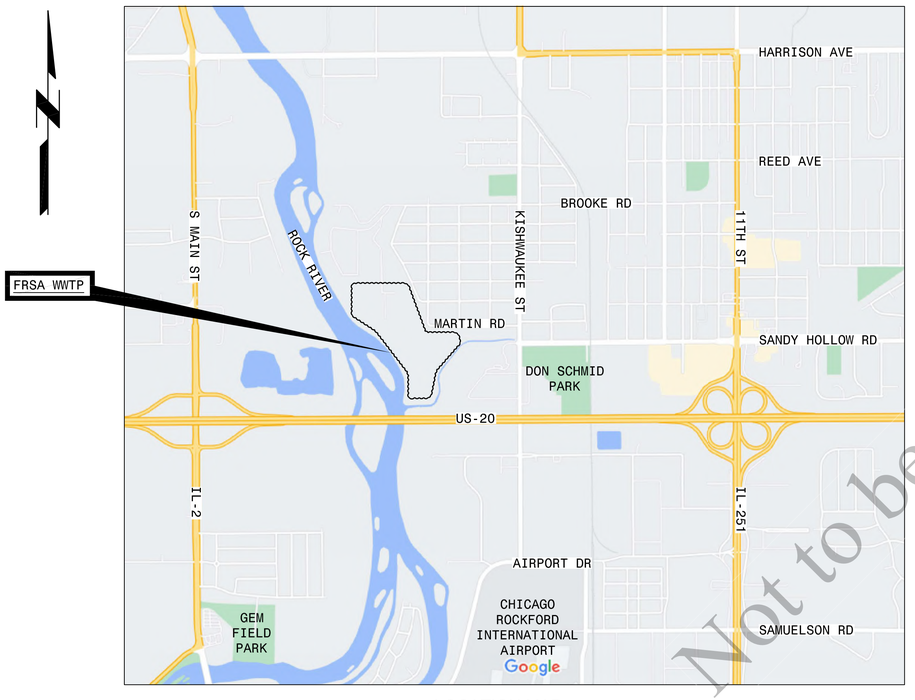
FOUR RIVERS SANITATION AUTHORITY
ROCKFORD, ILLINOIS

AEROBIC GRANULAR SLUDGE - PHASE I
CAPITAL PROJECT NO. 2207
DECEMBER 20, 2022
BID SET

IEPA WPCLP SRF PROJECT NO. L17-6127



LOCATION MAP
NO SCALE

SITE MAP
NO SCALE

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Four Rivers Sanitation Authority

BLACK & VEATCH
Black & Veatch Corporation
Chicago, Illinois
ILLINOIS PROFESSIONAL
DESIGN FIRM - 184.002143 -0006

FD193641

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Four Rivers Sanitation Authority

AEROBIC GRANULAR SLUDGE - PHASE 1

REVISIONS AND RECORD OF ISSUE

DESIGNED:	JL
DETAILED:	VP
CHECKED:	AM/JH
APPROVED:	MR
DATE:	12/20/2022
PROJECT NO.:	411752

GENERAL

GENERAL

INDEX OF DRAWINGS

00-G-002

PLOTTED: 12/16/2022 11:23:14 AM
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FD11000
D11000

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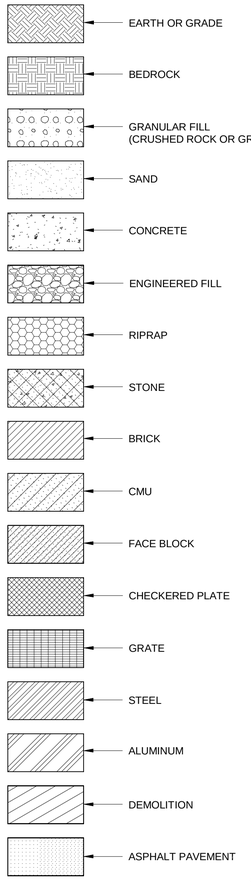
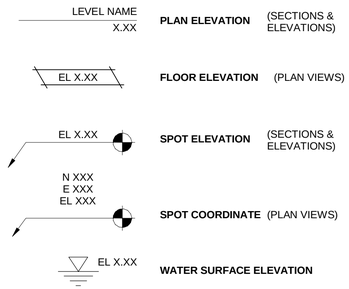
FILL PATTERNS



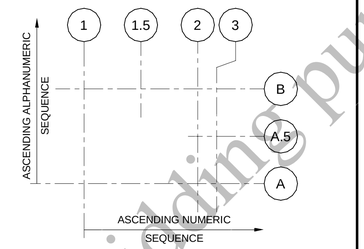
ELEVATION & GRID CALLOUTS

ELEVATION CALLOUTS



GRID/COLUMN CALLOUTS

TYPICAL GRID/COLUMN LAYOUT

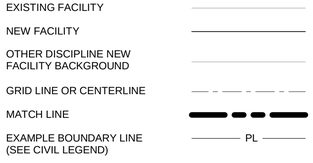


NORTH ARROW

NORTH ARROW
(TRUE NORTH)

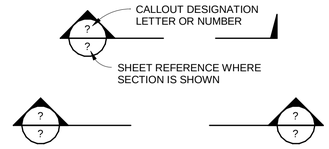
BREAKS

LINE STYLES

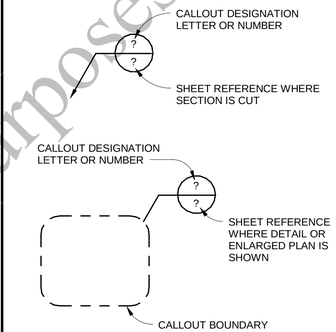


VIEW CALLOUTS

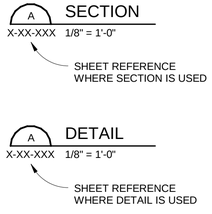
SECTION CALLOUTS



DETAIL/ENLARGED PLAN AREA CALLOUTS

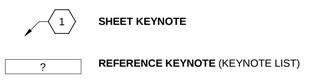


SECTION & DETAIL VIEW TITLES



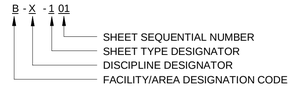
ANNOTATION

SHEET NOTES



REVISIONS

DRAWING NUMBERING SYSTEM



DISCIPLINE DESIGNATORS

A	ARCHITECTURAL
C	CIVIL
D	DEMOLITION
E	ELECTRICAL
F	FIRE PROTECTION
G	GENERAL
H	HVAC/BUILDING MECHANICAL
I	INSTRUMENTATION AND CONTROLS
L	LANDSCAPE
M	PROCESS MECHANICAL
P	PLUMBING
S	STRUCTURAL

AREA/FACILITY DESIGNATION CODES

00	GENERAL
01	AGS REACTORS AND PIPE GALLERY
02	AGS SUPPORT FACILITIES
98	YARD
99	DETAILS

SHEET TYPE DESIGNATORS

0	GENERAL (SYMBOLS, LEGENDS, NOTES, ETC.)
1	PLANS (ARRANGEMENT PLANS, PARTIAL PLANS)
2	ELEVATIONS
3	SECTIONS
4	LARGE SCALE VIEWS (ENLARGED PLANS, STAIR SECTIONS OR SECTIONS THAT ARE NOT DETAILS)
5	DETAILS
6	SCHEDULES & DIAGRAMS
7	SCHEMATICS (ONE-LINES, BLOCK DIAGRAMS)
8	USER DEFINED
9	3D MODEL (PERSPECTIVES, ISOMETRICS, PHOTOGRAPHS)

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AEROBIC GRANULAR SLUDGE - PHASE 1

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DESIGNED:	JL
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GENERAL

GENERAL

ANNOTATION AND SYMBOLS LEGEND

00-G-003

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

PLOTTED: 12/16/2022 11:50:55 AM
FILE: BIM 360://409469 - Aerobic Granular Sludge Phase 1/409469 - AGS.rvt
D11000

A

AB	AGGREGATE BASE
ABV	ABOVE
AC	ASPHALT CONCRETE
ACP	ASBESTOS CEMENT PIPE
AD	AREA DRAIN, ANODE
ADD	ADDITIONAL
ADJ	ADJUSTABLE, ADJACENT
ADMIN	ADMINISTRATION
ADWF	AVERAGE DRY-WEATHER FLOW
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AH	AHEAD
ALT	ALTERNATE, ALTERNATIVE
ANC	ANCHOR
AP	ACCESS PANEL, ANGLE POINT
APPR	APPROACH
APPROX	APPROXIMATE, APPROXIMATELY
AR	ANCHOR ROD
ARCH	ARCHITECTURAL
ASSY	ASSEMBLY
ATM	ATMOSPHERE, ATMOSPHERIC
AUTO	AUTOMATIC
AUX	AUXILIARY
AVG	AVERAGE
AWG	AMERICAN WIRE GAUGE
AWWA	AMERICAN WATER WORKS ASSOCIATION
AWWF	AVERAGE WET-WEATHER FLOW

B

B	BORE HOLE
B TO B	BACK TO BACK
BAL	BALANCE
BC	BACK OF CURB
BET	BETWEEN
BF	BLIND FLANGE
BHP	BRAKE HORSEPOWER
BITUM	BITUMINOUS
BLDG	BUILDING
BLK	BLOCK
BM	BENCHMARK
BNR	BIOLOGICAL NUTRIENT REMOVAL
BOD	BIOLOGICAL/BIOCHEMICAL OXYGEN DEMAND
BOF	BOTTOM OF FOOTING
BOP	BOTTOM OF PIPE
BOT	BOTTOM
BP	BACK PRESSURE
BRG	BEARING
BS	BOTH SIDES
BU	BELL-UP
BVC	BEGINNING OF VERTICAL CURVE

C

C	CURVE
C TO C	CENTER TO CENTER
CB	CATCH BASIN
CF	CUBIC FEET
CFM	CUBIC FEET PER MINUTE
CFS	CUBIC FEET PER SECOND
C&G	CURB AND GUTTER
CIP	CAST IRON PIPE
CISP	CAST IRON SOIL PIPE
CL	CLASS
C/L	CENTERLINE
CLG	CEILING
CLR	CLEAR, CLEARANCE
CLSM	CONTROLLED LOW STRENGTH MATERIAL
CMC	CEMENT MORTAR COATED
CML	CEMENT MORTAR LINED
CMP	CORRUGATED METAL PIPE
CO	CLEAN OUT, COMPANY
COD	CHEMICAL OXYGEN DEMAND
COL	COLUMN
COMB	COMBINATION
COMB SWR	COMBINED SEWER
CONC	CONCRETE
CONN	CONNECTION
CONST	CONSTRUCTION
CONT	CONTINUED, CONTINUOUS, CONTINUATION, CONTROL
CONTR	CONTRACTOR
COR	CORNER
CORR	CORRIDOR, CORRUGATED
CP	CONTROL POINT, CATHODIC PROTECTION, CATCH POINT
CPLG	COUPLING
CPVC	CHLORINATED POLYVINYL CHLORIDE
CSP	CORRUGATED STEEL PIPE
CTR(S)	CENTER(S)
CTS	CORROSION/CATHODIC TEST STATION
CU	CUBIC, COPPER
CY	CUBIC YARD

D

D	DOOR
DB	DUCT BANK
DBL	DOUBLE
DEG	DEGREE
DEPT	DEPARTMENT
DET	DETAIL
DI	DROP INLET, DUCTILE IRON
DIA	DIAMETER
DIFF	DIFFUSER
DIM	DIMENSION
DIP	DUCTILE IRON PIPE
DISCH	DISCHARGE
DIST	DISTRIBUTION
DIV	DIVISION
DMJ	DISMANTLING JOINT
DN	DOWN
DRN	DRAIN
DW	DRY WELL
DWG(S)	DRAWING(S)

E

E	EAST, EASTING
EA	EACH
ECC	ECCENTRIC
ECC RED	ECCENTRIC REDUCER
EFF	EFFLUENT, EFFICIENCY
EG	EXISTING GRADE
EJ	EXPANSION JOINT
EL	ELEVATION
ELB	ELBOW
ELL	ELBOW
ELEC	ELECTRIC, ELECTRICAL
EMER	EMERGENCY
ENC	ENCASEMENT
ENCL	ENCLOSURE
EOL	END OF LINE
EOP	EDGE OF PAVEMENT
EOS	EDGE OF SLAB
EQ	EQUAL
EQUIP	EQUIPMENT
EVC	END OF VERTICAL CURVE
EW	EACH WAY
EXH	EXHAUST
EXIST	EXISTING
EXP	EXPANSION, EXPOSED
EXT	EXTENSION, EXTERIOR, EXTERNAL

F

F	FAHRENHEIT, FACE
F TO F	FACE TO FACE
FAB	FABRICATE(D)(TION)
FC	FACE OF CONCRETE, FAIL CLOSED
FCA	FLANGED COUPLING ADAPTER
FD	FLOOR DRAIN
FF	FINISHED FLOOR
FG	FINISHED GRADE
FH	FIRE HYDRANT
FIG	FIGURE
FL	FLOOR, FLOW LINE
FLEX	FLEXIBLE
FLG	FLANGE(D)
FM	FORCE MAIN
FMH	FLEXIBLE METAL HOSE
FO	FAIL OPEN
FOB	FLAT ON BOTTOM
FOM	FACE OF MASONRY
FOT	FLAT ON TOP
FPS	FEET PER SECOND
FRP	FIBERGLASS REINFORCED PLASTIC
FS	FAR SIDE, FLOOR SLEEVE
FT	FOOT, FEET
FTG	FOOTING
FURN	FURNISH, FURNISHED
FWD	FORWARD

G

G	GAS
GA	GAUGE
GAL	GALLON
GALV	GALVANIZED
GB	GRADE BREAK
GC	GROOVED COUPLING
GEN	GENERAL, GENERATOR
GL	GLASS
GM	GAS METER
GPD	GALLONS PER DAY
GPM	GALLONS PER MINUTE
GR	GRADE

H

H	HIGH, HOUR
HDG	HOT-DIPPED GALVANIZED
HDPE	HIGH DENSITY POLYETHYLENE
HEX	HEAT EXCHANGER
HGT	HEIGHT
HH	HANDHOLE
HMC	HARNESSED MECHANICAL COUPLING
HMJ	HARNESSED MECHANICAL JOINT
HORIZ	HORIZONTAL
HP	HIGH POINT, HIGH PRESSURE, HORSEPOWER
HR	HOUR, HANDRAIL
HS	HIGH STRENGTH
HVAC	HEATING, VENTILATING AND AIR CONDITIONING
HWY	HIGHWAY
HYDRO	HYDROPNEUMATIC, HYDROGENERATION

I

ID	INSIDE DIAMETER
IE	INVERT ELEVATION
IF	INSIDE FACE
IN	INCH(ES)
INCL	INCLUDING
INCR	INCREASE
INST	INSTRUMENT, INSTRUMENTATION
INSUL	INSULATE, INSULATED, INSULATING
INT	INTERIOR, INTERNAL
INV	INVERT
IPS	IRON PIPE SIZE

J

JB	JUNCTION BOX
JT	JOINT

K

KVA	KILOVOLT AMPERE

L

L	LENGTH, LONG, LOW
LAT	LATERAL, LATITUDE
LB(S)	POUND(S)
LC	LENGTH OF CURVE
LF	LINEAR FEET
LH	LEFT HAND
LIN	LINEAL, LINEAR
LONG	LONGITUDE
LP LOW	POINT, LOW PRESSURE
LT	LEFT

M

MAINT	MAINTENANCE
MAN	MANUAL(LY)
MAX	MAXIMUM
MBR	MEMBRANE BIOREACTOR
MC	MECHANICAL COUPLING
MECH	MECHANICAL
MED	MEDIUM
MF	MICROFILTRATION
MFR	MANUFACTURER
MG	MILLION GALLONS
MG/L	MILLIGRAMS PER LITER
MGD	MILLION GALLONS PER DAY
MH	MAINTENANCE HOLE, MANHOLE
MIN	MINIMUM, MINUTE
MISC	MISCELLANEOUS
MJ	MECHANICAL JOINT
MJRG	MECHANICAL JOINT RETAINER GLAND
MJTR	MECHANICAL JOINT WITH TIE ROD
MO	MOTOR OPERATED
MSL	MEAN SEA LEVEL
MTD	MOUNTED
MTL	MATERIAL
MTR	MOTOR
MW	MONITORING WELL

N

N	NORTH, NORTHING, NITROGEN (TOTAL AS N)
N/A	NOT APPLICABLE
NAD	NORTH AMERICAN DATUM (HORIZONTAL)
NAVD	NORTH AMERICAN VERTICAL DATUM
NC	NORMALLY CLOSED
NF	NEAR FACE
NG	NATURAL GAS
NIC	NOT IN CONTRACT
NO	NORMALLY OPEN
NO.	NUMBER(S)
NOM	NOMINAL
NPSH	NET POSITIVE SUCTION HEAD
NPSHR	NET POSITIVE SUCTION HEAD REQUIRED
NPT	NATIONAL PIPE THREAD
NRS	NON-RISING STEM
NS	NEAR SIDE
NTS	NOT TO SCALE

O

OC	ON CENTER, ODOR CONTROL
OD	OUTSIDE DIAMETER
OF	OUTSIDE FACE, OVERFLOW
OH	OVERHEAD
OPER	OPERATING
OPNG	OPENING
OPP	OPPOSITE
OZ	OUNCE

P

P&ID	PIPING/PROCESS AND INSTRUMENTATION DIAGRAM
P	PHOSPHORUS (TOTAL AS P)
PPM	PARTS PER MILLION
PC	POINT OF CURVATURE
PCC	POINT OF COMPOUND CURVATURE
PCCP	PRESTRESSED CONCRETE CYLINDER PIPE
PE	PLAIN END
PG	PRESSURE GAUGE
PH	PIPE HANGER
PI	POINT OF INTERSECTION
PNL(S)	PANEL(S), PANELBOARD(S)
POC	POINT ON CIRCULAR CURVE, POINT OF CONNECTION
POT	POINT ON TANGENT
PP	POWER POLE
PROJ	PROJECTION
PRS	PRESSURE REDUCING STATION
PS	PIPE SUPPORT
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PSIA	POUNDS PER SQUARE INCH ABSOLUTE
PSIG	POUNDS PER SQUARE INCH GAUGE
PT	POINT OF TANGENCY, POINT
PVC	POLYVINYL CHLORIDE, POINT OF VERTICAL CURVATURE
PVT	POINT OF VERTICAL TANGENCY
PVCP	POLYVINYL CHLORIDE PIPE
PVI	POINT OF VERTICAL INTERSECTION
PVMT	PAVEMENT

Q

Q	RATE OF FLOW
QCPLG	QUICK COUPLING

R

R	RADIUS, RISER
R/W	RIGHT OF WAY
RCP	REINFORCED CONCRETE PIPE
RCCP	REINFORCED CONCRETE CYLINDER PIPE
RECIRC	RECIRCULATING
RED	REDUCER, REDUCING
REF	REFERENCE
REINF	REINFORCED, REINFORCING
REM	REMOVABLE, REMOVE
REQD	REQUIRED
RET	RETURN
REV	REVISION, REVISED, REVERSED
RH	RIGHT HAND
RO	REVERSE OSMOSIS
RPM	REVOLUTIONS PER MINUTE
RR	RAILROAD
RS	RISING STEM
RT	RIGHT
ROW	RIGHT OF WAY

S

S	SECOND, SLOPE, SOUTH
SCHED	SCHEDULE
SCFM	STANDARD CUBIC FEET PER MINUTE
SD	STORM DRAIN
SEC	SECOND
SECT	SECTION
SF	SQUARE FEET
SH	SHEET
SIM	SIMILAR
SP	STEEL PIPE
SPA	SPACING, SPACES
SPEC(S)	SPECIFICATION(S)
SPL	SPECIAL
SPLY	SUPPLY
SQ	SQUARE
SS	STAINLESS STEEL
SS	SANITARY SEWER
ST SWR	STORM SEWER
STA	STATION
STD	STANDARD
STL	STEEL
STOR	STORAGE
STR	STRUCTURAL
SUSP	SUSPENDED
SYM	SYMMETRICAL
SYS	SYSTEM

T

T	TELEPHONE, TOP
TAN	TANGENT
TBC	TOP BACK OF CURB
TBD	TO BE DETERMINED
TBM	TEMPORARY BENCHMARK
TC	TOP OF CURB
TDS	TOTAL DISSOLVED SOLIDS
TEMP	TEMPERATURE, TEMPORARY
TH	TEST HOLE
THD	THREADED
THK	THICK, THICKNESS
TOC	TOP OF CONCRETE, TABLE OF CONTENTS, TOTAL ORGANIC CARBON
TOF	TOP OF FOOTING
TOM	TOP OF MASONRY
TOP	TOP OF PIPE
TOW	TOP OF WALL
TP	TEST PIT
TRANS	TRANSFORMER
TS	TOTAL SOLIDS
TSS	TOTAL SUSPENDED SOLIDS
TYP	TYPICAL

U

UB	UTILITY BOX
UF	ULTRAFILTRATION
UG	UNDERGROUND
UNO	UNLESS NOTED OTHERWISE
UP	UTILITY POLE
USGS	UNITED STATES GEOLOGICAL SURVEY
UV	ULTRAVIOLET

V

V	VALVE (SEE P&ID ABBREVIATIONS), VERTICAL, VOLT, VENT
VAC	VACUUM
VB	VALVE BOX
VC	VERTICAL CURVE
VCP	VITRIFIED CLAY PIPE
VERT	VERTICAL
VIF	VERIFY IN FIELD
VOCs	VOLATILE ORGANIC COMPOUNDS
VP	VAPOR PRESSURE

W

W	WEST, WIDE, WATER
W/	WITH
WC	WATER COLUMN
WEF	WATER ENVIRONMENT FEDERATION
W	WATER LEVEL
WM	WATER METER
W/O	WITHOUT
WP	WATERPROOF
WS	WATERSTOP
WS	WATER SURFACE
WSL	WATER SURFACE LEVEL
WT	WEIGHT
WW	WETWELL

X

x	BY, TIMES

Y

YH	YARD HYDRANT

NOTES:

1. FOR EQUIPMENT ABBREVIATIONS, INCLUDING FOR VALVES, REFER TO P&ID LEGEND AND ABBREVIATIONS DRAWINGS FUNCTION CODE ABBREVIATIONS.
2. FOR SYSTEM AND PROCESS STREAM ABBREVIATIONS, REFER TO P&ID LEGEND AND ABBREVIATIONS DRAWINGS SYSTEM CODE AND PROCESS CODE ABBREVIATIONS.
3. FOR PIPE MATERIAL AND INSULATION MATERIAL ABBREVIATIONS REFER TO P&ID LEGEND AND ABBREVIATIONS DRAWINGS PIPELINE MATERIAL CODE AND INSULATION MATERIAL CODE ABBREVIATIONS.

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Black & Veatch Corporation
Chicago, Illinois
ILLINOIS PROFESSIONAL
DESIGN FIRM - 184.002143-0006

Four Rivers Sanitation Authority

AEROBIC GRANULAR SLUDGE - PHASE 1

REVISIONS AND RECORD OF ISSUE

DESIGNED:	JL
DETAILED:	VP
CHECKED:	AM/JH
APPROVED:	MR
DATE:	12/20/2022
PROJECT NO.:	411752

GENERAL

GENERAL

GENERAL, CIVIL, AND PROCESS MECHANICAL ABBREVIATIONS

00-G-004

3 OF 163

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

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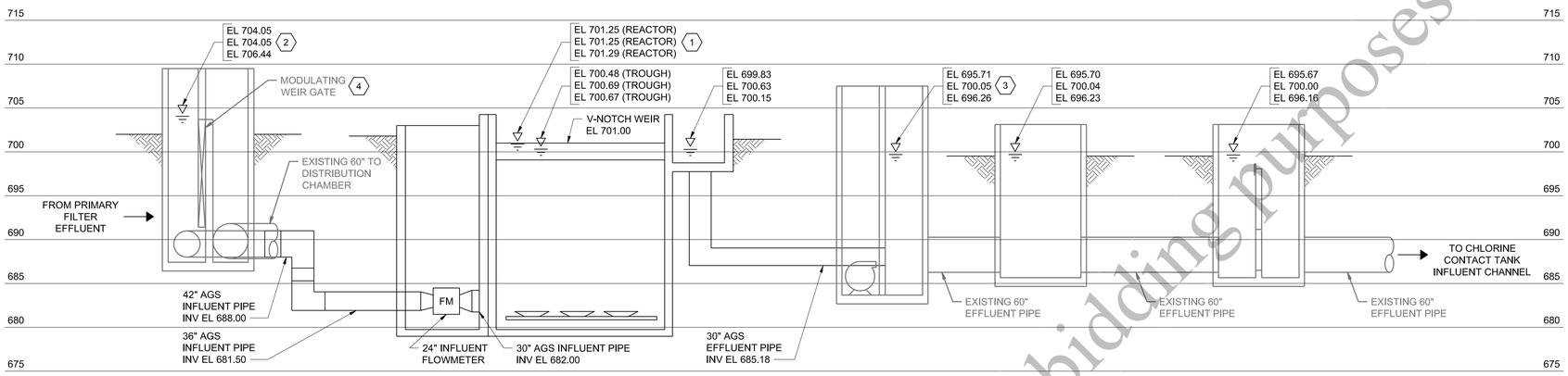
D11000



HYDRAULIC PROFILE
VERICAL SCALE 1/8" = 1'-0"

SHEET KEYNOTES

1. REACTOR WATER ELEVATION CORRESPONDS TO MAXIMUM PROCESS WATER LEVEL OF 21.5 FEET.
2. MAXIMUM WATER ELEVATION AT THE PRIMARY FILTER EFFLUENT DIVERSION STRUCTURE IS 706.50, BASED ON PRELIMINARY DIRECTION FROM THE AGS SYSTEM SUPPLIER AND ESTIMATED AGS EQUIPMENT HEADLOSS, THE MAXIMUM FLOW THROUGH THE AGS FACILITIES IS 15 MGD.
3. 30" AGS EFFLUENT PIPE CONNECTS TO NORTH CHAMBER OF FILTER EFFLUENT PUMP STATION.
4. PRIMARY FILTRATION EFFLUENT CONTROL GATE 2 HAS A MINIMUM WEIR ELEVATION OF 702.00 AND A MAXIMUM WEIR ELEVATION OF 707.50. WEIR GATE WILL MODULATE TO MAINTAIN A DESIRED FLOW RATE TO THE AGS FACILITIES.

KEY

DESIGN AVERAGE FLOW: 40 MGD PLANT INFLUENT FLOW, 10 MGD AGS FLOW
SHORT DURATION PEAK FLOW: 115 MGD PLANT INFLUENT FLOW, 10 MGD AGS FLOW
DESIGN MAX FLOW: 80 MGD PLANT INFLUENT FLOW, 15 MGD AGS FLOW

8' 4' 0 8' 16'
VERTICAL SCALE 1/8"=1'-0"

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

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Four Rivers Sanitation Authority

AEROBIC GRANULAR SLUDGE - PHASE 1

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GENERAL

GENERAL

HYDRAULIC PROFILE

00-G-601

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FDT1000
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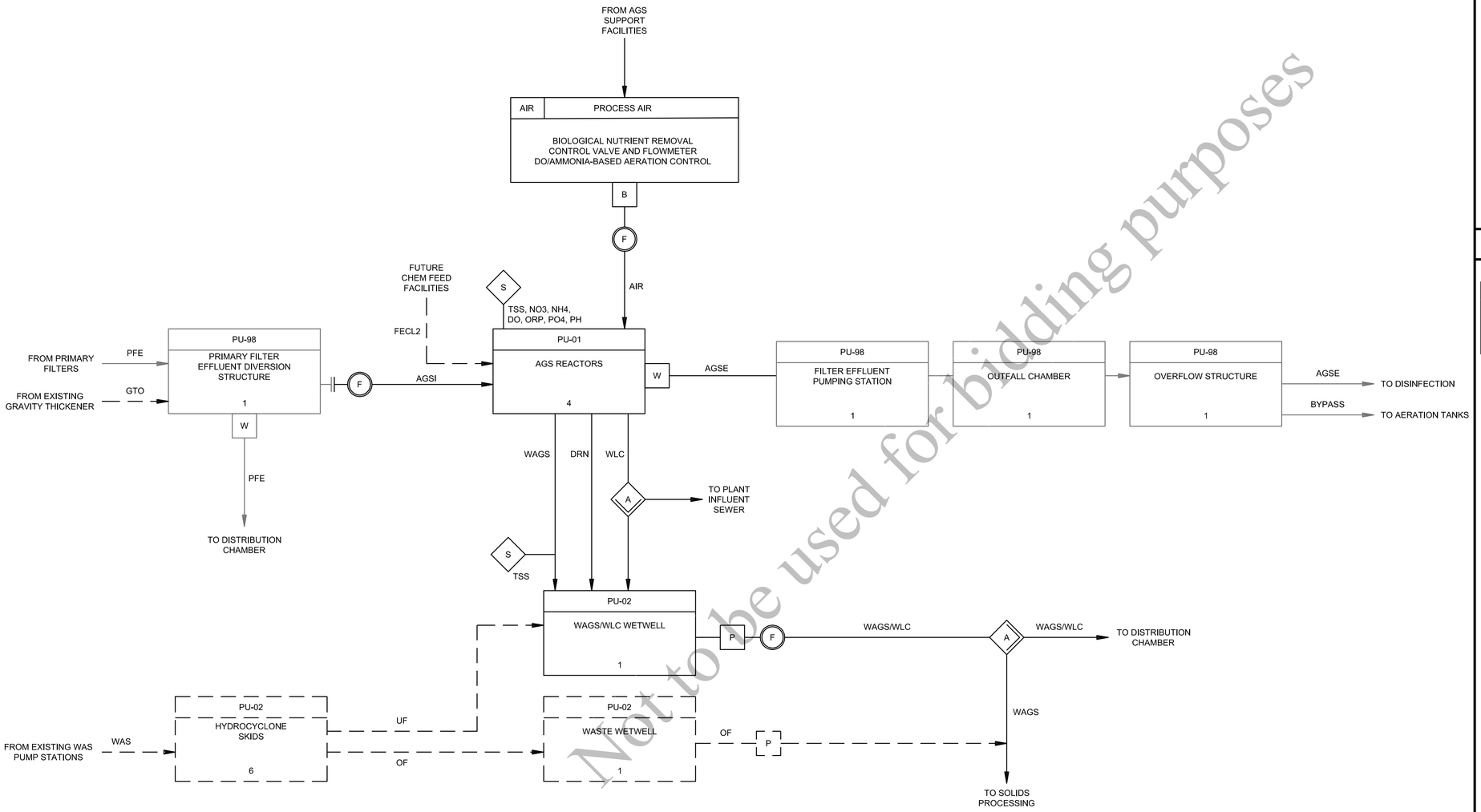

GENERAL SHEET NOTES

1. PROCESS FLOW SHALL NOT BE USED TO DETERMINE THE QUANTITY, LOCATION, OR OPERATION OF ANY EQUIPMENT, VALVES OR SYSTEM COMPONENTS. REFER TO CONTROL DESCRIPTIONS, P&IDS OR DRAWINGS FOR CLARIFICATION. PROCESS FLOW DIAGRAM IS USED TO SHOW INTERACTION OR INTERCONNECTED SYSTEMS.
2. SEE 00-I-003 FOR PROCESS CODE ABBREVIATIONS.

SHEET LEGEND

PU / DESCRIPTION / QTY — PROCESS UNIT

C1 / CHEMICAL / PURPOSE, FLOW PACING, DOSE CONTROL — CHEMICAL DOSING

- F — METERED FLOW
- A — ALTERNATIVE FLOW ROUTE
- A — ALTERNATIVE FLOW ROUTE WITH PREFERRED ROUTE
- S — SAMPLE POINT
- NEW
- EXISTING
- FUTURE

- P — PUMPS
- B — BLOWERS
- Co — COMPRESSORS
- W — WEIR
- E — EJECTOR
- FM — FLASH MIXER
- OM — ORIFICE MIXER
- M — MIXER

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Chicago, Illinois
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Four Rivers Sanitation Authority

AEROBIC GRANULAR SLUDGE - PHASE 1

REVISIONS AND RECORD OF ISSUE

DESIGNED:	JL
DETAILED:	VP
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PROJECT NO.:	411752

GENERAL

GENERAL

LIQUID PROCESS FLOW DIAGRAM

00-G-602

5 OF 163

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

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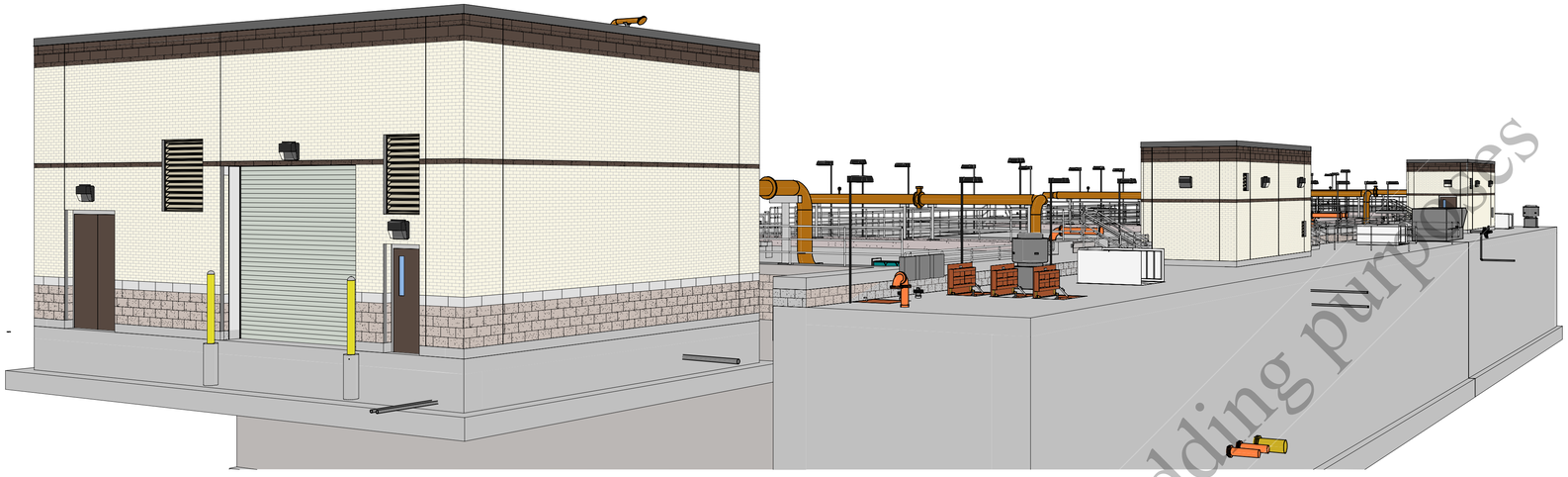
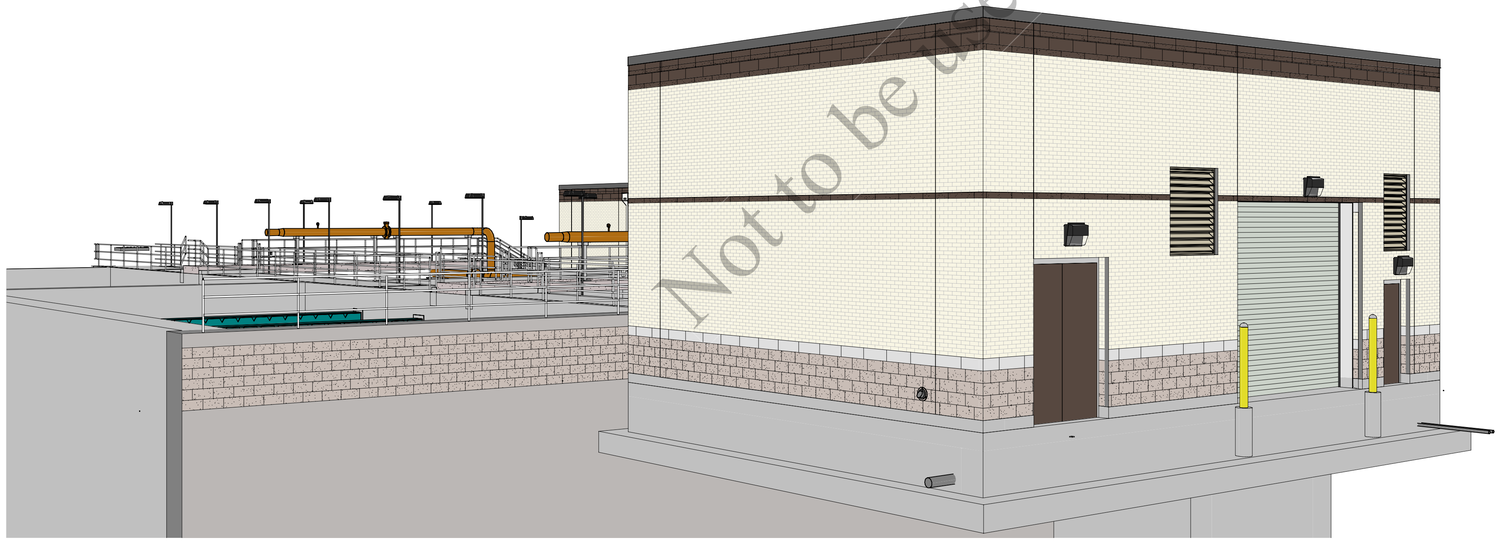


NORTHEAST PERSPECTIVE



SOUTHEAST PERSPECTIVE

GENERAL SHEET NOTES

1. PERSPECTIVE VIEWS ARE FOR GENERAL REFERENCE ONLY AND MAY NOT INCLUDE ALL NECESSARY BUILDING COMPONENTS OR EQUIPMENT REQUIRED. REFER TO OTHER DRAWINGS FOR COMPLETE DETAILED DESIGN.

B&V Design, LLC
Kansas City, Missouri
ILLINOIS PROFESSIONAL
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Four Rivers
Sanitation Authority

AEROBIC GRANULAR SLUDGE - PHASE 1

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DETAILED:	TMB
CHECKED:	PDR
APPROVED:	PDR
DATE:	12/20/2022
PROJECT NO.:	411752

GENERAL

ARCHITECTURAL

NORTHEAST AND SOUTHEAST PERSPECTIVES

00-A-001

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

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STRUCTURAL NOTES

GENERAL

1. THE APPLICABLE BUILDING CODE IS INDICATED ON THE LOADING CRITERIA DRAWING.
2. THE REQUIREMENTS INDICATED ON THIS SHEET ARE INTENDED AS A BASIC SUMMARY OF THE MATERIAL AND CONSTRUCTION REQUIREMENTS FOR THE PROJECT. ADDITIONAL, MORE STRINGENT REQUIREMENTS ARE GIVEN IN THE PROJECT DETAIL DRAWINGS AND SPECIFICATIONS.
3. ALL STRUCTURAL RELATED SHOP DRAWINGS SHALL BE REVIEWED BY THE ENGINEER PRIOR TO CONSTRUCTION.
4. STRUCTURES MAY BE BUOYANT WHEN EMPTY DURING CONSTRUCTION. CONTRACTOR SHALL PROTECT STRUCTURES AGAINST FLOTATION UNTIL CONSTRUCTION IS COMPLETE.
5. STRUCTURES MAY BE UNSTABLE UNTIL THEY ARE CONSTRUCTED IN THEIR ENTIRETY. CONTRACTOR IS RESPONSIBLE FOR DESIGNING TEMPORARY STRUCTURAL SUPPORTS TO RESIST WIND LOADS, CONSTRUCTION LOADS, AND ANY OTHER TEMPORARY CONDITIONS THAT MAY OCCUR DURING CONSTRUCTION, IN ORDER TO MAINTAIN STABILITY OF THE CONSTRUCTION WORK. ANCHORS FOR CONTRACTOR'S TEMPORARY SUPPORT SYSTEMS THAT ATTACH TO CONCRETE OR MASONRY SHALL BE LOCATED TO AVOID DAMAGING EMBEDDED REINFORCEMENT OR UTILITIES.
6. PIPE/ CABLES AND DUCT PENETRATIONS NOT SHOWN ON STRUCTURAL DRAWINGS. CONTRACTOR SHALL COORDINATE WALL AND SLAB PENETRATIONS WITH MECHANICAL, ELECTRICAL, HVAC, PLUMBING AND INSTRUMENTATION DRAWINGS.

CAST-IN-PLACE CONCRETE

1. A MINIMUM 28 DAY COMPRESSIVE STRENGTH (f'c) OF 4,000 PSI WAS UTILIZED IN THE DESIGN OF STRUCTURAL REINFORCED CONCRETE. SEE SPECIFICATIONS FOR CONSTRUCTION STRENGTH REQUIREMENTS.
2. THE LOCATION OF ALL CONSTRUCTION JOINTS AND OTHER TYPES OF JOINTS, OTHER THAN THOSE SPECIFIED OR SHOWN ON THE PLANS, SHALL BE ACCEPTABLE TO THE ENGINEER PRIOR TO PLACING CONCRETE.

REINFORCING STEEL

1. ALL REINFORCING BAR SHALL BE GRADE 60, DEFORMED, ASTM A615, UNLESS NOTED OTHERWISE.
2. DIMENSIONS TO REINFORCING BARS ARE TO BAR CENTERLINES, UNLESS NOTED OTHERWISE. BAR COVER IS THE CLEAR DISTANCE BETWEEN THE BAR AND THE CONCRETE SURFACE.
3. NO WELDING OF REINFORCING BARS SHALL BE PERMITTED UNLESS APPROVAL IS OBTAINED FROM THE ENGINEER PRIOR TO CONSTRUCTION.
4. FOR CONCRETE SLABS THAT HAVE A SLOPING TOP FACE, THE TOP LAYERS OF REINFORCEMENT SHALL BE PLACED ON A SIMILAR SLOPE SO THAT SPECIFIED COVER IS MAINTAINED.

POST-INSTALLED ANCHORS

1. POST-INSTALLED ANCHORS SHALL INCLUDE ADHESIVE ANCHORS (THREADED RODS, BOLTS OR REINFORCING BARS), EXPANSION ANCHORS, AND UNDERCUT ANCHORS INSTALLED INTO HARDENED CONCRETE OR MASONRY. SEE THE ANCHORAGE IN CONCRETE AND MASONRY SPECIFICATION SECTION FOR ADDITIONAL REQUIREMENTS.
2. POST-INSTALLED ANCHORS SHALL ONLY BE USED WHERE INDICATED ON THE DRAWINGS. CONTRACTOR SHALL OBTAIN APPROVAL FROM ENGINEER PRIOR TO USING POST-INSTALLED ANCHORS FOR MISSING OR MISPLACED CAST-IN-PLACE ANCHORS.
3. CARE SHALL BE TAKEN TO AVOID CONFLICTS WITH EXISTING REINFORCING STEEL AND OTHER EMBEDDED ITEMS WHEN DRILLING HOLES. REINFORCING BARS SHALL NOT BE DAMAGED DURING DRILLING OR ANCHOR INSTALLATION. HOLES SHALL BE DRILLED AND CLEANED PER THE PRODUCT MANUFACTURER'S INSTRUCTIONS. ANCHORS SHALL BE INSTALLED PER THE PRODUCT MANUFACTURER'S INSTRUCTIONS AT NOT LESS THAN MINIMUM EDGE DISTANCES AND/OR SPACING INDICATED IN THE MANUFACTURER'S LITERATURE.
4. SUBSTITUTION REQUESTS FOR PRODUCTS OTHER THAN THOSE LISTED IN THE SPECIFICATION OR INDICATED ON THE DRAWINGS SHALL BE SUBMITTED TO ENGINEER FOR REVIEW AND APPROVAL. PRODUCT ICC-ESR EVALUATION REPORTS SHALL BE INCLUDED WITH THE SUBMITTAL PACKAGE. IF REQUESTED, CALCULATIONS PREPARED BY A REGISTERED PROFESSIONAL ENGINEER USING METHODS AND PROCEDURES REQUIRED BY THE BUILDING CODE MAY BE REQUIRED AS PART OF THE SUBMITTAL PACKAGE.
5. UNLESS NOTED OTHERWISE, THE MINIMUM EMBEDMENT PROVIDED FOR ADHESIVE ANCHORED REINFORCING BARS SHALL DEVELOP THE FULL TENSILE STRENGTH OF THE BAR.
6. SPECIAL INSPECTION WILL BE PROVIDED FOR ALL POST-INSTALLED ANCHORS.

STAINLESS STEEL

1. STAINLESS STEEL BOLTS SHALL CONFORM TO ASTM F593, ALLOY GROUP 1 OR 2, UNLESS NOTED OTHERWISE. MINIMUM YIELD STRENGTH SHALL BE 45 KSI.
2. STAINLESS STEEL PLATES SHALL CONFORM TO ASTM A240, TYPE 316L.
3. STAINLESS STEEL STRUCTURAL SHAPES SHALL CONFORM TO ASTM A1069 OR ASTM A276, TYPE 316L.

ALUMINUM

1. UNLESS NOTED OTHERWISE, ALUMINUM ALLOY IN ALL ALUMINUM STRUCTURAL MATERIALS SHALL BE 6061-T6. PIPE AND TUBING FOR GUARDRAIL AND HANDRAIL SHALL BE ALLOY 6061-T6 OR 6005A-T61.
2. ALL ALUMINUM SURFACES IN CONTACT WITH CONCRETE OR DISSIMILAR METALS SHALL BE COATED OR COVERED WITH A HEAVY COAT OF BITUMINOUS PAINT TO PREVENT ALUMINUM-CONCRETE REACTION OR ELECTROLYTIC ACTION.

MASONRY

1. CONCRETE MASONRY UNITS SHALL CONFORM TO ASTM C90. THE TOTAL MASONRY ASSEMBLAGE SHALL HAVE A COMPRESSIVE STRENGTH EQUAL TO 2500 PSI AT 28 DAYS.
2. MASONRY MORTAR SHALL CONFORM TO ASTM C270, TYPE S.
3. ALL BOND BEAMS AND ANY BLOCK CELLS CONTAINING REINFORCING STEEL, ANCHORS OR OTHER EMBEDMENTS SHALL BE FILLED WITH GROUT MEETING THE REQUIREMENTS OF ASTM C476. WALLS SHALL BE FULLY GROUTED WHEN INDICATED ON THE DRAWINGS.
4. BOND BEAM REINF SHALL BE CONTINUOUS AT CORNERS, INTERSECTIONS AND CONTROL JOINTS.

STRUCTURAL STEEL

1. ROLLED WIDE FLANGE SHAPES SHALL HAVE A MINIMUM YIELD STRENGTH OF 50 KSI;
   CHANNELS, PLATES, AND ANGLES A MINIMUM OF 36 KSI;
   STRUCTURAL PIPES A MINIMUM OF 35 KSI;
   ROUND STRUCTURAL TUBES A MINIMUM OF 46 KSI;
   RECTANGULAR STRUCTURAL TUBES A MINIMUM OF 50 KSI.
2. WELDING SHALL BE DONE WITH A FILLER MATERIAL HAVING A MINIMUM TENSILE STRENGTH OF 70 KSI.
3. BOLTED CONNECTIONS SHALL USE 3/4" DIA ASTM F3125, GRADE A325 BOLTS OR GRADE F1852 TWIST-OFF BOLTS, WITH THE THREADS EXCLUDED FROM THE SHEAR PLANE, UNLESS NOTED OTHERWISE.
4. CARBON STEEL OR GALVANIZED STEEL ANCHOR RODS AND ANCHOR BOLTS SHALL CONFORM TO ASTM F1554 GRADE 36.
5. HOLES FOR ANCHOR RODS AND ANCHOR BOLTS IN COLUMN BASE PLATES USING ASTM F844 OR F436 FLAT CIRCULAR WASHERS SHALL BE AS FOLLOWS:

   BOLTS/RODS 3/4" TO 1" - 5/16" OVERSIZE
   BOLTS/RODS 1" TO 2" - 1/2" OVERSIZE
   BOLTS/RODS OVER 2" - 1" OVERSIZE

   AT THE CONTRACTORS OPTION, OVERSIZE HOLES LARGER THAN THOSE LISTED ABOVE MAY BE USED, PROVIDED THAT 3/8" PLATE WASHERS ARE USED WITH STANDARD HOLES AND FIELD WELDED WITH A 5/16" FILLET WELD TO THE BASE PLATE ALONG A MIN OF 3 SIDES.
6. STEEL LEGEND

   INDICATES ANGLE OR PLATE TO BE WELDED ON THREE SIDES

   INDICATES MOMENT CONNECTION

EXCAVATION, BACKFILL, AND FOUNDATIONS

1. FOUNDATION CONSTRUCTION SHALL NOT BEGIN UNTIL ANY REQUIRED SPECIAL INSPECTION HAS BEEN COMPLETED AND THE CONTRACTOR NOTIFIED TO PROCEED.
2. TO FACILITATE SCHEDULING, AT LEAST 48 HOURS ADVANCE NOTICE SHALL BE GIVEN TO THE ENGINEER PRIOR TO THE REQUIRED INSPECTIONS.
3. UNLESS NOTED OTHERWISE, BACKFILL SHALL NOT BE PLACED AGAINST WALLS WHICH SUPPORT A CONCRETE SLAB OR WALKWAY UNTIL THE TOP SLAB OR WALKWAY HAS BEEN PLACED IN ITS ENTIRETY AND ALL CONCRETE HAS REACHED THE SPECIFIED DESIGN STRENGTH.
4. OVER-EXCAVATION OF SOIL, OR OVER-BREAKING OF ROCK, THAT WOULD RESULT IN A STRUCTURAL CONCRETE THICKNESS GREATER THAN INDICATED ON THE DRAWINGS SHALL BE CLASSIFIED AS UNAUTHORIZED EXCAVATION. CONTRACTOR SHALL SELECT ONE OF TWO METHODS TO ADDRESS UNAUTHORIZED EXCAVATION.
   - REPLACE UNAUTHORIZED EXCAVATION MATERIAL WITH LEAN CONCRETE THAT IS PLACED SEPARATELY FROM THE STRUCTURAL CONCRETE INDICATED ON THE DRAWINGS. CONTRACTOR WILL RECEIVE NO ADDITIONAL PAYMENT FOR THE LEAN CONCRETE.
   - REPLACE UNAUTHORIZED EXCAVATION MATERIAL WITH STRUCTURAL CONCRETE THAT IS PLACED MONOLITHICALLY WITH THE STRUCTURAL CONCRETE INDICATED ON THE DRAWINGS, CREATING AN ENLARGED SECTION. CONTRACTOR SHALL NOTIFY ENGINEER FOR DIRECTION PRIOR TO PERFORMING THIS WORK. THE INCREASED CONCRETE THICKNESS MAY REQUIRE ADDITIONAL REINFORCEMENT AND/OR OTHER DESIGN MODIFICATIONS. IF THE INCREASED CONCRETE THICKNESS EXCEEDS 36 INCHES, ENGINEER MAY REQUIRE CONTRACTOR TO IMPLEMENT MASS CONCRETE HEAT MITIGATION PROCEDURES. CONTRACTOR WILL RECEIVE NO ADDITIONAL PAYMENT FOR EXTRA STRUCTURAL CONCRETE, ADDITIONAL REINFORCEMENT, OTHER DESIGN MODIFICATIONS, OR MASS CONCRETING PROCEDURES.
5. THE FOLLOWING NET ALLOWABLE BEARING PRESSURES WERE UTILIZED IN THE DESIGN OF THE FOUNDATIONS.

   SPREAD FOOTINGS.....3000 PSF
   FROST DEPTH.....4'-0"
   COEFFICIENT AGAINST SLIDING (ULTIMATE).....0.40
6. FOUNDATION DESIGN IS BASED UPON THE INFORMATION AND RECOMMENDATION INCLUDED IN THE FINAL GEOTECHNICAL ENGINEERING REPORT - DATED OCTOBER 27, 2022 BY GEOCON PROFESSIONAL SERVICES, 9370 W LARAWAY Rd, FRANKFORT, IL 60423, GEOCON PROJECT NO. 21-G801.

EXISTING STRUCTURES

1. THE DRAWINGS DEPICT WORK AT EXISTING STRUCTURES. ALL DIMENSIONS AND ALL DEPICTIONS SHALL BE FIELD VERIFIED BY THE CONTRACTOR PRIOR TO ORDERING MATERIALS, STARTING FABRICATION, OR STARTING CONSTRUCTION.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE, REPAIRS OR STRUCTURAL MODIFICATIONS THAT ARE REQUIRED DUE TO DEMOLITION BEYOND THE LIMITS IDENTIFIED IN THE DRAWINGS.
3. REINFORCEMENT FOR ANY EXISTING CONCRETE OR MASONRY ELEMENT SHALL NOT BE DAMAGED UNLESS THE ELEMENT IS TO BE DEMOLISHED. WHEN LOCATING EXISTING REINFORCEMENT IS REQUIRED, IT SHALL BE LOCATED USING NON-DESTRUCTIVE METHODS. REINFORCING STRANDS IN EXISTING PRESTRESSED CONCRETE SHALL NOT BE CUT UNLESS INDICATED ON THE DRAWINGS OR OTHERWISE AUTHORIZED BY THE ENGINEER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE, REPAIRS OR STRUCTURAL MODIFICATIONS THAT ARE REQUIRED DUE TO DAMAGE OF CONCRETE, MASONRY OR REINFORCEMENT THAT HAS BEEN IDENTIFIED ON THE DRAWINGS TO REQUIRE FIELD VERIFICATION.
4. CORE DRILLING AND SAW CUTTING SHALL NOT BE PERFORMED UNLESS INDICATED ON THE DRAWINGS OR APPROVED BY ENGINEER.
5. EXPOSED CONCRETE SURFACES THAT REMAIN AFTER DEMOLITION SHALL BE REPAIRED TO MATCH ADJACENT CONCRETE SURFACES.
6. UNLESS OTHERWISE INDICATED ON THE DRAWINGS, EXPOSED CONCRETE SURFACES WITH REINFORCEMENT, ANCHOR BOLTS, HANGER RODS, OR OTHER EXPOSED METAL EMBEDMENTS SHALL BE REPAIRED BY CUTTING OFF THE METAL AT THE FACE OF THE CONCRETE, GRINDING SMOOTH, AND COATING. COATING SHALL EXTEND A MINIMUM OF 1" BEYOND THE EDGE OF ANY EXPOSED METAL.

SPECIAL INSPECTIONS

1. CODE REQUIRED SPECIAL INSPECTIONS AND TESTS WILL BE CONDUCTED BY APPROVED AGENCIES EMPLOYED BY THE OWNER IN ACCORDANCE WITH THE APPLICABLE BUILDING CODE.
2. THE STATEMENT OF SPECIAL INSPECTIONS WILL BE PREPARED BY THE REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE DURING CONSTRUCTION.
3. SEE THE QUALITY CONTROL SECTION AND THE CODE REQUIRED SPECIAL INSPECTIONS AND PROCEDURES SECTION OF THE SPECIFICATIONS FOR FURTHER CLARIFICATION OF RESPONSIBILITIES.

DELEGATED DESIGN

1. THE FOLLOWING ITEMS ARE IDENTIFIED IN THE DRAWINGS AND SPECIFICATIONS AS BEING DESIGNED AND SEALED BY OTHERS IN ACCORDANCE WITH SPECIFICATIONS. SUBMITTALS FOR THESE ITEMS SHALL BE PREPARED BY THE SUPPLIERS AND SUBMITTED TO ENGINEER AND CODE OFFICIAL FOR REVIEW.

   SPECIFICATION SECTION 01 61 00 – EQUIPMENT AND NON-STRUCTURAL COMPONENTS.
   SPECIFICATION SECTION 05 52 13 – METAL RAILINGS.
   SPECIFICATION SECTION 05 81 00 – EQUIPMENT ANCHORAGE.
   SHEET 99-S-506 – STEEL PAN STAIRS.
   SPECIFICATION SECTION 40 05 07 – PIPE SUPPORTS FOR 12" AND SMALLER DIAMETER PIPES
   SPECIFICATION SECTION 05 50 00 – METAL LADDERS.
   SPECIFICATION SECTION 05 31 00 – STEEL DECKING.
   SPECIFICATION SECTION 05 53 13 – METAL GRATINGS.
   SPECIFICATION SECTION 03 41 00 – PRECAST STRUCTURAL CONCRETE.
   SPECIFICATION SECTION 26 05 11 – CABLE TRAY & SUPPORTS.
   SPECIFICATION SECTION 05 50 00 & 05 50 13 – STEEL CROSS OVER STAIRS.

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Four Rivers Sanitation Authority

AEROBIC GRANULAR SLUDGE - PHASE 1

REVISIONS AND RECORD OF ISSUE

DESIGNED:	SKA
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APPROVED:	TNG
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PROJECT NO.:	411752

GENERAL

STRUCTURAL

GENERAL NOTES

00-S-001

7 OF 163

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

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FILE: BIM 360://409469 - Aerobic Granular Sludge Phase 1/409469 - AGS.rvt
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STRUCTURAL ABBREVIATIONS

A

ADDL	ADDITIONAL
AFF	ABOVE FINISH FLOOR
AGS	AEROBIC GRANULAR SLUDGE
AHR	ANCHOR
ALT	ALTERNATE
ALUM	ALUMINUM
APPROX	APPROXIMATE
ARCH	ARCHITECTURAL
AROD	ANCHOR ROD
ASSY	ASSEMBLY
AWG	AMERICAN WIRE GAUGE

B

BLDG	BUILDING
BM	BENCHMARK, BEAM
BO	BOTTOM OF
BOT	BOTTOM
BRDG	BRIDGING
BRG	BEARING
BTWN	BETWEEN
BTB	BACK TO BACK

C

C	CAMBER
CANTIL	CANTILEVER
CHKD	CHECKERED
CHKDPL	CHECKERED PLATE
CIP	CAST-IN-PLACE
CJ	CONSTRUCTION JOINT
CJP	COMPLETE JOINT PENETRATION
CL	CENTERLINE
CLR	CLEAR
CMU	CONCRETE MASONRY UNIT
COL	COLUMN
CONC	CONCRETE
CONN	CONNECTION
CONSTR	CONSTRUCTION
CONT	CONTINUOUS,CONTINUATION, CONTROL
COORD	COORDINATE
COV	COVER
CRNR	CORNER
CTRD	CENTERED
CTRS	CENTERS

D

db	BAR DIAMETER
DBA	DEFORMED BAR ANCHOR
DET	DETAIL
DIA	DIAMETER
DIAG	DIAGONAL
DIM	DIMENSION
DN	DOWN
DWA	DEFORMED WIRE ANCHOR
DWG(S)	DRAWING, DRAWINGS
DWL(S)	DOWEL, DOWELS

E

E	EAST
EA	EACH
EE	EACH END
EF	EACH FACE
EJ	EXPANSION JOINT
EL	ELEVATION
EMBED	EMBEDMENT
EMER	EMERGENCY
ENGR	ENGINEER
EQ	EQUAL
EQUIP	EQUIPMENT
EQUIV	EQUIVALENT
EW	EACH WAY
EXIST	EXISTING
EXP	EXPANSION
EXT	EXTERIOR

F

FAB	FABRICATE
f'c	28 DAY CONCRETE STRENGTH =
FD	FLOOR DRAIN
FDN	FOUNDATION
FGL	FINISHED GROUND LEVEL
FIN	FINISH(ED)
FLR	FLOOR
FS	FAR SIDE
FT	FOOT
FTG	FOOTING
FUT	FUTURE
FV	FIELD VERIFY
Fy	STRUCTURAL STEEL YIELD STRENGTH =
fy	REINFORCING STEEL YIELD STRENGTH =

G

GA	GAUGE
GALV	GALVANIZED
GEN	GENERAL
GR	GRADE

H

H	HORIZONTAL REACTION
HC	HOLLOW CORE
HCA	HEADED CONCRETE ANCHOR
HEX	HEXAGONAL
HGR	HANGER
HORIZ	HORIZONTAL
HP	HIGH POINT
HSS	HOLLOW STRUCTURAL SECTION

I

ID	INSIDE DIAMETER
IF	INSIDE FACE
IN	INCHES
INT	INTERIOR, INTERNAL
INV	INVERT

J

JT	JOINT

K

K	KIPS (1000 LBS)
KSF	KIPS PER SQUARE FOOT
KSI	KIPS PER SQUARE INCH

L

L	LENGTH, ANGLE
LAB	LABORATORY
LB(S)	POUND, POUNDS
ld	DEVELOPMENT LENGTH
LE	LEFT END
LIN	LINES
LLBB	LONG LEG BACK TO BACK
LLH	LONG LEG HORIZONTAL
LLV	LONG LEG VERTICAL
LONG	LONGITUDINAL
LP	LOW POINT
LSH	LONG SIDE HORIZONTAL
LSHP	LONG SLOTTED HOLE PARALLEL
LSLT	LONG SLOTTED HOLE TRANSVERSE
LSV	LONG SIDE VERTICAL
LWC	LIGHTWEIGHT CONCRETE

M

M	MOMENT
MAS	MASONRY
MATL	MATERIAL
MAX	MAXIMUM
MC	MOMENT CONNECTION, MECHANICAL COUPLING
MECH	MECHANICAL
MEZZ	MEZZANINE
MFR	MANUFACTURE(R)
MIN	MINIMUM
MISC	MISCELLANEOUS
MTL	METAL

N

N	NORTH
N/A	NOT APPLICABLE
NIC	NOT IN CONTRACT
NO.	NUMBER
NOM	NOMINAL
NS	NEAR SIDE
NTS	NOT TO SCALE
NWC	NORMAL WEIGHT CONCRETE

O

OC	ON CENTER
OD	OUTSIDE DIAMETER
OF	OUTSIDE FACE
OPER	OPERATING
OPH	OPPOSITE HAND
OPNG	OPENING
OPP	OPPOSITE
OVS	OVERSIZED HOLE
OZ	OUNCE

P

P	AXIAL LOAD
PAF	POWDER ACTUATED FASTENER
PAR	PARALLEL
PCC	PRECAST CONCRETE
PCF	POUNDS PER CUBIC FOOT
PEMB	PRE-ENGINEERED METAL BUILDING
PERP	PERPENDICULAR
PJP	PARTIAL JOINT PENETRATION
PL	PLATE
PLCS	PLACES
PLF	POUNDS PER LINEAR FOOT
PR	PAIR
PRELIM	PRELIMINARY
PROJ	PROJECTION
PROP	PROPERTY
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PT	POST TENSIONED

Q

QTY	QUANTITY

R

R	RADIUS, RISER, REMAINDER
RCP	REINFORCED CONCRETE PIPE
RD	ROOF DRAIN
RECT	RECTANGULAR
REF	REFERENCE
REINF	REINFORCEMENT
REQD	REQUIRED
REV	REVISION
RO	ROUGH OPENING

S

S	SOUTH
SC	SLIP CRITICAL, SHEAR CONNECTOR
SCHED	SCHEDULE
SECT	SECTION
SF	SIDE FACE REINFORCEMENT
SH	SHEET
SIM	SIMILAR
SJ	SAW JOINT
SLBB	SHORT LEG BACK TO BACK
SPA	SPACING
SPEC	SPECIFICATION
SPRT	SUPPORT
SQ	SQUARE
SS	STAINLESS STEEL
SSHP	SHORT SLOTTED HOLE PARALLEL
SSHT	SHORT SLOTTED HOLE TRANSVERSE
STD	STANDARD
STIF	STIFFENER
STIR	STIRRUP
STL	STEEL
STR	STRUCTURE, STRUCTURAL
SYM	SYMMETRICAL

T

T	TREAD, SCHEDULED PLATE THICKNESS, TOP
T&B	TOP & BOTTOM
TAN	TANGENT
TEMP	TEMPERATURE
THD	THREADED
THK	THICK, THICKNESS
TO	TOP OF
TOC	TOP OF CONCRETE
TOF	TOP OF FOOTING
TOM	TOP OF MASONRY
TOS	TOP OF STEEL
TOW	TOP OF WALL
TPV	THERMOPLASTIC VULCANIZATE
TYP	TYPICAL

U

UNO	UNLESS NOTED OTHERWISE
USGS	UNITED STATES GEOLOGICAL SURVEY

V

VERT	VERTICAL
VNR	VENEER

W

W	WEST
W/	WITH
W/O	WITHOUT
WF	WIDE FLANGE
WP	WORK POINT
WT	WEIGHT
WWR	WELDED WIRE REINFORCEMENT

X

x	BY, TIMES
XS	EXTRA STRONG
XXS	DOUBLE EXTRA STRONG

Y

NOT USED

Z

NOT USED

SPECIAL CHARACTERS

@	AT
&	AND
ø	DIAMETER
#	NUMBER
%	PERCENT

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GENERAL

STRUCTURAL

LEGENDS AND ABBREVIATIONS

00-S-002

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

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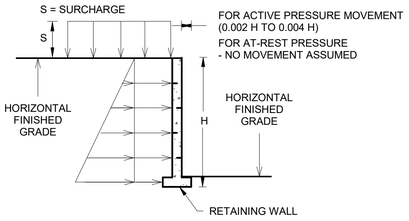
BASIC LOADING CRITERIA

THE APPLICABLE BUILDING CODE IS THE 2015 INTERNATIONAL BUILDING CODE (IBC), WITH CITY OF ROCKFORD AMENDMENDS

1. DEAD LOAD ..... CALCULATED
2. LIVE LOADS:
   - OPERATING AND PROCESS FLOORS ..... 150 PSF
   - STAIRS, SERVICE PLATFORMS & LANDINGS ..... 100 PSF
   - ELECTRICAL AND CONTROL ROOM FLOORS ..... 250 PSF
   - CHEMICAL STORAGE ROOMS ..... 250 PSF
   - STORAGE ..... 250 PSF
   - ALL FLOORS NOT INDICATED ..... 100 PSF
   - ROOF ..... 20 PSF(UNREDUCED)
3. LATERAL EARTH PRESSURE (EQUIVALENT FLUID PRESSURE)
   - NON-SATURATED ..... 60 PSF/FT
   - SATURATED ..... 94 PSF/FT

EARTH PRESSURE COEFFICIENTS

EARTH PRESSURE COEFFICIENTS EARTH PRESSURE CONDITIONS	COEFFICIENT FOR BACKFILL TYPE	EQUIVALENT FLUID DENSITY (pcf)		SURCHARGE PRESSURE, p1 (psf)	EARTH PRESSURE, p2 (psf)
		DRAINED	UNDRAINED		
AT-REST (Ko)	GRANULAR - 0.50	60	94	(0.50) S	(60)H
ACTIVE (Ka)	GRANULAR - 0.33	40	94	(0.33) S	(40)H
PASSIVE (Kp)	GRANULAR - 3.0 COHESIVE - 2.4	360 290	--	-- --	(360)H (290)H



4. LATERAL SURCHARGE ..... EQUIVALENT TO 2 FEET OF SOIL WHERE ADJACENT TO A ROADWAY
5. COMPACTIVE SURCHARGE LOAD ..... 400 PSF AT FINISH GRADE ELEVATION DECREASING LINEARLY AT SAME RATE AS BACKFILL LOAD INCREASES. FOR WALLS 8 FEET OR LESS IN HEIGHT, USE CRITERIA 4 ABOVE AS COMPACTIVE SURCHARGE.
6. HYDROSTATIC FLUID PRESSURE ..... 63 PSF/FT
7. SNOW LOAD:
   - GROUND SNOW LOAD (P_g) ..... 30 PSF
   - SNOW EXPOSURE FACTOR (C_e) 1.2
8. SEISMIC LOAD:
   - MAPPED MCE SHORT PERIOD SPECTRAL RESPONSE ACCELERATION (S_S) 0.124g
   - MAPPED MCE ONE SECOND PERIOD SPECTRAL RESPONSE ACCELERATION (S_1) 0.058g
   - DESIGN SPECTRAL RESPONSE ACCELERATION AT SHORT PERIODS (S_{DS}) 0.132g
   - DESIGN SPECTRAL RESPONSE ACCELERATION AT ONE SECOND PERIOD (S_{D1}) 0.092g
   - SITE CLASS ..... D
9. WIND LOAD:
   - BASIC (ULTIMATE) DESIGN WIND SPEED ..... 120 MPH
   - ALLOWABLE STRESS (NOMINAL) DESIGN WIND SPEED ..... 93 MPH
   - GROUND ELEVATION FACTOR (K_e) 1.0
   - EXPOSURE ..... B
10. DESIGN FLOOD ELEVATION ..... EL 697.30 (NAVD 88) (FROM FLOOD INSURANCE RATE MAP 17201C0376E AND 17201C0377E, ZONE X, OUTSIDE OF THE 0.2% AND 1% ANNUAL CHANCE FLOOD HAZARD)
11. DESIGN NORMAL GROUND WATER ELEVATION ..... EL 688.00

SNOW AND SEISMIC LOADING CRITERIA FOR BUILDINGS	AGS REACTORS PIPE GALLERY SLAB	AGS REACTORS STAIR TOWER	AGS SUPPORT FACILITY
RISK CATEGORY	III	III	III
FLAT-ROOF SNOW LOAD (P_f), PSF	34	34	34
SNOW DRIFT SURCHARGE LOAD (P_d), PSF	57	27.4	33.3
SNOW DRIFT WIDTH (W), FEET	12.75	33.3	7.45
SNOW IMPORTANCE FACTOR (I_S)	1.1	1.1	1.1
THERMAL FACTOR (C_t)	1.2	1.2	1.2
SEISMIC IMPORTANCE FACTOR	1.25	1.25	1.25
SEISMIC DESIGN CATEGORY	B	B	B
BASIC LATERAL FORCE RESISTING SYSTEM	CONCRETE SHEAR WALL	ORDINARY REINFORCED CMU WALL	ORDINARY REINFORCED CMU WALL
STRENGTH DESIGN BASE SHEAR, KIPS	-	13	65
SEISMIC RESPONSE COEFFICIENT (C_S)	-	0.083	0.083
RESPONSE MODIFICATION FACTOR (R)	-	2	2
SEISMIC ANALYSIS PROCEDURE	EQUIVALENT STATIC ANALYSIS	EQUIVALENT STATIC ANALYSIS	EQUIVALENT STATIC ANALYSIS

AGS REACTORS STAIR TOWER

- INTERNAL PRESSURE COEFFICIENT ..... ±0.55
- DIMENSION "a" FOR WALLS ..... 3.00 FT
- DIMENSION "h" FOR ROOF ..... 11.17 FT
- ROOF TYPE 1

EFFECTIVE WIND AREA (SQUARE FEET)

ROOF		<=10	20	50	>=100	
INTERIOR ZONE 1 (PSF)	(+)	19	18	17	16	
	(-)	-34	-33	-32	-32	
EDGE ZONE 2 (PSF)	(+)	19	18	17	16	
	(-)	-52	-47	-41	-36	
CORNER ZONE 3 (PSF)	(+)	19	18	17	16	
	(-)	-73	-62	-47	-36	

EFFECTIVE WIND AREA (SQUARE FEET)

WALL		<=10	20	50	100	>=500
INTERIOR ZONE 4 (PSF)	(+)	32	31	29	28	26
	(-)	-34	-33	-31	-30	-28
EXTERIOR ZONE 5 (PSF)	(+)	32	31	29	28	26
	(-)	-40	-38	-35	-33	-28

AGS SUPPORT FACILITY

- INTERNAL PRESSURE COEFFICIENT ..... ±0.55
- DIMENSION "a" FOR WALLS ..... 3.00 FT
- DIMENSION "h" FOR ROOF ..... 17.83 FT
- ROOF TYPE 1

EFFECTIVE WIND AREA (SQUARE FEET)

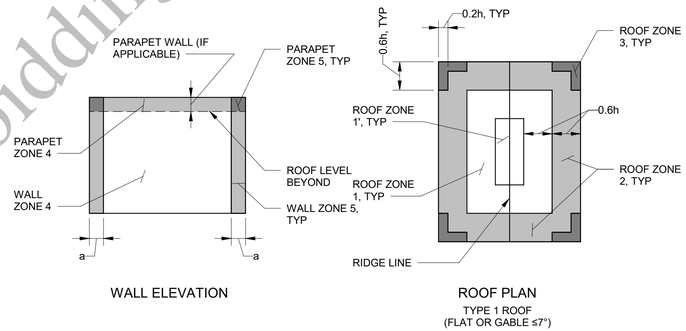
ROOF		<=10	20	50	>=100	
INTERIOR ZONE 1 (PSF)	(+)	24	23	22	21	
	(-)	-43	-42	-41	-40	
EDGE ZONE 2 (PSF)	(+)	40	39	37	36	
	(-)	-66	-60	-52	-46	
CORNER ZONE 3 (PSF)	(+)	40	39	37	36	
	(-)	-66	-60	-52	-46	

EFFECTIVE WIND AREA (SQUARE FEET)

WALL		<=10	20	50	100	>=500
INTERIOR ZONE 4 (PSF)	(+)	40	39	37	36	33
	(-)	-43	-42	-40	-39	-35
EXTERIOR ZONE 5 (PSF)	(+)	40	39	37	36	33
	(-)	-51	-48	-44	-42	-35

NOTES:

1. a = 0.1 x LEAST HORIZ DIM, OR 0.4xh, WHICHEVER IS SMALLER BUT NOT LESS THAN 0.04 x LEAST HORIZ OR 3'-0".
2. h = EAVE HT.
3. POSITIVE PRESSURES ACT TOWARDS THE SURFACE. NEGATIVE PRESSURES ACT AWAY FROM THE SURFACE.
4. LINEARLY INTERPOLATE PRESSURES FOR EFFECTIVE WIND AREAS BETWEEN THOSE SCHEDULED OR USE PRESSURES FOR THE SMALLER EFFECTIVE WIND AREA.
5. ALL ROOF OVERHANG PRESSURES ACT UPWARD.
6. SOFFITS BELOW ROOF OVERHANGS ARE DESIGNED FOR THE PRESSURE ON THE WALL BELOW THE SOFFIT.
7. PARAPET PRESSURES ARE THE TOTAL OF THE WINDWARD AND LEEWARD PARAPET FACE VALUES.
8. PRESSURES MENTIONED IN THE ABOVE TABLE ARE AT STRENGTH LEVEL.
9. PRESSURES MENTIONED IN THE ABOVE TABLE INCLUDE INTERNAL PRESSURE COEFFICIENT.
10. NET WIND PRESSURE OF 54 PSF IS APPLICABLE ON HVAC/EQUIPMENTS ON ROOF TOP.
11. NET WIND PRESSURE OF 106 PSF IS APPLICABLE FOR PARAPET WALL DESIGN.



WIND ZONE DIAGRAMS

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LOADING CRITERIA

00-S-003

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

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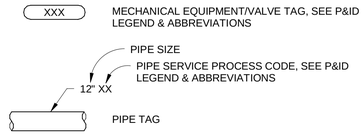
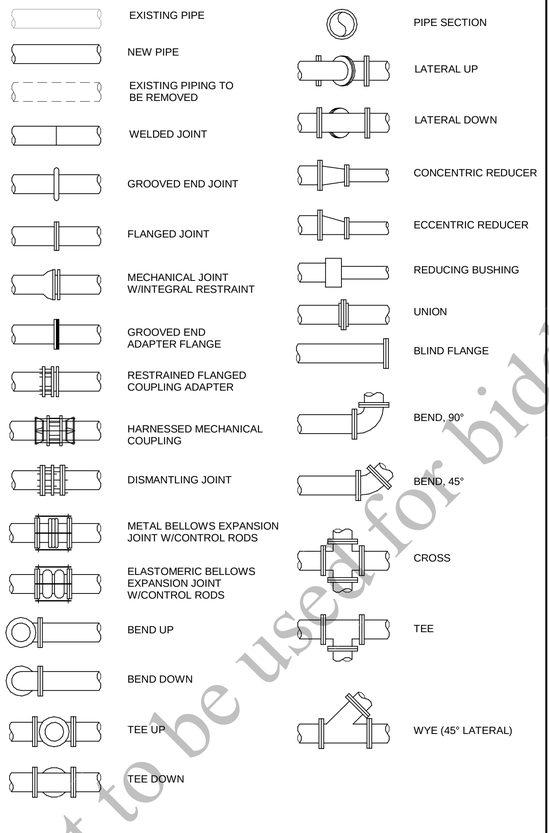
PIPE, EQUIPMENT & VALVE TAG LEGEND

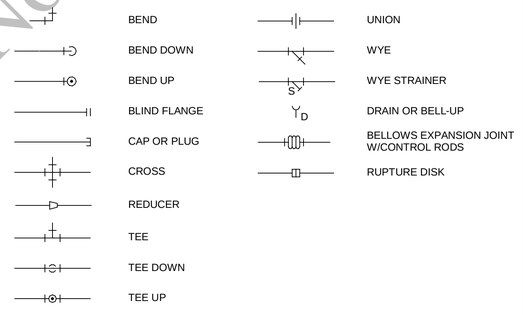


PIPE & FITTINGS SYMBOL LEGEND

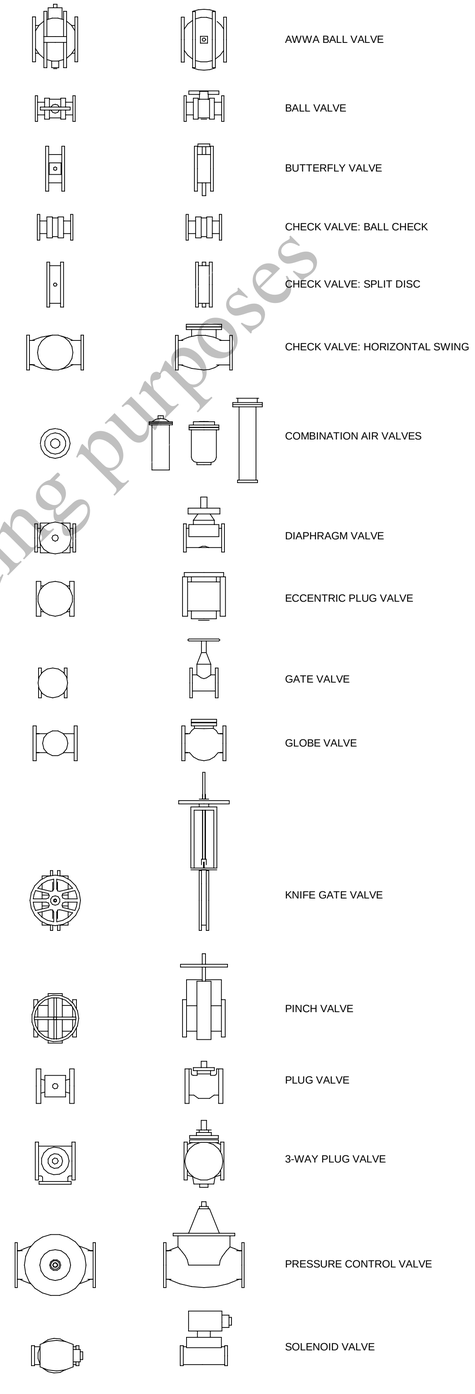
DOUBLE LINE



SINGLE LINE



VALVE SYMBOL LEGEND



GENERAL PROCESS MECHANCAL NOTES

1. LEGENDS SHOWN IN THIS DRAWING ARE BASED ON A TEMPLATE THAT IS NOT PROJECT SPECIFIC. SOME LEGEND SYMBOLS ARE NOT USED ON THIS PROJECT, BUT ARE SHOWN TO PROVIDE A DICTIONARY FOR SYMBOLS THAT MAY ALSO BE USED DURING THE PROJECT CONSTRUCTION PHASE.
2. FOR PROCESS MECHANICAL ABBREVIATIONS, REFER TO GENERAL ABBREVIATIONS.
3. REFER TO THE P&ID LEGEND AND ABBREVIATIONS FOR SINGLE-LINE VALVE, GATE, ACTUATOR, FITTING, EQUIPMENT, AND OTHER SYMBOLS.
4. FITTING TYPES IN THE LEGEND ON THIS DRAWING SHOW FLANGED END CONNECTIONS. FITTINGS FOR OTHER END CONNECTION TYPES ARE SIMILAR.
5. VALVE TYPES IN THE LEGEND ON THIS DRAWING REPRESENT THE TYPICAL APPEARANCE FOR EACH TYPE OF VALVE. THE ACTUAL VALVES USED FOR THIS PROJECT MAY VARY IN APPEARANCE.
6. LAY PIPE TO UNIFORM GRADE BETWEEN INDICATED ELEVATION POINTS.
7. SIZE OF FITTINGS SHOWN ON DRAWINGS SHALL MATCH CONNECTING PIPING, UNLESS OTHERWISE INDICATED. TYPE OF JOINT AND FITTING MATERIAL SHALL BE THE SAME AS CONNECTING PIPING.
8. NOT ALL REQUIRED HANGERS, SUPPORTS, BRACES, INSERTS, AND ACCESSORIES ARE SHOWN ON THE DRAWINGS. PIPE SUPPORTS FOR 12-INCH DIAMETER AND SMALLER PIPES SHALL BE DESIGNED AND FURNISHED BY THE CONTRACTOR AS SPECIFIED.
9. ALL PRESSURIZED OR SURCHARGED PIPELINES, PIPE FITTINGS, COUPLINGS, JOINTS, EXPANSION JOINTS, TANK CONNECTIONS, AND CHANNEL CONNECTIONS SHALL BE PROVIDED WITH THRUST RESTRAINT BASED ON SPECIFIED PRESSURES AND TEMPERATURES.
10. NUMBER AND LOCATION OF UNIONS AND COUPLINGS SHOWN ON DRAWINGS ARE APPROXIMATE. CONTRACTOR SHALL PROVIDE ALL UNIONS AND COUPLINGS REQUIRED BY THE SPECIFICATIONS AND AS NECESSARY TO FACILITATE CONVENIENT REMOVAL OF VALVES AND MECHANICAL EQUIPMENT.
11. WHERE A GROOVED END JOINT IS SHOWN, IT SHALL BE THE RIGID JOINT TYPE, UNLESS OTHERWISE SPECIFIED. WHERE A FLANGED COUPLING ADAPTER IS SHOWN, A STANDARD FLANGE SHALL BE JOINED TO THE COUPLING ADAPTER.
12. CONTRACTOR SHALL ORIENT VALVES AS SPECIFIED.

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GENERAL

PROCESS MECHANICAL

LEGENDS AND GENERAL NOTES

00-M-001

10 OF 163

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

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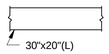
SYSTEM ABBREVIATIONS

CWR	CHILLED WATER RETURN
CWS	CHILLED WATER SUPPLY
C	CONDENSATE DRAIN
CDWR	CONDENSER WATER RETURN
CDWS	CONDENSER WATER SUPPLY
HWR	HEATING WATER RETURN
HWS	HEATING WATER SUPPLY
LPC	LOW PRESSURE CONDENSATE
LPS	LOW PRESSURE STEAM (<15 PSIG
R	REFRIGERANT

HVAC LEGEND

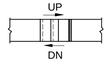

DIFFUSER FOR FLEXIBLE DUCT



DUCTWORK DIMENSIONS, THE FIRST DIMENSION IS THE SIDE SEEN OR SIDE THE LEADER LINE TOUCHES. SEE GENERAL MECHANICAL NOTES.


FLEXIBLE CONNECTION

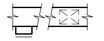

FLEXIBLE DUCTWORK



INCLINED RISE (UP) OR DROP (DN) IN RESPECT TO DIRECTION OF AIRFLOW


NEGATIVE PRESSURE DUCT


POSITIVE PRESSURE DUCT

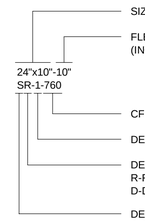

REGISTER, GRILLE OR DIFFUSER

ROUND OR FLEXIBLE DUCT TAKEOFF


ROUND TO SQUARE TRANSITION


TURNING VANES

AIR INLET & OUTLET IDENTIFICATIONS



SIZE-LENGTH BY WIDTH (INCHES)

FLEXIBLE DUCT DIAMETER (INCHES, IF USED)

CFM THRU DEVICE

DEVICE DESIGNATION

DEVICE GROUP:
R-REGISTER, G-GRILLE,
D-DIFFUSER

DEVICE TYPE:
S-SUPPLY, E-EXHAUST,
R-RETURN, T-TRANSFER

CONTROLS & INSTRUMENTATION LEGEND

CS	CONTROL STATION
DG	DRAFT GAUGE
E EP	ELECTRIC OPERATOR (EXPLOSION PROOF)
E M	ELECTRIC OPERATOR (MODULATING)
E	ELECTRIC OPERATOR (2 POSITION)
EVS 1	EMERGENCY VENTILATION SWITCH W/ NUMBER
FS	FLOW SWITCH
	GAUGE ACTIVATOR/ISOLATOR
H 1	HUMIDISTAT W/ NUMBER
LS	LEVEL SWITCH
PDS 1	PRESSURE DIFFERENTIAL SWITCH W/ NUMBER
P	PRESSURE GAUGE W/ SHUTOFF VALVE
PS	PRESSURE SWITCH
SMD 1	SMOKE DETECTOR W/ NUMBER
S	SOLENOID OPERATOR
	THERMOMETER - DIAL TYPE
	THERMOMETER - STEM TYPE
TS 1	TEMPERATURE SENSOR WITH NUMBER
T 1	THERMOSTAT WITH NUMBER
V	VACUUM GAUGE W/ SHUTOFF VALVE

MECHANICAL ABBREVIATIONS

A

A	ALARM
AC	AIR COMPRESSOR
AD	ACCESS DOOR
AF	AIR FLOW, AIRFOIL
AFD	ADJUSTABLE FREQUENCY DRIVE
AFF	ABOVE FINISH FLOOR
AFM	AIR FLOW MONITOR
AHU	AIR HANDLING UNIT
ALUM	ALUMINUM
AP	ACCESS PANEL
APPROX	APPROXIMATE
AS	AIR SEPARATOR
ATU	AIR TERMINAL UNIT
AUTO	AUTOMATIC
AVG	AVERAGE

B

B	BELT DRIVE, BLOW THROUGH
BDD	BACKDRAFT DAMPER
BF	BLIND FLANGE
BFF	BELOW FINISH FLOOR
BFP	BACKFLOW PREVENTER
BH	BASEBOARD HEATER
BI	BACKWARD INCLINED, BUILT-IN THERMOSTAT
BL	BOTTOM LEVEL
BLDG	BUILDING
BLR	BLOWER
BOD	BOTTOM OF DUCT ELEVATION
BOT	BOTTOM
BTUH	BRITISH THERMAL UNITS PER HOUR
BU	BELL-UP
BV	BALL VALVE

C

C	CHANNEL, CONVECTOR, COOLING, COOLING (MAKE ON RISE)
CB	CENTRIFUGAL BLOWER
CBD	COUNTERBALANCE BACKDRAFT DAMPER
CC	COOLING COIL
CD	CONTROL DAMPER
CDWP	CONDENSER WATER PUMP
CENTR	CENTRIFUGAL
CF	CABINET FAN
CFM	CUBIC FEET PER MINUTE
CH	CONVECTION HEATER
C/L	CENTERLINE
CO	CLEANOUT
CONC	CONCRETE
CONN	CONNECTION
CONT	CONTINUATION
CS	CONTROL STATION
CT	COOLING TOWER
CU	CONDENSING UNIT
CV	CHECK VALVE, CONTROL VALVE
CWP	CHILLED WATER PUMP

D

D	DIRECT DRIVE, DRAW-THRU
DB	DRY BULB
DDC	DIRECT DIGITAL CONTROL
DEH	DEHUMIDIFIER
DF	DUCT FAN
DIA	DIAMETER
DM	DUCT MOUNTED
DN	DOWN
DX	DIRECT EXPANSION

E

E	ELECTRIC, ELECTRIC OPERATOR, EXHAUST
EA	EACH, EXHAUST AIR
EAT	ENTERING AIR TEMPERATURE
EC	ECONOMIZER, EVAPORATIVE COOLER
ECH	ELECTRIC CABINET HEATER
ECP	EQUIPMENT CONTROL PANEL
EDH	ELECTRIC DUCT HEATER
EF	EXHAUST FAN
EFF	EFFICIENCY
EGS	EMERGENCY GAS SCRUBBER
EIH	ELECTRIC INFRARED HEATER
EL	ELEVATION
EP	EXPLOSION PROOF
EQUIP	EQUIPMENT
ES	EMERGENCY SWITCH
ESP	EXTERNAL STATIC PRESSURE
ET	EXPANSION TANK
EUH	ELECTRIC UNIT HEATER
EV	EXHAUST VALVE
EVS	EMERGENCY VENTILATION SWITCH
EWT	ENTERING WATER TEMPERATURE
EXIST	EXISTING

F

F	DEGREES FAHRENHEIT
FBD	FACE AND BYPASS DAMPER
FC	FORWARD CURVE, FAN COIL
FD	FIRE DAMPER
FDB	DEGREES FAHRENHEIT DRY BULB
FEF	FUME EXHAUST FAN
FLEX	FLEXIBLE
FM	FLOW METER
FPM	FEET PER MINUTE
FR	FUNNEL RECEPTOR
FRP	FIBERGLASS REINFORCED PLASTIC PIPE
FS	FLOW SWITCH
FSD	COMBINATION FIRE/SMOKE DAMPER
FT	FEET, FIN TUBE HEATER
FUR	FURNACE
FWB	DEGREES FAHRENHEIT WET BULB

G

GA	GAUGE
GALV	GALVANIZED
GIH	GAS INFRARED HEATER
GPM	GALLONS PER MINUTE
GUH	GAS UNIT HEATER
GV	GATE VALVE

H

H	HAND OPERATOR, HEATING, HEATING (MAKE ON FALL), HEIGHT, HORIZONTAL, HUMIDISTAT
HC	HEATING COIL
HCH	HEATING WATER CABINET HEATER
HE	HEAT EXCHANGER
HO	HAND-OFF
HOA	HAND-OFF-AUTO
HP	HEAT PUMP, HORSEPOWER
HR	HEAT RECOVERY UNIT
HUH	HEATING WATER UNIT HEATER
HUM	HUMIDIFIER
HWB	HEATING WATER BOILER
HWP	HEATING WATER PUMP
HZ	HERTZ

I

I	INTAKE
ID	INSIDE DIAMETER
IN	INCHES
INV	INVERT

K

KW	KILOWATT

L

L	LINED DUCT, LOUVER
LAT	LEAVING AIR TEMPERATURE
LBS	POUNDS
LD	COMBINATION LOUVER/DAMPER
LI	LEVEL INDICATOR
LS	LEVEL SWITCH
LWT	LEAVING WATER TEMPERATURE

M

MAU	MAKEUP AIR UNIT
MAX	MAXIMUM
MCA	MINIMUM CIRCUIT AMPS
ME	MIST ELIMINATOR
MFR	MANUFACTURER
MOCP	MAXIMUM OVERCURRENT PROTECTION
MIN	MINIMUM
MOD	MODULATING

N

NC	NORMALLY CLOSED
NO	NORMALLY OPEN, NUMBER
NPSHR	NET POSITIVE SUCTION HEAD REQUIRED

O

OA	OUTSIDE AIR
OD	OUTSIDE DIAMETER

P

P	PNEUMATIC
PD	PRESSURE DROP (INCHES OF WATER FOR AIR, FEET OF WATER FOR FLUIDS)
PAC	PACKAGED AIR CONDITIONING UNIT
PAH	PACKAGED AIR HANDLING UNIT
PDS	PRESSURE DIFFERENTIAL SWITCH
PF	PROPELLER FAN
PHP	PACKAGED HEAT PUMP
PL	PLATE
POS	POSITION
PPM	PARTS PER MILLION
PROP	PROPELLER
PRS	PRESSURE REDUCING STATION
PRV	POWER ROOF VENTILATOR, PRESSURE REDUCING VALVE
PS	PRESSURE SWITCH
PSI	POUNDS PER SQUARE INCH
PSIA	POUNDS PER SQUARE INCH ABSOLUTE
PSIG	POUNDS PER SQUARE INCH GAUGE
PTAC	PACKAGED TERMINAL AIR CONDITIONER

R

RA	REACTIVATION AIR, RETURN AIR
RAC	ROOM AIR CONDITIONER
RCS	REMOTE CONTROL STATION
REQD	REQUIRED
RH	RELATIVE HUMIDITY, ROOF HOOD
RSF	ROOF SUPPLY FAN

S

SA	SUPPLY AIR
SCD	SMOKE CONTROL DAMPER
SCFM	STANDARD CUBIC FEET PER MINUTE
SF	SQUARE FEET, SUPPLY FAN
SH	SHEET
SIM	SIMILAR
SMD	SMOKE DETECTOR
SP	STATIC PRESSURE (INCHES OF WATER)
SPS	STATIC PRESSURE SENSOR
SS	STAINLESS STEEL
STD	STANDARD
SV	SERVICE VALVE, SHUTOFF VALVE, SOLENOID VALVE

T

T	THERMOSTAT
TCP	TEMPERATURE CONTROL PANEL
TCV	TEMPERATURE CONTROL VALVE
TE	TEMPERATURE ELEMENT
TG	TRANSFER GRILLE
TL	TOP LEVEL
TS	TIP SPEED
TYP	TYPICAL

V

V	VERTICAL
VAC	VACUUM OUTLET
VANE	VANEAXIAL
VAV	VARIABLE AIR VOLUME
VCD	VOLUME CONTROL DAMPER
VF	VANEAXIAL FAN

W

W	WIDE FLANGE, WIDTH
WB	WET BULB
WC	WATER CHILLER WATER COLUMN
WF	WALL FAN
WG	WATER GAUGE
WH	WALL HEATER
WM	WALL MOUNTED
WST	WATER STORAGE TANK
WT	WEIGHT
WV	WATER CONTROL VALVE

Z

ZD	ZONE DAMPER

GENERAL HVAC NOTES

1. THIS IS GENERAL LEGEND AND ABBREVIATION SHEET FOR HVAC DRAWINGS. SOME ITEMS CONTAINED ON THIS SHEET MAY NOT BE USED ON THIS SPECIFIC PROJECT.
2. ALL MECHANICAL HVAC WORK SHALL BE IN ACCORDANCE WITH THE FOLLOWING APPLICABLE CODES:
   IBC 2015 - INTERNATIONAL BUILDING CODE (WITH LOCAL AMENDMENTS)
   IMC 2015 - INTERNATIONAL MECHANICAL CODE (WITH LOCAL AMENDMENTS)
   STATE OF ILLINOIS ENERGY CONSERVATION CODE, 2015 EDITION
3. FOR ROOFTOP EQUIPMENT CURBS, FLUES, AND FLASHING DETAILS, SEE ARCHITECTURAL DRAWINGS.
4. SEE ARCHITECTURAL AND STRUCTURAL DRAWINGS FOR ALL EQUIPMENT BASE DETAILS.
5. "SCREENED" DELINEATION DENOTES EXISTING AND NEW FACILITIES AND IS FOR REFERENCE ONLY. "LIGHT" LINE DELINEATION DENOTES EXISTING MECHANICAL EQUIPMENT AND SYSTEMS. EXISTING FACILITY AND MECHANICAL SYSTEMS INFORMATION WAS TAKEN FROM PREVIOUS DRAWINGS, CONSTRUCTION RECORDS, DATA, AND FIELD SURVEY INFORMATION. ACTUAL LOCATION, ARRANGEMENT, AND DIMENSIONS SHALL BE FIELD VERIFIED AND WORK INSTALLED TO MEET ACTUAL CONDITIONS AND LOCATIONS ENCOUNTERED. "BOLD" (DARK) DELINEATION IS NEW WORK TO BE CONSTRUCTED UNDER THIS CONTRACT.
6. ALL MATERIALS, FITTINGS, COVERS, AND EQUIPMENT INSTALLED IN RETURN AIR PLENUMS SHALL BE NONCOMBUSTIBLE AND UL LISTED FOR USE IN RETURN AIR PLENUMS.
7. ALL PIPE AND DUCT PENETRATIONS THROUGH FIRE RESISTANCE RATED ASSEMBLIES SHALL BE PROVIDED WITH FIRESTOP SYSTEMS, EQUIPMENT AND ACCESSORIES TO RESIST THE PASSAGE OF FIRE, SMOKE AND OTHER GASES. THE ORIGINAL FIRE RESISTANCE RATING OF THE ASSEMBLY PENETRATED SHALL BE MAINTAINED FOR ALL TYPES OF PENETRATIONS. SEE ARCHITECTURAL DRAWINGS FOR RATED ASSEMBLY LOCATIONS.
8. METAL ROOF DECKING OR BOTTOM CHORD OF BAR JOISTS SHALL NOT BE USED FOR THE SUPPORT OF EQUIPMENT, PIPING, OR DUCTWORK.
9. ALL HANGERS, BRACKETS, OR BRACES FOR PIPING, DUCTWORK AND EQUIPMENT ARE NOT INDICATED ON THE DRAWINGS. REFER TO THE SPECIFICATIONS FOR SUPPORT REQUIREMENTS NOT SHOWN ON THE PLANS.
10. OUTSIDE AIR INLETS SHALL BE LOCATED A MINIMUM OF 10'-0" AWAY FROM ANY EXHAUST AIR OR PLUMBING VENT OUTLET.
11. ALL EQUIPMENT, PIPING AND DUCTWORK FINAL LOCATIONS SHALL BE COORDINATED TO AVOID INTERFERENCES WITH STRUCTURE, OTHER PIPING, EQUIPMENT, DUCTWORK, AND CONDUIT. UNLESS SPECIFICALLY DIMENSIONED, THE PIPE AND DUCTWORK ROUTING SHOWN IS INTENDED TO INDICATE GENERAL LOCATION ONLY. INSTALL DUCTWORK TO ALLOW FOR PIPING TO BE ROUTED NEAR WALLS.
12. ALL PIPING AND DUCTWORK SHALL BE ROUTED AS HIGH AS POSSIBLE WITH A MINIMUM HEIGHT OF 8'-0" ABOVE THE WALKING SURFACE UNLESS OTHERWISE INDICATED BY A CENTERLINE OR BOTTOM OF DUCT ELEVATION.
13. DUCTWORK SHALL BE FABRICATED, REINFORCED, SUPPORTED AND SEALED FOR OPERATING PRESSURES INDICATED IN THE SCHEDULES FOR THE EQUIPMENT IT SERVES. ALL DUCTWORK SHALL HAVE A MINIMUM SMACNA PRESSURE CLASSIFICATION OF ONE INCH
14. DUCT SIZES INDICATED ARE CLEAR DIMENSIONS INSIDE THE DUCT OR DUCT LINING. SHEET METAL SIZES ARE LARGER FOR INTERNALLY LINED DUCTWORK.
15. MINIMUM INSULATION THICKNESSES FOR DUCTWORK SHALL BE AS INDICATED IN THE SPECIFICATIONS UNLESS OTHERWISE INDICATED ON THE PLANS WITH A "L" OR "W" DESIGNATION. WHERE AN INSULATION THICKNESS IS INDICATED ON THE DRAWINGS, IT SHALL GOVERN. THE FOLLOWING DENOTES THE DIFFERENT INSULATION THICKNESSES INDICATED ON THE DRAWINGS:
    L,L1 - 1 INCH INTERNALLY LINED — W,W1 - 1 INCH EXTERNALLY WRAPPED
    L15 - 1.5 INCH INTERNALLY LINED — W15 - 1.5 INCH EXTERNALLY WRAPPED
    L2 - 2 INCH INTERNALLY LINED — W2 - 2 INCH EXTERNALLY WRAPPED
16. DUCT CONNECTIONS TO EQUIPMENT, PIPING SIZES TO EQUIPMENT, AND EQUIPMENT SUPPORTS SHALL BE VERIFIED AND ADJUSTED TO MATCH ACTUAL EQUIPMENT FURNISHED.
17. THE LOCATION OF PIPING AND VALVES TO THE AIR HANDLING EQUIPMENT SHALL NOT INTERFERE WITH FILTER REMOVAL OR AIR HANDLING EQUIPMENT SERVICING.
18. ROOFTOP EQUIPMENT SHALL NOT BE LOCATED SUCH THAT ACCESS TO CONTROLS AND TO PERFORM SERVICE FOR EQUIPMENT IS LOCATED WITHIN 10'-0" OF THE FACILITIES EDGE.
19. CONTROL DAMPER SIZES SHALL MATCH DIMENSIONS OF ASSOCIATED LOUVER UNLESS OTHERWISE INDICATED.
20. SEISMIC RESTRAINTS/BRACING REQUIREMENTS SHALL BE IN ACCORDANCE WITH METEOROLOGICAL AND SEISMIC DESIGN CRITERIA SPECIFICATION 01 67 00.2. IF REQUIRED, THEY SHALL BE PROVIDED IN ACCORDANCE WITH THE LATEST SMACNA SEISMIC RESTRAINTS MANUAL AND ILLINOIS CODES. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL SEISMIC SUPPORTS AND ADDITIONAL/MISCELLANEOUS STEEL REQUIRED FOR PROPER INSTALLATION OF SUPPORTS. SUPPORTS AND SEISMIC RESTRAINTS DESIGN SUBMITTALS SHALL BEAR THE STAMP AND SIGNATURE OF A LICENSED ENGINEER.
21. INSULATION SHALL BE PROVIDED FOR EQUIPMENT, PIPING AND DUCT SYSTEMS AS INDICATED IN THE SPECIFICATIONS.

BLACK & VEATCH

Black & Veatch Corporation
Chicago, Illinois
ILLINOIS PROFESSIONAL
DESIGN FIRM - 184.002143-0006

Four Rivers Sanitation Authority

AEROBIC GRANULAR SLUDGE - PHASE 1

REVISIONS AND RECORD OF ISSUE

DESIGNED:	VSS
DETAILED:	AJP
CHECKED:	KMC
APPROVED:	SP
DATE:	12/20/2022
PROJECT NO.:	411752

AGS SUPPORT FACILITIES

HVAC

LEGENDS, ABBREVIATIONS, AND GENERAL NOTES

00-H-001

11 OF 163

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

PLOTTED: 12/16/2022 11:50:49 AM
FILE: BIM 360://409469 - Aerobic Granular Sludge Phase 1/409469 - AGS.rvt
D11000

GENERAL ABBREVIATIONS

A

A	ALARM, COMPRESSED AIR OUTLET
AC	AIR COMPRESSOR
AD	ACCESS DOOR, AIR DRYER
AFD	ADJUSTABLE FREQUENCY DRIVE
AFF	ABOVE FINISH FLOOR
ALUM	ALUMINUM
AP	ACCESS PANEL
APPROX	APPROXIMATE
AR	AIR RECEIVER
AUTO	AUTOMATIC
AVG	AVERAGE
AVS	AUTOMATIC VALVE STATION

B

BF	BLIND FLANGE
BFF	BELOW FINISH FLOOR
BFP	BACKFLOW PREVENTER
BLDG	BUILDING
BOT	BOTTOM
BTUH	BRITISH THERMAL UNITS PER HOUR
BU	BELL-UP
BV	BALL VALVE

C

C	CHANNEL
CENTR	CENTRIFUGAL
CF	CABINET FAN
C/L	CENTERLINE
CO	CLEANOUT
CONC	CONCRETE
CONN	CONNECTION
CONT	CONTINUATION
CP	CIRCULATING PUMP
CS	CONTROL STATION
CV	CHECK VALVE, CONTROL VALVE
CWW	CLEAR WATER WASTE

D

D	DIRECT DRIVE
DEH	DEHUMIDIFIER
DF	DRINKING FOUNTAIN
DIA	DIAMETER
DN	DOWN
DSN	DOWNSPOUT NOZZLE

E

E	ELECTRIC
EA	EACH
EEW	EMERGENCY EYE WASH
EFF	EFFICIENCY
EL	ELEVATION
EP	EXPLOSION PROOF
EQUIP	EQUIPMENT
ES	EMERGENCY SHOWER
ES/EEW	EMERGENCY SHOWER AND EYEWASH
ET	EXPANSION TANK
EWC	ELECTRIC WATER COOLER
EWH	ELECTRIC WATER HEATER
EWT	ENTERING WATER TEMPERATURE
EXIST	EXISTING

F

F	DEGREES FAHRENHEIT
FCO	FLOOR CLEANOUT
FD	FLOOR DRAIN
FDB	DEGREES FAHRENHEIT DRY BULB
FLEX	FLEXIBLE
FM	FLOW METER
FPM	FEET PER MINUTE
FR	FUNNEL RECEPTOR
FS	FLOOR SINK, FLOW SWITCH
FSW	FILTER SURFACE WASH
FT	FEET

G

G	GAS OUTLET
GA	GAUGE
GALV	GALVANIZED
GCO	GRADE CLEANOUT
GD	GARBAGE DISPOSER
GIH	GAS INFRARED HEATER
GPM	GALLONS PER MINUTE
GUH	GAS UNIT HEATER
GV	GATE VALVE
GW	GLASS WASHER
GWH	GAS WATER HEATER

H

H	HAND OPERATOR, HEIGHT, HORIZONTAL
HE	HEAT EXCHANGER, HELIUM
HF	HOSE FAUCET
HO	HAND-OFF
HOA	HAND-OFF-AUTO
HP	HORSEPOWER, HIGH POINT
HR	HOUR, HOSE REEL
HUM	HUMIDIFIER
HV	HOSE VALVE
HWB	HEATING WATER BOILER
HZ	HERTZ

I

I	INTAKE
ID	INSIDE DIAMETER
IN	INCHES
INV	INVERT

J

JS	JANITOR'S SINK

K

KS	KITCHEN SINK
KW	KILOWATT

L

LAV	LAVATORY
LBS	POUNDS
LI	LEVEL INDICATOR
LP	LOW POINT
LS	LABORATORY SINK, LEVEL SWITCH
LWT	LEAVING WATER TEMPERATURE

M

MAU	MAKEUP AIR UNIT
MAX	MAXIMUM
MCA	MINIMUM CIRCUIT AMPS
MFR	MANUFACTURER
MIN	MINIMUM
MOD	MODULATING
MS	MOP SINK

N

NC	NORMALLY CLOSED
NG	NATURAL GAS
NO	NORMALLY OPEN, NUMBER
NPSHR	NET POSITIVE SUCTION HEAD REQUIRED
NT	NEUTRALIZATION TANK

O

OD	OUTSIDE DIAMETER
ORD	OVERFLOW ROOF DRAIN

P

PD	PRESSURE DROP (FEET OF WATER)
PAC	PACKAGED AIR CONDITIONING UNIT
PDI	PLUMBING AND DRAINAGE INSTITUTE
PDS	PRESSURE DIFFERENTIAL SWITCH
PL	PLATE
POS	POSITION
PPM	PARTS PER MILLION
PRS	PRESSURE REDUCING STATION
PRV	PRESSURE REDUCING VALVE
PS	PRESSURE SWITCH
PSI	POUNDS PER SQUARE INCH
PSIA	POUNDS PER SQUARE INCH ABSOLUTE
PSIG	POUNDS PER SQUARE INCH GAUGE

R

RCS	REMOTE CONTROL STATION
RD	ROOF DRAIN
REQD	REQUIRED

S

SF	SQUARE FEET, SUPPLY FAN
SH	SHEET, SHOWER
SIM	SIMILAR
SS	STAINLESS STEEL, SERVICE SINK
SSP	SUBMERSIBLE SUMP PUMP
STD	STANDARD
SV	SERVICE VALVE, SHUTOFF VALVE, SUPPLY VALVE, SOLENOID VALVE

T

TD	TRENCH DRAIN
TPP	TRAP PRIMER PANEL
TS	TAMPER SWITCH
TYP	TYPICAL

U

UR	URINAL

V

V	VERTICAL
VAC	VACUUM OUTLET
VB	VACUUM BREAKER
VCD	VOLUME CONTROL DAMPER
VF	VANEAXIAL FAN
VP	VACUUM PUMP
VSP	VERTICAL COLUMN SUMP PUMP
VTR	VENT THRU ROOF

W

W	WIDE FLANGE, WIDTH
WBP	WATER BOOSTER PUMP
WC	WATER CLOSET, WATER COLUMN
WCO	WALL CLEANOUT
WG	WATER GAUGE
WH	WALL HYDRANT
WHA	WATER HAMMER ARRESTOR
WM	WALL MOUNTED
WST	WATER STORAGE TANK
WT	WEIGHT

SYSTEM ABBREVIATIONS

WATER

W4	COLD WATER (NON-POTABLE) / PLANT WELL WATER
DE	DEIONIZED WATER
DW	DISTILLED WATER
F	FIRE PROTECTION WATER
HWC	HOT WATER CIRCULATING (POTABLE)
NPHW	HOT WATER (NON-POTABLE)
HW	HOT WATER (POTABLE)
PEW	PLANT EFFLUENT WATER
SW	SOFTENED WATER
TNPW	TEMPERED NON-POTABLE WATER
TW	TEMPERED OR BLENDED WATER

WASTE

CRV	CHEMICAL RESISTANT VENT
CRW	CHEMICAL RESISTANT WASTE
CWW	CLEAR WATER WASTE
D	INDIRECT DRAIN
PD	SUMP PUMP DISCHARGE
SAN	SANITARY DRAIN
ST	STORM DRAIN
V	VENT

FUEL GAS

G	NATURAL GAS
PG	PROPANE GAS

SPECIAL

A	COMPRESSED AIR
A	CET ACETYLENE
AR	ARGON
H	HYDROGEN
HE	HELIUM
ME	METHANE
N	NITROGEN
NO	NITROUS OXIDE
OX	OXYGEN
VAC	VACUUM

VALVE LEGEND

PLAN	SECTION	2D SYMBOL	DESCRIPTION
			ANGLE VALVE
			BACKFLOW PREVENTER W/ STRAINER (2" AND SMALLER)
			BACKFLOW PREVENTER
			BACKWATER VALVE
			BALL VALVE
			BUTTERFLY VALVE
			CHECK VALVE
			GATE VALVE
			GLOBE VALVE
			PLUG VALVE
			PRESSURE REDUCING VALVE
			THREE WAY VALVE

PIPING ACCESSORIES LEGEND

PLAN	2D SYMBOL	DESCRIPTION
H H		FLEXIBLE CONNECTION
HF	HF	HOSE FAUCET W/0 VACUUM BREAKER
HFVB	HF	HOSE FAUCET W/ VACUUM BREAKER
HV		HOSE VALVE W/ HOSE NIPPLE
PRS	PRS	PRESSURE REDUCING STATION
		PRESSURE RELIEF VALVE
T		PRESSURE / TEMPERATURE RELIEF VALVE
Q	Q	QUICK COUPLING
WH	WH	WALL HYDRANT W/ VACUUM BREAKER
	M	METER
	S	WYE STRAINER
	S	WYE STRAINER W/ BLOWOFF
		VACUUM BREAKER

PIPING LEGEND

PLAN	2D SYMBOL	DESCRIPTION
		PIPING ABOVE FLOOR OR GRADE
		PIPING BELOW FLOOR OR GRADE
		PIPE TURNING UP
		PIPE TURNING DOWN

CONTROLS AND INSTRUMENTATION

2D SYMBOL	DESCRIPTION
FS	FLOW SWITCH
LS	LEVEL SWITCH
P	PRESSURE GAUGE W/ SHUTOFF VALVE
S	SOLENOID OPERATOR
	THERMOMETER - DIAL TYPE
	THERMOMETER - STEM TYPE
V	VACUUM GAUGE W/ SHUTOFF VALVE

PIPE FITTING LEGEND

PLAN	2D SYMBOL	DESCRIPTION
		BLIND FLANGE
		CAP
		REDUCER
		SLEEVE
TP	TP	TEST PLUG
		UNION
		P-TRAP
		VTR

PLUMBING LEGEND

PLAN	2D SYMBOL	DESCRIPTION
		BELL-UP DRAIN OR FUNNEL RECEPTOR W/ TRAP
	FCO	CLEANOUT (FLOOR)
	CO	CLEANOUT (PIPE)
	CW HW	BLENDING VALVE
		DOWNSPOUT NOZZLE
		EMERGENCY SHOWER / EYEWASH
		FLOOR DRAIN
		HOSE RACK
		HOSE REEL
		ROOF DRAIN
		SHOWER
		SPLASH BLOCK
	A	WATER HAMMER ARRESTOR W/ PDI SIZE DESIGNATION

SCHEMATICS

2D SYMBOL	DESCRIPTION
	AIR-GAP FITTING
	BELL-UP DRAIN OR FUNNEL RECEPTOR
	FLOOR CLEANOUT
	FLOOR DRAIN
	FLOOR DRAIN W/ FUNNEL
	VENT THROUGH ROOF

SCHEMATICS SPECIALTIES

2D SYMBOL	DESCRIPTION
	AUTOMATIC VALVE STATION
S	BASKET STRAINER
	COMBINATION PUMP DISCHARGE VALVE
	FLOW CONTROL VALVE
	FLOW SENSOR METER
	AIR VENT
	ROTAMETER
	SIGHT FLOW INDICATOR
	SUCTION DIFFUSER (SCHEMATIC)
TP	TRAP PRIMER

GENERAL PLUMBING NOTES

1. THIS IS GENERAL LEGEND AND ABBREVIATION SHEET FOR THE PLUMBING DRAWINGS. SOME ITEMS CONTAINED ON THIS SHEET MAY NOT BE USED ON THIS SPECIFIC PROJECT.
2. ALL MECHANICAL PLUMBING WORK SHALL BE IN ACCORDANCE WITH THE FOLLOWING APPLICABLE CODES:
   IBC 2015 - INTERNATIONAL BUILDING CODE
   IMC 2015 - INTERNATIONAL MECHANICAL CODE
   IFGC 2015 - INTERNATIONAL FUEL GAS CODE
   IPC 2014 - ILLINOIS PLUMBING CODE (IDPH)
3. FOR PLUMBING VENTS, FLUE FLASHING, AND ROOF DRAIN DETAILS, SEE ARCHITECTURAL DRAWINGS.
4. SEE ARCHITECTURAL AND STRUCTURAL DRAWINGS FOR ALL EQUIPMENT BASE DETAILS.
5. "SCREENED" DELINEATION DENOTES EXISTING AND NEW FACILITIES AND IS FOR REFERENCE ONLY. "LIGHT" LINE DELINEATION DENOTES EXISTING MECHANICAL EQUIPMENT AND SYSTEMS. EXISTING FACILITY AND MECHANICAL SYSTEMS INFORMATION WAS TAKEN FROM PREVIOUS DRAWINGS, CONSTRUCTION RECORDS, DATA, AND FIELD SURVEY INFORMATION. ACTUAL LOCATION, ARRANGEMENT, AND DIMENSIONS SHALL BE FIELD VERIFIED AND WORK INSTALLED TO MEET ACTUAL CONDITIONS AND LOCATIONS ENCOUNTERED."BOLD" (DARK) DELINEATION IS NEW WORK TO BE CONSTRUCTED UNDER THIS CONTRACT.
6. ALL PIPE PENETRATIONS THROUGH FIRE RESISTANCE RATED ASSEMBLIES SHALL BE PROVIDED WITH FIRESTOP SYSTEMS, EQUIPMENT AND ACCESSORIES TO RESIST THE PASSAGE OF FIRE, SMOKE AND OTHER GASES. THE ORIGINAL FIRE RESISTANCE RATING OF THE ASSEMBLY PENETRATED SHALL BE MAINTAINED FOR ALL TYPES OF PENETRATIONS. SEE ARCHITECTURAL DRAWINGS FOR RATED ASSEMBLY LOCATIONS.
7. METAL ROOF DECKING OR BOTTOM CHORD OF BAR JOISTS SHALL NOT BE USED FOR THE SUPPORT OF EQUIPMENT OR PIPING.
8. ALL HANGERS, BRACKETS, OR BRACES FOR EQUIPMENT AND PIPING ARE NOT INDICATED ON THE DRAWINGS. REFER TO THE SPECIFICATIONS FOR SUPPORT REQUIREMENTS NOT SHOWN ON THE PLANS.
9. ALL EQUIPMENT AND PIPING FINAL LOCATIONS SHALL BE COORDINATED TO AVOID INTERFERENCES WITH STRUCTURE, OTHER PIPING, EQUIPMENT, DUCTWORK, AND CONDUIT. UNLESS SPECIFICALLY DIMENSIONED, THE PIPE ROUTING SHOWN IS INTENDED TO INDICATE GENERAL LOCATION ONLY.
10. ALL PIPING SHALL BE ROUTED AS HIGH AS POSSIBLE WITH A MINIMUM HEIGHT OF 8'-0" ABOVE THE WALKING SURFACE UNLESS OTHERWISE INDICATED BY A CENTERLINE OR INVERT ELEVATION.
11. ALL HOSE FAUCETS AND HOSE VALVES SHALL BE INSTALLED 3'-0" ABOVE FINISHED FLOOR UNLESS OTHERWISE NOTED. ALL HOSE VALVES SHALL BE 1 1/2" NOMINAL PIPE SIZE UNLESS OTHERWISE NOTED.
12. ALL HOSE FAUCETS AND WALL HYDRANTS SHALL BE NOMINAL 3/4" PIPE SIZE UNLESS OTHERWISE NOTED. ALL HOSE VALVES SHALL BE 1 1/2" NOMINAL PIPE SIZE UNLESS OTHERWISE NOTED.
13. ALL HOSE FAUCETS, WALL HYDRANTS, AND OTHER OUTLETS ON NON-POTABLE WATER LINES WHICH COULD BE USED FOR DRINKING OR DOMESTIC USE SHALL BE POSTED WITH NON-POTABLE SIGNAGE AS PER FRSA STANDARD. REFER TO 99-P-501 FOR EXACT WORDING & DIMENSIONS.
14. ALL RELIEF VALVES SHALL BE PIPED TO FLOOR OR BELL-UP DRAINS.
15. SEISMIC RESTRAINTS/BRACING SHALL BE PROVIDED FOR ALL EQUIPMENT, PIPING, AND ACCESSORIES IN ACCORDANCE WITH THE LATEST SMACNA SEISMIC RESTRAINT MANUAL AND LOCAL BUILDING CODES. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL SEISMIC SUPPORTS AND ADDITIONAL/MISCELLANEOUS STEEL REQUIRED FOR PROPER INSTALLATION OF SUPPORTS. SUPPORTS AND SEISMIC RESTRAINTS DESIGN SUBMITTALS SHALL BEAR THE STAMP AND SIGNATURE OF A LICENSED ENGINEER
16. INSULATION SHALL BE PROVIDED FOR EQUIPMENT AND PIPING SYSTEMS AS INDICATED IN THE SPECIFICATIONS.
17. PLUMBING VENTS OUTLETS SHALL BE LOCATED A MINIMUM OF 10'-0" AWAY FROM ANY OUTSIDE AIR INLET.
18. PIPING SIZES TO EQUIPMENT AND EQUIPMENT SUPPORTS SHALL BE VERIFIED AND ADJUSTED TO MATCH ACTUAL EQUIPMENT FURNISHED.
19. ALL MATERIALS, FITTINGS, COVERS, AND EQUIPMENT INSTALLED IN RETURN AIR PLENUMS SHALL BE NONCOMBUSTIBLE AND UL LISTED FOR USE IN RETURN AIR PLENUMS.

BLACK & VEATCH
Black & Veatch Corporation
Chicago, Illinois
ILLINOIS PROFESSIONAL
DESIGN FIRM - 184.002143-0006

Four Rivers Sanitation Authority

AEROBIC GRANULAR SLUDGE - PHASE 1

REVISIONS AND RECORD OF ISSUE

DESIGNED:	SAM
DETAILED:	AJP
CHECKED:	DAV
APPROVED:	SP
DATE:	12/20/2022
PROJECT NO.:	411752

GENERAL

PLUMBING

LEGENDS, ABBREVIATIONS, AND GENERAL NOTES

00-P-001

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(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

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ONE-LINE DIAGRAM LEGEND

1500KVA
2.4KV Δ - 480Y/277V
3-PH, 60HZ
TRANSFORMER WITH PRIMARY AND SECONDARY VOLTAGE, AND KVA RATING AS NOTED

CS
4#14,3/4"
20
3P-60
22:3#8,#10G, 4#14,2"
CIRCUIT NO.22 WITH 3#8 INSULATED CONDUCTORS AND 1#10 GROUND WIRE FOR A 20HP MOTOR WITH 3 POLE, 60A, MOTOR DISCONNECT SWITCH AND 4#14 INSULATED CONDUCTORS FOR AUXILIARY ITEM, AS FOR EXAMPLE A CONTROL STATION, ALL IN 2" CONDUIT.

AUXILIARY ITEMS MAY NOT BE COMPLETELY SHOWN
HS
20
3P-60
22:3#8,#10G, 4#14,2"
CONDUCTORS FOR AUXILIARY ITEM SHALL NOT PASS THROUGH MOTOR DISCONNECT SWITCH.

AUXILIARY ITEMS MAY NOT BE COMPLETELY SHOWN
15
ONE-LINE SHOWING POWER AND CONTROL TO A PACKAGE UNIT, AS FOR EXAMPLE A STEAM GENERATOR OR AN AIR HANDLING UNIT, SHALL IMPLY THAT ANY AND ALL ASSOCIATED EQUIPMENT SHALL ALSO BE INSTALLED AND WIRED AS REQUIRED BY THE EQUIPMENT FURNISHED.

INDICATES THAT ALL OR PART OF CIRCUIT MAY BE ROUTED IN DUCT BANK OR UNDERGROUND. CONDUIT SIZE SHOWN ON ONE-LINE IS ABOVE GROUND AND/OR INSIDE OF STRUCTURE. SEE DUCT BANK SCHEDULE AND SECTIONS FOR CONDUIT SIZE OF UNDERGROUND PORTION OF CIRCUIT.

HIGH VOLTAGE DRAWOUT AIR OR VACUUM CIRCUIT BREAKER

3P - 20
LOW VOLTAGE AIR CIRCUIT BREAKER, 3 POLE, 20 AMPERE

S4
SIZE 4 COMBINATION MAGNETIC MOTOR STARTER

LOW VOLTAGE DRAWOUT AIR CIRCUIT BREAKER

HIGH VOLTAGE DRAWOUT CONTACTOR

FUSE AND DISCONNECT SWITCH

S2
SIZE 2 COMBINATION MAGNETIC MOTOR STARTER, REVERSING OR 2 SPEED

S1
SIZE 1 COMBINATION REDUCED VOLTAGE AUTOTRANSFORMER

POTENTIAL TRANSFORMER

CURRENT TRANSFORMER

CURRENT OR POTENTIAL TEST SWITCH

G
GENERATOR

K
KIRK KEY INTERLOCK

E
ELECTRICAL INTERLOCK

R
RESISTOR

59G
PROTECTION RELAY WITH IEEE DEVICE FUNCTION AS SHOWN

V
SINGLE-FUNCTION METER

SURGE OR LIGHTNING ARRESTER

SURGE ARRESTER WITH SURGE CAPACITOR

GROUND CONNECTION

SCHEMATIC SYMBOLS

- WIRE CONNECTION POINT
- EXTERNAL CONNECTION POINT
- NORMALLY OPEN CONTACT
- NORMALLY CLOSED CONTACT
- STARTER, CONTACTOR OR RELAY COIL
- NORMALLY OPEN PUSH BUTTON
- NORMALLY CLOSED PUSH BUTTON
- MAINTAINED PUSH BUTTON
- NORMALLY CLOSED GEARED LIMIT SWITCH
- NORMALLY OPEN GEARED LIMIT SWITCH
- INDICATING LIGHT
- FUSE
- POTENTIOMETER
- CAPACITOR
- DIODE
- RESISTOR
- CONTROL POWER TRANSFORMER
- SWITCH
- MS — MANUAL STARTER
- OL — OVERLOAD
- OVERLOAD
- ELECTRODE
- FLOAT SWITCH (CLOSING ON RISING LEVEL)
- FLOAT SWITCH (OPENING ON RISING LEVEL)
- P — PRESSURE SWITCH (CLOSING ON RISING PRESSURE)
- PRESSURE SWITCH (OPENING ON RISING PRESSURE)
- VACUUM SWITCH (CLOSING ON INCREASING VACUUM)
- VACUUM SWITCH (OPENING ON INCREASING VACUUM)
- TEMPERATURE SWITCH (CLOSING ON RISING TEMPERATURE)
- TEMPERATURE SWITCH (OPENING ON RISING TEMPERATURE)
- FLOW ACTUATED SWITCH (CLOSING ON INCREASE IN FLOW)
- FLOW ACTUATED SWITCH (OPENING ON INCREASE IN FLOW)
- ON TIME DELAY CONTACT (NORMALLY OPEN, WHEN THE COIL IS ENERGIZED THE CONTACT WILL CLOSE AFTER A TIME DELAY)
- ON TIME DELAY CONTACT (NORMALLY CLOSED, WHEN THE COIL IS ENERGIZED THE CONTACT WILL OPEN AFTER A TIME DELAY)
- OFF TIME DELAY CONTACT (NORMALLY OPEN, WHEN THE COIL IS DE-ENERGIZED THE CONTACT WILL OPEN AFTER A TIME DELAY)
- OFF TIME DELAY CONTACT (NORMALLY CLOSED, WHEN THE COIL IS DE-ENERGIZED THE CONTACT WILL CLOSE AFTER A TIME DELAY)
- TORQUE SWITCH (NORMALLY OPEN)
- TORQUE SWITCH (NORMALLY CLOSED)
- LIMIT SWITCH (NORMALLY OPEN)
- LIMIT SWITCH (NORMALLY OPEN, HELD CLOSED)
- LIMIT SWITCH (NORMALLY CLOSED)
- LIMIT SWITCH (NORMALLY CLOSED, HELD OPEN)
- DIFFERENTIAL PRESSURE SWITCH (NORMALLY OPEN, CLOSING ON INCREASING DIFF.)
- DIFFERENTIAL PRESSURE SWITCH (NORMALLY CLOSED, OPENING ON INCREASING DIFF.)

SWITCH & OUTLET SYMBOLS

- S — SINGLE POLE SWITCH
- S_2 — TWO POLE SWITCH
- S_{3A} — THREE-WAY SWITCH CONTROLLING LIGHTS WITH "A" DESIGNATION
- S_4 — FOUR-WAY SWITCH
- S^{C1}_{M} — MOMENTARY SWITCH CONTROLLING CONTACTOR C1
- S^{DM}_{A} — DIMMING WALL SWITCH CONTROLLING LIGHTS WITH "A" DESIGNATION
- S^{OS}_{A} — WALL SWITCH WITH OCCUPANCY SENSOR CONTROLLING LIGHTS WITH "A" DESIGNATION
- DUPLEX RECEPTACLE 120 VOLT
- SIMPLEX RECEPTACLE
- RANGE RECEPTACLE
- TWISTLOCK RECEPTACLE
- 30 — 240V, 1Ø RECEPTACLE, TYPICAL AMPERE RATING NOTED
- 60 — 480V, 3Ø WELDING RECEPTACLE, TYPICAL AMPERE RATING NOTED
- 120 VOLT DUPLEX RECEPTACLE (UPS)
- DUPLEX FLOOR OUTLET
- TELEPHONE OUTLET
- TELEPHONE FLOOR OUTLET
- CX — COAXIAL CABLE OUTLET
- DATA NETWORK OUTLET

MISCELLANEOUS SYMBOLS

- STROBE
- HORN & STROBE
- HORN
- T — THERMOSTAT
- J — JUNCTION BOX
- GROUND ROD
- GROUND ROD WITH TEST WELL
- GROUND CONNECTION
- DISCONNECT SWITCH
- COMBINATION STARTER
- POWER PANEL
- LIGHTING PANEL
- MISCELLANEOUS PANEL
- LIGHTING CONTACTOR
- CAMERA
- PE — PHOTOELECTRIC SENSOR, PHOTOCELL
- OS — CEILING MOUNTED OCCUPANCY SENSOR
- OS — WALL MOUNTED OCCUPANCY SENSOR
- LIGHTNING PROTECTION AIR TERMINAL

BREAKER DETAILS

DETAIL A

52 — 5KV, 1200A, 49KA
A 5KV CLASS MEDIUM-VOLTAGE, DRAWOUT, VACUUM OR AIR INSULATED CIRCUIT BREAKER WITH A 1,200 AMPERE FRAME. BREAKER HAS A 49,000 AMPERE MAXIMUM FAULT CURRENT INTERRUPTING RATING.

DETAIL B

3P - 50
A LOW VOLTAGE FIXED MOUNTED MOLDED CASE CIRCUIT BREAKER WITH A 50 AMPERE TRIP RATING.
TRIP UNIT IS NON-ADJUSTABLE THERMAL-MAGNETIC TYPE.

1000AT, 1200AF, SST, LSIG, AFRD
A LOW VOLTAGE FIXED MOUNTED MOLDED CASE CIRCUIT BREAKER WITH A 1200 AMPERE FRAME AND A 1000 AMPERE TRIP RATING.
TRIP UNIT IS ADJUSTABLE SOLID-STATE TYPE WITH LONG-TIME, SHORT-TIME, INSTANTANEOUS, GROUND FAULT AND ARC-FLASH REDUCTION PROTECTION FEATURES.

DETAIL C

800AT, 1000AS, 1600AF, AFRD
A LOW VOLTAGE, DRAWOUT, POWER OR INSULATED CASE CIRCUIT BREAKER WITH A 1600A FRAME AND SOLID-STATE TRIP UNIT.
TRIP UNIT HAS A SENSOR MODULE RATED FOR 1000 AMPERES AND WITH A TRIP RATING OF 800 AMPERES AND ARC-FLASH REDUCTION PROTECTION FEATURES.

CONDUIT & WIRING INSTALLATION LEGEND

- CONDUIT EXPOSED
- CONDUIT CONCEALED
- CONDUIT TURNING UP. CONDUIT TURNING DOWN.
- CONDUIT PLUGGED FLUSH. CONDUIT CAPPED.
- L2 - 5 — TYPICAL FOR HOME RUN TO BE ROUTED TO LIGHTING PANEL L2 & CONNECTED TO CIRCUIT #5 (MINIMUM NO. 12 AWG CONDUCTORS AND 3/4" CONDUIT)
- 1 — LP1-1, A — POLE OR STANCHION MOUNTED LIGHTING FIXTURE. REFER TO NUMBER OR LETTER IN FIXTURE SCHEDULE. POWERED FROM LIGHTING PANEL LP1, CIRCUIT 1. CONTROLLED VIA SWITCH A
- 1 — LP1-1, A — WALL MOUNTED LIGHTING FIXTURE. REFER TO NUMBER OR LETTER IN FIXTURE SCHEDULE. POWERED FROM LIGHTING PANEL LP1, CIRCUIT 1. CONTROLLED VIA SWITCH A
- 1 — LP1-1, A — CEILING, PENDANT, OR RECESSED LIGHTING FIXTURE. REFER TO NUMBER OR LETTER IN FIXTURE SCHEDULE. POWERED FROM LIGHTING PANEL LP1, CIRCUIT 1. CONTROLLED VIA SWITCH A
- LP1-3 — RECEPTACLE POWERED FROM LIGHTING PANEL LP1, CIRCUIT 3
- LP1-1, A, 11 — LINEAR LIGHTING FIXTURE. REFER TO NUMBER OR LETTER IN FIXTURE SCHEDULE. POWERED FROM LIGHTING PANEL LP1, CIRCUIT 1. CONTROLLED VIA SWITCH A.
- LP1-1, EX — EXIT LIGHTING FIXTURE. REFER TO FIXTURE NUMBER OR LETTERS IN FIXTURE SCHEDULE. POWERED FROM LIGHTING PANEL LP1, CIRCUIT 1.
- LP1-1, EM — EMERGENCY LIGHTING FIXTURE. REFER TO FIXTURE NUMBER OR LETTERS IN FIXTURE SCHEDULE. POWERED FROM LIGHTING PANEL LP1, CIRCUIT 1.
- E — E — UNDERGROUND CONCRETE ENCASED ELECTRICAL DUCT BANK
- UNDERGROUND CONCRETE ENCASED ELECTRICAL BANK ROUTED BENEATH SLAB-ON-GRADE
- EE — EE — DIRECT BURIED CONDUIT
- GROUND CONDUCTOR
- UE — UE — UNDERGROUND ELECTRIC
- OH — OH — OVERHEAD CIRCUIT

COMMUNICATION SYMBOLS

- HORN SPEAKER
- DUAL HORN SPEAKER
- WALL MOUNTED CONE SPEAKER
- SK — CEILING MOUNTED CONE SPEAKER

PROTECTION/RELAY DEVICE NUMBERS

25 - SYNCHRONIZING OR SYNCHRONISM-CHECK DEVICE
27 - UNDERVOLTAGE RELAY
32 - DIRECTIONAL POWER RELAY
37 - UNDERCURRENT OR UNDERPOWER RELAY
46 - REV. PHASE OR PHASE-BAL. CURRENT RELAY
47 - PHASE SEQ. OR PHASE BAL. VOLTAGE RELAY
49 - MACHINE OR TRANSFORMER THERMAL RELAY
50 - INSTANTANEOUS OVERCURRENT
51 - AC TIME OVERCURRENT RELAY
52 - AC CIRCUIT BREAKER
59 - OVERVOLTAGE RELAY
63 - PRESSURE SWITCH
64 - GROUND DETECTOR RELAY
67 - AC DIRECTIONAL OVERCURRENT RELAY
71 - LIQUID OR GAS LEVEL RELAY
81 - FREQUENCY RELAY
83 - AUTOMATIC SELECTIVE CONTROL OR TRANSFER RELAY
86 - LOCKOUT RELAY
87 - DIFFERENTIAL PROTECTIVE RELAY

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Chicago, Illinois
ILLINOIS PROFESSIONAL
DESIGN FIRM - 184.002143-0006

Four Rivers Sanitation Authority

AEROBIC GRANULAR SLUDGE - PHASE 1

REVISIONS AND RECORD OF ISSUE

DESIGNED:	EJB
DETAILED:	SFR
CHECKED:	SDS
APPROVED:	EJB
DATE:	12/20/2022
PROJECT NO.:	411752

GENERAL

ELECTRICAL

LEGENDS

00-E-001

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(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

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ELECTRICAL GENERAL NOTES

1. SOLID LINES (———————) INDICATE NEW WORK OR EQUIPMENT.
2. SCREENED LINES (▒▒▒▒▒▒▒▒▒▒▒) INDICATE EXISTING WORK OR EQUIPMENT.
3. DASHED LINES (– – – – – – – –) INDICATE FUTURE WORK OR EQUIPMENT.
4. REFER TO INDIVIDUAL DISCIPLINE CONTRACT DRAWINGS FOR ADDITIONAL ABBREVIATIONS, DETAILS, AND GENERAL DESIGN NOTES.
5. LEGEND SHEETS ARE GENERAL. SOME SYMBOLS AND ABBREVIATIONS MAY NOT BE UTILIZED ON THIS SPECIFIC PROJECT.
6. INFORMATION RELATED TO CIRCUIT IDENTIFICATION, WIRE & CONDUIT SIZES, AND ROUTING, IS ON THE FOLLOWING DRAWING TYPES.
   - A. ONE-LINE DIAGRAMS SHOW CIRCUIT IDENTIFICATION, WIRE QUANTITY AND SIZES, AND CONDUIT SIZE WITHIN STRUCTURES. ONE-LINE DIAGRAMS ALSO INDICATE ORIGIN AND DESTINATION OF CIRCUITS, AND IDENTIFY CIRCUITS ROUTED UNDERGROUND.
   - B. FOR CIRCUITS WITHOUT UNDERGROUND PORTIONS, FACILITY FLOOR PLANS SHOW LOCATION OF EQUIPMENT FOR DETERMINING CIRCUIT LENGTH WITHIN THE STRUCTURE. FOR CIRCUITS WITH UNDERGROUND PORTIONS, ANTICIPATED PENETRATION OF UNDERGROUND CONDUITS ARE SHOWN ON STRUCTURE PLANS FOR DETERMINING THE LENGTH OF THE IN-STRUCTURE PORTIONS OF CIRCUITS. FACILITY FLOOR PLANS MAY ALSO SHOW HOME RUNS FOR LIGHTING, RECEPTACLE, AND OTHER MISCELLANEOUS EQUIPMENT CIRCUITS.
   - C. SITE PLANS INDICATE THE GENERAL ROUTING OF UNDERGROUND CONDUITS AND DUCT BANKS. CIRCUITS ROUTED IN UNDERGROUND CONDUITS OR DUCT BANKS ARE INDICATED IN DUCT BANK SECTIONS REFERENCED ON THE SITE PLAN.
   - D. DUCT BANK SECTIONS AND SCHEDULES IDENTIFY CONDUIT SIZE, CONDUIT MATERIAL, ARRANGEMENT OF THE UNDERGROUND CONDUITS, AND CIRCUITS ROUTED IN EACH UNDERGROUND CONDUIT.

AREA DESIGNATIONS

THE SPECIAL AREA DESIGNATION BOXES, AS DEFINED BELOW, ARE LOCATED ON THE PLAN DRAWINGS TO DEFINE ELECTRICAL INSTALLATION REQUIREMENTS. DESIGNATION BOXES ARE LOCATED WITHIN ROOM OR BELOW ROOM NUMBER. ALL INDOOR AREAS NOT INDICATED OTHERWISE ARE AREA TYPE 1 AND MINIMUM NEMA TYPE 1 ENCLOSURES.

AREA TYPE 1A	CORROSIVE CHEMICAL FEED AND STORAGE ROOMS. CONDUIT SYSTEM SHALL BE EXPOSED SCHEDULE 80 PVC RIGID NON-METALLIC CONDUIT WITH PVC FITTINGS, BOXES AND ACCESSORIES.
AREA TYPE 4	INDOOR WET LOCATIONS SUCH AS VAULTS, HOSEDOWN AREAS, BASEMENTS, ETC. MINIMUM NEMA TYPE 4 ENCLOSURE FOR EQUIPMENT AND GASKETED FITTINGS IN A CONDUIT SYSTEM.
AREA TYPE 7A	CLASS I, DIVISION 1 AREA AS DEFINED BY NEC. ALL EQUIPMENT AND CONDUIT SYSTEMS SHALL BE RATED FOR USE IN THIS AREA.
AREA TYPE 7B	CLASS I, DIVISION 2, GROUP C AND D (METHANE, GASOLINE) AS DEFINED BY NEC. EQUIPMENT AND CONDUITS SYSTEMS SHALL BE RATED FOR USE IN THIS AREA.
AREA TYPE 12	INDOOR, DRY, DIRTY AREA. REQUIRES MINIMUM NEMA TYPE 12 GASKETED ENCLOSURES FOR ALL EQUIPMENT AND GASKETED FITTINGS IN CONDUIT SYSTEMS.
AREA TYPE 4X	OUTDOOR, WET, HARSH ENVIRONMENT SUCH AS AREAS IN AND AROUND THE REACTORS, MINIMUM NEMA TYPE 4X ENCLOSURES FOR EQUIPMENT AND GASKETED FITTINGS IN A CONDUIT SYSTEM

GENERAL REQUIREMENTS

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ROUTING ALL CONDUITS NOT SHOWN ON THE PLANS. THIS SHALL INCLUDE ALL CONDUITS SHOWN ON THE ONE-LINES AND HOME-RUNS SHOWN ON THE PLAN DRAWINGS. CONDUITS SHALL BE ROUTED AS DEFINED IN THE SPECIFICATIONS.
2. SPARE WIRES SHALL BE TAPED AND COILED AND LABELED TO INDICATE WHERE OTHER END OF SPARE WIRE IS LOCATED.
3. IF EQUIPMENT SUPPLIED BY MANUFACTURER HAS A LARGER LOAD THAN VALUE SHOWN, THE CABLE CONDUIT AND ELECTRICAL EQUIPMENT SHALL BE ENLARGED, AS REQUIRED, TO ACCOMMODATE THE HIGHER VALUE.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR FURNISHING PROPERLY SIZED STARTER OVERLOADS FOR EQUIPMENT FURNISHED.
5. LIGHTING AND RECEPTACLE CIRCUITS DESIGNATED ON THE FLOOR PLANS ARE NOT SHOWN ON THE ONE-LINES. CONDUCTORS FOR LIGHTING, RECEPTACLES, AND MISCELLANEOUS 120VAC CIRCUITS SHALL BE MINIMUM NO. 12 AWG. CONDUIT FOR LIGHTING, RECEPTACLES, AND MISCELLANEOUS 120VAC CIRCUITS SHALL BE MINIMUM 3/4".
6. IN AREAS WHERE THERE ARE OVERHEAD BRIDGE CRANES, HOISTS, ETC. NO CONDUITS SHALL BE RUN OVERHEAD THAT WILL INTERFERE WITH THE OPERATION OF THE EQUIPMENT.

ELECTRICAL ABBREVIATIONS

A

A	AMBER, AMPERE, ALARM
AC	ALTERNATING CURRENT
ACB	AIR CIRCUIT BREAKER
ACR	ACCESS CARD READER
AF	AMPERE FRAME
AFD	ADJUSTABLE FREQUENCY DRIVE
AFRD	ARC-FLASH REDUCTION DEVICE
AM	AMMETER
ANN	ANNUNCIATOR
AR	ALARM RELAY
AS	AMMETER SWITCH, AMPERE SENSOR
AT	AMPERE TRIP
ATS	AUTOMATIC TRANSFER SWITCH
AUX	AUXILIARY
AWG	AMERICAN WIRE GAUGE

B

B	BUS
BC	BATTERY CHARGER
BKR	BREAKER
BR	BRAKE
BT	BEARING TEMPERATURE

C

C	CLOSE, COUNTER, CONTACTOR, CONTROL, CCTV CAMERA
CAP	CAPACITOR
CB	CIRCUIT BREAKER
CB"A"	CIRCUIT BREAKER AUXILIARY CONTACT (OPEN WHEN BREAKER IS OPEN)
CB"B"	CIRCUIT BREAKER AUXILIARY CONTACT (CLOSED WHEN BREAKER IS OPEN)
CD	CONTROL DAMPER
CI	CELL INTERLOCK
CKT	CIRCUIT
CL2	CHLORINE
COS	CABLE OPERATED SWITCH
CP	CONTROL PANEL
CPT	CONTROL POWER TRANSFORMER
CR	CURRENT OF CONTROL RELAY, CARD READER
CS	CONTROL STATION
CT	CYCLE TIMER OR CURRENT TRANSFORMER
CTC	CYCLE TIMER CLUTCH
CTM	CYCLE TIMER MONITOR
2/C	2 CONDUCTOR
4"C	4" CONDUIT

D

DC	DIRECT CURRENT, DOOR CONTACT
DI	DOOR INTERLOCK
DM	DAMPER MOTOR, DEMAND METER, DIMMER SWITCH
DPDT	DOUBLE POLE DOUBLE THROW
DPST	DOUBLE POLE SINGLE THROW
DPR	DIFFERENTIAL PRESSURE REGULATOR
DPS	DIFFERENTIAL PRESSURE SWITCH
DS	DISCONNECT SWITCH, DOOR SWITCH, DESKTOP STATION
DVLS	DISCHARGE VALVE LIMIT SWITCH

E

E	ELECTRIC OPERATOR FOR CONTROL DAMPER OR VALVE
EC	EMPTY CONDUIT
EDS	ELECTRICAL DOOR STRIKE
EL	ELEVATION, EMERGENCY LIGHT
EMH	ELECTRICAL MANHOLE
ER	ELECTRODE RELAY
ES	END SWITCH, REQUEST TO EXIT SENSOR
E-STOP	EMERGENCY STOP
ETM	ELAPSED TIME METER
EX	EXISTING
EXP	EXPLOSION PROOF

F

F	FORWARD, FIELD
FO	FIBER OPTIC
FPR	FEEDER PROTECTION RELAY
FS	FLOW SWITCH

G

G	GREEN, GROUND, GENERATOR, GROUND FAULT
GD	GROUND DETECTOR
GEN	GENERATOR
GFCI,GFI	GROUND FAULT CURRENT INTERRUPTOR, GROUND FAULT INTERRUPTOR
GLS	GEARED LIMIT SWITCH
GPR	GENERATOR PROTECTION RELAY
GND	GROUND
#8G	#8 GROUND WIRE

H

H	HIGH, HUMIDISTAT
HH	HANDHOLE
HMT	HIGH MOTOR TEMPERATURE
HOA	HAND-OFF-AUTO
HOR	HAND-OFF-REMOTE
HP	HORSEPOWER
HS	HAND STATION
HWCO	HIGH WATER CUTOFF
HZ	HERTZ (CYCLE)

I

I/O	INPUT/OUTPUT
I	INSTANTANEOUS
IJB	INTERCOM JUNCTION BOX

J

J, JB	JUNCTION BOX

K

K	KEY INTERLOCK
KAIC	THOUSAND AMPERES INTERRUPTING CURRENT
KCMIL	THOUSAND CIRCULAR MIL
KO	KEY OPERATED
KV	KILOVOLT
KVA	KILOVOLT AMPERE
KVAR	KILOVAR
KW	KILOWATT
KWH	KILOWATT HOUR

L

L	LOW, LEVEL, LONG-TIME
LA	LIGHTNING ARRESTER
LAN	LOCAL AREA NETWORK
LC	LIGHTING CONTRACTOR
LCE	LIGHTING CONTACTOR ENCLOSURE
	LIGHTING CONTROL ENCLOSURE
LCP	LOCAL CONTROL PANEL
LCS	LOCAL CONTROL STATION
LOA	LOCAL-OFF-AUTO
LOR	LOCAL-OFF-REMOTE
LOS	LOCK OUT STOP
LP	LIGHTING PANEL
LS	LIMIT OR LEVEL SWITCH
LTG	LIGHTING
LWCO	LOW WATER CUTOFF

M

M	MAGNETIC MOTOR STARTER
MA	MILLIAMPERE
MCB	MAIN CIRCUIT BREAKER
MCC	MOTOR CONTROL CENTER
MCLU	MOTOR CONTROL LINEUP
MD	MOISTURE DETECTOR, MOTION DETECTOR
MDL	MAGNETIC DOOR LOCK
MFR	MANUFACTURER
MH	MANHOLE, MOUNTING HEIGHT
MOV	MOTOR OPERATED VALVE
MPR	MOTOR PROTECTION RELAY
MS	MANUAL MOTOR STARTER
MSH	MOTOR SPACE HEATER
MTS	MANUAL TRANSFER SWITCH
MV	MILLIVOLT, MEDIUM VOLTAGE
MVA	MEGAVOLT AMPERE

N

N	NEUTRAL
NGR	NEUTRAL GROUNDING RESISTOR
NGT	NEUTRAL GROUNDING TRANSFORMER
NC	NORMALLY CLOSED
NO	NORMALLY OPEN, NUMBER

O

O	OPEN
OL	OVERLOAD
OOA	ON-OFF-AUTO
OOR	ON-OFF-REMOTE
OS	OCCUPANCY SENSOR
O/U	OVER/UNDER

P

P	PRIMARY, POWER, POLE
PCS	PLANT CONTROL SYSTEM
PB	PUSH BUTTON, PULL BOX
PE	PHOTOELECTRIC SENSOR, PHOTOCELL
PF	POWER FACTOR
PFCC	POWER FACTOR CORRECTION CAPACITOR
PH	PHASE
PL	PILOT LIGHT
PLC	PROGRAMMABLE LOGIC CONTROLLER
PP	POWER PANEL
PR	PAIR
PRS	PROXIMITY SWITCH
PS	PRESSURE SWITCH
PT	POTENTIAL TRANSFORMER, PROGRAM TIMER

Q

	NOT USED

R

R	RED, RAISE, RELAY, REVERSE
RECP	RECEPTACLE
RES	RESISTOR
RH	REMOTE HANDSET
RT	REPEATING TIMER
RTD	RESISTANCE TEMPERATURE DETECTOR
RTU	REMOTE TERMINAL UNIT
RVSS	REDUCED VOLTAGE SOLID STATE STARTER

S

S	SHORT-TIME, SHIELDED, STARTER
SA	SURGE ARRESTER, SPEAKER AMPLIFIER
SCADA	SUPERVISORY CONTROL AND DATA ACQUISITION
SF6	SULFUR HEXAFLOURIDE
SH	SPACE HEATER
SN	SOLID NEUTRAL
SO	SOLENOID OILER
SP	SINGLE POLE
SPD	SURGE PROTECTION DEVICE
SPDT	SINGLE POLE DOUBLE THROW
SPST	SINGLE POLE SINGLE THROW
SS	SELECTOR SWITCH, START/STOP, STAINLESS STEEL
SSM	SOLID-STATE METERING
SSS	SOLID STATE STARTER
SST	SOLID-STATE TRIP
SUPV	SUPERVISORY CONTROL
SV	SOLENOID VALVE
SWB,SWBD	SWITCHBOARD
SWG,SWGR	SWITCHGEAR

T

T	THERMOSTAT, TIMER, TOTALIZER, TRANSFORMER
TACH	TACHOMETER
TB	TERMINAL BLOCK
TC	TIMER CLUTCH
TD	TIME DELAY RELAY
TEMP	TEMPERATURE
TM	TIMER MOTOR
TQ	TORQUE
TR	TIMER RELAY, TRIAD
TS	TEMPERATURE SWITCH
TTB	TELEPHONE TERMINAL BOARD

U

UG	UNDERGROUND
UPS	UNINTERRUPTIBLE POWER SUPPLY

V

V	VOLTS, VOLTAGE RESTRAINED
VA	VOLT AMPERE
VAR	VARMETER
VFD	VARIABLE FREQUENCY DRIVE
VI	VACUUM INTERRUPTER
VLS	VALVE LIMIT SWITCH
VM	VOLTMETER
VPI	VALVE POSITION INDICATOR
VS	VOLTMETER SWITCH

W

W	WHITE, WATTS
WH	WATTHOUR METER
WM	WATT METER
WP	WEATHERPROOF
WPI	WEATHERPROOF IN-USE
WS	WALL STATION

X

X	AUXILIARY RELAY
XFMR	TRANSFORMER
XP	EXPLOSION PROOF

Y

Y	YELLOW

Z

Z	AUXILIARY RELAY, IMPEDANCE
ZS	POSITION SWITCH
ZSS	ZERO SPEED SWITCH

1-1PR#16S	ONE, SINGLE PAIR, TWISTED SHIELDED #16 CABLE
3-7/C#14	THREE, SINGLE, SEVEN CONDUCTOR #14 MULTICONDUCTOR CONTROL CABLES

BLACK & VEATCH
Black & Veatch Corporation
Chicago, Illinois
ILLINOIS PROFESSIONAL
DESIGN FIRM - 184.002143-0006

Four Rivers Sanitation Authority

AEROBIC GRANULAR SLUDGE - PHASE 1

REVISIONS AND RECORD OF ISSUE

DESIGNED:	EJB
DETAILED:	SFR
CHECKED:	SDS
APPROVED:	EJB
DATE:	12/20/2022
PROJECT NO.:	411752

GENERAL

ELECTRICAL

ABBREVIATIONS AND NOTES

00-E-002

PLOTTED: 12/16/2022 11:51:10 AM
FILE: BIM 360://409469 - Aerobic Granular Sludge Phase 1/409469 - AGS.rvt
D11000

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

EQUIPMENT IDENTIFICATION DESCRIPTION

SSS- FFF - 9999

- SYSTEM CODE - DENOTES ASSOCIATED SYSTEM STREAM
- FUNCTION CODE - DENOTES ASSOCIATED EQUIPMENT ABBREVIATION
- SEQUENCE CODE - UNIQUE ALPHA-NUMERIC IDENTIFIER

PIPELINE IDENTIFICATION DESCRIPTION

SSS - PPP - MTL

- PIPE SIZE - INCHES UNLESS OTHERWISE NOTED
- PROCESS CODE - DENOTES PROCESS STREAM
- PIPELINE MATERIAL CODE - DENOTES MATERIAL

LINE SYMBOLS

- MAJOR PROCESS PIPING OR FLOW CHANNEL
- SECONDARY PROCESS PIPING
- MISCELLANEOUS PIPING
- SCREENED LINE DENOTES EXISTING PIPE OR EQUIPMENT
- DASHED LINE DENOTES FUTURE PIPE AND EQUIPMENT
- ELECTRIC SIGNAL
- HYDRAULIC SIGNAL
- PNEUMATIC SIGNAL
- SIGNAL CONNECTION POINT
- CONTROL SYSTEM BACKBONE NETWORK SIGNAL (ETHERNET)
- FIELD DEVICE NETWORK SIGNAL (ETHERNET)
- NON-STANDARD OR INDEPENDENT CONTROL SYSTEM NETWORK SIGNAL (AS NOTED ON DRAWINGS)
- B | I-XX — SIGNAL LINE COMING/GOING TO/FROM SHEET (MATCH LETTERS)
- B | I-XX — PROCESS LINE COMING/GOING TO/FROM ANOTHER (MATCH LETTERS)
- MATCH SHEET NO. IDENTIFIER
- MATCH LINE NO.
- B — SIGNAL CONNECTION WITHIN THE SAME SHEET
- FLOW ARROW FOR PROCESS PIPING
- PROCESS LINES CROSSING (NOT CONNECTED)

MISCELLANEOUS MECHANICAL EQUIPMENT SYMBOLS

- AFTERCOOLER
- BOILER
- FILTER, AIR
- FILTER, WATER CARTRIDGE TYPE
- FILTER, WATER MEMBRANE TYPE
- FILTER SEPARATOR
- HEAT EXCHANGER, AIR
- HEAT EXCHANGER, DOUBLE PIPE
- HEAT EXCHANGER, FINNED TUBE
- HEAT EXCHANGER, PLATE & FRAME
- HEAT EXCHANGER, SHELL & TUBE
- HEAT EXCHANGER, SPIRAL
- HEAT EXCHANGER, TYPE 1
- HEAT EXCHANGER, TYPE 2
- HYDROCYCLONE
- MIXER, MECHANICAL
- MIXER, STATIC
- PARTICULATE FILTER
- REGULATOR, AIR
- SILENCER
- VALVE, MATERIAL HANDLING ROTARY
- VAPORIZER, AMBIENT

PUMP & BLOWER SYMBOLS

- BLOWER, CENTRIFUGAL
- BLOWER, POSITIVE DISPLACEMENT
- COMPRESSOR
- COMPRESSOR, LIQUID RING
- COMPRESSOR, RECIPROCATING
- COMPRESSOR, ROTARY SCREW
- COMPRESSOR, ROTARY SCROLL
- FAN, CENTRIFUGAL
- MOTOR, ELECTRIC
- PUMP, CENTRIFUGAL OR OTHER TYPE NOT SPECIFIED
- PUMP, CENTRIFUGAL SUBMERGED
- PUMP, DIAPHRAGM METERING, MOTOR DRIVEN
- PUMP, DIAPHRAGM METERING, SOLENOID DRIVEN
- PUMP, DOUBLE DIAPHRAGM
- PUMP, DRUM
- PUMP, PERISTALTIC
- PUMP, PLUNGER
- PUMP, POSITIVE DISPLACEMENT
- PUMP, PROGRESSING CAVITY
- PUMP, ROTARY
- PUMP, SCREW (LIFT)
- PUMP, SUBMERSIBLE
- PUMP, VERTICAL

WATER & WASTEWATER MECHANICAL EQUIPMENT SYMBOLS

- BAR SCREEN, MANUAL
- BAR SCREEN, MECHANICAL
- BASIN, RECTANGULAR
- BELT FILTER PRESS
- CENTRIFUGE
- DISSOLVED AIR FLOTATION (DAF) THICKENER
- FLARE, GAS; WASTE GAS BURNER
- GRAVITY BELT THICKENER
- GRAVITY FILTER
- GRIT BASIN
- GRIT CLASSIFIER
- GRIT COLLECTOR, VORTEX TYPE
- GRIT CONCENTRATOR
- GRIT CONCENTRATOR & DEWATERING SCREW
- OZONE GENERATOR
- OZONE GENERATOR WITH POWER SUPPLY
- SEDIMENTATION BASIN, CIRCULAR
- SEDIMENTATION BASIN, RECTANGULAR W/SETTLING PLATES & SOLIDS COLLECTOR
- SEDIMENTATION BASIN, RECTANGULAR W/ SOLIDS COLLECTOR
- SLUDGE GRINDER, CHANNEL MOUNTED
- SLUDGE GRINDER, INLINE
- SOLIDS COLLECTOR
- THICKENER, GRAVITY
- UV, W/HORIZONTAL BULBS

PRIMARY ELEMENT & FITTING SYMBOLS

- CAP
- COUPLING
- DIAPHRAGM SEAL
- DIAPHRAGM SEAL, ANNULAR TYPE
- DRAIN, BELL-UP TYPE (D)
- DRAIN, FUNNEL TYPE (D)
- EXPANSION LOOP
- FLAME ARRESTER
- FLAME CHECK
- FLANGE
- FLEXIBLE CONNECTION
- FLOW CONDITIONER
- HORN OR SIREN
- HOSE CONNECTION
- IN-LINE TYPE ULTRASONIC FLOWMETER (SINGLE OR MULTI-PATH)
- P — INSTRUMENT PURGE OR FLUSHING DEVICE
- LE / CON — LEVEL SENSOR, CONDUCTANCE TYPE
- LE / GWR — LEVEL SENSOR, GUIDED WAVE RADAR TYPE
- LE / DP — LEVEL SENSOR, PRESSURE SENSING TYPE
- LIT / RAD — LEVEL SENSOR, RADAR TYPE
- LE / US — LEVEL SENSOR, ULTRASONIC TYPE
- MOISTURE SEPARATOR
- PLUG
- PRIMARY FLOW ELEMENT, AVERAGING PITOT TYPE
- PRIMARY FLOW ELEMENT, CORIOLIS MASS FLOWMETER
- PRIMARY FLOW ELEMENT, FLUME
- M — PRIMARY FLOW ELEMENT, MAGNETIC
- PRIMARY FLOW ELEMENT, ORIFICE PLATE
- ΔT — PRIMARY FLOW ELEMENT, THERMAL DISPERSION FLOWMETER
- PRIMARY FLOW ELEMENT, TURBINE OR PROPELLER-TYPE
- PRIMARY FLOW ELEMENT, VENTURI TUBE, FLOW NOZZLE, OR FLOW TUBE. * SEE MEASUREMENT SYMBOL NOTATIONS LIST
- PRIMARY FLOW ELEMENT, WEIR
- Q — QUICK CONNECT
- REDUCER - CONCENTRIC
- REDUCER - ECCENTRIC
- FG — ROTAMETER
- SEDIMENT TRAP
- LG — SIGHTGLASS
- STRAINER, BASKET TYPE
- STRAINER, Y TYPE
- SUCTION DIFFUSER
- SURGE CHAMBER
- T — TRAP
- UNION
- VENT
- VENT, SCREENED

CHEMICAL FEED EQUIPMENT SYMBOLS

- AS — AUTOMATIC SWITCHOVER
- CALIBRATION COLUMN
- CHLORINE DIOXIDE (CO_2) VAPORIZER
- CYLINDER, GAS
- DIFFUSER, CHANNEL
- DIFFUSER, INLINE
- DIFFUSER, POLYMER INJECTION RING
- DIFFUSER, TANK
- DOUBLE CONTAINED PIPING
- DRIP LEG HEATER
- DRY CHEMICAL FEEDER
- EMERGENCY COMBINATION SHOWER AND EYEWASH FOUNTAIN
- EMERGENCY EYEWASH FOUNTAIN
- EMERGENCY SHOWER
- EVAPORATOR
- EXPANSION TANK OR FUNNEL
- GAS FEEDER
- INJECTOR/EDUCTOR
- LIME SLAKER, PASTE TYPE
- PRESSURE BUILDING COIL
- PULSATION DAMPENER
- RUPTURE DISK
- SPECTACLE FLANGE, BLIND, CLOSED
- SPECTACLE FLANGE, BLIND, OPEN
- TON CONTAINER
- TOTE
- VAPOR SUPERHEATER
- WEIGH SCALE

VALVE & GATE SYMBOLS

- BACKFLOW PREVENTER
- M — CHLORINE VACUUM REGULATOR ASSEMBLY
- EXPLOSION RELIEF
- GATE, SLUICE OR SLIDE
- VALVE, AIR RELEASE
- VALVE, AIR VACUUM BREAK
- VALVE, ANGLE
- VALVE, BALL
- VALVE, BUTTERFLY
- VALVE, CHECK
- VALVE, CHECK W/STOP
- VALVE, CHLORINE WITH YOKE
- VALVE, COMBINATION AIR RELEASE AND VACUUM BREAK
- VALVE, DIAPHRAGM
- VALVE, DIVERTER
- VALVE, DIVERTER ASSEMBLY
- VALVE, ECCENTRIC PLUG
- VALVE, FLAP GATE
- VALVE, FOUR FUNCTION
- VALVE, FOUR WAY
- VALVE, GATE OR OTHER TWO-WAY TYPE NOT OTHERWISE IDENTIFIED
- VALVE, GLOBE
- VALVE, KNIFE GATE
- VALVE, MUD
- VALVE, NEEDLE
- VALVE, NON-ECCENTRIC PLUG
- VALVE, PINCH
- VALVE, PRESSURE AND VACUUM RELIEF
- VALVE, PRESSURE REDUCING
- VALVE, PRESSURE REDUCING (SELF ACTUATING TYPE)
- VALVE, PRESSURE RELIEF
- VALVE, PRESSURE SUSTAINING
- VALVE, PRESSURE SUSTAINING (SELF ACTUATING TYPE)
- P — VALVE, RELIEF, PILOT ACTUATED
- VALVE, ROTARY, GENERIC
- VALVE, SET STOP
- VALVE, SLEEVE
- VALVE, TELESCOPING
- VALVE, THERMAL SHUTOFF
- VALVE, THREE WAY
- VALVE, V-PORT BALL
- VALVE, VACUUM RELIEF
- VALVE, VENTED BALL

VALVE AND GATE ACTUATOR SYMBOLS

- P — AIR CYLINDER ACTUATOR
- P / DA — AIR CYLINDER ACTUATOR - DOUBLE ACTING
- P / SC — AIR CYLINDER ACTUATOR - SPRING CLOSE
- P / SO — AIR CYLINDER ACTUATOR - SPRING OPEN
- PO — AIR-OIL CYLINDER ACTUATOR
- DIAPHRAGM, PRESSURE BALANCED
- DIAPHRAGM, SPRING, OR OTHERWISE UNSPECIFIED
- E/H — ELECTRIC-HYDRAULIC
- FLOAT OPERATED FOR VALVE
- H — HYDRAULIC CYLINDER ACTUATOR
- M — INTELLIGENT ELECTRIC ACTUATOR
- LOADING/BACK PRESSURE FOR VALVE
- MANUAL
- QUICK CLOSING FOR VALVE
- QUICK OPENING FOR VALVE
- S — SOLENOID
- S / R — SOLENOID - MANUAL RESET
- S / R R — SOLENOID - REMOTE RESET
- SPRING OR WEIGHT FOR RELIEF VALVE OR LOADED FOR SAFETY VALVE
- M / SM — STANDARD ELECTRIC ACTUATOR
- P / V — VANE TYPE PNEUMATIC ACTUATOR

MATERIAL HANDLING EQUIPMENT SYMBOLS

- BIN, LIVE BOTTOM
- BIN, SLIDING FRAME
- BIN ACTIVATOR
- BIN/HOPPER, CLOSED TOP
- BIN/HOPPER, OPEN TOP
- CONVEYOR, BELT
- CONVEYOR, SCREW
- CONVEYOR, VIBRATORY
- CYCLONE SEPARATOR
- DUMPSTER
- DUST COLLECTOR
- GRINDER
- HORIZONTAL BAR SCREEN
- INSULATION
- INSULATION, W/ HEAT TRACING
- MIXER, BLENDER
- MIXER, PUGMILL
- PISTON CAKE PUMP, DOUBLE
- PISTON CAKE PUMP, SINGLE
- SCREEN, DOUBLE VIBRATORY
- SCREEN, SINGLE VIBRATORY
- TARGET BOX

GENERAL NOTES

1. IN GENERAL, THE P&ID SYMBOLS AND DEVICE IDENTIFICATIONS ARE BASED ON INTERNATIONAL SOCIETY OF AUTOMATION, STANDARD PRACTICE ANSI/ISA-5.1 (2022). SOME MODIFICATIONS, ADDITIONS, AND ALTERATIONS HAVE BEEN MADE AS NEEDED TO ACCOMMODATE THE PROJECT REQUIREMENTS.
2. SOME CONTROL AND INTERLOCK REQUIREMENTS WHICH CAN BE MORE CLEARLY ILLUSTRATED ON SCHEMATIC DRAWINGS HAVE BEEN OMITTED FROM THE P&ID DRAWINGS.
3. THIS IS A GENERAL LEGEND SHEET. SOME SYMBOLS AND ABBREVIATIONS MAY NOT BE UTILIZED ON THIS SPECIFIC PROJECT.

BLACK & VEATCH
Black & Veatch Corporation
Chicago, Illinois
ILLINOIS PROFESSIONAL DESIGN FIRM - 184.002143 -0006

Four Rivers Sanitation Authority

AEROBIC GRANULAR SLUDGE - PHASE 1

REVISIONS AND RECORD OF ISSUE

DESIGNED:	MJP
DETAILED:	DHH
CHECKED:	SAY
APPROVED:	MJP
DATE:	12/20/2022
PROJECT NO.:	411752

GENERAL

INSTRUMENTATION

P&ID - LEGEND AND ABBREVIATIONS SHEET 1 OF 3

00-I-001

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

PLOTTED: 12/16/2022 1:46:33 PM
FILE: C:\USERS\HO106334\APPDATA\LOCAL\AUTODESK\AUTOCAD PLANT 3D\COLLABORATIONCACHE\411752\PID DWG\00-I-001.DWG
FD11000
D11000

INSTRUMENT AND I/O ABBREVIATIONS

MEANINGS OF IDENTIFICATION LETTERS

LETTER	FIRST LETTER: MEASURED OR INITIATING VARIABLE	FIRST LETTER: VARIABLE MODIFIER	SUCCEEDING LETTERS: READOUT OR PASSIVE FUNCTION	SUCCEEDING LETTERS: OUTPUT OR ACTIVE FUNCTION	SUCCEEDING LETTERS: FUNCTION MODIFIER
A	ANALYSIS		ALARM		
B	BURNER, COMBUSTION		USER'S CHOICE	USER'S CHOICE	USER'S CHOICE
C	USER'S CHOICE			CONTROL	CLOSE
D	USER'S CHOICE	DIFFERENTIAL			DEVIATION
E	VOLTAGE (EMF)		SENSOR, PRIMARY ELEMENT		
F	FLOW, FLOW RATE	RATIO (FRACTION)			
G	USER'S CHOICE		GLASS, GAUGE, VIEWING DEVICE		
H	HAND (MANUALLY INITIATED)				HIGH
I	CURRENT (ELECTRICAL)		INDICATE		
J	POWER		SCAN		
K	TIME OR TIME-SCHEDULE	TIME RATE OF CHANGE		CONTROL STATION	
L	LEVEL		LIGHT		LOW
M	MOISTURE	MOMENTARY			MIDDLE OR INTERMEDIATE
N	USER'S CHOICE		USER'S CHOICE	USER'S CHOICE	USER'S CHOICE
O	USER'S CHOICE		ORIFICE (RESTRICTION)		OPEN
P	PRESSURE OR VACUUM		POINT (TEST CONNECTION)		
Q	QUANTITY	INTEGRATE OR TOTALIZE	INTEGRATE OR TOTALIZE		
R	RADIATION		RECORD		RUN
S	SPEED OR FREQUENCY	SAFETY		SWITCH	STOP
T	TEMPERATURE			TRANSMIT	
U	MULTIVARIABLE		MULTIFUNCTION	MULTIFUNCTION	
V	VIBRATION OR MECHANICAL ANALYSIS			VALVE, DAMPER OR LOUVER	
W	WEIGHT OR FORCE		WELL, PROBE		
X	UNCLASSIFIED	X-AXIS	ACCESSORY DEVICES OR UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED
Y	EVENT, STATE, OR PRESENCE	Y-AXIS		AUXILIARY DEVICES	
Z	POSITION, DIMENSION	Z-AXIS		DRIVE, ACTUATOR OR FINAL CTRL ELEMENT	

GENERAL NOTES

1. IN GENERAL, THE P&ID SYMBOLS AND DEVICE IDENTIFICATIONS ARE BASED ON INTERNATIONAL SOCIETY OF AUTOMATION, STANDARD PRACTICE ANSI/ISA-5.1 (2022). SOME MODIFICATIONS, ADDITIONS, AND ALTERATIONS HAVE BEEN MADE AS NEEDED TO ACCOMMODATE THE PROJECT REQUIREMENTS.
2. SOME CONTROL AND INTERLOCK REQUIREMENTS WHICH CAN BE MORE CLEARLY ILLUSTRATED ON SCHEMATIC DRAWINGS HAVE BEEN OMITTED FROM P&ID DRAWINGS.
3. THIS IS A GENERAL LEGEND SHEET. SOME SYMBOLS AND ABBREVIATIONS MAY NOT BE UTILIZED ON THIS SPECIFIC PROJECT. PIPING AND EQUIPMENT LEGEND APPLIES TO P&ID SHEETS.

PIPELINE MATERIAL CODE ABBREVIATIONS [1]

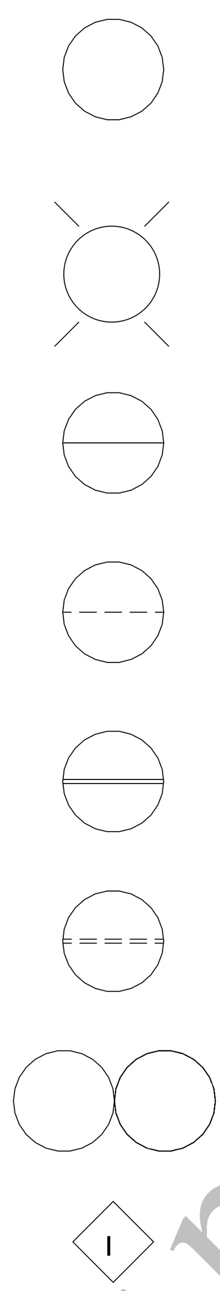
PIPE MATERIAL		SPECIFICATION NO.
BR	BRASS	40 05 41
CBCP	CONCRETE BAR-WRAPPED STEEL CYLINDER PIPE	40 05 39.16
CCFP	CENTRIFUGALLY CAST FIBERGLASS PIPE	40 05 36.11
CCP	CONCRETE CULVERT PIPE	33 42 16
CI	CAST IRON SOIL PIPE	22 13 16
CMP	CORRUGATED METAL PIPE	33 42 14
CPVC	CPVC	40 05 32
CS	MISCELLANEOUS STEEL PIPE	40 05 24.43
CSG	GALVANIZED STEEL PIPE	40 05 24.43
CSP	COMPOSITE SEWER PIPE	40 05 43
CU	COPPER TUBING	40 05 17
DIP	DUCTILE IRON PIPE	40 05 19
FRP	FRP	40 05 32
FRPA	FRP EXHAUST AIR PIPE	40 05 36.11
HDPE	HDPE PRESSURE PIPE	40 05 33.11
HS	HOSE	40 05 41
LHCP	LOW-HEAD CONCRETE PRESSURE	40 05 39.18
LWSP	LIGHT WALL STEEL PIPE	40 05 24.14
PCCP	PRESTRESSED CONCRETE CYLINDER PIPE	40 05 39.14
PE	POLYETHYLENE	40 05 32
PP	POLYPROPYLENE	40 05 32
PVC	PVC	40 05 32
PVCFJ	PVC FUSED JOINT PIPE	40 05 31.13
PVCPP	PVC PRESSURE PIPE	40 05 31.12
PVCSP	PVC SEWER PIPE	40 05 31.16
PVDF	PVDF	40 05 32
RCP	CONCRETE SEWER PIPE	40 05 39.24
RPT	REINFORCED PLASTIC TUBING	40 05 32
SP	STEEL PIPE	40 05 24
SS	STAINLESS STEEL PIPE	40 05 23
TG	TEMPERED GLASS	40 05 41
VCP	VITRIFIED CLAY PIPE	40 05 44

1. ABBREVIATION EXTENSIONS ARE ADDED AS NEEDED TO IDENTIFY THE MATERIAL SUB-CLASSIFICATION IN THE SPECIFICATION, SUCH AS "SS-1" FOR DIGESTER GAS PIPING.

INSTRUMENT AND I/O ABBREVIATION DEFINITIONS

AAH	ANALYZER ALARM HIGH
AAHH	ANALYZER ALARM HIGH-HIGH
AAL	ANALYZER ALARM LOW OR STROBE ALARM LIGHT
AALL	ANALYZER ALARM LOW-LOW
AAX	ALARM HORN
AE	ANALYZER SENSOR
AI	ANALYZER INDICATION
AIT	ANALYZER INDICATING TRANSMITTER
ASH	ANALYZER SWITCH HIGH
ASHH	ANALYZER SWITCH HIGH-HIGH
CB	CONTROL BLOCK REFERENCE (SCADA LEVEL)
FAH	FLOW ALARM HIGH
FAL	FLOW ALARM LOW
FC	FLOW CONTROLLER
FE	PRIMARY FLOW ELEMENT/SENSOR
FG	FLOW SIGHT GAUGE
FI	FLOW DIGITAL INDICATOR (LED OR SCREEN)
FIC	FLOW INDICATING CONTROLLER
FIT	FLOW INDICATING TRANSMITTER
FQG	FLOW TOTALIZING GAUGE
FQIT	FLOW TOTALIZING INDICATING TRANSMITTER
FSH	FLOW SWITCH HIGH
FSL	FLOW SWITCH LOW
FY	FLOW SIGNAL CONVERTER, REPEATER, OR ISOLATOR
HIC	HAND INDICATING CONTROLLER
HMS	MOMENTARY PUSHBUTTON OR SELECTOR SWITCH
HS	HAND SWITCH
IAH	CURRENT ALARM HIGH (MOTOR OVERLOAD)
IE	CURRENT ELEMENT/SENSOR
ISH	CURRENT SWITCH HIGH USED TO DETECT HIGH TORQUE
JA	POWER FAILURE ALARM
JI	POWER INDICATOR
JIT	POWER INDICATING TRANSMITTER
JL	POWER INDICATING LIGHT
KQI	TIME TOTALIZING INDICATOR
LAH	LEVEL ALARM HIGH
LAHH	LEVEL ALARM HIGH-HIGH
LAL	LEVEL ALARM LOW
LALL	LEVEL ALARM LOW-LOW
LE	PRIMARY LEVEL ELEMENT/SENSOR
LG	LEVEL SIGHT GAUGE
LI	LEVEL INDICATOR (LED OR SCREEN)
LSH	LEVEL SWITCH HIGH
LSHH	LEVEL SWITCH HIGH-HIGH
LSL	LEVEL SWITCH LOW
LSLL	LEVEL SWITCH LOW LOW
LY	LEVEL SIGNAL CONVERTER, ISOLATOR, OR REPEATER
OAH	TORQUE ALARM HIGH
OAHH	TORQUE ALARM HIGH HIGH
OSH	TORQUE SWITCH HIGH
OSHH	TORQUE SWITCH HIGH-HIGH
PAH	PRESSURE ALARM HIGH
PAHH	PRESSURE ALARM HIGH-HIGH
PAL	PRESSURE ALARM LOW
PALL	PRESSURE ALARM LOW-LOW
PDAH	DIFFERENTIAL PRESSURE ALARM HIGH
PDAHH	DIFFERENTIAL PRESSURE ALARM HIGH-HIGH
PDG	DIFFERENTIAL PRESSURE GAUGE
PDI	DIFFERENTIAL PRESSURE INDICATOR (LED OR SCREEN)
PDIT	DIFFERENTIAL PRESSURE INDICATING TRANSMITTER
PDSH	DIFFERENTIAL PRESSURE SWITCH HIGH
PDSHH	DIFFERENTIAL PRESSURE SWITCH HIGH-HIGH
PDSL	DIFFERENTIAL PRESSURE SWITCH LOW
PDSLL	DIFFERENTIAL PRESSURE SWITCH LOW-LOW
PE	PRESSURE SENSOR
PG	PRESSURE GAUGE
PI	PRESSURE INDICATOR (LED OR SCREEN)
PIT	PRESSURE INDICATING TRANSMITTER
PSH	PRESSURE SWITCH HIGH
PSL	PRESSURE SWITCH LOW
SC	SPEED CONTROL
SI	SPEED INDICATION (LED OR SCREEN)
SIK	SPEED INDICATING CONTROL STATION
SIT	SPEED INDICATING TRANSMITTER
SSL	SPEED SWITCH LOW
TAH	TEMPERATURE ALARM HIGH
TAHH	TEMPERATURE ALARM HIGH-HIGH
TAL	TEMPERATURE ALARM LOW
TDI	DIFFERENTIAL TEMPERATURE INDICATOR (LED OR SCREEN)
TDIT	DIFFERENTIAL TEMPERATURE TRANSMITTER
TE	TEMPERATURE SENSOR/RESISTANCE TEMPERATURE DETECTOR
TG	TEMPERATURE GAUGE
TI	TEMPERATURE INDICATOR (LED OR SCREEN)
TIT	TEMPERATURE INDICATING TRANSMITTER
TSH	TEMPERATURE SWITCH HIGH
TSHH	TEMPERATURE SWITCH HIGH HIGH
TSL	TEMPERATURE SWITCH LOW
UA	MULTIVARIABLE/COMMON ALARM/COMMON FAULT
UCR	RUN COMMAND
UCS	STOP COMMAND
VAH	VIBRATION ALARM HIGH
WE	PRIMARY WEIGHT SENSOR/LOAD CELL
WG	WEIGHT GAUGE
WIT	WEIGHT INDICATING TRANSMITTER
YA	GENERAL ALARM EVENT
YI	EVENT INDICATION (LED OR SCREEN)
YIR	RUNNING INDICATION
YIS	STOPPED INDICATION
YL	EVENT INDICATING LIGHT
YLR	RUNNING INDICATING LIGHT
YLS	STOPPED INDICATING LIGHT
ZI	POSITION INDICATOR
ZIC	CLOSED INDICATION
ZIO	OPEN INDICATION
ZIT	POSITION INDICATING TRANSMITTER
ZLC	CLOSED INDICATING LIGHT
ZLO	OPEN INDICATING LIGHT
ZSC	CLOSED POSITION SWITCH
ZSO	OPEN POSITION SWITCH
ZT	POSITION TRANSMITTER

GENERAL INSTRUMENT SYMBOLS



FIELD MOUNTED DISCRETE INSTRUMENT

PILOT LIGHT

DISCRETE INSTRUMENT MOUNTED ON FACE OF PRIMARY PANEL

DISCRETE INSTRUMENT MOUNTED BEHIND OR INSIDE OF PRIMARY PANEL

DISCRETE INSTRUMENT MOUNTED ON FACE OF LOCAL PANEL

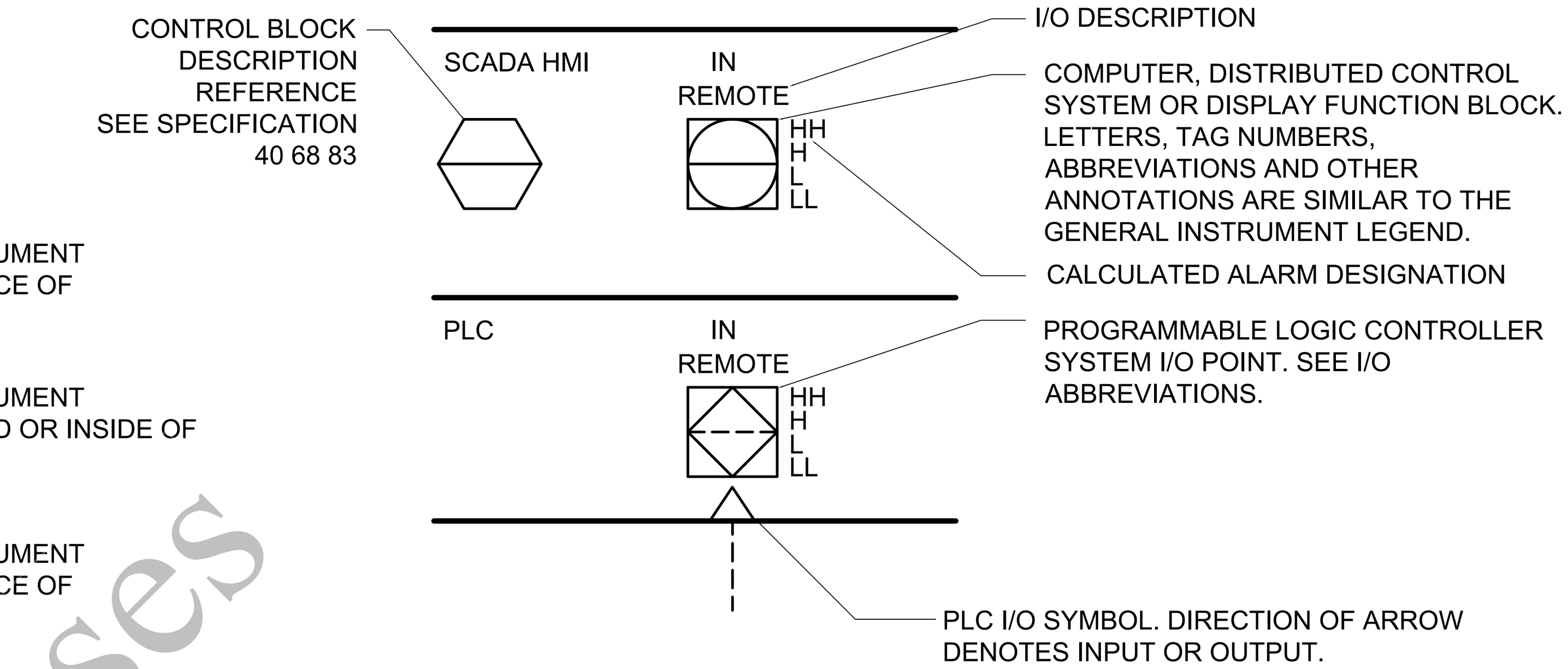
DISCRETE INSTRUMENT MOUNTED BEHIND OR INSIDE OF LOCAL PANEL

SINGLE INSTRUMENT HOUSING CONTAINING TWO (OR MORE) INSTRUMENTATION FUNCTIONS

GENERAL CONTROL INTERLOCK FUNCTION, SEE SCHEMATICS AND SYSTEM SPECIFICATIONS FOR SPECIFIC FUNCTION

DIGITAL SYSTEMS INTERFACE SYMBOLS

NOTE: REFER TO DETAILED SYSTEM SPECIFICATIONS FOR FUNCTIONAL DESCRIPTION. ALSO SEE I/O SCHEDULES FOR COMPLETE INPUT AND OUTPUT LISTINGS.



△ DISCRETE INPUT

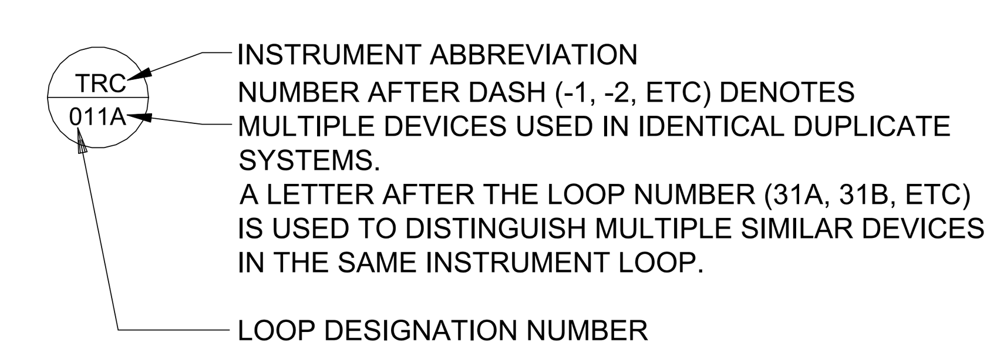
▽ DISCRETE OUTPUT

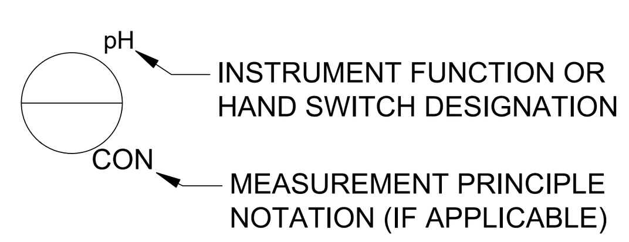
▲ ANALOG INPUT

▼ ANALOG OUTPUT

PULSE INPUT

INSTRUMENTATION SYMBOLOGY AND DESIGNATIONS





FUNCTION DESIGNATIONS AND ABBREVIATIONS

MEASUREMENT PRINCIPLE NOTATIONS

CON	CONDUCTANCE
DP	DIFFERENTIAL PRESSURE SENSING
FLN	FLOW NOZZLE
FLT	FLOW TUBE
GWR	GUIDED WAVE RADAR
RAD	RADAR
US	ULTRASONIC
VENT	VENTURI TUBE

CALCULATED ALARM DESIGNATIONS

H	HIGH
HH	HIGH-HIGH
L	LOW
LL	LOW-LOW

INDICATING LIGHT/ALARM DESIGNATIONS

OVRLD	OVERLOAD
TRQ HI	TORQUE HIGH
TRQ HI-HI	TORQUE HIGH HIGH

TRANSDUCER & CONVERTER DESIGNATION

E	VOLTAGE
FSK	FREQUENCY SHIF KEYING
H	HYDRAULIC
I	CURRENT
P	PNEUMATIC PULSE
PD	PULSE DURATION
PF	PULSE FREQUENCY
R	RESISTANCE (ELECTRICAL)

EXAMPLE: I/P = CURRENT TO PNEUMATIC TRANSDUCER

INSTRUMENT FUNCTIONS

Δ	SUBTRACT (DIFFERENCE)
Σ	ADD OR SUM (ADD AND SUBTRACT)
√‾	EXTRACT SQUARE ROOT
÷	DIVIDE
>	HIGH-SELECT
<	LOW-SELECT
×	MULTIPLY
∫	INTEGRATE (TIME INTEGRAL)
CH4	METHANE
CL2	CHLORINE RESIDUAL
CO2	CARBON DIOXIDE
COND	CONDUCTIVITY
DO	DISSOLVED OXYGEN
DWPT	DEWPOINT
F(X)	CHARACTERIZE SIGNAL
H2S	HYDROGEN SULFIDE
K	GAIN OR ATTENUATE (INPUT:OUTPUT)
-K	GAIN AND REVERSE
LEL	LOWER EXPLOSIVE LIMIT
MCC	MOTOR CONTROL CENTER
MLSS	MIXED LIQUOR SUSPENDED SOLIDS
NH3/NH4	AMMONIUM
NO3	NITRATE
02	OXYGEN (PURITY)
03	OZONE
ORP	OXYGEN REDUCTION POTENTIAL
pH	pH
PO4	PHOSPHATE
TSS	TOTAL SUSPENDED SOLIDS

HAND SWITCH DESIGNATIONS

ES	EMERGENCY STOP
FLT	FAULT
FR	FORWARD-REVERSE
HOA	HAND-OFF-AUTO
HOR	HAND-OFF-REMOTE
LOA	LOCAL-OFF-AUTO
LOR	LOCAL-OFF-REMOTE
LR	LOCAL REMOTE
OC	OPEN-CLOSE
OCA	OPEN-CLOSE-AUTO
OO	ON-OFF
OOA	ON-OFF-AUTO
OOR	ON-OFF-REMOTE
OSC	OPEN-STOP-CLOSE
RS	RESET
STP	STOP
STRT	START

POWER SUPPLY ABBREVIATIONS

120V — POWER SUPPLY SOURCE LABEL. USED ONLY WHERE NECESSARY TO HELP CLARIFY AN INSTRUMENT OR SYSTEM FUNCTION.

120V	120VAC
AS	AIR SUPPLY
ES	ELECTRIC SUPPLY
GS	GAS SUPPLY
HS	HYDRAULIC SUPPLY
NS	NITROGEN SUPPLY
SS	STEAM SUPPLY
WS	WATER SUPPLY

VALVE ACTUATOR DESIGNATIONS

NO	NORMALLY OPEN
NC	NORMALLY CLOSED

BLACK & VEATCH
Black & Veatch Corporation
Chicago, Illinois
ILLINOIS PROFESSIONAL DESIGN FIRM - 184.002143 -0006

Four Rivers Sanitation Authority

AEROBIC GRANULAR SLUDGE - PHASE 1

REVISIONS AND RECORD OF ISSUE

DESIGNED:	MJP
DETAILED:	DHH
CHECKED:	SAY
APPROVED:	MJP
DATE:	12/20/2022
PROJECT NO.:	411752

GENERAL

INSTRUMENTATION

P&ID - LEGEND AND ABBREVIATIONS SHEET 2 OF 3

00-I-002

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

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FD11000
D11000

SYSTEM CODE ABBREVIATIONS

ACE	ACETIC ACID
ACT	ACETYLENE
AER	AERATION SYSTEM
AGS	AEROBIC GRANULAR SLUDGE
AGSI	AEROBIC GRANULAR SLUDGE INFLUENT
AIR	AIR, AERATION OR PROCESS
ALS	ALUMINUM SULFATE
ARG	ARGON
ARW	AIR WASH
AS	ANTI-SEALANT
ASH	ASH
BAL	BALLASTED FLOCCULATION
BIO	BIOSOLIDS
BIT	BIOTOWER
BLS	BLENDED SLUDGE
BNR	BNR
BRN	BRINE
BWH	BACKWASH FOR MEMBRANE OR FILTER
CA	CITRIC ACID
CACL	CALCIUM HYPOCHLORITE
CAH	LIME, HYDRATED
CAI	COMPRESSED AIR, INSTRUMENT
CAO	LIME, QUICKLIME
CAS	CARBON SLURRY
CATS	CALCIUM THIOSULFATE
CDW	CONDENSATE WATER
CEB	CHEMICAL ENHANCED BACKWASH FOR MEMBRANE
CEN	CENTRATE
CI	CORROSION INHIBITOR
CIP	CLEAN IN PLACE
CL2	CHLORINE
CLO2	CHLORINE DIOXIDE
CMS	COMPRESSED AIR, SERVICE
C02	CARBON DIOXIDE
COA	COAGULATION
COLW	COOLING WATER
CUS	COPPER SULFATE
DAF	DISSOLVED AIR FLOTATION
DCB	DISINFECTION CONTACT BASIN
DCL	DECHLORINATION
DEIW	DEIONIZED WATER
DET	DETERGENT
DGA	DIGESTION, AEROBIC
DGM	DIGESTER GAS MIXING
DGG	DIGESTER GAS
DGS	DIGESTER SLUDGE
DIG	DIGESTION, ANAEROBIC
DRN	DRAINAGE
DW	DISTILLED WATER
DWT	DEWATERING
EFP	EFFLUENT PUMPING
EQB	EQUALIZATION BASIN
EXH	ENGINE EXHAUST
FE	FILTER EFFLUENT
FEC	FERRIC CHLORIDE
FES	FERRIC SULFATE
FLC	FLOCCULATION
FLT	FILTRATION
FO	FUEL OIL
FRC	FERROUS CHLORIDE
FRS	FERROUS SULFATE
FUE	DIESEL FUEL
FW	FIRE WATER
GAC	GRANULAR ACTIVATED CARBON
GOX	GASEOUS OXYGEN
GRS	GREASE
GRT	GRIT
GSL	GASOLINE
HCL	HYDROCHLORIC ACID
HCO3	CARBONIC ACID
HEL	HELIUM
HFL	HYDRAULIC FLUID
HFS	HYDROFLUOSILICIC ACID (FLUORIDE)
HSO4	SULFURIC ACID
HW	HOT OR HEATING WATER
HYD	HYDROGEN
INC	INCINERATION
INFP	INFLUENT PUMPING
INT	INTAKE
IRW	IRRIGATION WATER
KMN	POTASSIUM PERMANGANATE
LAG	LAGOON STORAGE
LAP	LAND APPLICATION
LIM	LIME, STABILIZATION
LOX	LIQUID OXYGEN
LPG	LP GAS OR PROPANE GAS
MEG	METHANE GAS
MEM	MEMBRANE
MGOH	MAGNESIUM HYDROXIDE
MTH	METHANOL
MXL	MIXED LIQUOR
NAC	SODA ASH
NAF	SODIUM FLUORIDE
NAL	SODIUM ALUMINATE
NAOH	SODIUM HYDROXIDE
NAM	SODIUM ALUMINATE
NASF	SODIUM SILICOFLUORIDE
NAX	SODIUM HEXAMETAPHOSPHATE
NBC	SODIUM BICARBONATE
NCL	SODIUM CHLORIDE
NCL2	SODIUM CHLORITE
NG	NATURAL GAS
NH3	ANHYDROUS AMMONIA
NHOH	AQUA AMMONIA
NHS	SODIUM BISULFITE
NIO	NITROUS OXIDE
NIT	NITROGEN
NOCL	SODIUM HYPOCHLORITE
NPW	NON-POTABLE WATER
NSO4	AMMONIUM SULFATE
ODC	ODOR CONTROL
OIL	OIL
OZD	OZONE DESTRUCT
OZN	OZONE
OZW	OZONATED WATER
PAC	POWDERED ACTIVATE CARBON
PACL	POLYALUMINUM CHLORIDE
PAR	PRE-AERATION
PER	HYDROGEN PEROXIDE
PEW	PLANT EFFLUENT WATER
PFE	PRIMARY EFFLUENT WATER
PO4	PHOSPHORIC ACID
POLY	POLYMER
PPP	PHOSPHATE
PRC	PRIMARY CLARIFICATION
PRS	PRIMARY SLUDGE
PSC	PRIMARY SCUM
PSD	PRESEDIMENTATION
PW	POTABLE WATER
RAS	RETURN ACTIVATED SLUDGE
RCS	RECIRCULATED SLUDGE
RCW	RECLAIMED WATER
REF	REFRIGERANT
RES	RESIDUALS
ROS	REVERSE OSMOSIS
RW	RAW WATER
RWP	RAW WATER PUMPING
RWS	RAW WATER STORAGE
SCL	SECONDARY CLARIFICATION
SCR	SCREENINGS
SEP	SEPTAGE
SET	SETTLED WATER
SEW	SEWAGE
SO2	SULFUR DIOXIDE
SSC	SECONDARY SCUM
STM	STEAM
STS	STORM SEWER
STW	STORM WATER
SW	SURFACE WASH
SWT	SEAL WATER
TERT	TERTIARY TREATMENT
TF	TRICKLING FILTER
THCK	THICKENING
TPRS	THICKENED PRIMARY SLUDGE
TW	TREATED WATER
TWAS	THICKENED WASTE ACTIVATED SLUDGE
UV	ULTRAVIOLET
VAC	VACUUM
WAGS	WASTE ACTIVATED GRANULAR SLUDGE
WAS	WASTE ACTIVATED SLUDGE
WW	WASH WATER
WLC	WATER LEVEL CORRECTION
WWP	RAW WASTEWATER PUMPING
WWT	WET WEATHER TREATMENT
WWW	WASTE WASH WATER
ZOP	ZINC ORTHOPHOSPHATE

PROCESS CODE ABBREVIATIONS

ACE_X	ACETIC ACID
ACT_X	ACETYLENE
AER_X	AERATION SYSTEM
AGSE_X	AEROBIC GRANULAR SLUDGE EFFLUENT
AGSI_X	AEROBIC GRANULAR SLUDGE INFLUENT
AIR_X	AIR, AERATION OR PROCESS
ALS_X	ALUMINUM SULFATE
ARG_X	ARGON
ARW_X	AIR WASH
AS_X	ANTI-SEALANT
ASH_X	ASH
BAL_X	BALLASTED FLOCCULATION
BIO_X	BIOTOWER
BIT_X	BLENDED SLUDGE
BLS_X	BNR
BNR_X	BIOSOLIDS
BRN_X	BRINE
BWH_X	BACKWASH FOR MEMBRANE OR FILTER
CA_X	CITRIC ACID
CACL_X	CALCIUM HYPOCHLORITE
CAH_X	LIME, HYDRATED
CAI_X	COMPRESSED AIR, INSTRUMENT
CAO_X	LIME, QUICKLIME
CAS_X	CARBON SLURRY
CATS_X	CALCIUM THIOSULFATE
CDW_X	CONDENSATE WATER
CEB_X	CHEMICAL ENHANCED BACKWASH FOR MEMBRANE
CEN_X	CENTRATE
CI_X	CORROSION INHIBITOR
CIP_X	CLEAN IN PLACE
CL2_X	CHLORINE
CLO2_X	CHLORINE DIOXIDE
CMS_X	COMPRESSED AIR, SERVICE
COA_X	COAGULATION
C02_X	CARBON DIOXIDE
COLW_X	COOLING WATER
CUS_X	COPPER SULFATE
DAF_X	DISSOLVED AIR FLOTATION
DCB_X	DISINFECTION CONTACT BASIN
DCL_X	DECHLORINATION
DEIW_X	DEIONIZED WATER
DET_X	DETERGENT
DGA_X	DIGESTION, AEROBIC
DGG_X	DIGESTER GAS
DGM_X	DIGESTER GAS MIXING
DGS_X	DIGESTER SLUDGE
DIG_X	DIGESTION, ANAEROBIC
DRN_X	DRAINAGE
DW_X	DISTILLED WATER
DWT_X	DEWATERING
EFP_X	EFFLUENT PUMPING
EQB_X	EQUALIZATION BASIN
EXH_X	ENGINE EXHAUST
FE_X	FILTER EFFLUENT
FEC_X	FERRIC CHLORIDE
FES_X	FERRIC SULFATE
FLC_X	FLOCCULATION
FLT_X	FILTRATION
FO_X	FUEL OIL
FRC_X	FERROUS CHLORIDE
FRS_X	FERROUS SULFATE
FUE_X	DIESEL FUEL
FW_X	FIRE WATER
GAC_X	GRANULAR ACTIVATED CARBON
GOX_X	GASEOUS OXYGEN
GRS_X	GREASE
GRT_X	GRIT
GSL_X	GASOLINE
GTO_X	GRAVITY THICKENER OVERFLOW
HCL_X	HYDROCHLORIC ACID
HCO3_X	CARBONIC ACID
HEL_X	HELIUM
HFL_X	HYDRAULIC FLUID
HFS_X	HYDROFLUOSILICIC ACID (FLUORIDE)
HSO4_X	SULFURIC ACID
HW_X	HOT OR HEATING WATER
HYD_X	HYDROGEN
INC_X	INCINERATION
INFP_X	INFLUENT PUMPING
INT_X	INTAKE
IRW_X	IRRIGATION WATER
KMN_X	POTASSIUM PERMANGANATE
LAG_X	LAGOON STORAGE
LAP_X	LAND APPLICATION
LIM_X	LIME STABILIZATION
LOX_X	LIQUID OXYGEN
LPG_X	LP GAS OR PROPANE GAS
MEG_X	METHANE GAS
MEM_X	MEMBRANE
MGOH_X	MAGNESIUM HYDROXIDE
MTH_X	METHANOL
MXL_X	MIXED LIQUOR
NAC_X	SODA ASH
NAF_X	SODIUM FLUORIDE
NAL_X	SODIUM ALUMINATE
NAM_X	SODIUM ALUMINATE
NAOH_X	SODIUM HYDROXIDE
NASF_X	SODIUM SILICOFLUORIDE
NAX_X	SODIUM HEXAMETAPHOSPHATE
NBC_X	SODIUM BICARBONATE
NCL_X	SODIUM CHLORIDE
NCL2_X	SODIUM CHLORITE
NG_X	NATURAL GAS
NH3_X	ANHYDROUS AMMONIA
NHOH_X	AQUA AMMONIA
NHS_X	SODIUM BISULFITE
NIO_X	NITROUS OXIDE
NIT_X	NITROGEN
NOCL_X	SODIUM HYPOCHLORITE
NPW_X	NON-POTABLE WATER
NSO4_X	AMMONIUM SULFATE
ODC_X	ODOR CONTROL
OIL_X	OIL
OZD_X	OZONE DESTRUCT
OZN_X	OZONE
OZW_X	OZONATED WATER
PAC_X	POWDERED ACTIVATE CARBON
PACL_X	POLYALUMINUM CHLORIDE
PAR_X	PRE-AERATION
PER_X	HYDROGEN PEROXIDE
PEW_X	PLANT EFFLUENT WATER
PO4_X	PHOSPHORIC ACID
POLY_X	POLYMER
PFE_X	PRIMARY FILTER EFFLUENT
PPP_X	PHOSPHATE
PRC_X	PRIMARY CLARIFICATION
PRS_X	PRIMARY SLUDGE
PSC_X	PRIMARY SCUM
PSD_X	PRESEDIMENTATION
PW_X	POTABLE WATER
RAS_X	RETURN ACTIVATED SLUDGE
RCS_X	RECIRCULATED SLUDGE
RCW_X	RECLAIMED WATER
REF_X	REFRIGERANT
RES_X	RESIDUALS
ROS_X	REVERSE OSMOSIS
RW_X	RAW WATER
RWP_X	RAW WATER PUMPING
RWS_X	RAW WATER STORAGE
SCL_X	SECONDARY CLARIFICATION
SCR_X	SCREENINGS
SEP_X	SEPTAGE
SET_X	SETTLED WATER
SEW_X	SEWAGE
SO2_X	SULFUR DIOXIDE
SSC_X	SECONDARY SCUM
STM_X	STEAM
STS_X	STORM SEWER
STW_X	STORM WATER
SW_X	SURFACE WASH
SWT_X	SEAL WATER
TERT_X	TERTIARY TREATMENT
TF_X	TRICKLING FILTER
THCK_X	THICKENING
TPRS_X	THICKENED PRIMARY SLUDGE
TW_X	TREATED WATER
TWAS_X	THICKENED WASTE ACTIVATED SLUDGE
UV_X	ULTRAVIOLET
VAC_X	VACUUM
WAGS_X	WASTE ACTIVATED GRANULAR SLUDGE
WAS_X	WASTE ACTIVATED SLUDGE
WLC_X	WATER LEVEL CORRECTION
WW_X	WASH WATER
WWP_X	RAW WASTEWATER PUMPING
WWT_X	WET WEATHER TREATMENT
WWW_X	WASTE WASH WATER
ZOP_X	ZINC ORTHOPHOSPHATE

X = PROCESS CODE SUFFIX USED TO FURTHER SPECIFY A PROCESS STREAM (I.E. CL2_G FOR CHLORINE GAS OR CL2_S FOR CHLORINE SOLUTION)

FUNCTION CODE ABBREVIATIONS

ACD	AERATOR, COARSE BUBBLE DIFFUSED
ACMB	ACTIVATION CHAMBER
AD	AIR DRYER
AEFD	AERATOR, FINE PORE DIFFUSED
AES	AERATOR, SURFACE
AF	AIR FILTER
AFC	AFTERCOOLER
AFD	ADJUSTABLE FREQUENCY DRIVE
AFS	AERATOR, FLOATING SURFACE
AR	AIR RECEIVER OR REGULATOR
ARV	AIR RELEASE VALVE
AS	AIR SEPARATOR
AST	AIR STRIPPER
AVRV	AIR VACUUM RELIEF VALVE
B	BIN (STORAGE - ALL TYPES)
BA	BIN ACTIVATOR
BDZ	BULLDOZER
BFP	BACKFLOW PREVENTER
BFPS	BELT FILTER PRESS
BFV	BUTTERFLY VALVE, AWWA
BFVI	BUTTERFLY VALVE, INDUSTRIAL
BL	BLOWER, POSITIVE DISPLACEMENT
BLW	BLOWER, CENTRIFUGAL
BLR	BOILER
BLV	BALL VALVE, AWWA
BLV	BALL VALVE, MISCELLEANEOUS
BNR	BASIN, BNR
BSNA	BASIN, AERATION
BSNC	BASIN, CHLORINE CONTACT
BSNO	BASIN, OXIC
BSNS	BASIN, SEDIMENTATION
BSNX	BASIN, ANOXIC/OXIC
CAB	COVER, ALUMINUM DOME BASIN
CCLM	CALIBRATION COLUMN
CDG	COVER, GAS HOLDER
CFD	COVER, FIXED DIGESTER
CFG	CENTRIFUGE
CFL	COVER, FLOATING DIGESTER
CGR	CLASSIFIER, GRIT
CGS	CHLORINE GAS SCRUBBER
CHF	CHEMICAL FEEDER
CMB	COVER, MEMBRANE
CML	COMPRESSOR, LIQUID RING
CMP	COMPRESSOR
CMPS	COMPRESSOR, STEAM
CMR	COMPRESSOR, ROTARY SCREW
COB	CONVEYOR, BELT
COS	CONVEYOR, SCREW
CRG	CRANE, GANTRY
CRJ	CRANE, JIB
CRN	CRANE
CRP	CRANE, PORTABLE GANTRY
CRT	CRANE, TRAVELING BRIDGE
CTR	CONTAINER, PROCESS
CV	CHECK VALVE
CW	CLEARWELL
CYG	CYLINDER, GAS
CYLC	CYLINDER, CHLORINE
DAF	DISSOLVED AIR FLOTATION THICKENER
DFB	DIFFUSER BANK
DFP	DIFFUSER, PIPELINE
DFT	DIFFUSER, TANK
DGAP	DIGESTER, ANAEROBIC PRIMARY
DGAS	DIGESTER, ANAEROBIC SECONDARY
DGE	DIGESTER, AEROBIC
DIF	DIFFUSER, CHANNEL
DPS	DIAPHRAGM SEAL
DSUV	DISINFECTION UNIT, UV
DUC	DUST COLLECTOR
DWS	DEWATERING SCREW
EDC	EDUCTOR
EEWF	EMERGENCY EYE WASH FOUNTAIN
EQPB	EQUIPMENT, BUILDING SERVICES
EQPE	ELECTRICAL EQUIPMENT, GENERAL
EQPG	EQUIPMENT, GENERAL OR UNSPECIFIED
ESEW	EMERGENCY SHOWER AND EYEWASH
ESHR	EMERGENCY SHOWER
EXC	EXPANSION CHAMBER
EV	EVAPORATOR
FAN	FAN, CENTRIFUGAL
FAR	FLAME ARRESTER
FAX	FAN, AXIAL FLOW
FC	FLAME CHECK
FD	FLOOR DRAIN
FGP	FILTER, GAS PARTICULATE
FL	FORKLIFT
FLC	FILTER, CARTRIDGE TYPE
FLCH	FLOCCULATOR, HORIZONTAL
FLCV	FLOCCULATOR, VERTICAL
FLG	FLARE, GAS
FLM	FLUME, PARSHALL
FLT	FILTER, UNDERDRAINS OR PRESSURE
FMSP	FOAM SEPARATOR
FS	FLOW SPLITTER
FST	FENCE STIRRER
FSW	FILTER. SURFACE WASH EQUIPMENT
FTNG	FITTING, MISCELLANEOUS
GBT	GRAVITY BELT THICKENER
GEN	GENERATOR, ENGINE (BACKUP POWER)
GFD	GAS FEEDER
GFL	GATE, FLAP
GRB	GRIT BASIN, VORTEX TYPE
GRC	GRIT SCREW CONCENTRATOR
GRD	GRINDER PULVERIZER
GRI	GRINDER, INLINE SEWAGE
GSD	GATE, SLIDE
GSL	GATE, SLUICE
GVT	GRAVITY THICKENER
GWH	GAS WATER HEATER
HEX	HEAT EXCHANGER
HSC	HOIST, CHAIN
HST	HOIST
HSW	HOIST, WIRE ROPE
HYC	HYDROCYCLONE
HYDF	HYDRANT, FIRE
HYDW	HYDRANT, WALL
INJ	INJECTOR, CHEMICAL
LS	LIME SLAKER
M	MOTOR
MBMF	MEMBRANE, MICROFILTRATION
MBNF	MEMBRANE, NANOFILTRATION
MBR	MEMBRANE
MBRO	MEMBRANE, REVERSE OSMOSIS
MBUF	MEMBRANE, ULTRAFILTRATION
MFL	MIXER, FLOCCULATION
MXC	MIXER, CARBON
MXI	MIXER, IN-LINE
MXP	MIXER, SUBMERSIBLE, PROP OR BLENDER
MXPG	MIXER, PUGMILL
MXR	MIXER, RAPID
MXS	MIXER, STATIC
ODU	OZONE DESTRUCT UNIT
OGEN	OZONE GENERATOR
OPSU	OZONE POWER SUPPLY UNIT
ORD	OVERFLOW ROOF DRAIN
P	PUMP, POSITIVE DISPLACEMENT, ROTARY, DRUM OR BELL MOUNTED
PAD	PUMP, AIR DIAPHRAGM
PBC	PRESSURE BUILDING COIL
PCL	PUMP, CENTRIFUGAL
PCLR	PRIMARY CLARIFIER
PCN	PARTICLE COUNTER
PD	PULSATION DAMPENER
PDM	PUMP, DIAPHRAGM METERING
PHE	PUMP, HORIZONTAL END SUCTION
PHW	PUMP, HOT OR HEATING WATER
PINJ	POLYMER INJECTOR RING
PIPE	PIPE
PLT	PELLETIZER
PNS	PENSTOCK
PP	PACKAGED PLANT
PPC	PUMP, PROGRESSING CAVITY
PPL	PUMP, PLUNGER
PPS	PUMP, PERISTALTIC
PRV	PRESSURE RELIEF VALVE
PSC	PUMP, HORIZONTAL SPLIT CASE
PSCH	PUMP, SUBMERSIBLE CHOPPER
PSE	PUMP, SCREW ENCLOSED
PSO	PUMP, SCREW OPEN
PSP	PUMP, SUMP
PSS	PUMP, SUBMERSIBLE SUMP
PST	PLATE SETTLER
PV	PLUG VALVE, ECCENTRIC
PV	PLUG VALVE, NON-ECCENTRIC
PVD	PUMP, VERTICAL DIFFUSION VANE
PVE	PUMP, VERTICAL END SUCTION
PVW	PUMP, VERTICAL WET PIT
RCO	RESIDUAL COLLECTOR
RD	RUPTURE DISK
RM	ROTAMETER
RSV	RESERVOIR
SAMP	SAMPLER
SBL	SOLIDS BLENDER, INLINE
SC	SCALE, WEIGHT
SCB	SCRUBBER
SCC	SLUDGE COLLECTOR, CIRCULAR
SCFC	SLUDGE COLLECTOR, FLOC-CLARIFYING
SCL	SCALE
SCLC	SLUDGE COLLECTOR, CROSS
SCLR	SECONDARY CLARIFIER
SCRB	SCREEN, MANUAL OR MECH CLEANED BAR
SCRH	SCREEN, HORIZONTAL
SCRI	SCREEN, INLINE SLUDGE
SCRS	SCREEN, STEP
SCRT	SCREEN, TRAVELING WATER
SCRV	SCREEN, VIBRATORY
SCSC	SLUDGE COLLECTOR, SOLIDS CONTACT
SCSE	SLUDGE COLLECTOR, SEC CLARIFIERS
SCSL	SLUDGE COLLECTOR, STRAIGHT LINE
SCW	SCUM WEIR, ROTATING
SEP	SEPARATOR, MOISTURE OR CYCLONE
SG	SIGHT GAUGE
SGR	SLUDGE GRINDER, INLINE OR CHANNEL
SGT	SIGHT GLASS, TALL
SIL	SILENCER
SMC	SCUM COLLECTOR
SPMP	SUBMERSIBLE PUMP
SRCH	SURGE CHAMBER
STR	STRAINER
STRB	STRAINER, BASKET TYPE
STRY	STRAINER, Y TYPE
TB	TURBINE
TBC	TURBINE COMPRESSOR
TBE	TURBINE ENGINE
TCC	TANK, CHLORINE CONTACTOR
TCN	TANK, AMMONIA STORAGE
TCP	TANK, METHANOL
TCR	TANK, CRYOGENIC STORAGE
TDW	TANK, DOUBLE WALL
TNK	TANK, GENERAL OR UNSPECIFIED
TNKC	TANK, FRP CHEMICAL STORAGE
TRK	TRUCK
TRP	TRAP, DRIP
TRPS	TRAP, SEDIMENT
TSA	TANK, STORAGE, ABOVE GROUND
TSE	TANK, ELEVATED STORAGE
TSMP	TANK, SAMPLER
TSW	TANK, STEEL WATER
TX	TANK, EXPANSION
UPS	UNINTERRUPTIBLE POWER SUPPLY
UVR	UV REACTOR
V	VALVE, GENERAL OR UNSPECIFIED
VAG	VALVE, ANGLE
VAP	VAPORIZER
VAVB	VALVE, AIR VACUUM BREAK
VBFP	VALVE, BACKFLOW PREVENTER
VCAV	VALVE, COMBINATION AIR RELEASE AND VACUUM BREAK
VCK	VALVE, CHECK
VCN	VALVE, CONE
VDG	VALVE, DIAPHRAGM OPERATED
VER	VALVE, EXPLOSION RELIEF
VFG	VALVE, FLAP GATE
VFW	VALVE, FOUR WAY
VG	VALVE, GATE
VGD	VALVE, DOUBLE DISC GATE
VGL	VALVE, GLOBE
VGR	VALVE, RESILIENT SEATED GATE
VKG	VALVE, KNIFE GATE
VMD	VALVE, MUD
VMR	VALVE, MATERIAL HANDLING ROTARY
VND	VALVE, NEEDLE
VP	VALVE, PROCESS
VPN	VALVE, PINCH
VPO	VALVE, PISTON OPERATED
VPRD	VALVE, PRESSURE REDUCING
VPS	VALVE, PRESSURE SUSTAINING
VPT	VALVE, PILOT
VPVR	VALVE, PRESSURE/VACUUM RELIEF
VRG	VACUUM REGULATOR
VS	VALVE, SAFETY
VSL	VALVE, SOLENOID
VSLB	VESSEL, BOOT
VSLV	VALVE, SLEEVE
VTLS	VALVE, TELESCOPING
VTS	VALVE, THERMAL SHUTOFF
VTW	VALVE, THREE WAY
VVB	VALVE, VACUUM BREAKER
VVP	VALVE, V-PORT BALL
WC	WEIR, CIPOLLETTI
WG	WEIR, GATE
WLHC	WELL, HORIZONTAL COLLECTOR
WLV	WELL, VERTICAL
WR	WEIR, RECTANGULAR
WV	WEIR, V-NOTCH

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Four Rivers Sanitation Authority

AEROBIC GRANULAR SLUDGE - PHASE 1

REVISIONS AND RECORD OF ISSUE

DESIGNED:	MJP
DETAILED:	DHH
CHECKED:	SAY
APPROVED:	MJP
DATE:	12/20/2022
PROJECT NO.:	411752

GENERAL

INSTRUMENTATION

P&ID - LEGEND AND ABBREVIATIONS SHEET 3 OF 3

00-I-003

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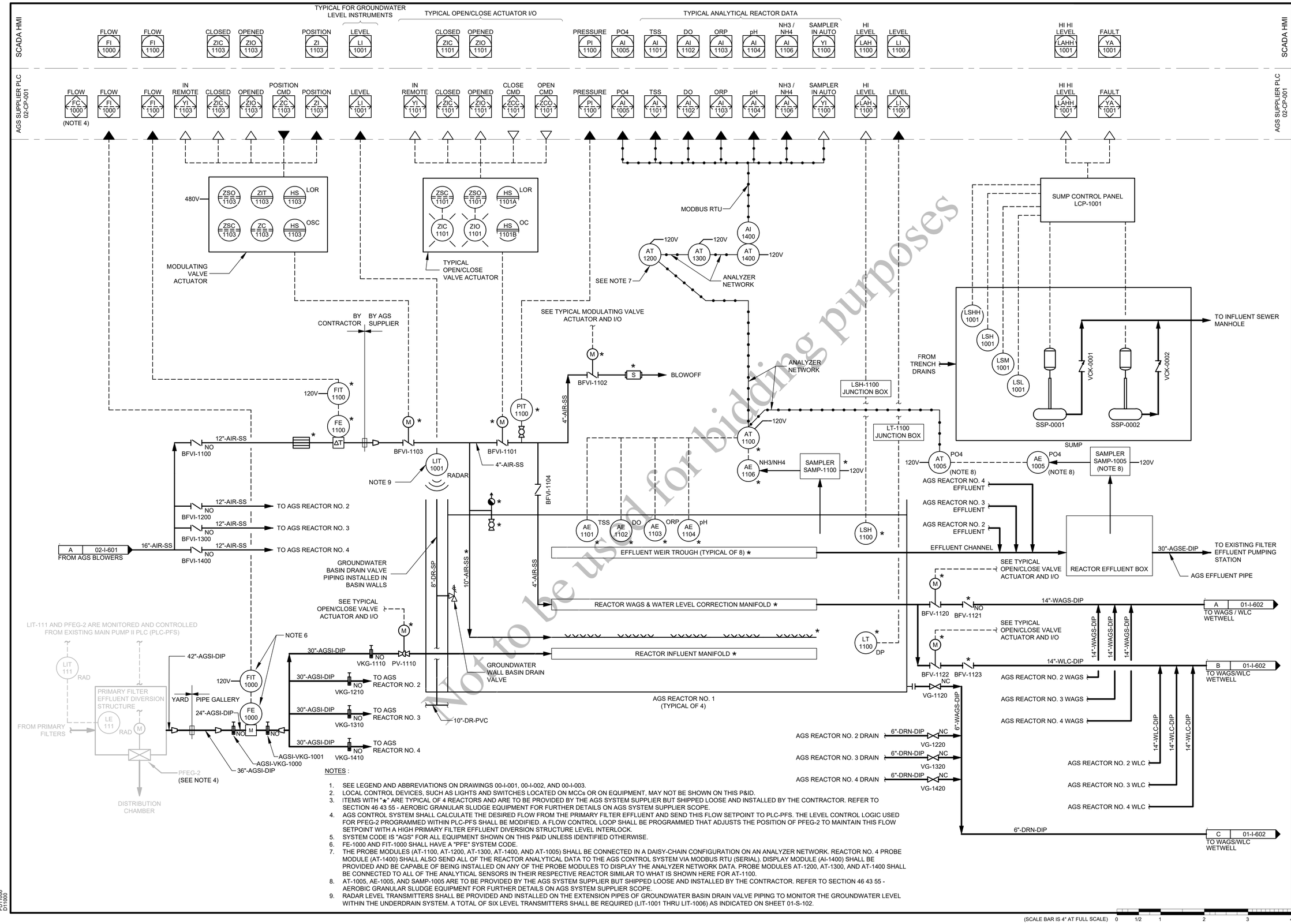

NOTES :

1. SEE LEGEND AND ABBREVIATIONS ON DRAWINGS 00-I-001, 00-I-002, AND 00-I-003.
2. LOCAL CONTROL DEVICES, SUCH AS LIGHTS AND SWITCHES LOCATED ON MCCs OR ON EQUIPMENT, MAY NOT BE SHOWN ON THIS P&ID.
3. ITEMS WITH "*" ARE TYPICAL OF 4 REACTORS AND ARE TO BE PROVIDED BY THE AGS SYSTEM SUPPLIER BUT SHIPPED LOOSE AND INSTALLED BY THE CONTRACTOR. REFER TO SECTION 46 43 55 - AEROBIC GRANULAR SLUDGE EQUIPMENT FOR FURTHER DETAILS ON AGS SYSTEM SUPPLIER SCOPE.
4. AGS CONTROL SYSTEM SHALL CALCULATE THE DESIRED FLOW FROM THE PRIMARY FILTER EFFLUENT AND SEND THIS FLOW SETPOINT TO PLC-PFS. THE LEVEL CONTROL LOGIC USED FOR PFEG-2 PROGRAMMED WITHIN PLC-PFS SHALL BE MODIFIED. A FLOW CONTROL LOOP SHALL BE PROGRAMMED THAT ADJUSTS THE POSITION OF PFEG-2 TO MAINTAIN THIS FLOW SETPOINT WITH A HIGH PRIMARY FILTER EFFLUENT DIVERSION STRUCTURE LEVEL INTERLOCK.
5. SYSTEM CODE IS "AGS" FOR ALL EQUIPMENT SHOWN ON THIS P&ID UNLESS IDENTIFIED OTHERWISE.
6. FE-1000 AND FIT-1000 SHALL HAVE A "PFE" SYSTEM CODE.
7. THE PROBE MODULES (AT-1100, AT-1200, AT-1300, AT-1400, AND AT-1005) SHALL BE CONNECTED IN A DAISY-CHAIN CONFIGURATION ON AN ANALYZER NETWORK. REACTOR NO. 4 PROBE MODULE (AT-1400) SHALL ALSO SEND ALL OF THE REACTOR ANALYTICAL DATA TO THE AGS CONTROL SYSTEM VIA MODBUS RTU (SERIAL). DISPLAY MODULE (AI-1400) SHALL BE PROVIDED AND BE CAPABLE OF BEING INSTALLED ON ANY OF THE PROBE MODULES TO DISPLAY THE ANALYZER NETWORK DATA. PROBE MODULES AT-1200, AT-1300, AND AT-1400 SHALL BE CONNECTED TO ALL OF THE ANALYTICAL SENSORS IN THEIR RESPECTIVE REACTOR SIMILAR TO WHAT IS SHOWN HERE FOR AT-1100.
8. AT-1005, AE-1005, AND SAMP-1005 ARE TO BE PROVIDED BY THE AGS SYSTEM SUPPLIER BUT SHIPPED LOOSE AND INSTALLED BY THE CONTRACTOR. REFER TO SECTION 46 43 55 - AEROBIC GRANULAR SLUDGE EQUIPMENT FOR FURTHER DETAILS ON AGS SYSTEM SUPPLIER SCOPE.
9. RADAR LEVEL TRANSMITTERS SHALL BE PROVIDED AND INSTALLED ON THE EXTENSION PIPES OF GROUNDWATER BASIN DRAIN VALVE PIPING TO MONITOR THE GROUNDWATER LEVEL WITHIN THE UNDERDRAIN SYSTEM. A TOTAL OF SIX LEVEL TRANSMITTERS SHALL BE REQUIRED (LIT-1001 THRU LIT-1006) AS INDICATED ON SHEET 01-S-102.

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AEROBIC GRANULAR SLUDGE - PHASE 1

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GENERAL

INSTRUMENTATION

P&ID - AGS REACTORS AND GALLERY

01-I-601

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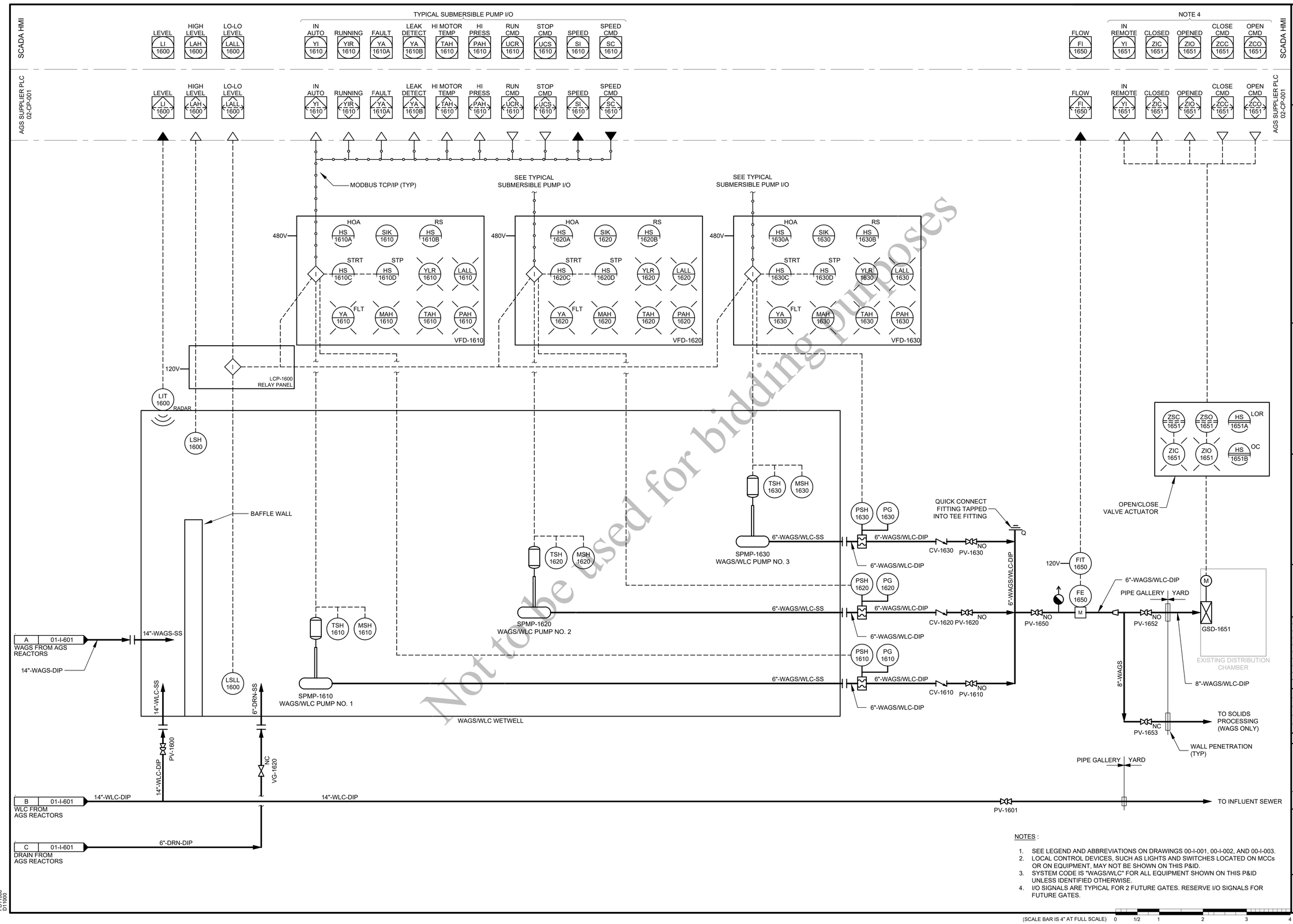

NOTES :

1. SEE LEGEND AND ABBREVIATIONS ON DRAWINGS 00-I-001, 00-I-002, AND 00-I-003.
2. LOCAL CONTROL DEVICES, SUCH AS LIGHTS AND SWITCHES LOCATED ON MCCs OR ON EQUIPMENT, MAY NOT BE SHOWN ON THIS P&ID.
3. SYSTEM CODE IS "WAGS/WLC" FOR ALL EQUIPMENT SHOWN ON THIS P&ID UNLESS IDENTIFIED OTHERWISE.
4. I/O SIGNALS ARE TYPICAL FOR 2 FUTURE GATES. RESERVE I/O SIGNALS FOR FUTURE GATES.

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AEROBIC GRANULAR SLUDGE - PHASE 1

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GENERAL

INSTRUMENTATION

P&ID - WAGS/WLC PUMPS

01-I-602

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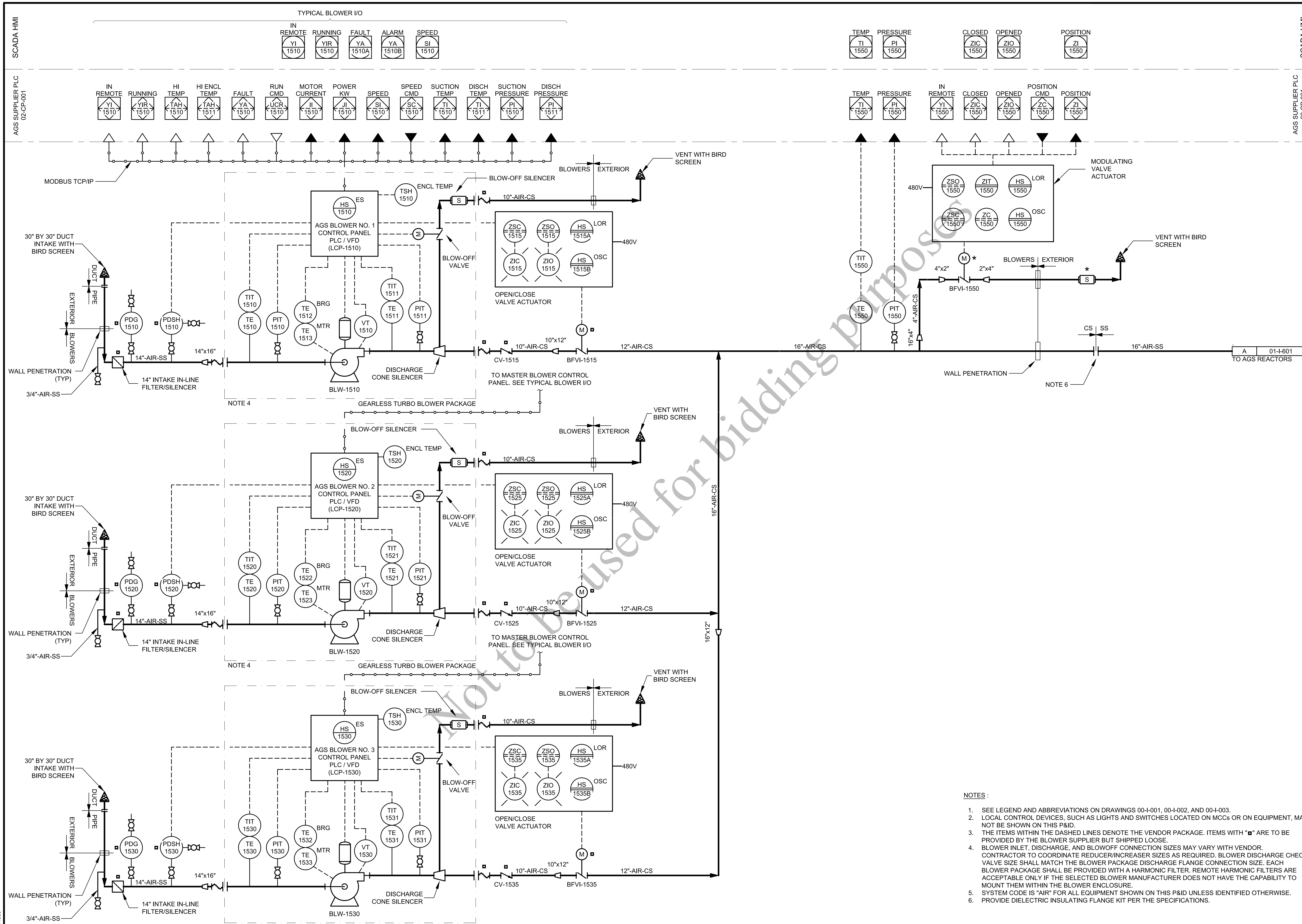

NOTES :

1. SEE LEGEND AND ABBREVIATIONS ON DRAWINGS 00-I-001, 00-I-002, AND 00-I-003.
2. LOCAL CONTROL DEVICES, SUCH AS LIGHTS AND SWITCHES LOCATED ON MCCs OR ON EQUIPMENT, MAY NOT BE SHOWN ON THIS P&ID.
3. THE ITEMS WITHIN THE DASHED LINES DENOTE THE VENDOR PACKAGE. ITEMS WITH "▪" ARE TO BE PROVIDED BY THE BLOWER SUPPLIER BUT SHIPPED LOOSE.
4. BLOWER INLET, DISCHARGE, AND BLOWOFF CONNECTION SIZES MAY VARY WITH VENDOR. CONTRACTOR TO COORDINATE REDUCER/INCREASER SIZES AS REQUIRED. BLOWER DISCHARGE CHECK VALVE SIZE SHALL MATCH THE BLOWER PACKAGE DISCHARGE FLANGE CONNECTION SIZE. EACH BLOWER PACKAGE SHALL BE PROVIDED WITH A HARMONIC FILTER. REMOTE HARMONIC FILTERS ARE ACCEPTABLE ONLY IF THE SELECTED BLOWER MANUFACTURER DOES NOT HAVE THE CAPABILITY TO MOUNT THEM WITHIN THE BLOWER ENCLOSURE.
5. SYSTEM CODE IS "AIR" FOR ALL EQUIPMENT SHOWN ON THIS P&ID UNLESS IDENTIFIED OTHERWISE.
6. PROVIDE DIELECTRIC INSULATING FLANGE KIT PER THE SPECIFICATIONS.

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AEROBIC GRANULAR SLUDGE - PHASE 1

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PROJECT NO.:	411752

GENERAL

INSTRUMENTATION

P&ID - BLOWERS

02-I-601

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(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

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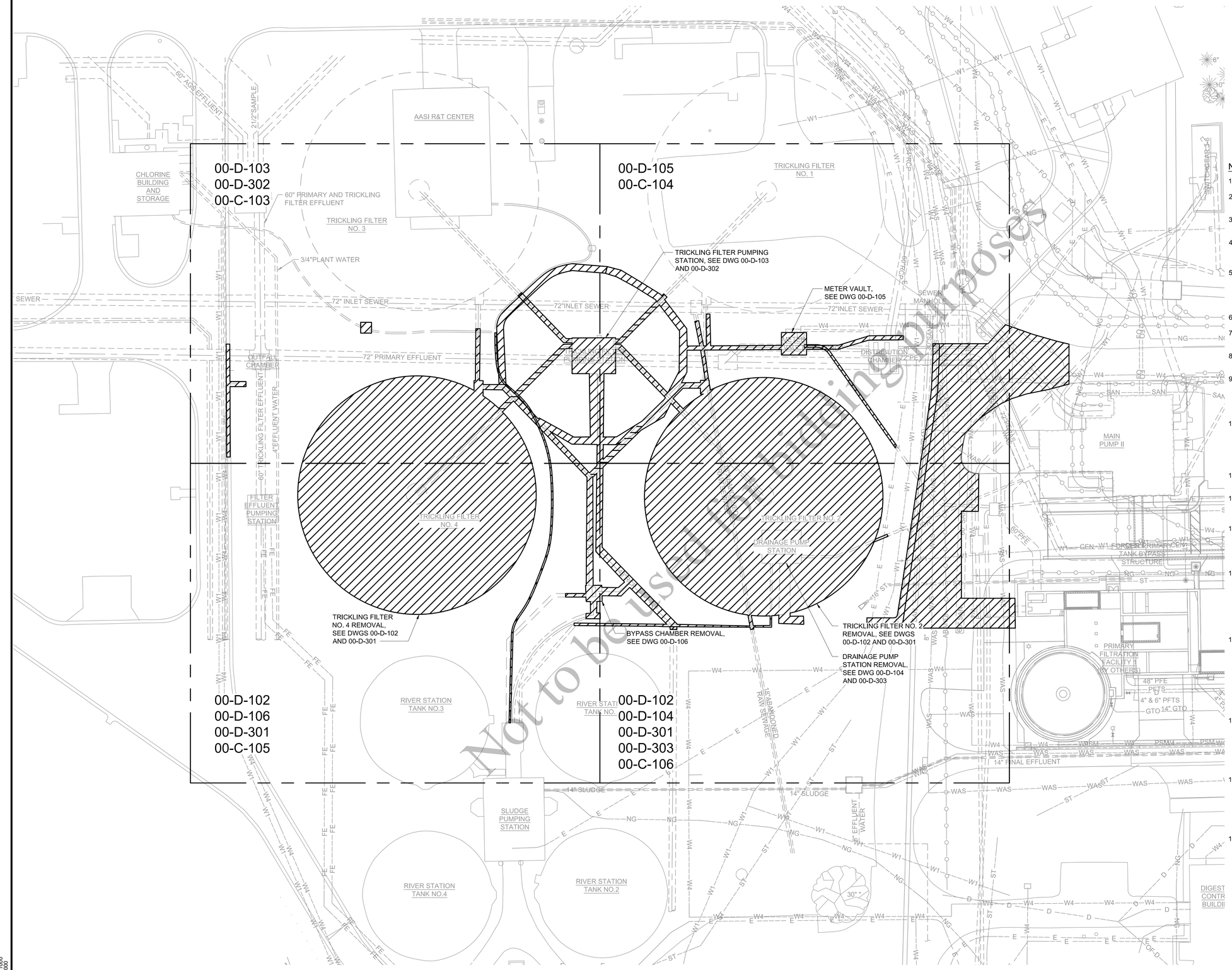

30' 15' 0 30' 60'

1"=30'

NOTES:

1. CONTRACTOR SHALL NOTIFY FRSA AT LEAST 72 HOURS PRIOR TO ANY EXCAVATION.
2. SEE DWG 00-C-001 FOR LEGEND AND GENERAL NOTES AND DWGS 00-C-103 THOUGH 00-C-106 FOR EXISTING CONDITIONS AND REMOVAL PLANS.
3. EXISTING PCC PAVEMENT AND CURB AND GUTTER IS DOWELED. PRESERVE DOWELS IN EXISTING CONCRETE TO REMAIN.
4. PARTIAL REMOVAL OF PCC PAVEMENT PANELS IS NOT PERMITTED. WHERE REMOVAL OF PCC PAVEMENT IS REQUIRED, CONTRACTOR SHALL REMOVE ENTIRE PANEL.
5. CONTRACTOR SHALL NOT BEGIN ANY LAND DISTURBING ACTIVITIES UNTIL EROSION CONTROL MEASURES AND DEVICES HAVE BEEN PUT IN PLACE. SEE DWG 00-C-102 FOR ADDITIONAL DETAILS AND EROSION AND SEDIMENT CONTROL NOTES.
6. ITEMS SHOWN AS EXISTING ON DRAWINGS ARE TO BE PROTECTED DURING CONSTRUCTION.
7. PLANT PERIMETER SHALL REMAIN SECURED AT ALL TIMES. CONTRACTOR IS RESPONSIBLE FOR TEMPORARY FENCING AS REQUIRED.
8. TRENCH, PAVEMENT, AND SITE RESTORATION SHALL MATCH ADJACENT EXISTING GRADE UNLESS OTHERWISE NOTED.
9. ALL EXISTING MANHOLES, CATCH BASINS, AND INLETS WITHIN THE LIMITS OF CONSTRUCTION TO REMAIN SHALL BE PROTECTED DURING CONSTRUCTION, AND, IF REQUIRED DUE TO NEW CONSTRUCTION, ADJUSTED TO FINAL GRADE AND/OR TO ACCEPT DRAINAGE.
10. ALL EXISTING SHRUBS, PLANTS, AND STRUCTURES WITHIN THE SITE SHALL BE PROTECTED BY MEANS OF FENCING AND OTHER DEVICES. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO PROTECT AND CLEAN UP ALL DEBRIS NEAR, ON, OR AROUND THESE AREAS AT COMPLETION OF WORK.
11. ALL WASTE EXCAVATION, CONSTRUCTION MATERIALS, DEMOLISHED STRUCTURES AND DEBRIS SHALL BE REMOVED FROM THE SITE.
12. CONTRACTOR AT HIS DISCRETION MAY ELECT TO PROCESS DEMOLISHED CONCRETE ON SITE FOR REUSE WITHIN ONE OF THE POTENTIAL CONTRACTOR STAGING AREAS.
13. SAWCUT AND REMOVE CONCRETE TO THE LIMITS NOTED. IN EXPOSED AREAS NOT COVERED BY NEW CONSTRUCTION, REMOVE REINFORCEMENT AND EMBEDMENTS 1" BEYOND FINISHED SURFACE AND PATCH SURFACE WITH PATCHING MORTAR TO MATCH ADJACENT FINISHED SURFACE.
14. REMOVE CONCRETE ANCHORS, ANCHOR BOLTS, AND OTHER EMBEDMENTS FOR MATERIALS AND EQUIPMENT BEING REMOVED. IN EXPOSED AREAS NOT COVERED BY NEW CONSTRUCTION, REMOVE CONCRETE ANCHORS, ANCHOR BOLTS, OTHER EMBEDMENTS 1" BEYOND FINISHED SURFACE AND PATCH SURFACE WITH PATCHING MORTAR. FINISH SURFACE TO MATCH ADJACENT FINISHED SURFACE.
15. WHERE EQUIPMENT IS INDICATED TO BE REMOVED, REMOVE ALL ASSOCIATED POWER AND CONTROL WIRING AND CONDUIT BACK TO SOURCE. REMOVE JUNCTION BOXES AND PULL BOXES ASSOCIATED WITH THE REMOVED CONDUITS. WHERE CONDUIT SYSTEM CONTAINS CIRCUITS TO OTHER EQUIPMENT THAT REMAINS, RETAIN THESE CIRCUITS AND RELOCATE EXISTING CONDUIT AND EXTEND EXISTING CIRCUITS AS REQUIRED FOR THE INSTALLATION OF NEW EQUIPMENT.
16. REMOVE ALL SUPPORTS ASSOCIATED WITH REMOVED PIPING, DUCTWORK, CONDUIT, AND EQUIPMENT. REMOVE RODS AND FASTENERS FROM CEILINGS, FLOORS, AND WALLS WITH CARE. WHERE SURFACE HAS BEEN MARRED, CHIPPED, SPRAWLED, ETC. AS A RESULT OF REMOVAL, PATCH SURFACE WITH PATCHING MORTAR AND FINISH TO MATCH ADJACENT FINISHED SURFACE.
17. REMOVE EXISTING PADS OF ANY EQUIPMENT BEING REMOVED. REMOVE CONCRETE REINFORCEMENT A MINIMUM OF 1" BEYOND FINISHED SURFACE AT ANY LOCATION WHERE NEW CONCRETE PAD WILL NOT COVER ROUGH SURFACE OF REMOVED PAD. PATCH SURFACE WITH PATCHING MORTAR AND FINISH TO MATCH ADJACENT FINISHED SURFACE.
18. WHERE OPENINGS ARE LEFT IN WALLS, SLABS, OR CEILINGS DUE TO REMOVED PIPING, DUCTWORK, EQUIPMENT, OR OTHER WORK, PATCH OPENING TO MATCH ADJACENT SURFACES UNLESS NOTED OTHERWISE. THE PERIMETER OF OPENINGS IN CONCRETE WALLS AND SLABS EXPOSED TO EARTH, WEATHER, OR WATER SHALL BE LINED WITH A GASKET TYPE WATERSTOP PRIOR TO PATCHING OF THE WALL. OPENINGS IN PRECAST CONCRETE ROOF MEMBERS ARE TO BE PATCHED WITH CONCRETE AND DOWELED TO THE EXISTING ROOF MEMBERS UNLESS NOTED OTHERWISE. ROOFING SYSTEM SHALL BE PATCHED TO PREVENT ANY LEAKING AT THE OPENING.

LEGEND:

ITEMS OR AREAS TO BE DEMOLISHED

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Four Rivers Sanitation Authority

AEROBIC GRANULAR SLUDGE - PHASE 1

REVISIONS AND RECORD OF ISSUE

DESIGNED:	SM
DETAILED:	AB
CHECKED:	AM/JH
APPROVED:	MR
DATE:	12/20/2022
PROJECT NO.:	411752

GENERAL

DEMOLITION

DEMOLITION SITE PLAN

00-D-101

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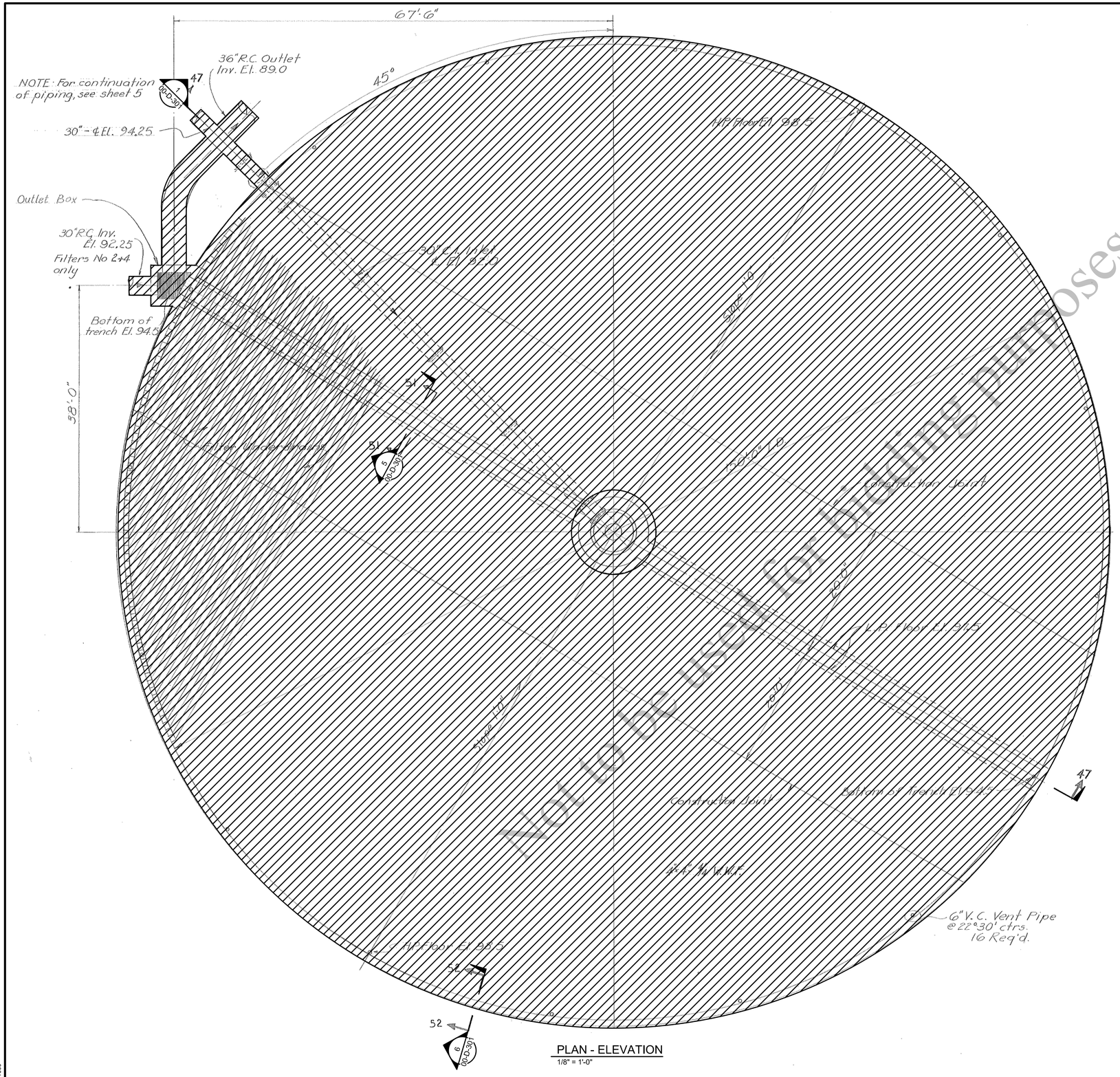


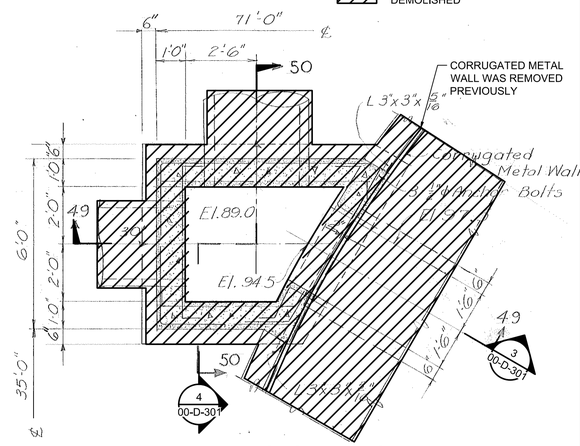
PLAN - ELEVATION
1/8" = 1'-0"

NOTES:

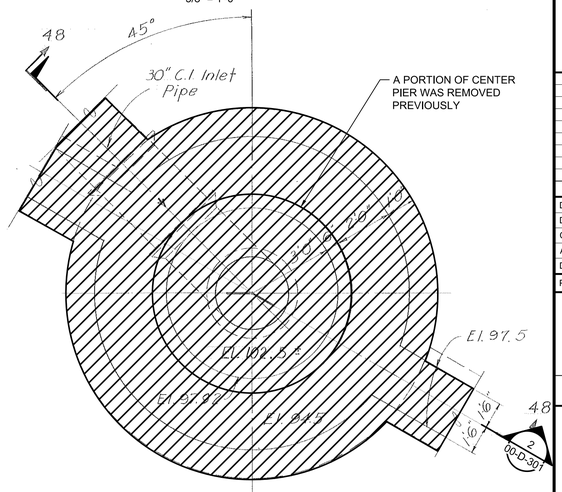
1. DEMOLITION PLAN DEPICTS TRICKLING FILTER NO.2. DEMOLITION OF TRICKLING FILTER NO.4 IS SIMILAR TO TRICKLING FILTER NO.2. HOWEVER, THE ORIENTATION OF THE INLET AND OUTLET PIPE DIFFERS.
2. REFER TO DWG 00-D-101 FOR GENERAL REMOVAL NOTES.
3. BECAUSE AN IMAGE FROM A RECORD DRAWING IS USED TO SHOW THE EXTENT OF DEMOLITION, THIS DRAWING IS NOT TO SCALE. CONTRACTOR SHALL FOLLOW THE DIMENSIONS SPECIFIED IN THE IMAGE.
4. CONVERT ELEVATIONS INDICATED ON RECORD DRAWING BACKGROUND IMAGES TO THE PROJECT DATUM BY ADDING 602.58. FOR EXAMPLE, RECORD DRAWING ELEVATION 90.6 EQUALS PROJECT DATUM ELEVATION 693.18.
5. CONTRACTOR TO FIELD VERIFY ALL DIMENSIONS AND ELEVATIONS.

LEGEND:

ITEMS OR AREAS TO BE DEMOLISHED



PLAN OF OUTLET BOX
3/8" = 1'-0"



PLAN OF CENTER PIER
3/8" = 1'-0"

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

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Four Rivers Sanitation Authority

AEROBIC GRANULAR SLUDGE - PHASE 1

REVISIONS AND RECORD OF ISSUE

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DATE:	12/20/2022
PROJECT NO.:	411752

GENERAL

DEMOLITION

TRICKLING FILTER NO. 2 AND NO. 4 PLANS

00-D-102

22 OF 163

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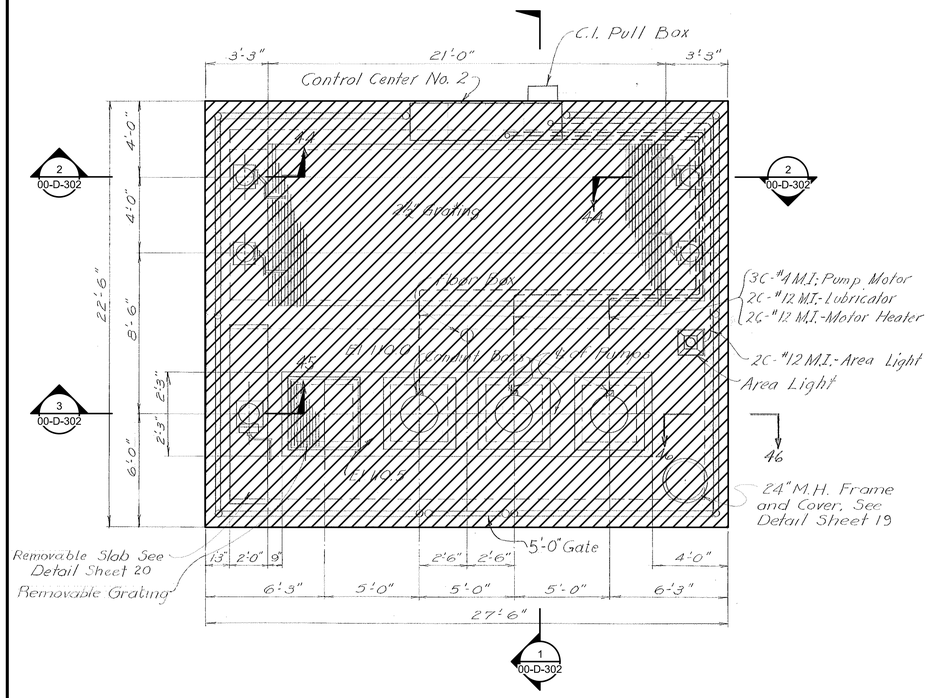
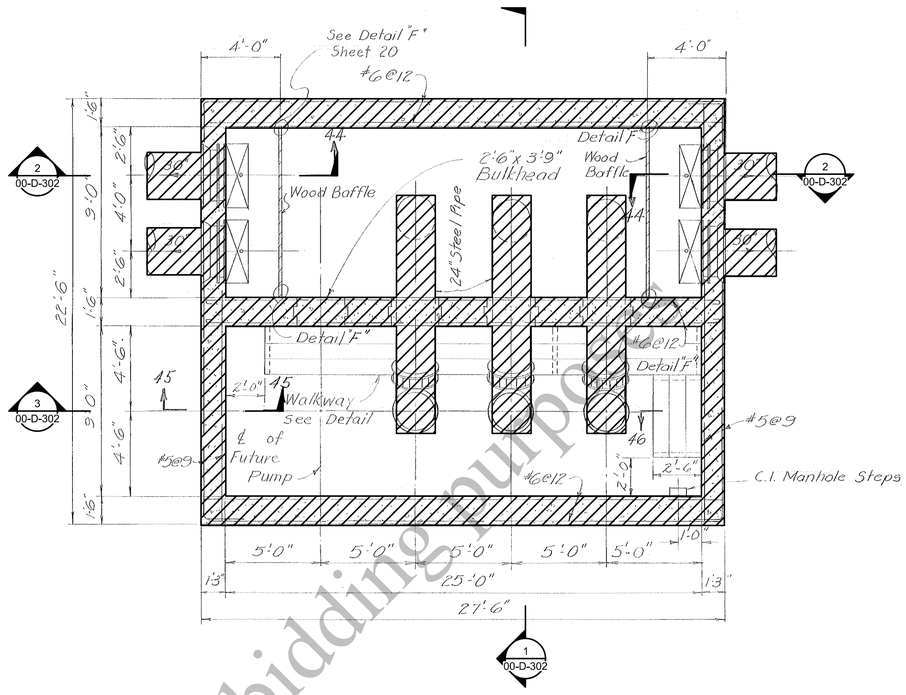


PLAN - ELEVATION 110.0

1/4" = 1'-0"



PLAN - ELEVATION 108.0

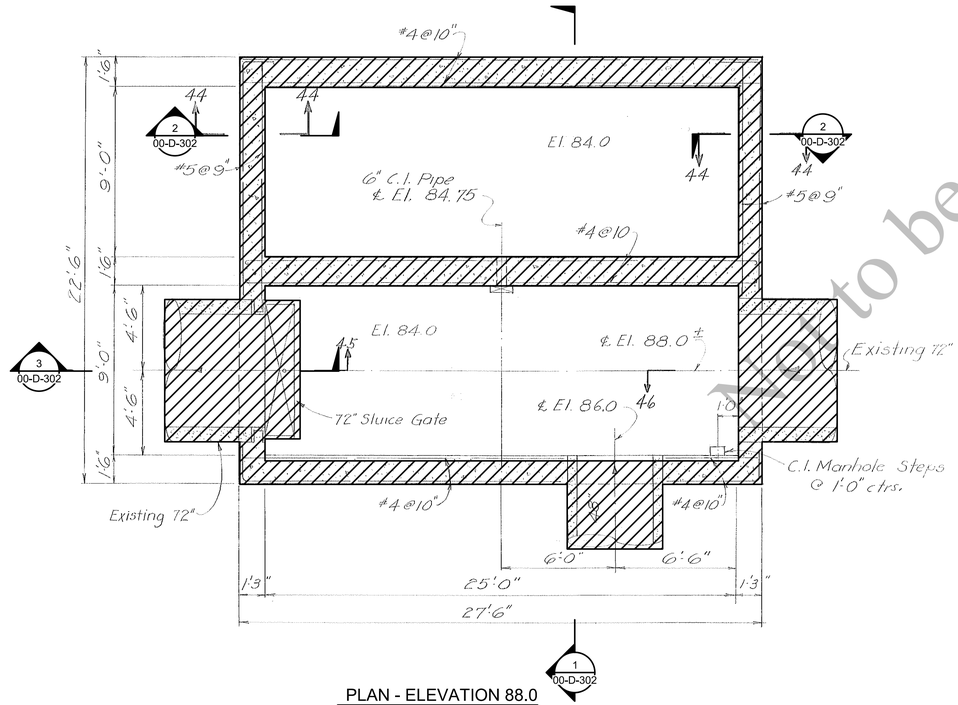
1/4" = 1'-0"

NOTES:

1. REFER TO DWG 00-D-101 FOR GENERAL REMOVAL NOTES.
2. BECAUSE AN IMAGE FROM A RECORD DRAWING IS USED TO SHOW THE EXTENT OF DEMOLITION, THIS DRAWING IS NOT TO SCALE. CONTRACTOR SHALL FOLLOW THE DIMENSIONS SPECIFIED IN THE IMAGE.
3. CONVERT ELEVATIONS INDICATED ON RECORD DRAWING BACKGROUND IMAGES TO THE PROJECT DATUM BY ADDING 602.58. FOR EXAMPLE, RECORD DRAWING ELEVATION 90.6 EQUALS PROJECT DATUM ELEVATION 693.18.
4. CONTRACTOR TO FIELD VERIFY ALL DIMENSIONS AND ELEVATIONS.

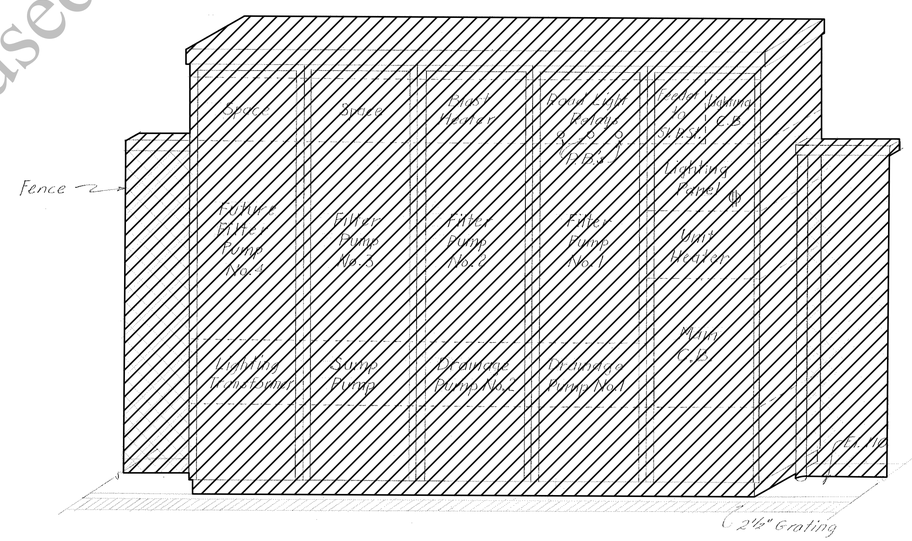
LEGEND:

ITEMS OR AREAS TO BE DEMOLISHED



PLAN - ELEVATION 88.0

1/4" = 1'-0"



CONTROL CENTER NO. 2

NTS

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Four Rivers Sanitation Authority

AEROBIC GRANULAR SLUDGE - PHASE 1

REVISIONS AND RECORD OF ISSUE	
DESIGNED:	SM
DETAILED:	AB
CHECKED:	AM/JH
APPROVED:	MR
DATE:	12/20/2022
PROJECT NO.:	411752

GENERAL

DEMOLITION

TRICKLING FILTER PUMPING STATION PLAN

00-D-103

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(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

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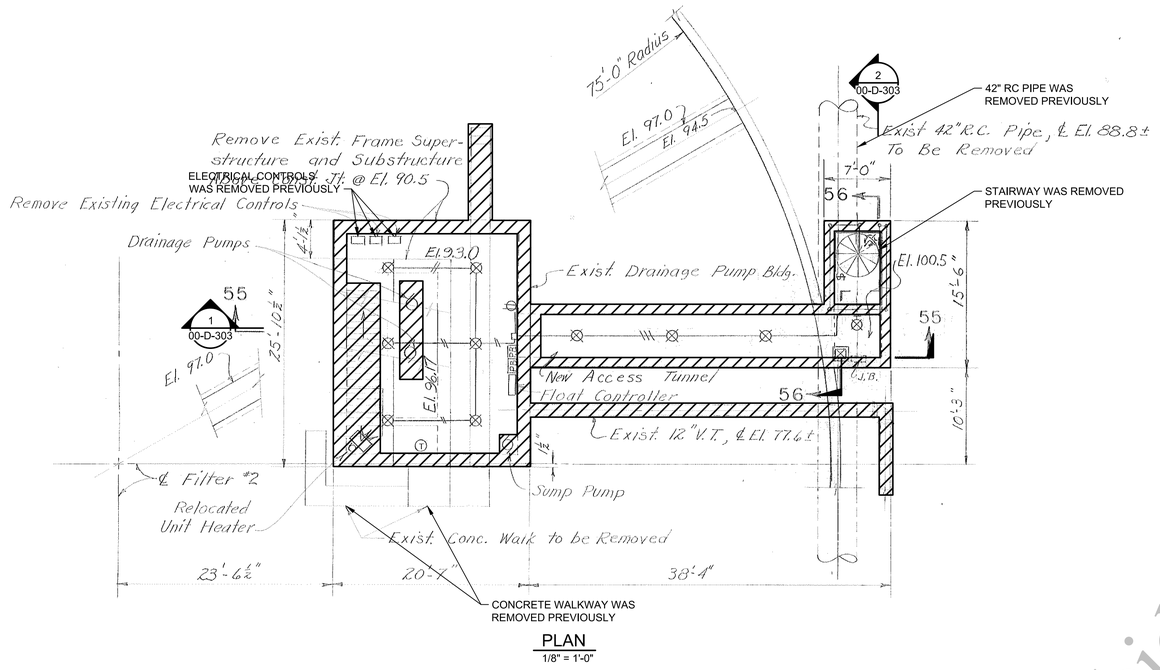
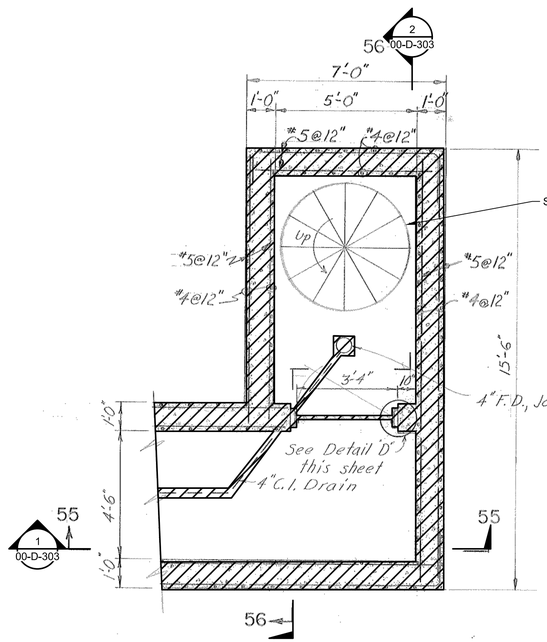
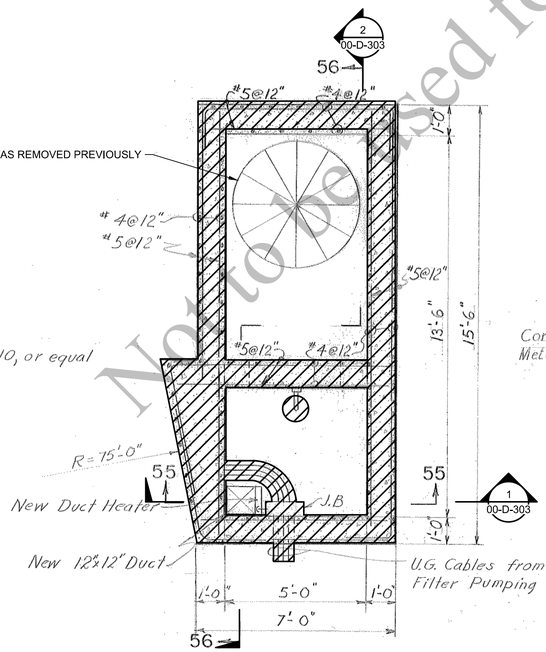


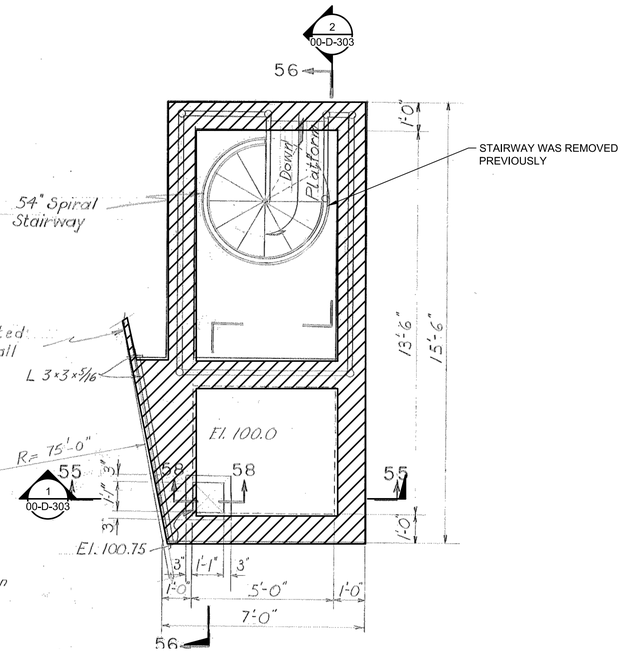
PLAN
1/8" = 1'-0"



PLAN EL. 83.25
3/8" = 1'-0"



PLAN EL. 92.5
3/8" = 1'-0"



PLAN EL. 100.5
3/8" = 1'-0"

NOTES:

1. REFER TO DWG 00-D-101 FOR GENERAL REMOVAL NOTES.
2. BECAUSE AN IMAGE FROM A RECORD DRAWING IS USED TO SHOW THE EXTENT OF DEMOLITION, THIS DRAWING IS NOT TO SCALE. CONTRACTOR SHALL FOLLOW THE DIMENSIONS SPECIFIED IN THE IMAGE.
3. CONVERT ELEVATIONS INDICATED ON RECORD DRAWING BACKGROUND IMAGES TO THE PROJECT DATUM BY ADDING 602.58. FOR EXAMPLE, RECORD DRAWING ELEVATION 90.6 EQUALS PROJECT DATUM ELEVATION 693.18.
4. CONTRACTOR TO FIELD VERIFY ALL DIMENSIONS AND ELEVATIONS.

LEGEND:

ITEMS OR AREAS TO BE DEMOLISHED

BLACK & VEATCH
Black & Veatch Corporation
Chicago, Illinois
ILLINOIS PROFESSIONAL
DESIGN FIRM - 184.002143 -0006

Four Rivers Sanitation Authority

AEROBIC GRANULAR SLUDGE - PHASE 1

REVISIONS AND RECORD OF ISSUE	
DESIGNED:	SM
DETAILED:	AB
CHECKED:	AM/JH
APPROVED:	MR
DATE:	12/20/2022
PROJECT NO.:	411752

GENERAL

DEMOLITION

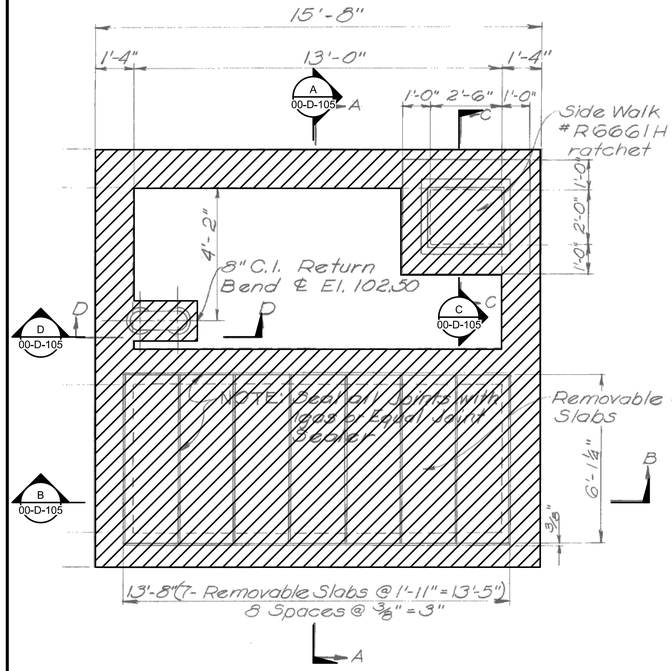
DRAINAGE PUMP STATION PLAN

00-D-104

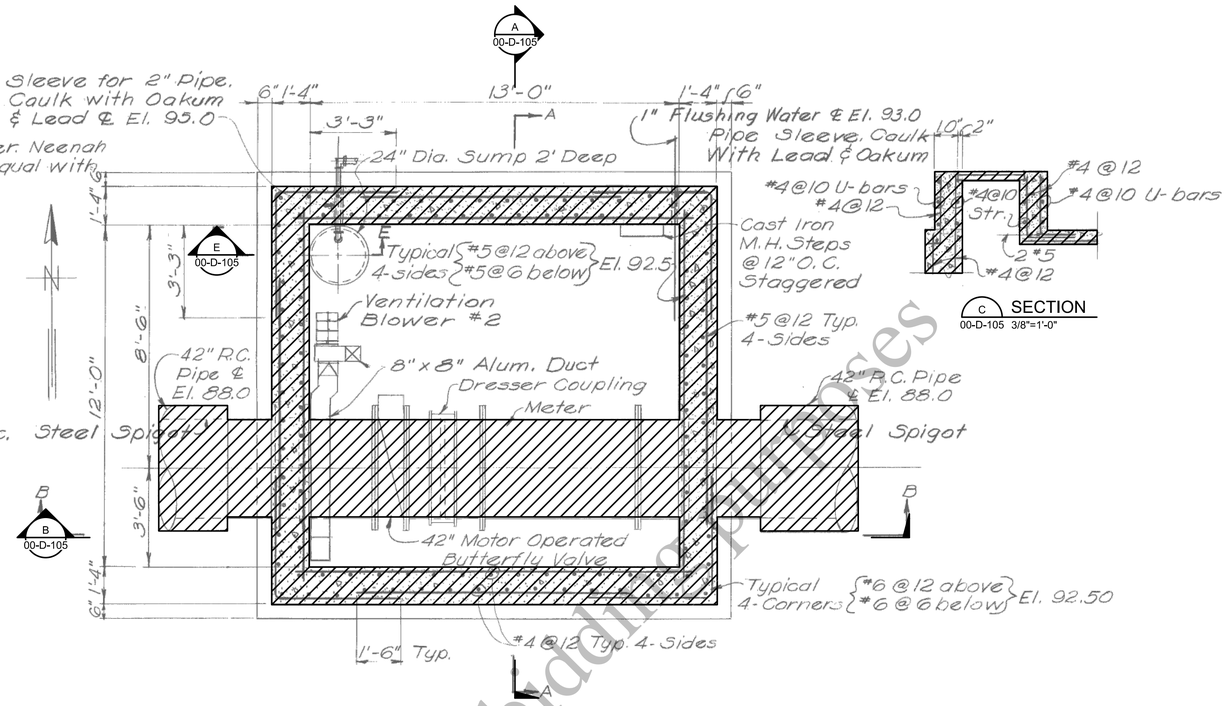
24 OF 163

PLOTTED: 12/12/2022 12:52:00 PM
FILE: C:\PW_WORKING\BVW_AMERICAS\D1495368\00-D-104.DWG
FS11000
FS11000

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4



PLAN - ELEVATION
3/8" = 1'-0"



SECTIONAL - ELEVATION
3/8" = 1'-0"

NOTES:

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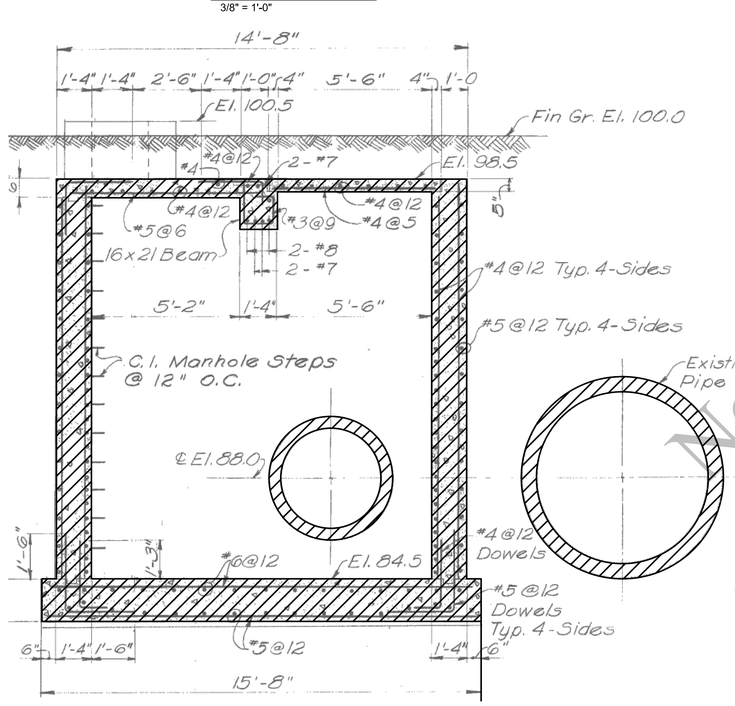
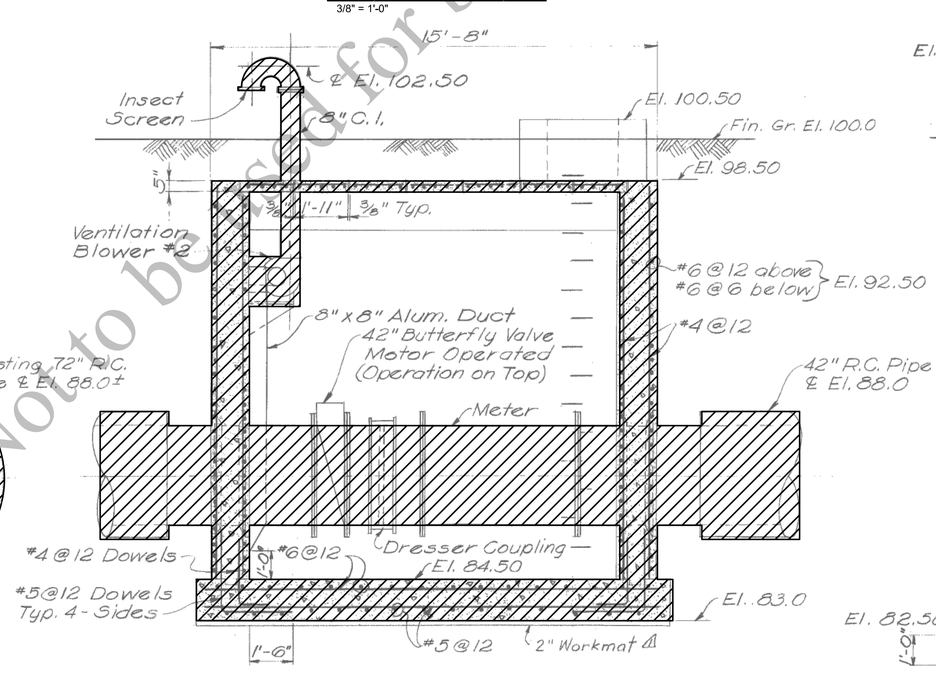
LEGEND:

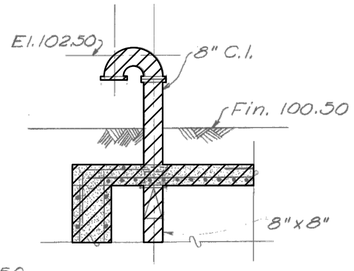
ITEMS OR AREAS TO BE DEMOLISHED



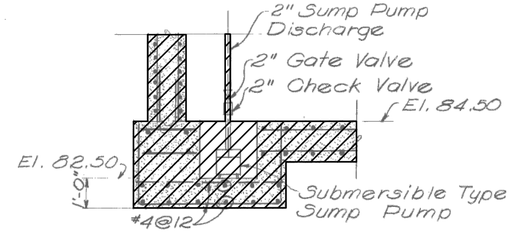
A SECTION
00-D-105 3/8"=1'-0"



B SECTION
00-D-105 3/8"=1'-0"



D SECTION
00-D-105 3/8"=1'-0"



E SECTION
00-D-105 3/8"=1'-0"

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Four Rivers Sanitation Authority

AEROBIC GRANULAR SLUDGE - PHASE 1

REVISIONS AND RECORD OF ISSUE

DESIGNED:	SM
DETAILED:	AB
CHECKED:	AM/JH
APPROVED:	MR
DATE:	12/20/2022
PROJECT NO.:	411752

GENERAL

DEMOLITION

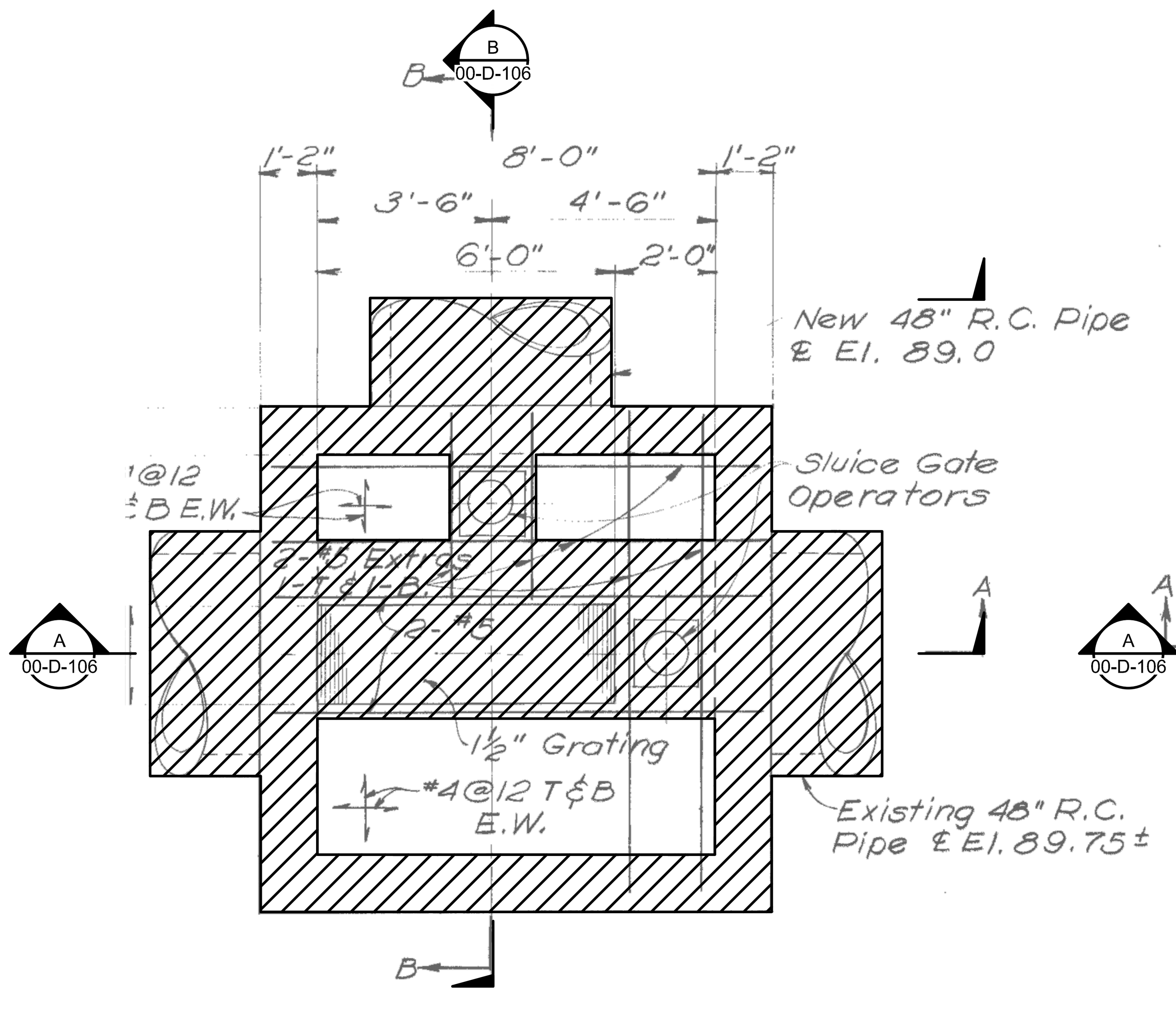
METER VAULT PLAN AND SECTIONS

00-D-105

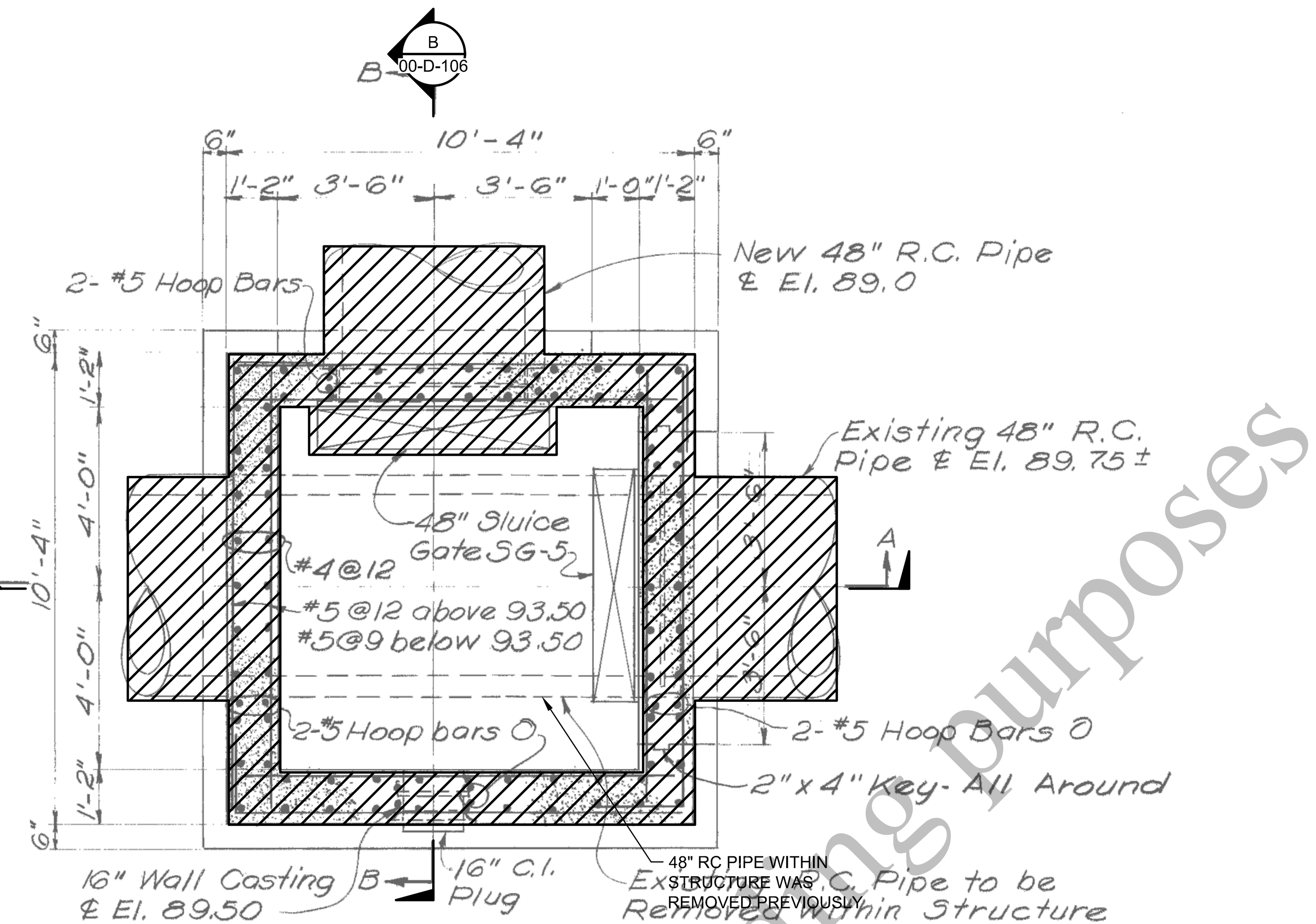
25 OF 163

PLOTTED: 12/12/2022 12:52:13 PM
FILE: C:\PW_WORKING\BVW_AMERICAS\D1495388\00-D-105.DWG
FDT1000
FDT1000
D-105

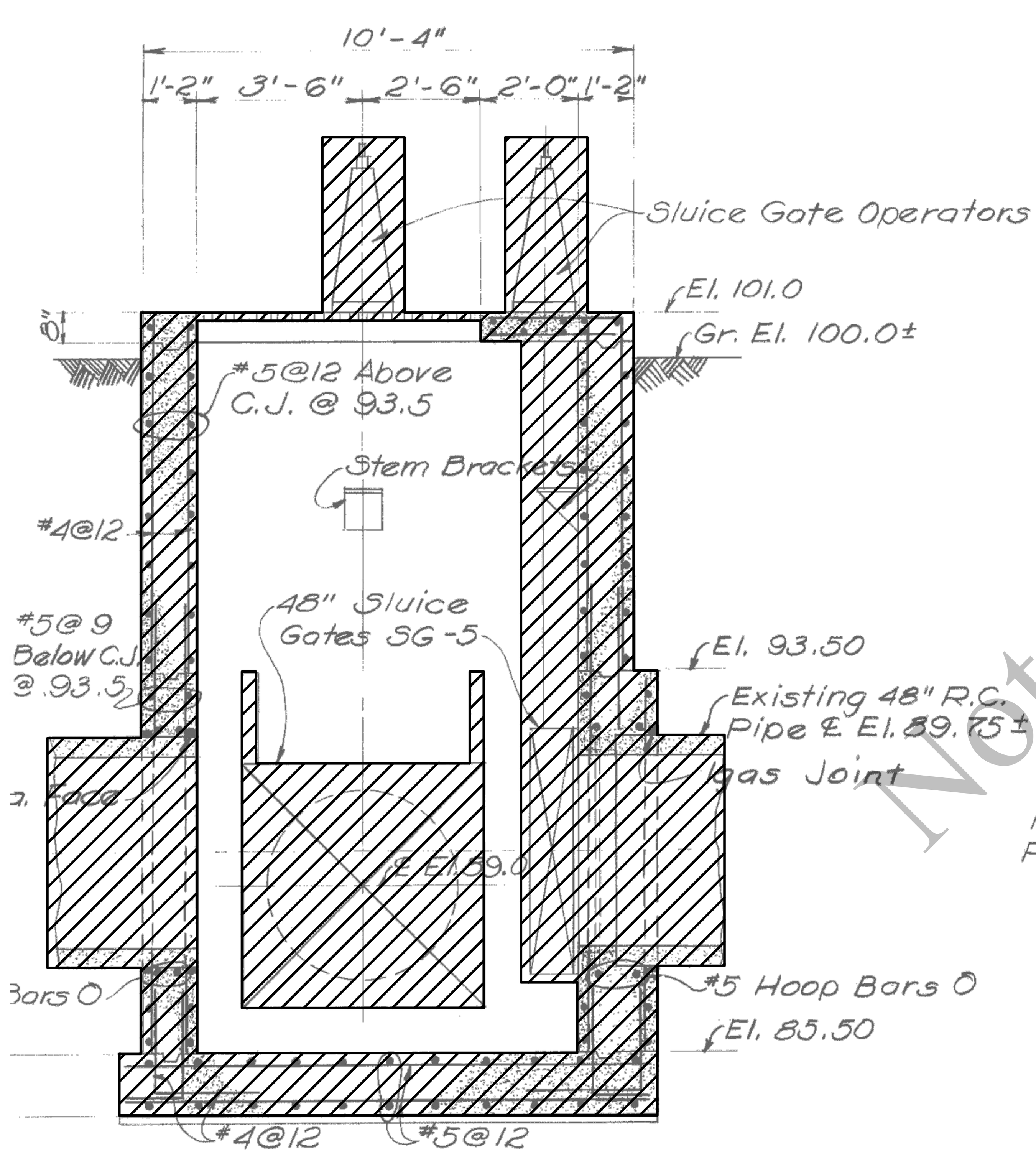
(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4



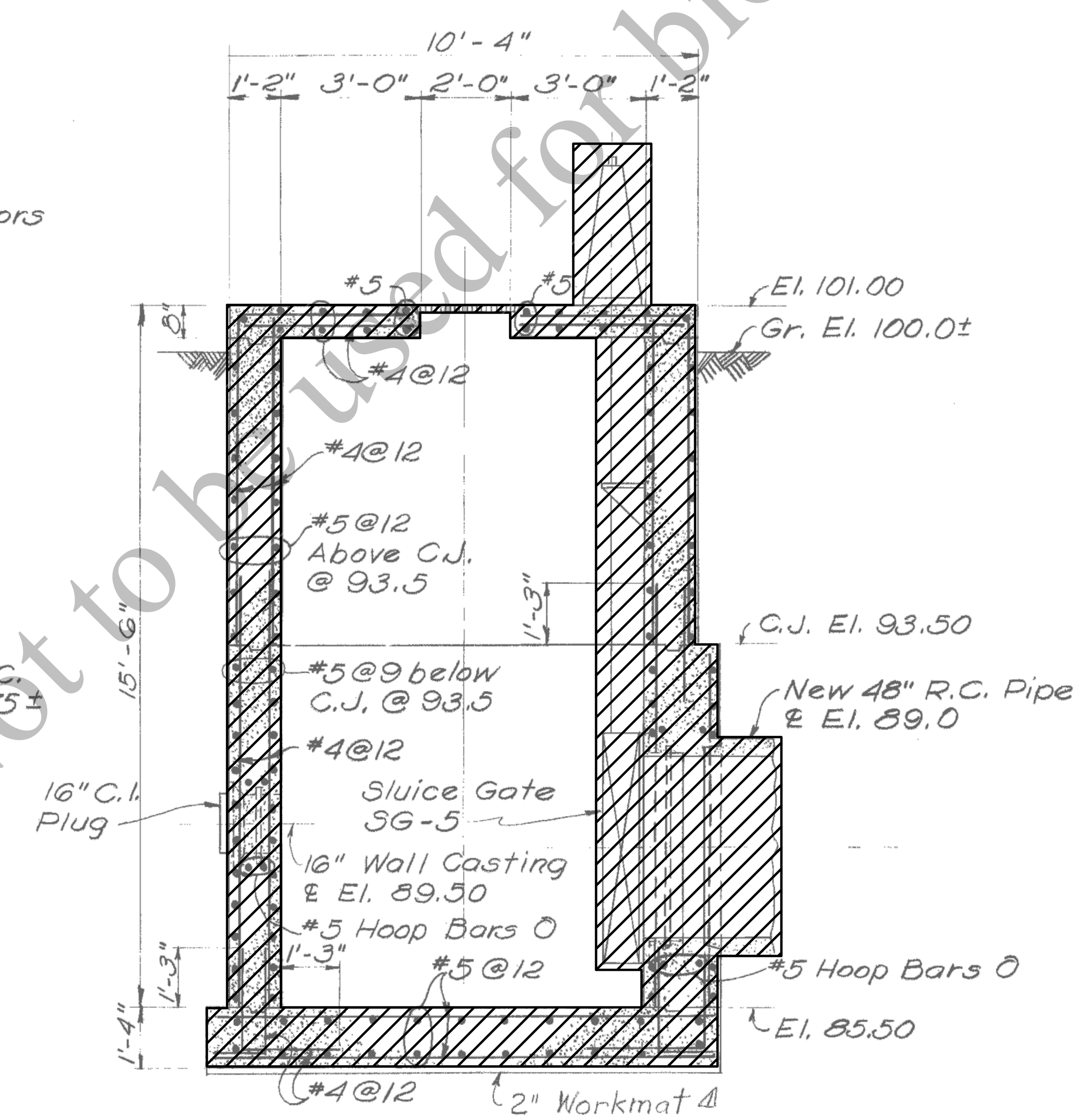
PLAN
3/8" = 1'-0"



SECTIONAL PLAN
3/8" = 1'-0"



SECTION A
00-D-106 3/8"=1'-0"



SECTION B
00-D-106 3/8"=1'-0"

NOTES:

1. REFER TO DWG 00-D-101 FOR GENERAL REMOVAL NOTES.
2. BECAUSE AN IMAGE FROM A RECORD DRAWING IS USED TO SHOW THE EXTENT OF DEMOLITION, THIS DRAWING IS NOT TO SCALE. CONTRACTOR SHALL FOLLOW THE DIMENSIONS SPECIFIED IN THE IMAGE.
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LEGEND:

ITEMS OR AREAS TO BE DEMOLISHED

BLACK & VEATCH
Black & Veatch Corporation
Chicago, Illinois
ILLINOIS PROFESSIONAL
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Four Rivers Sanitation Authority

AEROBIC GRANULAR SLUDGE - PHASE 1

REVISIONS AND RECORD OF ISSUE

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DETAILED:	AB
CHECKED:	AM/JH
APPROVED:	MR
DATE:	12/20/2022
PROJECT NO.:	411752

GENERAL

DEMOLITION

BYPASS CHAMBER PLAN AND SECTIONS

00-D-106

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

PLOTTED: 12/12/2022 12:52:24 PM
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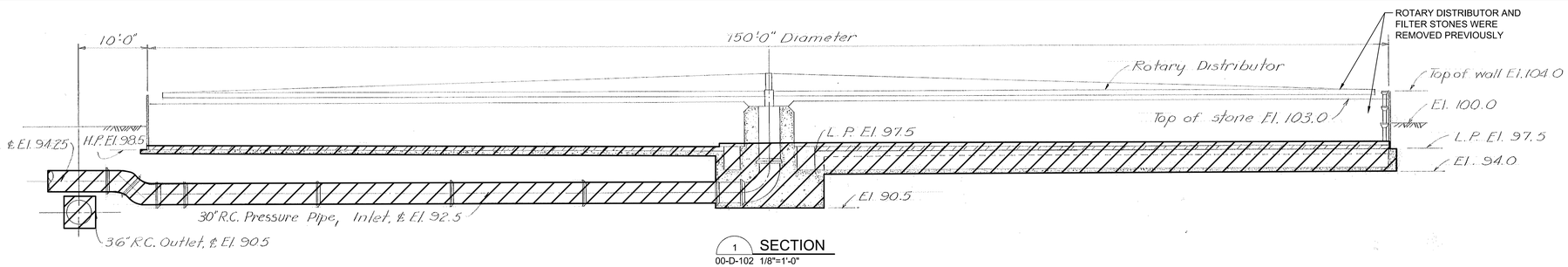
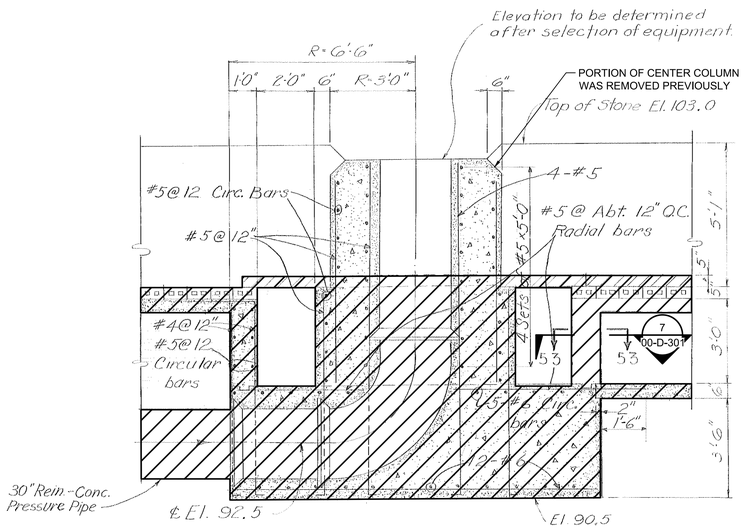
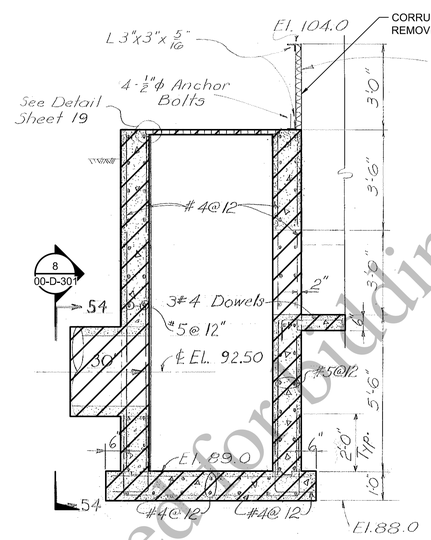
D11000



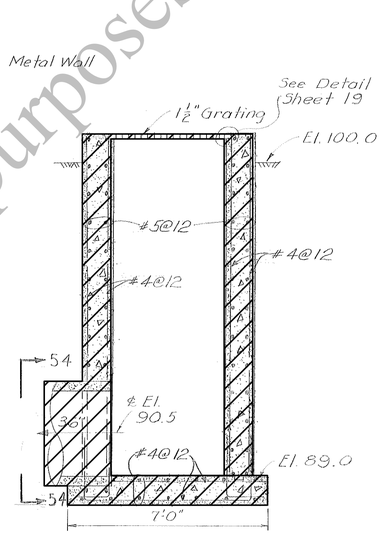
1 SECTION
00-D-102 1/8"=1'-0"



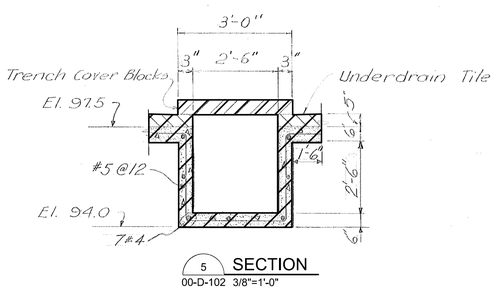
2 SECTION
00-D-102 3/8"=1'-0"



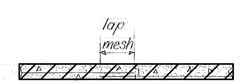
3 SECTION
00-D-102 3/8"=1'-0"



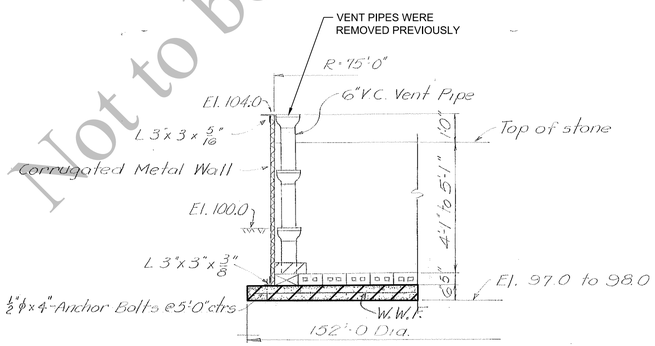
4 SECTION
00-D-102 3/8"=1'-0"



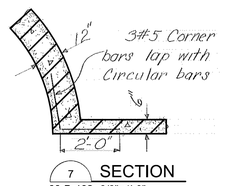
5 SECTION
00-D-102 3/8"=1'-0"



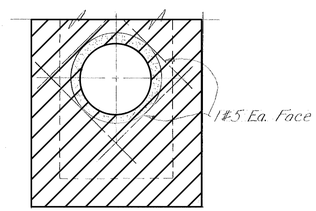
TYP. CONC. SLAB CONSTR. JOINT



6 SECTION
00-D-102 3/8"=1'-0"



7 SECTION
00-D-102 3/8"=1'-0"



8 SECTION
00-D-102 3/8"=1'-0"

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LEGEND:

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Black & Veatch Corporation
Chicago, Illinois
ILLINOIS PROFESSIONAL
DESIGN FIRM - 184.002143 -0006

Four Rivers Sanitation Authority

AEROBIC GRANULAR SLUDGE - PHASE 1

REVISIONS AND RECORD OF ISSUE	
DESIGNED:	SM
DETAILED:	AB
CHECKED:	AM/JH
APPROVED:	MR
DATE:	12/20/2022
PROJECT NO.:	411752

GENERAL

DEMOLITION

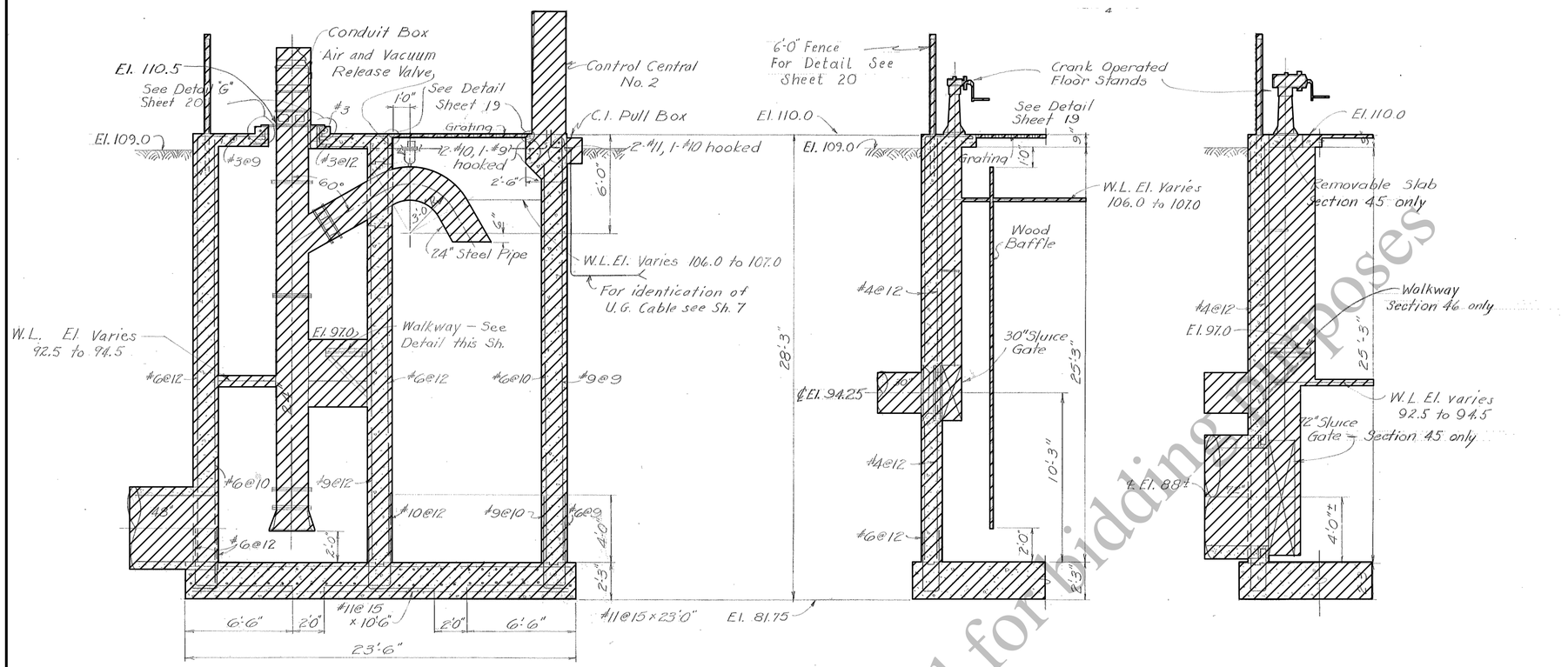
TRICKLING FILTER NO. 2 AND NO. 4 SECTIONS

00-D-301

27 OF 163

PLOTTED: 12/12/2022 12:52:34 PM
FILE: C:\PW_WORKING\BVW_AMERICAS\D1495368\00-D-301.DWG
PDT1000
D1000

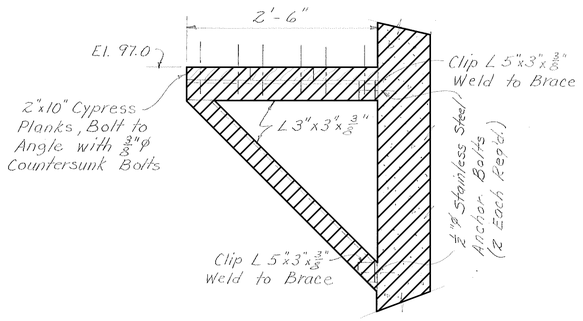
(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4



1 SECTION
00-D-103 1/4"=1'-0"

2 SECTION
00-D-103 1/4"=1'-0"

3 SECTION
00-D-103 1/4"=1'-0"



BRACKET DETAIL
(6 REQUIRED)
1/4" = 1'-10"

NOTES:

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Four Rivers Sanitation Authority

AEROBIC GRANULAR SLUDGE - PHASE 1

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DESIGNED:	SM
DETAILED:	AB
CHECKED:	AM/JH
APPROVED:	MR
DATE:	12/20/2022
PROJECT NO.:	411752

GENERAL

DEMOLITION

TRICKLING FILTER PUMP STATION SECTIONS

00-D-302

PLOTTED: 12/12/2022 12:52:43 PM
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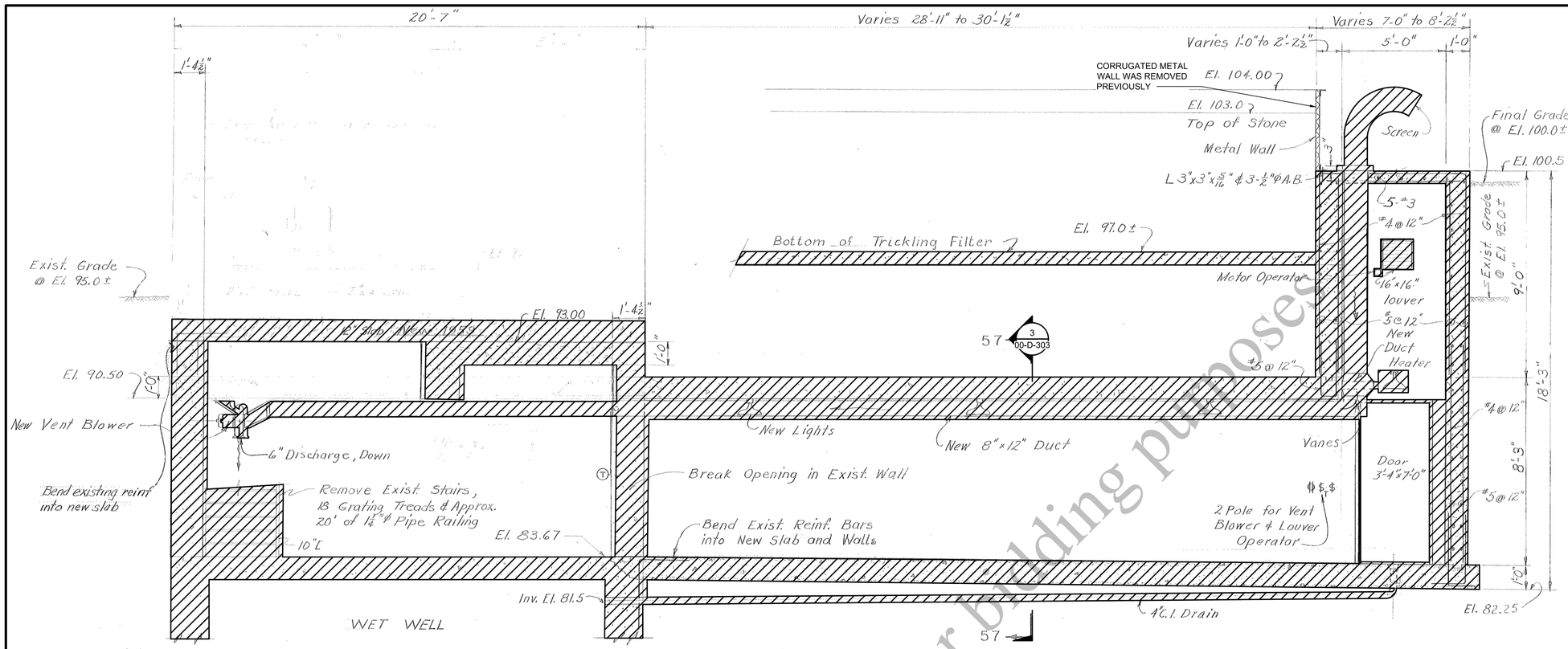
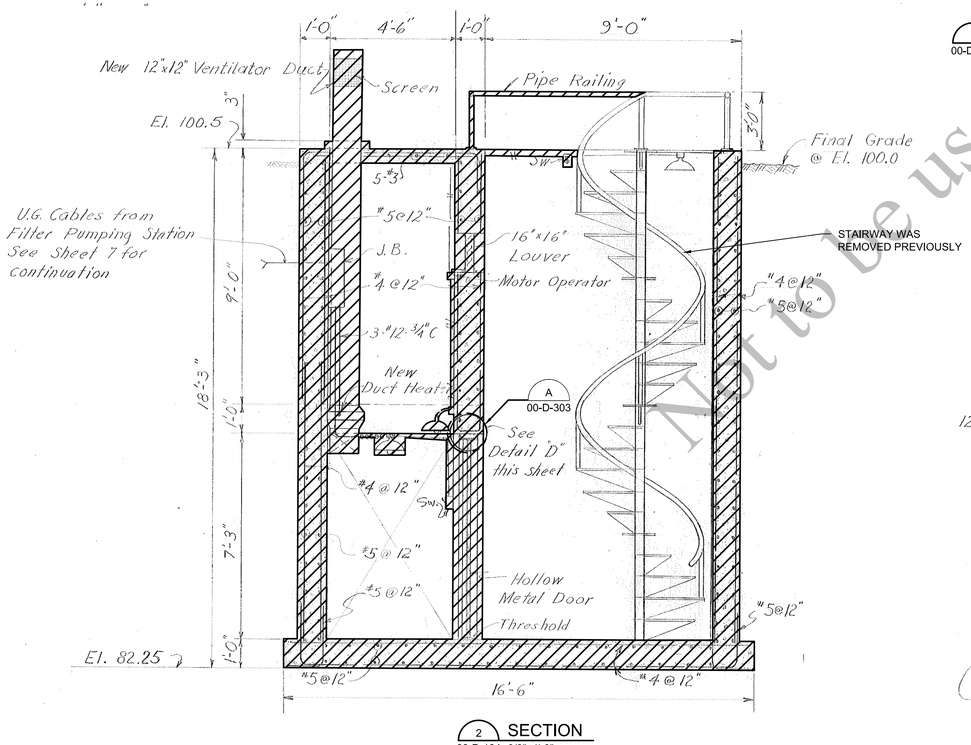
FDT1000
DT1000

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4



1 SECTION
00-D-104 3/8"=1'-0"



2 SECTION
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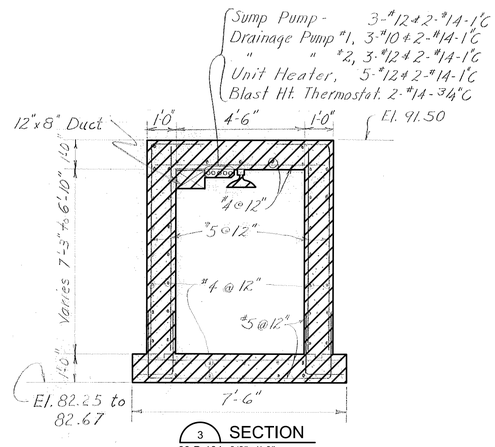
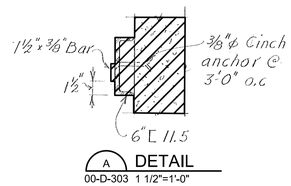


3 SECTION
00-D-104 3/8"=1'-0"



A DETAIL
00-D-303 1 1/2"=1'-0"

NOTES:

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2. BECAUSE AN IMAGE FROM A RECORD DRAWING IS USED TO SHOW THE EXTENT OF DEMOLITION, THIS DRAWING IS NOT TO SCALE. CONTRACTOR SHALL FOLLOW THE DIMENSIONS SPECIFIED IN THE IMAGE.
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LEGEND:

ITEMS OR AREAS TO BE DEMOLISHED

BLACK & VEATCH
Black & Veatch Corporation
Chicago, Illinois
ILLINOIS PROFESSIONAL
DESIGN FIRM - 184.002143 -0006

Four Rivers Sanitation Authority

AEROBIC GRANULAR SLUDGE - PHASE 1

REVISIONS AND RECORD OF ISSUE

DESIGNED:	SM
DETAILED:	AB
CHECKED:	AM/JH
APPROVED:	MR
DATE:	12/20/2022
PROJECT NO.:	411752

GENERAL

DEMOLITION

DRAINAGE PUMP STATION SECTIONS

00-D-303

29 OF 163

PLOTTED: 12/12/2022 12:52:54 PM
FILE: C:\PW_WORKING\BVW_AMERICAS\D1495368\00-D-303.DWG
FSTI1000
FSTI1003

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

CIVIL LEGENDS AND NOTES

EXISTING FACILITY LEGEND

- 326 — EXISTING GRADE CONTOUR
- EXISTING PIPING
- CENTERLINE
- E — E — ELECTRICAL (UNDERGROUND)
- FE — FE — FINAL EFFLUENT
- FO — FO — FIBER OPTIC
- NG — NG — NATURAL GAS
- OHE — OHE — ELECTRICAL (OVERHEAD)
- ST — ST — STORM SEWER
- W1 — W1 — POTABLE WATER
- W4 — W4 — WELL WATER
- WAS — WAS — WASTE ACTIVATED SLUDGE
- SAN — SAN — SANITARY SEWER
- TS — TS — THICKENED SLUDGE
- W — W — WATER LINE
- (G) (W) WATER OR GAS VALVE
- (WM) (GM) WATER OR GAS METER
- SEWER OR STORMDRAIN MANHOLE
- VALVE
- UTILITY POLE WITH GUY ANCHOR
- FIRE HYDRANT
- Y YARD HYDRANT
- STREET LIGHT POLE
- HEDGE, BRUSH, SHRUBS, WOODS
- 10" DECIDUOUS TREE AND TRUNK DIAMETER
- 4" CONIFEROUS TREE AND TRUNK DIAMETER
- SWAMP
- 4562.6 SPOT ELEVATION
- CONTROL POINT
- BENCHMARK

LEGENDS NOTES:

1. REFER TO PROCESS MECHANICAL LEGENDS FOR VALVE, PIPE JOINT, AND PIPE FITTING SYMBOLS.
2. LEGEND SYMBOLS AND ABBREVIATIONS SHOWN IN THIS DRAWING ARE BASED ON A TEMPLATE THAT IS NOT PROJECT SPECIFIC. SOME LEGEND SYMBOLS AND ABBREVIATIONS ARE NOT USED ON THIS SPECIFIC PROJECT, BUT ARE SHOWN TO PROVIDE A DICTIONARY FOR SYMBOLS AND ABBREVIATIONS THAT MAY ALSO BE USED DURING THE PROJECT CONSTRUCTION PHASE.

NEW FACILITY LEGEND

- 101 DESIGN POINT
- 1.5% PERCENT SLOPE
- 2+50 STATION
- 3:1 SLOPE RUN : RISE
- C1 CURVE NUMBER
- 4562.63 SPOT ELEVATION
- SURFACED STREET, ROAD OR DRIVE
- SURFACED STREET, ROAD OR DRIVE WITH CURBS
- CB CATCH BASIN
- S SD SEWER OR STORMDRAIN MANHOLE
- DRAINAGE COURSE OR FLOW LINE
- 326 FINISHED GRADE CONTOUR
- TOP / TOE BANK OR SLOPE LINES
- B3 TH5 BORE HOLE OR TEST HOLE AND NUMBER
- SURVEY LINE WITH PI, PT, OR POT
- CONCRETE ENCASEMENT - PLAN VIEW
- CULVERT
- NEW PIPING
- NG NATURAL GAS
- ST STORM SEWER
- W4 WELL WATER
- SAN SANITARY SEWER
- NEW PIPING IN PROFILE
- BUILDINGS, STRUCTURES
- STRUCTURES UNDERGROUND
- FUTURE BUILDINGS, STRUCTURES
- X FENCE
- CENTERLINE
- FIRE HYDRANT
- Y YARD HYDRANT
- STREET LIGHT POLE
- TO BE DEMOLISHED
- WHEELCHAIR ACCESSIBILITY MARKER
- EARTH OR GRADE
- GRANULAR FILL (CRUSHED ROCK OR GRAVEL)
- SAND
- CONCRETE
- ENGINEERED FILL
- RIPRAP
- ASPHALT PAVEMENT

PIPING IDENTIFICATION LEGEND

- 6" DS NEW PIPING
- PIPE SERVICE PROCESS CODE, SEE P&ID LEGEND & ABBREVIATIONS
- PIPE SIZE
- 6" DS EXISTING PIPING
- 6" DS FUTURE PIPING

EQUIPMENT & VALVE TAG LEGEND

- XXX MECHANICAL EQUIPMENT/VALVE TAG, SEE P&ID LEGEND AND ABBREVIATIONS

PROJECT BENCHMARKS

CONTROL POINT TABLE

CP#	NORTHING	EASTING	ELEVATION	DESCRIPTION
1	2025945.97	2587090.76	703.88	CP CUT X
9	2025705.88	2587300.21	704.21	CP CUT X
10	2025679.80	2587527.97	704.20	BRASS "CP" DISC
11 *	2025806.30	2587839.41	704.22	CP CUT X
12 *	2025666.07	2587616.15	704.22	CP CUT X
20	2025671.29	2587065.95	697.83	BRASS "CP" DISC
26	2025978.05	2587261.64	711.82	BRASS "CP" DISC

* ON DRAWING 00-C-101, CP POINTS 11 AND 12 ARE BEYOND THE PLAN LIMITS

BENCHMARK TABLE

BM#	NORTHING	EASTING	ELEVATION	DESCRIPTION
336**	2025808.87	2587839.10	704.18	BM CHISELED SQUARE
337**	2025668.91	2587840.60	704.19	BM COPPER DISC
340	2025804.10	2587357.97	704.32	BM CHISELED SQUARE
341	2025802.98	2587300.60	704.24	BM CHISELED SQUARE
342	2025697.73	2587168.21	704.06	BM CHISELED SQUARE
343	2025919.52	2587474.32	708.98	BM CHISELED SQUARE

** ON DRAWING 00-C-101, BM POINTS 336 AND 337 ARE BEYOND THE PLAN LIMITS

SOIL BORE HOLE TABLE

SOIL BORE HOLE NO.	NORTHING	EASTING	ELEVATION
1	2025767.03	2586752.74	700.20
2	2025951.86	2586758.64	703.60
3	2025917.01	2587083.86	702.80
4	2026040.10	2586886.09	703.30

GENERAL NOTES

1. HORIZONTAL CONTROL: COORDINATES ARE BASED ON WinGIS (WINNEBAGO COUNTY GEOGRAPHIC INFORMATION SYSTEM) CONTROL NETWORK DATUM. COORDINATES ON STRUCTURES DEPICT THE EXTERIOR FACE OF THE CONCRETE SUBSTRUCTURE FOUNDATION WALL OR FOOTING WALL.
2. VERTICAL CONTROL: ELEVATIONS ARE BASED ON WinGIS (WINNEBAGO COUNTY GEOGRAPHIC INFORMATION SYSTEM) CONTROL NETWORK DATUM. BENCHMARKS AND/OR STRUCTURE ELEVATIONS FROM EXISTING SURVEYS OR REFERENCE DRAWINGS MAY RESULT IN VARIANCES WITH ELEVATIONS INDICATED ON THE DRAWINGS FOR EXISTING FACILITIES.
3. THE PROJECTED BASE FLOOD ELEVATION IS 697.3 FEET.
4. EXISTING UTILITIES AND STRUCTURES (UNDERGROUND, SURFACE, OR OVERHEAD) ARE INDICATED ONLY TO THE EXTENT THAT SUCH INFORMATION WAS KNOWN, OR MADE AVAILABLE TO, OR DISCOVERED BY THE ENGINEER IN PREPARING THE DRAWINGS. THE LOCATIONS, CONFIGURATIONS, AND ELEVATIONS OF SUBSURFACE FACILITIES AND UTILITIES ARE APPROXIMATE, AND NOT ALL UTILITIES AND FACILITIES MAY BE INDICATED. OVERHEAD UTILITIES ARE NOT INDICATED IN ARCHITECTURAL ELEVATIONS, PROFILE OR SECTION DRAWINGS. THE ENGINEERING INVESTIGATIONS, LOCATION, AND DESIGNATION OF SUBSURFACE UTILITIES INDICATED IN THESE CONTRACT DOCUMENTS HAS BEEN PERFORMED TO QUALITY LEVEL C IN ACCORDANCE WITH GENERALLY ACCEPTED ENGINEERING PRINCIPLES AND PRACTICES AS OUTLINED IN ASCE STANDARD AND GUIDELINE BULLETIN CI/ASCE 38-02 UNLESS OTHERWISE DESIGNATED. WHERE SUCH ACTIVITIES HAVE BEEN TO A HIGHER LEVEL OF QUALITY, THE HIGHER QUALITY LEVEL FOR THE AFFECTED AREAS IS INDICATED IN THE CONTRACT DOCUMENTS.
5. "SCREENED" (LIGHT) DELINEATION INDICATED ON THE DRAWINGS DENOTES EXISTING FACILITIES. "SCREENED" INFORMATION WAS TAKEN FROM EXISTING CONSTRUCTION DRAWINGS AND DATA AND SURVEYS, IS FOR REFERENCE ONLY, AND SHALL BE FIELD VERIFIED BY THE CONTRACTOR PRIOR TO THE ORDERING OF MATERIALS AND BEGINNING OF CONSTRUCTION. "BOLD" DELINEATION IS NEW WORK TO BE CONSTRUCTED UNDER THIS CONTRACT.
6. CONTRACTOR'S STAGING, PARKING AND MATERIAL STORAGE SHALL BE LIMITED TO THE SPACE(S) DESIGNATED ON THE DRAWINGS. PROVIDING ADDITIONAL STORAGE OR PARKING SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
7. CALL BEFORE YOU DIG. CONTRACTOR SHALL NOTIFY FRSA AT LEAST 72 HOURS PRIOR TO ANY EXCAVATION. ACCURATE LOCATIONS AND ELEVATIONS OF ALL UTILITIES AND STRUCTURES, WHETHER INDICATED ON THE DRAWINGS OR NOT, SHALL BE DETERMINED BY THE CONTRACTOR IN ADVANCE, BY CONTACTING ALL UTILITIES AND OTHER AGENCIES AND BY PROSPECTING. CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVAL, DEMOLITION, RECONSTRUCTION, AND RECONNECTION OF EXISTING FACILITIES AS REQUIRED TO COMPLETE THE WORK. IF REQUIRED AFTER FIELD LOCATION AND VERIFICATION, CONTRACTOR SHALL COORDINATE WITH THE ENGINEER TO DETERMINE ANY NECESSARY MODIFICATIONS TO THE DESIGN OF NEW WORK.
8. BEFORE CONSTRUCTION IS STARTED, CONTRACTOR SHALL COORDINATE WITH THE OWNER OF EACH UTILITY AND DEFINE THE REQUIREMENTS AND METHODS TO ACCOMMODATE THE PROTECTION, TEMPORARY SUPPORT, ADJUSTMENT, OR RELOCATION OF ANY UTILITIES AFFECTED BY THE PROPOSED NEW WORK.
9. CONTRACTOR SHALL COMPLY WITH THE GOVERNING AGENCY NPDES CONSTRUCTION REQUIREMENTS, AND SHALL PROVIDE APPROPRIATE MITIGATION MEASURES OR PROTECTION AND RESTORATION AT ALL LOCATIONS AS REQUIRED BY THEIR OPERATIONS, AND AS DIRECTED BY ENGINEER. SPECIAL CONSTRUCTION REQUIREMENTS, TEMPORARY PROTECTIVE FENCING OR BARRICADES, SHEETING, SHORING, EROSION PROTECTION, AND SURFACE RESTORATION AT CERTAIN LOCATIONS ARE INDICATED ON THE DRAWINGS AND SPECIFIED TO BRING THE CONTRACTOR'S ATTENTION TO SENSITIVE AREAS.
10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL PROPERTY CORNER AND SURVEYING CONTROL MARKERS AND MONUMENTS. MONUMENTS DAMAGED BY CONSTRUCTION ACTIVITIES SHALL BE REESTABLISHED BY A PROFESSIONAL LAND SURVEYOR LICENSED IN THE STATE OF ILLINOIS.
11. THE LOCATION OF BORINGS, AND TEST HOLES INDICATED ON THE DRAWINGS ARE APPROXIMATE. CONTRACTOR SHALL REFER TO THE GEOTECHNICAL REPORT FOR ACTUAL BORINGS AND TEST HOLE LOCATIONS AND THE FINDINGS OF THE GEOTECHNICAL INVESTIGATIONS.
12. CONTRACTOR SHALL PROTECT AND MAINTAIN ALL EXISTING TREES, SHRUBS, AND PLANTS, UNLESS OTHERWISE NOTED.
13. CONTRACTOR SHALL INSTALL ALL PIPELINES, PAVING, WALKWAYS, AND CURB AND GUTTER AT A UNIFORM GRADE BETWEEN ELEVATIONS DEPICTED ON THE DRAWINGS.
14. FOR ALL SITE GRADING, SMOOTH PARABOLIC TRANSITIONS SHALL BE MADE BETWEEN CHANGES IN SLOPE, UNLESS NOTED OTHERWISE IN THE DRAWINGS. PARABOLIC ROUNDING SHALL APPLY TO ALL CUT AND FILL SECTIONS.
15. FINISHED GRADE ELEVATION AT THE FACILITIES FACE, WHERE NOT ADJACENT TO PAVEMENT, SHALL BE APPROXIMATELY 6 INCHES BELOW FINISHED FLOOR ELEVATION UNLESS OTHERWISE NOTED. FINISHED GRADE ELEVATION ADJACENT TO BASINS SHALL BE APPROXIMATE AS INDICATED BY CONTOURS, OR AS REQUIRED TO MEET STAIR LANDINGS.
16. THE CONTRACTOR'S CONSTRUCTION OPERATIONS SHALL CONFORM TO FEDERAL, STATE, AND LOCAL AGENCY SAFETY AND HEALTH RULES AND REGULATIONS FOR EXCAVATION AND TRENCHING, CONFINED SPACE ENTRY, WORK IN HAZARDOUS LOCATIONS, WORK AT HEIGHTS, AIR QUALITY CONTROL, NOISE CONTROL, TRAFFIC CONTROL, AND ANY OTHER POTENTIALLY HAZARDOUS CONDITIONS.
17. ALL PRESSURIZED OR SURCHARGED PIPELINES, PIPE FITTINGS, COUPLINGS, JOINTS, EXPANSION JOINTS, TANK CONNECTIONS, AND CHANNEL CONNECTIONS SHALL BE PROVIDED WITH THRUST RESTRAINT BASED ON SPECIFIED PRESSURES AND TEMPERATURES.
18. THE DRAWINGS INDICATE TYPES OF PIPE SUPPORT SYSTEMS AT VARIOUS LOCATIONS. HOWEVER, All PIPE SUPPORTS, HANGERS, BRACKETS, INSERTS OR BRACES ARE NOT SHOWN. CONTRACTOR SHALL REFER TO THE SPECIFICATIONS AND PROVIDE A COMPLETE SUPPORT SYSTEM AS REQUIRED.
19. THE TERM "PROPOSED" AS INDICATED ON THE DRAWINGS MEANS THE ITEM IS DESIGNED OR PLANNED TO BE PROVIDED BY OWNER OR OTHERS SEPARATE FROM THIS CONTRACT. THE TERM "FUTURE" AS INDICATED ON THE DRAWINGS REFERS TO THE ENGINEER'S INTERPRETATION OF THE ITEM FOR THE FUTURE, BASED ON AVAILABLE INFORMATION.
20. THE EXISTING PROCESS FACILITIES SHALL REMAIN IN OPERATION CONTINUOUSLY THROUGHOUT THE DURATION OF CONSTRUCTION ACTIVITIES. INDIVIDUAL PROCESS FACILITIES CAN BE TAKEN OUT OF SERVICE FOR LIMITED PERIODS OF TIME TO FACILITATE CONSTRUCTION AS SPECIFIED IN THE CONTRACT DOCUMENTS.
21. STRUCTURES SUCH AS CURBS AND GUTTERS, CONCRETE AND ASPHALT DRIVES AND WALKWAYS, PAVING BRICKS, FENCING, RETAINING WALLS, ETC., CROSSED BY PIPELINES ARE NOT ALL INDICATED IN PROFILE. CONTRACTOR SHALL RESTORE ANY EXISTING STRUCTURES THAT ARE DISTURBED, DAMAGED, OR REMOVED BY CONSTRUCTION.
22. CONTRACTOR SHALL REPLACE EXISTING PIPE CULVERTS THAT ARE REMOVED TO INSTALL NEW PIPELINES WITH NEW PIPE CULVERTS OF THE SAME SIZE, MATERIAL AND CONSTRUCTION AT THE SAME LOCATION AND INVERT ELEVATION AS THOSE THAT WERE REMOVED, AND SHAPE THE DITCH TO DRAIN WITH THE REPLACED CULVERT. CONTRACTOR SHALL PROVIDE ANY TEMPORARY CULVERTS THAT MAY BE REQUIRED FOR CONTRACTOR'S OPERATIONS. CONTRACTOR SHALL COORDINATE REMOVAL AND REPLACEMENT OF ANY CULVERTS WITHIN PUBLIC RIGHT-OF-WAY WITH THE REGULATING AGENCY.
23. HORIZONTAL STATIONING ALONG PIPELINE ALIGNMENTS IS A HORIZONTAL MEASUREMENT. FOR MEASUREMENT AND PAYMENT FOR PIPELINES, CONTRACTOR SHALL PROVIDE THE ACTUAL PIPE LENGTH DETERMINED ACCOUNTING FOR THE SLOPE OR VERTICAL CURVE ON WHICH PIPELINES ARE INSTALLED.
24. UNLESS OTHERWISE SPECIFIED, INDICATED ON THE DRAWINGS, OR DIRECTED BY THE ENGINEER, INSTALL PIPELINES SLOPING DOWNWARD FROM AN AIR VALVE. HIGH POINTS IN PIPELINES WILL NOT BE PERMITTED EXCEPT AT LOCATIONS OF AIR VALVES AS INDICATED ON THE DRAWINGS. REVIEW PIPELINE PROFILE REQUIREMENTS WITH THE ENGINEER PRIOR TO PREPARING LAYING SCHEDULES AND PERFORMING FIELD CONSTRUCTION STAKING.
25. PROVIDE A MINIMUM 5 FEET COVER FOR ALL PIPELINES, INCLUDING BLOW-OFFS, BASED ON FINISHED GRADE.
26. AIR RELEASE VALVES AND ISOLATION VALVES SHALL BE INSTALLED BELOW THE LEVEL IDENTIFIED ABOVE FOR REQUIRED MINIMUM COVER.
27. CONTRACTOR SHALL DETERMINE ACCURATE LOCATION, ELEVATION, AND ARRANGEMENT OF CONNECTIONS OF NEW PIPELINES WITH EXISTING PIPELINES BASED ON ACTUAL CONDITIONS IN THE FIELD, INCLUDING EXPOSING EXISTING PIPING, PRIOR TO FABRICATING NEW PIPING. CONTRACTOR SHALL PROVIDE FITTINGS, ADAPTERS, SOLID SLEEVE CLOSURES, AND HARNESSED MECHANICAL COUPLING; ROTATE FITTINGS; DEFLECT JOINTS; AND MODIFY EXISTING PIPING AS APPLICABLE AND AS REQUIRED TO MAKE CONNECTIONS, INCLUDING ADJUSTMENTS FOR ANY OFFSETS IN CENTERLINE ELEVATIONS BETWEEN PIPELINES. CONTRACTOR SHALL PROVIDE TEMPORARY PLUG WITH FACTORY OUTLET SIZED AS REQUIRED FOR CONTRACTOR'S TESTING AND DISINFECTION WORK BEFORE MAKING CONNECTION, WHERE APPLICABLE. CONTRACTOR SHALL COORDINATE MAKING EACH CONNECTION WITH THE OWNER.
28. ALL DUCTILE IRON PIPE (DIP) SHALL BE PROTECTED WITH POLYETHYLENE ENCASEMENT. LOCATIONS WHERE DIP IS TO BE WRAPPED (SINGLE OR DOUBLE) WITH POLYETHYLENE ENCASEMENT, AND WHERE PRESTRESSED CONCRETE CYLINDER (PCCP) AND CONCRETE BAR-WRAPPED, STEEL CYLINDER PIPE ARE TO BE WRAPPED (SINGLE OR DOUBLE) WITH POLYETHYLENE ENCASEMENT ARE AS SPECIFIED AND AS INDICATED ON THE DRAWINGS.
29. PROVIDE BURIED POTABLE WATER PIPELINE HORIZONTAL AND VERTICAL SEPARATION FROM SANITARY SEWER AND OTHER PIPELINES AS REQUIRED BY STATE-SPECIFIC DEPARTMENT OF HEALTH AND ENVIRONMENTAL QUALITY RULES AND REGULATIONS.

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Four Rivers Sanitation Authority

AEROBIC GRANULAR SLUDGE - PHASE 1

REVISIONS AND RECORD OF ISSUE

DESIGNED:	SM
DETAILED:	AB
CHECKED:	AM/JH
APPROVED:	MR
DATE:	12/20/2022
PROJECT NO.:	411752

GENERAL

CIVIL

LEGENDS AND GENERAL NOTES

00-C-001

30 OF 163

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

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40' 20' 0 40' 80'

1"=40'

NOTES:

1. SEE DWG 00-C-001 FOR LEGEND AND GENERAL NOTES AND PROJECT BENCHMARK INFORMATION.
2. CONTRACTOR SHALL ESTABLISH ADDITIONAL CONTROL POINTS AND BENCHMARKS AS REQUIRED TO MAINTAIN ADEQUATE CONTROL. SOME ESTABLISHED CONTROL POINTS AND BENCHMARKS MAY BE DISTURBED OR DESTROYED BY CONSTRUCTION.
3. CONTRACTOR SHALL MAINTAIN ACCESS TO EXISTING FACILITIES TO REMAIN DURING CONSTRUCTION FOR DELIVERIES.
4. FOR INTERFACE POINTS, CONTRACTOR SHALL UNDERTAKE CONSTRUCTION WORK IN COORDINATION WITH PRIMARY FILTRATION PROJECT PHASE 1.

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AEROBIC GRANULAR SLUDGE - PHASE 1

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GENERAL

CIVIL

KEY AND FACILITY ARRANGEMENT PLAN

00-C-101

31 OF 163

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

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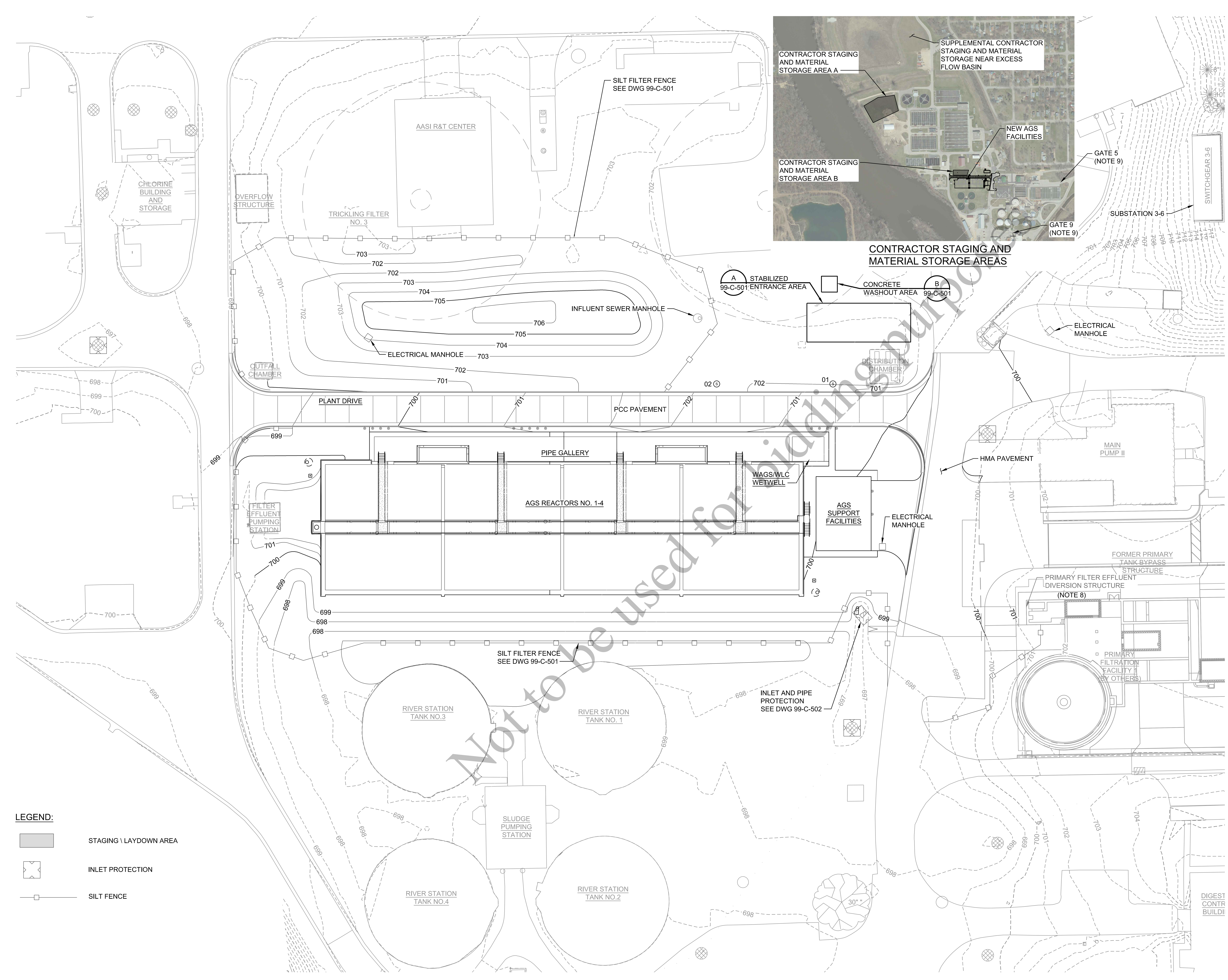

NOTES:

1. SEE DWG 00-C-001 FOR GENERAL NOTES, DRAWING 99-C-501 FOR SWPPP PLAN, AND SECTION 31 25 00 EROSION AND SEDIMENTATION CONTROLS FOR ADDITIONAL REQUIREMENTS.
2. PROVIDE TEMPORARY EROSION CONTROL DEVICES IN ACCORDANCE WITH ILLINOIS URBAN MANUAL, LATEST EDITION, AND IDOT STANDARD 280001-07. IDOT STANDARD 28001-07 INCLUDED ON DWG 99-C-501.
3. THE CONTRACTOR SHALL MAINTAIN INSTALLED EROSION CONTROL DEVICES IN A MANNER THAT PRESERVES THEIR EFFECTIVENESS FOR PREVENTING SEDIMENT FROM LEAVING THE SITE OR ENTERING A SENSITIVE AREA SUCH AS A NATURAL STREAM CORRIDOR, THE RIVER, AREAS OF THE SITE INTENDED TO BE LEFT UNDISTURBED, A STORM SEWER, OR AN ON-SITE DRAINAGE CHANNEL.
4. THE CONTRACTOR SHALL PROVIDE FOR CONTROL OF SURFACE EROSION AND SEDIMENT DEPOSITION DURING ALL PHASES OF CONSTRUCTION AND UNTIL THE DISTRICT ACCEPTS THE WORK AS COMPLETE. FOLLOWING WORK, EROSION CONTROL DEVICES MEASURES SHALL BE REMOVED ONCE 85 PERCENT OF THE PERMANENT COVER IS ESTABLISHED OVER 100 PERCENT OF THE PROJECT AREA.
5. CONTRACTOR MUST INSTALL AND MAINTAIN THE EROSION CONTROL DEVICES SHOWN AND IMPLIED ON THIS PLAN. IF THE DISTRICT OR DISTRICT'S REPRESENTATIVE DETERMINES THAT THE INSTALLATION OR THE MAINTENANCE IS INADEQUATE, THE CONTRACTOR MUST IMMEDIATELY CORRECT AT HIS/HER EXPENSE. IF IT IS DETERMINED THAT ADDITIONAL EROSION CONTROL MEASURES ARE NEEDED THE CONTRACTOR SHALL INSTALL AND MAINTAIN THOSE MEASURES.
6. THE CONTRACTOR SHALL REMOVE SEDIMENT FROM THE FLOW AREAS AND MAKE ALL NECESARY REPAIRS TO MAINTAIN THE INTEGRITY OF THE EROSION SEDIMENT AND CONTROL MEASURES.
7. FOLLOWING THE FINAL REMOVAL OF ALL EROSION, SEDIMENT AND CONTROL MEASURES THE CONTRACTOR SHALL RE-GRADE AND RE-SEED ALL AREAS THAT WERE DISTURBED BY THE REMOVAL.
8. THE PRIMARY FILTRATION FACILITY SHOWN HERE IS UNDER CONSTRUCTION AND IS EXPECTED TO BE COMPLETED BY THE END OF 2023 UNDER PHASE I OF THE PRIMARY FILTRATION PROJECT.
9. GATE NO. 5, 9 AND 16 MAY BE USED FOR CONSTRUCTION TRAFFIC, GATE 16 (NOT SHOWN ON THIS DRAWING) IS LOCATED AT THE NORTH END OF THE PLANT SITE AT THE INTERSECTION OF CHAPMAN ROAD AND BROOKE ROAD.

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AEROBIC GRANULAR SLUDGE - PHASE 1

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GENERAL

CIVIL

EROSION AND SEDIMENT CONTROL PLAN

00-C-102

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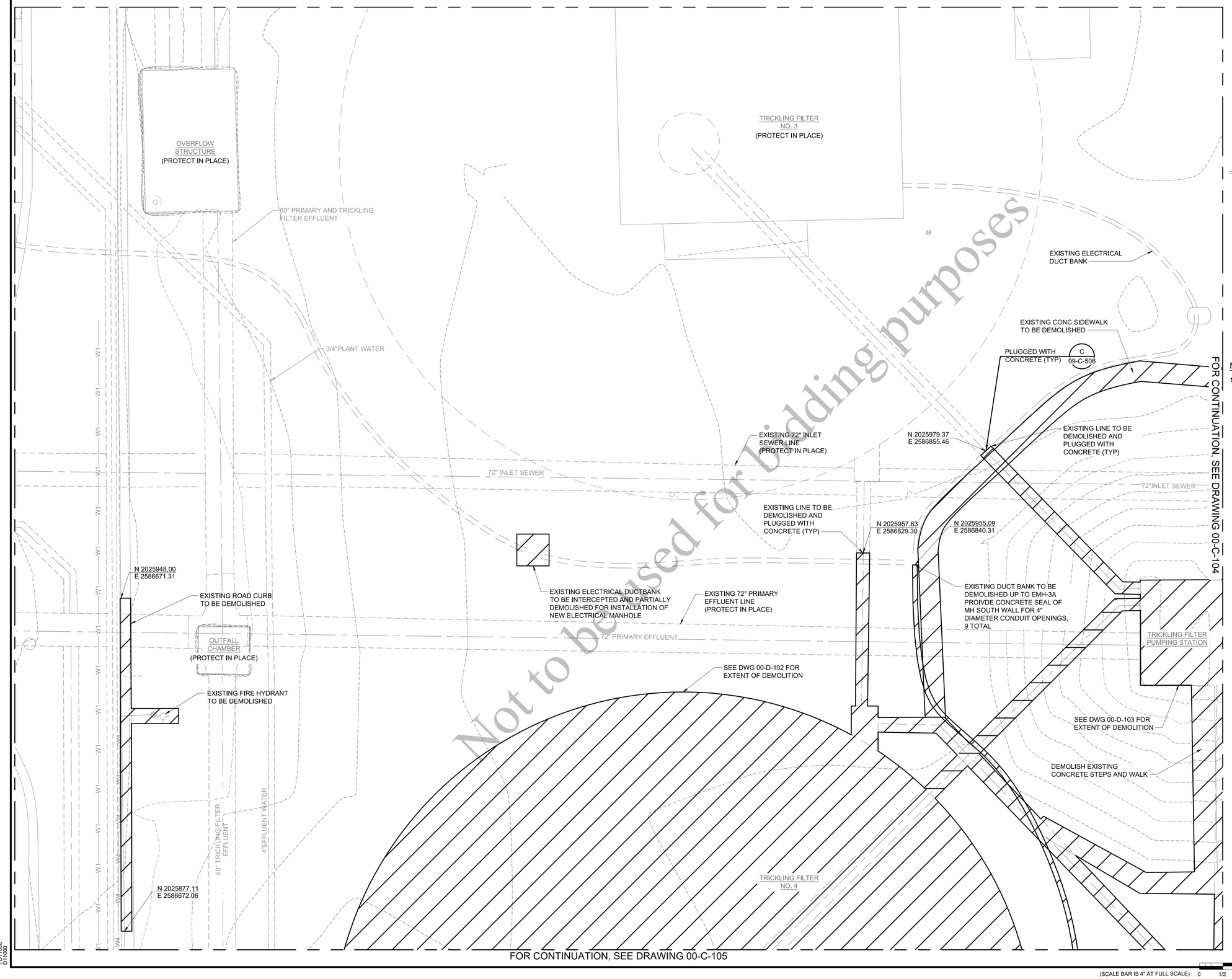

NOTES:

1. REFER TO DWG 00-D-101 FOR GENERAL REMOVAL NOTES.

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AEROBIC GRANULAR SLUDGE - PHASE 1

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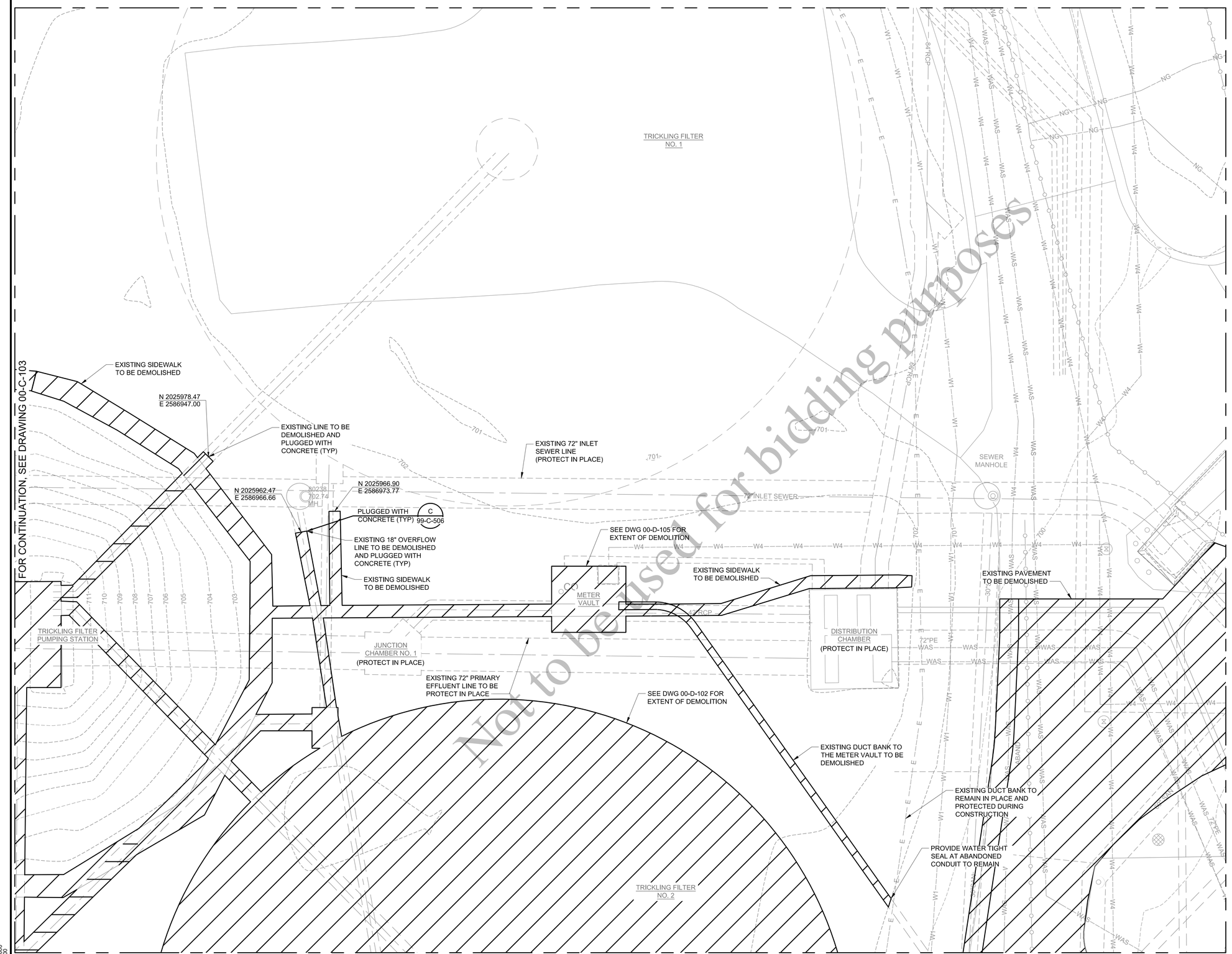
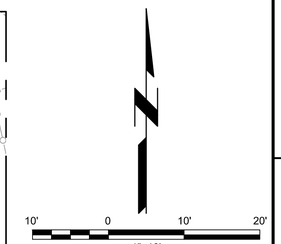
GENERAL

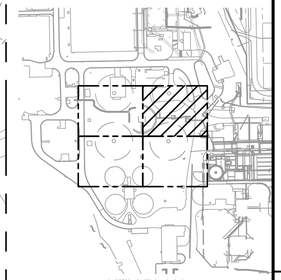
CIVIL

EXISTING CONDITIONS AND REMOVALS PLAN 1 OF 4

00-C-103







KEY PLAN

NOTES:

1. REFER TO DWG 00-D-101 FOR GENERAL REMOVAL NOTES.

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AEROBIC GRANULAR SLUDGE - PHASE 1

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PROJECT NO.:	411752

GENERAL

CIVIL

EXISTING CONDITIONS AND REMOVALS PLAN 2 OF 4

00-C-104

34 OF 163

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

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FOR CONTINUATION, SEE DRAWING 00-C-103

FILTER EFFLUENT PUMPING STATION
(PROTECT IN PLACE)

TRICKLING FILTER NO. 4

EXISTING DUCT BANK TO BE DEMOLISHED

SEE DWG 00-D-106 FOR EXTENT OF DEMOLITION

N 2025790.30
E 2586884.22

BYPASS CHAMBER

N 2025777.23
E 2586897.09

N 2025772.09
E 2586889.61

SEE DWG 00-D-102 FOR EXTENT OF DEMOLITION

48"RCP

RIVER STATION TANK NO.3
(PROTECT IN PLACE)

RIVER STATION TANK NO. 1
(PROTECT IN PLACE)

FOR CONTINUATION, SEE DRAWING 00-C-106

10' 0 10' 20'
1"=10'

KEY PLAN

NOTES:

1. REFER TO DWG 00-D-101 FOR GENERAL REMOVAL NOTES.

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

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AEROBIC GRANULAR SLUDGE - PHASE 1

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GENERAL

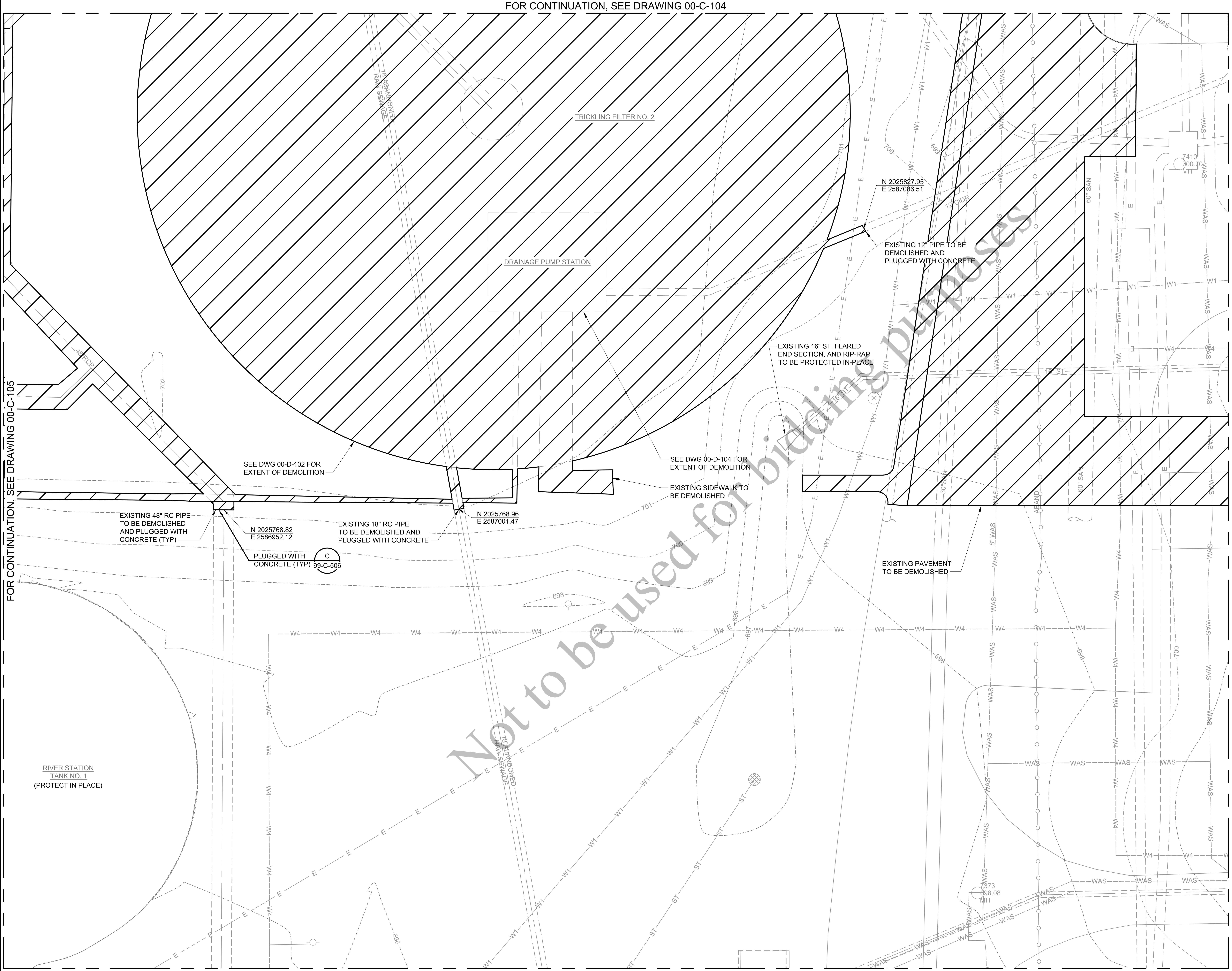
CIVIL

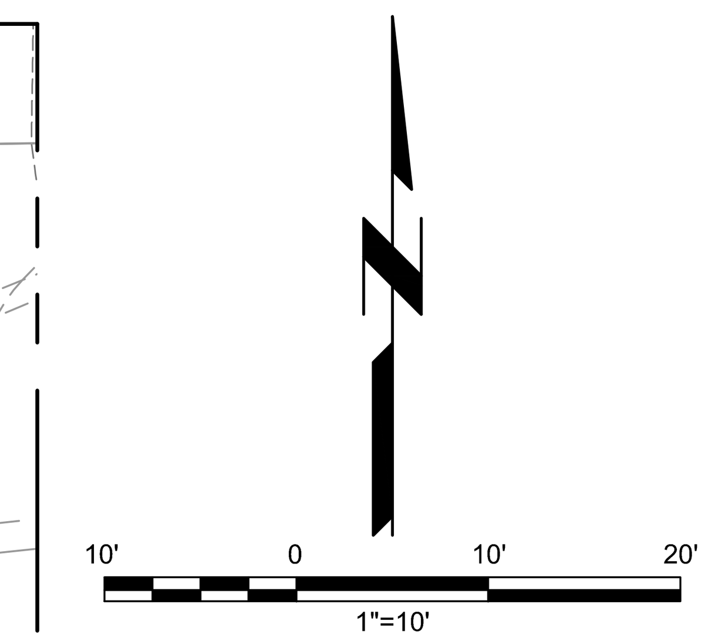
EXISTING CONDITIONS AND REMOVALS PLAN 3 OF 4

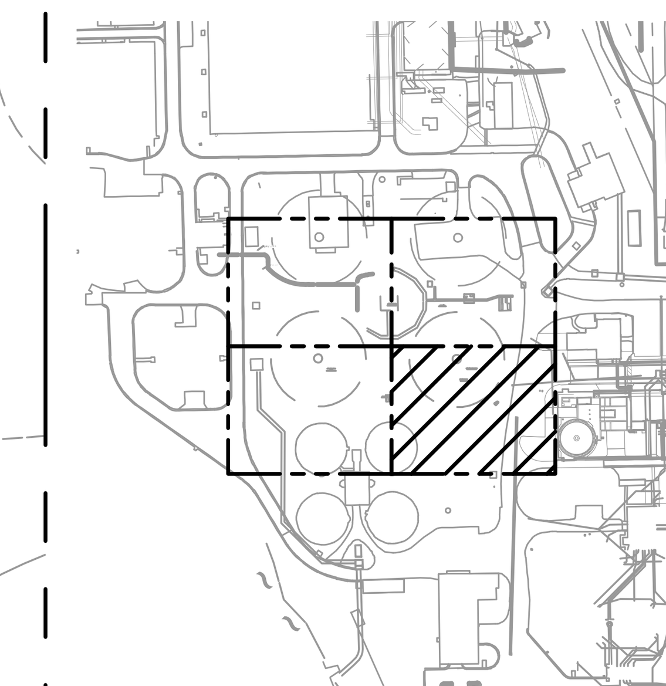
00-C-105

FOR CONTINUATION, SEE DRAWING 00-C-104

FOR CONTINUATION, SEE DRAWING 00-C-105







KEY PLAN

NOTES:

1. REFER TO DWG 00-D-101 FOR GENERAL REMOVAL NOTES.

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AEROBIC GRANULAR SLUDGE - PHASE 1

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GENERAL

CIVIL

EXISTING CONDITIONS AND REMOVALS PLAN 4 OF 4

00-C-106

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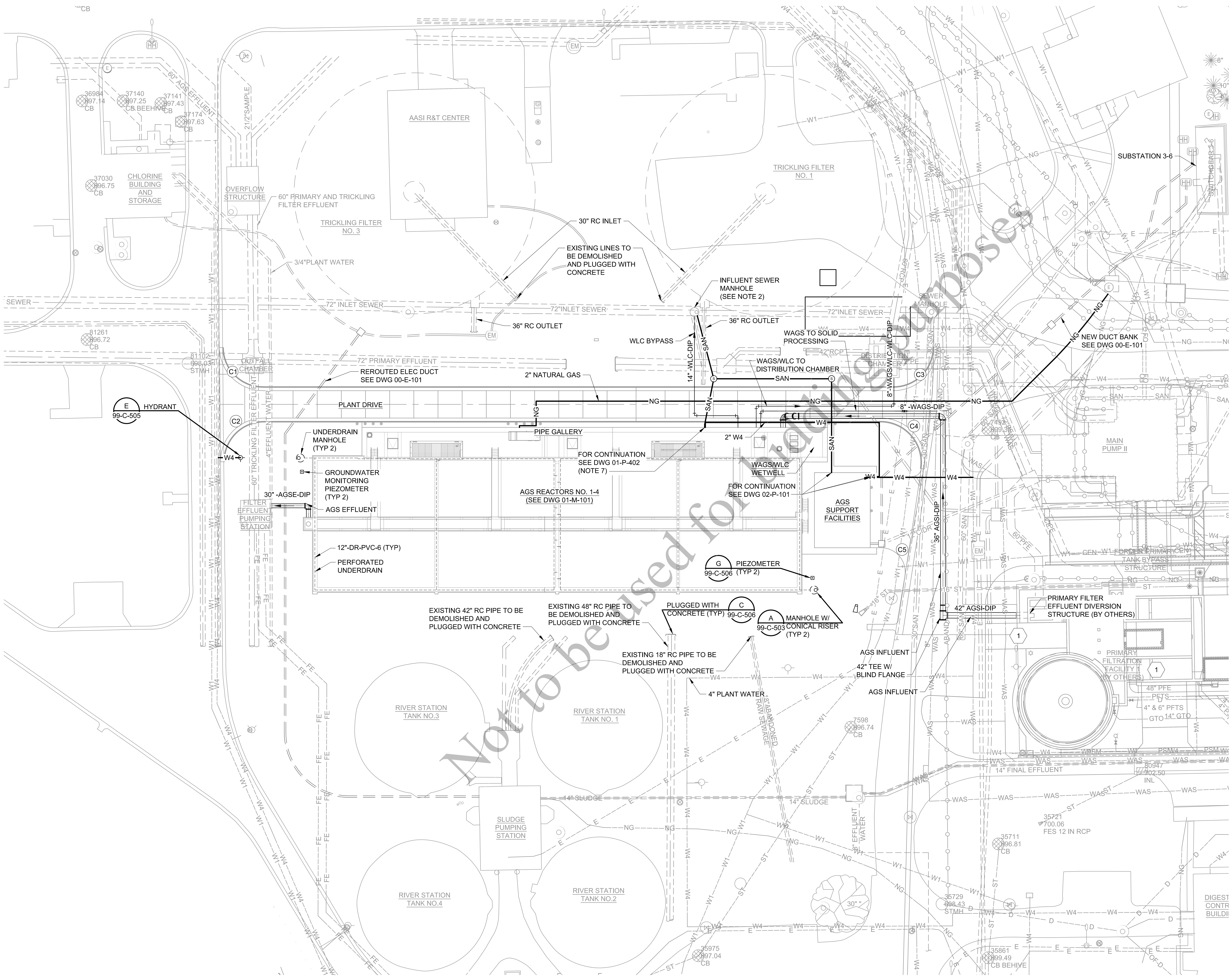

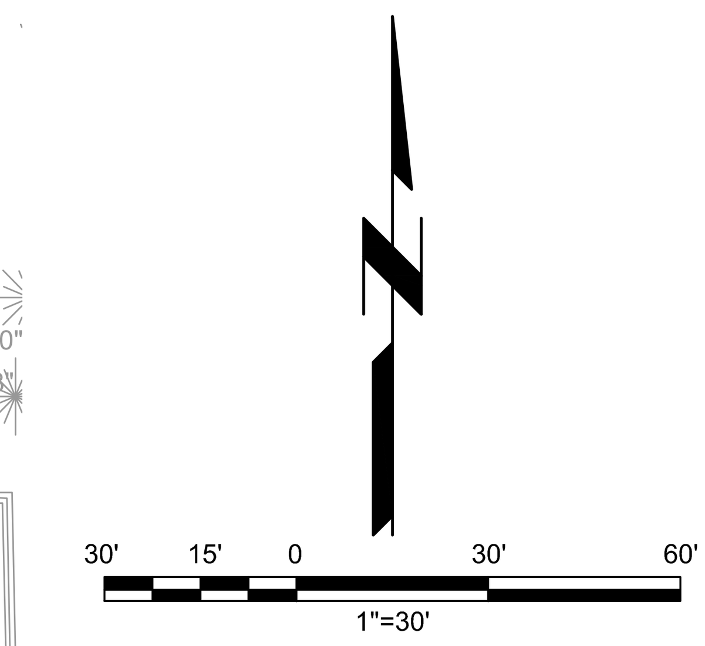

NOTES:

1. SEE DWG 00-C-001 FOR LEGENDS AND GENERAL NOTES.
2. PORTION OF EXISTING INFLUENT SEWER MANHOLE SHALL BE REHABILITATED AND REBUILT TO MAKE NEW 12" WLC BYPASS AND 4" SANITARY SEWER CONNECTION. REFER TO DWG 98-M-104 FOR THE EXTENT OF MANHOLE REHABILITATION.
3. ALL EXISTING PIPING AND BURIED UTILITIES SHALL BE FIELD VERIFIED FOR LOCATION AND ELEVATION AT CROSSINGS AND CONNECTION LOCATIONS.
4. UNLESS OTHERWISE INDICATED, ALL EXISTING YARD PIPING AND STRUCTURES, DUCT BANKS, UTILITIES, ETC. BENEATH NEW CONCRETE PAVEMENT SHALL BE PROTECTED WITH SHEETING, SHORING, OR OTHER MEANS NECESSARY TO PROTECT THEM FROM DAMAGE.
5. TRACER WIRE IS REQUIRED ON ALL NEW BURIED PIPING AND DUCT BANKS. PROVIDE TRACER WIRE AND ACCESS POINTS IN ACCORDANCE WITH FRSA TREATMENT PLANT TRACER WIRE AND ACCESS POINTS DETAIL ON DWG 99-C-504.
6. PIPING SHALL BE INSTALLED ON A CONTINUOUS GRADE WITHOUT SAGS OR HUMPS BETWEEN ELEVATIONS INDICATED. COORDINATE WITH THE ENGINEER FOR GUIDANCE WHERE THIS IS NOT POSSIBLE.
7. 2" PUMP DISCHARGE (PD) LINE ON DWG 01-P-402 CONTINUES AS 2" SANITARY LINE TO THE MANHOLE.

SHEET NOTES:

1. REFER TO "PRIMARY FILTRATION PROJECT PHASE I (CAPITAL PROJECT NO. 2022)" DRAWINGS PREPARED BY DONOHUE FOR PRIMARY FILTRATION FACILITIES. AT TIME OF BIDDING PRIMARY FILTRATION FACILITIES ARE UNDER CONSTRUCTION. LOCATIONS SHOWN ARE APPROXIMATE AND BASED ON PRIMARY FILTRATION BIDDING DOCUMENTS. CONTRACTOR SHALL VERIFY LOCATIONS, ELEVATIONS, AND SIZES OF FACILITIES AND PIPES PROVIDED BY OTHERS.

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Four Rivers Sanitation Authority

AEROBIC GRANULAR SLUDGE - PHASE 1

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GENERAL

CIVIL

OVERALL PIPING PLAN

00-C-107

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

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SEE DWG 98-M-103 FOR OVERFLOW STRUCTURE MODIFICATIONS

OVERFLOW STRUCTURE

AASI R&T CENTER

60" PRIMARY AND TRICKLING FILTER EFFLUENT

3/4"PLANT WATER

EXISTING ELECTRICAL DUCT BANK

EXISTING 30" RC PIPE TO BE DEMOLISHED AND PLUGGED WITH CONCRETE

72" INLET SEWER

72"INLET SEWER

REMOVE SECTION OF EXISTING DUCT BANK AND INSTALL NEW MANHOLE. SEE ELECTRICAL SITE PLAN

EXISTING DUCT BANK (TYP)

PLUG DEMOLISHED DUCT BANK OPENING WITH CONCRETE, SEE DWG 00-C-103

EXISTING 36" RC PIPE TO BE DEMOLISHED AND PLUGGED WITH CONCRETE

PLUGGED WITH CONCRETE (TYP) C 99-C-506

EXISTING 72" RC PIPE TO BE DEMOLISHED AND PLUGGED WITH CONCRETE

OUTFALL CHAMBER

72" PRIMARY EFFLUENT

REROUTED ELEC DUCT SEE DWG 00-E-101

PLANT DRIVE

UNDERDRAIN TO BE CENTERED BENEATH WALL IN ALIGNMENT WITH VERTICAL IN-WALL BASIN DRAIN VALVE PIPING EXCEPT BENEATH THE WALL SEPARATING AGS REACTOR NO. 2 AND NO. 3 (TYP SEE S DWGS)

NG

60" TRICKLING FILTER EFFLUENT

4"EFFLUENT WATER

REFER TO DETAIL A/99-C-503 MANHOLE W/ CONICAL RISER 5'-0" PRECAST CONC MH W/ RESILIENT CONNECTOR FOR 12" UNDERDRAIN IE 674.75 BOTTOM SLAB EL 671.75

N 2025879.42
E 2586721.62

SEE DETAIL A/01-S-501 FOR UNDERDRAIN PIPE EMBEDMENT DETAILING (TYP)

FOR CONTINUATION SEE DWG 01-P-402

NG

AIR UNIT

PIPE GALLERY

HYDRANT E 99-C-505

W4

N 2025879.64
E 2586684.50

12"-DR-PVC-6 PERFORATED UNDERDRAIN IE 674.75 (TYP)

3'-0"

FOR CONTINUATION, SEE DRAWING 00-C-109

FOR CONTINUATION, SEE DRAWING 00-C-110

10' 0 10' 20'
1"=10'

KEY PLAN

NOTES:

1. SEE DWG 00-C-107 FOR YARD PIPING GENERAL NOTES.

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Four Rivers Sanitation Authority

AEROBIC GRANULAR SLUDGE - PHASE 1

REVISIONS AND RECORD OF ISSUE

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PROJECT NO.:	411752

GENERAL

CIVIL

PIPING PLAN 1 OF 4

00-C-108

38 OF 163

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

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FOR CONTINUATION, SEE DRAWING 00-C-108

TRICKLING FILTER NO. 1

INFLUENT SEWER MANHOLE TO BE REHABILITATED. REFER TO DWG 98-M-104 FOR EXTENT OF REHABILITATION

EXISTING 30" RC PIPE TO BE DEMOLISHED AND PLUGGED WITH CONCRETE

N 2025967.27
E 2586966.33

80238
702.74
HH

N 2025967.88
E 2586968.11

1+72

72" INLET SEWER

CONNECT WLC TO REHABILITATED INFLUENT SEWER MANHOLE SEE DWG 98-M-104

EXISTING 42" RC PIPE TO BE DEMOLISHED AND PLUGGED WITH CONCRETE

WLC BYPASS SEE DWG 00-C-302 FOR PROFILE

SEWER MANHOLE

METER VAULT

HH

CUT AND PLUGGED EXISTING PIPE WITH CONCRETE (TYP)

4" SAN-PVC

42"RCP

EXISTING 72" RC PIPE TO BE DEMOLISHED AND PLUGGED WITH CONCRETE

NG FILTER
S STATION
MOLISHED)

JUNCTION CHAMBER NO. 1

STA 0+13.18
8" 90° BEND
N 2025911.61
E 2587004.67

STA 0+10.18
8" 90° BEND
N 2025908.61
E 2587007.42

WAGS/WLC TO DISTRIBUTION CHAMBER SEE DWG 00-C-302 FOR PROFILE

WAGS TO SOLID PROCESSING SEE DWG 00-C-302 FOR PROFILE

CONNECT WAGS/WLC TO DISTRIBUTION CHAMBER SEE DWG 98-M-101

DISTRIBUTION CHAMBER

72"PE WAS

N 2025928.64
E 2587051.49

PLUGGED WITH CONCRETE (TYP) C 99-C-506

4" SAN-PVC

SAN

1+00

14" -WL-C-DIP

0+50

2" SAN-PVC SAN

N 2025928.64
E 2586978.34

8" -WAGS/WLC-DIP

1+18

THRUST BLOCK (TYP) F 99-G-506

EXISTING 36" RC PIPE TO BE DEMOLISHED AND PLUGGED WITH CONCRETE

NG

STA 0+34.34
14" 90° BEND
N 2025905.74
E 2586966.32

STA 0+07.31
14" 90° BEND
N 2025905.74
E 2586993.35

0+50

1+00

8" -WAGS-DIP

1+26.88

NEW DUCT BANK SEE DWG 00-E-101

CONNECT WAGS TO EXISTING WAS

36" -AGSI-DIP

STA 0+98.68
8" 90° BEND
N 2025911.62
E 2587090.17

STA 1+69.23
36" 90° BEND
N 2025905.44
E 2587120.62

AGS INFLUENT SEE DWG 00-C-301 FOR PROFILE

STA 2+68.47
36" 90° BEND
N 2025905.44
E 2587021.38

STA 2+62.82
36" 45° BEND
N 2025905.44
E 2587027.02

FOR CONTINUATION SEE DWG 01-P-402 (NOTE 2)

FOR CONTINUATION SEE DWG 01-M-405

UNDERDRAIN TO BE CENTERED BENEATH WALL IN ALIGNMENT WITH VERTICAL IN-WALL BASIN DRAIN VALVE PIPING, (TYP SEE S DWGS)

SEE DETAIL A/01-S-501 FOR UNDERDRAIN PIPE EMBEDMENT DETAILING (TYP)

2" W4

4" -SAN-PVC

12"-DR-PVC-6 PERFORATED UNDERDRAIN IE 674.75 (TYP)

12"-DR-PVC-6 PERFORATED UNDERDRAIN IE 674.75 (TYP)

FOR CONTINUATION, SEE DRAWING 00-C-111

10' 0 10' 20'
1"=10'

KEY PLAN

NOTES:

1. SEE DWG 00-C-107 FOR YARD PIPING GENERAL NOTES.
2. 2" PUMP DISCHARGE (PD) LINE ON DWG 01-P-402 CONTINUES AS 2" SANITARY LINE TO THE MANHOLE.

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

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Four Rivers Sanitation Authority

AEROBIC GRANULAR SLUDGE - PHASE 1

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PROJECT NO.:	411752

GENERAL

CIVIL

PIPING PLAN 2 OF 4

00-C-109

39 OF 163

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FOR CONTINUATION, SEE DRAWING 00-C-108

REFER TO PIEZOMETER DETAIL G/99-C-506

N 2025870.92
E 2586722.62

AGS REACTOR NO. 1

AGS REACTOR NO. 2

CONNECT 30" AGS EFFLUENT TO NORTHERN CHAMBER OF FILTER EFFLUENT PUMPING STATION. SEE DWG 98-M-102

30"-AGSE-DIP

0+30

0+00

FILTER EFFLUENT PUMPING STATION

AGS EFFLUENT SEE DWG 00-C-301 FOR PROFILE

12"-DR-PVC-6 PERFORATED UNDERDRAIN IE 674.75 (TYP)

UNDERDRAIN TO BE CENTERED BENEATH WALL IN ALIGNMENT WITH VERTICAL IN-WALL BASIN DRAIN VALVE PIPING EXCEPT BENEATH THE WALL SEPARATING AGS REACTOR NO. 2 AND NO. 3 (TYP SEE S DWGS)

3'-00"

12"-DR-PVC-6 PERFORATED UNDERDRAIN IE 674.75 (TYP)

SEE DETAIL A/01-S-501 FOR UNDERDRAIN PIPE EMBEDMENT DETAILING (TYP)

PLUGGED WITH CONCRETE (TYP) C 99-C-506

EXISTING 42" RC PIPE TO BE DEMOLISHED AND PLUGGED WITH CONCRETE

42" RC FILTER EFFLUENT

NEW DUCT BANK SEE DWG 00-E-101

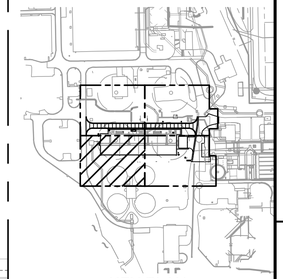
RIVER STATION TANK NO.3

RIVER STATION TANK NO. 1

FOR CONTINUATION, SEE DRAWING 00-C-111

10' 0 10' 20'
1"=10'

5' 0 5' 10'
1"=5'



KEY PLAN

NOTES:

1. SEE DWG 00-C-107 FOR YARD PIPING GENERAL NOTES.

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AEROBIC GRANULAR SLUDGE - PHASE 1

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GENERAL

CIVIL

PIPING PLAN 3 OF 4

00-C-110

40 OF 163

FOR CONTINUATION, SEE DRAWING 00-C-109

FOR CONTINUATION, SEE DRAWING 00-C-110

AGS REACTOR NO. 3

AGS REACTOR NO. 4

AGS SUPPORT FACILITIES

RIVER STATION TANK NO. 1

0+00

4" SANITARY SEWER

IE 697.1

2" W4

NEW DUCTBANK SEE DWG 00-E-101

THRUST BLOCK (TYP) F 99-C-506

ELECTRICAL MANHOLE

36" -AGSI-DIP

1+00

12"CIDR

60" SAN

SEE DETAIL A/01-S-501 FOR UNDERDRAIN PIPE EMBEDMENT DETAILING (TYP)

12"-DR-PVC-6 PERFORATED UNDERDRAIN IE 674.75 (TYP)

UNDERDRAIN TO BE CENTERED BENEATH WALL IN ALIGNMENT WITH VERTICAL IN-WALL BASIN DRAIN VALVE PIPING, (TYP SEE S DWGS)

REFER TO PIEZOMETER DETAIL G/99-C-506

N 2025804.93
E 2587039.62

6" -PE-5 CORRUGATED ST

AGS INFLUENT SEE DWG 00-C-301 FOR PROFILE

12"-DR-PVC-6 PERFORATED UNDERDRAIN IE 674.75 (TYP)

REFER TO DETAIL A/99-C-503 MANHOLE W/ CONICAL RISER 5'-0" PRECAST CONC MH W/ RESILIENT CONNECTOR FOR 12" UNDERDRAIN IE 674.75 BOTTOM SLAB EL 671.75

N 2025797.42
E 2587040.62

16" ST

0+50

STA 0+50.41
42" X 36" REDUCER
N 2025786.61
E 2587120.62

AGS INFLUENT

42" -AGSI-DIP

0+00

PROVIDE HARNESSED MECHANICAL COUPLING TO CONNECT AGS INFLUENT AT 42" STUB OUT

C 99-C-506 PLUGGED WITH CONCRETE (TYP)

EXISTING 48" RC PIPE TO BE DEMOLISHED AND PLUGGED WITH CONCRETE

48" RC RECIRCULATION

EXISTING 18" ABABNDOED RAW SEWAGE PIPE TO BE DEMOLISHED AND PLUGGED WITH CONCRETE

REFER TO DETAIL B ON DWG 99-C-503 FOR IDOT PRECAST HEADWALL FOR PIPE UNDERDRAINS
N - 2025791.61
E - 2587069.31
IE 696.90
THE COORDINATES PROVIDED ARE APPROXIMATE. STORM PIPE AND HEADWALL LOCATION TO BE PLACED IN ORDER TO REUSE EXISTING RIPRAP

PROTECT-IN-PLACE STORMWATER FLARED END SECTION AND RIPRAP

STA 0+45.49
42" TEE
N 2025781.70
E 2587120.62

30" SAN

ABAND

8" WAS

PLANT DRIVE TO PRIMARY FILTER EFFLUENT DIVERSION STRUCTURE

PRIMARY FILTER EFFLUENT STRUCTURE

TO ABANDONED RAW SEWAGE

14" FINAL EFFLUENT

10' 0 10' 20'
1"=10'

KEY PLAN

NOTES:

1. SEE DWG 00-C-107 FOR YARD PIPING GENERAL NOTES.

NOTES:

1. SEE DWG 00-C-107 FOR YARD PIPING GENERAL NOTES.

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

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AEROBIC GRANULAR SLUDGE - PHASE 1

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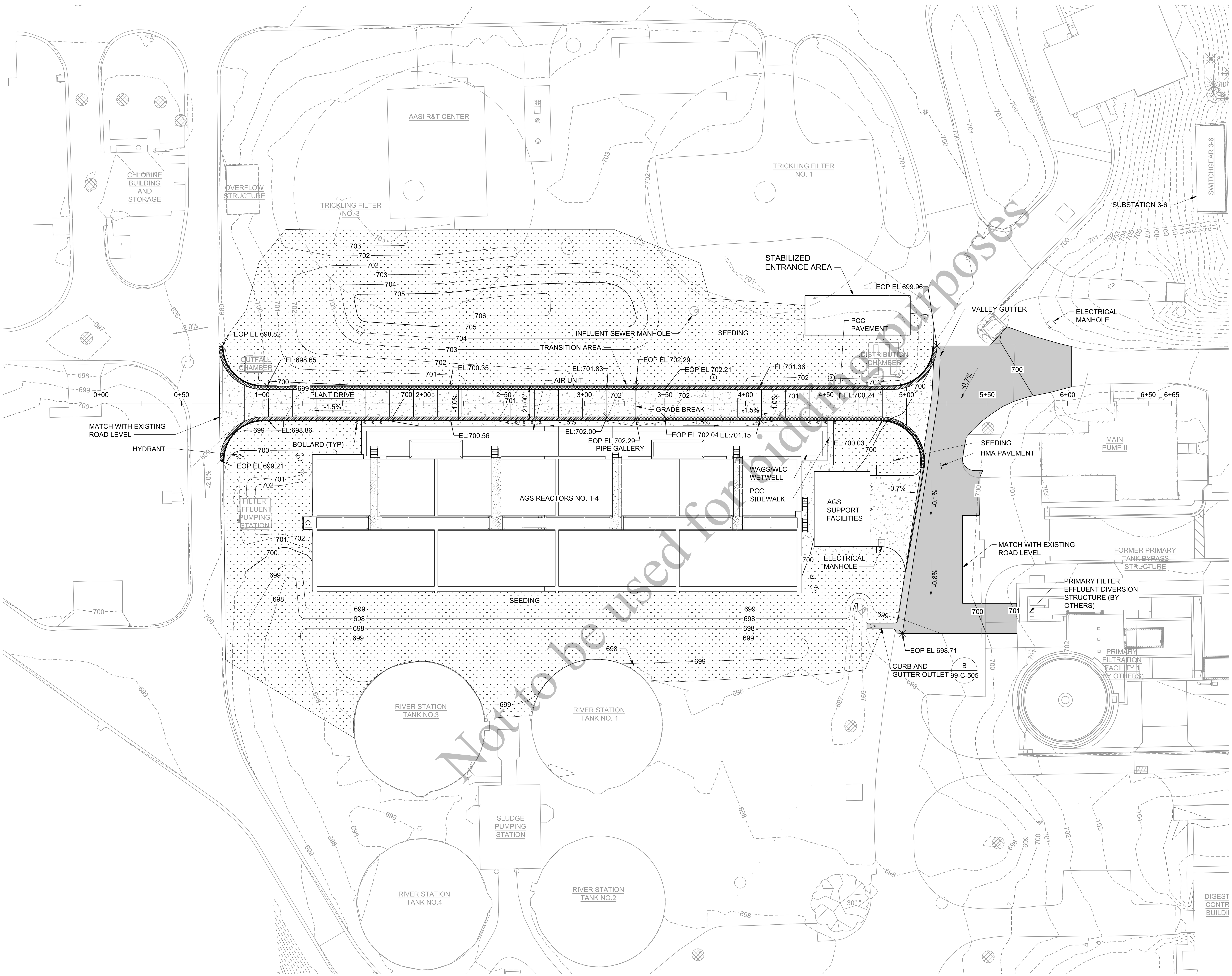
GENERAL

CIVIL

PIPING PLAN 4 OF 4

00-C-111



NOTES:

1. SEE DWG 00-C-001 FOR LEGENDS AND GENERAL NOTES.
2. TRENCH, PAVEMENT, AND SITE RESTORATION SHALL MATCH ADJACENT EXISTING GRADE UNLESS OTHERWISE NOTED.
3. ALL EXISTING MANHOLES, CATCH BASINS, AND INLETS WITHIN THE LIMITS OF CONSTRUCTION TO REMAIN SHALL BE PROTECTED DURING CONSTRUCTION AND, IF REQUIRED DUE TO NEW CONSTRUCTION, ADJUSTED TO FINAL GRADE AND/OR TO ACCEPT DRAINAGE.
4. PROVIDE PCC PAVEMENT JOINTING PER IDOT STANDARD 420001-09 AND 420101-07. PROVIDE JOINTING AND TIE BARS FOR PCC CURB AND GUTTER PER IDOT STANDARD 606001-07. PROVIDE PCC PAVEMENT ROUNDOUTS AT CASTING PER IDOT STANDARD 420111-04.
5. TYPICAL PCC PAVEMENT TRANSVERSE JOINT SPACING IS 15 FEET.
6. WHERE NEW PCC PAVEMENT IS REPLACING EXISTING, THE INTENT IS TO MATCH PRE-CONSTRUCTION GRADES, GEOMETRY AND JOINTING PATTERN.

LEGEND:

SEEDING
PCC PAVEMENT
HMA PAVEMENT
CURB AND GUTTER
TIP OUT CURB
M6.18 DEPRESSED CURB

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AEROBIC GRANULAR SLUDGE - PHASE 1

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GENERAL

CIVIL

OVERALL GRADING AND PAVING PLAN

00-C-112

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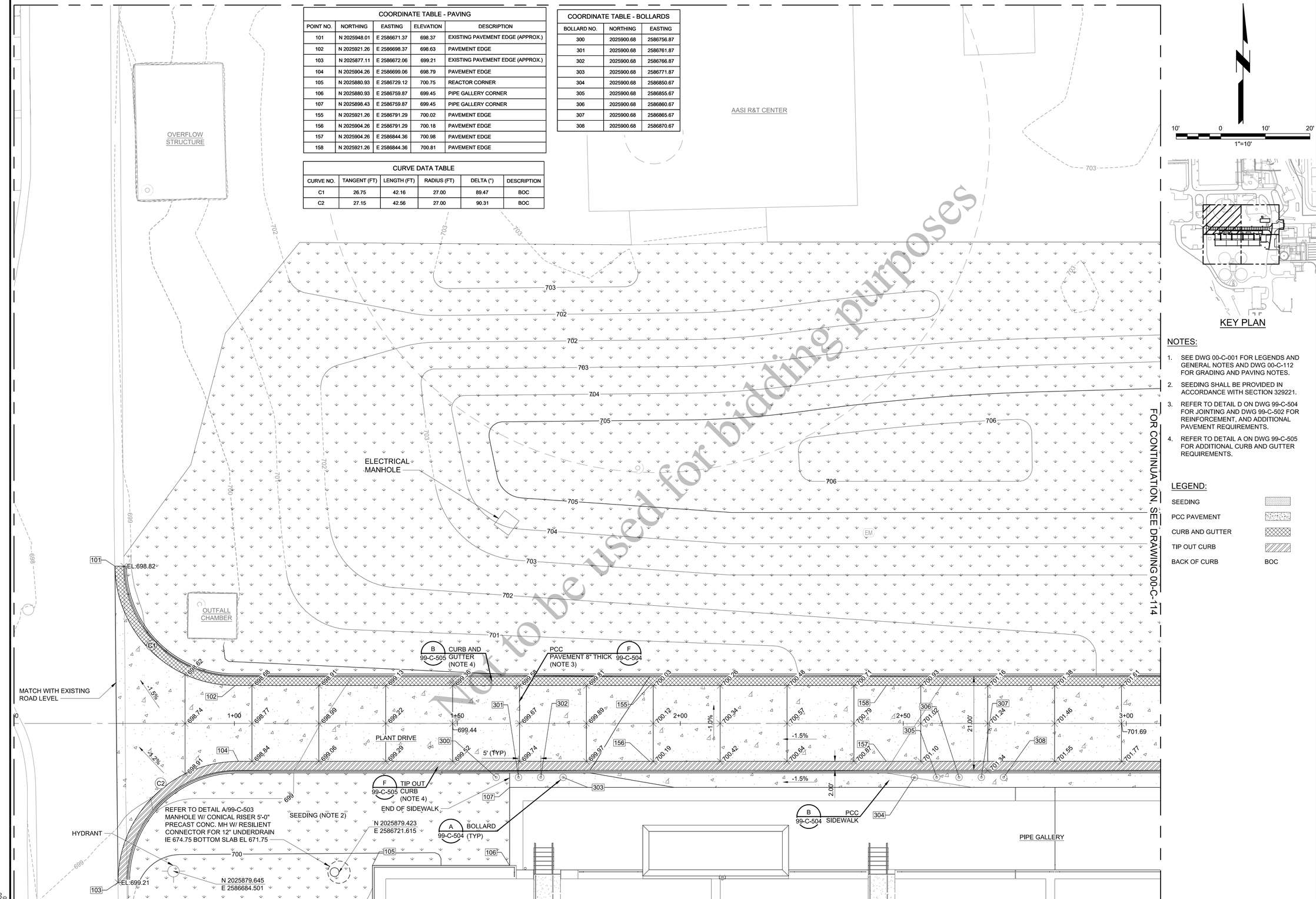
(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

COORDINATE TABLE - PAVING				
POINT NO.	NORTHING	EASTING	ELEVATION	DESCRIPTION
101	N 2025948.01	E 2586671.37	698.37	EXISTING PAVEMENT EDGE (APPROX.)
102	N 2025921.26	E 2586698.37	698.63	PAVEMENT EDGE
103	N 2025877.11	E 2586672.06	699.21	EXISTING PAVEMENT EDGE (APPROX.)
104	N 2025904.26	E 2586699.06	698.79	PAVEMENT EDGE
105	N 2025880.93	E 2586729.12	700.75	REACTOR CORNER
106	N 2025880.93	E 2586759.87	699.45	PIPE GALLERY CORNER
107	N 2025898.43	E 2586759.87	699.45	PIPE GALLERY CORNER
155	N 2025921.26	E 2586791.29	700.02	PAVEMENT EDGE
156	N 2025904.26	E 2586791.29	700.18	PAVEMENT EDGE
157	N 2025904.26	E 2586844.36	700.98	PAVEMENT EDGE
158	N 2025921.26	E 2586844.36	700.81	PAVEMENT EDGE

CURVE DATA TABLE					
CURVE NO.	TANGENT (FT)	LENGTH (FT)	RADIUS (FT)	DELTA (°)	DESCRIPTION
C1	26.75	42.16	27.00	89.47	BOC
C2	27.15	42.56	27.00	90.31	BOC

COORDINATE TABLE - BOLLARDS		
BOLLARD NO.	NORTHING	EASTING
300	2025900.68	2586756.87
301	2025900.68	2586761.87
302	2025900.68	2586766.87
303	2025900.68	2586771.87
304	2025900.68	2586850.67
305	2025900.68	2586855.67
306	2025900.68	2586860.67
307	2025900.68	2586865.67
308	2025900.68	2586870.67



10' 0 10' 20'
1"=10'

KEY PLAN

NOTES:

1. SEE DWG 00-C-001 FOR LEGENDS AND GENERAL NOTES AND DWG 00-C-112 FOR GRADING AND PAVING NOTES.
2. SEEDING SHALL BE PROVIDED IN ACCORDANCE WITH SECTION 329221.
3. REFER TO DETAIL D ON DWG 99-C-504 FOR JOINTING AND DWG 99-C-502 FOR REINFORCEMENT, AND ADDITIONAL PAVEMENT REQUIREMENTS.
4. REFER TO DETAIL A ON DWG 99-C-505 FOR ADDITIONAL CURB AND GUTTER REQUIREMENTS.

LEGEND:

SEEDING	
PCC PAVEMENT	
CURB AND GUTTER	
TIP OUT CURB	
BACK OF CURB	BOC

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GRADING AND PAVING PLAN 1 OF 4

00-C-113

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(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

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COORDINATE TABLE - PAVING				
POINT NO.	NORTHING	EASTING	ELEVATION	DESCRIPTION
108	N 2025921.26	E 2586912.09	701.82	PAVEMENT EDGE
109	N 2025904.26	E 2586912.09	701.82	PAVEMENT EDGE
110	N 2025904.26	E 2586948.09	698.61	PAVEMENT EDGE
111	N 2025921.26	E 2587090.01	700.19	PAVEMENT EDGE
112	N 2025948.27	E 2587117.01	699.96	EXISTING PAVEMENT EDGE (APPROX.)
113	N 2025904.26	E 2587081.88	700.07	PAVEMENT EDGE
114	N 2025883.04	E 2587108.71	699.77	PAVEMENT EDGE
116	N 2025898.43	E 2587048.87	700.22	PIPE GALLERY CORNER
117	N 2025876.93	E 2587048.87	700.25	PIPE GALLERY CORNER
118	N 2025876.93	E 2587033.12	700.28	REACTOR AND PIPE GALLERY CORNER
146	N 2025948.27	E 2587149.61	699.91	EXISTING PAVEMENT EDGE (APPROX.)
147	N 2025960.23	E 2587160.59	700.04	EXISTING PAVEMENT EDGE (APPROX.)
148	N 2025947.99	E 2587200.45	700.42	EXISTING PAVEMENT EDGE (APPROX.)
149	N 2025922.92	E 2587200.45	700.23	EXISTING PAVEMENT EDGE (APPROX.)
162	N 2025921.26	E 2586948.09	698.61	PAVEMENT EDGE

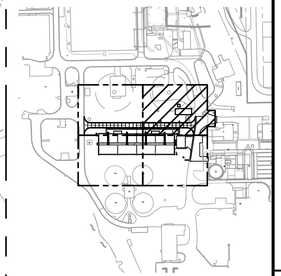
CURVE DATA TABLE					
CURVE NO.	TANGENT (FT)	LENGTH (FT)	RADIUS (FT)	DELTA (°)	DESCRIPTION
C3	27.02	42.43	27.00	90.04	BOC
C4	21.81	36.91	27.58	76.67	BOC

COORDINATE TABLE - BOLLARDS		
BOLLARD NO.	NORTHING	EASTING
309	2025900.68	2587038.02
310	2025900.68	2587043.02
311	2025900.68	2587048.02
312	2025900.68	2587053.72

LEGEND:

- SEEDING
- PCC PAVEMENT
- HMA PAVEMENT
- CURB AND GUTTER
- TIP OUT CURB
- M6.18 DEPRESSED CURB
- BACK OF CURB — BOC

10' 0 10' 20'
1"=10'



KEY PLAN

NOTES:

1. SEE DWG 00-C-001 FOR LEGENDS AND GENERAL NOTES AND DWG 00-C-112 FOR GRADING AND PAVING NOTES.
2. SEEDING SHALL BE PROVIDED IN ACCORDANCE WITH SECTION 329221.
3. REFER TO DETAIL D ON DWG 99-C-504 FOR JOINTING AND DWG 99-C-502 FOR REINFORCEMENT, AND ADDITIONAL PAVEMENT REQUIREMENTS.
4. REFER TO DETAIL A ON DWG 99-C-505 FOR ADDITIONAL CURB AND GUTTER REQUIREMENTS.

FOR CONTINUATION, SEE DRAWING 00-C-113

FOR CONTINUATION, SEE DRAWING 00-C-116

B 99-C-501 CONCRETE WASHOUT AREA

A 99-C-501 STABILIZED ENTRANCE AREA

INFLUENT SEWER MANHOLE

4' DIA MANHOLE (TYP) MH-02 — A 99-C-506

F 99-C-505 TIP OUT CURB (NOTE 4)

PCC PAVEMENT 8" THICK (NOTE 3) — F 99-C-504

4' DIA MANHOLE MH-01

DISTRIBUTION CHAMBER

TRANSITION LINE

1% SLOPE

-1.5%

17.00'

PLANT DRIVE

B 99-C-504 PCC SIDEWALK

CURB AND GUTTER (NOTE 4) — B 99-C-505

BOLLARD (TYP) — A 99-C-504

SEEDING (NOTE 2)

WAGS/WLC WETWELL

4.00'

R25'

B 99-C-505 CURB AND GUTTER (NOTE 4)

ELECTRICAL MANHOLE

MATCH WITH EXISTING ROAD LEVEL

HMA PAVEMENT — E 99-C-504

M6.18 DEPRESSED CURB — B 99-C-505

MATCH WITH EXISTING ROAD LEVEL

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

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GENERAL

CIVIL

GRADING AND PAVING PLAN 2 OF 4

00-C-114

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FOR CONTINUATION, SEE DRAWING 00-C-113

REFER TO PIEZOMETER DETAIL G/99-C-506

N 2025870.92
E 2586722.62

AGS REACTOR NO. 1

AGS REACTOR NO. 2

SEEDING (NOTE 2)

FILTER EFFLUENT PUMPING STATION

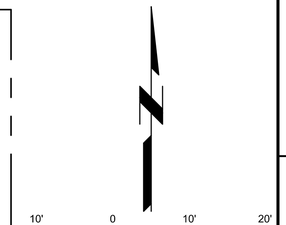
11.0%

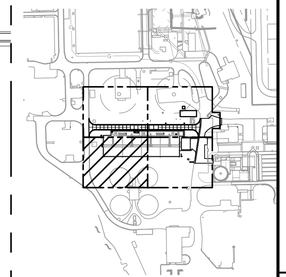
SEEDING (NOTE 2)

RIVER STATION TANK NO.3

RIVER STATION TANK NO. 1

FOR CONTINUATION, SEE DRAWING 00-C-116





KEY PLAN

NOTES:

1. SEE DWG 00-C-001 FOR LEGENDS AND GENERAL NOTES AND DWG 00-C-112 FOR GRADING AND PAVING NOTES.
2. SEEDING SHALL BE PROVIDED IN ACCORDANCE WITH SECTION 329221.

LEGEND:

SEEDING

COORDINATE TABLE - AGS REACTOR				
POINT NO.	NORTHING	EASTING	ELEVATION	DESCRIPTION
121	N 2025842.59	E 2586729.12	702.00	EFFLUENT BOX CORNER
122	N 2025842.59	E 2586723.45	702.00	EFFLUENT BOX CORNER
123	N 2025834.26	E 2586723.45	702.00	EFFLUENT BOX CORNER
124	N 2025834.26	E 2586729.12	702.00	EFFLUENT BOX CORNER
125	N 2025794.93	E 2586729.12	699.50	REACTOR WALL CORNER
126	N 2025795.93	E 2586732.12	699.50	REACTOR WALL CORNER
127	N 2025794.93	E 2586732.12	699.50	REACTOR WALL CORNER
128	N 2025795.93	E 2586805.12	699.50	REACTOR WALL CORNER
129	N 2025794.93	E 2586805.12	699.50	REACTOR WALL CORNER
130	N 2025794.93	E 2586807.12	699.50	REACTOR WALL CORNER
131	N 2025795.93	E 2586807.12	699.50	REACTOR WALL CORNER
132	N 2025795.93	E 2586880.12	699.50	REACTOR WALL CORNER
133	N 2025794.93	E 2586880.12	699.50	REACTOR WALL CORNER
134	N 2025794.93	E 2586882.12	699.50	REACTOR WALL CORNER
135	N 2025795.93	E 2586882.12	699.50	REACTOR WALL CORNER

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

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FDT1000
D1000

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DESIGN FIRM - 184.002143 -0006

Four Rivers Sanitation Authority

AEROBIC GRANULAR SLUDGE - PHASE 1

REVISIONS AND RECORD OF ISSUE

DESIGNED:	SM
DETAILED:	AB
CHECKED:	AM/JH
APPROVED:	MR
DATE:	12/20/2022
PROJECT NO.:	411752

GENERAL

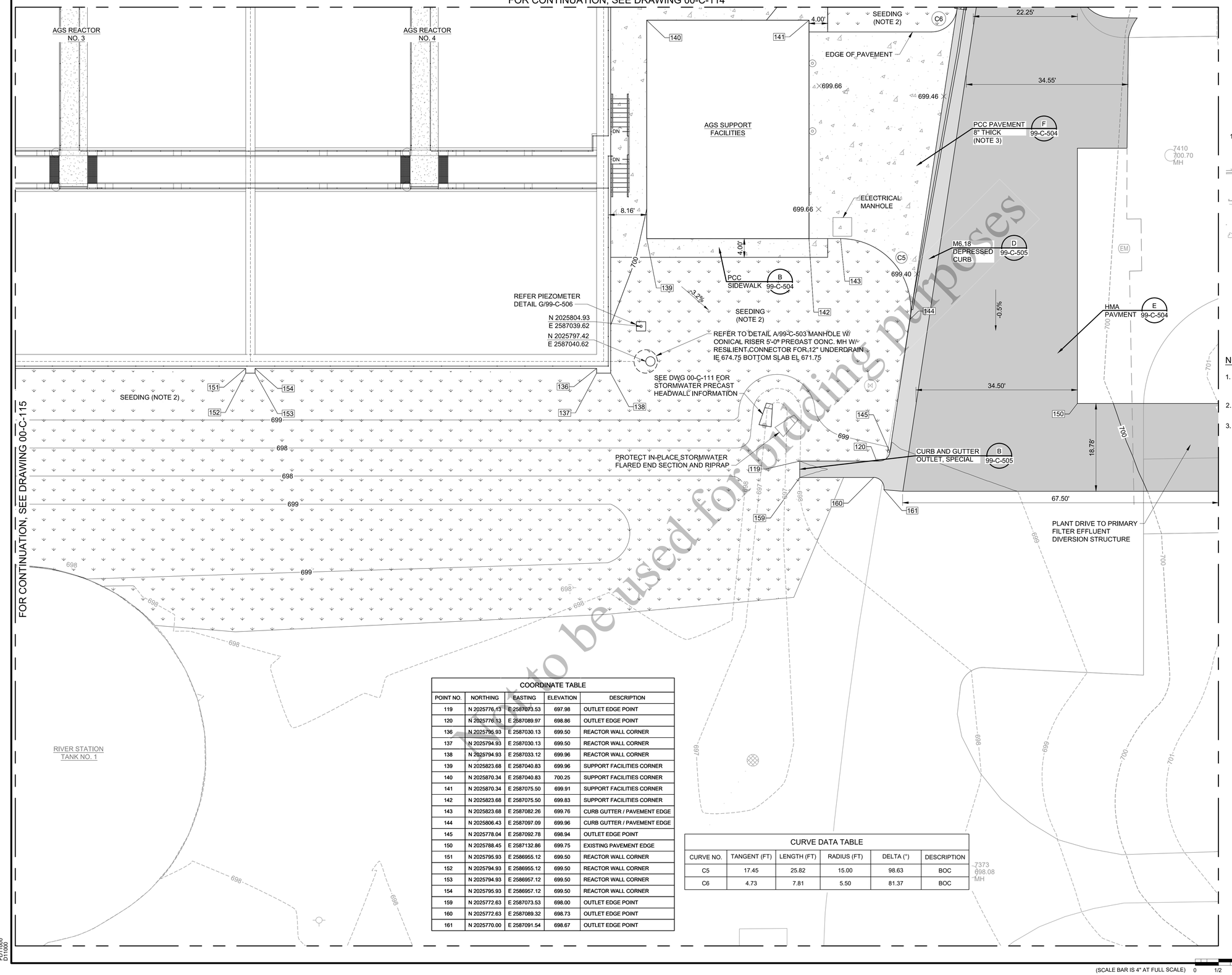
CIVIL

GRADING AND PAVING PLAN 3 OF 4

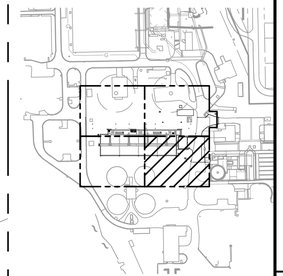
00-C-115

45 OF 163

FOR CONTINUATION, SEE DRAWING 00-C-114



KEY PLAN



NOTES:

1. SEE DWG 00-C-001 FOR LEGENDS AND GENERAL NOTES AND DWG 00-C-112 FOR GRADING AND PAVING NOTES.
2. SEEDING SHALL BE PROVIDED IN ACCORDANCE WITH SECTION 329221.
3. REFER TO DETAIL D ON DWG 99-C-504 FOR JOINTING AND DWG 99-C-502 FOR REINFORCEMENT, AND ADDITIONAL PAVEMENT REQUIREMENTS.

LEGEND:

SEEDING	
PCC PAVEMENT	
HMA PAVEMENT	
M6.18 DEPRESSED CURB	
BACK OF CURB	BOC

COORDINATE TABLE

POINT NO.	NORTHING	EASTING	ELEVATION	DESCRIPTION
119	N 2025776.13	E 2587073.53	697.98	OUTLET EDGE POINT
120	N 2025776.13	E 2587089.97	698.86	OUTLET EDGE POINT
136	N 2025795.93	E 2587030.13	699.50	REACTOR WALL CORNER
137	N 2025794.93	E 2587030.13	699.50	REACTOR WALL CORNER
138	N 2025794.93	E 2587033.12	699.96	REACTOR WALL CORNER
139	N 2025823.68	E 2587040.83	699.96	SUPPORT FACILITIES CORNER
140	N 2025870.34	E 2587040.83	700.25	SUPPORT FACILITIES CORNER
141	N 2025870.34	E 2587075.50	699.91	SUPPORT FACILITIES CORNER
142	N 2025823.68	E 2587075.50	699.83	SUPPORT FACILITIES CORNER
143	N 2025823.68	E 2587082.26	699.76	CURB GUTTER / PAVEMENT EDGE
144	N 2025806.43	E 2587097.09	699.96	CURB GUTTER / PAVEMENT EDGE
145	N 2025778.04	E 2587092.78	698.94	OUTLET EDGE POINT
150	N 2025788.45	E 2587132.86	699.75	EXISTING PAVEMENT EDGE
151	N 2025795.93	E 2586955.12	699.50	REACTOR WALL CORNER
152	N 2025794.93	E 2586955.12	699.50	REACTOR WALL CORNER
153	N 2025794.93	E 2586957.12	699.50	REACTOR WALL CORNER
154	N 2025795.93	E 2586957.12	699.50	REACTOR WALL CORNER
159	N 2025772.63	E 2587073.53	698.00	OUTLET EDGE POINT
160	N 2025772.63	E 2587089.32	698.73	OUTLET EDGE POINT
161	N 2025770.00	E 2587091.54	698.67	OUTLET EDGE POINT

CURVE DATA TABLE

CURVE NO.	TANGENT (FT)	LENGTH (FT)	RADIUS (FT)	DELTA (°)	DESCRIPTION
C5	17.45	25.82	15.00	98.63	BOC
C6	4.73	7.81	5.50	81.37	BOC

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

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D1002

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Four Rivers Sanitation Authority

AEROBIC GRANULAR SLUDGE - PHASE 1

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DATE:	12/20/2022
PROJECT NO.:	411752

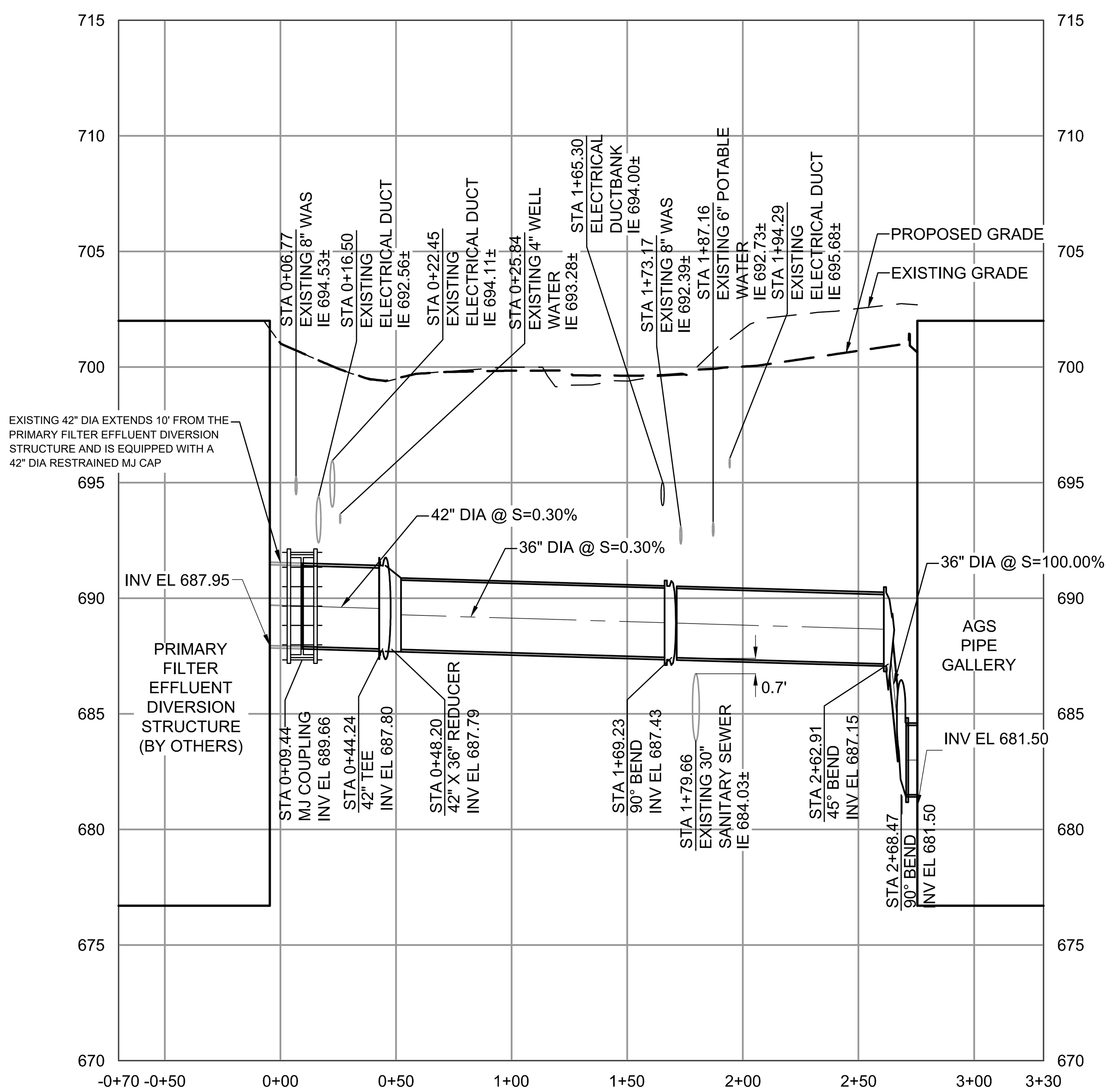
GENERAL

CIVIL

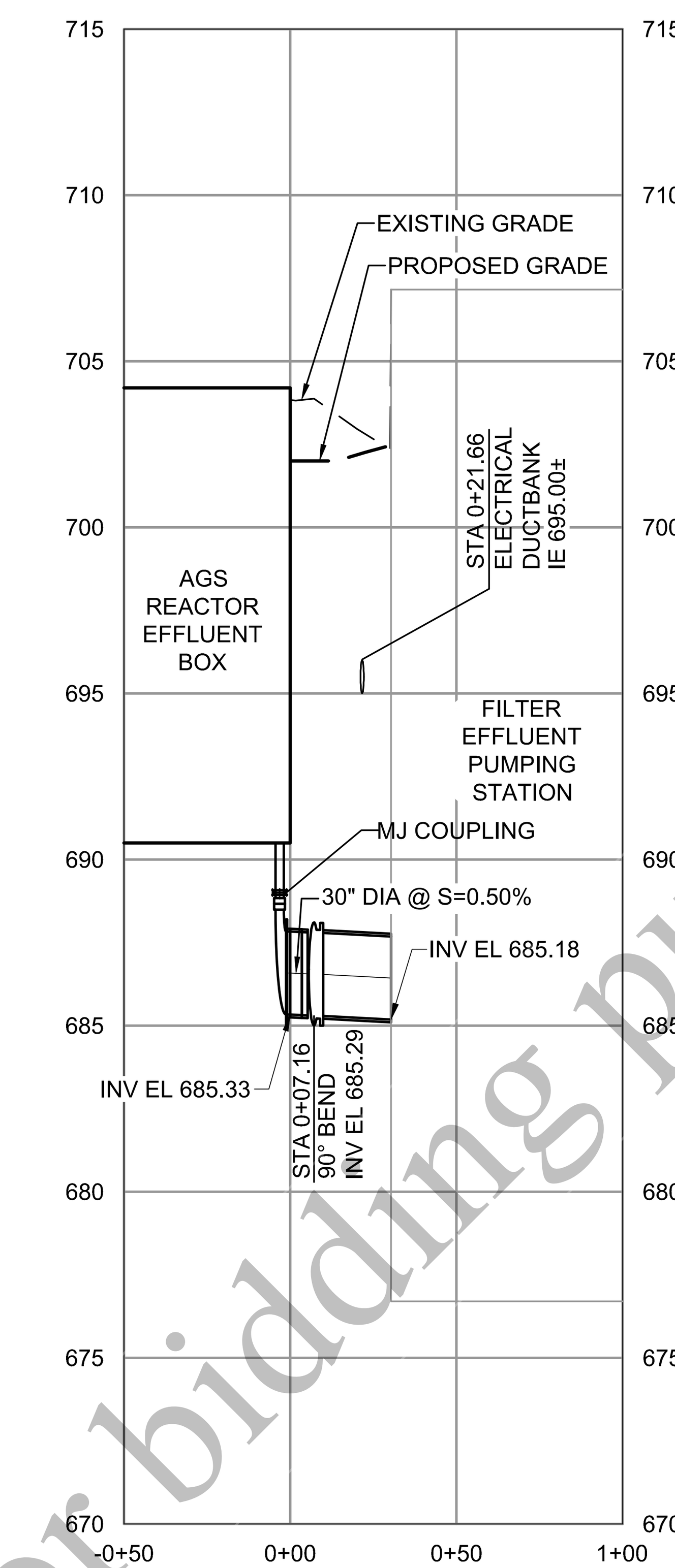
GRADING AND PAVING PLAN 4 OF 4

00-C-116

46 OF 163



- 36" AND 42" AGS INFLUENT PROFILE
00-C-109, 111 SCALE : HOR 1" = 50'
VER 1" = 5'



- 30" AGS EFFLUENT PROFILE
00-C-110 SCALE : HOR 1" = 50'
VER 1" = 5'

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PROJECT NO.:	411752

GENERAL

CIVIL

PIPING PROFILES 1 OF 2

00-C-301

47 OF 163

5' 0 5' 10'
1"=5'

50' 0 50' 100'
1"=50'

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

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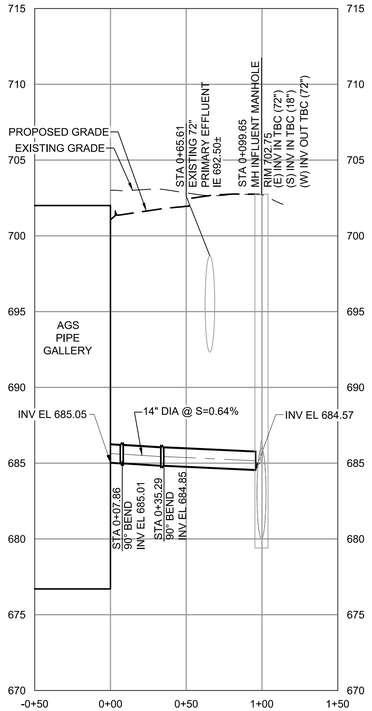
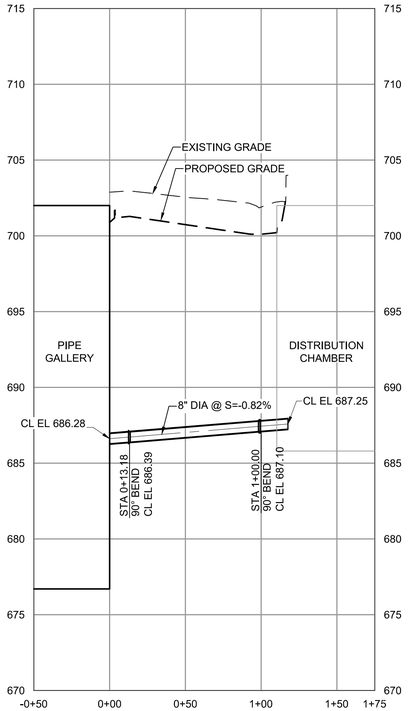
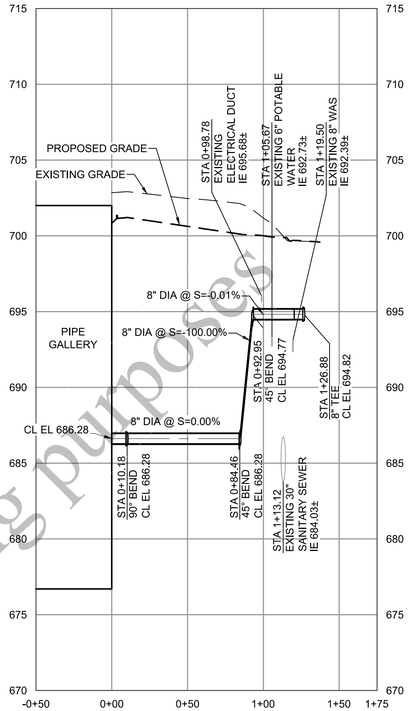
D11000



- 00-C-109 14" WLC BYPASS PROFILE
SCALE : HOR 1" = 50'
VER 1" = 5'



- 00-C-109 8" WAGS/WLC PUMP DISCHARGE PROFILE
SCALE : HOR 1" = 50'
VER 1" = 5'



- 00-C-109 8" WAGS PUMP DISCHARGE PROFILE
SCALE : HOR 1" = 50'
VER 1" = 5'

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AEROBIC GRANULAR SLUDGE - PHASE 1

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PROJECT NO.:	411752

GENERAL

CIVIL

PIPING PROFILES 2 OF 2

00-C-302

48 OF 163

5' 0 5' 10'
1"=5'

50' 0 50' 100'
1"=50'

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

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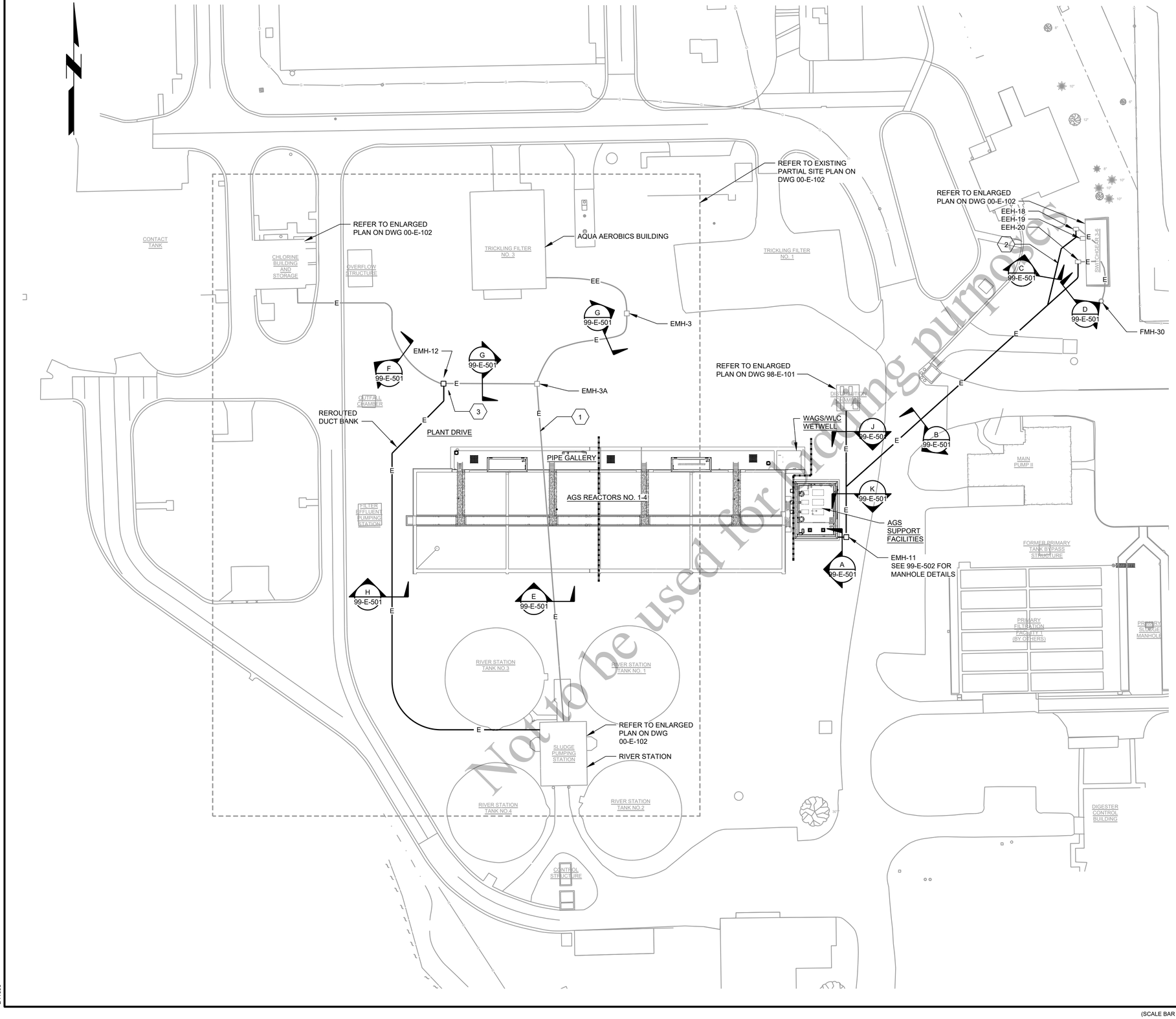

GENERAL SHEET NOTES

1. SEE DRAWINGS 00-E-001 AND 00-E-002 FOR LEGENDS, ABBREVIATIONS AND NOTES.

SHEET KEYNOTES

1. CONTRACTOR SHALL DEMOLISH EXISTING DUCT BANK BETWEEN EXISTING MANHOLE EMH-3A AND THE RIVER STATION. ALL CIRCUITS WITHIN SHALL BE REPLACED, TERMINATED, TESTED, AND PLACED BACK INTO SERVICE UTILIZING NEW CABLES IN NEW "REROUTED" DUCT BANK. FOR EXISTING CABLE DETAILS SEE 99-E-501. ANY OPENINGS IN EMH-3A FROM THE DEMOLISHED DUCT BANK SHALL BE SEALED FLUSH WITH CONCRETE.
2. CONTRACTOR SHALL CONNECT DUCT BANK GROUNDING CONDUCTORS TO EXISTING GROUNDING GRID AT SWITCHGEAR 3-6.
3. CONTRACTOR SHALL REMOVE A SECTION OF THE EXISTING DUCT BANK AND INSTALL A NEW MANHOLE. THE EXISTING DUCT BANK AND NEW DUCT BANK SHALL BE CONNECTED TO THIS NEW MANHOLE.

   EXISTING DUCT BANK AT NEW MANHOLE LOCATION IS THREE 4" DIAMETER CONDUITS WIDE AND TWO 4" CONDUITS TALL (APPROX 2'-0" W X 1.5" H). CONTRACTOR SHALL SAW CUT NO MORE THAN 6' WIDE SECTION FOR REMOVAL OF DUCT BANK SECTION. EXCAVATION SHALL BE SUPPORTED AS NEEDED. PLACE AND COMPACT STONE BENEATH, POUR SLAB BENEATH, FORM WALLS AROUND EXISTING DUCT BANK, CAST WALLS, REMOVE FORMS, FORM AND INSTALL TOP SLAB WITH 36" DIAMETER FRAME.

   EXISTING INFLUENT 72" INFLUENT SEWER IS APPROXIMATELY 18 TO 20-FT DEEP IN THIS AREA.

40' 20' 0 40' 80'

1"=40'

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

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Four Rivers Sanitation Authority

AEROBIC GRANULAR SLUDGE - PHASE 1

REVISIONS AND RECORD OF ISSUE

DESIGNED:	EJB
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APPROVED:	EJB
DATE:	12/20/2022
PROJECT NO.:	411752

GENERAL

ELECTRICAL

SITE PLAN

00-E-101

PLOTTED: 12/16/2022 11:02:46 AM
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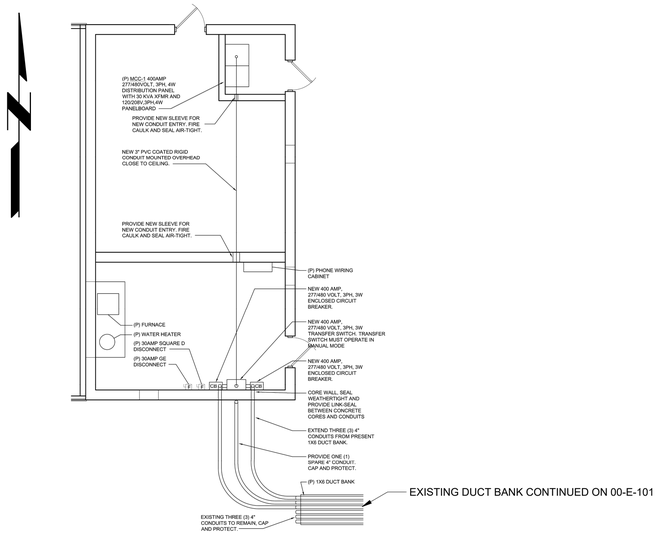
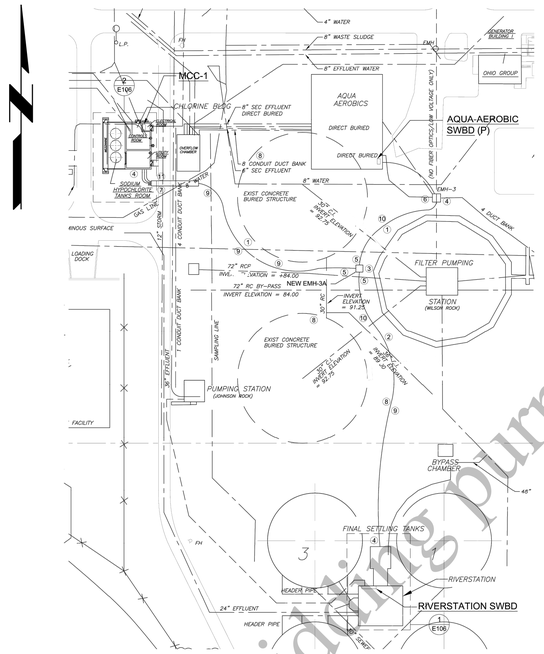
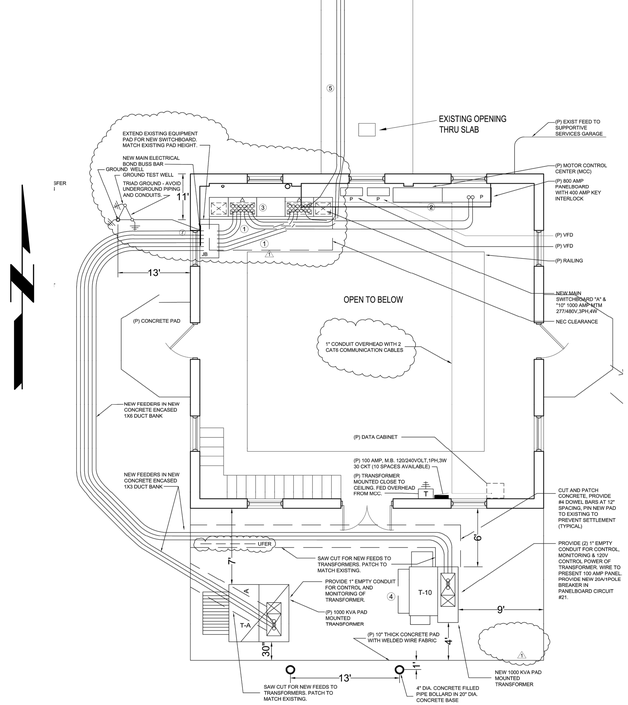


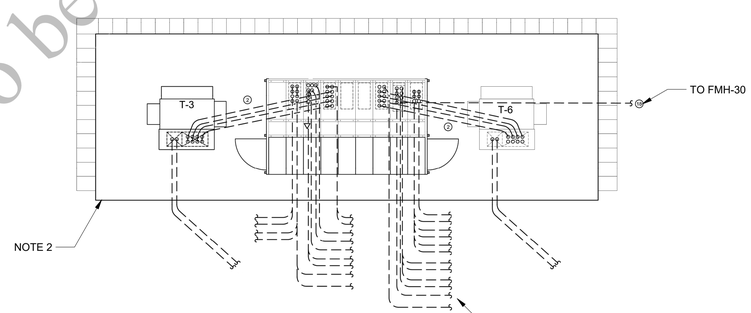
EXISTING CHLORINE BUILDING AND STORAGE ELECTRICAL DISTRIBUTION
NOT TO SCALE



EXISTING PARTIAL SITE PLAN
NOT TO SCALE



EXISTING RIVER STATION BURIED ELECTRICAL DISTRIBUTION
NOT TO SCALE



EXISTING SWITCHGEAR 3-6 PLAN
NOT TO SCALE

GENERAL SHEET NOTES

1. THE PLAN DRAWING EXCERPTS ON THIS SHEET ARE INTENDED TO INFORM CONTRACTOR OF THE LOCATION OF EXISTING EQUIPMENT AND STRUCTURES INVOLVED IN THE DUCT BANK RELOCATION AS DETAILED ON DRAWING 00-E-101. THIS SHEET IS FOR REFERENCE ONLY AND DOES NOT CONVEY ADDITIONAL SCOPE.
2. SWITCHGEAR 3-6 FEEDS NEW AGS FACILITIES. IT IS NOT INVOLVED IN THE DUCT BANK RELOCATION.

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AEROBIC GRANULAR SLUDGE - PHASE 1

REVISIONS AND RECORD OF ISSUE

DESIGNED:	EJB
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CHECKED:	SDS
APPROVED:	EJB
DATE:	12/20/2022
PROJECT NO.:	411752

AGS SUPPORT FACILITIES

ELECTRICAL

EXISTING ELECTRICAL PARTIAL PLANS

00-E-102

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

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FROM FILE: C:\pw_working\bvw_americas\d1149538\00-E-102.dwg

LIFE SAFETY LEGEND

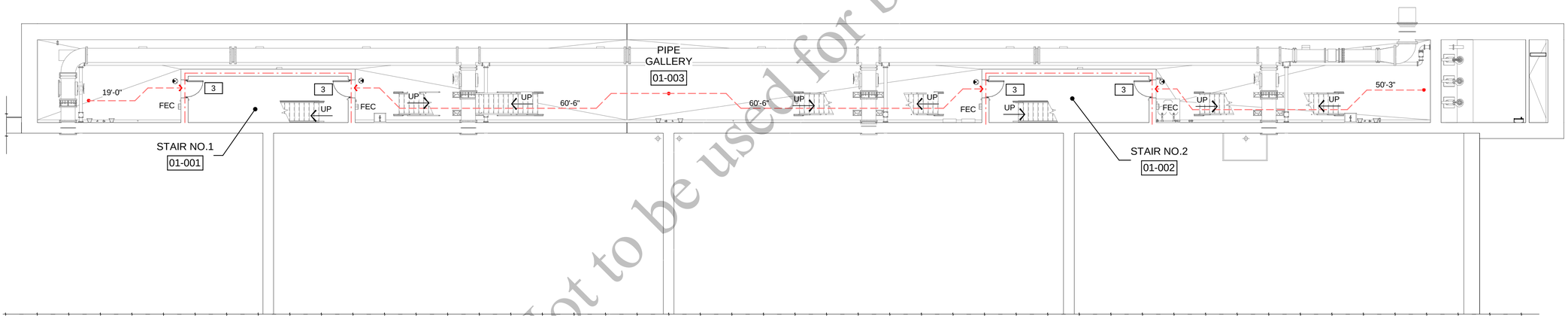
	WALL MOUNTED FIRE EXTINGUISHER CABINET (FEC)
X'-X"	PATH OF EGRESS TRAVEL
100 SF/PERSON 1 F-2	OCCUPANTS PER SF OCCUPANT LOAD OCCUPANCY CLASSIFICATION
5	CUMULATIVE OCCUPANT LOAD
	EXIT
AL	ACTIVE LEAF
	1 HOUR FIRE BARRIER

GENERAL SHEET NOTES

BUILDING CODE ANALYSIS

BUILDING CODES:
2015 INTERNATIONAL BUILDING CODE WITH AMENDMENTS

AGS REACTORS AND PIPE GALLERY	
OCCUPANCY	F-1 MODERATE HAZARD FACTORY INDUSTRIAL
TYPE OF CONSTRUCTION	II-B NON COMBUSTIBLE
ACTUAL AREA	3,373 SF
ACTUAL HEIGHT	16'
ALLOWABLE AREA	15,500 SF
ALLOWABLE HEIGHT	55'
DESIGN OCCUPANT LOAD	12
NUMBER OF STORIES	1
ALLOWABLE NUMBER OF STORIES	2
MINIMUM EXITS REQUIRED	3
NUMBER OF EXITS	4
ADA ACCESSIBILITY	EXEMPT PER SECTION 1103.2.9
FIRE SEPARATION	1-HOUR FIRE BARRIERS AROUND EGRESS STAIRS
FIRE SPRINKLERS	REQUIRED OWNER TO SEEK VARIANCE
MAX EXIT TRAVEL DISTANCE	300'
ENERGY CODE COMPLIANCE	WALLS - R-5.7 C.I. ROOF - R-25 C.I.
MAXIMUM COMMON PATH OF EGRESS TRAVEL	75'



REACTORS, SEE STRUCT DRAWINGS FOR CONTINUATION

GALLERY - LIFE SAFETY PLAN

3/32" = 1'-0"

12' 8' 4' 0' 10' 20'

3/32" = 1'-0"

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

B&V Design, LLC
Kansas City, Missouri
ILLINOIS PROFESSIONAL
DESIGN FIRM - 184007283

Four Rivers Sanitation Authority

AEROBIC GRANULAR SLUDGE - PHASE 1

REVISIONS AND RECORD OF ISSUE

DESIGNED:	RAB
DETAILED:	TMB
CHECKED:	PDR
APPROVED:	PDR
DATE:	12/20/2022
PROJECT NO.:	411752

AGS REACTORS AND PIPE GALLERY

ARCHITECTURAL

REACTORS AND GALLERY LIFE SAFETY PLAN AND CODE ANALYSIS

01-A-001

PLOTTED: 12/16/2022 11:47:56 AM
FILE: BIM 360://409469 - Aerobic Granular Sludge Phase 1/409469 - AGS.rvt
D11000

GENERAL SHEET NOTES

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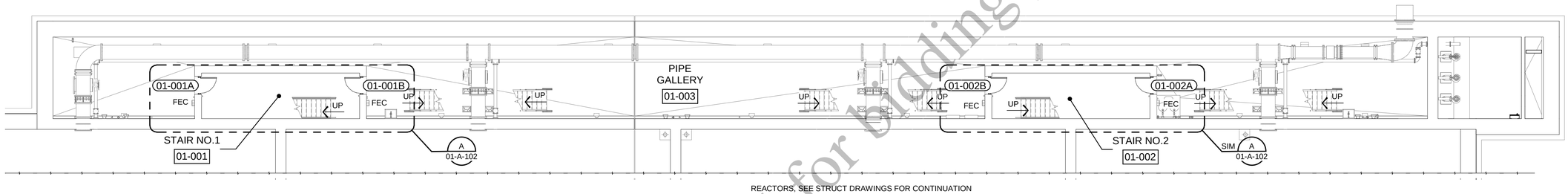
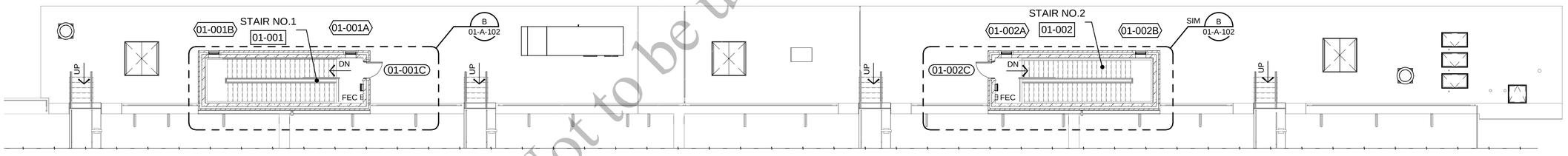
Kansas City, Missouri
ILLINOIS PROFESSIONAL
DESIGN FIRM - 184007283



REACTORS, SEE STRUCT DRAWINGS FOR CONTINUATION

FOUNDATION LEVEL OVERALL FLOOR PLAN

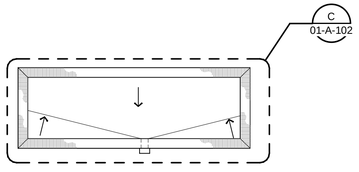
3/32" = 1'-0"

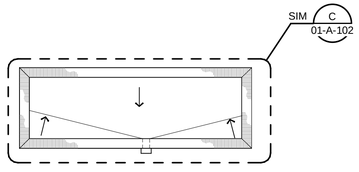


REACTORS, SEE STRUCT DRAWINGS FOR CONTINUATION

GALLERY TOP OVERALL FLOOR PLAN

3/32" = 1'-0"





STAIR NO.1 & NO.2 ROOF PLANS

3/32" = 1'-0"

12' 8' 4' 0' 10' 20'

3/32" = 1'-0"

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

Four Rivers Sanitation Authority

AEROBIC GRANULAR SLUDGE - PHASE 1

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AGS REACTORS AND PIPE GALLERY

ARCHITECTURAL

AGS REACTORS AND GALLERY OVERALL PLANS

01-A-101

52 OF 163

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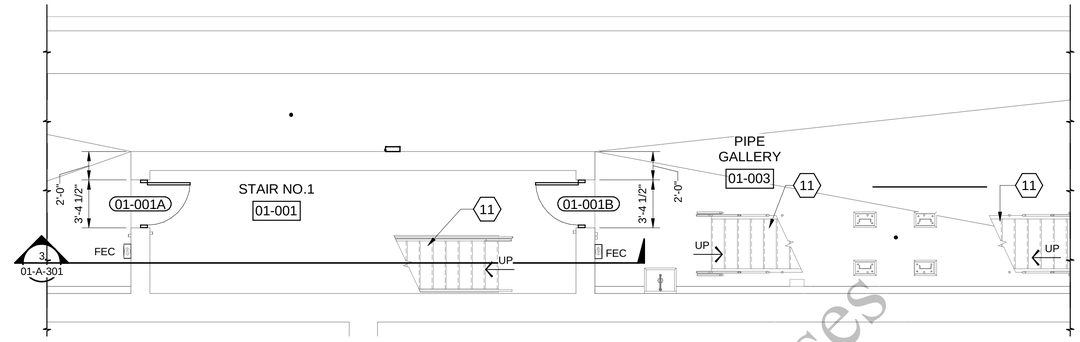
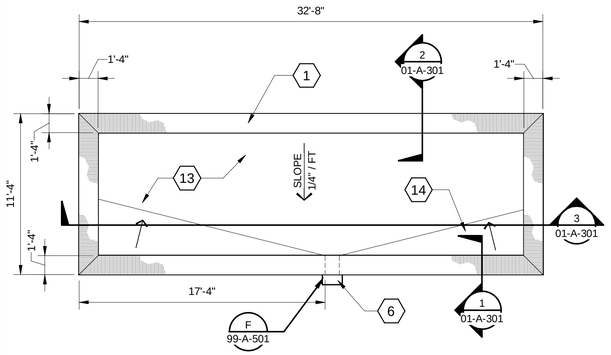
D11000



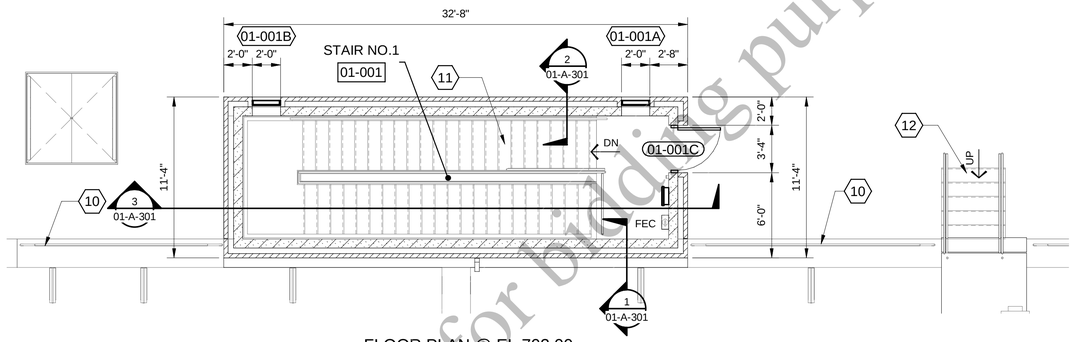
FLOOR PLAN

3/16" = 1'-0"



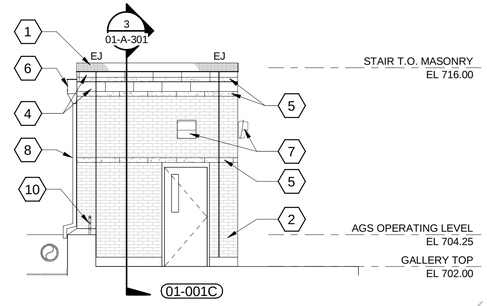
ROOF PLAN

3/16" = 1'-0"



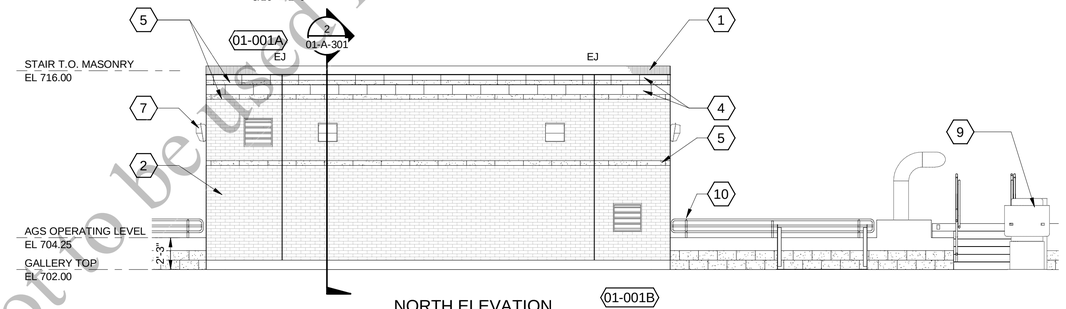
FLOOR PLAN @ EL 702.00

3/16" = 1'-0"



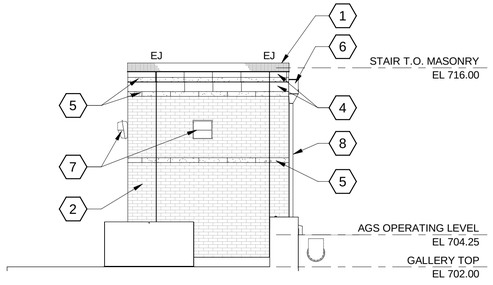
EAST ELEVATION

3/16" = 1'-0"



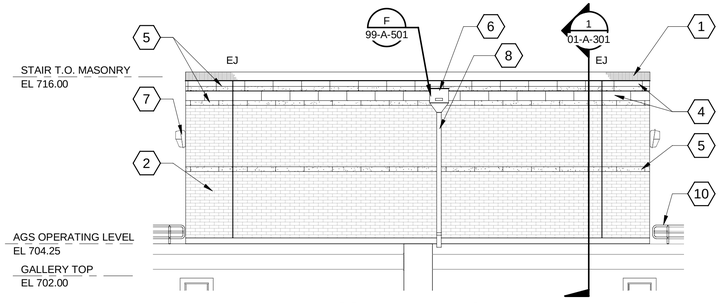
NORTH ELEVATION

3/16" = 1'-0"



WEST ELEVATION

3/16" = 1'-0"



SOUTH ELEVATION

3/16" = 1'-0"

GENERAL SHEET NOTES

1. VENEER FACE BRICK EXPANSION JOINT (EJ). SEE STRUCTURAL DRAWINGS FOR BACKUP MASONRY UNITS (CMU) WALL CONTROL JOINT (CJ) WALL CONTROL JOINT LOCATIONS.
2. STAIR NO.2 MASONRY WALLS AND ROOF DESIGN TO BE SAME AS STAIR NO.1 SHOWN ON DRAWING.
3. SHERWIN WILLIAMS STAIN COLORS:
   ACCENT BANDS (4",8", AND 12"): SW6107 NOMADIC DESERT
   UPPER DARK COLOR: SW7675 SEAL SKIN

SHEET KEYNOTES

1. PREFINISHED METAL COPING.
2. FACE BRICK - COLOR TO MATCH EXISTING PRIMARY FILTRATION FACILITY.
3. NOT USED.
4. 8 x 24 SMOOTHFACE MASONRY UNITS - SIZE, PATTERN AND COLOR TO MATCH EXISTING PRIMARY FILTRATION FACILITY.
5. 4 x 24 ROCKFACE MASONRY UNITS - SIZE, PATTERN AND COLOR TO MATCH EXISTING PRIMARY FILTRATION FACILITY.
6. PREFINISHED METAL CONDUCTOR HEAD WITH 16" x 8" OPENING.
7. LIGHT FIXTURE (TYP) - SEE ELECTRICAL DRAWINGS.
8. PREFINISHED METAL DOWNSPOUT.
9. HVAC EQUIPMENT - SEE HVAC DRAWINGS.
10. GUARDRAIL - SEE STRUCTURAL DRAWINGS.
11. METAL STAIRS - SEE STRUCTURAL DRAWINGS.
12. CONCRETE STAIRS - SEE STRUCTURAL DRAWINGS.
13. SINGLE-PLY ROOFING MEMBRANE OVER 1/2" COVER BOARD AND TAPERED INSULATION R-30.
14. CRICKET SYSTEM (TYP).

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Four Rivers Sanitation Authority

AEROBIC GRANULAR SLUDGE - PHASE 1

REVISIONS AND RECORD OF ISSUE

DESIGNED:	RAB
DETAILED:	TMB
CHECKED:	PDR
APPROVED:	PDR
DATE:	12/20/2022
PROJECT NO.:	411752

AGS REACTORS AND PIPE GALLERY

ARCHITECTURAL

GALLERY STAIR NO.1 PLANS AND ELEVATIONS

6' 4' 2' 0' 5' 10'

3/16" = 1'-0"

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

01-A-102

53 OF 163

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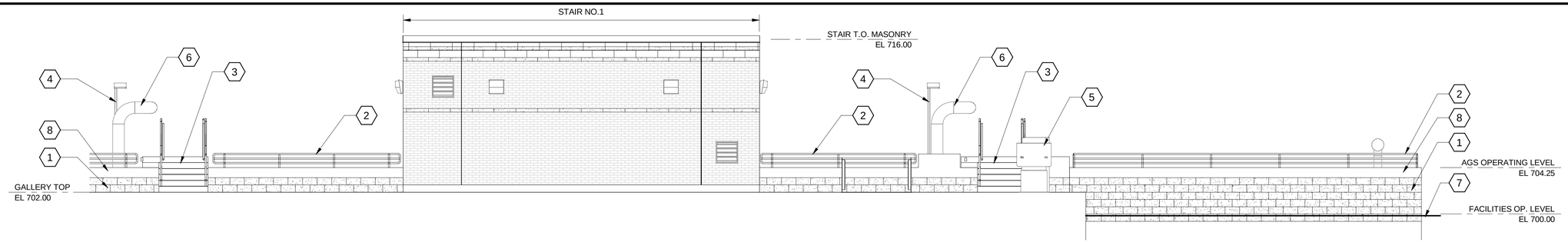
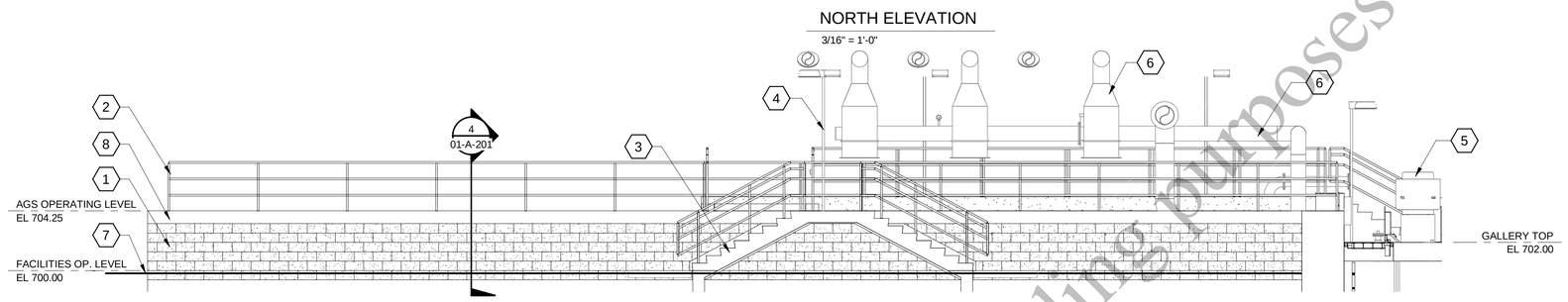


NORTH ELEVATION

3/16" = 1'-0"

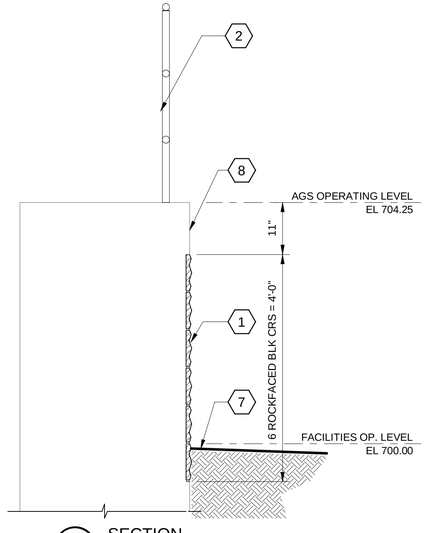


EAST ELEVATION

3/16" = 1'-0"

WEST ELEVATION

3/16" = 1'-0"



4 01-A-201 SECTION

3/4" = 1'-0"

GENERAL SHEET NOTES

1. SHERWIN WILLIAMS STAIN COLORS:
   ROCKFACE FORM LINER SCOTT SYSTEM #1516: SW6108 LATTE
   SMOOTH MASONRY UNIT LINER SCOTT SYSTEM #1500:
   SW6115 TOTALLY TAN

SHEET KEYNOTES

1. CAST IN PLACE CONCRETE BASIN WALL W/ FORMLINER - SIZE, PATTERN AND COLOR TO MATCH EXISTING PRIMARY FILTRATION FACILITY.
2. GUARDRAIL - SEE STRUCTURAL DRAWINGS.
3. CONCRETE STAIRS - SEE STRUCTURAL DRAWINGS.
4. LIGHT FIXTURE (TYP) - SEE ELECTRICAL DRAWINGS.
5. HVAC EQUIPMENT - SEE HVAC DRAWINGS.
6. MECHANICAL EQUIPMENT - SEE MECHANICAL DRAWINGS.
7. FINISHED GRADE - CIVIL DRAWINGS.
8. LIGHT/MEDIUM SANDBLAST BAND.

12" 6" 0' 1' 2' 3'

3/4" = 1'-0"

6' 4' 2' 0' 5' 10'

3/16" = 1'-0"

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

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ILLINOIS PROFESSIONAL
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AGS REACTORS AND PIPE GALLERY

ARCHITECTURAL

REACTOR PARTIAL ELEVATIONS

01-A-201

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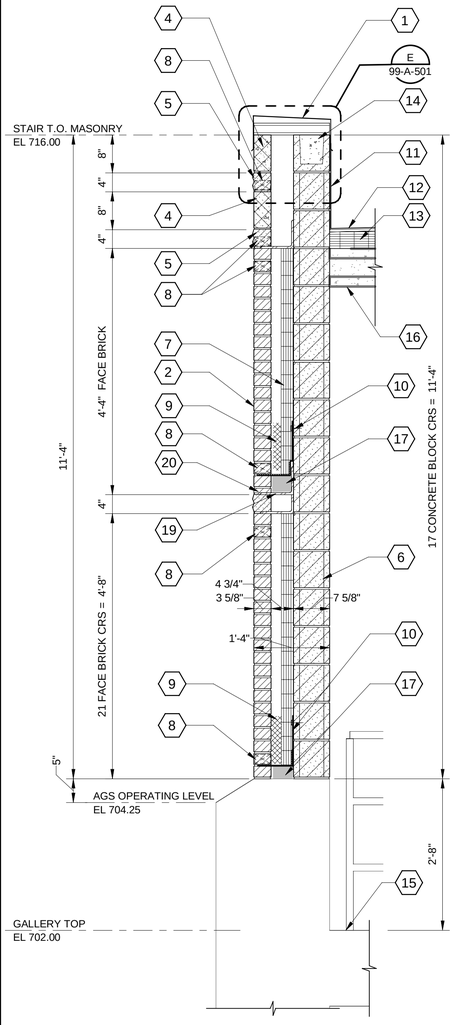
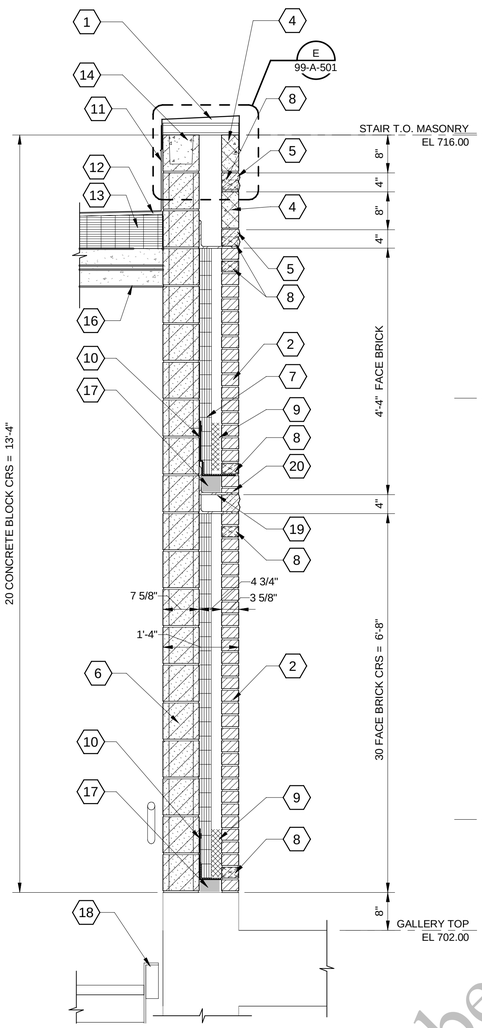
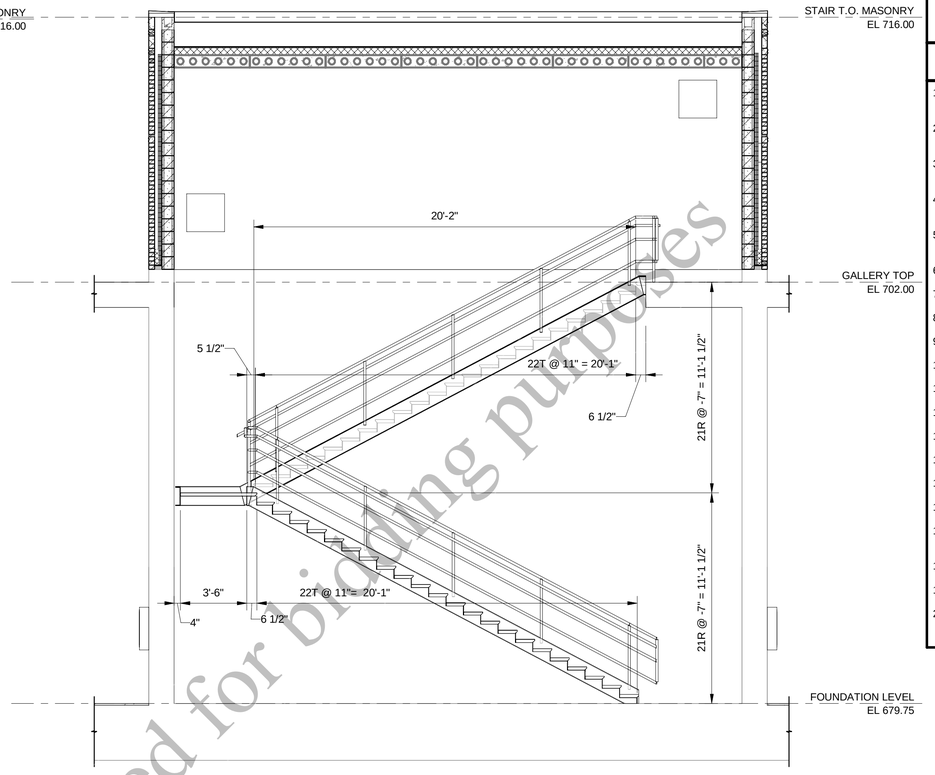


1 SECTION
01-A-102 3/4" = 1'-0"



2 SECTION
01-A-102 3/4" = 1'-0"



3 SECTION
01-A-102 1/4" = 1'-0"

GENERAL SHEET NOTES

1. FOR VERTICAL REINFORCING AND BOND BEAMS IN MASONRY DESIGN - SEE STRUCTURAL DRAWINGS.
2. FOR HORIZONTAL JOINT REINFORCING - SEE SPECIFICATION SECTION 042000.

SHEET KEYNOTES

1. PREFINISHED METAL COPING - SIZE, PATTERN AND COLOR TO MATCH EXISTING PRIMARY FILTRATION FACILITY.
2. FACE BRICK - SIZE, PATTERN AND COLOR TO MATCH EXISTING PRIMARY FILTRATION FACILITY.
3. 8 x 16 ROCKFACE MASONRY UNITS - SIZE, PATTERN AND COLOR TO MATCH EXISTING PRIMARY FILTRATION FACILITY.
4. 8 x 24 SMOOTHFACE MASONRY UNITS - SIZE, PATTERN AND COLOR TO MATCH EXISTING PRIMARY FILTRATION FACILITY.
5. 4 x 24 ROCKFACE MASONRY UNITS - SIZE, PATTERN AND COLOR TO MATCH EXISTING PRIMARY FILTRATION FACILITY.
6. 8" CONCRETE MASONRY UNIT.
7. 2 1/2" RIGID INSULATION R-12.
8. WEEP VENTS @ 24" 0.C.
9. 10" HIGH x 2" THICK MORTAR NET.
10. TOTALFLASH CAVITY-WALL DRAINAGE SYSTEM.
11. SINGLE-PLY ROOFING MEMBRANE EXTEND OVER PARAPET WALL.
12. 1/2" COVER BOARD.
13. TAPERED INSULATION R-30.
14. BOND BEAM - SEE STRUCTURAL DRAWINGS.
15. FINISHED FLOOR AS SCHEDULED.
16. HOLLOW CORE SLAB - SEE STRUCTURAL DRAWINGS.
17. MORTAR FILL UNDER THE TOTALFLASH CAVITY-WALL DRAINAGE SYSTEM.
18. METAL STAIRS - SEE STRUCTURAL DRAWINGS.
19. BRICK SHELF ANGLE - SEE DETAIL D/99-A-501.
20. CUT FACE BRCIK AS REQUIRED.

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AEROBIC GRANULAR SLUDGE - PHASE 1

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AGS REACTORS AND PIPE GALLERY

ARCHITECTURAL

WALL SECTIONS

01-A-301

55 OF 163

12" 6" 0' 1' 2' 3'
3/4" = 1'-0"

4' 2' 0' 4' 8'
1/4" = 1'-0"

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

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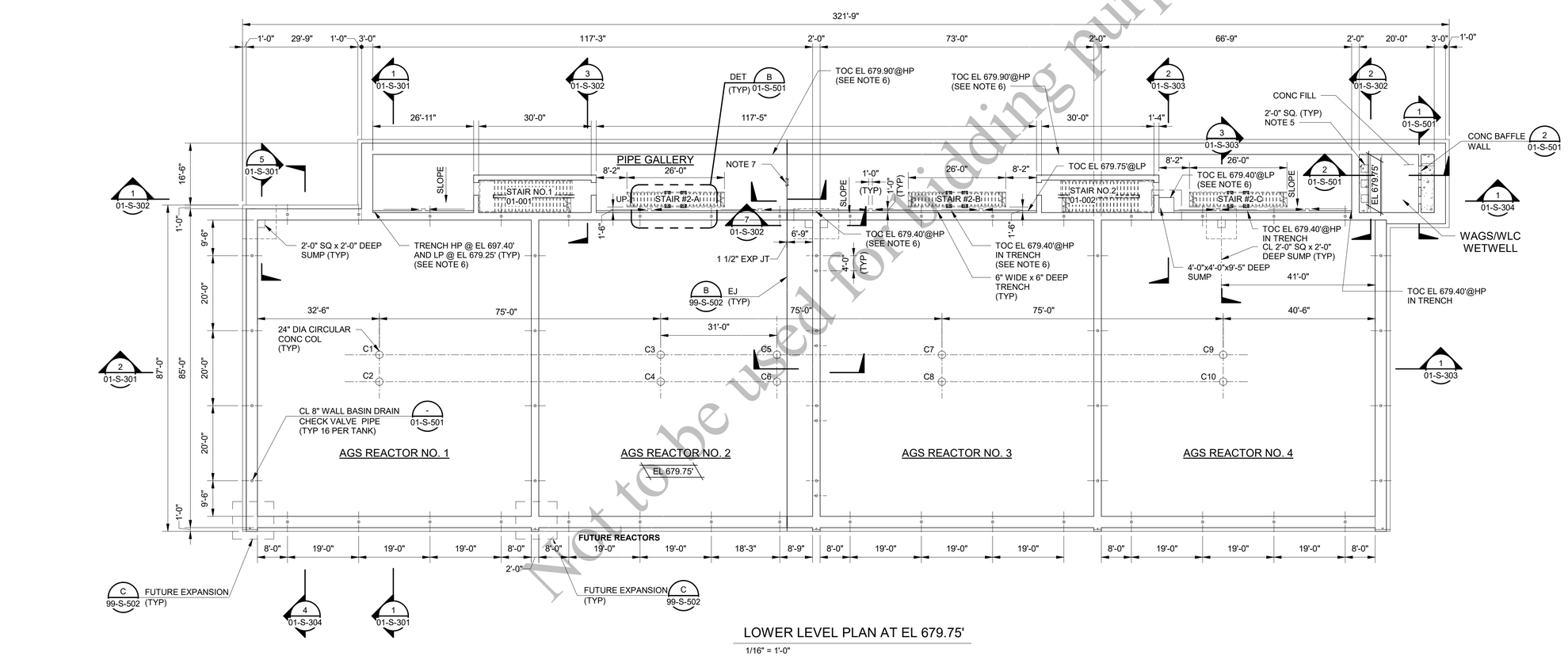
GENERAL SHEET NOTES:

1. FOR GENERAL STRUCTURAL NOTES, REFER TO SHEET 00-S-001.
2. FOR STRUCTURAL ABBREVIATIONS, REFER TO SHEET 00-S-002.
3. FOR OTHER NOTES, REFER TO SHEET 01-S-103.
4. FOR PIPE SUPPORT TYPE AND LOCATIONS SEE PIPING DWGS AND SCHEDULE ON SHEET 99-M-502.
5. COORDINATE PUMP BASE DIMENSIONS WITH PUMP SUPPLIER.
6. HP, LP AND SLOPES SHOWN IS APPROXIMATE. SEE PLUMBING DWG FOR REQUIRED ELEVATIONS AND SLOPE.
7. AT WALKING SURFACES, EXPANSION JOINT SHALL BE COVERED WITH STAINLESS STEEL PLATE. EXPANSION JOINT COVER PLATE SHALL BE MINIMUM 1/4" THICK AS MANUFACTURED BY SLIPNOT OR APPROVED EQUAL.



LOWER LEVEL PLAN AT EL 679.75'

1/16" = 1'-0"

16' 12' 8' 4' 0' 16' 32'

1/16" = 1'-0"

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

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AEROBIC GRANULAR SLUDGE - PHASE 1

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AGS REACTORS AND PIPE GALLERY

STRUCTURAL

AGS REACTORS AND GALLERY FOUNDATION PLAN

01-S-101

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FILE: BIM 360://409469 - Aerobic Granular Sludge Phase 1/409469 - AGS.rvt
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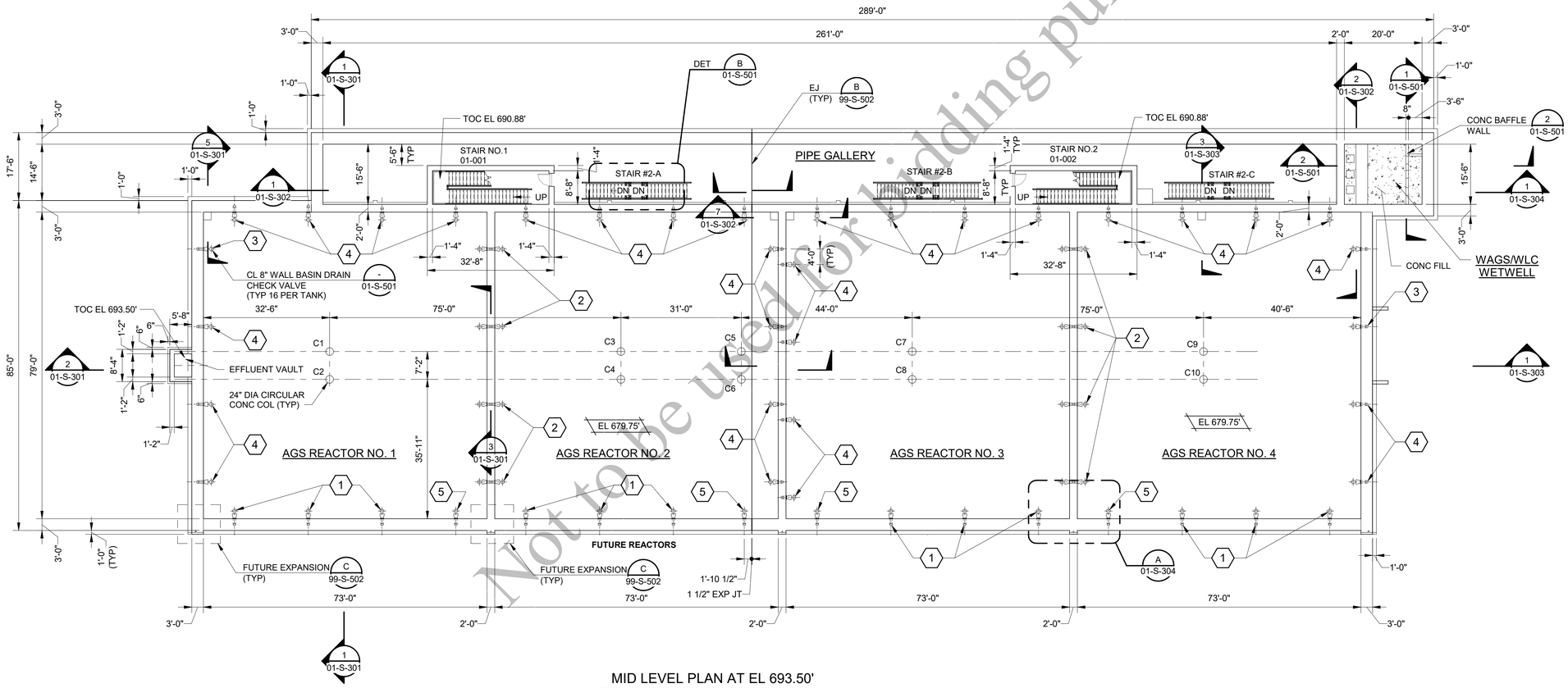
GENERAL SHEET NOTES:

1. FOR GENERAL NOTES, REFER TO SHEET 00-S-101.
2. FOR STRUCTURAL ABBREVIATIONS, REFER TO SHEET 00-S-002.
3. FOR OTHER NOTES, REFER TO SHEET 01-S-103.
4. FOR PIPE SUPPORT TYPE AND LOCATIONS SEE PIPING DRAWINGS AND SCHEDULE ON SHEET 99-M-502.

SHEET KEYNOTES

1. WALL BASIN DRAIN VALVE PER DETAIL D ON SHEET 01-S-501, AT FUTURE EXPANSION SIDE.
2. WALL BASIN DRAIN VALVE PER DETAIL C ON SHEET 01-S-501, AT COMMON WALLS SHOWN.
3. WALL BASIN DRAIN VALVE PER DETAIL H ON SHEET 01-S-501, AT RADAR LEVEL TRANSMITTER MONITORING LOCATIONS.
4. WALL BASIN DRAIN VALVE PER DETAIL A ON SHEET 01-S-501.
5. WALL BASIN DRAIN VALVE PER DETAIL E ON SHEET 01-S-501, AT FUTURE EXPANSION SIDE RADAR LEVEL TRANSMITTER MONITORING LOCATIONS.



MID LEVEL PLAN AT EL 693.50'

1/16" = 1'-0"

16' 12' 8' 4' 0' 16' 32'

1/16" = 1'-0"

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

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AGS REACTORS AND PIPE GALLERY

STRUCTURAL

AGS REACTORS AND GALLERY MID LEVEL PLAN

01-S-102

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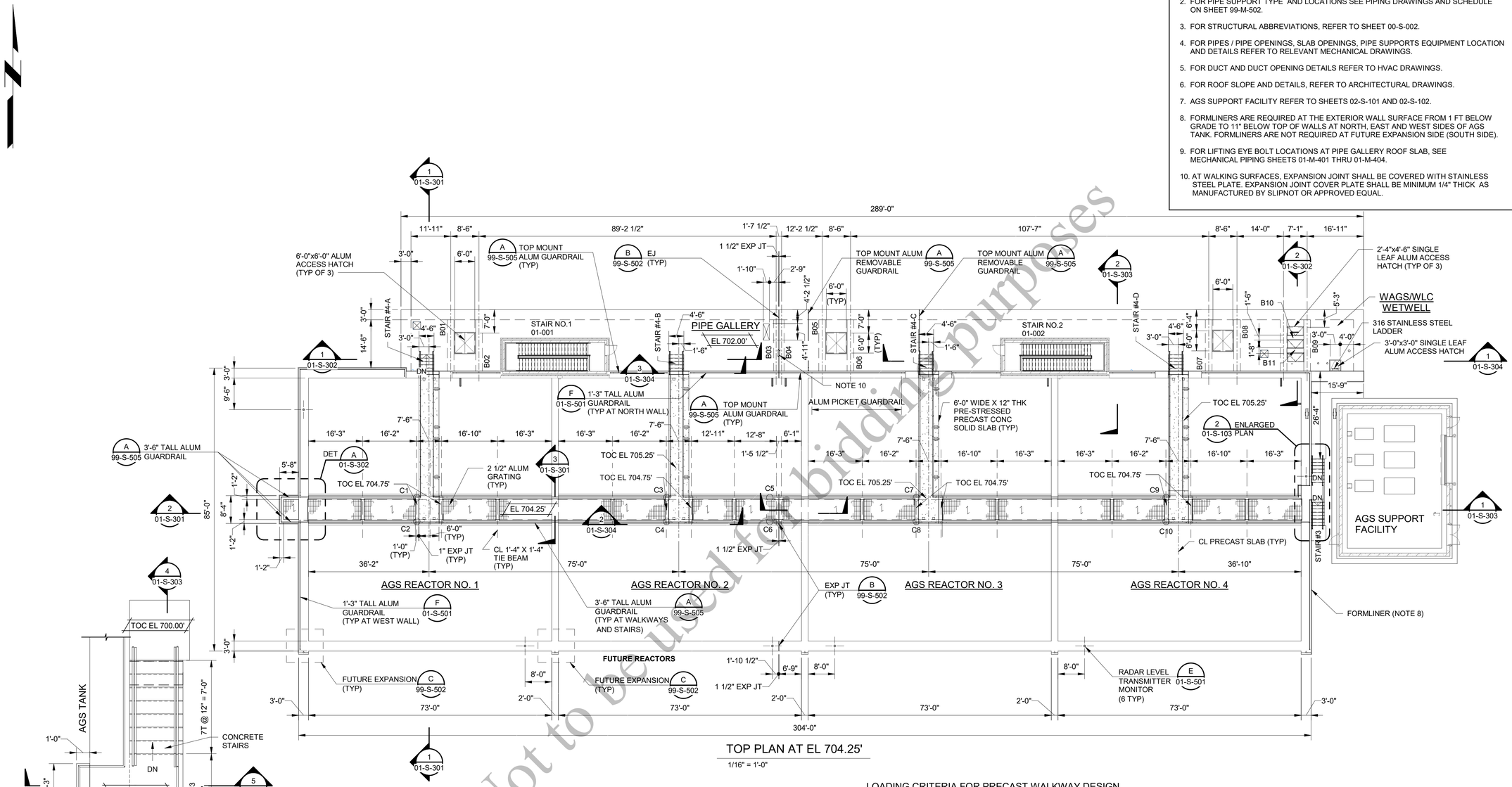
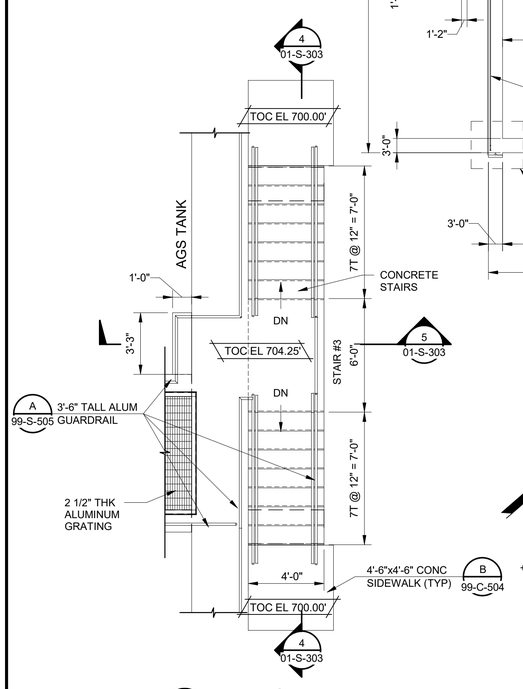
GENERAL SHEET NOTES:

1. FOR GENERAL NOTES, REFER TO SHEET 01-S-101
2. FOR PIPE SUPPORT TYPE AND LOCATIONS SEE PIPING DRAWINGS AND SCHEDULE ON SHEET 99-M-502.
3. FOR STRUCTURAL ABBREVIATIONS, REFER TO SHEET 00-S-002.
4. FOR PIPES / PIPE OPENINGS, SLAB OPENINGS, PIPE SUPPORTS EQUIPMENT LOCATION AND DETAILS REFER TO RELEVANT MECHANICAL DRAWINGS.
5. FOR DUCT AND DUCT OPENING DETAILS REFER TO HVAC DRAWINGS.
6. FOR ROOF SLOPE AND DETAILS, REFER TO ARCHITECTURAL DRAWINGS.
7. AGS SUPPORT FACILITY REFER TO SHEETS 02-S-101 AND 02-S-102.
8. FORMLINERS ARE REQUIRED AT THE EXTERIOR WALL SURFACE FROM 1 FT BELOW GRADE TO 11" BELOW TOP OF WALLS AT NORTH, EAST AND WEST SIDES OF AGS TANK. FORMLINERS ARE NOT REQUIRED AT FUTURE EXPANSION SIDE (SOUTH SIDE).
9. FOR LIFTING EYE BOLT LOCATIONS AT PIPE GALLERY ROOF SLAB, SEE MECHANICAL PIPING SHEETS 01-M-401 THRU 01-M-404.
10. AT WALKING SURFACES, EXPANSION JOINT SHALL BE COVERED WITH STAINLESS STEEL PLATE. EXPANSION JOINT COVER PLATE SHALL BE MINIMUM 1/4" THICK AS MANUFACTURED BY SLIPNOT OR APPROVED EQUAL.



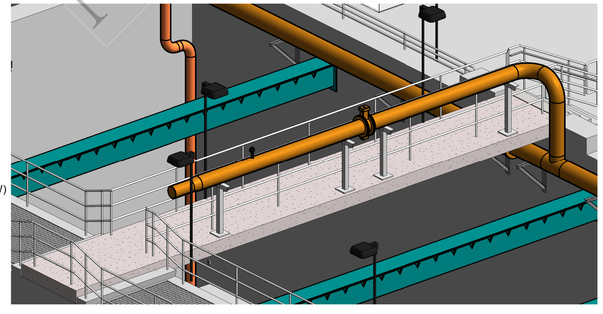
TOP PLAN AT EL 704.25'

1/16" = 1'-0"



ENLARGED PLAN

1/4" = 1'-0"



LOADING CRITERIA FOR PRECAST WALKWAY DESIGN

1. DEAD LOAD AS CALCULATED BY PRECAST MANUFACTURER.
2. LIVE LOAD : 100 PSF
3. SNOW LOAD : 34 PSF
4. VIBRATIONS CONSIDERATIONS FOR WALKWAY SHALL BE PROVIDED, MINIMUM fn = 4.4 HERTZ. CALCULATIONS PROVIDED SHALL INCLUDE DETERMINATION OF MINIMUM FUNDAMENTAL NATURAL FREQUENCY.

WALKWAY LOADING

	DEAD LOAD (KIPS)	ICE LOAD (KIPS)	WIND LOADS				
			X (KIPS)	Z (KIPS)	Mx (KIP-FT)	My (KIP-FT)	Mz (KIP-FT)
AIR PIPE SUPPORT	0.5	0.3	0.6	0.2	0.8	0.1	3
LAMP POST	0.6	0.6	1.0	1.0	6.0	0.1	6

NOTES:-

1. WIND AND ICE LOAD REACTIONS INDICATED ABOVE ARE AT CODE LEVEL ULTIMATE REACTIONS.
2. POSITIVE REACTIONS INDICATE DOWNWARD LOAD ON SLAB.
3. SEE SPECIFICATION 03 41 00 FOR OTHER DESIGN REQUIREMENTS.
4. SEE MECHANICAL AND ELECTRICAL SHEETS FOR AIR PIPE SUPPORT AND LAMP POST LOCATIONS.

4' 2' 0' 4' 8'

1/4" = 1'-0"

16' 12' 8' 4' 0' 16' 32'

1/16" = 1'-0"

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

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Four Rivers Sanitation Authority

AEROBIC GRANULAR SLUDGE - PHASE 1

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AGS REACTORS AND PIPE GALLERY

STRUCTURAL

AGS REACTORS AND GALLERY TOP PLAN

01-S-103

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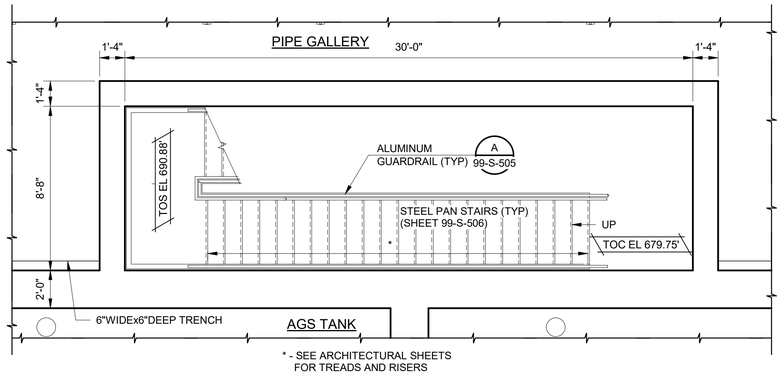
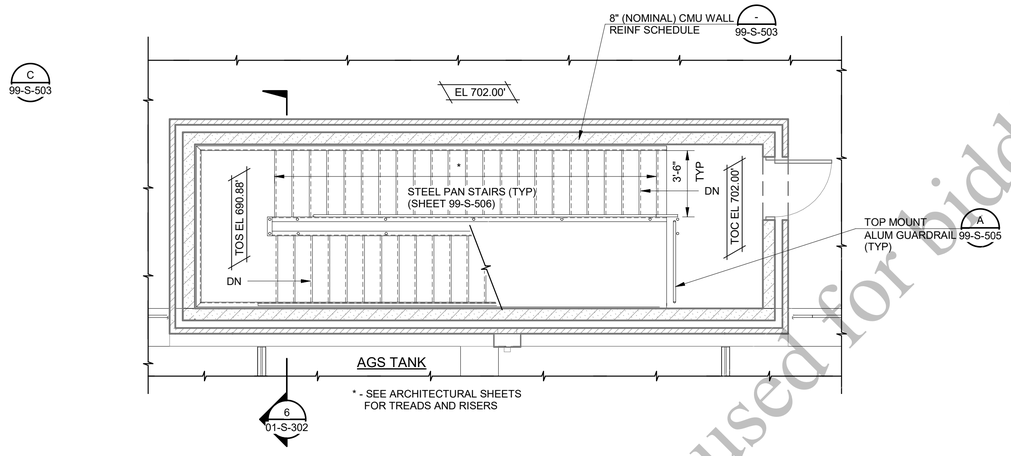


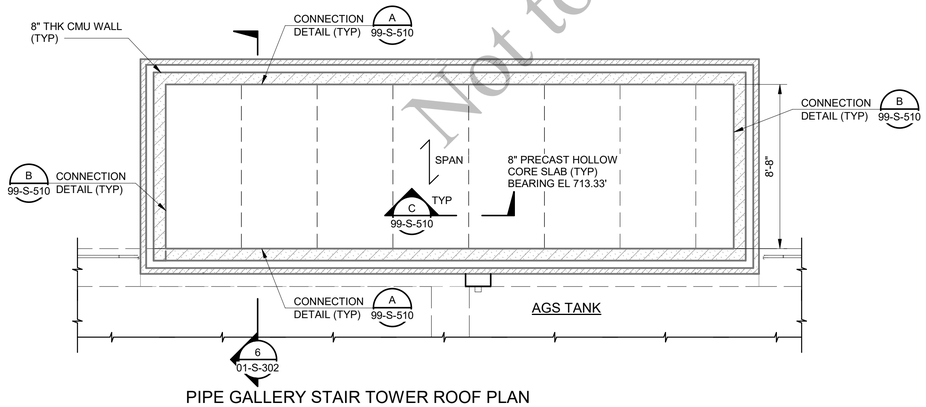
PIPE GALLERY STAIR TOWER LOWER LEVEL PLAN

1/4" = 1'-0" (STAIR NO.1 (01-001) SHOWN. STAIR NO.2 (01-002) IS SIMILAR, MIRROR IMAGE OF STAIR NO.1)



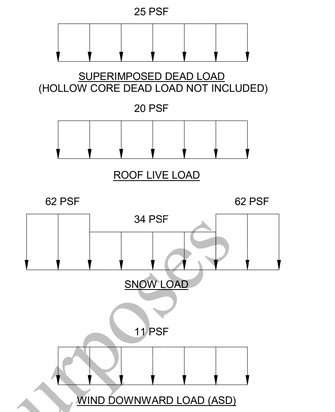
PIPE GALLERY STAIR TOWER PLAN AT EL 702.00

1/4" = 1'-0" (STAIR NO.1 (01-001) SHOWN. STAIR NO.2 (01-002) IS SIMILAR, MIRROR IMAGE OF STAIR NO.1)



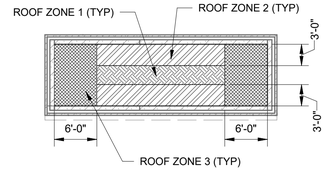
PIPE GALLERY STAIR TOWER ROOF PLAN

1/4" = 1'-0" (STAIR NO.1 (01-001) SHOWN. STAIR NO.2 (01-002) IS SIMILAR, MIRROR IMAGE OF STAIR NO.1)



A LOADING DIAGRAM FOR PRECAST HOLLOW CORE ROOF SLAB

NO SCALE



B ROOF WIND ZONES PLAN

3/32" = 1'-0"

4' 2' 0' 4' 8'

1/4" = 1'-0"

12' 8' 4' 0' 10' 20'

3/32" = 1'-0"

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

GENERAL SHEET NOTES:

1. FOR GENERAL NOTES, REFER TO SHEET 01-S-101.
2. FOR STRUCTURAL ABBREVIATIONS, REFER TO SHEET 00-S-002.
3. FOR OTHER NOTES, REFER TO SHEET 01-S-103.
4. FOR PIPE SUPPORT TYPE AND LOCATIONS SEE PIPING DRAWINGS AND SCHEDULE ON SHEET 99-M-502.

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AGS REACTORS AND PIPE GALLERY

STRUCTURAL

PIPE GALLERY STAIR TOWER PLANS

01-S-104

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FILE: BIM 360://409469 - Aerobic Granular Sludge Phase 1/409469 - AGS.rvt
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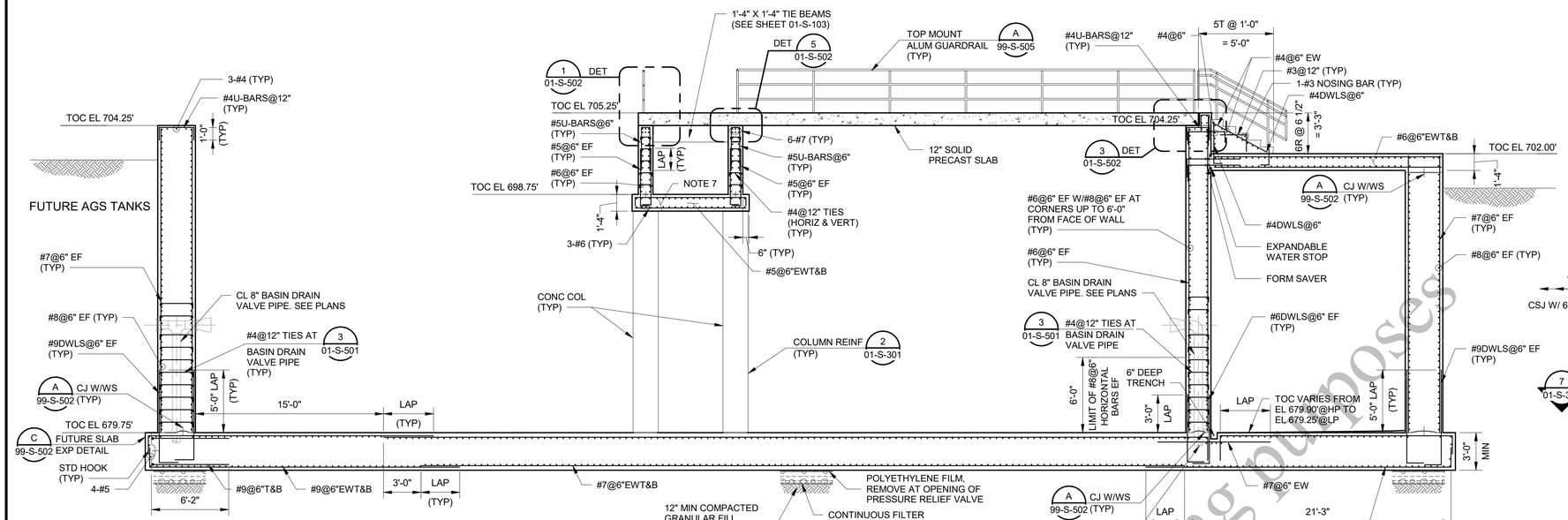
GENERAL SHEET NOTES:

1. FINISHED GRADE ELEVATION SHOWN IS APPROXIMATE. SEE CIVIL SITE PLAN FOR REQUIRED GRADE ELEVATION OF THIS LOCATION.
2. FOR GENERAL NOTES, REFER TO SHEET 01-S-101.
3. FOR STRUCTURAL ABBREVIATIONS, REFER TO SHEET 00-S-002.
4. FOR OTHER NOTES, REFER TO SHEET 01-S-103.
5. MINIMUM COVER FOR TOP REINFORCEMENT OF SLAB WITH SLOPING TOP SURFACE SHALL BE MAINTAINED AT LP ELEVATION. TOP REINFORCEMENT CAN BE LAID FLAT.
6. THE CONTRACTOR SHALL COORDINATE THE LOCATION AND SIZE OF OPENING WITH THE EQUIPMENT SUPPLIER.
7. THE SCAFFOLDING SUPPORTING THE EFFLUENT CHANNEL BOTTOM SLAB MUST REMAIN IN PLACE UNTIL THE CONCRETE SIDE WALLS HAVE ACHIEVED 28 DAY COMPRESSIVE STRENGTH.



(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

6' 4' 2' 0' 5' 10' 3/16" = 1'-0"
4' 2' 0' 4' 8' 1/4" = 1'-0"
12" 0' 1' 2' 3' 4' 5' 6' 7' 3/8" = 1'-0"
12" 9" 6" 3" 0' 1' 2' 1" = 1'-0"

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AGS REACTORS AND PIPE GALLERY

STRUCTURAL

SECTIONS AND DETAILS 1 OF 4

01-S-301

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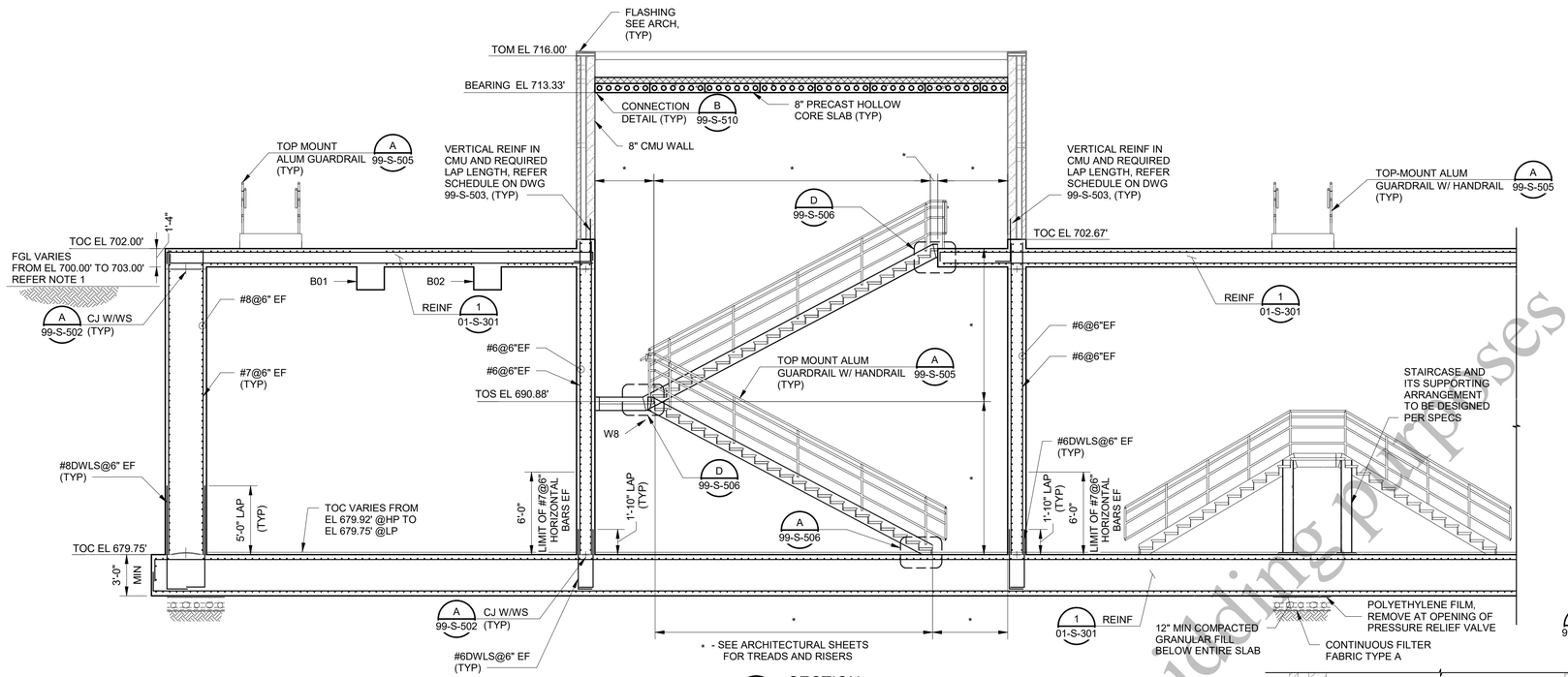
D1000

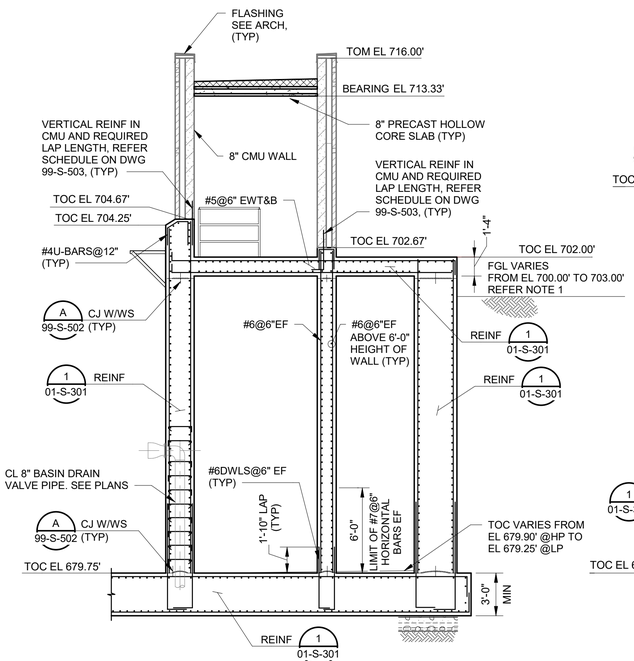
GENERAL SHEET NOTES:

1. FINISHED GRADE ELEVATION SHOWN IS APPROXIMATE. SEE CIVIL SITE PLAN FOR REQUIRED GRADE ELEVATION OF THIS LOCATION.
2. FOR GENERAL NOTES, REFER TO SHEET 01-S-101.
3. FOR STRUCTURAL ABBREVIATIONS, REFER TO SHEET 00-S-002.
4. FOR OTHER NOTES, REFER TO SHEET 01-S-103.

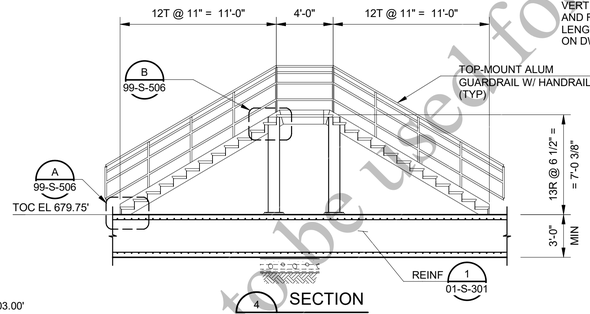


1 01-S-101 01-S-102 01-S-103 SECTION 3/16" = 1'-0"

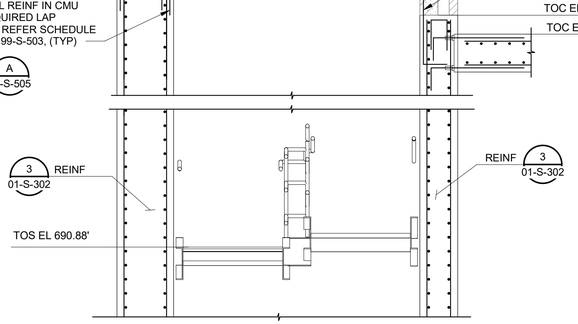
2 01-S-101 01-S-102 01-S-103 SECTION 3/16" = 1'-0"



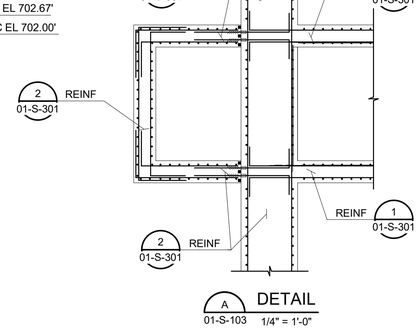
3 01-S-101 3/16" = 1'-0" SECTION



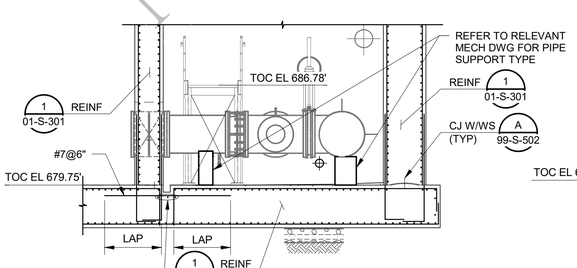
4 01-S-501 3/16" = 1'-0" SECTION



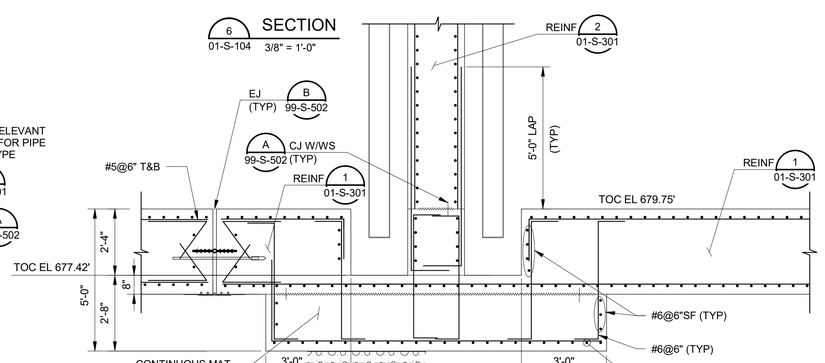
6 01-S-104 3/8" = 1'-0" SECTION



A 01-S-103 1/4" = 1'-0" DETAIL



5 01-S-501 3/16" = 1'-0" SECTION



7 01-S-101 3/8" = 1'-0" SECTION

12" 0' 1' 2' 3' 4' 5' 6' 7' 3/8" = 1'-0"

4' 2' 0' 4' 8' 1/4" = 1'-0"

6' 4' 2' 0' 5' 10' 3/16" = 1'-0"

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

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Four Rivers Sanitation Authority

AEROBIC GRANULAR SLUDGE - PHASE 1

REVISIONS AND RECORD OF ISSUE

DESIGNED:	SKA
DETAILED:	UBS
CHECKED:	CG
APPROVED:	TNG
DATE:	12/20/2022
PROJECT NO.:	411752

AGS REACTORS AND PIPE GALLERY

STRUCTURAL

SECTIONS AND DETAILS 2 OF 4

01-S-302

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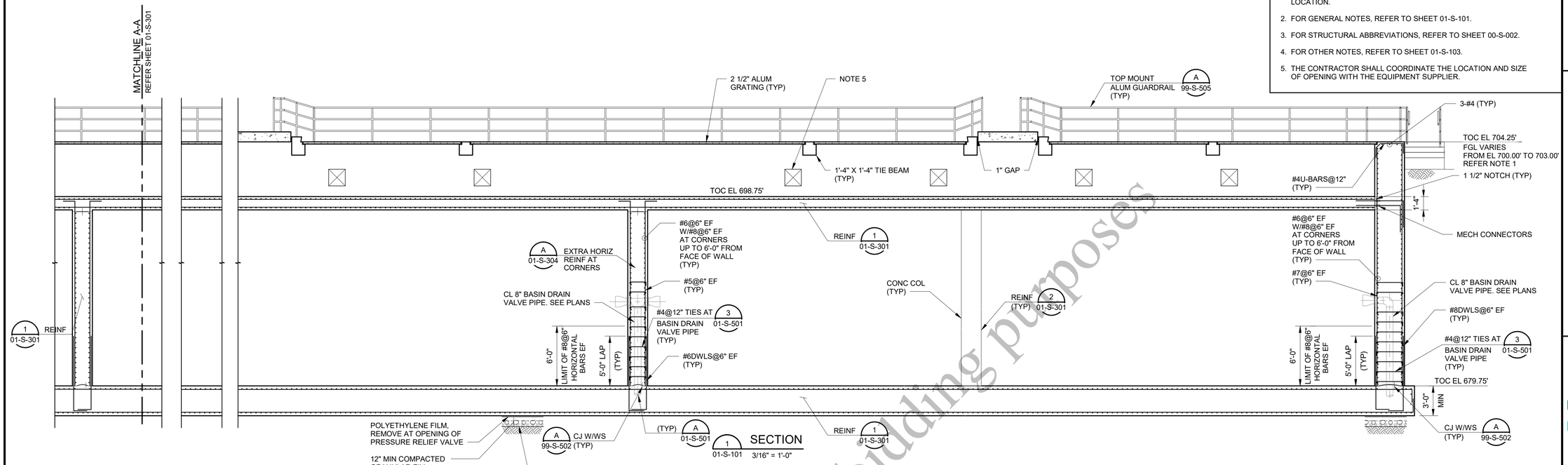
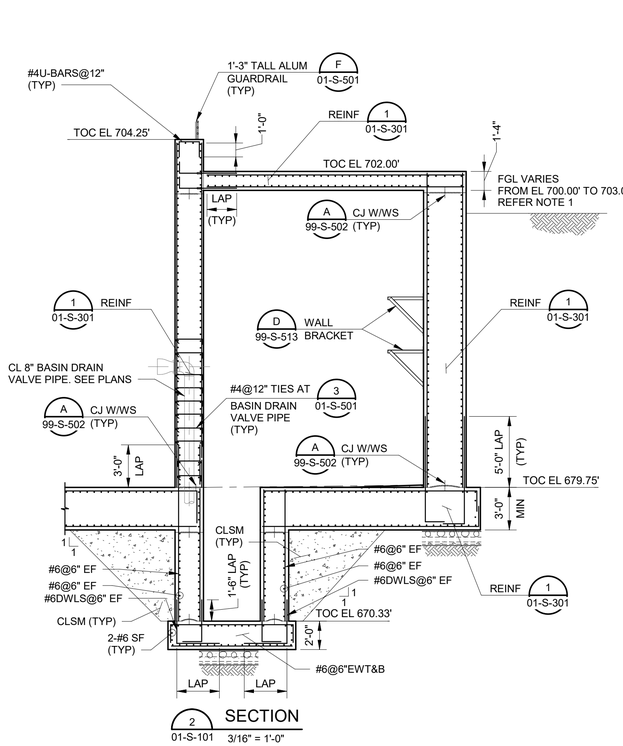
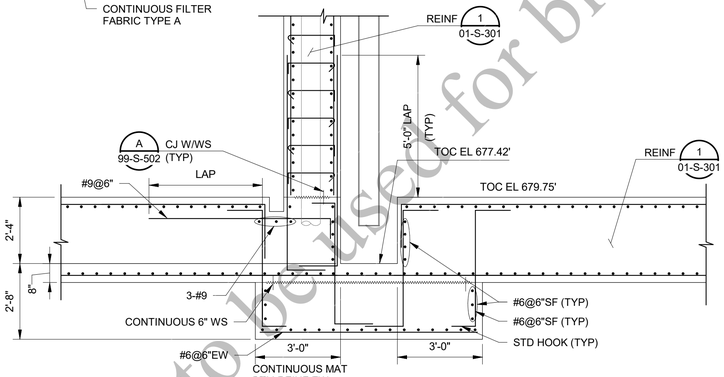
FILE: BIM 360://409469 - Aerobic Granular Sludge Phase 1/409469 - AGS.rvt
D11000

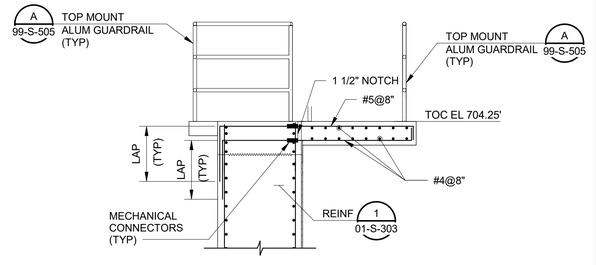
GENERAL SHEET NOTES:

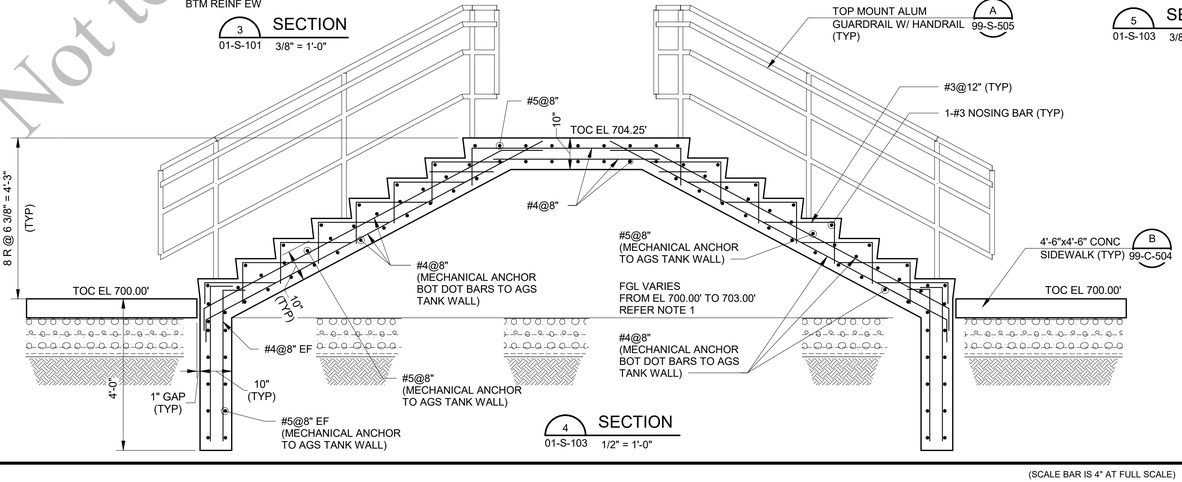
1. FINISHED GRADE ELEVATION SHOWN IS APPROXIMATE. SEE CIVIL SITE PLAN FOR REQUIRED GRADE ELEVATION OF THIS LOCATION.
2. FOR GENERAL NOTES, REFER TO SHEET 01-S-101.
3. FOR STRUCTURAL ABBREVIATIONS, REFER TO SHEET 00-S-002.
4. FOR OTHER NOTES, REFER TO SHEET 01-S-103.
5. THE CONTRACTOR SHALL COORDINATE THE LOCATION AND SIZE OF OPENING WITH THE EQUIPMENT SUPPLIER.

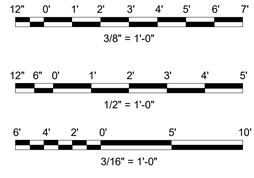












(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

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AEROBIC GRANULAR SLUDGE - PHASE 1

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PROJECT NO.:	411752

AGS REACTORS AND PIPE GALLERY

STRUCTURAL

SECTIONS AND DETAILS 3 OF 4

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FILE: BIM 360://409469 - Aerobic Granular Sludge Phase 1/409469 - AGS.rvt
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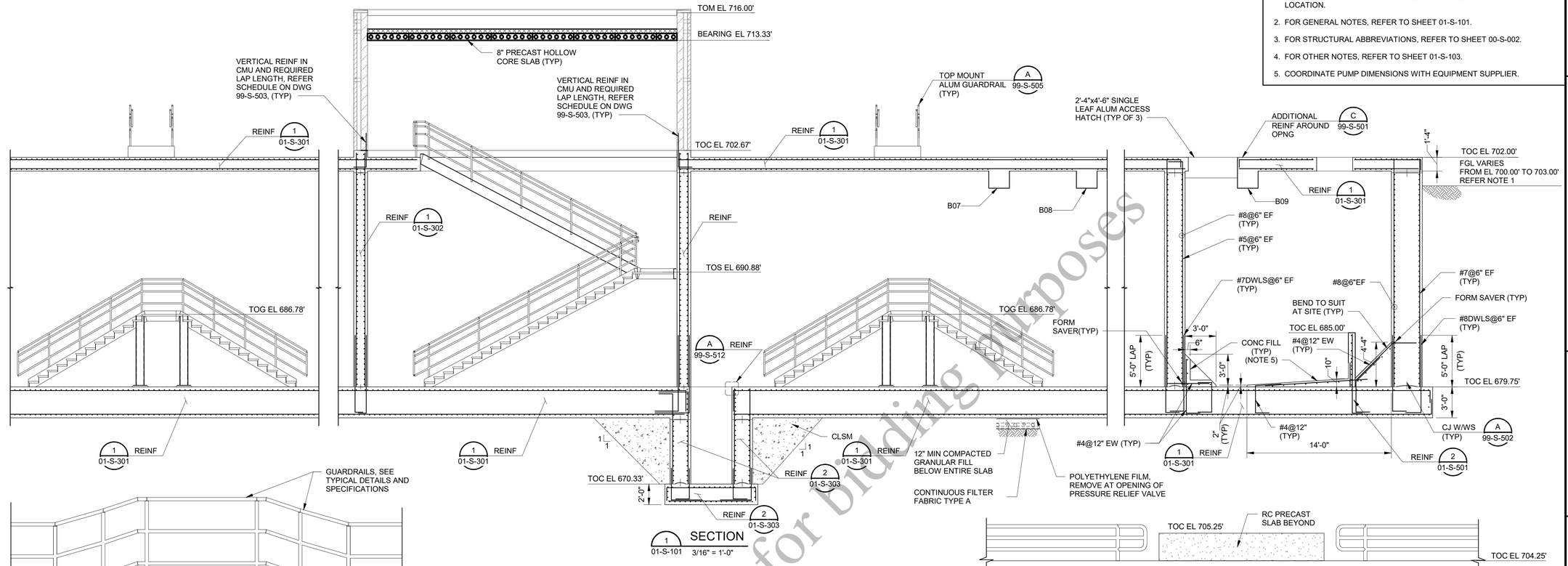
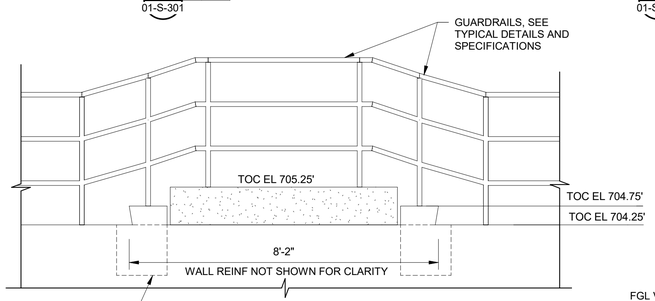
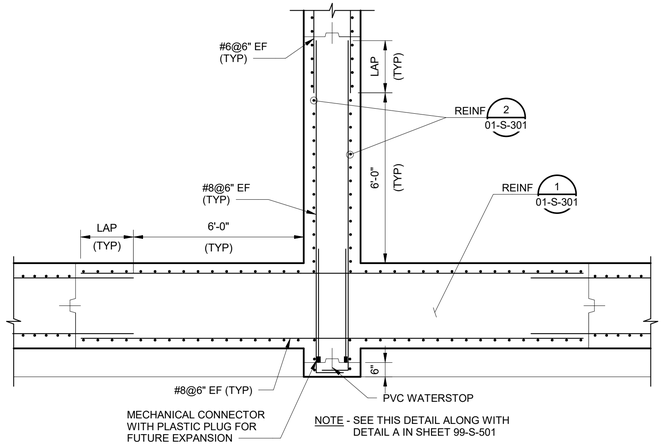
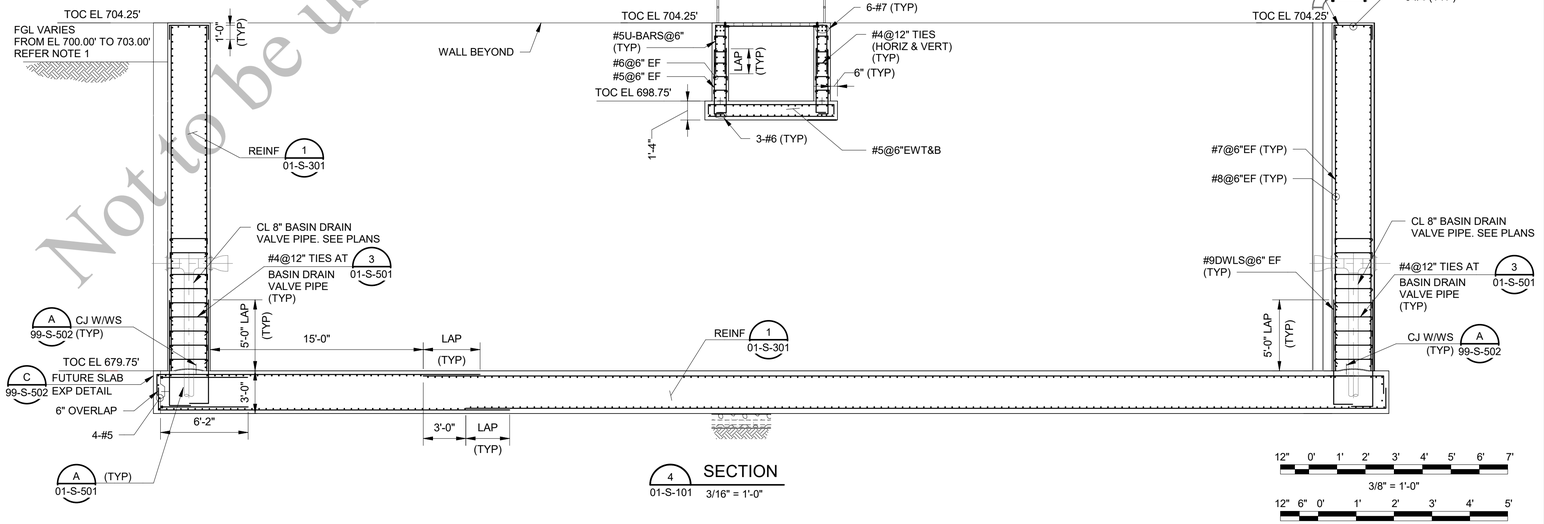
GENERAL SHEET NOTES:

1. FINISHED GRADE ELEVATION SHOWN IS APPROXIMATE. SEE CIVIL SITE PLAN FOR REQUIRED GRADE ELEVATION OF THIS LOCATION.
2. FOR GENERAL NOTES, REFER TO SHEET 01-S-101.
3. FOR STRUCTURAL ABBREVIATIONS, REFER TO SHEET 00-S-002.
4. FOR OTHER NOTES, REFER TO SHEET 01-S-103.
5. COORDINATE PUMP DIMENSIONS WITH EQUIPMENT SUPPLIER.









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AEROBIC GRANULAR SLUDGE - PHASE 1

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AGS REACTORS AND PIPE GALLERY

STRUCTURAL

SECTIONS AND DETAILS 4 OF 4

01-S-304

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(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

12" 0' 1' 2' 3' 4' 5' 6' 7'
3/8" = 1'-0"
12" 6" 0' 1' 2' 3' 4' 5'
1/2" = 1'-0"
6' 4' 2' 0' 5' 10'
3/16" = 1'-0"

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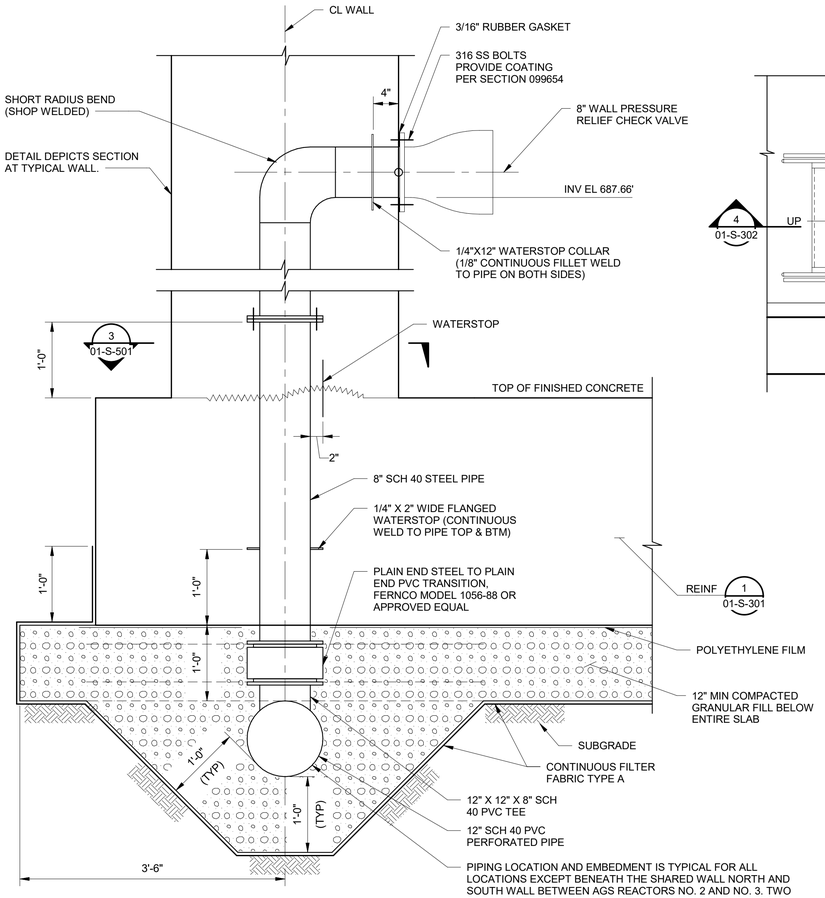
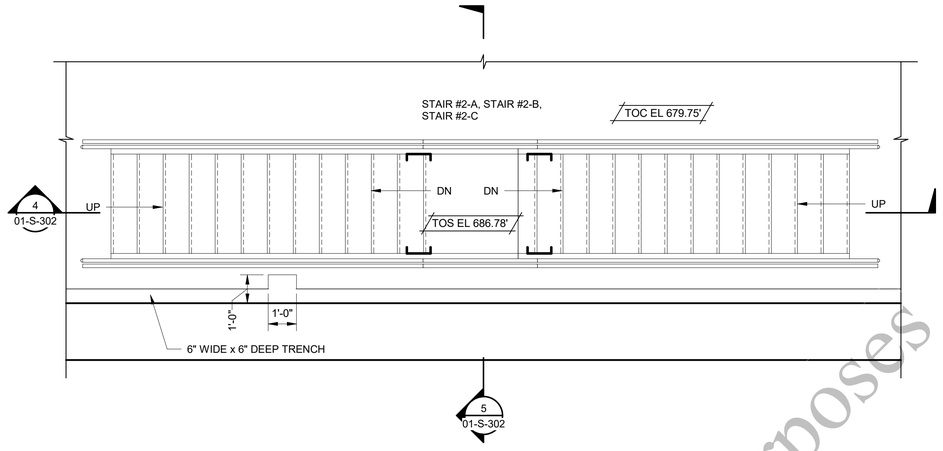
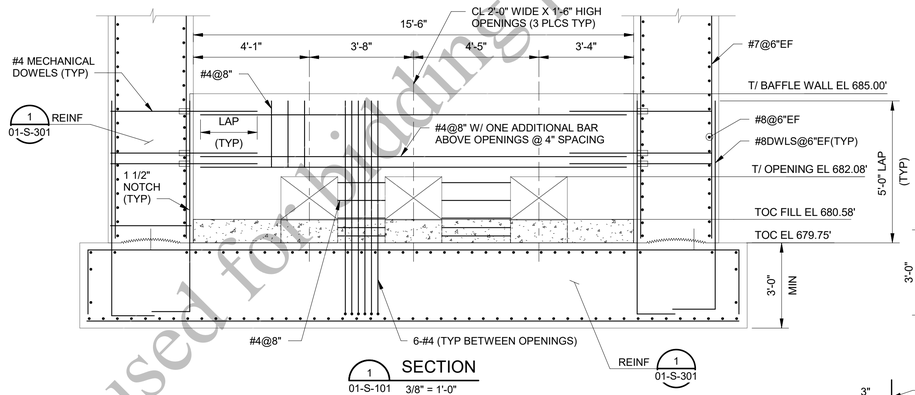


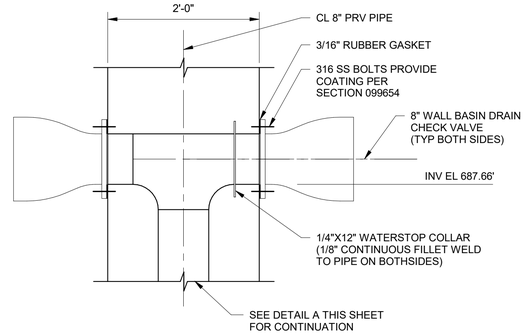
A WALL BASIN DRAIN VALVE
01-S-101 1" = 1'-0"



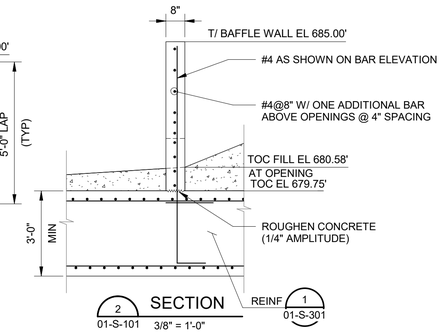
B DETAIL
01-S-101 3/8" = 1'-0"



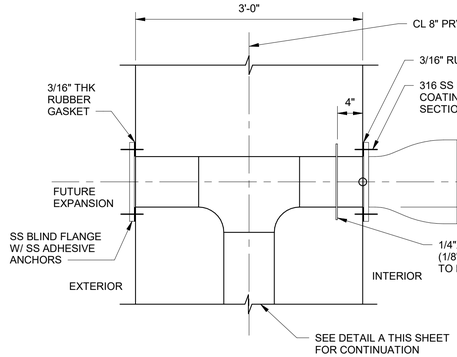
1 SECTION
01-S-101 3/8" = 1'-0"



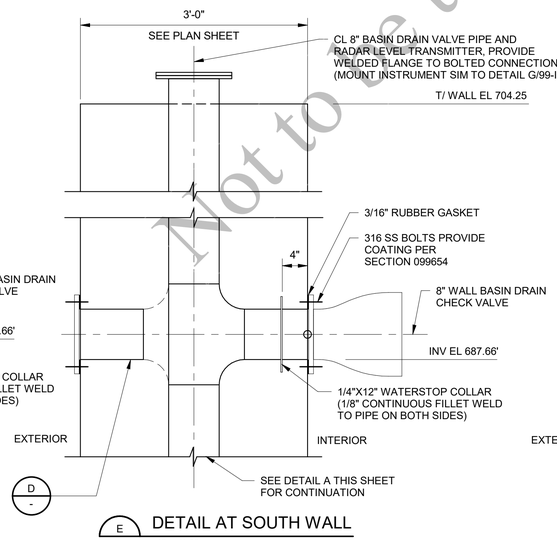
C AT COMMON WALL W/ BASIN DRAIN VALVES ON BOTH SIDES
1" = 1'-0"



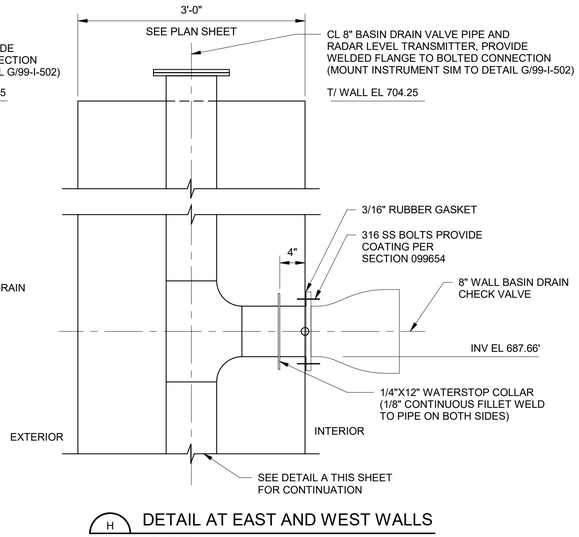
2 SECTION
01-S-101 3/8" = 1'-0"



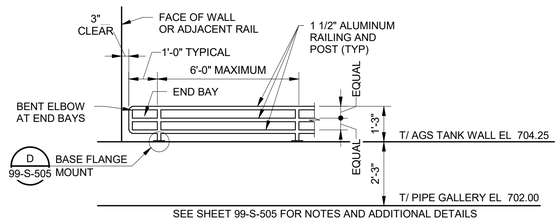
D AT FUTURE EXPANSION WALL
1" = 1'-0"



E DETAIL AT SOUTH WALL
1" = 1'-0"

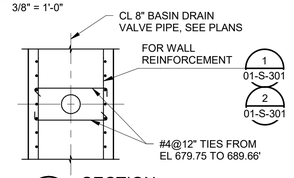


H DETAIL AT EAST AND WEST WALLS
1" = 1'-0"



SEE SHEET 99-S-505 FOR NOTES AND ADDITIONAL DETAILS

1'-3" TALL GUARDRAIL F DETAIL
3/8" = 1'-0"



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

12" 9" 6" 3" 0" 1' 2"
1" = 1'-0"

12" 0" 1' 2" 3" 4" 5" 6" 7"
3/8" = 1'-0"

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

AT RADAR LEVEL TRANSMITTER MONITORING LOCATIONS

GENERAL NOTE:

1. FOR GENERAL STRUCTURAL NOTES, REFER TO SHEET 00-S-001.
2. FOR STRUCTURAL ABBREVIATIONS, REFER TO SHEET 00-S-002.
3. FOR OTHER NOTES, REFER TO SHEET 01-S-103.
4. SEE CIVIL SHEET 00-C-107 FOR UNDERDRAIN DETAILS.

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AEROBIC GRANULAR SLUDGE - PHASE 1

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AGS REACTORS AND PIPE GALLERY

STRUCTURAL

DETAILS 1 OF 2

01-S-501

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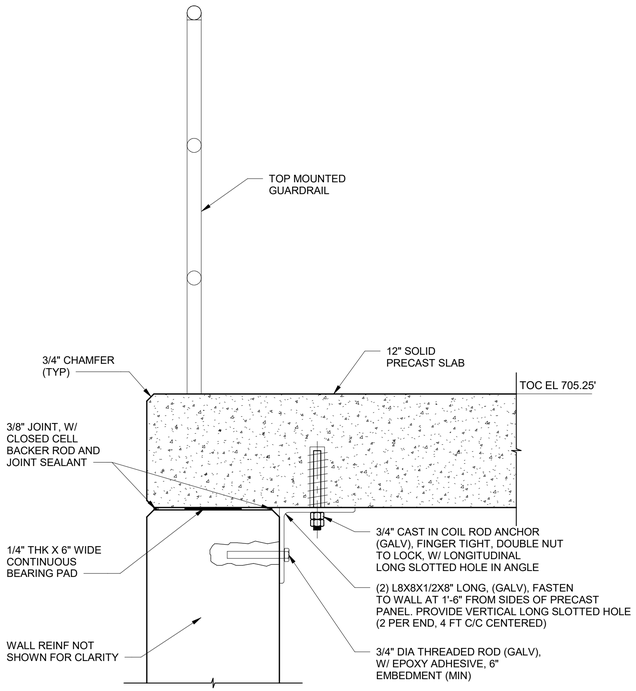
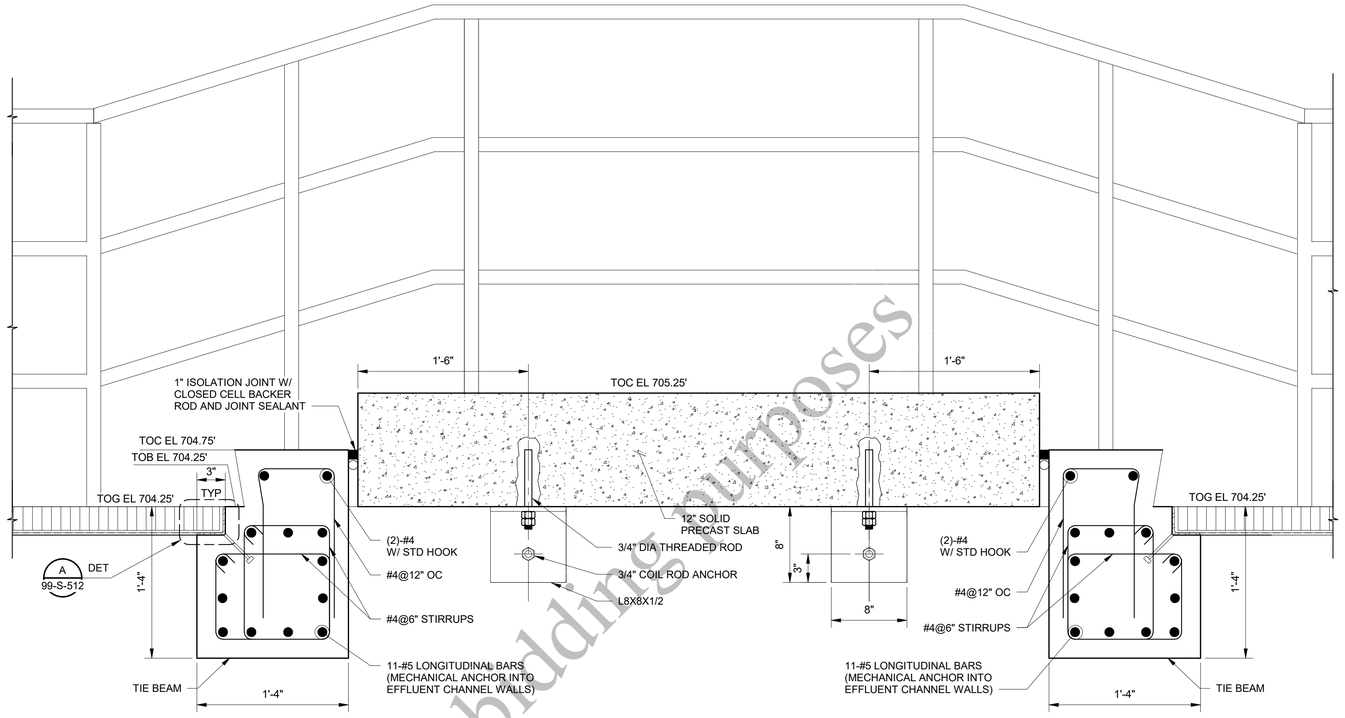
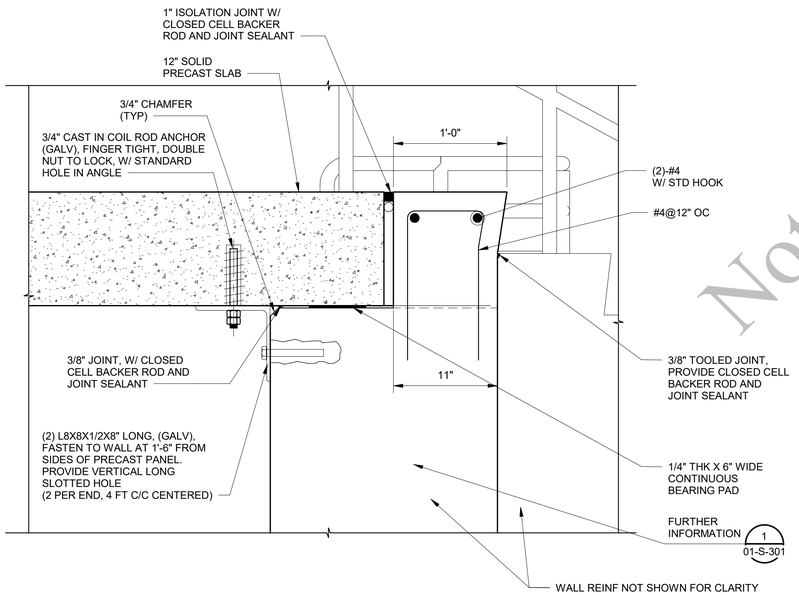


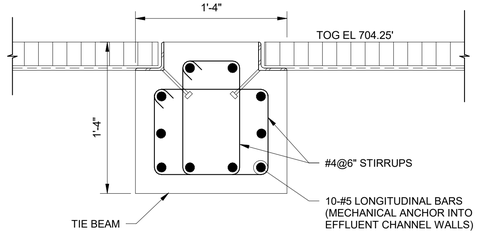
1 DETAIL 01-S-301 1 1/2" = 1'-0"



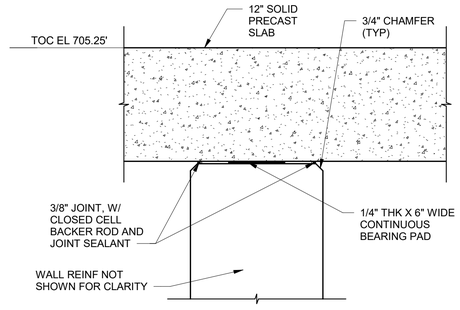
2 DETAIL 01-S-301 1 1/2" = 1'-0"



3 DETAIL 01-S-301 1 1/2" = 1'-0"



4 DETAIL 01-S-301 1 1/2" = 1'-0"



5 DETAIL 01-S-301 1 1/2" = 1'-0"

12" 9" 6" 3" 0" 1'
1 1/2" = 1'-0"

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

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Four Rivers Sanitation Authority

AEROBIC GRANULAR SLUDGE - PHASE 1

REVISIONS AND RECORD OF ISSUE

DESIGNED:	SKA
DETAILED:	UBS
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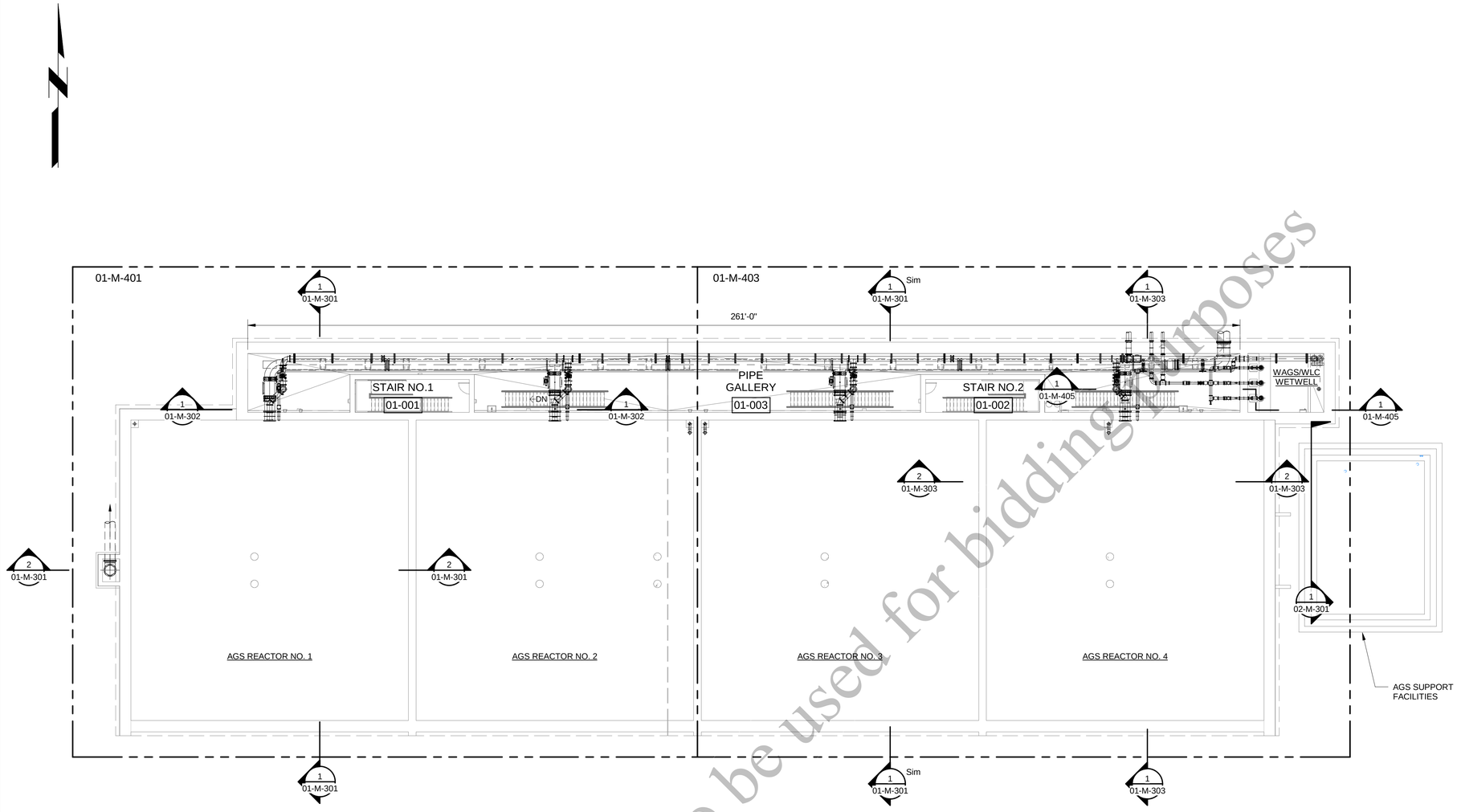
DATE:	12/20/2022
PROJECT NO.:	411752

AGS REACTORS AND PIPE GALLERY

STRUCTURAL

DETAILS 2 OF 2

01-S-502



OVERALL SECTIONAL PLAN

1/16" = 1'-0"

GENERAL SHEET NOTES

1. REFER TO ENLARGED PLANS FOR ADDITIONAL DETAIL.
2. ALL BLOWER INLET, BLOW-OFF AND DISCHARGE PIPING SHALL BE INSULATED AND JACKETED. REFER TO SECTION 40 42 11 - MECHANICAL INSULATION FOR REQUIREMENTS.

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AEROBIC GRANULAR SLUDGE - PHASE 1

REVISIONS AND RECORD OF ISSUE	
DESIGNED:	JL
DETAILED:	VP
CHECKED:	AM/JH
APPROVED:	MR
DATE:	12/20/2022
PROJECT NO.:	411752

AGS REACTORS AND PIPE GALLERY

PROCESS MECHANICAL

OVERALL SECTIONAL PLAN

01-M-101

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16' 12' 8' 4' 0' 16' 32'

1/16" = 1'-0"

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

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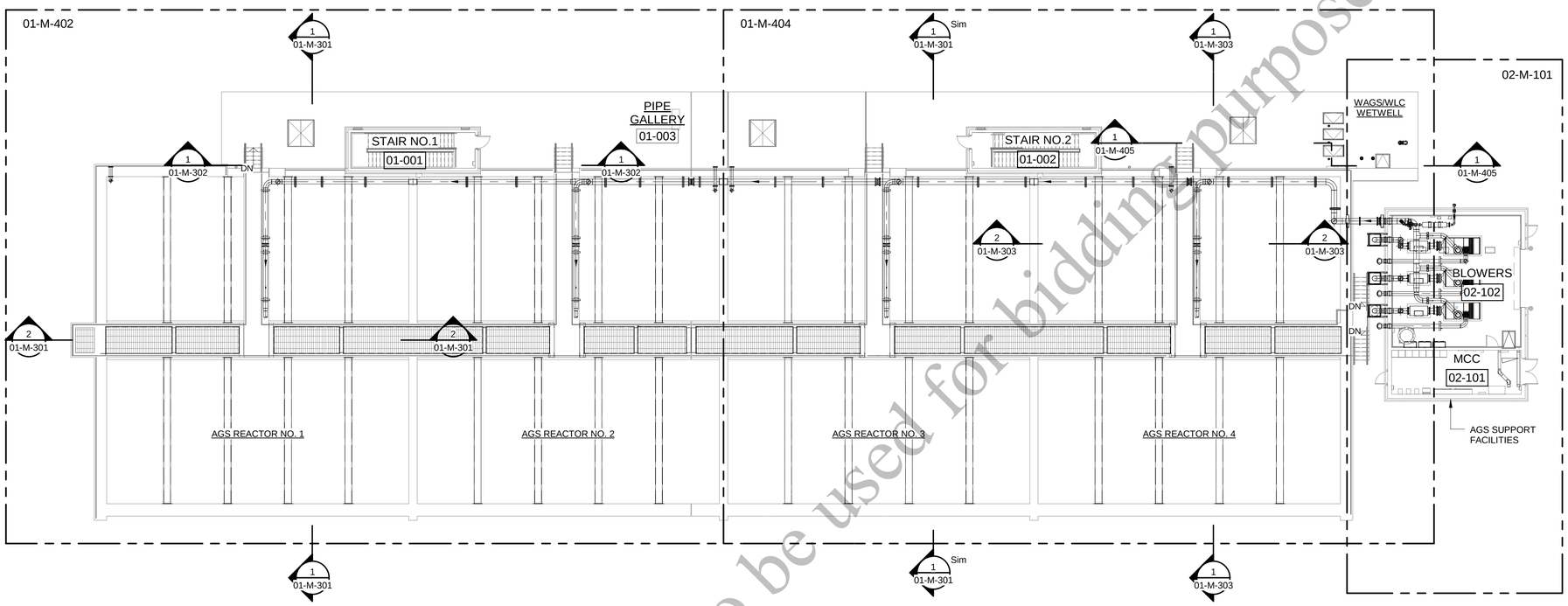

OVERALL TOP PLAN

1/16" = 1'-0"

GENERAL SHEET NOTES

1. REFER TO ENLARGED PLANS FOR ADDITIONAL DETAIL.
2. ALL BLOWER INLET, BLOW-OFF AND DISCHARGE PIPING SHALL BE INSULATED AND JACKETED. REFER TO SECTION 40 42 11 - MECHANICAL INSULATION FOR REQUIREMENTS.

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DESIGN FIRM - 184.002143-0006

Four Rivers Sanitation Authority

AEROBIC GRANULAR SLUDGE - PHASE 1

REVISIONS AND RECORD OF ISSUE

DESIGNED:	JL
DETAILED:	VP
CHECKED:	AM/JH
APPROVED:	MR
DATE:	12/20/2022
PROJECT NO.:	411752

AGS REACTORS AND PIPE GALLERY

PROCESS MECHANICAL

OVERALL TOP PLAN

16' 12' 8' 4' 0' 16' 32'

1/16" = 1'-0"

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

01-M-102

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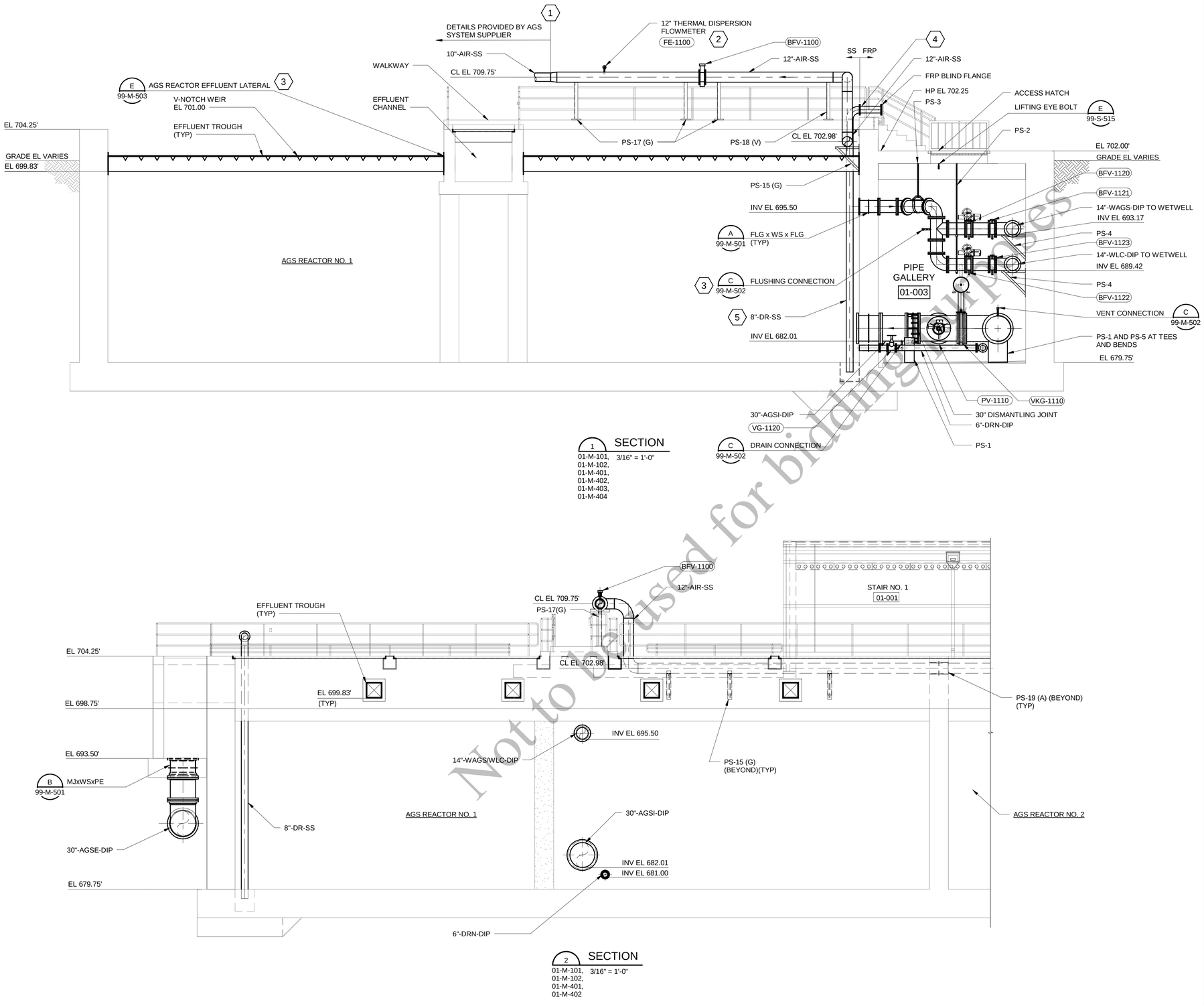

1 SECTION
01-M-101, 01-M-102, 01-M-401, 01-M-402, 01-M-403, 01-M-404
3/16" = 1'-0"

2 SECTION
01-M-101, 01-M-102, 01-M-401, 01-M-402
3/16" = 1'-0"

GENERAL SHEET NOTES

1. AIR DIFFUSER LAYOUT AND CONNECTION DETAILS SHALL BE PROVIDED BY AGS SYSTEM SUPPLIER AFTER AWARD OF CONTRACT.
2. AGS REACTOR TANK INTERNAL EQUIPMENT INCLUDING MANIFOLDS, TROUGHS, SUPPORTS AND DIFFUSERS ARE PROVIDED BY AGS SYSTEM SUPPLIER. FINAL EQUIPMENT AND PIPING LAYOUT IS PROPRIETARY AND SHALL BE AS PROVIDED IN VENDOR SUBMITTAL DRAWINGS. FINAL EQUIPMENT LIST AND QUANTITIES TO BE PROVIDED BY AGS SYSTEM SUPPLIER. REFER TO AGS SPECIFICATION AND SHEETS 99-M-502, 99-M-503, AND 99-M-504 FOR ADDITIONAL DETAIL.
3. PS-X REPRESENTS PIPE SUPPORT TYPE. SEE PIPE SUPPORT SCHEDULE ON SHEET 99-M-502.

   AIR PIPING SUPPORT TYPES ARE IDENTIFIED USING THE FOLLOWING DESIGNATIONS:

   (G) : GUIDE SUPPORT
   (A) : AXIAL STOP
   (V) : VERTICAL SUPPORT
   (SPR) : SPRING HANGER SUPPORT
4. PIPE SUPPORTS TO BE ADJUSTED IN THE FIELD AS REQUIRED TO AVOID FLANGE LOCATIONS IN PIPES.

SHEET KEYNOTES

1. REFER TO P&IDS AND EQUIPMENT SPECIFICATION FOR ADDITIONAL INFORMATION ON AGS SYSTEM SUPPLIER SCOPE. DETAILED PIPE ROUTING AND EQUIPMENT LOCATIONS TO BE PROVIDED BY SUPPLIER AFTER AWARD OF CONTRACT. AGS SYSTEM SUPPLIER IS RESPONSIBLE FOR PIPE SUPPORTS WITHIN THE PIPING PROVIDED BY THE AGS SYSTEM SUPPLIER.
2. THERMAL DISPERSION FLOWMETER PROVIDED BY AGS SYSTEM SUPPLIER. FLOWMETERS SHALL BE PROVIDED WITH MINIMUM UPSTREAM STRAIGHT RUN OF 10 PIPE DIAMETERS AND MINIMUM DOWNSTREAM STRAIGHT RUN OF 5 PIPE DIAMETERS.
3. CONTRACTOR SHALL COORDINATE THE LOCATION AND SIZE OF EFFLUENT CHANNEL OPENINGS WITH THE AGS SYSTEM SUPPLIER.
4. DRAIN PIPING SHOWN IS TYPICAL OF AGS REACTOR NO. 1. FOR AGS REACTORS NO. 2, 3, AND 4, CONTRACTOR SHALL ROUTE DRAIN PIPING TO AVOID AIR PIPING.
5. SUPPORTS FOR DRAIN PIPING SHALL BE DUPLEX SS AND SHALL MEET THE REQUIREMENTS OF SECTION 40 05 07 PIPE SUPPORTS.

6' 4' 2' 0' 5' 10'
3/16" = 1'-0"

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

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Four Rivers Sanitation Authority

AEROBIC GRANULAR SLUDGE - PHASE 1

REVISIONS AND RECORD OF ISSUE

DESIGNED:	JL
DETAILED:	VP
CHECKED:	AM/JH
APPROVED:	MR
DATE:	12/20/2022
PROJECT NO.:	411752

AGS REACTORS AND PIPE GALLERY

PROCESS MECHANICAL

REACTOR SECTIONS 1 OF 3

01-M-301

68 OF 163

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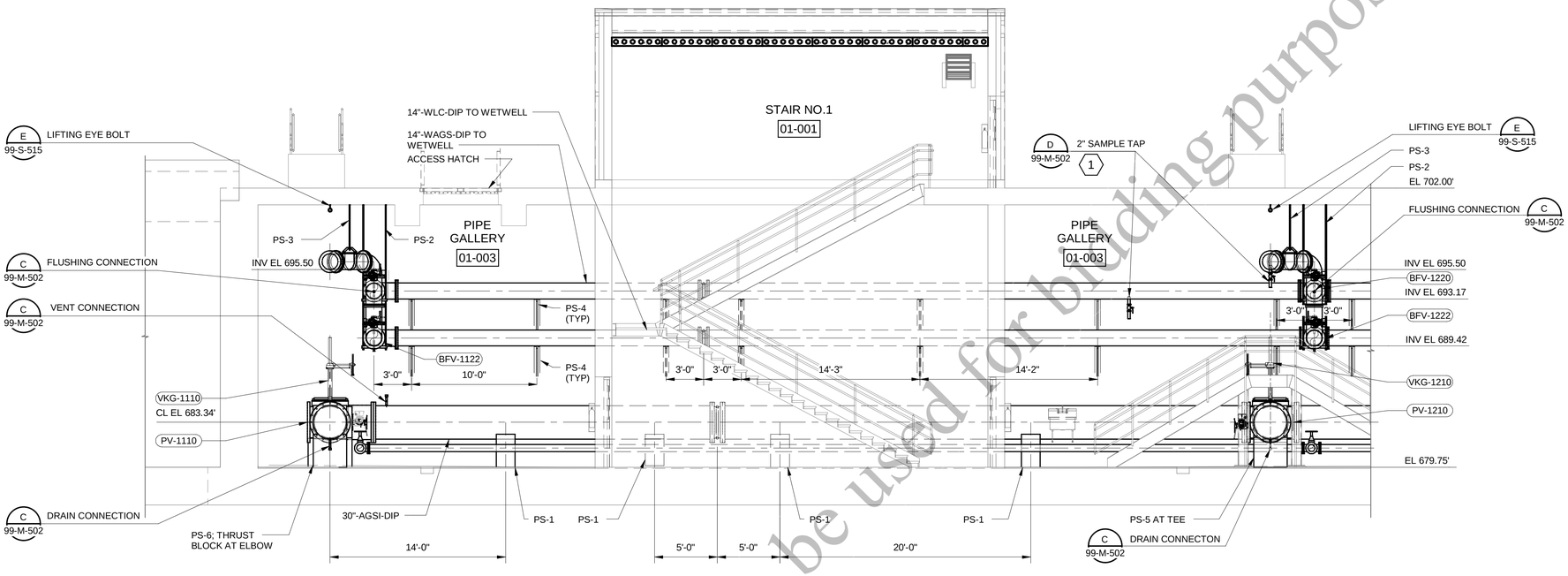

1 SECTION
01-M-101, 01-M-102, 01-M-401, 01-M-402
3/16" = 1'-0"

GENERAL SHEET NOTES

1. PIPE SUPPORTS TO BE ADJUSTED IN THE FIELD AS REQUIRED TO AVOID FLANGE LOCATIONS IN PIPES.
2. PS-X REPRESENTS PIPE SUPPORT TYPE. SEE PIPE SUPPORT SCHEDULE ON SHEET 99-M-502.

   AIR PIPING SUPPORT TYPES ARE IDENTIFIED USING THE FOLLOWING DESIGNATIONS:

   (G) : GUIDE SUPPORT
   (A) : AXIAL STOP
   (V) : VERTICAL SUPPORT
   (SPR) : SPRING HANGER SUPPORT

SHEET KEYNOTES

1. CONTRACTOR TO FIELD ROUTE SAMPLE PIPING TO NEAREST SERVICE SINK.

6' 4' 2' 0' 5' 10'
3/16" = 1'-0"

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

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AEROBIC GRANULAR SLUDGE - PHASE 1

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AGS REACTORS AND PIPE GALLERY

PROCESS MECHANICAL

REACTOR SECTIONS 2 OF 3

01-M-302

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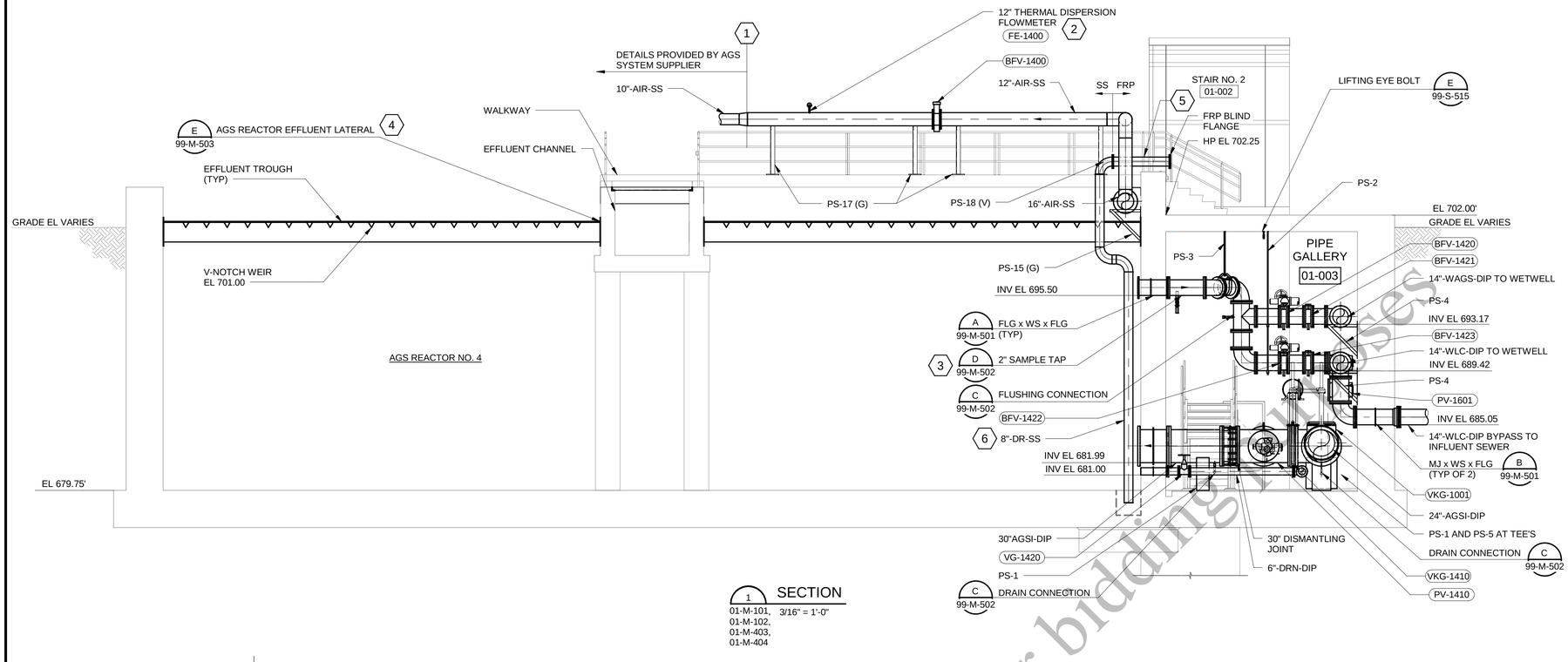
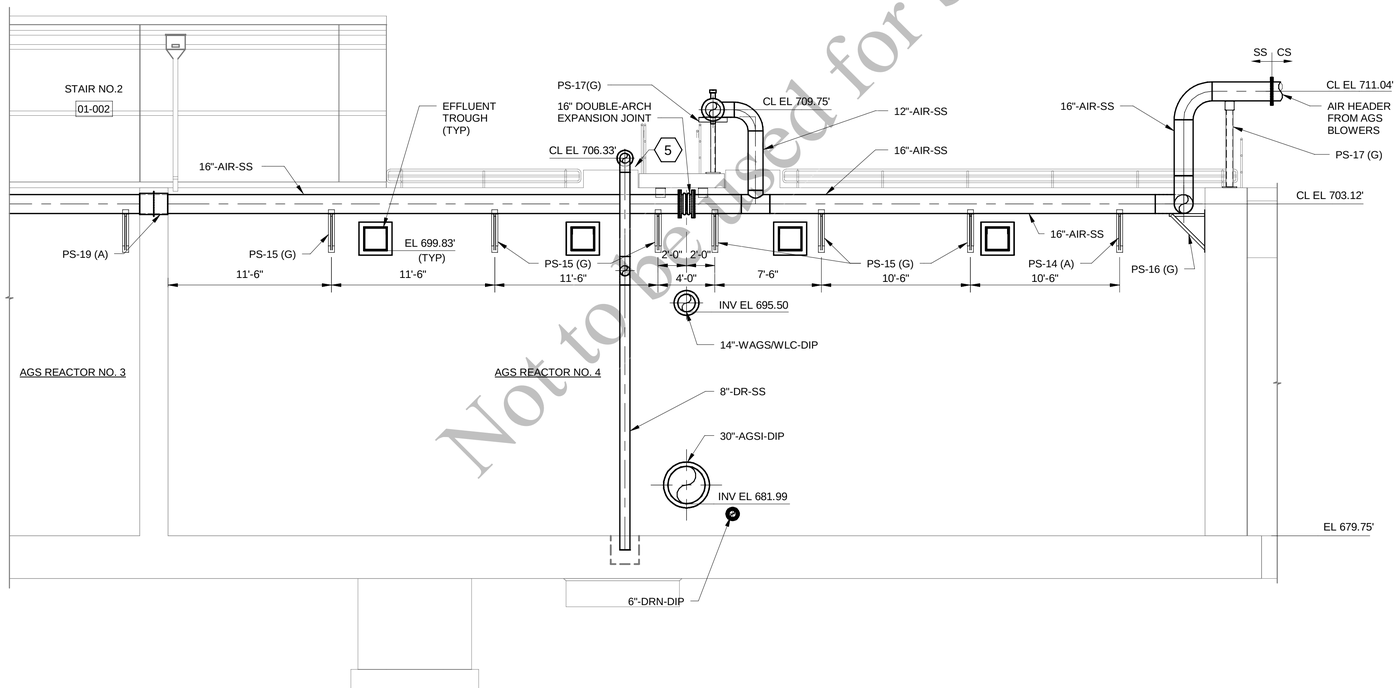


1 SECTION
01-M-101, 01-M-102, 01-M-403, 01-M-404
3/16" = 1'-0"



2 SECTION
01-M-101, 01-M-102, 01-M-403, 01-M-404
3/16" = 1'-0"

GENERAL SHEET NOTES

1. AIR DIFFUSER LAYOUT AND CONNECTION DETAILS SHALL BE PROVIDED BY AGS SYSTEM SUPPLIER AFTER AWARD OF CONTRACT.
2. AGS REACTOR TANK INTERNAL EQUIPMENT INCLUDING MANIFOLDS, TROUGHS, SUPPORTS AND DIFFUSERS ARE PROVIDED BY AGS SYSTEM SUPPLIER. FINAL EQUIPMENT AND PIPING LAYOUT IS PROPRIETARY AND SHALL BE AS PROVIDED IN VENDOR SUBMITTAL DRAWINGS. FINAL EQUIPMENT LIST AND QUANTITIES TO BE PROVIDED BY AGS SYSTEM SUPPLIER. REFER TO AGS SPECIFICATION AND SHEETS 99-M-502, 99-M-503, AND 99-M-504 FOR ADDITIONAL DETAIL.
3. PS-X REPRESENTS PIPE SUPPORT TYPE. SEE PIPE SUPPORT SCHEDULE ON SHEET 99-M-502.

   AIR PIPING SUPPORT TYPES ARE IDENTIFIED USING THE FOLLOWING DESIGNATIONS:
   (G) : GUIDE SUPPORT
   (A) : AXIAL STOP
   (V) : VERTICAL SUPPORT
   (SPR) : SPRING HANGER SUPPORT
4. PIPE SUPPORTS TO BE ADJUSTED IN THE FIELD AS REQUIRED TO AVOID FLANGE LOCATIONS IN PIPES.

SHEET KEYNOTES

1. REFER TO P&IDS AND EQUIPMENT SPECIFICATION FOR ADDITIONAL INFORMATION ON AGS SYSTEM SUPPLIER SCOPE. DETAILED PIPE ROUTING AND EQUIPMENT LOCATIONS TO BE PROVIDED BY SUPPLIER AFTER AWARD OF CONTRACT. AGS SYSTEM SUPPLIER IS RESPONSIBLE FOR PIPE SUPPORTS WITHIN THE PIPING PROVIDED BY THE AGS SYSTEM SUPPLIER.
2. THERMAL DISPERSION FLOWMETER PROVIDED BY AGS SYSTEM SUPPLIER. FLOWMETERS SHALL BE PROVIDED WITH MINIMUM UPSTREAM STRAIGHT RUN OF 10 PIPE DIAMETERS AND MINIMUM DOWNSTREAM STRAIGHT RUN OF 5 PIPE DIAMETERS.
3. CONTRACTOR TO FIELD ROUT SAMPLE PIPING TO NEAREST SERVICE SINK.
4. CONTRACTOR SHALL COORDINATE THE LOCATION AND SIZE OF EFFLUENT CHANNEL OPENINGS WITH THE AGS SYSTEM SUPPLIER.
5. DRAIN PIPING SHOWN IS TYPICAL OF AGS REACTOR NO. 2,3,4. CONTRACTOR SHALL ROUTE DRAIN PIPING TO AVOID AIR PIPING.
6. SUPPORTS FOR DRAIN PIPING SHALL BE DUPLEX SS AND SHALL MEET THE REQUIREMENTS OF SECTION 40 05 07 PIPE SUPPORTS.

6' 4' 2' 0' 5' 10'
3/16" = 1'-0"

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

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AEROBIC GRANULAR SLUDGE - PHASE 1

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AGS REACTORS AND PIPE GALLERY

PROCESS MECHANICAL

REACTOR SECTIONS 3 OF 3

01-M-303

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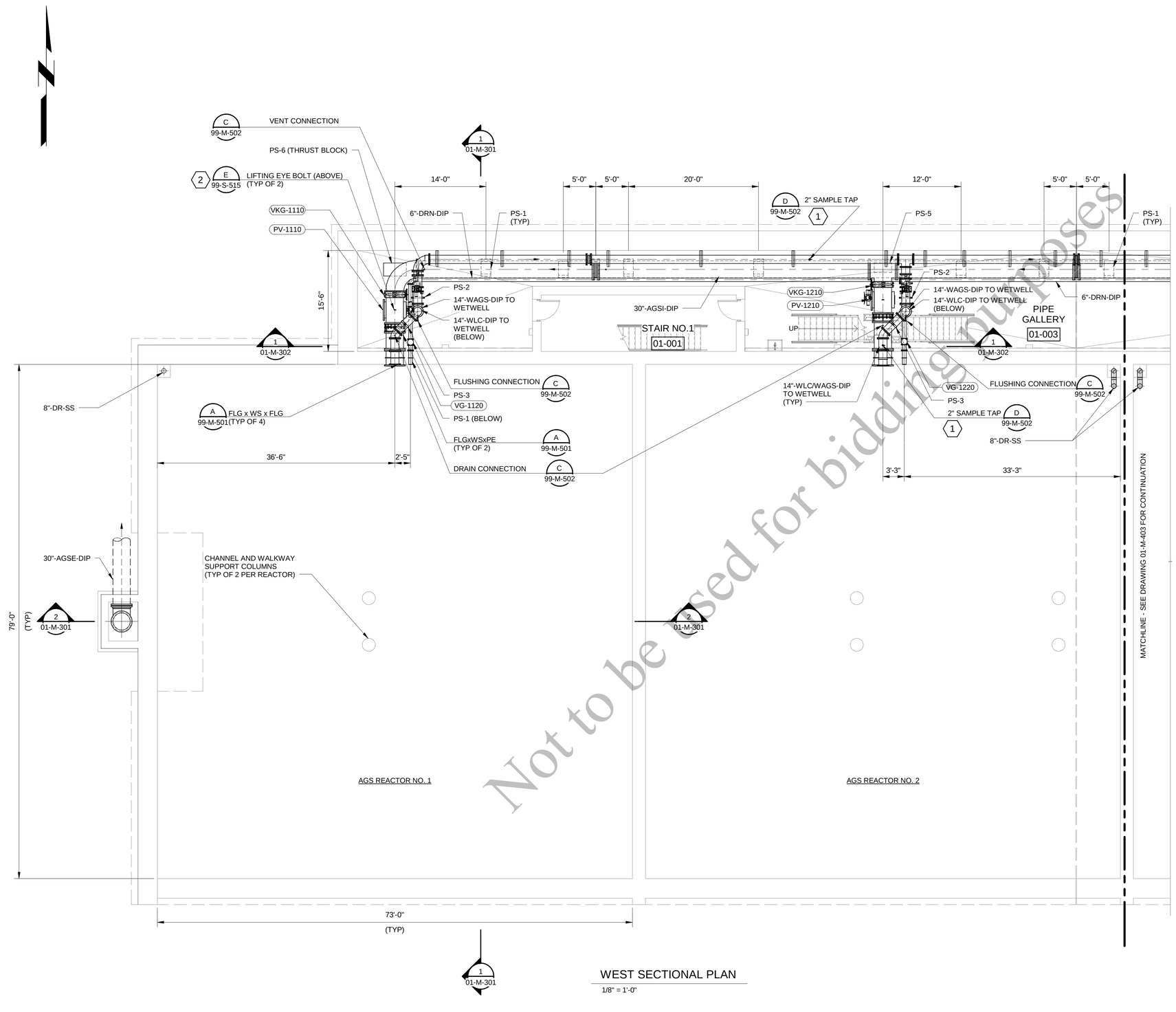

WEST SECTIONAL PLAN

1/8" = 1'-0"

GENERAL SHEET NOTES

1. AIR DIFFUSER LAYOUT AND CONNECTION DETAILS SHALL BE PROVIDED BY AGS SYSTEM SUPPLIER AFTER AWARD OF CONTRACT.
2. AGS REACTOR TANK INTERNAL EQUIPMENT INCLUDING MANIFOLDS, TROUGHS, SUPPORTS, AND DIFFUSERS ARE PROVIDED BY AGS SYSTEM SUPPLIER. FINAL EQUIPMENT AND PIPING LAYOUT IS PROPRIETARY AND SHALL BE AS PROVIDED IN VENDOR SUBMITTAL DRAWINGS. FINAL EQUIPMENT LIST AND QUANTITIES TO BE PROVIDED BY AGS SYSTEM SUPPLIER. REFER TO AGS SPECIFICATION AND SHEETS 99-M-502, 99-M-503, AND 99-M-504 FOR ADDITIONAL DETAIL.
3. PIPE SUPPORTS TO BE ADJUSTED IN THE FIELD AS REQUIRED TO AVOID FLANGE LOCATIONS IN PIPES.
4. PS-X REPRESENTS PIPE SUPPORT TYPE. SEE PIPE SUPPORT SCHEDULE ON SHEET 99-M-502.

   AIR PIPING SUPPORT TYPES ARE IDENTIFIED USING THE FOLLOWING DESIGNATIONS:

   (G) : GUIDE SUPPORT
   (A) : AXIAL STOP
   (V) : VERTICAL SUPPORT
   (SPR) : SPRING HANGER SUPPORT

SHEET KEYNOTES

1. CONTRACTOR TO FIELD ROUTE SAMPLE PIPING TO NEAREST SERVICE SINK.
2. LIFTING EYE BOLT TO BE LOCATED DIRECTLY ABOVE CENTER OF 30-INCH PLUG VALVE.

8' 4' 0' 8' 16'

1/8" = 1'-0"

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

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AEROBIC GRANULAR SLUDGE - PHASE 1

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CHECKED:	AM/JH
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AGS REACTORS AND PIPE GALLERY

PROCESS MECHANICAL

WEST SECTIONAL PLAN

01-M-401

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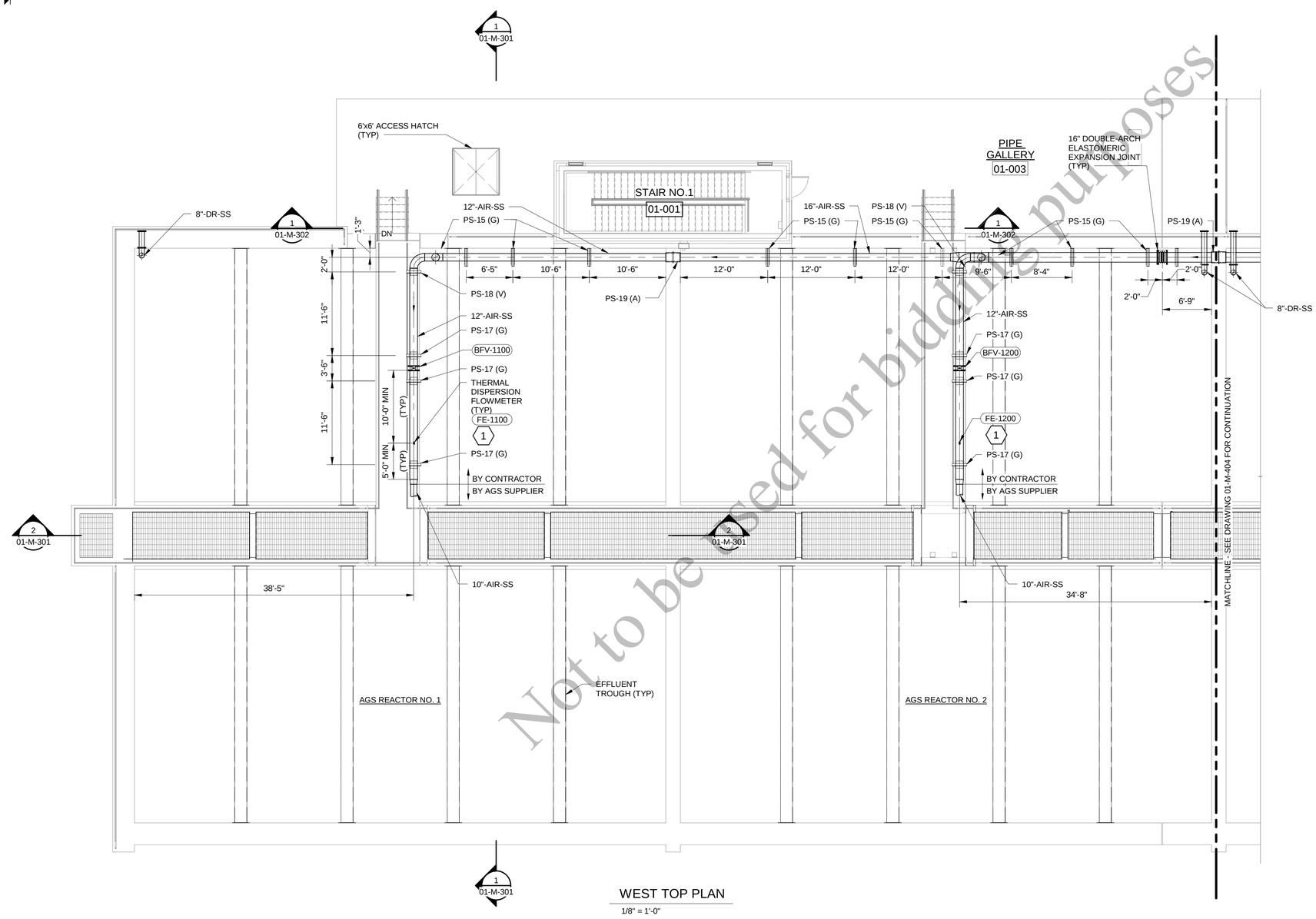

WEST TOP PLAN

1/8" = 1'-0"

GENERAL SHEET NOTES

1. AIR DIFFUSER LAYOUT AND CONNECTION DETAILS SHALL BE PROVIDED BY AGS SYSTEM SUPPLIER AFTER AWARD OF CONTRACT.
2. AGS REACTOR TANK INTERNAL EQUIPMENT INCLUDING MANIFOLDS, TROUGHS, SUPPORTS, AND DIFFUSERS ARE PROVIDED BY AGS SYSTEM SUPPLIER. FINAL EQUIPMENT AND PIPING LAYOUT IS PROPRIETARY AND SHALL BE AS PROVIDED IN VENDOR SUBMITTAL DRAWINGS. FINAL EQUIPMENT LIST AND QUANTITIES TO BE PROVIDED BY AGS SYSTEM SUPPLIER. REFER TO AGS SPECIFICATION AND SHEETS 99-M-502, 99-M-503, AND 99-M-504 FOR ADDITIONAL DETAIL.
3. PS-X REPRESENTS PIPE SUPPORT TYPE. SEE PIPE SUPPORT SCHEDULE ON SHEET 99-M-502.

   AIR PIPING SUPPORT TYPES ARE IDENTIFIED SING THE FOLLOWING DESIGNATIONS:

   (G) : GUIDE SUPPORT
   (A) : AXIAL STOP
   (V) : VERTICAL SUPPORT
   (SPR) : SPRING HANGER SUPPORT

SHEET KEYNOTES

1. THERMAL DISPERSION FLOWMETER PROVIDED BY AGS SYSTEM SUPPLIER. FLOWMETERS SHALL BE PROVIDED WITH MINIMUM UPSTREAM STRAIGHT RUN OF 10 PIPE DIAMETERS AND MINIMUM DOWNSTREAM STRAIGHT RUN OF 5 PIPE DIAMETERS.

8' 4' 0' 8' 16'

1/8" = 1'-0"

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

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AEROBIC GRANULAR SLUDGE - PHASE 1

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AGS REACTORS AND PIPE GALLERY

PROCESS MECHANICAL

WEST TOP PLAN

01-M-402

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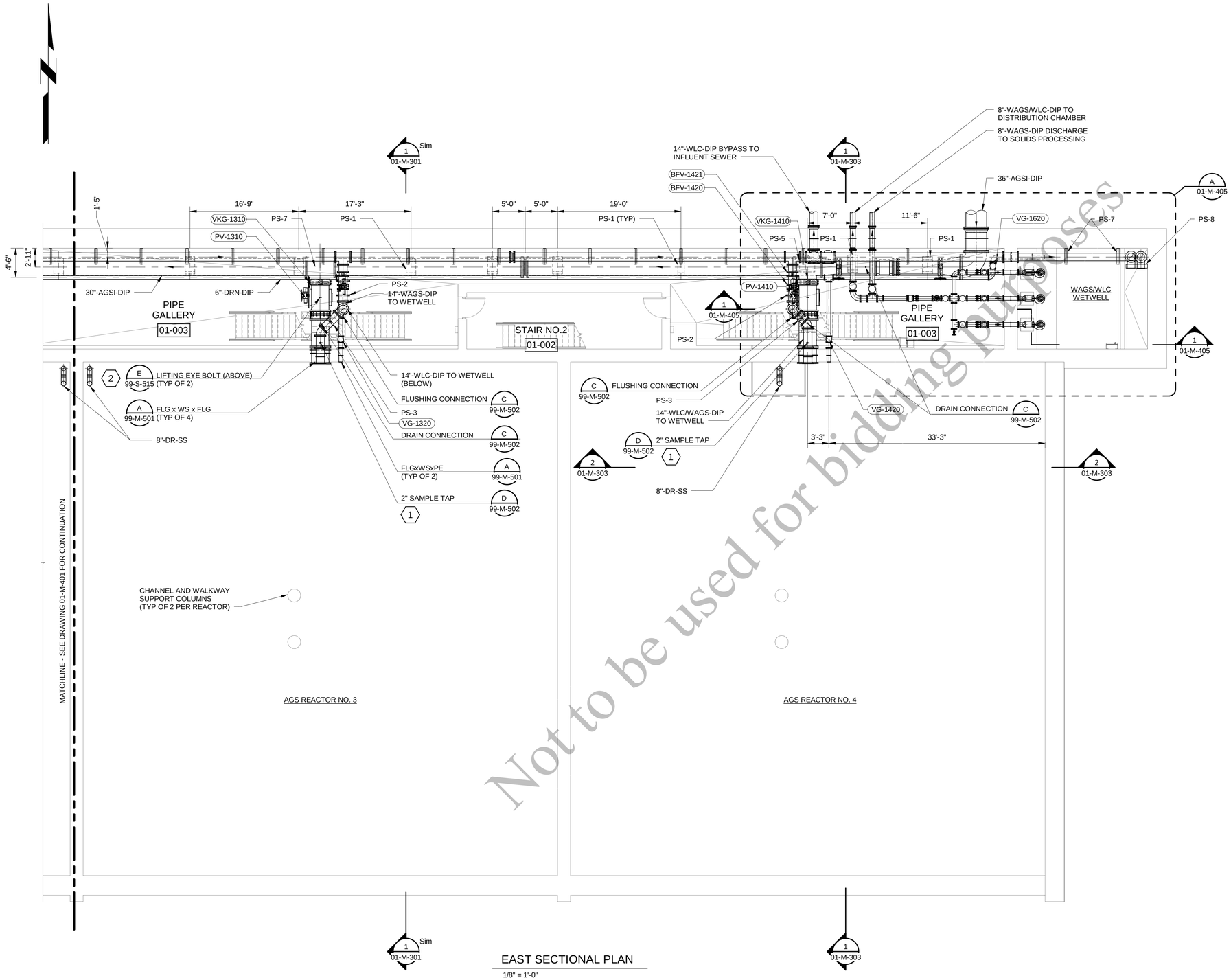

EAST SECTIONAL PLAN

1/8" = 1'-0"

GENERAL SHEET NOTES

1. AIR DIFFUSER LAYOUT AND CONNECTION DETAILS SHALL BE PROVIDED BY AGS SYSTEM SUPPLIER AFTER AWARD OF CONTRACT.
2. AGS REACTOR TANK INTERNAL EQUIPMENT INCLUDING MANIFOLDS, TROUGHS, SUPPORTS, AND DIFFUSERS ARE PROVIDED BY AGS SYSTEM SUPPLIER. FINAL EQUIPMENT AND PIPING LAYOUT IS PROPRIETARY AND SHALL BE AS PROVIDED IN VENDOR SUBMITTAL DRAWINGS. FINAL EQUIPMENT LIST AND QUANTITIES TO BE PROVIDED BY AGS SYSTEM SUPPLIER. REFER TO AGS SPECIFICATION AND SHEETS 99-M-502, 99-M-503, AND 99-M-504 FOR ADDITIONAL DETAIL.
3. PIPE SUPPORTS TO BE ADJUSTED IN THE FIELD AS REQUIRED TO AVOID FLANGE LOCATIONS IN PIPES.
4. PS-X REPRESENTS PIPE SUPPORT TYPE. SEE PIPE SUPPORT SCHEDULE ON SHEET 99-M-502.

   AIR PIPING SUPPORT TYPES ARE IDENTIFIED SING THE FOLLOWING DESIGNATIONS:

   (G) : GUIDE SUPPORT
   (A) : AXIAL STOP
   (V) : VERTICAL SUPPORT
   (SPR) : SPRING HANGER SUPPORT

SHEET KEYNOTES

1. CONTRACTOR TO FIELD ROUTE SAMPLE PIPING TO NEAREST SERVICE SINK.
2. LIFTING EYE BOLT TO BE LOCATED DIRECTLY ABOVE CENTER OF 30-INCH PLUG VALVE.

8' 4' 0' 8' 16'

1/8" = 1'-0"

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

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AEROBIC GRANULAR SLUDGE - PHASE 1

REVISIONS AND RECORD OF ISSUE

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DATE:	12/20/2022
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AGS REACTORS AND PIPE GALLERY

PROCESS MECHANICAL

EAST SECTIONAL PLAN

01-M-403

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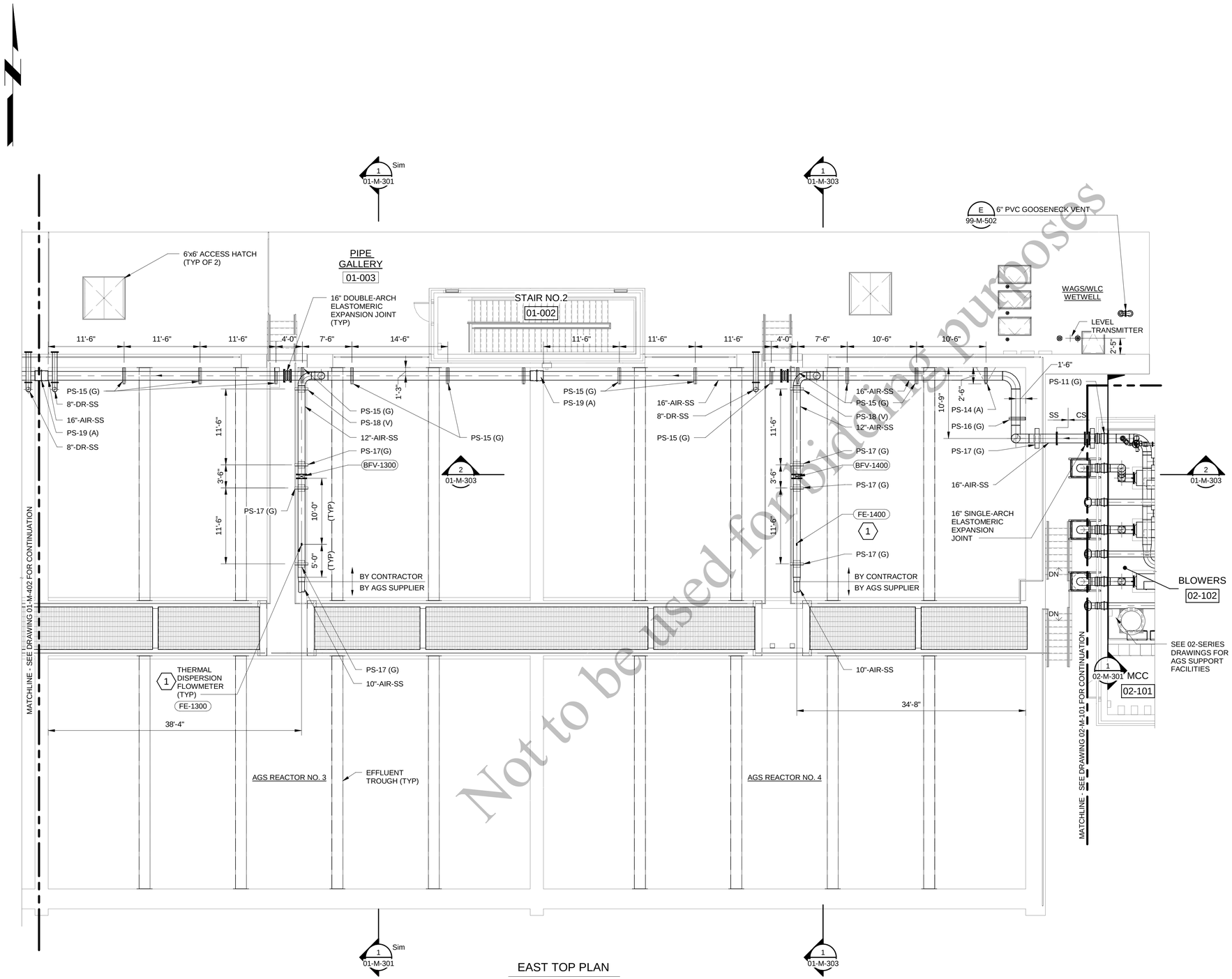

EAST TOP PLAN

1/8" = 1'-0"

8' 4' 0' 8' 16'

1/8" = 1'-0"

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

GENERAL SHEET NOTES

1. AIR DIFFUSER LAYOUT AND CONNECTION DETAILS SHALL BE PROVIDED BY AGS SYSTEM SUPPLIER AFTER AWARD OF CONTRACT.
2. AGS REACTOR TANK INTERNAL EQUIPMENT INCLUDING MANIFOLDS, TROUGHS, SUPPORTS, AND DIFFUSERS ARE PROVIDED BY AGS SYSTEM SUPPLIER. FINAL EQUIPMENT AND PIPING LAYOUT IS PROPRIETARY AND SHALL BE AS PROVIDED IN VENDOR SUBMITTAL DRAWINGS. FINAL EQUIPMENT LIST AND QUANTITIES TO BE PROVIDED BY AGS SYSTEM SUPPLIER. REFER TO AGS SPECIFICATION AND SHEETS 99-M-502, 99-M-503, AND 99-M-504 FOR ADDITIONAL DETAIL.
3. PS-X REPRESENTS PIPE SUPPORT TYPE. SEE PIPE SUPPORT SCHEDULE ON SHEET 99-M-502.

   AIR PIPING SUPPORT TYPES ARE IDENTIFIED USING THE FOLLOWING DESIGNATIONS:

   (G) : GUIDE SUPPORT
   (A) : AXIAL STOP
   (V) : VERTICAL SUPPORT
   (SPR) : SPRING HANGER SUPPORT

SHEET KEYNOTES

1. THERMAL DISPERSION FLOWMETER PROVIDED BY AGS SYSTEM SUPPLIER. FLOWMETERS SHALL BE PROVIDED WITH MINIMUM UPSTREAM STRAIGHT RUN OF 10 PIPE DIAMETERS AND MINIMUM DOWNSTREAM STRAIGHT RUN OF 5 PIPE DIAMETERS.

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AEROBIC GRANULAR SLUDGE - PHASE 1

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PROJECT NO.:	411752

AGS REACTORS AND PIPE GALLERY

PROCESS MECHANICAL

EAST TOP PLAN

01-M-404

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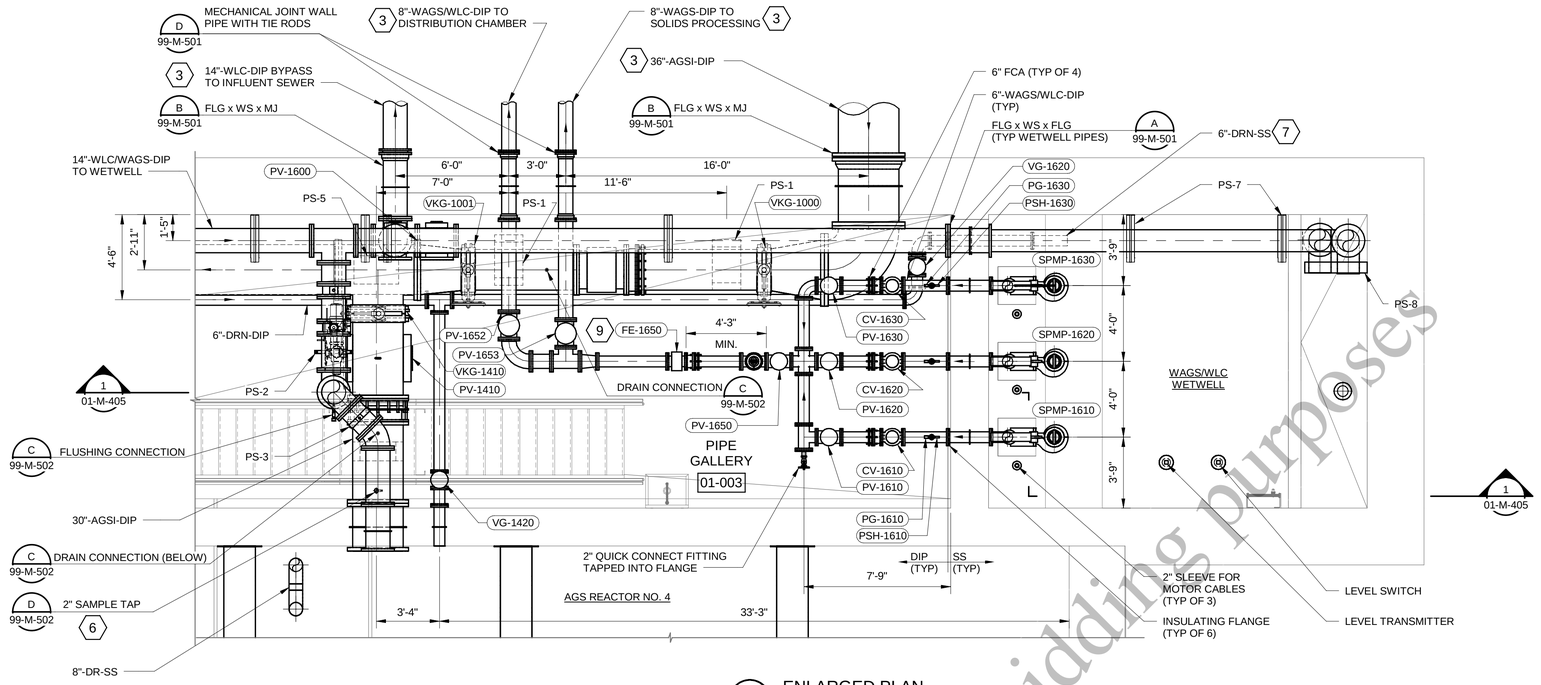
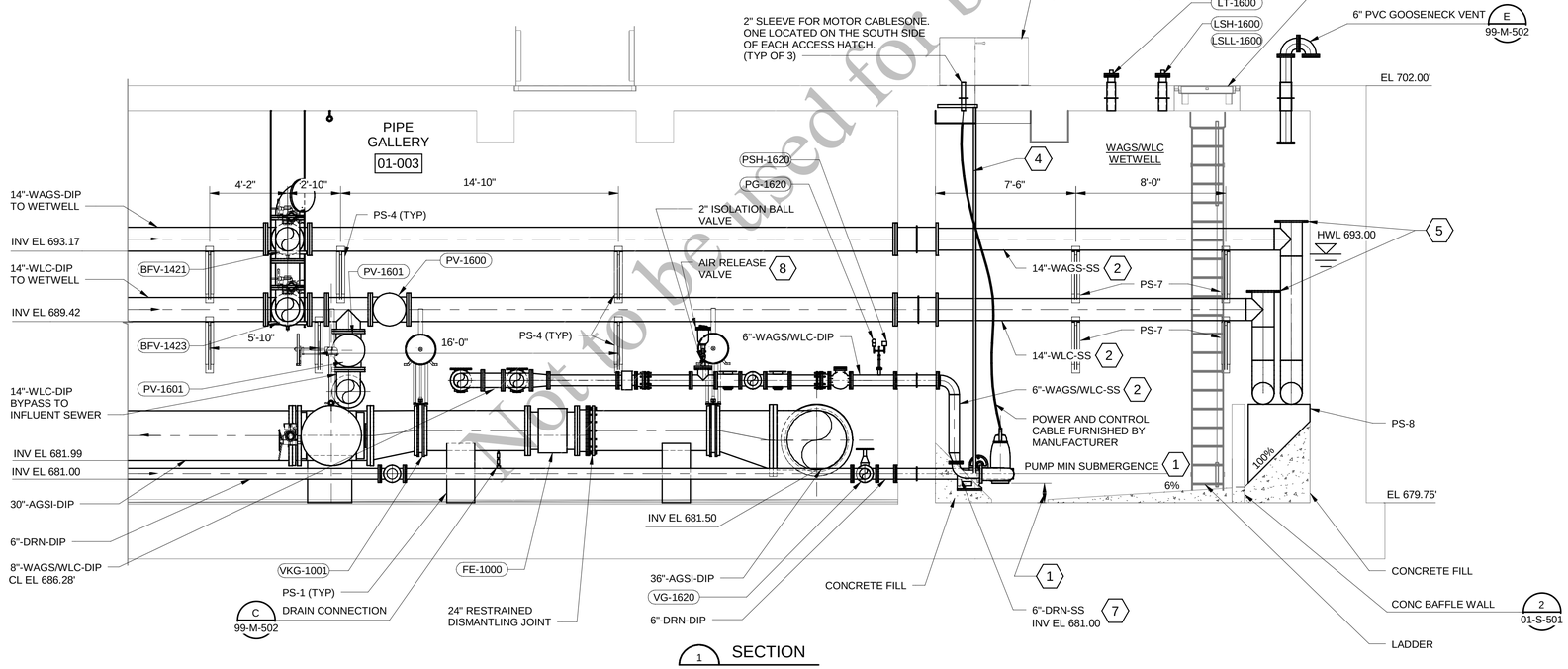


A 01-M-403 ENLARGED PLAN 1/4" = 1'-0"



1 01-M-101, 01-M-403, 01-M-405 SECTION 1/4" = 1'-0"

GENERAL SHEET NOTES

1. PIPING AND PIPE SUPPORTS IN WAGS/WLC WETWELL SHALL BE DUPLEX STAINLESS STEEL AND TRANSITION TO DUCTILE IRON PIPE AT LOCATION SHOWN IN PIPE GALLERY.
2. PS-X REPRESENTS PIPE SUPPORT TYPE. SEE PIPE SUPPORT SCHEDULE ON SHEET 99-M-502.

   AIR PIPING SUPPORT TYPES ARE IDENTIFIED USING THE FOLLOWING DESIGNATIONS:

   (G) : GUIDE SUPPORT
   (A) : AXIAL STOP
   (V) : VERTICAL SUPPORT
   (SPR) : SPRING HANGER SUPPORT
3. CONTRACTOR SHALL USE HANGER SUPPORTS FROM THE ROOF FOR ALL THE WAGS/WLC DISCHARGE LINES IN THE PIPE GALLERY.
4. PIPE SUPPORTS TO BE ADJUSTED IN THE FIELD AS REQUIRED TO AVOID FLANGE LOCATIONS IN PIPES.
5. ALL MATERIALS LOCATED IN THE WAGS/WLC WETWELL SHALL BE CORROSION RESISTANT TO A CHLORIDE CONCENTRATION OF 300 MG/L.

SHEET KEYNOTES

1. VARIES BY PUMP MANUFACTURER. CONTRACTOR TO COORDINATE.
2. FLANGED STAINLESS STEEL CAN BE SUBSTITUTED FOR WELDED STAINLESS STEEL. PROVIDE FLANGED PIPE AT WALL FITTINGS AS SHOWN ON THE DRAWINGS.
3. SEE YARD PIPING DRAWINGS FOR CONTINUATION.
4. PUMP MANUFACTURER SHALL PROVIDE STAINLESS STEEL GUIDE RAIL, GUIDE RAIL SUPPORTS, INTERMEDIATE GUIDE RAIL BRACKETS, AND CABLE HOOK. CONTRACTOR SHALL COORDINATE GUIDE RAIL SPACING WITH PUMP MANUFACTURER.
5. PROVIDE TEE WITH OPEN FLANGE IN VERTICAL FOR AIR RELEASE.
6. CONTRACTOR TO FIELD ROUTE SAMPLE PIPING TO NEAREST SERVICE SINK.
7. PROVIDE 6" DUCKBILL CHECK VALVE, RED VALVE TIDEFLEX SERIES TF-2 OR APPROVED EQUAL. PER SHEET KEYNOTE 2, PROVIDE SERIES 35 OR APPROVED EQUAL FOR FLANGED PIPING.
8. DISCHARGE LINE FROM AIR RELEASE VALVE SHALL BE SLOPED AND FIELD ROUTED TO NEAREST FLOOR DRAIN.
9. FLOWMETER SHALL BE PROVIDED WITH MINIMUM UPSTREAM STRAIGHT RUN OF 5 PIPE DIAMETERS AND MINIMUM DOWNSTREAM STRAIGHT RUN OF 2 PIPE DIAMETERS.

4' 2' 0' 4' 8'
1/4" = 1'-0"

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

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AEROBIC GRANULAR SLUDGE - PHASE 1

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AGS REACTORS AND PIPE GALLERY

PROCESS MECHANICAL

WETWELL ENLARGED PLAN AND SECTION

01-M-405

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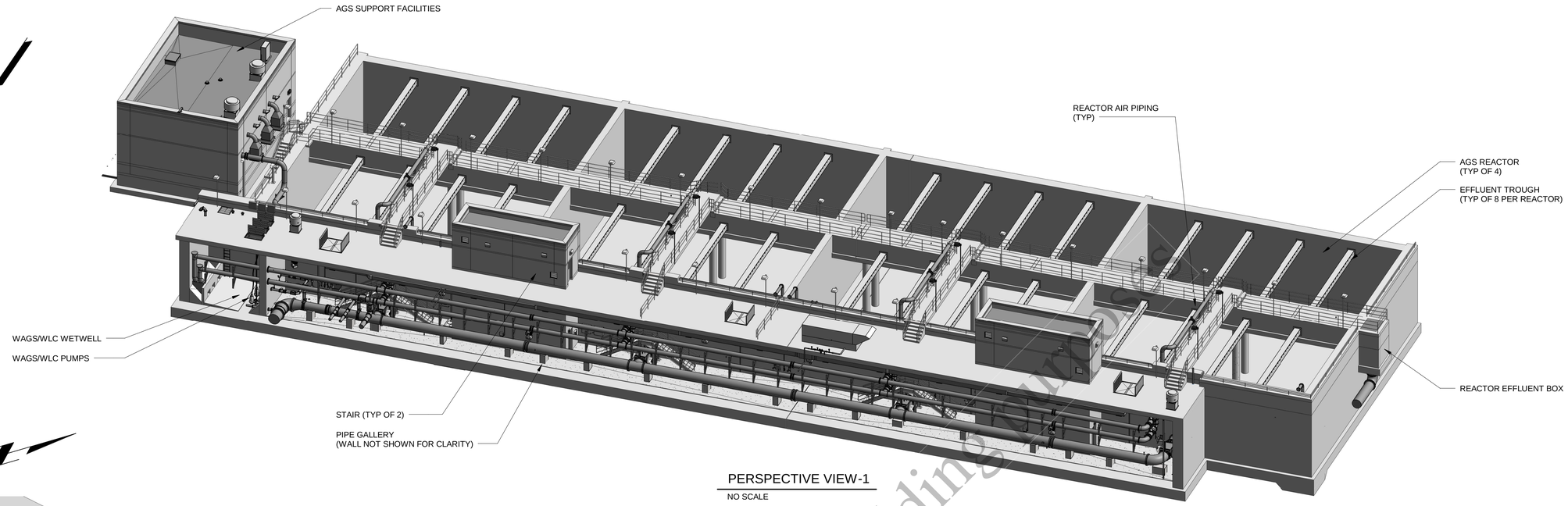
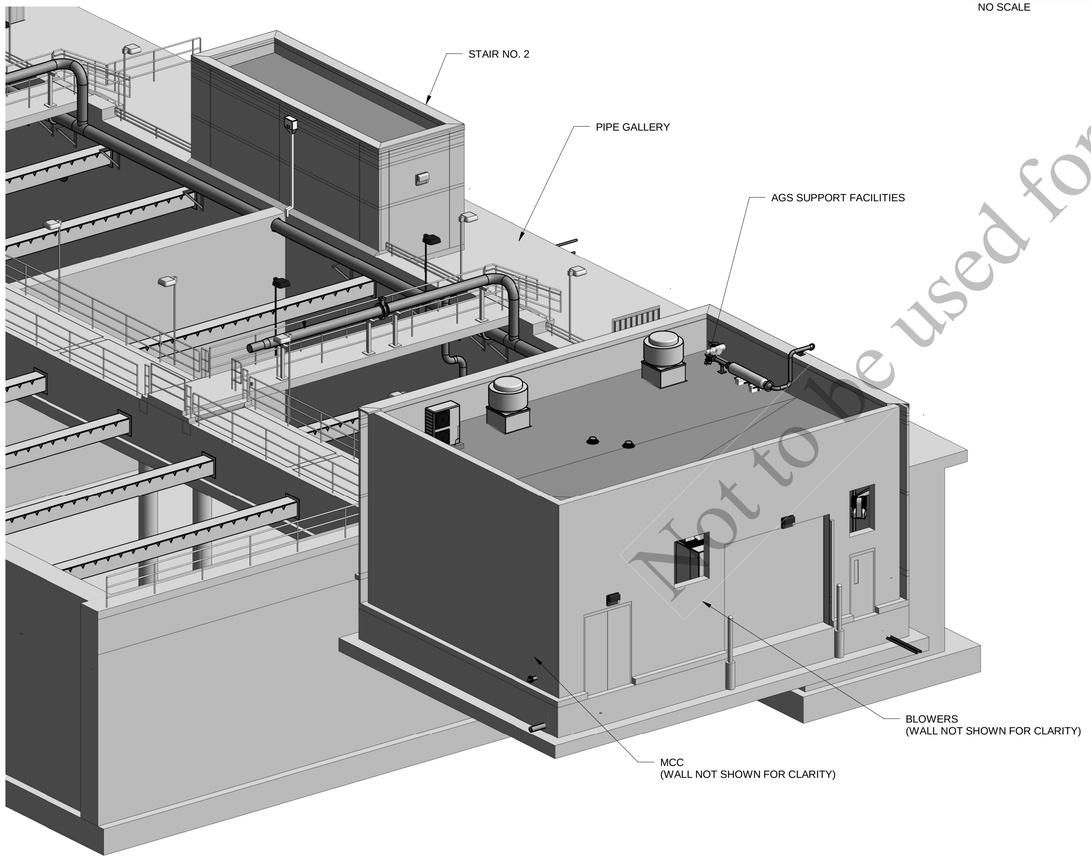


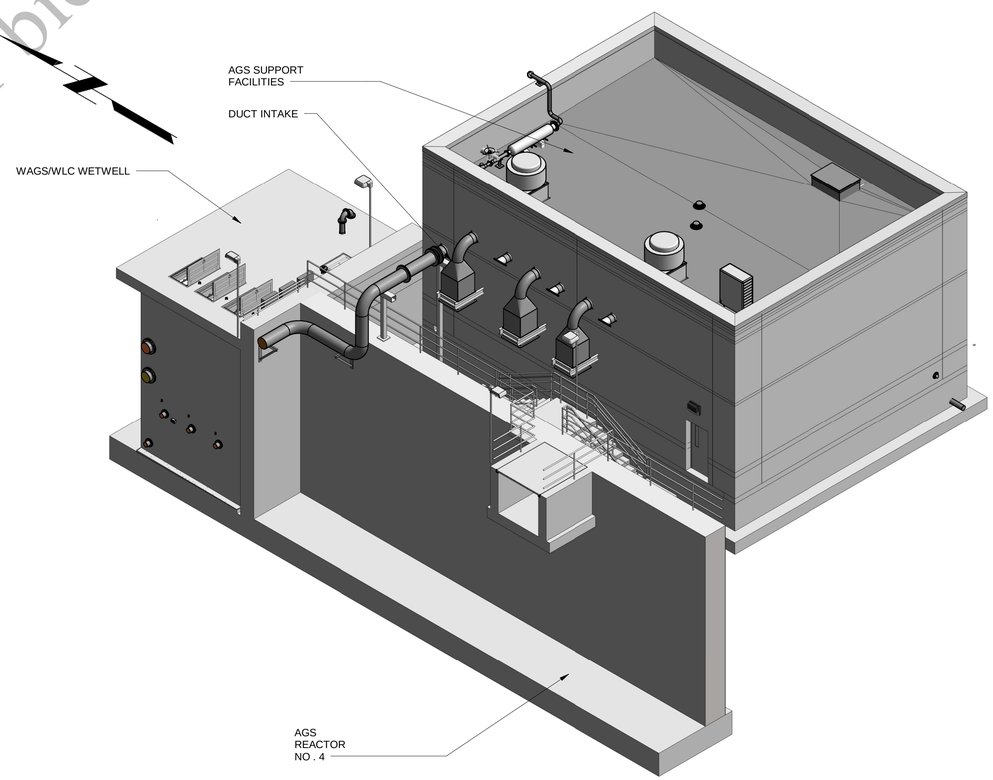
PERSPECTIVE VIEW-1

NO SCALE



PERSPECTIVE VIEW-2

NO SCALE



PERSPECTIVE VIEW-3

NO SCALE

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

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AEROBIC GRANULAR SLUDGE - PHASE 1

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AGS REACTORS AND PIPE GALLERY

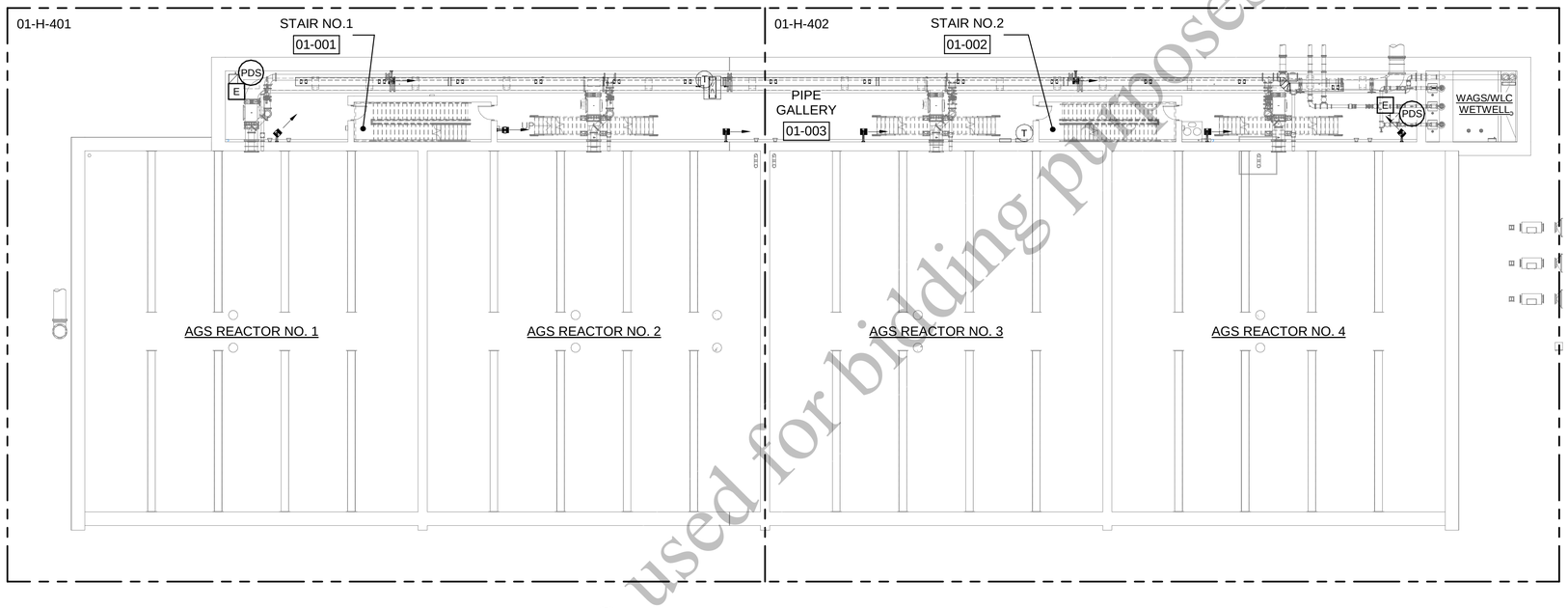
PROCESS MECHANICAL

PERSPECTIVE VIEWS

01-M-901

GENERAL SHEET NOTES

1. SEE DRAWING 00-H-001 FOR LEGENDS, ABBREVIATIONS AND GENERAL NOTES.



OVERALL FLOOR PLAN

1/16" = 1'-0"

16' 12' 8' 4' 0' 16' 32'

1/16" = 1'-0"

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

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Four Rivers Sanitation Authority

AEROBIC GRANULAR SLUDGE - PHASE 1

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CHECKED:	KMC
APPROVED:	SP
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PROJECT NO.:	411752

AGS REACTORS AND PIPE GALLERY

HVAC

REACTORS AND GALLERY OVERALL FLOOR PLAN

01-H-101

PLOTTED: 12/16/2022 11:47:46 AM
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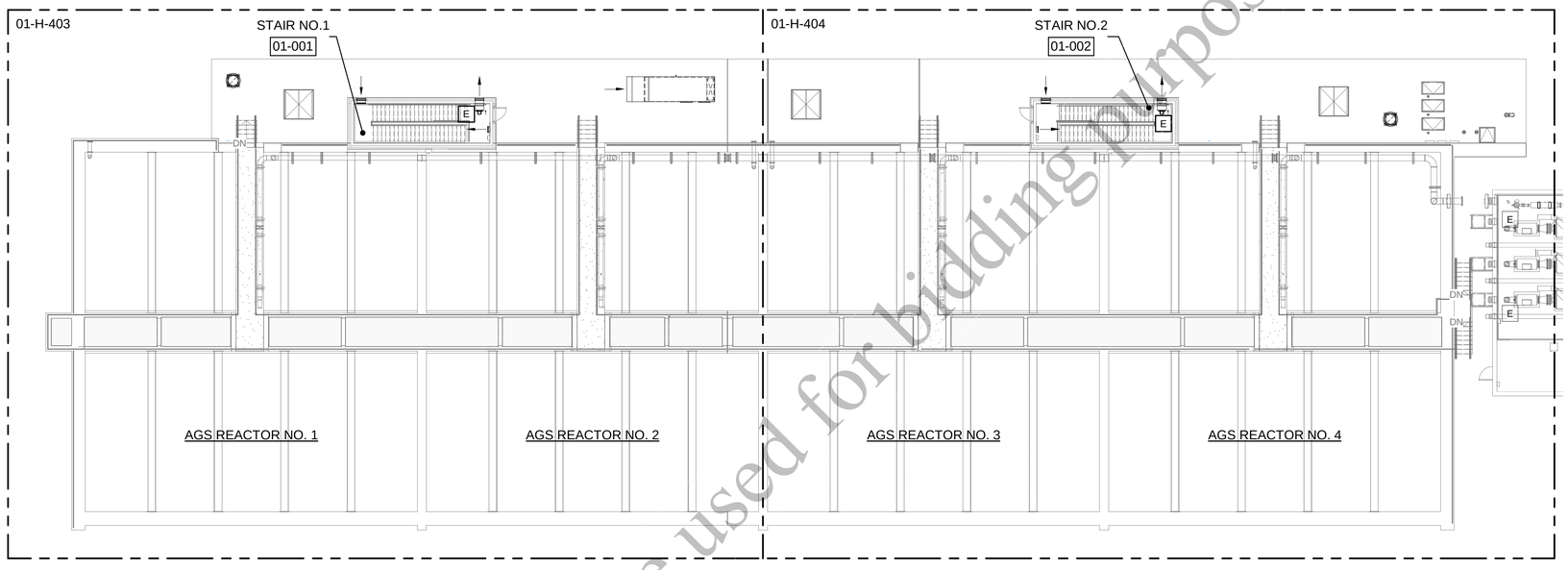
GENERAL SHEET NOTES

1. SEE DRAWING 00-H-001 FOR LEGENDS, ABBREVIATIONS AND GENERAL NOTES.



OVERALL TOP PLAN

1/16" = 1'-0"

16' 12' 8' 4' 0' 16' 32'

1/16" = 1'-0"

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

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Black & Veatch Corporation
Chicago, Illinois
ILLINOIS PROFESSIONAL
DESIGN FIRM - 184.002143-0006

Four Rivers Sanitation Authority

AEROBIC GRANULAR SLUDGE - PHASE 1

REVISIONS AND RECORD OF ISSUE

DESIGNED:	VSS
DETAILED:	AJP
CHECKED:	KMC
APPROVED:	SP
DATE:	12/20/2022
PROJECT NO.:	411752

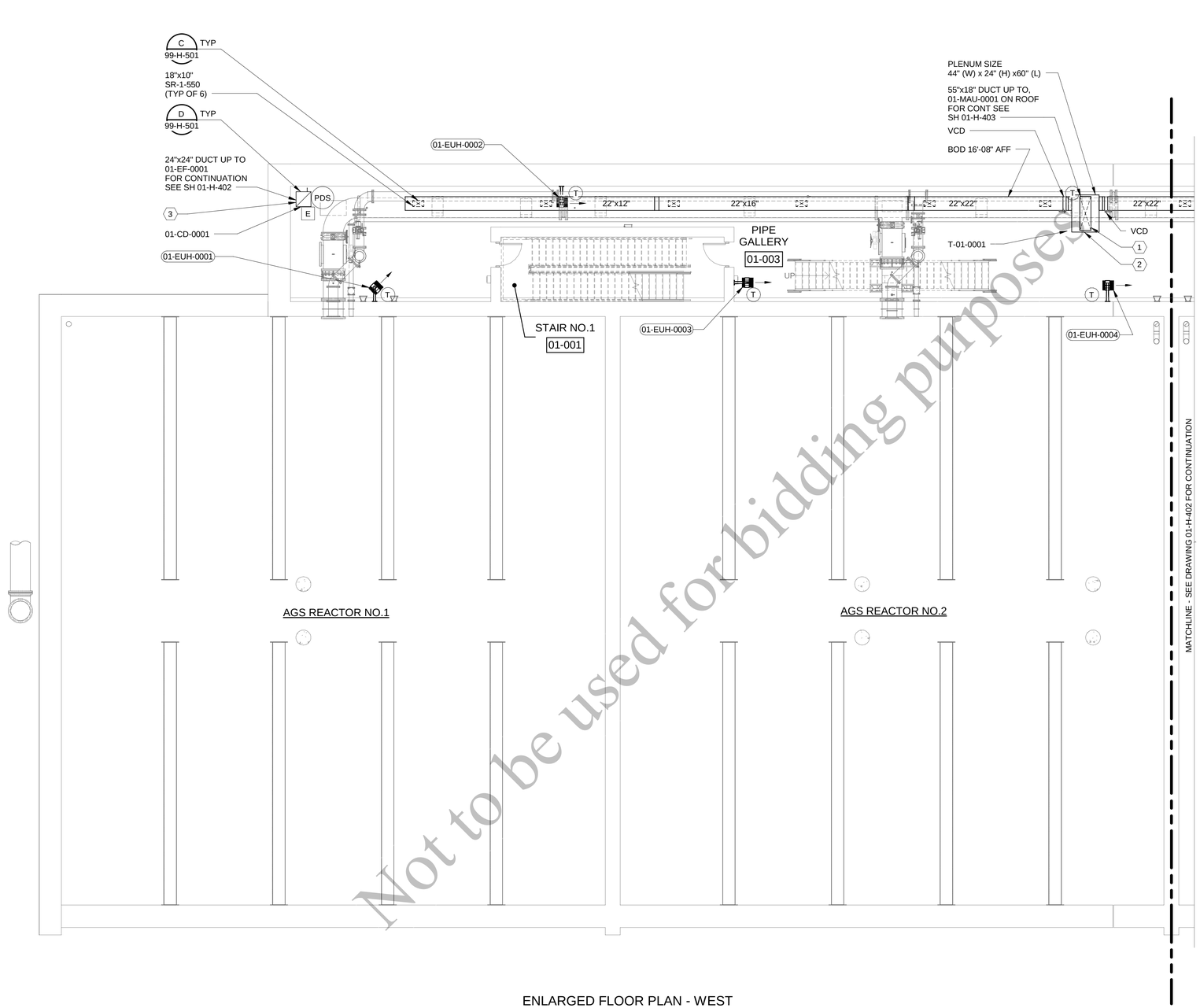
AGS REACTORS AND PIPE GALLERY

HVAC

REACTORS AND GALLERY OVERALL TOP PLAN

01-H-102

PLOTTED: 12/16/2022 11:50:09 AM
FILE: BIM 360://409469 - Aerobic Granular Sludge Phase 1/409469 - AGS.rvt
D11000



ENLARGED FLOOR PLAN - WEST

1/8" = 1'-0"

GENERAL SHEET NOTES

1. SEE DRAWING 00-H-001 FOR LEGENDS, ABBREVIATIONS AND GENERAL NOTES.

SHEET KEYNOTES

1. DUCT DROP FROM 01-MAU-0001
   MATERIAL - STAINLESS STEEL 304L
2. S/A DUCTING - FRP
3. DUCT SLEEVES AND PLENUMS FOR
   EXHAUST FANS - STAINLESS STEEL 304L

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AEROBIC GRANULAR SLUDGE - PHASE 1

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DESIGNED:	VSS
DETAILED:	AJP
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APPROVED:	SP
DATE:	12/20/2022
PROJECT NO.:	411752

AGS REACTORS AND PIPE GALLERY

HVAC

REACTORS AND GALLERY ENLARGED FLOOR PLAN - WEST

8' 4' 0' 8' 16'

1/8" = 1'-0"

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

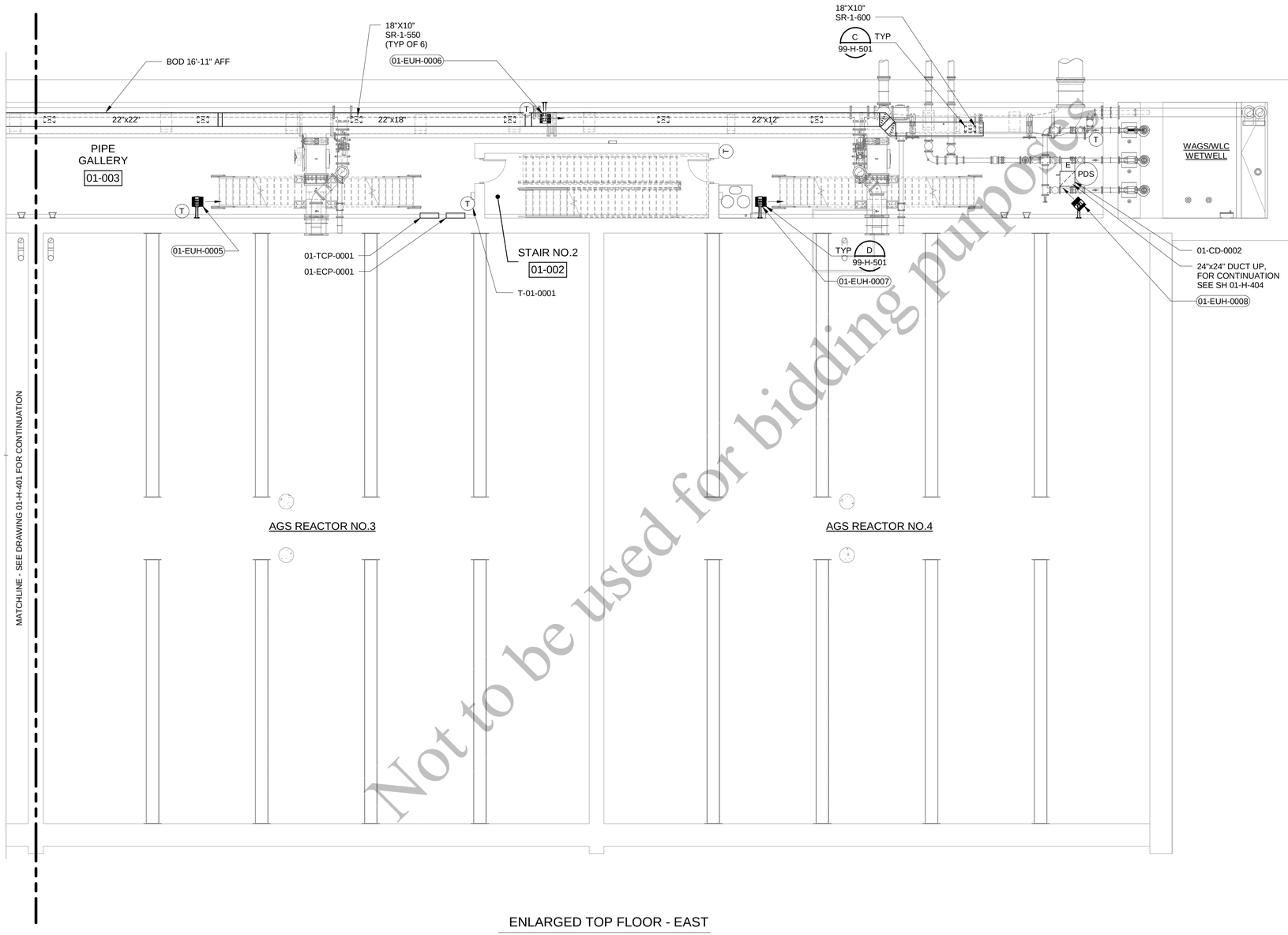
01-H-401

79 OF 163

PLOTTED: 12/16/2022 11:48:39 AM
FILE: BIM 360://409469 - Aerobic Granular Sludge Phase 1/409469 - AGS.rvt
D11000

GENERAL SHEET NOTES

1. SEE DRAWING 00-H-001 FOR LEGENDS, ABBREVIATIONS AND GENERAL NOTES.



ENLARGED TOP FLOOR - EAST

1/8" = 1'-0"

8' 4' 0' 8' 16'

1/8" = 1'-0"

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

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AEROBIC GRANULAR SLUDGE - PHASE 1

REVISIONS AND RECORD OF ISSUE

DESIGNED:	VSS
DETAILED:	AJP
CHECKED:	KMC
APPROVED:	SP
DATE:	12/20/2022
PROJECT NO.:	411752

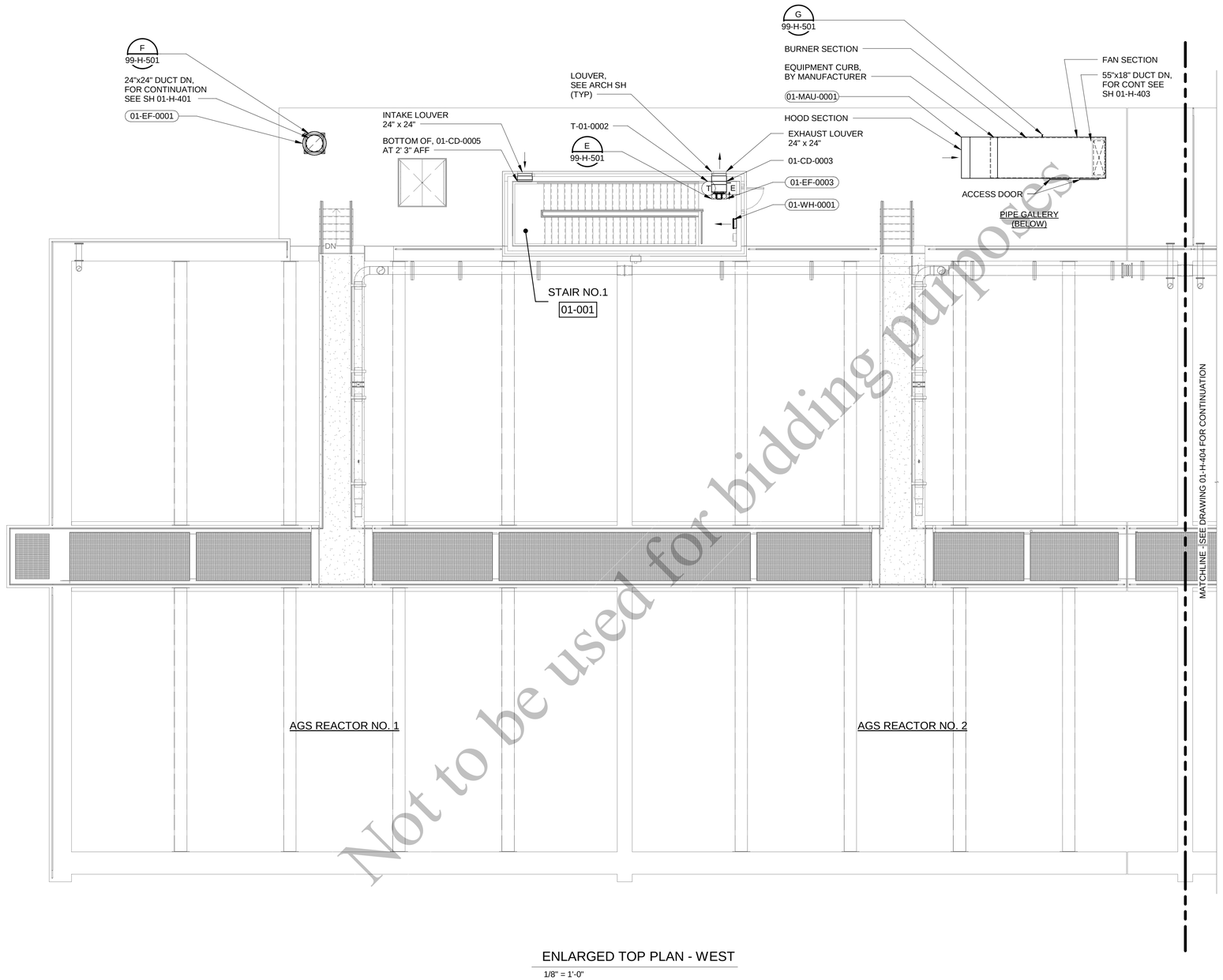
AGS REACTORS AND PIPE GALLERY

HVAC

REACTORS AND GALLERY ENLARGED FLOOR PLAN - EAST

01-H-402

PLOTTED: 12/16/2022 11:50:38 AM
FILE: BIM 360://409469 - Aerobic Granular Sludge Phase 1/409469 - AGS.rvt
D11000



ENLARGED TOP PLAN - WEST

1/8" = 1'-0"

GENERAL SHEET NOTES

1. SEE DRAWING 00-H-001 FOR LEGENDS, ABBREVIATIONS AND GENERAL NOTES.

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Four Rivers Sanitation Authority

AEROBIC GRANULAR SLUDGE - PHASE 1

REVISIONS AND RECORD OF ISSUE

DESIGNED:	VSS
DETAILED:	AJP
CHECKED:	KMC
APPROVED:	SP
DATE:	12/20/2022
PROJECT NO.:	411752

AGS REACTORS AND PIPE GALLERY

HVAC

REACTORS AND GALLERY ENLARGED TOP PLAN - WEST

01-H-403

81 OF 163

8' 4' 0' 8' 16'

1/8" = 1'-0"

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

PLOTTED: 12/16/2022 11:50:26 AM
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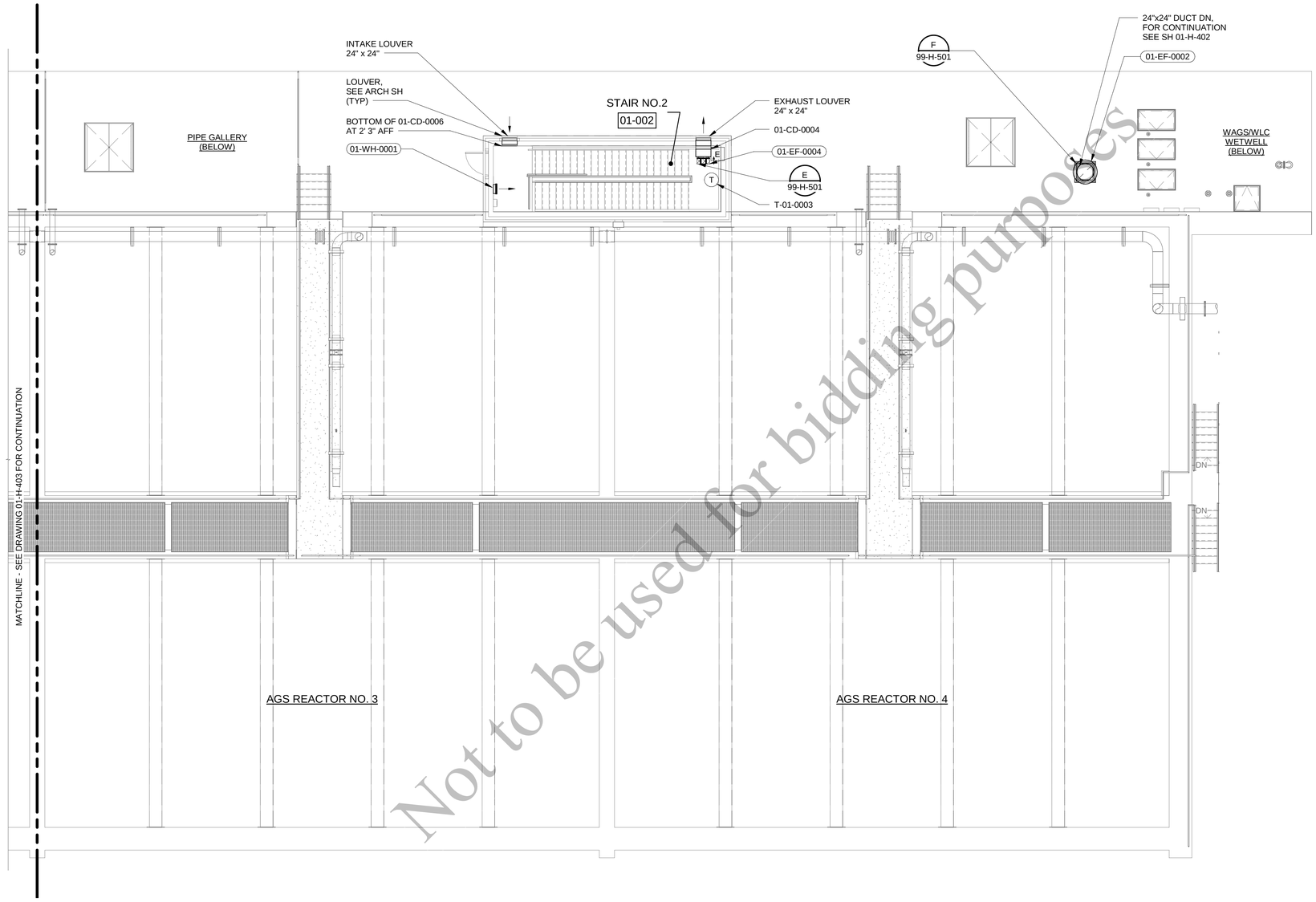
D11000



ENLARGED TOP PLAN - EAST

1/8" = 1'-0"

GENERAL SHEET NOTES

1. SEE DRAWING 00-H-001 FOR LEGENDS, ABBREVIATIONS AND GENERAL NOTES.

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Four Rivers Sanitation Authority

AEROBIC GRANULAR SLUDGE - PHASE 1

REVISIONS AND RECORD OF ISSUE

DESIGNED:	VSS
DETAILED:	AJP
CHECKED:	KMC
APPROVED:	SP
DATE:	12/20/2022
PROJECT NO.:	411752

AGS REACTORS AND PIPE GALLERY

HVAC

REACTORS AND GALLERY ENLARGED TOP PLAN - EAST

8' 4' 0' 8' 16'

1/8" = 1'-0"

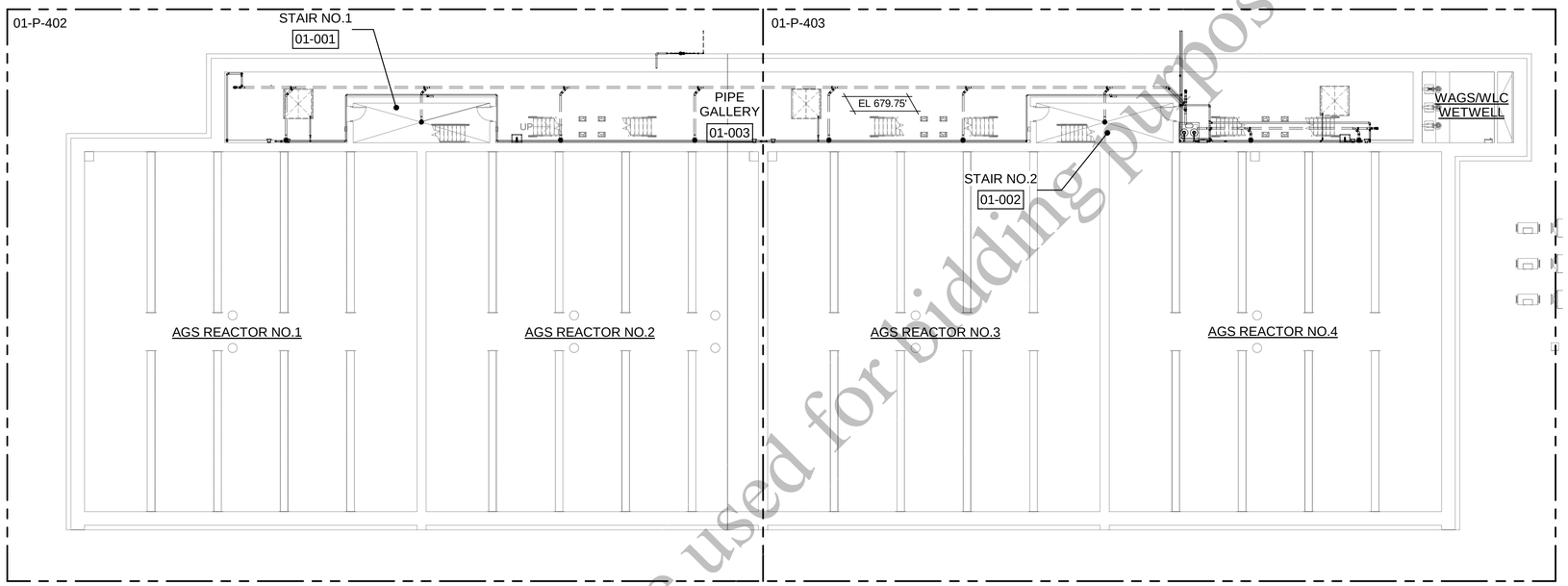
(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

01-H-404

PLOTTED: 12/16/2022 11:50:42 AM
FILE: BIM 360://409469 - Aerobic Granular Sludge Phase 1/409469 - AGS.rvt
D11000

GENERAL SHEET NOTES

1. SEE DRAWING 00-P-001 FOR LEGENDS, ABBREVIATIONS AND GENERAL NOTES.



OVERALL FLOOR PLAN

1/16" = 1'-0"

16' 12' 8' 4' 0' 16' 32'

1/16" = 1'-0"

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

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Four Rivers Sanitation Authority

AEROBIC GRANULAR SLUDGE - PHASE 1

REVISIONS AND RECORD OF ISSUE

DESIGNED:	SAM
DETAILED:	AJP
CHECKED:	DAV
APPROVED:	SP
DATE:	12/20/2022
PROJECT NO.:	411752

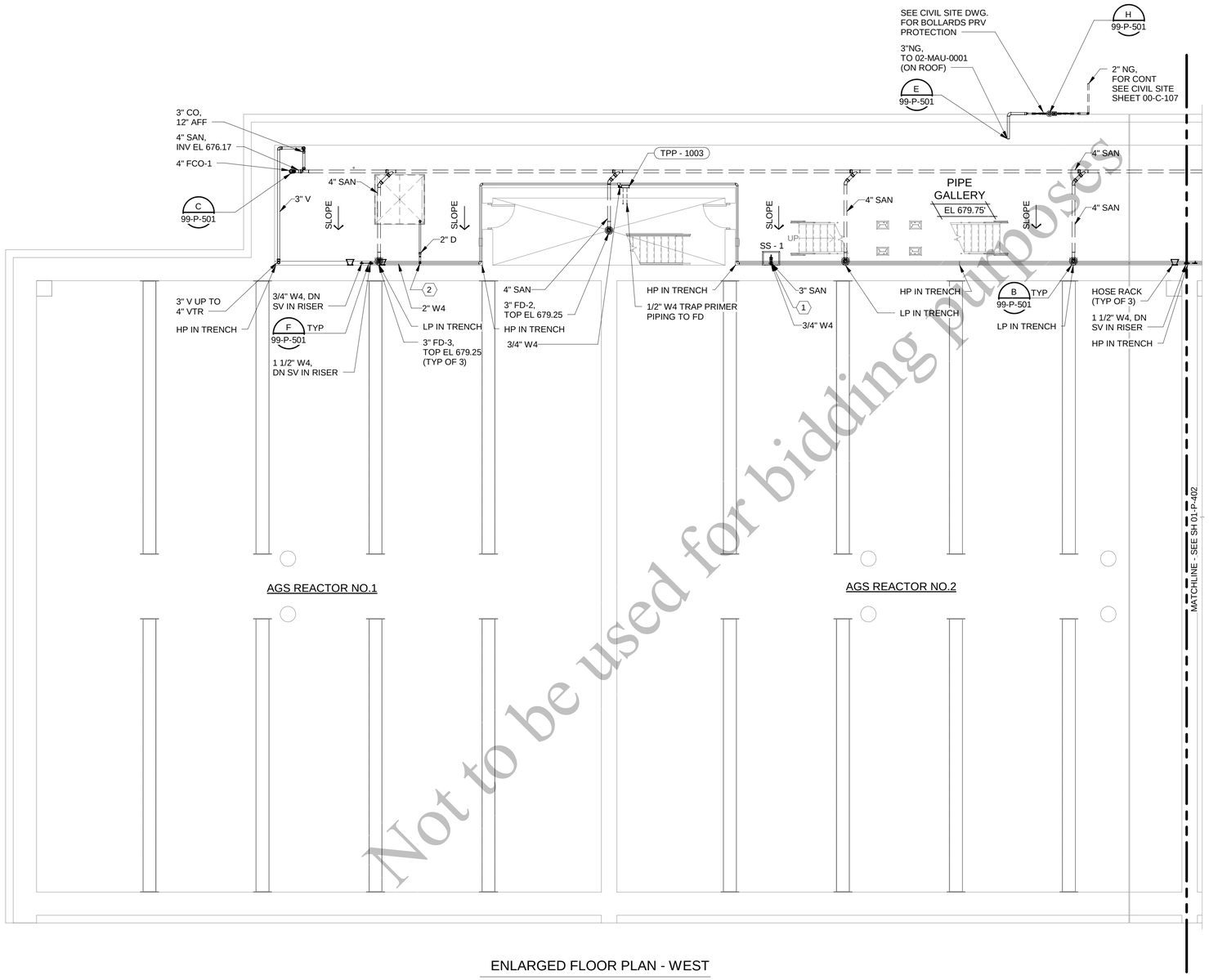
AGS REACTORS AND PIPE GALLERY

PLUMBING

REACTORS AND GALLERY OVERALL FLOOR PLAN

01-P-101

PLOTTED: 12/16/2022 11:54:07 AM
FILE: BIM 360://409469 - Aerobic Granular Sludge Phase 1/409469 - AGS.rvt
D11000



ENLARGED FLOOR PLAN - WEST

1/8" = 1'-0"

GENERAL SHEET NOTES

1. SEE DRAWING 00-P-001 FOR LEGENDS, ABBREVIATIONS AND GENERAL NOTES.

SHEET KEYNOTES

1. LEAVE 3" SAN LINE WITH 1" AIR GAP ABOVE TRENCH GRATING.
2. LEAVE 2" D LINE WITH 1" AIR GAP ABOVE TRENCH GRATING.

8' 4' 0' 8' 16'

1/8" = 1'-0"

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

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AEROBIC GRANULAR SLUDGE - PHASE 1

REVISIONS AND RECORD OF ISSUE

DESIGNED:	SAM
DETAILED:	AJP
CHECKED:	DAV
APPROVED:	SP
DATE:	12/20/2022
PROJECT NO.:	411752

AGS REACTORS AND PIPE GALLERY

PLUMBING

REACTORS AND GALLERY ENLARGED FLOOR PLAN - WEST

01-P-401

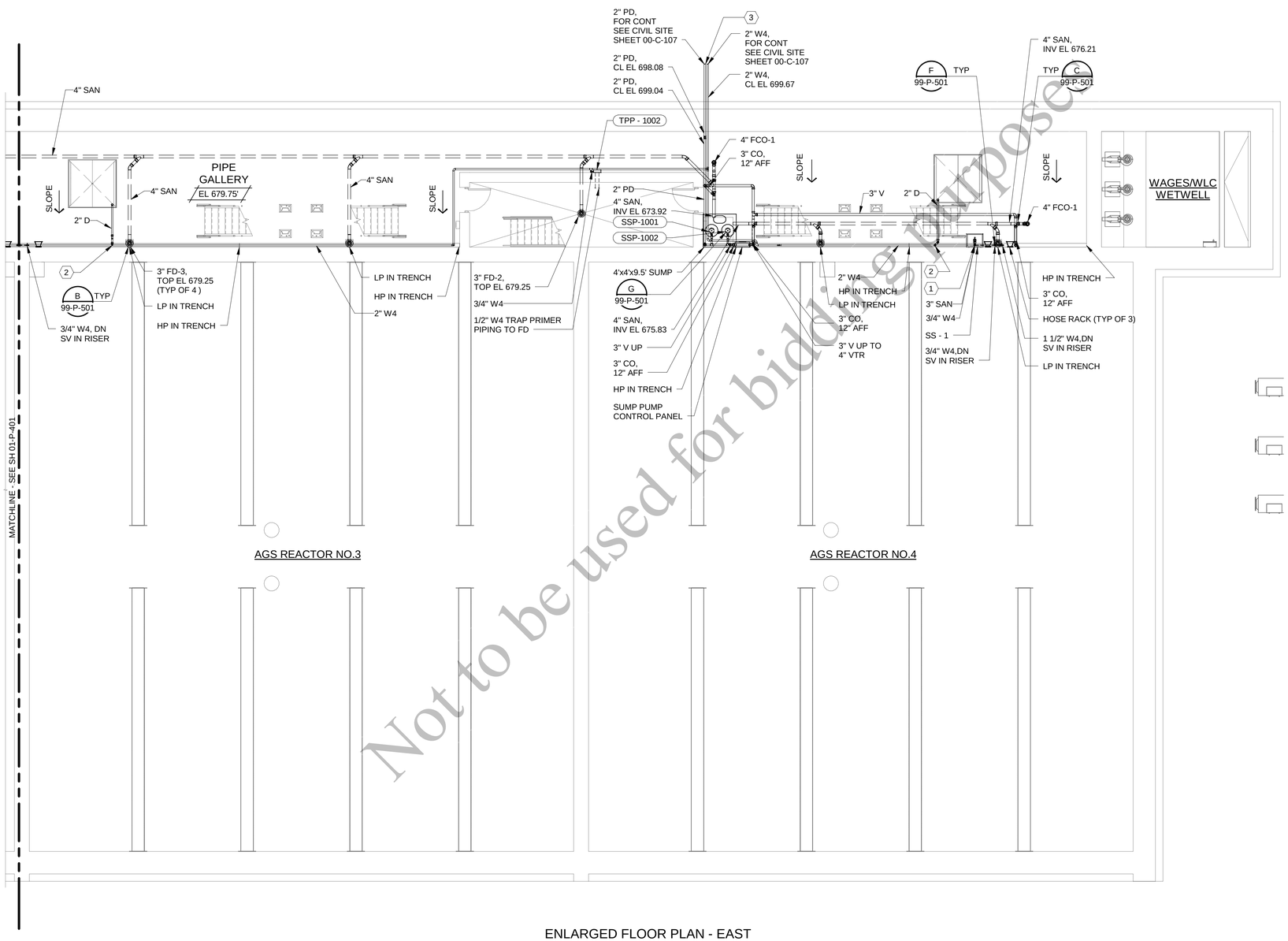
PLOTTED: 12/16/2022 11:47:51 AM
FILE: BIM 360://409469 - Aerobic Granular Sludge Phase 1/409469 - AGS.rvt
D11000

GENERAL SHEET NOTES

1. SEE DRAWING 00-P-001 FOR LEGENDS, ABBREVIATIONS AND GENERAL NOTES.

SHEET KEYNOTES

1. LEAVE 3" SAN LINE WITH 1" AIR GAP ABOVE TRENCH GRATING.
2. LEAVE 2" D LINE WITH 1" AIR GAP ABOVE TRENCH GRATING.
3. SUMP PUMP DISCHARGE (PD) CONTINUOUS AS SANITARY (SAN) ON 00-C-107.



ENLARGED FLOOR PLAN - EAST

1/8" = 1'-0"

8' 4' 0' 8' 16'

1/8" = 1'-0"

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

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AEROBIC GRANULAR SLUDGE - PHASE 1

REVISIONS AND RECORD OF ISSUE

DESIGNED:	SAM
DETAILED:	AJP
CHECKED:	DAV
APPROVED:	SP
DATE:	12/20/2022
PROJECT NO.:	411752

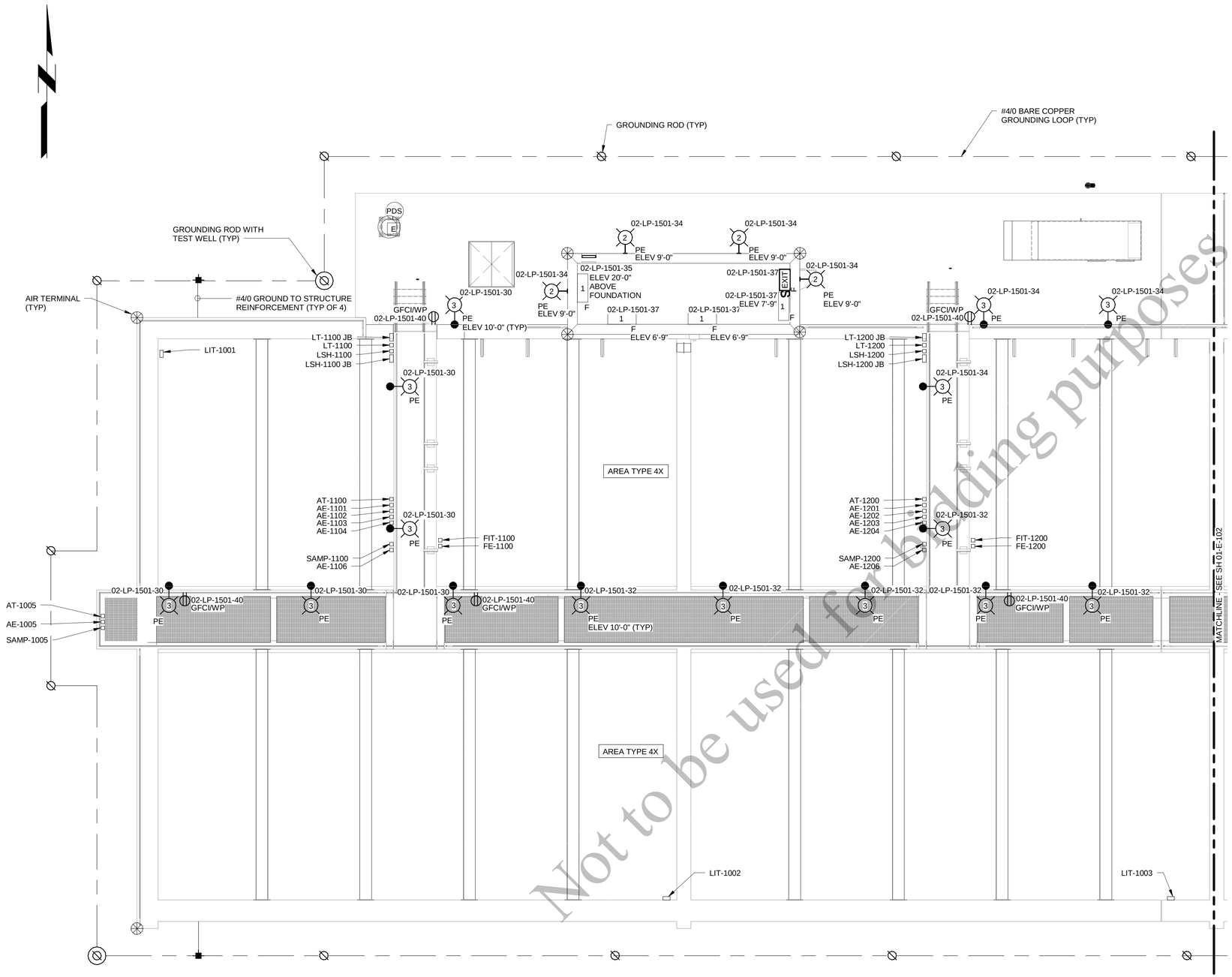
AGS REACTORS AND PIPE GALLERY

PLUMBING

REACTORS AND GALLERY ENLARGED FLOOR PLAN - EAST

01-P-402

PLOTTED: 12/16/2022 11:52:37 AM
FILE: BIM 360://409469 - Aerobic Granular Sludge Phase 1/409469 - AGS.rvt
D11000



ELECTRICAL PLAN

1/8" = 1'-0"

GENERAL NOTES

1. SEE DRAWINGS 00-E-001 AND 00-E-002 DOR LEGENDS, ABBREVIATIONS AND NOTES.
2. LOCATIONS OF VALVE ACTUATORS AND PRESSURE TRANSMITTERS ON AIR PIPING INTERNAL TO AGS REACTORS ARE PROVIDED BY AGS SYSTEM SUPPLIER. FINAL EQUIPMENT AND PIPING LAYOUT IS PROPRIETARY AND SHALL BE AS PROVIDED IN VENDOR SUBMITTAL DRAWINGS.

8' 4' 0' 8' 16'

1/8" = 1'-0"

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

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AEROBIC GRANULAR SLUDGE - PHASE 1

REVISIONS AND RECORD OF ISSUE

DESIGNED:	EJB
DETAILED:	SFR
CHECKED:	SDS
APPROVED:	EJB
DATE:	12/20/2022
PROJECT NO.:	411752

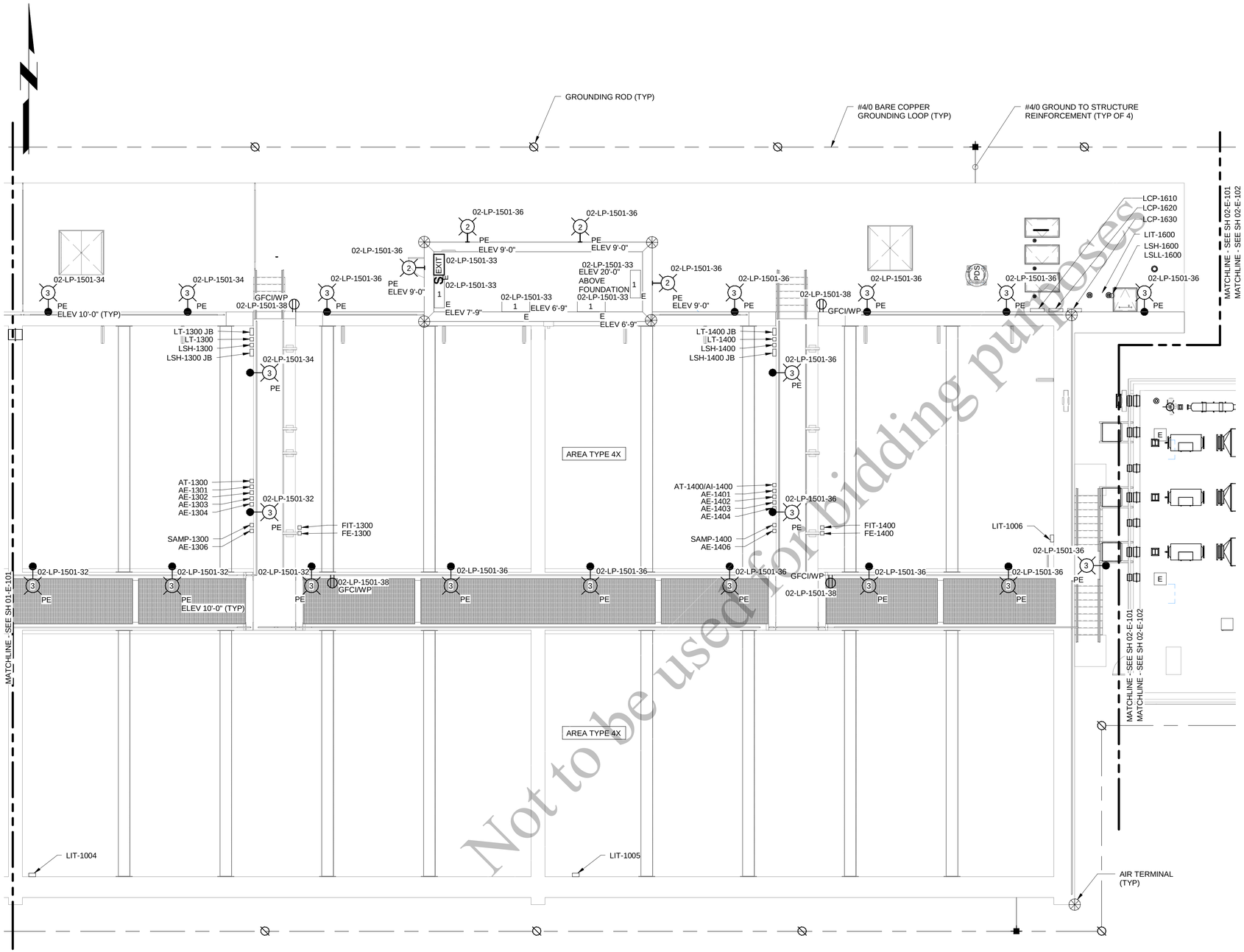
AGS REACTORS AND PIPE GALLERY

ELECTRICAL

REACTOR 1 AND REACTOR 2 ELECTRICAL PLAN

01-E-101

PLOTTED: 12/16/2022 11:53:19 AM
FILE: BIM 360://409469 - Aerobic Granular Sludge Phase 1/409469 - AGS.rvt
D11000



ELECTRICAL PLAN

1/8" = 1'-0"

GENERAL NOTES

1. SEE DRAWINGS 00-E-001 AND 00-E-002 DOR LEGENDS, ABBREVIATIONS AND NOTES.
2. LOCATIONS OF VALVE ACTUATORS AND PRESSURE TRANSMITTERS ON AIR PIPING INTERNAL TO AGS REACTORS ARE PROVIDED BY AGS SYSTEM SUPPLIER. FINAL EQUIPMENT AND PIPING LAYOUT IS PROPRIETARY AND SHALL BE AS PROVIDED IN VENDOR SUBMITTAL DRAWINGS.

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AEROBIC GRANULAR SLUDGE - PHASE 1

REVISIONS AND RECORD OF ISSUE

DESIGNED:	EJB
DETAILED:	SFR
CHECKED:	SDS
APPROVED:	EJB
DATE:	12/20/2022
PROJECT NO.:	411752

AGS REACTORS AND PIPE GALLERY

ELECTRICAL

REACTOR 3 AND REACTOR 4 ELECTRICAL PLAN

8' 4' 0' 8' 16'
1/8" = 1'-0"

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

01-E-102

PLOTTED: 12/16/2022 11:53:15 AM
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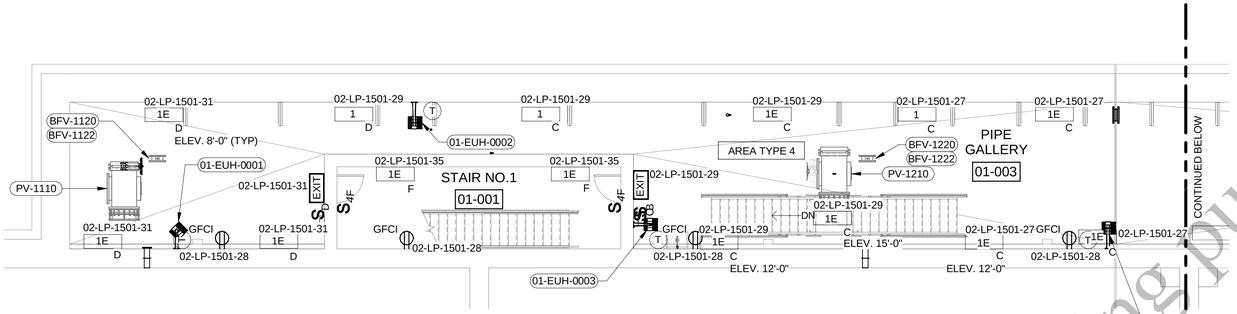
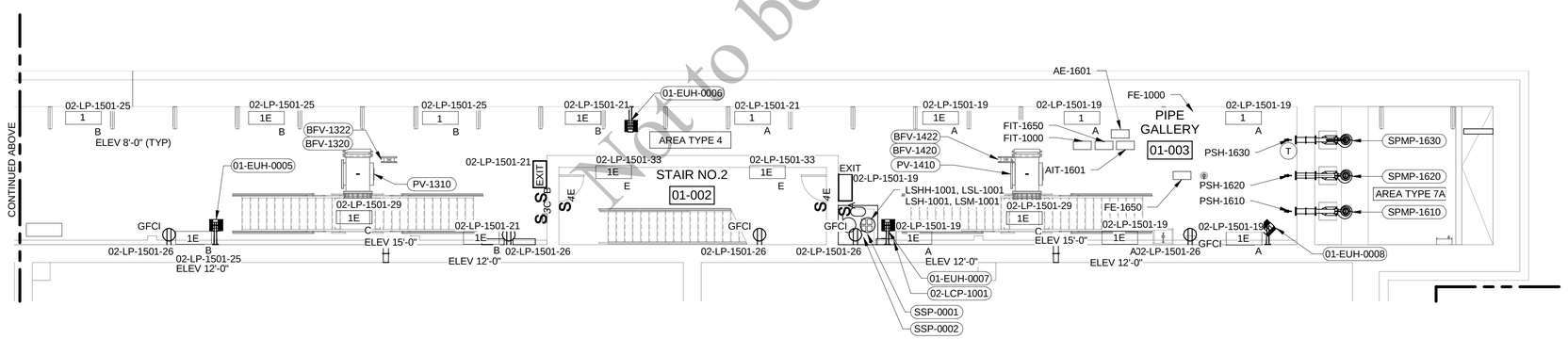
D11000



ELECTRICAL PLAN

1/8" = 1'-0"



ELECTRICAL PLAN

1/8" = 1'-0"

GENERAL NOTES

1. SEE DRAWINGS 00-E-001 AND 00-E-002 DOR LEGENDS, ABBREVIATIONS AND NOTES.

8' 4' 0' 8' 16'

1/8" = 1'-0"

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

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Chicago, Illinois
ILLINOIS PROFESSIONAL
DESIGN FIRM - 184.002143-0006

Four Rivers Sanitation Authority

AEROBIC GRANULAR SLUDGE - PHASE 1

REVISIONS AND RECORD OF ISSUE

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DETAILED:	SFR
CHECKED:	SDS
APPROVED:	EJB
DATE:	12/20/2022
PROJECT NO.:	411752

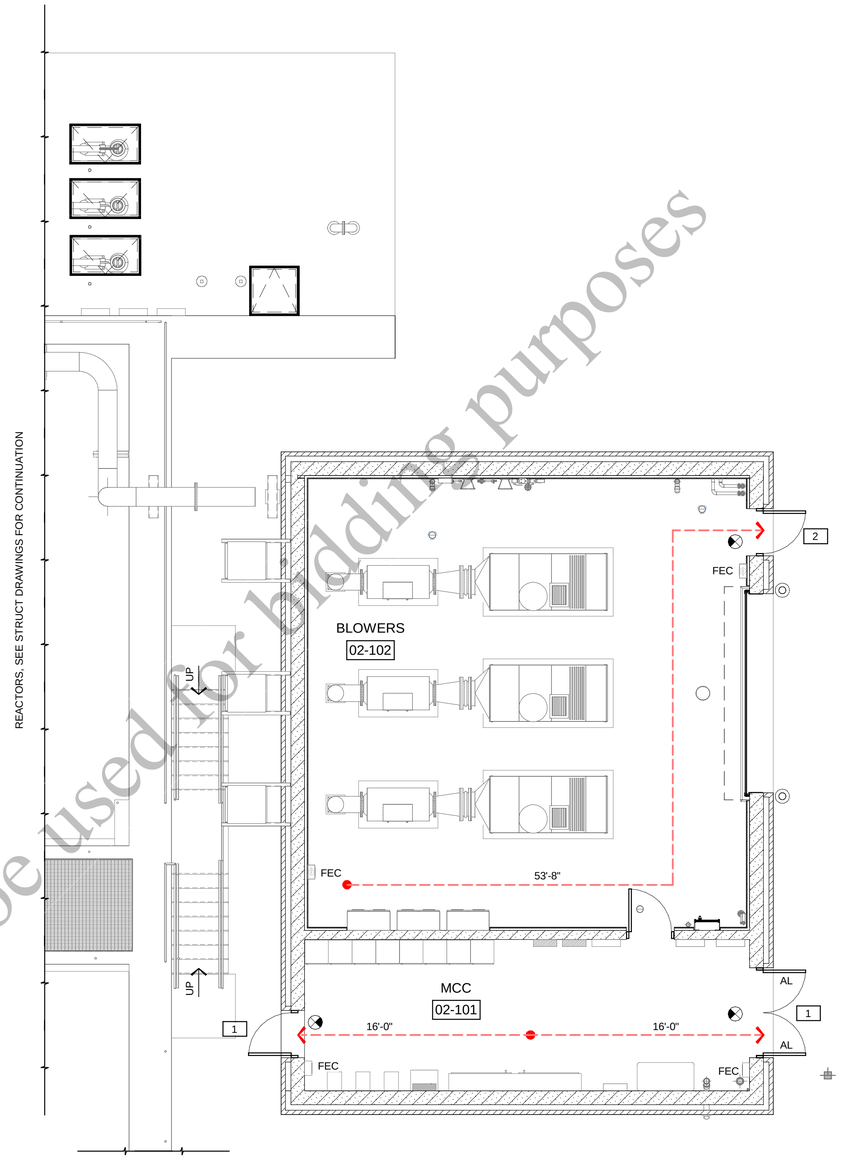
AGS REACTORS AND PIPE GALLERY

ELECTRICAL

GALLERY ELECTRICAL PLANS

01-E-103

PLOTTED: 12/16/2022 11:53:28 AM
FILE: BIM 360://409469 - Aerobic Granular Sludge Phase 1/409469 - AGS.rvt
D11000



AGS SUPPORT FACILITIES - LIFE SAFETY PLAN

3/16" = 1'-0"

GENERAL SHEET NOTES

BUILDING CODE ANALYSIS

BUILDING CODES:

2015 INTERNATIONAL BUILDING CODE WITH AMENDMENTS
2018 ILLINOIS ENERGY CONSERVATION CODE WITH AMENDMENTS

AGS SUPPORT FACILITES

OCCUPANCY	F-2 MODERATE HAZARD FACTORY INDUSTRIAL
TYPE OF CONSTRUCTION	II-B NON COMBUSTIBLE
ACTUAL AREA	1,617 SF
ACTUAL HEIGHT	20'-8"
ALLOWABLE AREA	15,500 SF
ALLOWABLE HEIGHT	55'
DESIGN OCCUPANT LOAD	16
NUMBER OF STORIES	1
ALLOWABLE NUMBER OF STORIES	2
MINIMUM EXITS REQUIRED	3
NUMBER OF EXITS	4
ADA ACCESSIBILITY	EXEMPT PER SECTION 1103.2.9
OCCUPANCY SEPARATION	NOT REQUIRED
FIRE SPRINKLERS	NOT REQUIRED
MAX EXIT TRAVEL DISTANCE	300'
ENERGY CODE COMPLIANCE	WALLS - R-5.7 C.I. ROOF - R-25 C.I.
MAXIMUM COMMON PATH OF EGRESS TRAVEL	75'

LIFE SAFETY LEGEND

	WALL MOUNTED FIRE EXTINGUISHER CABINET (FEC)
X'-X"	PATH OF EGRESS TRAVEL
100 SF/PERSON / 1 / F-2	OCCUPANTS PER SF OCCUPANT LOAD OCCUPANCY CLASSIFICATION
5	CUMULATIVE OCCUPANT LOAD
	EXIT
AL	ACTIVE LEAF
	1 HOUR FIRE BARRIER

6' 4' 2' 0' 5' 10'

3/16" = 1'-0"

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

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Kansas City, Missouri
ILLINOIS PROFESSIONAL
DESIGN FIRM - 184007283

Four Rivers Sanitation Authority

AEROBIC GRANULAR SLUDGE - PHASE 1

REVISIONS AND RECORD OF ISSUE

DESIGNED:	RAB
DETAILED:	TMB
CHECKED:	PDR
APPROVED:	PDR
DATE:	12/20/2022
PROJECT NO.:	411752

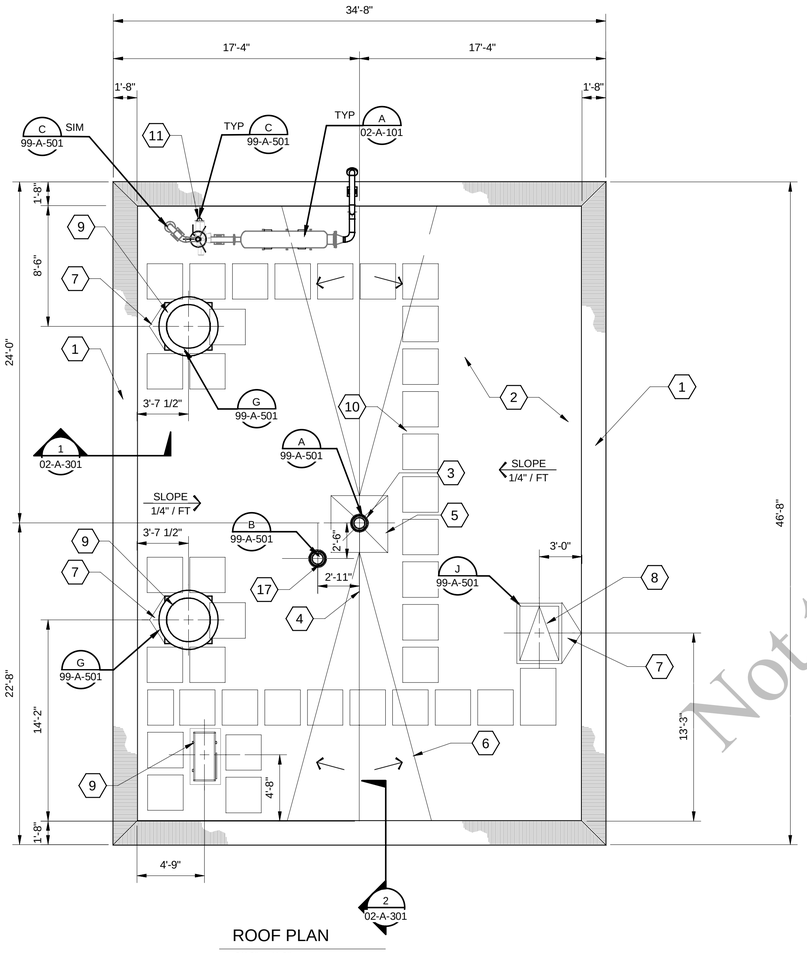
AGS SUPPORT FACILITIES

ARCHITECTURAL

LIFE SAFETY PLAN AND CODE ANALYSIS

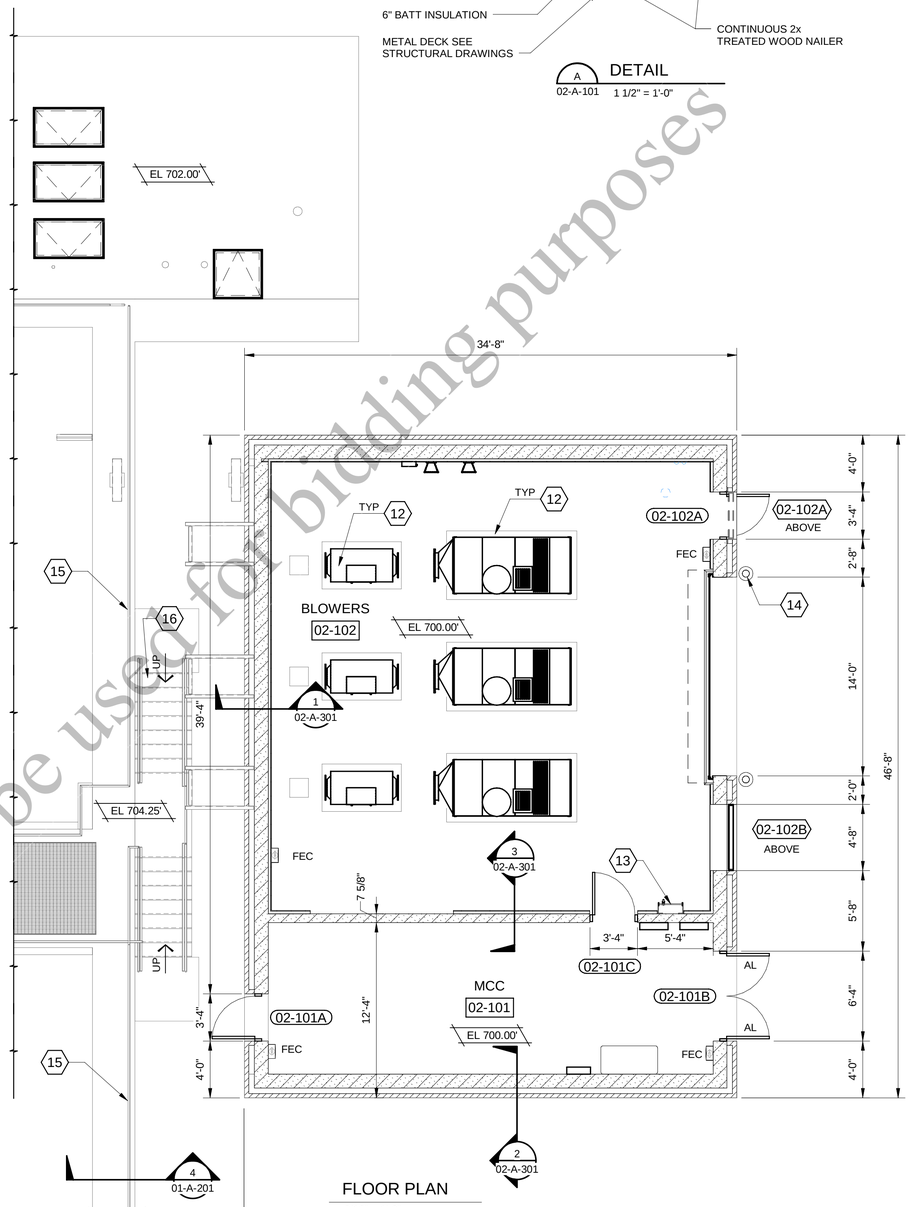
02-A-001

PLOTTED: 12/16/2022 11:51:03 AM
FILE: BIM 360://409469 - Aerobic Granular Sludge Phase 1/409469 - AGS.rvt
D11000



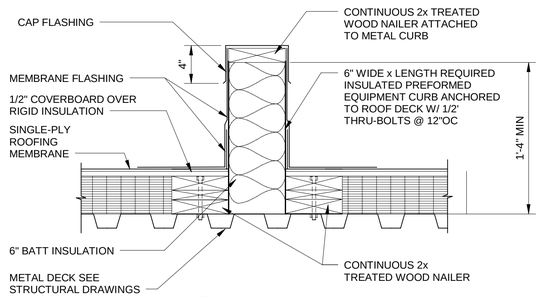
ROOF PLAN

3/16" = 1'-0"



FLOOR PLAN

3/16" = 1'-0"



A 02-A-101 DETAIL

1 1/2" = 1'-0"

GENERAL NOTES

SHEET KEYNOTES

1. PREFINISHED METAL COPING.
2. SINGLE-PLY ROOFING MEMBRANE OVER 1/2" COVER BOARD AND TAPERED INSULATION R-30.
3. ROOF DRAIN
4. TAPERED INSULATION VALLEY.
5. 4'-0" x 4'-0" ROOF DRAIN SUMP - 2" INSULATION AT DRAIN AND 3" INSULATION AT UPSLOPE.
6. CRICKET SYSTEM.
7. PROVIDE CRICKET SYSTEM AT ROOF EQUIPMENT.
8. ROOF SCUTTLE.
9. HVAC EQUIPMENT - SEE HVAC DRAWINGS.
10. ROOF WALK PADS.
11. PLUMBING VENT.
12. EQUIPMENT PADS - SEE STRUCTURAL DRAWINGS.
13. LADDER TO ROOF ABOVE WITH SAFETY EXTENSION POST.
14. BOLLARD - SEE CIVIL DRAWINGS.
15. GUARDRAIL - SEE STRUCTURAL DRAWINGS.
16. CONCRETE STAIRS - SEE STRUCTURAL DRAWINGS.
17. OVERFLOW ROOF DRAIN.

B&V Design, LLC
Kansas City, Missouri
ILLINOIS PROFESSIONAL
DESIGN FIRM - 184007283

Four Rivers Sanitation Authority

AEROBIC GRANULAR SLUDGE - PHASE 1

REVISIONS AND RECORD OF ISSUE

DESIGNED:	RAB
DETAILED:	TMB
CHECKED:	PDR
APPROVED:	PDR
DATE:	12/20/2022
PROJECT NO.:	411752

AGS SUPPORT FACILITIES

ARCHITECTURAL

FLOOR AND ROOF PLANS

02-A-101

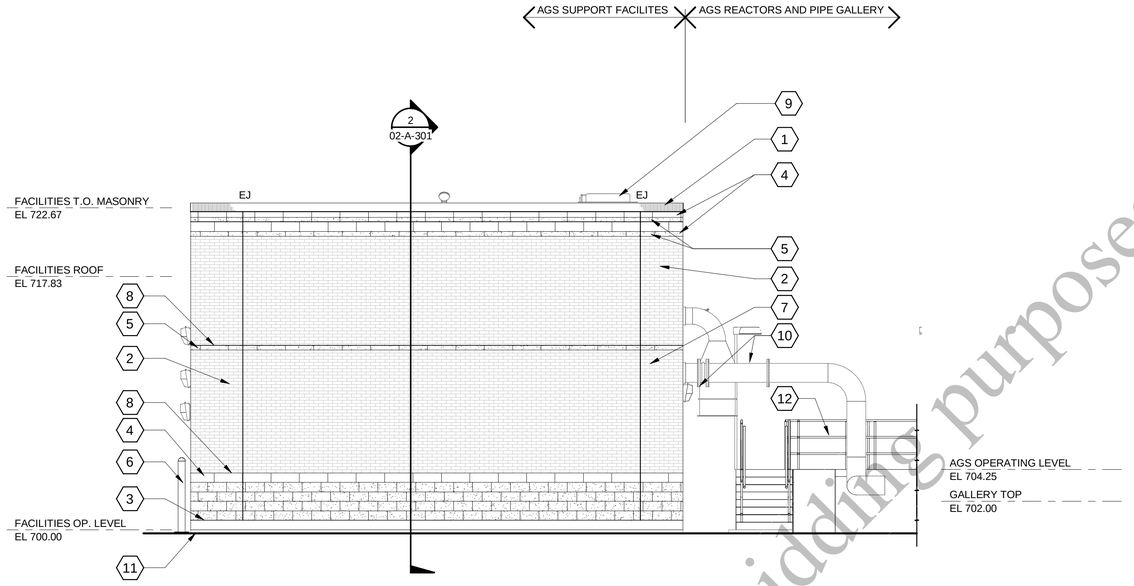
AGS REACTORS AND PIPE GALLERY | AGS SUPPORT FACILITES

6' 4' 2' 0' 5' 10'

3/16" = 1'-0"

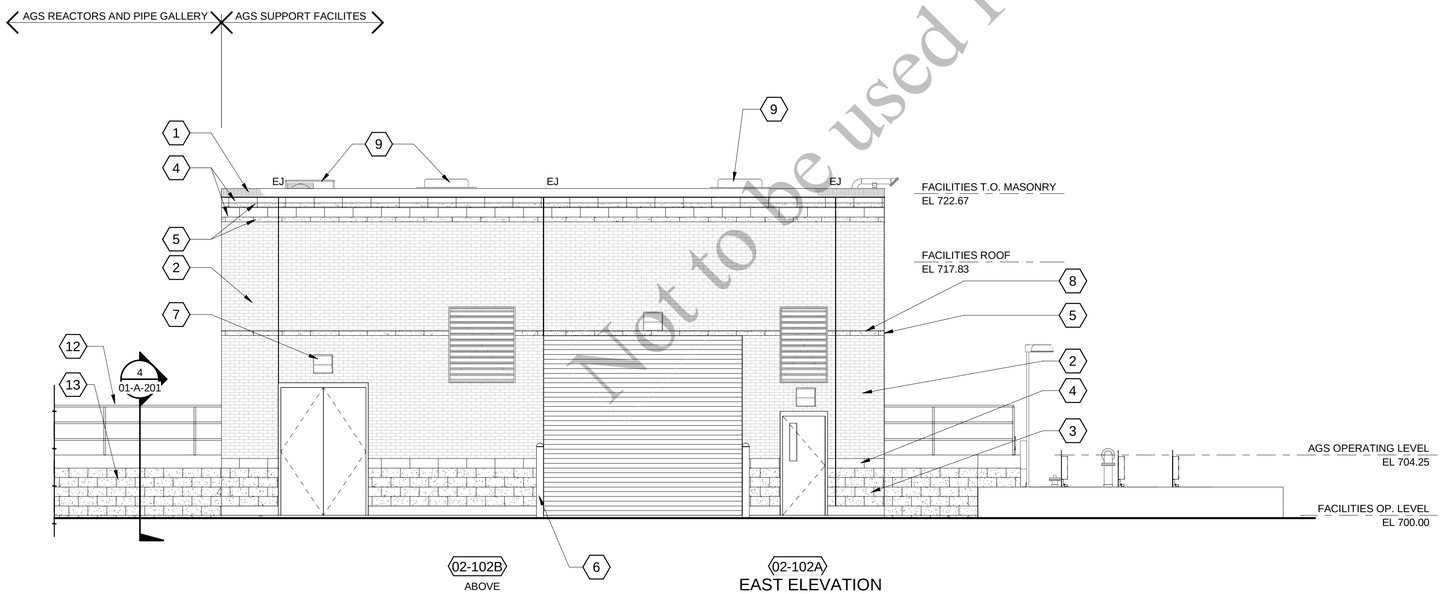
(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

PLOTTED: 12/16/2022 11:51:14 AM
FILE: BIM 360://409469 - Aerobic Granular Sludge Phase 1/409469 - AGS.rvt
D11000



NORTH ELEVATION

3/16" = 1'-0"



EAST ELEVATION

3/16" = 1'-0"

GENERAL SHEET NOTES

1. VENEER FACE BRICK EXPANSION JOINT (EJ). SEE STRUCTURAL DRAWINGS FOR BACKUP MASONRY UNITS (CMU) WALL CONTROL JOINT (CJ) WALL CONTROL JOINT LOCATIONS.
2. SHERWIN WILLIAMS STAIN COLORS:
   ACCENT BANDS (4",8", AND 12"): SW6107 NOMADIC DESERT
   UPPER DARK COLOR: SW7675 SEAL SKIN

SHEET KEYNOTES

1. PREFINISHED METAL COPING - SIZE, PATTERN AND COLOR TO MATCH EXISTING PRIMARY FILTRATION FACILITY.
2. FACE BRICK - SIZE, PATTERN AND COLOR TO MATCH EXISTING PRIMARY FILTRATION FACILITY.
3. 8 x 16 ROCKFACE MASONRY UNITS - SIZE, PATTERN AND COLOR TO MATCH EXISTING PRIMARY FILTRATION FACILITY.
4. 8 x 24 SMOOTHFACE MASONRY UNITS - SIZE, PATTERN AND COLOR TO MATCH EXISTING PRIMARY FILTRATION FACILITY.
5. 4 x 24 ROCKFACE MASONRY UNITS - SIZE, PATTERN AND COLOR TO MATCH EXISTING PRIMARY FILTRATION FACILITY.
6. BOLLARD - SEE CIVIL DRAWINGS.
7. LIGHT FIXTURE (TYP) - SEE ELECTRICAL DRAWINGS.
8. BRICK SHELF ANGLE - SEE DETAIL D/99-A-501.
9. HVAC EQUIPMENT - SEE HVAC DRAWINGS.
10. MECHANICAL EQUIPMENT - SEE MECHANICAL DRAWINGS.
11. FINISHED GRADE - CIVIL DRAWINGS.
12. GUARDRAIL - SEE STRUCTURAL DRAWINGS.
13. CAST IN PLACE CONCRETE BASIN WALL W/ FORMLINER - SIZE, PATTERN AND COLOR TO MATCH EXISTING PRIMARY FILTRATION FACILITY.

B&V Design, LLC
Kansas City, Missouri
ILLINOIS PROFESSIONAL
DESIGN FIRM - 184007283

Four Rivers Sanitation Authority

AEROBIC GRANULAR SLUDGE - PHASE 1

REVISIONS AND RECORD OF ISSUE

DESIGNED:	RAB
DETAILED:	TMB
CHECKED:	PDR
APPROVED:	PDR
DATE:	12/20/2022
PROJECT NO.:	411752

AGS SUPPORT FACILITIES

ARCHITECTURAL

NORTH AND EAST ELEVATIONS

6' 4' 2' 0' 5' 10'

3/16" = 1'-0"

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

02-A-201

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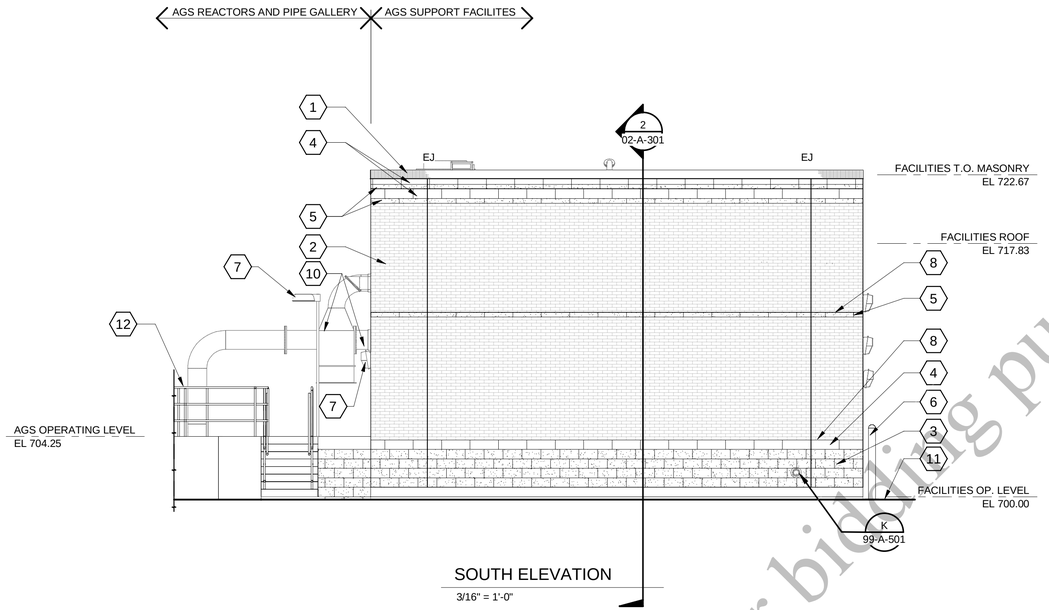
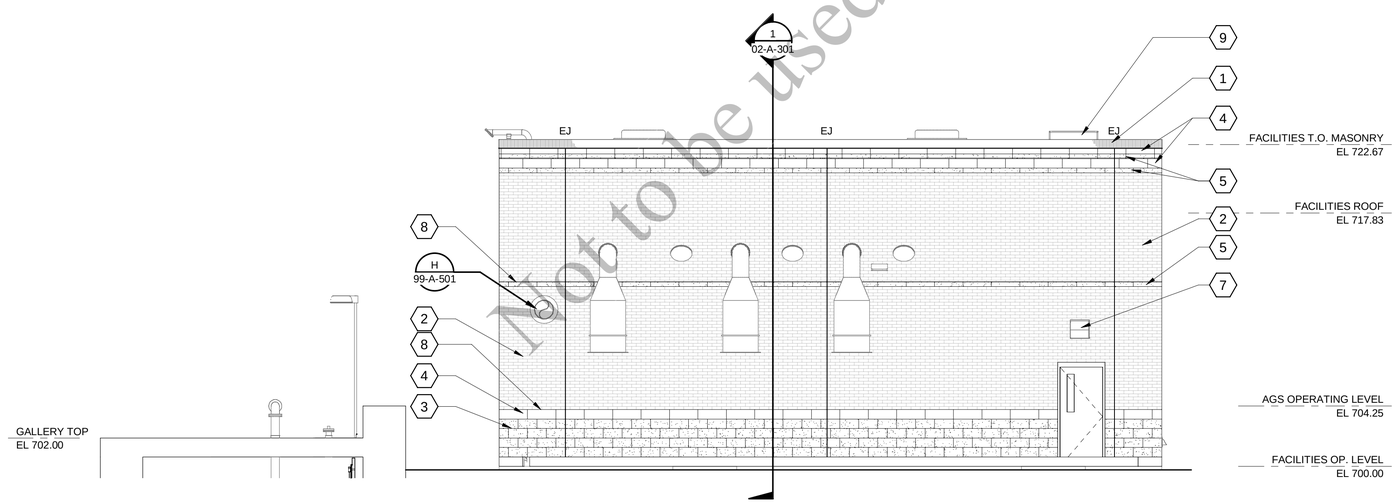


SOUTH ELEVATION

3/16" = 1'-0"



WEST ELEVATION

3/16" = 1'-0"

GENERAL SHEET NOTES

1. VENEER FACE BRICK EXPANSION JOINT (EJ). SEE STRUCTURAL DRAWINGS FOR BACKUP MASONRY UNITS (CMU) WALL CONTROL JOINT (CJ) WALL CONTROL JOINT LOCATIONS.
2. SHERWIN WILLIAMS STAIN COLORS:
   ACCENT BANDS (4",8", AND 12"): SW6107 NOMADIC DESERT
   UPPER DARK COLOR: SW7675 SEAL SKIN

SHEET KEYNOTES

1. PREFINISHED METAL COPING - SIZE, PATTERN AND COLOR TO MATCH EXISTING PRIMARY FILTRATION FACILITY.
2. FACE BRICK - SIZE, PATTERN AND COLOR TO MATCH EXISTING PRIMARY FILTRATION FACILITY.
3. 8 x 16 ROCKFACE MASONRY UNITS - SIZE, PATTERN AND COLOR TO MATCH EXISTING PRIMARY FILTRATION FACILITY.
4. 8 x 24 SMOOTHFACE MASONRY UNITS - SIZE, PATTERN AND COLOR TO MATCH EXISTING PRIMARY FILTRATION FACILITY.
5. 4 x 24 ROCKFACE MASONRY UNITS - SIZE, PATTERN AND COLOR TO MATCH EXISTING PRIMARY FILTRATION FACILITY.
6. BOLLARD - SEE CIVIL DRAWINGS.
7. LIGHT FIXTURE (TYP) - SEE ELECTRICAL DRAWINGS.
8. BRICK SHELF ANGLE - SEE DETAIL D/99-A-501.
9. HVAC EQUIPMENT - SEE HVAC DRAWINGS.
10. MECHANICAL EQUIPMENT - SEE MECHANICAL DRAWINGS.
11. FINISHED GRADE - CIVIL DRAWINGS.
12. GUARDRAIL - SEE STRUCTURAL DRAWINGS.
13. CAST IN PLACE CONCRETE BASIN WALL W/ FORMLINER - SIZE, PATTERN AND COLOR TO MATCH EXISTING PRIMARY FILTRATION FACILITY.

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AGS SUPPORT FACILITIES

ARCHITECTURAL

SOUTH AND WEST ELEVATIONS

6' 4' 2' 0' 5' 10'

3/16" = 1'-0"

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

02-A-202

PLOTTED: 12/16/2022 11:53:46 AM
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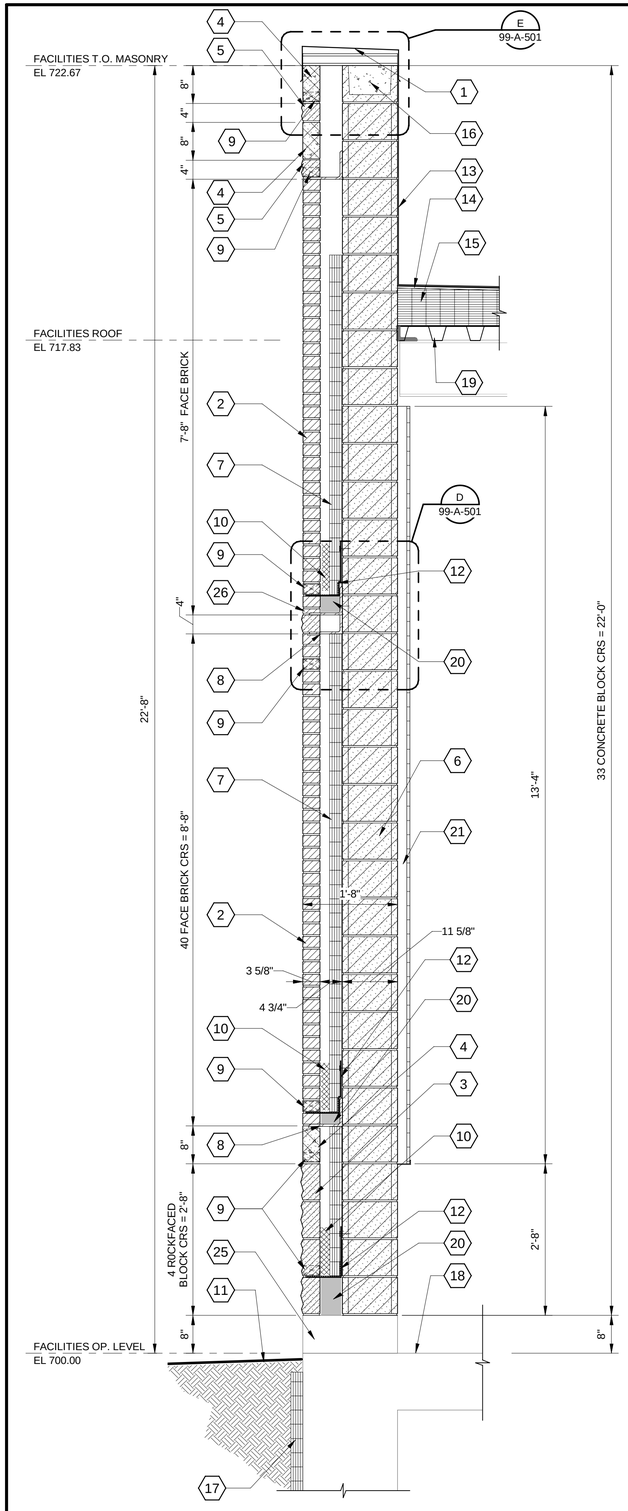
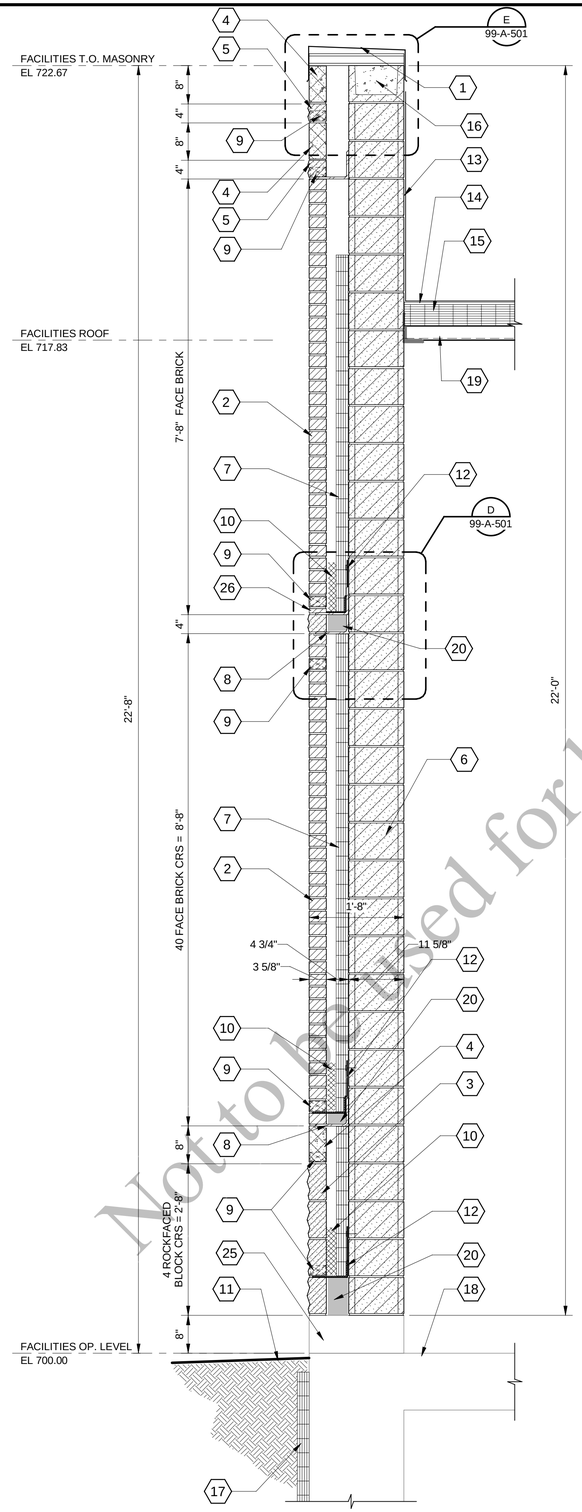
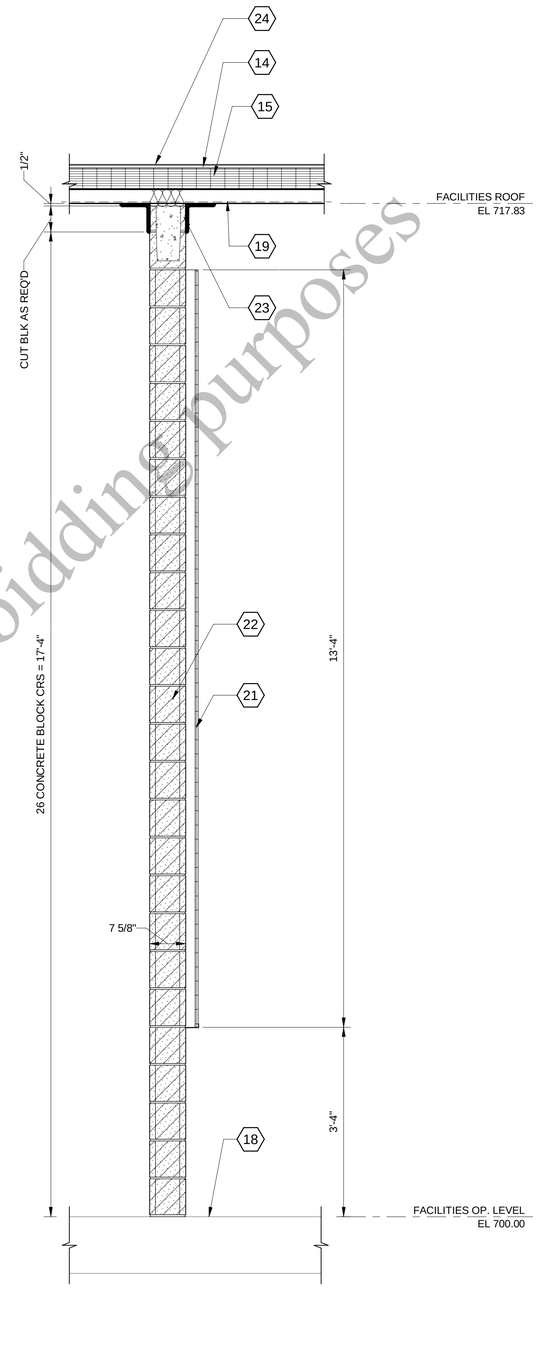


1 SECTION
02-A-101 3/4" = 1'-0"



2 SECTION
02-A-101 3/4" = 1'-0"



3 SECTION
02-A-101 3/4" = 1'-0"

GENERAL SHEET NOTES

1. FOR VERTICAL REINFORCING AND BOND BEAMS IN MASONRY DESIGN - SEE STRUCTURAL DRAWINGS.
2. FOR HORIZONTAL JOINT REINFORCING - SEE SPECIFICATION SECTION 042000.

SHEET KEYNOTES

1. PREFINISHED METAL COPING - SIZE, PATTERN AND COLOR TO MATCH EXISTING PRIMARY FILTRATION FACILITY.
2. FACE BRICK - SIZE, PATTERN AND COLOR TO MATCH EXISTING PRIMARY FILTRATION FACILITY.
3. 8 x 16 ROCKFACE MASONRY UNITS - SIZE, PATTERN AND COLOR TO MATCH EXISTING PRIMARY FILTRATION FACILITY.
4. 8 x 24 SMOOTHFACE MASONRY UNITS - SIZE, PATTERN AND COLOR TO MATCH EXISTING PRIMARY FILTRATION FACILITY.
5. 4 x 24 ROCKFACE MASONRY UNITS - SIZE, PATERN AND COLOR TO MATCH EXISTING PRIMARY FILTRATION FACILITY.
6. 12" CONCRETE MASONRY UNIT.
7. 2 1/2" RIGID INSULATION R-12.
8. BRICK SHELF ANGLE - SEE DETAIL D/99-A-501.
9. WEEP VENTS @ 24" O.C.
10. 10" HIGH x 2" THICK MORTAR NET.
11. FINISHED GRADE - CIVIL DRAWINGS.
12. TOTALFLASH CAVITY-WALL DRAINAGE SYSTEM.
13. SINGLE-PLY ROOFING MEMBRANE EXTEND OVER PARAPET WALL.
14. 1/2" COVER BOARD.
15. TAPERED INSULATION R-30.
16. BOND BEAM - SEE STRUCTURAL DRAWINGS.
17. FOUNDATION INSULATION R-10.
18. FINISHED FLOOR AS SCHEDULED.
19. METAL DECK - SEE STRUCTURAL DRAWINGS.
20. MORTAR FILL UNDER THE TOTALFLASH CAVITY-WALL DRAINAGE SYSTEM.
21. ACOUSTICAL WALL PANEL SYSTEM WITH METAL BOTTOM TRIM.
22. 8" CONCRETE MASONRY UNIT.
23. SEE STRUCTURAL DRAWINGS FOR CONNECTION.
24. SINGLE-PLY ROOFING MEMBRANE.
25. 8" x 1'-8" CONCRETE CURB - SEE STRUCTURAL DRAWINGS.
26. CUT FACE BRICK AS REQUIRED.

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ILLINOIS PROFESSIONAL
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Four Rivers Sanitation Authority

AEROBIC GRANULAR SLUDGE - PHASE 1

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AGS SUPPORT FACILITIES

ARCHITECTURAL

WALL SECTIONS

12" 6" 0' 1' 2' 3'
3/4" = 1'-0"

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

02-A-301

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PLOTTED: 12/16/2022 11:46:53 AM
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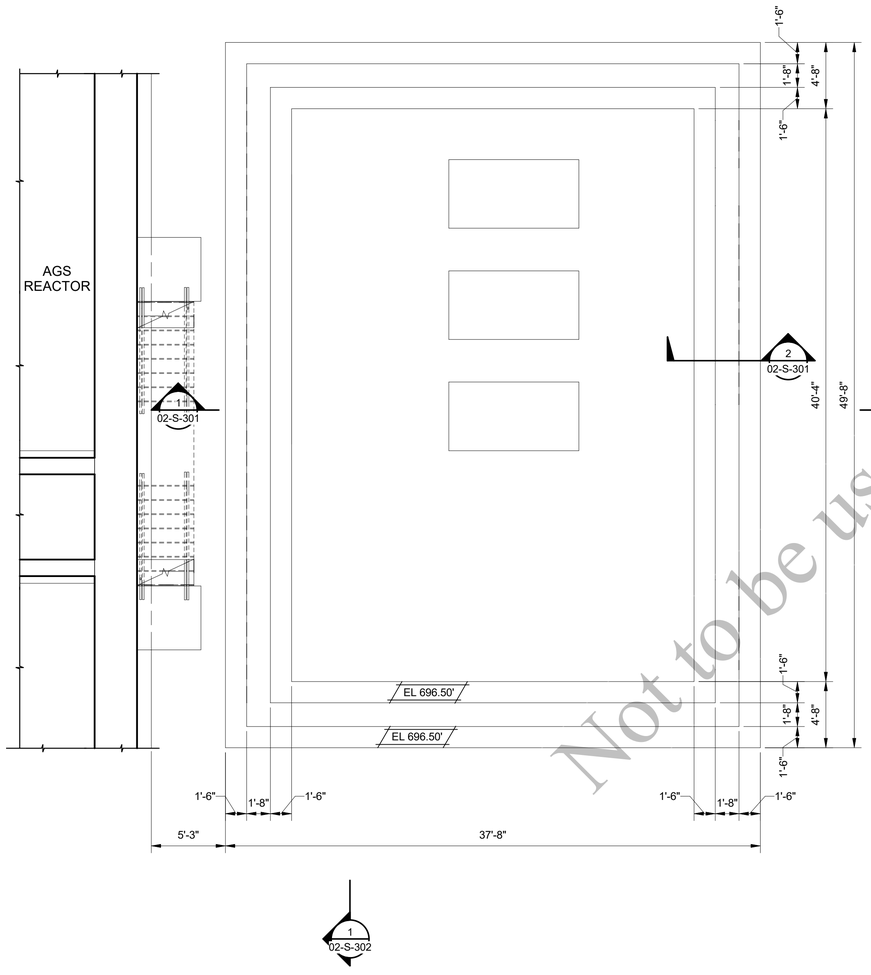
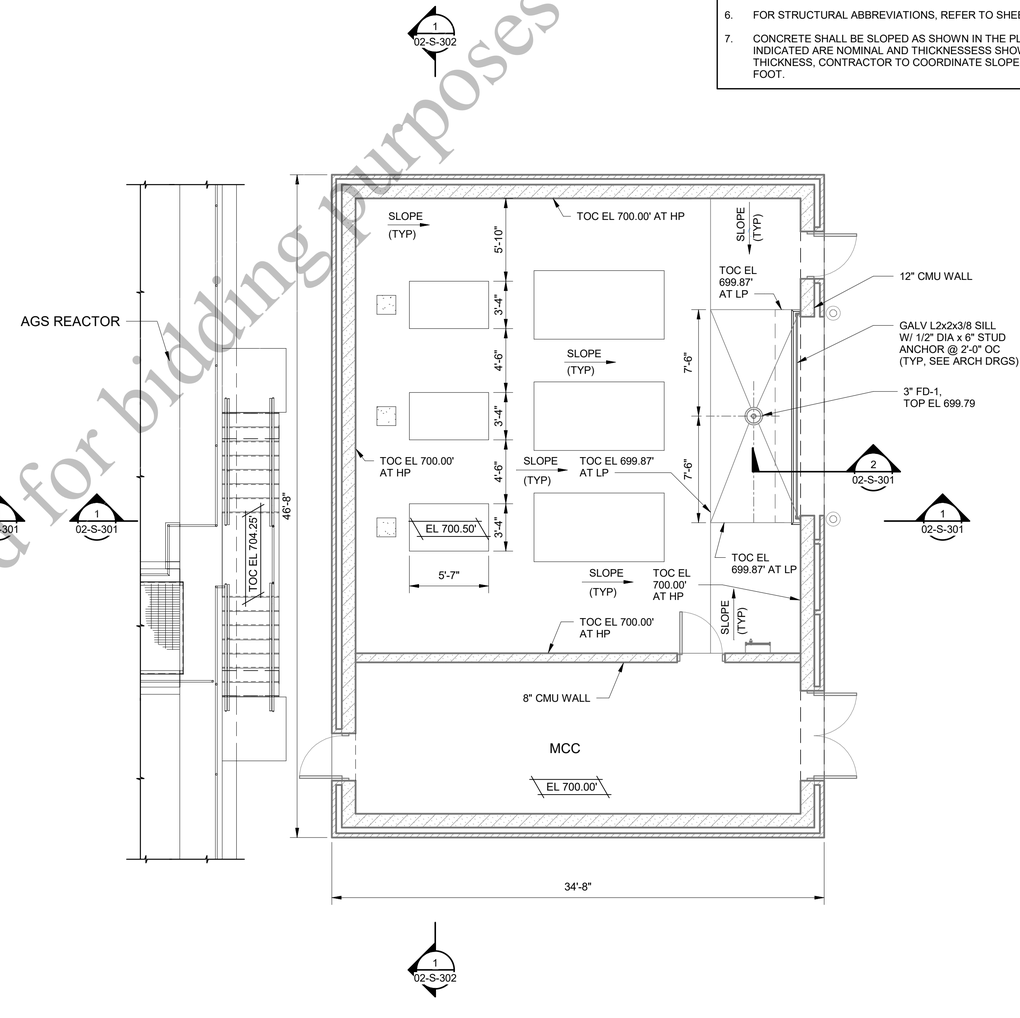
GENERAL SHEET NOTES:

1. FINAL DIMENSION OF ELECTRICAL AND MECHANICAL EQUIPMENT BASE SHALL BE DETERMINED DURING CONSTRUCTION AFTER RECEIPT OF SUBMITTAL AND COORDINATED BETWEEN MANUFACTURER AND GENERAL CONTRACTOR AFTER COMPLETION OF REVIEW PROCESS. SIZE MAY BE INCREASED IF STRUCTURALLY REQUIRED TO MAINTAIN ADEQUATE CONCRETE EDGE DISTANCE FROM CENTERLINE OF ANCHOR BOLTS TO EDGE OF CONCRETE. ELECTRICAL EQUIPMENT BASES NOT SHOWN, SEE SHEET 99-E-502.
2. CONCRETE PAN METAL STAIR AND GUARDRAIL ARE DELEGATED DESIGN ITEMS UNDER CONTRACTOR SCOPE OF WORK. DELEGATED ENGINEER, WHO UNDERTAKES SPECIALTY DESIGN SERVICE REGARDING A PORTION OF THE ENGINEERING, SHALL CONSIDER GIVEN DESIGN CRITERIA AND COEFFICIENTS PROVIDED ON DRAWING 00-S-001 AND 00-S-002 OF TECHNICAL SPECIFICATIONS AS A MINIMUM DESIGN LOADING CRITERIA.
3. 12" CMU WALL THIS LOCATION IS CONSIDERED AS ORDINARY MASONRY SHEAR WALL AND IT IS PART OF LATERAL FORCE RESISTING SYSTEM OF FACILITY.
4. GRANULAR FILL AS PER SPECIFICATION 31 23 11. SEE SECTION 1 ON SHEET 02-S-301 FOR FILL LIMITS.
5. FOR AGS REACTORS REFER TO SHEETS 01-S-101 TO 01-S-104.
6. FOR STRUCTURAL ABBREVIATIONS, REFER TO SHEET 00-S-002.
7. CONCRETE SHALL BE SLOPED AS SHOWN IN THE PLAN, ELEVATIONS INDICATED ARE NOMINAL AND THICKNESSESS SHOWN ARE MINIMUM THICKNESS, CONTRACTOR TO COORDINATE SLOPES, MINIMUM 1/4" PER FOOT.



FOUNDATION LEVEL PLAN

3/16" = 1'-0"



OPERATING FLOOR PLAN

3/16" = 1'-0"

6' 4' 2' 0' 5' 10'

3/16" = 1'-0"

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

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Four Rivers Sanitation Authority

AEROBIC GRANULAR SLUDGE - PHASE 1

REVISIONS AND RECORD OF ISSUE

DESIGNED:	SKA
DETAILED:	UBS
CHECKED:	CG
APPROVED:	TNG
DATE:	12/20/2022
PROJECT NO.:	411752

AGS SUPPORT FACILITY

STRUCTURAL

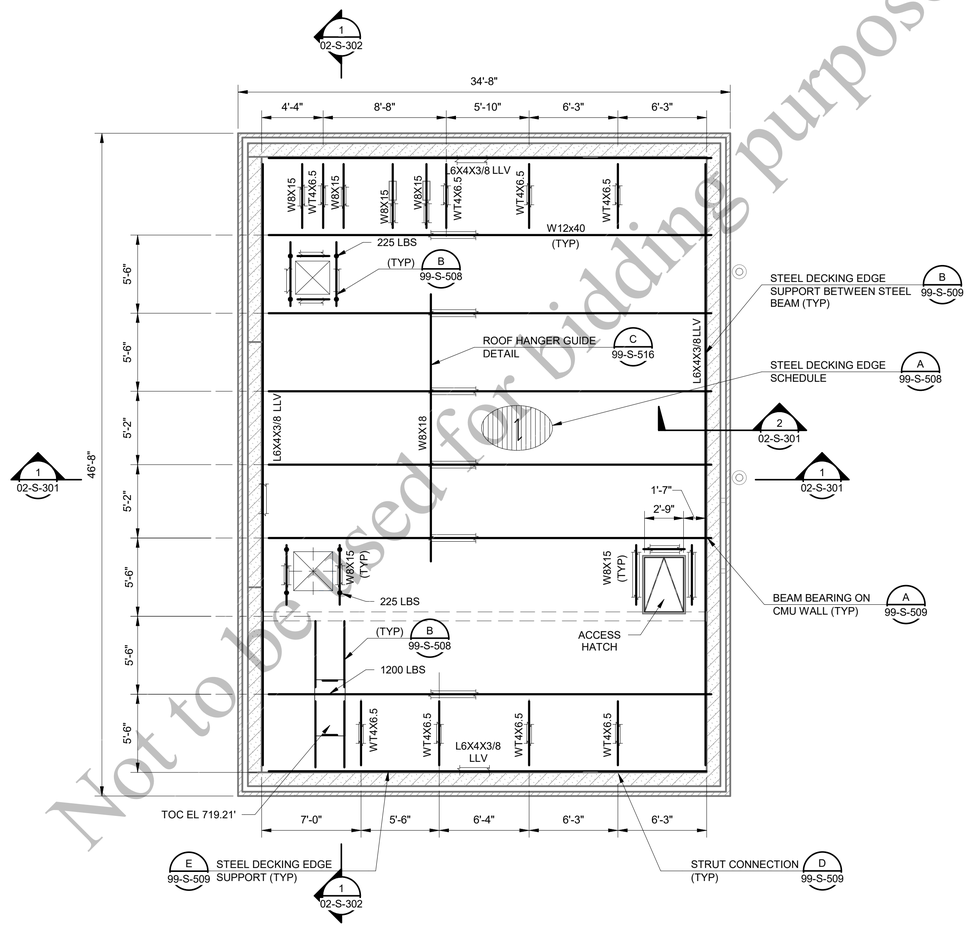
FOUNDATION AND OPERATING FLOOR PLAN

02-S-101

PLOTTED: 12/19/2022 5:10:45 PM
FILE: BIM 360://409469 - Aerobic Granular Sludge Phase 1/409469 - AGS.rvt
D11000

GENERAL SHEET NOTES:

1. FOR GENERAL NOTES, REFER TO SHEET 01-S-101.
2. FOR STRUCTURAL ABBREVIATIONS, REFER TO SHEET 00-S-002.
3. FOR OTHER NOTES, REFER TO SHEET 01-S-103.
4. FOR ROOF SLOPE AND DRAIN LOCATION, SEE MECH AND ARCH DRAWINGS.



ROOF PLAN

3/16" = 1'-0"

6' 4' 2' 0' 5' 10'

3/16" = 1'-0"

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

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AEROBIC GRANULAR SLUDGE - PHASE 1

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PROJECT NO.:	411752

AGS SUPPORT FACILITY

STRUCTURAL

ROOF PLAN

02-S-102

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PLOTTED: 12/19/2022 4:26:12 PM
FILE: BIM 360://409469 - Aerobic Granular Sludge Phase 1/409469 - AGS.rvt
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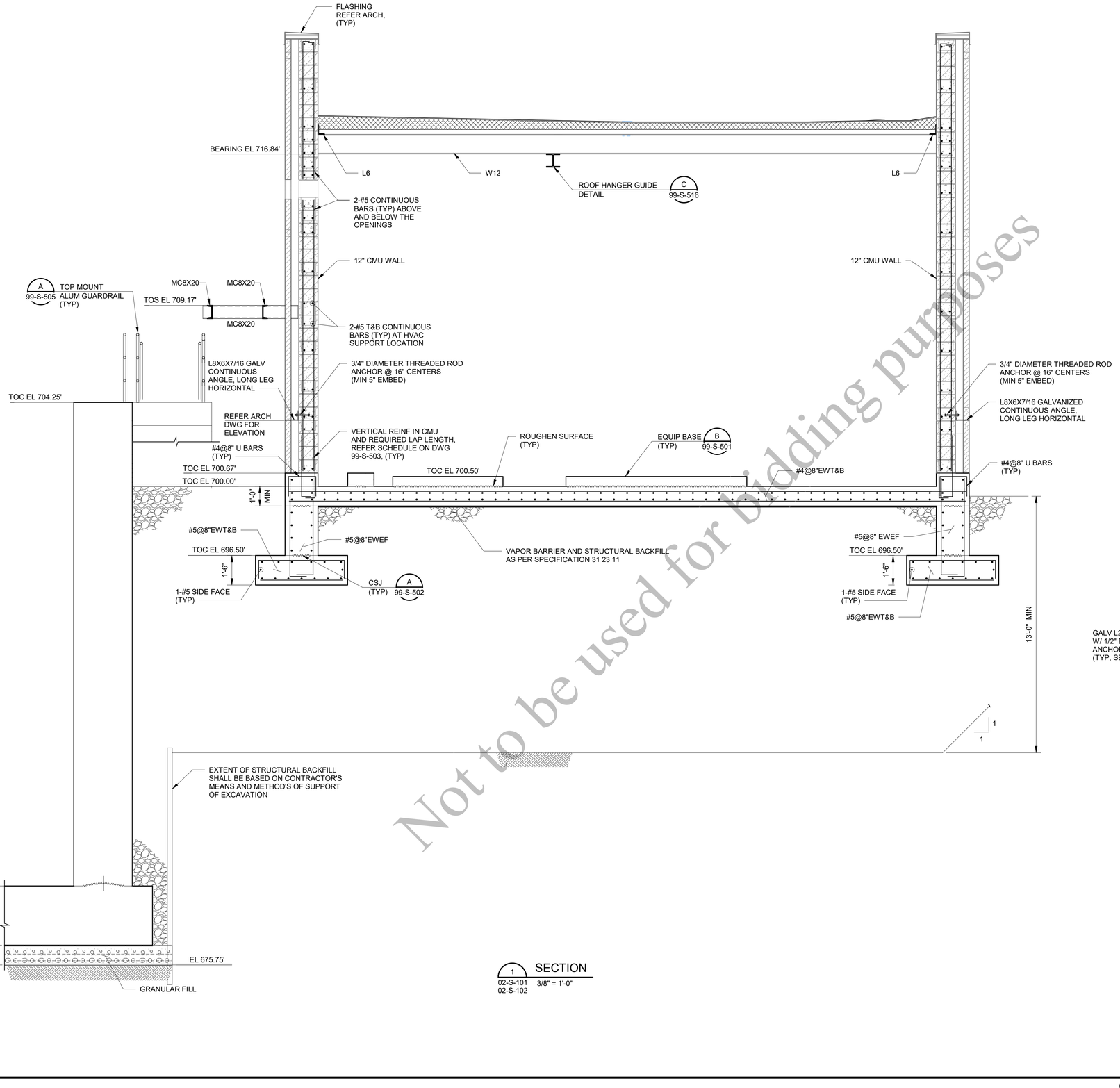
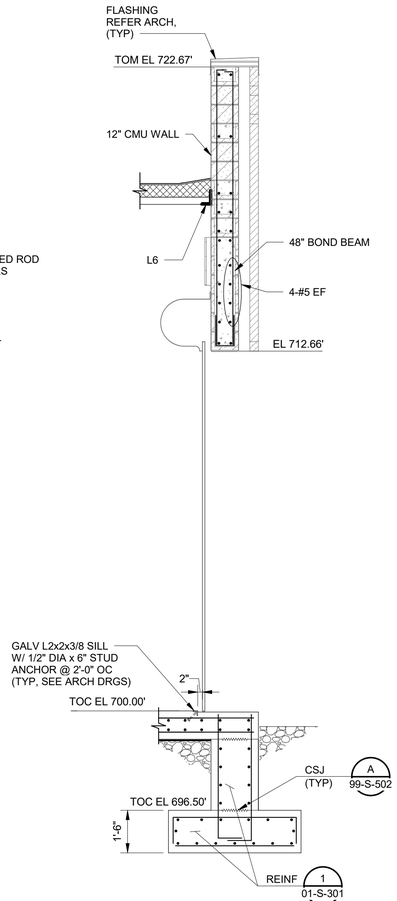
GENERAL SHEET NOTES:

1. FINISHED GRADE ELEVATION SHOWN IS APPROXIMATE. SEE CIVIL SITE PLAN FOR REQUIRED GRADE ELEVATION OF THIS LOCATION.
2. FOR AGS REACTORS, REFER TO SHEET 01-S-101 TO 01-S-104.
3. FOR GENERAL STRUCTURAL NOTES, REFER TO SHEET 00-S-001.
4. FOR STRUCTURAL ABBREVIATIONS, REFER TO SHEET 00-S-002.
5. FOR OTHER NOTES, REFER TO SHEET 01-S-103.



1 SECTION
02-S-101 3/8" = 1'-0"
02-S-102



2 SECTION
02-S-101 3/8" = 1'-0"
02-S-102

12" 0' 1' 2' 3' 4' 5' 6' 7'
3/8" = 1'-0"

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

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Four Rivers Sanitation Authority

AEROBIC GRANULAR SLUDGE - PHASE 1

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DETAILED:	UBS
CHECKED:	CG
APPROVED:	TNG
DATE:	12/20/2022
PROJECT NO.:	411752

AGS SUPPORT FACILITY

STRUCTURAL

SECTIONS AND DETAILS 1 OF 2

02-S-301

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PLOTTED: 12/19/2022 4:26:13 PM
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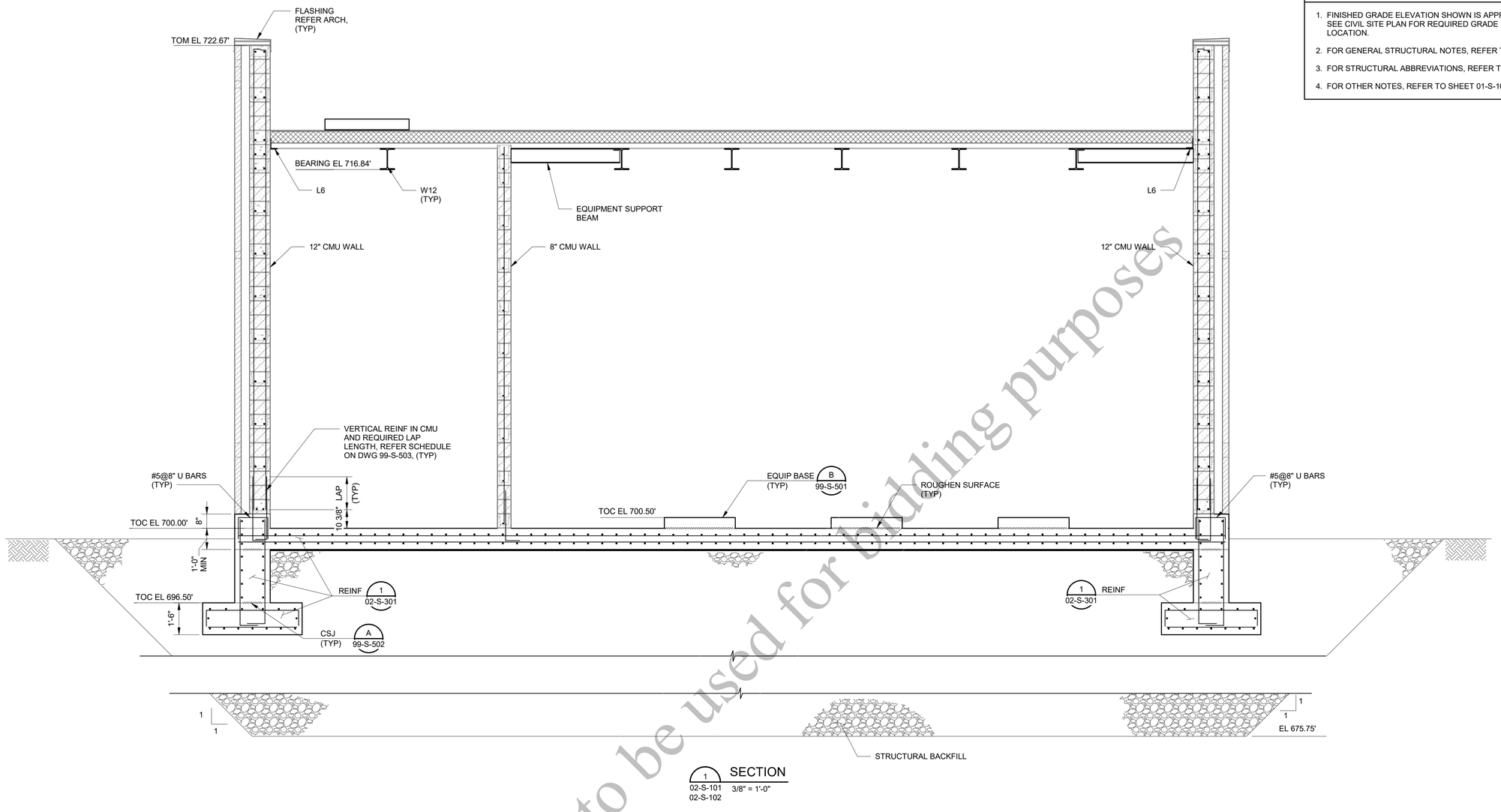

1 02-S-101 02-S-102 SECTION

3/8" = 1'-0"

GENERAL SHEET NOTES:

1. FINISHED GRADE ELEVATION SHOWN IS APPROXIMATE. SEE CIVIL SITE PLAN FOR REQUIRED GRADE ELEVATION OF THIS LOCATION.
2. FOR GENERAL STRUCTURAL NOTES, REFER TO SHEET 00-S-001.
3. FOR STRUCTURAL ABBREVIATIONS, REFER TO SHEET 00-S-002.
4. FOR OTHER NOTES, REFER TO SHEET 01-S-103.

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AEROBIC GRANULAR SLUDGE - PHASE 1

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AGS SUPPORT FACILITY

STRUCTURAL

SECTIONS AND DETAILS
2 OF 2

12" 0' 1' 2' 3' 4' 5' 6' 7'

3/8" = 1'-0"

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

02-S-302

97 OF 163

PLOTTED: 12/19/2022 5:10:45 PM
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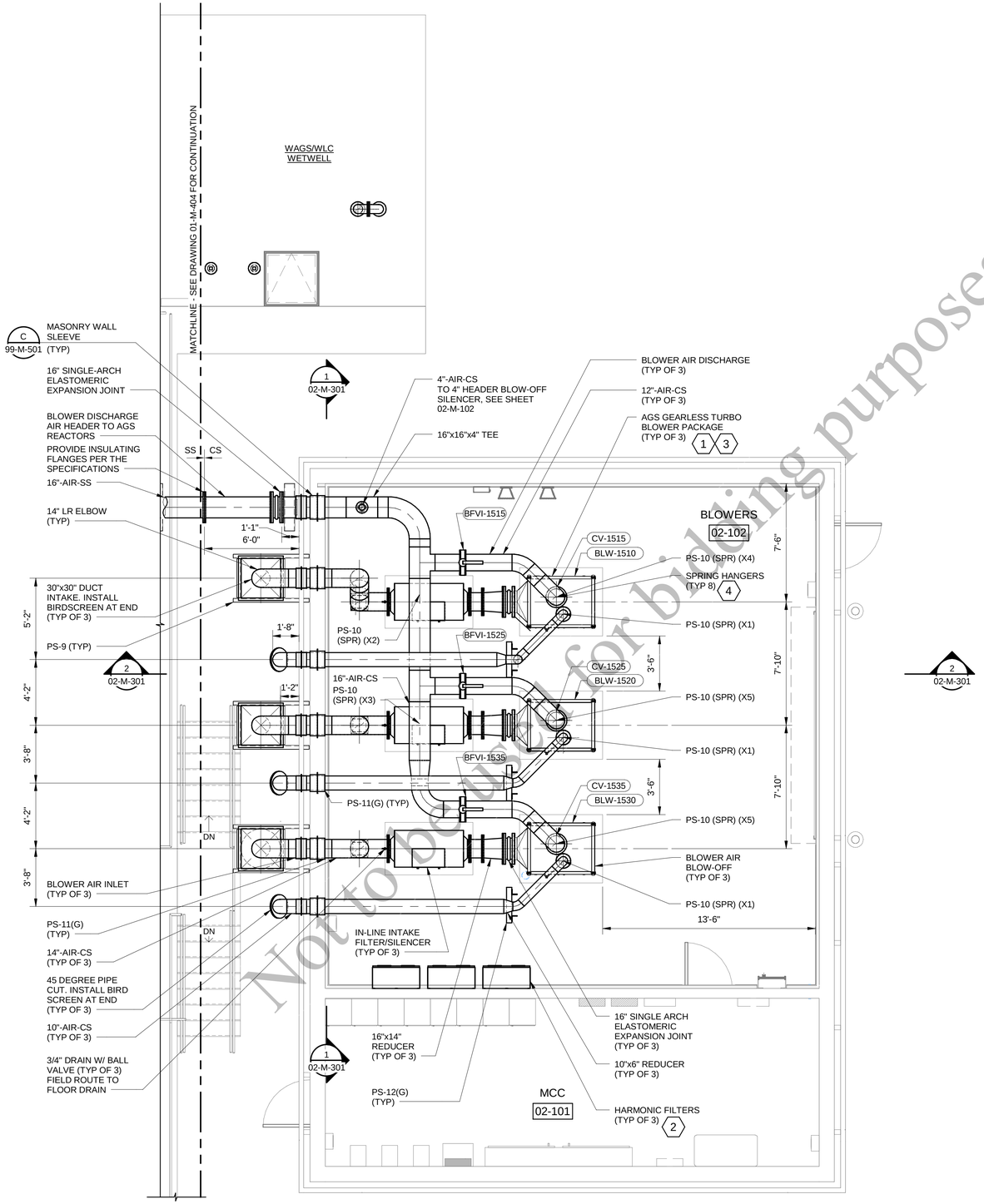

OPERATING PLAN

1/4" = 1'-0"

GENERAL SHEET NOTES

1. PS-X REPRESENTS PIPE SUPPORT TYPE. SEE PIPE SUPPORT SCHEDULE ON SHEET 99-M-502.

   AIR PIPING SUPPORT TYPES ARE IDENTIFIED USING THE FOLLOWING DESIGNATIONS:

   (G) : GUIDE SUPPORT
   (A) : AXIAL STOP
   (V) : VERTICAL SUPPORT
   (SPR) : SPRING HANGER SUPPORT

2. ALL BLOWER INLET, BLOW-OFF AND DISCHARGE PIPING SHALL BE INSULATED AND JACKETED. REFER TO SECTION 40 42 11 - MECHANICAL INSULATION FOR REQUIREMENTS.

SHEET KEYNOTES

1. BLOWER DIMENSIONS SHOWN ARE BASED ON ONE AIR BEARING BLOWER MANUFACTURER (AERZEN). BLOWER DIMENSIONS MAY VARY BASED ON THE MANUFACTURER. BLOWER INLET, DISCHARGE AND BLOWOFF CONNECTION SIZES AND LOCATIONS MAY VARY WITH VENDOR. CONTRACTOR TO COORDINATE REDUCER/INCREASER SIZES, PIPE ROUTING AND PIPE SUPPORT REVISIONS AS REQUIRED, IF A DIFFERENT MANUFACTURER IS SELECTED. BLOWER DISCHARGE CHECK VALVE SIZE SHALL MATCH THE BLOWER PACKAGE DISCHARGE FLANGE CONNECTION SIZE.
2. REMOTE HARMONIC FILTERS ARE ACCEPTABLE ONLY IF THE SELECTED BLOWER MANUFACTURER DOES NOT HAVE THE CAPABILITY TO MOUNT THEM WITHIN THE BLOWER ENCLOSURE.
3. MAXIMUM OVERALL BLOWER PACKAGE DIMENSIONS SHALL BE 4'-3" LONG BY 3'-3" WIDE.
4. SEE STRUCTURAL DETAIL SHEETS FOR SPRING HANGER SUPPORT DETAIL AND SIZES.

   (X#) = SPRING HANGER SIZE

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AEROBIC GRANULAR SLUDGE - PHASE 1

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DESIGNED:	JL
DETAILED:	VP
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APPROVED:	MR
DATE:	12/20/2022
PROJECT NO.:	411752

AGS SUPPORT FACILITIES

PROCESS MECHANICAL

BLOWERS FLOOR PLAN

02-M-101

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(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

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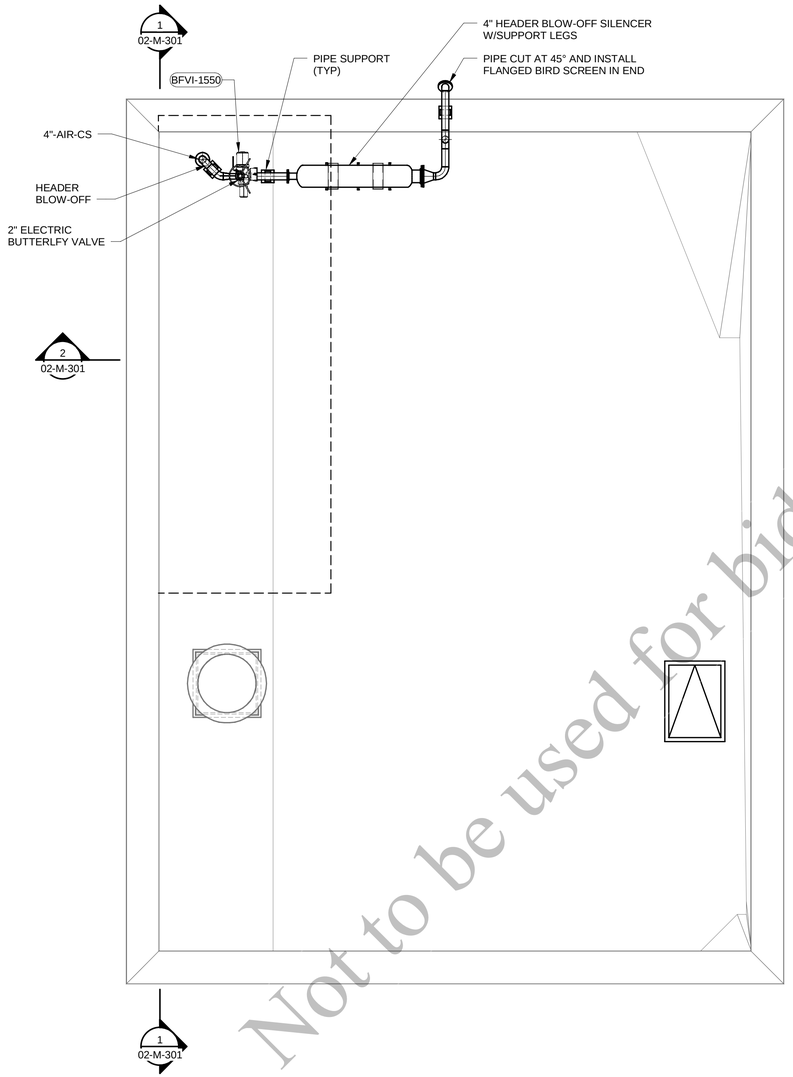

ROOF PLAN

1/4" = 1'-0"

GENERAL SHEET NOTES

1. PS-X REPRESENTS PIPE SUPPORT TYPE. SEE PIPE SUPPORT SCHEDULE ON SHEET 99-M-502.

   AIR PIPING SUPPORT TYPES ARE IDENTIFIED USING THE FOLLOWING DESIGNATIONS:

   (G) : GUIDE SUPPORT
   (A) : AXIAL STOP
   (V) : VERTICAL SUPPORT
   (SPR) : SPRING HANGER SUPPORT

2. ALL BLOWER INLET, BLOW-OFF AND DISCHARGE PIPING SHALL BE INSULATED AND JACKETED. REFER TO SECTION 40 42 11 - MECHANICAL INSULATION FOR REQUIREMENTS.

4' 2' 0' 4' 8'

1/4" = 1'-0"

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

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Four Rivers Sanitation Authority

AEROBIC GRANULAR SLUDGE - PHASE 1

1	Date 1	Description1

REVISIONS AND RECORD OF ISSUE

DESIGNED:	JL
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CHECKED:	AM/JH
APPROVED:	MR
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PROJECT NO.:	411752

AGS SUPPORT FACILITIES

PROCESS MECHANICAL

BLOWERS
ROOF PLAN

02-M-102

99
OF
163

PLOTTED: 12/16/2022 11:55:14 AM
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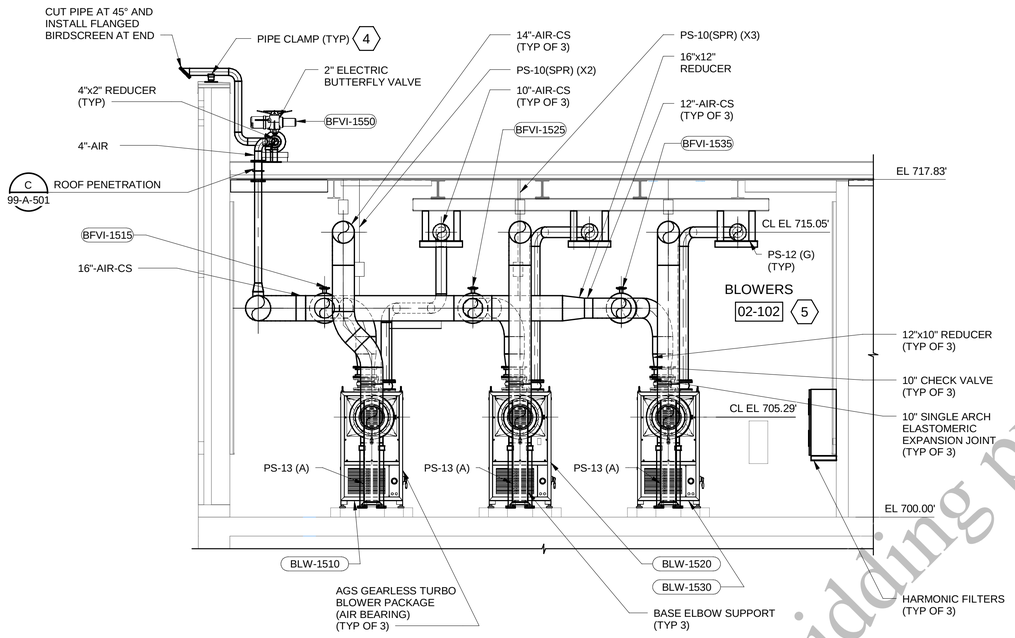
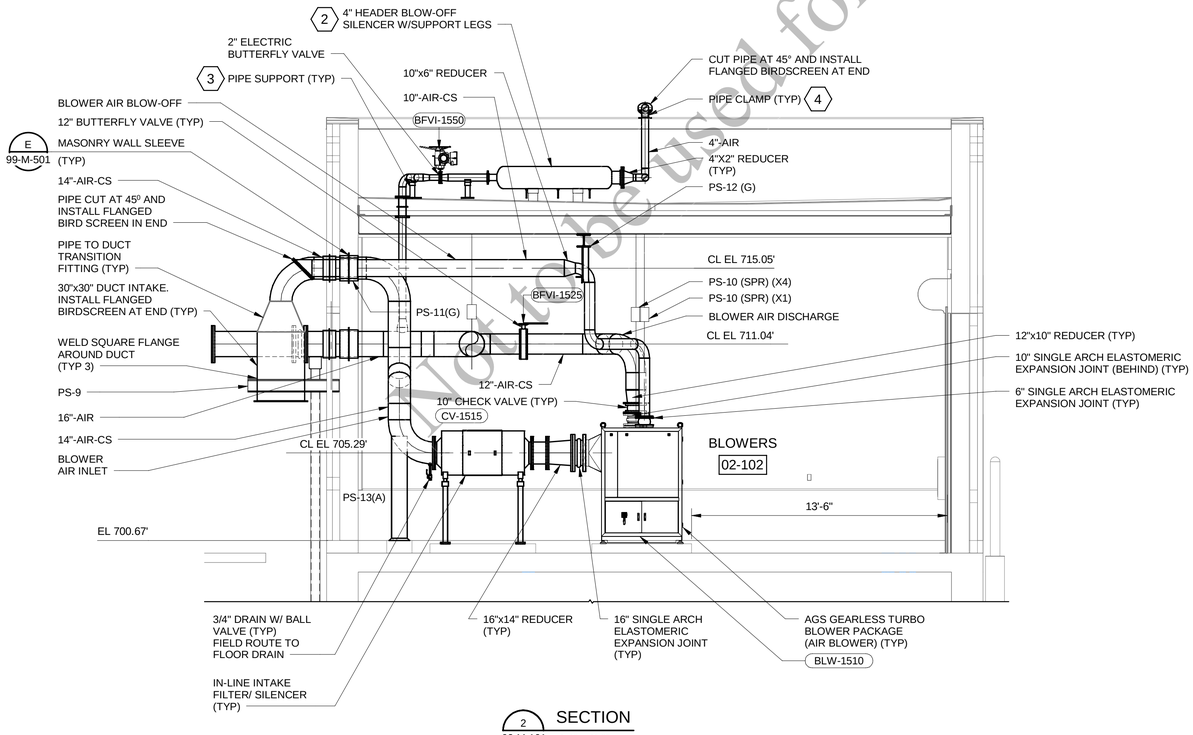


1 01-M-101 SECTION 1/4" = 1'-0"



2 02-M-101 SECTION 1/4" = 1'-0"

GENERAL SHEET NOTES

1. PS-X REPRESENTS PIPE SUPPORT TYPE. SEE PIPE SUPPORT SCHEDULE ON SHEET 99-M-502.

   PIPE SUPPORT TYPES ARE INDENTIFIED USING THE FOLLOWING DESIGNATIONS:

   (G) : GUIDE SUPPORT
   (A) : AXIAL STOP
   (V) : VERTICAL SUPPORT
   (SPR) : SPRING HANGER SUPPORT

SHEET KEYNOTES

1. CL ELEVATION OF THE PIPE SHALL MATCH THE CL ELEVATION OF THE HEADER BLOW-OFF SILENCER INLET FLANGE CONNECTION.
2. AIR HEADER BLOW-OFF SILENCER OVERALL DIMENSIONS ARE BASED ON STODDARD. DIMENSIONS MAY VARY BASED ON THE MANUFACTURER SELECTED.
3. PROVIDE PIPE SUPPORTS B-LINE "B3090" OR EQUAL PER THE PIPE SUPPORTS SPECIFICATION. PROVIDE 1/4" GAP BETWEEN U-BOLT AND PIPE.
4. PROVIDE PIPE CLAMPS PER THE PIPE SUPPORTS SPECIFICATION. PROVIDE 1/4" GAP BETWEEN CLAMP AND PIPE.

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AEROBIC GRANULAR SLUDGE - PHASE 1

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CHECKED:	AM/JH
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PROJECT NO.:	411752

AGS SUPPORT FACILITIES

PROCESS MECHANICAL

BLOWERS SECTIONS

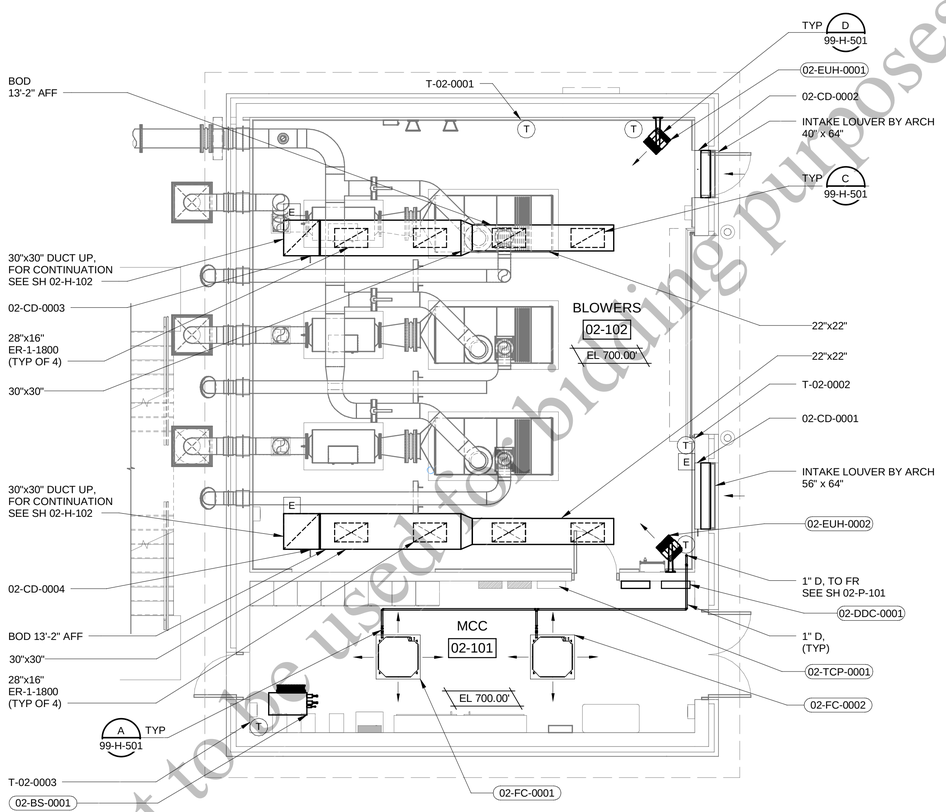
02-M-301

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

PLOTTED: 12/16/2022 11:55:47 AM
FILE: BIM 360://409469 - Aerobic Granular Sludge Phase 1/409469 - AGS.rvt
D11000

GENERAL SHEET NOTES

1. SEE DRAWING 00-H-001 FOR LEGENDS, ABBREVIATIONS AND GENERAL NOTES.
2. REFRIGERANT PIPING IS NOT SHOWN FOR CLARITY. SIZE AND ROUTE REFRIGERANT PIPING PER MANUFACTURER RECOMMENDATIONS.
3. HVAC SYSTEM IS DESIGNED BASED ON ATLAS COPCO MAGNETIC BEARING BLOWERS WHICH CAN SATISFY AERZEN BLOWER'S VENTILATION DESIGN REQUIREMENTS.



OPERATING FLOOR

3/16" = 1'-0"

6' 4' 2' 0' 5' 10'

3/16" = 1'-0"

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

BLACK & VEATCH

Black & Veatch Corporation
Chicago, Illinois
ILLINOIS PROFESSIONAL
DESIGN FIRM - 184.002143-0006

Four Rivers Sanitation Authority

AEROBIC GRANULAR SLUDGE - PHASE 1

REVISIONS AND RECORD OF ISSUE

DESIGNED:	VSS
DETAILED:	AJP
CHECKED:	KMC
APPROVED:	SP
DATE:	12/20/2022
PROJECT NO.:	411752

AGS SUPPORT FACILITIES

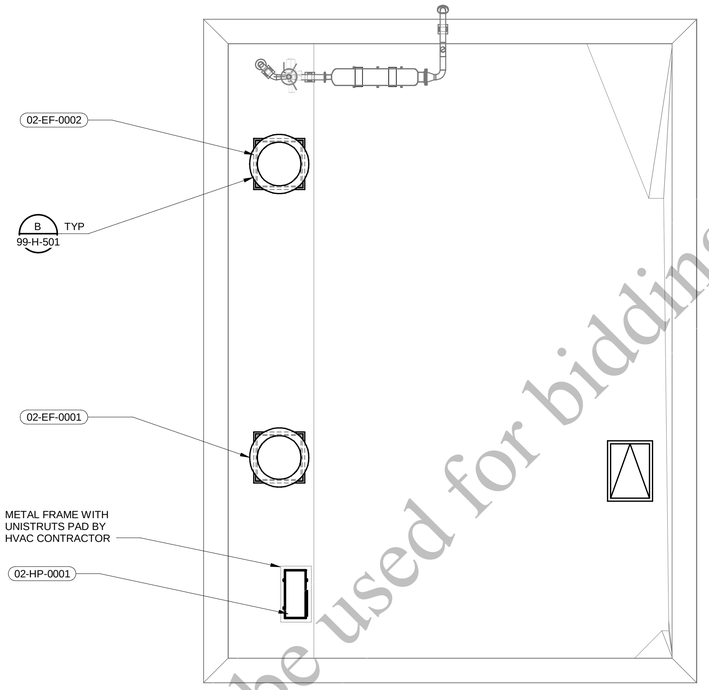
HVAC

BLOWERS FLOOR PLAN

02-H-101

101 OF 163

PLOTTED: 12/16/2022 11:50:15 AM
FILE: BIM 360://409469 - Aerobic Granular Sludge Phase 1/409469 - AGS.rvt
D11000



ROOF PLAN

3/16" = 1'-0"

GENERAL SHEET NOTES

1. SEE DRAWING 00-H-001 FOR LEGENDS, ABBREVIATIONS AND GENERAL NOTES.
2. REFRIGERANT PIPING IS NOT SHOWN FOR CLARITY. SIZE AND ROUTE REFRIGERANT PIPING PER MANUFACTURER RECOMMENDATIONS.

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Chicago, Illinois
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DESIGN FIRM - 184.002143-0006

Four Rivers Sanitation Authority

AERobic GRANULAR SLUDGE - PHASE 1

REVISIONS AND RECORD OF ISSUE

DESIGNED:	VSS
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DATE:	12/20/2022
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AGS SUPPORT FACILITIES

HVAC

BLOWERS ROOF PLAN

6' 4' 2' 0' 5' 10'

3/16" = 1'-0"

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

02-H-102

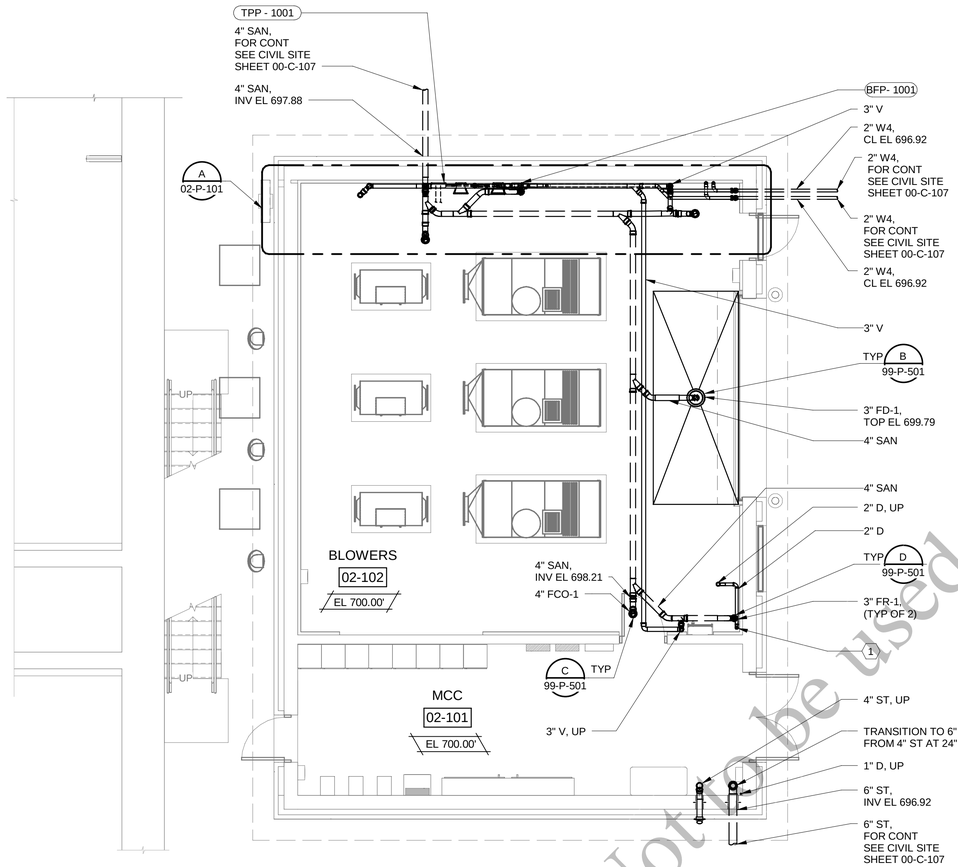
PLOTTED: 12/16/2022 11:50:45 AM
FILE: BIM 360://409469 - Aerobic Granular Sludge Phase 1/409469 - AGS.rvt
D11000

GENERAL SHEET NOTES

1. SEE DRAWING 00-P-001 FOR LEGENDS, ABBREVIATIONS AND GENERAL NOTES.

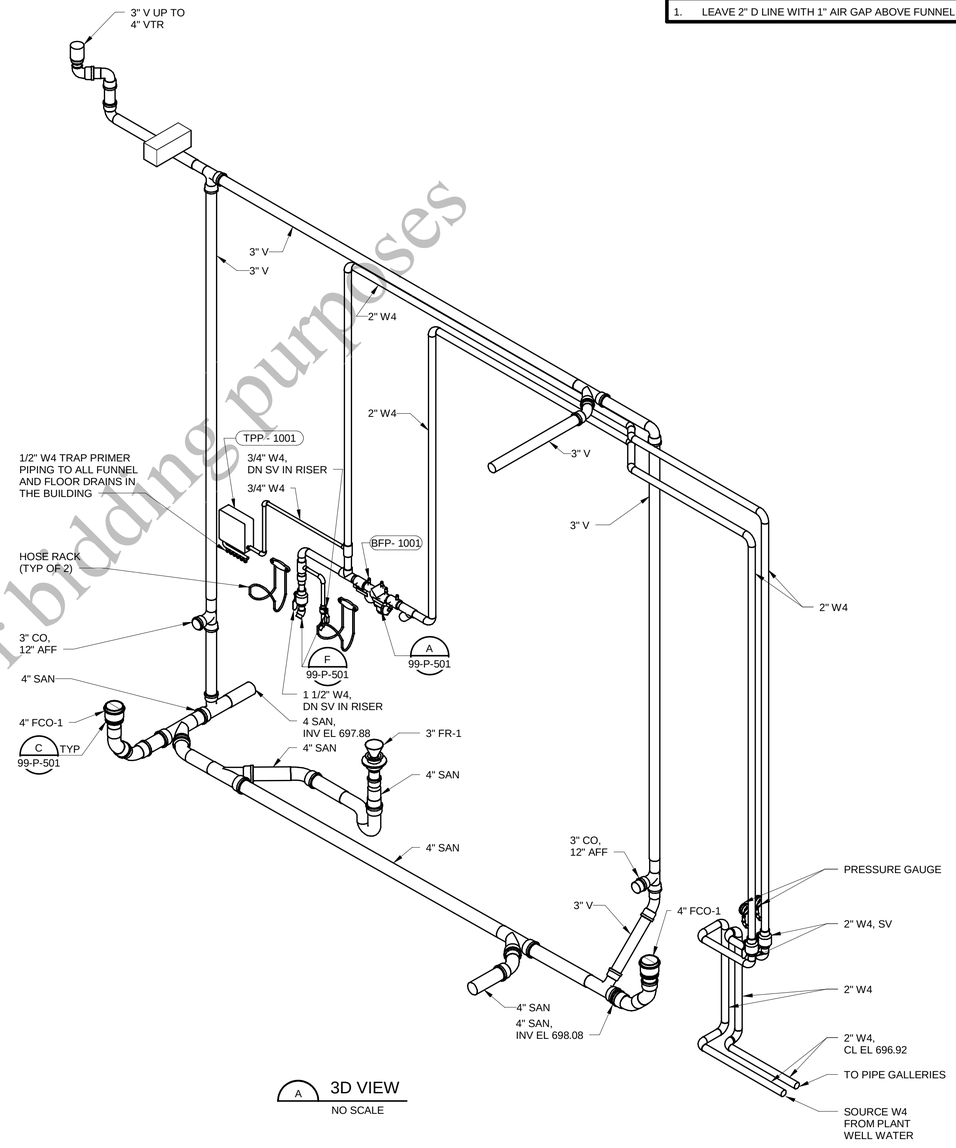
SHEET KEYNOTES

1. LEAVE 2" D LINE WITH 1" AIR GAP ABOVE FUNNEL RECEPTOR.



OPERATING FLOOR

3/16" = 1'-0"



A 3D VIEW

NO SCALE

6' 4' 2' 0' 5' 10'

3/16" = 1'-0"

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

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Four Rivers Sanitation Authority

AEROBIC GRANULAR SLUDGE - PHASE 1

REVISIONS AND RECORD OF ISSUE

DESIGNED:	SAM
DETAILED:	AJP
CHECKED:	DAV
APPROVED:	SP
DATE:	12/20/2022
PROJECT NO.:	411752

AGS REACTORS AND PIPE GALLERY

PLUMBING

BLOWERS FLOOR PLAN AND DETAIL

02-P-101

103 OF 163

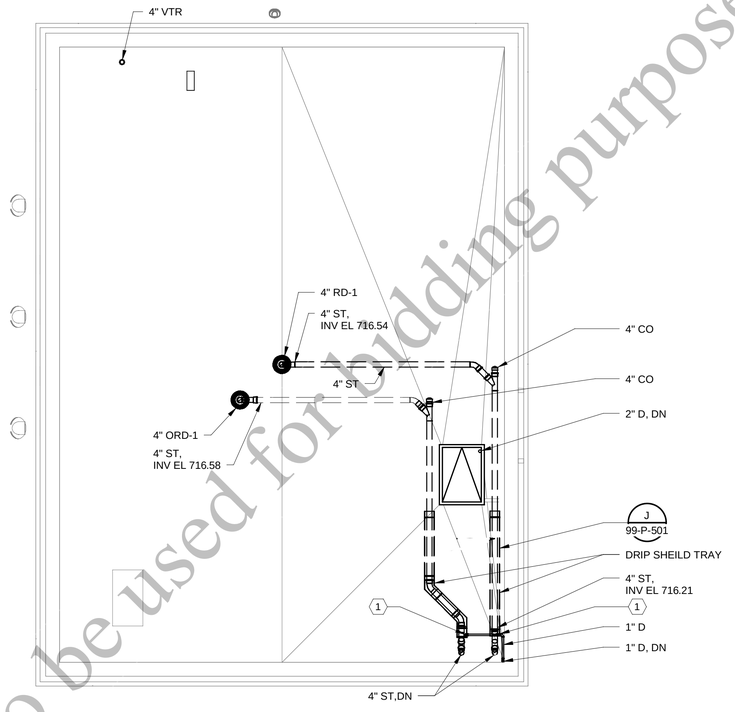
PLOTTED: 12/16/2022 11:53:57 AM
FILE: BIM 360://409469 - Aerobic Granular Sludge Phase 1/409469 - AGS.rvt
D11000

GENERAL SHEET NOTES

1. SEE DRAWING 00-P-001 FOR LEGENDS, ABBREVIATIONS AND GENERAL NOTES.

SHEET KEYNOTES

1. DRAIN LINE TO CONNECT WITH DRIP TRAY.



ROOF PLAN

3/16" = 1'-0"

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Four Rivers Sanitation Authority

AEROBIC GRANULAR SLUDGE - PHASE 1

REVISIONS AND RECORD OF ISSUE

DESIGNED:	SAM
DETAILED:	AJP
CHECKED:	DAV
APPROVED:	SP
DATE:	12/20/2022
PROJECT NO.:	411752

AGS REACTORS AND PIPE GALLERY

PLUMBING

BLOWERS ROOF PLAN

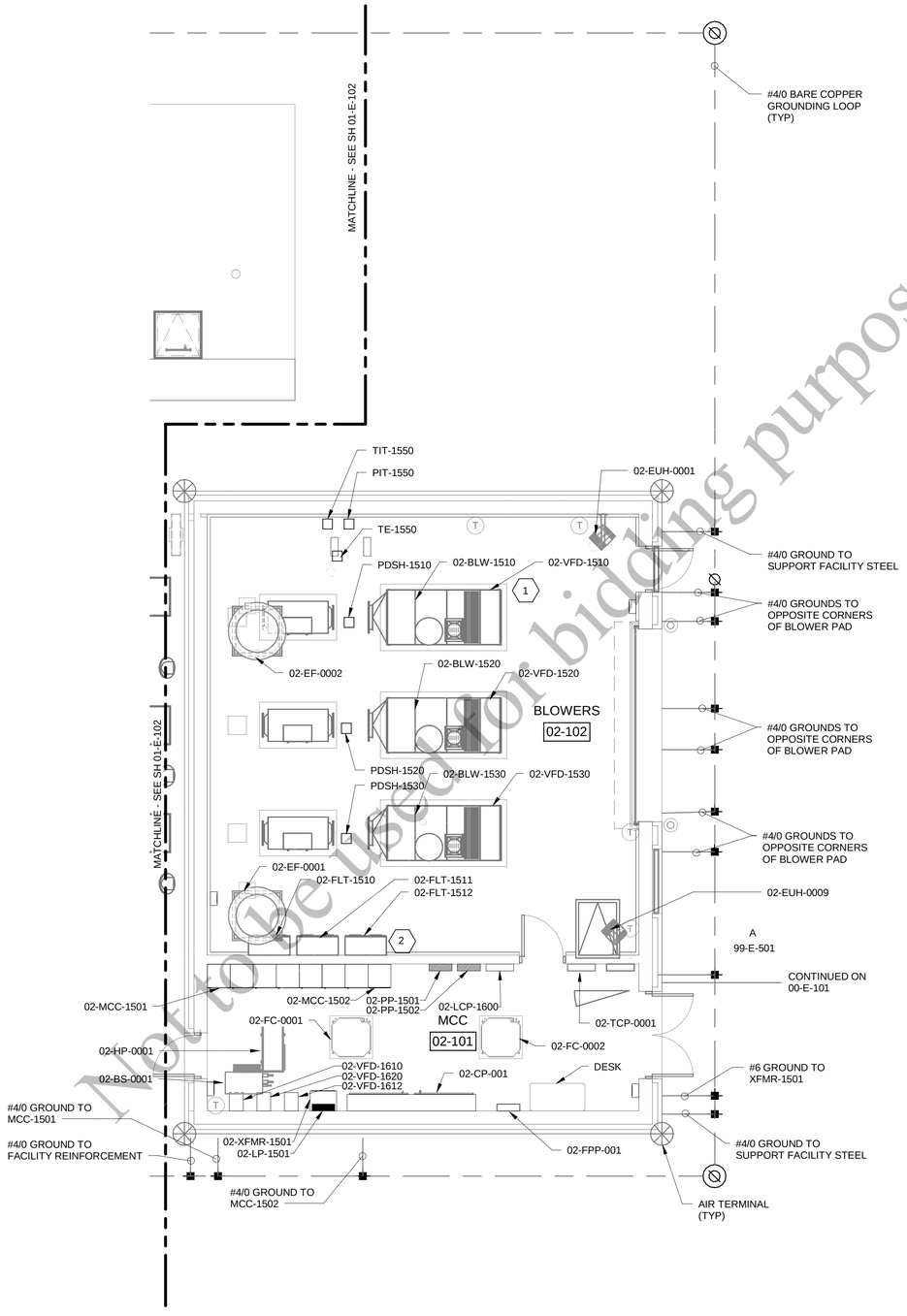
6' 4' 2' 0' 5' 10'

3/16" = 1'-0"

02-P-102

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

PLOTTED: 12/16/2022 11:54:00 AM
FILE: BIM 360://409469 - Aerobic Granular Sludge Phase 1/409469 - ACS.rvt
D11000



ELECTRICAL POWER AND GROUNDING PLAN

3/16" = 1'-0"

GENERAL NOTES

1. SEE DRAWINGS 00-E-001 AND 00-E-002 DOR LEGENDS, ABBREVIATIONS AND NOTES.

SHEET KEYNOTES

1. VARIABLE FREQUENCY DRIVES SUPPLIED AS PACKAGED UNIT WITH BLOWER BY BLOWER VENDOR. TYPICAL OF THREE BLOWERS.
2. HARMONIC FILTERS SUPPLIED BY BLOWER VENDOR BUT SHIPPED LOOSE. TYPICAL OF THREE BLOWERS.

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AEROBIC GRANULAR SLUDGE - PHASE 1

REVISIONS AND RECORD OF ISSUE

DESIGNED:	EJB
DETAILED:	SFR
CHECKED:	SDS
APPROVED:	EJB
DATE:	12/20/2022
PROJECT NO.:	411752

AGS SUPPORT FACILITIES

ELECTRICAL

FACILITIES POWER & GROUNDING PLAN

02-E-101

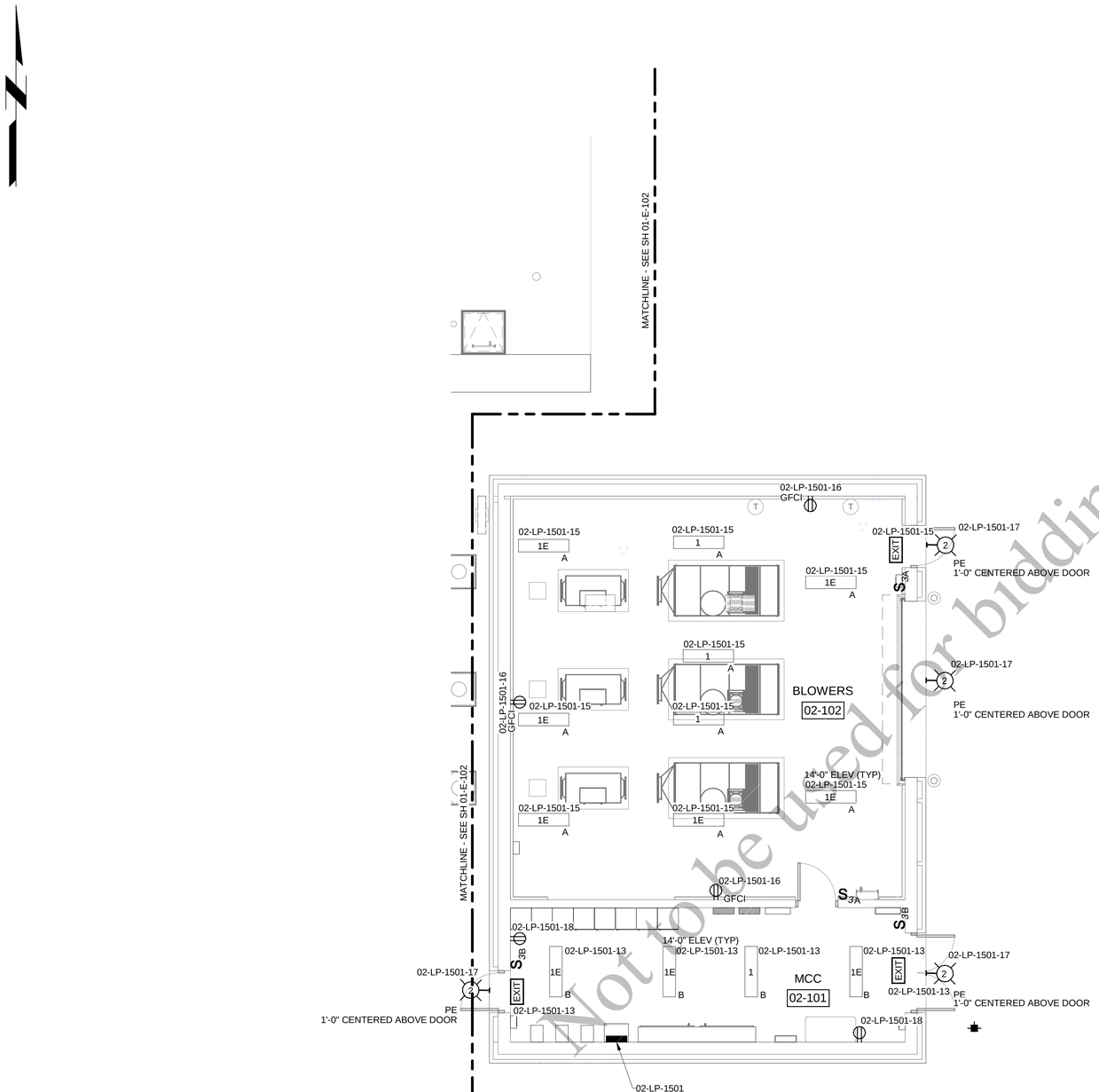
105 OF 163

6' 4' 2' 0' 5' 10'

3/16" = 1'-0"

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

PLOTTED: 12/16/2022 11:49:14 AM
FILE: BIM 360://409469 - Aerobic Granular Sludge Phase 1/409469 - AGS.rvt
D11000



ELECTRICAL LIGHTING PLAN

3/16" = 1'-0"

GENERAL NOTES

1. SEE DRAWINGS 00-E-001 AND 00-E-002 DOR LEGENDS, ABBREVIATIONS AND NOTES.

6' 4' 2' 0' 5' 10'

3/16" = 1'-0"

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

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AEROBIC GRANULAR SLUDGE - PHASE 1

REVISIONS AND RECORD OF ISSUE

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APPROVED:	EJB
DATE:	12/20/2022
PROJECT NO.:	411752

AGS SUPPORT FACILITIES

ELECTRICAL

FACILITIES LIGHTING PLAN

02-E-102

106 OF 163

PLOTTED: 12/16/2022 11:53:33 AM
FILE: BIM 360://409469 - Aerobic Granular Sludge Phase 1/409469 - AGS.rvt
D11000

PHASE			PANELBOARD:02-LP-1501		BUS: COPPER				MAINS: 3P-100A MAIN BREAKER		PHASE		
			SERVICE: 120/208V, 3PH, 4W, S/N		RATING: 100A				LOCATION: AGS SUPPORT FACILITIES				
"A"	"B"	"C"	MOUNTING: SURFACE								"A"	"B"	"C"
V.A.	V.A.	V.A.	LOAD	P	BKR	CKT #	CKT #	BKR	P	LOAD	V.A.	V.A.	V.A.
50			PRI FLT EFF DISCH FLW -FIT-1000	1	20	1	2	20	1	AGS SUPPLIER PLC-CP-001	500		
	50		AGS REACTOR NO.1 INFLUENT FLOW -FIT-1100	1	20	3	4	20	1	AGS REACTOR NO.1 ANALYZER -AIT-1100		50	
		50	WAGS/WLC PUMP COMMON DISCH FLW FIT-1650	1	20	5	6	20	1	AGS REACTOR NO.2 ANALYZER -AIT-1200			50
50			AGS REACTOR NO.2 INFLURNT FLOW -FIT-1200	1	20	7	8	45	2	MCC HEAT PUMP -HP-0001 NOTE 1	4500		
	50		AGS REACTOR NO.3 INFLURNT FLOW -FIT-1300	1	20	9	10	-	-	-		4500	
		50	AGS REACTOR NO.4 INFLURNT FLOW -FIT-1400	1	20	11	12	20	1	AGS REACTOR NO.3 ANALYZER -AIT-1300			50
511			MCC ROOM 02-101 LIGHTING	1	20	13	14	20	1	AGS REACTOR NO.4 ANALYZER -AIT-1400	50		
	1150		BLOWER ROOM 02-102 LIGHTING	1	20	15	16	20	1	BLOWER ROOM 02-102 RECEPTACLES		540	
		116	SUPPORT FACILITIES EXTERIOR LIGHTING	1	20	17	18	20	1	MCC ROOM 02-101 RECEPTACLES			360
333			PIPE GALLERY 01-001 - LIGHTING	1	20	19	20	20	2	STAIRWELL NO.1 EXHAUST FAN 01-EF-0003 NOTE 1	250		
	167		PIPE GALLERY 01-001 - LIGHTING	1	20	21	22	-	-	-		250	
		50	WAGS/WLC WETWELL CNTL PNL - LCP-1600	1	20	23	24	20	1	WAGS/WLC WETWELL INFLUENT TOTAL SUSPENDED SOLIDS AIT-1601			50
222			PIPE GALLERY 01-001 - LIGHTING	1	20	25	26	20	1	PIPE GALLERY 01-001 - RECEPTACLES	900		
	222		PIPE GALLERY 01-001 - LIGHTING	1	20	27	28	20	1	PIPE GALLERY 01-001 - RECEPTACLES		720	
		222	PIPE GALLERY 01-001 - LIGHTING	1	20	29	30	20	1	GALLERY TOP - EXTERIOR LIGHTING			228
167			PIPE GALLERY 01-001 - LIGHTING	1	20	31	32	20	1	GALLERY TOP - EXTERIOR LIGHTING	380		
	333		GALLERY STAIR NO.2 01-002 - LIGHTING	1	20	33	34	20	1	GALLERY TOP - EXTERIOR LIGHTING		343	
		167	GALLERY STAIR NO 1 01-001 - LIGHTING	1	20	35	36	20	1	GALLERY TOP - EXTERIOR LIGHTING			609
167			GALLERY STAIR NO 1 01-001 - LIGHTING	1	20	37	38	20	1	GALLERY TOP - RECEPTACLES	720		
	250		STAIRWELL NO.2 EXHAUST FAN - 01-EF-0004 NOTE 1	2	20	39	40	20	1	GALLERY TOP - RECEPTACLES		900	
		250	-	-	20	41	42	20	1	EFFLUENT CHANNEL PHOSPHATE ANALYZER AT-1005			50
0			SPARE	1	20	43	44	20	1	SPARE	0		
	0		SPARE	1	20	45	46	20	1	SPARE		0	
		0	SPARE	1	20	47	48	20	1	SPARE			0
0			SPARE	1	20	49	50	20	1	SPARE	0		
	0		SPARE	1	20	51	52	20	1	SPARE		0	
		0	SPARE	1	20	53	54	20	1	SPARE			0
1500			TOTAL "A"			8800				TOTAL "A"	7300		
	2222		TOTAL "B"			9525				TOTAL "B"		7303	
		905	TOTAL "C"			2302				TOTAL "C"			1397
			TOTAL	=		20627							

LIGHTING FIXTURE SCHEDULE

SYMBOL	LAMP	MTG HGT	DESCRIPTION	MANUFACTURER
1	LED 6096 LUMENS 50W	AS NOTED ON PLANS	RAB LED 1X4' 50 WATT WHITE FINISH	RAB SHARK 4 50 W/D10
1E	LED 6096 LUMENS 50W	AS NOTED ON PLANS	RAB LED 1X4' 50 WATT WHITE FINISH BATTERY BACKUP	RAB SHARK 4 50 W/D10 /E2
2	LED 3851 LUMENS 26W	AS NOTED ON PLANS	LED OUTDOOR WALLPACK WITH PHOTOCELL/MOTION SENSOR	RAB WPLED26
3	LED 4340 LUMENS 38W	AS NOTED ON PLANS	LED TYPE 2 DISTRIBUTION, 4,500 LUMENS, SLIPFITTER STYLE MOUNT, 5000K, BRONZE FINISH, 120-277V, 8FT LENS WATTSTOPPER 10'-0" BRONZE SQUARE POLE	RAB IVAT2-45LSF750ZU/WS RAB PS4-11-10WT
EXIT	LED .71W	1' ABOVE DOORWAYS	LITHONIA LQM EXIT SIGN, STENCIL, WHITE, SINGLE FACE, 120/277 DUAL VOLTAGE, NICKLE CADIUM BATTERY BACKUP	LITHONIA LQM S W 3 R 120/277 EL N

GENERAL SHEET NOTES

1. SEE SPECIFICATION SECTION 23 09 11 FOR COMPLETE HVAC CONTROL SYSTEM CABLES, INTERCONNECTIONS, AND REQUIREMENTS.
2. ALL TAGS ARE PREFACED BY "02" UNLESS OTHERWISE SHOWN.

BLACK & VEATCH
Black & Veatch Corporation
Chicago, Illinois
ILLINOIS PROFESSIONAL
DESIGN FIRM - 184.002143 -0006

Four Rivers Sanitation Authority

AEROBIC GRANULAR SLUDGE - PHASE 1

REVISIONS AND RECORD OF ISSUE

DESIGNED:	EJB
DETAILED:	SFR
CHECKED:	SDS
APPROVED:	EJB
DATE:	12/20/2022
PROJECT NO.:	411752

AGS SUPPORT FACILITIES

ELECTRICAL

LIGHTING PANEL AND FIXTURE SCHEDULE

02-E-601

PLOTTED: 12/16/2022 11:09 AM FILE: C:\pw_working\bvw_americas\d1495380\02-E-601.dwg
PLOTTED FROM FILE

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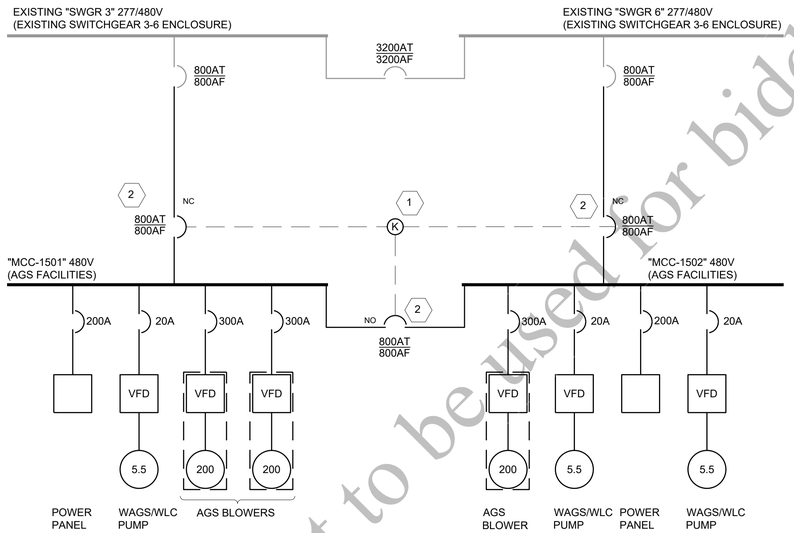

GENERAL SHEET NOTES

1. SEE DRAWINGS 00-E-001 AND 00-E-002 FOR LEGENDS, ABBREVIATIONS AND NOTES.

SHEET KEYNOTES

1. MAIN-TIE-MAIN KIRK KEY INTERLOCK SCHEME SUCH THAT ONLY TWO BREAKERS CAN BE CLOSED AT ANY TIME.
2. MCC MAIN AND TIE BREAKERS SHALL BE RATED TO OPERATE AT 800 AMPS CONTINUOUSLY.

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AEROBIC GRANULAR SLUDGE - PHASE 1

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AGS SUPPORT FACILITIES

ELECTRICAL

POWER DISTRIBUTION FUNCTIONAL DIAGRAM

02-E-701

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

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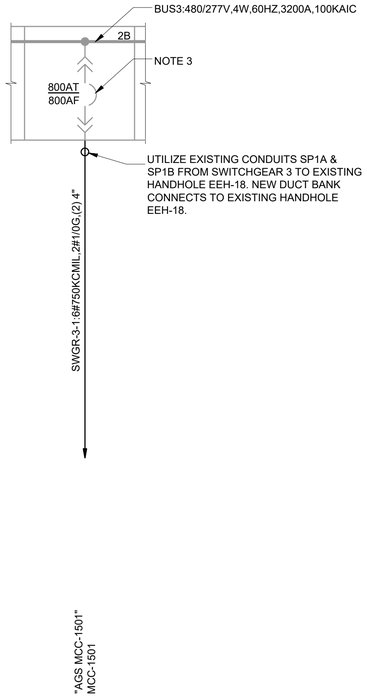
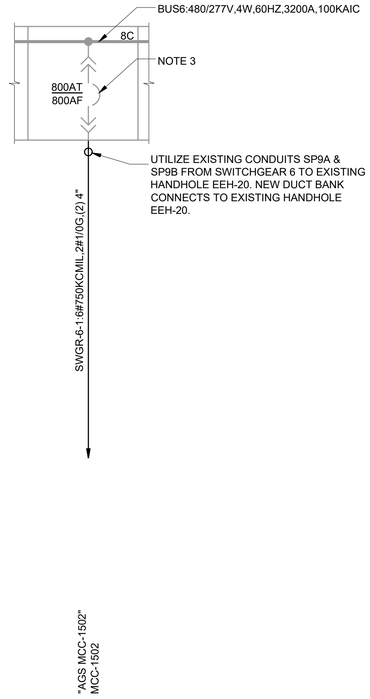


SWITCHGEAR 3 ONE-LINE DIAGRAM
SUBSTATION 3-6



SWITCHGEAR 6 ONE-LINE DIAGRAM
SUBSTATION 3-6

GENERAL SHEET NOTES

1. SEE DRAWINGS 00-E-001 AND 00-E-002 FOR LEGENDS, ABBREVIATIONS AND NOTES.
2. SWITCHGEAR NAMEPLATE WORDING IS SHOWN IN QUOTATION MARKS (" ") ON THE ONE-LINE DIAGRAM.
3. CONTRACTOR SHALL ADJUST TRIP SETTINGS FOR NEW BREAKERS PER THE POWER SYSTEMS STUDY RECOMMENDATIONS.

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Four Rivers Sanitation Authority

AEROBIC GRANULAR SLUDGE - PHASE 1

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AGS SUPPORT FACILITIES

ELECTRICAL

SWITCHGEAR PARTIAL ONE-LINE DIAGRAMS

02-E-702

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

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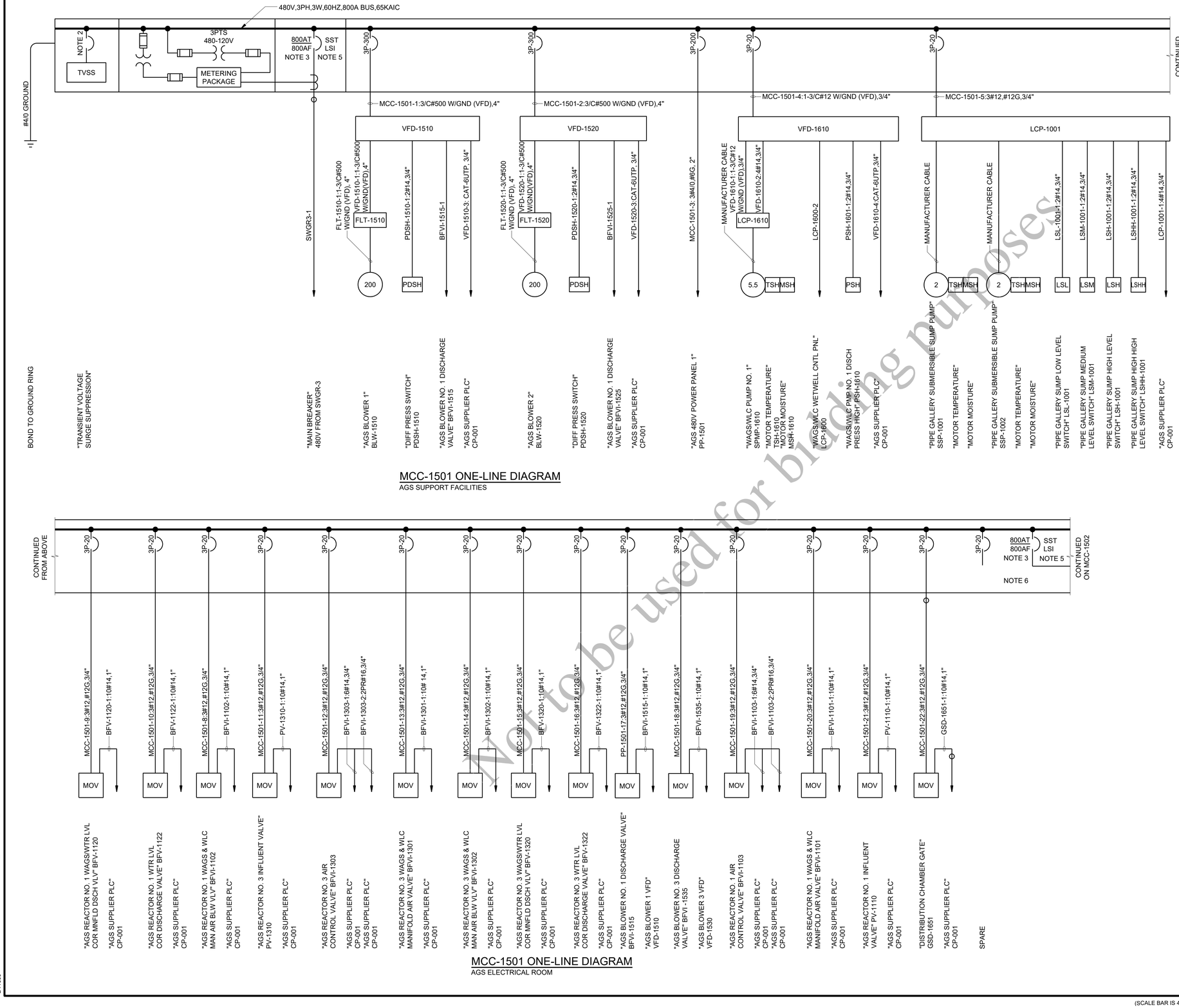

MCC-1501 ONE-LINE DIAGRAM
AGS SUPPORT FACILITIES

MCC-1501 ONE-LINE DIAGRAM
AGS ELECTRICAL ROOM

GENERAL SHEET NOTES

1. SEE DRAWINGS 00-E-001 AND 00-E-002 FOR LEGENDS, ABBREVIATIONS AND NOTES.
2. MCC NAMEPLATE WORDING IS SHOWN IN QUOTATION MARKS (" ") ON THE ONE-LINE DIAGRAM
3. MCC MAIN AND TIE BREAKERS SHALL BE RATED TO OPERATE AT 800 AMPS CONTINUOUSLY.
4. ALL TAGS ARE PREFACED BY "02" UNLESS OTHERWISE SHOWN.
5. THE MAIN AND TIE BREAKER INSTANTANEOUS OVER CURRENT PICKUPS MUST COORDINATE WITH ALL FEEDER AND STARTER BREAKERS.
6. SPARE SPACES SHALL BE PROCURED TO ACCOMMODATE 4 SIZE 2 MOTOR STARTERS.

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Four Rivers Sanitation Authority

AEROBIC GRANULAR SLUDGE - PHASE 1

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PROJECT NO.:	411752

AGS SUPPORT FACILITIES

ELECTRICAL

AGS MCC ONE-LINE DIAGRAM

02-E-703

110 OF 163

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

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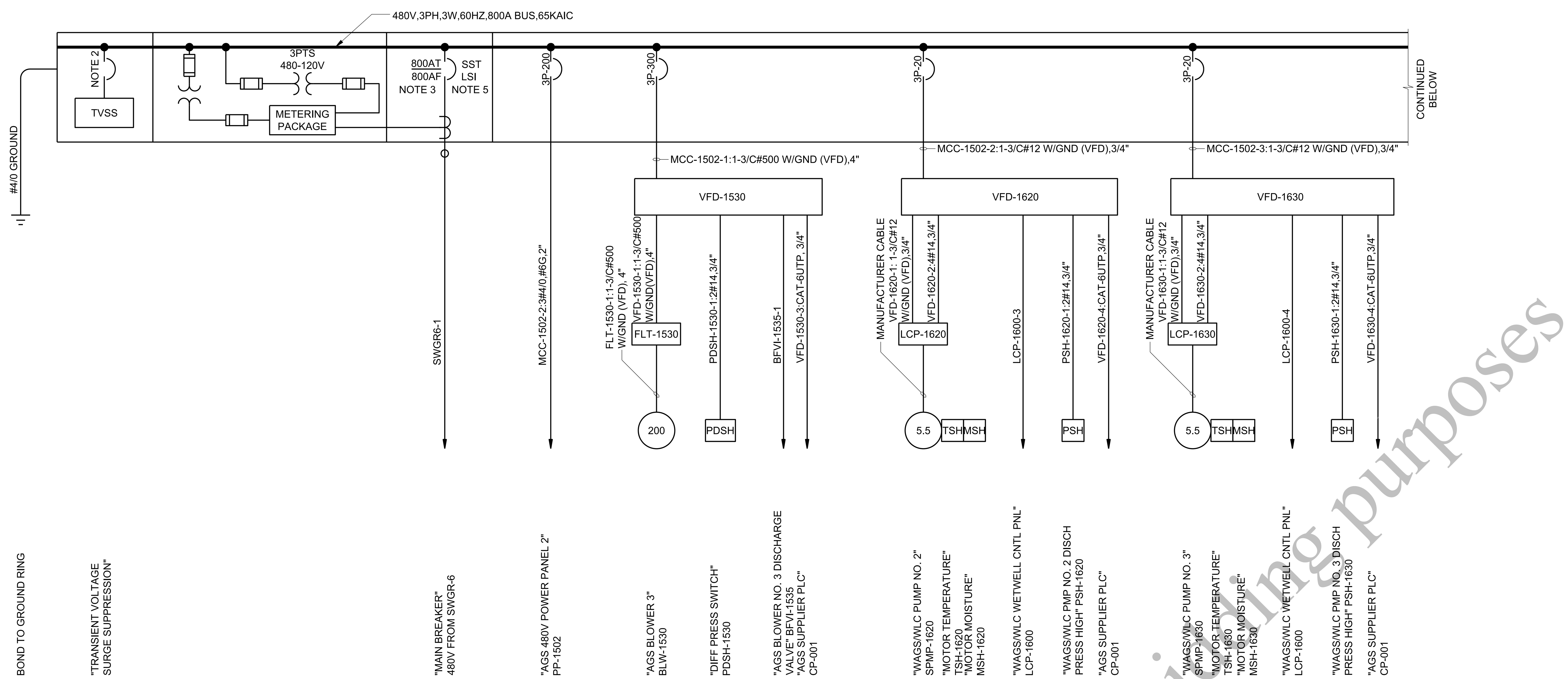
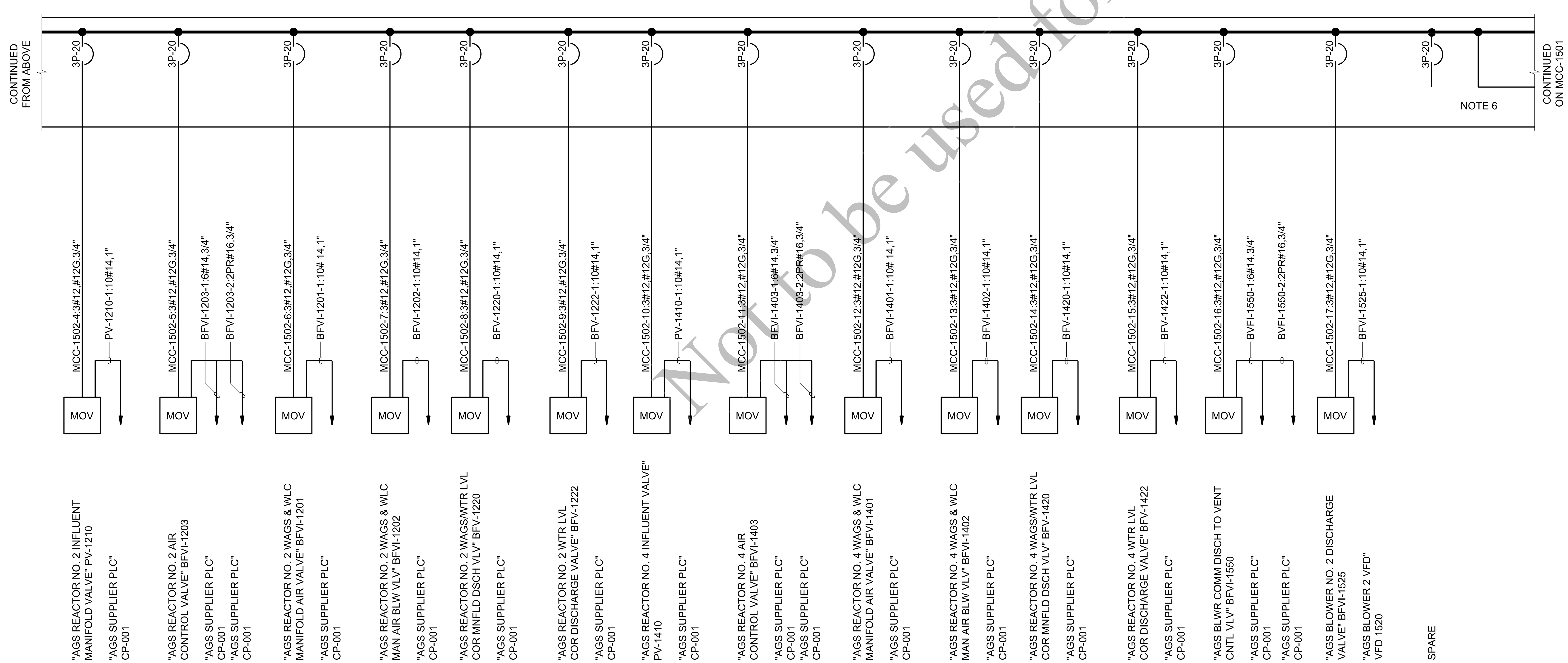


MCC-1502 ONE-LINE DIAGRAM
AGS SUPPORT FACILITIES



MCC-1502 ONE-LINE DIAGRAM
AGS ELECTRICAL ROOM

GENERAL SHEET NOTES

1. SEE DRAWINGS 00-E-001 AND 00-E-002 FOR LEGENDS, ABBREVIATIONS AND NOTES.
2. MCC NAMEPLATE WORDING IS SHOWN IN QUOTATION MARKS (" ") ON THE ONE-LINE DIAGRAM
3. MCC MAIN AND TIE BREAKERS SHALL BE RATED TO OPERATE AT 800 AMPS CONTINUOUSLY.
4. ALL TAGS ARE PREFACED BY "02" UNLESS OTHERWISE SHOWN.
5. THE MAIN AND TIE BREAKER INSTANTANEOUS OVER CURRENT PICKUPS MUST COORDINATE WITH ALL FEEDER AND STARTER BREAKERS.
6. SPARE SPACES SHALL BE PROCURED TO ACCOMMODATE 3 SIZE 2 MOTOR STARTERS.

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Four Rivers Sanitation Authority

AEROBIC GRANULAR SLUDGE - PHASE 1

REVISIONS AND RECORD OF ISSUE

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AGS SUPPORT FACILITIES

ELECTRICAL

AGS MCC ONE-LINE DIAGRAM

02-E-704

111 OF 163

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

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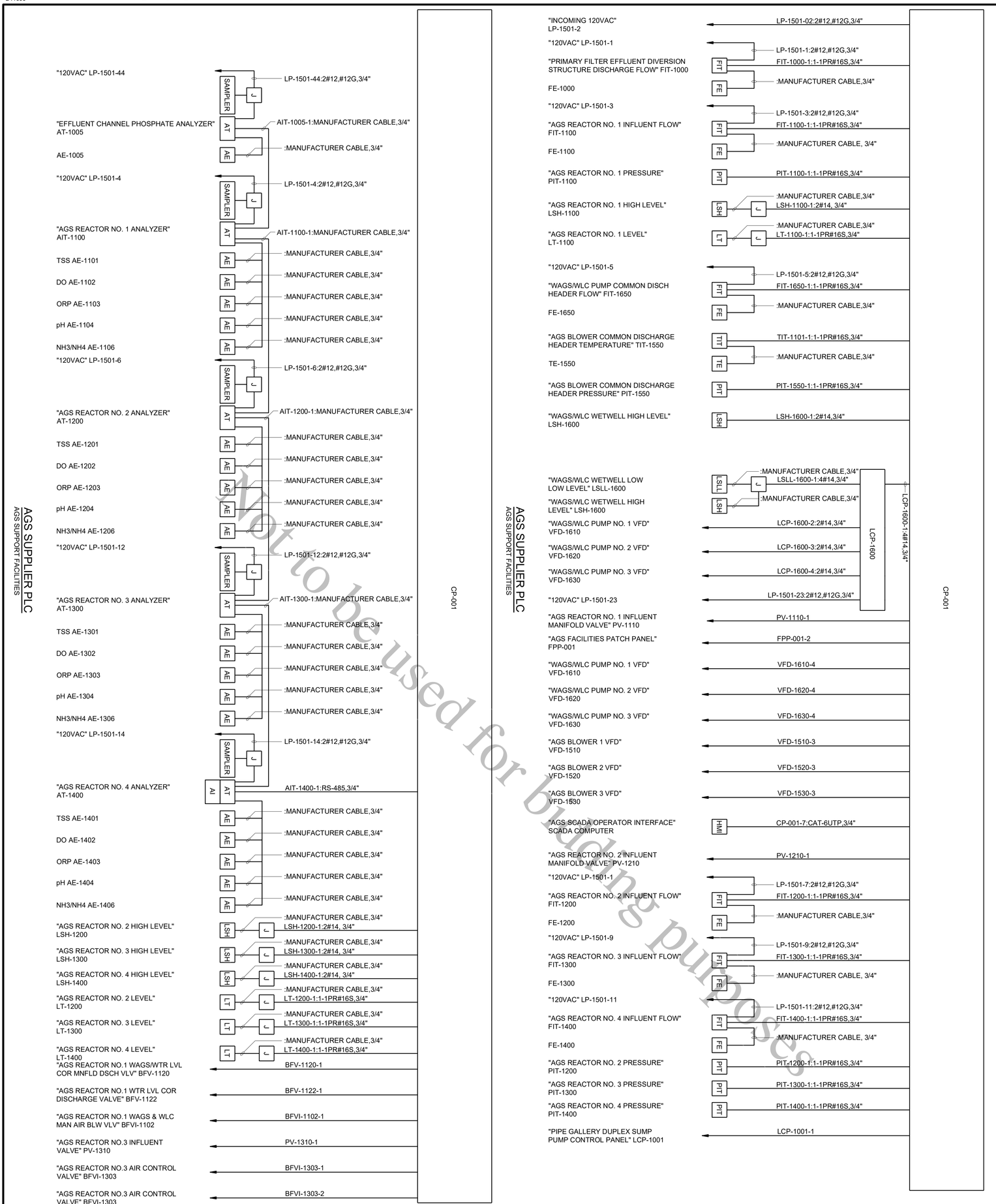


GENERAL SHEET NOTES

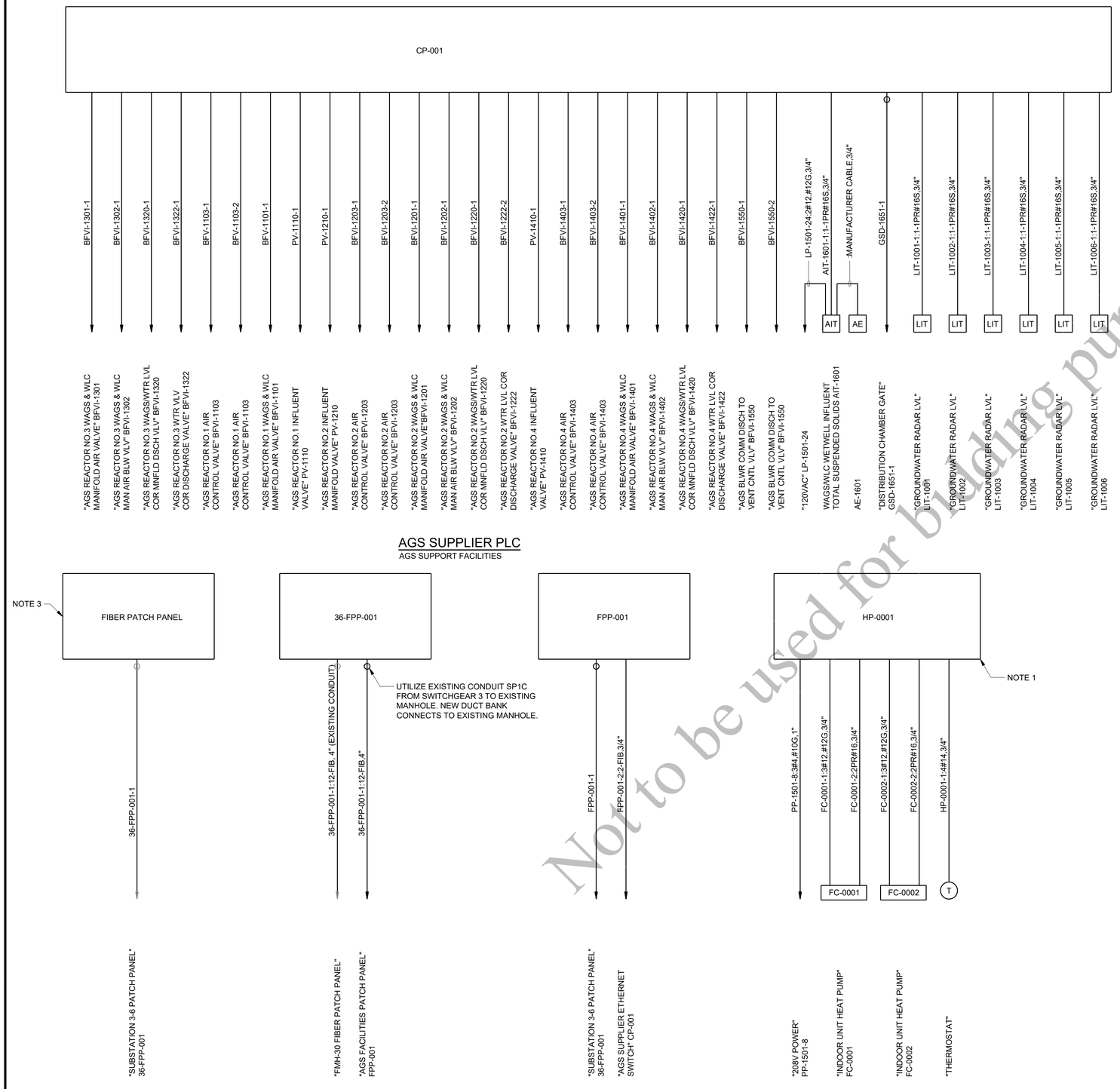
1. SEE SPECIFICATION SECTION 23 09 11 FOR COMPLETE HVAC CONTROL SYSTEM CABLES INTERCONNECTIONS AND REQUIREMENTS.
2. ALL TAGS ARE PREFACED BY "02" UNLESS OTHERWISE SHOWN.

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

02-E-705	112 OF 163
AGS PLC ONE-LINE DIAGRAM	
ELECTRICAL	
AGS SUPPORT FACILITIES	
PROJECT NO.: 411752	
DATE: 12/20/2022	
APPROVED: E.B	
CHECKED: SRS	
DETAILED: E.B	
DESIGNED: E.B	
REVISIONS AND RECORD OF ISSUE	
AEROBIC GRANULAR SLUDGE - PHASE 1	
Four Rivers Sanitation Authority	
Black & Veatch Corporation, Chicago, Illinois, ILLINOIS PROFESSIONAL DESIGN FIRM - 184.002143 -0006	

GENERAL SHEET NOTES

1. SEE SPECIFICATION SECTION 23 09 11 FOR COMPLETE HVAC CONTROL SYSTEM CABLES, INTERCONNECTIONS, AND REQUIREMENTS.
2. ALL TAGS ARE PREFACED BY "02" UNLESS OTHERWISE SHOWN.
3. FIBER PATCH PANEL IN "FIBER MANHOLE 30", FURNISHED AND INSTALLED BY OTHERS.



FMH-30 FIBER PATCH PANEL
FIBER MANHOLE 30

SUBSTATION 3-6 FIBER PATCH PANEL
SUBSTATION 3-6

AGS FACILITIES FIBER PATCH PANEL
AGS SUPPORT FACILITIES

AGS HEAT PUMP
AGS SUPPORT FACILITIES

ROLL-UP DOOR CONTROLLER
AGS SUPPORT FACILITIES

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Black & Veatch Corporation
Chicago, Illinois
ILLINOIS PROFESSIONAL
DESIGN FIRM - 184.002143 -0006

Four Rivers Sanitation Authority

AEROBIC GRANULAR SLUDGE - PHASE 1

REVISIONS AND RECORD OF ISSUE

DESIGNED:	EJB
DETAILED:	SFR
CHECKED:	SDS
APPROVED:	EJB
DATE:	12/20/2022
PROJECT NO.:	411752

AGS SUPPORT FACILITIES

ELECTRICAL

AGS PLC ONE-LINE DIAGRAMS

02-E-706

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

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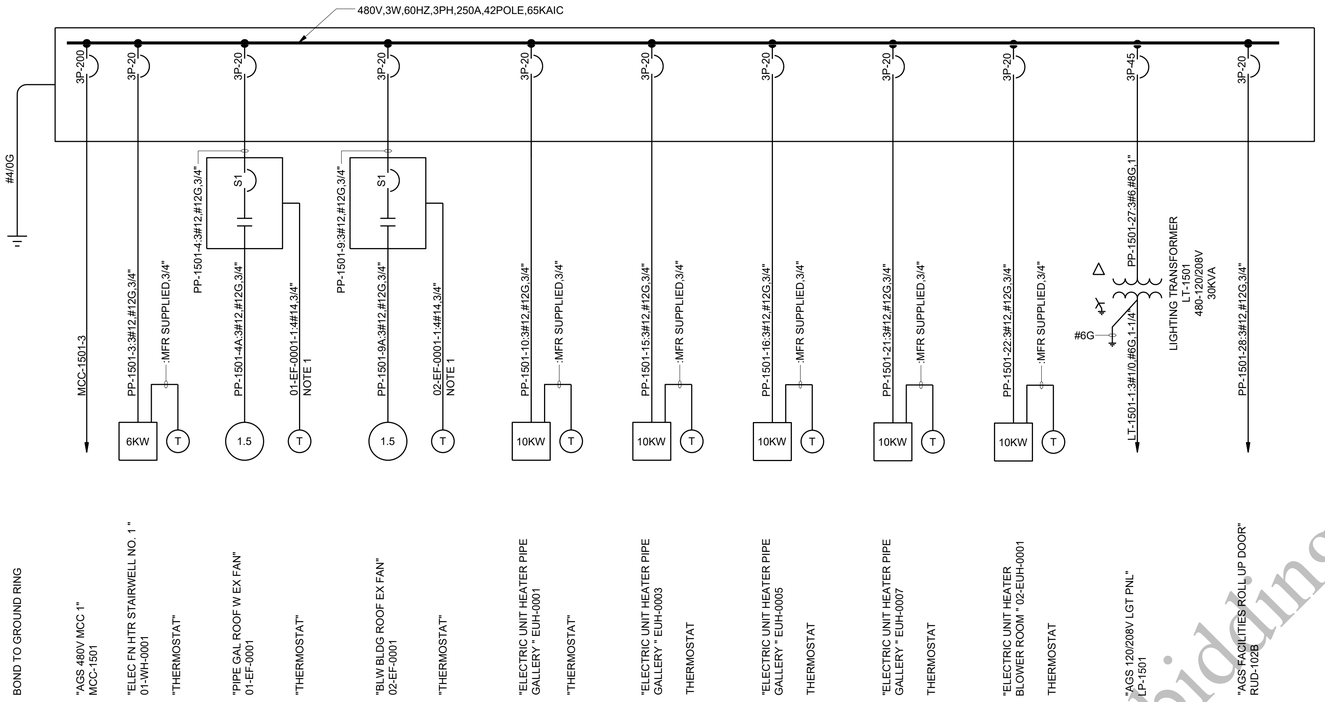
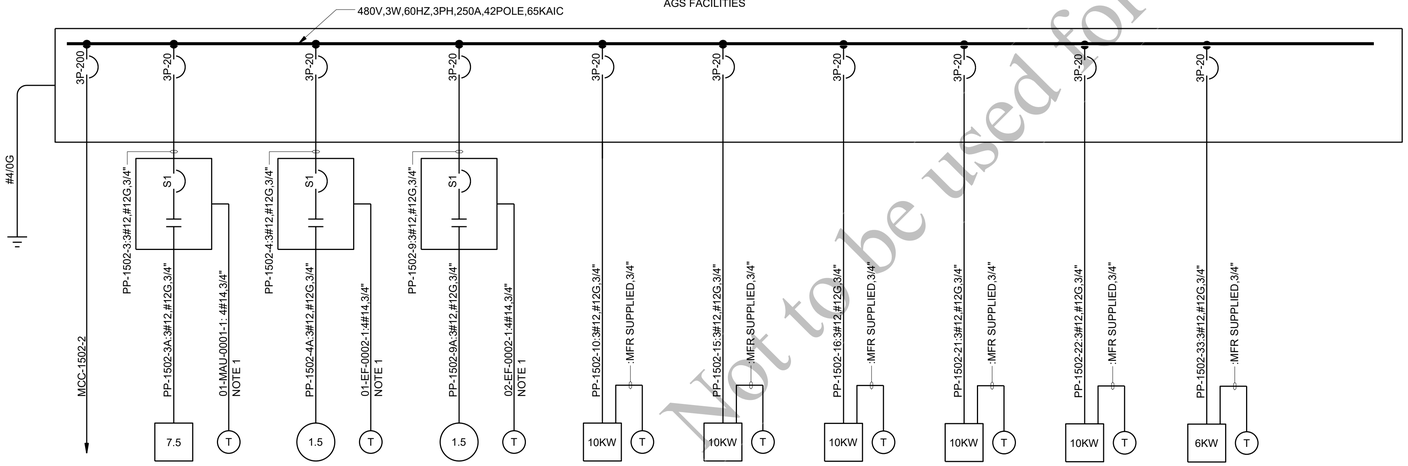


POWER PANEL PP-1501
AGS FACILITIES



POWER PANEL PP-1502
AGS FACILITIES

GENERAL SHEET NOTES

1. SEE SPECIFICATION SECTION 23 09 11 FOR COMPLETE HVAC CONTROL SYSTEM CABLES, INTERCONNECTIONS, AND REQUIREMENTS.
2. ALL TAGS ARE PREFACED BY "02" UNLESS OTHERWISE SHOWN.

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DESIGN FIRM - 184.002143 -0006

Four Rivers Sanitation Authority

AEROBIC GRANULAR SLUDGE - PHASE 1

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AGS SUPPORT FACILITIES

ELECTRICAL

AGS POWER PANEL ONE-LINE DIAGRAM

02-E-707

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

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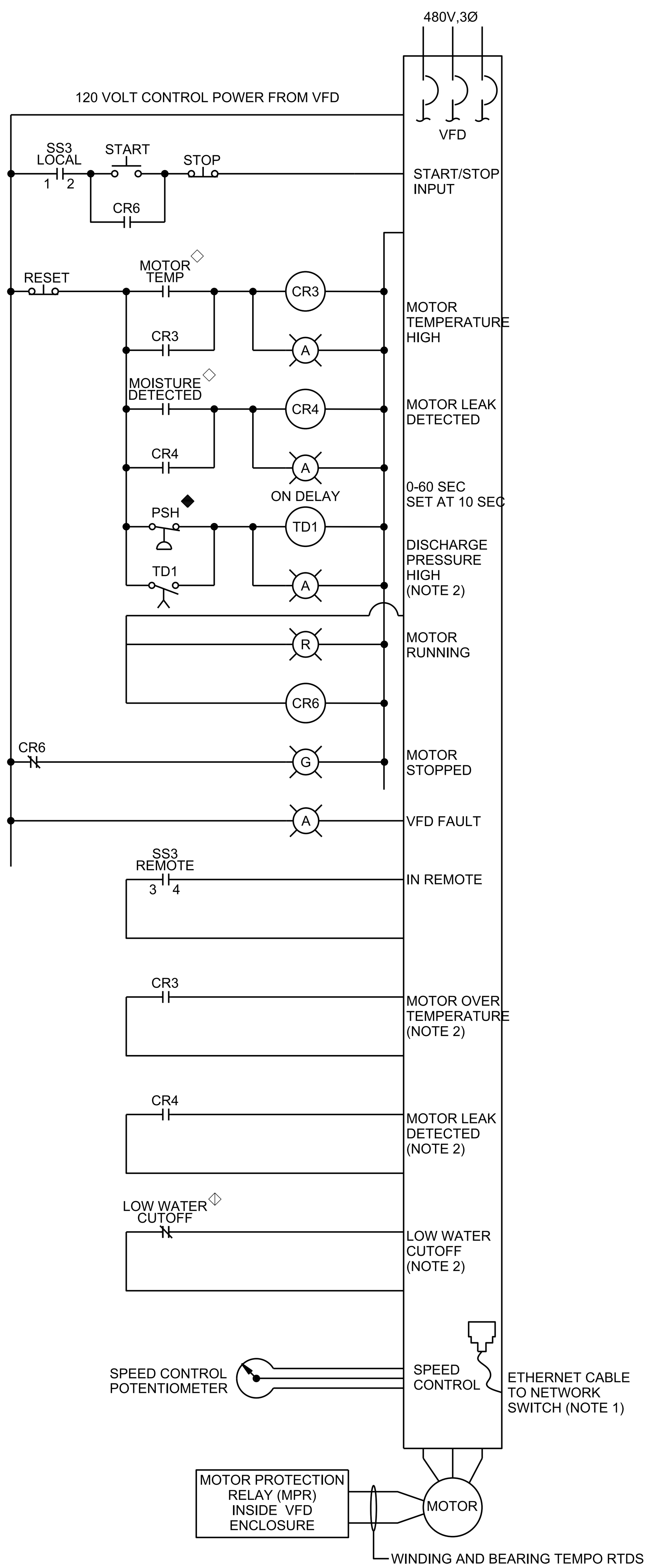


WAGS/WLC WETWELL PUMP 02-VFD-1610

SIMILAR FOR VFD-1620 AND VFD-1630

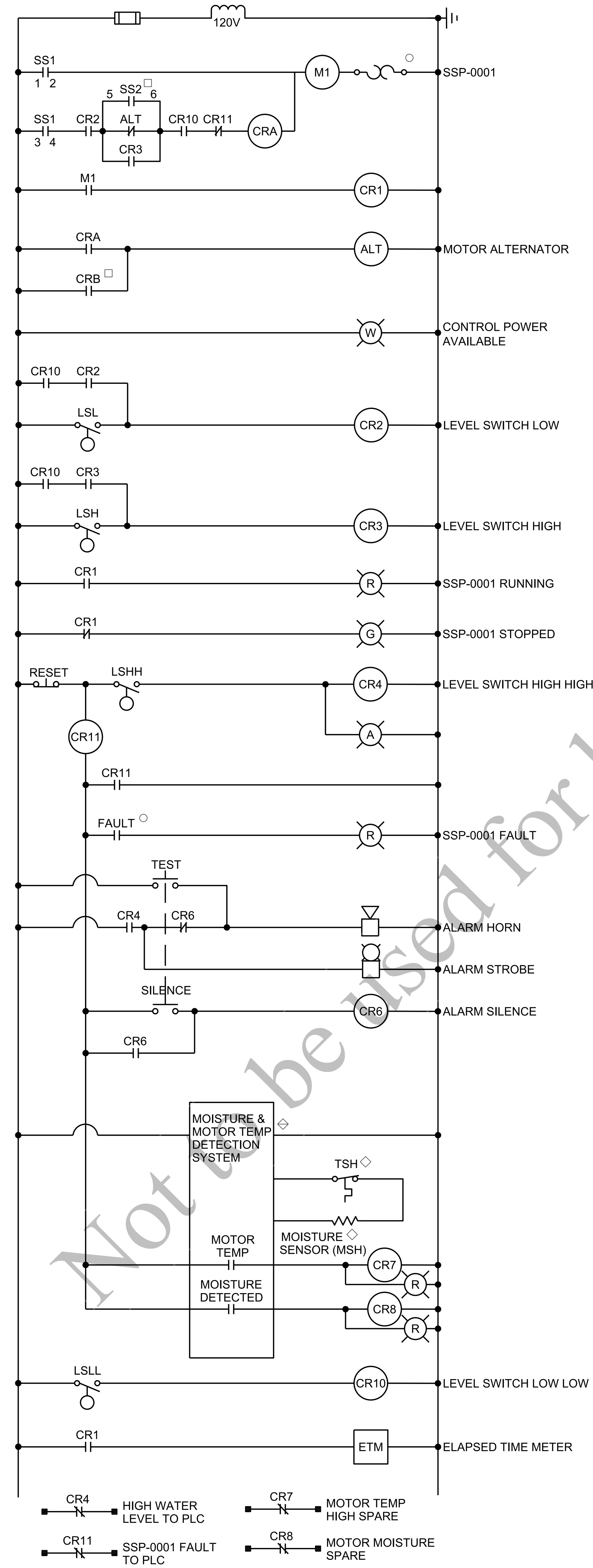
SWITCH DEVELOPEMENT:

SS3

CONTACTS	LOCAL	OFF	REMOTE
1-2	X		
3-4			X

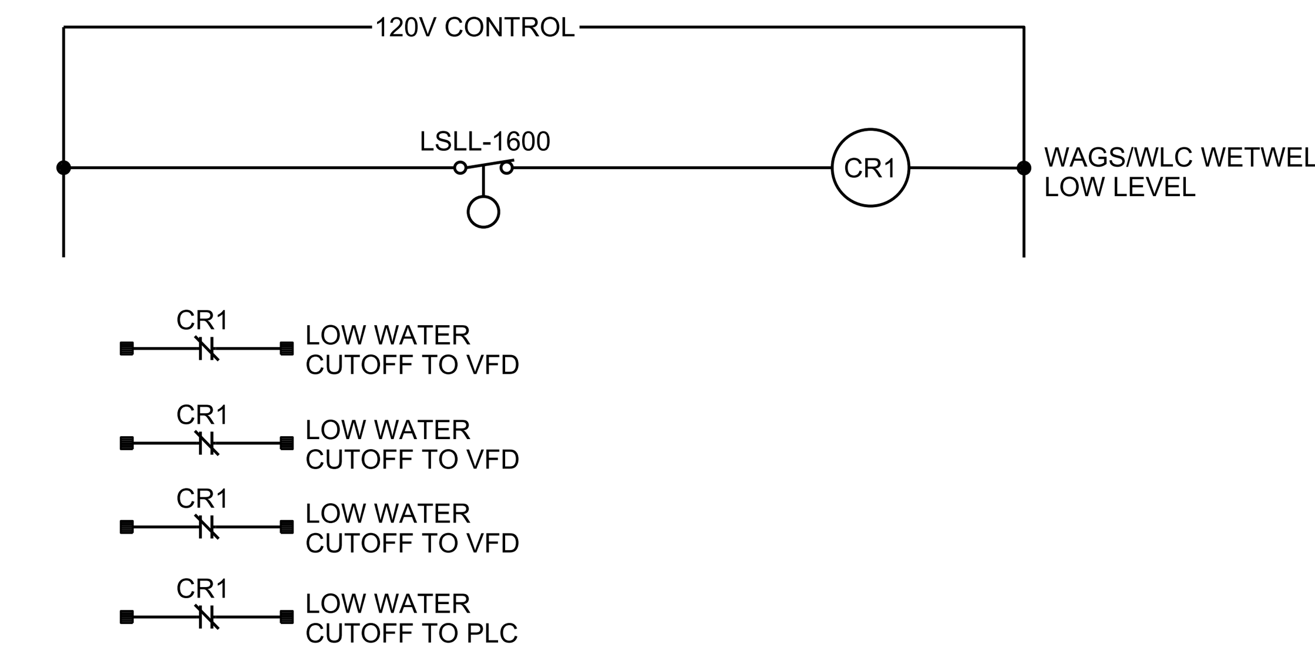
SS1 &SS2

CONTACTS	TEST	OFF	AUTO
1-2	X		
3-4			X
5-6		X	

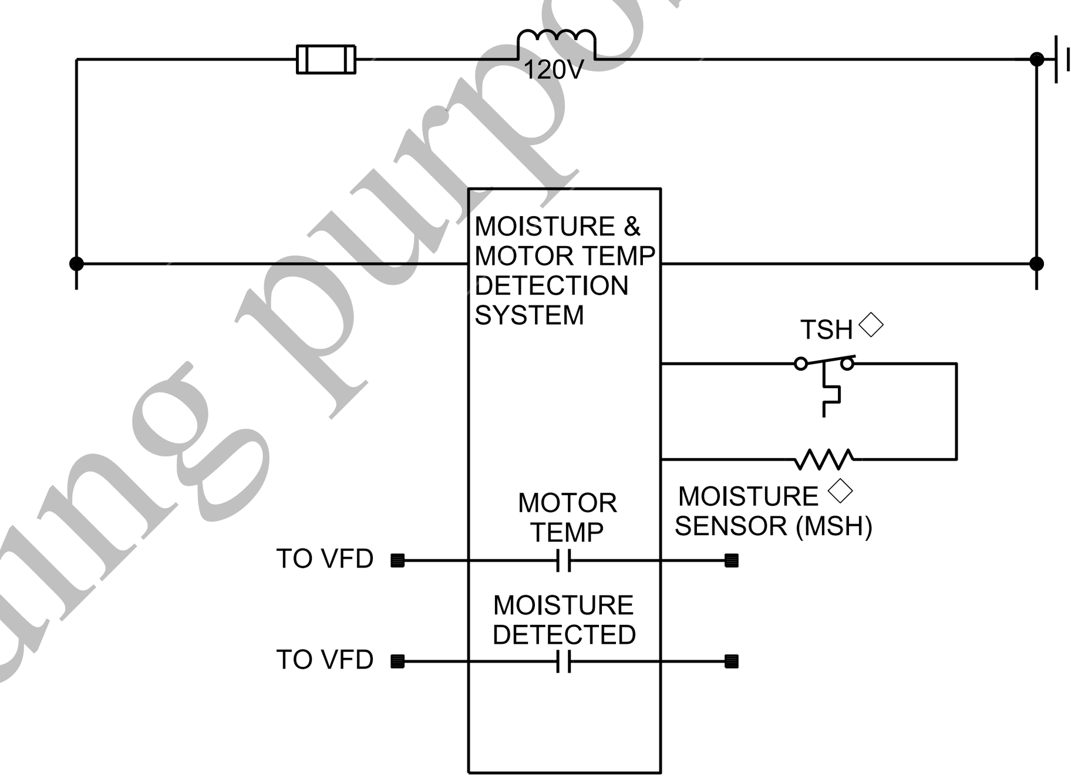


PIPE GALLERY DUPLEX SUMP PUMP CONTROL PANEL 02-LCP-1001

SIMILAR FOR SSP-0002 (SSP-0001 AND SSP-0002 CONTROLS IN SAME ENCLOSURE)

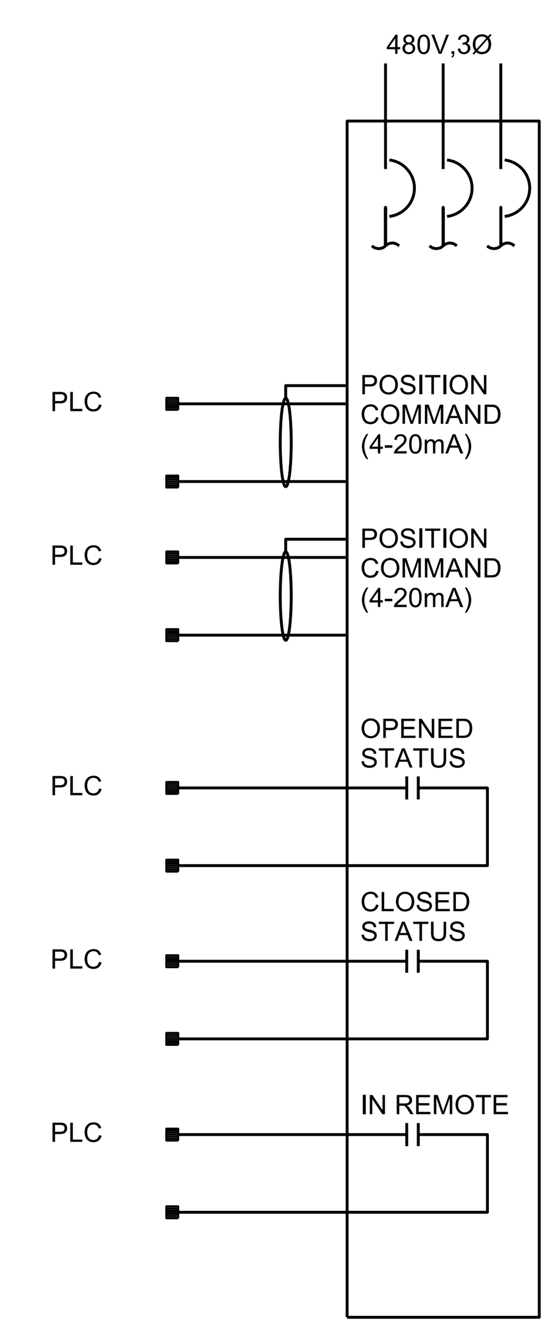


LOW WATER CUTOFF PANEL 02-LCP-1600

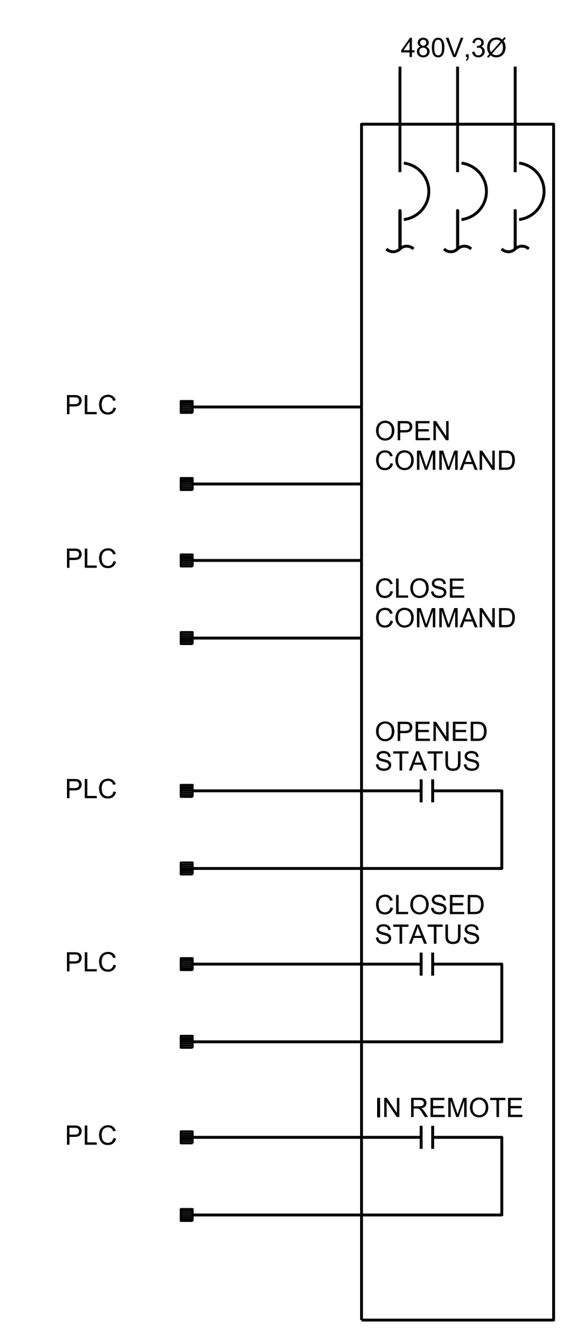


WAGS/WLC WETWELL CONTROL PANEL 02-LCP-1610

SIMILAR FOR LCP-1620 AND LCP-1630



TYPICAL MODULATING VALVE ACTUATOR



TYPICAL OPEN/CLOSE VALVE ACTUATOR

GENERAL SHEET NOTES

1. ALL ALARM CONDITIONS, PUMP CONTROL, AND MONITORING SIGNALS SHALL BE TRANSMITTED OVER NETWORK CONNECTION.
2. ALL ALARM INPUTS SHALL STOP THE PUMP IN ALL CONTROL MODES.

LEGEND:

- AT VALVE
- AT DRIVEN EQUIPMENT
- ON LOCAL CONTROL PANEL AT DRIVEN EQUIPMENT
- REMOTE FROM STARTER AND DRIVEN EQUIPMENT
- MOTOR PROTECTION DEVICE
- DEVICE LOCATED IN SIMILAR EQUIPMENT CONTROL SYSTEM

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Four Rivers Sanitation Authority

AEROBIC GRANULAR SLUDGE - PHASE 1

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AGS SUPPORT FACILITIES

ELECTRICAL

SCHEMATICS

02-E-708

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

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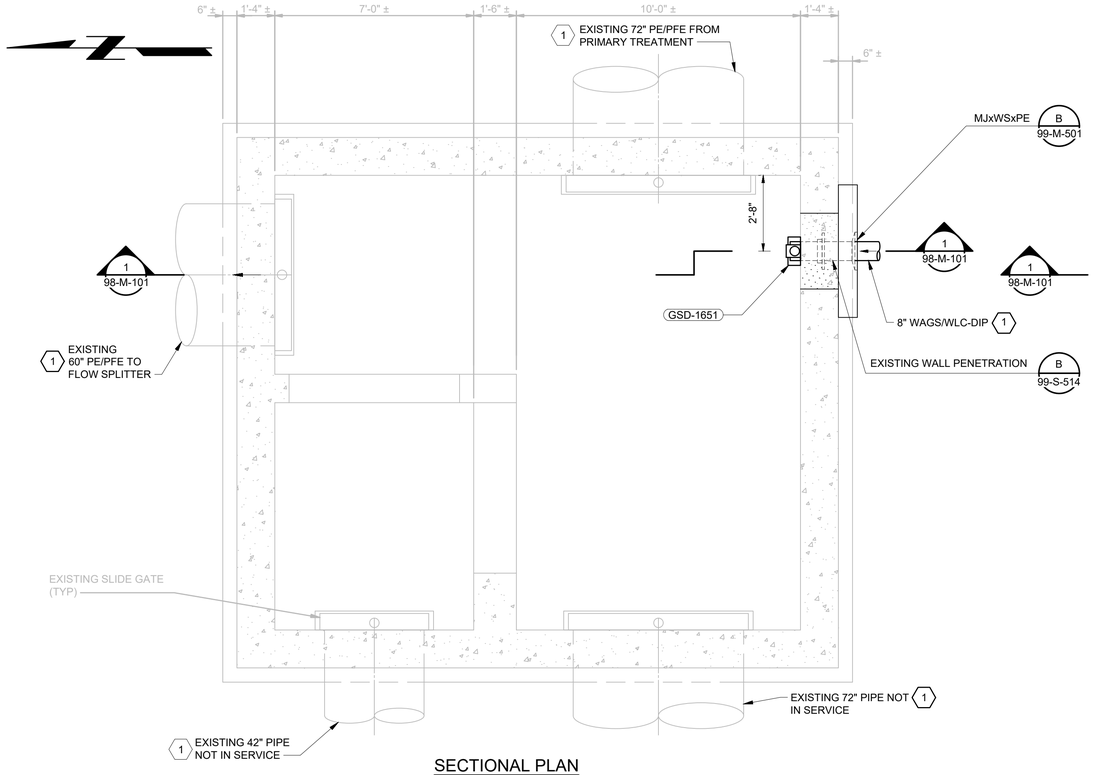
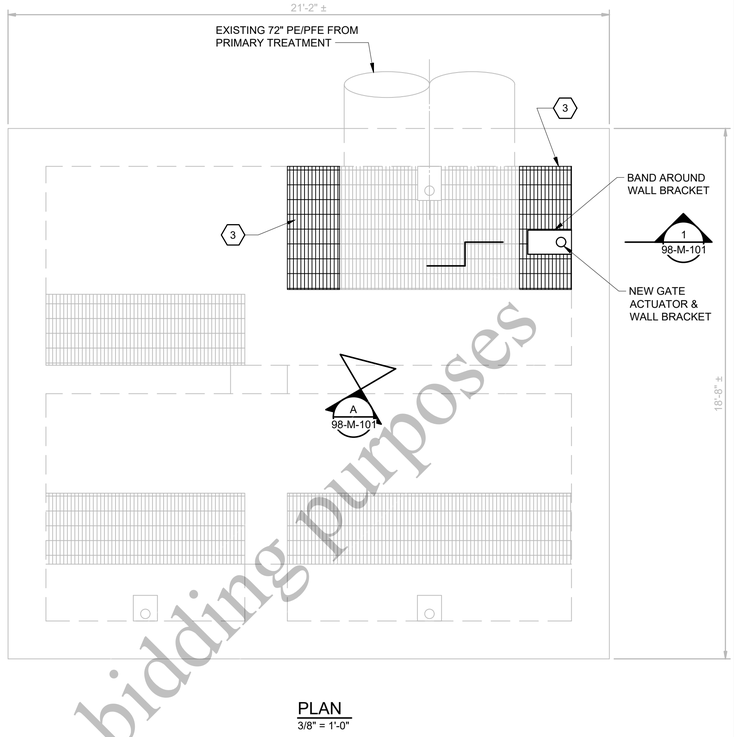
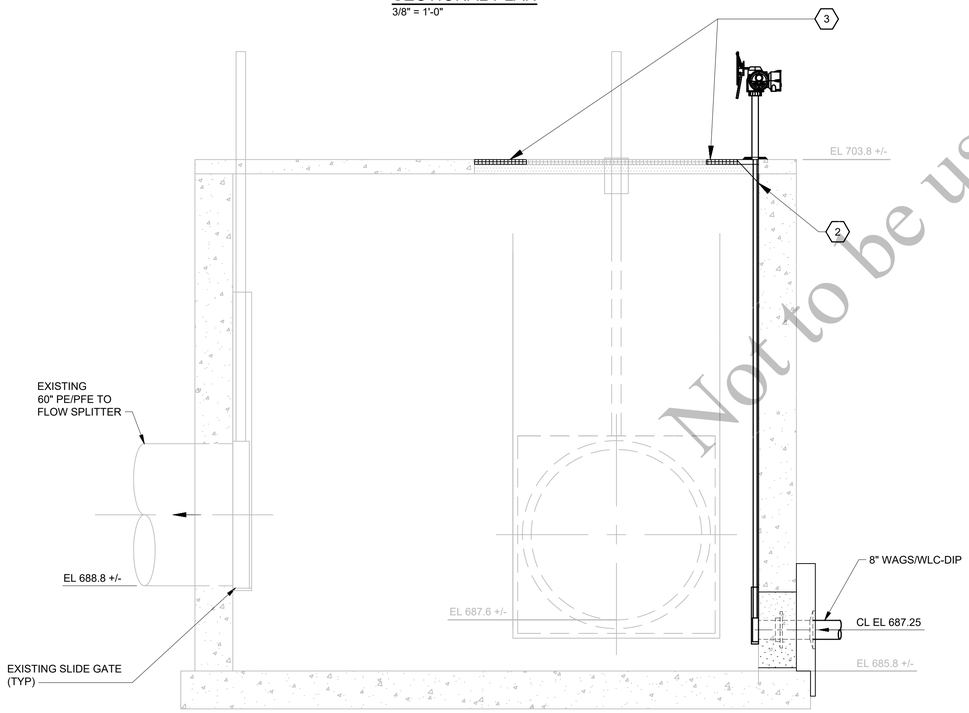


SECTIONAL PLAN
3/8" = 1'-0"



PLAN
3/8" = 1'-0"



1 SECTION
98-M-101 3/8" = 1'-0"

A EXISTING DISTRIBUTION CHAMBER GRATING AT 72" PE GATE OPERATOR
98-M-101 NO SCALE

GENERAL SHEET NOTES

1. SEE EXISTING STRUCTURE NOTES ON SHEET 00-S-001.
2. LOCATIONS AND ELEVATIONS OF ALL EXISTING PIPING, STRUCTURES, AND EQUIPMENT ARE BASED ON RECORD DRAWINGS. CONTRACTOR SHALL VERIFY ELEVATIONS AND LOCATIONS OF EXISTING PIPING, STRUCTURES, AND EQUIPMENT.

SHEET KEY NOTES:

1. SEE YARD PIPING DRAWING 00-C-109 FOR CONTINUATION.
2. GATE MANUFACTURER SHALL DESIGN AND FURNISH WALL BRACKET FOR SUPPORT OF GATE ACTUATOR.
3. NEW GALVANIZED STEEL GRATING. NEW GRATING THICKNESS SHALL MATCH EXISTING GRATING THICKNESS. BAND AROUND THE NEW WALL BRACKET AS SHOWN WITH 1" CLEAR GAP BETWEEN EDGE OF WALL BRACKET AND GRATING BANDING.

12" 6" 0 1' 2' 3' 4' 5' 6' 7'
3/8"=1'-0"

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

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Four Rivers Sanitation Authority

AEROBIC GRANULAR SLUDGE - PHASE 1

REVISIONS AND RECORD OF ISSUE

DESIGNED:	JL
DETAILED:	VP
CHECKED:	AM/JH
APPROVED:	MR
DATE:	12/20/2022
PROJECT NO.:	411752

YARD

PROCESS MECHANICAL

DISTRIBUTION CHAMBER PLANS AND SECTION

98-M-101

116 OF 163

PLOTTED: 11/17/2022 9:33:55 PM
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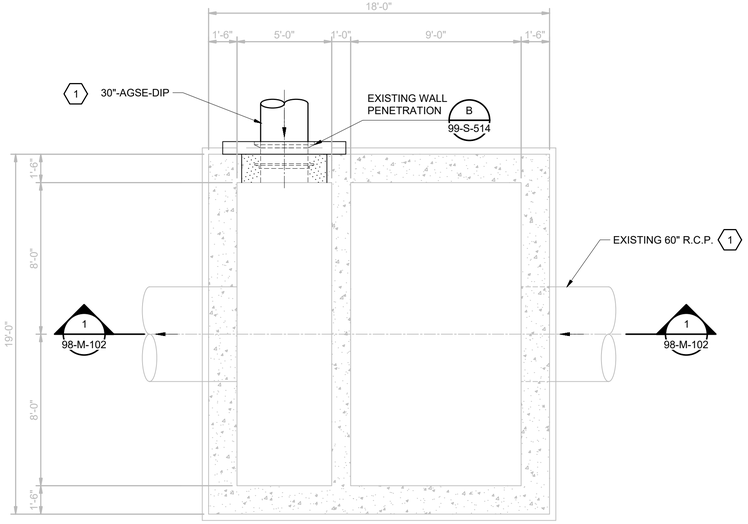
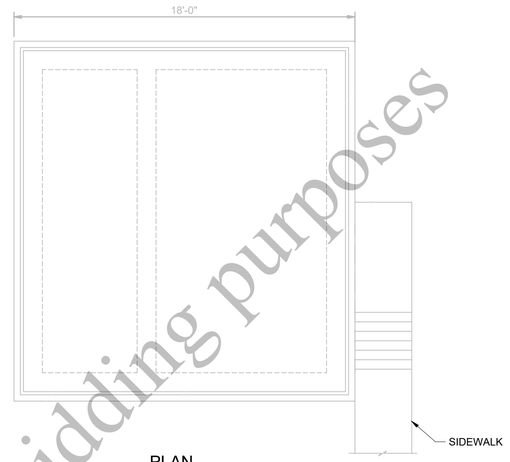
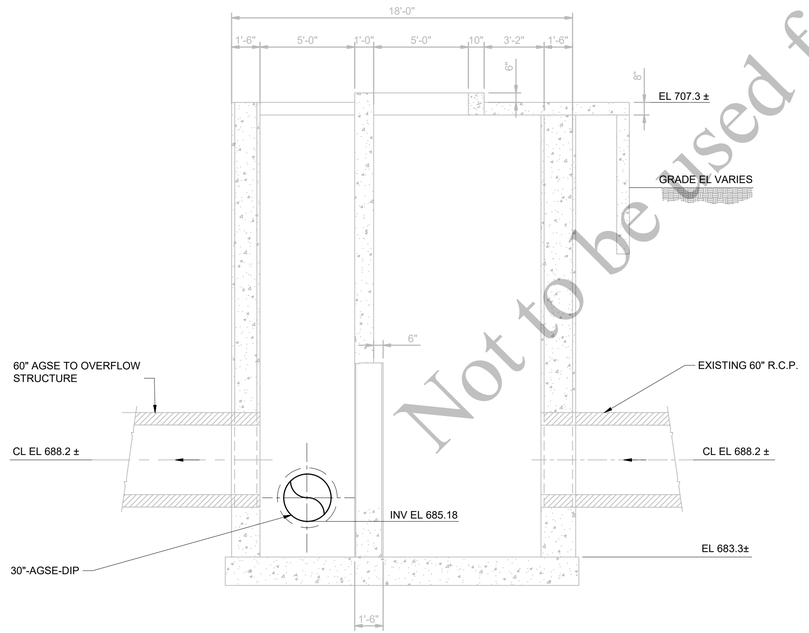


SECTIONAL PLAN
1/4" = 1'-0"



PLAN
1/4" = 1'-0"



1 SECTION
98-M-102 1/4" = 1'-0"

GENERAL SHEET NOTES

1. SEE EXISTING STRUCTURE NOTES ON SHEET 00-S-001.
2. LOCATIONS AND ELEVATIONS OF ALL EXISTING PIPING, STRUCTURES, AND EQUIPMENT ARE BASED ON RECORD DRAWINGS. CONTRACTOR SHALL VERIFY ELEVATIONS AND LOCATIONS OF EXISTING PIPING, STRUCTURES, AND EQUIPMENT.

SHEET KEY NOTES:

1. SEE YARD PIPING DRAWING 00-C-110 FOR CONTINUATION.

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AEROBIC GRANULAR SLUDGE - PHASE 1

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DESIGNED:	JL
DETAILED:	VP
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APPROVED:	MR
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PROJECT NO.:	411752

YARD

PROCESS MECHANICAL

FILTER EFFLUENT PUMPING STATION PLAN AND SECTION

98-M-102

117 OF 163

12" 6" 0 1' 2' 3' 4' 5' 6' 7'
3/8"=1'-0"

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

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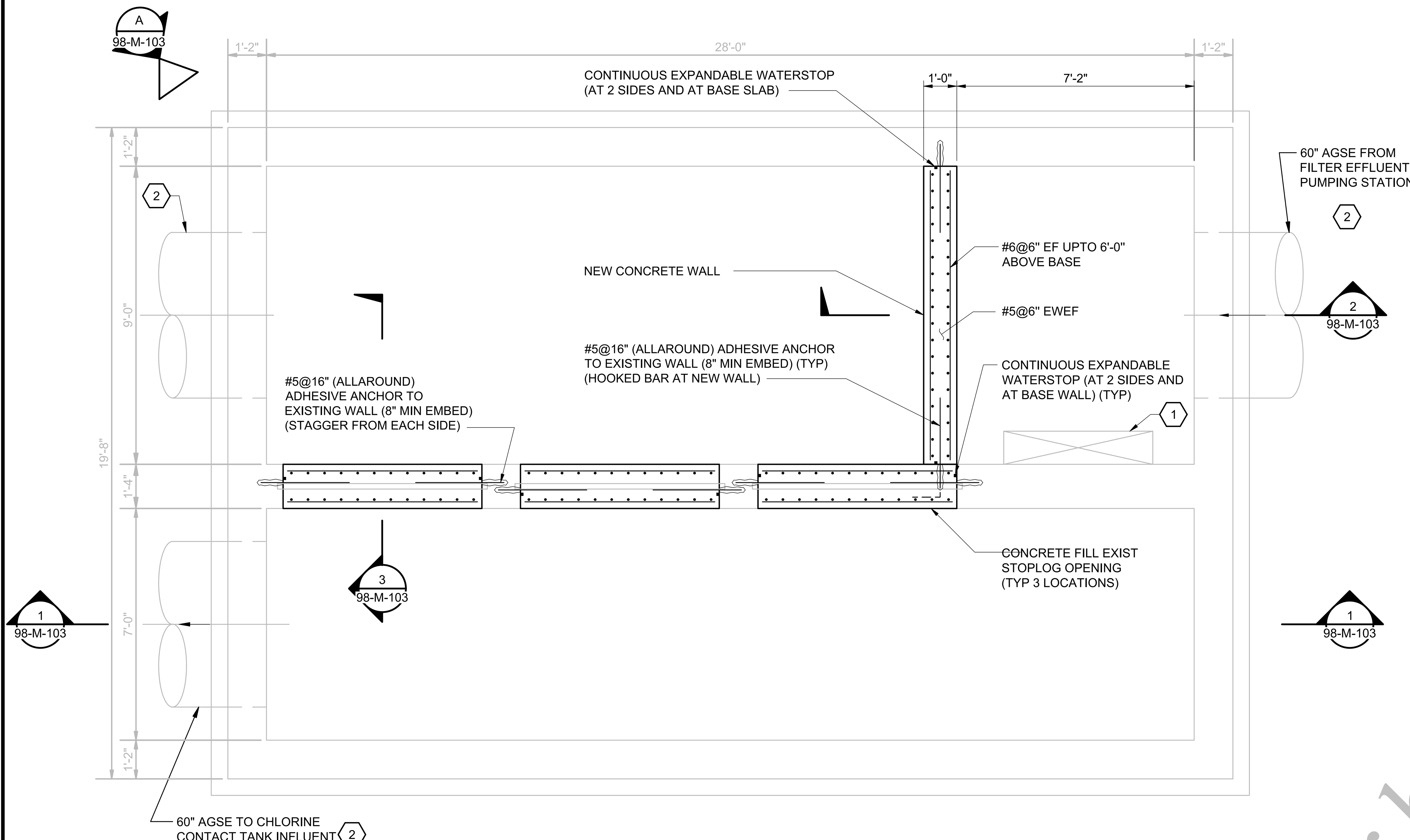
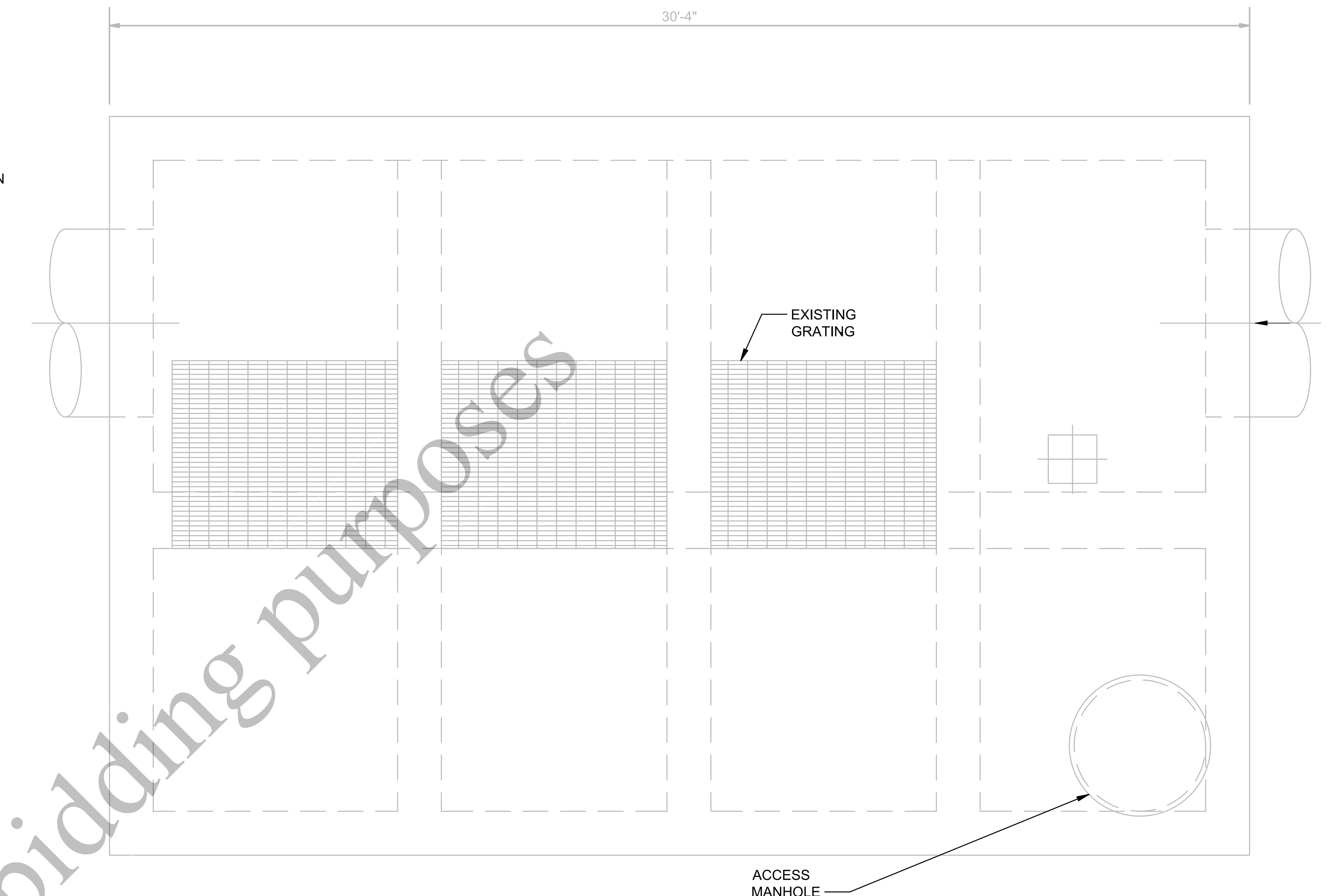
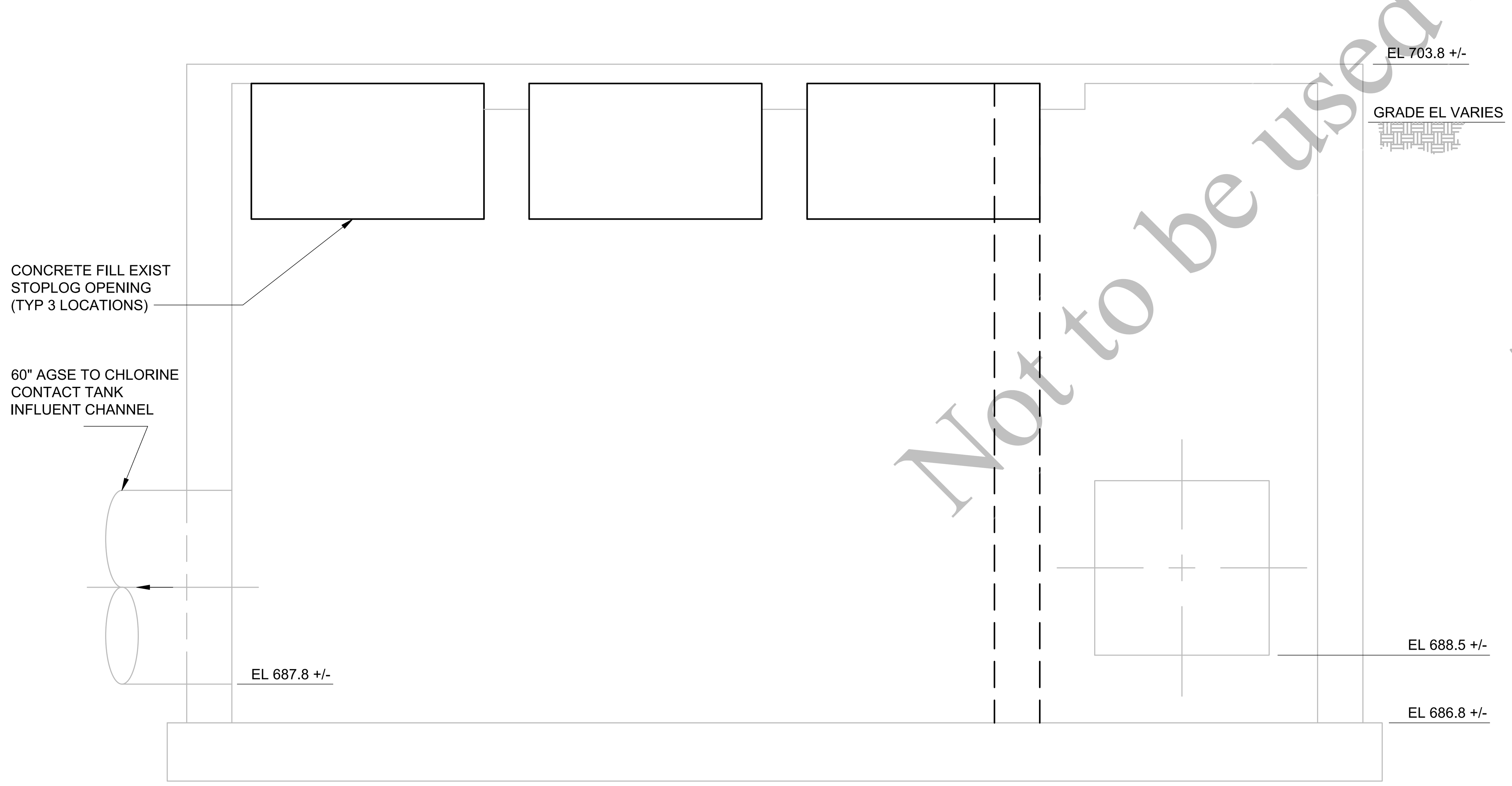


SECTIONAL PLAN
3/8" = 1'-0"

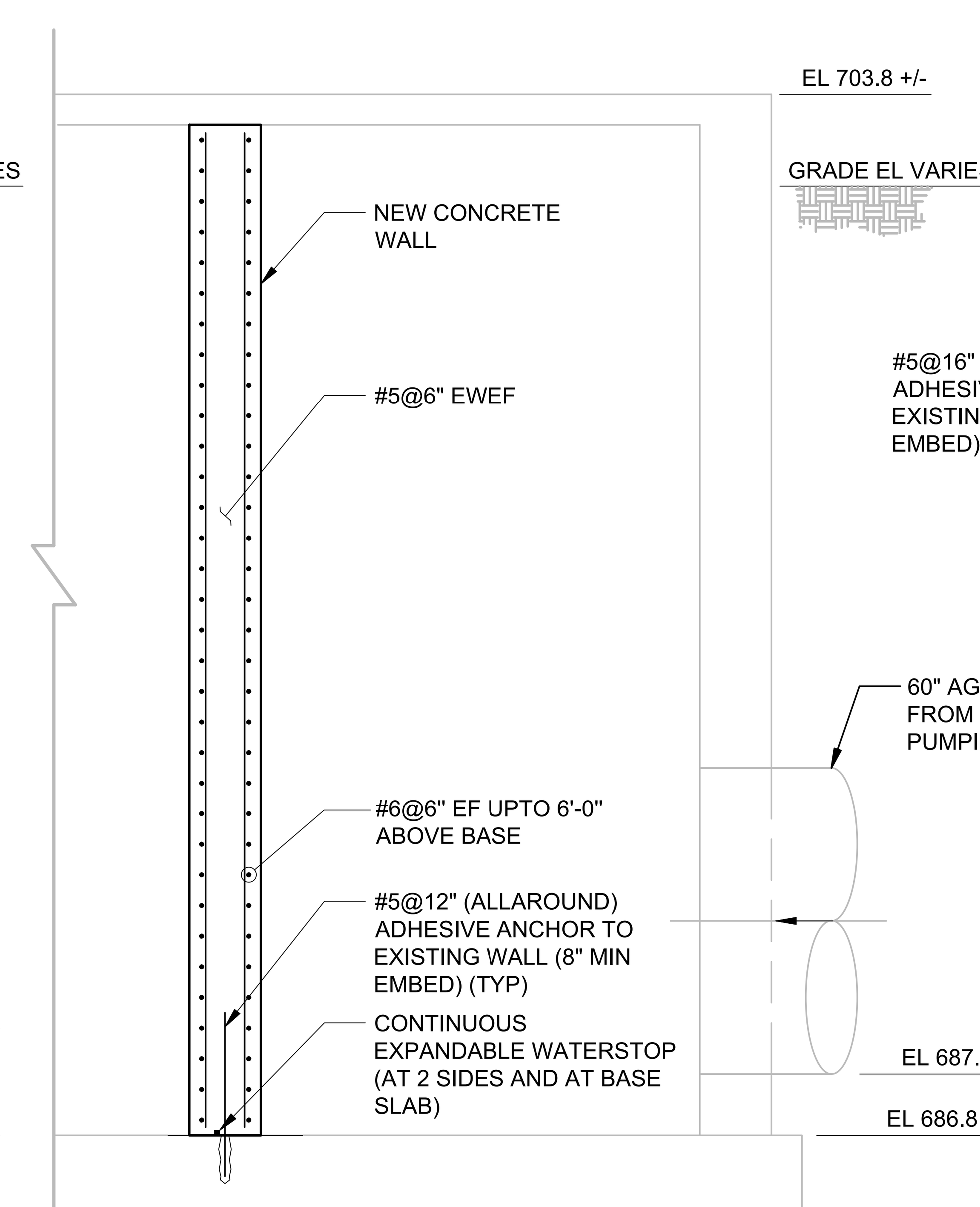


PLAN
3/8" = 1'-0"

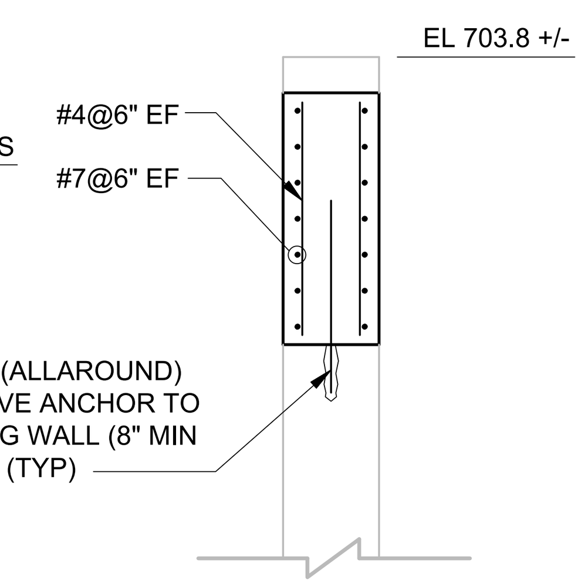
A EXISTING OVERFLOW STRUCTURE
98-M-103 NO SCALE



1 SECTION
98-M-103 3/8" = 1'-0"



2 SECTION
98-M-103 3/8" = 1'-0"



3 SECTION
98-M-103 3/8" = 1'-0"

GENERAL NOTES:

1. SEE EXISTING STRUCTURE NOTES ON SHEET 00-S-001.
2. LOCATIONS AND ELEVATIONS OF ALL EXISTING PIPING, STRUCTURES, AND EQUIPMENT ARE BASED ON RECORD DRAWINGS. CONTRACTOR SHALL VERIFY ELEVATIONS AND LOCATIONS OF EXISTING PIPING, STRUCTURES, AND EQUIPMENT.

SHEET KEY NOTES:

1. CONTRACTOR SHALL FIELD VERIFY CONDITION OF EXISTING GATE AND SERVICE AS NEEDED TO ENSURE FUNCTIONALITY.
2. SEE YARD PIPING DRAWING 00-C-108 FOR CONTINUATION.
3. EXISTING PUMPS AT OVERFLOW STRUCTURE SHALL BE PROTECTED-IN-PLACE DURING CONSTRUCTION. ANY OUTAGES SHALL BE COORDINATED WITH OWNER. CONTRACTOR SHALL PROVIDE AT LEAST 7 DAYS NOTICE PRIOR TO PROJECTED START DATE OF OUTAGE. SEE SPECIFICATION SECTION 00 00 08 AGREEMENT, MILESTONE NO. 1 FOR DETAILS ON OUTAGE LIMITS AND LIQUIDATED DAMAGES.

12" 6" 0 1' 2' 3' 4' 5' 6' 7'
3/8"=1'-0"

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

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Four Rivers
Sanitation Authority

AEROBIC GRANULAR
SLUDGE - PHASE 1

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APPROVED:	MR
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PROJECT NO.:	411752

YARD

PROCESS MECHANICAL

OVERFLOW STRUCTURE
PLANS AND SECTIONS

98-M-103

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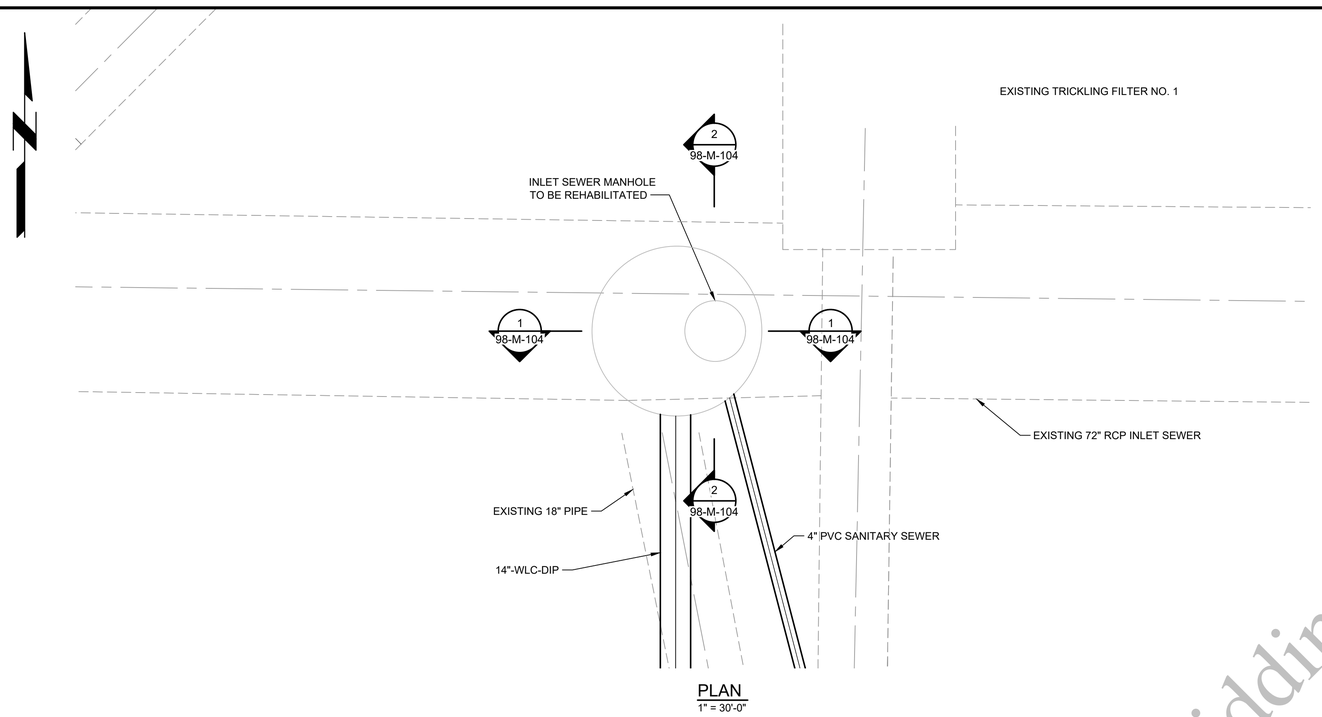
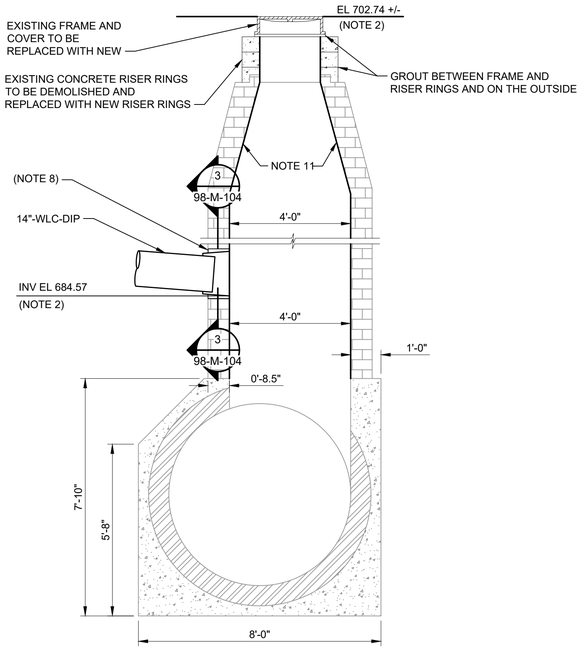
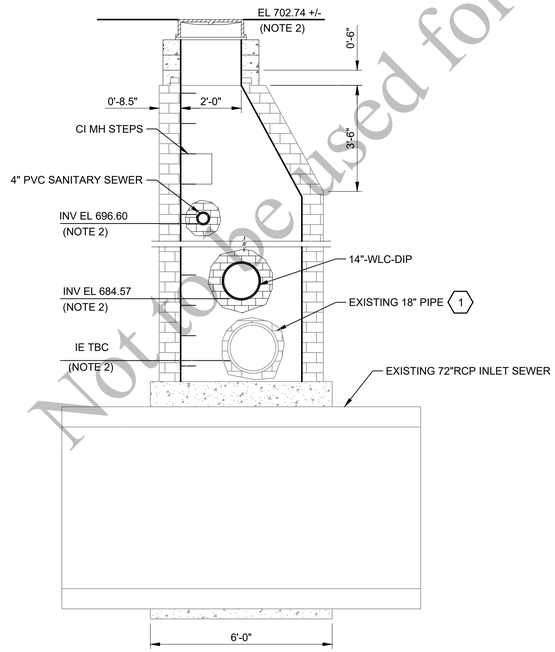


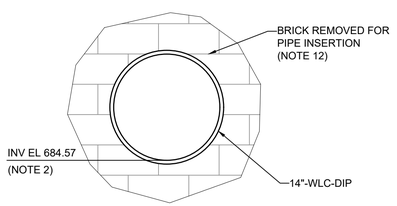
PLAN
1" = 30'-0"



1 SECTION
98-M-104 1" = 30'-0"



2 SECTION
98-M-104 1" = 30'-0"



3 SECTION
98-M-104 1" = 10'-0"

GENERAL SHEET NOTES

1. SEE EXISTING STRUCTURE NOTES ON SHEET 00-S-001.
2. LOCATIONS AND ELEVATIONS OF ALL EXISTING PIPING, STRUCTURES, AND EQUIPMENT ARE BASED ON RECORD DRAWINGS. CONTRACTOR SHALL VERIFY ELEVATIONS AND LOCATIONS OF EXISTING PIPING, STRUCTURES, AND EQUIPMENT.
3. ALL DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.
4. ALL CONNECTIONS MUST BE WATERTIGHT AND ANNULAR SPACE BETWEEN PIPE AND MANHOLE SHALL BE SEALED WITH NON-SHRINK GROUT. EXTRA ATTENTION SHALL BE PAID TO THE PENETRATION TO THE MANHOLE DUE TO AGE, CONSTRUCTION AND GROUNDWATER INTRUSION.
5. RECORD DRAWINGS WERE USED TO OBTAIN THE DIMENSIONS OF THIS MANHOLE. CONTRACTOR IS RESPONSIBLE TO VERIFY THE INFORMATION PROVIDED PRIOR TO BEGINNING ANY WORK ON OR AROUND THE STRUCTURE.
6. THE CONTRACTOR SHALL COMPLY WITH OSHA STANDARDS FOR WORK IN CONFINED SPACES. DANGEROUS LEVEL OF HYDROGEN SULFIDE MAY BE PRESENT AT WORK LOCATION AT ANY TIME. CONTRACTOR SHALL SUBMIT PRE-CONSTRUCTION AND POST-REHABILITATION VIDEO AND PHOTO DOCUMENTATION OF WORK.
7. WORK ON REHABILITATION TO BE PERFORMED DURING LOW FLOW CONDITIONS. CONTRACTOR TO COORDINATE THESE TIMES WITH THE FACILITY OWNER. FLOW BYPASS IS NOT ALLOWED.
8. ACCESS PROJECT AREA AND PROVIDE RESILIENT MANHOLE CONNECTOR ACCORDING TO ASTM C 923.
9. EXISTING STEPS IN THE MANHOLE SHALL NOT BE USED FOR ACCESS. APPROPRIATE ARRANGEMENT SHALL BE MADE BY THE CONTRACTOR FOR ACCESSING THE MANHOLE.
10. REMOVE ALL LOOSE MATERIAL AND DEBRIS OF THE MANHOLE'S EXISTING INTERNAL SURFACE IN ORDER TO INSPECT THE DEGREE OF RESTORATION REQUIRED (STRUCTURAL OR NON-STRUCTURAL DAMAGE) AND PERFORM MANHOLE SEALING.
11. MANHOLE STRUCTURE SEALING INCLUDES SEALING OF BARREL JOINTS, WALLS, CORBEL/CONE AND CHIMNEY USING CHEMICAL OR CEMENT GROUTING.
THE CONTRACTOR SHALL PROVIDE APPROPRIATE SEALING MATERIAL SUCH AS AVANTI AV-275 SOILGROUT WITH AV-219 FIBROTITE OR MAINSTAY ML-72 SPRAYABLE MICROSILICA RESTORATION MORTAR WITH DS-5 100% SOLID EPOXY COATING OR ANY SIMILAR SYSTEM BY RAVEN. THICKNESS OF THE LINER SHALL BE AS PER MANUFACTURER'S RECOMMENDATION.
12. 14" & 4" PIPE CONNECTION: BRICKS TO BE BROKEN OUT TO MAKE AND PROVIDE AN OPENING 6 INCHES LARGER THAN THE OUTSIDE DIAMETER OF THE NEW PIPE. INSTALL WATERSTOP AROUND NEW PIPE AND FILL WITH NON SHRINK GROUT.
13. THE ABOVE RECOMMENDATIONS ARE BASED ON THE ANTICIPATED INTERNAL CONDITIONS AND NEEDS FOR PIPE CONNECTIONS, REPAIR, AND REHABILITATION OF THE INLET SEWER MANHOLE. THE CONTRACTOR MAY RECOMMEND OTHER MEASURES TO ENSURE COMPLETE REHABILITATION OF THE MANHOLE. THE CONTRACTOR SHALL PROVIDE SUBMITTAL INFORMATION ON PROPOSED MATERIALS AND METHODS FOR REVIEW AND APPROVAL.

SHEET KEY NOTES:

1. EXISTING 18" PIPE SHALL BE CONCRETE SEALED. ANNULAR SPACE AROUND THE PIPE AND MANHOLE SHALL BE SEALED WITH NON SHRINK GROUT APPROVED BY THE ENGINEER.

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Four Rivers Sanitation Authority

AEROBIC GRANULAR SLUDGE - PHASE 1

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DESIGNED:	SM
DETAILED:	AB
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DATE:	12/20/2022
PROJECT NO.:	411752

YARD

PROCESS MECHANICAL

INLET SEWER MANHOLE PLAN AND SECTIONS

98-M-104

119 OF 163

10' 0 10' 20'
1"=10'

30' 15' 0 30' 60'
1"=30'

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

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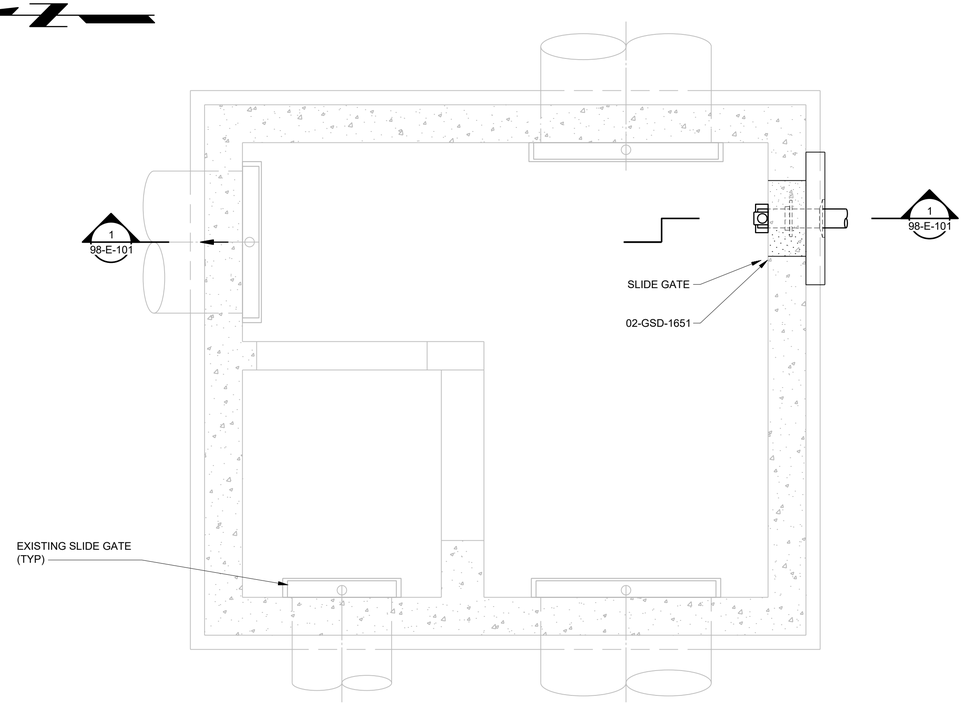
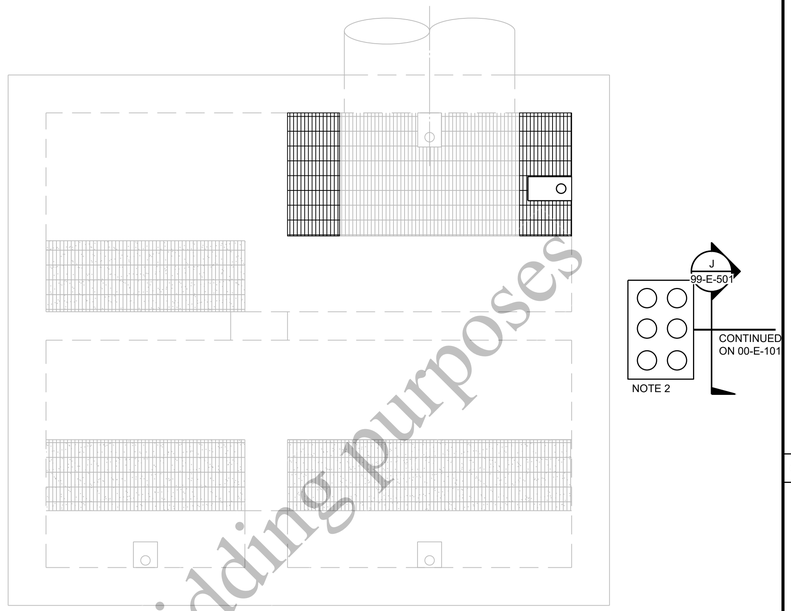
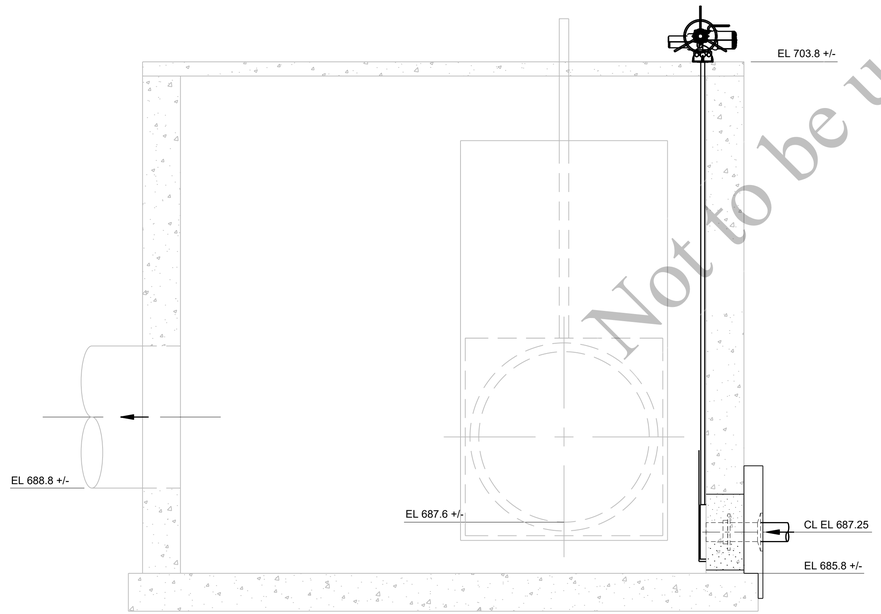


SECTIONAL PLAN
3/8" = 1'-0"



PLAN
3/8" = 1'-0"



1 SECTION
98-M-101 3/8" = 1'-0"

GENERAL SHEET NOTES

1. SEE DRAWINGS 0-E-001 AND 00-E-002 FOR LEGENDS, ABBREVIATIONS AND NOTES.
2. STUB UP DUCT BANK AND TERMINATE ALL DUCTS INTO A STAINLESS STEEL JUNCTION BOX.

SHEET KEY NOTES:

12" 6" 0 1' 2' 3' 4' 5' 6' 7"
3/8"=1'-0"

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

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YARD

ELECTRICAL

DISTRIBUTION CHAMBER PLANS AND SECTIONS

98-E-101

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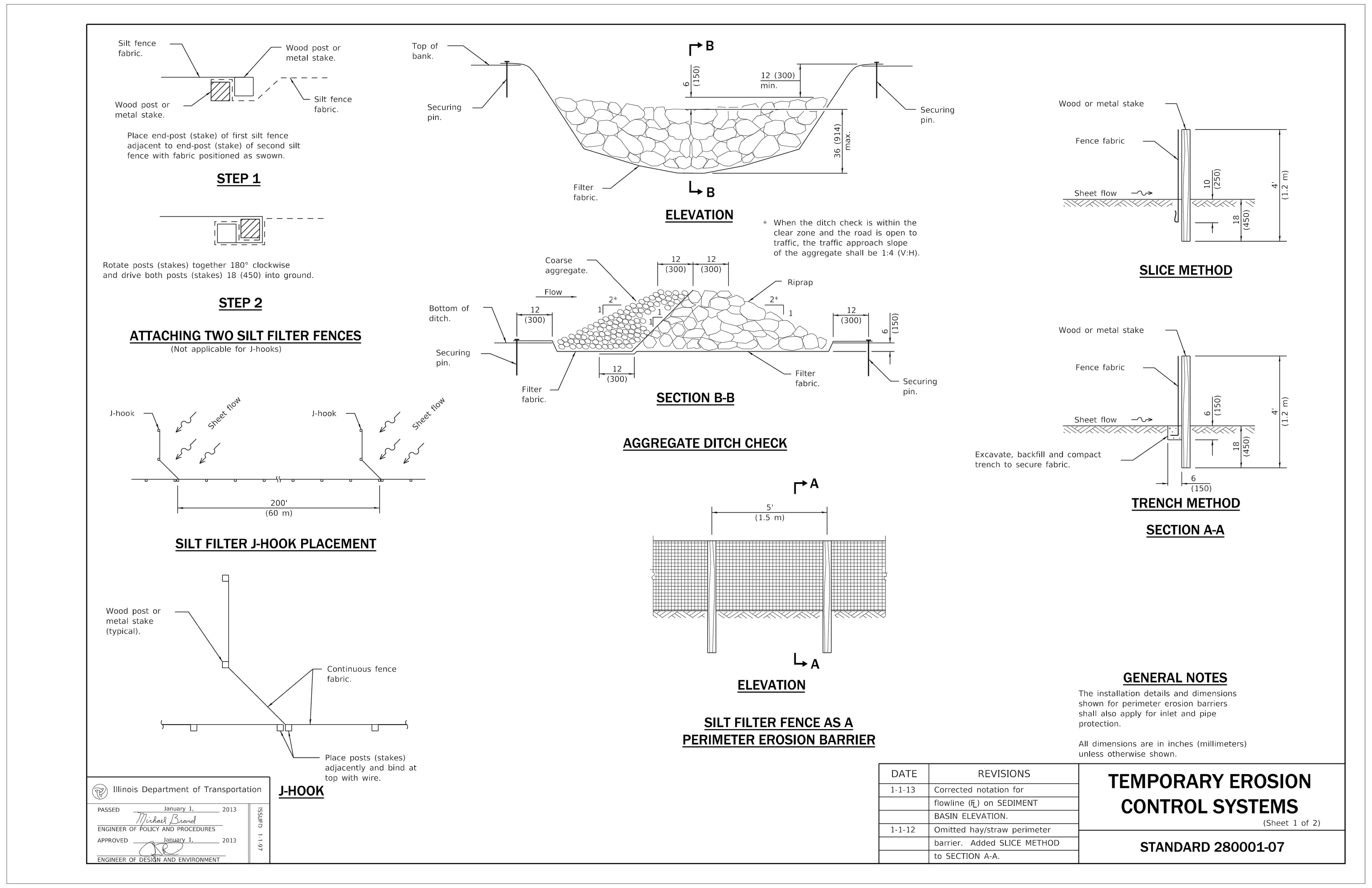
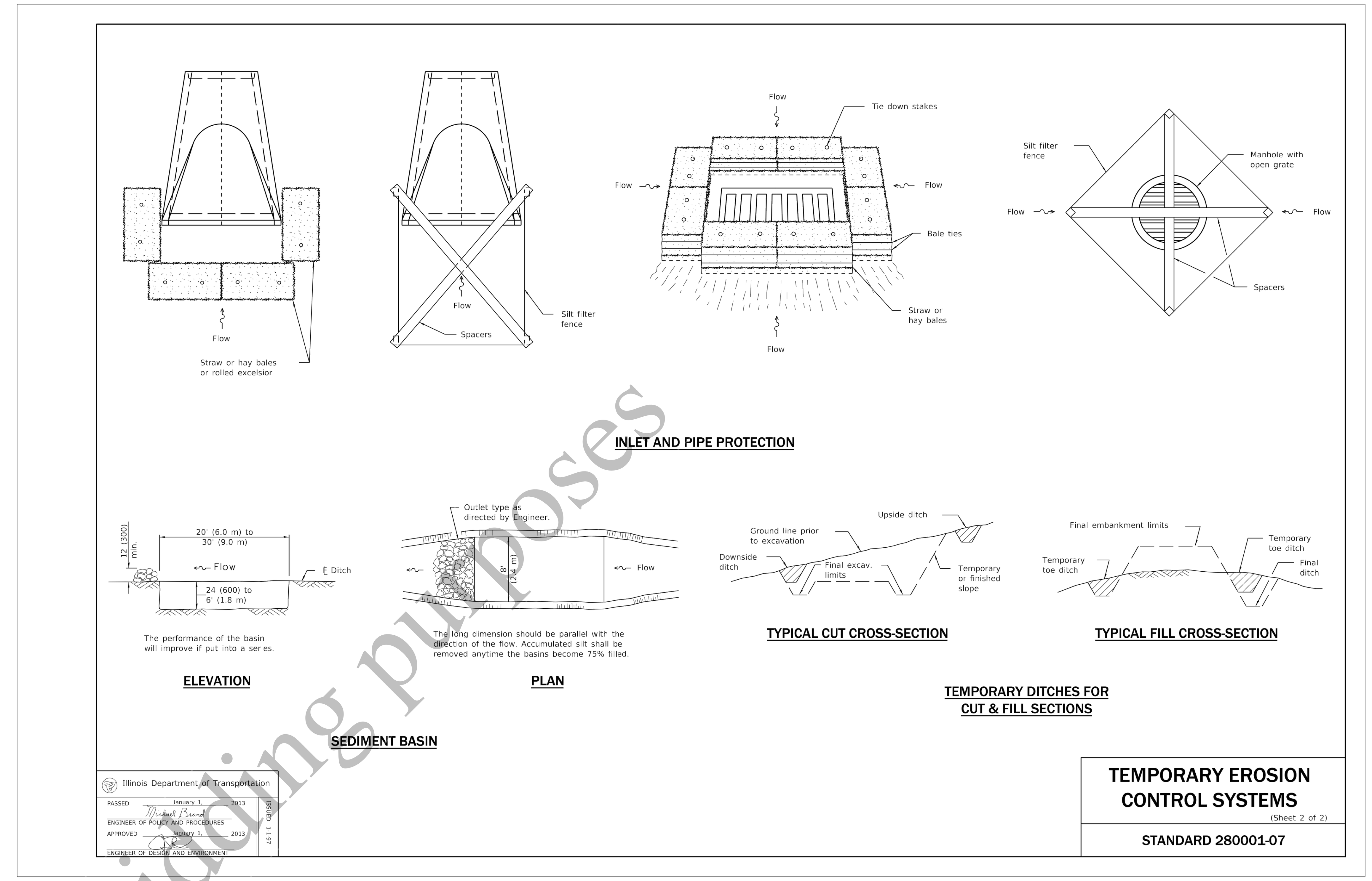
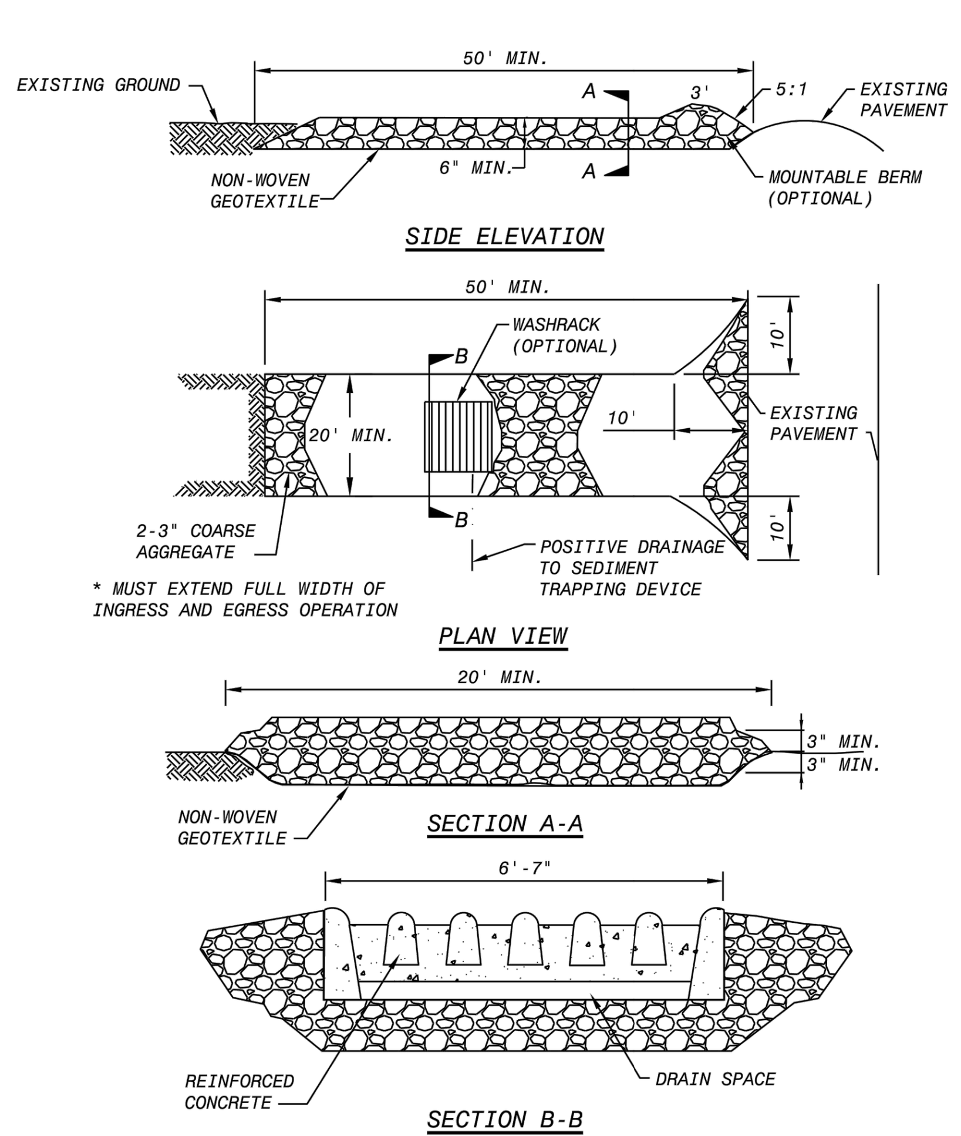




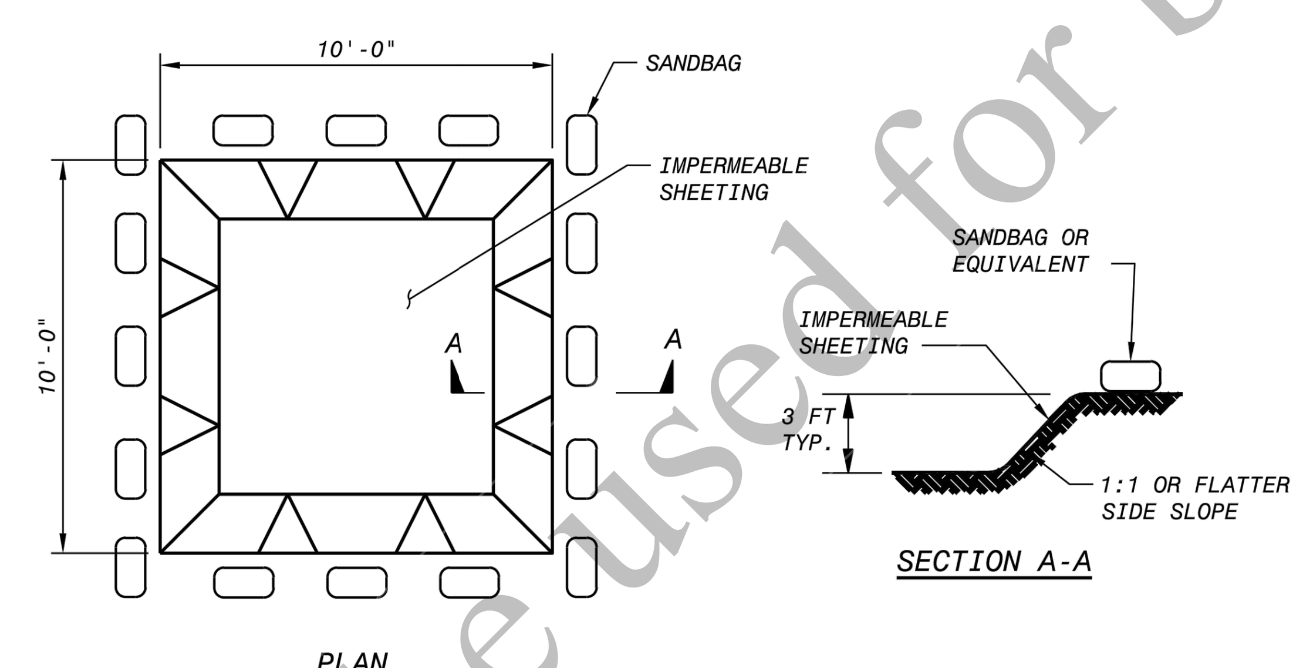


A) INSTALLATION:
1. AVOID LOCATIONS ON STEEP SLOPES OR AT CURVES ON PUBLIC ROADS. IF POSSIBLE, LOCATE WHERE PERMANENT ROADS WILL EVENTUALLY BE CONSTRUCTED.
2. REMOVE ALL VEGETATION AND OTHER UNSUITABLE MATERIAL FROM THE FOUNDATION AREA, GRADE, AND CROWN FOR POSITIVE DRAINAGE.
3. IF SLOPE TOWARDS THE PUBLIC ROAD EXCEEDS 2% CONSTRUCT A 6 TO 8 INCH HIGH RIDGE WITH 3H:1V SIDE SLOPES ACROSS THE FOUNDATION APPROXIMATELY 15 FEET FROM THE EDGE OF THE PUBLIC ROAD TO DIVERT RUNOFF AWAY FROM IT.
4. INSTALL PIPE UNDER THE ENTRANCE IF NEEDED TO MAINTAIN DRAINAGE DITCHES ALONG PUBLIC ROADS.
5. PLACE STONE TO DIMENSIONS AND GRADE AS SHOWN ON PLANS. LEAVE SURFACE SMOOTH AND SLOPED FOR DRAINAGE.
6. DIVERT ALL SURFACE RUNOFF AND DRAINAGE FROM THE ENTRANCE TO A SEDIMENT CONTROL DEVICE.
7. IF WET CONDITIONS ARE ANTICIPATED, PLACE GEOTEXTILE FABRIC ON THE GRADED FOUNDATION TO IMPROVE STABILITY.

B) TROUBLESHOOTING:
1. CONSULT WITH A QUALIFIED DESIGN PROFESSIONAL IF ANY OF THE FOLLOWING OCCUR:
   a. INADEQUATE RUNOFF CONTROL TO THE EXTENT THAT SEDIMENT WASHES ONTO PUBLIC ROAD - INSTALL DIVERSIONS OR OTHER RUNOFF CONTROL MEASURES.
   b. SMALL STONE, THIN PAD, OR ABSENCE OF GEOTEXTILE FABRIC RESULTS IN RUTS AND MUDDY CONDITIONS AS STONE IS PRESSED INTO SOIL - INCREASE STONE SIZE OR PAD THICKNESS OR ADD GEOTEXTILE FABRIC.
   c. PAD TOO SHORT FOR HEAVY CONSTRUCTION TRAFFIC - EXTEND PAD BEYOND THE MINIMUM 50 FOOT LENGTH AS NECESSARY.

C) INSPECTION MAINTENANCE:
1. INSPECT STONE PAD AND SEDIMENT DISPOSAL AREA WEEKLY AND AFTER 1/2-INCH OR GREATER STORM EVENTS.
2. RESHAPE PAD AS NEEDED FOR PROPER DRAINAGE AND RUNOFF CONTROL.
3. TOP DRESS WITH CLEAN 2 AND 3 INCH STONE AS NEEDED.
4. IMMEDIATELY REMOVE MUD OR SEDIMENT TRACKED OR WASHED ONTO PUBLIC ROAD. REPAIR ANY BROKEN ROAD PAVEMENT IMMEDIATELY.
5. REMOVE ALL TEMPORARY ROAD MATERIALS FROM AREAS WHERE PERMANENT VEGETATION WILL BE ESTABLISHED.

A TEMPORARY CONSTRUCTION ENTRANCE
00-C-102 NO SCALE



NOTES:

1. LOCATE WASHOUT STRUCTURE A MINIMUM OF 50 FEET AWAY FROM OPEN CHANNELS, STORM DRAIN INLETS, SENSITIVE AREAS, WETLANDS, BUFFERS AND WATER COURSES AND AWAY FROM CONSTRUCTION TRAFFIC.
2. SIZE WASHOUT STRUCTURE FOR VOLUME NECESSARY TO CONTAIN WASH WATER AND SOLIDS AND MAINTAIN AT LEAST 4 INCHES OF FREEBOARD. TYPICAL DIMENSIONS ARE 10 FEET X 10 FEET X 3 FEET DEEP.
3. PREPARE SOIL BASE FREE OF ROCKS OR OTHER DEBRIS THAT MAY CAUSE TEARS OR HOLES IN THE LINER. FOR LINER, USE 10 MIL OR THICKER UV RESISTANT, IMPERMEABLE SHEETING, FREE OF HOLES AND TEARS OR OTHER DEFECTS THAT COMPROMISE IMPERMEABILITY OF THE MATERIAL.
4. PROVIDE A SIGN FOR THE WASHOUT IN CLOSE PROXIMITY TO THE FACILITY.
5. KEEP CONCRETE WASHOUT STRUCTURE WATER TIGHT. REPLACE IMPERMEABLE LINER IF DAMAGED (E.G., RIPPED OR PUNCTURED). EMPTY OR REPLACE WASHOUT STRUCTURE THAT IS 75 PERCENT FULL, AND DISPOSE OF ACCUMULATED MATERIAL PROPERLY. DO NOT REUSE PLASTIC LINER. WET-VACUUM STORED LIQUIDS THAT HAVE NOT EVAPORATED AND DISPOSE OF IN AN APPROVED MANNER. PRIOR TO FORECASTED RAINSTORMS, REMOVE LIQUIDS OR COVER STRUCTURE TO PREVENT OVERFLOWS. REMOVE HARDENED SOLIDS, WHOLE OR BROKEN UP, FOR DISPOSAL OR RECYCLING. MAINTAIN RUNOFF DIVERSION AROUND EXCAVATED WASHOUT STRUCTURE UNTIL STRUCTURE IS REMOVED.
6. CONTRACTOR MAY SUBMIT AN ALTERNATIVE STRUCTURE TO THE ENGINEER FOR APPROVAL PRIOR TO BEGINNING CONSTRUCTION.
7. CONCRETE WASHOUT SHALL BE CONTAINED AT ALL TIMES. WASHOUT MATERIAL SHALL NOT BE ALLOWED TO ENTER WATER BODIES, STORM SEWERS OR LEACH INTO THE SOIL UNDER ANY CIRCUMSTANCES. ANY WASTE SHALL BE DISPOSED OF PROPERLY AND THE LOCATION OF THE WASHOUT SHALL BE DESIGNATED WITH PROPER SIGNAGE.

B CONCRETE WASHOUT
00-C-102 NO SCALE

GENERAL NOTES

1. THE ESTIMATED AREA OF DISTURBANCE FOR THIS PROJECT EXCEEDS 1 ACRE.
2. A NOTICE OF INTENT (N.O.I.) WILL BE FILLED.
3. A STORM WATER POLLUTION PREVENTION PLAN (S.W.P.P.P) HAS BEEN PREPARED FOR THIS PROJECT.
4. THE CONTRACTOR SHALL INSTALL A SWPPP MAILBOX IN AN ACCESSIBLE LOCATION ONSITE THAT SHALL CONTAIN THE SWPPP PLAN, ANY CHANGES TO THE SWPPP PLAN, INSPECTION REPORTS, AND ALL OTHER RELEVANT DOCUMENTS.
5. THE CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE REQUIREMENT OF THE ILLINOIS URBAN MANUAL, CURRENT EDITION, I.D.O.T. STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION. CURRENT EDITION, AND THE PROJECT SPECIFICATIONS AND DETAILS.
6. THE EROSION CONTROL DEVICES, MATERIALS AND PROCEDURES SHOWN IN THESE PLANS ARE TO BE CONSIDERED A MINIMUM. ADDITIONAL DEVICES OR MATERIALS MAY BE REQUIRED BASED ON EXISTING SITE CONDITIONS, AT THE DIRECTION OF THE ENGINEER. ANY DEVICES, MATERIALS, OR PROCEDURES REQUIRED BY THE ENGINEER DUE TO THE CONTRACTOR'S ACTIONS OR NEGLIGENCE WILL BE AT NO ADDITIONAL COST TO THE DISTRICT.
7. ALL DISTURBED AREAS SHALL BE SEEDED UNLESS AGRICULTURAL OR OTHERWISE NOTED ON THE PLANS.
8. THE CONTRACTOR IS RESTRICTED TO WORK IN TEMPORARY EASEMENTS OR WORK AREAS DELINEATED ON PLANS.
9. THE CONTRACTOR SHALL TAKE WHATEVER ACTIONS AND MEASURES ARE DEEMED NECESSARY BY THE AUTHORITY OR AUTHORIZED AGENCY TO ELIMINATE EXCESSIVE SILTATION OR EROSION AND TO STABILIZE THE PROJECT AREA.
10. DISCHARGE OF HAZARDOUS SUBSTATIONS INTO STORM WATER IS SUBJECT TO IEPA REPORTING AND CLEANUP REQUIREMENTS.

CONTROL MEASURES

1. EROSION AND SEDIMENT CONTROL MEASURES SHALL BE IN PLACE BEFORE CONSTRUCTION IN EACH AREA, AS DETERMINED BY THE ENGINEER, AND SHALL BE MAINTAINED THROUGHOUT CONSTRUCTION.
2. CONSTRUCTION ACTIVITIES SHALL ENSURE THAT EXISTING VEGETATION IS PRESERVED WHERE PRACTICAL.
3. THE FOLLOWING CONTROLS WILL BE PROVIDED AS A MINIMUM FOR THE DURATION OF THIS PROJECT:
   - SEDIMENT CONTROL SHALL BE PROVIDED DOWNSLOPE OF ALL STOCKPILE AREAS.
   - STABILIZED CONSTRUCTION ENTRANCES MUST BE INSTALLED AS DETAILED AND WHERE REQUIRED BY THE ROADWAY AUTHORITY OR DISTRICT.
   - INLET PROTECTION MUST BE INSTALLED FOR ALL INLETS THAT COULD BE SUBJECT TO SILTATION, AS DETERMINED BY THE ENGINEER.
   - ALL ROADWAYS SHALL BE KEPT CLEAN OF DEBRIS, MUD, SOIL, AND CONSTRUCTION MATERIALS AND SHALL BE INSPECTED AT THE END OF EACH DAY AND CLEANED AS NECESSARY.
   - ALL DISTURBED AREAS MUST BE STABILIZED WITHIN 7 DAYS IF THEY ARE TO REMAIN DISTURBED FOR MORE THAN 14 DAYS.

INSPECTIONS

1. INSPECTIONS MUST BE COMPLETED BY A QUALIFIED PERSON EVERY 7 DAYS AND WITHIN 24 HOURS OF EACH RAIN EVENT WITH OVER 0.5" OF RAIN OR SNOWFALL EQUIVALENT.
2. EROSION AND SEDIMENT CONTROL MEASURES SHALL BE REPAIRED AND MODIFIED AS NEEDED TO BE EFFECTIVE AND TO PREVENT EROSION AND POLLUTANTS FROM DISCHARGING FROM SITE.
3. A REPORT SHALL BE COMPLETED WITH EACH INSPECTION, AND SHALL BE KEPT ACCESSIBLE ONSITE WITH THE SWPPP.

MAINTENANCE

1. CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTENANCE AND REPAIR OF ALL EROSION AND SEDIMENT CONTROL DEVICES AND PROTECTIVE MEASURES AS REQUIRED TO MAINTAIN THE INTENDED FUNCTION.
2. SEDIMENT COLLECTED FROM THE CONSTRUCTION SITE SHALL BE DISPOSED OF ON THE SITE ON A REGULAR BASIS AS NEEDED.
3. ANY DEBRIS OR SILT DEPOSITED IN THE FLOW LINE OF DRAINAGE STRUCTURE, DITCHES, ETC. THAT COULD OBSTRUCT FLOW SHALL BE REMOVED AT THE CLOSE OF EACH WORKING DAY.
4. ALL DRAINAGE STRUCTURES SHALL BE FREE OF DIRT AND DEBRIS. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF ALL TEMPORARY EROSION CONTROL DEVICES WITHIN 30 DAYS OF FINAL SITE STABILIZATION APPROVAL BY THE AUTHORITY.
5. THE SITE SHALL HAVE MIN. OF 70% VEGETATIVE COVER TO BE CONSIDERED STABILIZED.

OTHER DISCHARGES

1. NON STORM WATER DISCHARGES INCLUDING WASHING OF VEHICLES, CONCRETE WASH-OUT, WATER FOR DUST CONTROL, AND TRENCH DEWATERING DISCHARGES SHALL BE DIRECTED AWAY FROM UNPROTECTED, BARE, OR UNSTABILIZED SOIL AND APPROPRIATE MEASURES SHALL BE IMPLEMENT TO PREVENT EROSION OR DEGRADATION OF RUNOFF FROM THE SITE.
2. DEWATERING DISCHARGE MUST BE INTO SILT CONTAINMENT BAGS WITH PROPERLY ENGINEERED ANIONIC POLYMER AND FABRIC PORE SIZE.
3. UNDER NO CIRCUMSTANCE SHALL DEWATERING DISCHARGE BE ALLOWED TO FLOW DIRECTLY INTO WATERWAYS.
4. A DEWATERING DISCHARGE PLAN BE SUBMITTED TO THE AUTHORITY FOR APPROVAL.

C STORM WATER POLLUTION PREVENTION PLAN
- NO SCALE

BLACK & VEATCH
Black & Veatch Corporation
Chicago, Illinois
ILLINOIS PROFESSIONAL
DESIGN FIRM - 184.002143 -0006

Four Rivers Sanitation Authority

AEROBIC GRANULAR SLUDGE - PHASE 1

REVISIONS AND RECORD OF ISSUE

DESIGNED:	SM
DETAILED:	AB
CHECKED:	AM/JH
APPROVED:	MR
DATE:	12/20/2022
PROJECT NO.:	411752

DETAILS

CIVIL

EROSION CONTROL DETAILS

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

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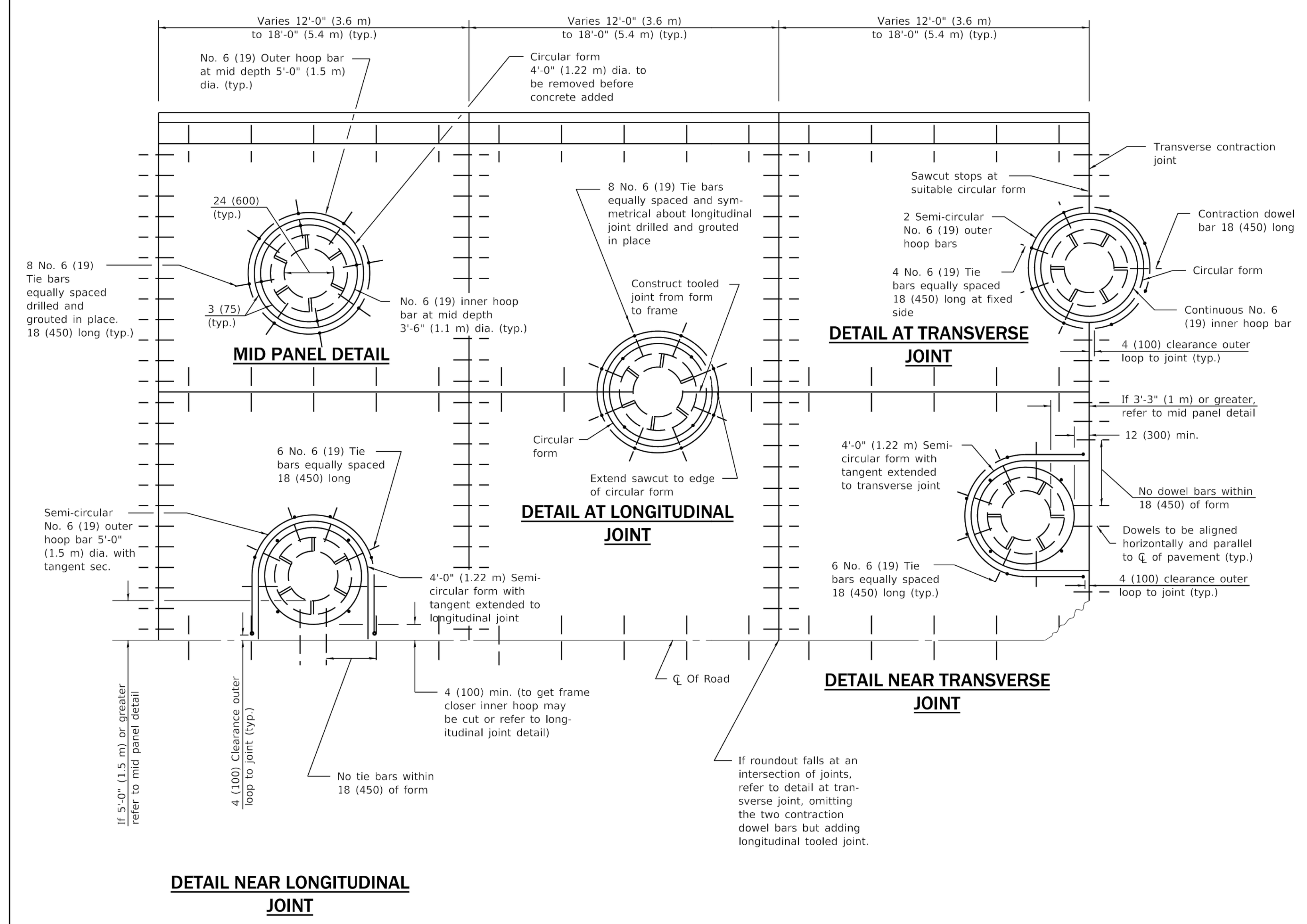


GENERAL NOTES

Transverse joints may be moved to accommodate roundout. Edge of circular joint shall be minimum 24 (600) from transverse joint. Relocated transverse joint shall be continuous from edge of pavement to edge of pavement.

The transverse joint spacing should be adjusted to use the DETAIL NEAR TRANSVERSE JOINT. If the joint cannot be adjusted to give the 12 (300) min. offset, use the DETAIL AT TRANSVERSE JOINT and ensure the joint is centered in the structure as shown.

Circular form shall be removed prior to drill and grout of tie bars.

Drill and grout is preferred, however tie bars can be poured in place if clearance is provided to outer edge of frame. Maximum 2 (50) clearance.

Shims shall be used to adjust all frames. After adjusting mortar has cured, the shims shall be removed and the voids under the frames filled with nonshrink grout.

Hoop reinforcement shall be one piece construction having a minimum lap length of 24 (600).

All situations not shown and may require combination of details.

WHEN USING CAST IN PLACE:
Frame shall be anchored to the structure to prevent movement during the paving operation.

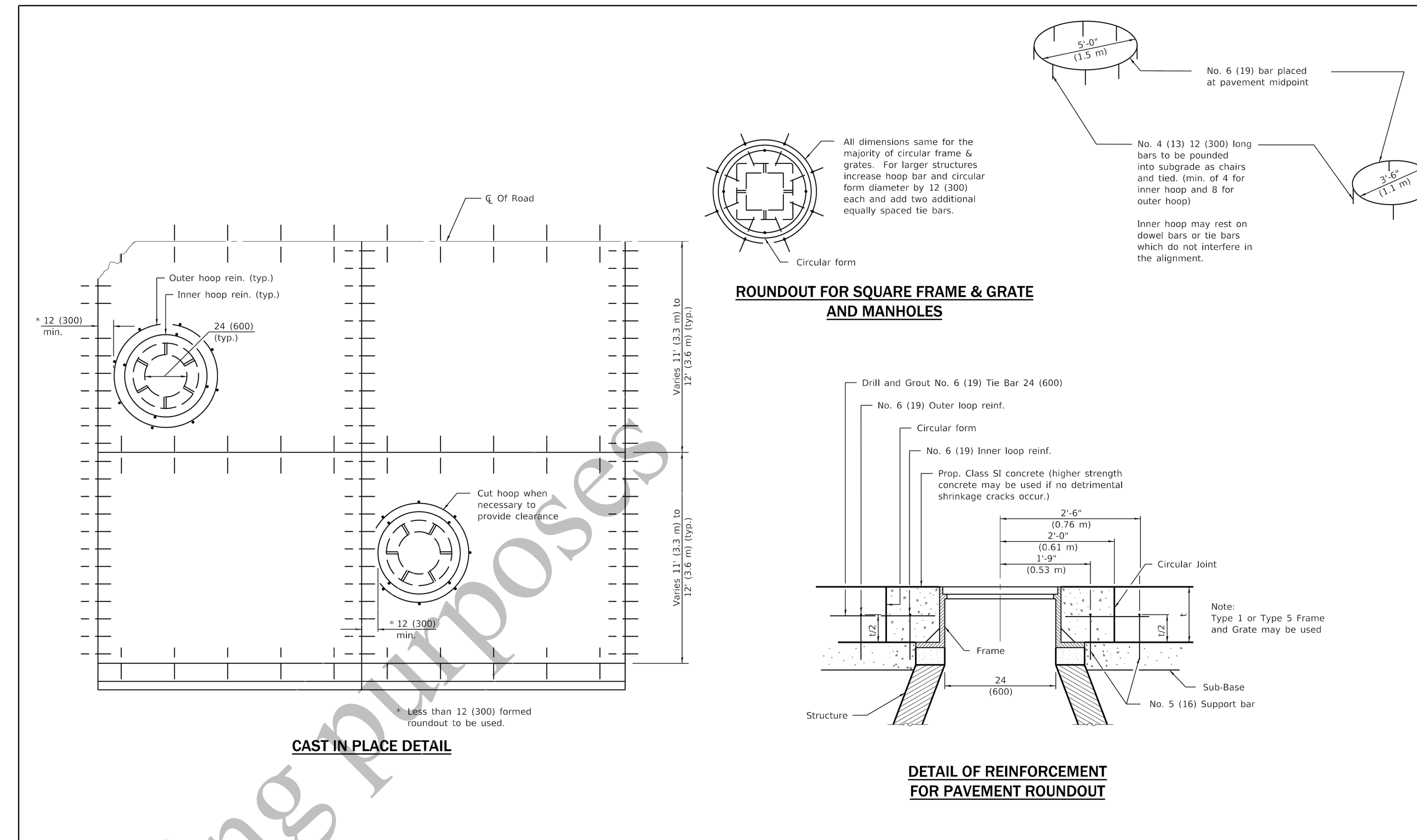
All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

DATE	REVISIONS
1-1-18	Revised standard for 36 (900) tie bar spacing. Revised General Notes.
1-1-11	Corrected 'T/2' dim. on DETAIL OF REINFORCEMENT FOR PAVEMENT ROUNDOUT.

PCC PAVEMENT ROUNDOUTS (Sheet 1 of 2)

STANDARD 420111-04

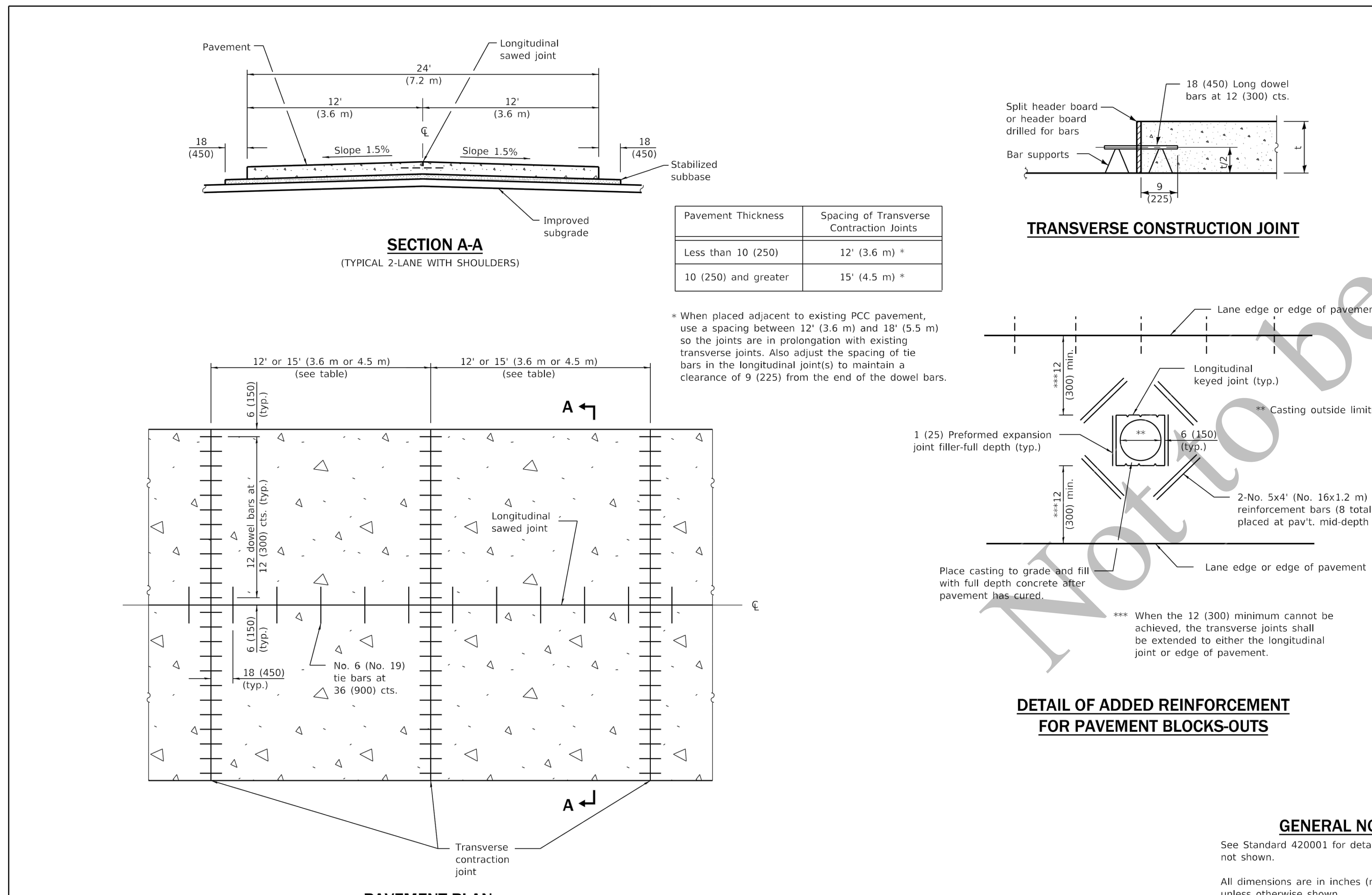


Illinois Department of Transportation

PCC PAVEMENT ROUNDOUTS (Sheet 2 of 2)

STANDARD 420111-04

A PAVEMENT ROUNDOUTS
NO SCALE



Pavement Thickness	Spacing of Transverse Contraction Joints
Less than 10 (250)	12' (3.6 m) *
10 (250) and greater	15' (4.5 m) *

* When placed adjacent to existing PCC pavement, use a spacing between 12' (3.6 m) and 18' (5.5 m) so the joints are in prolongation with existing transverse joints. Also adjust the spacing of tie bars in the longitudinal joint(s) to maintain a clearance of 9 (225) from the end of the dowel bars.

GENERAL NOTES

See Standard 420001 for details of joints not shown.

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

DATE	REVISIONS
1-1-22	Revised spacing of transverse contraction joints and header board callout.
1-1-18	Changed spacing of tie bars to 36 (900).

24' (7.2 m) JOINTED PCC PAVEMENT

STANDARD 420101-07

B CONCRETE PAVEMENT
NO SCALE

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Four Rivers Sanitation Authority

AEROBIC GRANULAR SLUDGE - PHASE 1

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DATE:	12/20/2022
PROJECT NO.:	411752

DETAILS

CIVIL

CIVIL DETAILS 1 OF 6

99-C-502

122 OF 163

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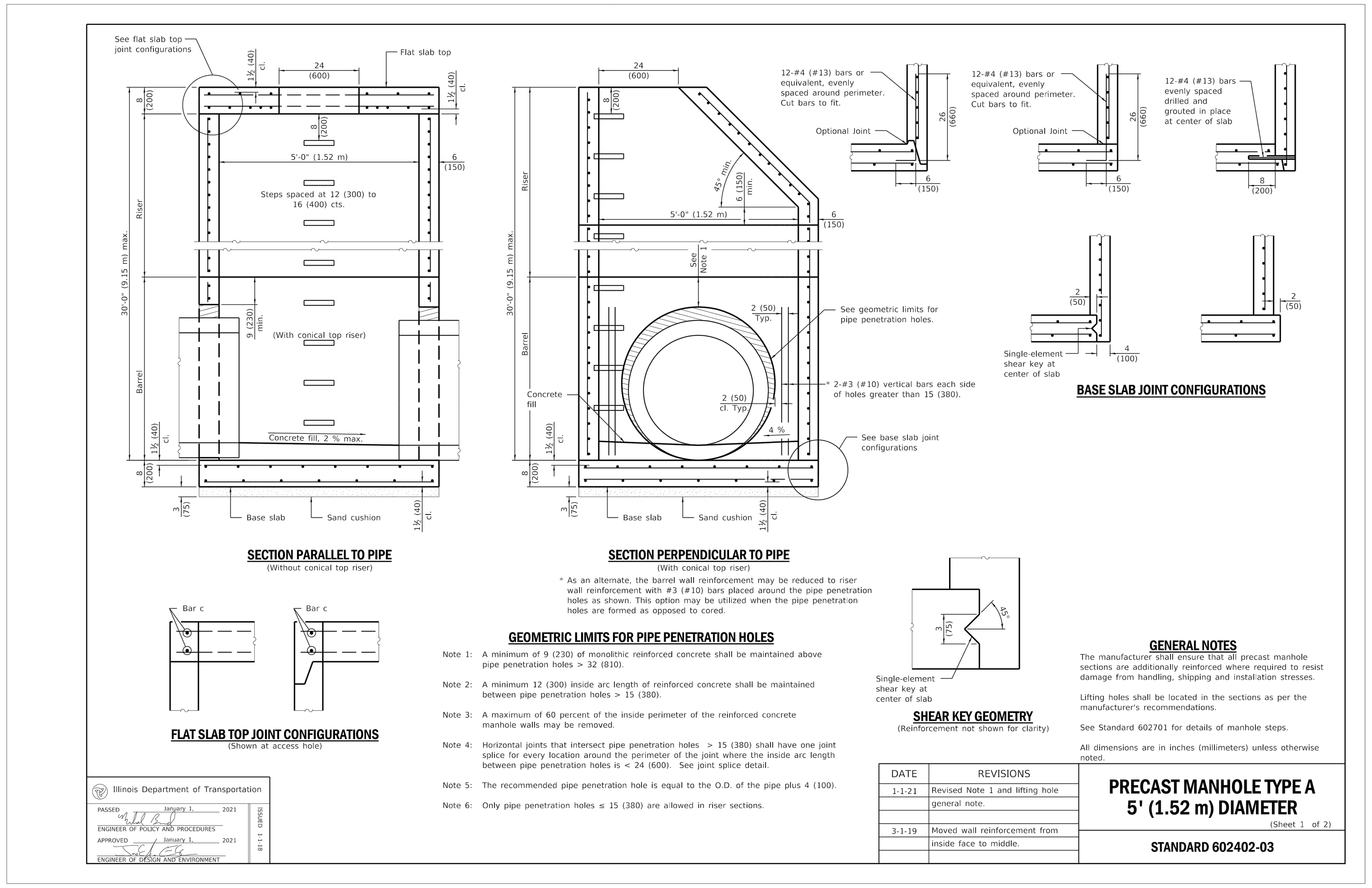
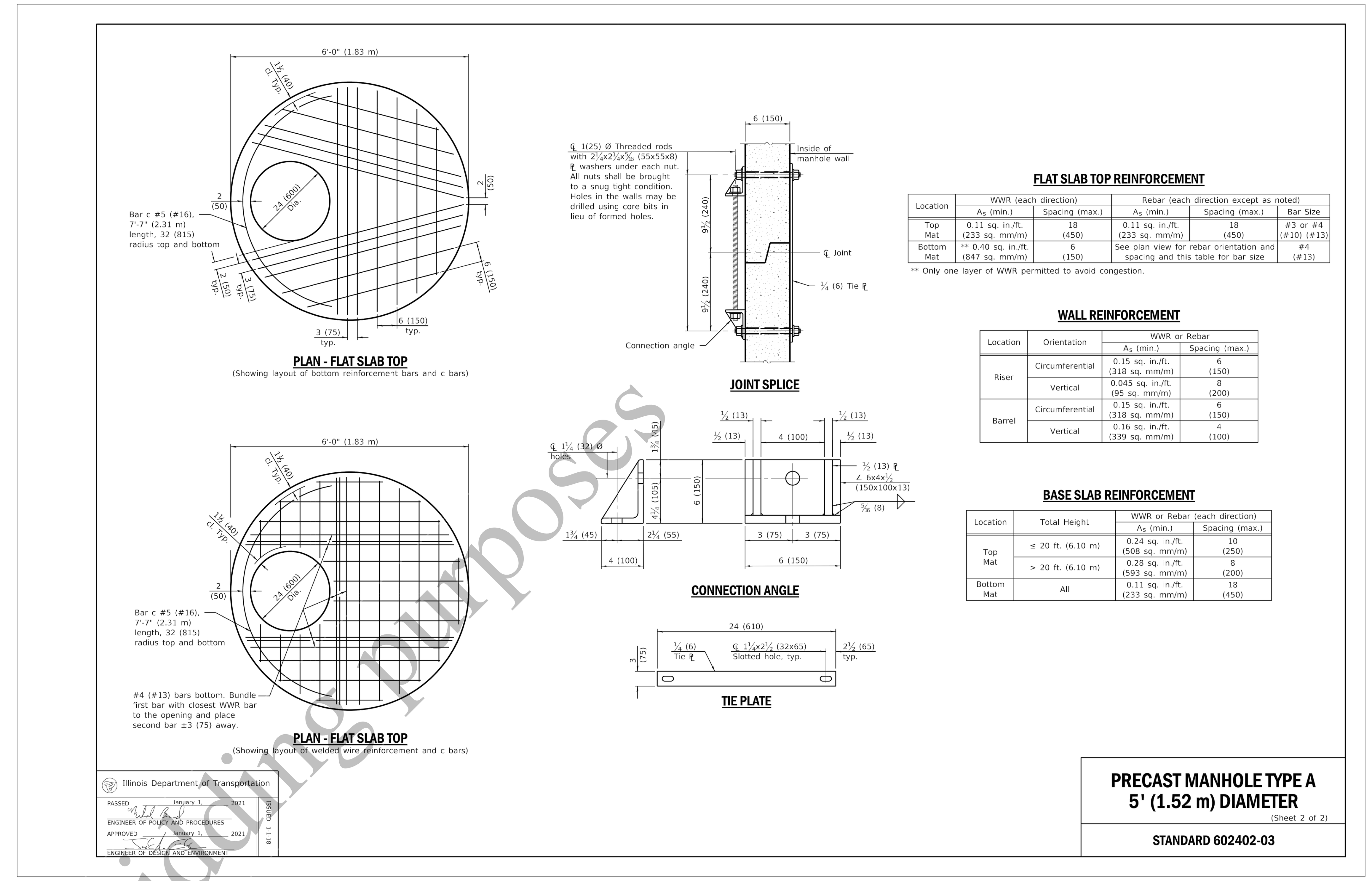
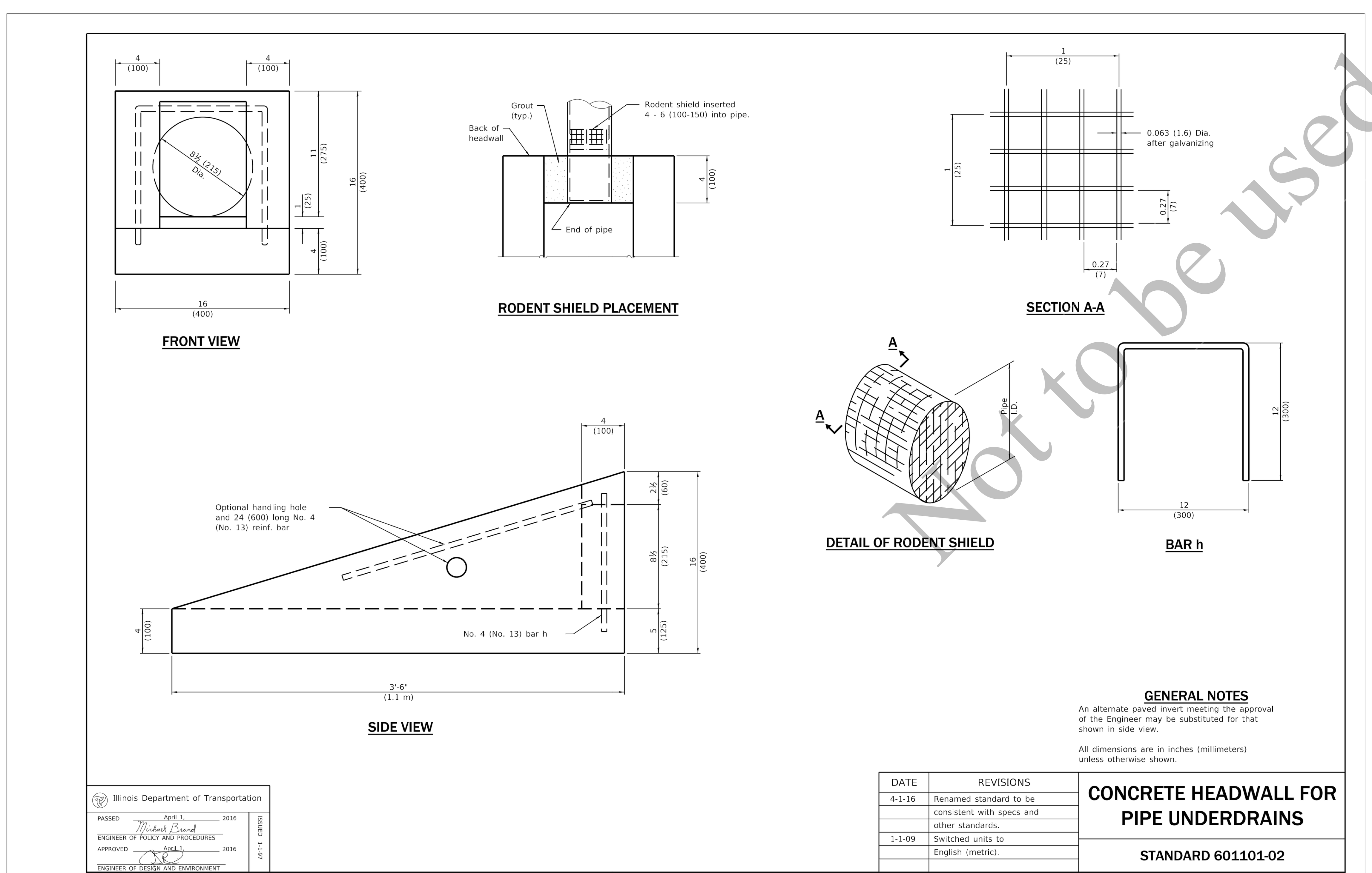


SECTION PARALLEL TO PIPE
(Without conical top riser)
SECTION PERPENDICULAR TO PIPE
(With conical top riser)
BASE SLAB JOINT CONFIGURATIONS
FLAT SLAB TOP JOINT CONFIGURATIONS
(Shown at access hole)
GEOMETRIC LIMITS FOR PIPE PENETRATION HOLES
Note 1: A minimum of 9 (230) of monolithic reinforced concrete shall be maintained above pipe penetration holes > 32 (810).
Note 2: A minimum 12 (300) inside arc length of reinforced concrete shall be maintained between pipe penetration holes > 15 (380).
Note 3: A maximum of 60 percent of the inside perimeter of the reinforced concrete manhole walls may be removed.
Note 4: Horizontal joints that intersect pipe penetration holes > 15 (380) shall have one joint splice for every location around the perimeter of the joint where the inside arc length between pipe penetration holes is < 24 (600). See joint splice detail.
Note 5: The recommended pipe penetration hole is equal to the O.D. of the pipe plus 4 (100).
Note 6: Only pipe penetration holes ≤ 15 (380) are allowed in riser sections.
SHEAR KEY GEOMETRY
(Reinforcement not shown for clarity)
GENERAL NOTES
The manufacturer shall ensure that all precast manhole sections are additionally reinforced where required to resist damage from handling, shipping and installation stresses.
Lifting holes shall be located in the sections as per the manufacturer's recommendations.
See Standard 602701 for details of manhole steps.
All dimensions are in inches (millimeters) unless otherwise noted.
Illinois Department of Transportation
DATE | REVISIONS
1-1-21 | Revised Note 1 and lifting hole general note.
3-1-19 | Moved wall reinforcement from inside face to middle.
PRECAST MANHOLE TYPE A
5' (1.52 m) DIAMETER
(Sheet 1 of 2)
STANDARD 602402-03



PLAN - FLAT SLAB TOP
(Showing layout of bottom reinforcement bars and c bars)
PLAN - FLAT SLAB TOP
(Showing layout of welded wire reinforcement and c bars)
JOINT SPLICE
CONNECTION ANGLE
TIE PLATE
FLAT SLAB TOP REINFORCEMENT
WALL REINFORCEMENT
BASE SLAB REINFORCEMENT
Illinois Department of Transportation
PRECAST MANHOLE TYPE A
5' (1.52 m) DIAMETER
(Sheet 2 of 2)
STANDARD 602402-03

A MANHOLE
00-C-115 NO SCALE
00-C-116



FRONT VIEW
RODENT SHIELD PLACEMENT
SECTION A-A
SIDE VIEW
DETAIL OF RODENT SHIELD
BAR h
GENERAL NOTES
An alternate paved invert meeting the approval of the Engineer may be substituted for that shown in side view.
All dimensions are in inches (millimeters) unless otherwise shown.
Illinois Department of Transportation
DATE | REVISIONS
4-1-16 | Renamed standard to be consistent with specs and other standards.
1-1-09 | Switched units to English (metric).
CONCRETE HEADWALL FOR
PIPE UNDERDRAINS
STANDARD 601101-02

B CONCRETE HEADWALL
FOR PIPE UNDERDRAINS
00-C-111 NO SCALE

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Four Rivers Sanitation Authority

AEROBIC GRANULAR SLUDGE - PHASE 1

REVISIONS AND RECORD OF ISSUE

DESIGNED:	SM
DETAILED:	AB
CHECKED:	AM/JH
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DATE:	12/20/2022
PROJECT NO.:	411752

DETAILS

CIVIL

CIVIL DETAILS 2 OF 6

99-C-503

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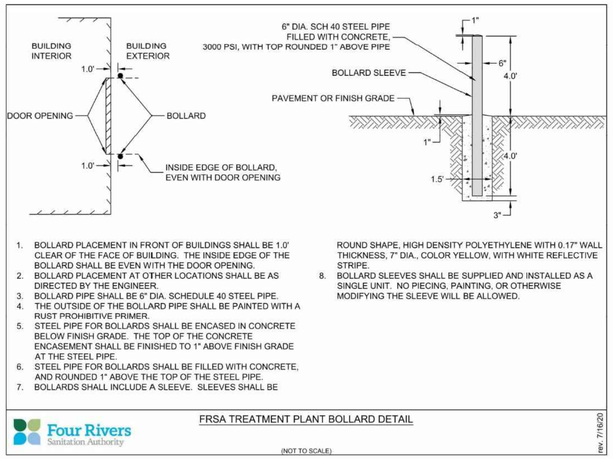


1. BOLLARD PLACEMENT IN FRONT OF BUILDINGS SHALL BE 1.0' CLEAR OF THE FACE OF BUILDING. THE INSIDE EDGE OF THE BOLLARD SHALL BE EVEN WITH THE DOOR OPENING.
2. BOLLARD PLACEMENT AT OTHER LOCATIONS SHALL BE AS DIRECTED BY THE ENGINEER.
3. BOLLARD PIPE SHALL BE 6" DIA. SCHEDULE 40 STEEL PIPE.
4. THE OUTSIDE OF THE BOLLARD PIPE SHALL BE PAINTED WITH A RUST PROHIBITIVE PRIMER.
5. STEEL PIPE FOR BOLLARDS SHALL BE ENCASED IN CONCRETE BELOW FINISH GRADE. THE TOP OF THE CONCRETE ENCASEMENT SHALL BE FINISHED TO 1" ABOVE FINISH GRADE AT THE STEEL PIPE.
6. STEEL PIPE FOR BOLLARDS SHALL BE FILLED WITH CONCRETE, AND ROUNDED 1" ABOVE THE TOP OF THE STEEL PIPE.
7. BOLLARDS SHALL INCLUDE A SLEEVE. SLEEVES SHALL BE ROUND SHAPE, HIGH DENSITY POLYETHYLENE WITH 0.17" WALL THICKNESS, 7" DIA., COLOR YELLOW, WITH WHITE REFLECTIVE STRIPE.
8. BOLLARD SLEEVES SHALL BE SUPPLIED AND INSTALLED AS A SINGLE UNIT. NO PIECING, PAINTING, OR OTHERWISE MODIFYING THE SLEEVE WILL BE ALLOWED.

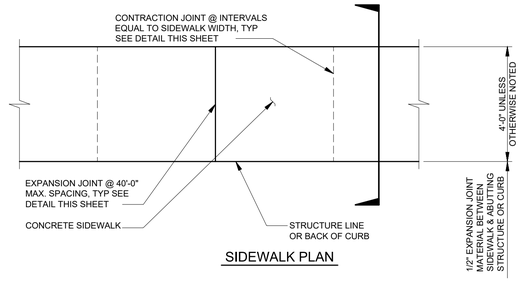
Four Rivers Sanitation Authority

FRSA TREATMENT PLANT BOLLARD DETAIL

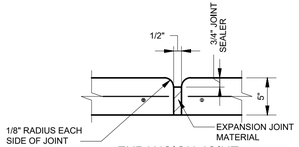
(NOT TO SCALE)

rev. 7/16/20

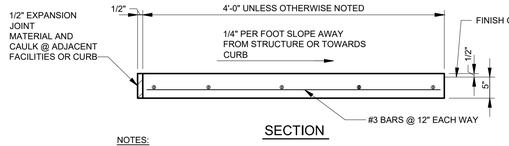
A BOLLARD
00-C-108, 00-C-113, 00-C-114, NO SCALE



SIDEWALK PLAN



EXPANSION JOINT



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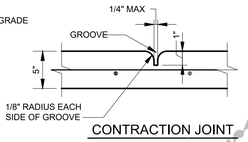
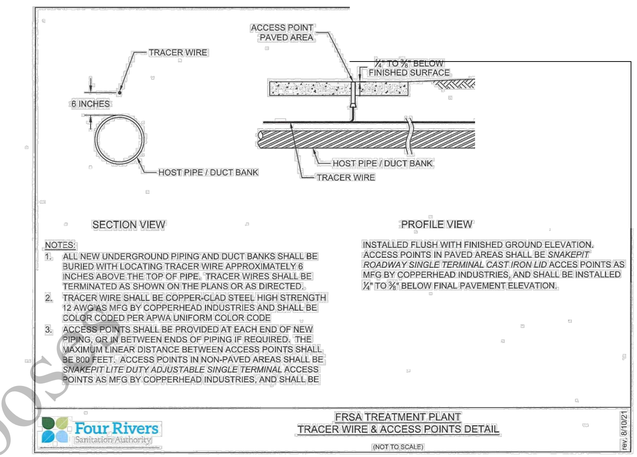


CONTRACTION JOINT

NOTES:

1. PROVIDE SIDEWALK AS INDICATED ON DRAWINGS TO PROVIDE CONTINUOUS WALKWAY AND RESTORE THE SITE TO EXISTING CONDITIONS. LIMITS OF NEW SIDEWALK TO EXTEND TO EXPANSION JOINTS OF NEAREST UNDISTURBED FULL SIDEWALK PANEL.
2. PCC SIDEWALKS LOCATED AS A GROUND COVER BETWEEN TWO STRUCTURES SHALL SLOPE TO DRAIN FROM A HIGH POINT RIDGELINE MIDWAY IN THE LENGTH TO ENDS. MINIMUM SLOPE TO ENDS SHALL BE 1%. ALL SURFACES SHALL SLOPE TO DRAIN.
3. 2" OF AGGREGATE BASE COURSE SHALL BE INSTALLED BELOW PROPOSED SIDEWALK (AGGREGATE BASE COURSE TO BE IDOT GRADATION CA-06).

B PCC SIDEWALK
00-C-113, 00-C-114 NO SCALE



NOTES:

1. ALL NEW UNDERGROUND PIPING AND DUCT BANKS SHALL BE BURIED WITH LOCATING TRACER WIRE APPROXIMATELY 6 INCHES ABOVE THE TOP OF PIPE. TRACER WIRES SHALL BE TERMINATED AS SHOWN ON THE PLANS OR AS DIRECTED.
2. TRACER WIRE SHALL BE COPPER-CLAD STEEL HIGH STRENGTH 12 AWG AS MFG BY COPPERHEAD INDUSTRIES AND SHALL BE COLOR CODED PER APWA UNIFORM COLOR CODE
3. ACCESS POINTS SHALL BE PROVIDED AT EACH END OF NEW PIPING, OR IN BETWEEN ENDS OF PIPING IF REQUIRED. THE MAXIMUM LINEAR DISTANCE BETWEEN ACCESS POINTS SHALL BE 800 FEET. ACCESS POINTS IN NON-PAVED AREAS SHALL BE *SNAKEPIT LITE DUTY ADJUSTABLE SINGLE TERMINAL* ACCESS POINTS AS MFG BY COPPERHEAD INDUSTRIES, AND SHALL BE INSTALLED FLUSH WITH FINISHED GROUND ELEVATION. ACCESS POINTS IN PAVED AREAS SHALL BE *SNAKEPIT ROADWAY SINGLE TERMINAL CAST IRON LID* ACCES POINTS AS MFG BY COPPERHEAD INDUSTRIES, AND SHALL BE INSTALLED ¼" TO ½" BELOW FINAL PAVEMENT ELEVATION.

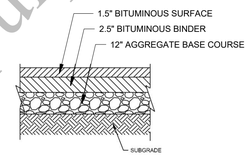
Four Rivers Sanitation Authority

FRSA TREATMENT PLANT
TRACER WIRE & ACCESS POINTS DETAIL

(NOT TO SCALE)

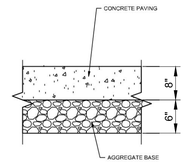
rev. 8/1/2021

C TRACER WIRE
- NO SCALE



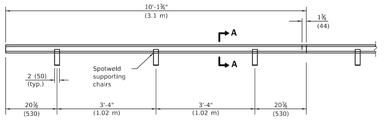
E HOT-MIX ASPHALT PAVEMENT
00-C-114 NO SCALE

NOTES:
12" AGGREGATE BASE COURSE UNDER HMA PAVEMENT SHALL BE CONSTRUCTED OF 8" LIFT OF IDOT GRADATATION CA-02 CAPPED WITH A 4" LIFT OF IDOT GRADATION CA-06.

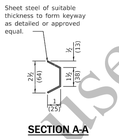


F PCC PAVEMENT
00-C-113 NO SCALE
00-C-114
00-C-116

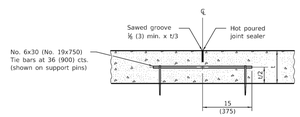
NOTES:
AGGREGATE BASE COURSE UNDER THE PCC PAVEMENT SHALL BE 8" IN THICKNESS (6" LIFT OF CA-02 CAPPED WITH A 2" LIFT OF CA-06.)



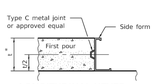
TYPE C METAL JOINT



SECTION A-A

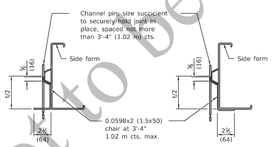


LONGITUDINAL SAWED JOINT



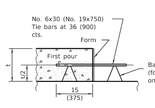
LONGITUDINAL KEYED JOINT

* 8 (203) min. pavement thickness for keyed joints.

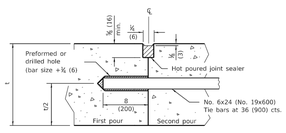


SUPPORTING CHAIR ALTERNATE

SUPPORTING CHAIR ALTERNATE



LONGITUDINAL CONSTRUCTION JOINT
(TIE BAR FORMED IN PLACE OR MECHANICALLY INSERTED)



LONGITUDINAL CONSTRUCTION JOINT
(TIE BAR GROUTED IN PLACE)

GENERAL NOTES

All slope ratios are expressed as units of vertical displacement to units of horizontal displacement (V:H).

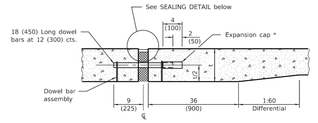
All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation
PASSED January 1, 2022 — ENGINEER OF POLICY AND PROCEDURES
APPROVED January 1, 2022 — ENGINEER OF OPERATIONS AND ENVIRONMENT
STATE OF ILLINOIS

DATE	REVISIONS
1-1-22	Revised DOWEL BAR TABLE
	on Sheet 2.
1-1-18	Changed tie bar spacing
	to 36 (900) cts. Revised
	DOWEL BAR TABLE.

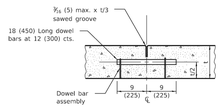
PAVEMENT JOINTS
(Sheet 1 of 2)

STANDARD 420001-10

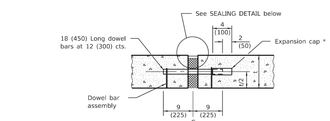


TRANSVERSE EXPANSION JOINT
(FOR PAVEMENTS WITH UNEQUAL THICKNESS)

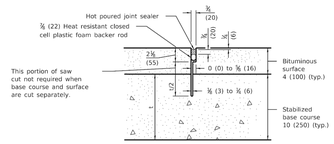
* Expansion caps shall be installed on the exposed end of each dowel bar once the header has been removed and the joint filler material has been installed.



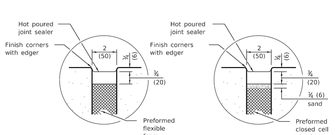
TRANSVERSE CONTRACTION JOINT



TRANSVERSE EXPANSION JOINT
(FOR PAVEMENTS WITH EQUAL THICKNESS)



TRANSVERSE CONTRACTION JOINT
(FOR CAM, CFA AND LFA BASE COURSE MIXTURES)



SEALING DETAIL

DOWEL BAR TABLE	
PAVEMENT THICKNESS	DOWEL BAR DIAMETER
10 (250) and greater	1½ (38)
8.01 (201) thru 9.99 (249)	1¼ (32)
8 (200) and less	1 (25)

Illinois Department of Transportation
PASSED January 1, 2022 — ENGINEER OF POLICY AND PROCEDURES
APPROVED January 1, 2022 — ENGINEER OF OPERATIONS AND ENVIRONMENT
STATE OF ILLINOIS

PAVEMENT JOINTS
(Sheet 2 of 2)

STANDARD 420001-10

D PAVEMENT JOINT
00-C-114 NO SCALE

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

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FDT1000
FDT1000

BLACK & VEATCH
Black & Veatch Corporation
Chicago, Illinois
ILLINOIS PROFESSIONAL
DESIGN FIRM - 184.002143 -0006

Four Rivers Sanitation Authority

AEROBIC GRANULAR SLUDGE - PHASE 1

REVISIONS AND RECORD OF ISSUE

DESIGNED:	SM
DETAILED:	AB
CHECKED:	AM/JH
APPROVED:	MR
DATE:	12/20/2022
PROJECT NO.:	411752

DETAILS

CIVIL

CIVIL DETAILS 3 OF 6

99-C-504

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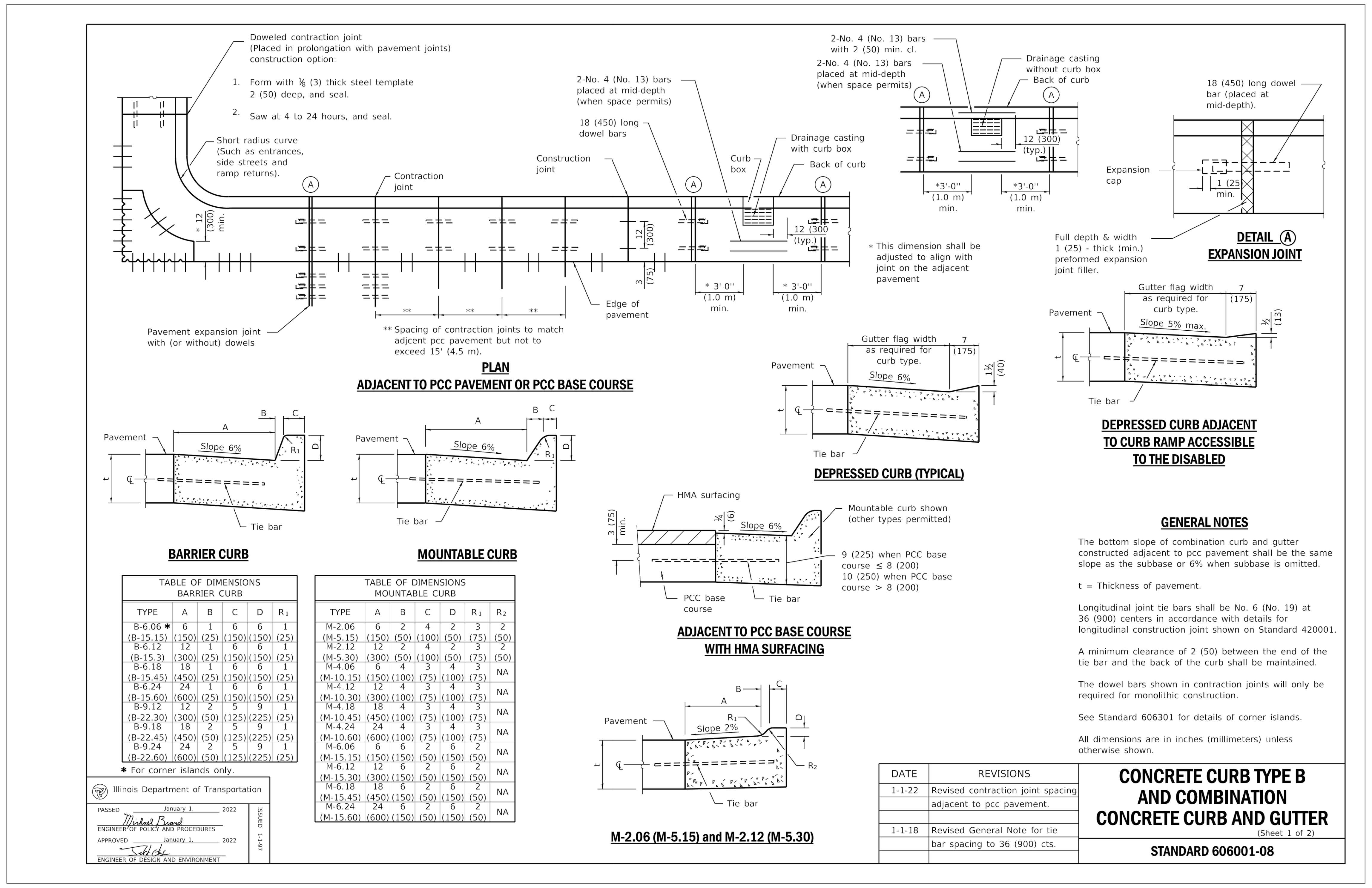
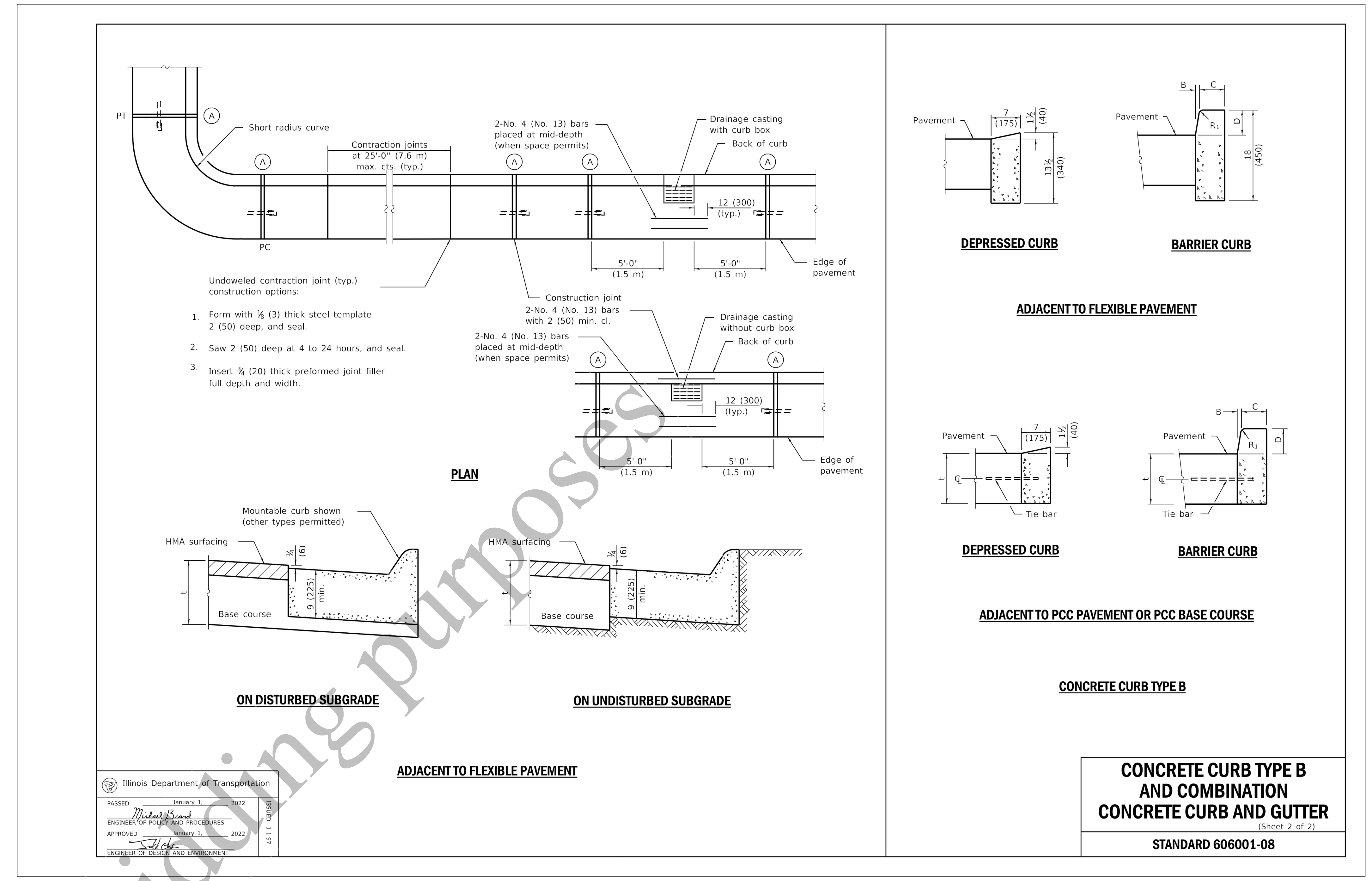
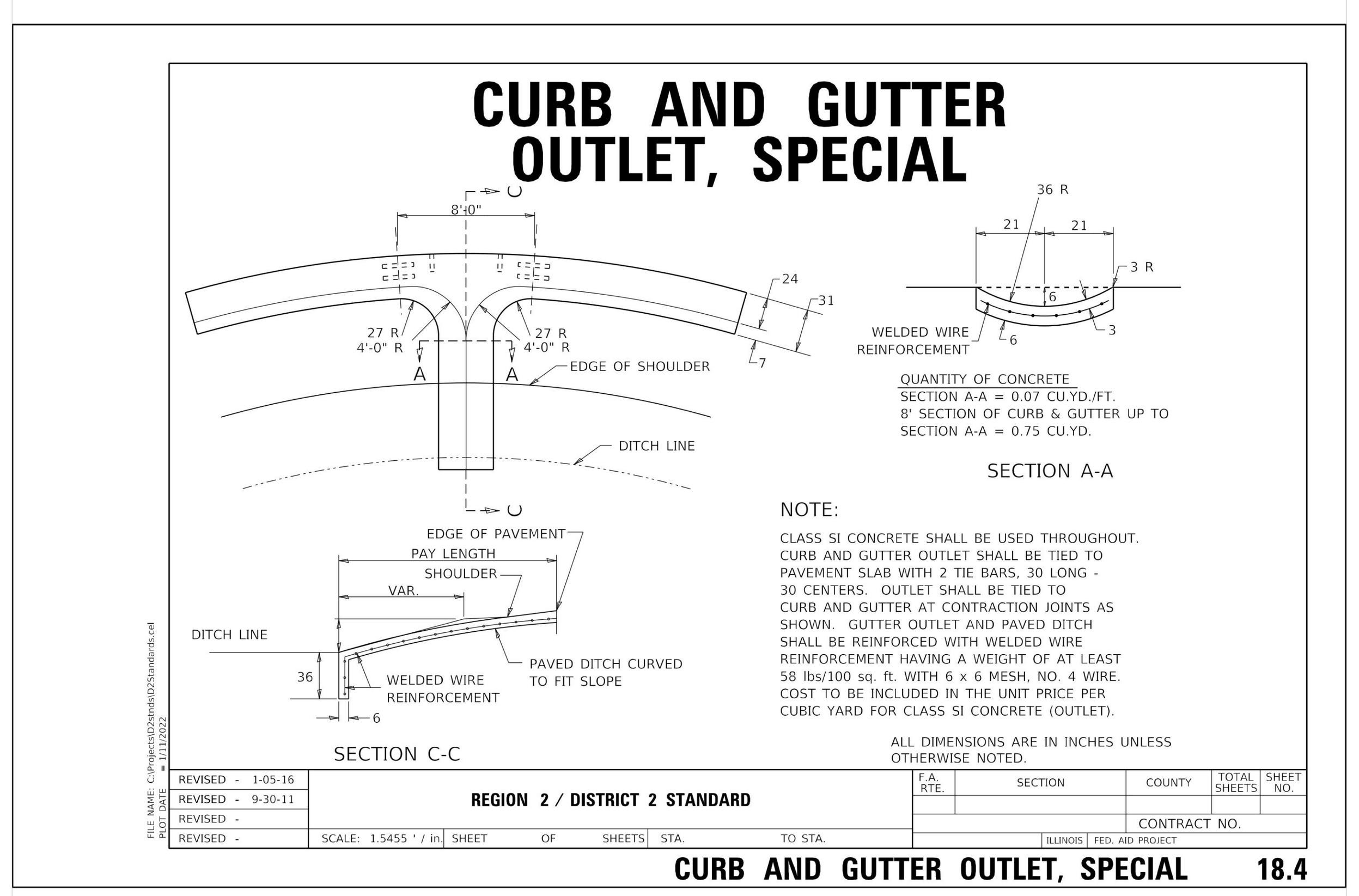
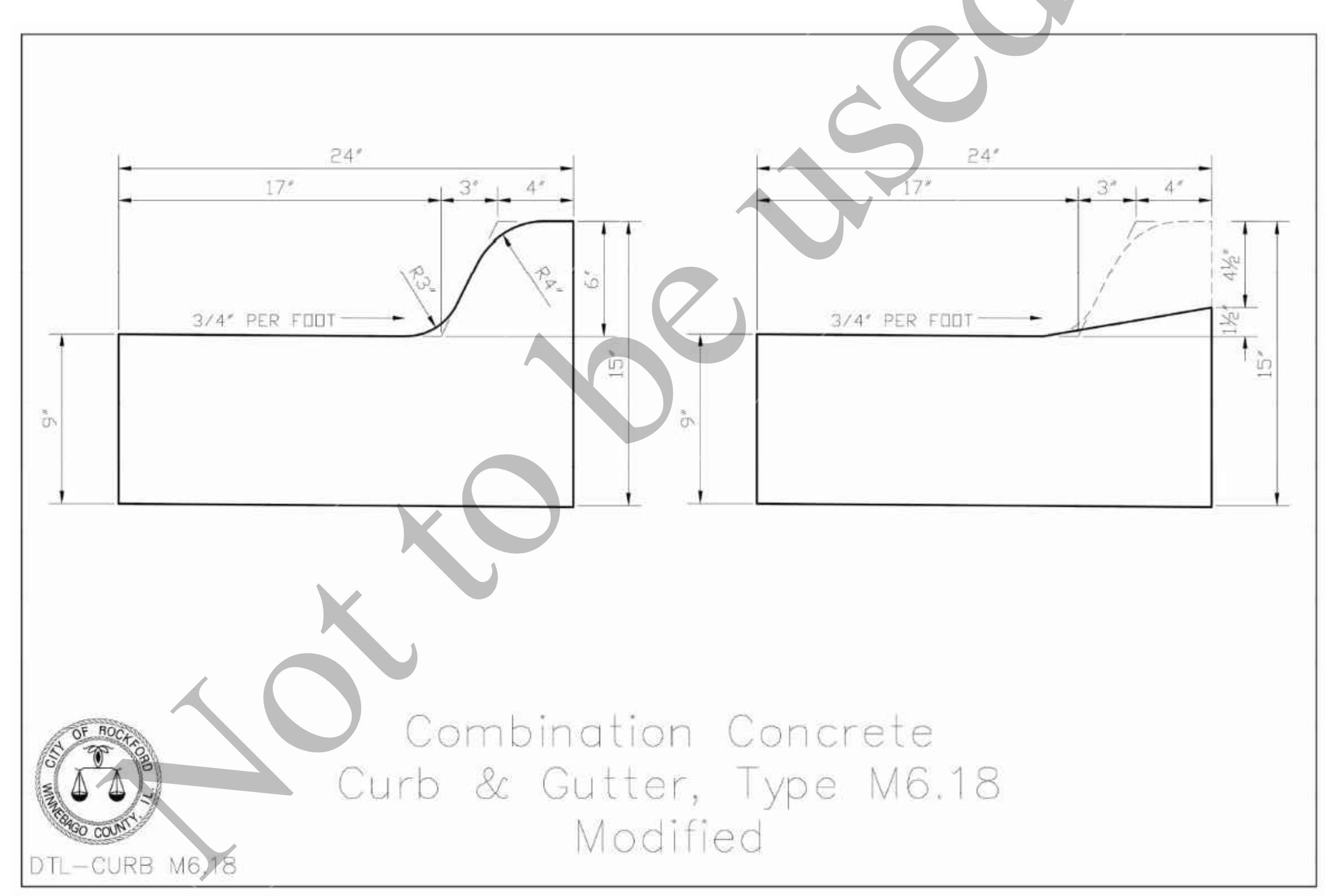




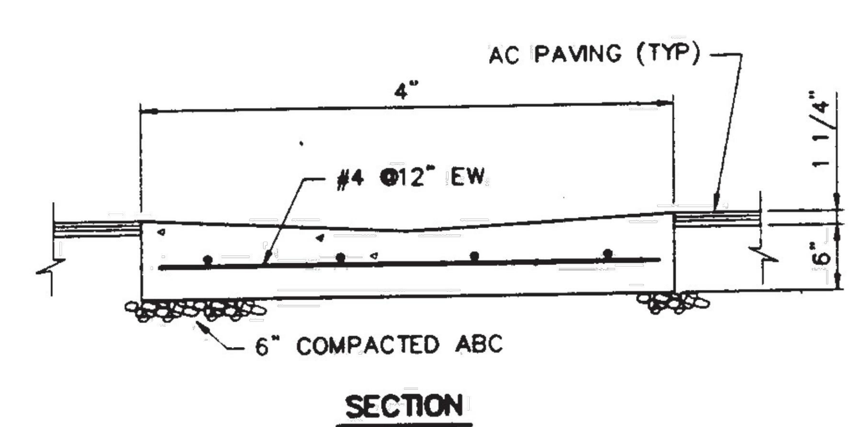
A CURB AND GUTTER
NO SCALE



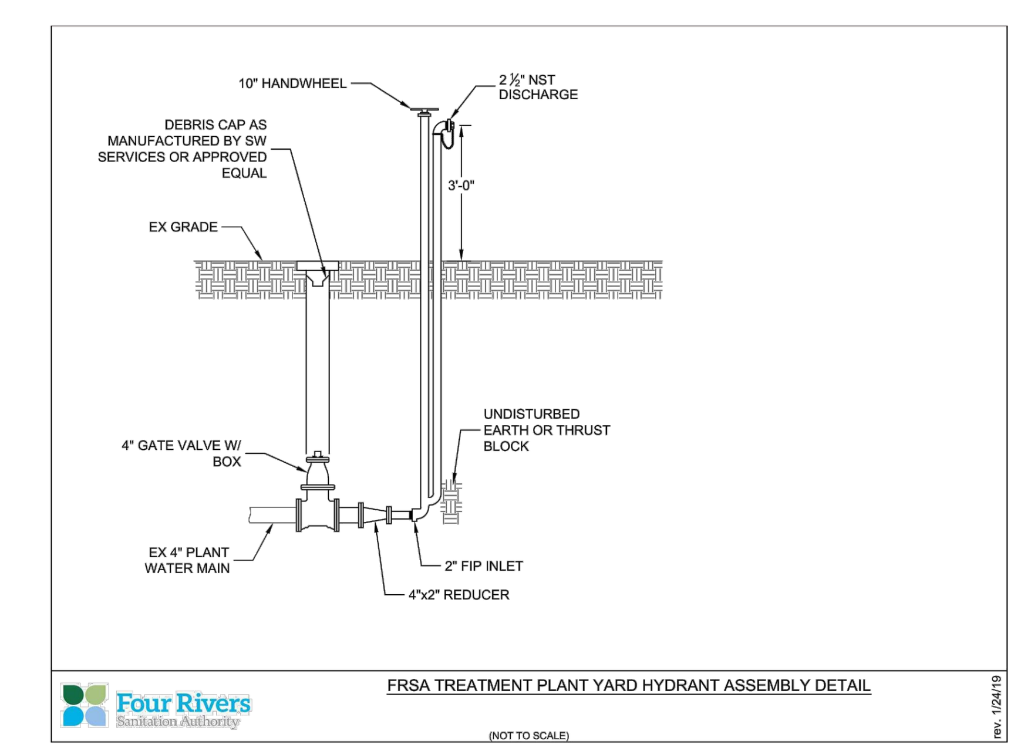
B CURB AND GUTTER OUTLET
00-C-116 NO SCALE



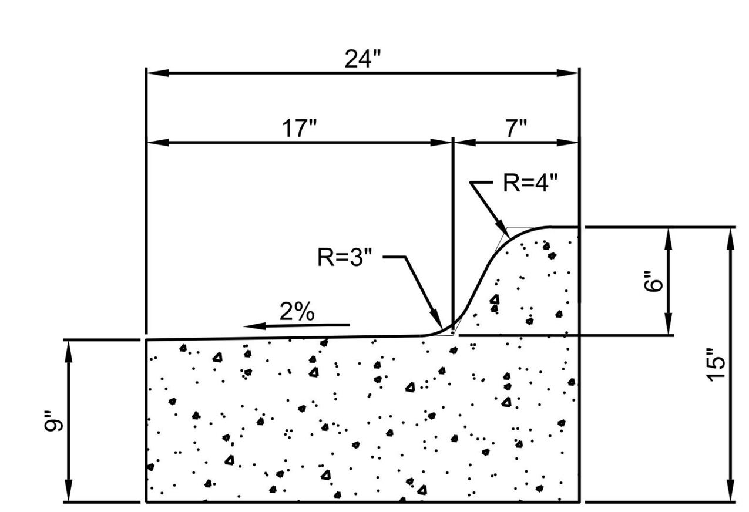
C CURB AND GUTTER
00-C-113 NO SCALE
00-C-114



D VALLEY GUTTER
00-G-116 NO SCALE



E YARD HYDRANT DETAIL
00-C-108 NO SCALE



F TIP-OUT CURB & GUTTER
00-C-113 NO SCALE
00-C-114

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Four Rivers Sanitation Authority

AEROBIC GRANULAR SLUDGE - PHASE 1

REVISIONS AND RECORD OF ISSUE

DESIGNED:	SM
DETAILED:	AB
CHECKED:	AM/JH
APPROVED:	MR
DATE:	12/20/2022
PROJECT NO.:	411752

DETAILS

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CIVIL DETAILS 4 OF 6

99-C-505

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(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

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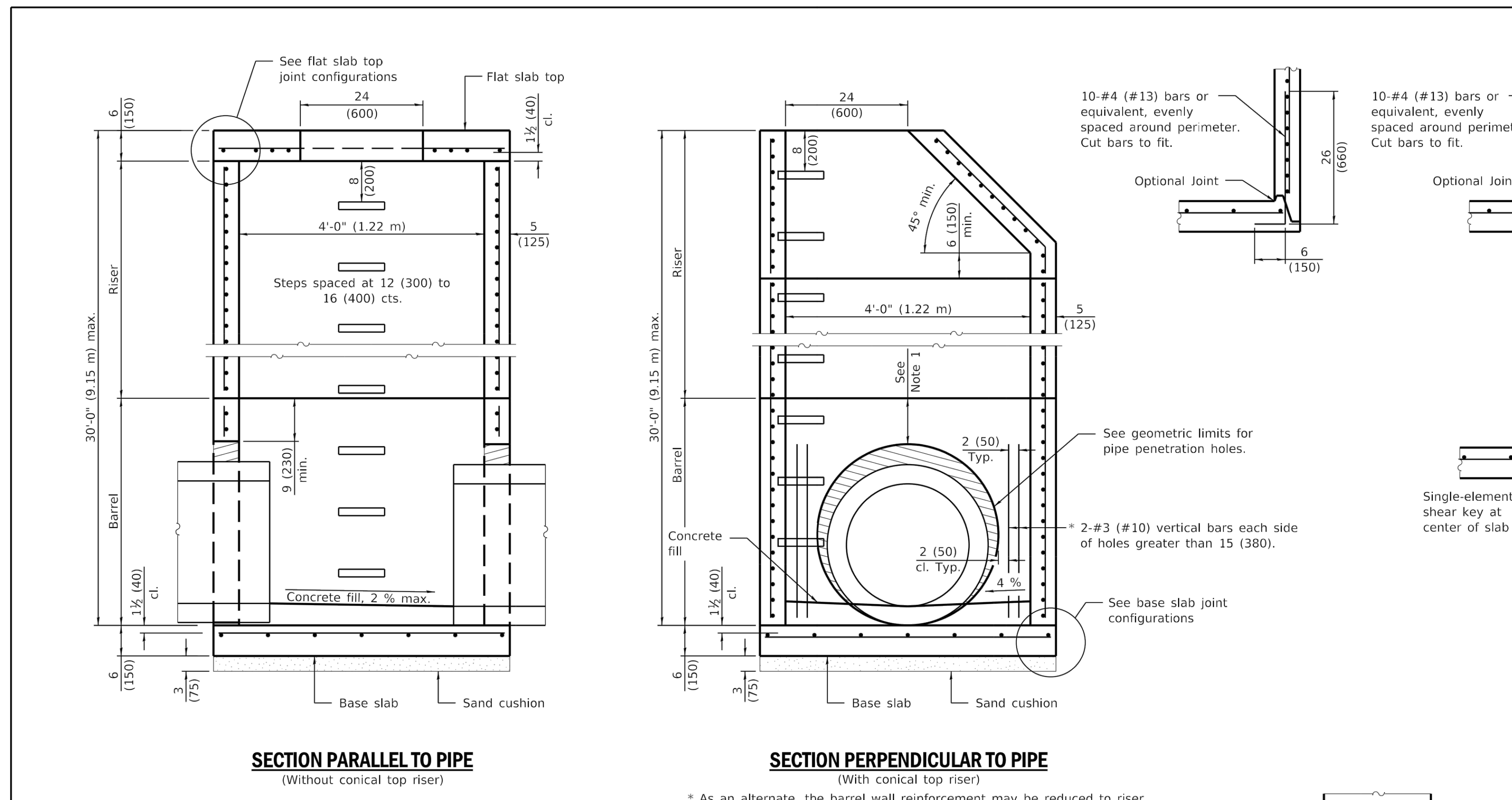
D11000



* As an alternate, the barrel wall reinforcement may be reduced to riser wall reinforcement with #3 (#10) bars placed around the pipe penetration holes as shown. This option may be utilized when the pipe penetration holes are formed as opposed to cored.

GEOMETRIC LIMITS FOR PIPE PENETRATION HOLES

Note 1: A minimum of 9 (230) of monolithic reinforced concrete shall be maintained above pipe penetration holes > 24 (600).

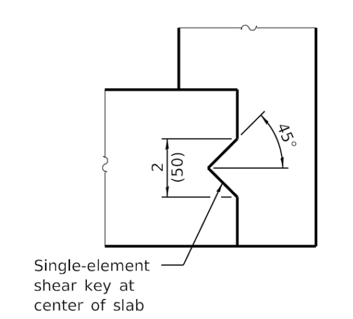
Note 2: A minimum 12 (300) inside arc length of reinforced concrete shall be maintained between pipe penetration holes > 15 (380).

Note 3: A maximum of 60 percent of the inside perimeter of the reinforced concrete manhole walls may be removed.

Note 4: Horizontal joints that intersect pipe penetration holes > 15 (380) shall have one joint splice for every location around the perimeter of the joint where the inside arc length between pipe penetration holes is < 24 (600). See joint splice detail.

Note 5: The recommended pipe penetration hole is equal to the O.D. of the pipe plus 4 (100).

Note 6: Only pipe penetration holes ≤ 15 (380) are allowed in riser sections.



SHEAR KEY GEOMETRY
(Reinforcement not shown for clarity)

GENERAL NOTES

The manufacturer shall ensure that all precast manhole sections are additionally reinforced where required to resist damage from handling, shipping and installation stresses.

Lifting holes shall be located in the sections as per the manufacturer's recommendations.

See Standard 602701 for details of manhole steps.

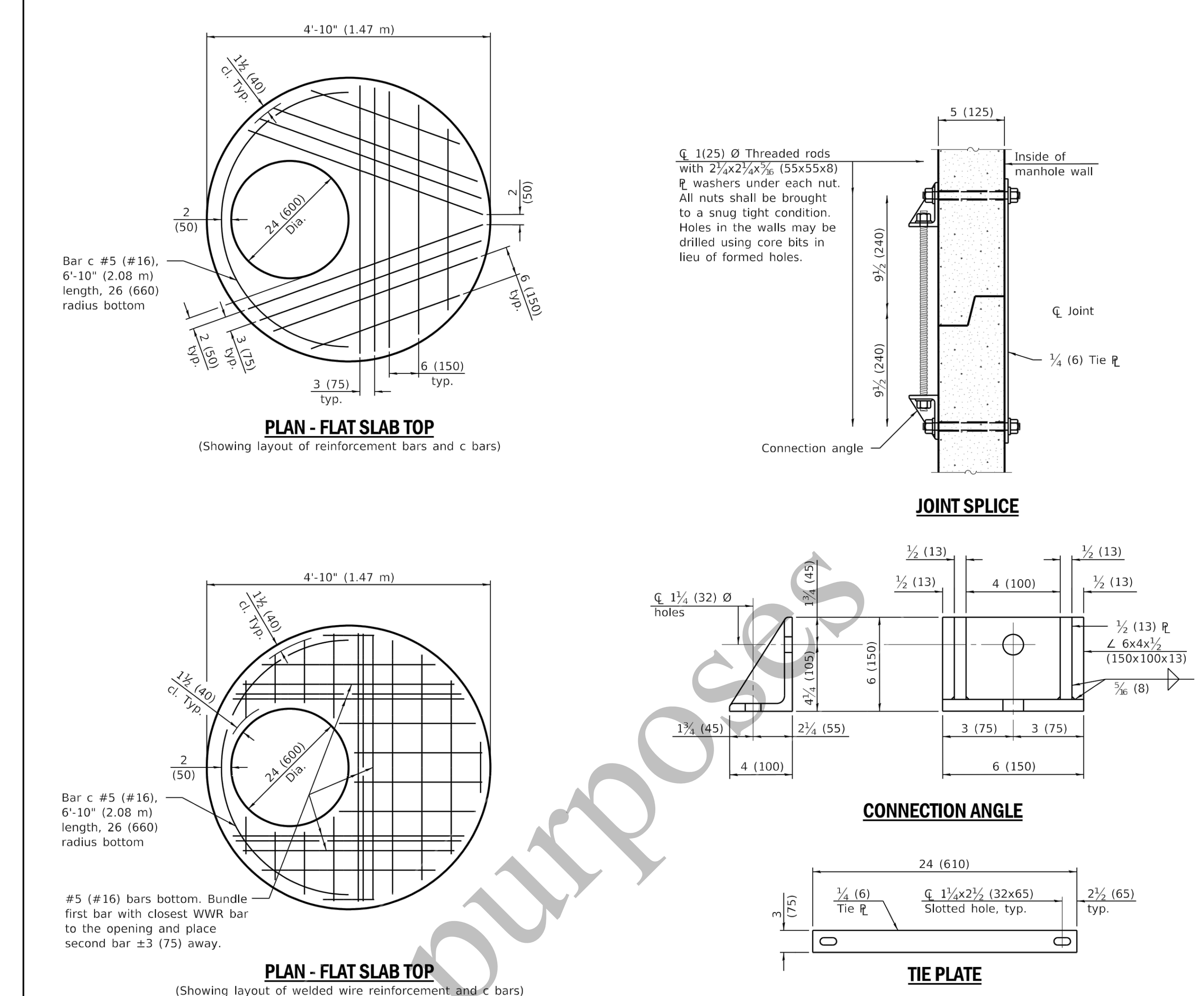
All dimensions are in inches (millimeters) unless otherwise noted.

DATE	REVISIONS
1-1-21	Revised Note 1 and lifting hole general note.
3-1-19	Moved wall reinforcement from inside face to middle.

Illinois Department of Transportation

PRECAST MANHOLE TYPE A 4' (1.22 m) DIAMETER
(Sheet 1 of 2)

STANDARD 602401-07



FLAT SLAB TOP REINFORCEMENT

Location	WWR (each direction)		Rebar		
	A_s (min.)	Spacing (max.)	A_s (min.)	Spacing (max.)	Bar Size
Bottom Mat	** 0.62 sq. in./ft. (1312 sq. mm/m)	6 (150)	See plan view for rebar orientation and spacing and this table for bar size		#5 (#16)

** Only one layer of WWR permitted to avoid congestion.

WALL REINFORCEMENT

Location	Orientation	WWR or Rebar	
		A_s (min.)	Spacing (max.)
Riser	Circumferential	0.12 sq. in./ft. (254 sq. mm/m)	6 (150)
	Vertical	0.045 sq. in./ft. (95 sq. mm/m)	8 (200)
Barrel	Circumferential	0.12 sq. in./ft. (254 sq. mm/m)	6 (150)
	Vertical	0.16 sq. in./ft. (339 sq. mm/m)	4 (100)

BASE SLAB REINFORCEMENT

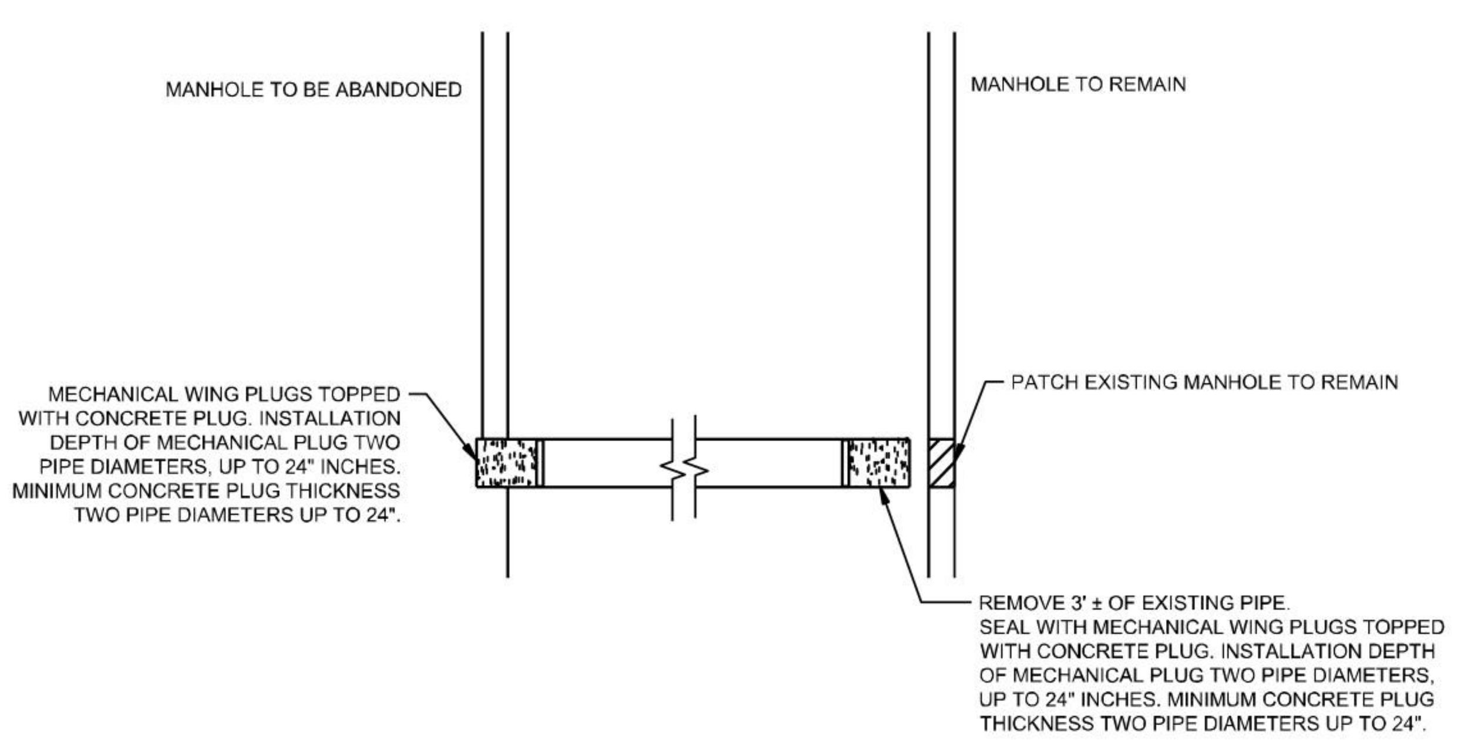
Location	Total Height	WWR or Rebar (each direction)	
		A_s (min.)	Spacing (max.)
Top Mat	≤ 20 ft. (6.10 m)	0.24 sq. in./ft. (508 sq. mm/m)	10 (250)
	> 20 ft. (6.10 m)	0.24 sq. in./ft. (508 sq. mm/m)	10 (250)

Illinois Department of Transportation

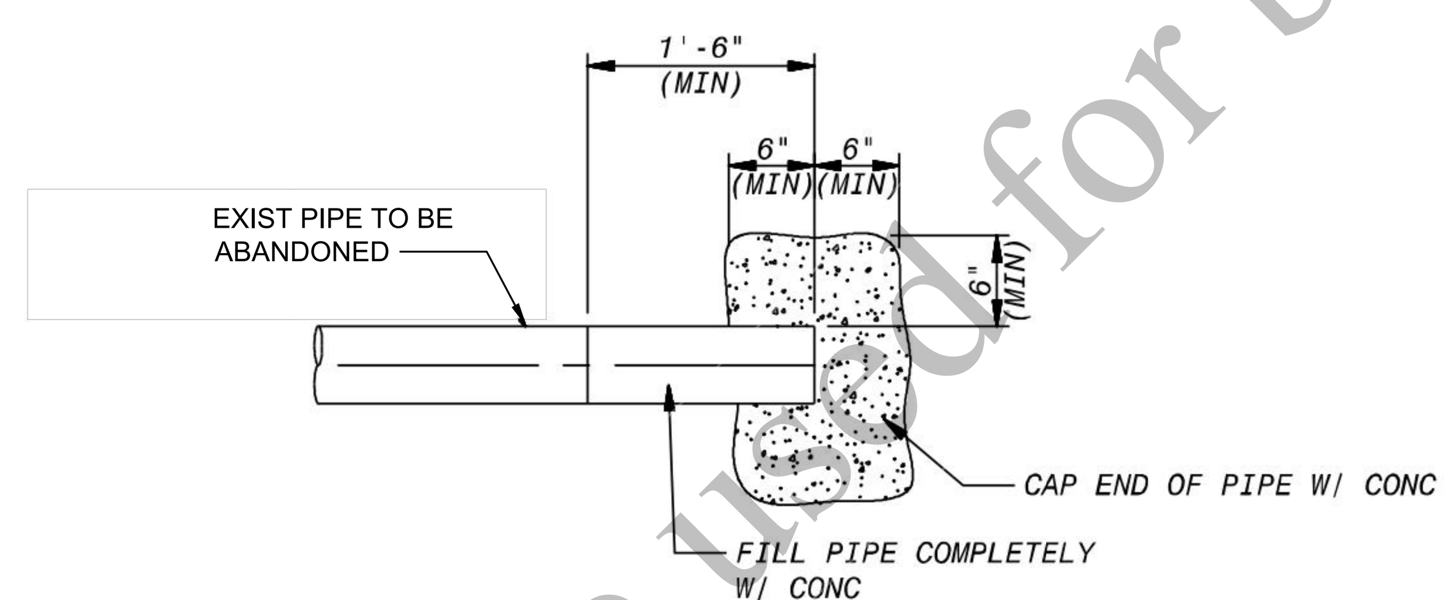
PRECAST MANHOLE TYPE A 4' (1.22 m) DIAMETER
(Sheet 2 of 2)

STANDARD 602401-07

A MANHOLE
00-C-114 NO SCALE



B PIPE ABANDONMENT DETAIL
- NO SCALE

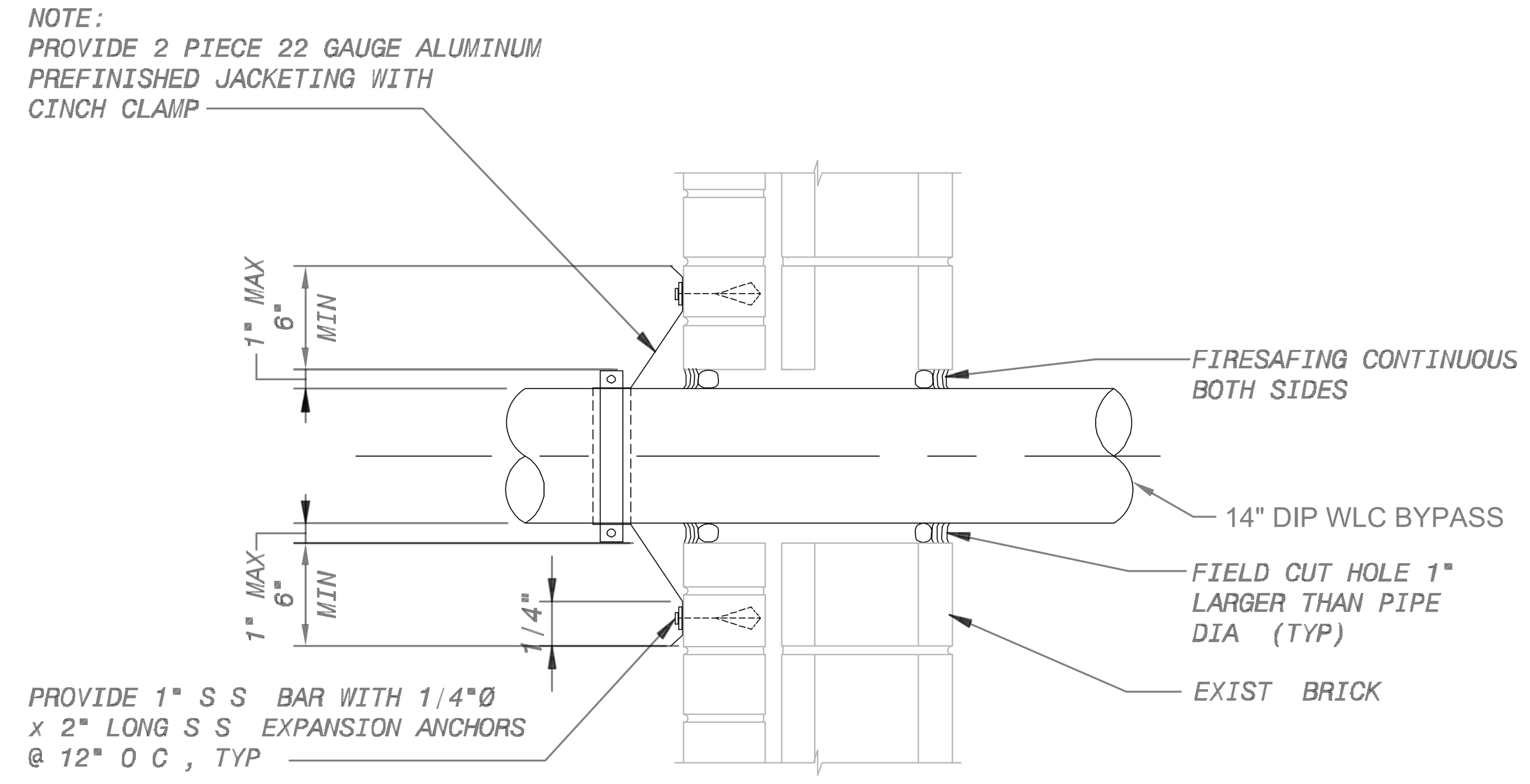


NOTE:

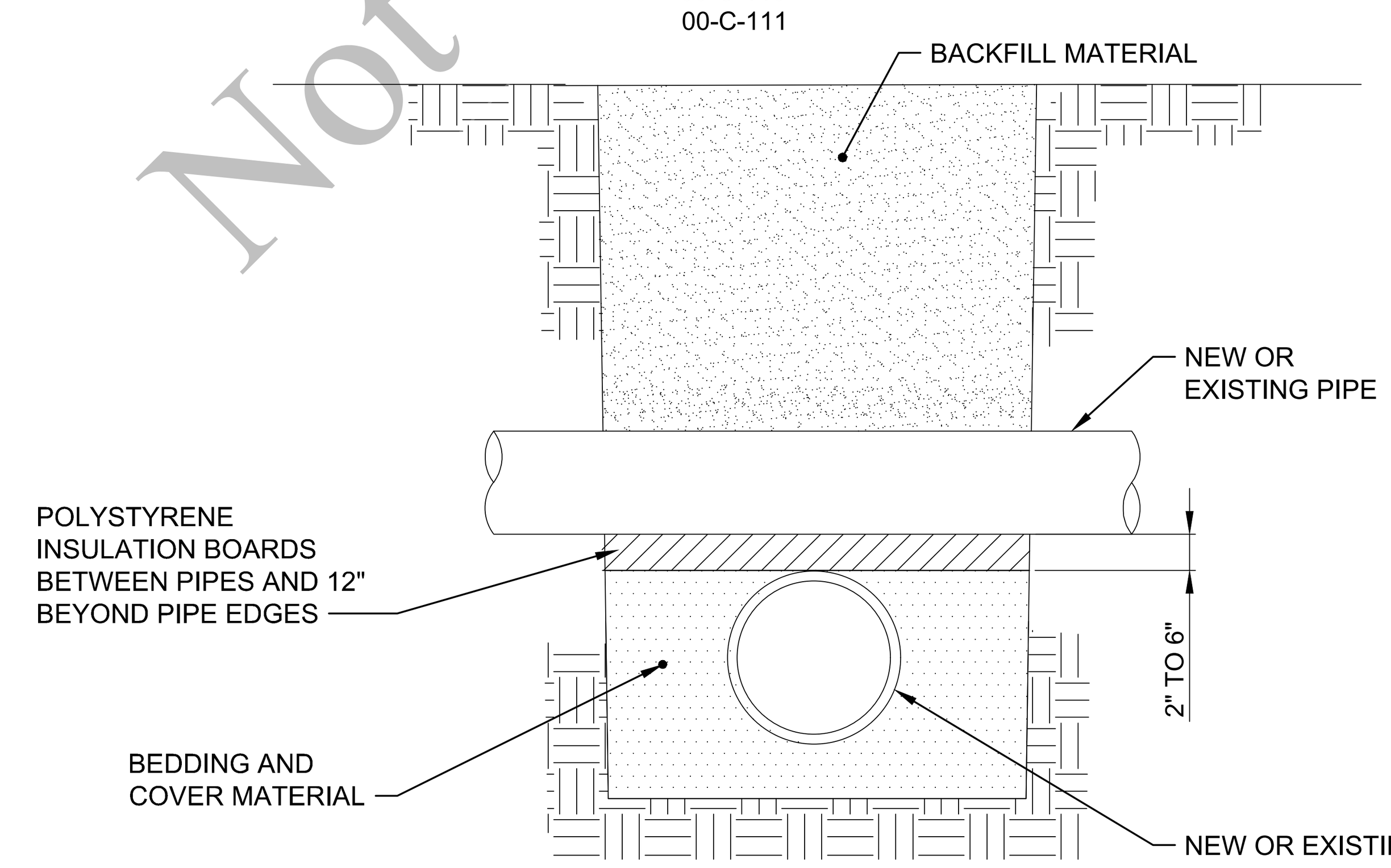
1. ALL ABANDONED IN PLACE PIPING SHALL HAVE ENDS CAPPED.

C PIPE PLUG DETAILS
00-C-108 NO SCALE
00-C-109
00-C-110
00-C-111

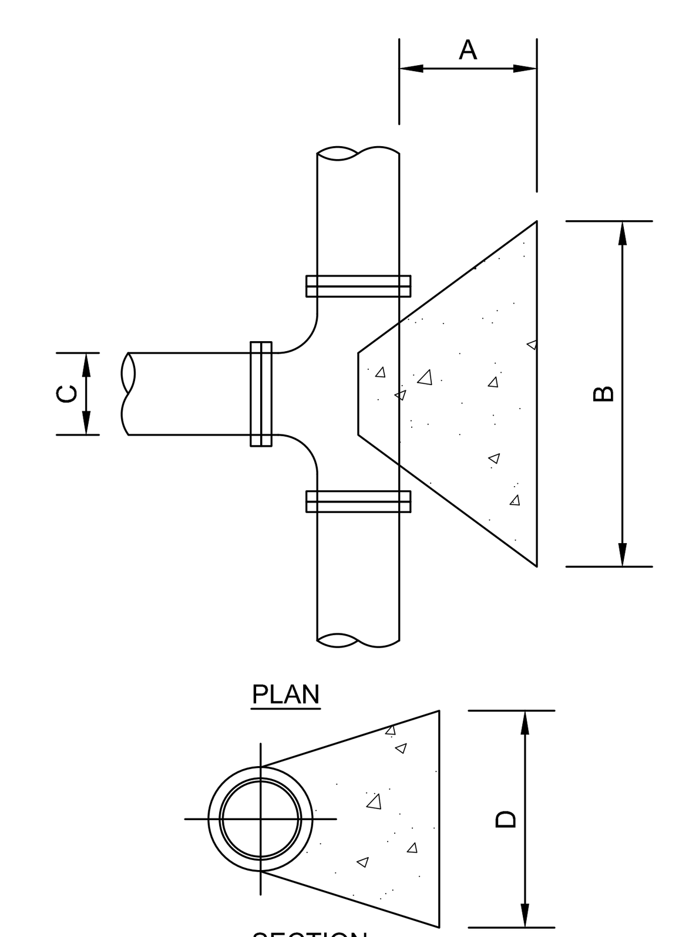
NOTE:
PROVIDE 2 PIECE 22 GAUGE ALUMINUM PREFINISHED JACKETING WITH CINCH CLAMP



D MASONRY PIPE PENETRATION
- NO SCALE



PIPE CROSSING DETAIL
E 6 INCHES OR LESS CLEARANCE
- NO SCALE

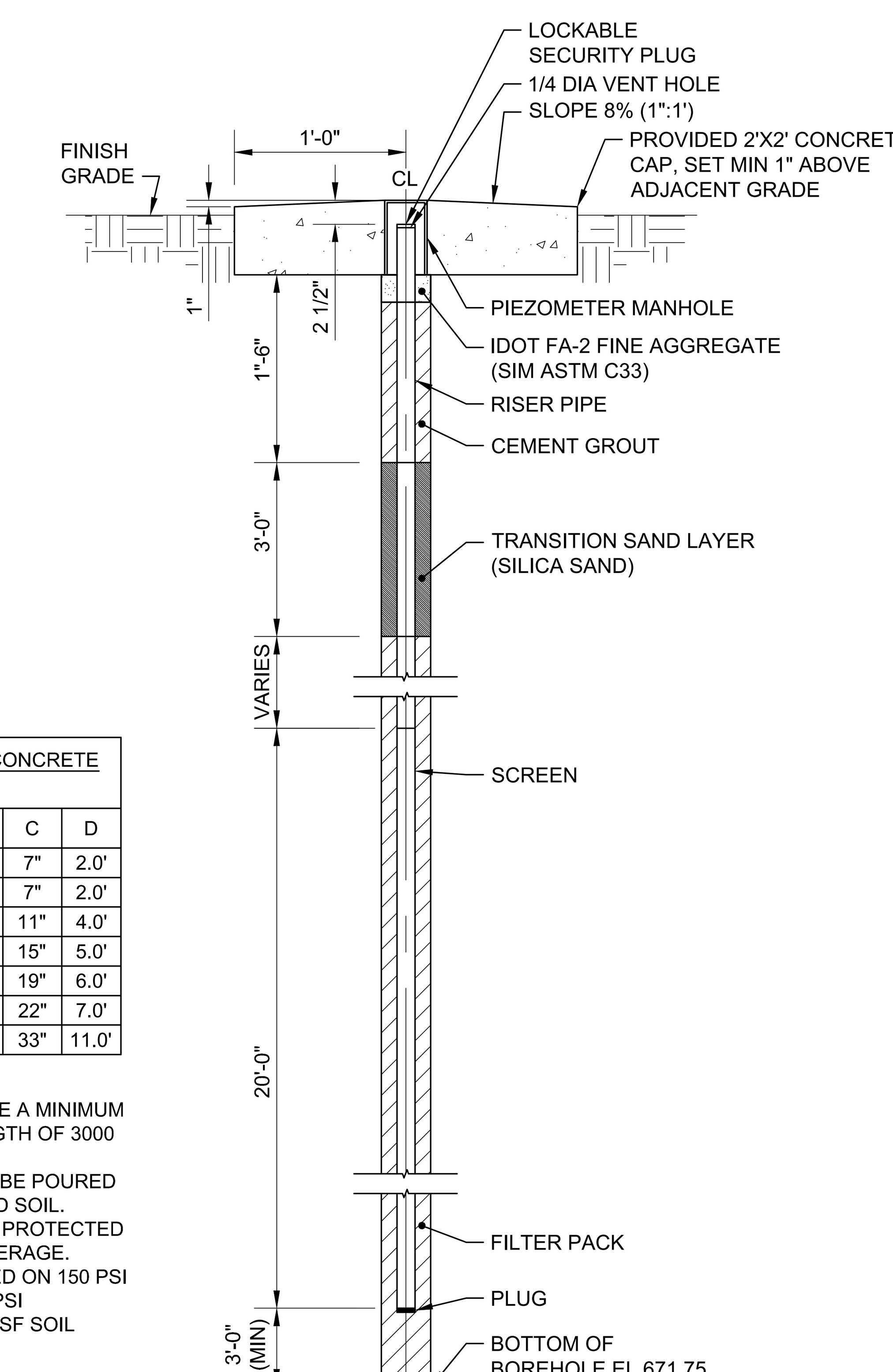


MINIMUM DIMENSIONS FOR CONCRETE BLOCKING

BEND	PIPE SIZE	A	B	C	D
TEES AND PLUGS	6"	1.5'	2.0'	7"	2.0'
	8"	2.0'	3.0'	7"	2.0'
	12"	2.0'	4.0'	11"	4.0'
	16"	3.0'	5.0'	15"	5.0'
	20"	4.0'	7.0'	19"	6.0'
	24"	5.0'	8.0'	22"	7.0'
	36"	7.0'	10.0'	33"	11.0'

NOTES:
1. CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI AT 28 DAYS.
2. THRUST BLOCK SHALL BE POURED AGAINST UNDISTURBED SOIL.
3. BOLTS/NUTS SHALL BE PROTECTED FROM CONCRETE COVERAGE.
4. DIMENSIONS ARE BASED ON 150 PSI LINE PRESSURE, 3000 PSI CONCRETE AND 2000 PSF SOIL BEARING PRESSURE.

F THRUST BLOCK
- NO SCALE



G PIEZOMETER
- NO SCALE

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Four Rivers Sanitation Authority

AEROBIC GRANULAR SLUDGE - PHASE 1

REVISIONS AND RECORD OF ISSUE

DESIGNED:	SM
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CHECKED:	AM/JH
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DATE:	12/20/2022
PROJECT NO.:	411752

DETAILS

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CIVIL DETAILS 5 OF 6

99-C-506

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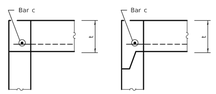
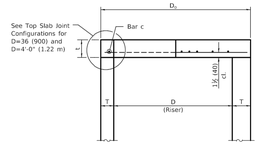
D11000

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

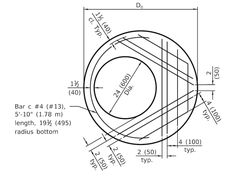


FLAT SLAB TOP JOINT CONFIGURATIONS FOR D = 36 (900) AND D = 4'-0" (1.22 m)

(Shown at access hole)

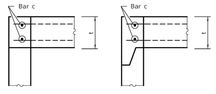


SECTION THRU FLAT SLAB TOP FOR D = 36 (900) AND D = 4'-0" (1.22 m)



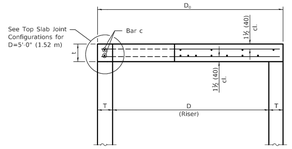
PLAN - FLAT SLAB TOP FOR D = 36 (900)

(Showing layout of reinforcement bars and c bars)

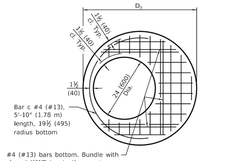


FLAT SLAB TOP JOINT CONFIGURATIONS D = 5'-0" (1.52 m)

(Shown at access hole)



SECTION THRU FLAT SLAB TOP FOR D = 5'-0" (1.52 m)



PLAN - FLAT SLAB TOP FOR D = 36 (900)

(Showing layout of welded wire reinforcement and c bars)

TABLE

D	T	D_0 (min.)	t
36 (900)	See applicable Standards	D + 27	6 (150)
4'-0" (1.2 m)			6 (150)
5'-0" (1.5 m)			8 (200)

GENERAL NOTES

The flat slab top may be used in lieu of the tapered tops shown on Standards 602001, 602016, or 602306 at the option of the Contractor or when field conditions prohibit the use of tapered tops.

Lifting holes shall be located in the sections as per the manufacturer's recommendations.

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

PASSED: January 1, 2019 — ENGINEER OF POLICY AND PROCEDURES

APPROVED: January 1, 2019 — ENGINEER OF BUREAU OF DESIGN AND ENVIRONMENT

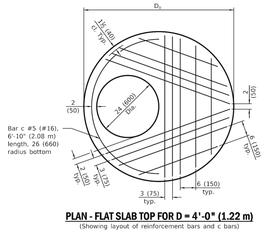
LAST REVISION: 1-1-19

DATE	REVISIONS
1-1-19	Expanded / refined reinforcement options.
1-1-18	Revised for compliance with LRFD.

PRECAST REINFORCED CONCRETE FLAT SLAB TOP

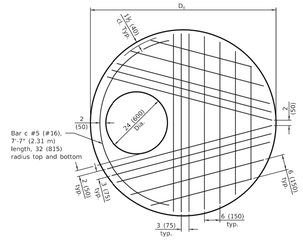
(Sheet 1 of 2)

STANDARD 602601-06



PLAN - FLAT SLAB TOP FOR D = 4'-0" (1.22 m)

(Showing layout of reinforcement bars and c bars)



PLAN - FLAT SLAB TOP FOR D = 5'-0" (1.52 m)

(Showing layout of bottom reinforcement bars and c bars)

FLAT SLAB TOP REINFORCEMENT FOR D = 36 (900)

Location	WWR (each direction)		Rebar		
	A_s (min.)	Spacing (max.)	A_s (min.)	Spacing (max.)	Bar Size
Bottom Mat	* 0.60 sq. in./ft. (1270 sq. mm/m)	6 (150)	See plan view for rebar orientation and spacing and this table for bar size		#4 (#13)

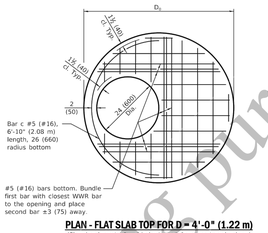
FLAT SLAB TOP REINFORCEMENT FOR D = 4'-0" (1.22 m)

Location	WWR (each direction)		Rebar		
	A_s (min.)	Spacing (max.)	A_s (min.)	Spacing (max.)	Bar Size
Bottom Mat	* 0.62 sq. in./ft. (1312 sq. mm/m)	6 (150)	See plan view for rebar orientation and spacing and this table for bar size		#5 (#16)

FLAT SLAB TOP REINFORCEMENT FOR D = 5'-0" (1.52 m)

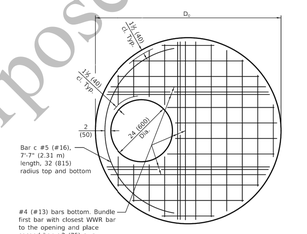
Location	WWR (each direction)		Rebar (each direction except as noted)	
	A_s (min.)	Spacing (max.)	A_s (min.)	Spacing (max.)	Bar Size
Top Mat	0.11 sq. in./ft. (233 sq. mm/m)	18 (450)	0.11 sq. in./ft. (233 sq. mm/m)	18 (450)	#3 or #4 (#10) (#13)
Bottom Mat	* 0.40 sq. in./ft. (847 sq. mm/m)	6 (150)	See plan view for rebar orientation and spacing and this table for bar size		#4 (#13)

* Only one layer of WWR permitted to avoid congestion.



PLAN - FLAT SLAB TOP FOR D = 4'-0" (1.22 m)

(Showing layout of welded wire reinforcement and c bars)



PLAN - FLAT SLAB TOP FOR D = 5'-0" (1.52 m)

(Showing layout of welded wire reinforcement and c bars)

Illinois Department of Transportation

PASSED: January 1, 2019 — ENGINEER OF POLICY AND PROCEDURES

APPROVED: January 1, 2019 — ENGINEER OF BUREAU OF DESIGN AND ENVIRONMENT

LAST REVISION: 1-1-19

PRECAST REINFORCED CONCRETE FLAT SLAB TOP

(Sheet 2 of 2)

STANDARD 602601-06

A CONCRETE FLAT SLAB TOP
- NO SCALE

BLACK & VEATCH

Black & Veatch Corporation
Chicago, Illinois
ILLINOIS PROFESSIONAL
DESIGN FIRM - 184.002143 -0006

Four Rivers Sanitation Authority

AEROBIC GRANULAR SLUDGE - PHASE 1

REVISIONS AND RECORD OF ISSUE

DESIGNED:	SM
DETAILED:	AB
CHECKED:	AM/JH
APPROVED:	MR
DATE:	12/20/2022
PROJECT NO.:	411752

DETAILS

CIVIL

CIVIL DETAILS 6 OF 6

99-C-507

127 OF 163

PLOTTED: 12/12/2022 10:18:27 PM
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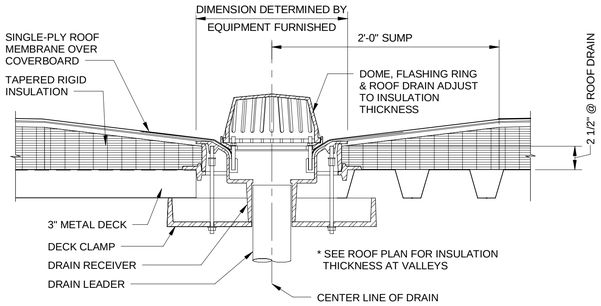
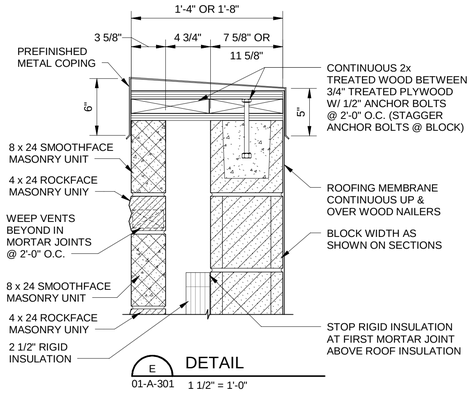
PD11000
D11004

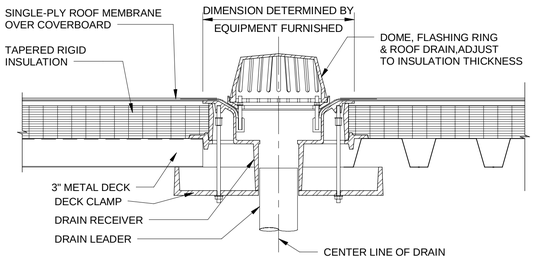
(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4



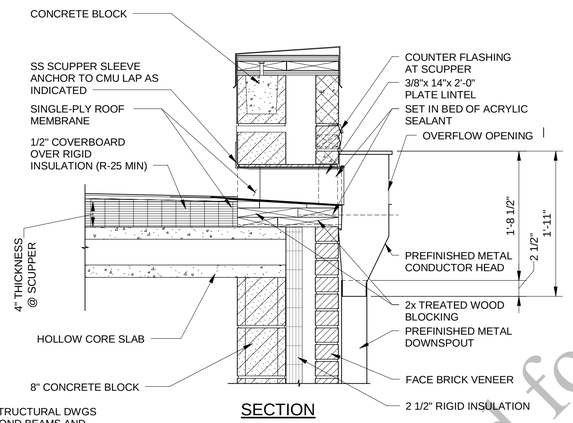
A DETAIL
02-A-101 1 1/2" = 1'-0"



E DETAIL
01-A-301 1 1/2" = 1'-0"

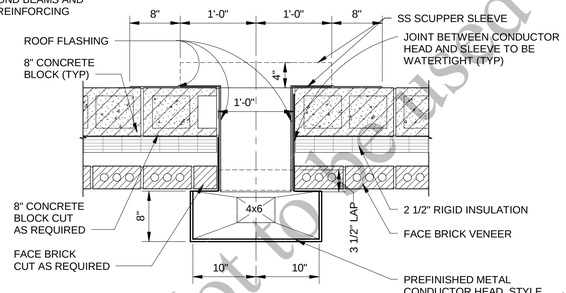


B DETAIL
1 1/2" = 1'-0"

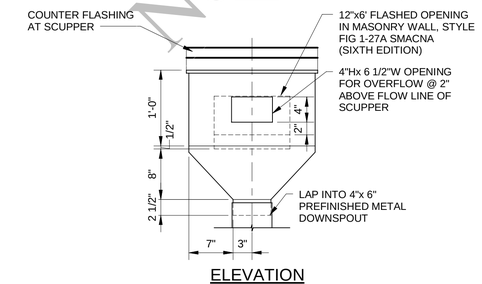


SECTION

NOTE:
SEE STRUCTURAL DWGS FOR BOND BEAMS AND WALL REINFORCING

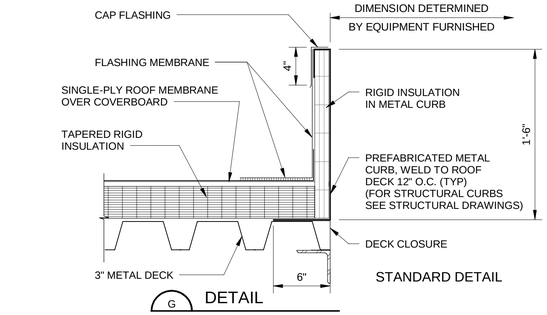


PLAN



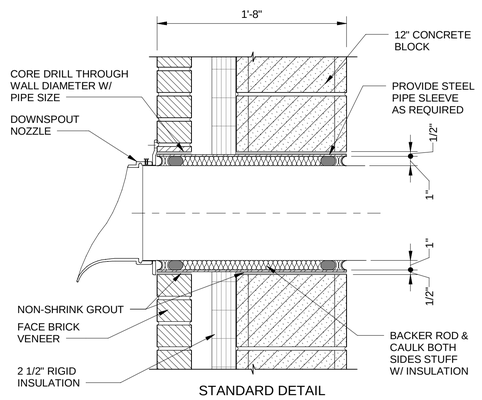
ELEVATION

F DETAIL
01-A-102 1" = 1'-0"



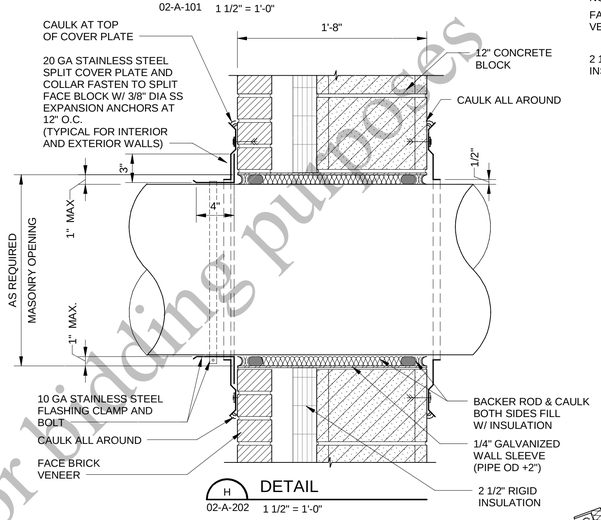
G DETAIL
02-A-101 1 1/2" = 1'-0"

STANDARD DETAIL

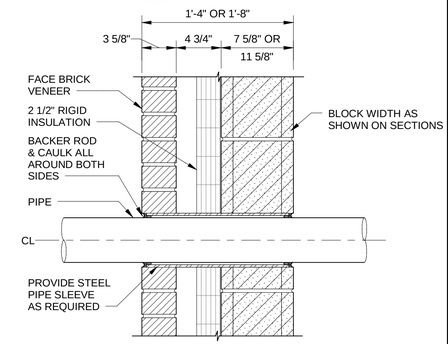


STANDARD DETAIL

K DETAIL
02-A-202 1 1/2" = 1'-0"

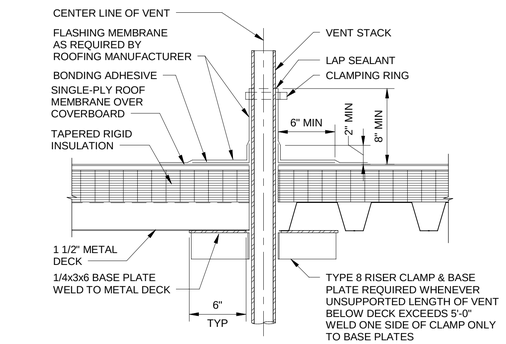


H DETAIL
02-A-202 1 1/2" = 1'-0"

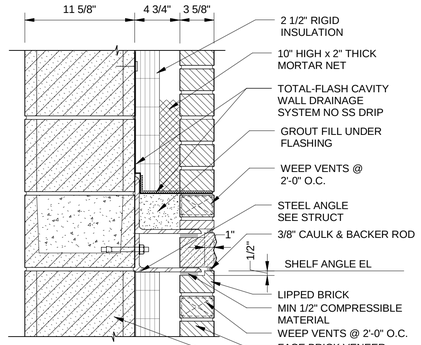


STANDARD DETAIL

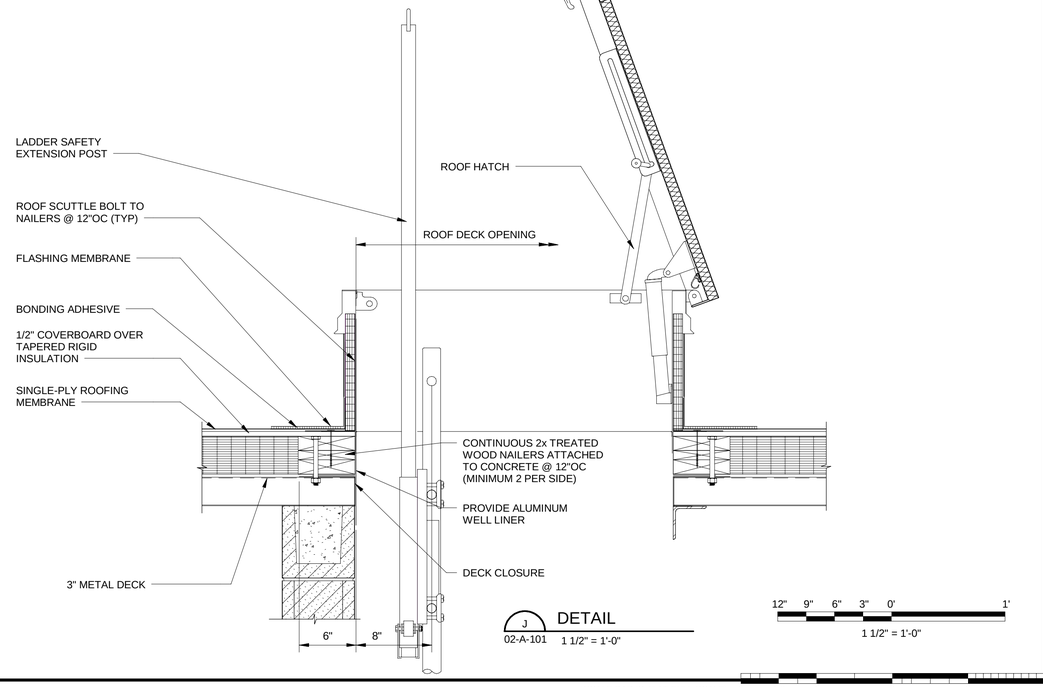
L DETAIL
1 1/2" = 1'-0"



C DETAIL
02-A-101 1 1/2" = 1'-0"



D DETAIL
02-A-301 1 1/2" = 1'-0"



J DETAIL
02-A-101 1 1/2" = 1'-0"

12" 9" 6" 3" 0" 1'
1 1/2" = 1'-0"

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

B&V Design, LLC
Kansas City, Missouri
ILLINOIS PROFESSIONAL DESIGN FIRM - 184007283

Four Rivers Sanitation Authority

AEROBIC GRANULAR SLUDGE - PHASE 1

REVISIONS AND RECORD OF ISSUE

DESIGNED:	RAB
DETAILED:	TMB
CHECKED:	PDR
APPROVED:	PDR
DATE:	12/20/2022
PROJECT NO.:	411752

GENERAL

ARCHITECTURAL

ROOF & MISCELLANEOUS DETAILS

99-A-501

128 OF 163

PLOTTED: 12/16/2022 11:54:42 AM
FILE: BIM 360://409469 - Aerobic Granular Sludge Phase 1/409469 - AGS.rvt
D11000

FINISH SCHEDULE

NO.	NAME	FLOOR		WALLS													CEILING			REMARKS
				NORTH			EAST			SOUTH			WEST							
		MATRL	FINISH	MATRL	FINISH	BASE	MATRL	FINISH	BASE	MATRL	FINISH	BASE	MATRL	FINISH	BASE		MATRL	FINISH	HEIGHT	
AGS REACTORS AND PIPE GALLERY																				
01-001	STAIR NO.1	CO	FS	CO/CB	PT/PT	NO	CO/CB	PT/PT	NO	CO/CB	PT/PT	NO	CO/CB	PT/PT	NO		CO	PT	34'-4"	
01-002	STAIR NO.2	CO	FS	CO/CB	PT/PT	NO	CO/CB	PT/PT	NO	CO/CB	PT/PT	NO	CO/CB	PT/PT	NO		CO	PT	34'-4"	
01-003	PIPE GALLERY	CO	FS	CO	PT	NO	CO	PT	NO	CO	PT	NO	CO	PT	NO		CO	PT	21'-3"	
AGS SUPPORT FACILITIES																				
02-101	MCC	CO	FS	CB	PT	NO	CB	PT	NO	CB	PT	NO	CB	PT	NO		MD	PT	25'-10"	
02-102	BLOWERS	CO	FS	CB/AWPS	PT/FF	NO	CB/AWPS	PT/FF	NO	CB/AWPS	PT/FF	NO	CB/AWPS	PT/FF	NO		MD	PT	25'-10"	

DOOR SCHEDULE (D)

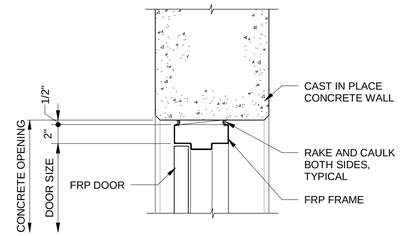
DOOR No. (D)	DOOR SIZE			DOOR							FRAME					REMARKS
						DETAILS							DIMENSIONS			
		WIDTH	HEIGHT	TYPE (D)	MATERIAL	HEAD	JAMB	SILL	HDWR	RATING	TYPE (F)	MATERIAL	HEAD	WIDTH	DEPTH	
AGS REACTORS AND PIPE GALLERY																
01-001A		3'-0"	7'-0"	B	FRP	1	2	3	3	45 MIN	A	FRP	2"	2"	5 3/4"	FIRE RATED GLASS
01-001B		3'-0"	7'-0"	B	FRP	1	2	3	3	45 MIN	A	FRP	2"	2"	5 3/4"	FIRE RATED GLASS
01-001C		3'-0"	7'-0"	B	FRP	6	5 SIM	7	1	-	A	FRP	4"	2"	5 3/4"	1" INSULATED GLASS
01-002A		3'-0"	7'-0"	B	FRP	1	2	3	3	45 MIN	A	FRP	2"	2"	5 3/4"	FIRE RATED GLASS
01-002B		3'-0"	7'-0"	B	FRP	1	2	3	3	45 MIN	A	FRP	2"	2"	5 3/4"	FIRE RATED GLASS
01-002C		3'-0"	7'-0"	B	FRP	6	5 SIM	7	1	-	A	FRP	4"	2"	5 3/4"	1" INSULATED GLASS
AGS SUPPORT FACILITIES																
02-101A		3'-0"	7'-0"	B	FRP	4	5	7	1	-	A	FRP	4"	2"	5 3/4"	1" INSULATED GLASS
02-101B	PR	3'-0"	9'-0"	A/A	FRP	4	5	7	2	-	A	FRP	4"	2"	5 3/4"	
02-101C		3'-0"	7'-0"	B	FRP	11	12	13	3	-	A	FRP	4"	2"	5 3/4"	1" INSULATED GLASS
02-102A		3'-0"	7'-0"	B	FRP	4	5	7	1	-	A	FRP	4"	2"	5 3/4"	1" INSULATED GLASS
02-102B		14'-0"	12'-8"	-	RA	8	9	10	-	-	-	RA			0"	MOTOR OPERATOR

LOUVER SCHEDULE (L)

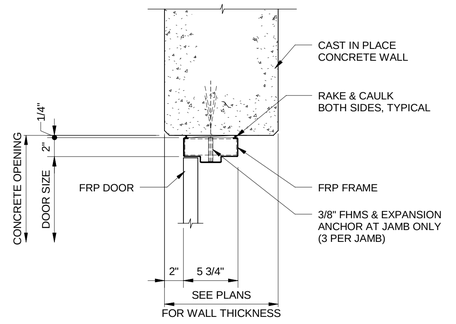
LEVEL	LOUVER No. (L)	OPENING		LOUVER					REMARKS
		WIDTH	HEIGHT	TYPE	HEAD	JAMB	SILL	TOP ELEV AFF	
AGS REACTORS AND PIPE GALLERY									
GALLERY TOP	01-001A	2'-0"	2'-0"	ALUM	14	15	16	10'-8"	
GALLERY TOP	01-001B	2'-0"	2'-0"	ALUM	14	15	16	4'-8"	
GALLERY TOP	01-002A	2'-0"	2'-0"	ALUM	14	15	16	4'-8"	
GALLERY TOP	01-002B	2'-0"	2'-0"	ALUM	14	15	16	10'-8"	
AGS SUPPORT FACILITIES									
FACILITIES OP. LEVEL	02-102A	3'-4"	5'-4"	ALUM	14	15	16	14'-8"	
FACILITIES OP. LEVEL	02-102B	4'-8"	5'-4"	ALUM	14	15	16	14'-8"	

SCHEDULE LEGEND

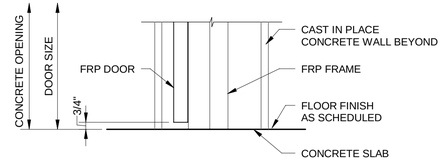
AL - ACTIVE LEAF
ALUM - ALUMINUM
AWPS - ACOUSTICAL WALL PANEL SYSTEM
CB - CONCRETE BLOCK
CO - CONCRETE
FF - FACTORY FINISH
FRP - FIBER REINFORCED PLASTIC
FS - FLOOR SEALER
MD - METAL DECK
NO - NONE
PT - PAINTED



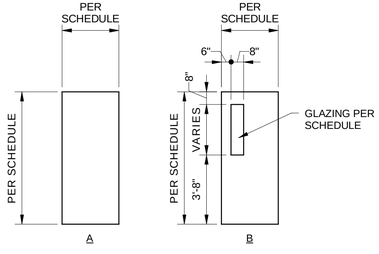
1 HEAD
1 1/2" = 1'-0"



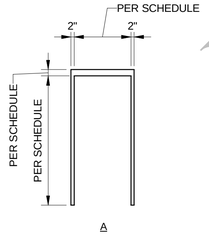
2 JAMB
1 1/2" = 1'-0"



3 SILL
1 1/2" = 1'-0"



DOOR TYPES
1/4" = 1'-0"



FRAME TYPES
1/4" = 1'-0"

12" 9" 6" 3" 0" 1'
1 1/2" = 1'-0"

4' 2' 0' 4' 8'
1/4" = 1'-0"

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

B&V Design, LLC
Kansas City, Missouri
ILLINOIS PROFESSIONAL
DESIGN FIRM - 184007283

Four Rivers Sanitation Authority

AEROBIC GRANULAR SLUDGE - PHASE 1

REVISIONS AND RECORD OF ISSUE

DESIGNED:	RAB
DETAILED:	TMB, KMF
CHECKED:	PDR
APPROVED:	PDR
DATE:	12/20/2022
PROJECT NO.:	411752

GENERAL

ARCHITECTURAL

SCHEDULES & DOOR DETAILS

99-A-601

129 OF 163

PLOTTED: 12/16/2022 11:46:59 AM
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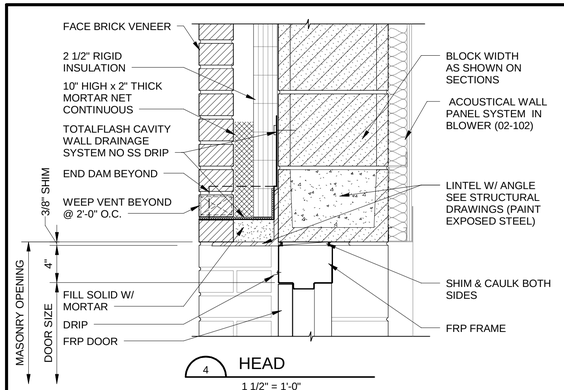
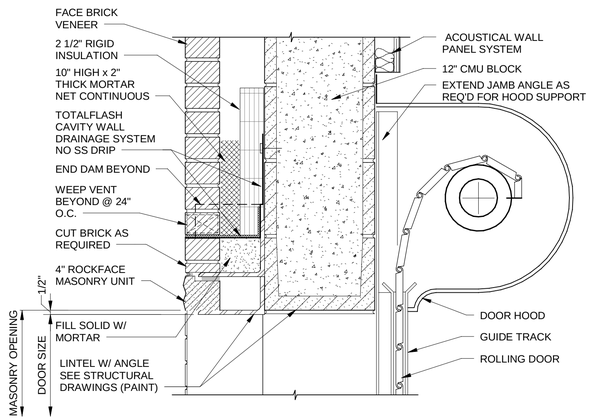
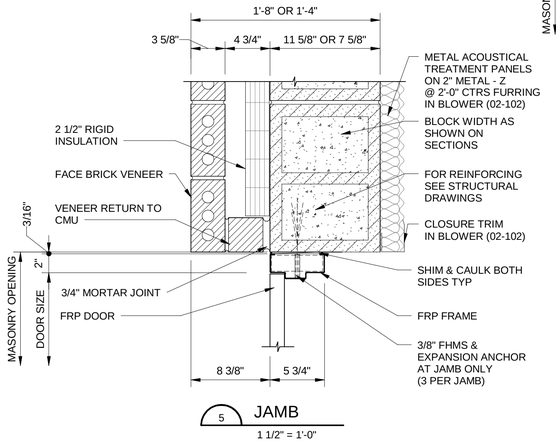
D11000



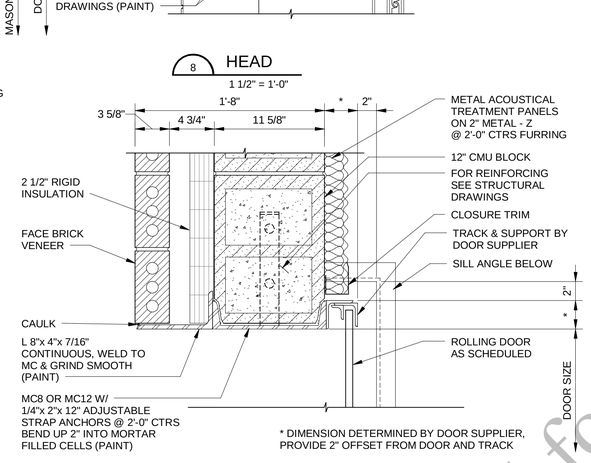
4 HEAD
1 1/2" = 1'-0"



8 HEAD
1 1/2" = 1'-0"



5 JAMB
1 1/2" = 1'-0"



9 JAMB
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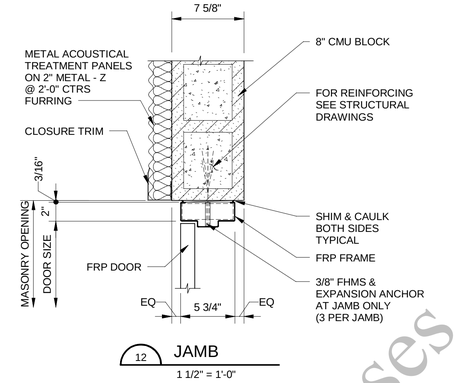

12 JAMB
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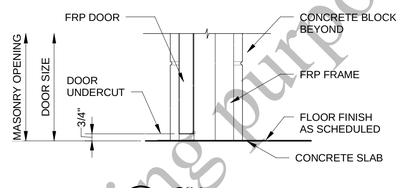
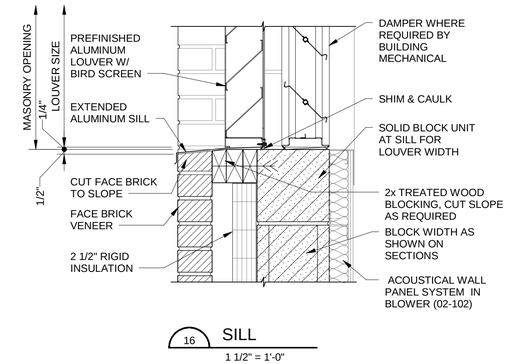
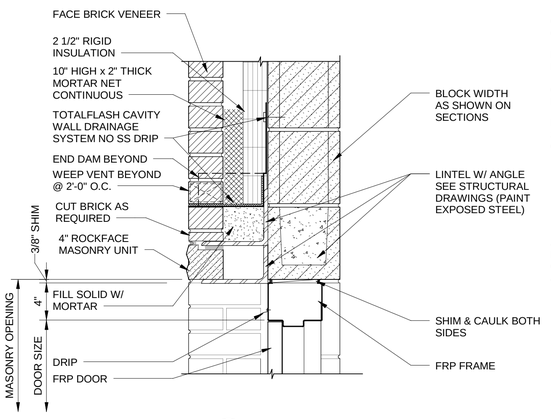


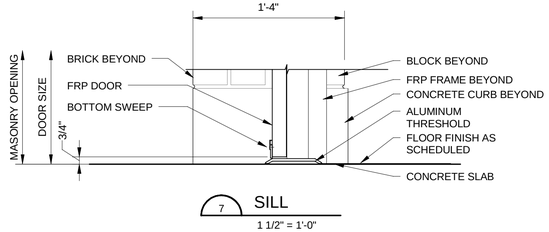
13 SILL
1 1/2" = 1'-0"



16 SILL
1 1/2" = 1'-0"



6 HEAD
1 1/2" = 1'-0"



7 SILL
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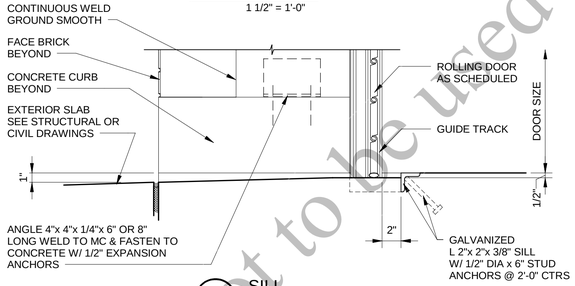

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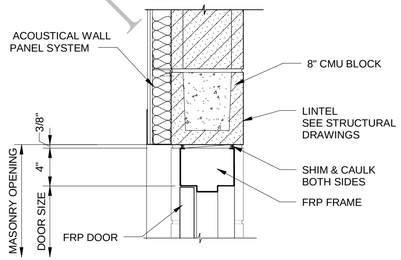
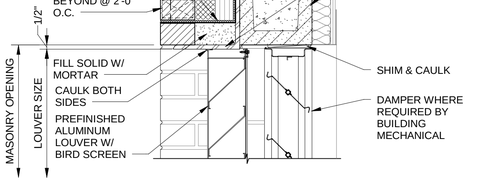
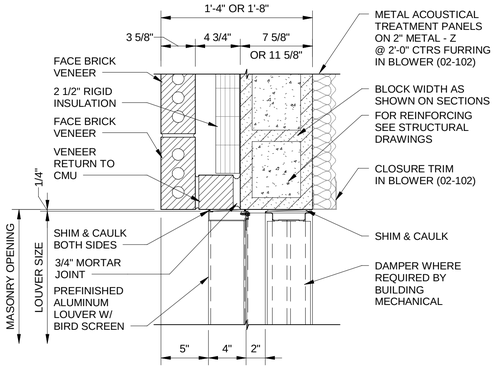


11 HEAD
1 1/2" = 1'-0"



14 HEAD
1 1/2" = 1'-0"



15 JAMB
1 1/2" = 1'-0"

B&V Design, LLC
Kansas City, Missouri
ILLINOIS PROFESSIONAL DESIGN FIRM - 184007283

Four Rivers Sanitation Authority

AEROBIC GRANULAR SLUDGE - PHASE 1

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DESIGNED:	RAB
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DATE:	12/20/2022
PROJECT NO.:	411752

GENERAL

ARCHITECTURAL

DOOR, WINDOW & LOUVER DETAILS

99-A-602

130 OF 163

1 1/2" = 1'-0"

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

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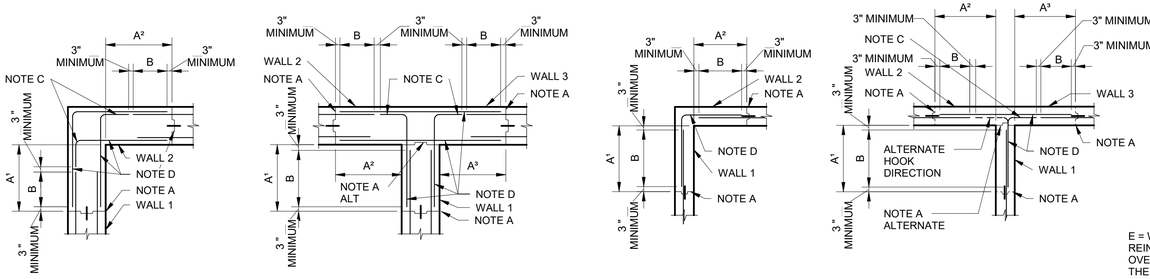
FILE: BIM 360:/409469 - Aerobic Granular Sludge Phase 1/409469 - AGS.rvt
D11000



A = VERTICAL CONSTRUCTION JOINT NEAREST TO WALL CORNER.

A (ALTERNATE) = ALTERNATE VERTICAL CONSTRUCTION JOINT NEAREST TO WALL CORNER IN T WALL JOINT WHICH DOES NOT REQUIRE WATERSTOP.

A^X = DISTANCE FROM INSIDE CORNER FACE TO NEAREST VERTICAL CONSTRUCTION JOINT IN SIMILARLY NUMBERED WALL. A^X SHALL NOT BE LESS THAN DIMENSIONS INDICATED BY THESE DETAILS; NOR GREATER THAN INDICATED ON PLAN DRAWINGS; BUT IN ANY CASE SHALL NOT EXCEED 30 FEET IN LIQUID CONTAINMENT STRUCTURES OR 40 FEET IN OTHER STRUCTURES. INT WALL JOINTS WHICH DO NOT REQUIRE WATERSTOP, A1 MAY BE ZERO.

B = OPTIONAL SPLICE LOCATION UNLESS SPECIFICALLY NOTED ON PLAN DRAWINGS. SPLICE LENGTH SHALL NOT BE LESS THAN THAT REQUIRED FOR TOP BARS AS SHOWN IN TABLE ON THIS SHEET. USE SPLICE LENGTH FOR THE SMALLER OF THE TWO BARS BEING SPLICED.

C = STANDARD HOOK

D = TYPICAL CORNER REINFORCEMENT. SIZE SHALL MATCH LARGEST ADJACENT WALL HORIZONTAL REINFORCEMENT; SPACING SHALL MATCH MINIMUM ADJACENT WALL HORIZONTAL REINFORCEMENT SPACING.

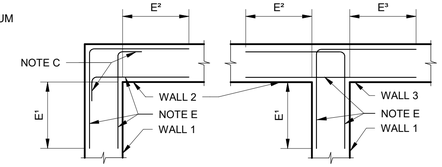
MAIN REINFORCEMENT FOR ALL STRUCTURES

NOTES:

1. VERTICAL REINFORCEMENT IS NOT SHOWN.
2. THESE DETAILS SHALL BE APPLICABLE TO ALL WALL CORNERS UNLESS NOTED OTHERWISE ON THE DRAWINGS.

A STANDARD CONCRETE REINFORCMENT DETAILS

NO SCALE

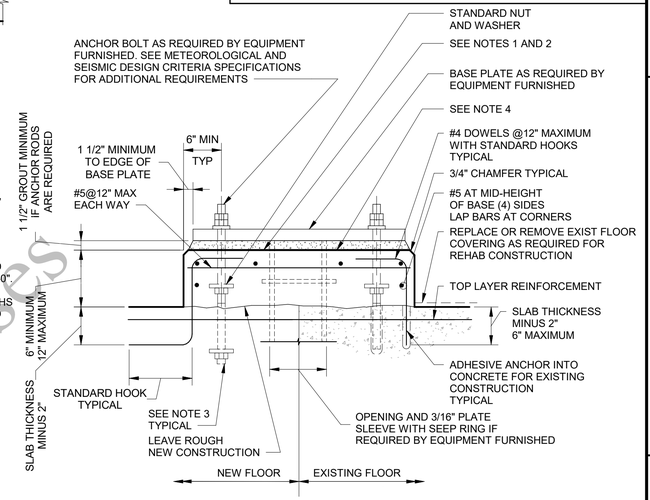


E = WHERE SPECIFICALLY NOTED ON THE DRAWINGS, ADDITIONAL CORNER REINFORCEMENT SHALL BE PLACED IN BOTH FACES OF THE INDICATED CORNER OVER THE FULL HEIGHT. ADDITIONAL CORNER REINFORCEMENT SHALL BE OF THE SAME SIZE AND SPACING AS THE MAIN CORNER REINFORCEMENT. PLACE ADDITIONAL REINFORCEMENT ALTERNATELY WITH, AND EQUAL DISTANCE BETWEEN, MAIN CORNER REINFORCEMENT.

E^X = DISTANCE FROM INSIDE CORNER FACE TO TERMINATION OF ADDITIONAL CORNER REINFORCEMENT IN SIMILARLY NUMBERED WALL. E^X SHALL NOT BE LESS THAN 0.20 THE CLEAR SPAN DISTANCE MEASURED HORIZONTALLY BETWEEN THIS CORNER AND THE NEXT OR 0.40 THE CLEAR SPAN DISTANCE OR CANTILEVERED DISTANCE MEASURED VERTICALLY, WHICHEVER IS SMALLER, BUT NOT LESS THAN 3'-0".

CONTRACTORS OPTION: E BAR TAILS MAY BE SPLICED USING LAPPED SPLICE LENGTHS FOR TOP BARS. SPLICES SHALL NOT BE LOCATED IN THE CORNER AREA COMMON TO BOTH WALLS AND SHALL CLEAR HOOK ENDS BY 3" MINIMUM.

ADDITIONAL REINFORCEMENT WHERE SPECIFICALLY NOTED ON THE DRAWINGS

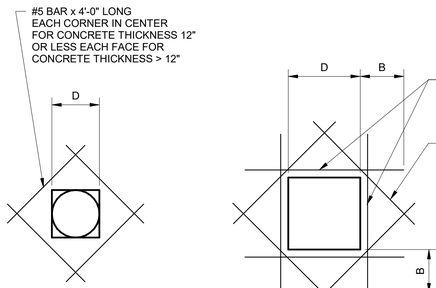


NOTES:

1. EQUIPMENT MANUFACTURER TO INDICATE REQUIRED FLATNESS WHERE NO GROUT IS SPECIFIED. TOLERANCES SHALL BE IN CONFORMANCE WITH ACI 117 - SPECIFICATION FOR TOLERANCES FOR CONCRETE CONSTRUCTION.
2. CONTRACTOR AND SUPPLIER SHALL COORDINATE FINAL LOCATION AND SIZE OF PADS WITH EQUIPMENT FURNISHED. COORDINATE ANCHOR BOLT REQUIREMENTS FOR REQUIRED EMBEDMENT DEPTHS AND CONCRETE EDGE DISTANCES.
3. WHERE THE DESIGN ANCHOR BOLT EMBEDMENT IS GREATER THAN THE CONCRETE EQUIPMENT BASE THICKNESS, THEN THE REQUIRED DEPTH OF EMBEDMENT SHALL BE MEASURED FROM THE TOP OF STRUCTURAL SLAB AND NOT THE TOP OF THE EQUIPMENT BASE.
4. EQUIPMENT BASE SHALL USE STRUCTURAL CONCRETE AS INDICATED IN THE CAST-IN-PLACE CONCRETE SPECIFICATION.
5. ANCHOR BOLTS AND REINFORCING WILL BE INSPECTED IN ACCORDANCE WITH THE CODE REQUIRED SPECIAL INSPECTIONS AND PROCEDURES SPECIFICATION.

B EQUIPMENT BASE DETAIL

1" = 1'-0"

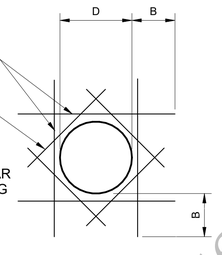


FOR OPENINGS 12" < = D < = 21"

DIAGONAL BAR LENGTH

THICKNESS OF CONCRETE	DIAGONAL BAR SIZE	RECTANGULAR OPENING	CIRCULAR OPENING
< 12"	#4	3'-0"	D+12"
12" TO 18"	#5	3'-0"	D+12"
> 18"	#6	3'-0"	D+12"

FOR RECTANGULAR OPENINGS 21" < D < = 54"



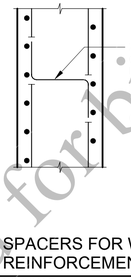
FOR CIRCULAR OPENINGS 21" < D < = 54"

B = THE REQUIRED LENGTH FOR LAPPED SPLICE FOR TOP BARS AS SHOWN ON THIS SHEET

TYPICAL REQUIRED UNLESS ADDITIONAL REINFORCEMENT SPECIFICALLY INDICATED AT OPENINGS ON DRAWINGS

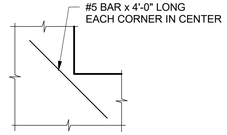
C TYPICAL EXTRA REINFORCEMENT AT OPENINGS 12" TO < = 54"

NO SCALE



D SPACERS FOR WALL REINFORCEMENT

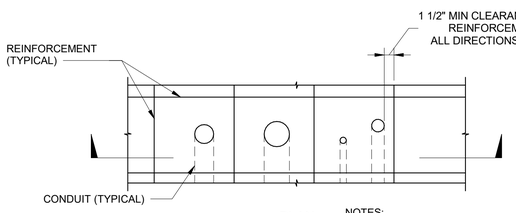
NO SCALE



E TYPICAL EXTRA REINFORCEMENT AT ISOLATED RE-ENTRANT CORNERS

NO SCALE

NOTE:
TYPICAL REQUIRED UNLESS ADDITIONAL REINFORCEMENT SPECIFICALLY INDICATED AT OPENINGS ON DRAWINGS



PLAN

SECTION

NOTES:
1. PLACE CONDUIT ONLY IN SHADED AREA.
2. FOR CONDUIT REQUIREMENTS SEE THE ELECTRICAL DRAWINGS AND SPECIFICATIONS.
3. CONDUIT THAT IS TOO LARGE OR CONGESTED TO FIT WITHIN THE SLAB AND REINFORCEMENT AS INDICATED SHALL BE ROUTED BELOW THE SLAB AS INDICATED IN THE ELECTRICAL SPECIFICATIONS OR ON THE DRAWINGS.

F CONDUIT PLACING DETAIL

NO SCALE

LENGTH OF LAPPED SPLICES FOR REINFORCEMENT (INCHES)

UNLESS NOTED OTHERWISE ON THE DRAWINGS

BAR SIZE *	BEAMS & COLUMNS		WALLS & SLABS		BAR SIZE *
	**TOP BARS	OTHERS	**TOP BARS	OTHERS	
#3	16	16	16	16	#3
#4	19	16	19	16	#4
#5	24	18	24	18	#5
#6	33	26	29	22	#6
#7	55	42	48	37	#7
#8	69	53	60	46	#8
#9	84	65	74	57	#9
#10	103	79	91	70	#10
#11	122	94	108	83	#11

* LAP SPLICE LENGTH FOR BARS OF DIFFERENT SIZES SHALL BE THE GREATER OF THE SMALL BAR LAP LENGTH OR 0.75x THE LARGER BAR LAP LENGTH.

** TOP BARS ARE HORIZONTAL BARS SO PLACED THAT MORE THAN 12" OF CONCRETE IS CAST IN THE MEMBER BELOW THE BAR. HORIZONTAL BARS IN WALLS ARE TO BE PROVIDED WITH LAP LENGTHS AS REQUIRED FOR TOP BARS. VERTICAL BARS MAY BE CONSIDERED AS OTHER BARS.

CONCRETE COVER FOR REINFORCEMENT

UNLESS NOTED OTHERWISE ON THE DRAWINGS

LOCATION	SPECIFIED COVER
UNFORMED SURFACES ADJACENT TO EXCAVATION	3"
SURFACES INSIDE OF OZONE CONTACTORS EXPOSED TO OZONE IN WATER OR AIR	3"
TOP SURFACES OF SLABS THAT ARE SUBMERGED	3"
FORMED SURFACES THAT ARE SUBMERGED, AND FORMED OR TOP SURFACES EXPOSED TO WEATHER, SATURATED AIR, OR EARTH	2"
OTHER LOCATIONS:	
BEAMS AND GIRDERS	1 1/2"
SLABS, WALLS AND JOISTS: #6 AND LARGER	1 1/2"
#5 AND SMALLER	1"

NOTES:

1. COVER IS MEASURED TO NEAREST BAR, STIRRUP, TIE, OR SPIRAL, AS APPLICABLE.
2. TOLERANCES FOR CONCRETE COVER AND THE FABRICATION AND PLACING OF REINFORCEMENT SHALL CONFORM TO ACI 117.

12" 9" 6" 3" 0" 1' 2'

1" = 1'-0"

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

GENERAL SHEET NOTES:

1. DETAILS ON THIS DRAWING APPLY TO ALL DRAWINGS UNLESS OTHERWISE NOTED.
2. WORK THIS DRAWING WITH THE STANDARD CONCRETE JOINT DETAILS.

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ILLINOIS PROFESSIONAL
DESIGN FIRM - 184.002143-0006

Four Rivers Sanitation Authority

AEROBIC GRANULAR SLUDGE - PHASE 1

REVISIONS AND RECORD OF ISSUE

DESIGNED:	SKA
DETAILED:	UBS
CHECKED:	CG
APPROVED:	TNG
DATE:	12/20/2022
PROJECT NO.:	411752

DETAILS

STRUCTURAL

STANDARD CONCRETE REINFORCING DETAILS

99-S-501

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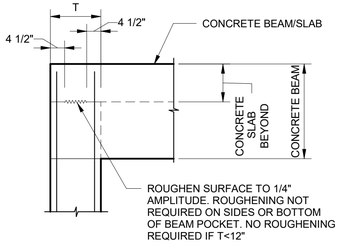
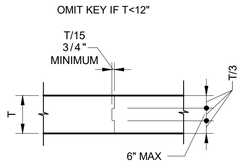
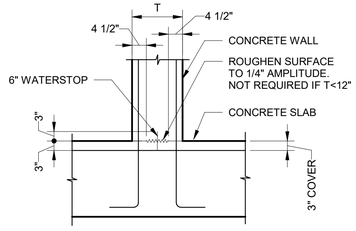


TOP OF WALL TO BEAM/SLAB

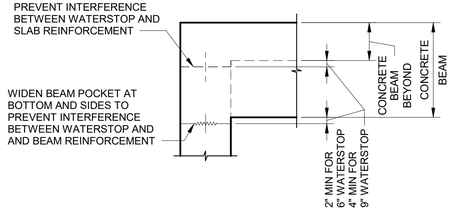


SLAB TO SLAB

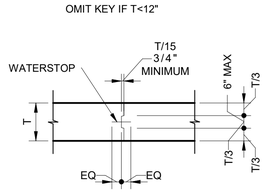


FOR T < 18"

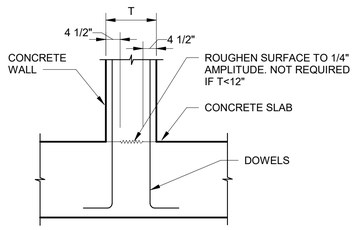
SLAB TO BOTTOM OF WALL



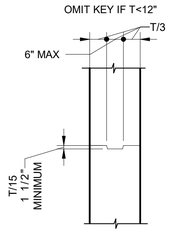
TOP OF WALL TO BEAM/SLAB



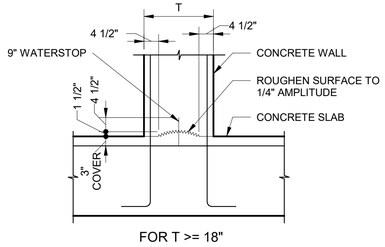
SLAB TO SLAB (T>=12")



SLAB TO BOTTOM OF WALL

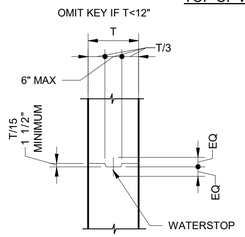


WALL TO WALL



FOR T >= 18"

SLAB TO BOTTOM OF WALL



WALL TO WALL

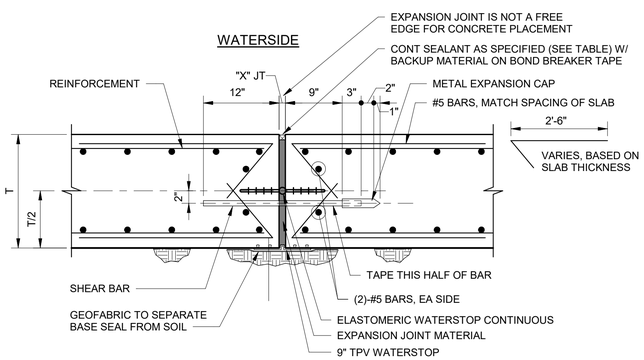
JOINTS WITHOUT WATERSTOPS

JOINTS WITH WATERSTOPS

NOTES:
1. REINFORCEMENT STEEL IS CONTINUOUS THROUGH ALL CONSTRUCTION JOINTS.
2. "CSJ W/ WS" - CONSTRUCTION JOINT WITH WATERSTOP.
3. "CSJ" - CONSTRUCTION JOINT WITHOUT WATERSTOP.
4. UNLESS NOTED OTHERWISE, WATERSTOPS MAY BE STEEL OR PVC.
5. WATERSTOP SIZE SHALL BE 6" FOR WALLS AND SLABS 18" OR LESS IN THICKNESS, AND SHALL BE 9" FOR WALLS AND SLABS THICKER THAN 18".

A TYPICAL CONSTRUCTION JOINTS

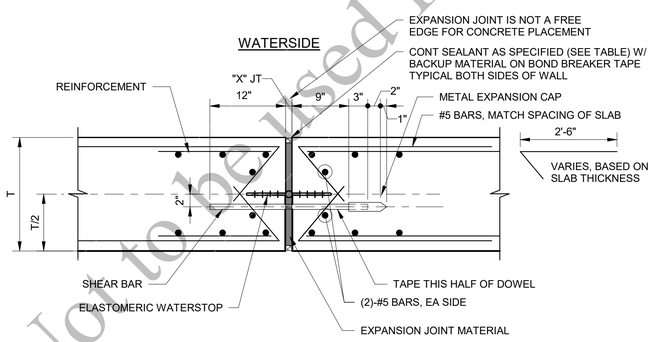
1/2" = 1'-0"



SLABS (SECTION)

EXPANSION JOINT (WALLS & SLAB)

SEALANT TYPE	EJ SIZE "X"	SEALANT DEPTH
POLYURETHANE OR POLYSULFIDE	3/4"	3/8"
	1"	1/2"
	1 1/2"	3/4"

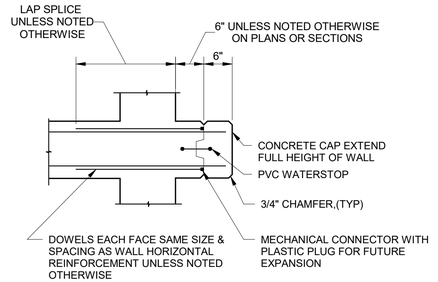


WALLS (PLAN)

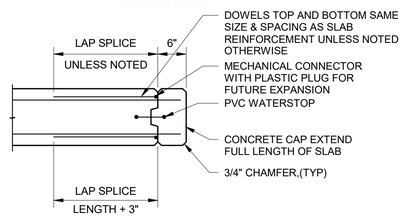
NOTES:
1. PROVIDE 1" DIAMETER SHEAR BARS @ 6" CENTERS ACROSS JOINT UNLESS NOTED OTHERWISE.
2. REINFORCING STEEL SHALL NOT BE EXTENDED ACROSS JOINT UNLESS NOTED OTHERWISE. SHEAR BARS SHALL BE SMOOTH FREE FROM RUST OR SCALE, AND GREASED TO PREVENT BOND (ONE HALF BAR ONLY).
3. WATERSTOP SIZE SHALL BE 6" FOR WALLS AND SLABS LESS THAN 18" IN THICKNESS, AND SHALL BE 9" FOR WALLS AND SLABS THICKER THAN 18".
4. "EJ W/ WS" - EXPANSION JOINT WITH ELASTOMERIC WATERSTOP
"EJ" - EXPANSION JOINT WITHOUT WATERSTOP

B TYPICAL EXPANSION JOINT DETAILS

1" = 1'-0"



WALLS (PLAN)



SLABS (SECTION)

C FUTURE EXPANSION DETAILS

3/4" = 1'-0"

12" 6" 0' 1' 2' 3'
3/4" = 1'-0"

12" 6" 0' 1' 2' 3' 4' 5'
1/2" = 1'-0"

12" 9" 6" 3" 0' 1' 2'
1" = 1'-0"

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

GENERAL SHEET NOTES:

1. DETAILS ON THIS DRAWING APPLY TO ALL DRAWINGS UNLESS NOTED OTHERWISE.
2. WORK THIS DRAWING WITH THE STANDARD CONCRETE REINFORCEMENT DETAILS.
3. AT WALL JOINTS AND AT WALL BASE JOINTS, SECURE ALL ELASTOMERIC WATERSTOPS IN THE CORRECT POSITION USING HOG RINGS OR GROMMETS SPACED AT 12 INCHES ALONG THE LENGTH OF THE WATERSTOP AND WIRE TIE TO ADJACENT REINFORCING STEEL.
4. AT SLAB JOINTS AND FOOTING JOINTS, ENSURE SPACE BENEATH AND AROUND WATERSTOP IS COMPLETELY FILLED WITH CONSOLIDATED CONCRETE. DURING OPERATION, MAKE VISUAL INSPECTION OF ENTIRE WATERSTOP AREA. LIMIT CONCRETE PLACEMENT TO ELEVATION OF WATERSTOP IN FIRST LIFT. RAISE ELASTOMERIC WATERSTOPS TO CONFIRM FULL CONSOLIDATION WITHOUT VOIDS. PLACE REMAINING CONCRETE TO FULL DEPTH OF SLAB.

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Four Rivers Sanitation Authority

AEROBIC GRANULAR SLUDGE - PHASE 1

REVISIONS AND RECORD OF ISSUE

DESIGNED:	SKA
DETAILED:	UBS
CHECKED:	CG
APPROVED:	TNG
DATE:	12/20/2022
PROJECT NO.:	411752

DETAILS

STRUCTURAL

STANDARD CONCRETE JOINT DETAILS

99-S-502

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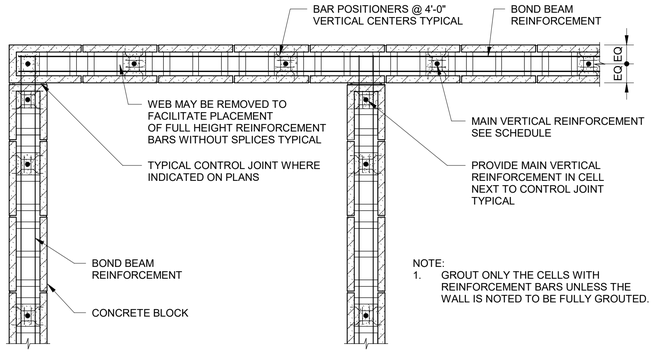
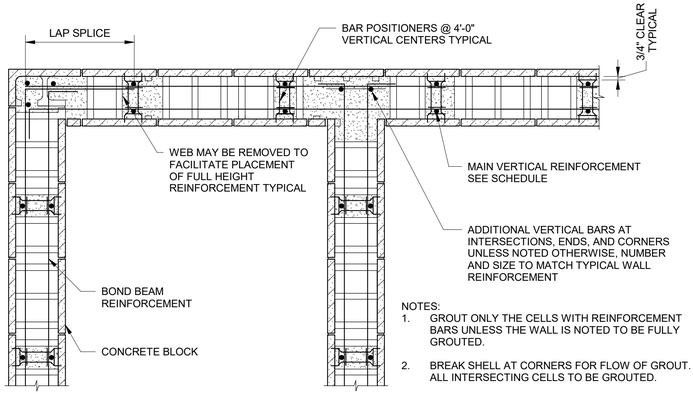


TYPICAL REINFORCEMENT WITH CORNER CONTROL JOINTS

SINGLE CURTAIN VERTICAL REINFORCEMENT SHOWN.
DOUBLE CURTAIN SIMILAR EXCEPT BARS POSITIONED EACH FACE, SEE ADJACENT DETAIL.

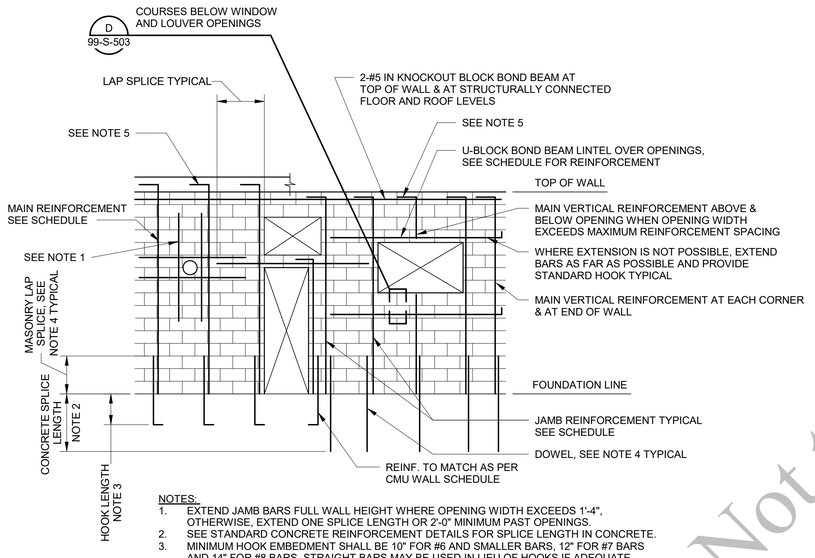


TYPICAL REINFORCEMENT WITHOUT CORNER CONTROL JOINTS

DOUBLE CURTAIN VERTICAL REINFORCEMENT SHOWN.
SINGLE CURTAIN SIMILAR EXCEPT BARS CENTERED IN WALL, SEE ADJACENT DETAIL.

A TYPICAL MASONRY REINFORCEMENT PLANS

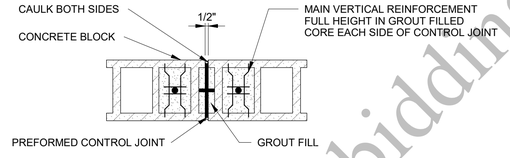
3/4" = 1'-0"



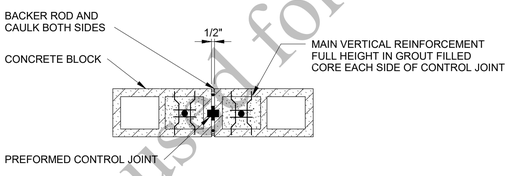
NOTES:
1. EXTEND JAMB BARS FULL WALL HEIGHT WHERE OPENING WIDTH EXCEEDS 1'-4", OTHERWISE, EXTEND ONE SPLICE LENGTH OR 2'-0" MINIMUM PAST OPENINGS.
2. SEE STANDARD CONCRETE REINFORCEMENT DETAILS FOR SPLICE LENGTH IN CONCRETE.
3. MINIMUM HOOK EMBEDMENT SHALL BE 10" FOR #6 AND SMALLER BARS, 12" FOR #7 BARS AND 14" FOR #8 BARS. STRAIGHT BARS MAY BE USED IN LIEU OF HOOKS IF ADEQUATE CONCRETE THICKNESS IS AVAILABLE.
4. THE SIZE AND QUANTITY OF DOWEL BARS PER CELL SHALL MATCH THE SIZE AND QUANTITY OF MAIN VERTICAL BARS IN THE CELL, UNLESS INDICATED OTHERWISE.
5. WHERE METAL OR PRECAST CONCRETE ROOFS ATTACH TO TOP BOND BEAM, VERTICAL WALL REINFORCEMENT SHALL TERMINATE 2 INCHES FROM THE TOP OF THE BOND BEAM WITH A STANDARD HOOK. WHERE CAST-IN-PLACE CONCRETE ROOFS ATTACH TO TOP BOND BEAM, VERTICAL WALL REINFORCEMENT SHALL TERMINATE 2 INCHES FROM THE TOP OF THE CONCRETE SLAB WITH A STANDARD HOOK. WHERE WALLS ARE NON-LOAD-BEARING, VERTICAL WALL REINFORCEMENT SHALL TERMINATE AS A STRAIGHT BAR 2 INCHES FROM TOP OF BOND BEAM.

B TYPICAL MASONRY REINFORCEMENT ELEVATION

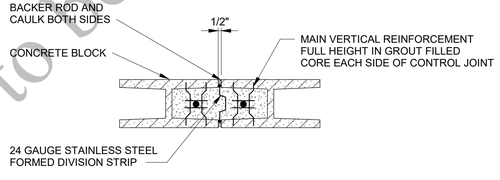
1/4" = 1'-0"



STRETCHER BLOCK TYPE



SASH BLOCK TYPE



H-BLOCK TYPE

NOTES:
1. LADDER TYPE JOINT REINFORCEMENT IS DISCONTINUOUS AT CONTROL JOINT.
2. BOND BEAM REINFORCEMENT IS DISCONTINUOUS THROUGH CONTROL JOINT, EXCEPT REINFORCEMENT SHALL BE CONTINUOUS AT CONTROL JOINTS WHERE BOND BEAMS ARE LOCATED AT ROOF AND FLOOR BEAM BEARING.
3. CONTROL JOINT IS CONTINUOUS FULL WALL HEIGHT.
4. CONTROL JOINT LOCATIONS SHALL BE AS INDICATED ON THE PLANS.
5. SEE ARCHITECTURAL DRAWINGS FOR LOCATION OF VENEER CONTROL OR EXPANSION JOINTS. CONTROL JOINTS IN CMU BACKUP AND VENEER DO NOT ALIGN.

C TYPICAL CMU CONTROL JOINT

1" = 1'-0"

GENERAL SHEET NOTES:

1. THE DETAILS ON THIS SHEET ARE APPLICABLE TO ALL CONCRETE MASONRY CONSTRUCTION. SPECIAL NOTES, SECTIONS AND DETAILS SPECIFICALLY NOTED ON THE DESIGN DRAWINGS SHALL BE APPLICABLE IN LIEU OF THESE TYPICAL DETAILS.
2. FOR MISCELLANEOUS APPURTENANCES INCLUDING EMBEDMENTS, BRACING, STEEL OR PRECAST LINTELS, VENEER, FLASHING, WEEPS, INSULATION, SEALING, CAULKING AND EMBEDDED PIPE AND ELECTRICAL CONDUIT, SEE THE DESIGN DRAWINGS.
3. WORK THIS DRAWING WITH THE STANDARD CONCRETE MASONRY LINTEL & JAMB REINFORCEMENT DETAILS DRAWING.

CMU WALL AND MAIN REINFORCEMENT SCHEDULE

BUILDING	WALL	BLOCK THICKNESS	GROUTING (NOTE 1)	MAIN VERTICAL REINFORCEMENT			MAIN HORIZONTAL REINFORCEMENT	WALL CONTROL JOINTS
				BARS PER REINFORCED CELL (NOTE 2)	BAR SIZE	MAX SPACING OF VERTICAL REINFORCEMENT		
AGS REACTORS AND PIPE GALLERY (STAIR TOWER)	NORTH	8"	R	1 (CENTERED)	#4	48"	PROVIDE 8" BOND BEAM SPACED 2'-0" VERTICALLY WITH 1-#5 AT BOTTOM	
	SOUTH	8"	R	1 (CENTERED)	#4	48"		
	EAST	8"	R	1 (CENTERED)	#4	48"		
	WEST	8"	R	1 (CENTERED)	#4	48"		
	INTERIOR	8"	R	1 (CENTERED)	#4	48"		
AGS SUPPORT FACILITY	NORTH	12"	F	2 (ONE AT EF)	#5	48"	PROVIDE 8" BOND BEAM SPACED 2'-0" VERTICALLY WITH 2-#5 AT BOTTOM IN 12" CMU WALL AND 1-#5 AT BOTTOM IN 8" CMU WALL	
	SOUTH	12"	F	2 (ONE AT EF)	#5	48"		
	EAST	12"	F	2 (ONE AT EF)	#5	8"		
	WEST	12"	F	2 (ONE AT EF)	#5	48"		
	INTERIOR	8"	F	1 (CENTERED)	#5	48"		

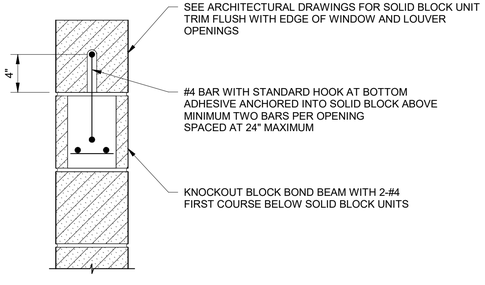
NOTES:
1. "F" INDICATES A FULLY GROUTED WALL, "R" INDICATES TO GROUT ONLY THE REINFORCED CELLS.
2. "1" INDICATES A SINGLE BAR CENTERED IN WALL, "2" INDICATES DOUBLE CURTAIN REINFORCEMENT, WITH ONE BAR EACH FACE OF CELL.
3. SEE THE OTHER STRUCTURAL DRAWINGS FOR ADDITIONAL REINFORCEMENT DETAILS AT CONNECTIONS, TOPS OF WALLS, JAMBS, LINTELS, ETC.
4. CMU = CONCRETE MASONRY UNIT

LENGTH OF LAP SPLICES FOR REINFORCEMENT (INCHES)

(f'_m 2500 PSI, IBC 2012, 2015 & 2018)

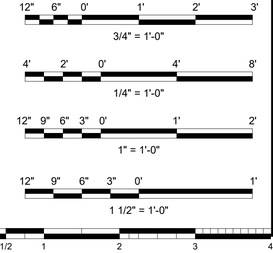
BAR SIZE	8" CONCRETE MASONRY UNIT		12" CONCRETE MASONRY UNIT	
	SINGLE REINFORCEMENT	DOUBLE REINFORCEMENT	SINGLE REINFORCEMENT	DOUBLE REINFORCEMENT
4	12	20	12	17
5	18	32	12	27
6	34	-	21	51
7	47	-	29	(71)
8	(71)	-	45	(110)

1. NON-CONTACT LAP SPLICES SHALL NOT BE USED.
2. ( ) BRACKETED SPLICE LENGTHS NOT RECOMMENDED. USE MECHANICAL CONNECTORS OR A FULL HEIGHT REINFORCEMENT BAR.



D COURSES BELOW WINDOW AND LOUVER OPENING

1 1/2" = 1'-0"



(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

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DESIGN FIRM - 184.002143-0006

Four Rivers Sanitation Authority

AEROBIC GRANULAR SLUDGE - PHASE 1

REVISIONS AND RECORD OF ISSUE

DESIGNED:	SKA
DETAILED:	UBS
CHECKED:	CG
APPROVED:	TNG
DATE:	12/20/2022
PROJECT NO.:	411752

DETAILS

STRUCTURAL

TYPICAL CONCRETE MASONRY REINFORCING DETAILS

99-S-503

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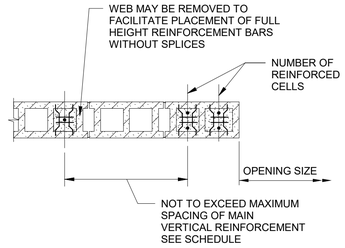
JAMB SCHEDULE

BUILDING	WALL	BLOCK THICKNESS	OPENING SIZE	JAMBS			REMARKS
				NUMBER OF REINFORCED CELLS	BARS PER REINFORCED CELL	BAR SIZE	
AGS REACTORS AND PIPE GALLERY (STAIR TOWER)	NORTH	8"	<=4'-0"	2	1 (CENTERED)	#4	
	EAST	8"	<=4'-0"	2	1 (CENTERED)	#4	
	WEST	8"	<=4'-0"	2	1 (CENTERED)	#4	
AGS SUPPORT FACILITY	NORTH	12"	<=4'-0"	1	2 (ONE EACH FACE)	#5	
	EAST	12"	<=4'-0"	1	2 (ONE EACH FACE)	#5	
			4'-0" TO 6'-6"	1	2 (ONE EACH FACE)	#5	
			6'-6" TO 14'-0"	2	2 (ONE EACH FACE)	#5	
	WEST	12"	<=4'-0"	1	2 (ONE EACH FACE)	#5	
	INTERIOR	8"	<=4'-0"	2	1 (CENTERED)	#5	

NOTES:
1. AN INTERIOR WALL IS A WALL IN WHICH NO PORTION OF THE WALL IS EXPOSED TO THE EXTERIOR.
2. REINFORCE JAMBS AS INDICATED UNLESS NOTED OTHERWISE ON THE DRAWINGS.



JAMB - PLAN

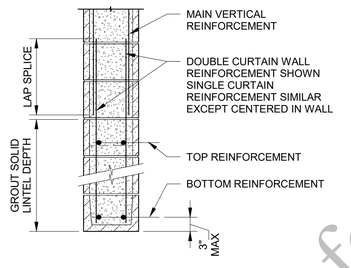
A TYPICAL MASONRY JAMB SCHEDULE AND PLAN

NO SCALE

LINTEL SCHEDULE

BUILDING	WALL	BLOCK THICKNESS	OPENING SIZE	LINTELS			REMARKS
				DEPTH	BOTTOM REINFORCEMENT	TOP REINFORCEMENT	
AGS REACTORS AND PIPE GALLERY (STAIR TOWER)	NORTH	8"	<=4'-0"	16"	1-#4	1-#4	
	EAST	8"	<=4'-0"	16"	1-#4	1-#4	
	WEST	8"	<=4'-0"	16"	1-#4	1-#4	
AGS SUPPORT FACILITY	NORTH	12"	<=4'-0"	16"	2-#5	2-#5	
	EAST	12"	<=4'-0"	24"	2-#5	2-#5	
			4'-0" TO 6'-6"	32"	2-#5	2-#5	
			6'-6" TO 14'-0"	48"	2-#6	2-#6	
	WEST	12"	<=4'-0"	24"	2-#5	2-#5	
	INTERIOR	8"	<=4'-0"	16"	1-#5	1-#5	

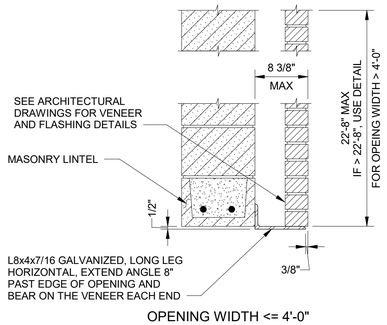
NOTES:
1. BEAR ALL LINTELS A MINIMUM 2'-0" AT EACH END.
2. REINFORCED LINTELS AS INDICATED UNLESS NOTED OTHERWISE ON THE DRAWINGS.



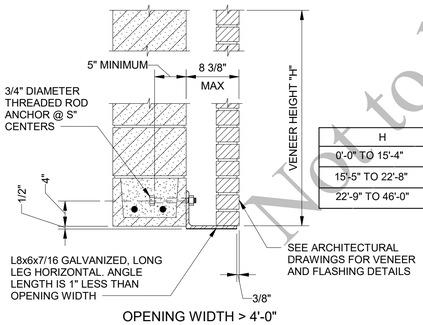
LINTEL - SECTION

B TYPICAL MASONRY LINTEL SCHEDULE AND SECTION

NO SCALE



OPENING WIDTH <= 4'-0"



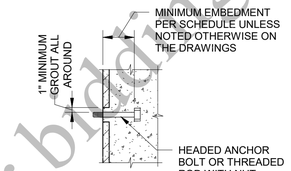
OPENING WIDTH > 4'-0"

H	S
0'-0" TO 15'-4"	24"
15'-5" TO 22'-8"	16"
22'-9" TO 46'-0"	8"

NOTE:
1. WHERE DIMENSION FROM FACE OF CMU TO OUTER FACE OF VENEER IS LESS THAN 8-3/8", TRIM HORIZONTAL ANGLE LEG TO MAINTAIN 3/8" INSET FROM VENEER, AND GRIND SMOOTH. GALVANIZE AFTER HORIZONTAL LEG IS TRIMMED.

D VENEER SUPPORT AT OPENING

1" = 1'-0"

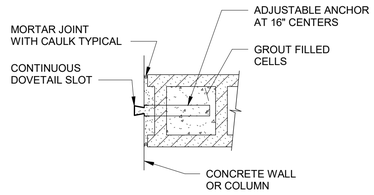


BOLT EMBEDMENT SCHEDULE UNLESS NOTED OTHERWISE	
BOLT SIZE	EMBED
1/2"	4"
5/8"	4"
3/4"	5"
7/8"	6"
1"	7"

NOTE:
MINIMUM BOLT SPACING SHALL BE (12) BOLT DIAMETERS WITH A MINIMUM EDGE DISTANCE OF (6) BOLT DIAMETERS AND WITH A MINIMUM OF 6" TO END OF WALL, UNLESS NOTED OTHERWISE.

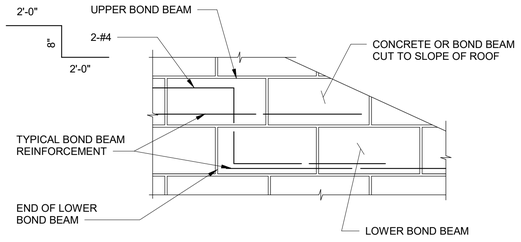
C TYPICAL MASONRY ANCHOR BOLT DETAIL

3/4" = 1'-0"



E TYPICAL MASONRY WALL AT CONCRETE WALL OR COLUMN

1 1/2" = 1'-0"



F BOND BEAM STEP DETAIL

1" = 1'-0"

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2. FOR MISCELLANEOUS APPURTENANCES INCLUDING EMBEDMENTS, BRACING, STEEL OR PRECAST LINTELS, VENEER, FLASHING, WEEPS, INSULATION, SEALING, CAULKING AND EMBEDDED PIPE AND ELECTRICAL CONDUIT, SEE THE DESIGN DRAWINGS.
3. WORK THIS DRAWING WITH THE STANDARD CONCRETE MASONRY WALL REINFORCEMENT DETAILS.

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Four Rivers Sanitation Authority

AEROBIC GRANULAR SLUDGE - PHASE 1

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DETAILS

STRUCTURAL

TYPICAL CONCRETE MASONRY LINTEL AND JAMB DETAILS

99-S-504

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12" 6" 0" 1' 2' 3'
3/4" = 1'-0"

12" 9" 6" 3" 0" 1' 2'
1" = 1'-0"

12" 9" 6" 3" 0" 1'
1 1/2" = 1'-0"

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

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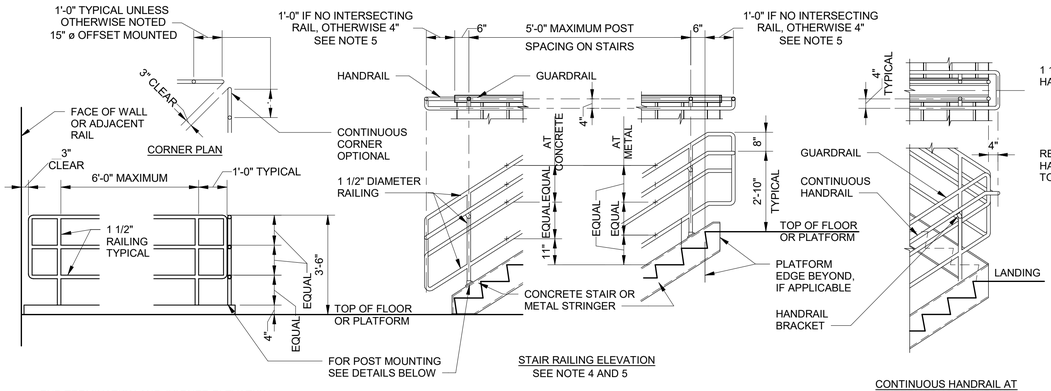
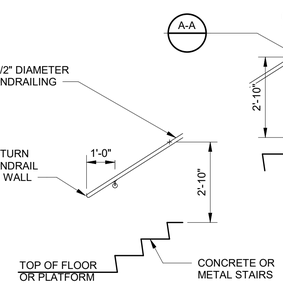
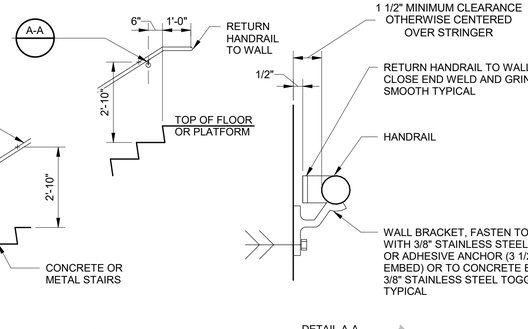


A THREE RAIL GUARDRAIL
3/8" = 1'-0"

CONTINUOUS HANDRAIL AT INTERMEDIATE LANDING

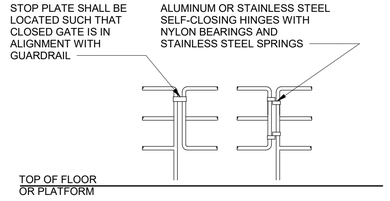


ELEVATION



DETAIL A-A
3" = 1'-0"

B WALL MOUNTED HANDRAIL
3/8" = 1'-0"



3 RAIL

GATE CONFIGURATION TO MATCH ADJACENT RAILING OR AS PROVIDED BY SELF-CLOSING SAFETY GATE MANUFACTURER IN SAME MATERIAL AS GUARDRAIL. SWING GATE INWARD WITH HINGES LOCATED TO PROVIDE LEAST OBSTRUCTION TO ACCESS.

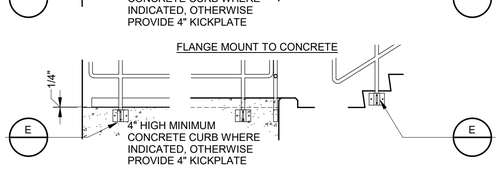
C SELF-CLOSING SWING GATE
3/8" = 1'-0"

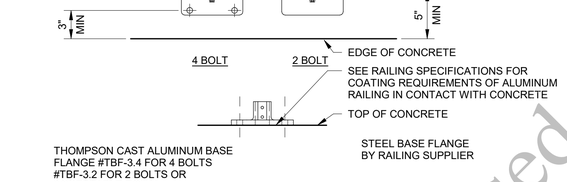
NOTES:

1. RAILING MATERIAL AND FABRICATION SHALL BE AS INDICATED ON THE DESIGN DRAWINGS AND IN THE PROJECT SPECIFICATIONS FOR HANDRAILING AND GUARDRAILING.
2. ALL RAILING AND MOUNTINGS SHALL BE DESIGNED AND FABRICATED IN COMPLIANCE WITH THE MOST STRINGENT REQUIREMENTS OF THE RAILING SPECIFICATIONS, THE APPLICABLE LOCAL BUILDING CODE AND ALL PERTINENT OSHA AND LOCAL SAFETY REGULATIONS.
3. GUARDRAIL AND HANDRAIL SHALL BE DESIGNED AND FABRICATED IN CONFIGURATIONS REQUIRED TO FIT THE LOCATIONS INDICATED ON THE DESIGN DRAWINGS. CONTRACTOR SHALL VERIFY FINAL DIMENSIONS BEFORE FABRICATION.
4. GUARDRAIL MAY BE REPLACED WITH WALL MOUNTED HANDRAIL AT STAIR EDGES AND STRINGERS LOCATED ADJACENT TO WALLS. IF THE OUTSIDE EDGE OF THE STAIR STRINGER IS MORE THAN 3" FROM THE WALL FACE, GUARDRAIL SHALL BE USED.
5. THE INBOARD HANDRAILING AT SWITCHBACK STAIR LANDINGS MUST BE CONTINUOUS FROM ONE STAIR RUN TO THE NEXT. ADJUST INDICATED DIMENSION AS REQUIRED TO ALIGN AND CONNECT RAILINGS OVER THE LANDING EDGE.
6. THE GUARDRAIL AND HANDRAIL CONFIGURATIONS ON THIS SHEET WILL NOT SATISFY ADA REQUIREMENTS FOR HANDICAPPED ACCESSIBILITY. AT LOCATIONS ON THE DESIGN DRAWINGS WHERE CONFORMANCE WITH ADA REQUIREMENTS IS SPECIFICALLY NOTED, THE RAILING SUPPLIER SHALL MODIFY THE CONFIGURATIONS TO COMPLY WITH THE MOST STRINGENT REQUIREMENTS OF ANSI 117.1 UNIFORM FEDERAL ACCESSIBILITY STANDARDS AND THE ACCESSIBILITY STANDARDS OF THE AMERICANS WITH DISABILITIES ACT (ADA).
7. AT LOCATIONS SPECIFICALLY INDICATED AS REMOVABLE RAILING, GUARDRAILING AND MOUNTING DETAILS SHALL BE MODIFIED AS FOLLOWS:

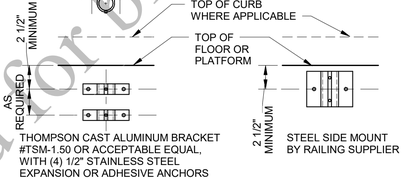
   * RAILING SHALL BE DETAILED IN SHORT LENGTHS THAT WEIGH NO MORE THAN 50 LBS. EACH PIECE SHALL INCLUDE AT LEAST 2, BUT NOT MORE THAN 3 POSTS. RAIL ENDS SHALL BE TERMINATED SIMILAR TO THE END TERMINATION DETAILS THIS SHEET.

   * MOUNTING DETAILS SHALL BE MODIFIED TO PERMIT RAILING PIECES TO BE REMOVED AND REINSTALLED WITHOUT USE OF TOOLS.
8. ALL GUARDRAILS AND HANDRAILS SHALL BE ALUMINUM

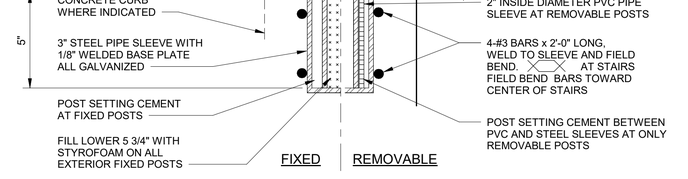




D BASE FLANGE MOUNT
1 1/2" = 1'-0"



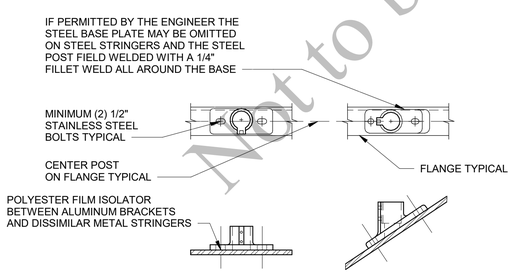
E SIDE MOUNT
1 1/2" = 1'-0"



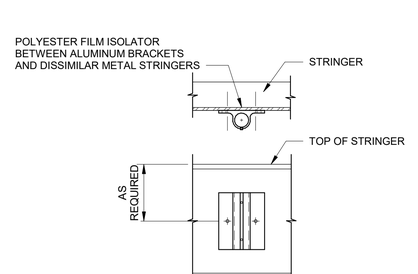
NOTES:

1. FIXED AND REMOVABLE DETAILS SIMILAR EXCEPT AS NOTED.
2. THE REMOVABLE SLEEVE MOUNT DETAIL SHALL NOT BE USED IN WET LOCATIONS SUBJECT TO FREEZING. SUBSTITUTE A REMOVABLE BASE FLANGE OR SIDE MOUNT DETAIL.

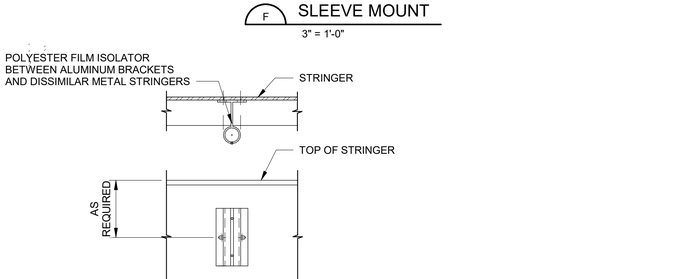
F SLEEVE MOUNT
3" = 1'-0"



G BASE FLANGE MOUNT
1 1/2" = 1'-0"



H SIDE MOUNT
1 1/2" = 1'-0"



J OFFSET SIDE MOUNT
1 1/2" = 1'-0"

POST MOUNTED TO METAL

12" 0' 1' 2' 3' 4' 5' 6' 7'
3/8" = 1'-0"

12" 9" 6" 3" 0' 1'
1 1/2" = 1'-0"

12" 9" 6" 3" 0"
3" = 1'-0"

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

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DETAILS

STRUCTURAL

STANDARD 3-RAIL GUARDRAIL AND HANDRAIL DETAILS

99-S-505

135 OF 163

PLOTTED: 12/19/2022 4:26:21 PM
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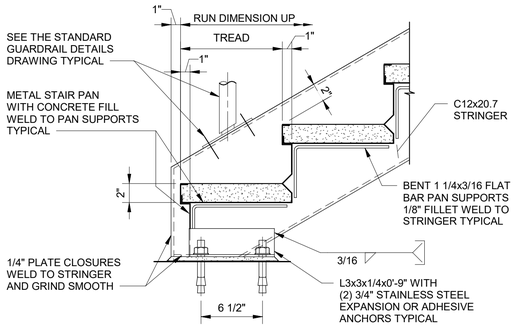
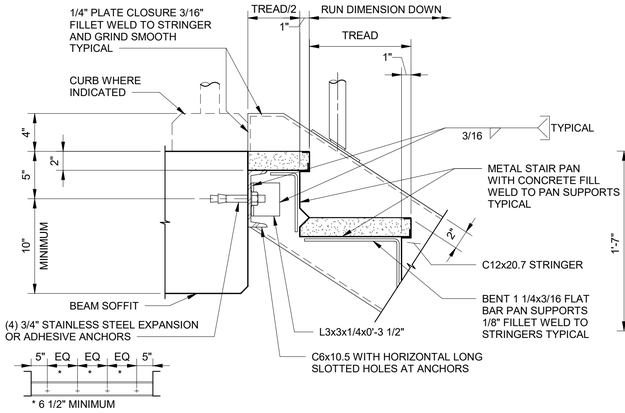
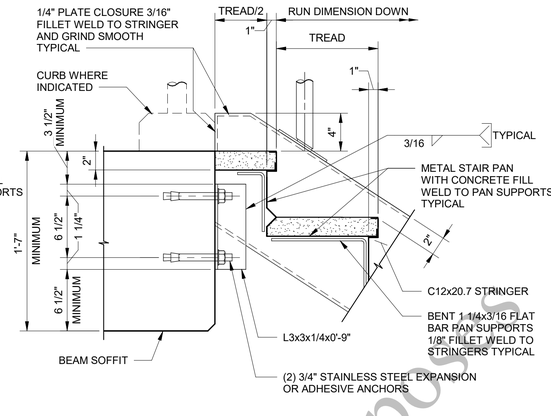


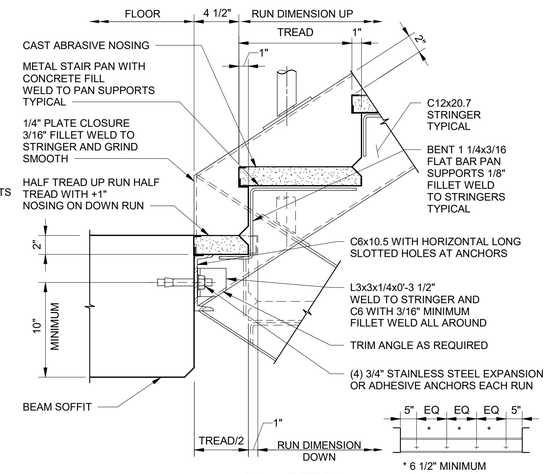
A DETAIL
1 1/2" = 1'-0"



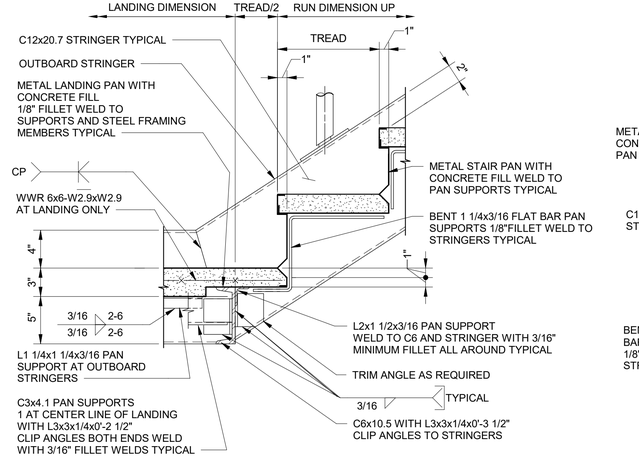
B DETAIL
1 1/2" = 1'-0"



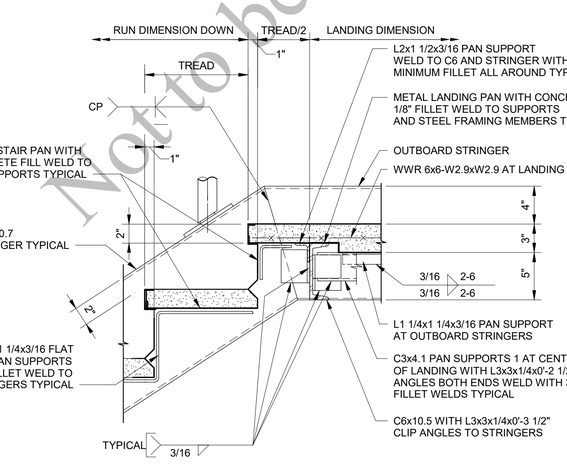
BB ALTERNATE DETAIL
1 1/2" = 1'-0"



C DETAIL
1 1/2" = 1'-0"



D DETAIL
1 1/2" = 1'-0"



E DETAIL
1 1/2" = 1'-0"

F DETAIL
1 1/2" = 1'-0"

G DETAIL
1 1/2" = 1'-0"

H DETAIL
1 1/2" = 1'-0"

STAIR DESIGN NOTES:

1. STAIRS SHALL BE DESIGNED BY THE SUPPLIER IN GENERAL ACCORDANCE WITH DETAILS INDICATED ON THESE DESIGN DRAWINGS. THE DESIGN SHALL COMPLY WITH ALL APPLICABLE PROVISIONS OF THE LOCAL BUILDING CODE, ANSI A117.1 AND OSHA.
2. THE DESIGN SHALL BE SEALED BY AN ENGINEER REGISTERED IN THE STATE OF THE PROJECT. IF REQUESTED, CALCULATIONS SHALL BE SUBMITTED FOR REVIEW.
3. THE COMPLETED FABRICATIONS SHALL SUPPORT THE LOADS AND DEFLECTION CRITERIA INDICATED IN THE STRUCTURAL METALS SPECIFICATION.
4. THE STAIR DESIGN AND DETAILS SHALL BE COORDINATED WITH THE HANDRAILING AND GUARDRAILING SUPPLIED. STAIR MEMBERS SHALL BE ADEQUATE TO ACCEPT LOADS FROM THE RAIL POSTS BASED UPON THE CRITERIA INDICATED IN THE RAILING SPECIFICATIONS.
5. CONNECTIONS TO THE SUPPORTING STRUCTURE SHALL BE ADEQUATE TO TRANSFER ALL LOADINGS, AND SHALL BE DESIGNED IN ACCORDANCE WITH ALL APPLICABLE PROVISIONS OF THE AISC MANUAL AND ACI 318. THE NUMBER AND TYPE OF CONNECTIONS SHALL COMPLY AT A MINIMUM, WITH THESE DESIGN DRAWINGS. ALL NECESSARY BRACKETS, BOLTS, AND ANCHORS SHALL BE PROVIDED.

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Four Rivers Sanitation Authority

AEROBIC GRANULAR SLUDGE - PHASE 1

REVISIONS AND RECORD OF ISSUE

DESIGNED:	SKA
DETAILED:	UBS
CHECKED:	CG
APPROVED:	TNG
DATE:	12/20/2022
PROJECT NO.:	411752

DETAILS

STRUCTURAL

STANDARD STEEL PAN STAIR DETAILS

99-S-506

136 OF 163

12" 9" 6" 3" 0" 1'
1 1/2" = 1'-0"

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

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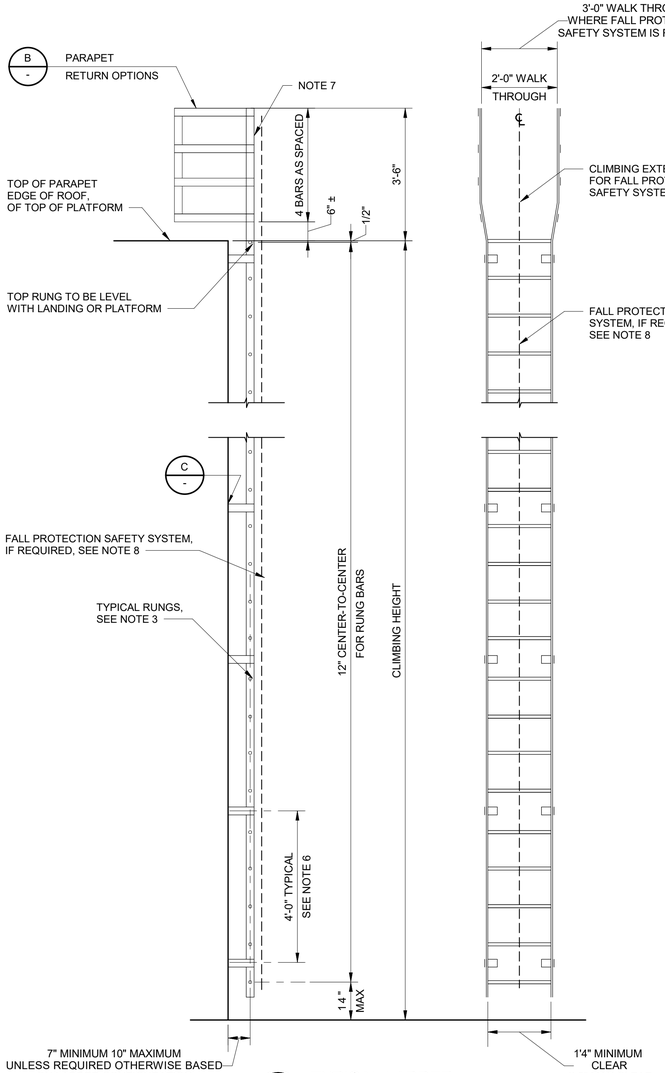
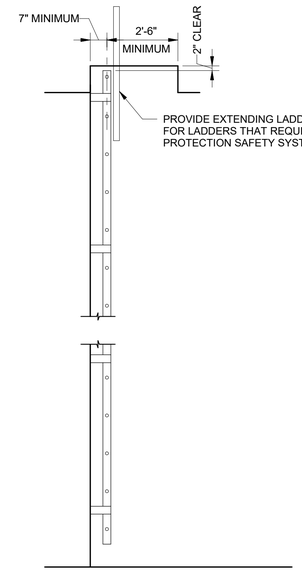
D11000



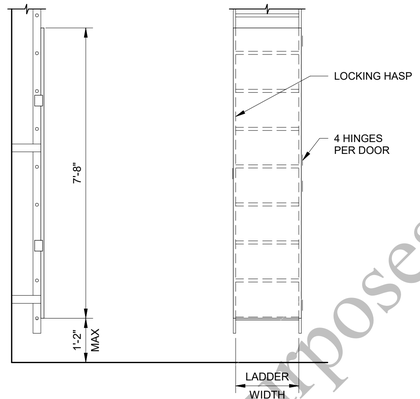
A TYPICAL LADDER

1/2" = 1'-0"



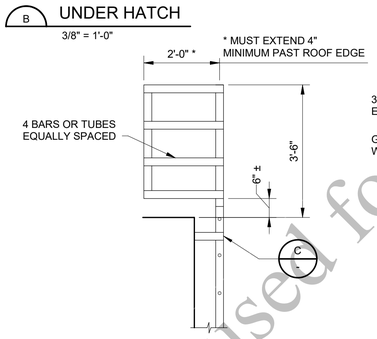
B UNDER HATCH

3/8" = 1'-0"



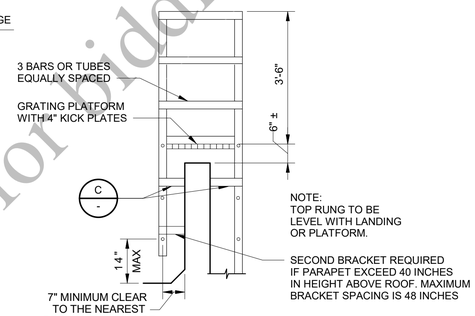
C SECURITY DOOR

1/2" = 1'-0"



DEFAULT OPTION 1

MINIMUM RETURN TO ROOF



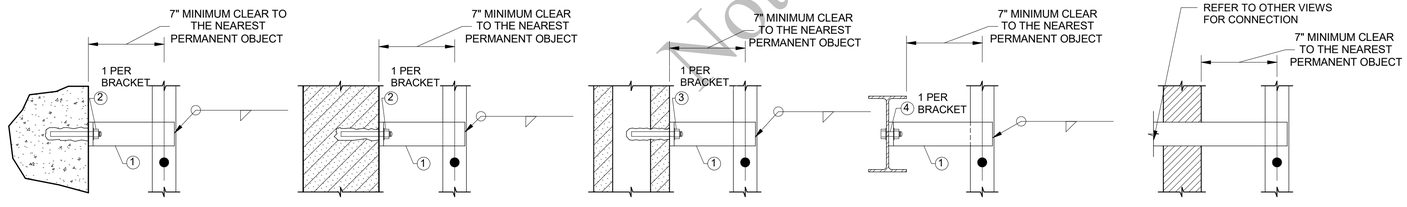
OPTION 2

RETURN TO REAR OF PARAPET WITH CROSSOVER PLATFORM

D PARAPET RETURN OPTIONS

1/2" = 1'-0"

USE OPTION 1 IF NONE INDICATED



CONCRETE | GROUTED CMU | HOLLOW CMU | STRUCTURAL STEEL | THROUGH MASONRY VENEER

① LADDER BRACKET BY LADDER SUPPLIER; WITH HOLES FOR CONNECTION TO STRUCTURE. ADJUSTABLE BRACKETS SHALL BE PROVIDED WHERE REQUIRED TO COMPENSATE FOR IRREGULAR OR OFFSET WALL SURFACES.

② 1/2" MIN STAINLESS STEEL ADHESIVE OR EXPANSION ANCHORS. MINIMUM EMBEDMENT PER THE ANCHOR MANUFACTURER'S ICC-ES REPORT.

③ 1/2" MIN DIAMETER STAINLESS STEEL ADHESIVE ANCHORS WITH SCREEN TUBES. MINIMUM EMBEDMENT PER THE ANCHOR MANUFACTURER'S ICC-ES REPORT.

④ IF LADDER IS PAINTED OR GALVANIZED STEEL, USE 3/4" GALVANIZED STEEL, USE 3/4" MIN GALVANIZED HIGH STRENGTH STEEL BOLTS WITH COMPATIBLE NUT AND WASHERS. IF LADDER IS STAINLESS STEEL OR ALUMINUM, USE 3/4" MIN STAINLESS STEEL BOLTS WITH COMPATIBLE NUTS AND WASHERS.

E TYPICAL LADDER BRACKET CONNECTIONS

1/2" = 1'-0"

GENERAL SHEET NOTES:

1. ALL LADDERS AND FALL PROTECTION SAFETY SYSTEM SHALL BE DESIGNED AND FABRICATED BY THE LADDER SUPPLIER IN CONFORMANCE WITH THE LATEST ISSUE OF OSHA/ANSI A14.3, SECTION 1910.27 APPLICABLE BUILDING CODE STANDARDS FOR FIXED WALL LADDERS, AND THE REQUIREMENTS OF THE CONTRACT DRAWINGS AND SPECIFICATIONS. GENERAL CONFIGURATION AND DETAILS SHALL CONFORM WITH THIS DRAWING.
2. LADDER AND ALL APPURTENANCES TO BE MATERIAL AS NOTED ON DRAWINGS. COORDINATE MATERIALS AND FABRICATION WITH THE SPECIFICATIONS FOR METAL FABRICATIONS AND FIBERGLASS, AS APPLICABLE.
   STEEL (PAINTED) - ASTM A36, SHOP PRIME PAINTED.
   STEEL (GALVANIZED) - ASTM A36, ZINC COATED IN ACCORDANCE WITH ASTM A123.
   ALUMINUM - ASTM A6061-T6 ALLOY WITH MILL FINISH UNLESS NOTED OTHERWISE.
   STAINLESS STEEL - ASTM TYPE 316L.
   FIBERGLASS - FIBERGLASS REINFORCED PULTRUDED TUBE, UV PROTECTED.
3. LADDER RUNGS TO BE MIN 1" DIAMETER BARS OR PREFABRICATED FLAT TOP LADDER TREADS WITH MINIMUM 1" WIDE SLIP RESISTANT SURFACES. SPACE RUNGS AT 12". LADDER SIDE RAILS SHALL BE FLAT STOCK.
4. FURNISH LADDERS IN CONFIGURATIONS REQUIRED TO FIT THE LOCATIONS INDICATED ON THE DESIGN DRAWINGS. CONTRACTOR SHALL VERIFY FINAL DIMENSIONS BEFORE FABRICATION.
5. LADDER SHOP DRAWINGS SHALL BE SEALED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF THE PROJECT. IF REQUESTED, CALCULATIONS OR TEST REPORTS VERIFYING THE LADDERS COMPLIANCE WITH APPLICABLE STANDARDS SHALL BE SUBMITTED, AND SHALL BE SEALED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF THE PROJECT.
6. IF A LADDER CONFIGURATION INDICATED ON THE DRAWINGS REQUIRES THAT THE LADDER SPAN A GREATER DISTANCE BETWEEN SUPPORTS THAN INDICATED ON THE TYPICAL DETAILS, THE LADDER SUPPLIER SHALL DESIGN THE LADDER, THE LADDER BRACKET, AND THE LADDER BRACKET CONNECTIONS FOR THE INDICATED SPAN IN ACCORDANCE WITH NOTE 1 ABOVE. THE BRACKET CONNECTIONS SHALL BE AT LEAST EQUAL TO THE TYPICAL CONNECTIONS INDICATED.
7. IF INTERRUPTION OF GUARDRAIL IS REQUIRED, SEE SELF-CLOSING SWING GATE DETAIL ON STANDARD GUARDRAIL DRAWING. SELF-CLOSING GATES SHALL BE UTILIZED AT ALL LADDER ENTRANCES EXCEPT LANDING (REST) PLATFORMS FOR CONTINUOUS LADDER CLIMBS.
8. A FALL PROTECTION SAFETY SYSTEM SHALL BE PROVIDED ON LADDERS AS INDICATED IN THE DRAWINGS AND WHERE THE LENGTH OF CLIMBING IS MORE THAN 24 FEET OR WHERE THE LENGTH OF CLIMB IS LESS THAN 24 FEET, BUT THE TOP OF THE LADDER IS MORE THAN 24 FEET ABOVE GROUND LEVEL, FLOOR OR ROOF. THE LADDER FALL PROTECTION SAFETY SYSTEM SHALL BE OSHA APPROVED. LADDER AND ANCHORAGES SHALL BE DESIGNED TO SUPPORT OSHA REQUIRED FALL PROTECTION LOADS AND ANY LOADS INDICATED IN THE FALL PROTECTION SAFETY SYSTEM'S PRODUCT LITERATURE.
9. WHERE A FALL PROTECTION SAFETY SYSTEM IS REQUIRED AND THE LADDER TERMINATES BELOW AN ACCESS HATCH, THE FALL PROTECTION SAFETY SYSTEM SHALL INCORPORATE A TELESCOPING ANCHOR EXTENSION WHICH IS INTEGRAL WITH THE SAFETY SYSTEM. THE TELESCOPING ANCHOR EXTENSION SHALL REPLACE THE REQUIREMENT FOR THE EXTENDING LADDER SAFETY POST.

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DETAILS

STRUCTURAL

STANDARD LADDER DETAILS

99-S-507

137 OF 163

12" 6" 0" 1' 2' 3' 4' 5'
1/2" = 1'-0"

12" 0" 1' 2' 3' 4' 5' 6' 7'
3/8" = 1'-0"

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

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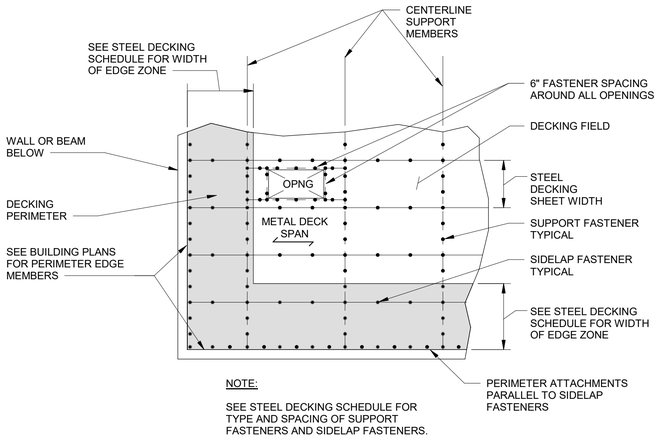
STEEL DECKING SCHEDULE

BUILDING	LOCATION	DECKING					SUPPORT FASTENERS			SIDELAP FASTENERS			EDGE ZONE WIDTH	PERIMETER ATTACHMENTS PARALLEL TO SIDELAP FASTENERS
		DEPTH	TYPE NOTE 1	GAUGE	SHOP COATING NOTE 2	MIN SPANS NOTE 3	TYPE NOTE 4	FIELD PATTERN	PERIMETER PATTERN	TYPE NOTE 4	FIELD SPACING	PERIMETER SPACING		
AGS SUPPORT FACILITY	ROOF	1 1/2"	B	20	G90	3	HILTI X-ENP-19-L15	36/4	36/4	HILTI S-SLC-01-M-MWH	12" OC	6" OC	3 FEET	HILTI X-ENP-19-L15

NOTES:

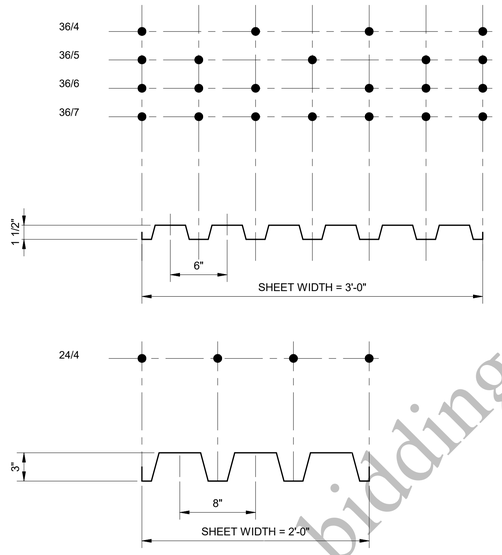
1. DECKING TYPE THAT INCLUDES "A" SHALL BE ACOUSTICAL DECKING.
2. "G60" AND "G90" INDICATE GALVANIZING THICKNESS, "PRIME" INDICATES PRIME PAINTING. SEE STEEL DECKING SPECIFICATION.
3. DECKING SHEETS SHALL BE CUT TO COVER AT LEAST THE NUMBER OF SPANS INDICATED.
4. "SCREWS", "POWER-ACTUATED", AND "PUNCHED" SHALL BE AS DESCRIBED IN THE STEEL DECKING SPECIFICATION.

A STEEL DECKING SCHEDULE
NO SCALE

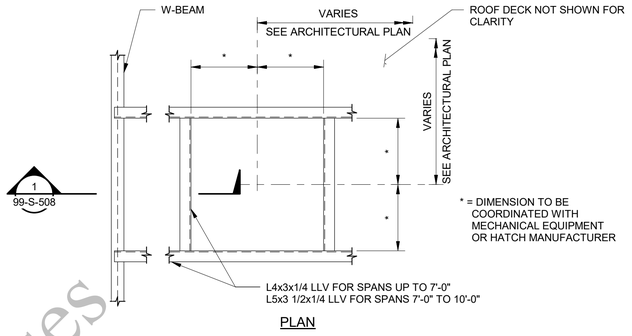


NOTE:

SEE STEEL DECKING SCHEDULE FOR TYPE AND SPACING OF SUPPORT FASTENERS AND SIDELAP FASTENERS.

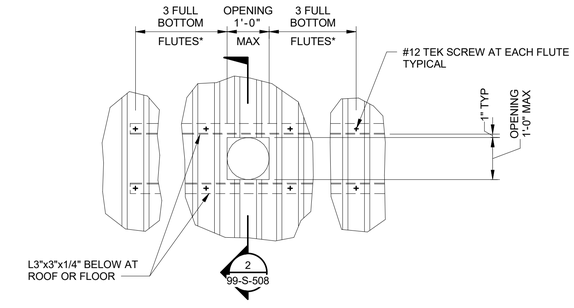


D METAL DECK ATTACHMENT DETAIL
1 1/2" = 1'-0"



PLAN

B TYPICAL STEEL DECK OPENING FRAMING DETAIL
1/2" = 1'-0"



PLAN VIEW

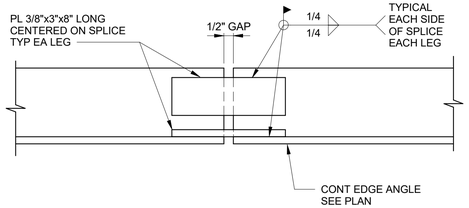
NOTES:

1. SEE ARCHITECTURAL, PROCESS MECHANICAL, AND ELECTRICAL DRAWINGS FOR LOCATION OF OPENINGS.
2. SEE ARCHITECTURAL DRAWINGS FOR FLASHING DETAILS.
3. * DENOTES TO CONNECT TO BEAM.

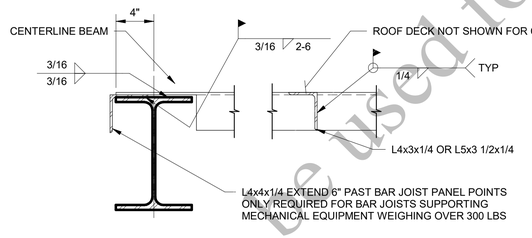
FRAMING FOR ROOF OPENING ≤ 1'-0"x1'-0" WITHOUT EQUIPMENT WEIGHT

F ROOF OPENING DETAIL
NO SCALE

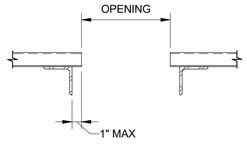
C STEEL DECKING FASTENER DETAIL
1/2" = 1'-0"



E EDGE ANGLE SPLICE DETAIL
3" = 1'-0"



1 SECTION
99-S-508 1 1/2" = 1'-0"



2 SECTION
99-S-508 1 1/2" = 1'-0"

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AEROBIC GRANULAR SLUDGE - PHASE 1

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DESIGNED:	SKA
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PROJECT NO.:	411752

DETAILS

STRUCTURAL

TYPICAL METAL DECK DETAILS

99-S-508

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12" 9" 6" 3" 0" 1' 2"
1" = 1'-0"
12' 6' 0' 1' 2' 3' 4' 5'
1/2" = 1'-0"
12" 9" 6" 3" 0" 1'
1 1/2" = 1'-0"

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

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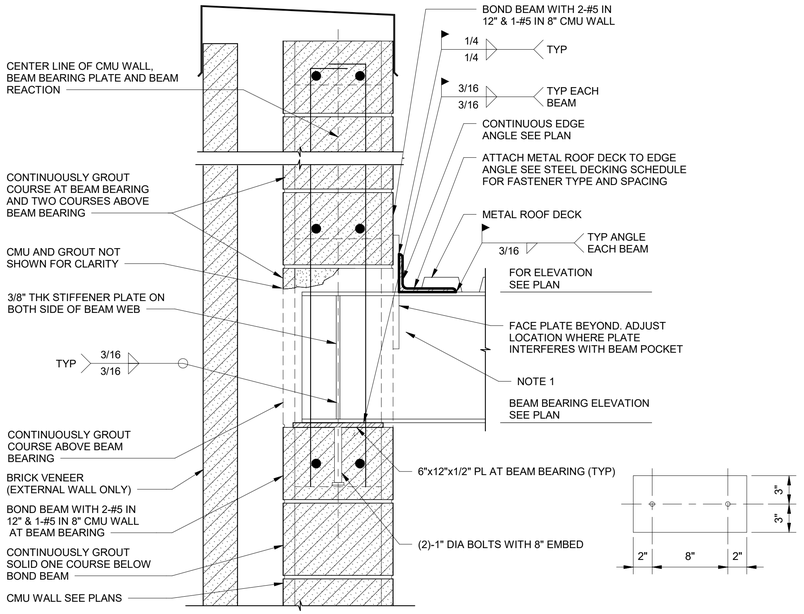
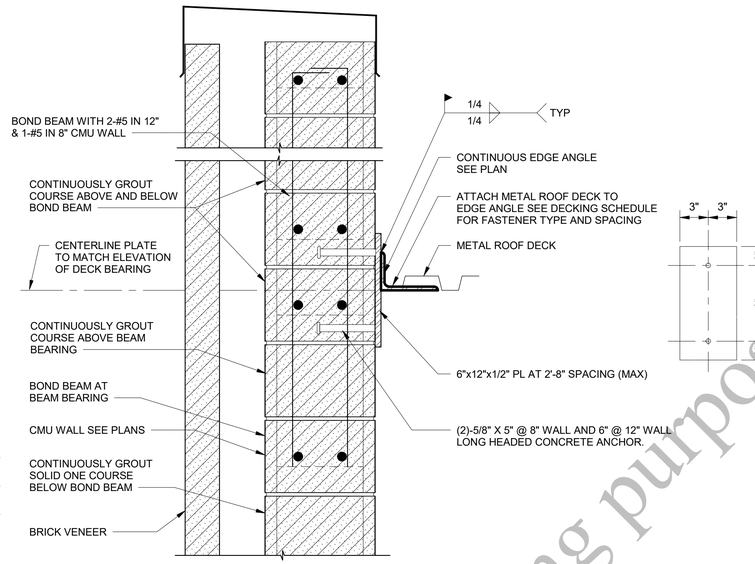


NOTE:

1. WHERE BEAM POCKETS ARE USED, POCKET LENGTH SHALL NOT EXCEED 16". FILL POCKET WITH GROUT AFTER BEAM INSTALLATION.

A STEEL BEAM BEARING ON CMU WALL (12"/8" CMU)

1 1/2" = 1'-0"

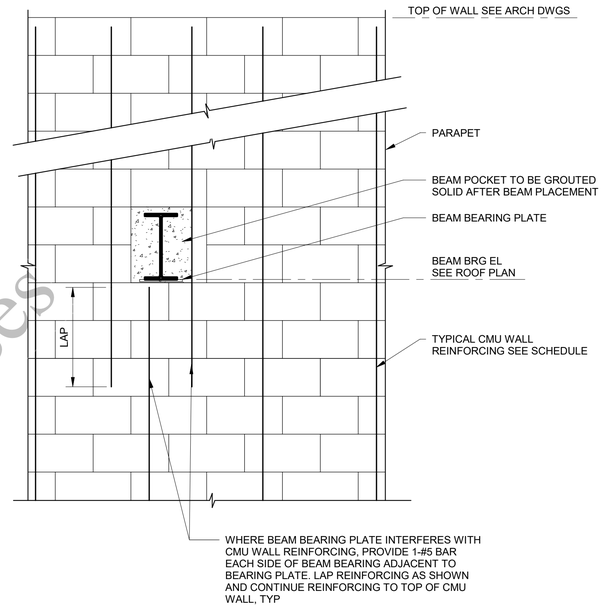


NOTE:

1. FIELD ADJUST THE LOCATION OF THE PLATE AS PER THE LOCATION OF ROOF BEAM/JOIST.

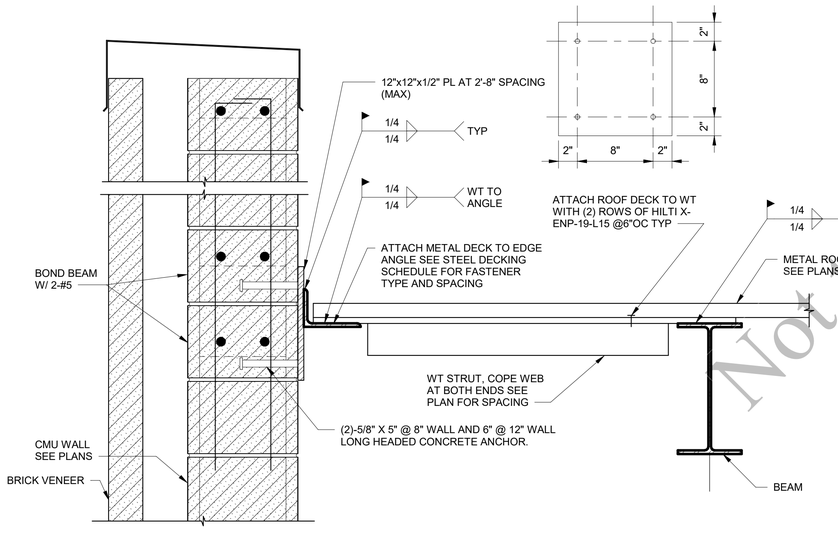
B EDGE SUPPORT BETWEEN BEAMS (12" CMU)

1 1/2" = 1'-0"



C TYPICAL WALL REINFORCING AT BEAM BEARING PLATE

3/4" = 1'-0"

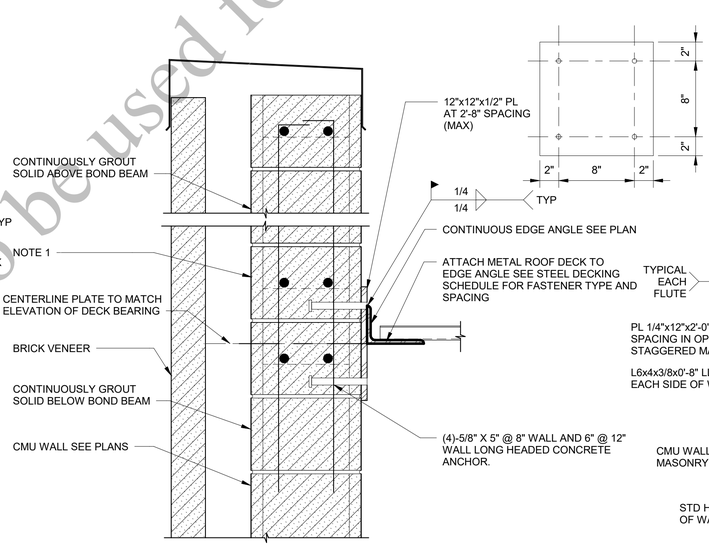


NOTES:

1. WHERE WT IS PLACED ON EACH SIDE OF BEAM, COPE AND WELD WT AS SHOWN FOR WT PLACED IN SINGLE BAY.
2. FIELD ADJUST THE LOCATION OF THE PLATE AS PER THE LOCATION OF WT STRUT.

D STRUT CONNECTION DETAIL (8" CMU/12" CMU)

1 1/2" = 1'-0"

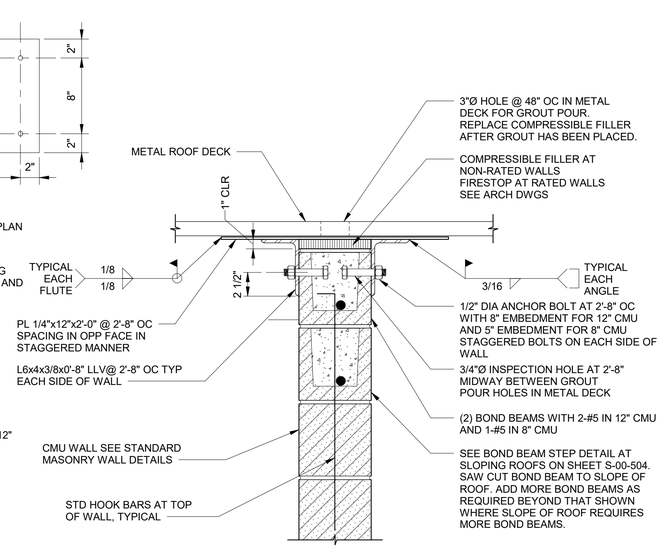


NOTES:

1. MAINTAIN 2 BOND BEAMS WITH 1-#5 AT EMBED PLATE. PROVIDE STEPPED BOND BEAM AT SLOPED ROOFS.
2. FIELD ADJUST THE LOCATION OF THE PLATE AS PER THE LOCATION OF WT STRUT.

E STEEL DECKING EDGE SUPPORT (8" CMU/12" CMU)

1 1/2" = 1'-0"



(CMU WALL PERPENDICULAR TO DECK SPAN)

F NON-LOAD BEARING CMU WALL BRACE DETAIL

1 1/2" = 1'-0"

12" 6" 0' 1' 2' 3'

3/4" = 1'-0"

12" 9" 6" 3" 0' 1'

1 1/2" = 1'-0"

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

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DETAILS

STRUCTURAL

STEEL ROOF TO CMU WALL CONNECTION DETAILS

99-S-509

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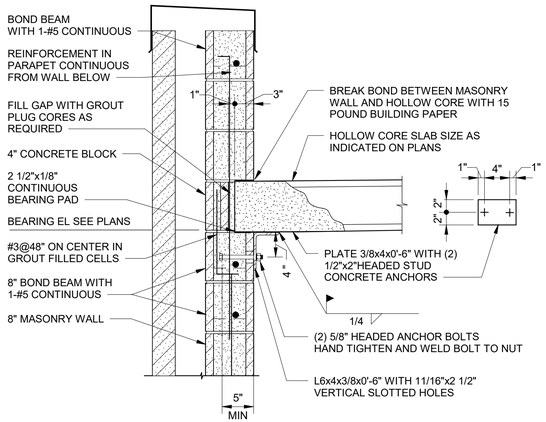
D11000



NOTES:

1. EMBEDDED PLATE AND HEADED CONCRETE ANCHORS SHOWN ARE REPRESENTATIVE. EMBEDDED PLATE AND HEADED CONCRETE ANCHORS SHALL BE DESIGNED BY THE PRECAST MANUFACTURER FOR THE FOLLOWING CONTROLLING STRENGTH LEVEL LOADS AND MOMENTS:

WIND LOADS

1.5 KIPS, 6.0 KIP-INCHES (PARALLEL TO WALL)
2.4 KIPS, 10.0 KIP-INCHES (PERPENDICULAR TO WALL)

SEISMIC LOADS

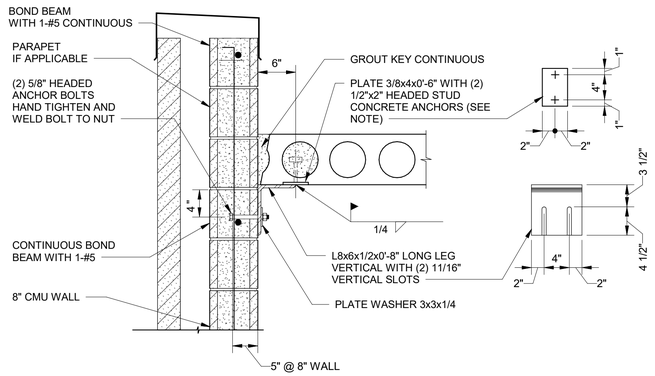
1.5 KIPS, 6.0 KIP-INCHES (PARALLEL TO WALL)
1.5 KIPS, 6.0 KIP-INCHES (PERPENDICULAR TO WALL)

2. UNLESS INDICATED OTHERWISE ON PLANS, PROVIDE ABOVE CONNECTIONS AT 4'-0" ON CENTER (MAXIMUM.) PRECAST MANUFACTURER SHALL OMIT VOIDS DURING MANUFACTURE OR GROUT VOIDS AFTER MANUFACTURE TO DEVELOP THE REQUIRED CAPACITY OF THE EMBED PLATES AND HEADED STUDS.

3. CONTRACTOR SHALL COORDINATE CONNECTION LOCATIONS WITH HOLLOW CORE SHOP DRAWINGS.

A HOLLOW CORE BEARING ON 8" MASONRY WALL WITH PARAPET MECHANICAL CONNECTION DETAIL

1" = 1'-0"



NOTES:

1. EMBEDDED PLATE AND HEADED CONCRETE ANCHORS SHOWN ARE REPRESENTATIVE. EMBEDDED PLATE AND HEADED CONCRETE ANCHORS SHALL BE DESIGNED BY THE PRECAST MANUFACTURER FOR THE FOLLOWING CONTROLLING STRENGTH LEVEL LOADS AND MOMENTS:

WIND LOADS

1.5 KIPS, 6.0 KIP-INCHES (PARALLEL TO WALL)
2.4 KIPS, 10.0 KIP-INCHES (PERPENDICULAR TO WALL)

SEISMIC LOADS

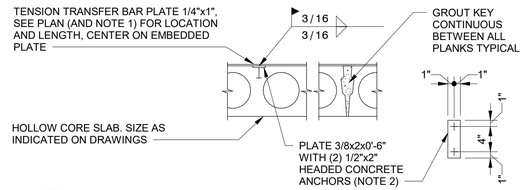
1.5 KIPS, 6.0 KIP-INCHES (PARALLEL TO WALL)
1.5 KIPS, 6.0 KIP-INCHES (PERPENDICULAR TO WALL)

2. UNLESS INDICATED OTHERWISE ON PLANS, PROVIDE ABOVE CONNECTIONS AT 4'-0" ON CENTER (MAXIMUM). PRECAST MANUFACTURER SHALL OMIT VOIDS DURING MANUFACTURE OR GROUT VOIDS AFTER MANUFACTURE TO DEVELOP THE REQUIRED CAPACITY OF THE EMBED PLATES AND HEADED STUDS.

3. CONTRACTOR SHALL COORDINATE CONNECTION LOCATIONS WITH HOLLOW CORE SHOP DRAWINGS.

B HOLLOW CORE SUPPORTING 8" MASONRY WALL MECHANICAL CONNECTION DETAIL

1" = 1'-0"



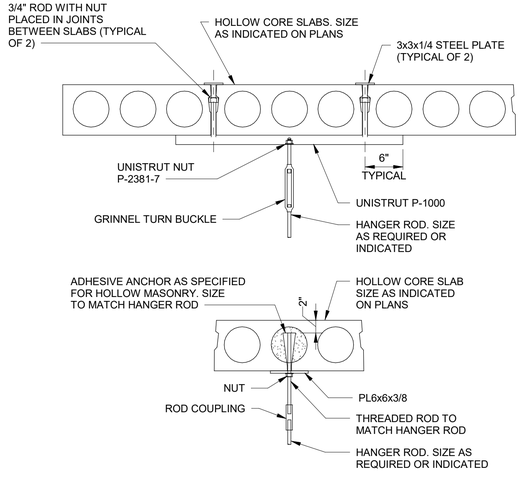
NOTES:

1. TENSION TRANSFER BAR SHALL BE MINIMUM LENGTH SHOWN ON PLANS, BUT SHALL EXTEND A MINIMUM OF 2" BEYOND THE CENTERLINE OF THE FARTHEST EMBEDDED PLATE.

2. PLATE IN HOLLOW CORE MAY BE CAST IN DURING MANUFACTURE AS SHOWN IN THE DETAIL, OR MAY BE GROUTED IN A HOLLOW CORE VOID BY THE PRECASTER AFTER CASTING; GROUT IN VOID SHALL EXTEND A MINIMUM OF 6" BEYOND HEADED ANCHOR CENTERLINE EACH WAY. IN EITHER CASE, THE PLATE SHALL BE AS CLOSE TO THE MIDDLE OF THE HOLLOW CORE AS POSSIBLE AND SHALL BE IN THE SAME RELATIVE LOCATION IN EACH HOLLOW CORE THAT WOULD BE WITHIN THE LENGTH OF THE TENSION TRANSFER BAR. IF NEED BE, THE TENSION TRANSFER BAR SHALL BE LONGER AS REQUIRED TO OBTAIN THE CORRECT LOCATION OF THE EMBEDDED PLATE IN THE FARTHEST HOLLOW CORE.

C HOLLOW CORE PANEL TO PANEL MECHANICAL CONNECTION DETAIL

NO SCALE



D UTILITY SUPPORT DETAILS

NO SCALE

12" 9" 6" 3" 0" 1' 2'

1" = 1'-0"

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

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Chicago, Illinois
ILLINOIS PROFESSIONAL
DESIGN FIRM - 184.002143-0006

Four Rivers Sanitation Authority

AEROBIC GRANULAR SLUDGE - PHASE 1

REVISIONS AND RECORD OF ISSUE

DESIGNED:	SKA
DETAILED:	UBS
CHECKED:	CG
APPROVED:	TNG
DATE:	12/20/2022
PROJECT NO.:	411752

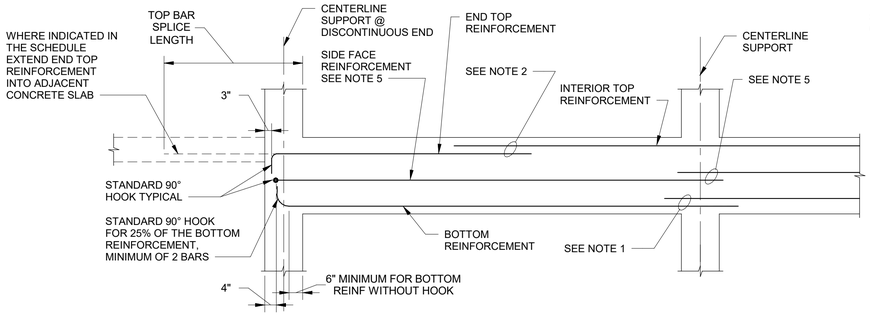
DETAILS

STRUCTURAL

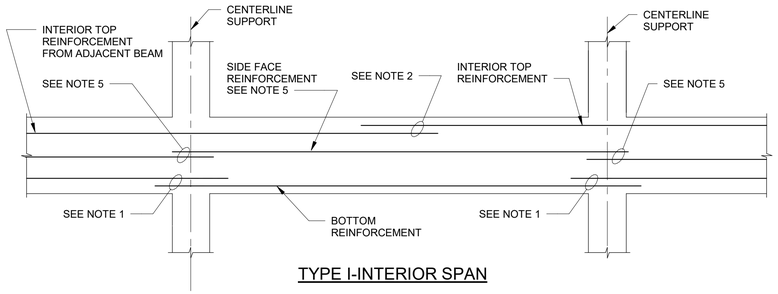
HOLLOWCORE ROOF SLAB CONNECTION DETAILS

99-S-510

PLOTTED: 12/19/2022 5:10:45 PM
FILE: BIM 360://409469 - Aerobic Granular Sludge Phase 1/409469 - AGS.rvt
D11000



TYPE E-END SPAN



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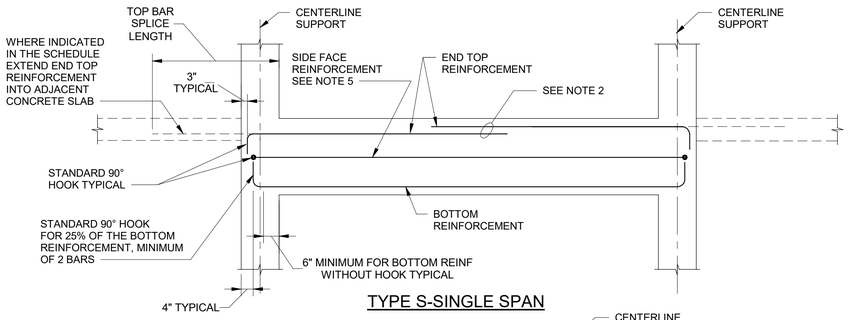
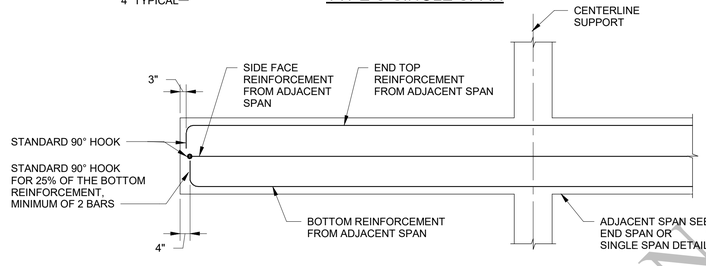
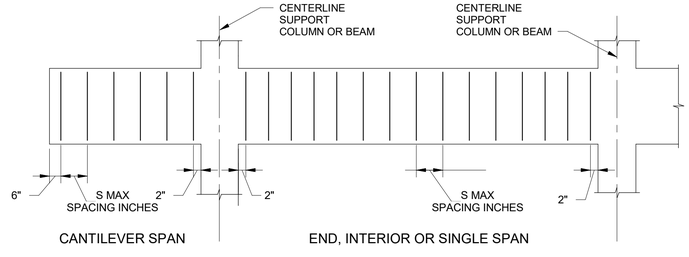


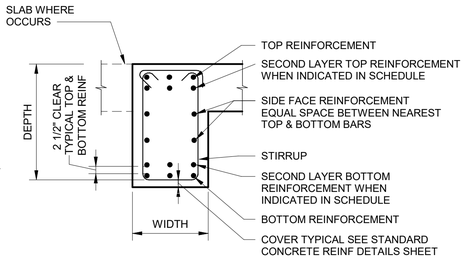
TYPE S-SINGLE SPAN



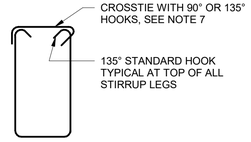
TYPE C-CANTILEVER SPAN



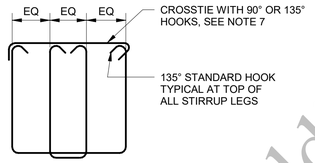
STIRRUP SPACING LAYOUT



TYPICAL BEAM SECTION



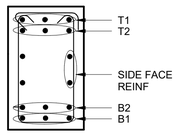
TYPE SA



TYPE SB

STIRRUP DETAILS

TYPICAL SECTION FOR BEAM B10 AND B11



LEGEND

GENERAL SHEET NOTE:

1. WORK THIS DRAWING WITH THE STANDARD CONCRETE BEAM SCHEDULE AND NOTES SHEET.

BEAM SCHEDULE

MARK	TYPE	BEAM SIZE		BOTTOM REINF	END TOP REINF	INT TOP REINF	SIDE FACE REINF EF	STIRRUPS			REMARKS
		WIDTH	DEPTH					TYPE	SIZE	S	
AGS REACTORS AND PIPE GALLERY											
B01, B02, B05, B06 B07, B08, B09	S	24"	36"	4-#6(B1) + 2-#6(B2)	4-#6(T1) + 2-#6(T2)	4-#6(T1) + 2-#6(T2)	2-#5	SB	#4	12"	TOP AND BOTTOM TWO LAYERS
B03, B04	S	18"	24"	3-#6(B1) + 3-#6(B2)	3-#6(T1) + 3-#6(T2)	3-#6(T1) + 3-#6(T2)	2-#5	SB	#4	6"	TOP AND BOTTOM TWO LAYERS
B10	S	18"	24"	4-#6	2-#6(T1) + 2-#6(T2)	2-#6(T1) + 2-#6(T2)	2-#5	SB	#4	6"	TOP TWO LAYERS
B11	S	20"	24"	4-#6	2-#6(T1) + 2-#6(T2)	2-#6(T1) + 2-#6(T2)	2-#5	SB	#4	6"	TOP TWO LAYERS

BEAM SCHEDULE NOTES:

1. UNLESS INDICATED OTHERWISE IN BEAM SCHEDULE, BOTTOM REINFORCEMENT SHALL HAVE LAP SPLICES CENTERED ON THE CENTERLINE OF THE SUPPORT USING THE LAP SPLICE LENGTH INDICATED ON THE STANDARD CONCRETE REINFORCING DETAILS SHEET. USE THE LAP SPLICE REQUIREMENT OF THE SMALLER BOTTOM BAR IF BAR SIZES IN ADJACENT SPANS DIFFER. AT THE CONTRACTOR'S OPTION, BOTTOM REINFORCEMENT MAY BE MADE CONTINUOUS, WITHOUT SPLICING, ACROSS THE SUPPORT IF BARS IN THE ADJACENT SPAN ARE EQUAL IN SIZE AND QUANTITY.
2. END AND INTERIOR TOP REINFORCEMENT SHALL BE LAPPED AT MID SPAN BETWEEN SUPPORTS USING THE LAP SPLICE LENGTH INDICATED ON THE STANDARD CONCRETE REINFORCING DETAILS SHEET. USE THE LAP SPLICE REQUIREMENT OF THE SMALLER TOP BAR, IF THE BAR SIZES EACH SIDE OF MID SPAN DIFFER. AT THE CONTRACTOR'S OPTION, TOP REINFORCEMENT MAY BE MADE CONTINUOUS, WITHOUT SPLICING, IF THE TOP BARS EACH SIDE OF MID SPAN ARE EQUAL IN SIZE AND QUANTITY.
3. TOP AND BOTTOM BARS SHALL BE PLACED IN THE BEAM SECTION SUCH THAT ONE OF THE BARS IS LOCATED IN EACH CORNER OF THE BEAM STIRRUPS.
4. ALL TOP AND BOTTOM BARS SHALL BE PLACED IN ONE LAYER UNLESS INDICATED OTHERWISE. WHERE MORE THAN ONE LAYER IS NOTED, PROVIDE 2.5 INCHES CLEAR BETWEEN LAYERS, AND PLACE HALF OF THE BARS IN EACH LAYER.
5. SIDE FACE REINFORCEMENT SHALL BE CONTINUOUS WITH LAP SPLICES CENTERED AT THE CENTERLINE OF THE SUPPORT. A 90° STANDARD HOOK SHALL BE PROVIDED AT THE EXTERIOR ENDS OF END SPANS AND AT BOTH ENDS OF SINGLE SPANS. SIDE FACE REINFORCEMENT SHALL BE SPACED EQUALLY ON EACH FACE.
6. PROVIDE MINIMUM #5 STIRRUP SUPPORT BARS IN ALL CORNERS OF STIRRUPS WHEN TOP OR BOTTOM BARS ARE NOT PRESENT. LAP #5 BARS 1'-8" MINIMUM TO SCHEDULED REINFORCEMENT.
7. UNLESS INDICATED OTHERWISE, CONSECUTIVE STIRRUP CROSSTIES SHALL HAVE THEIR 90° HOOK PLACED ON OPPOSITE SIDES. IN THE EVENT THAT A SLAB FRAMES INTO ONLY ONE SIDE OF A BEAM, THEN THE 90 DEGREE HOOK SHALL BE PLACED ON THE SLAB SIDE CONSISTENTLY. IN THE EVENT A BEAM IS NOT CONFINED BY A SLAB ON EITHER SIDE, THE STIRRUP CROSSTIE SHALL HAVE TWO 135° HOOKS AND NO 90° HOOK.
8. HEADED REINFORCEMENT IN ACCORDANCE WITH ACI 318 MAY BE USED INSTEAD OF STD. HOOKS.
9. ABBREVIATIONS USED:
   CL = CENTERLINE
   EF = EACH FACE
   INT = INTERIOR
   STD = STANDARD
   TYP = TYPICAL
   DEG = DEGREE
   EQ = EQUAL
   REINF = REINFORCEMENT

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DETAILS

STRUCTURAL

STANDARD CONCRETE BEAM AND SLAB SCHEDULE AND DETAILS

99-S-511

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PLOTTED: 12/19/2022 4:26:29 PM
FILE: BIM 360://409469 - Aerobic Granular Sludge Phase 1/409469 - AGS.rvt
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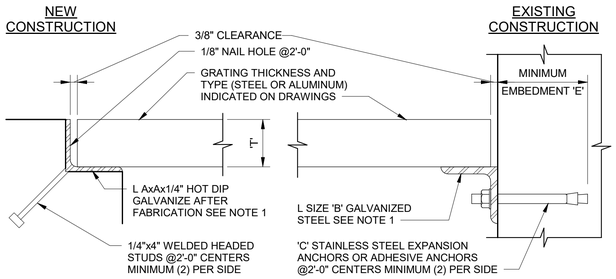
(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

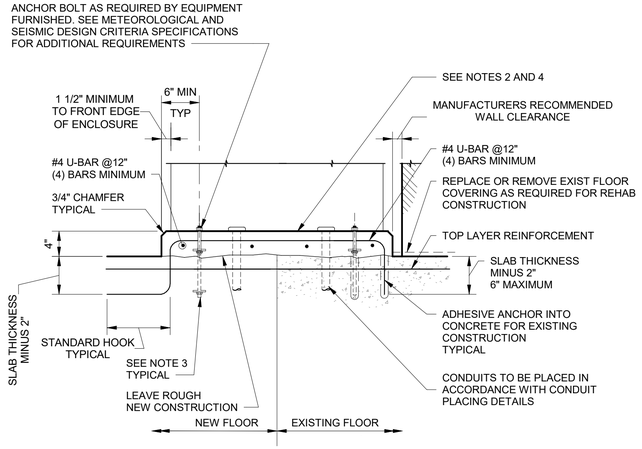
GRATING THICKNESS 'T'	L SIZE AxAx1/4 INCHES	L SIZE 'B' INCHES	'C' ANCHOR	
			DIA	MIN 'E'
1"	1 3/4 x 1 3/4*	2 1/2x2 1/2x1/4	1/2"	3 1/4"
1 1/4"	1 3/4 x 1 3/4*	2 1/2x2 1/2x1/4	1/2"	3 1/4"
1 1/2"	1 3/4 x 1 3/4	2 1/2x2 1/2x1/4	1/2"	3 1/4"
1 3/4"	2x2	3x3x3/8	3/4"	4 3/4"
2"	2 1/2x2 1/2*	3x3x3/8	3/4"	4 3/4"
2 1/4"	2 1/2x2 1/2	3x3x3/8	3/4"	4 3/4"
2 1/2"	3x3*	3x3x3/8	3/4"	4 3/4"

* TRIM AND BEVEL UPSTANDING LEG TO FIT

NOTE:
1. ALL GRATING SUPPORTED ON CONCRETE SHALL HAVE AN EMBEDDED ANGLE RECESSED AS SHOWN UNLESS NOTED OTHERWISE. GRATING SUPPORTED BY THE FACE MOUNTED ANGLE SHALL BE USED WHERE THE CONCRETE EXTENDS ABOVE THE TOP OF THE GRATING OR AT EXISTING STRUCTURES.



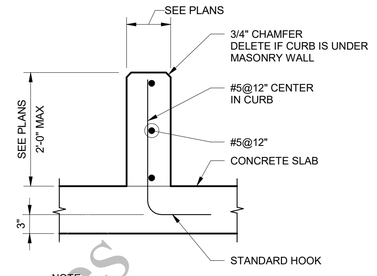
A GRATING SUPPORT
3" = 1'-0"



NOTES:

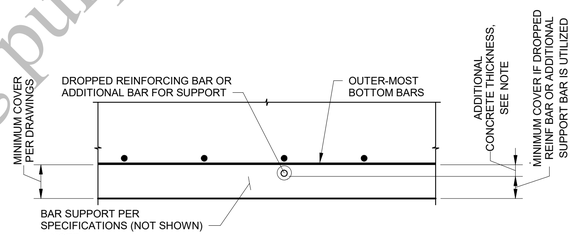
1. UNLESS OTHERWISE NOTED, ALL INDOOR FLOOR MOUNTED ELECTRICAL EQUIPMENT, INCLUDING SWITCHGEAR, SWITCHBOARDS, MOTOR CONTROL CENTERS, ADJUSTABLE FREQUENCY DRIVES, INSTRUMENT CABINETS, ECT., SHALL BE PROVIDED WITH EQUIPMENT BASES.
2. CONTRACTOR AND SUPPLIER SHALL COORDINATE FINAL LOCATION AND SIZE OF PADS WITH EQUIPMENT FURNISHED. COORDINATE ANCHOR BOLT REQUIREMENTS FOR REQUIRED EMBEDMENT DEPTHS AND CONCRETE EDGE DISTANCES.
3. WHERE THE DESIGN ANCHOR BOLT EMBEDMENT IS GREATER THAN THE CONCRETE EQUIPMENT BASE THICKNESS, THEN THE REQUIRED DEPTH OF EMBEDMENT SHALL BE MEASURED FROM THE TOP OF STRUCTURAL SLAB AND NOT THE TOP OF THE EQUIPMENT BASE.
4. EQUIPMENT BASE SHALL USE STRUCTURAL CONCRETE AS INDICATED IN THE CAST-IN-PLACE CONCRETE SPECIFICATION.
5. ANCHOR BOLTS AND REINFORCING WILL BE INSPECTED IN ACCORDANCE WITH THE CODE REQUIRED SPECIAL INSPECTIONS AND PROCEDURES SPECIFICATION.

B ELECTRICAL EQUIPMENT BASE
1" = 1'-0"



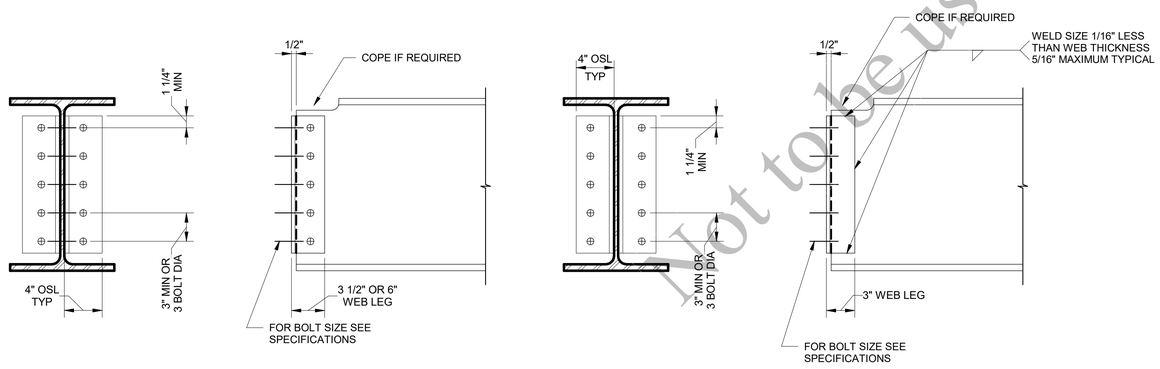
NOTE:
WHEN CURB WIDTH EXCEEDS 8", PROVIDE ABOVE REINFORCEMENT IN EACH FACE OF CURB

C TYPICAL CONCRETE CURB DETAIL
1" = 1'-0"



NOTE:
WHERE DROPPED REINFORCING BARS OR ADDITIONAL BARS ARE UTILIZED AS SUPPORT BARS IN THE PLACEMENT OF THE BOTTOM MAT REINFORCING, CONCRETE COVER TO THE SUPPORT BARS SHALL NOT BE LESS THAN REQUIRED PER THE DRAWINGS AND THE CONCRETE THICKNESS OF THE SLAB OR FOOTING SHALL BE INCREASED, EQUAL TO THE DIAMETER OF THE SUPPORT BAR, AT NO ADDITIONAL COST. ALTERNATIVELY, UPON THE APPROVAL OF THE ENGINEER, A SHALLOWER BOLSTER MADE BE USED TO MAINTAIN THE MINIMUM CLEAR COVER FOR THE BOTTOM MAT REINFORCING.

D REINFORCING SUPPORT DETAIL
1" = 1'-0"



E STANDARD STEEL FRAMING CONNECTION DETAILS
NO SCALE

SHOP BOLTED - FIELD BOLTED			
BEAM SIZE (ALL WEIGHTS)	NO OF BOLTS		ANGLE SIZE
	OSL	IN WEB	
W36	20	10	2L'S 4x3 1/2x3/8
W33	18	9	2L'S 4x3 1/2x3/8
W30	16	8	2L'S 4x3 1/2x3/8
W27	14	7	2L'S 4x3 1/2x3/8
W24 & S24	12	6	2L'S 4x3 1/2x3/8
W21 & S20	10	5	2L'S 4x3 1/2x3/8
W16 & W18, S15 & S18, C15, MC18	8	4	2L'S 4x3 1/2x3/8
W12 & W14, M12 & M14, S12, C12, MC12 & MC13	6	3	2L'S 4x3 1/2x3/8
W8 & W10, M8 & M10, S8 & S10 C8, C9 & C10, MC8, MC9 & MC10	4	2	2L'S 4x3 1/2x3/8
W6, M6, S6 & S7 C6 & C7, MC6 & MC7	2	2	2L'S 6x4x3/8

SHOP WELDED - FIELD BOLTED		
BEAM SIZE (ALL WEIGHTS)	NO OF BOLTS IN OSL	ANGLE SIZE
W36	20	2L'S 4x3x3/8
W33	18	2L'S 4x3x3/8
W30	16	2L'S 4x3x3/8
W27	14	2L'S 4x3x3/8
W24 & S24	12	2L'S 4x3x3/8
W21 & S20	10	2L'S 4x3x3/8
W16 & W18, S15 & S18, C15, MC18	8	2L'S 4x3x3/8
W12 & W14, M12 & M14, S12, C12, MC12 & MC13	6	2L'S 4x3x3/8
W8 & W10, M8 & M10, S8 & S10 C8, C9 & C10, MC8, MC9 & MC10	4	2L'S 4x3x3/8
W6, M6, S6 & S7 C6 & C7, MC6 & MC7	2	2L'S 4x3x3/8

NOTE: FABRICATOR SHALL PROVIDE ADDITIONAL CLIPS, SEATS, BOLTS, ETC AS REQUIRED TO COMPLY WITH OSHA SAFETY STANDARDS FOR STEEL ERECTION.

OSL = OUTSTANDING LEG

12" 9" 6" 3" 0" 1' 2'
1" = 1'-0"

12" 9" 6" 3" 0"
3" = 1'-0"

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

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MISCELLANEOUS DETAILS

99-S-512

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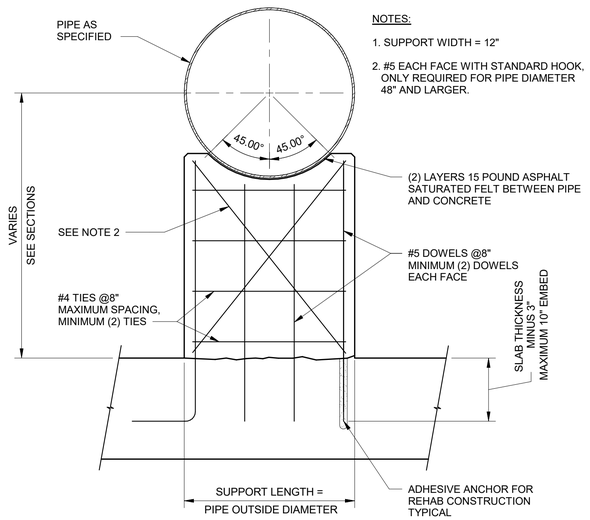
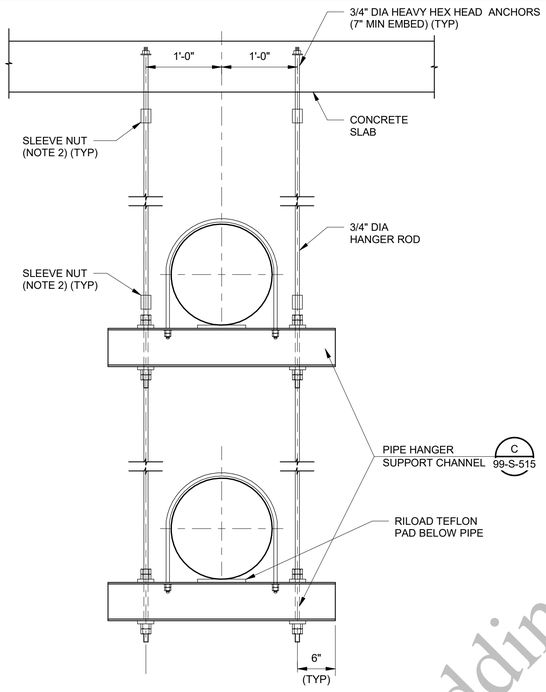


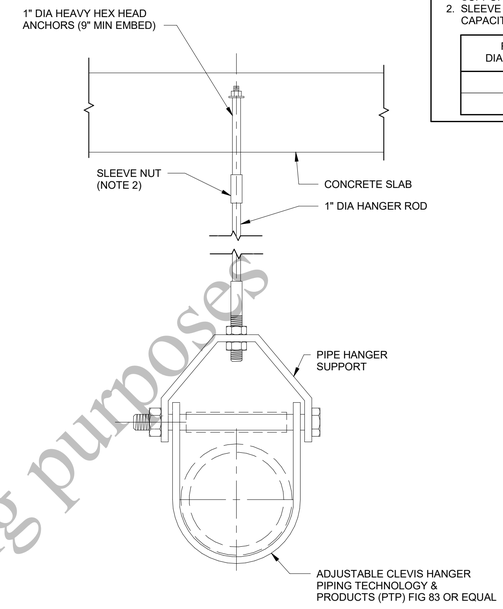
A CONCRETE SADDLE PIPE SUPPORT (PS-1)

1" = 1'-0"



B TRAPEZE SUPPORT (PS-2)

1" = 1'-0"



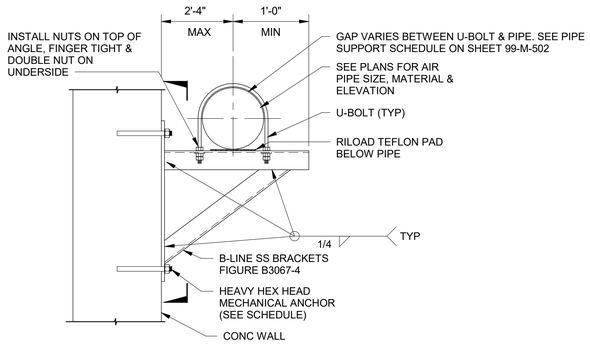
C HANGER SUPPORT FROM CONCRETE CEILING (PS-3)

1 1/2" = 1'-0"

GENERAL SHEET NOTES:

1. PS-X REPRESENT PIPE SUPPORT TYPE. FOR PIPE SUPPORT SCHEDULE, SEE SHEET 99-M-502. SEE MECHANICAL PIPING SHEETS FOR PIPE SUPPORT TYPE AND LOCATIONS.
2. SLEEVE NUTS SHALL HAVE THE FOLLOWING MINIMUM ALLOWABLE CAPACITIES:

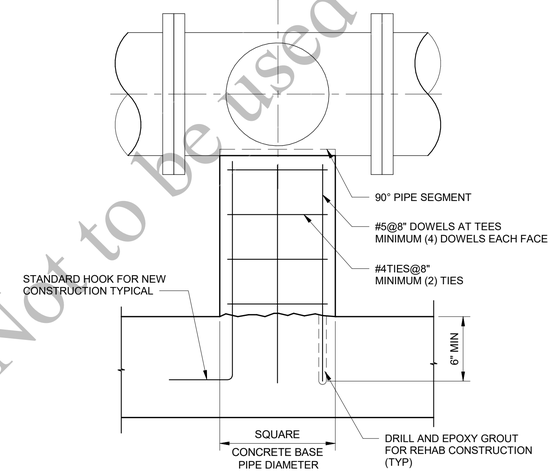
ROD DIAMETER	SLEEVE NUT CAPACITY
3/4"	3,000 LB
1"	4,000 LB



SECTION

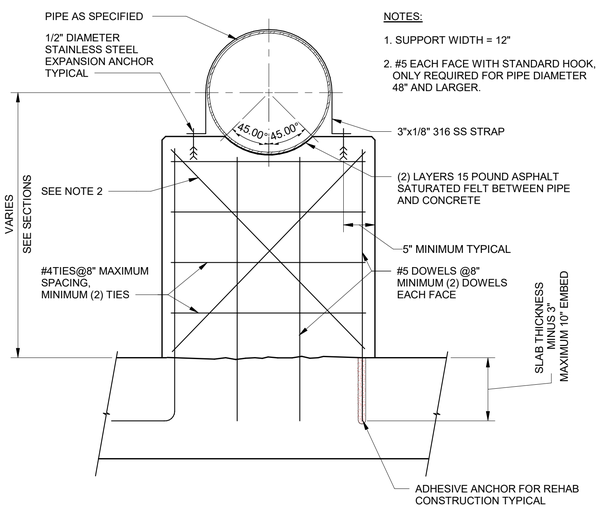
D WALL BRACKET PIPE SUPPORT (PS-4, PS-7, PS-15(G) & PS16(G))

1" = 1'-0"



E CONCRETE SUPPORT FOR HORIZONTAL TEE (PS-5)

1" = 1'-0"



F CONCRETE SADDLE PIPE SUPPORT WITH STRAP (PS-8)

1" = 1'-0"

WALL BRACKET SCHEDULE

LOCATION	PRODUCT	MAX SUPPORT SPACING (FT)	REQUIRED LOAD RATING (LBS)	ANCHORAGE
AGS TANK:16" DIA AIR HEADER	SS B-LINE FIG B3067-4 OR APPROVED EQUAL	15'-0"	3,000	1/2" DIA HEAVY HEX HEAD ANCHOR W/ 9" MIN EMBED
AGS TANK PIPE GALLERY:14" WAGS & 14" WLC	SS B-LINE FIG B3067-4 OR APPROVED EQUAL	15'-0"	3,000	1/2" DIA HEAVY HEX HEAD ANCHOR W/ 9" MIN EMBED

12" 9" 6" 3" 0" 1'

1 1/2" = 1'-0"

12" 9" 6" 3" 0" 1' 2'

1" = 1'-0"

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

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PIPE SUPPORT DETAILS 1 OF 4

99-S-513

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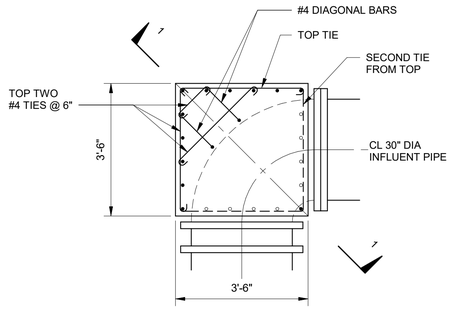
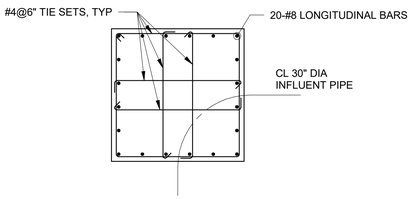
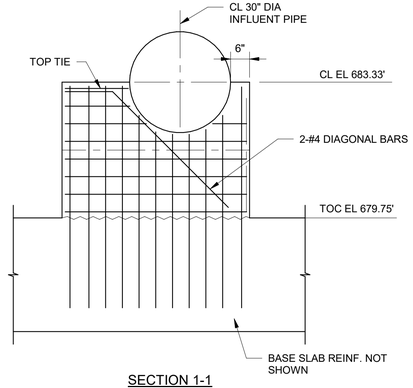


PLAN AT PIPE BEARING



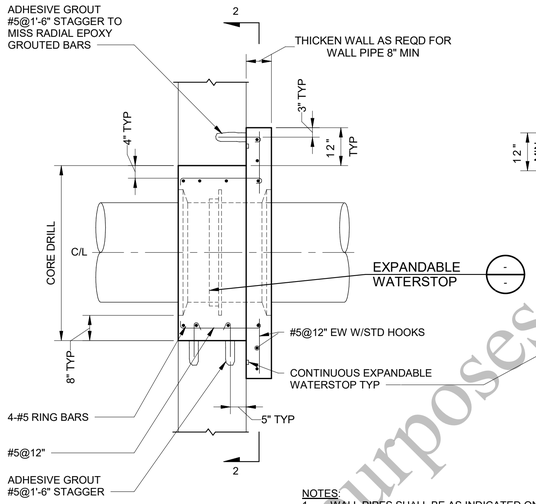
PLAN BELOW PIPE BEARING

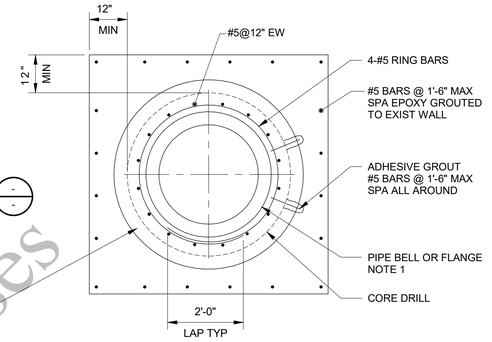


SECTION 1-1

A 30" INFLUENT PIPE THRUST BLOCK DETAILS (PS-6)

1/2" = 1'-0"





SECTION 2-2

NOTES:
1. WALL PIPES SHALL BE AS INDICATED ON PLANS.
2. WHERE PIPE IS REQUIRED ON ONE SIDE ONLY, PROVIDE MJ X PE WALL PIPE.
3. WALL PIPE MATERIAL SHALL BE DUCTILE IRON OR STEEL AS INDICATED ON DRAWINGS.
4. FOR BURIED PIPING, CONTRACTOR SHALL PROVIDE AN ADDITIONAL FIELD JOINT AS CLOSE AS PRACTICAL TO FACE OF WALL, BUT NO MORE THAN 5 FEET.
5. USE WAX TAPE TO PROTECT ALL BURIED FERROUS SURFACES INCLUDING PAINTED SURFACES. FOR PROTECTION OF ADJACENT PIPE BARREL SURFACES, SHRINK WRAP MAY BE USED IN LIEU OF WAX TAPE, SEE SPECIFICATIONS

B EXISTING WALL PENETRATION

1/2" = 1'-0"

GENERAL SHEET NOTE:

1. PS-X REPRESENT PIPE SUPPORT TYPE. FOR PIPE SUPPORT SCHEDULE, SEE SHEET 99-M-502. SEE MECHANICAL PIPING SHEETS FOR PIPE SUPPORT TYPE AND LOCATIONS.

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Four Rivers Sanitation Authority

AEROBIC GRANULAR SLUDGE - PHASE 1

REVISIONS AND RECORD OF ISSUE

DESIGNED:	SKA
DETAILED:	UBS
CHECKED:	CG
APPROVED:	TNG
DATE:	12/20/2022
PROJECT NO.:	411752

DETAILS

STRUCTURAL

PIPE SUPPORT DETAILS 2 OF 4

99-S-514

144 OF 163

12' 6' 0' 1' 2' 3' 4' 5'

1/2" = 1'-0"

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

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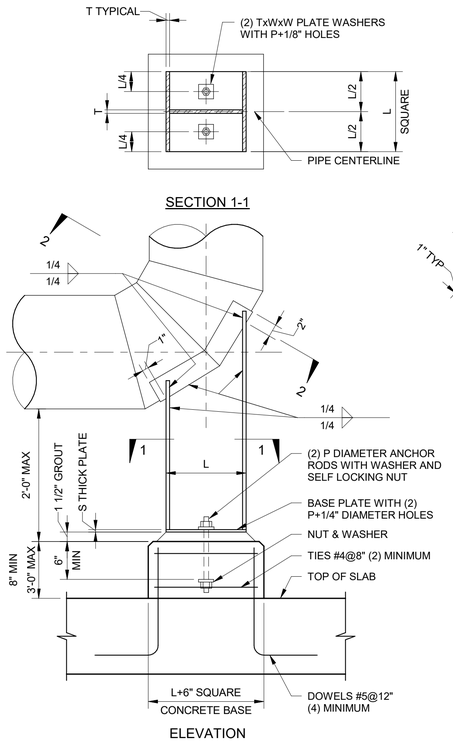
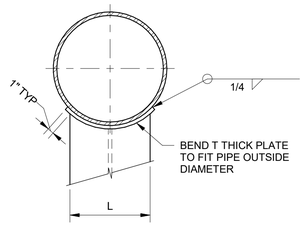
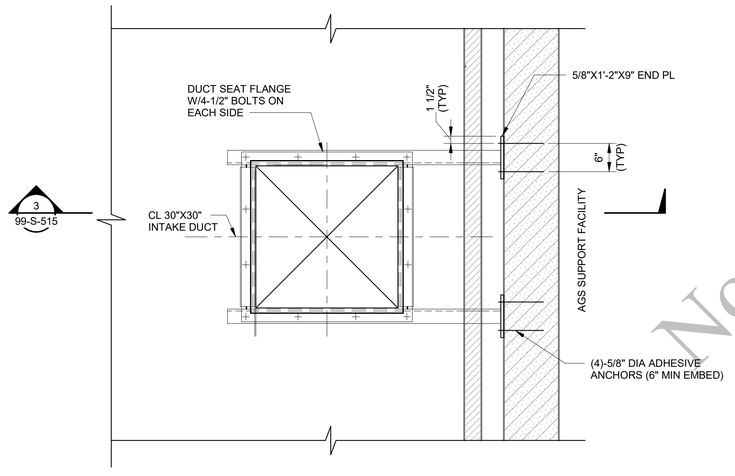


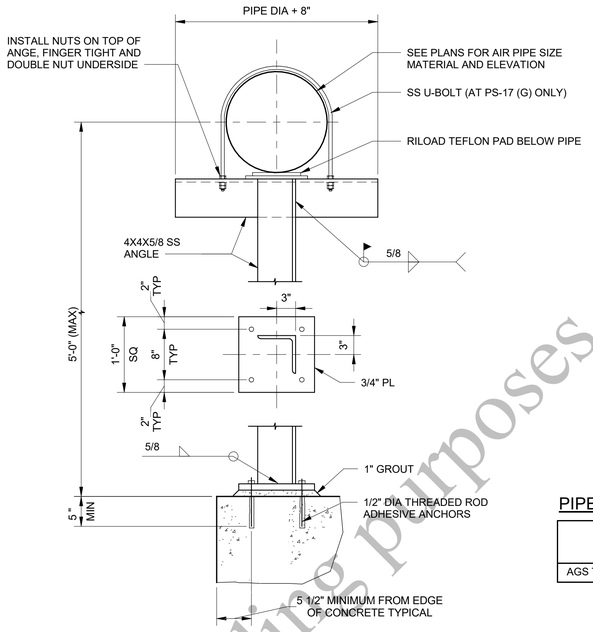


DIMENSIONS IN INCHES					
PIPE SIZE	T	S	P	W	L
14	1/4	3/8	3/4	1 3/4	10

A 90 DEGREE STEEL PIPE BASE ELBOW SUPPORT (PS-13 (A))
1" = 1'-0"

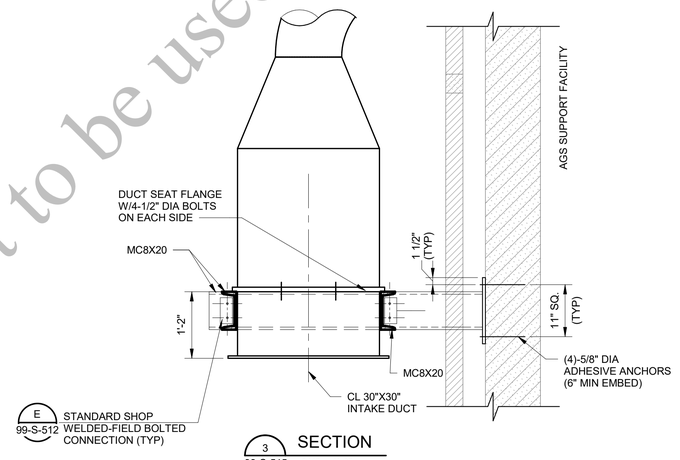


D INTAKE DUCT SUPPORT (PS-9)
99-S-515 3/4" = 1'-0"



NOTE:- CONTRACTOR TO COORDINATE WITH PRECAST MANUFACTURER AND VERIFY STRANDS WILL NOT BE DAMAGED WHEN INSTALLING ADHESIVE ANCHORS.

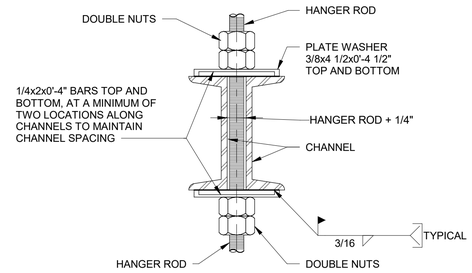
B ANGLE TEE STANCHION SUPPORT (PS-17 (G) & PS-18 (V))
1" = 1'-0"



3 SECTION
99-S-515 3/4" = 1'-0"

GENERAL SHEET NOTE:

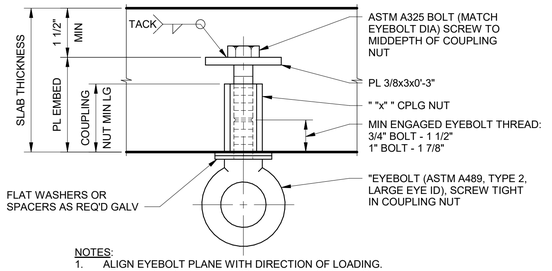
1. PS-X REPRESENT PIPE SUPPORT TYPE. FOR PIPE SUPPORT SCHEDULE, SEE SHEET 99-M-502. SEE MECHANICAL PIPING SHEETS FOR PIPE SUPPORT TYPE AND LOCATIONS.



C PIPE HANGER SUPPORT
3" = 1'-0"

PIPE HANGER SCHEDULE

LOCATION	CHANNEL MEMBER	HANGER ROD DIA (IN)	REQUIRED LOAD RATING AT EACH LEVEL (LBS)	MATERIAL
AGS TANK PIPE GALLERY TRAPEZE	MC6X12	3/4	3,000	GALV STEEL



NOTES:
1. ALIGN EYEBOLT PLANE WITH DIRECTION OF LOADING. SEAT SHOULDER FIRMLY AGAINST MATING SURFACE; USE WASHERS OR SPACERS AS REQUIRED.
2. DO NOT PAINT OR GALVANIZE EYEBOLT.
3. TAG EYEBOLT AS INDICATED BELOW. TAG AND WIRE TO BE CORROSION RESISTANT METAL.

SAFE VERTICAL WORKING LOAD (LBS)	SAFE WORKING LOAD AT 45° MAX (LBS)	MINIMUM SLAB THICKNESS (IN)	MINIMUM PLATE EMBED (IN)	COUPLING NUT SIZE DIA x MIN LENGTH (IN)	EYEBOLT SIZE (IN)
6000	1500	8	6	3/4 x 3 1/2	3/4

TYPICAL EYEBOLT

E LIFTING EYE BOLT DETAIL
NO SCALE

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Four Rivers Sanitation Authority

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DETAILS

STRUCTURAL

PIPE SUPPORT DETAILS 3 OF 4

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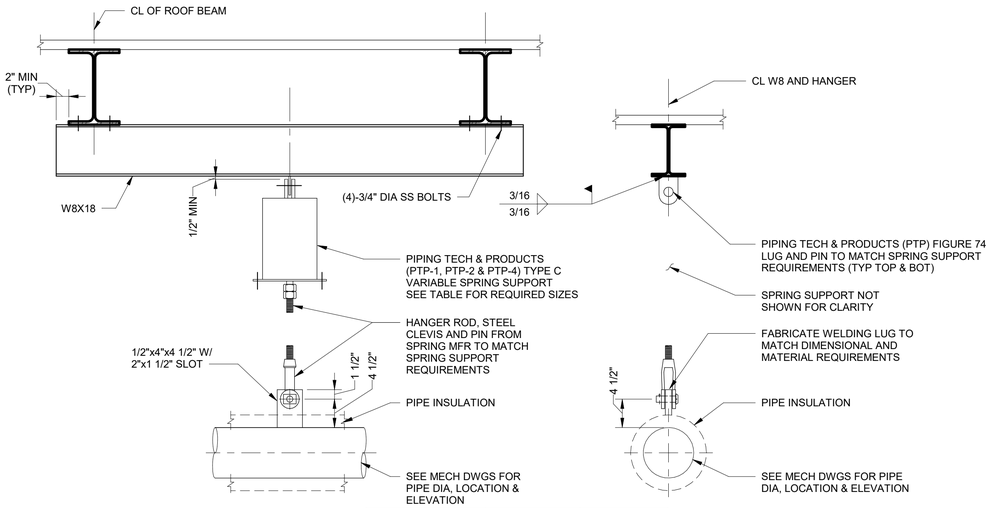
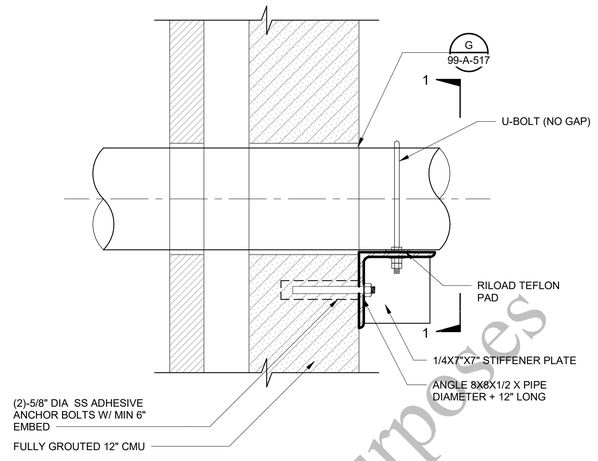
12" 9" 6" 3" 0"
3" = 1'-0"
12" 9" 6" 3" 0' 1' 2'
1" = 1'-0"
12" 6" 0' 1' 2' 3'
3/4" = 1'-0"

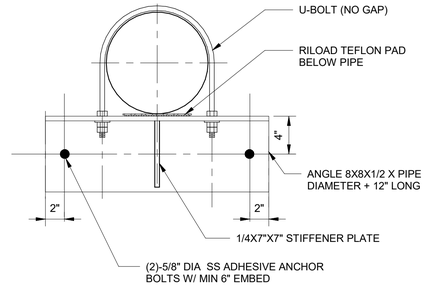
(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4



SUPPORT DESIGNATION	SPRING DESIGN	HANGER SIZE
X1	PTP-2	NO.40
X2	PTP-1	NO.110
X3	PTP-2	NO.80
X4	PTP-4	NO.80
X5	PTP-2	NO.80

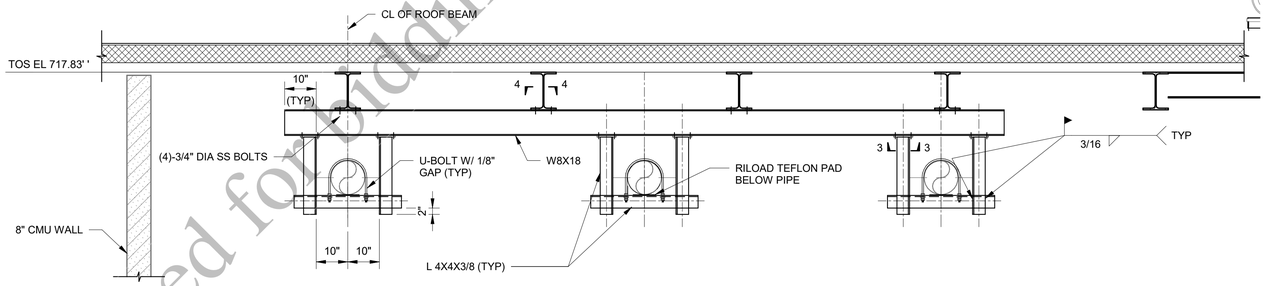
A VARIABLE SPRING HANGER SUPPORT (PS-10 (SPR))
NO SCALE



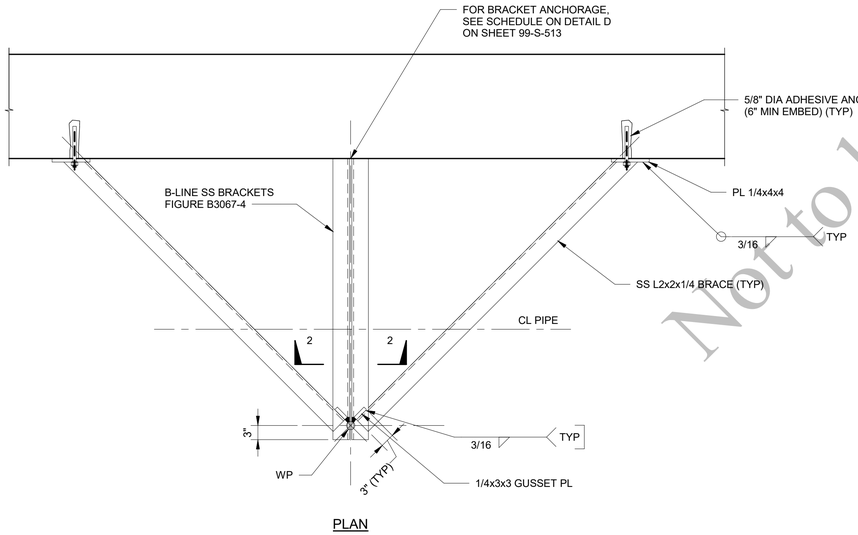


SECTION 1-1

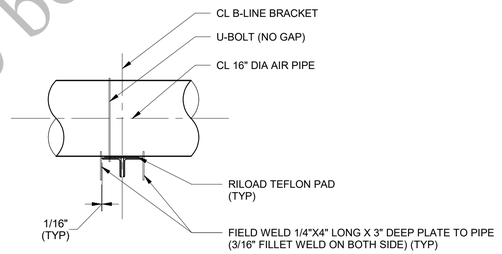
B MASONRY GUIDE SUPPORT (PS-11 (G))
NO SCALE



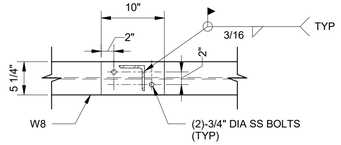
C ROOF HANGER GUIDE DETAILS (PS-12 (G))
1/2" = 1'-0"



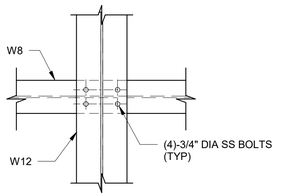
PLAN



SECTION 2-2



SECTION 3-3



SECTION 4-4

D WALL BRACKET (ANCHOR) SUPPORT (PS-14(A))
NO SCALE

GENERAL SHEET NOTE:

1. PS-X REPRESENT PIPE SUPPORT TYPE. FOR PIPE SUPPORT SCHEDULE, SEE SHEET 99-M-502. SEE MECHANICAL PIPING SHEETS FOR PIPE SUPPORT TYPE AND LOCATIONS.

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Four Rivers Sanitation Authority

AEROBIC GRANULAR SLUDGE - PHASE 1

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PROJECT NO.:	411752

DETAILS

STRUCTURAL

PIPE SUPPORT DETAILS 4 OF 4

99-S-516

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12" 6" 0' 1' 2' 3' 4' 5'
1/2" = 1'-0"

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

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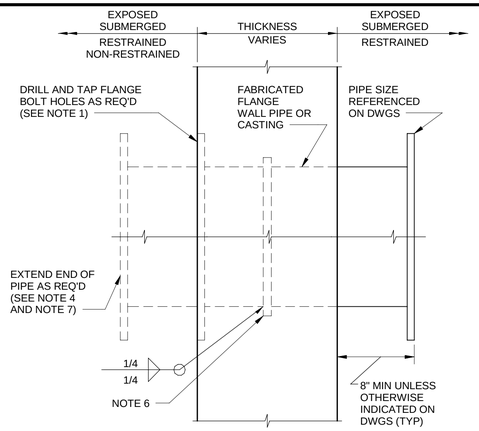
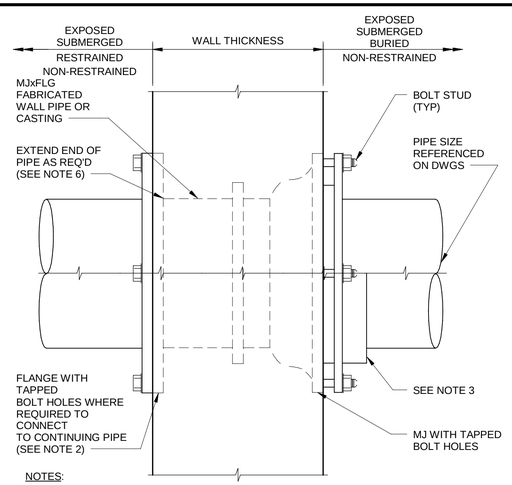


NOTES:

1. WALL PIPE MATERIAL SHALL BE DUCTILE IRON, STEEL OR AS INDICATED ON THE DRAWINGS. STEEL PIPE SHALL BE SCHEDULE 40 FOR PIPE 20 INCHES AND SMALLER, 3/8" FOR PIPE LARGER THAN 20", AND COATINGS SAME AS CONNECTING PIPE.
2. IF CONNECTING STEEL PIPE THICKNESS IS GREATER THAN 3/8", STEEL WALL PIPE THICKNESS SHALL BE INCREASED TO MATCH CONNECTING PIPE.
3. ANNULAR COLLAR SHALL BE SAME MATERIAL AS PIPE, 1/4" X 2" FOR PIPE 20" AND SMALLER, AND 3/8" X 3" FOR PIPE LARGER THAN 20".
4. WALL PIPE MAY BE FLUSH WITH FACE OF WALL OR EXTENDED WITH END AS REQUIRED OR INDICATED ON DRAWINGS.
5. WALL PIPE SHALL BE ORIENTED SO THAT THE BOLT HOLES STRADDLE THE TOP CENTERLINE.
6. FOR AIR PIPE WALL ANCHORS (SUPPORT DESIGNATION PS-16 (A)), WELD A SINGLE FLANGE BETWEEN PROCESS PIPE. FLANGE MATERIAL AND SIZE SHALL MATCH PROCESS PIPE.
7. WHERE PIPE IS REQUIRED ON ONE SIDE ONLY, PROVIDE FLGxPE WALL PIPE.

A FLANGED WALL PIPE

NO SCALE

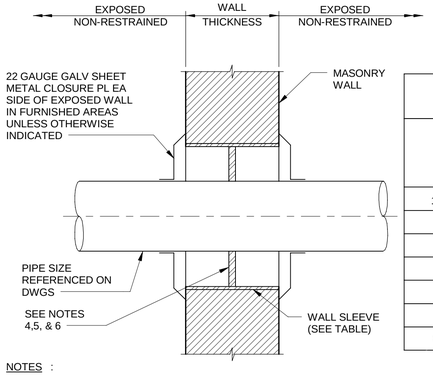


NOTES:

1. WALL PIPE SHALL BE ORIENTED SO THAT THE BOLT HOLES STRADDLE THE TOP CENTERLINE.
2. WHERE PIPE IS REQUIRED ON ONE SIDE ONLY, PROVIDE MJxPE WALL PIPE.
3. FOR STEEL PIPE APPLICATIONS BUILD UP END OF STEEL PIPE TO FIT MJ WALL PIPE.
4. FOR BURIED PIPING, CONTRACTOR SHALL PROVIDE AN ADDITIONAL FIELD JOINT AS CLOSE AS PRACTICAL TO FACE OF WALL, BUT NO MORE THAN 5 FEET.
5. USE WAX TAPE TO PROTECT ALL BURIED FERROUS SURFACES, INCLUDING PAINTED SURFACES. FOR PROTECTION OF ADJACENT PIPE BARREL SURFACES, SHRINK WRAP MAY BE USED IN LIEU OF WAX TAPE. SEE SPECIFICATIONS.
6. WALL PIPE FLANGE MAY BE FLUSH WITH FACE OF WALL OR EXTENDED WITH END AS REQUIRED OR INDICATED ON DRAWINGS.

B FLANGED - MECHANICAL JOINT WALL PIPE

NO SCALE



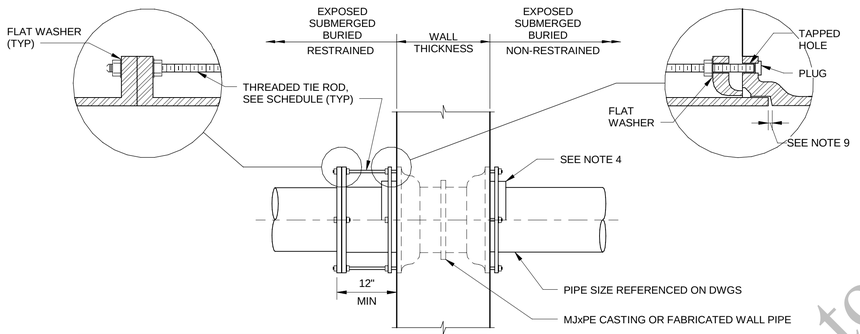
WALL SLEEVE TABLE	
PIPE SIZE	SLEEVE SIZE UNLESS OTHERWISE INDICATED (SEE NOTES 3 & 4)
1"& SMALLER	3"
1 1/4"&1 1/2"	3 1/2"
2" & 2 1/2"	4"
3"	6"
4"	6"
6"	8"
8"& LARGER	PIPE OD+2"±

NOTES :

1. SCHEDULE 40 GALV STEEL PIPE FOR PIPING SMALLER THAN 3", SCHEDULE 20 GALV STEEL PIPE FOR PIPING SMALLER THAN 6", AND GALV 1/4" MINIMUM WALL THICKNESS FOR PIPING LARGER THAN 6".
2. FOR PIPING LARGER THAN 3" PROVIDE PIPE SUPPORT WITHIN 3' OF WALL SLEEVE TO PREVENT THE TRANSFER OF PIPE LOADS TO MASONRY WALL WHEN MODULAR CASING SEALS ARE USED.
3. WHERE REQUIRED, USE SLEEVE LARGE ENOUGH FOR FLANGE OR OTHER JOINT RESTRAINT TO PASS THROUGH.
4. FOR PIPE SIZES 1 1/2" IN DIAMETER AND SMALLER, CAULK ANNULAR SPACE AROUND PIPE. FOR PIPE LARGER THAN 1 1/2" IN DIAMETER, USE MODULAR CASING SEALS AND COORDINATE SLEEVE SIZE WITH CASING SEAL MANUFACTURER.
5. PROVIDE MODULAR CASING SEALS ON ALL SLEEVES AT CHLORINE AND AMMONIA FEED AND STORAGE ROOMS AND WHERE INDICATED ON THE DRAWINGS. COORDINATE SLEEVE SIZE WITH CASING SEAL MANUFACTURER.
6. FIRESAFING TO BE PROVIDED AT ALL RATED WALLS INDICATED ON THE DRAWINGS AND INSTALLED PER ACCEPTED UL RATED SYSTEMS.

C MASONRY WALL SLEEVE

NO SCALE



TIE ROD SCHEDULE			
NOMINAL PIPE SIZE (INCHES)	MAX PRESSURE (PSI) (NOTE 1)	TIE BOLTS	
		NO. OF RODS (NOTE 2)	DIA OF RODS (INCHES)
6	250 OR LESS	2	3/4
8	150 OR LESS	2	3/4
10	200 OR LESS 350	2 6	3/4
12	150 OR LESS 300	2 4	3/4
14	100 OR LESS 200	2 4	3/4
16	75 OR LESS 150	2 4	3/4
18	75 OR LESS 150	2 4	3/4
20	50 OR LESS	2	3/4
24	75	4	3/4
30	50 OR LESS	4	1
36	50 OR LESS 100	4 8	1
42	50 OR LESS	4	1 1/4

NOTES :

1. PRESSURE SHALL BE THE PRESSURE AT WHICH THE PIPE IS HYDROSTATICALLY TESTED, OR IF THERE IS NO HYDROSTATIC FIELD TEST, IT SHALL BE THE SPECIFIED SHOP TEST PRESSURE.
2. UNLESS OTHERWISE INDICATED, TIE RODS SHALL BE SPACED UNIFORMLY AROUND THE PIPE, BEGINNING WITH THE FIRST TWO AT THE HORIZONTAL CENTERLINE OF THE PIPE, SUBJECT TO THE APPROVAL OF THE ENGINEER.
3. EXCEPT WHERE TIE RODS ARE REQUIRED, BOLTS FOR FOLLOWER RINGS SHALL BE BOLT-STUDS ON WALL PIPE. ALL BOLT HOLES IN WALL PIPE SHALL BE TAPPED. WALL PIPES SHALL BE ORIENTED SO THAT THE BOLT HOLES STRADDLE THE TOP CENTERLINE.

   FOR STEEL PIPE APPLICATIONS, BUILD UP END OF STEEL PIPE TO FIT MJ WALL PIPE.
4. FOR BURIED PIPING, CONTRACTOR SHALL PROVIDE AN ADDITIONAL FIELD JOINT AS CLOSE AS PRACTICAL TO FACE OF WALL, BUT NO MORE THAN 5 FEET.
5. USE WAX TAPE TO PROTECT ALL BURIED FERROUS SURFACES, INCLUDING PAINTED SURFACES. FOR PROTECTION OF ADJACENT PIPE BARREL SURFACES, SHRINK WRAP MAY BE USED IN LIEU OF WAX TAPE. SEE SPECIFICATIONS.
6. WHERE PIPE IS REQUIRED ON ONE SIDE ONLY, PROVIDE MJxPE WALL PIPE.
7. FOR PIPING FLEXIBILITY, PROVIDE GAP LARGE ENOUGH TO FACILITATE PIPE ASSEMBLY AND DISASSEMBLY AT ASSOCIATED FLANGE PIPE JOINTS.
8. FOR PENETRATION AT EXISTING WALL, REFER TO EXISTING WALL PENETRATION DETAIL.

D MECHANICAL JOINT WALL PIPE WITH TIE RODS

NO SCALE

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Four Rivers Sanitation Authority

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PROJECT NO.:	411752

DETAILS

PROCESS MECHANICAL

MECHANICAL DETAILS 1 OF 4

99-M-501

147 OF 163

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

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D11000

A NOT USED

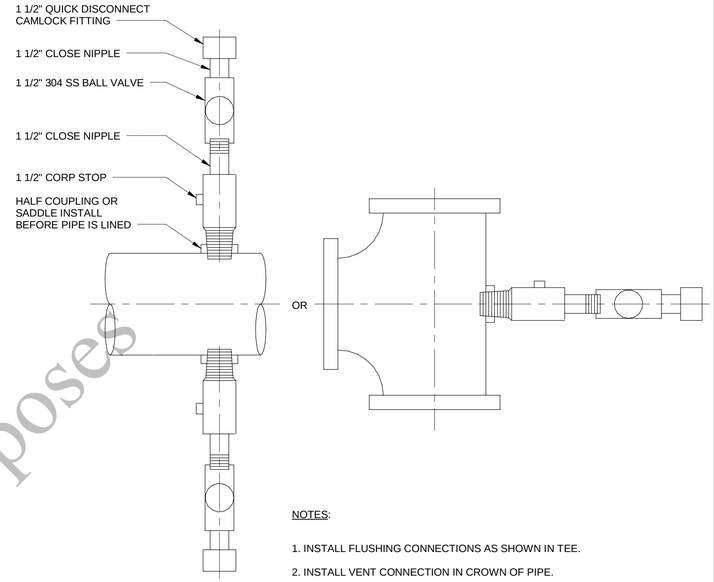
PIPE SUPPORT SCHEDULE

SUPPORT DESIGNATION	SUPPORT TYPE	LOCATION	PIPE	SUPPORT DETAIL/ SHEET	MATERIAL
PS-1	CONCRETE SADDLE	AGS REACTOR PIPE GALLERY	30" AGS INFLUENT	A/ 99-S-513	CONCRETE
PS-2	TRAPEZE	AGS REACTOR PIPE GALLERY	14" WAGS/ WLC	B/ 99-S-513	GALV STEEL
PS-3	ROOF HANGER	AGS REACTOR PIPE GALLERY	14" WAGS/ WLC	C/ 99-S-513	GALV STEEL
PS-4	WALL BRACKET	AGS REACTOR PIPE GALLERY	14" WAGS/ WLC	D/ 99-S-513	GALV STEEL
PS-5	CONCRETE SADDLE AT TEE	AGS REACTOR PIPE GALLERY	30" AGS INFLUENT	E/ 99-S-513	CONCRETE
PS-6	CONCRETE THRUST BLOCK AT ELBOW	AGS REACTOR PIPE GALLERY	30" AGS INFLUENT	A/ 99-S-514	CONCRETE
PS-7	WALL BRACKET	WAGS/ WLC WETWELL	14" WAGS/ WLC	D/ 99-S-513	STAINLESS STEEL (SEE NOTE 1)
PS-8	CONCRETE SADDLE W/ STRAP	WAGS/ WLC WETWELL	14" WAGS/ WLC	F/ 99-S-513	STAINLESS STEEL STRAP (SEE NOTE 1)
PS-9	INTAKE DUCT SUPPORT	AGS SUPPORT FACILITY	30" X 30" DUCT	D/ 99-S-515	GALV STEEL
PS-10 (SPR)	SPRING HANGER	AGS SUPPORT FACILITY	6", 12" & 16" AIR	A/ 99-S-516	GALV STEEL
PS-11 (G)	MASONRY GUIDE SUPPORT W/ NO GAP	AGS SUPPORT FACILITY	10", 14" & 16" AIR	B/ 99-S-516	GALV STEEL
PS-12 (G)	ROOF HANGER GUIDE SUPPORT W/ 1/8" GAP	AGS SUPPORT FACILITY	10" AIR	C/ 99-S-516	GALV STEEL
PS-13 (A)	BASE ELBOW SUPPORT	AGS SUPPORT FACILITY	14" AIR	A/ 99-S-515	GALV STEEL
PS-14 (A)	WALL BRACKET ANCHOR SUPPORT	AGS REACTOR TANK	16" AIR	D/ 99-S-516	STAINLESS STEEL (SEE NOTE 1)
PS-15 (G)	WALL BRACKET GUIDE SUPPORT W/ 1/4" GAP	AGS REACTOR TANK	12" & 16" AIR	D/ 99-S-513	STAINLESS STEEL (SEE NOTE 1)
PS-16 (G)	WALL BRACKET GUIDE SUPPORT W/ 1/2" GAP	AGS REACTOR TANK	16" AIR	D/ 99-S-513	STAINLESS STEEL (SEE NOTE 1)
PS-17 (G)	ANGLE TEE STANCHION GUIDE SUPPORT W/ 1/4" GAP	AGS REACTOR TANK	12" & 16" AIR	B/ 99-S-515	STAINLESS STEEL (SEE NOTE 1)
PS-18 (V)	ANGLE TEE STANCHION WITHOUT U CLAMPS	AGS REACTOR TANK	12" AIR	B/ 99-S-515	STAINLESS STEEL (SEE NOTE 1)
PS-19 (A)	WALL ANCHOR	AGS REACTOR TANK	16" AIR	A/ 99-M-501	STAINLESS STEEL (SEE NOTE 1)

NOTE:

1. PIPE SUPPORTS IN SUBMERGED LOCATIONS SHALL BE COMPATIBLE WITH CHLORIDE CONCENTRATIONS UP TO 300 MG/L.

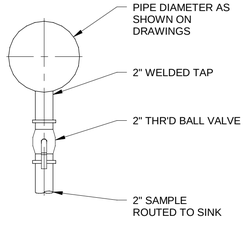
B PIPE SUPPORT SCHEDULE
NO SCALE



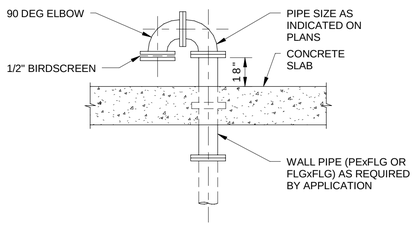
NOTES:

1. INSTALL FLUSHING CONNECTIONS AS SHOWN IN TEE.
2. INSTALL VENT CONNECTION IN CROWN OF PIPE.
3. INSTALL DRAIN CONNECTION AT INVERT OF PIPE.

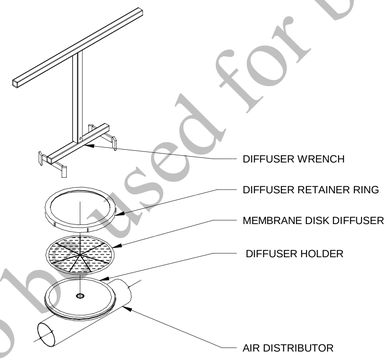
C FLUSHING/DRAIN/VENT CONNECTION
NO SCALE



D 2" SAMPLE TAP
NO SCALE



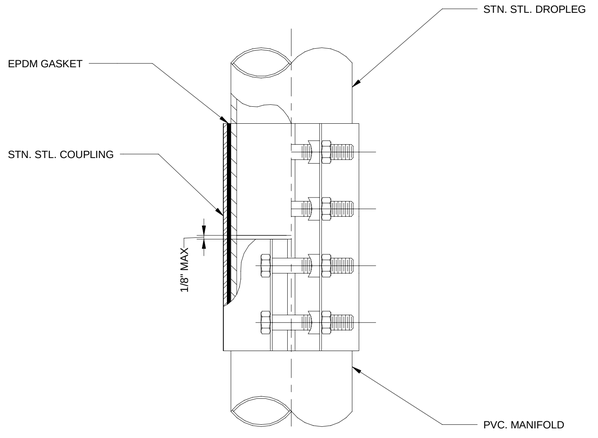
E GOOSENECK VENT
NO SCALE



NOTES:

1. THIS DETAIL IS PROVIDED FOR REFERENCE ONLY BY THE AGS SYSTEM SUPPLIER IDENTIFIED IN THE BASE BID (TYPE III) MATERIAL AND EQUIPMENT SCHEDULE. FINAL INSTALLATION DETAILS ARE TO BE COORDINATED BY THE CONTRACTOR BASED ON THE ACTUAL EQUIPMENT SUPPLIED AND AGS SYSTEM SUPPLIER SUBMITTAL PACKAGE.

F AGS REACTOR MEMBRANE DISK DIFFUSER ASSEMBLY
NO SCALE



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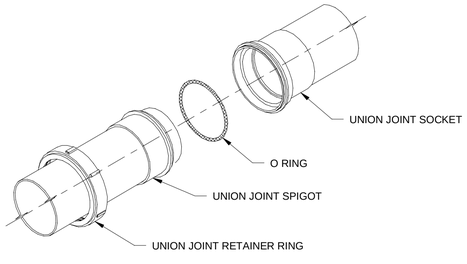
G AGS REACTOR RISER COUPLING
NO SCALE



NOTES:

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H AGS REACTOR RISER AIR DISTRIBUTOR UNION JOINT ASSEMBLY
NO SCALE

BLACK & VEATCH
Black & Veatch Corporation
Chicago, Illinois
ILLINOIS PROFESSIONAL
DESIGN FIRM - 184.002143-0006

Four Rivers Sanitation Authority

AEROBIC GRANULAR SLUDGE - PHASE 1

REVISIONS AND RECORD OF ISSUE

DESIGNED:	JL
DETAILED:	VP
CHECKED:	AM/JH
APPROVED:	MR
DATE:	12/20/2022
PROJECT NO.:	411752

DETAILS

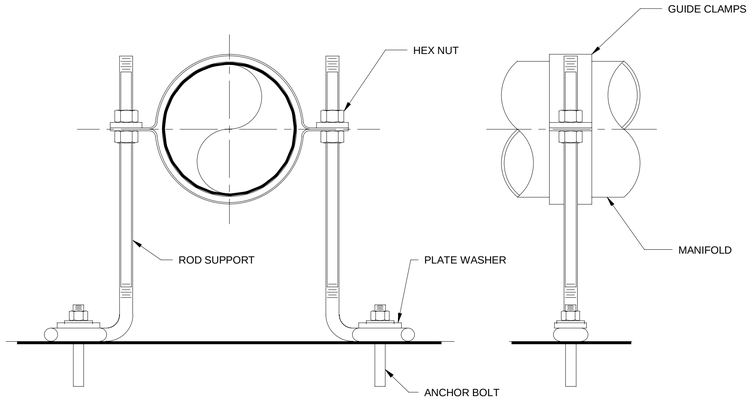
PROCESS MECHANICAL

MECHANICAL DETAILS 2 OF 4

99-M-502

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

PLOTTED: 12/16/2022 11:54:58 AM
FILE: BIM 360://409469 - Aerobic Granular Sludge Phase 1/409469 - AGS.rvt
D11000



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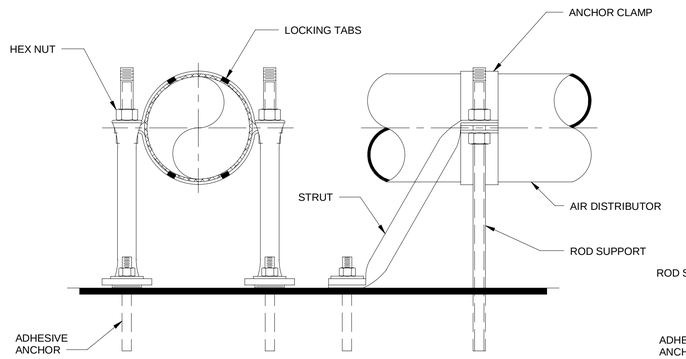
A AGS REACTOR MANIFOLD SUPPORT ASSEMBLY
NO SCALE



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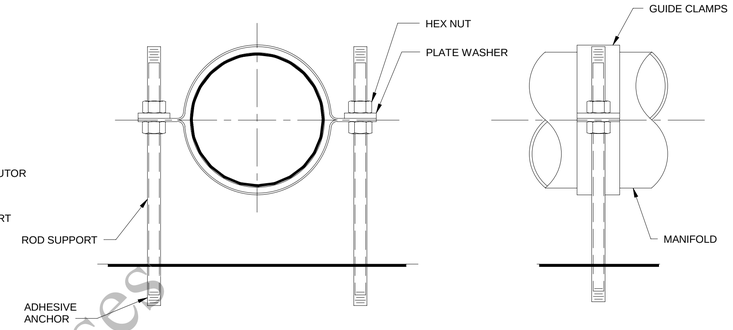
B AGS REACTOR AIR DISTRIBUTOR ANCHOR SUPPORT ASSEMBLY
NO SCALE



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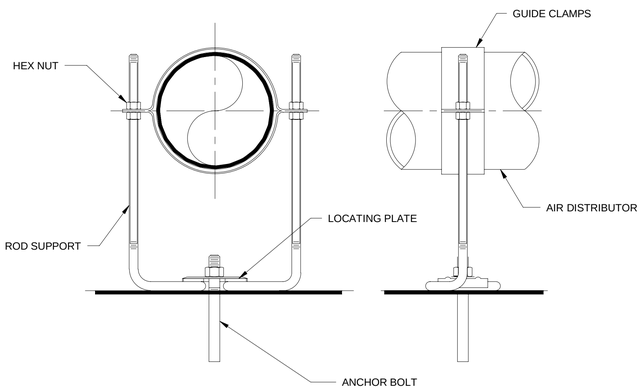
C AGS REACTOR RISER MANIFOLD SUPPORT ASSEBLY - ALL THREAD
NO SCALE



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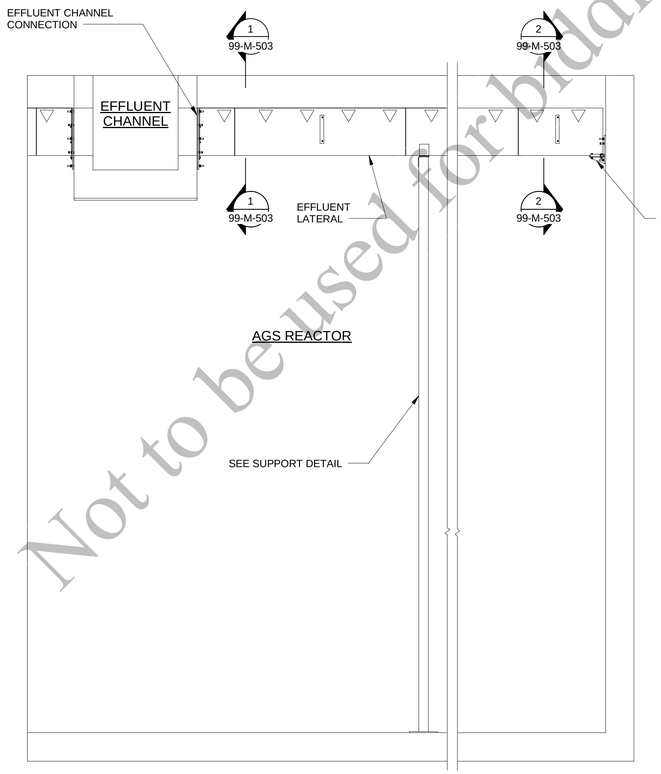
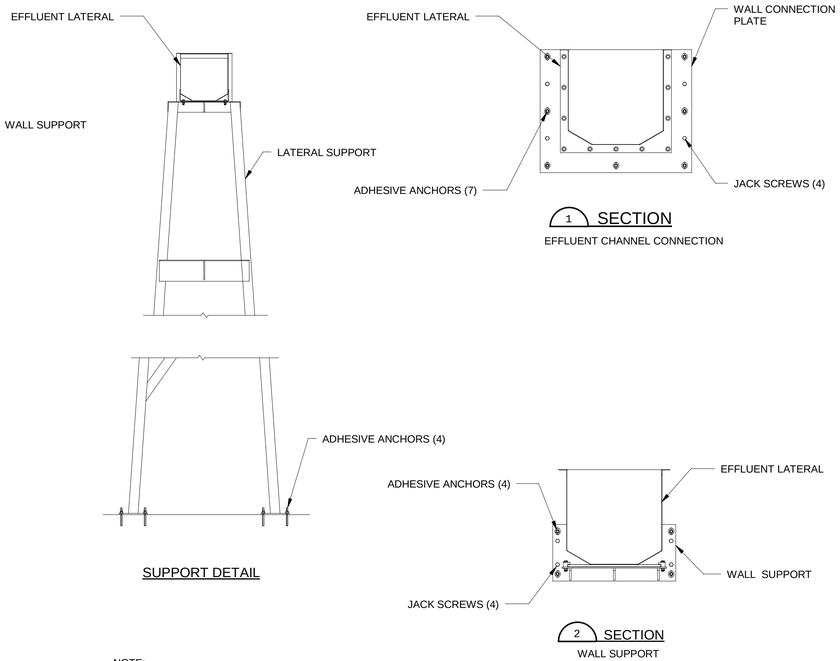
D AGS REACTOR RISER AIR DISTRIBUTOR GUIDE SUPPORT ASSEMBLY
NO SCALE



NOTE:

1. AGS SYSTEM SUPPLIER EFLUENT CHANNEL SIZED BY OTHERFOR FREE FLOW.



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E AGS REACTOR EFFLUENT LATERAL DETAILS
NO SCALE

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DESIGN FIRM - 184.002143-0006

Four Rivers Sanitation Authority

AEROBIC GRANULAR SLUDGE - PHASE 1

REVISIONS AND RECORD OF ISSUE

DESIGNED:	JL
DETAILED:	NN
CHECKED:	AM/JH
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PROJECT NO.:	411752

DETAILS

PROCESS MECHANICAL

MECHANICAL DETAILS 3 OF 4

99-M-503

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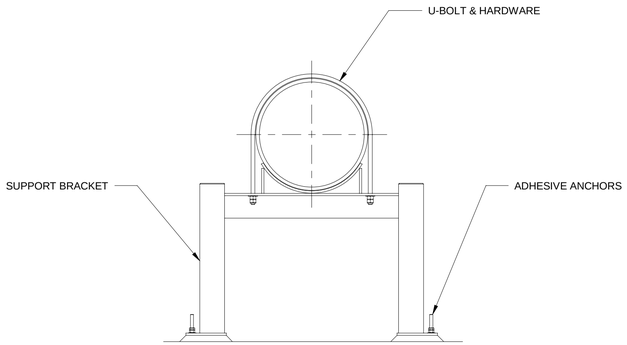
(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

PLOTTED: 12/16/2022 11:55:17 AM
FILE: BIM 360://409469 - Aerobic Granular Sludge Phase 1/409469 - AGS.rvt
D11000



NOTES:

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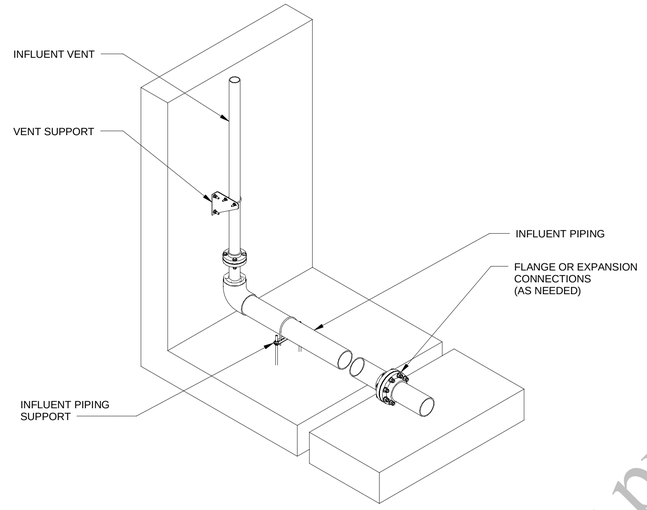
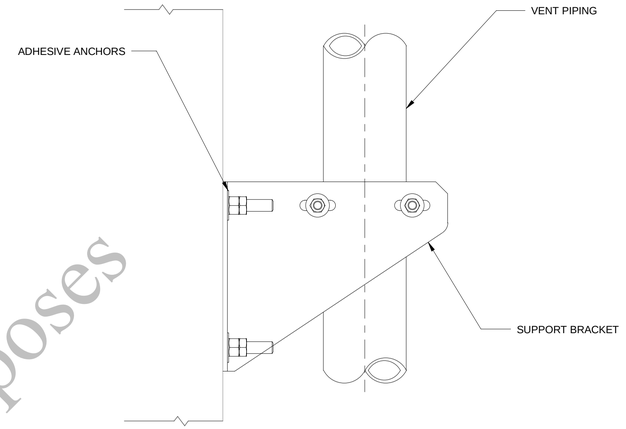
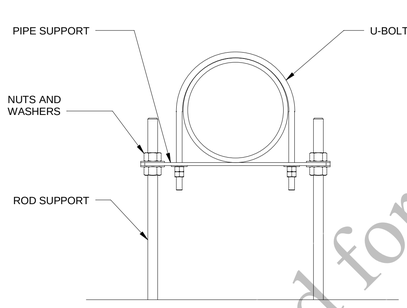
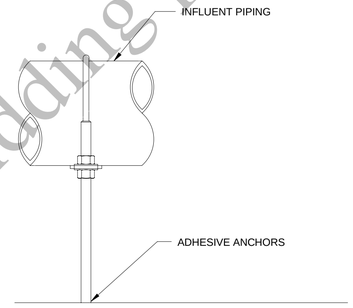
A AGS REACTOR INFLUENT HEADER SUPPORT DETAIL
NO SCALE









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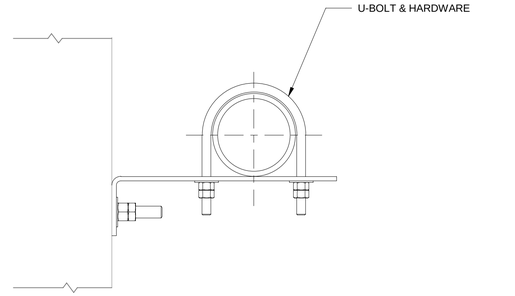
B AGS REACTOR INFLUENT LATERAL SUPPORT DETAIL
NO SCALE



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C AGS REACTOR VENT SUPPORT DETAIL
NO SCALE

INFLUENT DISTRIBUTION ASSEMBLY	
LATERALS	
LATERAL SIZE	8 IN
TOTAL LENGTH OF LATERAL PIPES	1,728 FT
NO. OF INFLUENT PIPING SUPPORTS	289
LATERAL MATERIAL	PVC
LATERAL VENT SIZE	3 IN
NO. OF VENT SUPPORTS	144
VENT MATERIAL	PVC
HEADERS	
HEADER SIZE	36 IN
TOTAL LENGTH OF HEADER	77 FT
NO. OF HEADER SUPPORTS	2
HEADER MATERIAL	HDPE
HEADER VENT SIZE	8 IN
NO. OF VENTS SUPPORTS	6
VENT MATERIAL	PVC

EFFLUENT WEIR ASSEMBLY	
LATERALS	
TOTAL LENGTH OF LATERALS	304 FT
NO. OF INTERMEDIATE SUPPORTS	8
NO. OF WALL SUPPORTS	16
LATERAL MATERIAL	316 SS
CHANNEL (BY OTHERS)	
LENGTH OF CHANNEL	73 FT
CHANNEL MATERIAL	CONCRETE

SOLIDS WASTE SYSTEM	
LATERALS	
LATERAL SIZE	8 IN
TOTAL LENGTH OF LATERALS	80 FT
LATERAL MATERIAL	HDPE
SOLIDS WASTE LATERALS MAY BE SUPPORTED WITH THE INTERMEDIATE EFFLUENT WEIR SUPPORTS	
HEADERS	
HEADER SIZE (H1)	16 IN
LENGTH OF HEADER (H1)	64 FT
NO. OF HEADER SUPPORTS	5
HEADER MATERIAL	HDPE

NOTES:

1. ALL SIZES ARE NOMINAL AND MAY BE ADJUSTED AT TIME OF ORDER.
2. ALL QUANTITIES AND LENGTHS ARE APPROXIMATE AND MAY VARY +/- 10%.
3. THIS DETAIL IS PROVIDED FOR REFERENCE ONLY BY THE AGS SYSTEM SUPPLIER IDENTIFIED IN THE BASE BID (TYPE III) MATERIAL AND EQUIPMENT SCHEDULE. FINAL INSTALLATION DETAILS ARE TO BE COORDINATED BY THE CONTRACTOR BASED ON THE ACTUAL EQUIPMENT SUPPLIED AND AGS SYSTEM SUPPLIER SUBMITTAL PACKAGE.

BLACK & VEATCH
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Chicago, Illinois
ILLINOIS PROFESSIONAL
DESIGN FIRM - 184.002143-0006

Four Rivers Sanitation Authority

AEROBIC GRANULAR SLUDGE - PHASE 1

REVISIONS AND RECORD OF ISSUE

DESIGNED:	MD
DETAILED:	NN
CHECKED:	JL
APPROVED:	MR
DATE:	12/20/2022
PROJECT NO.:	411752

DETAILS

PROCESS MECHANICAL

MECHANICAL DETAILS 4 OF 4

99-M-504

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(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

PLOTTED: 12/16/2022 11:55:21 AM
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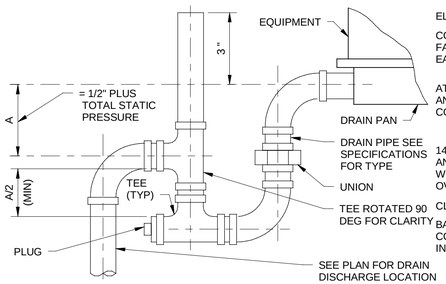
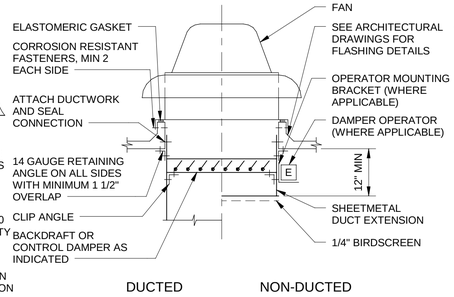
D11000



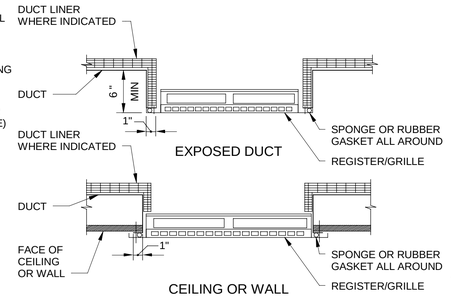
A DRAIN PAN TRAP - DRAW THROUGH

NO SCALE



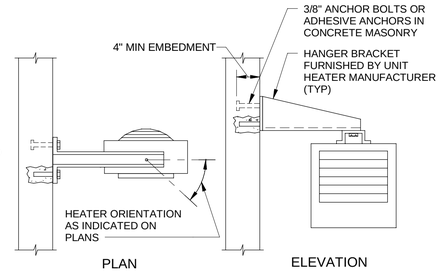
B ROOF MOUNTED FAN

NO SCALE



C REGISTER/GRILLE

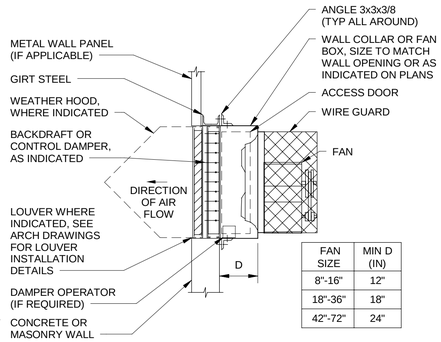
NO SCALE



NOTES:
1. MASONRY WALLS SHALL BE SOLIDLY GROUTED 4" MIN, ALL SIDES OF ANCHORS.
2. UNIT HEATER BOTTOM ELEVATION SHALL BE 8 FT ABOVE FINISHED FLOOR UNLESS OTHERWISE INDICATED.

D ELECTRIC UNIT HEATER SUPPORT

NO SCALE



FAN SIZE	MIN D (IN)
8"-16"	12"
18"-36"	18"
42"-72"	24"

E PROPELLER FAN

NO SCALE

F HVAC EQUIPMENT CURB

NO SCALE

G CONDENSATE DRAIN SUMP

NO SCALE

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Four Rivers Sanitation Authority

AEROBIC GRANULAR SLUDGE - PHASE 1

REVISIONS AND RECORD OF ISSUE

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DETAILED:	AJP
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DATE:	12/20/2022
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AGS REACTORS AND PIPE GALLERY

HVAC

DETAILS

99-H-501

151 OF 163

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

PLOTTED: 12/16/2022 11:48:43 AM
FILE: BIM 360://409469 - Aerobic Granular Sludge Phase 1/409469 - AGS.rvt
D11000

HVAC SEQUENCE OF OPERATIONS:

1. GENERAL SYSTEM OPERATIONS.

1.1. TEMPERATURE CONTROL PANEL(S). FRSA AGS BUILDINGS ARE CONTROLLED AND MONITORED BY DDC SYSTEM. THE SYSTEM HIERARCHY BUILT SUCH AS LOCAL PANELS 01-TCP-0001, 02-TCP-0001, 01-ECP-0001 ARE CONNECTED TO 01-DDC-0001 PANEL LOCATED IN THE MCC ROOM. THE DDC PANEL TIED IN WITH EXISTING PLANT DDC SYSTEM. ALL PANELS SHOULD HAVE NECESSARY CONTROLLERS AND COMPONENTS FOR EQUIPMENT MONITORING, REMOTE ACCESS, AND REMOTE COMMANDING. TEMPERATURE CONTROL PANEL(S) (TCP) AND EQUIPMENT CONTROL PANELS (ECP) IDENTIFIED IN THE SEQUENCE OF OPERATION SHALL BE PROVIDED WITH THE INDICATING LIGHTS, RUNNING LIGHTS, ALARM LIGHTS, AUDIBLE ALARMS, TIMERS, AND SELECTOR SWITCHES FOR CONTROL AND STATUS INDICATION OF THE EQUIPMENT SERVED. WHERE NO CONTROL PANELS ARE PROVIDED FOR EQUIPENT, THE LIGHTS AND SWITCHES SHALL BE AT THE STARTER OR MCC. RUNNING LIGHTS SHALL BE PROVIDED TO INDICATE BOTH ENERGIZED AND DE-ENERGIZED CONDITIONS FOR THE EQUIPMENT AND SHALL POSITIVELY INDICATE EQUIPMENT CONDITIONS FROM THE MOTOR STARTER OR CURRENT SENSOR. SWITCH POSITION SHALL NOT BE USED FOR LIGHT ILLUMINATION. INDICATING AND RUNNING LIGHTS SHALL BE LOCATED DIRECTLY ABOVE EACH RESPECTIVE SELECTOR SWITCH WITH LIGHT COLORS AS FOLLOWS:

RED -DE-ENERGIZED
GREEN -ENERGIZED
AMBER -ALARM
WHITE -STATUS

INDICATING LIGHTS AND SELECTOR SWITCHES SHALL BE LOCATED ON THE FACE OF THE TEMPERATURE CONTROL PANEL SERVING THE RESPECTIVE EQUIPMENT. IN ADDITION TO THE LIGHTS, TIMERS, AND SELECTOR SWITCHES DESCRIBED IN THE SEQUENCE OF OPERATION FOR THE INDIVIDUAL EQUIPMENT, EACH CONTROL PANEL SHALL BE PROVIDED WITH THE FOLLOWING:

"CONTROL POWER ON" STATUS LIGHT
"INDICATING LIGHT TEST" PUSHBUTTON
ALARM SILENCE PUSHBUTTON
"ALARM RESET" PUSHBUTTON (WHERE APPLICABLE)

CONTROL PANELS SPECIFIED TO BE PROVIDED WITH ALARM CONDITION INDICATING LIGHTS SHALL BE PROVIDED WITH AN ELECTRICALLY ISOLATED CONTACT TO PROVIDE A COMMON ALARM TO THE PLANT CONTROL SYSTEM (PCS).

TEMPERATURE CONTROL PANELS SHALL COME WITH PHENOLIC NAMEPLATES FOR EACH CONTROL SWITCH INDICATING SWITCH TYPE, EQUIPMENT CONTROLLED, ROOM OR AREA SERVED, AND SWITCH AUTOMATIC POSITION EQUIPMENT INTERLOCK

1.2. SYSTEM INTERLOCKS AND ALARMS

UNLESS OTHERWISE INDICATED, ALL EQUIPMENT INTERLOCKING DEVICES AS DESCRIBED HEREIN SHALL BE PROVIDED WITHIN THE RESPECTIVE TEMPERATURE/EQUIPMENT CONTROL PANEL (TCP/ECP).

1.3 LOW LIMIT TEMPERATURE ALARM PROVIDED BY THE DUCT SENSOR T-01-0001 WITH AUTO-RESET. ALARM SETPOINT: 38F

1.4. VENTILATION SYSTEM FAILURE.

1.4.1. VENTILATION SYSTEM FAILURE (AIRFLOW SWITCHES). VENTILATION SYSTEM FAILURE PRESSURE DIFFERENTIAL SWITCHES SHALL BE LOCATED IN THE SYSTEMS INDICATED BELOW. IN THE EVENT THAT AIRFLOW IS NOT ATTAINED OR LOST AS DETERMINED BY THE PRESSURE DIFFERENTIAL FLOW SWITCH, A "VENTILATION SYSTEM FAILURE" SIGNAL SHALL BE TRANSMITTED THE FIRE ALARM SIGNAL SHALL BE RECEIVED BY DDC SYSTEM AND IF A ZONE ALARM IS WHERE THE HVAC EQUIPMENT LOCATED, DDC SYSTEM SHALL DISABLE THE EQUIPMENT UNTIL ALARM CLEARED HAVE A NORMALLY OPEN CONTACT FOR TRANSMITTING A SIGNAL TO THE RESPECTIVE TEMPERATURE/EQUIPMENT CONTROL PANEL ILLUMINATING AN ALARM INDICATING LIGHT FOR THE RESPECTIVE EQUIPMENT.

EQUIPMENT	VENTILATION FAILURE ALARM DESTINATION	TEMPERATURE/EQUIPMENT CONTROL PANEL
01-EF-0001	01-PDS-0001	01-ECP-0001
01-EF-0002	01-PDS-0002	01-ECP-0001

1.4.2. VENTILATION SYSTEM FAILURE (CURRENT SENSOR SWITCHES). MOTOR CURRENT SENSOR SWITCHES SHALL BE INSTALLED ON THE EQUIPMENT OR AT THE EQUIPMENT MOTOR STARTER TO INDICATE VENTILATION SYSTEM FAILURE INCLUDING DETECTION OF BELT LOSS OR FAN MOTOR FAILURE. IN THE EVENT THAT THE EQUIPMENT FAILS TO OPERATE AS DETERMINED BY THE CURRENT SENSOR SWITCH, A "VENTILATION SYSTEM FAILURE" SIGNAL SHALL BE TRANSMITTED TO THE ALARM DESTINATION AS INDICATED BELOW. WHEN THE SIGNAL IS TRANSMITTED TO THE FIRE ALARM SIGNALING SYSTEM, A VISUAL ALARM SHALL BE ILLUMINATED AND AUDIBLE ALARM SHALL SOUND AT EACH ROOM ENTRANCE AND WITHIN THE ROOM. THE FIRE ALARM SIGNALING SYSTEMS SHALL HAVE A NORMALLY OPEN CONTACT FOR TRANSMITTING A SIGNAL TO THE RESPECTIVE TEMPERATURE/EQUIPMENT CONTROL PANEL ILLUMINATING A "VENTILATION FAILURE" INDICATING LIGHT FOR THE RESPECTIVE EQUIPMENT. WHEN THE SIGNAL IS TRANSMITTED TO THE PCS, A SIGNAL SHALL ALSO BE SENT TO THE RESPECTIVE TEMPERATURE/EQUIPMENT CONTROL PANEL ILLUMINATING A "VENTILATION FAILURE" INDICATING LIGHT FOR THE RESPECTIVE EQUIPMENT.

EQUIPMENT	VENTILATION FAILURE ALARM DESTINATION	TEMPERATURE/EQUIPMENT CONTROL PANEL
02-EF-0001	BUILT-IN	01-TCP-0001
02-EF-0002	BUILT-IN	01-TCP-0001

2. HEATING SYSTEMS.

2.1. ELECTRIC UNIT HEATERS. UNIT HEATERS SHALL BE CONTROLLED BY THEIR RESPECTIVE WALL-MOUNTED THERMOSTATS.

THE THERMOSTAT SHALL ENABLE THE RESPECTIVE UNIT HEATER TO MAINTAIN THE ROOM SETPOINT TEMPERATURE. UPON REACHING OF THE REQUIRED SETPOINT, THE UNIT HEATER SHALL BE DISABLED.

2.2. ELECTRIC FAN FORCED WALL HEATERS. WALL HEATERS SHALL BE CONTROLLED BY THEIR BUILT-IN THERMOSTATS. UPON REACHING THE SETPOINT, A WALL HEATER SHALL BE DISABLED.

3. VENTILATING/EXHAUST SYSTEMS.

3.1. "ON-OFF-AUTO" EQUIPMENT CONTROL. EQUIPMENT INDICATED FOR "ON-OFF-AUTO" CONTROL SHALL EACH BE CONTROLLED BY AN INDIVIDUAL "ON-OFF-AUTO" FAN SELECTOR SWITCH. THE SWITCH LOCATION SHALL BE AS INDICATED BELOW. WHEN THE SWITCH IS PLACED IN THE "AUTO" POSITION, THE FAN SHALL BE INTERLOCKED AND CONTROLLED BY THE FAN INTERLOCK. WHEN THE SWITCH IS PLACED IN THE "ON" POSITION, THE FAN SHALL BE ENERGIZED. BEFORE A FAN CAN OPERATE, THE CONTROL DAMPER 02-CD-0001 SHALL BE PROVEN OPEN FIRST. WHERE THE FAN IS INTERLOCKED WITH ANOTHER FAN OR EQUIPMENT WITH A FAN, THE FANS SHALL BE ENERGIZED SIMULTANEOUSLY AFTER ALL ASSOCIATED CONTROL DAMPERS ARE PROVEN OPEN. WHEN THE FAN IS DE-ENERGIZED, THE CONTROL DAMPER 02-CD-0002 SHALL RETURN TO NORMALLY CLOSED POSITION AT LAST UNLESS OTHERWISE INDICATED.

EQUIPMENT	SWITCH LOCATION	FAN INTERLOCK	CONTROL DAMPER(S)
01-EF-0001	01-TCP-0001	01-MAU-0001	01-CD-0001
01-EF-0002	01-TCP-0001	01-MAU-0001	01-CD-0002
01-EF-0003	01-TCP-0001	T-01-0002	01-CD-0003
01-EF-0004	01-TCP-0001	T-01-0003	01-CD-0004
02-EF-0001	02-TCP-0001	T-02-0001	02-CD-0001, 02-CD-0004
02-EF-0002	02-TCP-0001	T-02-0002	02-CD-0002, 02-CD-0003

4. HEATING AND VENTILATING SYSTEMS.

4.1. MAKEUP AIR UNIT (100% OUTSIDE AIR). MAKEUP AIR UNIT SHALL BE CONTROLLED BY AN INDIVIDUAL "SUMMER-OFF-WINTER" SYSTEM SELECTOR SWITCH. THE SWITCH LOCATION SHALL BE AS INDICATED BELOW. WHEN THE SWITCH IS PLACED IN THE "WINTER" POSITION, THE FAN SHALL OPERATE AND THE SUPPLY AIR SENSOR/THERMOSTAT SHALL MODULATE THE HEATING OUTPUT OF THE UNIT TO MAINTAIN THE DESIRED SUPPLY AIR TEMPERATURE. BEFORE THE FAN CAN OPERATE, THE CONTROL DAMPERS SHALL BE PROVEN OPEN. WHEN THE OUTSIDE AIR TEMPERATURE IS GREATER THAN THE HEATING CHANGEOVER TEMPERATURE SETPOINT AS DETECTED BY THE OUTDOOR AIR SENSOR/THERMOSTAT, THE HEATING SHALL BE LOCKED OUT. WHEN THE SWITCH IS PLACED IN THE "SUMMER" POSITION, THE FAN SHALL OPERATE AND THE HEATING SHALL BE LOCKED OUT. WHEN THE UNIT IS DE-ENERGIZED, THE CONTROL DAMPER(S) SHALL CLOSE, AND INTERLOCKED EQUIPMENT 01-EF-0001, 01-EF-0002 SHALL BE DE-ENERGIZED.

THE MAKEUP AIR UNIT FAN SHALL BE PROVIDED WITH A TWO-SPEED MOTOR OR VARIABLE FREQUENCY DRIVE. THE FAN MOTOR SHALL OPERATE AT FULL SPEED WHEN OUTDOOR AIR TEMPERATURE IS ABOVE THE CHANGEOVER SETPOINT AS DETECTED BY THE OUTDOOR AIR SENSOR, OR THE BUILDING IS OCCUPIED AS DETECTED BY A SIGNAL FROM THE DDC SYSTEM BUILDING LIGHTS, DOOR SWITCHES, COMBUSTIBLE GAS IS DETECTED AS INDICATED BY A SIGNAL FROM THE DDC SYSTEM COMBUSTIBLE GAS DETECTOR (WHERE INSTALLED). AT ALL OTHER CONDITIONS THE FAN SHALL OPERATE AT HALF SPEED. THE 01-MAU-0001 SHALL BE INTERLOCKED WITH 01-EF-0001 AND 01-EF-0002 WITH SPEED INTERLOCK. WHEN SUPPLY FAN IN HALF SPEED, BOTH EXHAUST FANS ARE IN HALF SPEED ALSO. PIPE GALLERY VENTILATION SYSTEM SHALL MAINTAIN THE ROOM UNDER POSITIVE 0.1" W.C. PRESSURE TO PREVENT OUTDOOR ODORS INFILTRATE THE ROOM. THE BALANCING CONTRACTOR TO SET THE AIRFLOW TO MEET THE REQUIRED ROOM PRESSURE.

EQUIPMENT	SWITCH LOCATION	SUPPLY AIR THERMOSTAT	CONTROL DAMPER(S)
01-MAU-0001	01-ECP-0001	T-01-0001	BUILT-IN

5. AIR CONDITIONING SYSTEMS.

5.1. DUCTLESS SPLIT SYSTEMS. DUCTLESS SPLIT SYSTEMS SHALL BE CONTROLLED BY THEIR RESPECTIVE THERMOSTAT. SYSTEM OPERATION SHALL BE CONTROLLED BY AN "OFF-HEAT-AUTO-COOL" (AUTOMATIC CHANGEOVER, PROGRAMMABLE) SYSTEM SWITCH AND AN "AUTO-ON" FAN SWITCH LOCATED ON THE THERMOSTAT SUB-BASE. WHEN THE FAN SWITCH IS PLACED IN THE "AUTO" POSITION, THE RESPECTIVE EQUIPMENT FAN SHALL BE ENERGIZED UPON A CALL FOR COOLING OR HEATING AS REQUIRED TO MAINTAIN THE DESIRED ROOM TEMPERATURE. WHEN THE FAN SWITCH IS PLACED IN THE "ON" POSITION, THE FAN SHALL BE ENERGIZED. BEFORE THE FAN CAN OPERATE. BOTH FCus SHALL BE ENERGIZED AND OPERATED SIMULTANEOUSLY MODULATING THE OUTPUT TO MEET THE ROOM SETPOINT.

EQUIPMENT	ROOM THERMOSTAT	CONTROL DAMPER(S)
02-FC-0001	T-02-0003	---
02-FC-0002	T-02-0003	---

12. THERMOSTAT SETPOINTS

12.1 THERMOSTAT SETPOINTS SHALL BE AS INDICATED BELOW, UNLESS THE SETPOINT HAS BEEN DESCRIBED PREVIOUSLY IN THIS SEQUENCE OF OPERATIONS.

LOW TEMPERATURE THERMOSTATS	- 40 F
HEATERS	- 50 F
MAKEUP AIR SUPPLY HEATING	- 50 F
VENTILATING EQUIPMENT	- 90 F
PROGRAMMABLE THERMOSTATS	- 85 F COOLING
	- 65 F HEATING

AIR DEVICE SCHEDULE

SYMBOL	MANUFACTURER	MODEL	FRAME/BORDER	MODULE SIZE	MATERIAL	FINISH	DAMPER TYPE	NOTES
ER-1	TITUS	3F	SURFACE MOUNT	---	ALUMINUM	BAKED WHITE ENAMEL	OPPOSED BLADE	1
SR-1	TITUS	271	SURFACE MOUNT	---	ALUMINUM	BAKED WHITE ENAMEL	OPPOSED BLADE	1

HEAT PUMP BRANCH SELECTOR UNIT SCHEDULE

UNIT NUMBER	MANUFACTURER	MODEL	POWER SUPPLY		MINIMUM CIRCUIT AMPACITY	NOTES
			VOLTS	PHASE		
02-BS-0001	MITSUBISHI	TAC-MKA32BC	208	1	0.01	---

HEAT PUMP SCHEDULE

UNIT NUMBER	LOCATION	MANUFACTURER	MODEL	COOLING				HEATING OUTPUT RATED CAPACITY (BTUH)	POWER SUPPLY		MINIMUM CIRCUIT AMPACITY	ARI MINIMUM EFFICIENCY	MATCHED WITH INDOOR UNIT	APPROX WEIGHT (LBS)	NOTES
				MAX RATED CAPACITY (BTUH)	MIN RATED CAPACITY (BTUH)	SUCTION TEMPERATURE (F)			VOLTS	PHASE					
						MINIMUM	MAXIMUM								
02-HP-0001	MCC (02-101)	MITSUBISHI	NTXSH42A152AA	38000	15500	45	55	27600	208	1	42	EER 13.4	02-FC-0001 & 02-FC-0002	300	1

FAN COIL SCHEDULE

UNIT NUMBER	LOCATION	MANUFACTURER	MODEL	AIRFLOW (CFM)	AIR PD (IN WC)	EAT		LAT (FDB)	CAPACITY (BTUH)		MCA	POWER SUPPLY		APPROX WEIGHT (LBS)	NOTES
						(FDB)	(FWB)		COOLING	HEATING		VOLTS	PHASE		
02-FC-0001	MCC (02-101)	MITSUBISHI	TPLA0A0241EA70B	710	0.25	80	67	55.8	19000	13800	1.0	208	1	100	1,2
02-FC-0002	MCC (02-101)	MITSUBISHI	TPLA0A0241EA70B	710	0.25	80	67	55.8	19000	13800	1.0	208	1	100	1,2

FAN SCHEDULE

UNIT NUMBER	LOCATION	MANUFACTURER	MODEL	FAN TYPE	AIRFLOW (CFM)	ESP (IN WC)	BRAKE HP	MOTOR HP	POWER SUPPLY		MINIMUM WHEEL DIAMETER (IN)	WHEEL TYPE	DRIVE	VIBRATION ISOLATION	APPROX WEIGHT (LBS)	NOTES
									VOLTS	PHASE						
01-EF-0001	PIPE GALLERY ROOF (01-001)	GREENHECK	CUBE-240-10	PRV	3900	0.375	0.52	1	480	3	24	C	BELT	INTERNAL	300	1,2
01-EF-0002	PIPE GALLERY ROOF (01-001)	GREENHECK	CUBE-240-10	PRV	3900	0.375	0.52	1	480	3	24	C	BELT	INTERNAL	300	1,2
01-EF-0003	STAIR NO.1 (01-002)	GREENHECK	SE1-14-440-VG	PF	1100	0.675	0.41	1/2	208	1	14	P	DIRECT	INTERNAL	100	1,2,3
01-EF-0004	STAIR NO.1 (01-003)	GREENHECK	SE1-14-440-VG	PF	1100	0.675	0.41	1/2	208	1	14	P	DIRECT	INTERNAL	100	1,2,3
02-EF-0001	BLOWERS ROOM (02-102)	GREENHECK	CUBE-300-20	PRV	7200	0.75	1.67	3	480	3	30	C	BELT	INTERNAL	300	1,2
02-EF-0002	BLOWERS ROOM (02-102)	GREENHECK	CUBE-300-20	PRV	7200	0.75	1.67	3	480	3	30	C	BELT	INTERNAL	300	1,2

HEATER SCHEDULE

UNIT NUMBER	LOCATION	MANUFACTURER	MODEL	TYPE	UNIT ORIENTATION	EAT (F)	AIR FLOW (CFM)	OUTPUT CAPACITY		MOTOR HP	POWER SUPPLY		APPROX WEIGHT (LBS)	NOTES
								(BTUH)	(KW)		VOLTS	PHASE		
01-EUH-0001	PIPE GALLERY (01-001)	CHROMALOX	HD3D	EUHCR	VERTICAL	60	1180	---	10	1/15	480	3	100	2
01-EUH-0002	PIPE GALLERY (01-001)	CHROMALOX	HD3D	EUHCR	VERTICAL	60	1180	---	10	1/15	480	3	100	2
01-EUH-0003	PIPE GALLERY (01-001)	CHROMALOX	HD3D	EUHCR	VERTICAL	60	1180	---	10	1/15	480	3	100	2
01-EUH-0004	PIPE GALLERY (01-001)	CHROMALOX	HD3D	EUHCR	VERTICAL	60	1180	---	10	1/15	480	3	100	2
01-EUH-0005	PIPE GALLERY (01-001)	CHROMALOX	HD3D	EUHCR	VERTICAL	60	1180	---	10	1/15	480	3	100	2
01-EUH-0006	PIPE GALLERY (01-001)	CHROMALOX	HD3D	EUHCR	VERTICAL	60	1180	---	10	1/15	480	3	100	2
01-EUH-0007	PIPE GALLERY (01-001)	CHROMALOX	HD3D	EUHCR	VERTICAL	60	1180	---	10	1/15	480	3	100	2
01-EUH-0008	PIPE GALLERY (01-001)	CHROMALOX	HD3D	EUHCR	VERTICAL	60	1180	---	10	1/15	480	3	100	2
01-WH-0001	STAIR NO.1 (01-002)	INDEECO	933U05000U	WH	VERTICAL	60	160	---	5	---	480	3	100	1
01-WH-0001	STAIR NO.2 (01-003)	INDEECO	933U05000U	WH	VERTICAL	60	160	---	5	---	480	3	100	1
02-EUH-0001	BLOWERS ROOM (02-102)	CHROMALOX	HD3D	EUHCR	VERTICAL	60	1180	---	10	1/15	480	3	100	2
02-EUH-0002	BLOWERS ROOM (02-102)	CHROMALOX	HD3D	EUHCR	VERTICAL	60	1180	---	10	1/15	480	3	100	2

MAKEUP AIR UNIT SCHEDULE

UNIT NUMBER	LOCATION	MANUFACTURER	MODEL	HEATING TYPE	AIRFLOW (CFM)	ESP (IN WC)	MOTOR HP	POWER SUPPLY		OUTPUT CAPACITY (BTUH OR (KW))	MINIMUM WHEEL DIA (IN)	FILTER DATA		VIBRATION ISOLATION	APPROX WEIGHT (LBS)	NOTES
								VOLTS	PHASE			TYPE	THICKNESS (IN)			
01-MAU-0001	PIPE GALLERY	HASTINGS	SBD215	DF	7200	0.75	7.5	480	3	505000	15	PLEATED	2	INTERNAL	1300	1,2,3,4,5,6

SCHEDULE NOTES

SEE DRAWINGS 00-H-001 FOR LEGEND, ABREVIATIONS AND GENERAL NOTES.

AIR DEVICE SCHEDULE:

NOTES:
1. SEE DRAWINGS FOR DEVICE LENGTH, WIDTH, AND SUPPLY PATTERN.

HEAT PUMP SCHEDULE:

OUTDOOR COIL ENTERING AIR TEMPERATURE:
COOLING – 91˚ F DESIGN / 0˚ F MIN
HEATING – -13˚ F (HEAT PUMP)

NOTES:
1. UNIT IS SUBJECT TO CORROSION FROM A HYDROGEN SULFIDE LADEN ATMOSPHERE. ALL AIRSTREAM COMPONENTS AND EXPOSED HEAT TRANSFER COMPONENTS SHALL BE GIVEN A PROTECTIVE SPECIAL COATING OF HERESITE OR APPROVED EQUAL. CONTROLS PANELS, WIRING CONNECTIONS AND OTHER SENSITIVE ELECTRONICS SHALL HAVE A CONFORMAL COATING APPLIED.

FAN COIL SCHEDULE:

NOTES:
1. UNIT IS SUBJECT TO CORROSION FROM A HYDROGEN SULFIDE LADEN ATMOSPHERE. ALL AIRSTREAM COMPONENTS AND EXPOSED HEAT TRANSFER COMPONENTS SHALL BE GIVEN A PROTECTIVE SPECIAL COATING OF HERESITE OR APPROVED EQUAL. CONTROLS PANELS, WIRING CONNECTIONS AND OTHER SENSITIVE ELECTRONICS SHALL HAVE A CONFORMAL COATING APPLIED.
2. INDOOR UNIT POWERED BY OUTDOOR UNIT.

FAN SCHEDULE:

FAN TYPE ABBREVIATIONS:
PRV - POWER ROOF VENTILATOR

WHEEL TYPE ABBREVIATIONS:
A - AXIAL
C - CENTRIFUGAL
P - PROPELLER

NOTES:
1. UNIT IS SUBJECT TO CORROSION FROM A HYDROGEN SULFIDE LADEN ATMOSPHERE. ALL AIRSTREAM COMPONENTS AND EXPOSED HEAT TRANSFER COMPONENTS SHALL BE GIVEN A PROTECTIVE SPECIAL COATING OF HERESITE OR APPROVED EQUAL. CONTROLS PANELS, WIRING CONNECTIONS AND OTHER SENSITIVE ELECTRONICS SHALL HAVE A CONFORMAL COATING APPLIED.
2. CONSTURCTION A) ALUMINUM FAN BLADES B) STEEL FAN BLADES.
3. EC TYPE SPEED CONTROLLER SHALL BE PROVIDED BY MANUFACTURER

HEATER SCHEDULE:

TYPE ABBREVIATIONS:
EUHCR - CORROSION RESISTANT ELECTRIC UNIT HEATER
WH - WALL HEATER

NOTES:
1. SURFACE WALL MOUNTING BOX.
2. SURFACE WALL MOUNTING BRACKET.

MAKEUP AIR UNIT SCHEDULE:

CAPACITY NOTE: CAPACITIES LISTED IN PARENTHESES ARE IN UNITS OF "KW". CAPACITIES LISTED WITHOUT PARENTHESES ARE IN UNITS OF "BTUH".

HEATING TYPE ABBREVIATIONS:
DF - DIRECT FIRED

NOTES:
1. FILTER VELOCITY SHALL NOT EXCEED 350 FEET PER MINUTE.
2. UNIT IS SUBJECT TO CORROSION FROM A HYDROGEN SULFIDE LADEN ATMOSPHERE. ALL AIRSTREAM COMPONENTS AND EXPOSED HEAT TRANSFER COMPONENTS SHALL BE GIVEN A PROTECTIVE SPECIAL COATING OF HERESITE OR APPROVED EQUAL. CONTROLS PANELS, WIRING CONNECTIONS AND OTHER SENSITIVE ELECTRONICS SHALL HAVE A CONFORMAL COATING APPLIED.
3. UNIT SHOULD BE PROVIDED WITH INTAKE HOOD, INLET DAMPER, BURNER SECTION, FAN SECTION AND FILTER SECTION.
4. DIRECT GAS FIRED BURNER WITH SPARK IGNITED INTERMITTENT PILOT, WITH 22:1 TURNDOWN RATIO. AUTOMATIC MILD WEATHER BURNER LOCKOUT.
5. TOTALLY ENCLOSED FAN MOTOR. THE MOTOR SHALL BE I NVERTER DRIVEN SUITABLE FOR VFD CONTROL. VFD TO BE PROVIDED BY THE UNIT MANUFACTURER AND INSTALLED ONBOARD THE UNIT INSIDE THE LOCAL CONTROL PANEL.
6. DUAL FAN FOR MAKEUP AIR UNIT.

BLACK & VEATCH
Black & Veatch Corporation
Chicago, Illinois
ILLINOIS PROFESSIONAL
DESIGN FIRM - 184.002143-0006

Four Rivers Sanitation Authority

AEROBIC GRANULAR SLUDGE - PHASE 1

REVISIONS AND RECORD OF ISSUE

DESIGNED:	VSS
DETAILED:	AJP
CHECKED:	KMC
APPROVED:	SP
DATE:	12/20/2022
PROJECT NO.:	411752

AGS REACTORS AND PIPE GALLERY

HVAC

SEQUENCE OF OPERATIONS AND SCHEDULES

99-H-601

152 OF 163

PLOTTED: 12/16/2022 11:50:23 AM
FILE: BIM 360://409469 - Aerobic Granular Sludge Phase 1/409469 - AGS.rvt
D11000

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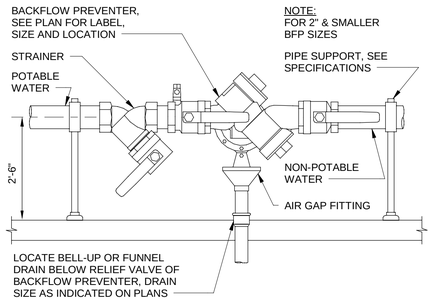

A BACKFLOW PREVENTER
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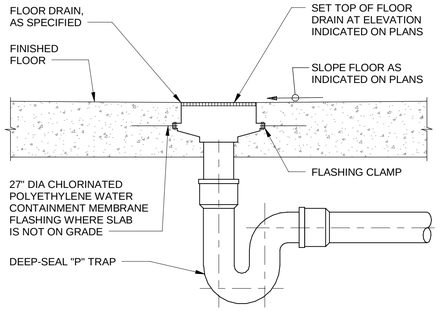
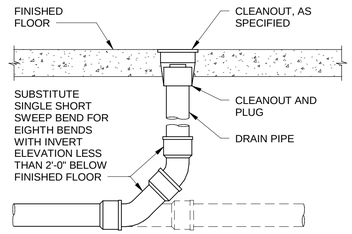


B FLOOR DRAIN - NEW FLOOR
NO SCALE



C FLOOR CLEANOUT - NEW FLOOR
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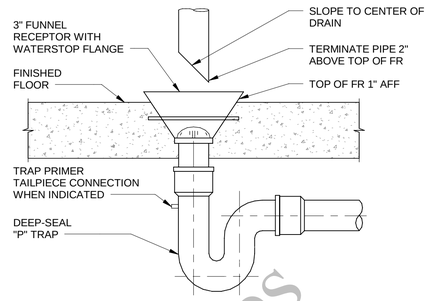

D FUNNEL DRAIN - NEW FLOOR
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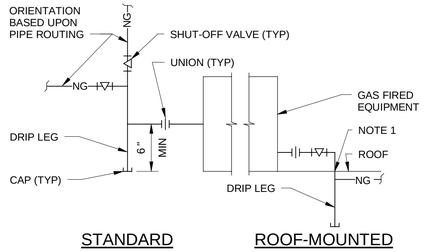
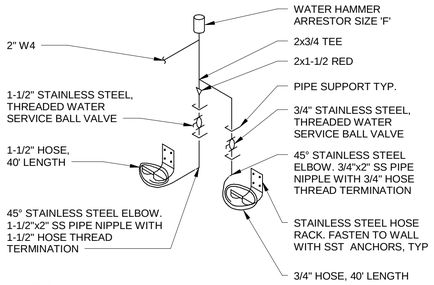


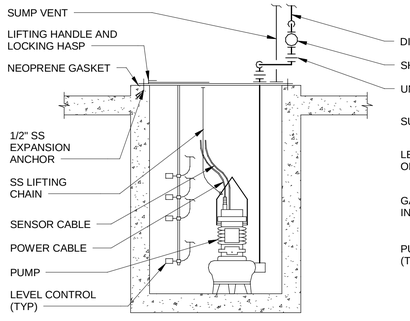
NOTES:
1. SEE ARCHITECTURAL DRAWINGS AND THE SPECIFICATIONS FOR FLASHING REQUIREMENTS.

E FUEL GAS PIPING CONNECTION AT EQUIPMENT
NO SCALE

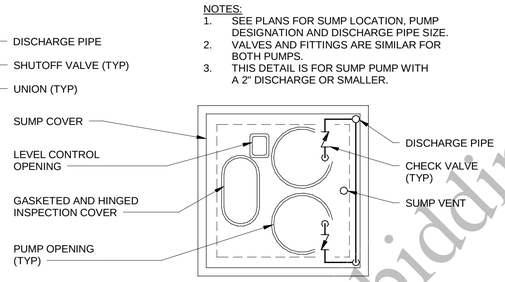


NOTES:
1. PROVIDE NON-POTABLE WATER SIGN AT EACH HB.
2. INSTALL EACH HOSE CONNECTION 3'-0" ABOVE FINISHED FLOOR OR GRATING, UNLESS INDICATED OTHERWISE.

F HOSE CONNECTION DETAIL
NO SCALE



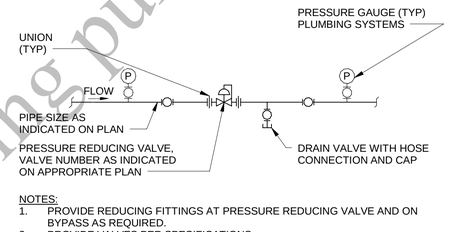
SECTION



PLAN

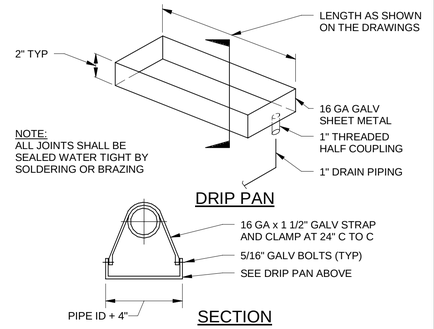
NOTES:
1. SEE PLANS FOR SUMP LOCATION, PUMP DESIGNATION AND DISCHARGE PIPE SIZE.
2. VALVES AND FITTINGS ARE SIMILAR FOR BOTH PUMPS.
3. THIS DETAIL IS FOR SUMP PUMP WITH A 2" DISCHARGE OR SMALLER.

G SUBMERSIBLE SUMP PUMP - FLOOR MOUNTED
NO SCALE



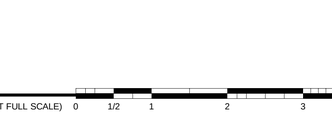
NOTES:
1. PROVIDE REDUCING FITTINGS AT PRESSURE REDUCING VALVE AND ON BYPASS AS REQUIRED.
2. PROVIDE VALVES PER SPECIFICATIONS.

H PRESSURE REDUCING STATION
NO SCALE



NOTE:
ALL JOINTS SHALL BE SEALED WATER TIGHT BY SOLDERING OR BRAZING

DRIP PAN



SECTION

J DRIP SHIELD
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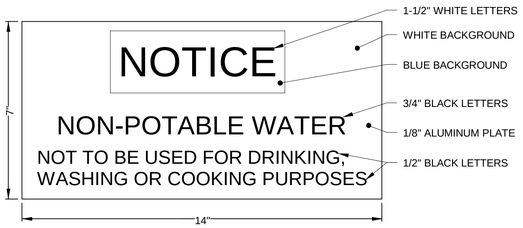

NOTES: PROVIDE NON-POTABLE SIGN AT EACH HOSE CONNECTION.

K NON-POTABLE WATER SIGN
NO SCALE

BLACK & VEATCH
Black & Veatch Corporation
Chicago, Illinois
ILLINOIS PROFESSIONAL
DESIGN FIRM - 184.002143-0006

Four Rivers Sanitation Authority

AEROBIC GRANULAR SLUDGE - PHASE 1

REVISIONS AND RECORD OF ISSUE	
DESIGNED:	SAM
DETAILED:	AJP
CHECKED:	DAV
APPROVED:	SP
DATE:	12/20/2022
PROJECT NO.:	411752

AGS REACTORS AND PIPE GALLERY

PLUMBING

DETAILS

99-P-501

153 OF 163

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

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D11000

BACKFLOW PREVENTER SCHEDULE

UNIT NUMBER	SERVICE	BODY SIZE (IN)	MAXIMUM FLOW (GPM)	MAXIMUM PRESSURE DIFFERENTIAL (PSI)	MANUFACTURER	NOTES
BFP- 1001	BLOWERS BUILDING	2	50	14	WATTS #LF009	---

PIPING ACCESSORIES SCHEDULE

UNIT NUMBER	MANUFACTURER	MODEL	DESCRIPTION	NOTES
FCO-1	SMITH	4111 SERIES	HEAVY DUTY FLOOR CLEANOUT, SECURED ROUND ADJUSTABLE NICKEL BRONZE TOP	---
FD-1	SMITH	2141 SERIES	HEAVY DUTY CAST IRON FLOOR DRAIN, ADJUSTABLE TOP, LOOSE SET CAST IRON GRATE	---
FD-2	SMITH	2310 SERIES	MEDIUM DUTY CAST IRON FLOOR DRAIN, ADJUSTABLE TOP, LOOSE SET CAST IRON GRATE	---
FD-3	SMITH	2310-D SERIES	MEDIUM DUTY CAST IRON FLOOR DRAIN, ADJUSTABLE TOP, DOME GRATE	---
FR-1	SMITH	SERIES 3800 FIGURE SQ-3-1793-DBS	MEDIUM DUTY CAST IRON FUNNEL RECEPTOR, WATERSTOP FLANGE, THREADED OR NO-HUB CONNECTION	---
ORD-1	SMITH	1010-E SERIES	CAST IRON OVERFLOW ROOF DRAIN WITH 1" STANDPIPE	---
RD-1	SMITH	1010-E SERIES	CAST IRON PRIMARY ROOF DRAIN.	---

PLUMBING EQUIPMENT SCHEDULE

UNIT NUMBER	DESCRIPTION	MANUFACTURER	NOTES
TPP - 1001	ELECTRONIC TRAP PRIMING MANIFOLD, SURFACE MOUNTED, 3/4" NPT INLET, 1/2" PEX TUBE CONNECTIONS, 120 VOLT, 1 PHASE, 60Hz, (10 CONNECTIONS)	PRECISION PLUMBING PRODUCTS, INC. PRIME-TIME PT-10	---
TPP - 1002	ELECTRONIC TRAP PRIMING MANIFOLD, SURFACE MOUNTED, 3/4" NPT INLET, 1/2" PEX TUBE CONNECTIONS, 120 VOLT, 1 PHASE, 60Hz, (2 CONNECTIONS)	PRECISION PLUMBING PRODUCTS, INC. PRIME-TIME PT-2	---
TPP - 1003	ELECTRONIC TRAP PRIMING MANIFOLD, SURFACE MOUNTED, 3/4" NPT INLET, 1/2" PEX TUBE CONNECTIONS, 120 VOLT, 1 PHASE, 60Hz, (2 CONNECTIONS)	PRECISION PLUMBING PRODUCTS, INC. PRIME-TIME PT-2	---

PLUMBING FIXTURE SCHEDULE

UNIT NUMBER	MANUFACTURER	DESCRIPTION	WATER (IN)		WASTE (IN)		NOTES
			HOT	COLD	WASTE	VENT	
SS-1	SINK: ADVANCED TABCO FS-WM-2721-F FAUCET: K-160	SERVICE SINK, 24"x20", WALL MOUNTED, STAINLESS STEEL WITH TUBULAR SUPPORT, SINGLE BOWL, BLANK BACK, SPLASH MOUNTED 6" SWIVEL SPOUT FAUCET	---	1/2 "	3 "	---	1

PRESSURE REDUCING VALVE SCHEDULE

UNIT NUMBER	SERVICE	TYPE	FLOW RATE (GAS-SCFH)			REDUCED PRESSURE SETPOINT(PSI)	INLET PRESSURE (PSI)		MINIMUM PRESSURE AT MAXIMUM FLOW (PSI)	NOTES
			MINIMUM	MAXIMUM	ORDINARY		MINIMUM	MAXIMUM		
PRV-1001	NATURAL GAS	DIRECT ACTING	0	978	978	0.43	4.5	5	0.5	1

SUBMERSIBLE SUMP PUMP SCHEDULE

UNIT NUMBER	LOCATION	PUMP TYPE	CAPACITY (GPM)	TOTAL HEAD (FT)	MAXIMUM SPEED (RPM)	MOTOR HP	POWER SUPPLY		DISCHARGE SIZE (IN)	SUMP LEVEL (IN)				MANUFACTURER / MODEL	NOTES
							VOLTS	PHASE		OFF	LEAD	LAG	HWA		
SSP-1001	PIPE GALLERY	DUPLEX, SUBMERSIBLE, HEAVY DUTY SUMP PUMP	30.0	31	1750	1.5	480	3	2"	2	2.63	2.96	3.3	WEIL #1413	1,2,3,4,5
SSP-1002	PIPE GALLERY	DUPLEX, SUBMERSIBLE, HEAVY DUTY SUMP PUMP	30.0	31	1750	1.5	480	3	2"	2	2.63	2.96	3.3	WEIL #1413	1,2,3,4,5

SCHEDULE NOTES

SEE DRAWINGS 00-P-001 FOR LEGEND, ABBREVIATIONS AND GENERAL NOTES.

PLUMBING FIXTURE SCHEDULE:

NOTES:
1. PROVIDE ONLY COLD WATER SUPPLY.

PRESSURE REDUCING VALVE SCHEDULE:

NOTES:
1. PRESSURE REDUCEING VALVE SCHEDULE MODEL 325L SERIES LEVER-ACTING NUMBERS BASED ON MAXITROL.

SUMP AND SEWAGE PUMP SCHEDULE:

SUMP LEVELS: PUMPS OFF, LEAD PUMP START, LAG PUMP START AND HIGH WATER ALARM ELEVATIONS ARE AS MEASURED FROM THE BOTTOM OF THE SUMP

NOTES:
1. HIGH WATER ALARM.
2. FLOOR MOUNTED.
3. SUMP COVER REQUIRED.
4. CUTLESS RUBBER LOWER BEARING.
5. STAINLESS STEEL LIFTING CHAIN REMOVAL SYSTEM.

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Chicago, Illinois
ILLINOIS PROFESSIONAL
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Four Rivers Sanitation Authority

AEROBIC GRANULAR SLUDGE - PHASE 1

REVISIONS AND RECORD OF ISSUE

DESIGNED:	SAM
DETAILED:	AJP
CHECKED:	DAV
APPROVED:	SP
DATE:	12/20/2022
PROJECT NO.:	411752

AGS REACTORS AND PIPE GALLERY

PLUMBING

SCHEDULES

99-P-601

154 OF 163

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

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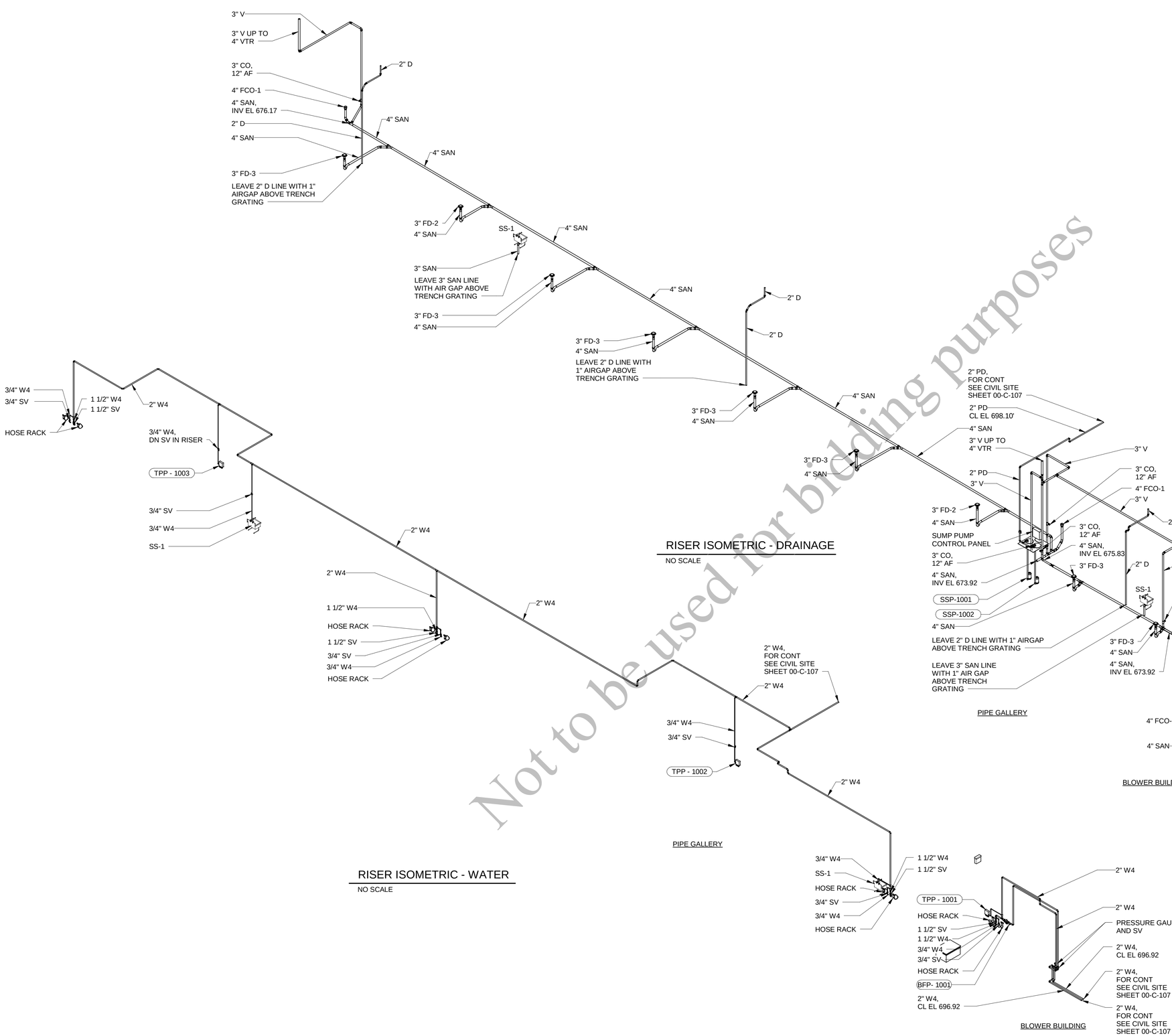

RISER ISOMETRIC - DRAINAGE

NO SCALE

RISER ISOMETRIC - WATER

NO SCALE

GENERAL SHEET NOTES

1. SEE DRAWING 00-P-001 FOR LEGENDS, ABBREVIATIONS AND GENERAL NOTES.

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AGS REACTORS AND PIPE GALLERY

PLUMBING

WATER AND DRAINAGE ISOMETRICS

99-P-901

155 OF 163

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

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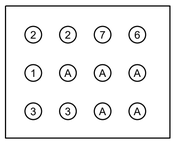
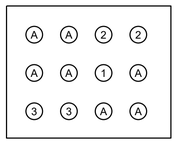


A SECTION
00-E-101
02-E-101



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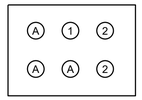

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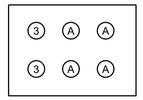
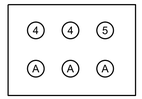


D SECTION
00-E-101

E SECTION
00-E-101

F SECTION
00-E-101

G SECTION
00-E-101



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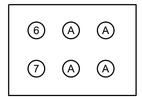
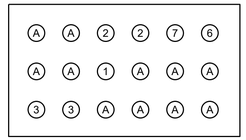


J SECTION
00-E-101



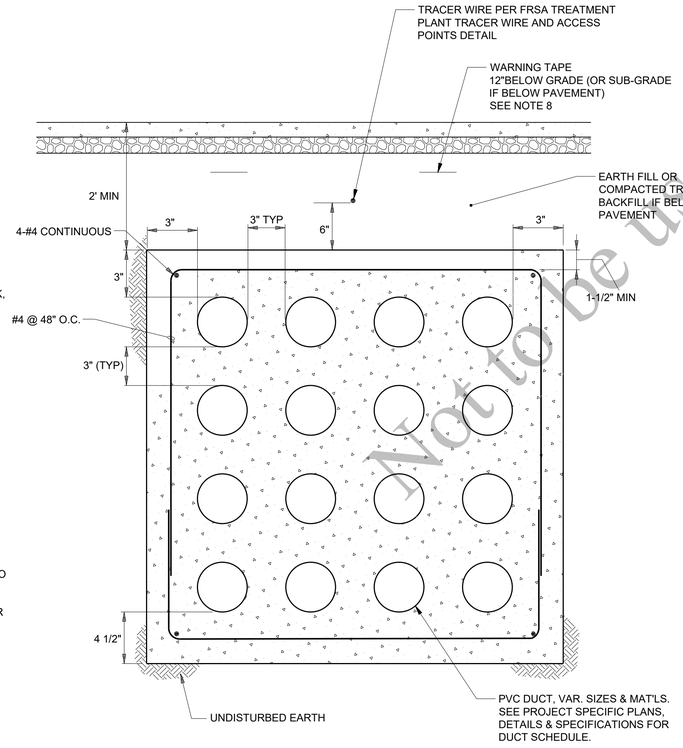
K SECTION
00-E-101

DUCT BANK SCHEDULE

COND.	SIZE	CIRCUIT NUMBER	REMARKS
A	4"	PULLSTRING	SPARE
1	4"	FPP-001-1	FIBER OPTIC
2	4"	SWGR3-1	AGS PHASE 1
3	4"	SWGR6-1	AGS PHASE 1
4 NOTE 2	4"	MCC-1	3 - 500KCMIL XHHW-2 CABLES AND #2AWG GROUND
5 NOTE 2	4"	AQUA AEROBICS	3 - 500KCMIL XHHW-2 CABLES AND #2AWG GROUND
6	4"	MCC-1501-22	DISTRIBUTION CHAMBER VALVE POWER
7	4"	GSD-1651-1	DISTRIBUTION CHAMBER VALVE CONTROL

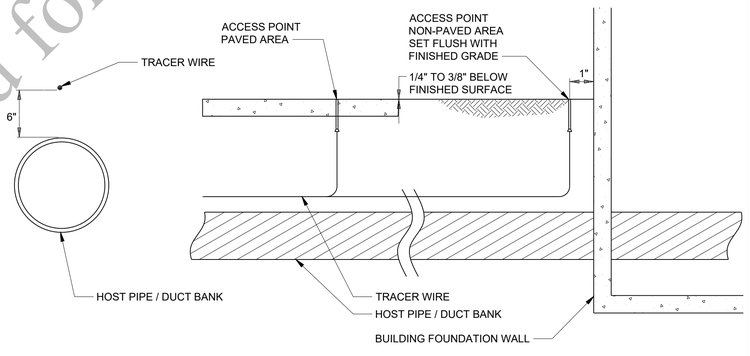
NOTES:

1. EARTHEN CONCRETE FORMING WILL NOT BE PERMITTED UNLESS APPROVED BY THE FOUR RIVERS SANITATION AUTHORITY (FRSA).
2. WOOD OR MANUFACTURED FORMS SHALL BE PROVIDED THE FULL LENGTH OF THE DUCT BANK, AND SHALL BE BRACED AND TIED TO PROVIDE THE STRUCTURAL CAPACITY REQUIRED TO PRODUCE FINISHED CONCRETE TO THE LINES AND GRADES SHOWN ON THE PLANS.
3. FORMS SHALL REMAIN IN PLACE FOR 24 HOURS OR AS DIRECTED BY THE FRSA.
4. NO CONCRETE SHALL BE PLACED ON ICE, SNOW, OR FROZEN FOUNDATION MATERIAL.
5. CONCRETE SHALL BE PLACED IN A MANNER IN A MANNER SO AS TO AVOID SEGREGATION OR SEPARATION OF AGGREGATES OR THE DISPLACEMENT OF REINFORCEMENT.
6. CONCRETE SHALL BE IDOT CLASS DS PER SECTION 1020 OF THE IDOT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, CURRENT EDITION.
7. CONCRETE SHALL HAVE RED DYE BROOMED INTO TOP OF DUCT BANK.
8. ONE (1) WARNING TAPE SHALL BE PROVIDED FOR DUCT BANKS UP TO 24" WIDE. TWO (2) WARNING TAPES SHALL BE PROVIDED FOR DUCT BANKS GREATER THEN 24" WIDE.



FRSA TREATMENT PLANT CONCRETE DUCT BANK DETAIL

NO SCALE



SECTION VIEW PROFILE VIEW

NOTES:

1. ALL NEW UNDERGROUND PIPING AND DUCT BANKS SHALL BE BURIED WITH LOCATING TRACER WIRE APPROXIMATELY 6 INCHES ABOVE THE TOP OF PIPE. TRACER WIRES SHALL BE TERMINATED AS SHOWN ON THE PLANS OR AS DIRECTED.
2. TRACER WIRE SHALL BE COPPER-CLAD STEEL HIGH STRENGTH 12 AWG AS MFG BY COPPERHEAD INDUSTRIES AND SHALL BE COLOR CODED PER APWA UNIFROM COLOR CODE.
3. ACCESS POINTS SHALL BE PROVIDED AT EACH END OF NEW PIPING, OR IN BETWEEN ENDS OF PIPING IF REQUIRED. THE MAXIMUM LINEAR DISTANCE BETWEEN ACCESS POINTS SHALL BE 800 FEET. ACCESS POINTS IN NON-PAVED AREAS SHALL BE SNAKEPIT LITE DUTY ADJUSTABLE SINGLE TERMINAL ACCESS POINTS AS MFG BY COPPERHEAD INMDUSTRIES, AND SHALL BE INSTALLED FLUSH WITH FINISHED GROUND ELEVATION. ACCESS POINTS IN PAVED AREAS SHALL BE SNAKEPIT ROADWAY SINGLE TERMINAL CAST IRON LID ACCESS POINTS AS MFG BY COPPERHEAD INDUSTRIES, AND SHALL BE INSTALLED 1/4" TO 3/8" BELOW FINAL PAVEMENT ELEVATION.

FRSA TREATMENT PLANT TRACER WIRE & ACCESS POINTS DETAIL

NO SCALE

GENERAL SHEET NOTES

1. SEE DRAWINGS 00-E-001 AND 00-E-002 FOR LEGENDS, ABBREVIATIONS AND NOTES.
2. CONTRACTOR SHALL DEMOLISH CABLES IN CONDUITS 4 AND 5 AS SHOWN IN EXISTING DUCT BANK SECTION CUTS. NEW CABLES OF EQUIVALENT SIZE AND TYPE SHALL BE INSTALLED INTO NEW DUCT BANK AND EXISTING DUCT BANKS AS NECESSARY TO REPLACE DEMOLISHED CABLES.

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AEROBIC GRANULAR SLUDGE - PHASE 1

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DATE:	12/20/2022
PROJECT NO.:	411752

AGS SUPPORT FACILITIES

ELECTRICAL

DETAILS

99-E-501

156 OF 163

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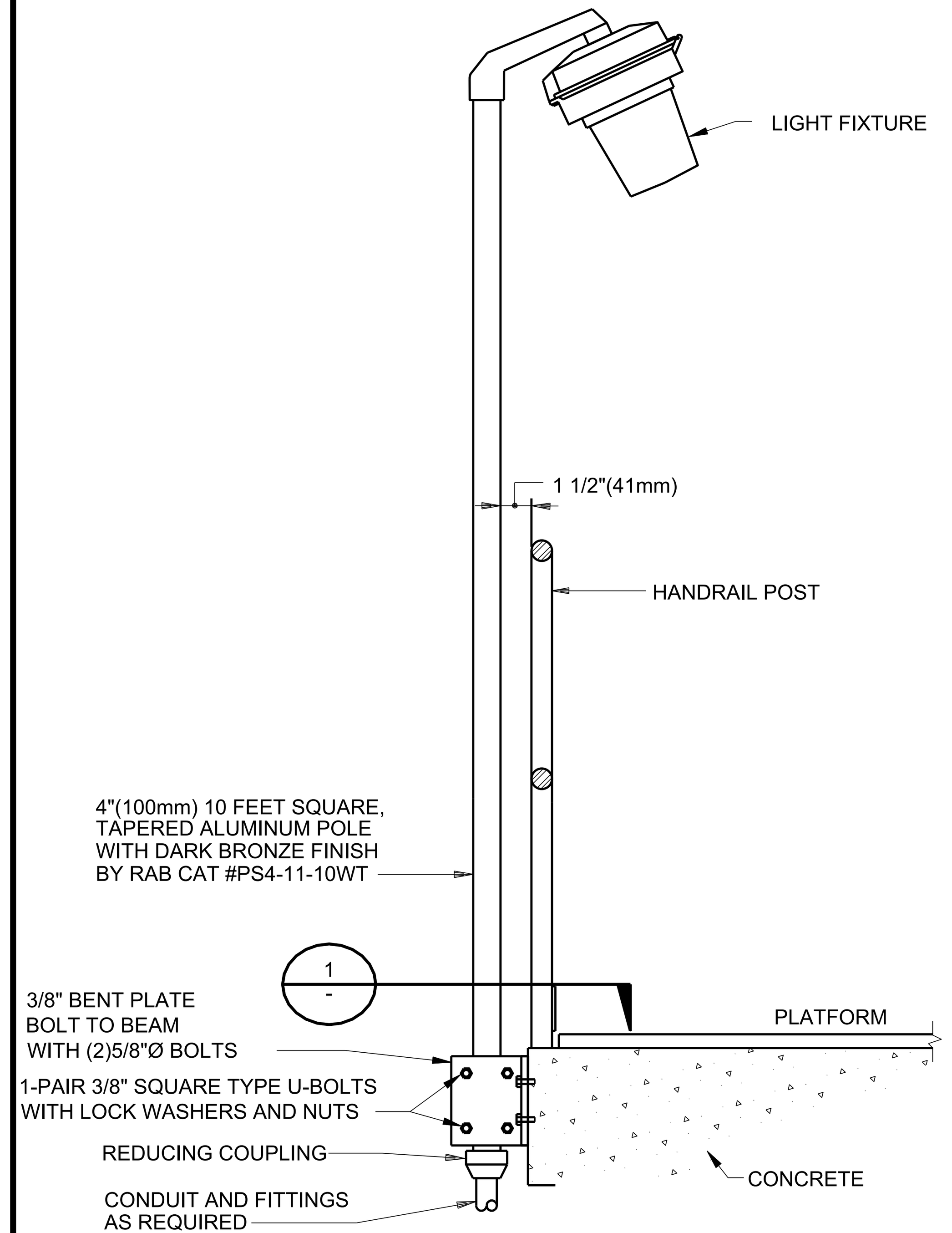
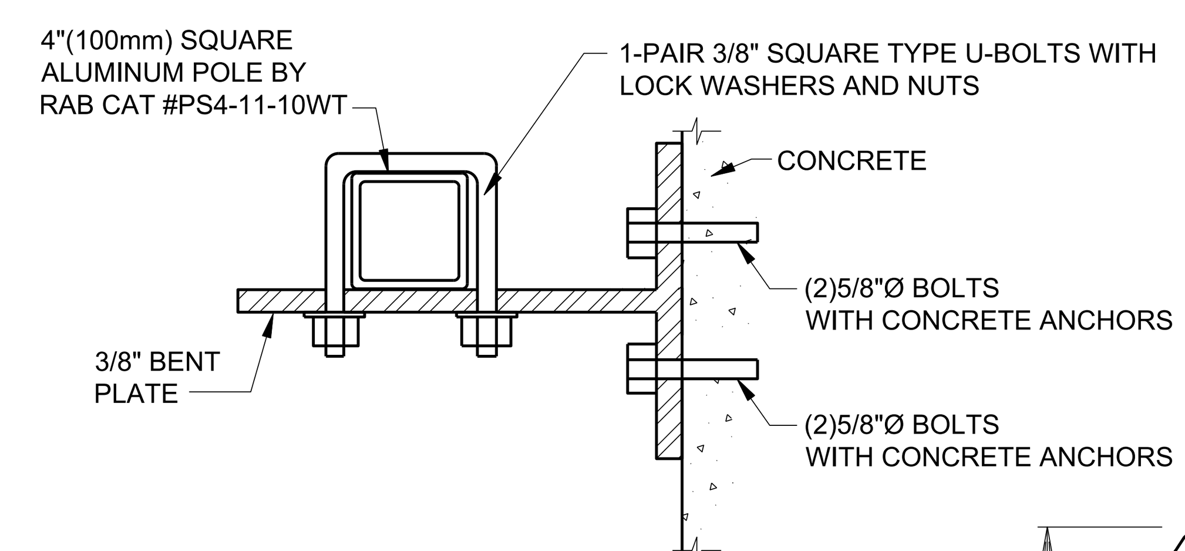


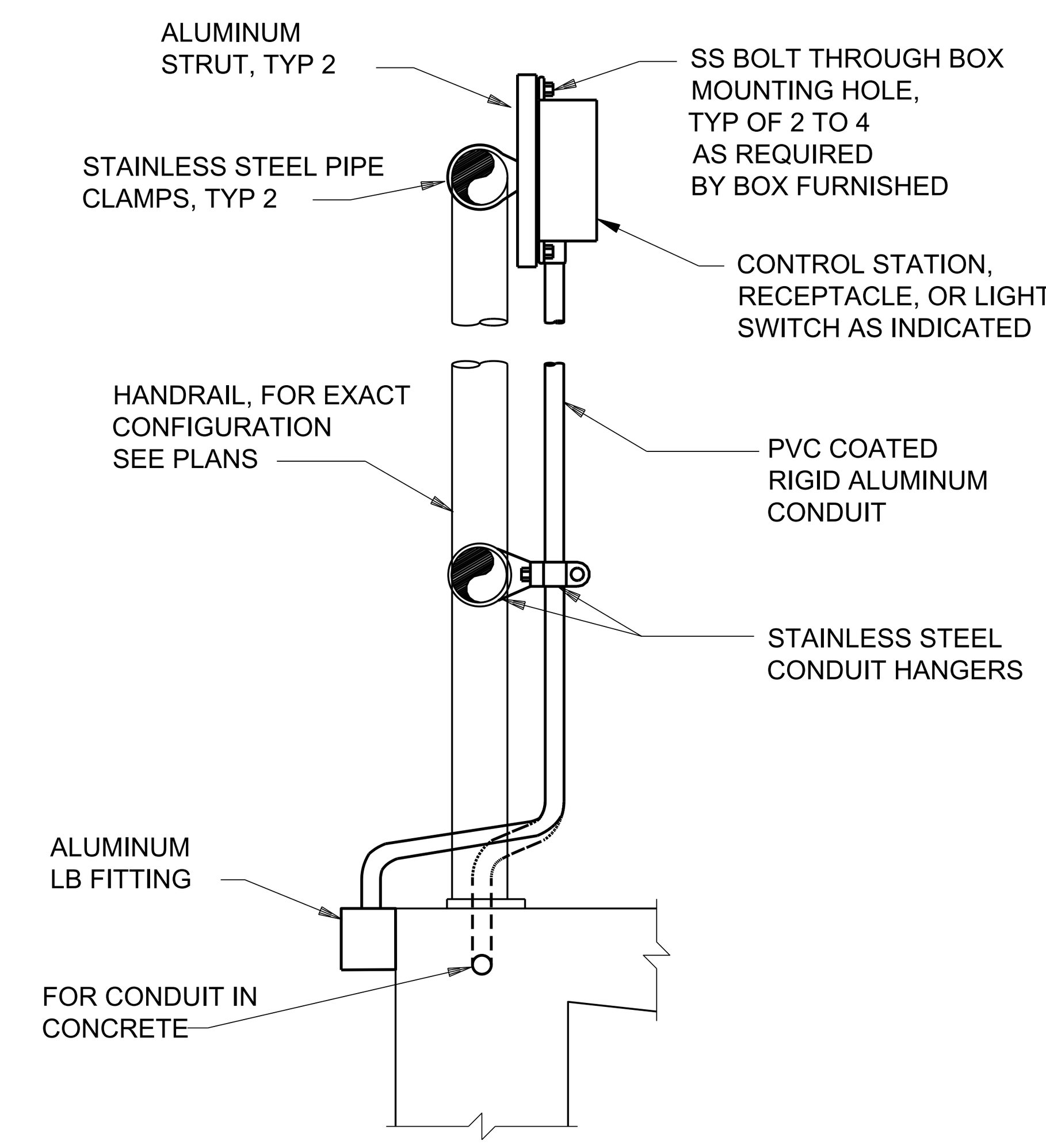
ELEVATION



SECTION 1

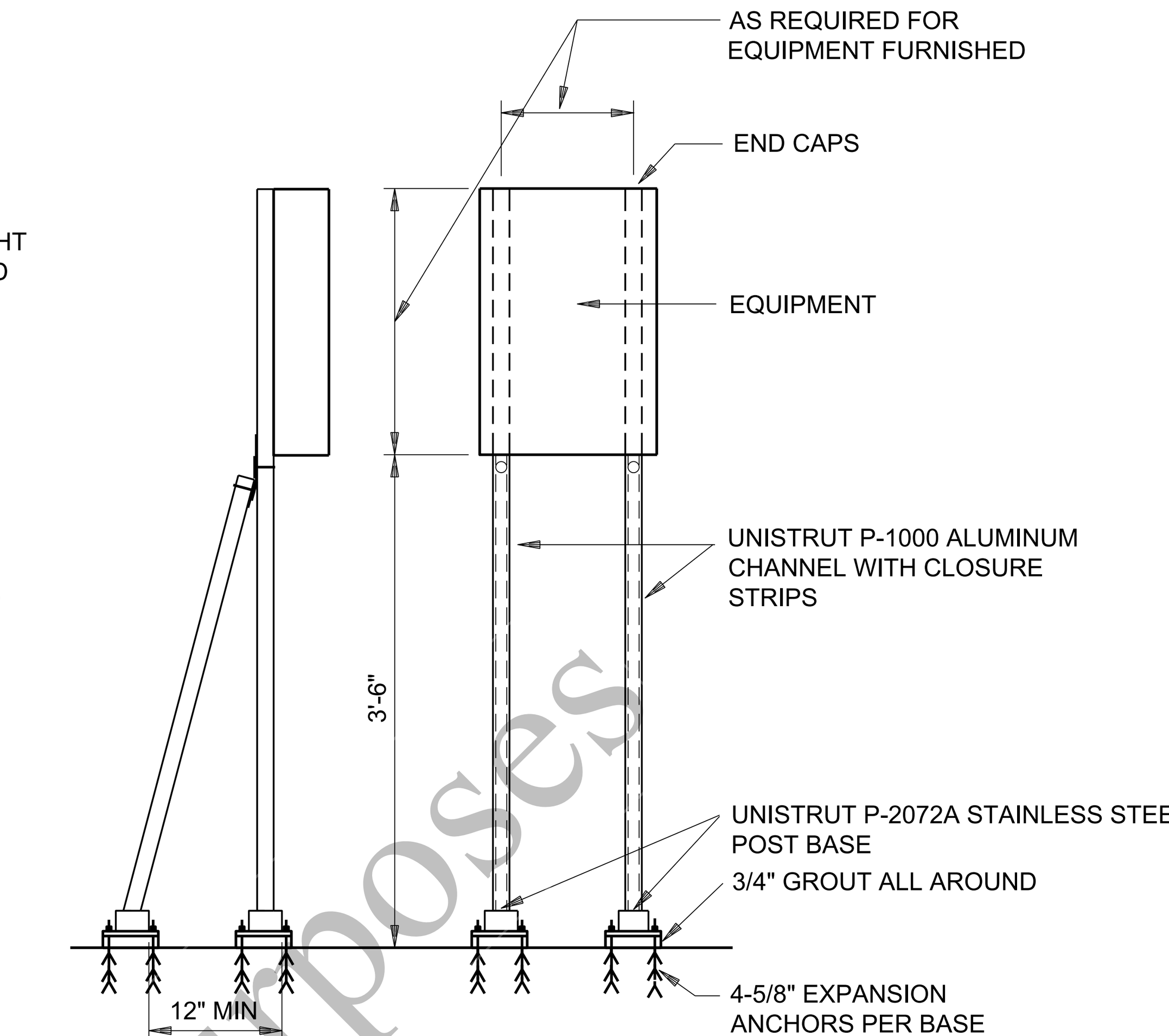
TYPICAL STANCHION MOUNTED LIGHT FIXTURE INSTALLATION (ALUMINUM POLE)

NO SCALE



TYPICAL HANDRAIL MOUNTING DETAIL

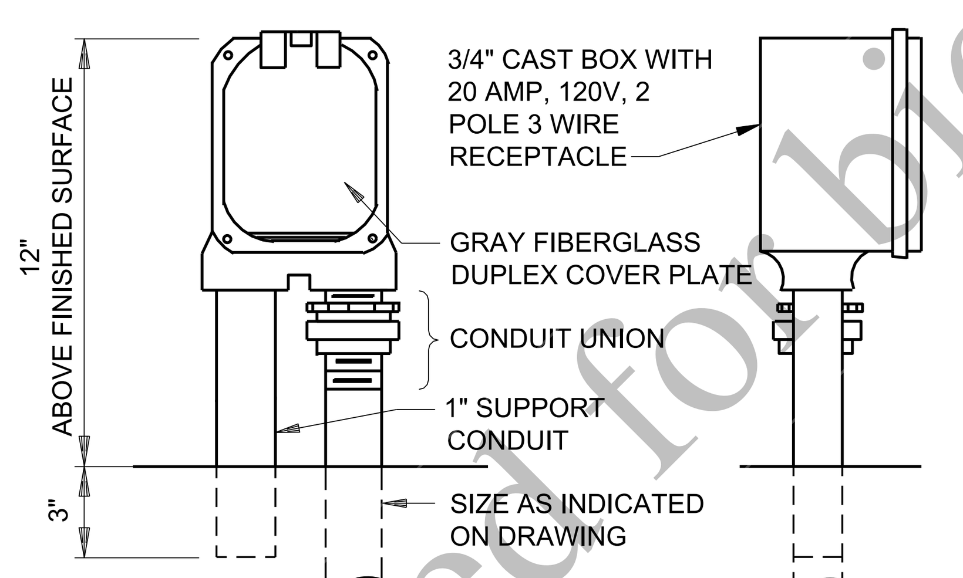
NO SCALE



TYPICAL EQUIPMENT MOUNTING DETAIL

NO SCALE

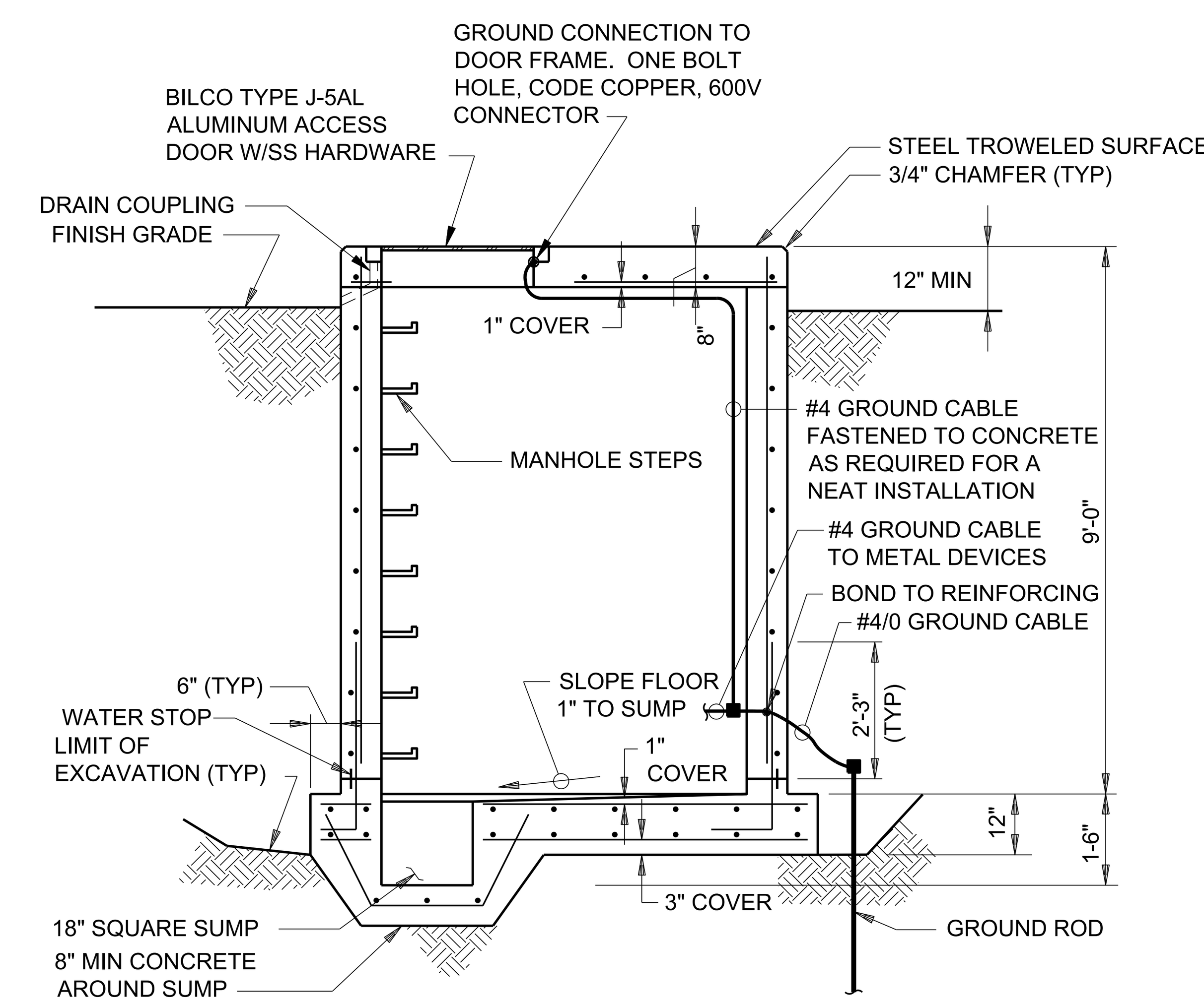
NOTE: IN ALL LOCATIONS, USE STAINLESS STEEL BOLTS, NUTS, WASHERS, AND ANCHOR BOLTS.



NOTE: ALL EXPOSED CONDUIT SHALL BE PVC COATED RIGID STEEL.

TYPICAL WEATHERPROOF RECEPTACLE MOUNTING DETAIL

NO SCALE

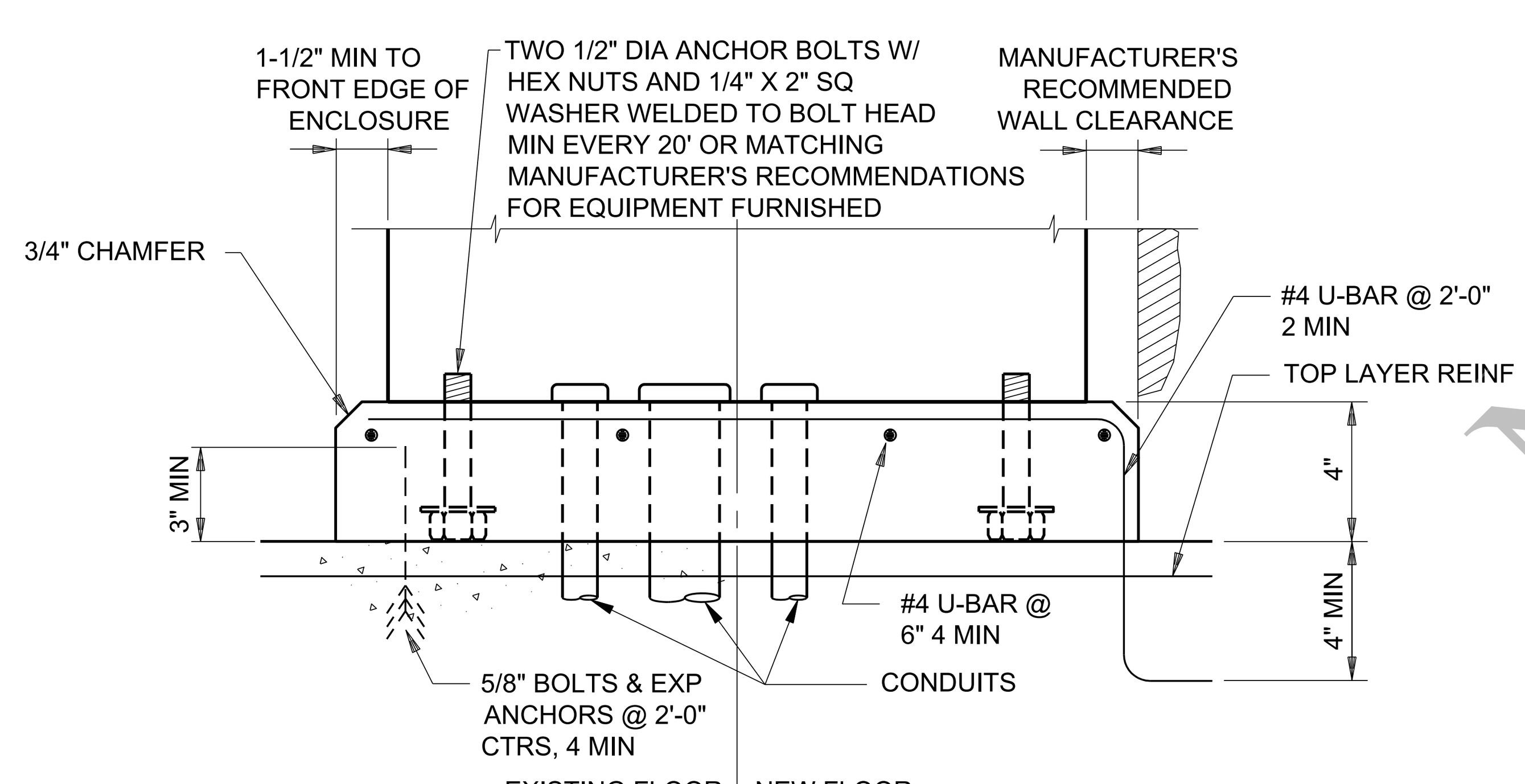


ELECTRICAL MANHOLE NOTES:

1. CABLE AND CONDUIT SUPPORTS SHALL BE SPACED AT 2'-0" HORIZONTAL CENTERS IN WALLS AND SHALL BEGIN 2'-0" FROM FLOOR.
2. SUPPORTS IN CEILINGS SHALL RUN FROM WALL TO WALL.
3. OPENING SHALL BE PROVIDED IN MANHOLE WALLS FOR CONDUIT BANK ENTRANCE AS REQUIRED.
4. ALL REINFORCING ON THIS DETAIL SHALL BE #5@12" UNLESS NOTED OTHERWISE. CENTER VERTICAL REINFORCING IN THE WALLS.
5. CONCRETE TO BE ROUGH AND CLEAN AT CONSTRUCTION JOINT FACES.

ELECTRICAL MANHOLE SECTION

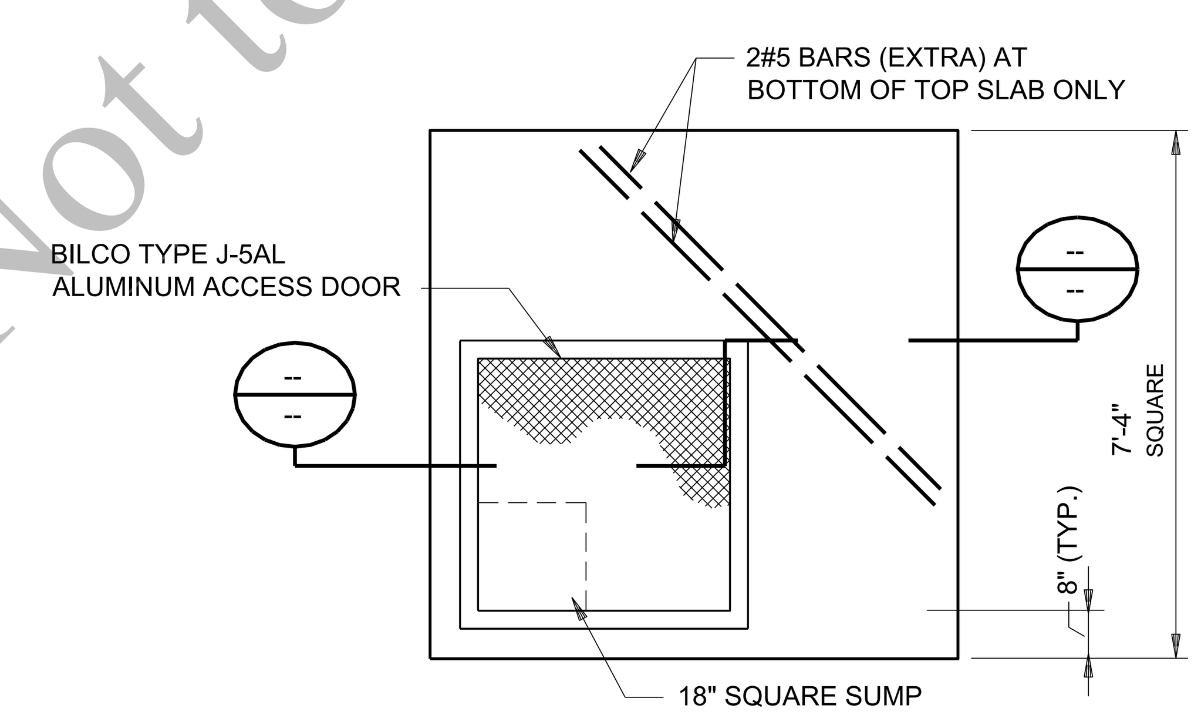
NO SCALE NOT SUITABLE FOR ROADWAY LOCATIONS



ELECTRICAL EQUIPMENT BASE

NO SCALE

NOTE: UNLESS OTHERWISE NOTED, ALL INDOOR FLOOR MOUNTED ELECTRICAL EQUIPMENT, INCLUDING SWITCHGEAR, SWITCHBOARDS, MOTOR CONTROL CENTERS, ADJUSTABLE FREQUENCY DRIVES, HARMONIC FILTERS, INSTRUMENT CABINETS, ETC., SHALL BE PROVIDED WITH EQUIPMENT BASES.



TYPICAL ELECTRICAL MANHOLE (SINGLE CHAMBER)

NO SCALE NOT SUITABLE FOR ROADWAY LOCATIONS

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Four Rivers Sanitation Authority

AEROBIC GRANULAR SLUDGE - PHASE 1

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PROJECT NO.:	411752

AGS SUPPORT FACILITIES

ELECTRICAL

DETAILS

99-E-502

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

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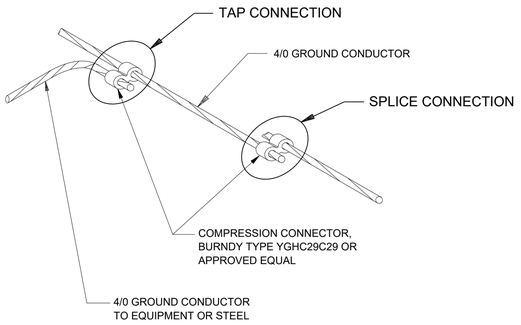
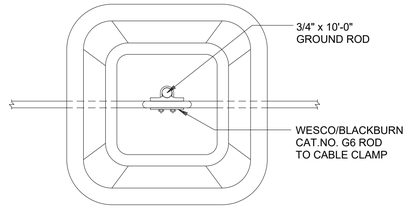
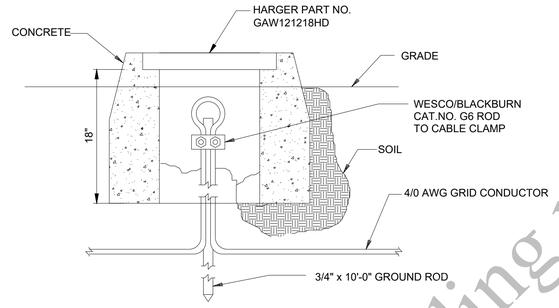


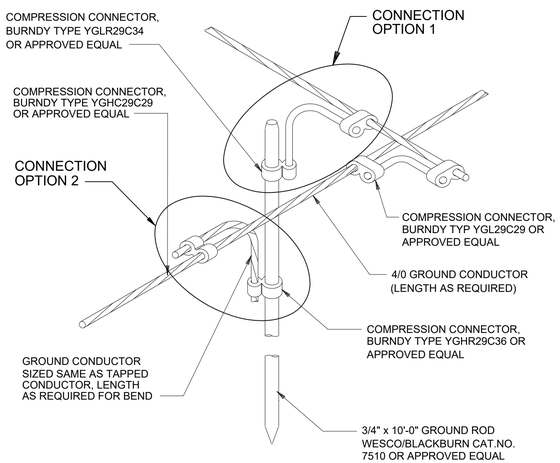
NOTE:
CONTRACTOR SHALL APPLY AN OXIDE-INHIBITING JOINT COMPOUND TO THE INSIDE CONTACT SURFACE OF THE COMPRESSION CONNECTOR PRIOR TO INSTALLING THE COMPRESSION CONNECTOR.

TYPICAL COMPRESSION FITTING TEE CONNECTION





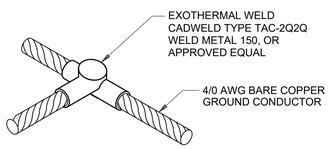
ELEVATION
TYPICAL GROUND TEST STATION



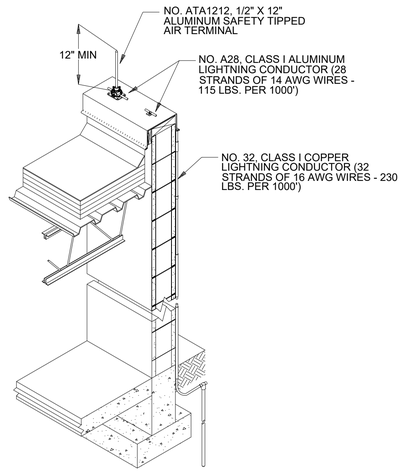
NOTE:
CONTRACTOR SHALL APPLY AN OXIDE-INHIBITING JOINT COMPOUND TO THE INSIDE CONTACT SURFACE OF THE COMPRESSION CONNECTORS PRIOR TO INSTALLING THE COMPRESSION CONNECTORS.

TYPICAL COMPRESSION FITTING
GROUND ROD TO CONNECTION AT CROSS OR TEE

(TWO CONNECTION OPTIONS SHOWN)



TYPICAL EXOTHERMAL WELD
TEE CONNECTION



NOTE - ALL SPECIFIED EQUIPMENT AND INSTALLATION CONFIGURATIONS TO BE FINALIZED AND APPROVED BY QUALIFIED LIGHTNING PROTECTION ENGINEER.

LIGHTNING PROTECTION AIR
TERMINAL AND DOWN CONDUCTOR

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AGS SUPPORT FACILITIES

ELECTRICAL

DETAILS

99-E-503

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

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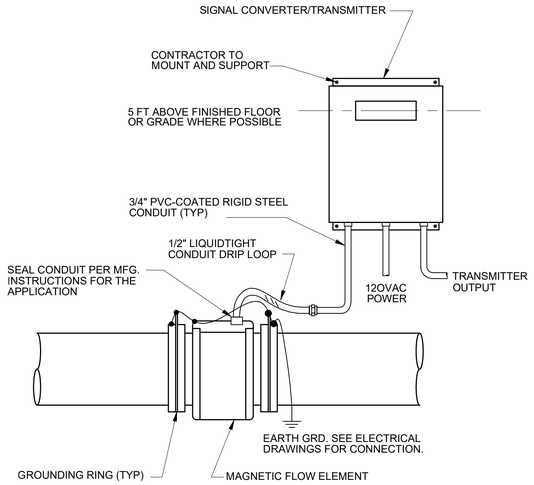
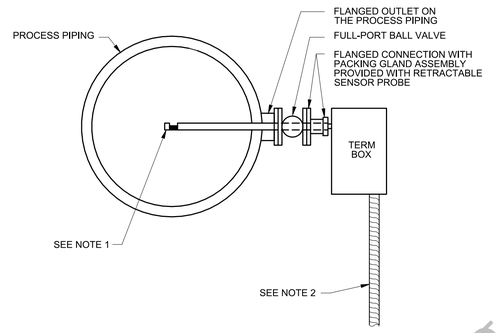


A MAGNETIC FLOWMETER

NO SCALE

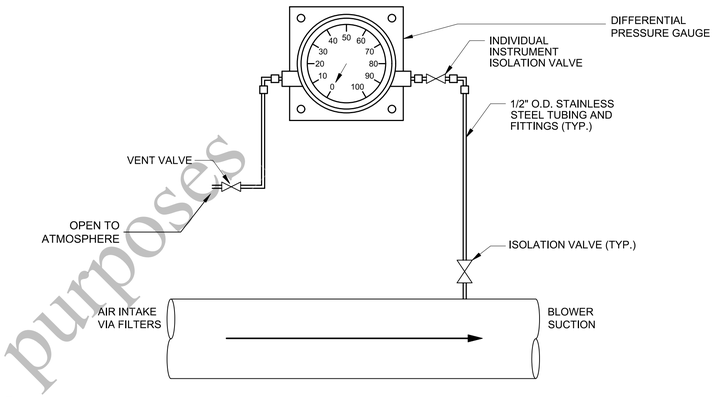
NOTES:
1. PIPE TO BE SUPPORTED ON BOTH SIDES OF METER.



B THERMAL DISPERSION FLOWMETER (HOT-TAP TYPE SENSOR)

NO SCALE

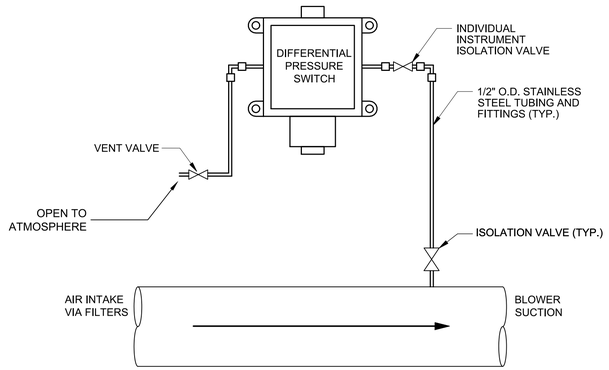
NOTES:
1. PROBE LENGTH AND ORIENTATION OF PROBE TO FLOW PROFILE SHALL CONFORM TO MANUFACTURER RECOMMENDATIONS.
2. LENGTH OF LIQUIDTIGHT FLEXIBLE METAL CONDUIT TO INDICATOR/TRANSMITTER AS REQUIRED TO ALLOW EASY REMOVAL OF SENSOR, CABLE BETWEEN PROBE AND INDICATOR/TRANSMITTER SHALL BE MANUFACTURER SUPPLIED.



C DIFFERENTIAL PRESSURE GAUGE

NO SCALE

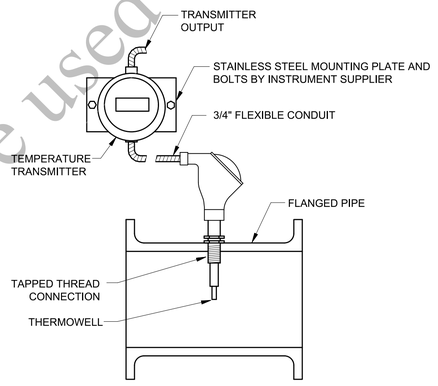
NOTES:
1. DETAIL SHOWS SCHEMATIC REPRESENTATION OF PRESSURE CONNECTIONS. PROVIDE MFR BRACKETS, UNISTRUTS, OR OTHER SUPPORTS AS NECESSARY.
2. INSTRUMENTATION SHALL BE MOUNTED AS TO BE EASILY VISIBLE AND SERVICED.



D DIFFERENTIAL PRESSURE SWITCH

NO SCALE

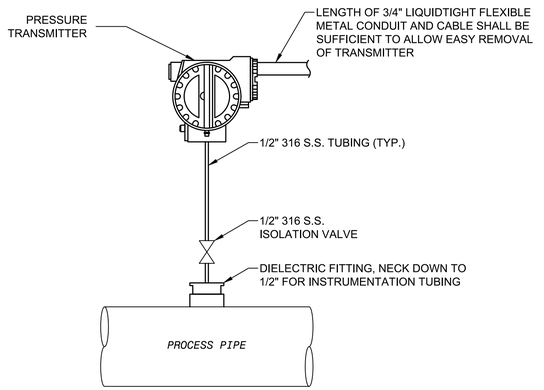
NOTES:
1. DETAIL SHOWS SCHEMATIC REPRESENTATION OF PRESSURE CONNECTIONS. PROVIDE MFR BRACKETS, UNISTRUTS, OR OTHER SUPPORTS AS NECESSARY.
2. INSTRUMENTATION SHALL BE MOUNTED AS TO BE EASILY VISIBLE AND SERVICED.



E TEMPERATURE TRANSMITTER (REMOTE-MOUNT)

NO SCALE

NOTES:
1. THERMOWELLS SHALL BE EITHER WELD-TYPE OR THREADED. SITE CONNECTIONS OR APPLICATION SHALL DETERMINE TYPE.
2. THERMOWELLS AND RTS'S TO BE SIZED FOR THE INSERTION DEPTH OF THE PIPE.



F PRESSURE TRANSMITTER

NO SCALE

NOTES:
1. PROVIDE MFR BRACKET OR UNISTRUT SUPPORT FOR PRESSURE INSTRUMENTATION AS REQUIRED.

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DETAILS

INSTRUMENTATION

INSTRUMENT INSTALLATION DETAILS 1 OF 4

99-I-501

159 OF 163

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

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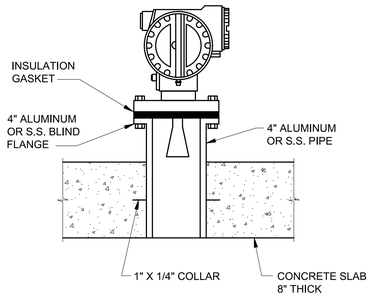
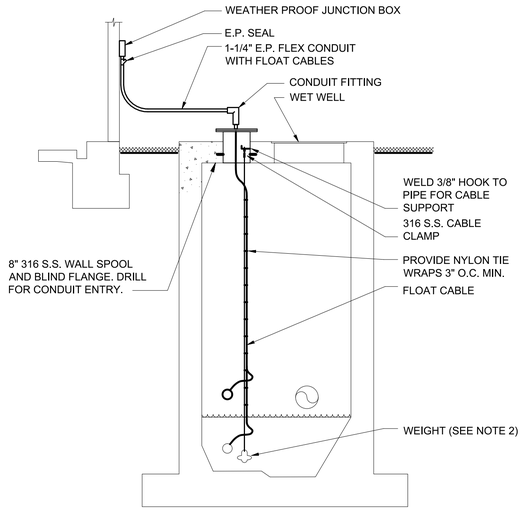


G RADAR LEVEL TRANSMITTER

NO SCALE

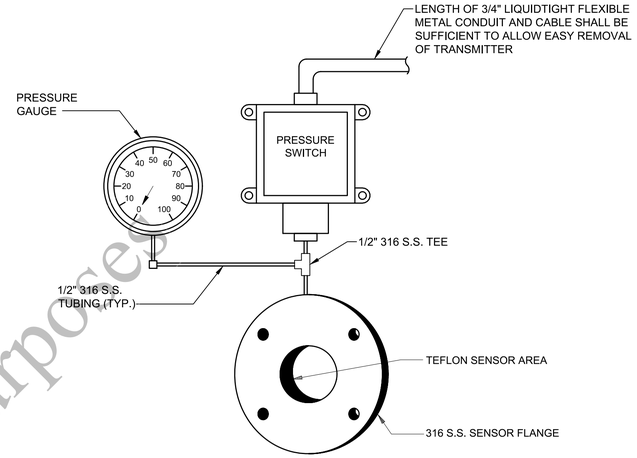
NOTES:
1. THIS DETAIL ALSO APPLIES FOR LEVEL TRANSMITTERS ON THE GROUNDWATER BASIN DRAIN VALVE PIPING AS INDICATED ON 01-I-601. NOTE THAT FOR THIS APPLICATION, THE RADAR LEVEL TRANSMITTERS SHALL BE INSTALLED ON VERTICAL 8" STEEL PIPE EXTENDING OUT OF THE BASIN WALL. THIS 8" STEEL PIPE SHALL BE ROUTED THROUGH THE BASIN WALL TO THE 10" PERFORATED PVC PIPING.



H FLOAT SWITCH (CABLE-MOUNT)

NO SCALE

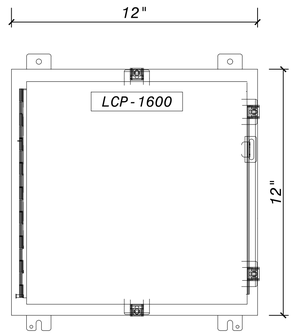
NOTES:
1. SEE DEVICE SCHEDULE AND SCHEMATICS FOR ELEVATIONS CONTACT REQUIREMENTS, AND NUMBER OF FLOAT SWITCHES.
2. CONTRACTOR SHALL PROVIDE A WEIGHT TO KEEP THE FLOATS IN POSITION. THE WEIGHT MATERIAL SHALL BE COMPATIBLE WITH THE PROCESS CONDITIONS WITHIN WETWELL AND A CHLORIDE CONCENTRATION OF 300 MG/L. WEIGHT AND FLOAT CABLE SHALL BE INCLUDED WITH THE FLOAT LEVEL SWITCH SUBMITTAL FOR REVIEW BY ENGINEER.



I PRESSURE SWITCH / GAUGE WITH ANNULAR SEAL

NO SCALE

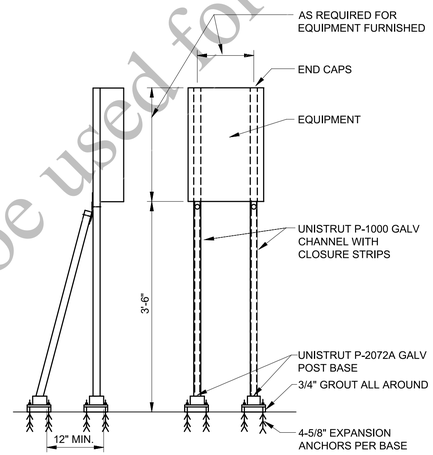
NOTES:
1. PROVIDE MFR BRACKET OR UNISTRUT SUPPORT FOR PRESSURE INSTRUMENTATION AS REQUIRED.



J LOW WATER CUTOFF RELAY PANEL

NO SCALE

NOTES:
1. SEE PANEL SCHEMATIC ON DRAWING 02-E-708.
2. PANEL SHALL BE STAINLESS STEEL RATED NEMA 4X WITH A MINIMUM SIZE OF 12"H X 12"W X 6"D.



K TYPICAL EQUIPMENT MOUNTING

NO SCALE

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AEROBIC GRANULAR SLUDGE - PHASE 1

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DETAILS

INSTRUMENTATION

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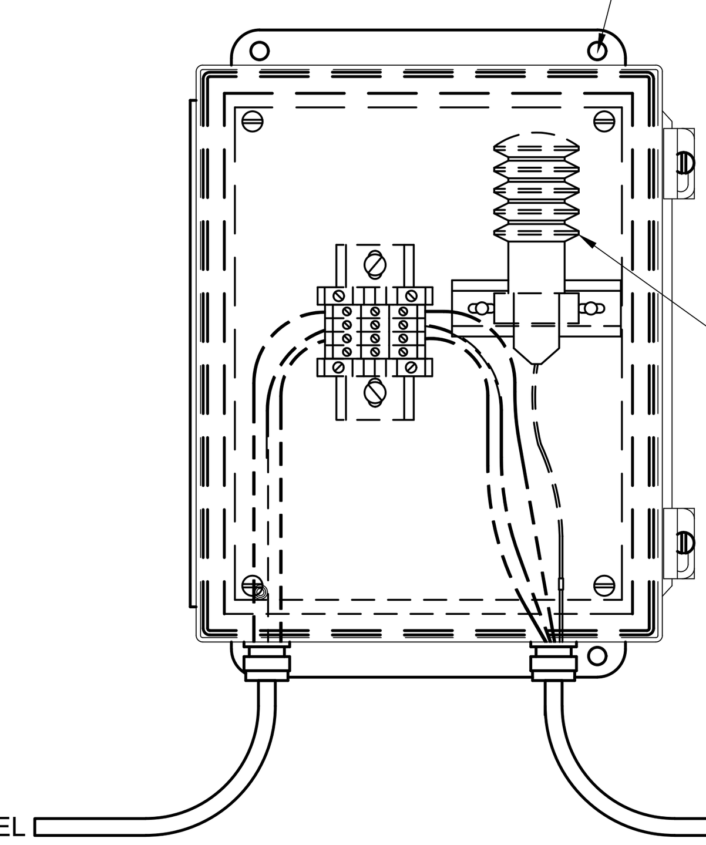
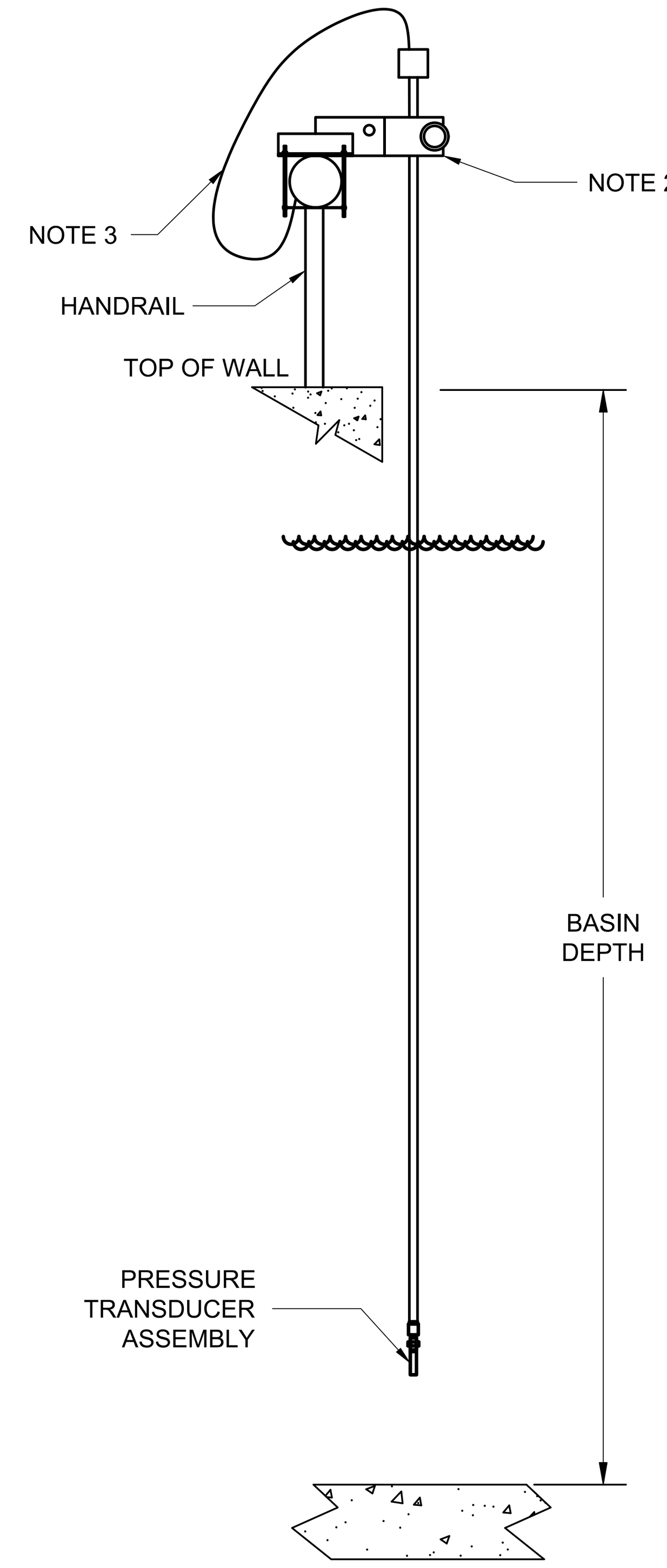


(L) AGS REACTOR JUNCTION BOX

NO SCALE

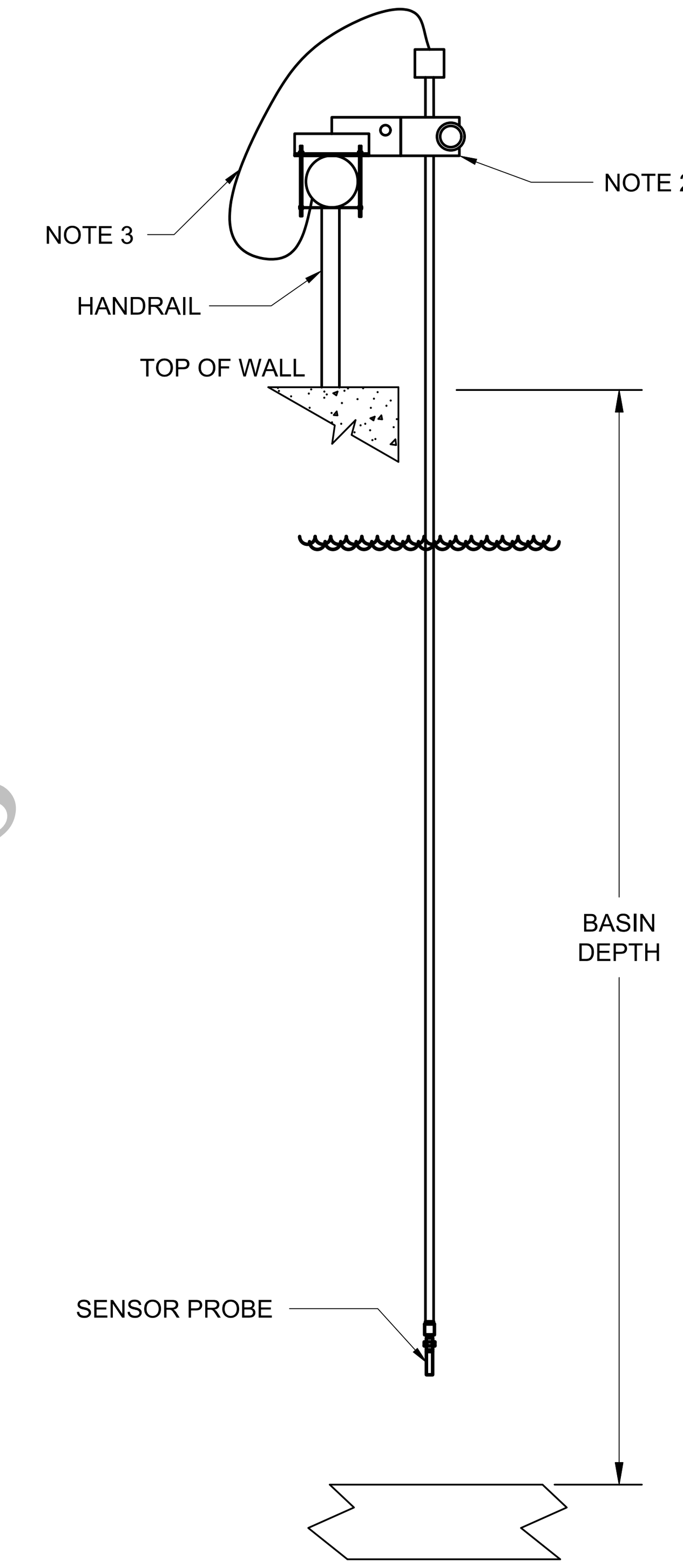
NOTES:
1. THIS DETAIL IS PROVIDED FOR REFERENCE ONLY BY THE AGS SYSTEM SUPPLIER IDENTIFIED IN THE BASE BID (TYPE III) MATERIAL AND EQUIPMENT SCHEDULE. FINAL INSTALLATION DETAILS ARE TO BE COORDINATED BY THE CONTRACTOR BASED ON THE ACTUAL EQUIPMENT SUPPLIED AND AGS SYSTEM SUPPLIER SUBMITTAL PACKAGE.



(M) AGS REACTOR PRESSURE TRANSDUCER

NO SCALE

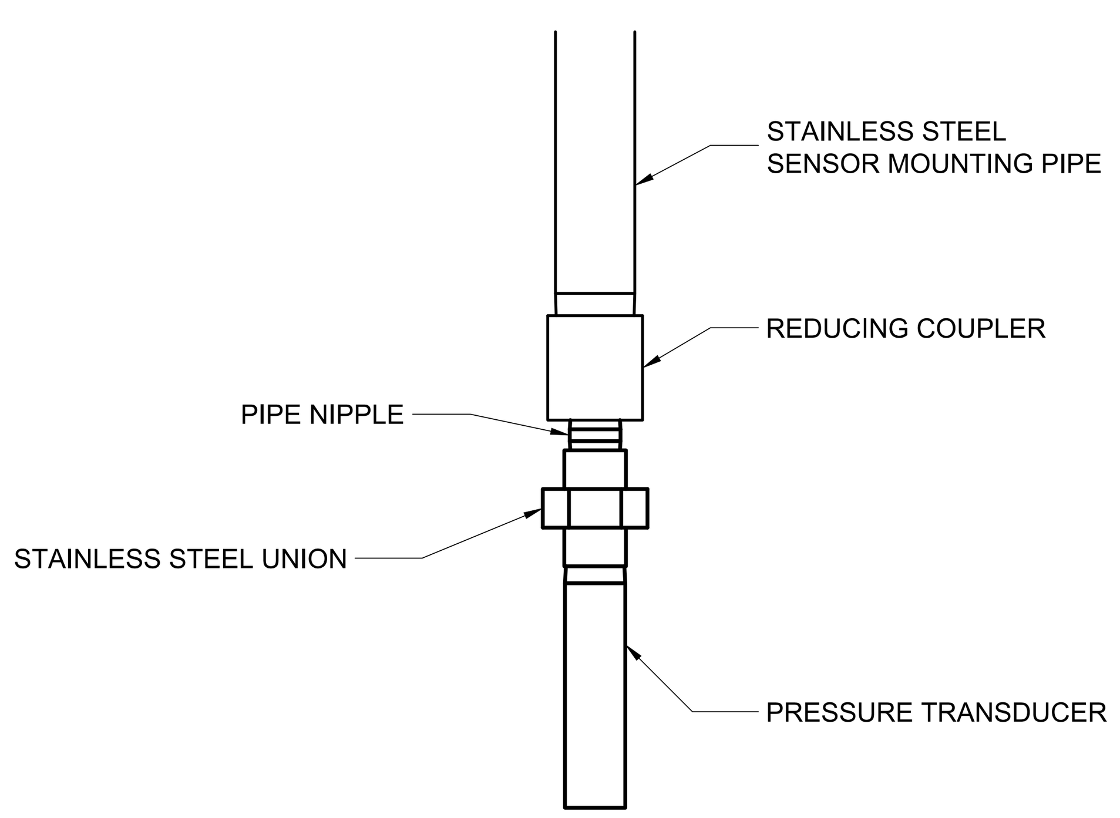
NOTES:
1. THIS DETAIL IS PROVIDED FOR REFERENCE ONLY BY THE AGS SYSTEM SUPPLIER IDENTIFIED IN THE BASE BID (TYPE III) MATERIAL AND EQUIPMENT SCHEDULE AND REVISED BY ENGINEER TO MEET OWNER REQUESTS. FINAL INSTALLATION DETAILS ARE TO BE COORDINATED BY THE CONTRACTOR BASED ON THE ACTUAL EQUIPMENT SUPPLIED AND AGS SYSTEM SUPPLIER SUBMITTAL PACKAGE.
2. PROVIDE AND INSTALL A BRACKET THAT IS SECURED TO TOP HORIZONTAL RAIL OF HANDRAIL AND HOLDS PRESSURE TRANSDUCER ASSEMBLY. BRACKET SHALL BE CONSTRUCTED OF STAINLESS STEEL AND USE STAINLESS STEEL U-BOLTS, NUTS, AND WASHERS.
3. SENSOR CABLE ROUTED IN CONDUIT TO AGS REACTOR JUNCTION BOX.



(N) AGS REACTOR PROBE

NO SCALE

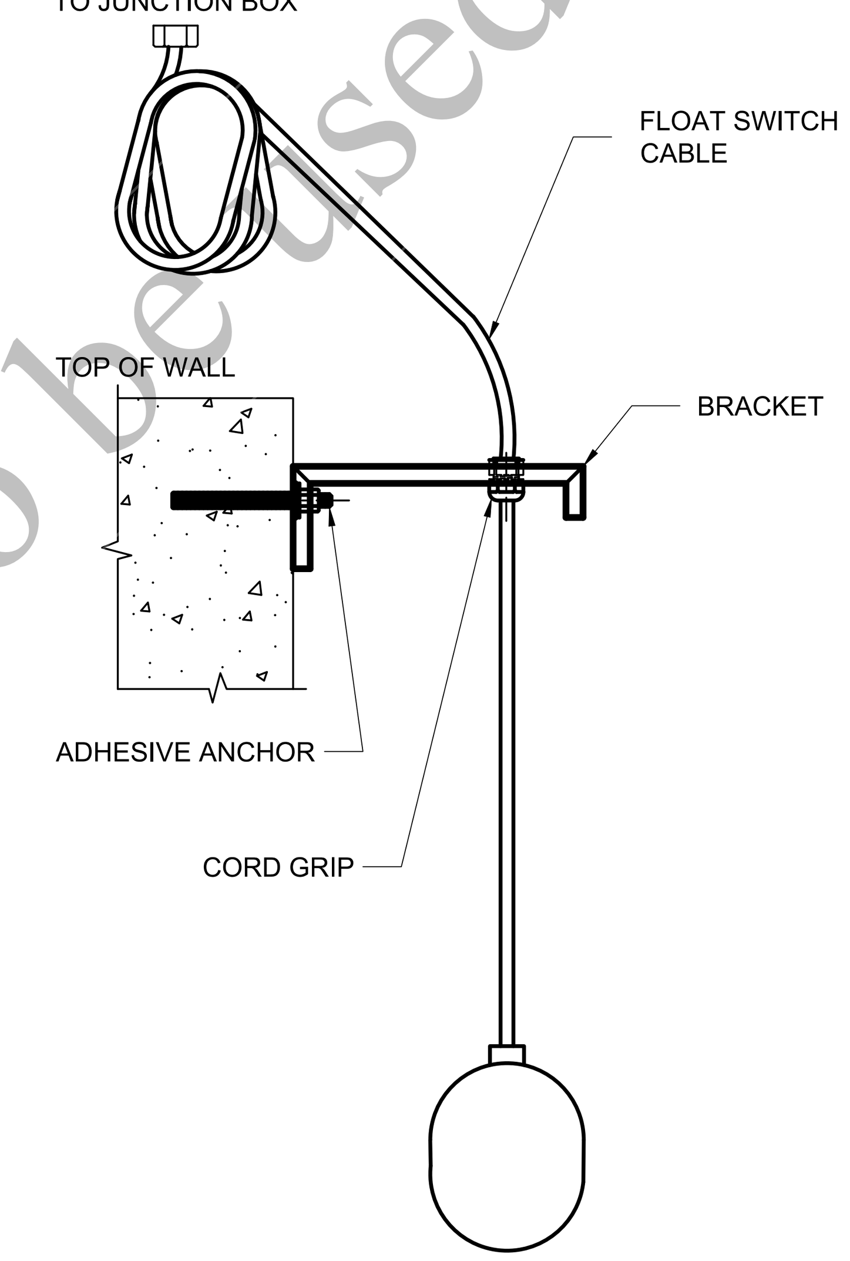
NOTES:
1. THIS DETAIL IS PROVIDED FOR REFERENCE ONLY BY THE AGS SYSTEM SUPPLIER IDENTIFIED IN THE BASE BID (TYPE III) MATERIAL AND EQUIPMENT SCHEDULE AND REVISED BY ENGINEER TO MEET OWNER REQUESTS. FINAL INSTALLATION DETAILS ARE TO BE COORDINATED BY THE CONTRACTOR BASED ON THE ACTUAL EQUIPMENT SUPPLIED AND AGS SYSTEM SUPPLIER SUBMITTAL PACKAGE.
2. PROVIDE AND INSTALL A BRACKET THAT IS SECURED TO TOP HORIZONTAL RAIL OF HANDRAIL AND HOLDS REACTOR SENSOR PROBE AND AMMONIUM OR PHOSPHATE ANALYZER. BRACKET SHALL BE CONSTRUCTED OF STAINLESS STEEL AND USE STAINLESS STEEL U-BOLTS, NUTS, AND WASHERS.
3. SENSOR CABLE ROUTED IN CONDUIT TO AGS REACTOR JUNCTION BOX.



(O) AGS REACTOR PRESSURE TRANSDUCER ENLARGED SENSOR ASSEMBLY

NO SCALE

NOTES:
1. THIS DETAIL IS PROVIDED FOR REFERENCE ONLY BY THE AGS SYSTEM SUPPLIER IDENTIFIED IN THE BASE BID (TYPE III) MATERIAL AND EQUIPMENT SCHEDULE. FINAL INSTALLATION DETAILS ARE TO BE COORDINATED BY THE CONTRACTOR BASED ON THE ACTUAL EQUIPMENT SUPPLIED AND AGS SYSTEM SUPPLIER SUBMITTAL PACKAGE.



(P) FLOAT SWITCH DETAILS

NO SCALE

NOTES:
1. THIS DETAIL IS PROVIDED FOR REFERENCE ONLY BY THE AGS SYSTEM SUPPLIER IDENTIFIED IN THE BASE BID (TYPE III) MATERIAL AND EQUIPMENT SCHEDULE. FINAL INSTALLATION DETAILS ARE TO BE COORDINATED BY THE CONTRACTOR BASED ON THE ACTUAL EQUIPMENT SUPPLIED AND AGS SYSTEM SUPPLIER SUBMITTAL PACKAGE.

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INSTRUMENTATION

INSTRUMENT INSTALLATION DETAILS 3 OF 4

99-I-503

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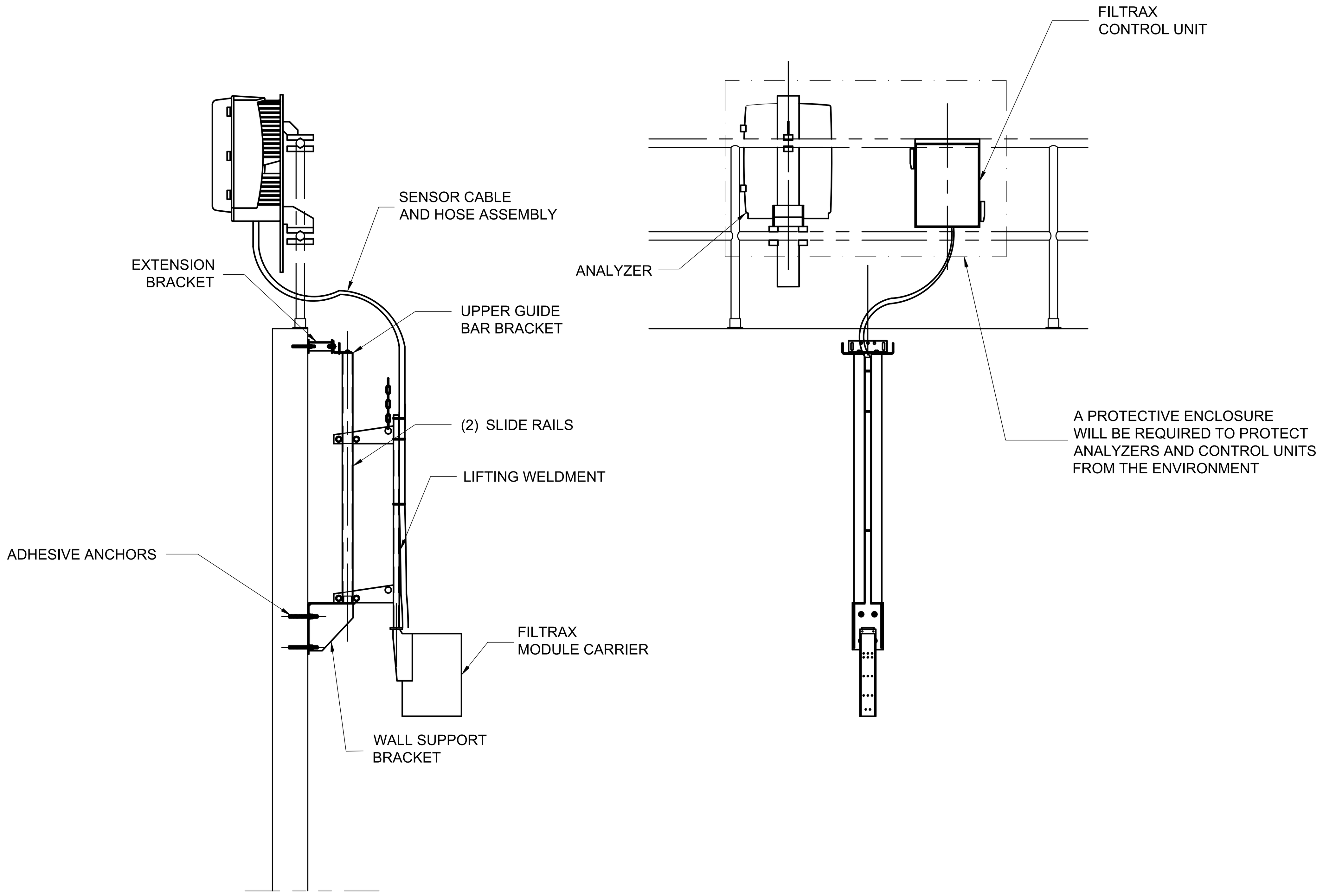

Q AGS REACTOR FILTRAX

NO SCALE

NOTES:
1. THIS DETAIL IS PROVIDED FOR REFERENCE ONLY BY THE AGS SYSTEM SUPPLIER IDENTIFIED IN THE BASE BID (TYPE III) MATERIAL AND EQUIPMENT SCHEDULE. FINAL INSTALLATION DETAILS ARE TO BE COORDINATED BY THE CONTRACTOR BASED ON THE ACTUAL EQUIPMENT SUPPLIED AND AGS SYSTEM SUPPLIER SUBMITTAL PACKAGE.

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INSTRUMENT INSTALLATION DETAILS 4 OF 4

99-I-504

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

CAT6 — ETHERNET COMMUNICATION CABLE (COPPER)

FO — FIBER OPTIC CABLE (SINGLE MODE)

FOTC - FIBER OPTIC CABLE TERMINATING CABINET (PATCH PANEL)

INDUSTRIAL ETHERNET SWITCH

OPERATOR INTERFACE TERMINAL

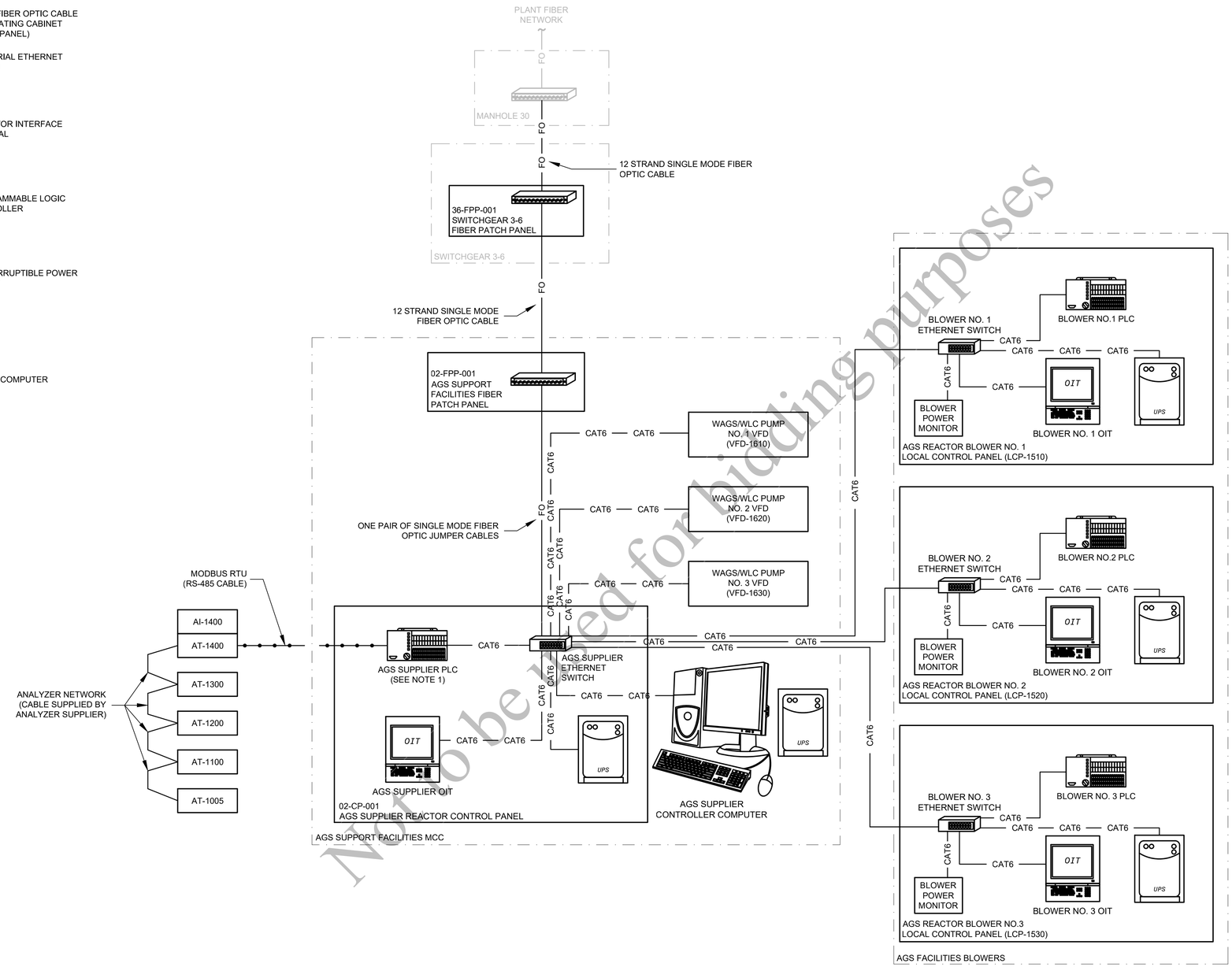
PROGRAMMABLE LOGIC CONTROLLER

UNINTERRUPTIBLE POWER SUPPLY

SCADA COMPUTER

NOTES :

1. IF THE AGS SUPPLIER DOES NOT PROVIDE AN EMERSON AUTOMATION PLC, AGS SUPPLIER SHALL PROVIDE A PLC MODULE OR PROTOCOL CONVERTER TO ALLOW THE AGS SUPPLIER PLC TO COMMUNICATE WITH PLANT CONTROL SYSTEM VIA MODBUS TCP/IP.



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CONTROL SYSTEM BLOCK DIAGRAM

99-I-601

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