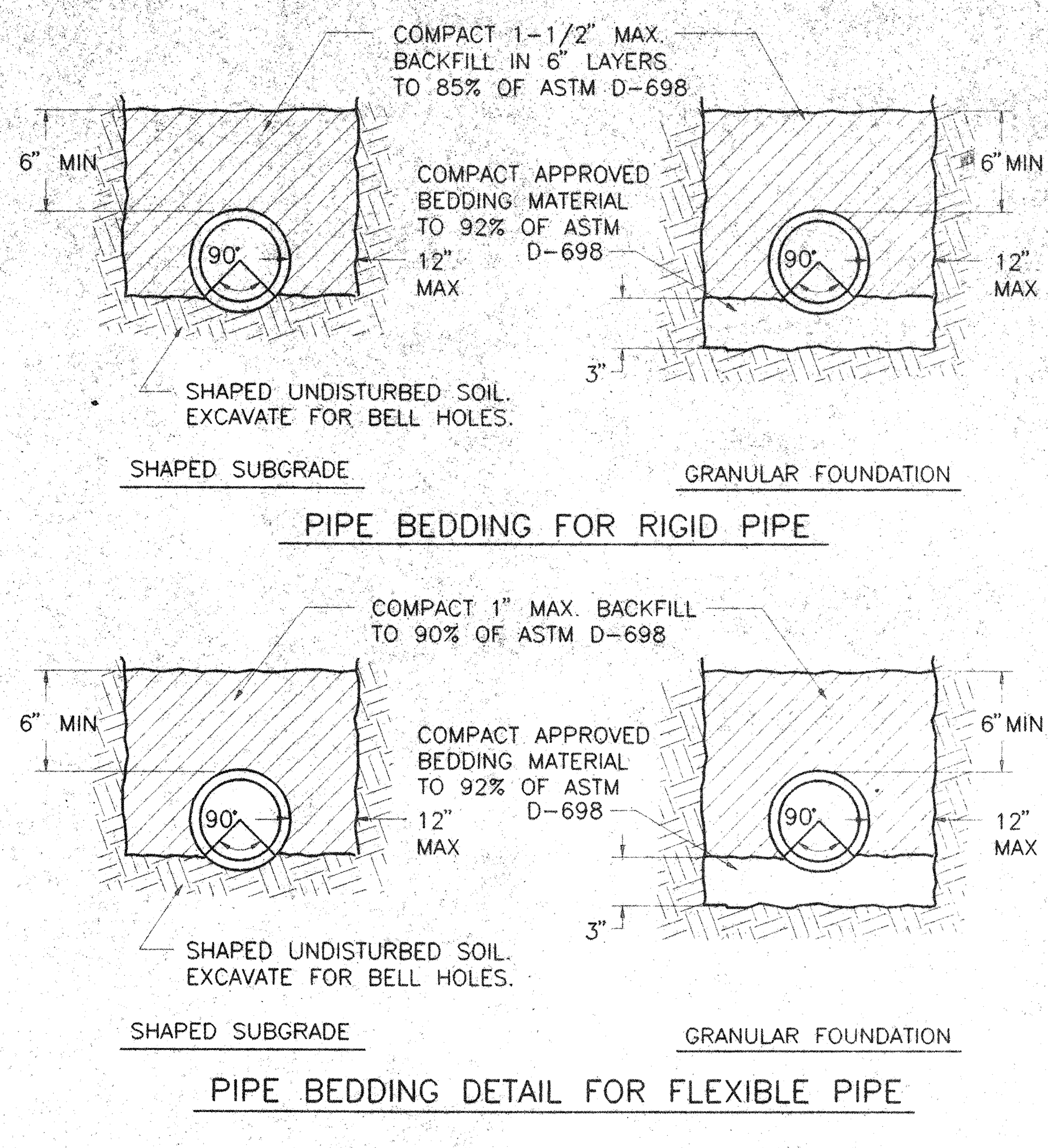
PUMP STATION

PROJECT NO. 90046

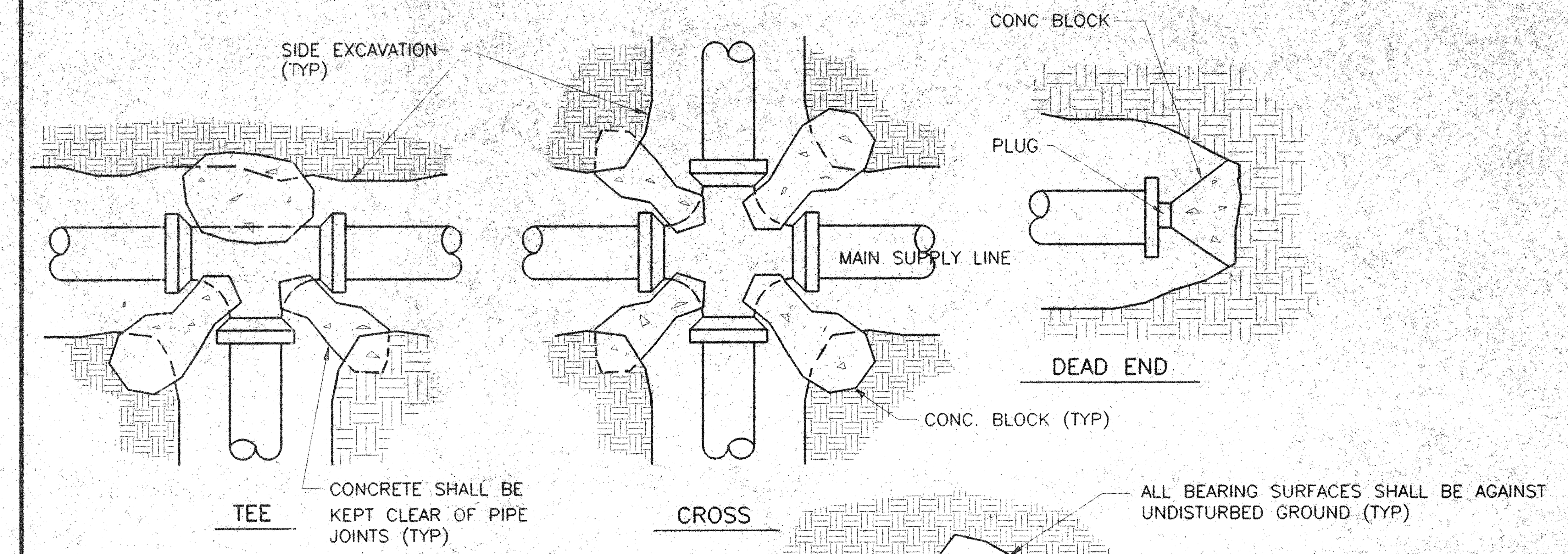
SHEET NO. 16



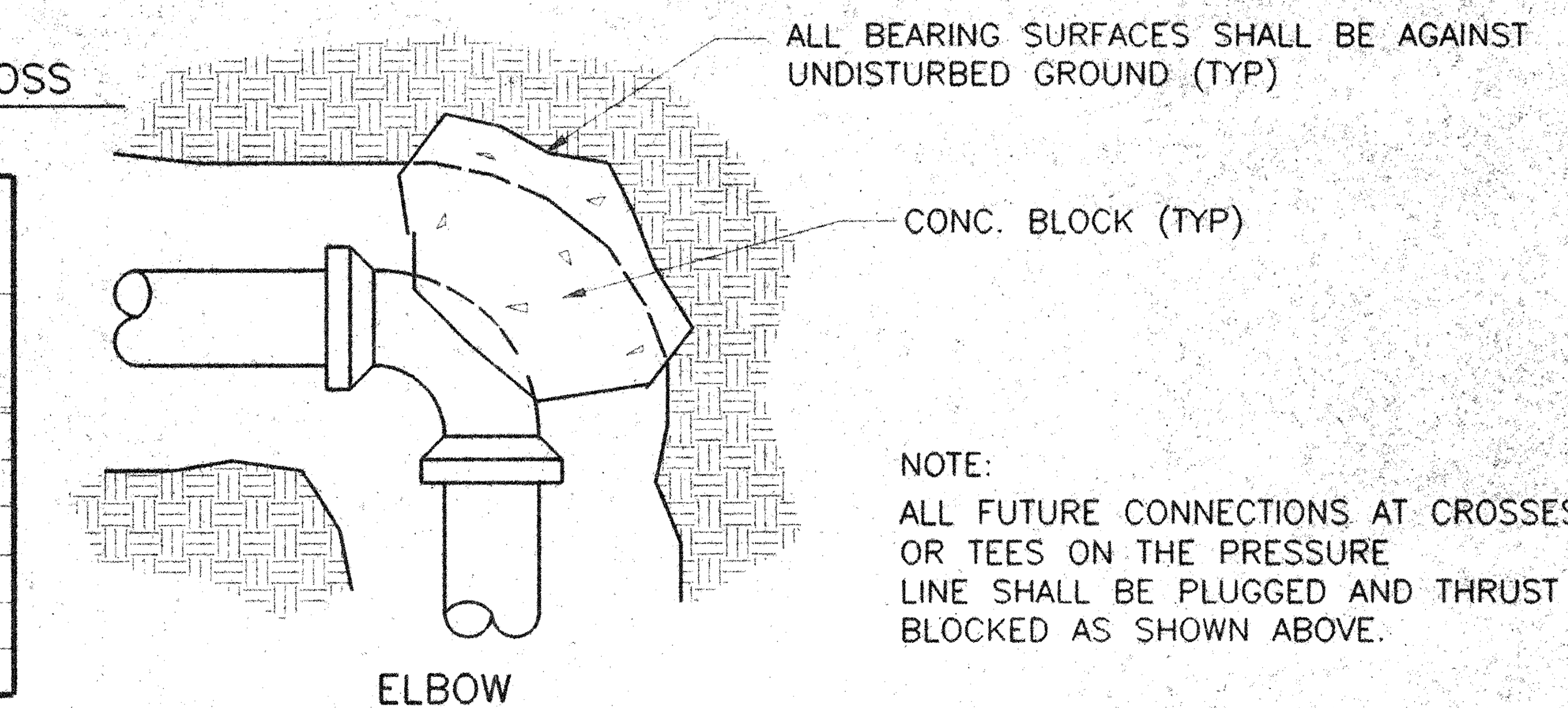
ASPHALT SURFACE REPAIR A
NO SCALE



PIPE BEDDING DETAILS B
NO SCALE

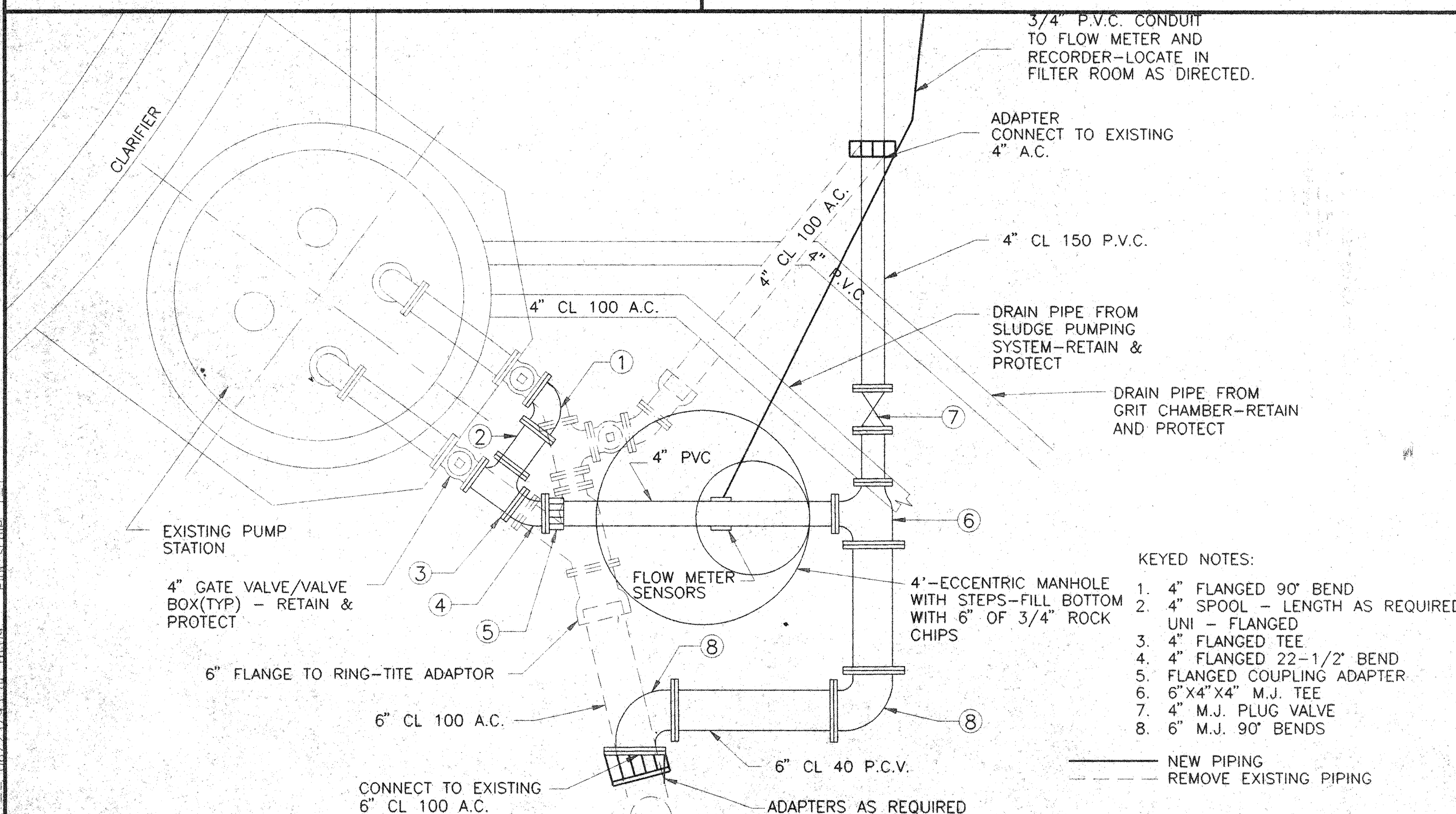


BEARING AREAS EACH DIRECTION OF THRUST IN SQUARE FEET				
PIPE SIZE	TEES & DEAD END	90° ELBOW	45° ELBOW CROSSES IN DIRECTION OF FL.	22-1/2° ELBOW
6"	4.0	5.5	3.0	2.0
8"	7.0	9.5	5.0	3.0
10"	9.5	13.5	7.0	4.0
12"	13.5	19.0	10.0	5.0
14"	18.0	23.5	14.0	7.0
16"	23.0	33.0	18.0	9.0



NOTE:
ALL FUTURE CONNECTIONS AT CROSSES OR TEES ON THE PRESSURE LINE SHALL BE PLUGGED AND THRUST BLOCKED AS SHOWN ABOVE.

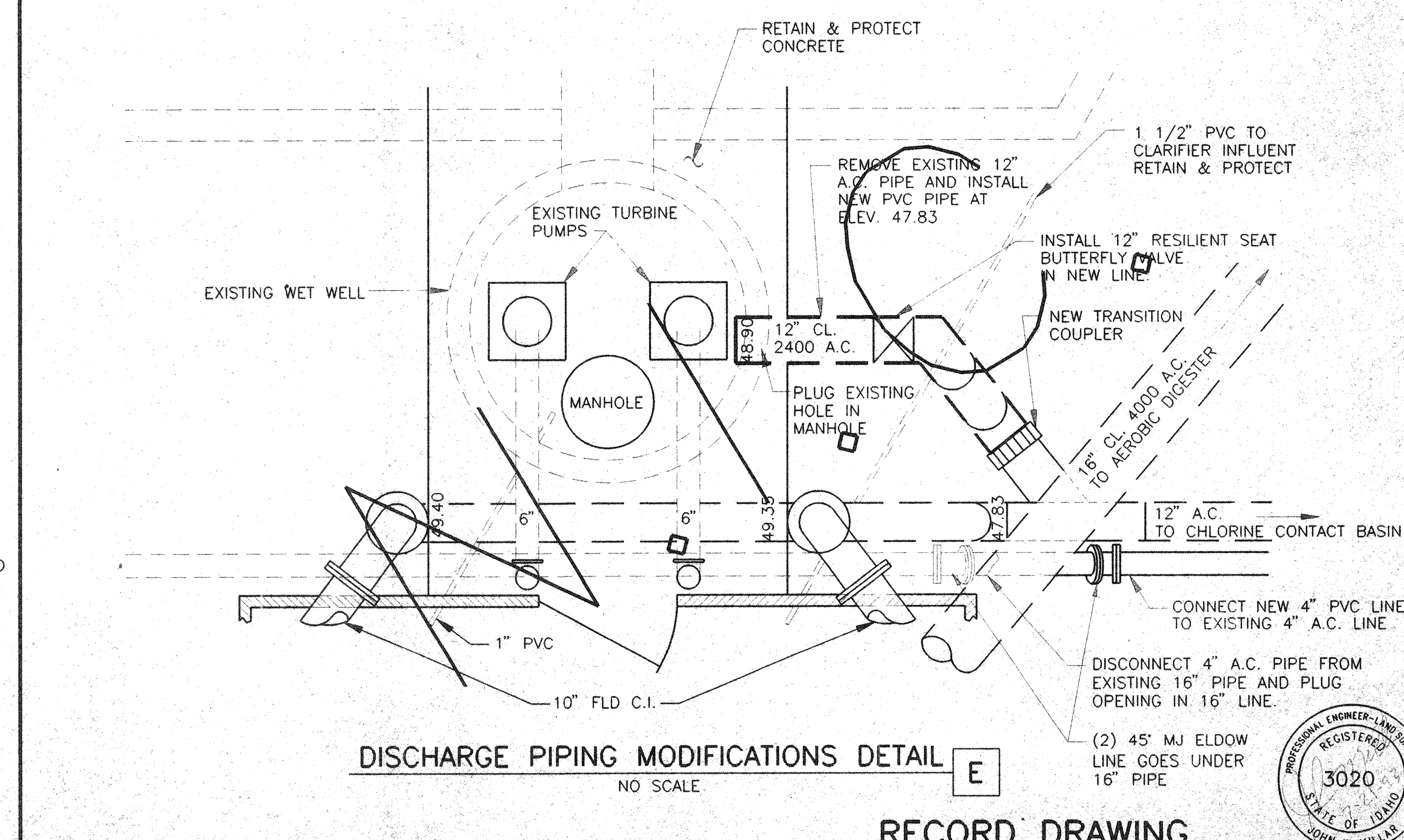
THRUST BLOCK DETAILS C
NO SCALE



KEYED NOTES:
1. 4" FLANGED 90° BEND
2. 4" SPOOL - LENGTH AS REQUIRED UNI - FLANGED
3. 4" FLANGED TEE
4. 4" FLANGED 22-1/2° BEND
5. FLANGED COUPLING ADAPTER
6. 6"X4"X4" M.J. TEE
7. 4" M.J. PLUG VALVE
8. 6" M.J. 90° BENDS

NEW PIPING
REMOVE EXISTING PIPING

PIPE MODIFICATIONS FOR RAS & WAS FLOW METER INSTALLATION D
NO SCALE



DISCHARGE PIPING MODIFICATIONS DETAIL E
NO SCALE

RECORD DRAWING

NO.	REVISIONS	BY	DATE

DRAWN 2/90 JLT — CHECKED 2/91 KAP
DESIGNED 2/7/91 — PROJECT ENGINEER JWM
APPROVED 2/7/91 — PROJECT MANAGER WRD

CITY OF ABERDEEN, IDAHO

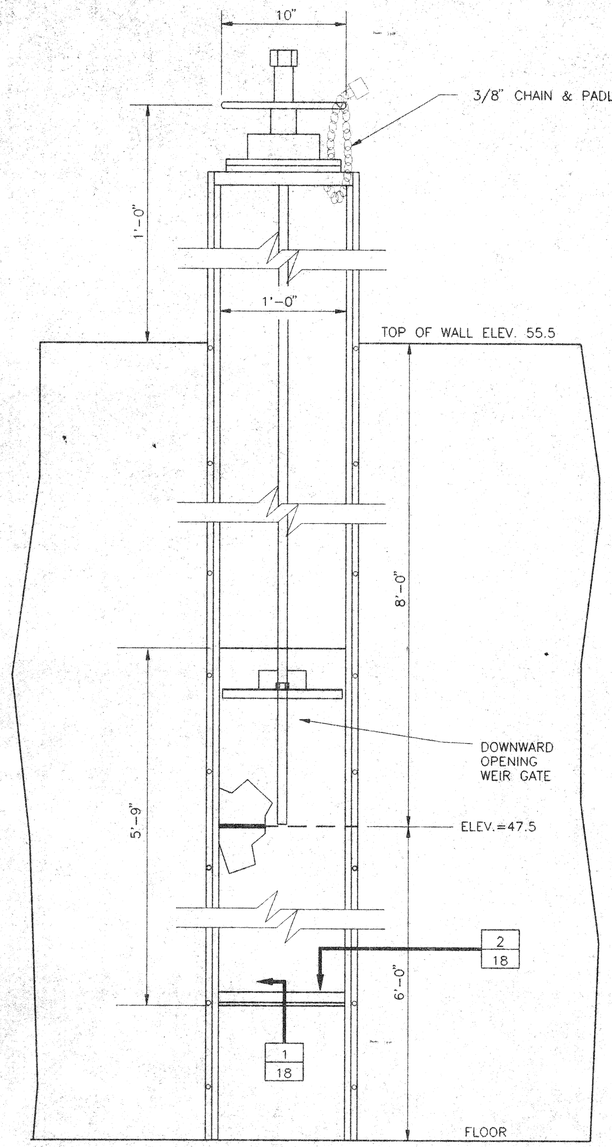
FORSGREN ASSOCIATES / P.A.

WWTP REHABILITATION

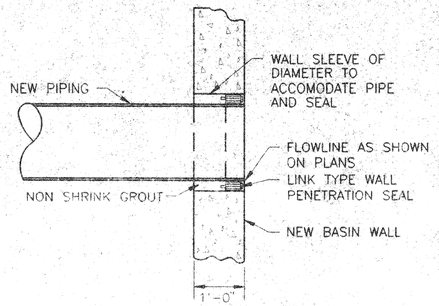
MISCELLANEOUS DETAILS

PROJECT NO. 90046

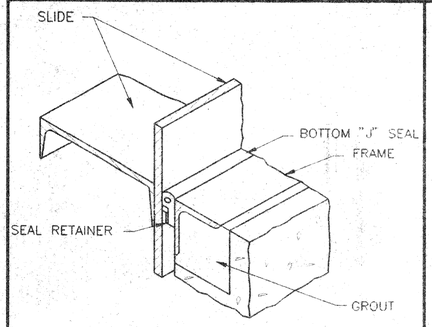
SHEET NO. 17



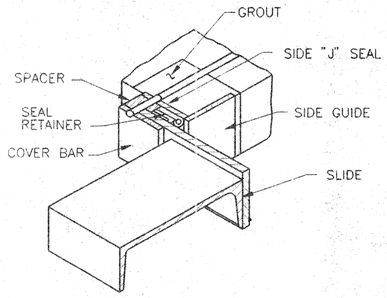
SUPERNATING WEIR — A
SCALE: 2"=1'



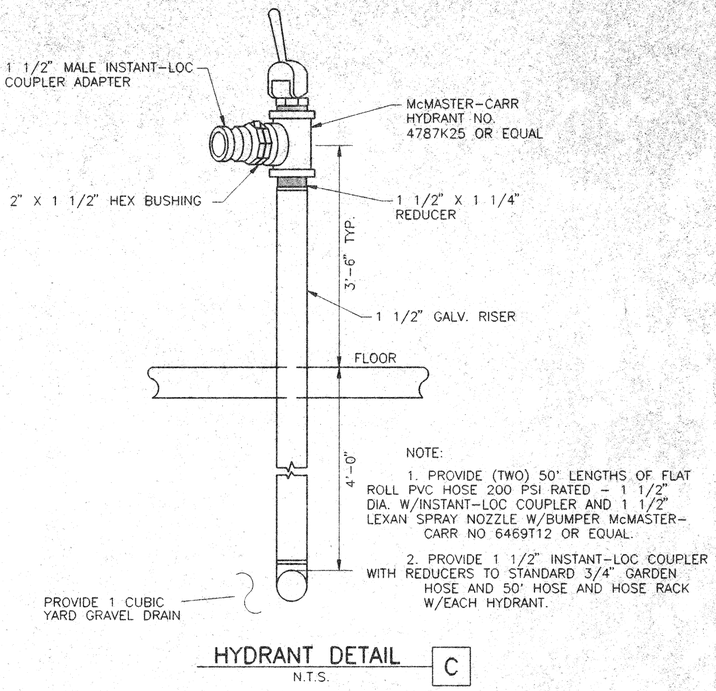
WALL PENETRATION DETAIL — B
N.T.S.



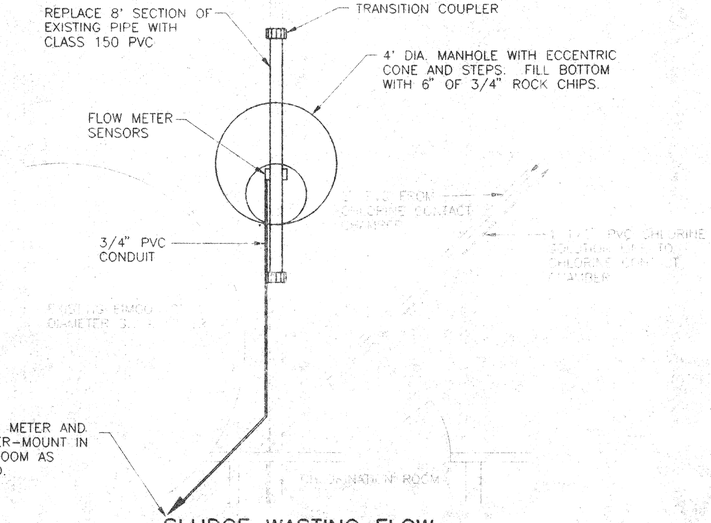
WEIR GATE BOTTOM SECTION — 1
NOT TO SCALE



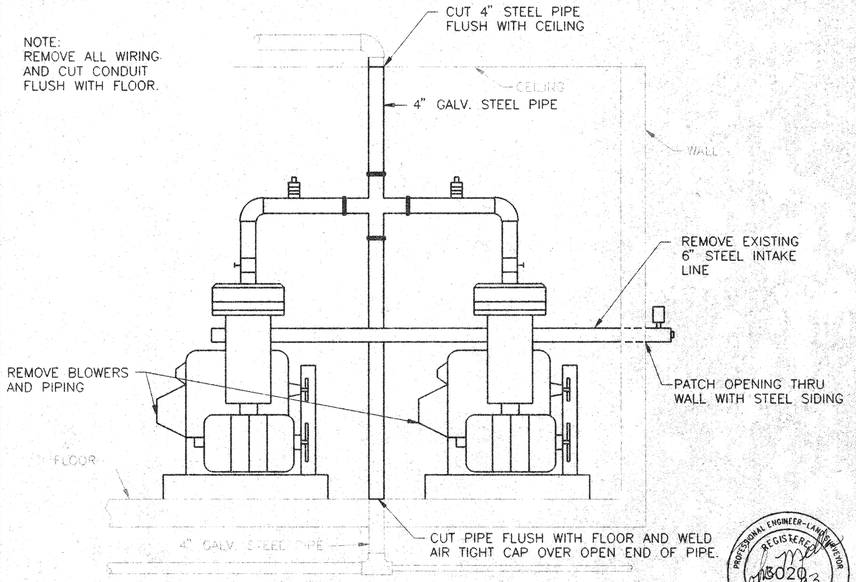
WEIR GATE SIDE SECTION — 2
NOT TO SCALE



HYDRANT DETAIL — C
N.T.S.



SLUDGE WASTING FLOW METER INSTALLATION — D
NOT TO SCALE



AIRLINE REMOVAL DETAIL — E
N.T.S.

RECORD DRAWING

PROFESSIONAL ENGINEER-LAND SURVEYOR REGISTERED 15029 7-21-93 STATE OF IDAHO JOHN W. MILLAR

NO	REVISIONS	BY	DATE

DRAWN BWM 5/90 (DATE) CHECKED 2/91 KAP (DATE)
DESIGNED 2/7/91 (DATE) JWM (PROJECT ENGINEER)
APPROVED 2/7/91 (DATE) WRD (PROJECT MANAGER)

CITY OF ABERDEEN
IDAHO

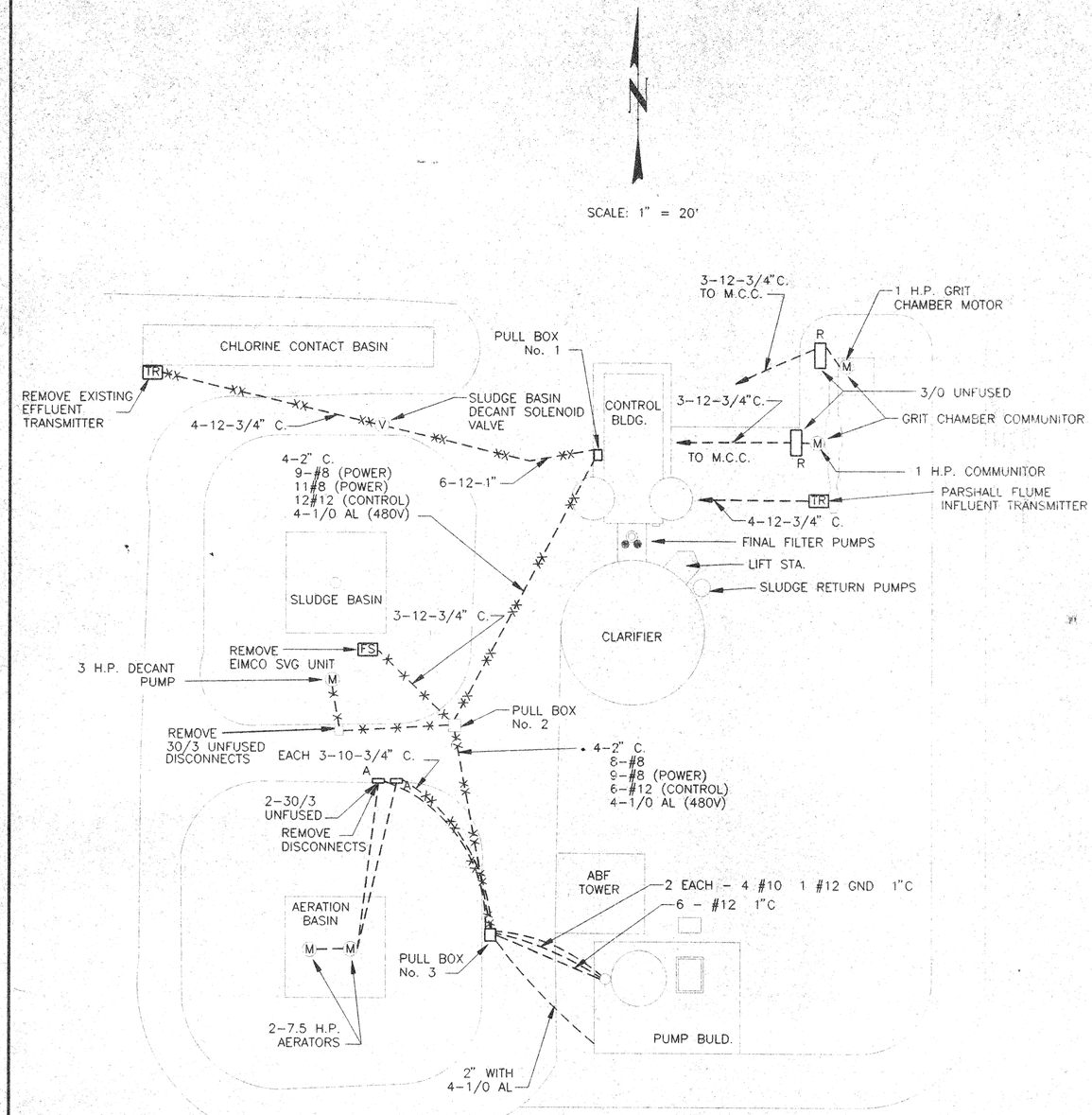
FORSGREN ASSOCIATES / P.A.

WWTP REHABILITATION

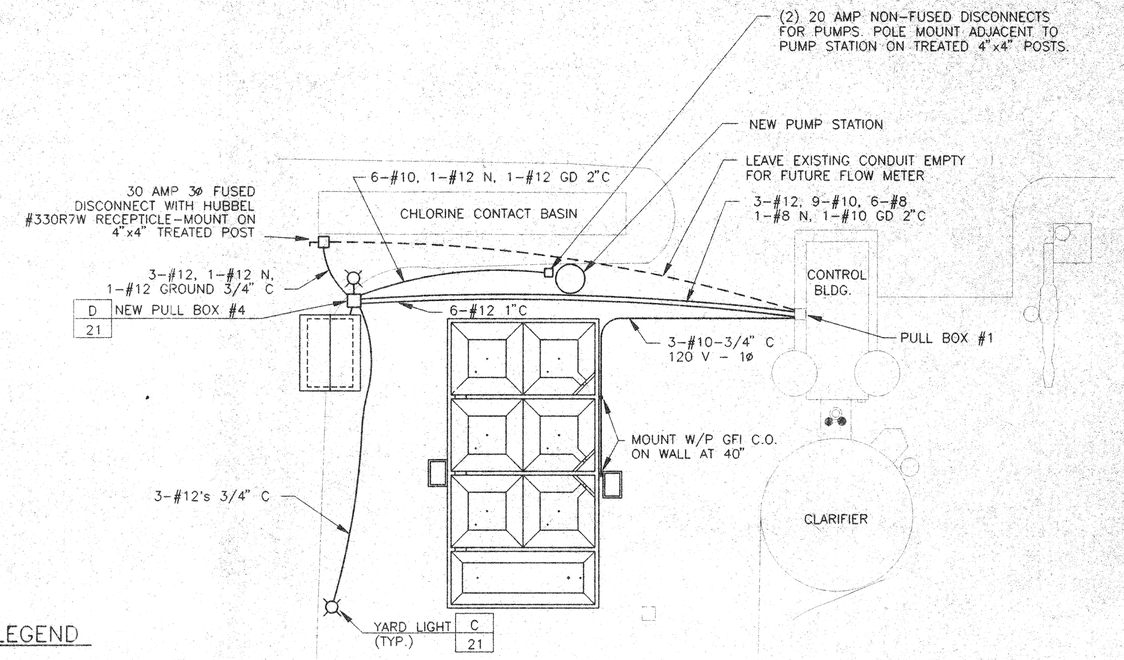
MISCELLANEOUS DETAILS

PROJECT NO. 90046

SHEET NO. 18



EXISTING YARD ELECTRICAL A



PROPOSED NEW YARD ELECTRICAL B

LEGEND

- EXISTING CONDUIT
- ABANDON CONDUIT AND REMOVE WIRE
- RETAIN CONDUIT AND REMOVE UNUSED WIRING

NOTES

1. RETAIN AND PROTECT ALL CONDUIT AND WIRING UNLESS OTHERWISE NOTED.
2. VERIFY ALL CIRCUITS PRIOR TO REMOVING ANY WIRING.
3. CONTRACTOR MAY REUSE UNPULLED WIRING BETWEEN JUNCTION POINTS.

PROFESSIONAL ENGINEER-LAND SURVEYOR REGISTERED 3020 2-27-93 STATE OF IDAHO JOHN W. MILLAR

RECORD DRAWING

NO.	REVISIONS	BY	DATE

DRAWN TTW 4/90 DATE — CHECKED 2/91 KAP DATE
DESIGNED 2/7/91 DATE — JWM PROJECT ENGINEER
APPROVED 2/7/91 DATE — WRD PROJECT MANAGER

CITY OF ABERDEEN
IDAHO

FORSGREN ASSOCIATES / P.A.

WWTP REHABILITATION

ELECTRICAL SITE PLAN

PROJECT NO. 90046

SHEET NO. 19

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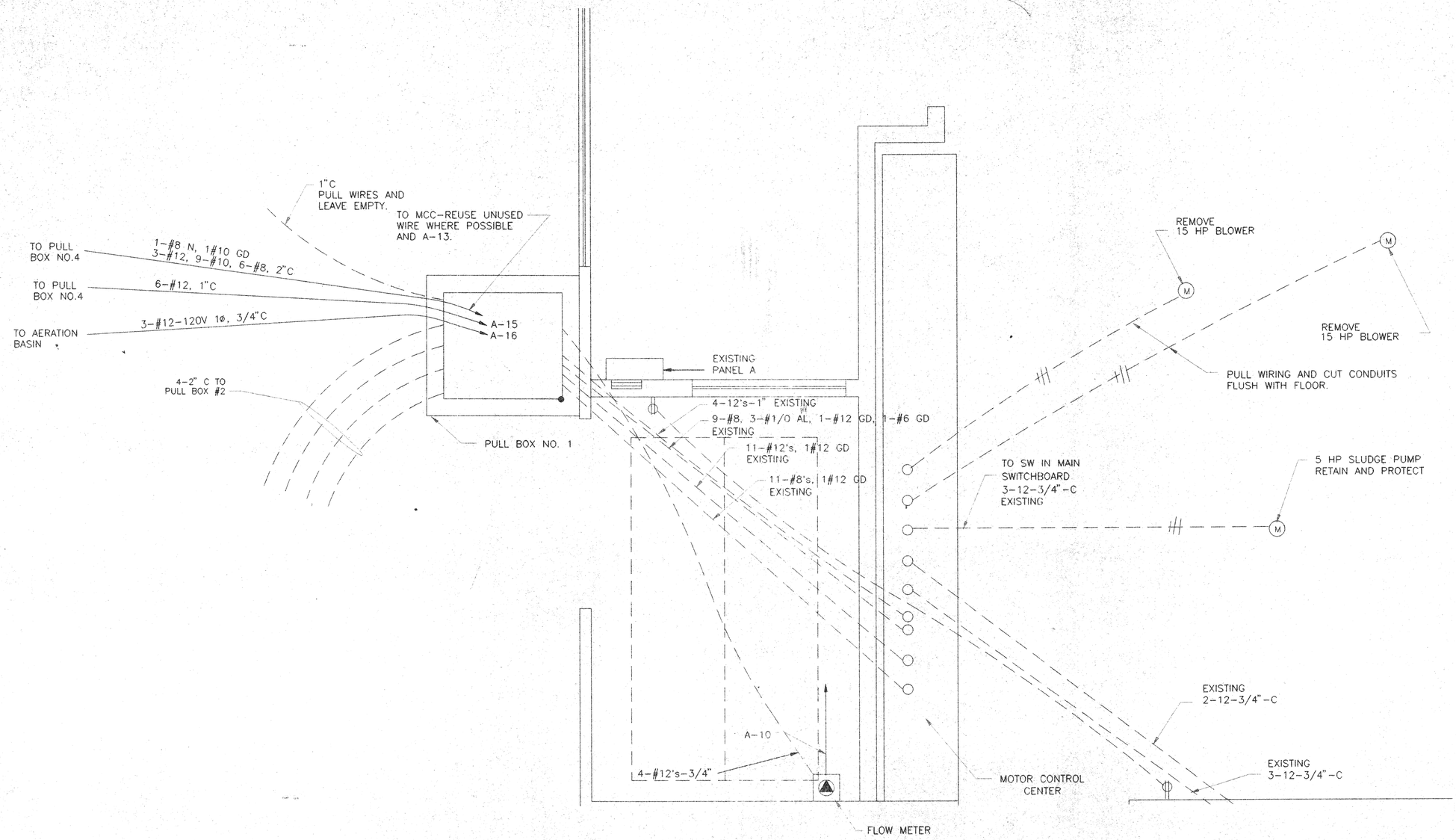

PROFESSIONAL ENGINEER — REGISTERED — 3020 — 7-2-92 — STATE OF IDAHO — JOHN W. MILLAR

RECORD DRAWING

NO.	REVISIONS	BY	DATE

DRAWN BWM 9/90 DATE — CHECKED 2/91 KAP DATE

DESIGNED 2/7/91 DATE — JWM PROJECT ENGINEER

APPROVED 2/7/91 DATE — WRD PROJECT MANAGER

CITY OF ABERDEEN,
IDAHO

FORSGREN ASSOCIATES / P.A.

WWTP REHABILITATION

CONTROL BUILDING-ELECTRICAL

PROJECT NO. 90046

SHEET NO. 20

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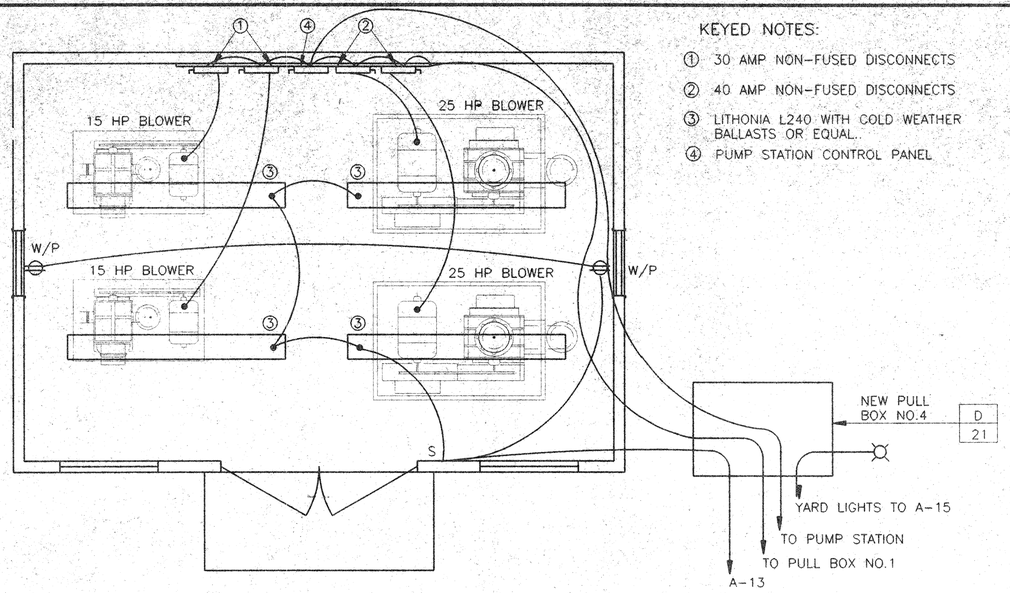


KEYED NOTES:

1. 30 AMP NON-FUSED DISCONNECTS
2. 40 AMP NON-FUSED DISCONNECTS
3. LITHONIA L240 WITH COLD WEATHER BALLASTS OR EQUAL..
4. PUMP STATION CONTROL PANEL

BLOWER BUILDING ELECTRICAL LAYOUT — A

NO SCALE

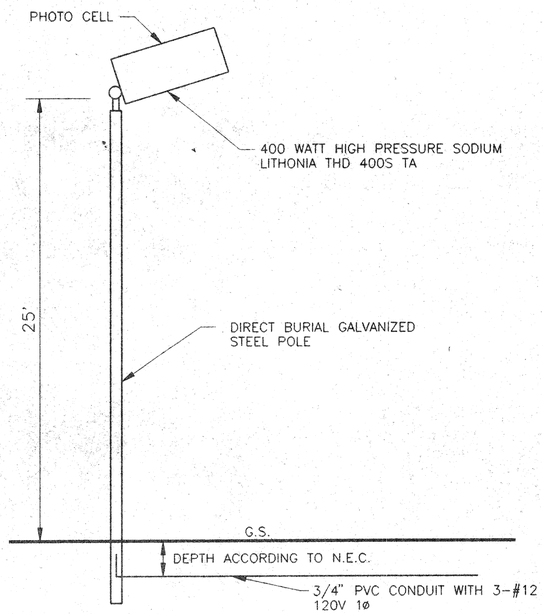
FILTER LIFT PUMP		SLUDGE REC. PUMP	COMMINUTER		SLUDE PUMP	AIR COMPRESSOR	POLYMER MIXER	MAIN
FILTER LIFT PUMP		SLUDGE REC. PUMP	CHLORINE BASIN ③		BLOWER ①	SPRINKLER BOOSTER PUMP	PLANT PUMP STATION ④	
ABF PUMP		AF BLOWER 1 ②	GRIT UNIT		BLOWER ①	Cl_2 BOOSTER PUMP	SPARE	GRIT CHAMBER TIMER
ABF PUMP		AF BLOWER 2 ②	SELECTO STRAINER		CLARIFIER	ALUM FEED PUMP	PANEL A BREAKER / LIGHTING	
			SPARE			ALUM MIXER	SPARE / HEAT	BUSS BAR
						POLYMER FEED PUMP	TRANSFORMER	

KEYED NOTES:

1. REUSE AS IS TO RUN RELOCATED BLOWERS – REWIRE AS REQUIRED.
2. REPLACE STARTERS, FUSES BLOCKS, FUSES, AND WIRING AS REQUIRED TO PROVIDE POWER TO 25 HP BLOWERS. RELABEL DOORS.
3. REUSE AS IS TO PROVIDE POWER TO PORTABLE DEWATERING PUMP– RELABEL.
4. REMOVE STARTER AND USE AS 20 AMP FUSED DISCONNECT, LABEL "PLANT PUMP STATION".

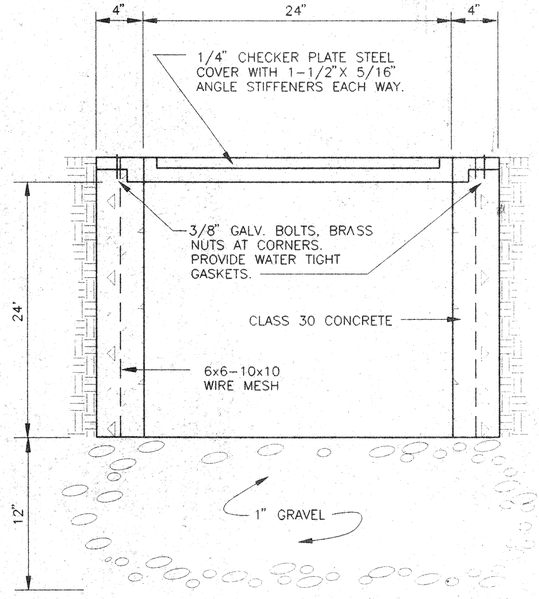
EXISTING MOTOR CONTROL CENTER MODIFICATIONS — B

NO SCALE



YARD LIGHT DETAIL — C

NO SCALE



PULL BOX DETAIL — D

NO SCALE

RECORD DRAWING

NO.	REVISIONS	BY	DATE

DRAWN RRW 9-90 DATE — CHECKED 2/7 KAP DATE

DESIGNED 2/7/91 DATE — JWM PROJECT ENGINEER

APPROVED 2/7/91 DATE — WRD PROJECT MANAGER

CITY OF ABERDEEN, IDAHO

FORSGREN ASSOCIATES / P.A.

WWTP REHABILITATION

ELECTRICAL DETAILS

PROJECT NO. 90046

SHEET NO. 21

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 ADDENDUM 4

SECTION 40 62 00 – SCADA COMPUTERS AND SOFTWARE

PART 1 - GENERAL

1.1 WORK INCLUDED

A. The Contractor shall provide and install a PC-based Supervisory Control And Data Acquisition (SCADA) software system complete and operable, in accordance with the Contract Documents.

1. Keller Associates will be completing the SCADA and PLC programming and integration under separate contract with the Owner (to be excluded from Contractor scope and bid). Contractor is to provide hardware and software as identified in the design documentation and in coordination with Keller Associates following award of bid.

1.2 SUBMITTALS

A. Submittals shall be in accordance with the applicable requirements of Sections 40 70 00 – Instrumentation and Control, General.

B. Shop Drawings: At a minimum, the following information shall be submitted for SCADA Computer and Software.

1. Data sheets and technical specifications for PC hardware and associated operating systems.

2. Data sheets and technical specification for SCADA software. Clearly identify version numbers, licensing information, point counts, and minimum hardware/OS requirements.

3. Contractor shall submit screen prints of SCADA overview displays and equipment control pop-ups for Owner review and approval.

C. Operation and Maintenance Manuals: The following items shall also be included in with the SCADA Operations and Maintenance Manuals:

1. A file containing a full backup of the SCADA application and instructions for a full restoration. Backup shall be the newest version of what is running on the system.

2. A tabular listing of all operating system and SCADA software version numbers, product keys, serial numbers, license numbers. Include source vendor name and contact information, support agreement numbers, and support plan expiration dates.

1.3 QUALITY ASSURANCE

A. Warranty: The Contractor shall provide a warranty for materials and labor on all installed equipment for a minimum period of one year from date of acceptance.

B. PC hardware shall be provided with a minimum 3-year manufacturer's warranty.

PART 2 - PRODUCTS

2.1 GENERAL

A. All materials and all equipment furnished under this Contract shall be new, free from defects, of first quality, and produced by manufacturers regularly engaged in the manufacture of these products.

B. Hardware Commonality: Where there is more than one item of similar equipment being furnished all such similar equipment shall be the product of a singular manufacturer.

C. All computer hardware software and other accessories required to form a complete system shall be provided. Parts may be required to complete the system that are not shown on the drawings but are the responsibility of the contractor to furnish in order to provide a complete, operable system.

D. All materials shall be UL listed.

2.2 SCADA COMPUTERS

A. SCADA Server. Located in Control building.

1. Minimum requirements:

Item	Specification
Operating System	Microsoft® Windows® Server 2022 Standard 64-Bit
CPU Processor	Intel® Xeon® E5, 20MB Cache, 8 cores
Memory	16GB
Hard Drives	2 x 2TB SATA 6Gb/s (7200rpm), Integrated RAID 0
Optical Drive	16X DVD+/-RW
Video	Dual Monitor support
Audio	Integrated
LAN	Integrated
2nd LAN Card	PCIe GbE
Keyboard	HP USB
Mouse	HP USB optical scroll mouse
Antivirus	Kapersky or Equal
Support / Warranty	3/3/3 (parts/labor/next business day on-site) limited warranty
Monitors	Two (2) 24-inch Flat Panel Displays – DisplayPort, built-in speakers.
UPS	Provide appropriately sized UPS by APC or equal.

2. Manufacturer, or equal:

    a. Hewlett Packard Z440 Series Workstation

2.3 SCADA SOFTWARE

A. Existing licenses. Proficy oFIX

B. Provide the following on the SCADA Server:

1. Core Ignition System Platform with the Perspective Module, unlimited.

    a. Include Alarm Notification module with SMS Notification module.

2. Microsoft SQL server.

    a. Include reporting module.

3. Remote Desktop to support up to two simultaneous terminal sessions.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Refer to specification 40 70 00 – Instrumentation & Control, General for a general description of the work to be performed.

B. Configure up to eight existing Windows PCs for remote desktop access to SCADA Server. Pre-configure shortcuts for Owners use.

C. The SCADA server shall also be utilized as a runtime station.

3.2 SCADA DISPLAYS

A. All equipment status, alarms and other displays outlined in Specification 40 61 96 – Control Strategies shall be included in the integration of the SCADA system.

B. TAG Licensing: The Contractor and/or Programmer shall be responsible for providing software with sufficient number of TAGs to accommodate the Work outlined in the Contract Documents, with an additional 50% spare (minimum).

C. SCADA displays converted from existing applications shall retain the same look and operational function except as approved by owner/engineer.

D. Individual Display Navigational Buttons and Features: Provide updates to each and every existing window navigational feature for all existing display screens to provide access to any new or modified windows. Provide navigational features on all new displays that are logically needed to link or jump to connected or associated displays.

E. General Display Requirements: The Contractor shall configure the SCADA software to implement all functions specified in the Contract Documents. This includes providing new PLC and SCADA/OIT programming for all processes shown on the P&IDs and other modifications as included as part of this project. The Contractor will coordinate this Work with all Equipment Manufacturer Control Panels. This Work includes such configuration and programming as is required to perform data transfer and communication between local equipment control panels, PLCs and SCADA system.

1. SCADA/OIT displays shall be configured to maximize user friendliness for the operators. Each display shall include navigational devices to directly go to related displays and to the main menu display. The various required displays shall use text of all capital letters with the exception of certain engineering units. All text shall be horizontal. Screens showing equipment shall include the equipment number and name as used in the Contract Drawings. Each display shall show the current time and date which shall appear in the same place on each display.

2. SCADA displays refer to PC-Based SCADA computers.

3. OIT displays refer to local touchscreens to be installed in the door of PLC enclosures. OITs shall contain all functions and features associated with equipment and instruments in the local PLC.

4. The Contractor shall provide SCADA interface to vendor package systems as described in the associated Division 43 to 46 specifications. SCADA/OIT displays associated with vendor package systems that have a vendor provided OIT shall have a layout similar to the vendor OIT but follow graphic standard of the primary SCADA system.

F. Base Displays: The Contractor shall configure displays to show all status and analog data contained in the SCADA/OIT system database. Some status and analog points shall be displayed on more than one display, especially where it relates to more than one process or is significant to operation. Every analog and status value shall appear on at least one display. All scaling values, timers, setpoint (alarm and operational) shall appear on a display. All values that may possibly be changed in the future shall appear on a display. Analog values shall be displayed with appropriate engineering units, and shall use techniques such as variable fill and/or color changes to provide clarity to operators. Status points shall incorporate symbol and/or color changes along with labels (Open/Close, On/Off, etc.) to inform operators of the current status.

G. Control Pop-Ups: The Programmer shall configure Control Pop-ups to allow operators to access and modify control parameters as described in Section 40 61 96 - Control Strategies.

1. Control functions shall in general be accessible from a point and click target within the related display(s) and by name. Control functions may be incorporated into the appropriate display. Control functions shall not be possible directly from a base display.

2. The entry of setpoints for analog scaling, alarming, etc. shall be in a fashion similar to the existing displays. The Programmer shall confirm the setpoint entry method with the Owner prior to the first display submittal, and shall use the Owner's preferred setpoint entry method for all SCADA displays developed under this Contract.

H. Trend Displays: The Programmer shall provide trend displays to include all processes and sub processes provided or modified as part of this project. In general, each trend display shall show real time and historical process data in an X- Y plot with time on the horizontal axis. Trend displays shall be configured as listed below with from one to six process variables displayed. Each variable shall be drawn in a separate color with its vertical axis, scale, units, tag number, and description shown in the same color. All variables on a trend display shall be shown on a single full display X- Y plot with a vertical axis and scale for each variable, and a common horizontal time axis.

1. All analog values shall be trended.

2. Some trends shall be displayed on more than one display. Logically group analog values to provide informative display of process operation.

I. Alarm System Displays: The system shall provide Alarm display and acknowledge capabilities. Alarms, along with detailed configuration requirements, are described in Section 40 61 96 – Control Strategies.

1. Only those alarms identified in the Contract Documents shall have setpoints entered by the Programmer. All setpoints shall be able to be easily entered, by personnel with the required security level.

J. Reports: The Programmer shall configure reports as defined in sections 40 70 00 which shall be processed as required by the Owner. Operator shall be able to toggle a pushbutton at the SCADA/OMI to enable/disable printing of each of the reports. Each report shall be able to be displayed on the SCADA/OMI terminal and shall also be logged to the SCADA/OMI's hard disk, in the same manner as the existing reports.

1. Each report shall include a report title, header and footer information, and other applicable features as found on reports currently generated by the system. Reports which require multiple pages to print shall include page numbers and suitable column(s) printed at the top of each page. Said columns shall include at least the date and day of the week for monthly reports. Reports which include calculations shall automatically display N/A if required data to perform that calculation is not available rather than performing the calculation with an implied zero.

2. All reports shall include variable tag names, if applicable, and descriptions. Engineering units for all values shall be displayed. Numerical formats shall be included. Column headings shall be clear and concise and any abbreviations shall be commonly accepted.

3. Reports shall include minimum, maximum, and average hourly or daily values for trended variables or other numerically significant variables such as equipment run times, out of service times, etc. as currently generated by the SCADA system or as determined by the Engineer. Where applicable, existing reports shall be modified to incorporate changes made to the plant as part of this project. The following reports shall be included as a minimum:

a. Daily Report

b. Weekly Report

c. Monthly Report

4. The Programmer shall test the report at least twice during startup using real process data. The resultant reports shall be submitted to the Engineer for checking and approval. The Programmer shall repeat the tests at no additional cost to the Owner until the spreadsheet calculations are correct and the reports conform to the Contract Document requirements.

K. Security: The use of security levels and entry of security passwords shall be in a fashion similar to the existing SCADA displays. Security levels within the current system shall be incorporated into all new displays and appropriate SCADA/OIT components. Security levels for viewing, changing operator settings, and tunable values as defined in the control strategies shall equal existing security levels for similar displays or components. The Programmer shall confirm the security methods and levels with the Owner prior to the first SCADA/OIT display submittal and shall use the Owner's preferred security methods for all displays developed under this Contract.

END OF SECTION 40 62 00

SECTION 40 63 43 – PLC-BASED CONTROL SYSTEM HARDWARE

PART 1 - GENERAL

1.1 WORK INCLUDED

A. The Contractor, through the use of the Instrumentation and Control System Contractor (ICSC), shall provide a PLC-based control system (PLCS) complete and operable, in accordance with the Contract Documents.

1. Keller Associates will be completing the SCADA and PLC programming and integration under separate contract with the Owner (to be excluded from Contractor scope and bid). Contractor is to provide hardware and software as identified in the design documentation and in coordination with Keller Associates following award of bid.

a. Panel design will be completed by Keller Associates and provided via future Addendum for provision and installation by Contractor.

1.2 SUBMITTALS

A. Submittals shall be in accordance with the applicable requirements of Section 40 70 00 – Instrumentation and Control, General and Section 01 33 00 – Submittal Procedures.

B. Shop Drawings: The PLC hardware submittal shall be included with the control panel submittals per Section 40 67 00 – Control Panels. PLC hardware submittals shall include but are not limited to the following:

1. Data sheets shall be included for each PLCS component together with a technical product brochure or bulletin. These data sheets shall show the component name as used within the Contract Documents, the manufacturer's model number or other identifying product designation, the project tag number, the project system of which it is a part, the input and output characteristics, the requirements for electric power, the ambient operating condition requirements, and details on materials of construction.

2. Complete and detailed bills of materials: A bill of material list, including quantity, description, manufacturer, and part number, shall be submitted for each component of the PLC system. Bills of material shall include all items within an enclosure.

3. Proposed version of PLC firmware.

C. UPS and battery load calculations to show that the backup capacity and time meet the specified requirements.

D. Operation and Maintenance Manuals: The following items shall also be included in with the SCADA Operations and Maintenance Manuals:

1. All PLC control panel drawings.

2. All control panel and PLC submittal information.

3. A CD or DVD containing a pdf of documented PLC program and copy of the downloadable source code.

1.3 QUALITY ASSURANCE

A. Special warranty requirements shall be in accordance with the applicable requirements of Section 40 70 00 – Instrumentation and Control, General.

B. Equipment, software, and materials which do not achieve design requirements after installation shall be replaced or modified by the Contractor to attain compliance. The cost for doing so shall be the Contractor's responsibility. Following replacement or modification, the Contractor shall retest the system and perform any additional procedures needed to place the complete PLC in satisfactory operation and attain design compliance approval from the Engineer.

C. The Contractor warrants the materials and workmanship used for the PLCS equipment and materials and further guarantees the materials and workmanship used for any equipment and materials produced and furnished hereunder as a part of the Work to be as required and agreed upon, free from injurious defects, and in all respects satisfactory for the service required.

D. The Contractor warrants/guarantees the satisfactory performance of the equipment and materials under operating conditions for a period of two years after the date of final acceptance. In the event that tests and inspections disclose latent defects or failure to meet the specified requirements, the Contractor upon notification by the Owner shall proceed at once to correct or repair any such defects or non-conformance or to furnish, at the delivery point named in the Contract Documents, such new equipment or parts as may be necessary for conformity to the requirements, and shall receive no additional compensation therefore. In case of any required repairs or other corrective or remedial work covered under warranty, the warranties on all such corrections, repairs, new equipment, or parts shall be extended for an additional 24 months from the date of final acceptance or 12 months from the date of completion of any such corrections, repairs, new equipment, or parts, whichever date is later. If the Owner performs repair, the Contractor shall reimburse the Owner for all costs incurred in the removal of the defective material and installation of the replacement.

PART 2 - PRODUCTS

2.1 GENERAL

A. All materials and all equipment furnished under this Contract shall be new, free from defects, of first quality, and produced by manufacturers regularly engaged in the manufacture of these products.

B. Hardware Commonality: Where there is more than one item of similar equipment being furnished all such similar equipment shall be the product of a singular manufacturer.

C. All PLCs, I/O modules, power supplies and other accessories required to form a complete system shall be provided. Parts may be required to complete the system that are not shown

on the drawings but are the responsibility of the Contractor to furnish in order to provide a complete, operable system.

D. All materials shall be UL listed.

2.2 PLC ENCLOSURES

A. Each PLC and its corresponding I/O modules, power supply module(s), communication interface device(s), and peripheral equipment shall be mounted inside suitable enclosures. All I/O wiring from the field to the I/O modules shall be terminated on terminal blocks in the enclosure.

B. PLC enclosures shall be provided in accordance with Section 40 67 00 - Control Panels.

2.3 PROGRAMMABLE LOGIC CONTROLLER (PLC)

A. PLCs shall be provided for locations listed in Section 40 70 00 – Instrumentation and Control, General.

B. Each PLC shall be of solid-state design. All CPU operating logic shall be contained on plug-in modules for quick replacement. Chassis wired logic is not acceptable. The controller shall be capable of operating in a hostile industrial environment and designed to provide high reliability specifically in this process application. The internal wiring of the controller is to be fixed, with the logic functions it must perform in a given application to be programmed into its memory. The controller shall be supplied with the CPU, input/output scanner, inputs, outputs, memory, power supply, and all power and interface cables necessary to function as a complete and operable PLC system. Each PLC shall be furnished with multiple onboard communication ports to support all communication functions as outlined by Drawings and other Contract Documents.

C. Central Processors (CPU): Each CPU shall contain all the relays, timers, counters, number storage registers, shift registers, sequencer, arithmetic capability, and comparators necessary to perform the indicated control functions. It shall be capable of interfacing sufficient discrete inputs, analog inputs, discrete outputs, and analog outputs to meet requirements plus excess capacity as described above. Specifically, the PLCs shall have the following features and capabilities:

1. The CPU within the system shall perform internal diagnostic checking and give visual indication to the user by illuminating a "green" indicator when no fault is detected and a "red" indicator when a fault is detected.

2. Non-volatile memory shall store the operating system information to protect against loss in the case of power loss or system shut-down. Only at the time of a hardware change shall this configuration status be altered or reentered.

3. PLC firmware shall be the most currently available from the manufacturer at the time of hardware procurement.

D. Program Creation and Storage (Memory): Memory capacity shall be configurable to allow for the most efficient match to the intended application. It shall be possible to upgrade to a processor with a larger memory size simply by saving a program, replacing the processor, and downloading the program to the new system without having to make any program changes.

1. The operator shall be able to backup volatile memory, including data and program logic onto either CD-Rom or external hard disk, at their option.

2. Each unit shall be supplied with sufficient memory to implement the indicated control functions plus a reserve capacity. This reserve capacity shall be totally free from any system use. The memory shall be programmed in a multi-mode configuration with multiple series or parallel contacts, counters, timers, and arithmetic functions.

E. PLC Power Supply: The PLC shall operate in compliance with an electrical service of either 120 VAC, single phase; in the frequency range from 47 to 63 Hz, or 24 VDC. The power supply shall be mounted in the PLC housing and be sized to power all modules mounted in that housing and an "average module load" for any empty housing slots plus 25 percent above that total. Power supply shall be by the same manufacturer as the PLC and shall be of the same product line. A single main power supply shall have the capability of supplying power to the CPU and local input/output modules. Auxiliary power supplies shall provide power to remotely located racks.

1. Design features of the PLC power supply shall include diagnostic indicators mounted in a position to be easily viewed by the user.

2. The power supply shall offer fuse protection.

F. PLC Input/Output (I/O) Modules: All I/O housings and modules shall be suitable for hostile industrial environments as described above. All I/O modules shall be isolated and conform to IEEE Surge Withstand Standards and NEMA Noise Immunity Standards.

1. Modules shall be removable without having to disconnect wiring from the module's terminals by means of a swing-arm or plug-in wiring connector.

2. Each PLC I/O location shall contain the I/O modules required to provide all of the I/O points contained in the I/O Lists.

3. 20% Spare I/O capacity shall be provided.

G. Manufacturer, without exception: PLCs shall be Allen Bradley CompactLogix 5380 Series. All Processors, Power Supplies, Ethernet Modules, Chassis, and IO cards will be of the same CompactLogix 5380 family.

2.4 UNINTERRUPTIBLE POWER SUPPLY (UPS)

A. Provide and install UPSs to power each PLC per requirements listed in Section 40 67 00 – Control Panels.

2.5 OPERATOR INTERFACE TERMINAL (OIT)

A. The PLC panels as indicated on the Drawings shall be provided with a panel mounted industrial Operator Interface Terminal.

1. Provide 512 MB memory and 512 MB Flash/RAM.

2. Provide with Ethernet/IP communications.

B. Manufacturer, or similar.

1. Inductive Automation Ignition EDGE Panel

2. Allen Bradley Panelview Plus 7 Performance Terminal, 12 inches

2.6 SOFTWARE

A. The Contractor shall provide one copy of PLC programming software licensed in the name of the Owner. Programming software shall be installed on the SCADA Server.

B. Manufacturer, without exception:

1. Rockwell Studio 5000 Full Edition.

2.7 REDUNDANCY

A. PLC redundancy not required.

2.8 SPARE PARTS

A. Spare parts shall be provided in original manufacturer packaging with unbroken seals.

B. Provide the following spare parts:

1. Quantity one (1) spare PLC Power supply.

2. Quantity one (1) spare PLC Processor.

3. Quantity one (1) spare PLC Ethernet Bridge Module.

4. Quantity one (1) spare PLC I/O module for each type required in each PLC.

5. Provide all other manufacturer recommended PLC system spare parts.

PART 3 - EXECUTION

3.1 STORAGE AND HANDLING

A. All equipment and materials delivered to the Site shall be stored in a location which shall not interfere with the operations of the Owner's personnel or interfere with construction. Storage and handling shall be performed in a manner which shall afford maximum

protection to the equipment and materials. It is the Contractor's responsibility to assure proper handling and on-site storage.

3.2 INSTALLATION

A. The Contractor shall utilize personnel to accomplish, or supervise the physical installation of all elements, components, accessories, or assemblies which it provides. The Contractor shall employ installers who are skilled and experienced in the installation and connection of all elements, components, accessories, and assemblies it provides.

3.3 CALIBRATION, TESTING, AND COMMISSIONING

A. Provide calibration, testing, and commissioning as specified in Section 40 79 23 – Testing, Calibration, and Commissioning.

END OF SECTION 40 63 43

DEVICE	TAG	I/O TAGNAME	P&ID	CONTROLLER	TYPE	DESCRIPTION	ANALOG SIGNAL LEVEL	DISCRETE SIGNAL LEVEL	OFF/4 mA	ON/20 mA	POWER	NOTES
FIT-1020	FI	FIT_1020_FI	EI-701-A	A-PLC-01	AI	INFLUENT FLOW	4-20 mA		0GPM	4000GPM	EXISTING	
FIT-1020	FQI	FIT_1020_FQ	EI-701-A	A-PLC-01	DI	INFLUENT TOTAL FLOW		120V	EXISTING	EXISTING		WIRED TO SIGNAL SPLITTER
LIT-1001	LI	LIT_1001_LI	EI-701-A	A-PLC-01	AI	FINE SCREEN #1 LEVEL	ETHERNET		EXISTING	EXISTING	EXISTING	
SCR-1	YA	SCR_1_YA	EI-701-A	A-PLC-01	DI	FINE SCREEN #1 FAIL	ETHERNET		GOOD	FAILED		
LT-1008	LAH	LT_1008_LAH	EI-701-A	A-PLC-01	DI	FINE SCREEN #2 HIGH LEVEL ALARM	ETHERNET		NO ALARM	ALARM	120V	
SCR-2	YI	SCR_2_YI	EI-701-A	A-PLC-01	DI	FINE SCREEN #2 RUNNING	ETHERNET		NOT RUNNING	RUNNING	EXTERNAL	
SCR-2	YA	SCR_2_YA	EI-701-A	A-PLC-01	DI	FINE SCREEN #2 OVERLOAD	ETHERNET		NO ALARM	OVERLOAD		
GP-1	YA	GP_1_YA	EI-701-A	A-PLC-01	DI	GRIT CLASSIFIER PUMP 60-110A FAIL		120V	GOOD	FAILED	EXISTING	
GP-1	YI	GP_1_YI	EI-701-A	A-PLC-01	DI	GRIT CLASSIFIER PUMP 60-110A E-STOP		120V	STOP	GOOD		
GC-1	YA	GC_1_YA	EI-701-A	A-PLC-01	DI	GRIT CLASSIFIER GRIT 60-110B FAIL		120V	GOOD	FAILED	EXISTING	
GC-1	YI	GC_1_YI	EI-701-A	A-PLC-01	DI	GRIT CLASSIFIER GRIT 60-110B E-STOP		120V	STOP	GOOD		
ASH-1001-1	AAH	ASH_1001-1 _AAH	EI-701-A	A-PLC-01	DI	1001-1 LEL LEVEL DETECTED HIGH		120V	GOOD	LEVEL HIGH	EXISTING	
ASH-1001-2	AAH	ASH_1001-2_AAH	EI-701-A	A-PLC-01	DI	1001-2 H2S LEVEL DETECTED HIGH		120V	GOOD	LEVEL HIGH	EXISTING	

DEVICE	TAG	I/O TAGNAME	P&ID	CONTROLLER	TYPE	DESCRIPTION	ANALOG SIGNAL LEVEL	DISCRETE SIGNAL LEVEL	OFF/4 mA	ON/20 mA	POWER	NOTES
PMP-0101	YI.AM	PMP_0101_YI.AM	EI-702-A	A-PLC-01	DI	PMP-0101 AUTO/MANUAL	ETHERNET		OFF	ON		
PMP-0101	SC	PMP_0101_SC	EI-702-A	A-PLC-01	AO	PMP-0101 SPEED CONTROL	ETHERNET		0	60HZ		
PMP-0101	YI.LR	PMP_0101_YI.LR	EI-702-A	A-PLC-01	DI	PMP-0101 LOCAL/REMOTE	ETHERNET		IN LOCAL	IN REMOTE		
PMP-0101	SI	PMP_0101_SI	EI-702-A	A-PLC-01	AI	PMP-0101 SPEED INDICATE	ETHERNET		0	60HZ		
PMP-0101	KI.ACC	PMP_0101_KI.ACC	EI-702-A	A-PLC-01	AI	PMP-0101 ETM	ETHERNET				EXTERNAL	
PMP-0101	YA	PMP_0101_YA	EI-702-A	A-PLC-01	DI	PMP-0101 FAIL	ETHERNET		GOOD	FAILED		
PMP-0101	YA.ES	PMP_0101_YA.ES	EI-702-A	A-PLC-01	DI	PMP-0101 ESTOP	ETHERNET		STOP	GOOD		
PMP-0101	II	PMP_0101_II	EI-702-A	A-PLC-01	AI	PMP-0101 MOTOR CURRENT	ETHERNET					
PMP-0101	TAH	PMP_0101_TAH	EI-702-A	A-PLC-01	AI	PMP-0101 TEMPERATURE ALARM HIGH	ETHERNET		NO ALARM	ALARM		
PMP-0102	YI.AM	PMP_0102_YI.AM	EI-702-A	A-PLC-01	DI	PMP-0102 HAND SWITCH	ETHERNET		OFF	ON		
PMP-0102	SC	PMP_0102_SC	EI-702-A	A-PLC-01	AO	PMP-0102 SPEED CONTROL	ETHERNET		0	60HZ		
PMP-0102	YI.LR	PMP_0102_YI.LR	EI-702-A	A-PLC-01	DI	PMP-0102 IN REMOTE	ETHERNET		IN LOCAL	IN REMOTE		
PMP-0102	SI	PMP_0102_SI	EI-702-A	A-PLC-01	AI	PMP-0102 SPEED INDICATE	ETHERNET		0	60HZ		
PMP-0102	KI.ACC	PMP_0102_KI.ACC	EI-702-A	A-PLC-01	AI	PMP-0102 ETM	ETHERNET				EXTERNAL	
PMP-0102	YA	PMP_0102_YA	EI-702-A	A-PLC-01	DI	PMP-0102 FAIL	ETHERNET		NO ALARM	ALARM		
PMP-0102	YA.ES	PMP_0102_YA.ES	EI-702-A	A-PLC-01	DI	PMP-0102 ESTOP	ETHERNET		STOP	GOOD		
PMP-0102	II	PMP_0102_II	EI-702-A	A-PLC-01	AI	PMP-0102 MOTOR CURRENT	ETHERNET		0			
PMP-0102	TAH	PMP_0102_TAH	EI-702-A	A-PLC-01	DI	PMP-0102 TEMPERATURE ALARM HIGH	ETHERNET		NO ALARM	ALARM		
PMP-0103	YI.AM	PMP_0103_YI.AM	EI-702-A	A-PLC-01	DI	PMP-0103 HAND SWITCH	ETHERNET		OFF	ON		
PMP-0103	SC	PMP_0103_SC	EI-702-A	A-PLC-01	AO	PMP-0103 SPEED CONTROL	ETHERNET		0	60HZ		
PMP-0103	YI.LR	PMP_0103_YI.LR	EI-702-A	A-PLC-01	DI	PMP-0103 IN REMOTE	ETHERNET		IN LOCAL	IN REMOTE		
PMP-0103	SI	PMP_0103_SI	EI-702-A	A-PLC-01	AI	PMP-0103 SPEED INDICATE	ETHERNET		0	60HZ		
PMP-0103	KI.ACC	PMP_0103_KI.ACC	EI-702-A	A-PLC-01	AI	PMP-0103 ETM	ETHERNET				EXTERNAL	
PMP-0103	YA	PMP_0103_YA	EI-702-A	A-PLC-01	DI	PMP-0103 FAIL	ETHERNET		GOOD	FAILED		
PMP-0103	YA.ES	PMP_0103_YA.ES	EI-702-A	A-PLC-01	DI	PMP-0103 ESTOP	ETHERNET		STOP	GOOD		
PMP-0103	II	PMP_0103_II	EI-702-A	A-PLC-01	AI	PMP-0103 MOTOR CURRENT	ETHERNET		0			
PMP-0103	TAH	PMP_0103_TAH	EI-702-A	A-PLC-01	DI	PMP-0103 TEMPERATURE ALARM HIGH	ETHERNET		GOOD	TEMPURATURE HIGH		
LT-60-140	LI	LT_60-140_LI	EI-702-A	A-PLC-01	AI	LEVEL	ETHERNET		EXISTING	EXISTING	EXISTING	
LSH-61-100	LAHH	LSH_61-100_LAHH	EI-702-A	A-PLC-01	DI	HIGH LEVEL	ETHERNET		NO ALARM	ALARM	EXISTING	
LSL61-100B	LALL	LSL61_100B_LALL	EI-702-A	A-PLC-01	DI	LOW LEVEL	ETHERNET		NO ALARM	ALARM	EXISTING	
LS-0101	SP.OFF	LS_0101_SP.OFF	EI-702-A	A-PLC-01	DI	LOW LEVEL PUMPS OFF	ETHERNET		OPEN	CLOSED	EXISTING	
LS-0102	SP.LG2	LS_0105_SP.LG2	EI-702-A	A-PLC-01	DI	PEAK FLOW LEVEL LAG PUMP ON	ETHERNET		OPEN	CLOSED	EXISTING	
LS-0103	SP.LD2	LS_0102_SP.LD2	EI-702-A	A-PLC-01	DI	NORMAL FLOW LEVEL LEAD PUMP ON	ETHERNET		OPEN	CLOSED	EXISTING	
LS-0104	SP.LG1	LS_0103_SP.LG1	EI-702-A	A-PLC-01	DI	NORMAL FLOW LEVEL LAG PUMP ON	ETHERNET		OPEN	CLOSED	EXISTING	
LS-0105	SP.LD1	LS_0104_SP.LD1	EI-702-A	A-PLC-01	DI	PEAK FLOW LEVEL LEAD PUMP ON	ETHERNET		OPEN	CLOSED	EXISTING	
A-ATS-01	ZI.UP	A_ATS-01_ZI.UP	EI-702-A	A-PLC-01	DI	A-ATS-01 UTILITY POWER		120V	STANDBY POWER	UTILITY POWER	EXTERNAL	
A-ATS-01	ZI.EP	A_ATS-01_ZI.EP	EI-702-A	A-PLC-01	DI	A-ATS-01 STANDBY POWER		120V	UTILITY POWER	STANDBY POWER		
A-ATS-01	YI	A_ATS-01_YI	EI-702-A	A-PLC-01	DI	A-ATS-01 SYSTEM STATUS		120V	NOT RUNNING	RUNNING		
GEN-02	YI.AM	GEN_02_YI.AM	EI-702-A	A-PLC-01	DI	SYSTEM IN AUTO		120V	MANUAL	IN AUTO	EXTERNAL	RE-USE EXISTING I/O POINT
GEN-02	YI	GEN_02_YI	EI-702-A	A-PLC-01	DI	GENERATOR RUNNING		120V	NOT RUNNING	RUNNING		RE-USE EXISTING I/O POINT
GEN-02	YA	GEN_02_YA	EI-702-A	A-PLC-01	DI	GENERATOR FAULT		120V	NO ALARM	ALARM		RE-USE EXISTING I/O POINT
ATS-02	ZI.UP	ATS_02_ZI.UP	EI-702-A	A-PLC-01	DI	ATS-02 UTILITY POWER		120V	STANDBY POWER	UTILITY POWER	EXTERNAL	
ATS-02	ZI.EP	ATS_02_ZI.EP	EI-702-A	A-PLC-01	DI	ATS-02 STANDBY POWER		120V	UTILITY POWER	STANDBY POWER		
ATS-02	YA	ATS_02_YA	EI-702-A	A-PLC-01	DI	ATS-02 SYSTEM STATUS (ON)		120V	NOT RUNNING	RUNNING		

DEVICE	TAG	I/O TAGNAME	P&ID	CONTROLLER	TYPE	DESCRIPTION	ANALOG SIGNAL LEVEL	DISCRETE SIGNAL LEVEL	OFF/4 mA	ON/20 mA	POWER	NOTES
AIT-2002	AI	AIT_2002_AI	EI-701-B	PLC-100-B2	AI	IFAS DO CONCENTRATION TRAIN #2	4-20 mA		0%	100%	120V	VENDOR PLC
AIT-2002	TI	AIT_2002_TI	EI-701-B	PLC-100-B2	AI	IFAS TEMPERATURE TRAIN #2	4-20 mA		0°F	100°F		VENDOR PLC
LSH-2003	LAH	LSH_2003_LAH	EI-701-B	PLC-100-B2	DI	IFAS HIGH WATER ALARM BASIN #2A		24V	NO ALARM	HIGH WATER	N/A	VENDOR PLC
AIT-2004	AI	AIT_2004_AI	EI-701-B	PLC-100-B2	AI	IFAS DO CONCENTRATION TRAIN #1	4-20 mA		0%	100%	120V	VENDOR PLC
TIT-2004	TI	TIT_2004_TI	EI-701-B	PLC-100-B2	AI	IFAS TEMPERATURE TRAIN #1	4-20 mA		0°F	100°F		VENDOR PLC
LSH-2005	LAH	LSH_2005_LAH	EI-701-B	PLC-100-B2	DI	IFAS HIGH WATER ALARM BASIN #1A		24V	NO ALARM	HIGH WATER	N/A	VENDOR PLC
LSH-2006	LAH	LSH_2006_LAH	EI-701-B	PLC-100-B2	DI	IFAS HIGH WATER ALARM BASIN#2B		24V	NO ALARM	HIGH WATER	N/A	VENDOR PLC
LT-2007	LI	LT_2007_LI	EI-701-B	PLC-100-B2	AI	IFAS BASIN LEVEL TRAIN #2	4-20 mA		0'0"	13'6"	LOOP	VENDOR PLC
LT-2008	LI	LT_2008_LI	EI-701-B	PLC-100-B2	AI	IFAS BASIN LEVEL TRAIN #1	4-20 mA		0'0"	13'6"	LOOP	VENDOR PLC
SV-2009	ZCO	SV_2009_ZCO	EI-701-B	PLC-100-B2	DO	CYLINDRICAL SCREEN SCOUR COMMAND BASIN #1A		24V	CLOSE	OPEN	120V	VENDOR PLC
SV-2010	ZCO	SV_2010_ZCO	EI-701-B	PLC-100-B2	DO	CYLINDRICAL SCREEN SCOUR COMMAND BASIN #2A		24V	CLOSE	OPEN	120V	VENDOR PLC
SV-2013	ZCO	SV_2013_ZCO	EI-701-B	PLC-100-B2	DO	CYLINDRICAL SCREEN SCOUR COMMAND BASIN #2B		24V	CLOSE	OPEN	120V	VENDOR PLC
SV-2014	ZCO	SV_2014_ZCO	EI-701-B	PLC-100-B2	DO	CYLINDRICAL SCREEN SCOUR COMMAND BASIN #1B		24V	CLOSE	OPEN	120V	VENDOR PLC
LSH-2015	LAH	LSH_2015_LAH	EI-701-B	PLC-100-B2	DI	IFAS HIGH WATER ALARM BASIN #1B		24V	NO ALARM	HIGH WATER	N/A	VENDOR PLC

DEVICE	TAG	I/O TAGNAME	P&ID	CONTROLLER	TYPE	DESCRIPTION	ANALOG SIGNAL LEVEL	DISCRETE SIGNAL LEVEL	OFF/4 mA	ON/20 mA	POWER	NOTES
TSH-2101	TAH	TSH_2101_TAH	EI-701-B2	PLC-100-B2	DI	BLOWER #1 HIGH TEMPERATURE	ETHERNET		NO ALARM	ALARM ON	N/A	
TSH-2102	TAH	TSH_2102_TAH	EI-701-B2	PLC-100-B2	DI	BLOWER #2 HIGH TEMPERATURE	ETHERNET		NO ALARM	ALARM	N/A	
TSH-2103	TAH	TSH_2103_TAH	EI-701-B2	PLC-100-B2	DI	BLOWER# 3 HIGH TEMPERATURE	ETHERNET		NO ALARM	ALARM	N/A	
FIT-2104	FI	FIT_2104_FI	EI-701-B2	PLC-100-B2	AI	IFAS TRAIN #1 AIR FLOW	ETHERNET		BY VENDOR	BY VENDOR	120V	VENDOR PLC
FIT-2105	FI	FIT_2105_FI	EI-701-B2	PLC-100-B2	AI	IFAS TRAIN #2 AIR FLOW	ETHERNET		BY VENDOR	BY VENDOR	120V	VENDOR PLC
VFD-B1	SI	VFD_B1_SI	EI-701-B2	PLC-100-B2	AI	SPEED FEEDBACK	ETHERNET		0 HZ	60 HZ	EXTERNAL	VENDOR PLC
VFD-B1	YC	VFD_B1_YC	EI-701-B2	PLC-100-B2	DO	START/RUN	ETHERNET		STANDBY	START		VENDOR PLC
VFD-B1	YI.AM	VFD_B1_YI.AM	EI-701-B2	PLC-100-B2	DI	AUTO/MANUAL	ETHERNET		MANUAL	AUTO		VENDOR PLC
VFD-B1	YI	VFD_B1_YI	EI-701-B2	PLC-100-B2	DI	RUNNING	ETHERNET		NOT RUNNING	RUNNING		VENDOR PLC
VFD-B1	YA	VFD_B1_YA	EI-701-B2	PLC-100-B2	DI	FAULT	ETHERNET		NO ALARM	ALARM		VENDOR PLC
VFD-B1	SC	VFD_B1_SC	EI-701-B2	PLC-100-B2	AO	SPEED COMMAND	ETHERNET		0 HZ	60 HZ		VENDOR PLC
VFD-B2	SI	VFD_B2_SI	EI-701-B2	PLC-100-B2	AI	SPEED FEEDBACK	ETHERNET		0 HZ	60 HZ	EXTERNAL	VENDOR PLC
VFD-B2	YC	VFD_B2_YC	EI-701-B2	PLC-100-B2	DO	START/RUN	ETHERNET		STANDBY	START		VENDOR PLC
VFD-B2	YI.AM	VFD_B2_YI.AM	EI-701-B2	PLC-100-B2	DI	AUTO/MANUAL	ETHERNET		MANUAL	AUTO		VENDOR PLC
VFD-B2	YI	VFD_B2_YI	EI-701-B2	PLC-100-B2	DI	RUNNING	ETHERNET		NOT RUNNING	RUNNING		VENDOR PLC
VFD-B2	YA	VFD_B2_YA	EI-701-B2	PLC-100-B2	DI	FAULT	ETHERNET		NO ALARM	ALARM		VENDOR PLC
VFD-B2	SC	VFD_B2_SC	EI-701-B2	PLC-100-B2	AO	SPEED COMMAND	ETHERNET		0 HZ	60 HZ		VENDOR PLC
VFD-B3	SI	VFD_B3_SI	EI-701-B2	PLC-100-B2	AI	SPEED FEEDBACK	ETHERNET		0 HZ	60 HZ	EXTERNAL	VENDOR PLC
VFD-B3	YC	VFD_B3_YC	EI-701-B2	PLC-100-B2	DO	START/RUN	ETHERNET		STANDBY	START		VENDOR PLC
VFD-B3	YI.AM	VFD_B3_YI.AM	EI-701-B2	PLC-100-B2	DI	AUTO/MANUAL	ETHERNET		MANUAL	AUTO		VENDOR PLC
VFD-B3	YI	VFD_B3_YI	EI-701-B2	PLC-100-B2	DI	RUNNING	ETHERNET		NOT RUNNING	RUNNING		VENDOR PLC
VFD-B3	YA	VFD_B3_YA	EI-701-B2	PLC-100-B2	DI	FAULT	ETHERNET		NO ALARM	ALARM		VENDOR PLC
VFD-B3	SC	VFD_B3_SC	EI-701-B2	PLC-100-B2	AO	SPEED COMMAND	ETHERNET		0 HZ	60 HZ		VENDOR PLC
FIT-1020	FI	FIT_1020_FI	EI-701-B2	PLC-100-B2	AO	INFLUENT FLOW	ETHERNET		0 GPM	4000 GPM	EXTERNAL	INPUT TO PLC REQUIRED BY VENDOR
FIT-3001	FI	FIT_3001_FI	EI-701-B2	PLC-100-B2	AO	RAS FLOW	ETHERNET		0 GPM	4000 GPM	EXTERNAL	INPUT TO PLC REQUIRED BY VENDOR
FIT-3002	FI	FIT_3002_FI	EI-701-B2	PLC-100-B2	AO	WAS FLOW	ETHERNET		0 GPM	4000 GPM	EXTERNAL	INPUT TO PLC REQUIRED BY VENDOR

DEVICE	TAG	I/O TAGNAME	P&ID	CONTROLLER	TYPE	DESCRIPTION	ANALOG SIGNAL LEVEL	DISCRETE SIGNAL LEVEL	OFF/4 mA	ON/20 mA	POWER	NOTES
TS-3001	TAH	TS_3001_TAH	EI-701-C	PLC-RAS-1	DI	RAS PUMP #1 HIGH TEMPERATURE		24V	ALARM OFF	ALARM ON		
MS-3001	MAH	MS_3001_MAH	EI-701-C	PLC-RAS-1	DI	RAS PUMP #1 MOISTURE DETECTED		24V	ALARM OFF	ALARM ON	EXISTING	
PMP-3001	YA	PMP_3001_YA	EI-701-C	PLC-RAS-1	DI	RAS PUMP #1 COMMON FAULT		24V	ALARM OFF	ALARM ON		
TS-3002	TAH	TS_3002_TAH	EI-701-C	PLC-RAS-1	DI	RAS PUMP #2 HIGH TEMPERATURE		24V	ALARM OFF	ALARM ON		
MS-3002	MAH	MS_3002_MAH	EI-701-C	PLC-RAS-1	DI	RAS PUMP #2 MOISTURE DETECTED		24V	ALARM OFF	ALARM ON	EXISTING	
PMP-3002	YA	PMP_3002_YA	EI-701-C	PLC-RAS-1	DI	RAS PUMP #2 COMMON FAULT		24V	ALARM OFF	ALARM ON		
TS-3003	TAH	TS_3003_TAH	EI-701-C	PLC-RAS-2	DI	RAS PUMP #3 HIGH TEMPERATURE		24V	ALARM OFF	ALARM ON		
MS-3003	MAH	MS_3003_MAH	EI-701-C	PLC-RAS-2	DI	RAS PUMP #3 MOISTURE DETECTED		24V	ALARM OFF	ALARM ON	EXISTING	
PMP-3003	YA	PMP_3003_YA	EI-701-C	PLC-RAS-2	DI	RAS PUMP #3 COMMON FAULT		24V	ALARM OFF	ALARM ON		
TS-3004	TAH	TS_3004_TAH	EI-701-C	PLC-RAS-2	DI	RAS PUMP #4 HIGH TEMPURATURE		24V	ALARM OFF	ALARM ON		
MS-3004	MAH	MS_3004_MAH	EI-701-C	PLC-RAS-2	DI	RAS PUMP #4 MOISTURE DETECTED		24V	ALARM OFF	ALARM ON	EXISTING	
PMP-3004	YA	PMP_3004_YA	EI-701-C	PLC-RAS-2	DI	RAS PUMP #4 COMMON FAULT		24V	ALARM OFF	ALARM ON		
FIT-3001	FI	FIT_3001_FI	EI-701-C	PLC-100-E	AI	WAS FLOW TO DIGESTERS	4-20 mA		EXISTING	EXISTING	EXISTING	
FCV-3001	YA	FCV_3001_YA	EI-701-C	PLC-100-E	DI	MOTOR CONTROLLED WAS VALVE FAULT		24V	ALARM OFF	ALARM ON		
FIT-3002	FI	FIT_3002_FI	EI-701-C	PLC-100-E	AI	RAS FLOW TO IFAS	4-20 mA		EXISTING	EXISTING	EXISTING	
FCV-3002	YA	FCV_3002_YA	EI-701-C	PLC-100-E	DI	MOTOR CONTROLLED RAS VALVE FAULT		24V	ALARM OFF	ALARM ON		
CLA-1	YA	CLA_1_YA	EI-701-C	A-PLC-01	DI	CLA-1 CUTOUT DRIVE RAKE		24V	ALARM OFF	ALARM ON	EXISTING	
CLA-1	NAH	CLA_1_NAH	EI-701-C	A-PLC-01	DI	CLA-1 TORQUE ALARM HIGH		24V	ALARM OFF	ALARM ON		
CLA-2	YA	CLA_2_YA	EI-701-C	A-PLC-01	DI	CLA-2 CUTOUT DRIVE RAKE		24V	ALARM OFF	ALARM ON	EXISTING	
CLA-2	NAH	CLA_2_NAH	EI-701-C	A-PLC-01	DI	CLA-2 TORQUE ALARM HIGH		24V	ALARM OFF	ALARM ON		
CLA-3	YA	CLA_3_YA	EI-701-C	A-PLC-01	DI	CLA-3 CUTOUT DRIVE RAKE		24V	ALARM OFF	ALARM ON	EXISTING	
CLA-3	NAH	CLA_3_NAH	EI-701-C	A-PLC-01	DI	CLA-3 TORQUE ALARM HIGH		24V	ALARM OFF	ALARM ON		
CLA-4	YA	CLA_4_YA	EI-701-C	A-PLC-01	DI	CLA-4 CUTOUT DRIVE RAKE		24V	ALARM OFF	ALARM ON	EXISTING	
CLA-4	NAH	CLA_4_NAH	EI-701-C	A-PLC-01	DI	CLA-4 TORQUE ALARM HIGH		24V	ALARM OFF	ALARM ON		

DEVICE	TAG	I/O TAGNAME	P&ID	CONTROLLER	TYPE	DESCRIPTION	ANALOG SIGNAL LEVEL	DISCRETE SIGNAL LEVEL	OFF/4 mA	ON/20 mA	POWER	NOTES
FIT-4001	FI	FIT_4001_FI	EI-701-D	RIO-4000	AI	FILTER INFLUENT FLOW	4-20 mA		0 GPM	4000 GPM	120V	
PSL-4014	PAL	PSL_4014_PAL	EI-701-D	RIO-4000	DI	HEADLOSS PRESSURE LOW		24V	NO ALARM	LOW PRESSURE	N/A	FROM VCP-4000
PSL-4013	PAL	PSL_4013_PAL	EI-701-D	RIO-4000	DI	LOW AIR PRESSURE		24V	NO ALARM	LOW PRESSURE	N/A	FROM VCP-4000
FIT-4002	FI	FIT_4002_FI	EI-701-D	RIO-4000	AI	FILTER EFFLUENT FLOW	4-20 mA		0 GPM	4000 GPM	120V	
FIL-4001	YC	FIL_4001_YC	EI-701-D	RIO-4000	DO	FIL-1 RUN COMMAND		24V	STANDBY	RUN COMMAND	N/A	
FIL-4001	YI	FIL_4001_YI	EI-701-D	RIO-4000	DI	FIL-1 RUNNING		24V	NOT RUNNING	RUNNING	N/A	
FIL-4002	YC	FIL_4002_YC	EI-701-D	RIO-4000	DO	FIL-2 RUN COMMAND		24V	STANDBY	RUN COMMAND	N/A	
FIL-4002	YI	FIL_4002_YI	EI-701-D	RIO-4000	DI	FIL-2 RUNNING		24V	NOT RUNNING	RUNNING	N/A	
FIL-4003	YC	FIL_4003_YC	EI-701-D	RIO-4000	DO	FIL-3 RUN COMMAND		24V	STANDBY	RUN COMMAND	N/A	
FIL-4003	YI	FIL_4003_YI	EI-701-D	RIO-4000	DI	FIL-3 RUNNING		24V	NOT RUNNING	RUNNING	N/A	
FIL-4004	YC	FIL_4004_YC	EI-701-D	RIO-4000	DO	FIL-4 RUN COMMAND		24V	STANDBY	RUN COMMAND	N/A	
FIL-4004	YI	FIL_4004_YI	EI-701-D	RIO-4000	DI	FIL-4 RUNNING		24V	NOT RUNNING	RUNNING	N/A	
FIL-4005	YC	FIL_4005_YC	EI-701-D	RIO-4000	DO	FIL-5 RUN COMMAND		24V	STANDBY	RUN COMMAND	N/A	
FIL-4005	YI	FIL_4005_YI	EI-701-D	RIO-4000	DI	FIL-5 RUNNING		24V	NOT RUNNING	RUNNING	N/A	

DEVICE	TAG	I/O TAGNAME	P&ID	CONTROLLER	TYPE	DESCRIPTION	ANALOG SIGNAL LEVEL	DISCRETE SIGNAL LEVEL	OFF/4 mA	ON/20 mA	POWER	NOTES
LT-4101	LI	LT_4101_LI	EI-702-D	RIO-4000	AI	ALUM TANK LEVEL	4-20 mA		0'	5'	LOOP	
YS-4102	YA	YS_4102_YA	EI-702-D	RIO-4000	DI	ALUM PIPING LEAK DETECTOR		24V	NO ALARM	LEAK DETECTED	120V	
PMP-4101	YI	PMP_4101_YI	EI-702-D	RIO-4000	DI	RUNNING		24V	LOCAL	REMOTE		
PMP-4101	YA	PMP_4101_YA	EI-702-D	RIO-4000	DI	FAULT		24V	ALARM OFF	ALARM ON		
PMP-4101	YC	PMP_4101_YC	EI-702-D	RIO-4000	DO	RUN/START		24V	OFF	RUN	EXTERNAL	
PMP-4101	SC	PMP_4101_SC	EI-702-D	RIO-4000	AO	SPEED REFERENCE	4-20 mA		0 HZ	60 HZ		
PMP-4101	SI	PMP_4101_SI	EI-702-D	RIO-4000	AI	SPEED FEEDBACK	4-20 mA		0 HZ	60 HZ		
PMP-4102	YI	PMP_4102_YI	EI-702-D	RIO-4000	DI	RUNNING		24V	LOCAL	REMOTE		
PMP-4102	YA	PMP_4102_YA	EI-702-D	RIO-4000	DI	FAULT		24V	ALARM OFF	ALARM ON		
PMP-4102	YC	PMP_4102_YC	EI-702-D	RIO-4000	DO	RUN/START		24V	OFF	RUN	EXTERNAL	
PMP-4102	SC	PMP_4102_SC	EI-702-D	RIO-4000	AO	SPEED REFERENCE		24V	0 HZ	60 HZ		
PMP-4102	SI	PMP_4102_SI	EI-702-D	RIO-4000	AI	SPEED FEEDBACK		24V	0 HZ	60 HZ		
PMP-4103	YI	PMP_4103_YI	EI-702-D	RIO-4000	DI	RUNNING		24V	LOCAL	REMOTE		
PMP-4103	YA	PMP_4103_YA	EI-702-D	RIO-4000	DI	FAULT		24V	ALARM OFF	ALARM ON		
PMP-4103	YC	PMP_4103_YC	EI-702-D	RIO-4000	DO	RUN/START		24V	OFF	RUN	EXTERNAL	
PMP-4103	SC	PMP_4103_SC	EI-702-D	RIO-4000	AO	SPEED REFERENCE	4-20 mA		0 HZ	60 HZ		
PMP-4103	SI	PMP_4103_SI	EI-702-D	RIO-4000	AI	SPEED FEEDBACK	4-20 mA		0 HZ	60 HZ		
PMP-4104	YI	PMP_4104_YI	EI-702-D	RIO-4000	DI	RUNNING		24V	LOCAL	REMOTE		
PMP-4104	YA	PMP_4104_YA	EI-702-D	RIO-4000	DI	FAULT		24V	ALARM OFF	ALARM ON		
PMP-4104	YC	PMP_4104_YC	EI-702-D	RIO-4000	DO	RUN/START		24V	OFF	RUN	EXTERNAL	
PMP-4104	SC	PMP_4104_SC	EI-702-D	RIO-4000	AO	SPEED REFERENCE	4-20 mA		0 HZ	60 HZ		
PMP-4104	SI	PMP_4104_SI	EI-702-D	RIO-4000	AI	SPEED FEEDBACK	4-20 mA		0 HZ	60 HZ		

DEVICE	TAG	I/O TAGNAME	P&ID	CONTROLLER	TYPE	DESCRIPTION	ANALOG SIGNAL LEVEL	DISCRETE SIGNAL LEVEL	OFF/4 mA	ON/20 mA	POWER	NOTES
PMP-4201	YI	PMP_4201_YI	EI-703-D	RIO-4000	DI	RUNNING		24V	NOT RUNNING	RUNNING		
PMP-4201	YA	PMP_4201_YA	EI-703-D	RIO-4000	DI	FAULT		24V	LOCAL	REMOTE		
PMP-4201	YC	PMP_4201_YC	EI-703-D	RIO-4000	DO	RUN/START		24V	OFF	RUN	EXTERNAL	
PMP-4201	SC	PMP_4201_SC	EI-703-D	RIO-4000	AO	SPEED REFERENCE	4-20 mA		0 HZ	60 HZ		
PMP-4201	SI	PMP_4201_SI	EI-703-D	RIO-4000	AI	SPEED FEEDBACK	4-20 mA		0 HZ	60 HZ		
PMP-4201	YA	PMP_4201_YA	EI-703-D	RIO-4000	DI	FAULT		24V	NO ALARM	ALARM		
PMP-4202	YI	PMP_4202_YI	EI-703-D	RIO-4000	DI	RUNNING		24V	NOT RUNNING	RUNNING		
PMP-4202	YA	PMP_4202_YA	EI-703-D	RIO-4000	DI	FAULT		24V	LOCAL	REMOTE		
PMP-4202	YC	PMP_4202_YC	EI-703-D	RIO-4000	DO	RUN/START		24V	OFF	RUN	EXTERNAL	
PMP-4202	SC	PMP_4202_SC	EI-703-D	RIO-4000	AO	SPEED REFERENCE	4-20 mA		0 HZ	60 HZ		
PMP-4202	SI	PMP_4202_SI	EI-703-D	RIO-4000	AI	SPEED FEEDBACK	4-20 mA		0 HZ	60 HZ		
PMP-4202	YA	PMP_4202_YA	EI-703-D	RIO-4000	DI	FAULT		24V	NO ALARM	ALARM		

DEVICE	TAG	I/O TAGNAME	P&ID	CONTROLLER	TYPE	DESCRIPTION	ANALOG SIGNAL LEVEL	DISCRETE SIGNAL LEVEL	OFF/4 mA	ON/20 mA	POWER	NOTES
VFD-4301	II	VFD_4301_II	EI-701-D1	RIO-4300	AI	MOTOR CURRENT	ETHERNET		0 A	20 A	EXTERNAL	
VFD-4301	YC	VFD_4301_YC	EI-701-D1	RIO-4300	DO	RUN COMMAND	ETHERNET		OFF	RUN		
VFD-4301	YC.RST	VFD_4301_YC.RST	EI-701-D1	RIO-4300	DO	RESET COMMAND	ETHERNET		OFF	RESET		
VFD-4301	YI.LR	VFD_4301_YI.LR	EI-701-D1	RIO-4300	DI	REMOTE	ETHERNET		LOCAL	REMOTE		
VFD-4301	YI	VFD_4301_YI	EI-701-D1	RIO-4300	DI	RUNNING	ETHERNET		NOT RUNNING	RUNNING		
VFD-4301	YA	VFD_4301_YA	EI-701-D1	RIO-4300	DI	FAULT	ETHERNET		ALARM OFF	ALARM ON		
VFD-4301	SI	VFD_4301_SI	EI-701-D1	RIO-4300	AI	SPEED FEEDBACK	ETHERNET		0 HZ	60 HZ		
VFD-4301	SC	VFD_4301_SC	EI-701-D1	RIO-4300	AO	SPEED REFERENCE	ETHERNET		0 HZ	60 HZ		
ME-4301	MAH	ME_4301_MAH	EI-701-D1	RIO-4300	DI	MOISTURE DETECTED	ETHERNET		ALARM OFF	ALARM ON		
TE-4301	TAH	TE_4301_TAH	EI-701-D1	RIO-4300	DI	HIGH TEMPERATURE	ETHERNET		ALARM OFF	HIGH TEMP		
VFD-4302	II	VFD_4302_II	EI-701-D1	RIO-4300	AI	MOTOR CURRENT	ETHERNET		0 A	20 A	EXTERNAL	
VFD-4302	YC	VFD_4302_YC	EI-701-D1	RIO-4300	DO	RUN COMMAND	ETHERNET		OFF	RUN		
VFD-4302	YC.RST	VFD_4302_YC.RST	EI-701-D1	RIO-4300	DO	RESET COMMAND	ETHERNET		OFF	RESET		
VFD-4302	YI.LR	VFD_4302_YI.LR	EI-701-D1	RIO-4300	DI	REMOTE	ETHERNET		LOCAL	REMOTE		
VFD-4302	YI	VFD_4302_YI	EI-701-D1	RIO-4300	DI	RUNNING	ETHERNET		NOT RUNNING	RUNNING		
VFD-4302	YA	VFD_4302_YA	EI-701-D1	RIO-4300	DI	FAULT	ETHERNET		ALARM OFF	ALARM ON		
VFD-4302	SI	VFD_4302_SI	EI-701-D1	RIO-4300	AI	SPEED FEEDBACK	ETHERNET		0 HZ	60 HZ		
VFD-4302	SC	VFD_4302_SC	EI-701-D1	RIO-4300	AO	SPEED REFERENCE	ETHERNET		0 HZ	60 HZ		
ME-4302	MAH	ME_4302_MAH	EI-701-D1	RIO-4300	DI	MOISTURE DETECTED	ETHERNET		ALARM OFF	ALARM ON		
TE-4302	TAH	TE_4302_TAH	EI-701-D1	RIO-4300	DI	HIGH TEMPERATURE	ETHERNET		ALARM OFF	HIGH TEMP		
VFD-4303	II	VFD_4303_II	EI-701-D1	RIO-4300	AI	MOTOR CURRENT	ETHERNET		0 A	20 A	EXTERNAL	
VFD-4303	YC	VFD_4303_YC	EI-701-D1	RIO-4300	DO	RUN COMMAND	ETHERNET		OFF	RUN		
VFD-4303	YC.RST	VFD_4303_YC.RST	EI-701-D1	RIO-4300	DO	RESET COMMAND	ETHERNET		OFF	RESET		
VFD-4303	YI.LR	VFD_4303_YI.LR	EI-701-D1	RIO-4300	DI	REMOTE	ETHERNET		LOCAL	REMOTE		
VFD-4303	YI	VFD_4303_YI	EI-701-D1	RIO-4300	DI	RUNNING	ETHERNET		NOT RUNNING	RUNNING		
VFD-4303	YA	VFD_4303_YA	EI-701-D1	RIO-4300	DI	FAULT	ETHERNET		ALARM OFF	ALARM ON		
VFD-4303	SI	VFD_4303_SI	EI-701-D1	RIO-4300	AI	SPEED FEEDBACK	ETHERNET		0 HZ	60 HZ		
VFD-4303	SC	VFD_4303_SC	EI-701-D1	RIO-4300	AO	SPEED REFERENCE	ETHERNET		0 HZ	60 HZ		
ME-4303	MAH	ME_4303_MAH	EI-701-D1	RIO-4300	DI	MOISTURE DETECTED	ETHERNET		ALARM OFF	ALARM ON		
TE-4303	TAH	TE_4303_TAH	EI-701-D1	RIO-4300	DI	HIGH TEMPERATURE	ETHERNET		ALARM OFF	HIGH TEMP		
LSHH-4307	LAHH	LSHH_4307_LAHH	EI-701-D1	RIO-4300	DI	WET WELL HIGH LEVEL		24V	ALARM OFF	HIGH LEVEL	N/A	
LSLL-4308	LALL	LSLL_4308_LALL	EI-701-D1	RIO-4300	DI	WET WELL LOW LEVEL		24V	ALARM OFF	LOW LEVEL	N/A	
LT-4309	LI	LT_4309_LI	EI-701-D1	RIO-4300	DI	WET WELL LEVEL	4-20 mA		0'	9'	LOOP	

DEVICE	TAG	I/O TAGNAME	P&ID	CONTROLLER	TYPE	DESCRIPTION	ANALOG SIGNAL LEVEL	DISCRETE SIGNAL LEVEL	OFF/4 mA	ON/20 mA	POWER	NOTES
LPF-1	YI	LPF_1_YI	EI-701-E	PLC-100-E	DI	POLYMER SYSTEM RUNNING	ETHERNET		NOT RUNNING	RUNNING		
LPF-1	YA	LPF_1_YA	EI-701-E	PLC-100-E	DI	POLYMER SYSTEM FAULT	ETHERNET		NO ALARM	FAULT		
LPF-1	SC	LPF_1_SC	EI-701-E	PLC-100-E	AO	POLYMER PUMP PACING	ETHERNET		0 HZ	60 HZ	EXTERNAL	
LPF-1	YI.LR	LPF_1_YI.LR	EI-701-E	PLC-100-E	DI	POLYMER SYSTEM LOCAL/REMOTE	ETHERNET		LOCAL	REMOTE		
LPF-1	YC	LPF_1_YC	EI-701-E	PLC-100-E	DO	POLYMER SYSTEM START/STOP	ETHERNET		STOP	START		
FIT-8005	FI	FIT_8005_FI	EI-701-E	PLC-100-E	AI	SCREW PRESS INLET SLUDGE FLOW	ETHERNET		0 GPM	15 GPM		
SCP-1A	YC	SCP_1A_YC	EI-701-E	PLC-100-E	DO	SCREW PRESS REMOTE START	ETHERNET		STANDBY	START		
SCP-1A	YA.ES	SCP_1A_YA.ES	EI-701-E	PLC-100-E	DI	SCREW PRESS E-STOP	ETHERNET		E-STOP HIT	NO ALARM		
SCP-1A	YI.AM	SCP_1A_YI.AM	EI-701-E	PLC-100-E	DI	SCREW PRESS AUTO	ETHERNET		MANUAL	AUTO		
SCP-1A	YI.FWD	SCP_1A_YI.FWD	EI-701-E	PLC-100-E	DI	SCREW PRESS FORWARD	ETHERNET		STANDBY	FORWARD		
SCP-1A	YI.REV	SCP_1A_YI.REV	EI-701-E	PLC-100-E	DI	SCREW PRESS REVERSE	ETHERNET		STANDBY	REVERSE		
SCP-1A	YI	SCP_1A_YI	EI-701-E	PLC-100-E	DI	SCREW PRESS RUNNING	ETHERNET		NOT RUNNING	RUNNING		
SCP-1A	YA	SCP_1A_YA	EI-701-E	PLC-100-E	DI	SCREW PRESS FAULT	ETHERNET		NO ALARM	FAULT		
SCP-1B	YI.FWD	SCP_1B_YI.FWD	EI-701-E	PLC-100-E	DI	SCREW PRESS SPRAY DRIVE FORWARD	ETHERNET		STANDBY	FORWARD	EXTERNAL	
SCP-1B	YI.REV	SCP_1B_YI.REV	EI-701-E	PLC-100-E	DI	SCREW PRESS SPRAY DRIVE REVERSE	ETHERNET		STANDBY	REVERSE		
SCP-1B	YI.AM	SCP_1B_YI.AM	EI-701-E	PLC-100-E	DI	SCREW PRESS SPRAY DRIVE AUTO	ETHERNET		MANUAL	AUTO		
SCP-1B	YI	SCP_1B_YI	EI-701-E	PLC-100-E	DI	SCREW PRESS SPRAY WASH RUNNING	ETHERNET		NOT RUNNING	RUNNING		
PT-8006	PI	PT_8006_PI	EI-701-E	PLC-100-E	AI	SCREW PRESS PRESSURE	ETHERNET		BY VENDOR	BY VENDOR		
PSL-8015	PAL	PSL_8015_PAL	EI-701-E	PLC-100-E	DI	SCREW PRESS LOW AIR PRESSURE	ETHERNET		NO ALARM	LOW PRESSURE		
PSL-8023	PAL	PSL_8023_PAL	EI-701-E	PLC-100-E	DI	SCREW PRESS WATER WASH LOW PRESSURE	ETHERNET		NO ALARM	LOW PRESSURE		
ZSC-8007	ZIC	ZSC_8007_ZIC	EI-701-E	PLC-100-E	DI	SCREW PRESS SPRAY DRIVE HOME	ETHERNET		STANDBY	HOME		
ZSC-8008	ZIC	ZSC_8008_ZIC	EI-701-E	PLC-100-E	DI	SCREW PRESS SPRAY DRIVE AWAY	ETHERNET		STANDBY	AWAY		
VFD-8001	YI.LR	VFD_8001_YI.LR	EI-701-E	PLC-100-E	DI	SLUDGE PUMP #1 AUTO/REMOTE	ETHERNET		AUTO	REMOTE		
VFD-8001	YI	VFD_8001_YI	EI-701-E	PLC-100-E	DI	SLUDGE PUMP #1 RUNNING	ETHERNET		NOT RUNNING	RUNNING		
VFD-8001	YA	VFD_8001_YA	EI-701-E	PLC-100-E	DI	SLUDGE PUMP #1 FAULT	ETHERNET		NO ALARM	FAULT		
VFD-8001	SC	VFD_8001_SC	EI-701-E	PLC-100-E	AO	SLUDGE PUMP #1 SPEED REFERENCE	ETHERNET		0 HZ	60 HZ	EXTERNAL	
VFD-8001	YC	VFD_8001_YC	EI-701-E	PLC-100-E	DO	SLUDGE PUMP #1 RUN/START	ETHERNET		OFF	RUN		
VFD-8001	TAH	VFD_8001_TAH	EI-701-E	PLC-100-E	DI	SLUDGE PUMP #1 DRY-RUN ALARM	ETHERNET		NO ALARM	DRY RUN		
VFD-8001	PAH	VFD_8001_PAH	EI-701-E	PLC-100-E	DI	SLUDGE PUMP #1 PRESS ALARM	ETHERNET		NO ALARM	HIGH PRESS		
VFD-8001	SI	VFD_8001_SI	EI-701-E	PLC-100-E	AI	SLUDGE PUMP #1 SPEED FEEDBACK	ETHERNET		0 HZ	60 HZ		
VFD-8002	YI.LR	VFD_8002_YI.LR	EI-701-E	PLC-100-E	DI	SLUDGE PUMP #2 AUTO/REMOTE	ETHERNET		AUTO	REMOTE		
VFD-8002	YI	VFD_8002_YI	EI-701-E	PLC-100-E	DI	SLUDGE PUMP #2 RUNNING	ETHERNET		NOT RUNNING	RUNNING		
VFD-8002	YA	VFD_8002_YA	EI-701-E	PLC-100-E	DI	SLUDGE PUMP #2 FAULT	ETHERNET		NO ALARM	FAULT		
VFD-8002	SC	VFD_8002_SC	EI-701-E	PLC-100-E	AO	SLUDGE PUMP #2 SPEED REFERENCE	ETHERNET		0 HZ	60 HZ	EXTERNAL	
VFD-8002	YC	VFD_8002_YC	EI-701-E	PLC-100-E	DO	SLUDGE PUMP #2 RUN/START	ETHERNET		OFF	RUN		
VFD-8002	TAH	VFD_8002_TAH	EI-701-E	PLC-100-E	DI	SLUDGE PUMP #2 DRY-RUN ALARM	ETHERNET		NO ALARM	DRY RUN		
VFD-8002	PAH	VFD_8002_PAH	EI-701-E	PLC-100-E	DI	SLUDGE PUMP #2 PRESS ALARM	ETHERNET		NO ALARM	HIGH PRESS		
VFD-8002	SI	VFD_8002_SI	EI-701-E	PLC-100-E	AI	SLUDGE PUMP #2 SPEED FEEDBACK	ETHERNET		0 HZ	60 HZ		
CONV-1	YI.LR	CONV_1_YI.LR	EI-701-E	PLC-100-E	DI	CONVEYOR #1 IN REMOTE	ETHERNET		LOCAL	REMOTE		
CONV-1	YI	CONV_1_YI	EI-701-E	PLC-100-E	DI	CONVEYOR #1 RUNNING	ETHERNET		NOT RUNNING	RUNNING		
CONV-1	YA	CONV_1_YA	EI-701-E	PLC-100-E	DI	CONVEYOR #1 FAULT	ETHERNET		NO ALARM	FAULT		
CONV-1	YC	CONV_1_YC	EI-701-E	PLC-100-E	DO	CONVEYOR #1 RUN COMMAND	ETHERNET		STANDBY	RUN	EXTERNAL	
HS-8016	YA.ES	HS_8016_YA.ES	EI-701-E	PLC-100-E	DI	CONVEYOR #1 E-STOP	ETHERNET		ESTOP PULLED	NO ALARM		
SSL-8014	SAL	SSL_8014_SAL	EI-701-E	PLC-100-E	DI	CONVEYOR #1 ZERO SPEED	ETHERNET		RUNNING	ZERO SPEED		
ISH-8015	IAH	ISH_8015_IAH	EI-701-E	PLC-100-E	DI	CONVEYOR #1 LOCKED ALARM	ETHERNET		NO ALARM	LOCKED		
CONV-2	YI.LR	CONV_2_YI.LR	EI-701-E	PLC-100-E	DI	CONVEYOR #2 IN REMOTE	ETHERNET		LOCAL	REMOTE		
CONV-2	YI	CONV_2_YI	EI-701-E	PLC-100-E	DI	CONVEYOR #2 RUNNING	ETHERNET		NOT RUNNING	RUNNING		
CONV-2	YA	CONV_2_YA	EI-701-E	PLC-100-E	DI	CONVEYOR #2 FAULT	ETHERNET		NO ALARM	FAULT		

DEVICE	TAG	I/O TAGNAME	P&ID	CONTROLLER	TYPE	DESCRIPTION	ANALOG SIGNAL LEVEL	DISCRETE SIGNAL LEVEL	OFF/4 mA	ON/20 mA	POWER	NOTES
CONV-2	YC	CONV_2_YC	EI-701-E	PLC-100-E	DO	CONVEYOR #2 RUN COMMAND	ETHERNET		STANDBY	RUN	EXTERNAL	
HS-8017	YA.ES	HS_8017_YA.ES	EI-701-E	PLC-100-E	DI	CONVEYOR #2 E-STOP	ETHERNET		ESTOP PULLED	NO ALARM		
SSL-8020	SAL	SSL_8020_SAL	EI-701-E	PLC-100-E	DI	CONVEYOR #2 ZERO SPEED	ETHERNET		RUNNING	ZERO SPEED		
ISH-8019	IAH	ISH_8019_IAH	EI-701-E	PLC-100-E	DI	CONVEYOR #2 LOCKED ALARM	ETHERNET		NO ALARM	LOCKED		
CONV-3	YI.LR	CONV_3_YI.LR	EI-701-E	PLC-100-E	DI	CONVEYOR #3 IN REMOTE	ETHERNET		LOCAL	REMOTE		
CONV-3	YI	CONV_3_YI	EI-701-E	PLC-100-E	DI	CONVEYOR #3 RUNNING	ETHERNET		NOT RUNNING	RUNNING		
CONV-3	YA	CONV_3_YA	EI-701-E	PLC-100-E	DI	CONVEYOR #3 FAULT	ETHERNET		NO ALARM	FAULT		
CONV-3	YC	CONV_3_YC	EI-701-E	PLC-100-E	DO	CONVEYOR #3 RUN COMMAND	ETHERNET		STANDBY	RUN	EXTERNAL	
HS-8018	YA.ES	HS_8018_YA.ES	EI-701-E	PLC-100-E	DI	CONVEYOR #3 E-STOP	ETHERNET		ESTOP PULLED	NO ALARM		
SSL-8022	SAL	SSL_8022_SAL	EI-701-E	PLC-100-E	DI	CONVEYOR #3 ZERO SPEED	ETHERNET		RUNNING	ZERO SPEED		
ISH-8021	IAH	ISH_8021_IAH	EI-701-E	PLC-100-E	DI	CONVEYOR #3 LOCKED ALARM	ETHERNET		NO ALARM	LOCKED		

DEVICE	TAG	I/O TAGNAME	P&ID	CONTROLLER	TYPE	DESCRIPTION	ANALOG SIGNAL LEVEL	DISCRETE SIGNAL LEVEL	OFF/4 mA	ON/20 mA	POWER	NOTES
LCP-100-E	YA	LCP_100-E_YA	EI-702-E	PLC-100-E	DO	EXTERNAL FAULT	ETHERNET		ALARM OFF	ALARM ON	EXTERNAL	
VCP-9000	YC	VCP_9000_YC	EI-702-E	PLC-100-E	DO	REMOTE RUN COMMAND	ETHERNET		OFF	ON		
VCP-9000	YA	VCP_9000_YA	EI-702-E	PLC-100-E	DI	SYSTEM FAULT	ETHERNET		ALAM OFF	ALARM ON		
VCP-9000	YI	VCP_9000_YI	EI-702-E	PLC-100-E	DI	SYSTEM RUNNING	ETHERNET		OFF	ON		
PIT-9004	PI	PIT_9004_PI	EI-702-E	PLC-100-E	AI	AIRGAP DISCHARGE PRESSURE	ETHERNET		0 PSI	150 PSI		
FIT-9005	FI	FIT_9005_FI	EI-702-E	PLC-100-E	AI	AIRGAP DISCHARGE FLOW	ETHERNET		0 PSI	150 GPM		
FSL-8102	FAL	FSL_8102_FAL	EI-702-E	PLC-100-E	DI	LOW SUPPLY AIRFLOW		24VDC	NO ALARM	LOW AIRFLOW	24VDC	
FSL-8103	FAL	FSL_8103_FAL	EI-702-E	PLC-100-E	DI	LOW EXHAUST AIRFLOW		24VDC	NO ALARM	LOW AIRFLOW	24VDC	
YS-8105	**YA**	**YS_8105_YA**	**EI-702-E**	**PLC-100-E**	**DI**			**24VDC**	**NO ALARM**	**ALARM ON**	**24VDC**	**ADDED ADDENDUM #4**
YS-8106	**YA**	**YS_8106_YA**	**EI-702-E**	**PLC-100-E**	**DI**			**24VDC**	**NO ALARM**	**ALARM ON**	**24VDC**	**ADDED ADDENDUM #4**
YS-8107	**YA**	**YS_8107_YA**	**EI-702-E**	**PLC-100-E**	**DI**			**24VDC**	**NO ALARM**	**ALARM ON**	**24VDC**	**ADDED ADDENDUM #4**
YS-8108	**YA**	**YS_8108_YA**	**EI-702-E**	**PLC-100-E**	**DI**			**24VDC**	**NO ALARM**	**ALARM ON**	**24VDC**	**ADDED ADDENDUM #4**
YS-8109	**YA**	**YS_8109_YA**	**EI-702-E**	**PLC-100-E**	**DI**			**24VDC**	**NO ALARM**	**ALARM ON**	**24VDC**	**ADDED ADDENDUM #4**
AIT-8110	**AI**	**AIT_8110_AI**	**EI-702-E**	**PLC-100-E**	**AI**		**4-20mA**		**0%**	**100%**	**120VAC**	**ADDED ADDENDUM #4**

DEVICE	TAG	I/O TAGNAME	P&ID	CONTROLLER	TYPE	DESCRIPTION	ANALOG SIGNAL LEVEL	DISCRETE SIGNAL LEVEL	OFF/4 mA	ON/20 mA	POWER	NOTES
STR-5001	YC	STR_5001_YC	EI-701-G1	RIO-5000	DO	ME-5001 START COMMAND		24V	STANDBY	START		
STR-5001	YI	STR_5001_YI	EI-701-G1	RIO-5000	DI	ME-5001 RUNNING		24V	NOT RUNNING	RUNNING	EXTERNAL	
STR-5001	YA	STR_5001_YA	EI-701-G1	RIO-5000	DI	ME-5001 FAULT		24V	NO ALARM	ALARM		
STR-5001	YI.AM	STR_5001_YI.AM	EI-701-G1	RIO-5000	DI	ME-5001 AUTO/MANUAL		24V	MANUAL	AUTO		
STR-5002	YC	STR_5002_YC	EI-701-G1	RIO-5000	DO	ME-5002 START COMMAND		24V	STANDBY	START		
STR-5002	YI	STR_5002_YI	EI-701-G1	RIO-5000	DI	ME-5002 RUNNING		24V	NOT RUNNING	RUNNING	EXTERNAL	
STR-5002	YA	STR_5002_YA	EI-701-G1	RIO-5000	DI	ME-5002 FAULT		24V	NO ALARM	ALARM		
STR-5002	YI.AM	STR_5002_YI.AM	EI-701-G1	RIO-5000	DI	ME-5002 AUTO/MANUAL		24V	MANUAL	AUTO		
STR-5003	YC	STR_5003_YC	EI-701-G1	RIO-5000	DO	ME-5003 START COMMAND		24V	STANDBY	START		
STR-5003	YI	STR_5003_YI	EI-701-G1	RIO-5000	DI	ME-5003 RUNNING		24V	NOT RUNNING	RUNNING	EXTERNAL	
STR-5003	YA	STR_5003_YA	EI-701-G1	RIO-5000	DI	ME-5003 FAULT		24V	NO ALARM	ALARM		
STR-5003	YI.AM	STR_5003_YI.AM	EI-701-G1	RIO-5000	DI	ME-5003 AUTO/MANUAL		24V	MANUAL	AUTO		
FIT-4002	FI	FIT_4002_FI	EI-701-G1	RIO-5001	DO	EFFLUENT FLOW TO SAMPLER		24V	0 GPM	4000 GPM	---	

DEVICE	TAG	I/O TAGNAME	P&ID	CONTROLLER	TYPE	DESCRIPTION	ANALOG SIGNAL LEVEL	DISCRETE SIGNAL LEVEL	OFF/4 mA	ON/20 mA	POWER	NOTES
P-7010	YC	P_7010_YC	EI-701-G2	RIO-7000	DO	RUN COMMAND	ETHERNET		OFF	ON		
P-7010	YC.RST	P_7010_YC.RST	EI-701-G2	RIO-7000	DO	RESET COMMAND	ETHERNET		OFF	RESET		
P-7010	YI.LR	P_7010_YI.LR	EI-701-G2	RIO-7000	DI	REMOTE	ETHERNET		LOCAL	REMOTE		
P-7010	YI	P_7010_YI	EI-701-G2	RIO-7000	DI	RUNNING	ETHERNET		NOT RUNNING	RUNNING	EXTERNAL	
P-7010	YA	P_7010_YA	EI-701-G2	RIO-7000	DI	FAILED	ETHERNET		ALARM OFF	ALARM ON		
ME-7010	MAH	ME_7010_MAH	EI-701-G2	RIO-7000	DI	MOISTURE DETECTED	ETHERNET		ALARM OFF	MOISTURE		
TE-7010	TAH	TE_7010_TAH	EI-701-G2	RIO-7000	DI	HIGH TEMPERATURE	ETHERNET		ALARM OFF	HIGH TEMP		
P-7020	YC	P_7020_YC	EI-701-G2	RIO-7000	DO	RUN COMMAND	ETHERNET		OFF	ON		
P-7020	YC.RST	P_7020_YC.RST	EI-701-G2	RIO-7000	DO	RESET COMMAND	ETHERNET		OFF	RESET		
P-7020	YI.LR	P_7020_YI.LR	EI-701-G2	RIO-7000	DI	REMOTE	ETHERNET		LOCAL	REMOTE		
P-7020	YI	P_7020_YI	EI-701-G2	RIO-7000	DI	RUNNING	ETHERNET		NOT RUNNING	RUNNING	EXTERNAL	
P-7020	YA	P_7020_YA	EI-701-G2	RIO-7000	DI	FAILED	ETHERNET		ALARM OFF	ALARM ON		
ME-7020	MAH	ME_7020_MAH	EI-701-G2	RIO-7000	DI	MOISTURE DETECTED	ETHERNET		ALARM OFF	MOISTURE		
TE-7020	TAH	TE_7020_TAH	EI-701-G2	RIO-7000	DI	HIGH TEMPERATURE	ETHERNET		ALARM OFF	HIGH TEMP		
LSH-7005	LAH	LSH_7005_LAH	EI-701-G2	RIO-7000	DI	WET WELL HIGH LEVEL		24V	ALARM OFF	HIGH LEVEL	N/A	
LSL-7006	LAL	LSL_7006_LAL	EI-701-G2	RIO-7000	DI	WET WELL LOW LEVEL		24V	ALARM OFF	LOW LEVEL	N/A	
LT-7007	LI	LT_7007_LI	EI-701-G2	RIO-7000	AI	WET WELL LEVEL	4-20mA		1'	4'	LOOP	

DEVICE	TAG	I/O TAGNAME	P&ID	CONTROLLER	TYPE	DESCRIPTION	ANALOG SIGNAL LEVEL	DISCRETE SIGNAL LEVEL	OFF/4 mA	ON/20 mA	POWER	NOTES
500	YA	500_YA	EI-701-K	PP-500	DI	ACTUATOR FAIL	ETHERNET		ALARM OFF	ALARM ON		
500	YA	500_YA	EI-701-K	PP-500	DI	MINOR ALARM	ETHERNET		ALARM OFF	ALARM ON		
500	YA	500_YA	EI-701-K	PP-500	DI	INCOMPLETE SEQUENCE	ETHERNET		ALARM OFF	ALARM ON		
500	YA	500_YA	EI-701-K	PP-500	DI	MODULE FAIL	ETHERNET		ALARM OFF	ALARM ON		
500	YA	500_YA	EI-701-K	PP-500	DI	COMMUNICATION FAIL	ETHERNET		ALARM OFF	ALARM ON		
500	ZI	500_ZI	EI-701-K	PP-500	DI	OPEN/CLOSE	ETHERNET		CLOSE	OPEN		
500	ZI	500_ZI	EI-701-K	PP-500	DI	OPEN/CLOSE	ETHERNET		CLOSE	OPEN		
500	YA	500_YA	EI-701-K	PP-500	DI	MULT LAMP FAIL	ETHERNET		ALARM OFF	ALARM ON		
500	YA	500_YA	EI-701-K	PP-500	DI	PLC FAIL	ETHERNET		ALARM OFF	ALARM ON		
500	YA	500_YA	EI-701-K	PP-500	DI	BANK FAIL	ETHERNET		ALARM OFF	ALARM ON	EXISTING	
500	YA	500_YA	EI-701-K	PP-500	DI	ADJ LAMP FAIL	ETHERNET		ALARM OFF	ALARM ON		
500	YA	500_YA	EI-701-K	PP-500	DI	LOW U/V FAIL	ETHERNET		ALARM OFF	ALARM ON		
500	YA	500_YA	EI-701-K	PP-500	DI	LEAD/LAG	ETHERNET		ALARM OFF	ALARM ON		
500	YA	500_YA	EI-701-K	PP-500	DI	OFFLINE	ETHERNET		ONLINE	OFFLINE		
500	YC	500_YC	EI-701-K	PP-500	DO	RUN	ETHERNET		OFF	ON		
500	YI	500_YI	EI-701-K	PP-500	DI	ON	ETHERNET		OFF	ON		
500	YI.AM	500_YI.AM	EI-701-K	PP-500	DI	AUTO	ETHERNET		MANUAL	AUTO		
500	YI.AM	500_YI.AM	EI-701-K	PP-500	DI	AUTO	ETHERNET		MANUAL	AUTO		
YA-6001	YC	YA_6001_YC	EI-701-K	PP-500	DI	YA-6001 OPEN/CLOSE	ETHERNET		CLOSE	OPEN	EXISTING	
YA-6003	YC	YA_6003_YC	EI-701-K	PP-500	DI	YA-6003 OPEN/CLOSE	ETHERNET		CLOSE	OPEN	EXISTING	
LT-K01	LI	LT_K01_LI	EI-701-K	PP-500	AI	UV SYSTEM #1 LEVEL	ETHERNET		EXISTING	EXISTING	EXISTING	
LT-502	LI	LT_502_LI	EI-701-K	PP-500	AI	UV SYSTEM #2 LEVEL	ETHERNET		EXISTING	EXISTING	EXISTING	
K-101	FI	K_101_FI	EI-701-K	PP-500	AI	EFF FLOW GPM	4-20mA		EXISTING	EXISTING	EXISTING	FLOW METER REMOVED, DEMO WIRING FROM PANEL AND REMOVE ASSOCIATED CONTROLS
K-101	FQI	K_101_FQI	EI-701-K	PP-500	AI	EFF FLOW TOTALIZED	4-20mA		EXISTING	EXISTING		FLOW METER REMOVED, DEMO WIRING FROM PANEL AND REMOVE ASSOCIATED CONTROLS
K-101	FI	K_101_FI	EI-701-K	PP-500	AI	EFF FLOW	4-20mA		EXISTING	EXISTING		FLOW METER REMOVED, DEMO WIRING FROM PANEL AND REMOVE ASSOCIATED CONTROLS

SECTION 40 67 00 - CONTROL PANELS

PART 1 - GENERAL

1.1 WORK INCLUDED

A. The Contractor shall provide control panels, complete and operable, in accordance with the Contract Documents.

B. The provisions of this Section apply to local panels provided in equipment systems specified in other sections unless indicated otherwise in those sections.

1.2 REFERENCE STANDARDS

A. ASTM A 283 Low and Intermediate Tensile Strength Carbon Steel Plates

B. UL 508A Industrial Control Panels

1.3 SUBMITTALS

A. Submittals shall be furnished in accordance with Sections 01 33 00 – Submittal Procedures and Section 40 70 00 – Instrumentation and Controls, General.

B. Shop Drawings: The Contractor shall submit shop drawings for each panel and enclosure provided under Division 40. The shop drawings shall completely define and document the construction, finish, layout, power circuits, signal and safety grounding circuits, fuses, circuit breakers, signal circuits, internally mounted instrumentation, face plate mounted instrumentation components, internal panel arrangements, and external panel arrangements. The submittal shall include the following:

1. A complete index shall appear in the front of each bound volume. Drawings and data sheets associated with a panel shall be grouped together with the panels being indexed by systems or process areas. Panel tagging and nameplate nomenclature shall be consistent with the requirements of the Contract Documents.

2. Scaled physical arrangement drawings drawn to scale that define and quantify the physical groupings comprising control panel sections, auxiliary panels, subpanels, and racks. Cutout locations with nameplate identifications shall be shown.

3. Front panel layouts for all control panels.

4. Schematic/elementary diagrams shall depict all control devices and circuits and their functions.

5. Interconnection diagrams shall locate and identify all external connections between the control panel/control panel devices and associated equipment. These diagrams shall show interconnecting wiring by lines, designate terminal assignments, and show the physical location of all panel ingress and egress points.

6. A bill of material that enumerates all devices associated with the control panel.

PART 2 - PRODUCTS

2.1 GENERAL

A. Environmental Suitability: Indoor and outdoor control panels and instrument enclosures shall be suitable for operation in the ambient conditions associated with the locations designated in the Contract Documents. Heating, cooling, and dehumidifying devices shall be provided, as indicated, in order to maintain all instrumentation devices within 20 percent of the minimums and maximums of their rated environmental operating ranges. The Contractor shall provide all power wiring for these devices. Instrumentation in hazardous areas shall be suitable for use in the particular hazardous or classified location in which it is to be installed.

B. The control panel shall be the source of power for any 120 VAC solenoid valves interconnected with the control panel. Equipment associated with the control panel shall be ready for service after connection of conductors to equipment, controls, and control panel.

C. Instrument power circuits shall be fed from the associated PLC panel.

D. Control panels shall not contain any voltages greater than 120VAC.

E. Unless indicated otherwise, control panels shall be housed in NEMA rated enclosures in accordance with Section 26 05 00 – Electrical, General. Panels shall be either freestanding, pedestal-mounted or equipment skid-mounted, as indicated. Internal control components shall be mounted on an internal back-panel or side-panel as required.

F. Each source of foreign voltage shall be isolated by providing disconnecting or pull-apart terminal blocks. Each control panel shall be provided with identified terminal strips for the connection of all external conductors. The Contractor shall provide sufficient terminal blocks to connect 25 percent additional conductors for future use.

G. Motor starters, where required, shall be in accordance with Section 26 29 00 – Motor Controllers and Section 26 29 23 – Variable-Frequency Motor Controllers. Each motor starter shall be provided with contact closures for motor overload, local indication, and remote alarm. Discrete outputs from the control panel shall be provided by electrically isolated interposing relay contacts. Analog inputs and outputs leaving the envelope of the building shall be isolated 4-20 mA, 2-wire signals with power supply. All analog inputs and outputs shall be individually fused.

H. Control panel mounted devices shall be mounted a minimum of 3 feet above finished floor elevation.

2.2 CONTROL PANELS

A. Each PLC and remote I/O system and corresponding housing, including I/O modules, power supply modules, communication interface devices, and peripheral equipment shall be mounted inside a NEMA enclosure in accordance with Section 26 05 00 – Electrical, General. I/O wiring from the field to the remote I/O system shall be terminated on terminal blocks in the lower portion of the enclosure.

B. Materials: Panels shall be constructed **per requirements and rating as identified in 40 67 00.A.** Panel section faces shall be No. 12 gauge minimum thickness for free standing panels and No. 14 gauge minimum thickness for wall mounted or pedestal mounted panels. Materials shall be selected for levelness and smoothness.

1. Relay rack high density type panels shall utilize standard relay racks with No. 14 gauge steel frame and supports.

2. Structural shapes and strap steel shall comply with ASTM A 283 - Low and Intermediate Tensile Strength Carbon Steel Plates, Grade C.

3. Bolting Material: Commercial quality carbon steel bolts, nuts, and washers shall be 1/2-inch diameter with UNC threads. Carriage bolts shall be used for attaching end plates. All other bolts shall be hex end machine bolts. Nuts shall be hot pressed hex, American Standard, heavy. Standard wrought washers shall be used for foundation bolts and attachments to building structures. Other bolted joints shall have SAE standard lock washers.

C. Construction: Dimensions shall be in accordance with vendor's requirements for housing all components. Elevations and horizontal spacing shall be subject to Engineer's approval.

D. Fabrication: End plates, top plates, and top closure panels (to hung ceiling) shall be provided when required by the material requisition. End plates, top plates, and top closure panels shall be removable with countersunk bolts to match panels. Top closure panels shall be furnished in lengths which match the widths of standard panels, except that one top closure panel may extend across two 4-foot 6-inch wide or five 2-foot wide standard panels. The vertical joints of these panels shall align with the vertical joints of the standard panels.

1. End closure or rear closure doors shall be provided where required. Such doors shall be flush fitting, gasketed, and be of the hinged lift-off type with lockable door handles. A common key shall be provided for all doors on one panel assembly. Removable access panels shall be provided with dished handle fasteners. Screw driver 1/4 turn or Dzus type fasteners are not acceptable.

2. The flanged edges of all panels shall be straight and smooth. Corners shall be welded and ground smooth.

3. The face of the panel shall be true and level after angling.

4. All panel cutouts and holes may be cut or drilled by any standard method that does not cause deformation. Burrs shall be ground smooth.

5. Adjacent panels shall assemble with races flush. Gaps or cracks shall not be visible from the front of the assembled instrument board.

6. Stiffeners shall be welded to the back of panels, as required to prevent panel deformation due to the weight of face mounted instruments.

7. Panels shall be self-supporting as defined below.

E. Framework and Supports: The rear of each panel section shall have a steel framework assembled to it for supporting conduit, wireways, switches, piping, and instrument accessory Items such as relay or terminal enclosures, transducers, pressure switches, valves, and air relays.

1. The main frame work shall be constructed of standard structural shapes. Special shapes such as "Unistrut" may be used for secondary supports. Framework must neither interfere with instrument connections nor interfere with access needed for maintenance or adjustments.

2. Steel framework shall extend 2-feet 4-inches back from the panel face or as indicated in the material requisition. Where indicated, individual adjustable leg supports shall be provided at the back of the framework so that the entire panel is self-supporting.

F. Preparation of Panel Surface: The following requirements apply to the front and rear face of the panel, both sides and the edges of all flanges, and the periphery of all holes or cutouts.

1. High spots, burrs, and rough spots shall be ground smooth.

2. The surfaces shall be sanded or sandblasted to a smooth, clean, bright finish.

3. All traces of oil shall be removed with a solvent.

4. The first coat of primer shall be applied immediately.

G. Instrument Finishing: The final coats applied to painted surface of instrument cases, doors, or bezels which are visible from the front of panels shall be manufacturer's standard unless otherwise indicated. Black Japan or "crinkle" finishes on instrument cases are not acceptable.

H. Mounting of Instruments: The panel vendor shall provide cutouts and shall mount all instrument items indicated to be panel mounted, including any instruments indicated to be furnished by other vendors but installed in the panel.

1. The panel vendor shall also mount behind the panels other instrument accessory items as required for functionality as indicated.

2. Equipment mounted at the rear of panel shall be installed to allow for commissioning adjustments, servicing requirements, and cover removal.

3. Spare space shall be kept clear of wiring, etc., to give maximum space for future additions.

I. Panel Components:

1. Terminal Blocks.

a. Terminal blocks for power distribution and digital signals shall comply with the following requirements

1) Terminal blocks shall be UL rated for 600V, 30A minimum.

2) Terminal blocks shall have a compression-style screw or spring clamp connection.

3) Terminal blocks shall be capable of accepting #12 AWG wire.

4) Terminal blocks directly associated with digital I/O signals shall be two-tier with pre-manufactured jumper bars for distribution of common signals.

b. Terminal blocks for analog signals shall comply with the following requirements:

1) Terminal blocks shall be UL rated for 300V, 20A minimum.

2) Terminal blocks shall have a compression-style screw or spring clamp connection.

3) Terminal blocks shall be capable of accepting #16 AWG wire.

4) Terminal blocks shall be three-tier sensor blocks for termination of signal positive, negative, and shield with pre-manufactured jumper bars for distribution of common signals.

c. Fuse blocks shall comply with the following requirements:

1) Fuse blocks shall be UL rated for 600V, 10A minimum.

2) Fuse blocks shall incorporate a hinged lever that accepts 5x20 mm fuses.

3) Fuse blocks shall have a compression-style screw clamp connection.

4) Fuse blocks shall be capable of accepting #12 AWG wire.

5) Fuse blocks shall contain an LED blown-fuse indicator.

d. All terminal blocks and fuse blocks shall be designed for DIN rail mounting. Extra deep 15 mm DIN rail shall be used.

e. Contractor shall provide terminal block end sections and end stops as necessary for a complete installation.

f. Terminal blocks and fuse blocks shall be provided with pre-printed snap-on label strips. Stick-on labeling is not acceptable. Labeling shall be consistent with Contractor’s control panel drawings. Contractor shall clearly label all terminal blocks in every control panel; unlabeled terminal blocks are not acceptable.

g. Terminal blocks and fuse blocks shall be Phoenix Contact, WAGO, or approved equal.

2. Instrument Power: All instruments requiring power that are wired to a PLC shall also have power supplied from the same PLC control panel. All instrument power sources shall be individually fused.

3. Signal surge suppressors. Signal surge suppressors shall be provided for all analog signals leaving the envelope of the building.

a. Signal surge suppressors shall be Phoenix Contact TTC-6-1X2-M-24DC-PT-I or equal.

4. Control Relays. Control relays shall comply with the following requirements:

a. Relays shall be plug-in style with a DIN-rail mountable base.

b. Relays shall have on/off indication.

c. General purpose control relays shall have 24VDC or 120VAC coil as required for application. Relay contacts shall be rated 10A at 120VAC or 125VDC. Contractor shall be responsible for quantity of contacts as required for application. **Phoenix Contact RIF series or equal.**

d. Digital output interposing relays shall be terminal block style. **Phoenix Contact PLC-RSC series or equal.**

5. Intrinsically Safe Barriers. Relays shall be solid-state electronic type in which the energy level of the sensing or actuation circuit is low enough to allow safe use in hazardous areas. Relays shall be located in non-hazardous areas. **Intrinsically safe barriers shall be manufactured by Phoenix Contact, Pepperl+Fuchs, or equal.**

6. Circuit Breakers. Circuit breakers for use in control panels shall be rated for 600V service.

a. Control panel circuit breakers shall be DIN-rail mounted.

b. Control panel circuit breakers shall be Phoenix Contact, Allen-Bradley, or approved equal.

7. Surge Suppression. PLC control panels shall incorporate a transient-voltage surge suppressor on the incoming line. Surge suppressors shall be properly sized by the Contractor based upon the maximum current draw of the control panel.

a. Surge suppressors shall be Phoenix Contact, Allen Bradley, or equal.

8. DC Power Supplies. PLC control panels shall be provided with a redundant DC power supply system containing two identical 24VDC power supplies and a redundancy module to regulate loading.

a. DC Power Supplies shall be redundant. A redundancy module shall be used to regulate loading.

b. Size DC power supplies based upon the actual 24V load. Power supplies shall not be loaded more than 50% of rated capacity.

c. DC power supply systems shall be Phoenix Contact, Allen Bradley, or equal.

9. Digital Panel Indicators. Digital indicators shall be designed for semi-flush mounting in a panel. The indicator shall be a 3 1/2 digit LED, LCD, or gas discharge type display, with digits at least 0.5 inch high. The indicator shall be easily read at a distance of 10 feet in varying control room lighting environments. Operating temperature range shall be 32°F to 140°F. Accuracy shall be ±0.1 percent. The indicator shall be scaled in engineering units, with the units engraved on the display face or on the associated nameplate. **Indicators shall be Precision Digital Corporation, Dwyer, Red Lion Controls, or equal.**

10. Selector Switches. Selector switches shall be 30.5-mm, heavy-duty, oil-tight type with gloved-hand or wing lever operators. Position legends shall be engraved on the switch faceplate. Switches for electric circuits shall have silver butting or sliding contacts, rated 10A continuous at 120 VAC. Contact configuration shall be as indicated on the Drawings or for the application. Switches used in electronic signal circuits shall have contacts suitable for that duty. **Switches shall be Allen Bradley 800T/H series, Schneider 9001 series, Eaton 10250T series, or equal**.

11. Indicating Lights. Indicating lights shall be 30.5-mm, heavy-duty, oil-tight type, with full voltage LED lamps. Legends shall be engraved on the lens or on a legend faceplate. Lights shall be push-to-test type. **Indicating lights shall be Allen Bradley 800T/H series, Schneider 9001 series, Eaton 10250T series, or equal.**

12. Pushbuttons. Push buttons shall be 30.5-mm, heavy-duty, oil-tight type. Legends shall be engraved on the push-button faceplate. Contacts shall be rated 10A continuous at 120 VAC. **Push buttons shall be Allen Bradley 800T/H series, Schneider 9001 series, Eaton 10250T series, or equal.**

13. Alarm Horns. Horns shall be high-decibel, panel-mount, vibrating type designed for heavy-duty use. Horn volume shall be field-adjustable from 78 to 103 dB at 10 feet. Horns shall operate at 120 volts ac. Horns shall be weatherproof NEMA Type 4X. Horns shall be panel front mounted and shall be supplied with gasket. **Horns shall be Allen Bradley 855P series, or equal.**

J. Electrical Requirements:

1. All conduit, wireways, switches, wire, and electrical fittings for 120 VAC circuits to instruments and other electrical devices as required for a complete and operable installation.

2. Conduit, wireways, junction boxes and fittings shall be provided for signal wire, thermocouple, or resistance thermometer lead wire. Conduit or wireway runs shall

include those required between temperature sensors and temperature transmitters and between the thermocouple wireway or junction box and instruments.

3. Each terminal connection shall have a plastic plate with a terminal and instrument tag number. Wiring shall be identified with stamped tubular wire end markers.

4. PLC control panels shall be provided with a 15A, 120 VAC service outlet circuit within the back-of-panel area.

5. PLC control panels shall be provided with LED light and door activated switch.

6. Wall mounted or pedestal mounted panels shall be so sized as to adequately - dissipate heat generated by equipment mounted in or on the panel.

7. Control panels mounted outside shall be provided with thermostatically controlled heaters that maintain inside temperature above 40 degrees F.

8. Wiring Methods: Wiring methods and materials for all panels shall be in accordance with the NEC requirements for General Purpose (no open wiring) unless otherwise indicated. Control Panels shall be UL508A listed Control Panels.

9. Signal and Control Circuit Wiring: Wire type and sizes: Conductor shall be flexible stranded copper machine tool wire, UL listed Type MTW, and shall be rated 600 volts. Wires, including shielded cables, shall be No. 16 AWG minimum.

    a. Wire Insulation Colors: Ungrounded control circuit conductors operating at the supply voltage shall have black insulation. Grounded circuit conductors shall have white insulation. Insulation for ungrounded AC control circuit conductors operating at less than the supply voltage shall be red. Wires energized by a voltage source external to the control panel shall have yellow insulation. Insulation for ungrounded DC conductors shall be blue. Insulation for grounded DC conductors shall be white with blue stripe. Twisted pair wiring shall be positive(+) black and negative(-) white/clear.

    b. Wire Marking: Wire numbers shall be marked using white numbered wire markers made from plastic-coated cloth, Brady Type B 500 or equal, or shall be heat shrink plastic.

    c. Flexible conduit is not acceptable except when specifically approved by the Engineer in writing. Conduit fittings shall be Crouse Hinds cast fittings or equal.

    d. Splicing of wires will only be allowed in junction boxes. Splices shall be either soldered or pressure crimped type.

    e. For case grounding, panels shall be provided with a 1/4-inch by 1-inch copper ground bus complete with solderless connector for one No.4 AWG bare stranded copper cable. The copper cable shall be provided by the Contractor and be connected to a system ground loop.

10. Power Supply: Unless otherwise indicated control panel primary power supplies shall be 120V, 60 Hz circuits. 24VDC subsystems shall be provided for PLC control panels and as indicated on the drawings.

K. Labor and Workmanship: Panels shall be fabricated, piped, and wired by fully qualified workmen who are properly trained, experienced, and supervised.

L. At a minimum, control panels shall be constructed in a UL shop and contain UL labels prior to shipment.

2.3 UNINTERRUPTIBLE POWER SUPPLY (UPS)

A. Provide and install UPS(s) to power all PLC hardware furnished under this Specification.

B. The UPS shall receive a 120 VAC, 60 HZ power input, and generate a 120 VAC, 60 HZ output signal which is protected from incoming spikes, sags, noise, brownouts, and power outages.

1. The UPS shall incorporate a transformer, a battery pack, a battery charger, an inverter, and a microprocessor based controller to provide continuous, on-line, computer grade uninterruptible power. Lighting and surge protection shall meet ANSI/IEEE c62.41 categories A and B. The UPS shall be U.L. listed. Spike attenuation shall be 2000 to 1. The output neutral shall be bonded to ground. Noise isolation shall be 120 Db common-mode, 60 Db normal mode. Output voltage regulation shall be + 3% with less than 5% total harmonic distortion. UPS efficiency shall be at least 85%. The UPS shall be rated for ambient temperatures from 32 degrees F to 104 degrees F and relative humidity from 0 to 95%

2. Each UPS shall maintain power to all of its connected loads, including non-constant loads such as alarms and printers, for a minimum of 15 minutes with a 50% growth factor over the connected load. The equipment submittal shall include sizing calculations which support the model and size selected. The UPS shall be supplied with a low output voltage cutoff to prevent damage to loads when the battery power is exhausted.

C. The equipment shall include sizing calculation which support the unit selected being able to power all its connected loads for the indicated time period with a 50% growth factor.

D. The uninterruptible power supply shall be Schneider APC, Phoenix Contact Quint, Allen Bradley 1609, or equal.

2.4 SPARE PARTS AND SPECIAL TOOLS

A. Control panel spare parts selected by the Engineer and special tools shall be furnished in accordance with Section 40 70 00 – Instrumentation and Control, General.

PART 3 - EXECUTION

3.1 LISTING AND INSTALLATION

A. Control panels shall be installed in accordance with Section 40 70 00 – Instrumentation and Control, General.

B. Control Panels shall be fabricated in accordance with UL 508A and shall be UL Listed Industrial Control Panels.

3.2 EQUIPMENT DELIVERY

A. Panels shall be crated for shipment using a heavy framework and skids. Panel sections shall be cushioned to protect the finish of the instruments and panel during shipment. Instruments which are shipped with the panel shall further have suitable shipping stops and cushioning material installed to protect parts which could be damaged due to mechanical shock. Each separate panel unit shall be provided with removable lifting lugs to facilitate handling.

B. Shipments by air ride van unless otherwise indicated. Control panel testing and inspection, if required, shall be performed prior to shipping.

3.3 CONTROL PANEL SIGNAL AND CONTROL CIRCUIT WIRING

A. Wiring Installation: Wires shall be run in plastic wireways except (1) field wiring, (2) wiring between mating blocks in adjacent sections, (3) wiring from components on a swing out panel to components on a part of the fixed structure, and (4) wiring to panel mounted components. Wiring run from components on a swing out panel to other components on a fixed panel shall be made up in tied bundles. These bundles shall be tied with nylon wire ties and shall be secured to panels at both sides of the "hinge loop" so that conductors are not strained at the terminals.

B. Wiring run to control devices on the front panels shall be tied together at short intervals with nylon wire ties and be secured to the inside face of the panel using adhesive mounts.

C. Wiring to rear terminals on panel-mount instruments shall be in plastic wireways secured to horizontal brackets above or below the instruments in about the same plane as the rear of the instruments.

D. Shop Drawings shall show conformance to the above wiring installation requirements.

E. Wire Marking: Each signal, control, alarm, and indicating circuit conductor connected to a given electrical point shall be designated by a single unique number which shall be shown on Shop Drawings. These numbers shall be marked on conductors at every terminal.

3.4 CALIBRATION, TESTING, AND INSTRUCTION

A. Calibration, testing, and instruction shall be performed in accordance with Section 40 79 23 – Testing, Calibration, and Commissioning.

B. Inspection and Approval: Panel fabricator shall conduct the following tests before shipment.

1. Alarm circuits rung out to determine their operability.

2. Electrical circuits checked for continuity and where applicable, operability.

3. Any other test required to place the panel in an operating condition.

C. It shall be the responsibility of the Contractor to furnish all necessary testing devices and sufficient manpower to perform the tests required by the Engineer.

D. Factory Acceptance Testing: PLC control panels shall be factory tested as required by Division 40 specifications.

E. Field Testing: Each control panel shall be tested again for functional operation in the field after the connection of external conductors and prior to equipment startup.

END OF SECTION 40 67 00

LOCATION	PANEL NO.	P&ID	PANEL DESCRIPTION	POWER	AREA CLASSIFICATION	DIMENSIONS	MOUNTING	RATING	SPECIFICATION	FURNISHED BY	NEW/EXISTING/ RELOCATED	NOTES
HEADWORKS	A-PLC-01	EI-701-A	HEADWORKS BUILDING CONTROL PANEL	120 VAC	UNCLASSIFIED	36" W x 20" D	WALL	EXISTING	N/A	N/A	EXISTING	**NEW HMI TO BE INSTALLED**
HEADWORKS	LCP-SCR-1	EI-701-A	SCREEN 1 CONTROL PANEL	480 VAC	UNCLASSIFIED	36" W x 20" D	WALL	EXISTING	N/A	N/A	EXISTING	
HEADWORKS	LCP-SCR-2	EI-701-A	SCREEN 2 CONTROL PANEL	480 VAC	UNCLASSIFIED	36" W x 20" D	WALL	**NEMA 4X**	46 21 35	VENDOR	NEW	
HEADWORKS	LCP-VG-1	EI-701-A	GRIT VORTEX PANEL	480 VAC	UNCLASSIFIED	36" W x 20" D	WALL	EXISTING	N/A	N/A	EXISTING	
HEADWORKS	LCP-HWLS-01	EI-702-A	HEADWORKS LIFT STATION PANEL	480 VAC	UNCLASSIFIED	72" W x 20" D	FLOOR	EXISTING	N/A	N/A	EXISTING	
IFAS BLOWER BUILDING	VCP-100-B2	EI-701-B EI-701-B2	IFAS CONTROL PANEL	120 VAC	UNCLASSIFIED	60" H x 48" W x 18" D	FLOOR	**NEMA 12**	**IFAS, APPENDIX D**	VENDOR	NEW	
IFAS BLOWER BUILDING	**RCP-2000**	**EI-701-B2**	**REMOTE CONTROL PANEL**	**120 VAC**	**UNCLASSIFIED**	**36" H x 36" W x 18" D**	**WALL**	**NEMA 12**	**40 67 00**	**CONTRACTOR**	**NEW**	**PANEL DESIGN BY KELLER ASSOCIATES**
IFAS BLOWER BUILDING	**FCP-2101**	**E-503**	**HVAC FAN CONTROL PANEL**	**120 VAC**	**UNCLASSIFIED**	**36" H x 36" W x 12" D**	**WALL**	**NEMA 12**	**N/A**	**CONTRACTOR**	**NEW**	**SEE E-503 FOR WIRING SCHEMATIC**
ELECTRICAL BLDG.	LCP-RAS-1	EI-701-C	RAS/WAS 1 CONTROL PANEL	480 VAC	UNCLASSIFIED	36" H x 36" W x 18" D	WALL	EXISTING	N/A	N/A	EXISTING	
ELECTRICAL BLDG.	LCP-RAS-2	EI-701-C	RAS/WAS 2 CONTROL PANEL	480 VAC	UNCLASSIFIED	36" H x 36" W x 18" D	WALL	EXISTING	N/A	N/A	EXISTING	
ELECTRICAL BLDG.	LCP-CLA-1	EI-701-C	CLARIFIER 1 CONTROL PANEL	480 VAC	UNCLASSIFIED	24" H x 24" W x 18" D	WALL	EXISTING	N/A	N/A	EXISTING	
ELECTRICAL BLDG.	LCP-CLA-2	EI-701-C	CLARIFIER 2 CONTROL PANEL	480 VAC	UNCLASSIFIED	24" H x 24" W x 18" D	WALL	EXISTING	N/A	N/A	EXISTING	
TERTIARY TREATMENT	RCP-4000	EI-701-D	TERTIARY TREATMENT REMOTE CONTROL PANEL	120 VAC	UNCLASSIFIED	36" H x 30" W x 18" D	WALL	**NEMA 4**	40 67 00	CONTRACTOR	NEW	**PANEL DESIGN BY KELLER ASSOCIATES**
TERTIARY TREATMENT	VCP-4000	EI-701-D	AIR CONTROL PANEL	120 VAC	UNCLASSIFIED	36" H x 30" W x 12"D	WALL	**NEMA 4X**	**TERTIARY FILTERS, APPENDIX C**	VENDOR	NEW	
TERTIARY TREATMENT	VCP-4001	EI-701-D	COMPRESSOR SKID CONTROL PANEL	480 VAC	UNCLASSIFIED	3.5" W x 3" H x 2.25" D	SKID	**NEMA 4**	**TERTIARY FILTERS, APPENDIX C**	VENDOR	NEW	
TERTIARY TREATMENT	**FCP-4301**	**E-503**	**HVAC FAN CONTROL PANEL**	**120 VAC**	**UNCLASSIFIED**	**36" H x 36" W x 12" D**	**WALL**	**NEMA 12**	**N/A**	**CONTRACTOR**	**NEW**	**SEE E-503 FOR WIRING SCHEMATIC**
TERTIARY TREATMENT	MCP-4300	EI-701-D1	LIFT STATION MOTOR CONTROL PANEL	480 VAC	UNCLASSIFIED	36" H x 30" W x 12" D	WALL	NEMA 4	40 67 00	CONTRACTOR	NEW	
DEWATERING	LCP-100-E	EI-701-E	LOCAL CONTROL PANEL	120 VAC	UNCLASSIFIED	48" H x 36 "W x 12" D	WALL	**NEMA 4**	40 67 00	CONTRACTOR	NEW	**PANEL DESIGN BY KELLER ASSOCIATES**
DEWATERING	VCP-SCP-1	EI-701-E	SCREW PRESS 1 VENDOR CONTROL PANEL	480 VAC	UNCLASSIFIED	60" H x 36" W x 12" D	WALL	**NEMA 4X**	**DEWATERING EQUIPMENT, APPENDIX E**	VENDOR	NEW	
DEWATERING	VCP-ACP-1	EI-701-E	SCREW PRESS 1 AIR CONTROL PANEL	N/A	UNCLASSIFIED	18"H x 14" W x 9" D	SKID	**NEMA 4X**	**DEWATERING EQUIPMENT, APPENDIX E**	VENDOR	NEW	
DEWATERING	VCP-LPF-1	EI-701-E	POLYMER SYSTEM VENDOR CONTROL PANEL	120 VAC	UNCLASSIFIED	20" H x 18" W x 6" D	SKID	**NEMA 4X**	**DEWATERING EQUIPMENT, APPENDIX E**	VENDOR	NEW	
DEWATERING	VCP-9000	EI-702-E	AIR GAP VENDOR CONTROL PANEL	480 VAC	UNCLASSIFIED	57" H x 24.5" W x 10" D	**SKID**	**NEMA 3R**	**22 11 24**	VENDOR	NEW	
DEWATERING	VCP-SCP-2	EI-703-E	SCREW PRESS 2 VENDOR CONTROL PANEL	480 VAC	UNCLASSIFIED	60" H x 36" W x 12" D	WALL	**NEMA 4X**	N/A	VENDOR	FUTURE	
DEWATERING	VCP-ACP-2	EI-703-E	SCREW PRESS 2 AIR CONTROL PANEL	120 VAC	UNCLASSIFIED	18"H x 14" W x 9" D	WALL	**NEMA 4X**	N/A	VENDOR	FUTURE	
DEWATERING	VCP-LPF-2	EI-703-E	POLYMER PUMP VENDOR CONTROL PANEL	120 VAC	UNCLASSIFIED	20" H x 18" W x 6" D	SKID	**NEMA 4X**	N/A	VENDOR	FUTURE	
DEWATERING	RIP-8001	EI-701-E	SLUDGE PUMP TEMPERATURE SWITCH PANEL	120 VAC	UNCLASSIFIED	10" H x 10" W x 6" D	WALL	**NEMA 4**	40 67 00	CONTRACTOR	NEW	
DEWATERING	**FCP-8101**	**E-503**	**HVAC FAN CONTROL PANEL**	**208/120 VAC**	**UNCLASSIFIED**	**36" H x 36" W x 12" D**	**WALL**	**NEMA 12**	**N/A**	**CONTRACTOR**	**NEW**	**SEE E-503 FOR WIRING SCHEMATIC**
DEWATERING	MCP-CONV	EI-701-E	CONVEYOR MOTOR CONTROL PANEL	480 VAC	UNCLASSIFIED	36" H x 30" W x 12"D	WALL	**NEMA 4**	41 12 13.36	CONTRACTOR	NEW	
DEWATERING	DNE-100-E	EI-700	SITE DATA NETWORKING ENCLOSURE	120 VAC	UNCLASSIFIED	26" H x 23" W X 25" D	WALL	**NEMA 4**	**40 67 00 40 70 00.2**	CONTRACTOR	NEW	**COORDINATE WITH INTERNET SERVICE PROVIDER**
BLOWER	RCP-5000	EI-701-G	BLOWER REMOTE CONTROL PANEL	120 VAC	UNCLASSIFIED	36" H x 30" W x 18" D	WALL	**NEMA 4**	40 67 00	CONTRACTOR	NEW	**PANEL DESIGN BY KELLER ASSOCIATES**
DECANT LIFT STATION	MCP-7000	EI-701-G2	DECANT LIFT STATION MOTOR CONTROL PANEL	480 VAC	UNCLASSIFIED	36" H x 30" W x 12"D	WALL	**NEMA 4**	40 67 00	CONTRACTOR	NEW	

SECTION 40 70 00 – INSTRUMENTATION AND CONTROL, GENERAL

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. General requirements applicable to all Process Control and Instrumentation Work.

2. General requirements for process control and instrumentation submittals.

3. See Section 40 70 00.2 – Instrumentation and Control, System Description for a list of Prequalified System Integrator (SI) and a complete description of the system.

4. As specified in this Section the Contractor shall provide the following services including, but not limited to:

   a. PLC panels and panel submittals

   b. Instrumentation required for the successful completion of the project that is not explicitly provided by others. Refer to Sections 40 67 00 A and 40 70 00 A for description of equipment which is provided by the Contractor.

   c. Termination of all control wiring of instrumentation in the field and in control panels.

   d. Loop testing and documentation of all instrumentation loops.

   e. System Integrator shall be responsible for:

      1) HMI software and configuration

      2) PLC software and programming

      3) SCADA system programming

      4) SCADA computer(s) hardware and installation

      5) Assist electrical contractor in performing loop tests.

      6) Control system startup, documentation, and training.

5. It is the intent of these Specifications that the entire instrumentation and control system be complete and operable. Provide all necessary material and labor for the complete system from source of power to final utilization equipment, including all connections, testing, calibration of all equipment furnished by others, as well as equipment furnished by the Contractor.

B. Related sections:

1. The Contract Documents are complementary; what is called for by one is as binding as if called for by all.

2. It is the Contractor's responsibility for scheduling and coordinating the Work of subcontractors, suppliers, and other individuals or entities performing or furnishing any of Contractor's Work.

   a. Items involving electrical, control, and instrumentation construction may be indicated on the Drawings or specified in the Specifications that do not apply specifically to electrical, control and instrumentation systems.

3. It is the duty of the Contractor to see that the completed Work complies accurately with the Contract Documents.

C. Interfaces to equipment, instruments, and other components:

1. The Drawings, Specifications, and overall design are based on preliminary information furnished by various equipment manufacturers, which identify a minimum scope of supply from the manufacturers. This information pertains to, but is not limited to, instruments, control devices, electrical equipment, packaged mechanical systems, and control equipment provided with mechanical systems.

2. Provide all material and labor needed to install the actual equipment furnished, include all costs to add any additional instruments, wiring, control system inputs/outputs, controls, interlocks, electrical hardware etc., which may be necessary to make a complete, functional installation based on the actual equipment furnished:

   a. Make all changes necessary to meet the manufacturer's wiring requirements.

3. Submit all such changes and additions to the Engineer for acceptance as specified in **Division 1**.

4. Review the complete set of Drawings and Specifications in order to ensure that all items related to the instrumentation and control systems are completely accounted for. Include any items indicated on the Drawings or in Specifications from another discipline in the scope of Work:

   a. If a conflict between Drawings and Specifications is discovered, refer conflict to the Engineer as soon as possible for resolution.

D. All instrumentation, and control equipment and systems for the entire project to comply with the requirements specified in the Instrumentation and Control Specifications, whether referenced in the individual Equipment Specifications or not:

1. The requirements of the Instrumentation and Control Specifications apply to all Instrumentation and Control Work specified in other Specifications, including HVAC controls, packaged mechanical systems, LCPs, VCPs, etc.

2. Inform all vendors supplying instrumentation, control systems, panels, and/or equipment of the requirements of the Instrumentation and Control Specifications.

3. The Owner is not responsible for any additional costs due to the failure of the Contractor to notify all subcontractors and suppliers of the Instrumentation and Control Specifications' requirements.

E. Contract Documents:

1. General:

a. The Drawings and Specifications are complementary and are to be used together in order to fully describe the Work.

2. Specifications:

a. As specified in Division 1.

b. These requirements are in addition to all General Requirements.

3. Contract Drawings:

a. The Instrumentation and Control Drawings show in a diagrammatic manner, the desired locations, and arrangements of the components of the Instrumentation Work. Follow the Drawings as closely as possible, use professional judgment and coordinate with the other trades to secure the best possible installation, use the entire Drawing set for construction purposes.

b. Locations of equipment, control devices, instruments, boxes, panels, etc. are approximate only, exercise professional judgment in executing the Work to ensure the best possible installation:

1) The equipment locations and dimensions indicated on the Drawings and elevations are approximate. Use the shop drawings to determine the proper layout, foundation, and pad requirements, etc. for final installation. Coordinate with all subcontractors to ensure that all instrumentation and control equipment is compatible with other equipment and space requirements. Make changes required to accommodate differences in equipment dimensions.

2) The Contractor has the freedom to select any of the named manufacturers as identified in the individual Specifications; however, the Engineer has designed the spatial equipment layout based upon a single manufacturer and has not confirmed that every named manufacturer's equipment fits in the allotted space. It is the Contractor's responsibility to ensure that the equipment being furnished fits within the defined space.

c. Installation details:

1) The Contract Drawings include installation details showing means and methods for installing instrumentation and control equipment. For cases where typical details are not provided or compatible with an installed location, develop installation details that are necessary for completing the Work, and submit these details for review by the Engineer.

d. Schematic diagrams:

1) Schematic diagrams show control function only. Incorporate other necessary functions for proper operation and protection of the system.

2) Add slave relays, where required, to provide all necessary contacts for the control system or where needed to function as interposing relays for control voltage coordination, equipment coordination, or control system voltage drop considerations.

3) Mount all devices shown on motor controller schematic diagrams in the controller compartment enclosure, unless otherwise noted or indicated.

4) Control schematics are to be used as a guide in conjunction with the descriptive operating sequences in the Specifications. Combine all information and furnish a coordinated and fully functional control system.

F. Alternates/Alternatives:

1. Substitute item provisions as specified in Section C700 – General Conditions.

G. Changes and change orders:

1. As specified in Section C700 - General Conditions.

1.2 REFERENCES

A. See Section 40 70 00.1 – Instrumentation and Control, References and Definitions

1.3 DEFINITIONS

A. See Section 40 70 00.1 – Instrumentation and Control, References and Definitions

1.4 SYSTEM DESCRIPTION

A. See Section 40 70 00.2 – Instrumentation and Control, System Description

1.5 SUBMITTALS

A. Furnish submittals as specified in Section 01 33 00 – Submittals and this Section.

1. Furnish the submittals required by each section in the Electrical Specifications.

2. Adhere to the wiring numbering scheme specified in Section 26 05 00 – Electrical, General throughout the Project:

a. Uniquely number each wire.

b. Wire numbers must appear on all Equipment Drawings.

3. Use equipment and instrument tags, as indicated on the Drawings, for all submittals.

B. Submittal organization as specified in Section 01 33 00 – Submittal Procedures and this Section

C. Submittal requirements as specified in Section 01 33 00 – Submittal Procedures and this Section:

1. Furnish submittals including:

a. Project Shop Drawing submittals.

b. The Process Control and SCADA Software Submittal including control system software, programming, and screens.

c. Testing, Calibration and Start-up procedures.

d. O&M Manual as specified in Section 01 78 23 – Operation and Maintenance Data.

e. Training Submittals.

f. Record Documents.

g. Testing Documents

D. Submittal preparation as specified in Section 01 33 00 – Submittal Procedures and this Section:

E. Specific submittal requirements:

1. Control panel hardware submittal in 1 package

a. Project Shop Drawing submittals.

1) Control panel hardware submittal in 1 package with complete and detailed bills of materials:

a) Including quantity, description, manufacturer, and part number for each assembly or component for each control panel.

b) Include all items within an enclosure.

2) Furnish sufficient information to evaluate the suitability of the proposed material or equipment for the intended use, and for compliance with these Specifications.

3) Use equipment and instrument tags as depicted on the P&IDs for all submittals.

4) Adhere to wiring identification scheme outlined in Specification 26 05 00 – Electrical, General throughout the Project.

5) Wire numbers must appear on all equipment drawings.

b. Requirements for physical separation between control system components and 120 VAC, 480 VAC, and medium voltage power cables.

c. UPS and battery load calculations to show that the backup capacity and time meet the specified requirements.

d. Provide a data sheet for each control system component together with a technical product brochure or bulletin.

2. O&M Manual

a. Spare parts list:

b. Control and SCADA System Software Record Documents:

1) Include electronic copies of all software and applications.

2) Navigation tree and screen shots of all SCADA screens with basic narrative.

3) Navigation tree and screen shots of all OIT screens with basic narrative

c. Instrument data sheets and cut sheets:

d. Training Submittals.

e. Record Documents.

3. Training submittals:

a. Develop and submit for review a general training plan. Include complete descriptions of all planned training classes, a preliminary training schedule, a list of all proposed instructors along with resumes, examples of proposed training manuals, and a description of any special training tools to be used (simulators, self-paced modules, personal computer-based training, etc.).

b. The Engineer will review the general training plan. Special emphasis will be placed on review of the qualifications of the proposed instructors and the timing of the individual courses to maximize their effectiveness. If, in the opinion of the Engineer, the proposed instructors are not sufficiently qualified to conduct the specified training courses, or lack experience, where required, on the specific configuration of the system, provide more qualified instructors.

4. Record documents:

a. Furnish as specified in Section 01 77 00 – Closeout Procedures.

b. Provide record documents of all Instrumentation Drawings.

c. Shop drawings:

d. Review and corrections:

1) Correct any record documents or other documents found to be incomplete, not accurate, of poor quality, or containing errors.

e. Control Panel Drawings

f. Control System Diagram:

1) Submit a complete set of control system diagrams including the following information:

a) All PLCs, workstations, printers, communication devices, and communication links:

b) All cables required for communication requirements.

5. Testing, Calibration, and Start-up Submittal:

a. General testing submittal requirements are specified in this Section and other Sections.

b. Test Procedure Submittals:

1) Submit the proposed procedures to be followed during tests of the PCIS and its components in two parts:

a) Preliminary Submittal: Outline of the specific proposed tests and examples of proposed forms and checklists.

b) Detailed Submittal: After successful review of the Preliminary Submittal, submit the proposed detailed test procedures, forms, and checklists. Include a statement of test objectives with the test procedures.

c. Provide certified and witnessed test and calibration checklists for any of the following tests:

1) Calibration, adjustment, and test details for all components and systems.

2) Factory Acceptance Tests (FAT).

3) Site Acceptance Test (SAT)

4) Operational Readiness Test (ORT).

d. Test reports:

1) As specified in Section 01 33 00 – Submittal Procedures.

1.6 QUALITY ASSURANCE

F. Manufacture instruments at facilities certified to the quality standards of ISO 9001.

G. Furnish all equipment listed by and bearing the label of UL or of an independent testing laboratory acceptable to the Engineer and the Authority Having Jurisdiction.

H. The panel provider must have their own operating UL listed panel fabrication facility. All panels must be fabricated at this facility and meet all UL 508/508A requirements.

I. System Integration:

1. The Contractor, through the use of a pre-qualified SI, is responsible for the implementation of the PCIS and the integration of the PCIS with other required instrumentation and control devices.

2. The contractor assumes full responsibility, working with the SI where applicable, to perform all work to select, furnish, install, test, calibrate, and place into operation all instrumentation, controls, telemetry equipment, control panels, and SCADA system including application software, for a complete, integrated and functional PCIS system.

3. Due to the complexities associated with the interfacing of numerous control system devices, it is the intent of these Specifications that the SI be responsible for the integration of the PCIS with existing devices and devices provided under the Contract Documents with the objective of providing a completely integrated control system.

J. Hazardous Location Rating of Equipment: Equipment manufacturer shall reference the hazardous-area classification drawing in the Contract Documents and provide equipment in compliance with the defined NEC- classification requirements. It will be the manufacturer's sole responsibility to submit equipment in compliance with the Contract Documents, NFPA 820, and NEC requirements.

1.7 DELIVERY, STORAGE, AND HANDLING

K. Store all equipment and materials delivered to the job site in a location that will not interfere with the construction or the Owner’s operations.

L. Shipping precautions:

1. After completion of shop assembly, successful FAT, pack all equipment, cabinets, panels, and consoles in protective crates and enclose in heavy-duty polyethylene envelopes or secured sheeting to provide complete protection from damage, dust, and moisture.

2. Place dehumidifiers when required, inside the polyethylene coverings.

3. Skid-mount the equipment for final transport.

4. Provide lifting rings for moving without removing protective covering.

5. Display boxed weight on shipping tags together with instructions for unloading, transporting, storing, and handling at the job site.

M. Tagging:

1. Tag each component and/or instrument to identify its location, instrument tag number, and function in the system.

2. Firmly attach a permanent tag indelibly machine marked with the instrument tag number, as given in the tabulation, on each piece of equipment constituting the PCIS.

3. Tag instruments immediately upon receipt in the field.

4. Prominently display identification on the outside of the package.

5. Utilize the Tag and Loop Number identifications shown on the P&IDs.

N. Delivery and inspection:

1. Deliver products in undamaged condition, in manufacturer's original container or packaging with identifying labels intact and legible. Include date of manufacture on label.

1.8 PROJECT OR SITE CONDITIONS

O. Site conditions:

1. Provide a PCIS, including all equipment, raceways and any other components required for a complete installation that meets the environmental conditions for the Site as specified in the General Requirements and below.

1.9 SEQUENCING

P. General:

1. As specified in Section 01 31 19 – Project Meetings and 01 35 13 – Special Project Procedures.

2. Testing requirements are specified in Section 40 70 00 – Instrument Calibration, and other sections.

3. General scheduling requirements are specified in Section 01 32 16 – Construction Progress Schedule.

4. Other scheduling activities to be determined between the Owner, Contractor, Engineer and SI.

Q. Training:

1. As specified in this Section.

2. Complete all training as agreed upon with the Owner, Contractor, Engineer and SI.

3. Within 10 days after the completion of training, submit the following:

   a. A list of all Owner personnel that attended the session.

   b. A copy of the training materials utilized during the lesson with all notes, diagrams, and comments.

R. Site Acceptance Test (SAT) or Pre-commissioning test:

1. Commence after acceptance of all training, wire test, calibration tests, and loop validation tests, and all inspections have demonstrated that the PCIS complies with all Contract requirements.

2. The Programmer will assist with SAT testing for PLCs programmed by the Programmer.

3. The Programmer shall not be required to be on site, nor shall the Programmer be required to supply application software, until the loop validation tests are complete for a PLC and all prerequisites for the pre-commissioning test are completed.

4. Complete SAT test before the ORT.

S. Operational Readiness Test (ORT)

1. Complete all with the Owner, Contractor, Engineer and SI.

2. Confirmation by the Owner, Contractor and Engineer that the PCIS functions correctly and as designed.

T. Substantial completion testing: The following conditions be fulfilled before the PCIS is considered complete:

1. All submittals have been completed and approved.

2. The Owner training has been performed.

3. All required spare parts, expendable supplies, and test equipment have been delivered to the Owner.

4. The PCIS has been calibrated, loop tested and pre-commissioned.

5. The ORT has been successfully completed.

6. All debris associated with installation of instrumentation has been removed.

7. All probes, elements, sample lines, transmitters, tubing, and enclosures have been cleaned and are in like-new condition.

1.10 WARRANTY

U. Warrant the PCIS as specified in Section C800 – Standard General Conditions of the Construction Contract:

1. Provide additional warranty as specified in the individual Instrumentation and Control Specifications.

1.11 SYSTEM START-UP

V. Replace or modify equipment, software, and materials that do not achieve design requirements after installation in order to attain compliance with the design requirements:

1. Following replacement or modification, retest the system and perform additional testing to place the complete system in satisfactory operation and obtain compliance acceptance from the Engineer.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Provide similar items from a single manufacturer throughout the PCIS portion of the Project.

B. Allowable manufacturers are specified in individual instrument and equipment specifications in other sections of the Instrumentation and Control Specifications.

2.2 MATERIALS

A. Furnish all materials under this Contract that are new, free from defects, and standard products produced by manufacturers regularly engaged in the production of these devices and that bear all approvals and labels as required by the Specifications.

B. Provide materials complying with the applicable industrial standard as specified in the Contract Documents.

2.3 SOURCE QUALITY CONTROL

A. Provide all equipment that is new, free from defects, and standard products produced by manufacturers regularly engaged in the production of these products that bear all approvals and labels as required by the Specifications.

B. Arrange with all manufacturers of the equipment and fabricators of panels and cabinets, to allow the Owner and Engineer to inspect and witness the testing of the equipment at the site of fabrication:

1. Equipment includes the cabinets, special control systems, flow measuring devices, and other pertinent systems and devices.

C. Factory testing is specified in Division 26 and other sections of the Electrical, and the Instrumentation and Control Specifications.

PART 3 - EXECUTION

3.1 EXAMINATION

A. The SI is encouraged to attend a pre-bid conference and examine the premises completely before bidding. It is the SI's responsibility to be fully familiar with the existing conditions and local requirements and regulations.

B. Review the existing Site conditions and examine all shop drawings for the various items of equipment in order to determine exact routing and final terminations for all wiring and cables.

C. Provide a complete instrumentation and control system:

1. Install all extra conduits, cables, and interfaces as may be necessary to provide a complete and operating electrical, and process control and instrumentation system.

3.2 FIELD QUALITY CONTROL

A. Inspection:

1. Allow for inspection of PCIS installation.

2. Provide any assistance necessary to support inspection activities.

3. Engineer inspections may include, but are not limited to, the following:

a. Inspect equipment and materials for physical damage.

b. Inspect installation for compliance with Drawings and Specifications.

c. Inspect installation for obstructions and adequate clearances around equipment.

d. Inspect equipment installation for proper leveling, alignment, anchorage, and assembly.

e. Inspect equipment nameplate data to verify compliance with design requirements.

f. Inspect cable terminations.

g. Inspect/witness instrument calibrations/verifications.

4. Inspection activities conducted during construction do not satisfy inspection requirements specified in Division 26.

B. Instrument Installation Inspection:

1. Provide any assistance necessary to support inspection activities.

2. Inspections may include, but are not limited to, the following:

a. Inspect equipment and materials for physical damage.

b. Inspect the installed arrangement, lay lengths, orientation, piping obstructions etc. that could affect the instruments accuracy or repeatability.

c. Inspect installation for compliance with Drawings and Specifications.

d. Inspect installation for obstructions and adequate clearances around equipment.

e. Inspect equipment installation for proper leveling, alignment, anchorage, and assembly.

f. Inspect equipment nameplate data to verify compliance with design requirements.

g. Inspect cable terminations.

h. Inspect/witness instrument calibrations/verifications.

3. Inspection activities conducted during construction do not satisfy inspection requirements specified in Division 26.

C. Field testing is specified in Division 26 and Section 01 75 16.

D. Installation supervision:

1. Ensure that the entire PCIS is installed in a proper and satisfactory manner. At a minimum, the contractor with assistance of the SI where applicable, shall provide the following services:

a. Installation resources:

1) Coordinate with the Contractor regarding installation requirements of the Contract Documents.

b. Provide technical assistance to installation personnel by telephone:

1) Furnish installation personnel with at least one copy of the approved submittals, including all installation details.

c. Periodic inspections during the construction period.

d. A complete check of the completed installation to ensure that it is in conformance with the requirements of the equipment manufacturer and the Contract Documents.

e. Field-verify accuracy and calibration of all instruments.

3.3 CLEANING

A. As specified in Section 01 77 00 – Project Closeout.

3.4 PROTECTION

A. Protect all Work from damage or degradation until date of Substantial Completion.

END OF SECTION 40 70 00

LOCATION	INSTRUMENT TAG NO.	SERVICE DESCRIPTION	POWER	P&ID	SETPOINT/RANGE	SPECIFICATION	SCOPE	FURNISHED BY	INSTALLED BY	NOTES
HEADWORKS	LIT-1001	SCR-01 OUTLET LEVEL	---	EI-701-A	---	---	EXISTING	EXISTING	EXISTING	
HEADWORKS	LIT-1002	SCR-01 INLET LEVEL	---	EI-701-A	---	---	EXISTING	EXISTING	EXISTING	
HEADWORKS	LE-1001	SCR-01 INFLOW LEVEL ELEMENT	---	EI-701-A	---	---	EXISTING	EXISTING	EXISTING	
HEADWORKS	LE-1002	SCR-01 OUTFLOW LEVEL ELEMENT	---	EI-701-A	---	---	EXISTING	EXISTING	EXISTING	
HEADWORKS	SV-1001	SCR-01 SOLENOID VALVE	---	EI-701-A	---	---	EXISTING	EXISTING	EXISTING	
HEADWORKS	SV-1002	SCR-01 SOLENOID VALVE	---	EI-701-A	---	---	EXISTING	EXISTING	EXISTING	
HEADWORKS	SV-1003	SCR-01 SOLENOID VALVE	---	EI-701-A	---	---	EXISTING	EXISTING	EXISTING	
HEADWORKS	PS-1001	SCR-1 PRESSURE SWITCH	---	EI-701-A	---	---	EXISTING	EXISTING	EXISTING	
HEADWORKS	SV-1004	GC-1 SOLENOID VALVE	---	EI-701-A	---	---	EXISTING	EXISTING	EXISTING	
HEADWORKS	AIT-1001-1	LEL GAS DETECTOR	---	EI-701-A	---	---	EXISTING	EXISTING	EXISTING	
HEADWORKS	AIT-1001-2	H2S GAS DETECTOR	---	EI-701-A	---	---	EXISTING	EXISTING	EXISTING	
HEADWORKS	FE-1020	SCR-2 INFLOW MAG ELEMENT	---	EI-701-A	---	---	EXISTING	EXISTING	EXISTING	
HEADWORKS	FIT-1020	SCR-2 INFLOW	---	EI-701-A	---	---	EXISTING	EXISTING	EXISTING	
HEADWORKS	LT-1008	SCR-2 OUTLET LEVEL	120V	EI-701-A	BY VENDOR	**46 21 35**	NEW	VENDOR	CONTRACTOR	
HEADWORKS	SV-1005	SCR-2 WASH SOLENOID VALVE	N/A	EI-701-A	NC	**46 21 35**	NEW	VENDOR	VENDOR	
HEADWORKS	SV-1006	SCR-2 WASH SOLENOID VALVE	N/A	EI-701-A	NC	**46 21 35**	NEW	VENDOR	VENDOR	
HEADWORKS	SV-1007	SCR-2 WASH SOLENOID VALVE	N/A	EI-701-A	NC	**46 21 35**	NEW	VENDOR	VENDOR	
HEADWORKS LIFT STATION	LT-0101	HEADWORKS LIFT STATION LEVEL TRANSMITTER	---	EI-702-A	---	---	EXISTING	EXISTING	EXISTING	
HEADWORKS LIFT STATION	LE-0101	HEADWORKS LIFT STATION LEVEL ELEMENT	---	EI-702-A	---	---	EXISTING	EXISTING	EXISTING	
HEADWORKS LIFT STATION	LS-0105	PEAK FLOW LAG PUMP ON LEVEL SWITCH	---	EI-702-A	---	---	EXISTING	EXISTING	EXISTING	
HEADWORKS LIFT STATION	LS-0104	PEAK FLOW LEAD PUMP ON LEVEL SWITCH	---	EI-702-A	---	---	EXISTING	EXISTING	EXISTING	
HEADWORKS LIFT STATION	LS-0103	NORMAL FLOW LAG PUMP ON LEVEL SWITCH	---	EI-702-A	---	---	EXISTING	EXISTING	EXISTING	
HEADWORKS LIFT STATION	LS-0102	NORMAL FLOW LEAD PUMP ON LEVEL SWITCH	---	EI-702-A	---	---	EXISTING	EXISTING	EXISTING	
HEADWORKS LIFT STATION	LS-0101	LOW LEVEL PUMPS OFF LEVEL SWITCH	---	EI-702-A	---	---	EXISTING	EXISTING	EXISTING	
HEADWORKS LIFT STATION	TS-0101	P-0101 TEMPERATURE SWITCH	---	EI-702-A	---	---	EXISTING	EXISTING	EXISTING	
HEADWORKS LIFT STATION	MS-0101	P-0101 MOISTURE SWITCH	---	EI-702-A	---	---	EXISTING	EXISTING	EXISTING	
HEADWORKS LIFT STATION	TS-0102	P-0102 TEMPERATURE SWITCH	---	EI-702-A	---	---	EXISTING	EXISTING	EXISTING	
HEADWORKS LIFT STATION	MS-0102	P-0102 MOISTURE SWITCH	---	EI-702-A	---	---	EXISTING	EXISTING	EXISTING	
HEADWORKS LIFT STATION	TS-0103	P-0103 TEMPERATURE SWITCH	---	EI-702-A	---	---	EXISTING	EXISTING	EXISTING	
HEADWORKS LIFT STATION	MS-0103	P-0103 MOISTURE SWITCH	---	EI-702-A	---	---	EXISTING			
IFAS TREATMENT	AIT-2002	IFAS TRAIN #2 DO CONCENTRATION/ TEMPERATURE	120V	EI-701-B	0-100% / 0-100°F	**APPENDIX D**	NEW	VENDOR	CONTRACTOR	REFER TO VEOLIA
IFAS TREATMENT	AE/TE-2002	IFAS TRAIN #2 ANALYZER ELEMENT	N/A	EI-701-B	0-100%	**APPENDIX D**	NEW	VENDOR	CONTRACTOR	REFER TO VEOLIA
IFAS TREATMENT	LSH-2003	IFAS BASIN #2A HIGH LEVEL SWITCH	N/A	EI-701-B	13'6"	**APPENDIX D**	NEW	VENDOR	CONTRACTOR	REFER TO VEOLIA
IFAS TREATMENT	AIT-2004	IFAS TRAIN #1 DO CONCENTRATION/ TEMPERATURE	120V	EI-701-B	0-100%	**APPENDIX D**	NEW	VENDOR	CONTRACTOR	REFER TO VEOLIA
IFAS TREATMENT	AE/TE-2004	IFAS TRAIN #1 ANALYZER ELEMENT	N/A	EI-701-B	0-100%	**APPENDIX D**	NEW	VENDOR	CONTRACTOR	REFER TO VEOLIA
IFAS TREATMENT	LSH-2005	IFAS BASIN #1A HIGH LEVEL SWITCH	N/A	EI-701-B	13'6"	**APPENDIX D**	NEW	VENDOR	CONTRACTOR	REFER TO VEOLIA
IFAS TREATMENT	LT-2007	IFAS TRAIN #2 LEVEL	LOOP	EI-701-B	**0-10 PSI**	**APPENDIX D**	NEW	VENDOR	CONTRACTOR	REFER TO VEOLIA
IFAS TREATMENT	LT-2008	IFAS TRAIN #1 LEVEL	LOOP	EI-701-B	**0-10 PSI**	**APPENDIX D**	NEW	VENDOR	CONTRACTOR	REFER TO VEOLIA
IFAS TREATMENT	SV-2009	CYLINDRICAL SCREEN SCOUR SOLENOID COMMAND BASIN #1A	120V	EI-701-B	NC	**APPENDIX D**	NEW	VENDOR	CONTRACTOR	REFER TO VEOLIA
IFAS TREATMENT	SV-2010	CYLINDRICAL SCREEN SCOUR SOLENOID COMMAND BASIN #2A	120V	EI-701-B	NC	**APPENDIX D**	NEW	VENDOR	CONTRACTOR	REFER TO VEOLIA
IFAS TREATMENT	SV-2013	CYLINDRICAL SCREEN SCOUR SOLENOID COMMAND BASIN #2B	120V	EI-701-B	NC	**APPENDIX D**	NEW	VENDOR	CONTRACTOR	REFER TO VEOLIA
IFAS TREATMENT	SV-2014	CYLINDRICAL SCREEN SCOUR SOLENOID COMMAND BASIN #1B	120V	EI-701-B	NC	**APPENDIX D**	NEW	VENDOR	CONTRACTOR	REFER TO VEOLIA
IFAS TREATMENT	LSH-2006	IFAS BASIN #2B HIGH LEVEL SWITCH	N/A	EI-701-B	13'6"	**APPENDIX D**	NEW	VENDOR	CONTRACTOR	REFER TO VEOLIA
IFAS TREATMENT	LSH-2015	IFAS BASIN #1B HIGH LEVEL SWITCH	N/A	EI-701-B	13'6"	**APPENDIX D**	NEW	VENDOR	CONTRACTOR	REFER TO VEOLIA
IFAS BLOWERS BUILDING	FE-2104	THERMAL DISPERSION FLOW ELEMENT	N/A	EI-701-B2	BY VENDOR	**APPENDIX D**	NEW	VENDOR	CONTRACTOR	REFER TO VEOLIA
IFAS BLOWERS BUILDING	FIT-2104	AIR FLOW TO IFAS TRAIN #1	120V	EI-701-B2	BY VENDOR	**APPENDIX D**	NEW	VENDOR	CONTRACTOR	REFER TO VEOLIA

LOCATION	INSTRUMENT TAG NO.	SERVICE DESCRIPTION	POWER	P&ID	SETPOINT/RANGE	SPECIFICATION	SCOPE	FURNISHED BY	INSTALLED BY	NOTES
IFAS BLOWERS BUILDING	FE-2105	THERMAL DISPERSION FLOW ELEMENT	N/A	EI-701-B2	BY VENDOR	**APPENDIX D**	NEW	VENDOR	CONTRACTOR	REFER TO VEOLIA
IFAS BLOWERS BUILDING	FIT-2105	AIR FLOW TO IFAS TRAIN #2	120V	EI-701-B2	BY VENDOR	**APPENDIX D**	NEW	VENDOR	CONTRACTOR	REFER TO VEOLIA
IFAS BLOWERS BUILDING	PI-2101	BLOWER #1 PRESSURE GAUGE	N/A	EI-701-B2	BY VENDOR	**43 11 33**	NEW	VENDOR	VENDOR	REFER TO VEOLIA
IFAS BLOWERS BUILDING	TI-2101	BLOWER #1 TEMPERATURE GAUGE	N/A	EI-701-B2	BY VENDOR	**43 11 33**	NEW	VENDOR	VENDOR	
IFAS BLOWERS BUILDING	TSH-2101	BLOWER #1 TEMPERATURE SWITCH	N/A	EI-701-B2	BY VENDOR	**43 11 33**	NEW	VENDOR	VENDOR	
IFAS BLOWERS BUILDING	PI-2102	BLOWER #2 PRESSURE GAUGE	N/A	EI-701-B2	BY VENDOR	**43 11 33**	NEW	VENDOR	VENDOR	
IFAS BLOWERS BUILDING	TI-2102	BLOWER #2 TEMPERATURE GAUGE	N/A	EI-701-B2	BY VENDOR	**43 11 33**	NEW	VENDOR	VENDOR	
IFAS BLOWERS BUILDING	TSH-2102	BLOWER #2 TEMPERATURE SWITCH	N/A	EI-701-B2	BY VENDOR	**43 11 33**	NEW	VENDOR	VENDOR	
IFAS BLOWERS BUILDING	PI-2103	BLOWER #3 PRESSURE GAUGE	N/A	EI-701-B2	BY VENDOR	**43 11 33**	NEW	VENDOR	VENDOR	
IFAS BLOWERS BUILDING	TI-2103	BLOWER #3 TEMPERATURE GAUGE	N/A	EI-701-B2	BY VENDOR	**43 11 33**	NEW	VENDOR	VENDOR	
IFAS BLOWERS BUILDING	TSH-2103	BLOWER #3 TEMPERATURE SWITCH	N/A	EI-701-B2	BY VENDOR	**43 11 33**	NEW	VENDOR	VENDOR	
CLARIFIERS	FE-3001	WAS FLOW MAGNETIC FLOW ELEMENT	---	EI-701-C	---	---	EXISTING	EXISTING	EXISTING	
CLARIFIERS	FIT-3001	WAS FLOW TO DIGESTER 1	---	EI-701-C	---	---	EXISTING	EXISTING	EXISTING	
CLARIFIER 1	TS-3001	P-3001 RAS PUMP 1 TEMPERATURE SWITCH	---	EI-701-C	---	---	EXISTING	EXISTING	EXISTING	
CLARIFIER 1	MS-3001	P-3001 RAS PUMP 1 MOISTURE DETECT	---	EI-701-C	---	---	EXISTING	EXISTING	EXISTING	
CLARIFIER 1	TS-3002	P-3002 RAS PUMP 2 TEMPERATURE SWITCH	---	EI-701-C	---	---	EXISTING	EXISTING	EXISTING	
CLARIFIER 1	MS-3002	P-3002 RAS PUMP 2 MOISTURE DETECT	---	EI-701-C	---	---	EXISTING	EXISTING	EXISTING	
CLARIFIER 1	NSH-CLA-1A	CLARIFIER 1 LONG COLLECTOR TORQUE SWITCH	---	EI-701-C	---	---	EXISTING	EXISTING	EXISTING	
CLARIFIER 1	NSH-CLA-1B	CLARIFIER 1 CROSS COLLECTOR TORQUE SWITCH	---	EI-701-C	---	---	EXISTING	EXISTING	EXISTING	
CLARIFIERS	FE-3002	RAS FLOW MAGNETIC FLOW ELEMENT	---	EI-701-C	---	---	EXISTING	EXISTING	EXISTING	
CLARIFIERS	FIT-3002	RAS FLOW TO IFAS SPLITTER BOX	---	EI-701-C	---	---	EXISTING	EXISTING	EXISTING	
CLARIFIER 2	TS-3003	P-3003 RAS PUMP 1 TEMPERATURE SWITCH	---	EI-701-C	---	---	EXISTING	EXISTING	EXISTING	
CLARIFIER 2	MS-3003	P-3003 RAS PUMP 1 MOISTURE DETECT	---	EI-701-C	---	---	EXISTING	EXISTING	EXISTING	
CLARIFIER 2	TS-3004	P-3004 RAS PUMP 2 TEMPERATURE SWITCH	---	EI-701-C	---	---	EXISTING	EXISTING	EXISTING	
CLARIFIER 2	MS-3004	P-3004 RAS PUMP 2 MOISTURE DETECT	---	EI-701-C	---	---	EXISTING	EXISTING	EXISTING	
CLARIFIER 2	NSH-CLA-2A	CLARIFIER 2 LONG COLLECTOR TORQUE SWITCH	---	EI-701-C	---	---	EXISTING	EXISTING	EXISTING	
CLARIFIER 2	NSH-CLA-2B	CLARIFIER 2 CROSS COLLECTOR TORQUE SWITCH	---	EI-701-C	---	---	EXISTING	EXISTING	EXISTING	
TERTIARY TREATMENT	FE-4001	MAGNETIC FLOW METER	N/A	EI-701-D	0-4000 GPM	40 70 13	NEW	CONTRACTOR	CONTRACTOR	
TERTIARY TREATMENT	FIT-4001	TERTIARY FILTER INFLUENT FLOW	120V	EI-701-D	0-4000 GPM	40 70 13	NEW	CONTRACTOR	CONTRACTOR	
TERTIARY TREATMENT	PCV-4001	AIR TO SAND FILTERS	N/A	EI-701-D	BY VENDOR	**APPENDIX C**	NEW	VENDOR	VENDOR	GAUGE ON PCV, REFER TO NEXOM
TERTIARY TREATMENT	FE-4002	MAG FLOW METER	N/A	EI-701-D	0-4000 GPM	40 70 13	NEW	CONTRACTOR	CONTRACTOR	
TERTIARY TREATMENT	FIT-4002	TERTIARY FILTER EFFLUENT FLOW	120V	EI-701-D	0-4000 GPM	40 70 13	NEW	CONTRACTOR	CONTRACTOR	
TERTIARY TREATMENT	PI-4014	HEADLOSS PRESSURE GAUGE	N/A	EI-701-D	BY VENDOR	**APPENDIX C**	NEW	VENDOR	CONTRACTOR	REFER TO NEXOM
TERTIARY TREATMENT	PT-4014	HEADLOSS PRESSURE TRANSMITTER	LOOP	EI-701-D	BY VENDOR	**APPENDIX C**	NEW	VENDOR	CONTRACTOR	REFER TO NEXOM
TERTIARY TREATMENT	AE-4015	PH PHOSPHATE TERTIARY EFFLUENT ANALYZER	N/A	EI-701-D	0.05-15.00 mg/L	40 75 69	NEW	CONTRACTOR	CONTRACTOR	REFER TO MANUFACTURER FOR INSTALLATION
TERTIARY TREATMENT	AIT-4015	PH PHOSPHATE TERTIARY EFFLUENT ANALYZING TRANSMITTER	120V	EI-701-D	0.05-15.00 mg/L	40 75 69	NEW	CONTRACTOR	CONTRACTOR	REFER TO MANUFACTURER FOR INSTALLATION
TERTIARY TREATMENT	XV-4003	PNEUMATIC VALVE TO FIL-1	DISCRETE	EI-701-D	NC	**APPENDIX C**	NEW	VENDOR	CONTRACTOR	REFER TO NEXOM
TERTIARY TREATMENT	XV-4004	PNEUMATIC VALVE TO FIL-2	DISCRETE	EI-701-D	NC	**APPENDIX C**	NEW	VENDOR	CONTRACTOR	REFER TO NEXOM
TERTIARY TREATMENT	XV-4005	PNEUMATIC VALVE TO FIL-3	DISCRETE	EI-701-D	NC	**APPENDIX C**	NEW	VENDOR	CONTRACTOR	REFER TO NEXOM
TERTIARY TREATMENT	XV-4006	PNEUMATIC VALVE TO FIL-4	DISCRETE	EI-701-D	NC	**APPENDIX C**	NEW	VENDOR	CONTRACTOR	REFER TO NEXOM
TERTIARY TREATMENT	XV-4007	PNEUMATIC VALVE TO FIL-5	DISCRETE	EI-701-D	NC	**APPENDIX C**	NEW	VENDOR	CONTRACTOR	REFER TO NEXOM
TERTIARY TREATMENT	LSL-4008	OPERATING LEVEL FIL-1	DISCRETE	EI-701-D	BY VENDOR	**APPENDIX C**	NEW	VENDOR	CONTRACTOR	REFER TO NEXOM
TERTIARY TREATMENT	LSL-4009	OPERATING LEVEL FIL-2	DISCRETE	EI-701-D	BY VENDOR	**APPENDIX C**	NEW	VENDOR	CONTRACTOR	REFER TO NEXOM
TERTIARY TREATMENT	LSL-4010	OPERATING LEVEL FIL-3	DISCRETE	EI-701-D	BY VENDOR	**APPENDIX C**	NEW	VENDOR	CONTRACTOR	REFER TO NEXOM
TERTIARY TREATMENT	LSL-4011	OPERATING LEVEL FIL-4	DISCRETE	EI-701-D	BY VENDOR	**APPENDIX C**	NEW	VENDOR	CONTRACTOR	REFER TO NEXOM
TERTIARY TREATMENT	LSL-4012	OPERATING LEVEL FIL-5	DISCRETE	EI-701-D	BY VENDOR	**APPENDIX C**	NEW	VENDOR	CONTRACTOR	REFER TO NEXOM

LOCATION	INSTRUMENT TAG NO.	SERVICE DESCRIPTION	POWER	P&ID	SETPOINT/RANGE	SPECIFICATION	SCOPE	FURNISHED BY	INSTALLED BY	NOTES
TERTIARY TREATMENT	PSL-4013	LOW FILTER AIR PRESSURE SWITCH	DISCRETE	EI-701-D	BY VENDOR	**APPENDIX C**	NEW	VENDOR	CONTRACTOR	REFER TO NEXOM
TERTIARY TREATMENT	LT-4101	ALUM TANK LEVEL	LOOP	EI-702-D	0-5'	40 72 00	NEW	CONTRACTOR	CONTRACTOR	
TERTIARY TREATMENT	LI/LE-4101	REVERSE FLOAT LEVEL INDICATION	N/A	EI-702-D	0-5'	**43 41 43**	NEW	VENDOR	CONTRACTOR	
TERTIARY TREATMENT	YS-4102	ALUM LEAK DETECTOR SWITCH	120V	EI-702-D	NO	40 72 83	NEW	CONTRACTOR	CONTRACTOR	
TERTIARY TREATMENT	YE-4102A	LEAK DETECTOR PROBE IN PIPE TO IFAS TRAIN #1	N/A	EI-702-D	NO	40 72 83	NEW	CONTRACTOR	CONTRACTOR	
TERTIARY TREATMENT	YE-4102B	LEAK DETECTOR PROBE IN PIPE TO IFAS TRAIN #2	N/A	EI-702-D	NO	40 72 83	NEW	CONTRACTOR	CONTRACTOR	
TERTIARY TREATMENT	PI-4110	ALUM P-4101 DISCHARGE PRESSURE GAUGE	N/A	EI-702-D	BY VENDOR	**46 30 00**	NEW	VENDOR	VENDOR	
TERTIARY TREATMENT	FI-4111	ALUM P-4101 DISCHARGE ROTAMETER	N/A	EI-702-D	BY VENDOR	**46 30 00**	NEW	VENDOR	VENDOR	
TERTIARY TREATMENT	PI-4120	ALUM P-4102 DISCHARGE PRESSURE GAUGE	N/A	EI-702-D	BY VENDOR	**46 30 00**	NEW	VENDOR	VENDOR	
TERTIARY TREATMENT	FI-4121	ALUM P-4102 DISCHARGE ROTAMETER	N/A	EI-702-D	BY VENDOR	**46 30 00**	NEW	VENDOR	VENDOR	
TERTIARY TREATMENT	PI-4130	ALUM P-4103/P-4104 DISCHARGE PRESSURE GAUGE	N/A	EI-702-D	BY VENDOR	**46 30 00**	NEW	VENDOR	VENDOR	
TERTIARY TREATMENT	FI-4131	ALUM P-4103/P-4104 DISCHARGE ROTAMETER	N/A	EI-702-D	BY VENDOR	**46 30 00**	NEW	VENDOR	VENDOR	
TERTIARY TREATMENT	PI-4210	CAUSTIC SODA P-4201/P-4202 DISCHARGE PRESSURE GAUGE	N/A	EI-703-D	BY VENDOR	**46 30 00**	NEW	VENDOR	VENDOR	
TERTIARY TREATMENT	FI-4211	CAUSTIC SODA P-4201/P-4202 DISCHARGE ROTAMETER	N/A	EI-703-D	BY VENDOR	**46 30 00**	NEW	VENDOR	VENDOR	
TERTIARY LIFT STATION	ME-4301	P-4301 MOISTURE DETECTOR	N/A	EI-701-D1	NO	**43 25 00**	NEW	VENDOR	VENDOR	INTERNAL TO PUMP
TERTIARY LIFT STATION	TE-4301	P-4301 TEMPERATURE DETECTOR	N/A	EI-701-D1	NO	**43 25 00**	NEW	VENDOR	VENDOR	INTERNAL TO PUMP
TERTIARY LIFT STATION	ME-4302	P-4302 MOISTURE DETECTOR	N/A	EI-701-D1	NO	**43 25 00**	NEW	VENDOR	VENDOR	INTERNAL TO PUMP
TERTIARY LIFT STATION	TE-4302	P-4302 TEMPERATURE DETECTOR	N/A	EI-701-D1	NO	**43 25 00**	NEW	VENDOR	VENDOR	INTERNAL TO PUMP
TERTIARY LIFT STATION	ME-4303	P-4303 MOISTURE DETECTOR	N/A	EI-701-D1	NO	**43 25 00**	NEW	VENDOR	VENDOR	INTERNAL TO PUMP
TERTIARY LIFT STATION	TE-4303	P-4303 TEMPERATURE DETECTOR	N/A	EI-701-D1	NO	**43 25 00**	NEW	VENDOR	VENDOR	INTERNAL TO PUMP
TERTIARY LIFT STATION	LSHH-4307	TERTIARTY LIFT STATION WET WELL HIGH LEVEL	N/A	EI-701-D1	6'	40 72 00	NEW	CONTRACTOR	CONTRACTOR	
TERTIARY LIFT STATION	LSLL-4308	TERTIARY LIFT STATION WET WELL LOW LEVEL	N/A	EI-701-D1	3'	40 72 00	NEW	CONTRACTOR	CONTRACTOR	
TERTIARY LIFT STATION	LT-4309	TERTIARTY LIFT STATION WET WELL LEVEL	LOOP	EI-701-D1	0-9'	40 72 00	NEW	CONTRACTOR	CONTRACTOR	
TERTIARY LIFT STATION	PI-4310	P-4301 DISCHARGE PRESSURE GAUGE WITH ANNULAR SEAL	N/A	EI-701-D1	**0-60 PSI**	40 73 00	NEW	CONTRACTOR	CONTRACTOR	
TERTIARY LIFT STATION	PI-4311	P-4302 DISCHARGE PRESSURE GAUGE WITH ANNULAR SEAL	N/A	EI-701-D1	**0-60 PSI**	40 73 00	NEW	CONTRACTOR	CONTRACTOR	
TERTIARY LIFT STATION	PI-4312	P-4303 DISCHARGE PRESSURE GAUGE WITH ANNULAR SEAL	N/A	EI-701-D1	**0-60 PSI**	40 73 00	NEW	CONTRACTOR	CONTRACTOR	
DECANT LIFT STATION	MSH-7010	P-7010 MOISTURE SWITCH	N/A	EI-701-G2	NC	**43 25 00**	NEW	VENDOR	VENDOR	
DECANT LIFT STATION	TSH-7010	P-7010 TEMPERATURE SWITCH	N/A	EI-701-G2	NC	**43 25 00**	NEW	VENDOR	VENDOR	
DECANT LIFT STATION	MSH-7020	P-7020 MOISTURE SWITCH	N/A	EI-701-G2	NC	**43 25 00**	NEW	VENDOR	VENDOR	
DECANT LIFT STATION	TSH-7020	P-7020 TEMPERATURE SWITCH	N/A	EI-701-G2	NC	**43 25 00**	NEW	VENDOR	VENDOR	
DECANT LIFT STATION	LSH-7005	DECANT LIFT STATION WET WELL LEVEL HIGH SWITCH	N/A	EI-701-G2	4'	40 72 00	NEW	CONTRACTOR	CONTRACTOR	
DECANT LIFT STATION	LSL-7006	DECANT LIFT STATION WET WELL LEVEL LOW SWITCH	N/A	EI-701-G2	1'	40 72 00	NEW	CONTRACTOR	CONTRACTOR	
DECANT LIFT STATION	LT-7007	DECANT LIFT STATION WET WELL LEVEL	LOOP	EI-701-G2	0-4'	40 72 00	NEW	CONTRACTOR	CONTRACTOR	
DEWATERING BUILDING	FSL-8028	LOW POLYMER FEED SWITCH	N/A	EI-701-E	BY VENDOR	**APPENDIX E**	NEW	VENDOR	VENDOR	REFER TO VELODYNE
DEWATERING BUILDING	SV-8023	SOLENOID VALVE FROM AIR GAP PUMPS	120V	EI-701-E	NC	**APPENDIX E**	NEW	VENDOR	VENDOR	REFER TO VELODYNE
DEWATERING BUILDING	PI-8025	WATER TO POLYMER MIXER PRESSURE	N/A	EI-701-E	BY VENDOR	**APPENDIX E**	NEW	VENDOR	VENDOR	REFER TO VELODYNE
DEWATERING BUILDING	FI-8024	WATER TO POLYMER MIXER ROTAMETER	N/A	EI-701-E	BY VENDOR	**APPENDIX E**	NEW	VENDOR	VENDOR	REFER TO VELODYNE
DEWATERING BUILDING	TE-8001	P-8001 DRY RUN PROTECTION	N/A	EI-701-E	BY VENDOR	**43 25 57.01**	NEW	VENDOR	VENDOR	
DEWATERING BUILDING	TS-8001	P-8001 DRY RUN SWITCH	120V	EI-701-E	BY VENDOR	**43 25 57.01**	NEW	VENDOR	VENDOR	
DEWATERING BUILDING	PDSL-8026	LOW POLYMER PRESSURE DIFFERENTIAL SWITCH	N/A	EI-701-E	BY VENDOR	**APPENDIX E**	NEW	VENDOR	VENDOR	REFER TO VELODYNE
DEWATERING BUILDING	PI-8027	POLYMER DIFFERENTIAL PRESSURE GAUGE	N/A	EI-701-E	BY VENDOR	**APPENDIX E**	NEW	VENDOR	VENDOR	REFER TO VELODYNE
DEWATERING BUILDING	TE-8002	P-8002 DRY RUN PROTECTION	N/A	EI-701-E	BY VENDOR	**43 25 57.01**	NEW	VENDOR	VENDOR	
DEWATERING BUILDING	TS-8002	P-8002 DRY RUN SWITCH	120V	EI-701-E	BY VENDOR	**43 25 57.01**	NEW	VENDOR	VENDOR	
DEWATERING BUILDING	PI-8003	INLET SLUDGE FEED PRESSURE GAUGE WITH ANNULAR SEAL	N/A	EI-701-E	**-30 in. Hg - 6 PSI**	40 73 00	NEW	CONTRACTOR	CONTRACTOR	
DEWATERING BUILDING	PI-8004	SLUDGE FEED DISCHARGE PRESSURE GAUGE WITH ANNULAR SEAL	N/A	EI-701-E	**0-100 PSI**	40 73 00	NEW	CONTRACTOR	CONTRACTOR	
DEWATERING BUILDING	PSH-8004	HIGH SLUDGE FEED DISCHARGE PRESSURE SWITCH WITH ANNULAR SEAL	N/A	EI-701-E	70 PSI	40 73 00	NEW	CONTRACTOR	CONTRACTOR	

LOCATION	INSTRUMENT TAG NO.	SERVICE DESCRIPTION	POWER	P&ID	SETPOINT/RANGE	SPECIFICATION	SCOPE	FURNISHED BY	INSTALLED BY	NOTES
DEWATERING BUILDING	FE-8005	MAGNETIC FLOW METER	N/A	EI-701-E	0-15 GPM	40 70 13	NEW	CONTRACTOR	CONTRACTOR	
DEWATERING BUILDING	FIT-8005	FLOW FROM DIGESTERS	120V	EI-701-E	0-15 GPM	40 70 13	NEW	CONTRACTOR	CONTRACTOR	
DEWATERING BUILDING	TSH-SCP-1A	SCREW PRESS MOTOR HIGH TEMPERATURE SWITCH	N/A	EI-701-E	BY VENDOR	APPENDIX E	NEW	VENDOR	VENDOR	
DEWATERING BUILDING	TSH-SCP-1B	SCREW PRESS SPRAY MOTOR HIGH TEMPERATURE SWITCH	N/A	EI-701-E	BY VENDOR	**APPENDIX E**	NEW	VENDOR	VENDOR	
DEWATERING BUILDING	PT-8006	SCREW PRESS PRESSURE	LOOP	EI-701-E	VENDOR SPECIFIED	**APPENDIX E**	NEW	VENDOR	VENDOR	REFER TO HUBER SCREW PRESS
DEWATERING BUILDING	ZS-8007	SPRAY ARM HOME	N/A	EI-701-E	NO	**APPENDIX E**	NEW	VENDOR	VENDOR	REFER TO HUBER SCREW PRESS
DEWATERING BUILDING	ZS-8008	SPRAY ARM AWAY	N/A	EI-701-E	NO	**APPENDIX E**	NEW	VENDOR	VENDOR	REFER TO HUBER SCREW PRESS
DEWATERING BUILDING	SV-8009	SCREW PRESS SPRAY SOLENOID - PNEUMATIC CONE	120V	EI-701-E	NC	**APPENDIX E**	NEW	VENDOR	VENDOR	REFER TO HUBER SCREW PRESS
DEWATERING BUILDING	SV-8010	SCREW PRESS SPRAY SOLENOID - LOWER WASH #1	120V	EI-701-E	NC	**APPENDIX E**	NEW	VENDOR	VENDOR	REFER TO HUBER SCREW PRESS
DEWATERING BUILDING	SV-8011	SCREW PRESS SPRAY SOLENOID - LOWER WASH #2	120V	EI-701-E	NC	**APPENDIX E**	NEW	VENDOR	VENDOR	REFER TO HUBER SCREW PRESS
DEWATERING BUILDING	SV-8012	SCREW PRESS SPRAY SOLENOID - UPPER WASH #1	120V	EI-701-E	NC	**APPENDIX E**	NEW	VENDOR	VENDOR	REFER TO HUBER SCREW PRESS
DEWATERING BUILDING	SV-8014	SCREW PRESS AIR SOLENOID VALVE	120V	EI-701-E	NC	**APPENDIX E**	NEW	VENDOR	VENDOR	REFER TO HUBER SCREW PRESS
DEWATERING BUILDING	PSL-8015	SCREW PRESS AIR LOW PRESSURE SWITCH	N/A	EI-701-E	NO	**APPENDIX E**	NEW	VENDOR	VENDOR	REFER TO HUBER SCREW PRESS
DEWATERING BUILDING	PSL-8023	SCREW PRESS WATER SOLENOID VALVE	120V	EI-701-E	NC	**APPENDIX E**	NEW	VENDOR	CONTRACTOR	REFER TO HUBER SCREW PRESS
DEWATERING BUILDING	SSL-8014	CONVEYOR #1 LOW SPEED SWITCH	N/A	EI-701-E	0 RPM	40 05 93	NEW	CONTRACTOR	CONTRACTOR	
DEWATERING BUILDING	HS-8016	CONVEYOR #1 E-STOP PULL CORD	N/A	EI-701-E	NC	40 05 93	NEW	CONTRACTOR	CONTRACTOR	
DEWATERING BUILDING	ISH-8015	CONVEYOR #1 LOCKED ALARM	120V	EI-701-E	NC	40 05 93	NEW	CONTRACTOR	CONTRACTOR	
DEWATERING BUILDING	SSL-8020	CONVEYOR #2 LOW SPEED SWITCH	N/A	EI-701-E	**0 RPM**	40 05 93	NEW	CONTRACTOR	CONTRACTOR	
DEWATERING BUILDING	HS-8017	CONVEYOR #2 E-STOP PULL CORD	N/A	EI-701-E	NC	40 05 93	NEW	CONTRACTOR	CONTRACTOR	
DEWATERING BUILDING	ISH-8019	CONVEYOR #2 LOCKED ALARM	120V	EI-701-E	NC	40 05 93	NEW	CONTRACTOR	CONTRACTOR	
DEWATERING BUILDING	SSL-8022	CONVEYOR #3 LOW SPEED SWITCH	N/A	EI-701-E	**0 RPM**	40 05 93	NEW	CONTRACTOR	CONTRACTOR	
DEWATERING BUILDING	HS-8018	CONVEYOR #3 E-STOP PULL CORD	N/A	EI-701-E	NC	40 05 93	NEW	CONTRACTOR	CONTRACTOR	
DEWATERING BUILDING	ISH-8021	CONVEYOR #3 LOCKED ALARM	120V	EI-701-E	NC	40 05 93	NEW	CONTRACTOR	CONTRACTOR	
DEWATERING BUILDING	PI-8017	INLET SLUDGE FEED PRESSURE GAUGE WITH ANNULAR SEAL	N/A	EI-701-E	**-30 in. Hg - 6 PSI**	40 73 00	NEW	CONTRACTOR	CONTRACTOR	
DEWATERING BUILDING	PI-8018	SLUDGE FEED DISCHARGE PRESSURE GAUGE WITH ANNULAR SEAL	N/A	EI-701-E	**0-100 PSI**	40 73 00	NEW	CONTRACTOR	CONTRACTOR	
DEWATERING BUILDING	PSH-8018	HIGH SLUDGE FEED DISCHARGE PRESSURE SWITCH WITH ANNULAR SEAL	N/A	EI-701-E	70 PSI	40 73 00	NEW	CONTRACTOR	CONTRACTOR	
DEWATERING BUILDING	FSL-8102	LOW SUPPLY AIRFLOW SWITCH	N/A	EI-702-E	NO	23 09 23.14	NEW	CONTRACTOR	CONTRACTOR	
DEWATERING BUILDING	FSL-8103	LOW EXHAUST AIRFLOW SWITCH	N/A	EI-702-E	NO	23 09 23.14	NEW	CONTRACTOR	CONTRACTOR	
DEWATERING BUILDING	**YS-8105**	**PROCESS ROOM SMOKE DETECTED**	**24V**	**EI-702-E**	**NO**	**28 46 20**	**NEW**	**CONTRACTOR**	**CONTRACTOR**	
DEWATERING BUILDING	**YS-8106**	**ELECTRICAL ROOM SMOKE DETECTED**	**24V**	**EI-702-E**	**NO**	**28 46 20**	**NEW**	**CONTRACTOR**	**CONTRACTOR**	
DEWATERING BUILDING	**YS-8107**	**MECHANICAL ROOM SMOKE DETECTED**	**24V**	**EI-702-E**	**NO**	**28 46 20**	**NEW**	**CONTRACTOR**	**CONTRACTOR**	
DEWATERING BUILDING	**YS-8108**	**LAB SMOKE DETECTED**	**24V**	**EI-702-E**	**NO**	**28 46 20**	**NEW**	**CONTRACTOR**	**CONTRACTOR**	
DEWATERING BUILDING	**YS-8109**	**OFFICE SMOKE DETECTED**	**24V**	**EI-702-E**	**NO**	**28 46 20**	**NEW**	**CONTRACTOR**	**CONTRACTOR**	
DEWATERING BUILDING	**AE-8110**	**METHANE ANALYZER ELEMENT**	**N/A**	**EI-702-E**	**0-100%**	**40 76 23**	**NEW**	**CONTRACTOR**	**CONTRACTOR**	
DEWATERING BUILDING	AIT-8110	METHANE ANALYZER	120V	EI-702-E	0-100%	40 76 23	NEW	CONTRACTOR	CONTRACTOR	
DEWATERING BUILDING	PI-9001	PRESSURE GAUGE	N/A	EI-702-E	0-100 PSI	**22 11 24**	NEW	VENDOR	VENDOR	
DEWATERING BUILDING	LSL-9002	LOW TANK LEVEL SWITCH	N/A	EI-702-E	NC	**22 11 24**	NEW	VENDOR	VENDOR	
DEWATERING BUILDING	PI-9003	PRESSURE GAUGE	N/A	EI-702-E	0-100 PSI	**22 11 24**	NEW	VENDOR	VENDOR	
DEWATERING BUILDING	PIT-9004	AIR GAP DISCHARGE PRESSURE	LOOP	EI-702-E	0-100 PSI	**22 11 24**	NEW	VENDOR	VENDOR	
DEWATERING BUILDING	FE-9005	MAGNETIC FLOW METER	N/A	EI-702-E	0-180 GPM	**22 11 24**	NEW	VENDOR	VENDOR	
DEWATERING BUILDING	FIT-9005	AIRGAP DISCHARGE FLOW	120V	EI-702-E	0-180 GPM	**22 11 24**	NEW	VENDOR	VENDOR	
UV BUILDING	AE-301		---	EI-701-K	---	---	EXISTING	EXISTING	EXISTING	
UV BUILDING	AIT-301		---	EI-701-K	---	---	EXISTING	EXISTING	EXISTING	
UV BUILDING	AE-302		---	EI-701-K	---	---	EXISTING	EXISTING	EXISTING	
UV BUILDING	AIT-302		---	EI-701-K	---	---	EXISTING	EXISTING	EXISTING	
UV BUILDING	AE-305		---	EI-701-K	---	---	EXISTING	EXISTING	EXISTING	

LOCATION	INSTRUMENT TAG NO.	SERVICE DESCRIPTION	POWER	P&ID	SETPOINT/RANGE	SPECIFICATION	SCOPE	FURNISHED BY	INSTALLED BY	NOTES
UV BUILDING	AIT-305		---	EI-701-K	---	---	EXISTING	EXISTING	EXISTING	
UV BUILDING	AE-306		---	EI-701-K	---	---	EXISTING	EXISTING	EXISTING	
UV BUILDING	AIT-306		---	EI-701-K	---	---	EXISTING	EXISTING	EXISTING	

SECTION 40 70 00.1 – INSTRUMENTATION AND CONTROL, REFERENCES AND DEFINITIONS

1.1 REFERENCES

A. Code compliance:

1. As specified in Section 01 42 19 – Reference Standards.

   a. The publications are referred to in the text by basic designation only. The latest edition accepted by the Authority Having Jurisdiction of referenced publications in effect at the time of Bid governs.

2. The following codes and standards are hereby incorporated into this Section:

   a. American National Standards Institute (ANSI).

   b. International Organization for Standardization (ISO):

      1) 9001 – Quality Management Systems – Requirements.

   c. International Society of Automation (ISA):

      1) 5.1 – Instrumentation Symbols and Identification.

      2) 5.4 – Instrument Loop Diagrams.

      3) 20 – Specification Forms for Process Measurement and Control Instruments, Primary Elements, and Control Valves.

   d. National Electrical Manufacturers Association (NEMA):

      1) 250 – Enclosures for Electrical Equipment (1000 V Maximum).

   e. National Fire Protection Association (NFPA).

   f. National Institute of Standards and Technology (NIST).

   g. Underwriters Laboratories, Inc. (UL):

      1) 508 – Standard of Safety for Industrial Control Equipment.

      2) 508A – Standard of Safety for Industrial Control Panels.

B. Compliance with Laws and Regulations:

1. As specified in accordance with requirements of industry standards defined in 1.1.A. and other Contract Documents.

1.2 DEFINITIONS

A. Definitions of terms and other electrical and instrumentation considerations in accordance with:

1. Factory Mutual (FM).

2. International Electrotechnical Commission (IEC).

3. Institute of Electrical and Electronics Engineers (IEEE).

4. International Society of Automation (ISA).

5. International Organization for Standardization (ISO).

6. National Electrical Code (NEC).

7. National Electrical Manufacturers Association (NEMA).

8. InterNational Electrical Testing Association (NETA).

9. National Fire Protection Association (NFPA).

10. National Institute of Standards and Technology (NIST).

11. Underwriters Laboratories (UL).

B. Specific definitions:

1. Control circuit: Any circuit operating at 120 volts alternating current (VAC) or direct current (VDC) or less, whose principal purpose is the conveyance of information (including performing logic) and not the conveyance of energy for the operation of an electrically powered device.

2. Panel: An instrument support system that may be a flat surface, a partial enclosure, or a complete enclosure for instruments and other devices used in process control systems. Unless otherwise specified or clearly indicated by the context, the term “panel” in these Contract Documents is interpreted as a general term, which includes flat surfaces, enclosures, cabinets and consoles.

3. Power circuit: Any circuit operating at 90 volts (AC or DC) or more, whose principal purpose is the conveyance of energy for the operation of an electrically powered device.

4. Signal circuit: Any circuit operating at less than 50 VAC or VDC, which conveys analog information or digital communications information.

5. Digital bus: A communication network, such as PROFIBUS, Foundation Fieldbus, or DeviceNet, allowing instruments and devices to transmit data, control functions and diagnostic information.

6. 2-Wire transmitter (loop powered): A transmitter that derives its operating power supply from the signal transmission circuit and requires no separate power supply connections. As used in this Section, two-wire transmitter refers to a transmitter that provides 4 to 20 milliamperes current regulation of a signal in a series circuit with an external 24 VDC driving potential.

7. Powered transmitters: A transmitter that requires a separate power source (120 VAC, 240 VAC, etc.) in order for the transmitter to develop its signal. As used in this Section, the produced signal may be a 4 to 20 milliampere current signal, a digital bus communications signal or both.

8. System supplier - As specified in SI Qualifications in the Quality Assurance article of this Section.

9. Modifications: Changing, extending, interfacing to, removing or altering an existing circuit.

C. NEMA:

1. Type 1 enclosure in accordance with NEMA 250.

2. Type 2 enclosure in accordance with NEMA 250.

3. Type 3 enclosure in accordance with NEMA 250.

4. Type 3R enclosure in accordance with NEMA 250.

5. Type 3S enclosure in accordance with NEMA 250.

6. Type 3X enclosure in accordance with NEMA 250.

7. Type 3RX enclosure in accordance with NEMA 250.

8. Type 3SX enclosure in accordance with NEMA 250.

9. Type 4 enclosure in accordance with NEMA 250.

10. Type 4X enclosure in accordance with NEMA 250.

11. Type 5 enclosure in accordance with NEMA 250.

12. Type 6 enclosure in accordance with NEMA 250.

13. Type 6P enclosure in accordance with NEMA 250.

14. Type 12 enclosure in accordance with NEMA 250.

15. Type 12K enclosure in accordance with NEMA 250.

16. Type 13 enclosure in accordance with NEMA 250.

D. Acronym definitions:

1. CCS: The SCADA central computer system (CCS) consisting of personal computers and software. The personal computer-based hardware and software system that includes the operator interface, data storage, data retrieval, archiving, alarming, historian, reports, trending, and other higher level control system software and functions.

2. DPDT: Double-pole, double-throw.

3. ES: Enterprise system: Computer based communications or data sharing system utilized for non-process control functions such as E-mail, sharing files, creating documents, etc.

4. FAT: Factory acceptance test.

5. HART: Highway addressable remote transducer.

6. HOA: Hand-Off-Auto control function that is totally PLC based. In the Hand mode, equipment is started or stopped, valves are opened or closed through operator direction under the control of the PLC software. In the Auto mode, equipment is started or stopped and valves are opened or closed through a control algorithm within the PLC software. In the Off mode, the equipment is prohibited from responding from the PLC control.

7. HMI: Human machine interface: PLC based operator interface device consisting of an alphanumeric or graphic display with operator input functionality. The HMI is typically a flat panel type of display mounted on the front of a PLC enclosure with either a touch screen or tactile button interface.

8. IJB: Instrument junction boxes: A panel designed with cord sets to easily remove, replace or relocate instrument signals.

9. I/O: Input/Output.

10. IP: Internet protocol or ingress protection.

11. LCP: Local control panel: Operator interface panel that may contain an HMI, pilot type control devices, operator interface devices, control relays, etc. and does not contain a PLC or RIO.

12. LAN: Local area network: A control or communications network that is limited to the physical boundaries of the facility.

13. LOR: Local-Off-Remote control function. In the Remote mode, equipment is started or stopped, and valves are opened or closed through the PLC based upon the selection of the HOA. In the Local mode, equipment is started or stopped, valves are opened or closed based upon hardwired control circuits completely independent of the PLC with minimum interlocks and permissive conditions. In the Off mode, the equipment is prohibited from responding to any control commands.

14. NJB: Network junction box. An enclosure that contains multiple access points to various networks within the facility. Networks could be Ethernet, Ethernet/IP, Fieldbus, RIO etc.

15. OIT: Operator interface terminal: PC-based interface device used for operator interface with the SCADA system.

16. P&ID: Process and instrumentation diagram.

17. PC: Personal computer.

18. PCIS: Process control and instrumentation system: Includes the entire instrumentation system, the entire control system, and all of the Work specified in the Instrumentation and Control Specifications and depicted on the Instrumentation Drawings.

19. PCM: Process control module: An enclosure containing any of the following devices: PLC, RTU, or RIO.

20. PJB: Power junction box: An enclosure with terminal blocks that distribute power to multiple instruments.

21. PLC: Programmable logic controller.

22. RIO: Remote I/O device for the PLC consisting of remote I/O racks, or remote I/O blocks.

23. RTU: Remote telemetry unit: A controller typically consisting of a PLC, and a means for remote communications. The remote communications devices typically are radios, modems, etc.

24. SAT: Site acceptance test.

25. SCADA: Supervisory control and data acquisition system: A general name for the computerized system that gathers and processes data from sensors and applies operational controls to the process equipment. It includes the PLCs and/or RTUs, HMI PLC-based operator interface units, related interconnecting communications systems, and the CCS operator interface and data management system.

26. SI: System Integrator: Subcontractor who specializes in the design, construction, fabrication, software development, installation, testing, and commissioning of industrial instrumentation and control systems.

27. SPDT: Single-pole, double-throw.

28. SPST: Single-pole, single-throw.

29. UPS: Uninterruptible power supply.

30. VCP: Vendor control panel: Control panels that are furnished with particular equipment by a vendor other than the SI. These panels may contain PLCs, RIO, OIT, HMI, etc.

31. WAN: Wide area network: A control or communications network that extends beyond the physical boundaries of the facility.

END OF SECTION 40 70 00.1

SECTION 40 70 00.2 – INSTRUMENTATION AND CONTROL, SYSTEM DESCRIPTION

1.1 SYSTEM DESCRIPTION

A. System Integrator (SI)

1. Keller Associates will be completing the SCADA and PLC programming and integration under separate contract with the Owner (to be excluded from Contractor scope and bid). Contractor is to provide hardware and software as identified in the design documentation and in coordination with Keller Associates following award of bid.

B. Scope of Work

1. PCIS Network Upgrades.

a. Existing PCIS Network.

1) The current Ethernet switch based PCIS network originates from building H (electrical building) and extends out in a star configuration to existing PLCs at the UV building, clarifiers, and blower buildings. A fiber optic cable and patch panel connects the network to the headworks building.

2) Each existing location has existing unmanaged ethernet switches.

3) SCADA center is currently located in building F. This shall be moved to building E.

b. PCIS Network Upgrades. – To be Provided by the Contractor

1) Provide and install new single mode fiber where specified.

2) Provide and install new industrial Ethernet switches for new PLC locations and remote IO panels. **Refer to panel designs to be provided by Keller Associates as part of future Addendum.**

3) Coordinate with internet service provider for final size needed for DNE-100-E. Provide and install managed ethernet switch Allen Bradley 1783-CMS20DP or equal approved by engineer.

4) Refer to EI-700 for network configuration.

2. PCIS PLCs – To be Provided by the Contractor.

a. PLC-100-E

3. Package System Interfaces. Provide SCADA interface to the following vendor supplied package systems. Where vendor systems do not include PLCs, interface shall be via hard wired I/O as described in these specifications. Where vendor system includes a PLC, interface shall be in the form of message commands or produced/consumed tags between SCADA PLCs and vendor PLCs or via direct communications between vendor PLCs and SCADA software. Package system providers will be required to supply a list of data addresses for SCADA interface requirements. Package systems include:

    a. Fine screen. SCR-1

    b. Fine screen. SCR-2

    c. Headworks lift station. LCP-HWLS

    d. IFAS. PLC-100-B2

    e. LCP-RAS-1

    f. LCP-RAS-2

    g. Tertiary filter air control panel. VCP-4000

    h. Alum chemical dosing pump skids (x2)

    i. Caustic soda chemical dosing pump skid.

    j. Dewatering screw press (SCP-1)

    k. Polymer feed skid (VCP-LPF-1)

    l. Dewatering conveyors

    m. Air Gap skid

4. Instrumentation. Contractor to provide and install control system instrumentation as described in the drawings and specifications. Refer to 40 70 00 A – Device List for complete list of instrumentation.

5. Control Panels. Contractor to provide control panels as described in the drawings and specifications. Refer to 40 67 00 – Control Panels

6. Contractor to provide conduit and cable for associated instrumentation and control as described in the drawings and specifications. Refer to cable schedules in drawings.

7. Programming/Startup/Commissioning/Training. Provide complete system installation, programming, commissioning, and training as described in these drawings and specifications and as necessary to provide a complete and functional instrumentation and control system.

C. Control system installation and startup constraints:

1. Every effort shall be made to minimize downtime and maintain SCADA access to existing PLC hardware during construction and startup.

2. All PCIS and network outages shall be scheduled and pre-approved by the Engineer. The Contractor shall submit a PCIS and network cutover plan to the Engineer for approval.

3. The new SCADA server shall be fully and completely tested as specified prior to installation, cut over, and commissioning. The existing SCADA server shall remain in service through the duration of construction until the new SCADA server is prepared and ready to be put online.

4. The new network shall be fully installed, terminated, tested per specifications, and approved by the Engineer prior to cut-over from the existing network. This includes all patch panels, network switches, cables, fiber jumpers, and patch cords.

D. General requirements:

1. The Work includes everything necessary for and incidental to executing and completing the Instrumentation and Control System Work indicated on the Drawings and specified in the Specifications and reasonably inferable there from including but not limited to:

a. Preparing hardware submittals for field instrumentation.

b. Design, develop, and draft control panel designs and all other drawing submittals specified in the Instrumentation and Control Specifications.

c. Prepare the test plan, the training plan, and the spare parts submittals.

d. Provide all SCADA system hardware and software as indicated in the documentation.

e. Fabricate panels.

f. Perform factory tests on panels.

g. Perform bench calibration and verify calibration after installation.

h. Oversee and certify installation of the PCIS.

i. Oversee, document, and certify loop testing.

j. Oversee, document, and certify system pre-commissioning.

k. Conduct the performance tests.

l. Prepare operation and maintenance manuals.

m. Conduct training classes.

n. Integrate the PCIS with instrumentation and control devices provided under other sections.

o. Prepare Record Drawings.

1) Develop all Record Drawings associated with instruments and equipment provided under the scope of this contract.

2) Contract Documents and all Owner furnished and any existing equipment the system is interfacing.

p. Resolve signal, power, or functional incompatibilities between the PCIS and interfacing devices.

q. Perform all required corrective and preventative maintenance.

2. Coordinate all aspects of the Work between Contractor and all subcontractors before bidding to ensure that all costs associated with a complete installation are included. The Owner is not responsible for any change orders due to lack of coordination of the Work between the Contractor, the SI, the other subcontractors or suppliers.

3. Furnish detailed, complete, and thorough operations and maintenance documentation, including but not limited to operations manuals, maintenance manuals, as-built wiring drawings, training manuals, as-built software documentation, and all other documentation required to operate, modify, and maintain all parts of the PCIS.

4. Portions of this Project involve installation in existing facilities and interfaces to existing circuits, power systems, controls, and equipment. Perform and document detailed field investigations of existing conditions (circuits, power systems, controls, equipment, etc.) before performing any Work.

5. Defective Work:

a. As specified in Section C-700 – General Conditions.

E. Operating facility:

1. Portions of this existing facility must remain fully functional throughout the entire construction period. In consideration of this requirement, comply with the following guidelines:

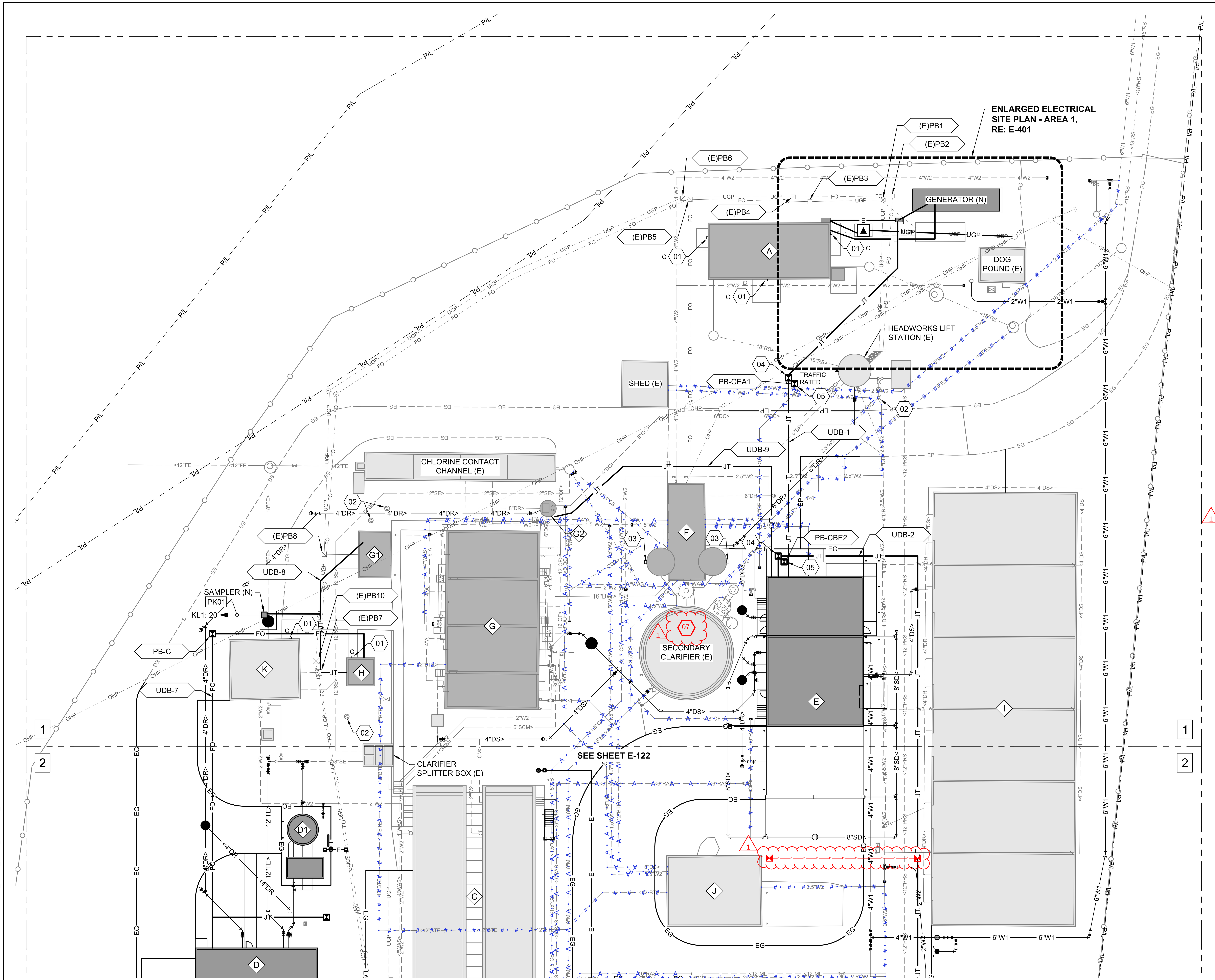
a. All outages must be of minimal duration and fully coordinated and agreed to by the Owner. Adjust the construction to meet the requirements of the Owner.

b. As weather and facility demand conditions dictate, re-adjust the construction schedule to meet the demands placed upon the Owner by its users.

2. The Contractor is responsible for the integrity and measurement accuracy of all loops. However, any defect found in existing equipment is the responsibility of the Owner.

3. The standards of documentation, instrument tagging, cable and conductor termination, terminal identification and labeling that apply to the new installation apply equally to the existing installation effected by this work.

END OF SECTION 40 70 00.2



0 20 40

GENERAL SHEET NOTES

1. RE: E-001 FOR GENERAL ELECTRICAL NOTES
2. RE: E039 FOR UNDERGROUND JUNCTION BOX DETAIL.

SHEET KEYNOTES

01 EXISTING WALL PACK LIGHT TO BE REPLACED WITH NEW. FIELD VERIFY EXISTING CIRCUITRY AND PROVIDE COMPATIBLE LED REPLACEMENT FIXTURE.

02 EXISTING SITE LIGHT POLE AND FIXTURE TO REMAIN. RETAIN AND PROTECT.

03 EXISTING SITE LIGHT TO BE REMOVED. DISCONNECT AND REMOVE ALL ASSOCIATED CONDUIT AND WIRING BACK TO SOURCE.

04 3'X3'X3' SITE PULL BOX FOR POWER.

05 2'X2'X2' SITE PULL BOX FOR COMMUNICATIONS.

06 EXISTING SITE LIGHT TO BE UPGRADED WITH NEW LAMP/DRIVER.

07 DISCONNECT AND REMOVE EXISTING CLARIFIER AND CLRIFIER PUMP ELECTRICAL.

EQUIPMENT KEYNOTES

A-MCB-2	MAIN CIRCUIT BREAKER
ATS-02	AUTOMATIC TRANSFER SWITCH
GEN	GENERATOR

STRUCTURE DESIGNATORS

A	HEADWORKS (E)
B2	IFAS BLOWER BUILDING (N)
C	CLARIFIER (E)
D	TERTIARY BUILDING (N)
D1	TERTIARY LIFT STATION (N)
E	CONTROL & DEWATERING BUILDING (N) (ROOF OVERHANG NOT SHOWN, RE: S-100-E)
F	CONTROL BUILDING (E)
G	DIGESTERS (E)
G1	DIGESTER BLOWER BUILDING (E)
G2	DECANT LIFT STATION (E)
H	ELECTRICAL BUILDING (E)
I	SLUDGE DRYING BEDS (E)
J	MAINTENANCE BUILDING (E)
K	UV BUILDING (E)

KEY PLAN

1 2

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PROFESSIONAL ENGINEER, LICENSED, 15164, 8/9/2024, STATE OF IDAHO, ADAM L. NEIWERT

NO.	REVISIONS	DATE
1	ADDENDUM NO. 4	8/9/2024

City of Aberdeen

ABERDEEN WWTP IMPROVEMENTS

ELECTRICAL SITE PLAN - AREA 1

DRAWN: TLL CHECK: ALN

VERIFY SCALE: Scales based on 22"x34" prints.
1-1/2 Inches

PROJECT NO. 222032 PAGE

SHEET NO. E-121

J:\222032 ABERDEEN WW IMPR\C_DESN_CAD\3_DESIGN\D_PLANS-108_ELEC\E-121.DWG LAST SAVED: 5/29/2024 4:02 PM PRINTED: 6/14/2024 7:55 AM

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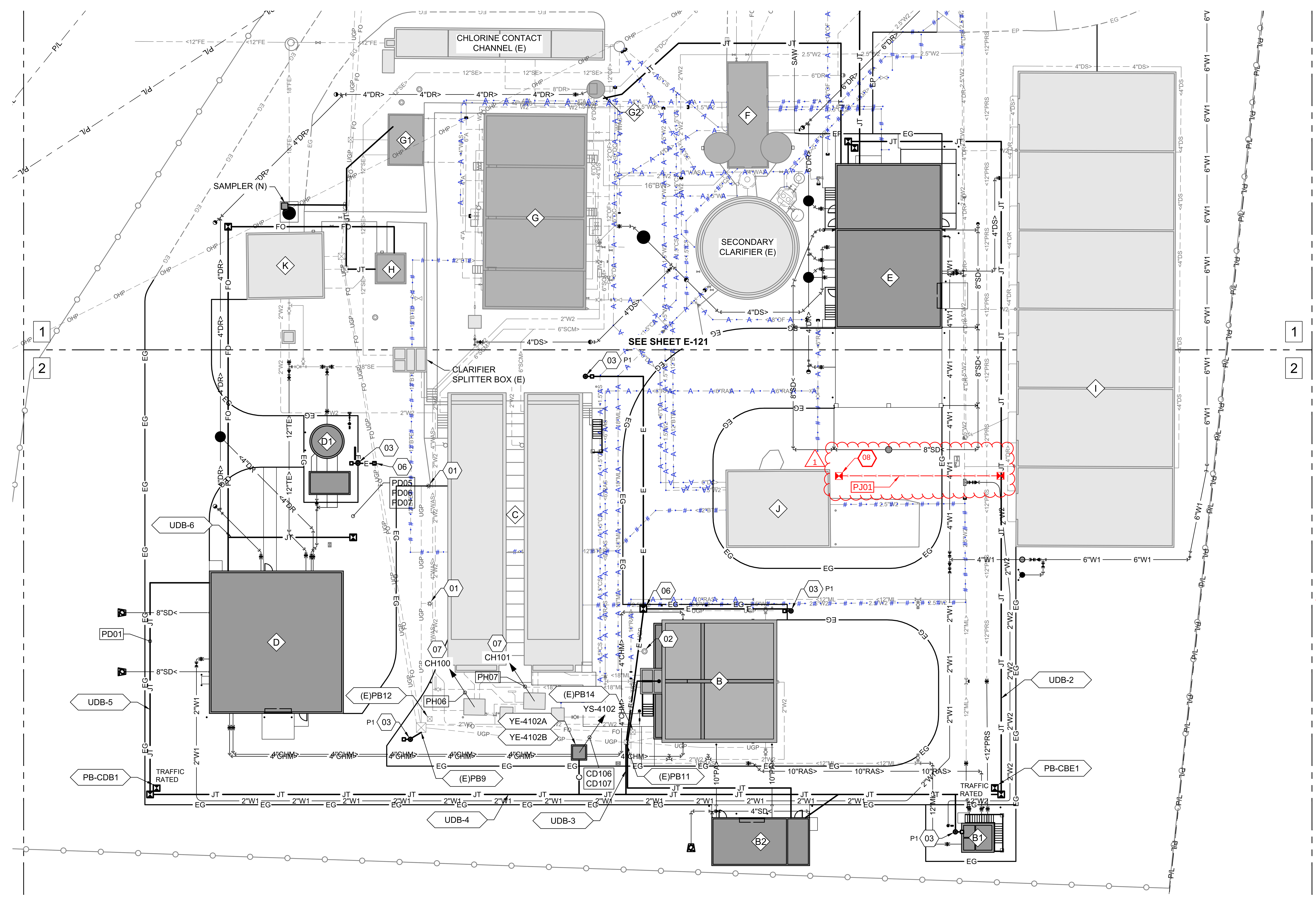


LUMINAIRE SCHEDULE

FIXTURE ID	MANUFACTURER	CATALOG	DESCRIPTION	MOUNTING	MOUNTING HEIGHT	LAMP TYPE	VOLTS	WATTS	NOTES
P1	LITHONIA	DSX1-LED-P5-40K-70CRI-T5W-MVOLT-SPA-DDBXD	LED LIGHT POLE FIXTURE, 4000K	POLE	25'	LED	120	142	
P2	LITHONIA	DSX1-LED-P5-40K-70CRI-T5W-MVOLT-SPA-DDBXD	LED LIGHT POLE FIXTURE, 4000K	POLE	25'	LED	120	284	
P1 POLE	KW	SSP25-4-11-BRZ-DM10-BC	25' LIGHT POLE SINGLE HEAD	POLE	25'	LED	120	0	
P2 POLE	KW	SSP25-4-11-BRZ-DM2180-BC	25' LIGHT POLE DUAL HEAD	POLE	25'	LED	120	0	
C	LITHONIA	DSXW1-LED-10C-1000-40K-T3M-MVOLT-DDBXD	LED WALL PACK, 4000K	WALL		LED	120	44	

GENERAL SHEET NOTES

1. RE: E-001 FOR GENERAL ELECTRICAL NOTES
2. RE: E039 FOR UNDERGROUND JUNCTION BOX DETAIL.

SHEET KEYNOTES

01 EXISTING SITE LIGHTING FIXTURE TO BE DEMOLISHED. MAINTAIN CIRCUITRY TO DOWNSTREAM DEVICES.

02 EXISTING SITE LIGHT POLE AND FIXTURE TO REMAIN. RETAIN AND PROTECT.

03 NEW SITE LIGHTING BASE, POLE AND FIXTURE. CIRCUIT TO EXISTING SITE LIGHTING CIRCUIT ROUTED TO PANEL H-ELCP-01 LOCATED IN BUILDING H. RE: E006

04 3'X3'X3' SITE PULL BOX FOR POWER.

05 2'X2'X2' SITE PULL BOX FOR COMMUNICATIONS.

06 2'X1'X1' SITE PULL BOX FOR LIGHTING.

07 NEW ACTUATORS FOR WAS VALVES FCV-3001 AND FCV-3002 TO BE INSTALLED. RECONNECT EXISTING CABLE AND CONDUIT.

08 INSTALL CONDUIT WTIH PULL CORD FOR FUTURE ELECTRIAL IMPROVEMENTS TO BUILDING J. TERMINATE IN AN ACCESSIBLE PULL BOX. VERIFY EXACT LOCATION PRIOR TO ROUGH-IN.

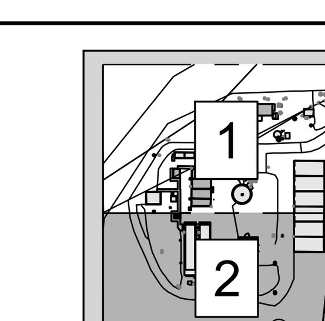
EQUIPMENT KEYNOTES

YE-4102A ALUM LEAK DETECTOR PROBE
YE-4102B ALUM LEAK DETECTOR PROBE

STRUCTURE DESIGNATORS

B IFAS (E)
B1 IFAS SPLITTER BOX (N)
B2 IFAS BLOWER BUILDING (N)
C CLARIFIER (E)
D TERTIARY BUILDING (N)
D1 TERTIARY LIFT STATION (N)
E CONTROL & DEWATERING BUILDING (N) (ROOF OVERHANG NOT SHOWN, RE: S-100-E)
F CONTROL BUILDING (E)
G DIGESTERS (E)
G1 DIGESTER BLOWER BUILDING (E)
G2 DECANT LIFT STATION (E)
H ELECTRICAL BUILDING (E)
I SLUDGE DRYING BEDS (E)
J MAINTENANCE BUILDING (E)
K UV BUILDING (E)

KEY PLAN



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PROFESSIONAL ENGINEER 15164 8/19/2024 STATE OF IDAHO ADAM L. NEIWERT

NO.	REVISIONS	DATE
1	ADDENDUM NO. 4	8/9/2024

City of Aberdeen

ABERDEEN WWTP IMPROVEMENTS

ELECTRICAL SITE PLAN - AREA 2

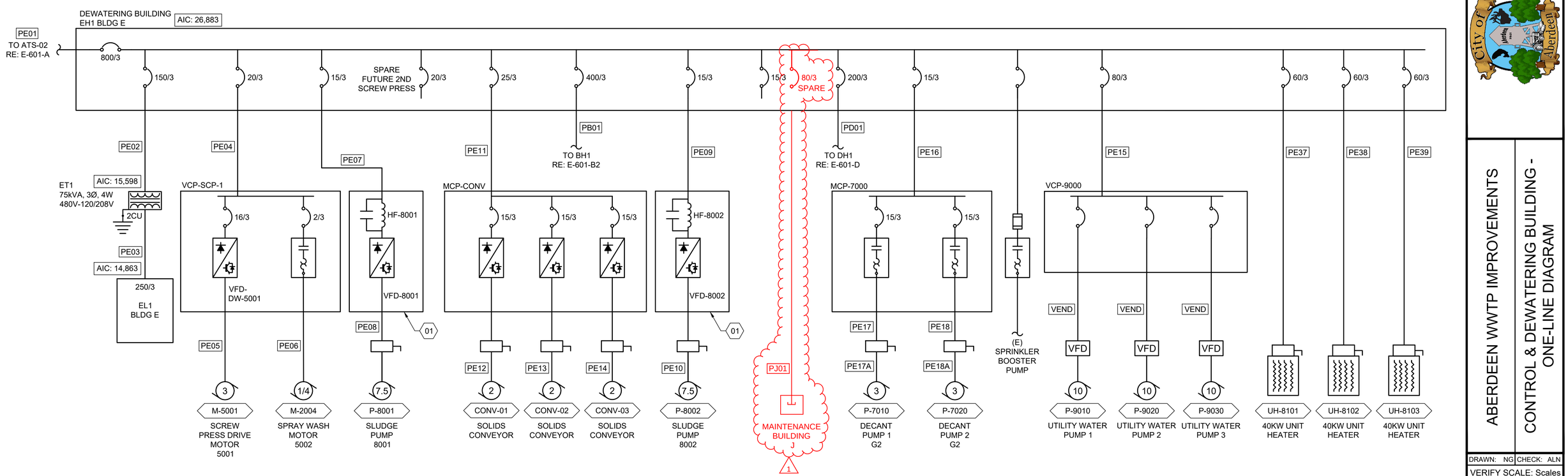
DRAWN: TLL CHECK: ALN

VERIFY SCALE: Scales based on 22"x34" prints.
1-1/2 Inches

PROJECT NO. 222032
PAGE
SHEET NO. E-122

GENERAL SHEET NOTES

1. VFD TO BE PROVIDED WITH PASSIVE HARMONIC FILTER FOR HARMONIC MITIGATION.



A1 CONTROL & DEWATERING BUILDING ONE-LINE DIAGRAM

N.T.S.

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PROFESSIONAL ENGINEER
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Adam L. Newiert
15164
06/19/2024
STATE OF IDAHO
ADAM L. NEIWERT

NO.	REVISIONS	DATE
1	ADDENDUM NO. 4	8/9/2024

ABERDEEN WWTP IMPROVEMENTS

CONTROL & DEWATERING BUILDING - ONE-LINE DIAGRAM

DRAWN: NG | CHECK: ALN

VERIFY SCALE: Scales based on 22"x34" prints.

1-1/2 Inches

PROJECT NO. 222032 | PAGE

SHEET NO. E-601-E

PANEL NAME: EH1

LOCATION: DEWATER BLDG
FED FROM: ATS-02
MOUNTING: SURFACE

VOLTAGE: 480Y/277
PHASE & WIRE: 3PH 4W
AIC RATING: 42K
ENCLOSURE: N3R

BUS: 800A
FEED: BOTTOM
MAIN BREAKER: 800A
SPACES: 54

NOTES:

NOTES	CIRCUIT DESCRIPTION	CODE	LOAD	POLE	BKR	CKT	PH	CKT	BKR	POLE	LOAD	CODE	CIRCUIT DESCRIPTION	NOTES
			14494			1	A	2			2382			
	PANEL EL1 VIA ET1		10274	3	150	3	B	4	20	3	2382		VCP-SCP-1	
			14537			5	C	6			2382			
			2382			7	A	8			1330			
	VCP-SCP-2 (FUTURE)		2382	3	20	9	B	10	15	3	1330		SLUDGE FEED PUMP 8001 (VFD)	
			2382			11	C	12			1330			
		H	13333			13	A	14			1330			
	UH-8101	H	13333	3	60	15	B	16	15	3	1330		SLUDGE FEED PUMP 8002 (VFD)	
		H	13333			17	C	18			1330			
		H	13333			19	A	20			1330			
	UH-8102	H	13333	3	60	21	B	22	25	3	1330		MCP-CONV	
		H	13333			23	C	24			1330			
		H	13333			25	A	26			2382			
	UH-8103	H	13333	3	50	27	B	28	20	3	2382		MCP-7000	
		H	13333			29	C	30			2382			
			6000			31	A	32			7756			
	WH-8101		6000	3	30	33	B	34	80	3	7756		VCP-9000	
			6000			35	C	36			7756			
			80127			37	A	38			41893			
	BH1		77945	3	400	39	B	40	200	3	41324		PANEL DH1	
			79477			41	C	42			41040			
1						43	A	44						
	JH1 (FUTURE)			3	80	45	B	46						
						47	C	48						
						49	A	50						
						51	B	52						
						53	C	54						

CONNECTED VA PHASE A:	201403.5	**% CONNECTED VA PHASE A:**	34%
CONNECTED VA PHASE B:	194432.5	**% CONNECTED VA PHASE B:**	33%
CONNECTED VA PHASE C:	199943.5	**% CONNECTED VA PHASE C:**	34%

TOTAL VA:	595779.4		
CONNECTED AMPS:	716.6		
DIVERSITY:	0.8	**DIVERSIFIED AMPS:**	572.3

PANEL NAME: EL1

LOCATION: DEWATER BLDG
FED FROM: EL1 VIA ET1
MOUNTING: SURFACE

VOLTAGE: 208Y/120
PHASE & WIRE: 3PH 4W
AIC RATING: 22K
ENCLOSURE: N3R

BUS: 250A
FEED: BOTTOM
MAIN BREAKER: 250A
SPACES: 54

NOTES: 3 GFCI BREAKER FOR PERSONNEL PROTECTION 5mA

NOTES	CIRCUIT DESCRIPTION	CODE	LOAD	POLE	BKR	CKT	PH	CKT	BKR	POLE	LOAD	CODE	CIRCUIT DESCRIPTION	NOTES
	INTERIOR LIGHTS		656	1	20	1	A	2	20	1	801		DEWATERING ROOM LIGHTS	
	EXTERIOR LIGHTS		209	1	20	3	B	4	20	1	400		LCP-100-E	
	ELEC ROOM RECEPTACLES		720	1	20	5	C	6	50	2	3952		FN-8102	
	OUTDOOR RECEPTACLES		180	1	20	7	A	8			3952			
	POLYMER PUMP LPF-1		1440	1	20	9	B	10			0			
	POLYMER PUMP LPF-2 (F)		0	1	20	11	C	12	30	3	0		SPARE	
	RESTROOM RECEPTACLES		720	1	20	13	A	14			0			
3	WATER FOUNTAIN		600	1	20	15	B	16	50	2	0		SPARE	
	LAB EQUIPMENT RECEPTACLES		540	1	20	17	C	18			0			
	LAB REFRIGERATOR		360	1	20	19	A	20	20	2	180		LAB COUNTER TOP RECEPT	
	LAB MICROWAVE		360	1	20	21	B	22	20	1	720		OFFICE RECEPTACLES	
	CU-8101		2360	2	25	23	C	24	50	1	1500		OVEN RECEPTACLE	
			2360			25	A	26			1500			
	CU-8102		2360	2	30	27	B	28	20	1	180		LAB HOOD RECEPTACLE	
			2360			29	C	30	20	1	1200		WASHING MACHINE	
	DRYER		2000	2	30	31	A	32			1105			
			2000			33	B	34	20	3	1105		FCP-F8101	
	SUMP PUMP		500	1	20	35	C	36			1105			
	DNE-100-E		500	1	20	37	A	38	20	1	180		COMPRESSOR RECEPTACLE	
	DEWATERING ROOM RECEPTACLES		720	1	20	39	B	40	20	1	180		COMPRESSOR RECEPTACLE	
	EF-8102		300	1	15	41	C	42						
						43	A	44						
						45	B	46						
						47	C	48						
						49	A	50						
						51	B	52						
						53	C	54						

CONNECTED VA PHASE A:	14494	**% CONNECTED VA PHASE A:**	37%
CONNECTED VA PHASE B:	10274	**% CONNECTED VA PHASE B:**	26%
CONNECTED VA PHASE C:	14537	**% CONNECTED VA PHASE C:**	37%

TOTAL VA:	39305		
CONNECTED AMPS:	109.1		
DIVERSITY:	1.0	**DIVERSIFIED AMPS:**	109.1

LCP NAME: LCP-SP-01 SCREW PRESS PANEL

LOCATION:
FED FROM:
MOUNTING: SURFACE

VOLTAGE: 480Y/277
PHASE & WIRE: 3PH 4W
AIC RATING: 42K
ENCLOSURE: N1

HORIZ. BUS:
VERT. BUS:
FEED: BOTTOM
MAIN:

MOTOR LOADS

LOAD	HP	MOTOR FLA	STARTER	SPACE FACTOR	LOAD TYPE	DESIGN AMPACITY
M-5001 SP DRIVE MOTOR	2	3.4	VFD		CONTINUOUS	4.3
M-5002 SPRAY WASH MOTOR	0.25	0.4	FVNR		CONTINUOUS	0.5
P-5003 SLUDGE PUMP	3	4.8	VFD		CONTINUOUS	6.0

NON-MOTOR LOADS

LOAD	VA	CONNECTED AMPS	BREAKER	SPACE FACTOR	LOAD TYPE	DESIGN AMPACITY
CONTROL PANEL						

SUBTOTAL:	10.8
+25% OF LARGEST MOTOR:	1.2
TOTAL AMPS:	12.0
FEEDER AMPACITY:	

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PROFESSIONAL ENGINEER LICENSED Adam L. Neiwert 15164 06/19/2024 STATE OF IDAHO ADAM L. NEIWERT

NO.	REVISIONS	DATE
1	ADDENDUM NO. 4	8/9/2024

City of Aberdeen

ABERDEEN WWTP IMPROVEMENTS

CONTROL & DEWATERING BUILDING - ELECTRICAL SCHEDULES

DRAWN: NG | CHECK: ALN

VERIFY SCALE: Scales based on 22"x34" prints.
1-1/2 Inches

PROJECT NO. 222032 | PAGE

SHEET NO. E-602-E

ELECTRICAL CABLE AND CONDUIT SCHEDULE

CONDUIT TAG	REF. SHEET	UDB	CONDUIT SPEC*	CABLE SPEC	SERVICE	DESCRIPTION	ORIGIN	DESTINATION	NOTES
					E - CONTROL & DEWATERING BUILDING				
PE01	E-601-A, E-601-E, E-121	1	(3) 3"	EACH W/ (4) 300 MCM CU, (1) 1/0 CU GND	480V	POWER FEED TO DEWATERING BUILDING	ATS-02	EH1	
PE02	E-601-E, E-101-E		1 1/2"	(3) #1/0 CU, (1) #6 CU GND	480V	TRANSFORMER ET1 PRIMARY	EH1	ET1	
PE03	E-601-E, E-101-E		2 1/2"	(4) 250 MCM CU, (1) #2 CU GND	208V	PANEL EL1 FEED	ET1	EL1	
PE04	E-601-E, E-102-E		1"	(3) #12 CU, (1) #12 CU GND	480V	VCP-SCP-1	EH1	VCP-SCP-1	
PE05	E-601-E, E-102-E		3/4"	(3) #12 CU, (1) #12 CU GND	480V	M-5001	VCP-SCP-1	M-5001	
PE06	E-601-E, E-102-E		3/4"	(3) #12 CU, (1) #12 CU GND	480V	M-2004	VCP-SCP-1	M-2004	
PE07	E-101-E, E-601-E		3/4"	(3) #12 CU, (1) #12 CU GND	480V	VFD-8001	EH1	VFD-8001	ROUTE THROUGH HARMONIC FILTER HF-8001
PE08	E-102-E, E-601-E		3/4"	(3) #12 CU, (1) #12 CU GND	480V	P-8001	VFD-8001	P-8001	ROUTE THROUGH LOCAL DISCONNECT
PE09	E-101-E, E-601-E		3/4"	(3) #12 CU, (1) #12 CU GND	480V	VFD-8002	EH1	VFD-8002	ROUTE THROUGH HARMONIC FILTER HF-8002
PE10	E-102-E, E-601-E		3/4"	(3) #12 CU, (1) #12 CU GND	480V	P-8002	VFD-8002	P-8002	ROUTE THROUGH LOCAL DISCONNECT
PE11	E-102-E, E-601-E		3/4"	(3) #10 CU, (1) #10 CU GND	480V	MCP-CONV	EH1	MCP-CONV	
PE12	E-102-E, E-601-E		3/4"	(3) #12 CU, (1) #12 CU GND	480V	CONV-01	MCP-CONV	CONV-01	ROUTE THROGH LOCAL DISCONNECT
PE13	E-102-E, E-601-E		3/4"	(3) #12 CU, (1) #12 CU GND	480V	CONV-02	MCP-CONV	CONV-02	ROUTE THROGH LOCAL DISCONNECT
PE14	E-102-E, E-601-E		3/4"	(3) #12 CU, (1) #12 CU GND	480V	CONV-03	MCP-CONV	CONV-03	ROUTE THROGH LOCAL DISCONNECT
PE15	E-102-E, E-601-E		1 1/4"	(3) #4 CU, (1) #8 CU GND	480V	VCP-9000	EH1	VCP-9000	
PE16	E-102-E, E-601-E		3/4"	(3) #12 CU, (1) #12 CU GND	480V	MCP-7300	EH1	MCP-7300	
PE17	E-122, E-101-D, E-601-D, E-101-G2	9	1"	(3) #10 CU, (1) #12 CU GND	480V	DECANT LIFT STATION PUMP 1 DISCONNECT	MCP-7300	DISCONNECT P-7010	CONTRACTOR PROVIDED
PE17A	E-122, E-101-D, E-601-D, E-101-G2		2"	VENDOR PROVIDED	480V	DECANT LIFT STATION PUMP 1	DISCONNECT P-7010	P-7010	VENDOR PROVIDED SUBMERSIBLE PUMP CABLE
PE18	E-122, E-101-D, E-601-D, E-101-G2	9	1"	(3) #10 CU, (1) #12 CU GND	480V	DECANT LIFT STATION PUMP 2 DISCONNECT	MCP-7300	DISCONNECT P-7020	CONTRACTOR PROVIDED
PE18A	E-122, E-101-D, E-601-D, E-101-G2		2"	VENDOR PROVIDED	480V	DECANT LIFT STATION PUMP 2	DISCONNECT P-7020	P-7020	VENDOR PROVIDED SUBMERSIBLE PUMP CABLE
PE19	E-102-E		3/4"	(2) #12 CU, (1) #12 CU GND	120V	POLYMER SKID LPF-1	EL1	LPF-1 RECEPTACLE	
PE20	E-102-E		3/4"	(2) #12 CU, (1) #12 CU GND	120V	POLYMER SKID LPF-2	EL1	LPF-2 RECEPTACLE	FUTURE INSTALLAT
PE21	E-102-E		3/4"	(4) #12 CU, (1) #12 CU GND	120V	AIR COMPRESSOR RECEPTACLES	EL1	AIR COMPRESSOR RECEPTACLES	
PE22	E-101-E		3/4"	(2) #10 CU, (1) #10 CU GND	208V	CONDENSING UNIT 1	EL1	CU-8101	
PE23	E-101-E		3/4"	(4) #12 CU, (1) #12 CU GND	208V	INDOOR CONDENSING UNIT 1	CU-8101	FN-8101	
PE24	E-101-E		3/4"	(2) #10 CU, (1) #10 CU GND	208V	CONDENSING UNIT 2	EL1	CU-8102	
PE25	E-101-E		3/4"	(3) #8 CU, (1) #8 CU GND	208V	INDOOR CONDENSING UNIT 2	CU-8102	FN-8102	
PE26	E-101-E		3/4"	(2) #12 CU, (1) #12 CU GND	120V	ELECTRICAL ROOM RECEPTACLES	EL1	ELECTRICAL ROOM RECEPTACLES	
PE27	E-101-E		3/4"	(2) #12 CU, (1) #12 CU GND	120V	OUTDOOR RECEPTACLES	EL1	OUTDOOR RECEPTACLES	
PE28	E-101-E		3/4"	(2) #12 CU, (1) #12 CU GND	120V	RESTROOM RECEPTACLES	EL1	RESTROOM RECEPTACLES	
PE29	E-101-E		3/4"	(2) #12 CU, (1) #12 CU GND	120V	WATER FOUNTAIN	EL1	WATER FOUNTAIN	
PE30	E-101-E		3/4"	(2) #12 CU, (1) #12CU GND	120V	LAB EQUIPMENT RECEPTACLES	EL1	LAB EQUIPMENT RECEPTACLES	
PE31	E-101-E		3/4"	(2) #12 CU, (1) #12 CU GND	120V	LAB REFRIGERATOR	EL1	LAB REFRIGERATOR	
PE32	E-101-E		3/4"	(2) #12 CU, (1) #12 CU GND	120V	LAB MICROWAVE	EL1	LAB MICROWAVE	
PE33	E-101-E		3/4"	(2) #12 CU, (1) #12 CU GND	120V	LAB COUNTER TOP RECEPTACLE	EL1	COUNTER TOP RECEPTACLE	
PE34	E-101-E		3/4"	(2) #12 CU, (1) #12 CU GND	120V	OFFICE RECEPTACLES	EL1	OFFICE RECEPTACLES	
PE35	E-101-E		3/4"	(2) #12 CU, (1) #12 CU GND	120V	OVEN RECEPTACLE	EL1	OVEN RECEPTACLE	
PE36	E-101-E		3/4"	(2) #12 CU, (1) #12 CU GND	120V	LAB HOOD RECEPTACLE	EL1	LAB HOOD RECEPTACLE	
PE37	E-101-E, E-601-E		1"	(3) #6 CU, (1) #10 CU GND	480V	UNIT HEATER 1	EH1	UH-8101	
PE38	E-101-E, E-601-E		1"	(3) #6 CU, (1) #10 CU GND	480V	UNIT HEATER 2	EH1	UH-8102	
PE39	E-101-E, E-601-E		1"	(3) #6 CU, (1) #10 CU GND	480V	UNIT HEATER 3	EH1	UH-8103	
PE40	E-101-E		3/4"	(2) #12 CU, (1) #12 CU GND	120V	WASHING MACHINE	EL1	WASHING MACHINE	
PE41	E-101-E		3/4"	(3) #10 CU, (1) #12 CU GND	208V	CLOTHES DRYER	EL1	CLOTHES DRYER	
PE42	E-105-E		3/4"	(2) #12 CU, (1) #12 CU GND	120V	DEWATERING ROOM LIGHTS	EL1	DEWATERING ROOM LIGHTS	
PE43	E-105-E		3/4"	(2) #12 CU, (1) #12 CU GND	120V	EXTERIOR LIGHTS	EL1	EXTERIOR LIGHTS	
PE44	E-105-E		3/4"	(2) #12 CU, (1) #12 CU GND	120V	CONTROL BUILDING LIGHTS	EL1	CONTROL BUILDING LIGHTS	
PE45	E-102-E		3/4"	(3) #12 CU, (1) #12 CU GND	208V	FCP-8101 POWER	EL1	FCP-8101	
PE46	E-102-E		3/4"	(3) #12 CU, (1) #12 CU GND	208V	EXHAUST FAN	FCP-8101	EF-8101	
PE47	E-102-E		3/4"	(3) #12 CU, (1) #12 CU GND	208V	SUPPLY FAN	FCP-8101	SF-8101	
PE48	E-102-E		3/4"	(2) #12 CU, (1) #12 CU GND	120V	SUMP PUMP	EL1	SUMP-8101	
PE49	E-101-E		3/4"	(2) #12 CU, (1) #12 CU GND	120V	DATA NETWORK ENCLOSURE	EL1	DNE-100-E	
PE50	E-101-E		3/4"	(2) #12 CU, (1) #12 CU GND	120V	LOCAL CONTROL PANEL	EL1	LCP-100-E	
PE51	E-102-E		3/4"	(2) #12 CU, (1) #12 CU GND	120V	DEWATERING ROOM RECEPTACLES	EL1	RECEPTACLES	
PE52	E-103-E		3/4"	(2) #12 CU, (1) #12 CU GND	120V	CONVEYOR 1 HEAT MAP	MCP-CONV	CONV-1	
PE53	E-103-E		3/4"	(2) #12 CU, (1) #12 CU GND	120V	CONVEYOR 2 HEAT MAP	MCP-CONV	CONV-2	
PE54	E-103-E		3/4"	(2) #12 CU, (1) #12 CU GND	120V	CONVEYOR 3 HEAT MAP	MCP-CONV	CONV-3	
PE55	E-101-E		3/4"	(4) #10 CU, (1) #10 CU GND	480V	WATER HEATER	EH1	WH-8101	ROUTE CIRCUIT THROUGH LOCAL DISCONNECT
PE56	E-101-E		3/4"	(2) #12 CU, (1) #12 CU GND	120V	EF-8102	EL1	EF-8102	
1 PJ001	E-122		3"	PULL CORD	SPARE 480V	BUILDING J POWER FEED	EH1	BUILDING J	STUB UP AND CAP WITHIN A PULL BOX NEAR BUILDING J

***NOTE: CONDUIT SPECIFICATION IS INDICATIVE OF THE TYPE OF INSTALLATION REQUIRED FOR MAJORITY OF CABLE ROUTING. EC IS RESPONSIBLE FOR ALL WIRING METHODS AND MATERIALS INCLUDING CONDUIT TRANSITIONS, SUPPORTS, PENETRATIONS, ETC., AS REQUIRED FOR A COMPLETE INSTALLATION AND MEETING ALL REQUIREMENTS OF ARTICLE 300 OF THE NATIONAL ELECTRIC CODE.**

KELLER ASSOCIATES
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PROFESSIONAL ENGINEER LICENSED Adam L. Newert 15164 06/19/2024 STATE OF IDAHO ADAM L. NEWERT

NO.	REVISIONS	DATE
1	ADDENDUM NO. 4	6/9/2024

City of Aberdeen

ABERDEEN WWTP IMPROVEMENTS

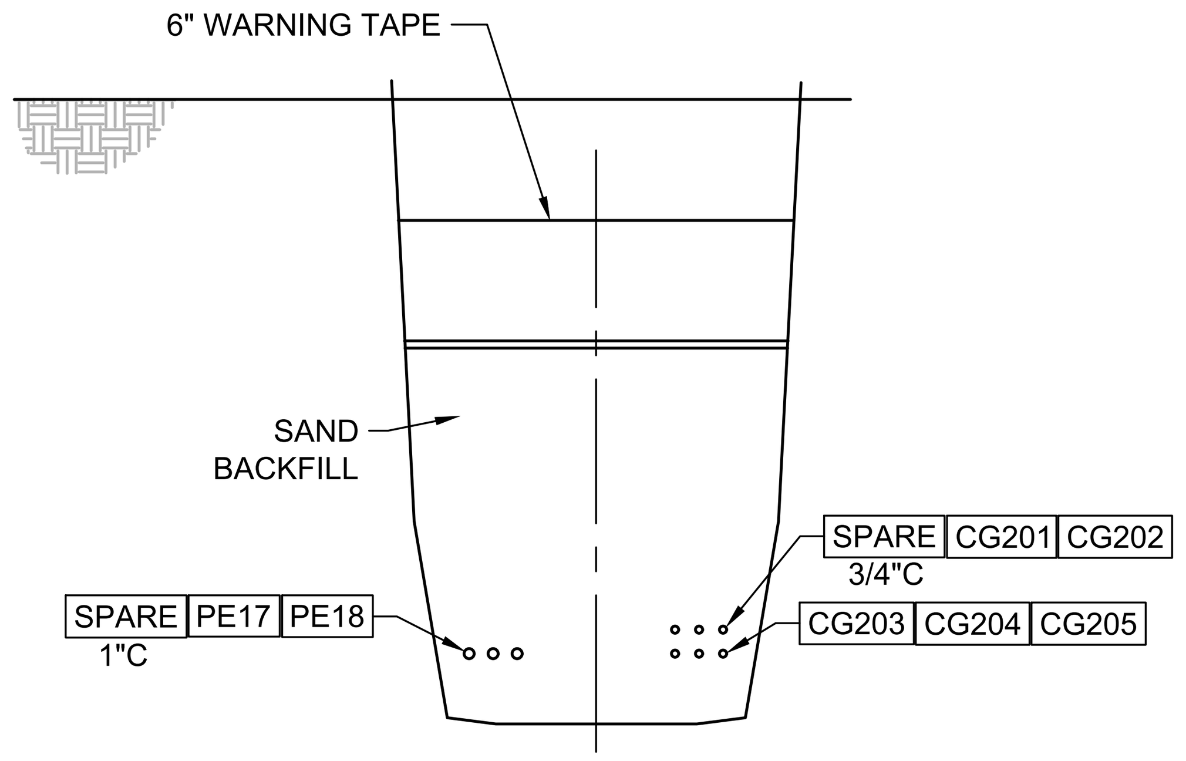
CONTROL & DEWATERING BUILDING - CABLE AND CONDUIT SCHEDULES

DRAWN: NG | CHECK: ALN

VERIFY SCALE: Scales based on 22"x34" prints.
1-1/2 Inches

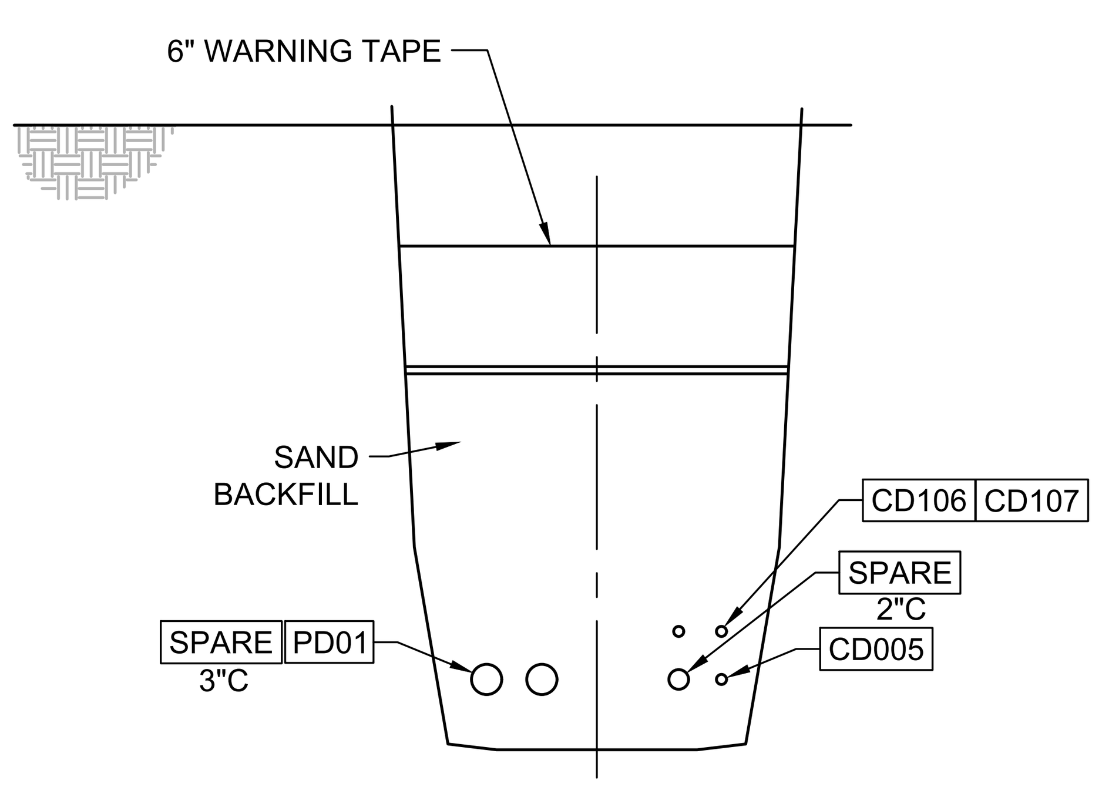
PROJECT NO. 222032 | PAGE

SHEET NO. E-603-E



RE: E003/E-501 FOR STANDARD ELECTRICAL DUCT DETAIL

E109 UDB-9 DUCT BANK DETAIL
N.T.S.



RE: E003/E-501 FOR STANDARD ELECTRICAL DUCT DETAIL

E105 UDB-5 DUCT BANK DETAIL
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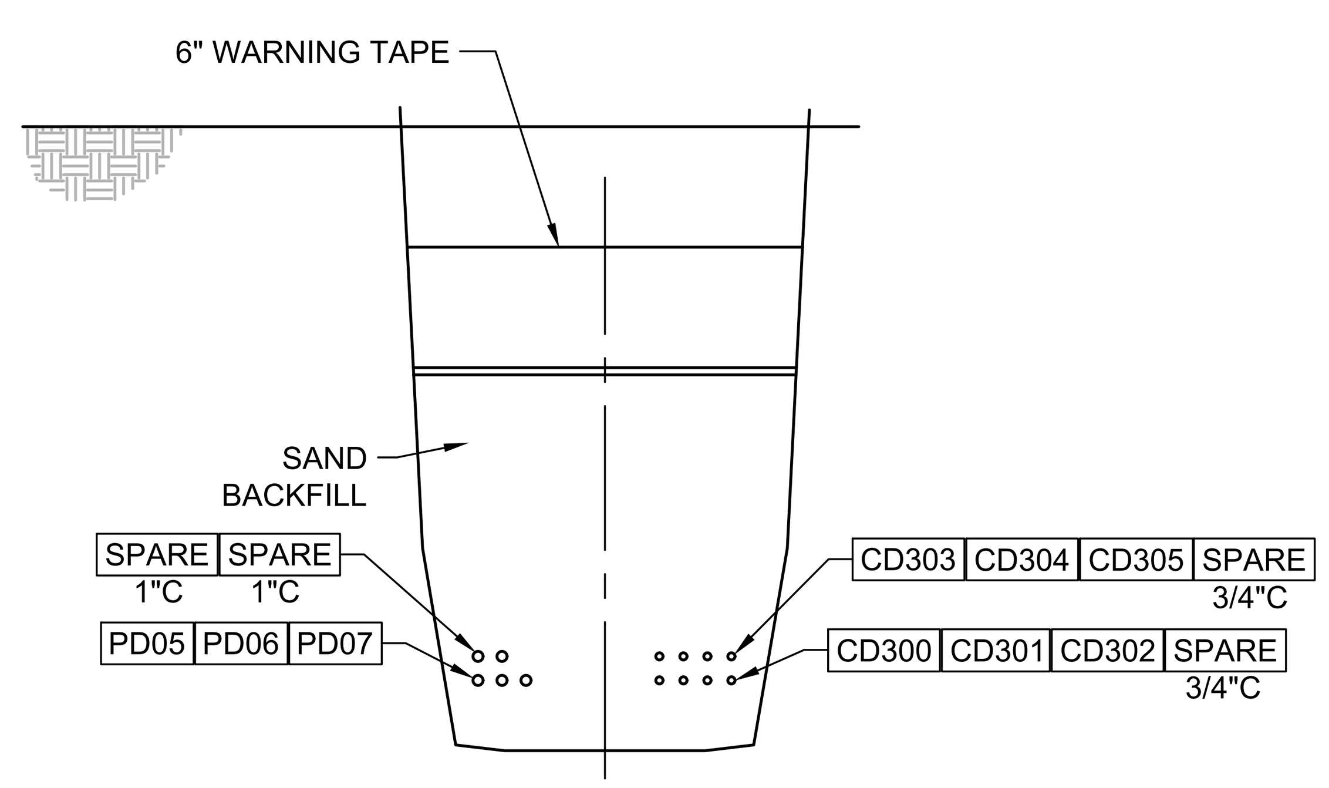

RE: E003/E-501 FOR STANDARD ELECTRICAL DUCT DETAIL

E106 UDB-6 DUCT BANK DETAIL
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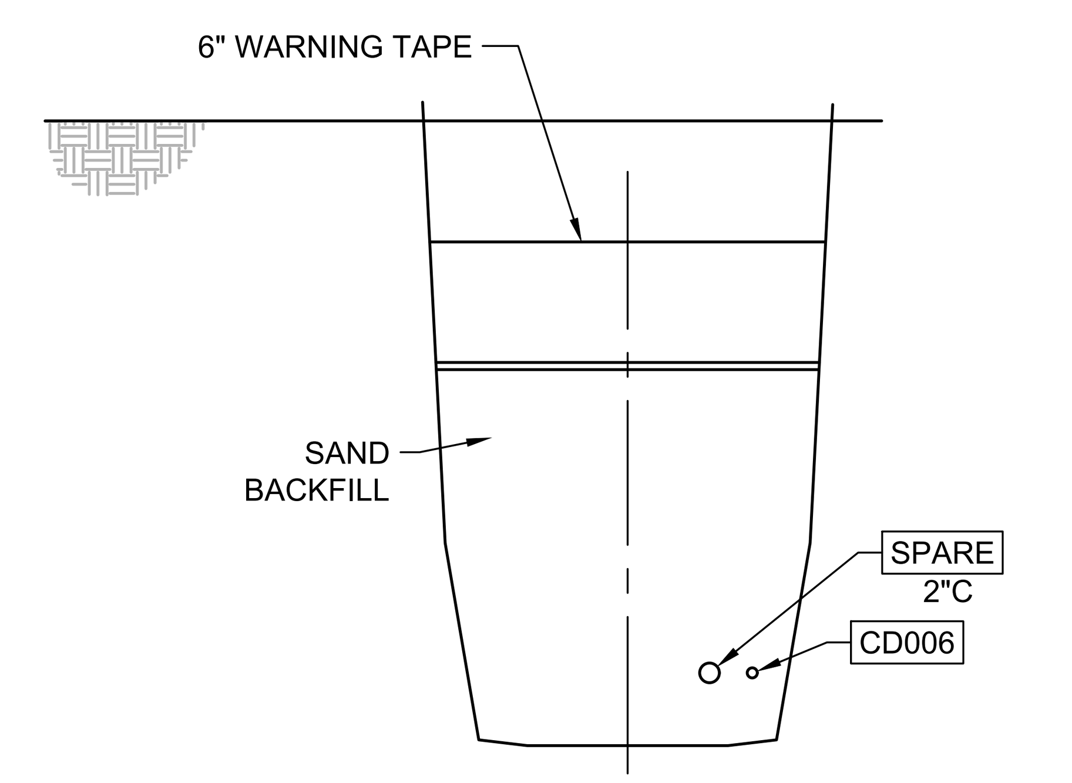

RE: E003/E-501 FOR STANDARD ELECTRICAL DUCT DETAIL

E107 UDB-7 DUCT BANK DETAIL
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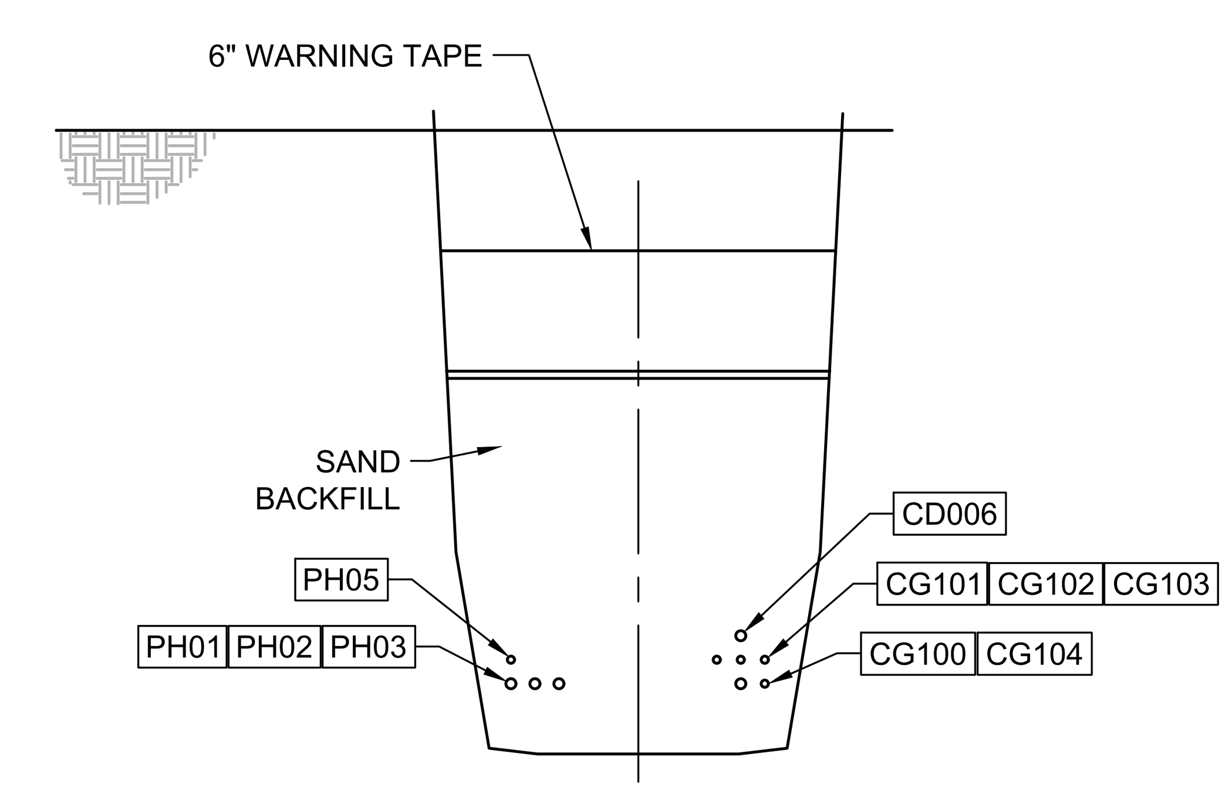

RE: E003/E-501 FOR STANDARD ELECTRICAL DUCT DETAIL

E108 UDB-8 DUCT BANK DETAIL
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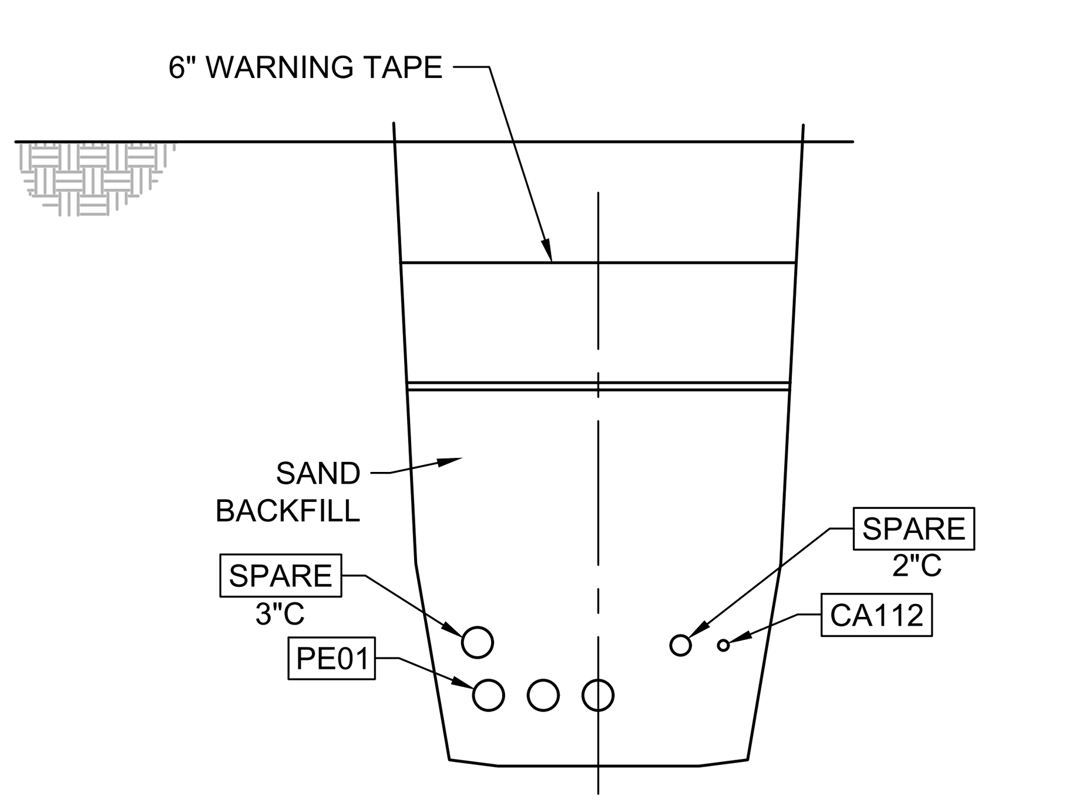

RE: E003/E-501 FOR STANDARD ELECTRICAL DUCT DETAIL

E101 UDB-1 DUCT BANK DETAIL
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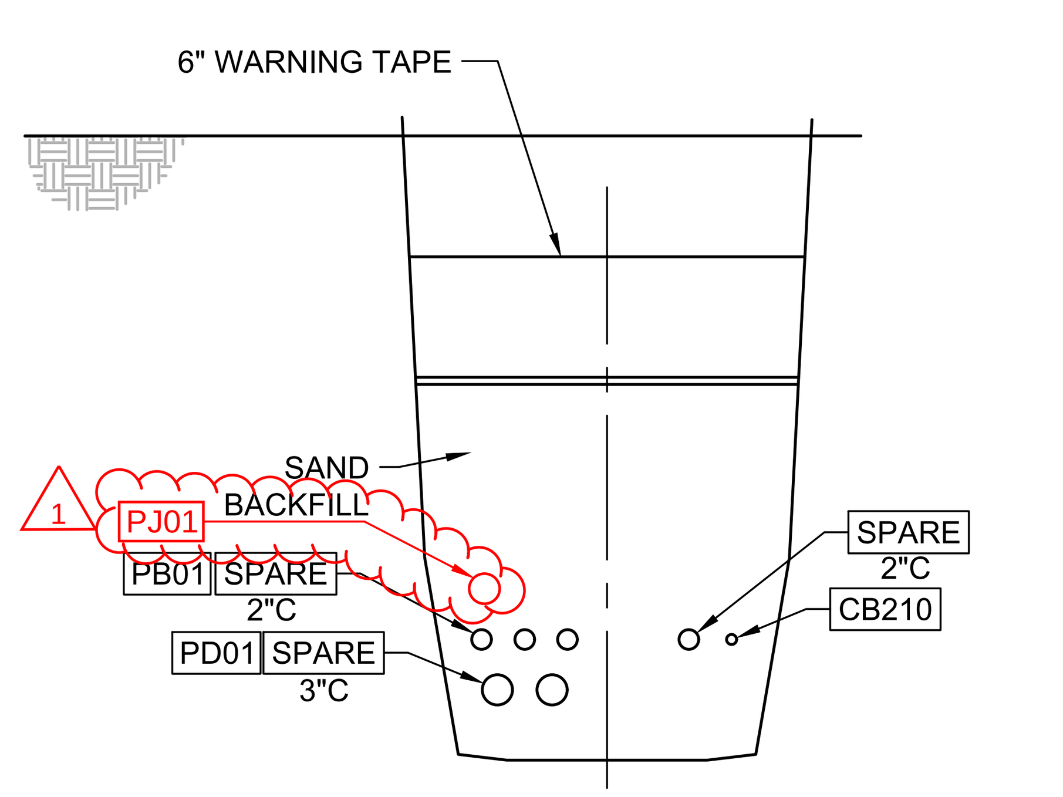

RE: E003/E-501 FOR STANDARD ELECTRICAL DUCT DETAIL

E102 UDB-2 DUCT BANK DETAIL
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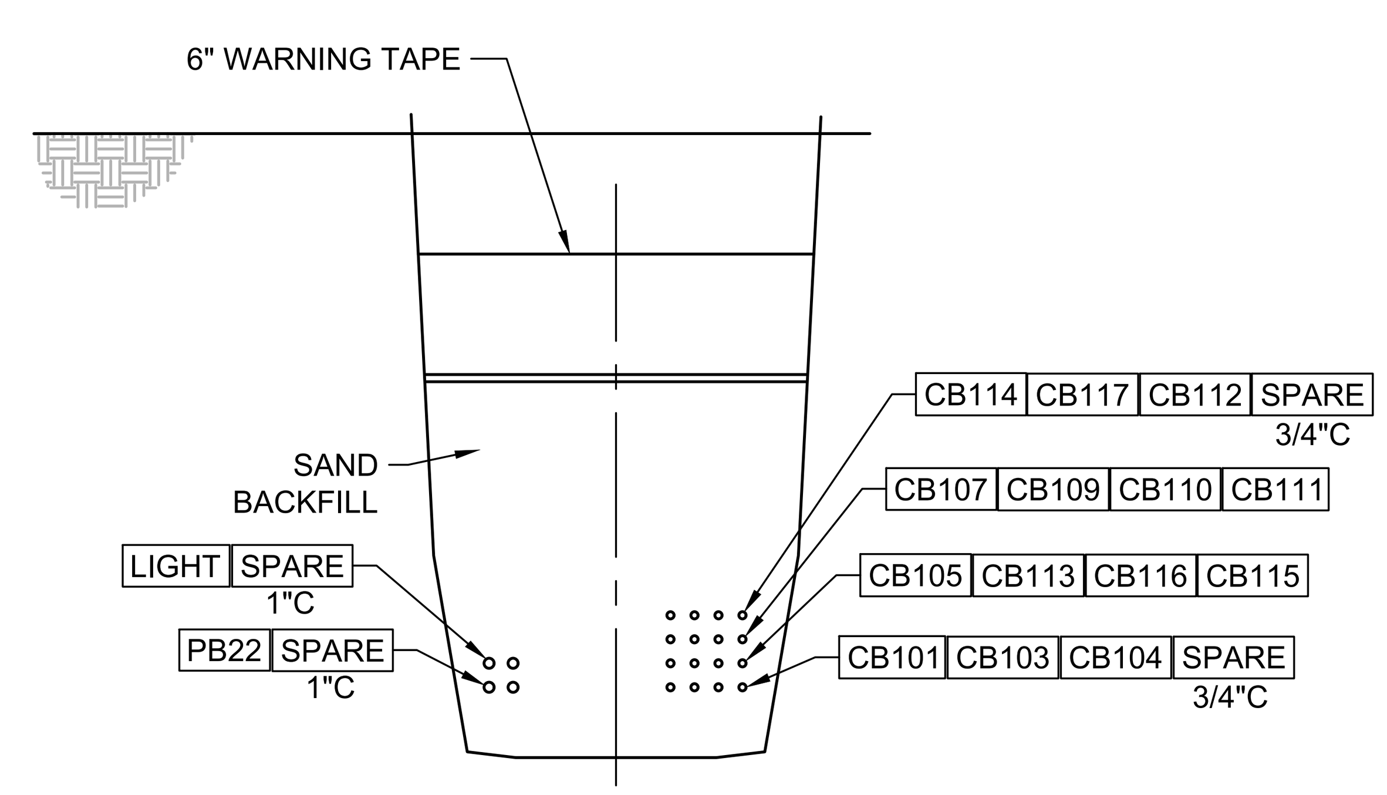

RE: E003/E-501 FOR STANDARD ELECTRICAL DUCT DETAIL

E103 UDB-3 DUCT BANK DETAIL
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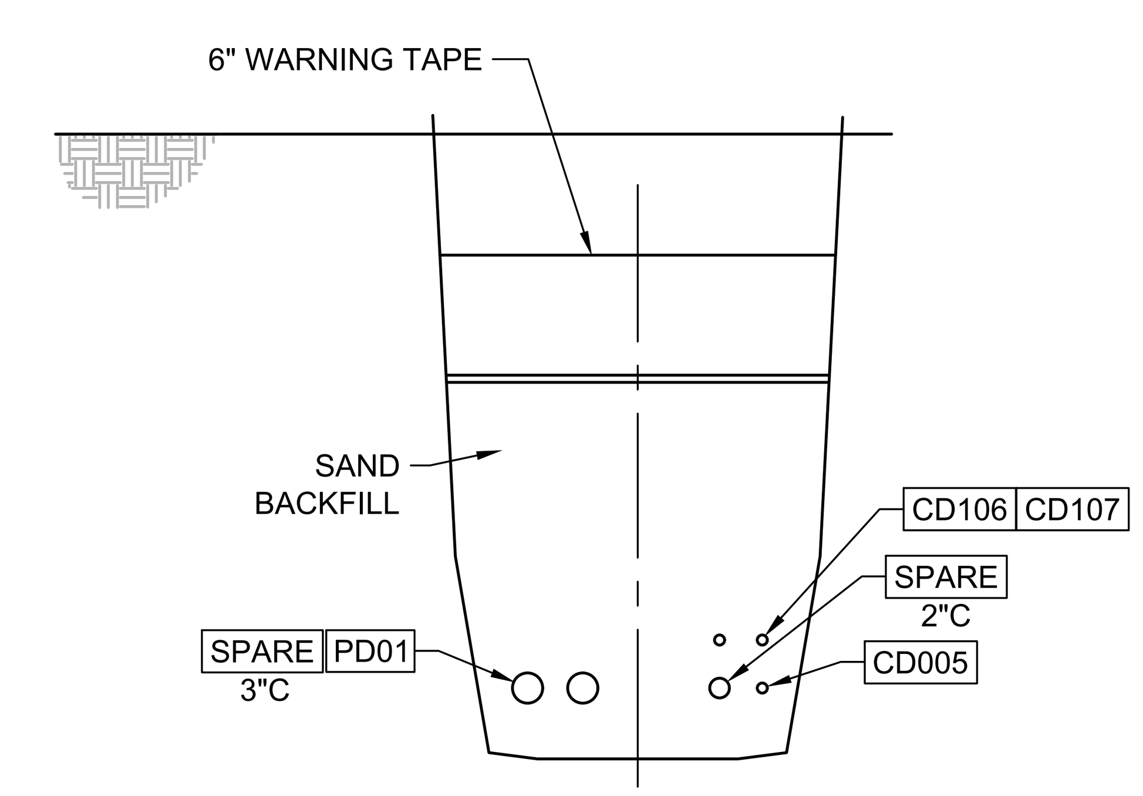

RE: E003/E-501 FOR STANDARD ELECTRICAL DUCT DETAIL

E104 UDB-4 DUCT BANK DETAIL
N.T.S.

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PROFESSIONAL ENGINEER LICENSED 15164 6/19/2024 STATE OF IDAHO ADAM L. NEWERT

NO.	REVISIONS	DATE
1	ADDENDUM NO. 4	8/9/2024

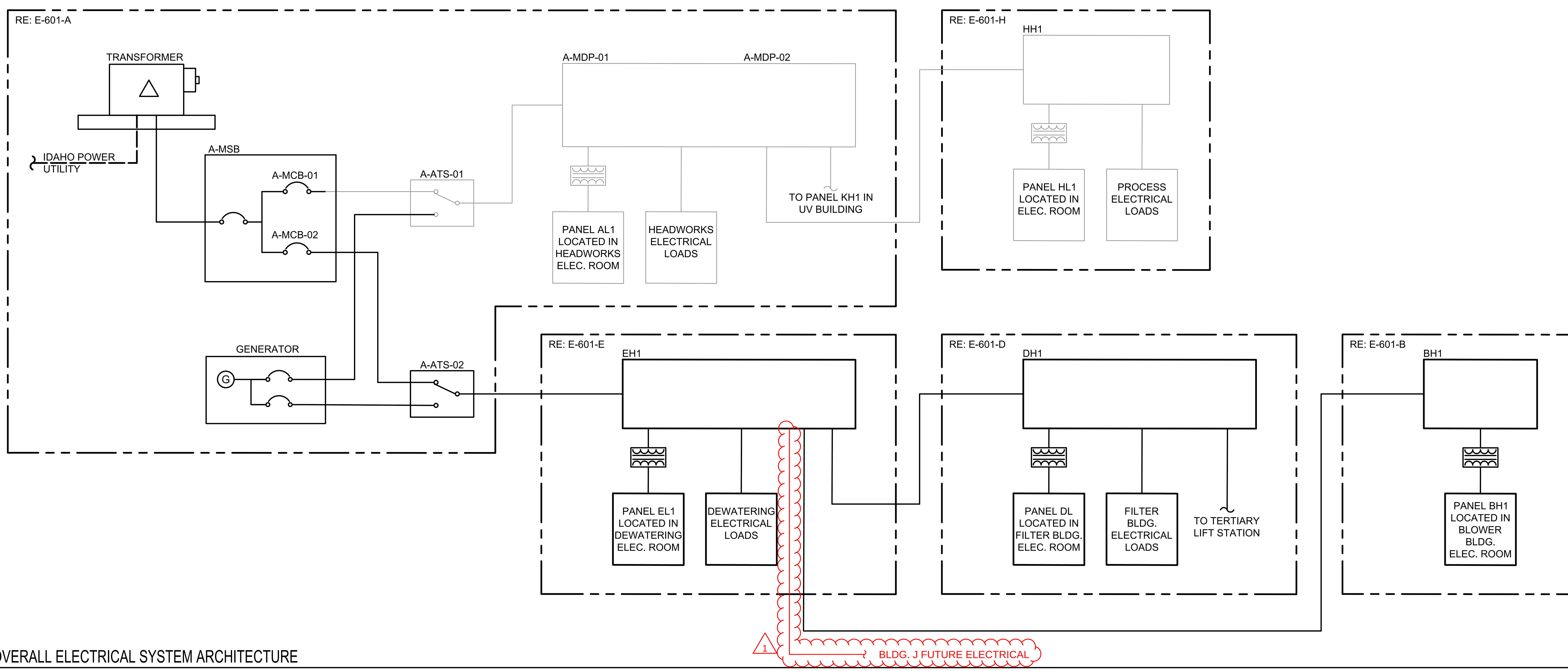
ABERDEEN WWTP IMPROVEMENTS

ELECTRICAL DETAILS

DRAWN: TLL CHECK: ALN

VERIFY SCALE: Scales based on 22"x34" prints.
1-1/2 Inches

PROJECT NO. 222032
PAGE
SHEET NO. E-504



A1 OVERALL ELECTRICAL SYSTEM ARCHITECTURE

N.T.S.

J:\222032 ABERDEEN WW IMPR\C_DESN_CAD\3_DESIGN\D_PLANS-108_ELEC\E-601.DWG LAST SAVED: 5/15/2024 7:50 AM PRINTED: 6/14/2024 7:40 AM

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PROFESSIONAL ENGINEER LICENSED 15164 8/19/2024 STATE OF IDAHO ADAM L. NEIWERT

NO.	REVISIONS	DATE
1	ADDENDUM NO. 4	8/9/2024

City of Aberdeen

ABERDEEN WWTP IMPROVEMENTS

OVERALL ELECTRICAL SYSTEM ARCHITECTURE

DRAWN: TLL CHECK: ALN

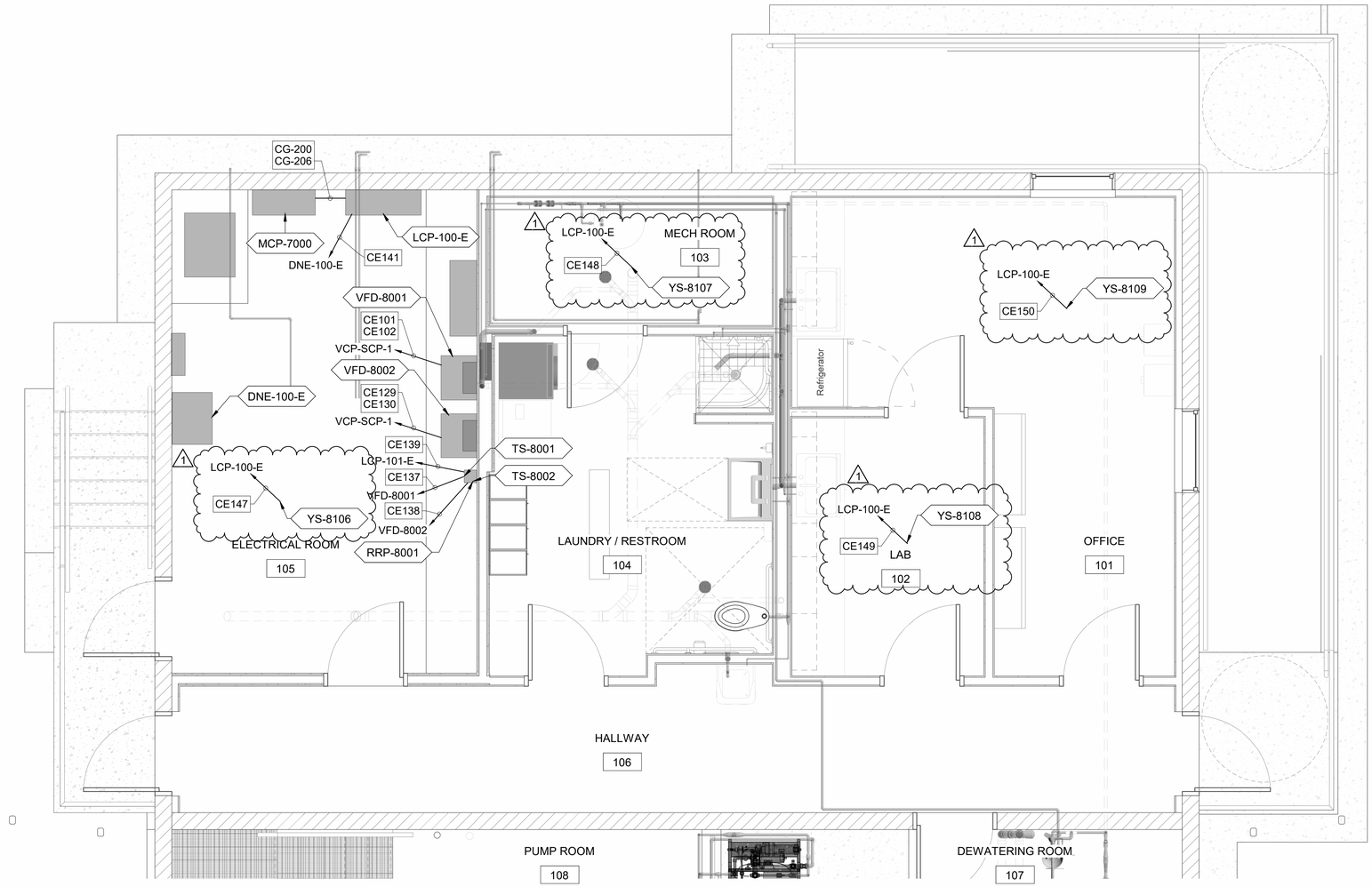
VERIFY SCALE: Scales based on 22"x34" prints.

1-1/2 Inches

PROJECT NO. 222032

PAGE

SHEET NO. E-601



GENERAL SHEET NOTES

1. CONTRACTOR TO PROVIDE ALL EQUIPMENT AND ACCESSORIES REQUIRED FOR A COMPLETE INSTALLATION.
2. COORDINATE WORK AND ROUGH-IN LOCATIONS WITH RELATED TRADES.
3. CONCEAL ALL RACEWAYS WITHIN FINISHED WALLS, CEILINGS, AND FLOORS, UNLESS OTHERWISE INDICATED.
4. ROUTE CONDUIT IN COMMON TRENCH WHENEVER POSSIBLE.
5. COORDINATE WITH SCADA INTEGRATOR.
6. RE: EI-601-E FOR CONDUIT SCHEDULE.

EQUIPMENT KEYNOTES

DNE-100-E	DATA NETWORK ENCLOSURE
LCP-100-E	LOCAL CONTROL PANEL
MCP-7000	DECANT LIFT STATION MOTOR CONTROL PANEL
RRP-8001	REMOTE RELAY PANEL
TS-8001	PMP-8001 TEMPERATURE SWITCH RELAY
TS-8002	PMP-8002 TEMPERATURE SWITCH RELAY
VFD-8001	VARIABLE FREQUENCY DRIVE
VFD-8002	VARIABLE FREQUENCY DRIVE
YS-8106	SMOKE DETECTOR
YS-8107	SMOKE DETECTOR
YS-8108	SMOKE DETECTOR
YS-8109	SMOKE DETECTOR

A1 ELECTRICAL INSTRUMENTATION PLAN AREA 1

3/8" = 1'-0"

3/8" 0 2' 4' 6'

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PROFESSIONAL ENGINEER LICENSED A918141260A80440 19242 STATE OF IDAHO 8/8/2024 BRADLEY M. CULVER

NO.	REVISIONS	DATE
1	ADDENDUM #4	08-09-24

City of Aberdeen

ABERDEEN WWTP IMPROVEMENTS

CONTROL & DEWATERING BUILDING - ENLARGED INSTRUMENTATION PLAN AREA #1

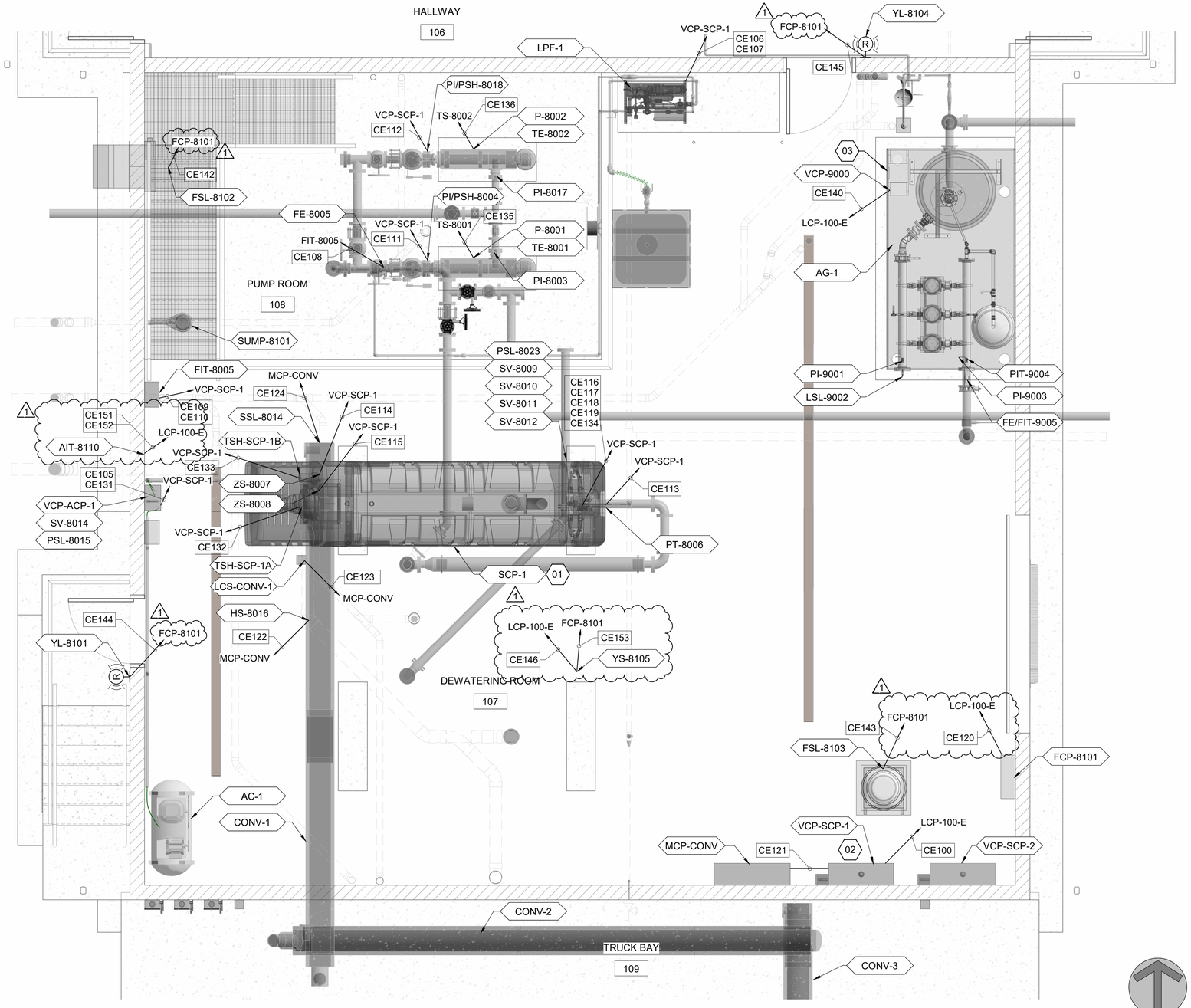
DRAWN: TLL CHECK: BCM

VERIFY SCALE: Scales based on 22"x34" prints.

1-1/2 Inches

PROJECT NO. 222032 PAGE

SHEET NO. EI-101-E



A1 ELECTRICAL INSTRUMENTATION PLAN AREA 2

3/8" = 1'-0"

3/8" 0 2' 4' 6'

GENERAL SHEET NOTES

1. CONTRACTOR TO PROVIDE ALL EQUIPMENT AND ACCESSORIES REQUIRED FOR A COMPLETE INSTALLATION.
2. COORDINATE WORK AND ROUGH-IN LOCATIONS WITH RELATED TRADES.
3. CONCEAL ALL RACEWAYS WITHIN FINISHED WALLS, CEILINGS, AND FLOORS, UNLESS OTHERWISE INDICATED.
4. ROUTE CONDUIT IN COMMON TRENCH WHENEVER POSSIBLE.
5. COORDINATE WITH SCADA INTEGRATOR.
6. RE: EI-601-E FOR CONDUIT SCHEDULE.

SHEET KEYNOTES

01 COORDINATE WITH HUBER FOR INSTRUMENTATION LOCATION.

02 OWNER PROVIDED SCREW PRESS PANEL. COORDINATE STUB UP LOCATIONS PRIOR TO ROUGH-IN.

03 CONTRACTOR TO ENSURE AIRGAP SKID COMMUNICATION WITH LCP-100-E.

EQUIPMENT KEYNOTES

AC-1	PORTABLE AIR COMPRESSOR (BY OWNER)
AG-1	AIRGAP SKID, RE: SPECS
AIT-8110	ANALYSIS INDICATING TRANSMITTER
CONV-1	SCREW CONVEYOR, RE: SPECS
CONV-2	SCREW CONVEYOR, RE: SPECS
CONV-3	SCREW CONVEYOR, RE: SPECS
FCP-8101	FAN CONTROL PANEL; RE: E-503
FE-8005	2" MAGNETIC SLUDGE FLOW METER; RE: SPECS
FE/FIT-9005	AIRGAP SKID DISCHARGE FLOW
FIT-8005	SLUDGE FEED FLOW INDICATING TRANSMITTER
FSL-8102	LOW SUPPLY AIRFLOW SWITCH
FSL-8103	LOW EXHAUST AIRFLOW SWITCH
HS-8016	CONVEYOR ESTOP PULL CORD
LCS-CONV-1	CONVEYOR LOCAL CONTROL STATION
LPF-1	LIQUID POLYMER FEED SYSTEM (BY OWNER)
LSL-9002	AIR GAP SKID LOW LEVEL SWITCH
MCP-CONV	CONVEYOR VENDOR CONTROL PANEL
P-8001	SLUDGE FEED PUMP, RE: SPECS
P-8002	SLUDGE FEED PUMP, RE: SPECS
PI-8003	PRESSURE GAUGE WITH ANNULAR SEAL; RE: M321 & SPECS
PI-8017	PRESSURE GAUGE WITH ANNULAR SEAL; RE: M321 & SPECS
PI-9001	AIRGAP SKID PRESSURE GAUGE
PI-9003	AIRGAP SKID PRESSURE GAUGE
PI/PSH-8004	SLUDGE DISCHARGE PRESSURE SWITCH HIGH
PI/PSH-8018	SLUDGE DISCHARGE PRESSURE SWITCH HIGH
PIT-9004	AIRGAP SKID DISCHARGE PRESSURE
PSL-8023	SPRAY AIR PRESSURE SWITCH LOW
PT-8006	SCREW PRESS PRESSURE
SCP-1	SCREW PRESS (BY OWNER)
SSL-8014	CONVEYOR ZERO SPEED SWITCH
SUMP-8101	SUMP PUMP; RE: MP-601 & U028
SV-8009	SPRAY ARM SOLENOID VALVE
SV-8010	SPRAY ARM SOLENOID VALVE
SV-8011	SPRAY ARM SOLENOID VALVE
SV-8012	SPRAY ARM SOLENOID VALVE
SV-8014	AIR FLOW CONTROL VALVE
TE-8001	PMP-8001 TEMPERATURE SWITCH
TE-8002	PMP-8002 TEMPERATURE SWITCH
TSH-SCP-1A	SCREW PRESS MOTOR TEMPERATURE HIGH
TSH-SCP-1B	SCREW PRESS MOTOR TEMPERATURE HIGH
VCP-9000	VENDOR CONTROL PANEL FOR AIRGAP SKID
VCP-ACP-1	AIR CONTROL PANEL FOR SCP-1 (BY OWNER)
VCP-SCP-1	VENDOR CONTROL PANEL FOR SCREW PRESS (BY OWNER)
VCP-SCP-2	VENDOR CONTROL PANEL FOR FUTURE SCREW PRESS
YL-8101	A/V BEACON/ SIGNAL
YL-8104	A/V BEACON/ SIGNAL
YS-8105	SMOKE DETECTOR
ZS-8007	SCREW PRESS CLOSED
ZS-8008	SCREW PRESS OPENED

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PROFESSIONAL ENGINEER LICENSED 19242 STATE OF IDAHO BRADLEY M. CULVER 8/31/2024

NO.	REVISIONS	DATE
1	ADDENDUM #4	08-09-24

ABERDEEN WWTP IMPROVEMENTS

CONTROL & DEWATERING BUILDING - ENLARGED INSTRUMENTATION PLAN AREA #2

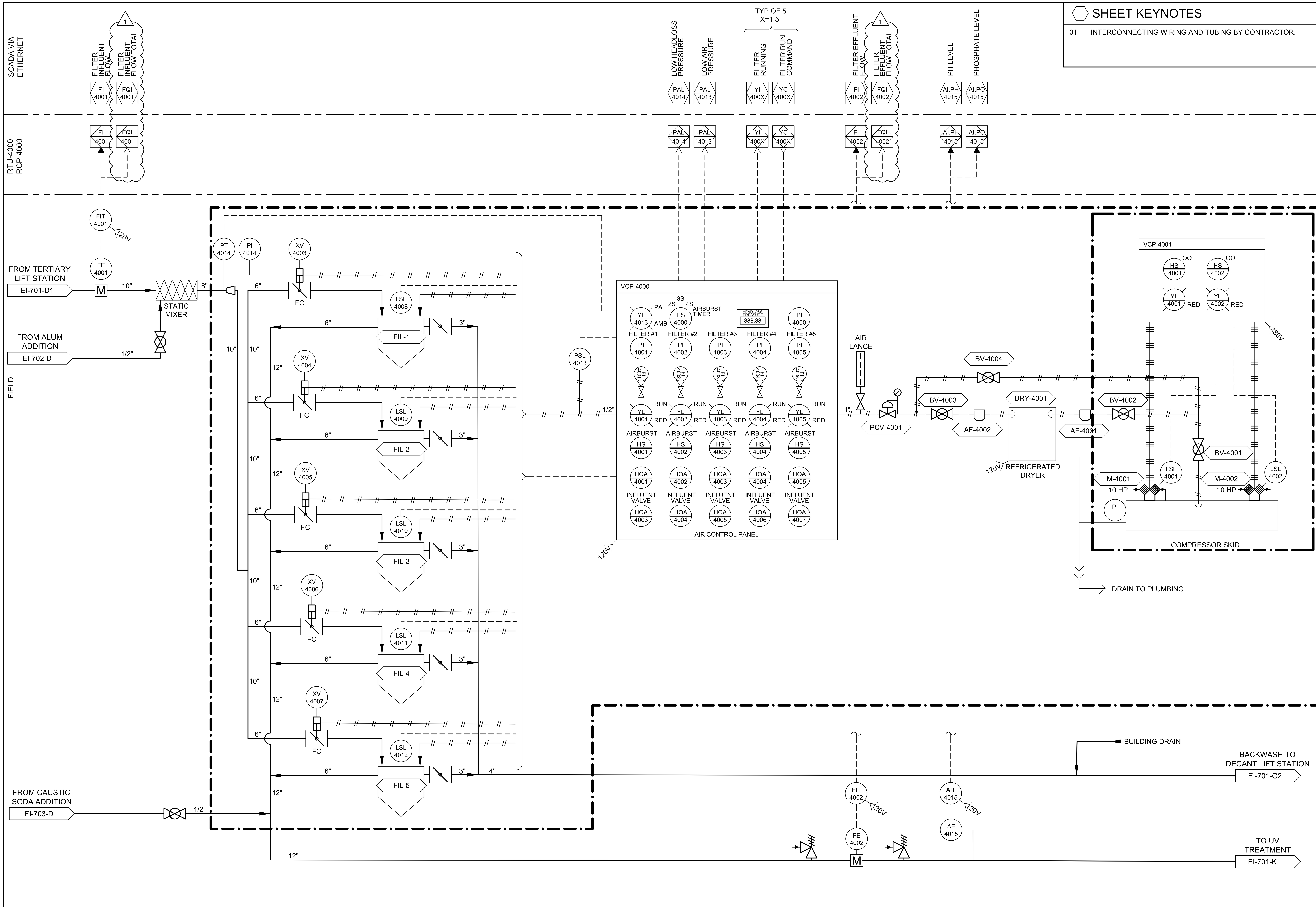
DRAWN: TLL | CHECK: BCM

VERIFY SCALE: Scales based on 22"x34" prints.

1-1/2 Inches

PROJECT NO. 222032 | PAGE

SHEET NO. EI-102-E


SCADA VIA ETHERNET
RTU-4000
RCP-4000
FIELD
FILTER INFLUENT FLOW
FILTER INFLUENT FLOW TOTAL
FI 4001
FQI 4001
LOW HEADLOSS PRESSURE
LOW AIR PRESSURE
TYP OF 5 X=1-5
FILTER RUNNING
FILTER RUN COMMAND
FILTER EFFLUENT FLOW
FILTER EFFLUENT FLOW TOTAL
PH LEVEL
PHOSPHATE LEVEL
PAL 4014
PAL 4013
YI 400X
YC 400X
FI 4002
FQI 4002
AI.PH 4015
AI.PO 4015
FIT 4001
FE 4001
120V
FROM TERTIARY LIFT STATION
EI-701-D1
10"
8"
STATIC MIXER
FROM ALUM ADDITION
EI-702-D
1/2"
PT 4014
PI 4014
XV 4003
XV 4004
XV 4005
XV 4006
XV 4007
FC
LSL 4008
LSL 4009
LSL 4010
LSL 4011
LSL 4012
FIL-1
FIL-2
FIL-3
FIL-4
FIL-5
6"
3"
10"
12"
4"
PSL 4013
VCP-4000
PAL
AMB
YL 4013
2S 3S 4S
HS 4000
AIRBURST TIMER
HEADLOSS PRESSURE 888.88
PI 4000
FILTER #1
FILTER #2
FILTER #3
FILTER #4
FILTER #5
PI 4001
PI 4002
PI 4003
PI 4004
PI 4005
FI 4001
FI 4002
FI 4003
FI 4004
FI 4005
RUN
RED
YL 4001
YL 4002
YL 4003
YL 4004
YL 4005
AIRBURST
HS 4001
HS 4002
HS 4003
HS 4004
HS 4005
HOA 4001
HOA 4002
HOA 4003
HOA 4004
HOA 4005
INFLUENT VALVE
HOA 4003
HOA 4004
HOA 4005
HOA 4006
HOA 4007
AIR CONTROL PANEL
120V
1/2"
1"
AIR LANCE
PCV-4001
BV-4004
BV-4003
AF-4002
DRY-4001
REFRIGERATED DRYER
AF-4001
BV-4002
BV-4001
VCP-4001
OO
HS 4001
HS 4002
YL 4001
YL 4002
RED
480V
LSL 4001
LSL 4002
M-4001
10 HP
M-4002
10 HP
PI
COMPRESSOR SKID
DRAIN TO PLUMBING
BUILDING DRAIN
BACKWASH TO DECANT LIFT STATION
EI-701-G2
FROM CAUSTIC SODA ADDITION
EI-703-D
FIT 4002
FE 4002
AIT 4015
AE 4015
TO UV TREATMENT
EI-701-K

SHEET KEYNOTES

01 INTERCONNECTING WIRING AND TUBING BY CONTRACTOR.

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PROFESSIONAL ENGINEER LICENSED 19242 8/9/2024 STATE OF IDAHO BRADLEY M. CULVER

NO.	REVISIONS	DATE
1	ADDENDUM #4	08-09-24

City of Aberdeen

ABERDEEN WWTP IMPROVEMENTS

TERTIARY TREATMENT - P&ID

DRAWN: TLL CHECK: ALN

VERIFY SCALE: Scales based on 22"x34" prints.

1-1/2 Inches

PROJECT NO. 222032

PAGE

SHEET NO. EI-701-D

CONTROL CABLE AND CONDUIT SCHEDULE

CONDUIT TAG	REF. SHEET	CONDUIT SPEC*	CABLE SPEC	SERVICE	DESCRIPTION	ORIGIN	DESTINATION	NOTES
CE100	EI-102-E	1"	CAT6	ETHERNET	VCP-SCP-1 COMMUNICATION	LCP-100-E	VCP-SCP-1	
CE101	EI-101-E	3/4"	2PR#18 TWOS	ANALOG	SLUDGE PUMP #1 VFD-8001 ANALOG SIGNALS	VCP-SCP-1	VFD-8001	
CE102	EI-101-E	3/4"	6/C#16	DISCRETE	SLUDGE PUMP #1 VFD-8001 DISCRETE SIGNALS	VCP-SCP-1	VFD-8001	
CE103	EI-103-E	3/4"	2/C#16	DISCRETE	CONVEYOR #2 E-STOP PULL CORD	MCP-CONV	HS-8017	
CE104	EI-103-E	3/4"	2/C#16	DISCRETE	CONVEYOR #3 E-STOP PULL CORD	MCP-CONV	HS-8018	
CE105	EI-102-E	3/4"	2/C#16	DISCRETE	SCREW PRESS AIR SUPPLY LOW PRESSURE	VCP-SCP-1	PSL-8015	LOCATED IN VCP-ACP-1
CE106	EI-102-E	3/4"	1PR#18 TWOS	ANALOG	POLYMER FEED ANALOG SIGNALS	VCP-SCP-1	VCP-LPF-1	
CE107	EI-102-E	3/4"	7/C#16	DISCRETE	POLYMER FEED DISCRETE SIGNALS	VCP-SCP-1	VCP-LPF-1	
CE108	EI-102-E	3/4"	VENDOR CABLE	SIGNAL	SCREW PRESS INLET FLOW METER	FIT-8005	FE-8005	
CE109	EI-102-E	3/4"	1PR#18 TWOS	ANALOG	SCREW PRESS SLUDGE INLET FLOW TRANSMITTER SIGNAL	VCP-SCP-1	FIT-8005	
CE110	EI-102-E	3/4"	(2) #14, #14 GND	POWER	SCREW PRESS SLUGE INLET FLOW TRANSMITTER POWER	VCP-SCP-1	FIT-8005	
CE111	EI-102-E	3/4"	2/C#16	DISCRETE	HIGH SLUDGE DISCHARGE PRESSURE	VCP-SCP-1	PSH-8004	
CE112	EI-102-E	3/4"	2/C#16	DISCRETE	HIGH SLUDGE DISCHARGE PRESSURE	VCP-SCP-1	PSH-8018	
CE113	EI-102-E	3/4"	1PR#18 TWOS	ANALOG	SCREW PRESS PRESSURE	VCP-SCP-1	PT-8006	
CE114	EI-102-E	3/4"	2/C#16	DISCRETE	SCREW PRESS SPRAY ARM HOME	VCP-SCP-1	ZS-8007	
CE115	EI-102-E	3/4"	2/C#16	DISCRETE	SCREW PRESS SPRAY ARM AWAY	VCP-SCP-1	ZS-8008	
CE116	EI-102-E	3/4"	(2) #14, #14 GND	DISCRETE	SCREW PRESS SPRAY SOLENOID - PNEUMATIC CONE	VCP-SCP-1	SV-8009	
CE117	EI-102-E	3/4"	(2) #14, #14 GND	DISCRETE	SCREW PRESS SPRAY SOLENOID - LOWER WASH #1	VCP-SCP-1	SV-8010	
CE118	EI-102-E	3/4"	(2) #14, #14 GND	DISCRETE	SCREW PRESS SPRAY SOLENOID - LOWER WASH #2	VCP-SCP-1	SV-8011	
CE119	EI-102-E	3/4"	(2) #14, #14 GND	DISCRETE	SCREW PRESS SPRAY SOLENOID - UPPER WASH #1	VCP-SCP-1	SV-8012	
CE120	EI-102-E	3/4"	6/C#16	DISCRETE	LOW AIRFLOW ALARMS	LCP-100-E	FCP-8101	
CE121	EI-102-E	1"	(3) 15/C#16	DISCRETE	CONVEYOR PANEL COMMUNICATION	VCP-SCP-1	MCP-CONV	
CE122	EI-102-E	3/4"	2/C#16	DISCRETE	CONVEYOR #1 ESTOP PULL CORD	MCP-CONV	HS-8016	
CE123	EI-102-E	3/4"	4/C#16	DISCRETE	CONVEYOR #1 LOCAL CONTROL STATION	MCP-CONV	LCS-CONV-1	
CE124	EI-102-E	3/4"	VENDOR CABLE	DISCRETE	CONVEYOR #1 ZERO SPEED PROBE	MCP-CONV	SSL-8014	
CE125	EI-103-E	3/4"	4/C#16	DISCRETE	CONVEYOR #2 LOCAL CONTROL STATION	MCP-CONV	LCS-CONV-2	
CE126	EI-103-E	3/4"	VENDOR CABLE	DISCRETE	CONVEYOR #2 ZERO SPEED PROBE	MCP-CONV	SSL-8020	
CE127	EI-103-E	3/4"	4/C#16	DISCRETE	CONVEYOR #3 LOCAL CONTROL STATION	MCP-CONV	LCS-CONV-3	
CE128	EI-103-E	3/4"	VENDOR CABLE	DISCRETE	CONVEYOR #3 ZERO SPEED PROBE	MCP-CONV	SSL-8022	
CE129	EI-101-E	3/4"	2PR#18 TWOS	ANALOG	SLUDGE PUMP #2 VFD-8002 DISCRETE SIGNALS	VCP-SCP-1	VFD-8002	
CE130	EI-101-E	3/4"	6/C#16	DISCRETE	SLUDGE PUMP #2 VFD-8002 ANALOG SIGNALS	VCP-SCP-1	VFD-8002	
CE131	EI-102-E	3/4"	(2) #14, #14 GND	DISCRETE	SCREW PRESS AIR FEED SOLENOID VALVE	VCP-SCP-1	SV-8014	LOCATED IN VCP-ACP-1
CE132	EI-102-E	3/4"	2/C#16	DISCRETE	SCREW PRESS MOTOR HIGH TEMPERATURE SWITCH	VCP-SCP-1	TSH-SCP-1A	
CE133	EI-102-E	3/4"	2/C#16	DISCRETE	SPRAY MOTOR HIGH TEMPERATURE SWITCH	VCP-SCP-1	TSH-SCP-1B	
CE134	EI-102-E	3/4"	2/C#16	DISCRETE	LOW WATER PRESSURE SWITCH	VCP-SCP-1	PSL-8023	
CE135	EI-102-E	3/4"	1PR#18 TWOS	SENSOR	SLUDGE PUMP #1 DRY SENSOR	TS-8001	TE-8001	SEEPEX TSE TEMPERATURE SWITCH RELAY
CE136	EI-102-E	3/4"	1PR#18 TWOS	SENSOR	SLUDGE PUMP #2 DRY SENSOR	TS-8002	TE-8002	SEEPEX TSE TEMPERATURE SWITCH RELAY
CE137	EI-101-E	3/4"	2/C#16	DISCRETE	SLUDGE PUMP #1 DRY RUN RELAY	VFD-8001	TS-8001	
CE138	EI-101-E	3/4"	2/C#16	DISCRETE	SLUDGE PUMP #2 RUN DRY RUN RELAY	VFD-8002	TS-8002	
CE139	EI-101-E	3/4"	(2) #14, #14 GND	POWER	SLUDGE PUMP DRY RUN RELAY POWER	LCP-100-E	RRP-8001	POWER
CE140	EI-102-E	1"	CAT6	COMMUNICATION	AIR GAP SKID SIGNALS	LCP-100-E	VCP-9000 (AG-1)	CONTROL PANEL MOUNTED ON AIR GAP SKID
CE141	EI-101-E	1"	CAT6	COMMUNICATION	LCP-100-E NETWORK CONNECTION	DNE-100-E	LCP-100-E	
CE142	EI-102-E	3/4"	2/C#16	DISCRETE	LOW SUPPLY AIRFLOW SWITCH	FCP-8101	FSL-8102	
CE143	EI-102-E	3/4"	2/C#16	DISCRETE	LOW EXHAUST AIRFLOW SWITCH	FCP-8101	FSL-8103	
CE144	EI-102-E	3/4"	(2) #14, #14 GND	POWER	LOW SUPPLY AIRFLOW COMBINATION BEACON AND HORN	FCP-8101	YL-8101	
CE145	EI-102-E	3/4"	(2) #14, #14 GND	POWER	LOW EXHAUST AIRFLOW COMBINATION BEACON AND HORN	FCP-8101	YL-8104	
CE146	EI-102-E	3/4"	2/C#16 (2)#14,#14GND	DISCRETE POWER	SMOKE DETECTED SMOKE DETECTOR POWER	LCP-100-E	YS-8105	
CE147	EI-101-E	3/4"	2/C#16 (2)#14,#14GND	DISCRETE POWER	SMOKE DETECTED SMOKE DETECTOR POWER	LCP-100-E	YS-8106	
CE148	EI-101-E	3/4"	2/C#16 (2)#14,#14GND	DISCRETE POWER	SMOKE DETECTED SMOKE DETECTOR POWER	LCP-100-E	YS-8107	
CE149	EI-101-E	3/4"	2/C#16 (2)#14,#14GND	DISCRETE POWER	SMOKE DETECTED SMOKE DETECTOR POWER	LCP-100-E	YS-8108	
CE150	EI-101-E	3/4"	2/C#16 (2)#14,#14GND	DISCRETE POWER	SMOKE DETECTED SMOKE DETECTOR POWER	LCP-100-E	YS-8109	
CE151	EI-102-E	3/4"	1PR#18 TWOS	ANALOG	METHANE LEVEL	LCP-100-E	AIT-8110	
CE152	EI-102-E	3/4"	(2) #14, #14 GND	POWER	ANALYZER POWER	LCP-100-E	AIT-8110	
CE153	EI-102-E	3/4"	2/C#16	DISCRETE	SMOKE DETECTED TO FAN CONTROL PANEL	FCP-8101	YS-8105	

*NOTE: CONDUIT SPECIFICATION IS INDICATIVE OF THE TYPE OF INSTALLATION REQUIRED FOR MAJORITY OF CABLE ROUTING. EC IS RESPONSIBLE FOR ALL WIRING METHODS AND MATERIALS INCLUDING CONDUIT TRANSITIONS, SUPPORTS, PENETRATIONS, ETC., AS REQUIRED FOR A COMPLETE INSTALLATION AND MEETING ALL REQUIREMENTS OF ARTICLE 300 OF THE NATIONAL ELECTRIC CODE.
EC MAY COMBINE LOW VOLTAGE SIGNAL CABLES IN SAME CONDUITS AND RACEWAYS WHERE APPROPRIATE FOR ROUTING AND MAY INCREASE CONDUIT SIZE AS NEEDED FOR GROUPED CABLES. INSTRUMENT, SIGNAL, AND NETWORK CABLES ARE TO BE SEPARATED FROM POWER CONDUCTORS.
CABLE VOLTAGE > 30V SHALL BE ROUTED IN A SEPARATE RACEWAY OR SEGREGATED VIA PHYSICAL BARRIER SEPARATION AND/OR MINIMUM DISTANCE OF 12 IN. FROM SIGNAL CABLES, MAINTAINED FOR ENTIRE LENGTH OF CABLE RUN.

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PROFESSIONAL ENGINEER 15164 8/9/2024 STATE OF IDAHO ADAM L. NEWERT

NO.	REVISIONS	DATE
1	ADDENDUM #4	08-09-24

City of Aberdeen

ABERDEEN WWTP IMPROVEMENTS

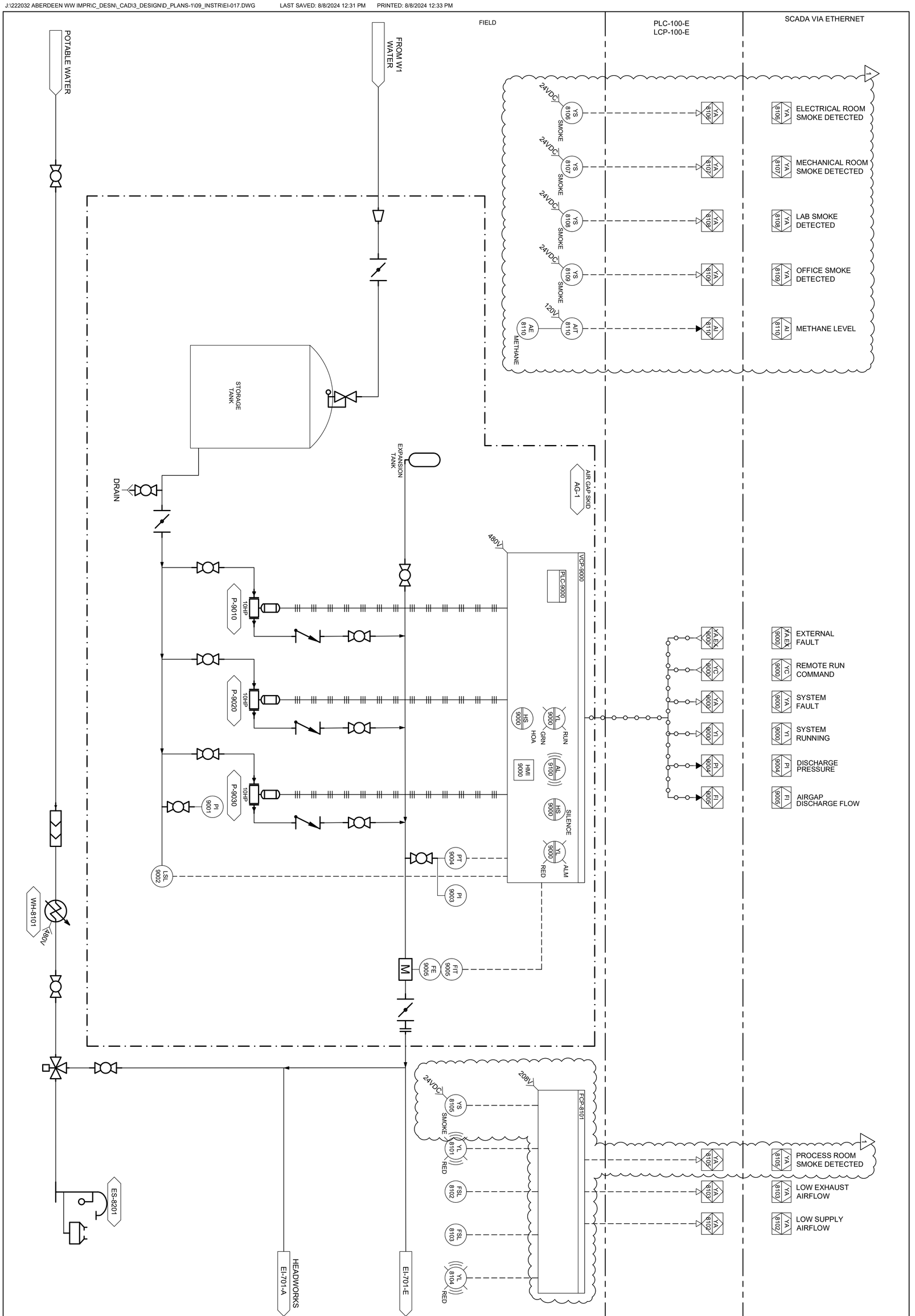
CONTROL & DEWATERING BUILDING - CONTROL CABLE & CONDUIT SCHEDULE

DRAWN: ACM CHECK: ALN

VERIFY SCALE: Scales based on 22"x34" prints.
1-1/2 Inches

PROJECT NO. 222032
PAGE

SHEET NO. EI-601-E



SHEET NO	EI-702-E	
PROJECT NO	222032	
PAGE		
1-1/2 Inches	VERIFY SCALE: Scales based on 22"x34" prints.	
DRAWN	---	CHECK: ---

ABERDEEN WWTP IMPROVEMENTS

CONTROL & DEWATERING BUILDING - AIR GAP SYSTEM - P&ID

NO.	REVISIONS	DATE
1	ADDENDUM #4	08-09-24

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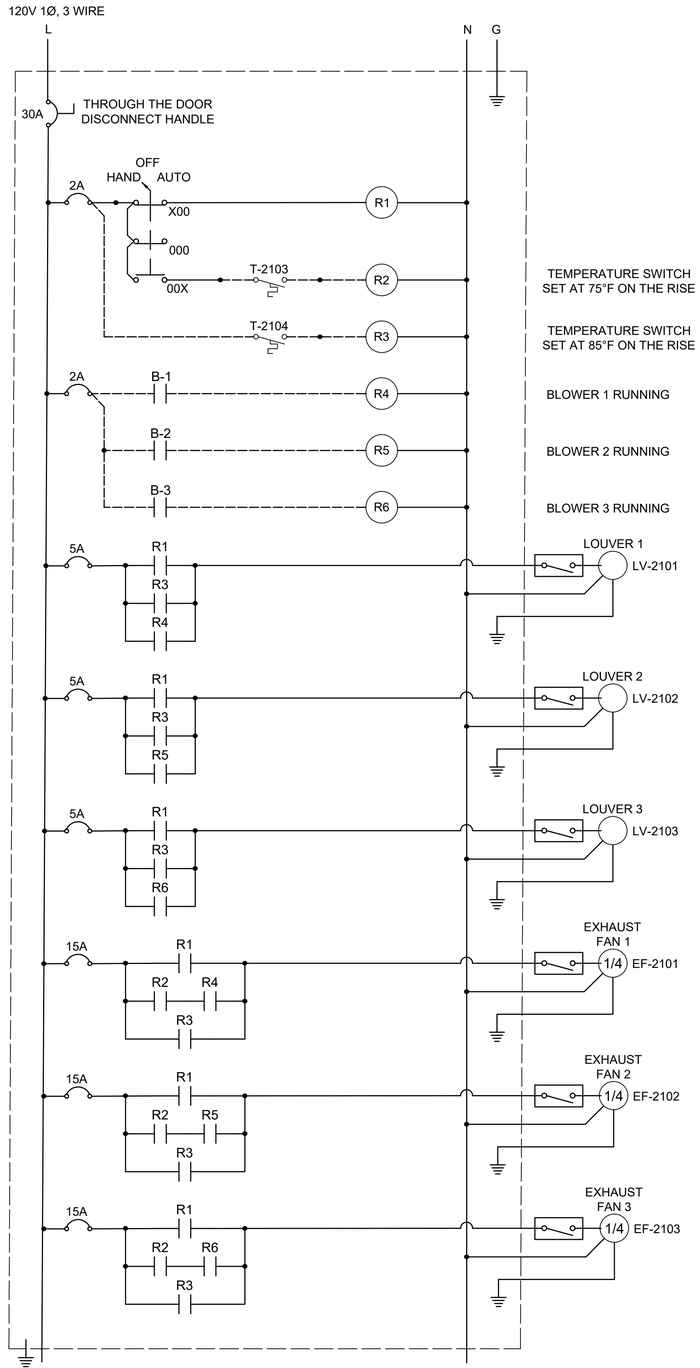

A1 FAN CONTROL PANEL FCP-F2101
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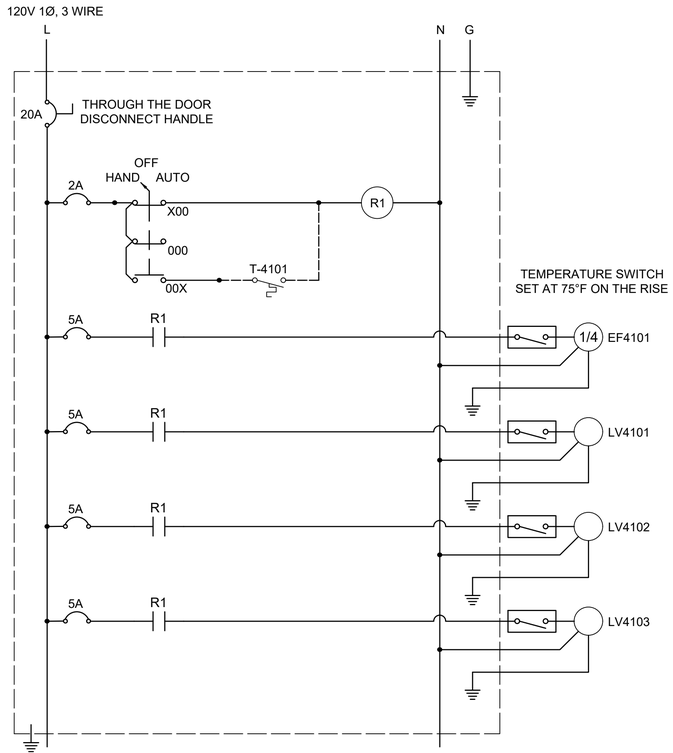
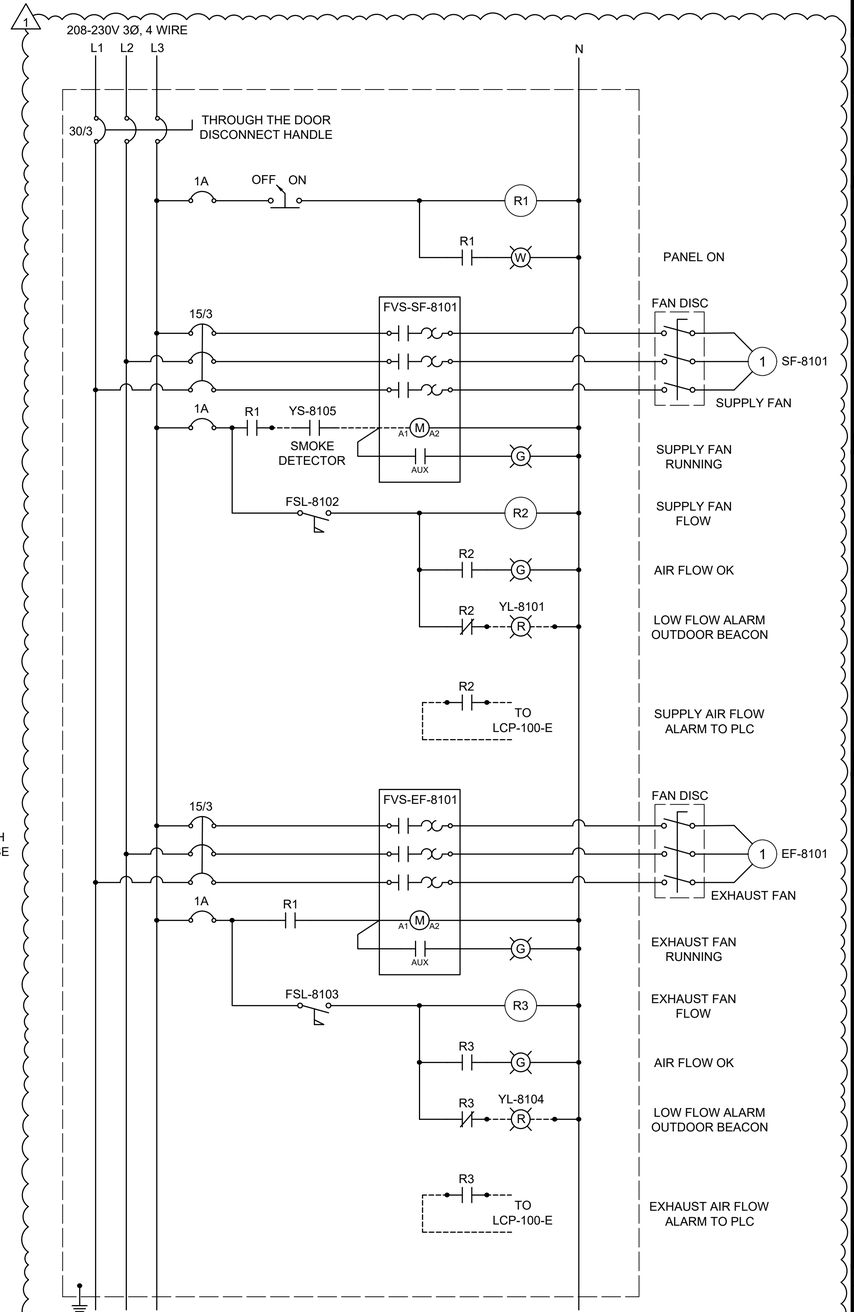


A3 FAN CONTROL PANEL FCP-F4301
N.T.S.



A5 FAN CONTROL PANEL FCP-8101
N.T.S.

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PROFESSIONAL ENGINEER LICENSED
ADAM L. NEIWERT
15164
8/9/2024
STATE OF IDAHO

NO.	REVISIONS	DATE
1	ADDENDUM #4	08-09-24

ABERDEEN WWTP IMPROVEMENTS

ELECTRICAL DETAILS

DRAWN: TLL CHECK: ALN

VERIFY SCALE: Scales based on 22"x34" prints.
1-1/2 Inches

PROJECT NO. 222032
PAGE
SHEET NO. E-503

J:\222032 ABERDEEN WW IMPRC_DESN_CAD\3_DESIGN\D_PLANS-1108_ELEC\E-503.DWG LAST SAVED: 8/8/2024 1:15 PM PRINTED: 8/8/2024 1:17 PM