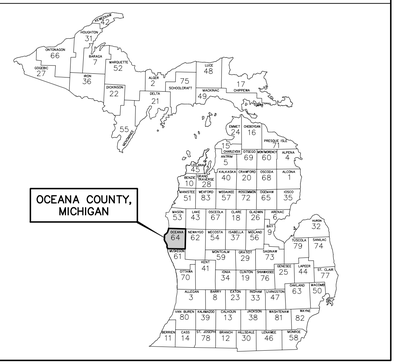
CITY OF HART
OCEANA COUNTY, MICHIGAN

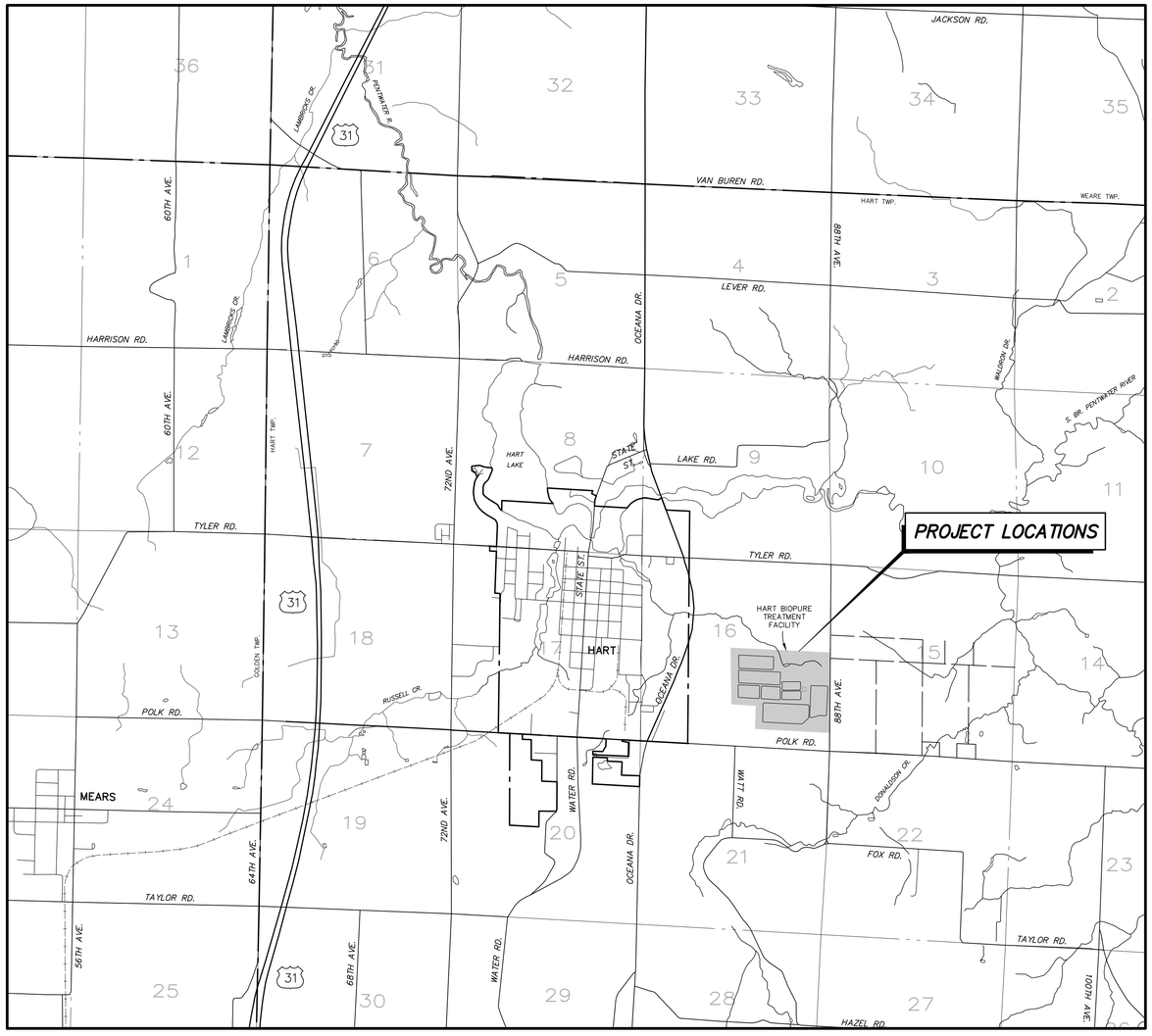
WASTEWATER SYSTEM IMPROVEMENTS

BIOPURE TREATMENT FACILITY

U.S. DEPARTMENT OF COMMERCE
ECONOMIC DEVELOPMENT ADMINISTRATION AWARD No. 06-79-06430

SITE LOCATION MAP

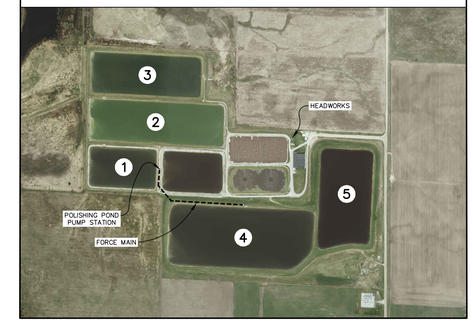




North

SCALE : 1" = 2000'±

HART BIOPURE PLANT OVERVIEW MAP



SECTION No.
SHEET No. SECTION CUT | SHEET No. SECTION LOCATED

CROSS REFERENCING SYSTEM

INCIDENTAL DISCOVERY

IF ANY PREHISTORIC OR HISTORIC ARCHAEOLOGICAL ARTIFACTS OR HUMAN REMAINS ARE DISCOVERED DURING CONSTRUCTION OR RELATED EARTHWORK ACTIVITIES, OR IF THE SCOPE OF WORK CHANGES IN ANY WAY, RECIPIENT SHALL CEASE CONSTRUCTION ACTIVITY AND IMMEDIATELY NOTIFY THE U.S. ECONOMIC DEVELOPMENT ADMINISTRATION (EDA), THE MICHIGAN STATE OF HISTORIC PRESERVATION OFFICE AND THE MIAMI TRIBE OF OKLAHOMA FOR FURTHER INSTRUCTION.

MIAMI TRIBE OF OKLAHOMA
DIANE HUNTER
(918) 541-8966
DHUNTER@MIAMINATION.COM

U.S. FISH AND WILDLIFE SERVICE

IF ANY IDENTIFIED ENDANGERED OR THREATENED SPECIES AND ASSOCIATED HABITAT ARE OBSERVED WITHIN THE PROJECT AREA DURING CONSTRUCTION, DEMOLITION, OR EARTHMOVING ACTIVITIES, OR IF THE SCOPE OF WORK CHANGES IN ANY WAY THAT MAY IMPACT IDENTIFIED SPECIES, THE RECIPIENT SHALL IMMEDIATELY STOP WORK AND NOTIFY U.S. ECONOMIC DEVELOPMENT ADMINISTRATION (EDA) AND THE MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES & ENERGY (EGLE).

FOLLOW GUIDANCE ON WHEN TO SCHEDULE ACTIVITIES OR IMPLEMENT AVOIDANCE AND MINIMIZATION MEASURES TO REDUCE IMPACTS TO MIGRATORY BIRDS AND THE BALD EAGLE, REVIEW THE PROBABILITY OF PRESENCE SUMMARY INCLUDED IN THE MARCH 21, 2022 LETTER FROM U.S. FISH AND WILDLIFE SERVICE (USFWS) TO SEE WHEN THESE BIRDS ARE MOST LIKELY TO BE PRESENT AND BREEDING IN THE EDA PROJECT AREA.

REFER TO APPENDIX A OF THE SPECIFICATION FOR THE MARCH 21, 2022 LETTER FROM USFWS, FOUND IN APPENDIX C OF THE PROJECT SPECIFICATIONS.

UTILITIES

ELECTRIC
HART HYDRO
407 STATE ST.
HART, MI 49420
PHONE : (231) 873-5367
ATTN: MIKE SCHILLER

GAS
DTE
2359 OLTHOF DR.
MUSKEGON, MI 49444
PHONE : (231) 777-4034
ATTN: ANTHONY FERRIER

STORM/SANITARY/WATER
CITY OF HART
407 STATE ST.
HART, MI 49420
PHONE : (231) 873-3100
ATTN: BRAD WHITNEY

TELEPHONE
FRONTIER
860 TERRACE ST.
MUSKEGON, MI 49440
PHONE : (231) 727-1642
ATTN: CHRIS BEISEL

CABLE TELEVISION
CHARTER COMMUNICATIONS
315 DAVIS ST.
GRAND HAVEN, MI 49417
PHONE : (616) 836-9207
ATTN: CRAIG MELLAND

811 Know what's below. Call before you dig.

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PROJECT DATUM INFORMATION

COORDINATE SYSTEM :	STATE PLANE GRID
ZONE :	MICHIGAN SOUTH 2113
ELLIPSOID :	GRS 80
HORIZONTAL DATUM :	NAD 83 (2011)
VERTICAL DATUM :	NAVD 88
GEOID :	GEOID 18
UNITS :	INTERNATIONAL FEET

PROJECT COMBINED SCALE FACTOR (PCSF) =1.000006284244
GROUND DISTANCE = GRID DISTANCE/PCSF

SHEET INDEX

SHEET No.	DESCRIPTION
TITLE	TITLE SHEET
SITE	
C1	EXISTING SITE PLAN
C2	SOIL BORINGS
C3	DEMOLITION PLAN
C4	YARD PIPING PLAN – EAST
C5	YARD PIPING DETAIL – EAST
C6	YARD PIPING PLAN – WEST
C7	YARD PIPING DETAIL – WEST
C8	PROPOSED YARD PIPING PROFILES
C9	PROPOSED YARD PIPING PROFILES
C10	PROPOSED YARD PIPING PROFILES
C11	YARD PIPING DETAILS
C12	YARD PIPING DETAILS
C13	YARD PIPING DETAILS
C14	YARD PIPING DETAILS
C15	PROPOSED SITE PLAN
C16	PROPOSED SITE PLAN DETAIL – EAST
C17	SITE PLAN DETAILS
C18	SITE STRUCTURAL DETAILS
C19	SITE STRUCTURAL DETAILS
C20	ELECTRICAL LEGEND
C21	ELECTRICAL SITE PLAN – EXISTING
C22	ELECTRICAL SITE PLAN – PROPOSED
C23	ELECTRICAL SINGLE LINE DIAGRAMS
C24	WIRING DIAGRAM
C25	SCADA COMMUNICATION RISER
HEADWORKS (ALTERNATE No. 1)	
H1	PROCESS PLANS
H2	PROCESS SECTIONS
H3	PROCESS SECTIONS
H4	BASE SLAB, FOUNDATION & WALL PLAN
H5	FLOOR & SLAB PLAN – EL. 701'-0"
H6	FLOOR & SLAB PLAN – EL. 704'-6"
H7	ROOF PLANK PLAN
H8	ELEVATIONS
H9	STRUCTURAL SECTIONS
H10	STRUCTURAL SECTIONS
H11	STRUCTURAL STAIRS

SHEET No.	DESCRIPTION
HEADWORKS (ALTERNATE No. 1)	
H12	TYPICAL STRUCTURAL DETAILS
H13	TYPICAL STRUCTURAL DETAILS
H14	STRUCTURAL DETAILS
H15	STRUCTURAL DETAILS
H16	MECHANICAL PLANS
H17	MECHANICAL SCHEDULES & DETAILS
H18	MECHANICAL SCHEDULES & DETAILS
H19	ELECTRICAL PLANS
H20	SINGLE LINE DIAGRAM & SCHEDULES
H21	WIRING DIAGRAMS
INLET/SPLITTER BOX	
IS1	PLANS & DETAILS
IS2	SECTIONS & DETAILS
IS3	ELECTRICAL PLANS & DETAILS
TREATMENT BUILDING	
T1	AIR SUPPLY PLANS & SECTIONS
T2	ELECTRICAL PLAN – PROPOSED
T3	WIRING DIAGRAMS & DETAILS
POLISHING POND PS (ALTERNATE No. 2)	
PP1	DEMOLITION
PP2	PUMP STATION DETAILS
PP3	DETAILS
PP4	ELECTRICAL PLANS & DETAILS
PP5	WIRING DIAGRAMS
BIOSOLIDS PUMP STATION	
B1	PUMP STATION DETAILS
B2	ELECTRICAL PLAN & DETAILS
B3	WIRING DIAGRAMS
PROCESS	
P1	SCHEDULES
P2	HYDRAULIC PROFILE
P3	EXISTING PROCESS SCHEMATIC
P4	PROPOSED PROCESS SCHEMATIC
RAPID INFILTRATION BASIN (RIB)	
R1	RAPID INFILTRATION BASIN (RIB)
R2	RIB ELECTRICAL PLAN & DETAILS

STATE OF MICHIGAN
PETER W. BRINK
ENGINEER
No. 6201051071
LICENSED PROFESSIONAL ENGINEER

STATE OF MICHIGAN
NATHAN A. VER HEUL
ENGINEER
No. 6201054907
LICENSED PROFESSIONAL ENGINEER

STATE OF MICHIGAN
DEVIN A. BROWN
ENGINEER
No. 6201061968
LICENSED PROFESSIONAL ENGINEER
STRUCTURAL

STATE OF MICHIGAN
MATTHEW A. TIPPING
ENGINEER
No. 6201043947
LICENSED PROFESSIONAL ENGINEER
ELECTRICAL

ISSUED FOR RE-BIDDING MAY 26, 2023

Prein&Newhof
Engineers ▪ Surveyors ▪ Environmental ▪ Laboratory

PROJECT NO.
2211159
SHEET NO.
TITLE

BENCHMARK EL. 695.32
N 88TH AVENUE & W POLK ROAD
2015'± W & 1405'± N OF C/L "X", FOUND RR SPIKE SET IN N SIDE OF POWER POLE 210' S OF EX. VALVE CHAMBER
(0.8' A/GROUND)

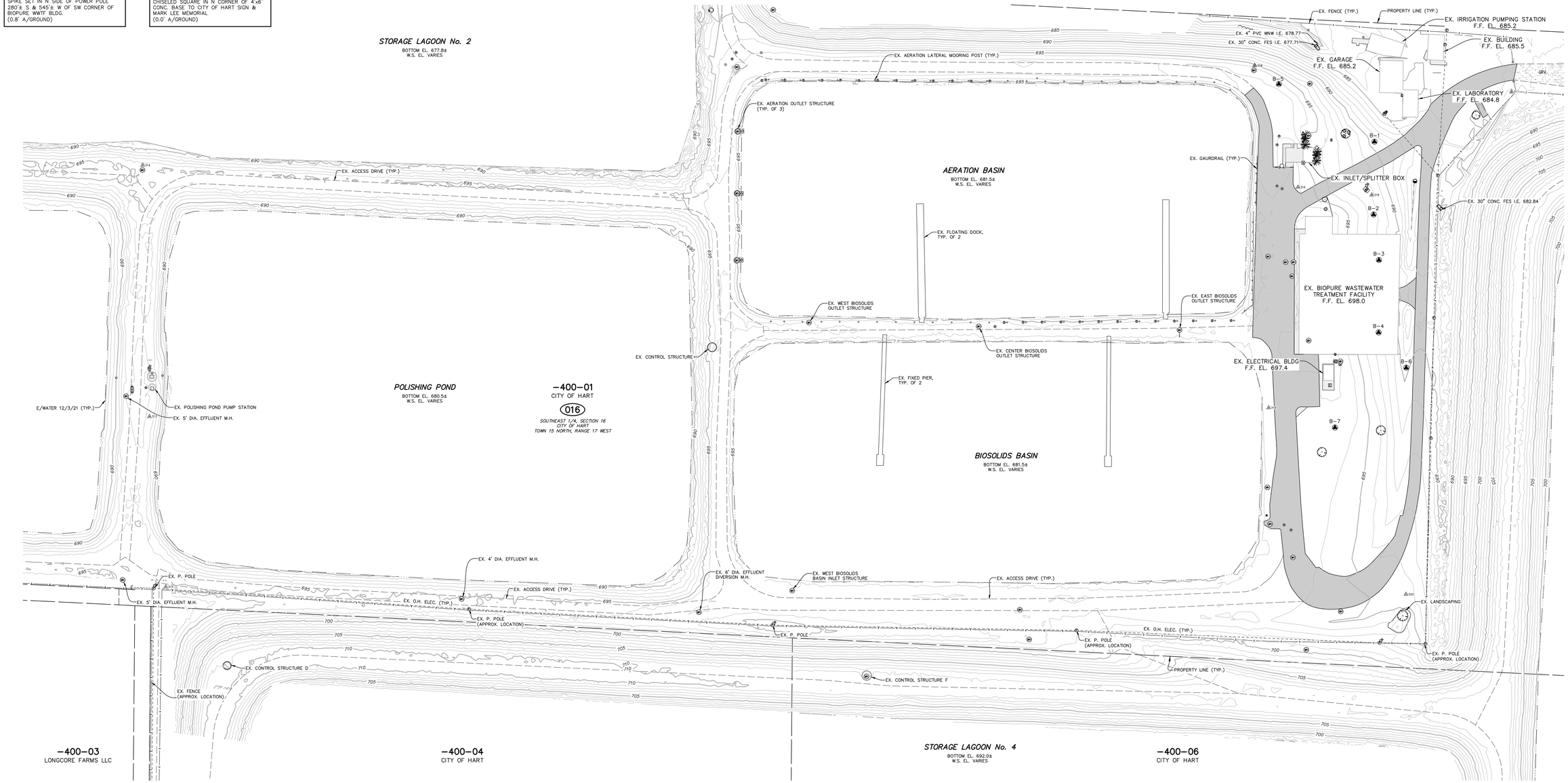
BENCHMARK EL. 685.17
N 88TH AVENUE & W POLK ROAD
750'± W & 1900'± N OF C/L "X", FOUND RR SPIKE SET IN S SIDE OF OLD P. POLE 22' SSE OF SW CORNER OF GARAGE
(0.4' A/GROUND)

BENCHMARK EL. 694.88
N 88TH AVENUE & W POLK ROAD
1375'± W & 1340'± N OF C/L "X", RR SPIKE SET IN N SIDE OF POWER POLE 280'± S & 545'± W OF SW CORNER OF BIOPURE WWTF BLDG.
(0.8' A/GROUND)

BENCHMARK EL. 692.30
N 88TH AVENUE & W POLK ROAD
770'± W & 1820'± N OF C/L "X", CHISELED SQUARE IN N CORNER OF 4'x6' CONC. BASE TO CITY OF HART SIGN & MARK LEE MEMORIAL
(0.0' A/GROUND)

CONTROL POINT TABLE

POINT No.	NORTHING	EASTING	ELEVATION
2	805475.271	12601328.650	695.52
308	805475.271	12601328.650	695.52
313	805113.529	12600189.000	693.63
314	805372.590	12600182.030	693.73
315	804937.891	12600205.800	694.46
316	805349.890	12601373.330	696.15
317	805448.279	12601593.410	686.04
318	805341.988	12601449.360	692.10



LEGEND

GENERAL SYMBOLS

- BUSH/SHRUB
- DECIDUOUS TREE
- CONIFEROUS TREE
- GUY ANCHOR
- ELECTRIC METER
- POST
- ROCK
- SOIL BORING
- SIGN
- IRRIGATION CONTROL BOX
- CATCH BASIN – ROUND FRAME
- CULVERT
- FLARED END SECTION
- SQUARE HANDHOLE – GENERIC
- HYDRANT
- LIGHT POLE
- VALVE & BOX
- CONTROL POINT
- BENCHMARK

LINETYPE LEGEND

- 605 INDEX CONTOUR
- 601 INTERMEDIATE CONTOUR
- BUILDING
- DITCH
- EDGE OF WATER
- FENCELINE
- GUARDRAIL
- GUY WIRE
- VEGETATION LINE
- GRAVEL/DIRT
- UNPLATTED PROPERTY LINE
- OVERHEAD ELECTRIC

PAVEMENT HATCHING LEGEND
EXISTING
ASPHALT CONCRETE

EXISTING SITE PLAN

SCALE : 1" = 50'

North

NOTE REGARDING ALTERNATES

WORK ASSOCIATED WITH ALTERNATE BID ITEMS IS GENERALLY INDICATED ON THE DRAWINGS. SEE SECTION 01 23 00 ALTERNATES FOR A MORE DETAILED DESCRIPTION OF THE SCOPE INCLUDED IN ALTERNATE ACTIVITY. FOR EACH ALTERNATE, IT IS INTENDED THAT ALL WORK ITEMS REQUIRED FOR THE COMPLETE FUNCTIONAL SYSTEM OF THAT ALTERNATE BE INCLUDED IN THE ALTERNATE PRICING.

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NO.	REVISIONS	BY	DATE

DRAWN R.P.S.
DATE MAY '23
CHECKED P.W.B.
DATE MAY '23

Prein&Newhof
Engineers • Surveyors • Environmental • Laboratory

CITY OF HART
OCEANA COUNTY, MICHIGAN
WASTEWATER SYSTEM IMPROVEMENTS
BIOPURE TREATMENT FACILITY
EXISTING SITE PLAN

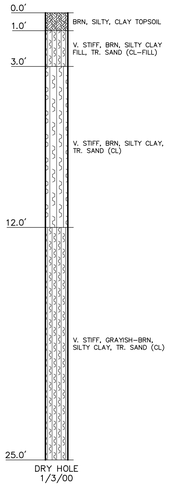
PROJECT NO. 2211159
SHEET NO. C1 OF C25

T:\CIVIL3D PROJECTS\2021\2211159_HART_WWTP\4_PROD\C4 HEADWORKS LAGOON SPLITS AND POLISHING POND PS\2211159_C4_SITE EXISTING - RSTRENG - May. 22 2023 - 09:31am - Prein&Newhof

SOIL BORING LOG

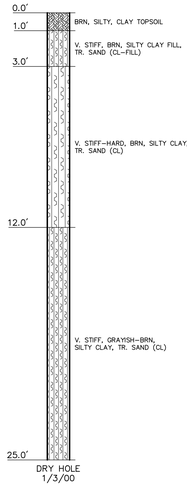
SCALE : VERT. 1" = 4'

B-1



DRY HOLE
1/3/00

B-2



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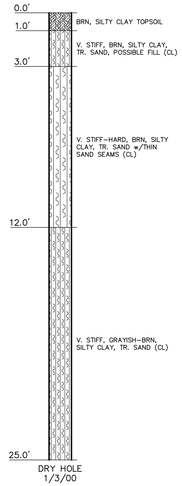
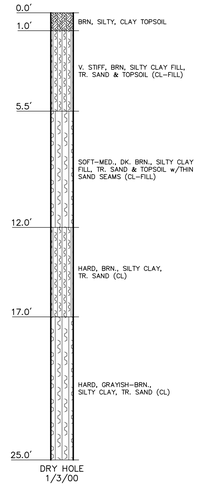
1/3/00

B-3



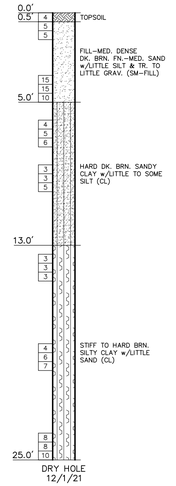
DRY HOLE
1/3/00

B-4



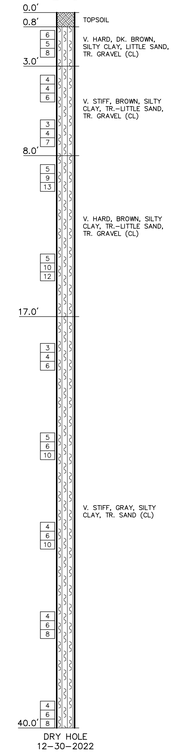
DRY HOLE
1/3/00

B-5



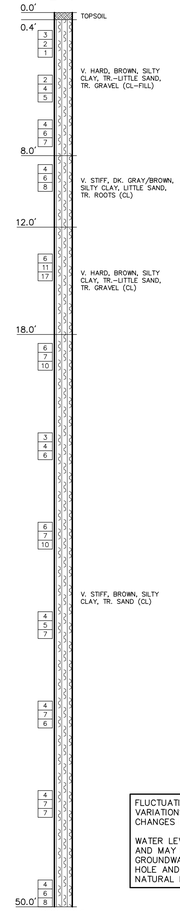
DRY HOLE
12/1/21

B-6



DRY HOLE
12-30-2022

B-7



DRY HOLE
1-5-2023

GROUNDWATER NOTES

FLUCTUATIONS IN GROUNDWATER LEVELS SHOULD BE ANTICIPATED DUE TO SEASONAL VARIATIONS, FOLLOWING PERIODS OF PROLONGED PRECIPITATION OR DROUGHT AND WITH CHANGES IN THE WATER LEVEL OF THE NEARBY SURFACE WATERS.

WATER LEVELS REPORTED IN BORINGS ARE LEVELS OBSERVED IN THE HOLE DURING DRILLING AND MAY NOT REPRESENT THE STATIC GROUNDWATER LEVEL. THE RATE AT WHICH GROUNDWATER WILL REACH ITS STATIC LEVEL IN A BORING DEPENDS ON THE SOILS IN THE HOLE AND CAN BE LIMITED BY THE TENDENCY OF DRILLING OPERATIONS TO SEAL OFF THE NATURAL PATHS OF GROUNDWATER FLOW.

SOIL BORING GENERAL NOTES

THE BORING LOGS SHOWN ON THE CONSTRUCTION PLANS ARE BEING FURNISHED FOR CONVENIENCE AND GENERAL INFORMATION ONLY. THE DATA SHOWN ON THE BORING LOGS REPRESENTS SOIL AND GROUNDWATER CONDITIONS ENCOUNTERED AT THE RESPECTIVE BORING LOCATIONS. VARIATIONS MAY OCCUR BETWEEN THESE LOCATIONS. ADDITIONALLY, THE STRATIGRAPHIC LINES REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES; HOWEVER, THE TRANSITION MAY BE MORE GRADUAL THAN WHAT IS SHOWN. FURTHERMORE, GROUNDWATER LEVELS CAN FLUCTUATE WITH SEASONAL VARIATIONS AND FOLLOWING PERIODS OF PROLONGED PRECIPITATION. THE BIDDER WILL BE RESPONSIBLE FOR MAKING THEMSELVES FAMILIAR WITH SUBSURFACE CONDITIONS BY WHATEVER MEANS THEY DEEM NECESSARY AND SHALL MAKE THEIR OWN DETERMINATIONS THEREFROM.

THE BIDDER BY SUBMITTING A BID, WAIVES ALL CLAIM FOR DAMAGES WHICH THEY MAY SUFFER BY REASONS OF THE INADEQUACIES OR DISCREPANCIES OF THE INFORMATION SHOWN ON THESE BORING LOGS AND UNDERSTANDS THAT NO COMPENSATION WILL BE PAID TO THEM DUE TO AN INADEQUACY OR DISCREPANCY IN THIS DATA.

WITHIN BORING B5, SOIL SAMPLES WERE OBTAINED BY THE STANDARD PENETRATION TEST METHOD, ASTM D1586, WHEREBY A SPLIT-SPOON SAMPLER IS DRIVEN THREE SUCCESSIVE 6-INCH INCREMENTS WITH A 140 POUND WEIGHT FALLING 30 INCHES. THE NUMBER OF BLOWS REQUIRED TO DRIVE THE SAMPLER FOR EACH INCREMENT IS PRESENTED ON THE BORING LOG.

NO.	REVISIONS	BY	DATE

DRAWN R.P.S.
DATE MAY '23
CHECKED P.W.B.
DATE MAY '23

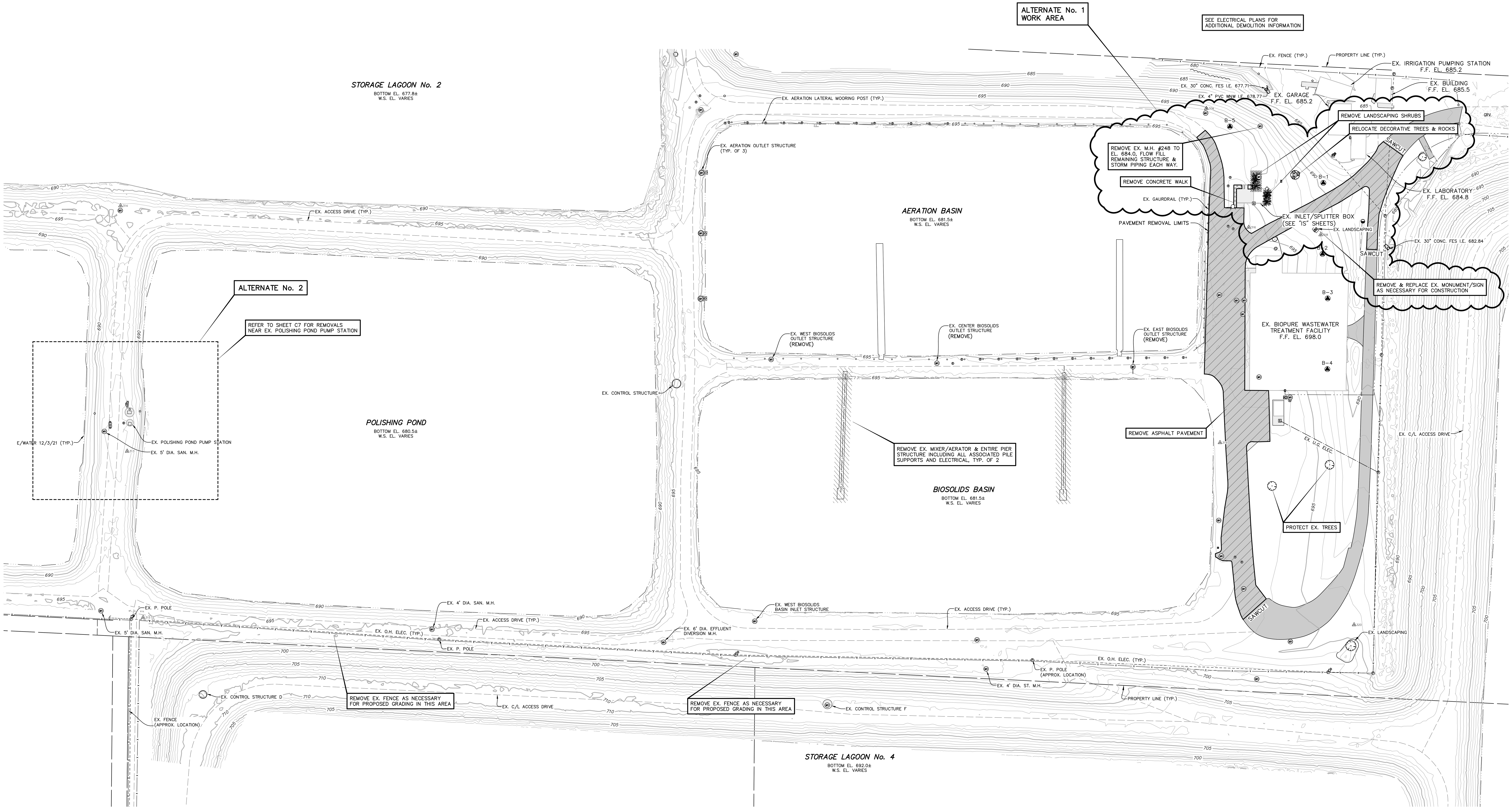
Prein&Newhof
Engineers • Surveyors • Environmental • Laboratory

CITY OF HART
OCEANA COUNTY, MICHIGAN

WASTEWATER SYSTEM IMPROVEMENTS
BIOPURE TREATMENT FACILITY

SOIL BORINGS

PROJECT NO. 2211159
SHEET NO. C2 OF C25



DEMOLITION PLAN

SCALE : 1" = 50'

North

LEGEND

GENERAL SYMBOLS

- BUSH/SHRUB
- DECIDUOUS TREE
- CONIFEROUS TREE
- GUY ANCHOR
- ELECTRIC METER
- POST
- ROCK
- SOIL BORING
- SIGN
- IRRIGATION CONTROL BOX
- CATCH BASIN – ROUND FRAME
- CULVERT
- FLARED END SECTION
- SQUARE HANDHOLE – GENERIC
- HYDRANT
- LIGHT POLE
- VALVE & BOX
- CONTROL POINT
- BENCHMARK

LINETYPE LEGEND

- 605 INDEX CONTOUR
- 601 INTERMEDIATE CONTOUR
- BUILDING
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- EDGE OF WATER
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- GUARDRAIL
- GUY WIRE
- VEGETATION LINE
- GRAVEL/DIRT
- UNPLATTED PROPERTY LINE
- OVERHEAD ELECTRIC

PAVEMENT HATCHING LEGEND

EXISTING

ASPHALT CONCRETE

REMOVAL LEGEND

- REMOVE HMA SURFACE
- REMOVE CONCRETE PAVEMENT
- REMOVE ITEMS AS NOTED

BIOSOLIDS REMOVAL/TRANSFER NOTES

PRIOR TO WORK IN THE POLISHING POND, THE OWNER WILL PARTIALLY DRAW DOWN THE WATER LEVEL AND REMOVE SOLIDS PRESENT IN THE POLISHING POND TO WITHIN THE BOTTOM 1 FOOT OF DEPTH. CONTRACTOR SHALL BE RESPONSIBLE FOR TRANSFERRING ANY REMAINING SOLIDS TO THE EXISTING BIOSOLIDS BASIN AND BE RESPONSIBLE FOR CLEANING OF THE BOTTOM OF THE EXISTING POLISHING POND AS NECESSARY TO COMPLETE THE WORK.

AFTER THE WEST BIOSOLIDS BASIN HAS BEEN CONSTRUCTED, THE OWNER WILL PARTIALLY DRAW DOWN THE WATER LEVEL IN THE EXISTING BIOSOLIDS BASIN AND REMOVE SOLIDS IN THE BIOSOLIDS BASIN TO WITHIN THE BOTTOM 1 FOOT OF DEPTH. CONTRACTOR SHALL THEN BE RESPONSIBLE FOR TRANSFERRING ANY REMAINING SOLIDS TO THE WEST BIOSOLIDS BASIN AND CLEANING OF THE BASIN BOTTOM AS NECESSARY TO ALLOW FOR CONSTRUCTION OF THE PROPOSED SOUTH AERATION BASIN AND PROPOSED EAST BIOSOLIDS BASIN.

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Engineers•Surveyors•Environmental•Laboratory

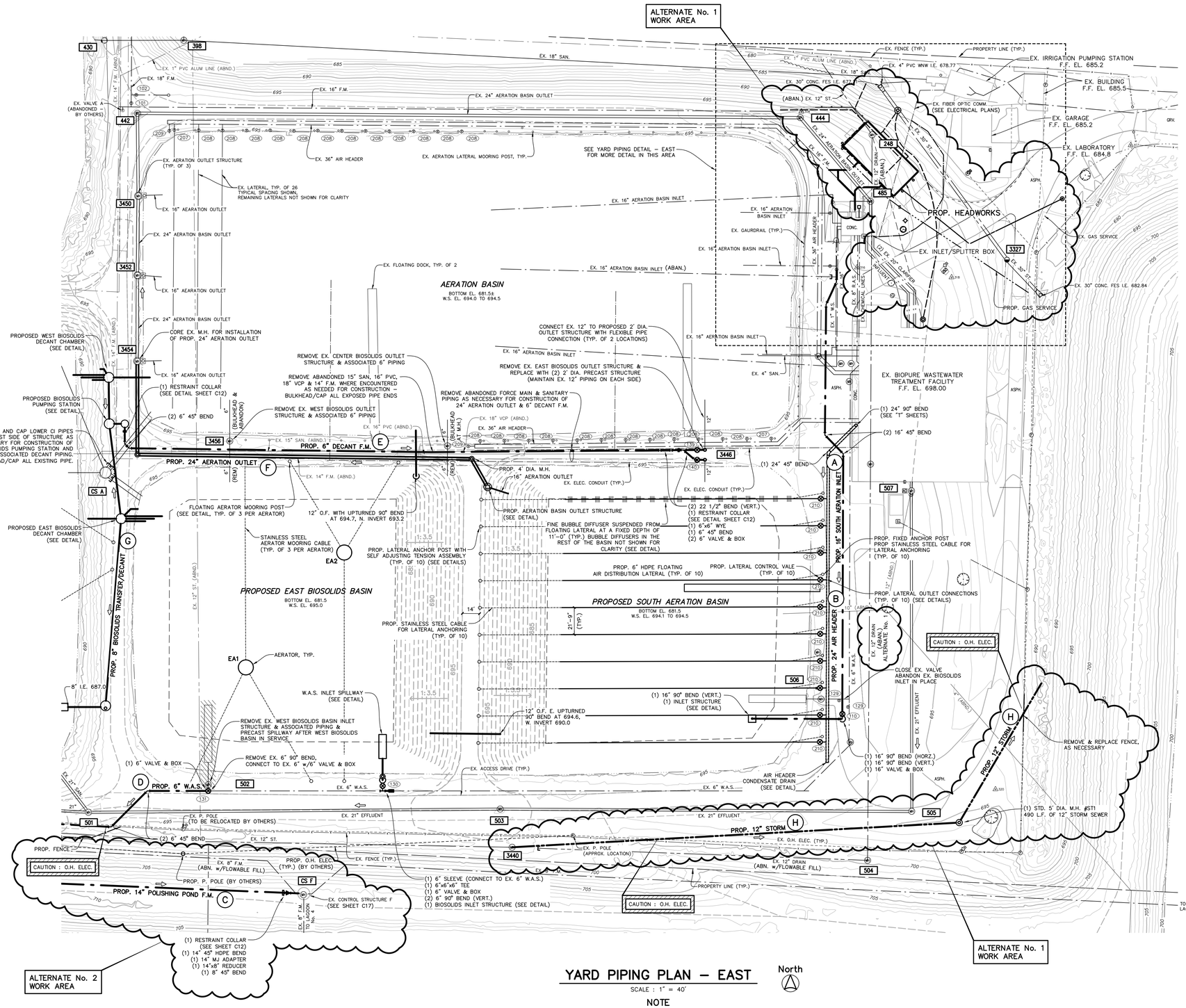
CITY OF HART
OCEANA COUNTY, MICHIGAN

WASTEWATER SYSTEM IMPROVEMENTS
BIOPURE TREATMENT FACILITY

DEMOLITION PLAN

PROJECT NO. 2211159

SHEET NO. C3 OF C25



EXISTING STRUCTURE UNDERGROUND INFORMATION

ID	DESCRIPTION
444	5' DIA. M.H. (PC) RIM 696.71 24" W I.E. 688.80 (F.V.) 24" SE I.E. 688.70 (F.V.)
485	5' DIA. M.H. (PC) RIM 694.81 24" NW I.E. 689.42 (F.V.) 24" S I.E. 689.32 (F.V.) 12" W I.E. 692.91 (F.V.)
3327	5' DIA. M.H. (PC) RIM 685.63 36" NW I.E. 680.93 (CONC) 36" SE I.E. 680.93 (CONC)
248	4' DIA. M.H. (PC) **(REMOVE)** RIM 693.06 12" NW I.E. 676.02 12" S I.E. 676.02 6" SE I.E. 677.42 **ALTERNATE No. 1**
3450	5' DIA. M.H. (PC) RIM 696.36 T/WER 693.11 N-S CHANNEL 691.26
3452	5' DIA. M.H. (PC) RIM 696.37 T/WER 693.42 N-S CHANNEL 691.52
442	4' DIA. M.H. (PC) RIM 697.33
501	6' DIA. M.H. (PC) RIM 697.20 21" W I.E. 685.75± (PVC) 21" NW I.E. 685.75± (PVC) 21" E I.E. 685.85± (PVC)
502	4' DIA. M.H. (PC) RIM 697.20± 6" N I.E. 695.20 6" S I.E. 694.80
CS A	8' DIA. (PC) RIM 697.00± 12" W I.E. 689.50± 12" SE I.E. 694.50± 12" SE I.E. 692.90± 12" NE I.E. 694.50± 12" NE I.E. 692.90± 12" NW I.E. 689.50±

ID	DESCRIPTION
3454	5' DIA. M.H. (PC) RIM 696.49 T/WER 693.44 N CHANNEL 691.64
3456	4' DIA. M.H. (PC) **(REMOVE)** RIM 697.30 N CHANNEL 694.30 S CHANNEL 694.35
3446	4' DIA. M.H. w/LINING PLASTIC IN CONC (PC) **(REMOVE)** RIM 697.63 12" N 694.28 (CONC w/LINER) 12" S 694.33 (CONC w/LINER)
3440	4' DIA. M.H. (PC) RIM 696.99 12" W I.E. 683.34 (CLAY) 12" E I.E. 678.34 (CLAY)
CS F	8' DIA. M.H. (PC) RIM 714.84 T/12" 709.34 (DI) 3 VERT. (DI) 90° BENDS
430	4' DIA. M.H. (PC) NO LID RIM 696.28 12" W I.E. 689.40 (CMP) 12" PIPE W VALVE I.E. 685.36 (METAL) 12" PIPE W VALVE I.E. 682.94 (METAL) 12" PIPE W VALVE I.E. 680.18 (METAL)
398	4' DIA. M.H. (PC) RIM 682.66
503	4' DIA. M.H. (PC) RIM 697.50± 21" W I.E. 686.18± (PVC) 21" E I.E. 686.28± (PVC)
504	4' DIA. M.H. (PC) (BURIED) 12" N I.E. 677.51± (CLAY) 12" W I.E. 677.61± (CLAY)
505	4' DIA. M.H. (PC) RIM 695.39± 21" W I.E. 686.62± (PVC) 21" N I.E. 686.72± (PVC)
506	4' DIA. M.H. (PC) RIM 697.20± 6" E I.E. 695.20 6" W I.E. 695.80
507	4' DIA. M.H. (PC) RIM 697.00± 20" N I.E. 684.67± (DI) 21" S I.E. 686.98± (PVC)

YARD PIPING PROFILE LEGEND

(A) 16" SOUTH AERATION INLET	(F) 24" AERATION OUTLET
(B) 24" AIR HEADER	(G) 8" BIOSOLIDS TRANSFER/DECANT
(C) 10"/14" POLISHING POND F.M. (ALTERNATE No. 2)	(H) 12" STORM (ALTERNATE No. 1)
(D) 6" W.A.S.	(I) 16" F.M./RAW (ALTERNATE No. 1)
(E) 6" DECANT F.M.	(J) 8" DRAIN (ALTERNATE No. 1)
	(K) 4" N.P.W. (ALTERNATE No. 1)

DECANT F.M. INSTALLATION NOTE

ABANDONED 15" SAN, 16" PVC, 18" VCP, AND 14" FM MAY BE ENCOUNTERED WITHIN 3–8 FEET OF DEPTH. CONTRACTOR SHALL REMOVE ALL ABANDONED PIPING WITHIN 1 FOOT OF PROPOSED PIPING, AND CAP OR BULKHEAD ANY OPEN ENDS.

ELECTRICAL UTILITY NOTE

SEE ELECTRICAL PLANS FOR ADDITIONAL UNDERGROUND UTILITY INFORMATION

NOTES

1. EXISTING UTILITIES ARE SHOWN BASED ON AVAILABLE INFORMATION. CONTRACTOR SHALL FIELD VERIFY LOCATION OF EXISTING UNDERGROUND UTILITIES PRIOR TO CONSTRUCTION. NOTIFY ENGINEER OF ANY POTENTIAL CONFLICTS WITH PROPOSED PIPING.
2. EX. UTILITIES SHALL BE SUPPORTED AND PROTECTED AS NECESSARY DURING CONSTRUCTION.
3. ENDS OF ALL ABANDONED PIPING THAT ARE REMOVED DURING CONSTRUCTION SHALL BE CUT AND CAPPED.
4. SEE ELECTRICAL & MECHANICAL PLANS FOR ADDITIONAL UNDERGROUND UTILITY INFORMATION.

YARD PIPING PLAN – EAST

SCALE : 1" = 40'

North

NOTE

ALL DUCTILE IRON PIPE SHALL BE RESTRAINED JOINT & INSTALLED WRAPPED IN A SEAMLESS POLYETHYLENE ENCASEMENT.

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UTILITY LOCATIONS ARE DERIVED FROM ACTUAL MEASUREMENTS OR AVAILABLE RECORDS. THEY SHOULD NOT BE INTERPRETED TO BE EXACT LOCATIONS NOR SHOULD IT BE ASSUMED THAT THEY ARE THE ONLY UTILITIES IN THIS AREA.

NO.	REVISIONS	BY	DATE

DRAWN R.P.S.
DATE MAY '23
CHECKED P.W.B.
DATE MAY '23

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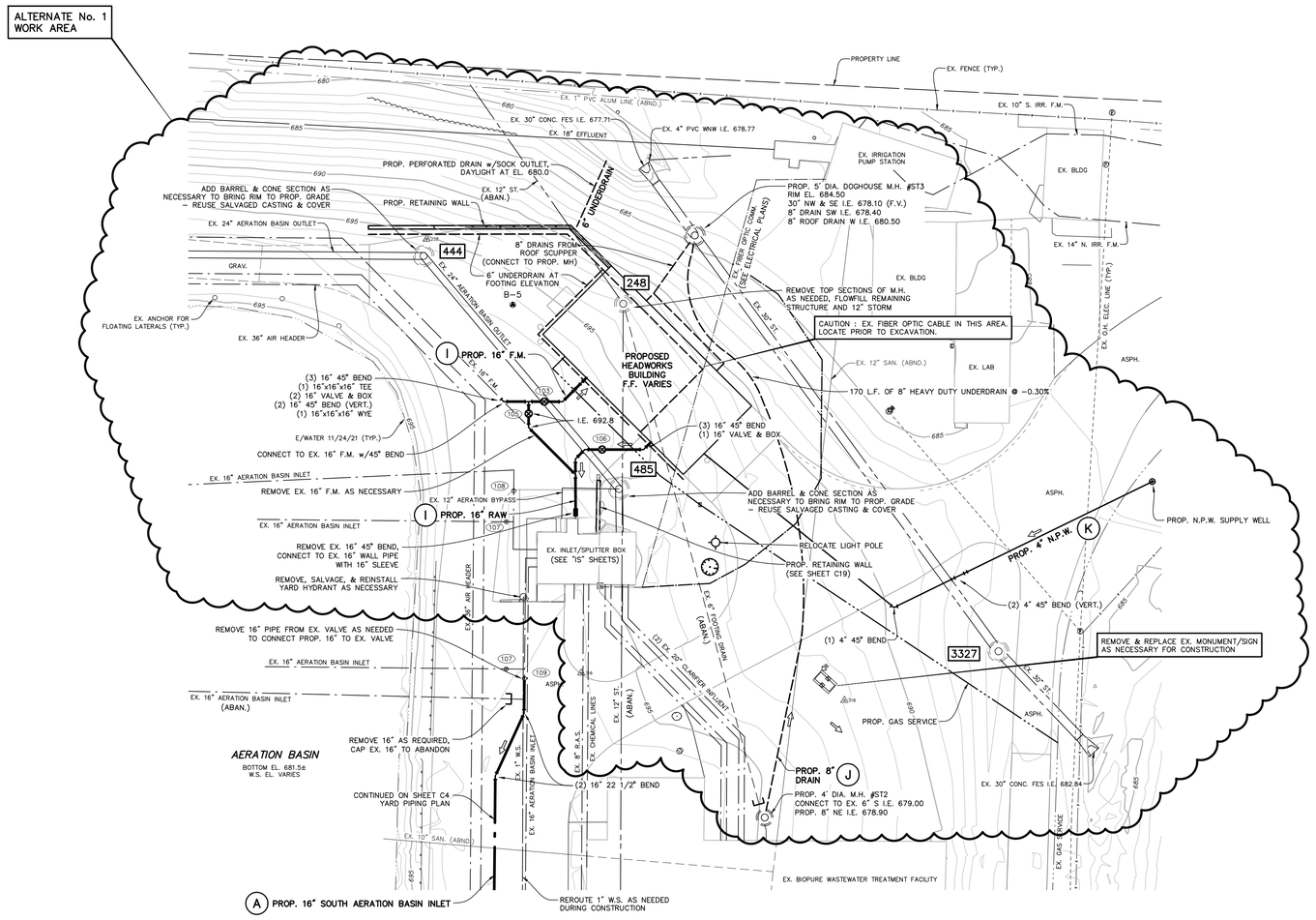
CITY OF HART
OCEANA COUNTY, MICHIGAN

WASTEWATER SYSTEM IMPROVEMENTS
BIOPURE TREATMENT FACILITY

YARD PIPING PLAN – EAST

PROJECT NO. 2211159
SHEET NO. C4 OF C25

I:\CIVIL3D PROJECTS\2021\2211159_HART_WWTP\4_PROD\C4 HEADWORKS LAGOON SPLITS AND POLISHING POND PS\2211159_C4_YP PLAN EAST.DWG - RSTRONG - May. 23 2023 - 11:23am - PrintMeNewhof



YARD PIPING DETAIL – EAST

SCALE : 1" = 20'

North

EXISTING STRUCTURE UNDERGROUND INFORMATION

ID	DESCRIPTION
444	5' DIA. M.H. (PC) RIM 696.71 24" W I.E. 688.80 (F.V.) 24" SE I.E. 688.70 (F.V.)
485	5' DIA. M.H. (PC) RIM 694.81 24" NW I.E. 689.42 (F.V.) 24" S I.E. 689.32 (F.V.) 12" W I.E. 692.91 (F.V.)
3327	5' DIA. M.H. (PC) RIM 685.63 36" NW I.E. 680.93 (CONC) 36" SE I.E. 680.93 (CONC)
248	4' DIA. M.H. (PC) RIM 693.06 12" NW I.E. 676.02 (F.V.) 12" S I.E. 676.02 (F.V.) 6" SE I.E. 677.42 (F.V.)

YARD PIPING PROFILE LEGEND

A 16" SOUTH AERATION INLET	F 24" AERATION OUTLET
B 24" AIR HEADER	G 8" BIOSOLIDS TRANSFER/DECANT
C 10"/14" POLISHING POND F.M. (ALTERNATE No. 2)	H 12" STORM (ALTERNATE No. 1)
D 6" W.A.S.	I 16" F.M./RAW (ALTERNATE No. 1)
E 6" DECANT F.M.	J 8" DRAIN (ALTERNATE No. 1)
	K 4" N.P.W. (ALTERNATE No. 1)

CONSTRUCTION NOTES

1. ALL PIPES TO BE ABANDONED SHALL BE FLOWFILLED & HAVE OPEN ENDS CAPPED OR BULKHEADED.
2. ALL DUCTILE IRON PIPE SHALL BE RESTRAINED JOINT & INSTALLED WRAPPED IN A POLYETHYLENE ENCASEMENT, PER STANDARD SPECIFICATIONS FOR FORCE MAINS.

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WASTEWATER SYSTEM IMPROVEMENTS
BIOPURE TREATMENT FACILITY

YARD PIPING DETAIL – EAST

PROJECT NO. 2211159
SHEET NO. C5 OF C25

EXISTING STRUCTURE UNDERGROUND INFORMATION

ID	DESCRIPTION
3103	8' DIA. M.H. (PC) RIM 693.97
3124	5' DIA. M.H. (PC) RIM 694.02 21" NE I.E. 684.52 (PVC) 21" S I.E. 684.57 (PVC)
3398	5' DIA. M.H. (PC) RIM 693.39 21" N I.E. 684.74 (PVC) 21" E I.E. 684.64 (PVC)

ID	DESCRIPTION
501	6' DIA. M.H. (PC) RIM 697.20 21" W I.E. 685.75± (PVC) 21" NW I.E. 685.75± (PVC) **(REMOVED)** 21" E I.E. 685.85± (PVC)
CS A	8' DIA. (PC) RIM 697.00± 12" W I.E. 689.50± 12" SE I.E. 694.50± 12" SE I.E. 692.90± 12" NE I.E. 694.50± 12" NE I.E. 692.90± 12" NW I.E. 689.50±

YARD PIPING PROFILE LEGEND

A	16" SOUTH AERATION INLET	F	24" AERATION OUTLET
B	24" AIR HEADER	G	8" BIOSOLIDS TRANSFER/DECANT
C	10"/14" POLISHING POND F.M. (ALTERNATE No. 2)	H	12" STORM (ALTERNATE No. 1)
D	6" W.A.S.	I	16" F.M./RAW (ALTERNATE No. 1)
E	6" DECANT F.M.	J	8" DRAIN (ALTERNATE No. 1)
		K	4" N.P.W. (ALTERNATE No. 1)

ELECTRICAL UTILITY NOTE

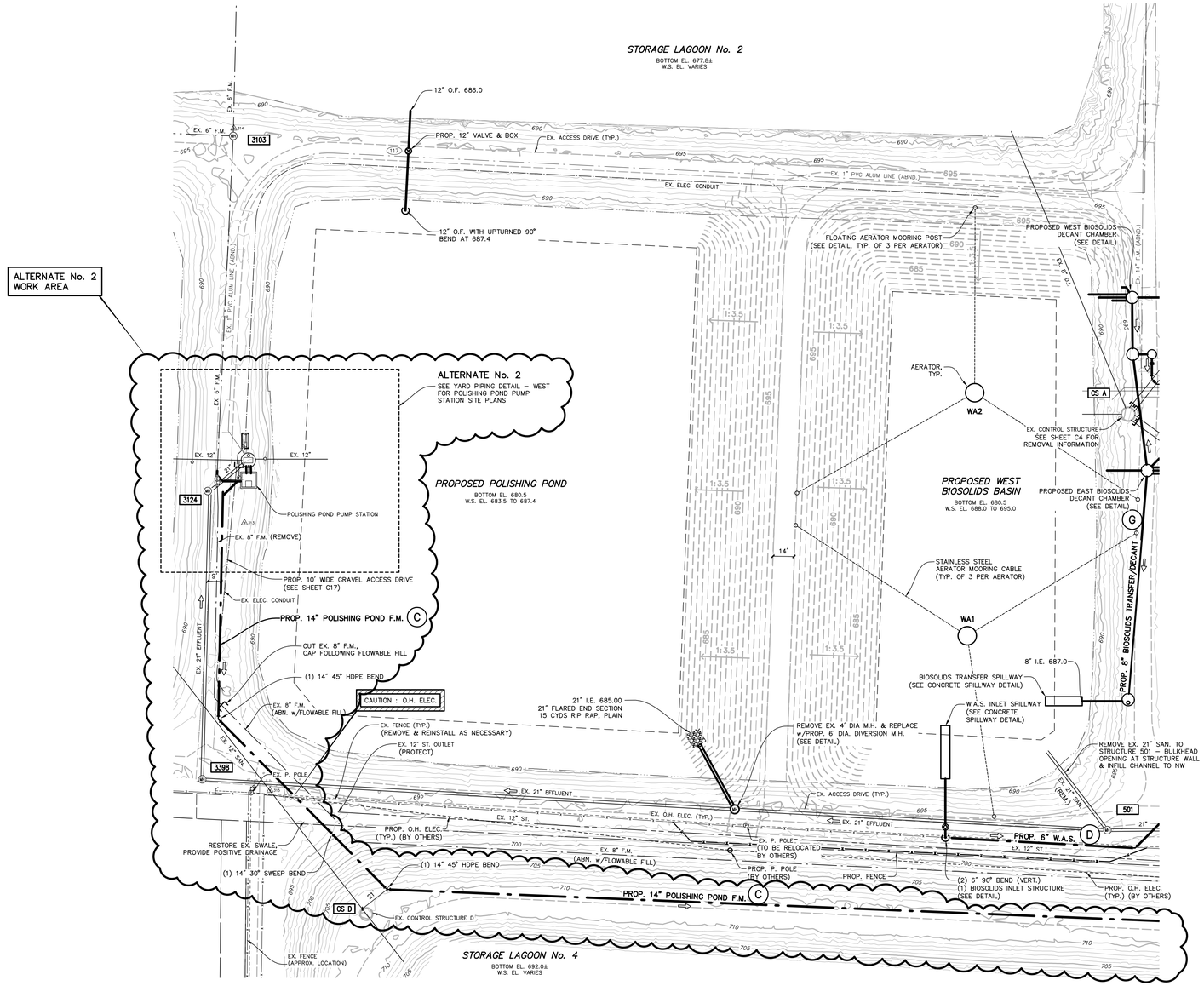
SEE ELECTRICAL PLANS FOR ADDITIONAL UNDERGROUND UTILITY INFORMATION

DATUM NOTE

SITE PLAN & PROPOSED ELEVATIONS ARE BASED ON NAVD '88 UNLESS INDICATED OTHERWISE. DATUM USED FOR RECORD PLANS IS UNKNOWN, AND DIFFERENCE BETWEEN RECORD PLAN ELEVATIONS & PROPOSED ELEVATIONS MAY VARY. FIELD VERIFY ALL ELEVATIONS AS NECESSARY FOR CONSTRUCTION.

ALTERNATE No. 2 – POLISHING POND FORCE MAIN NOTES

1. ALL DUCTILE IRON PIPE SHALL BE RESTRAINED JOINT AND INSTALLED WRAPPED IN A POLYETHYLENE ENCASEMENT, PER STANDARD SPECIFICATION FOR FORCE MAINS.
2. CONTRACTOR SHALL FLOW FILL EXISTING 8" FORCE MAIN TO BOTTOM OF CONTROL STRUCTURE F BASE SLAB. AFTER FLOWABLE FILL HAS CURED, INSTALL INFILL CONCRETE AND CAP WEST END OF FORCE MAIN.
3. REPLACE 10' WIDE ACCESS DRIVE IN ALL DISTURBED AREAS PER THE CROSS SECTION PROVIDED (SEE SHEET C17). CONTRACTOR SHALL FILL DRIVE AREAS AS NECESSARY TO ACHIEVE 5' MINIMUM COVER OVER PROPOSED FORCE MAIN.
4. PLACE TOPSOIL AND SEED AROUND CONTROL STRUCTURE F AS NECESSARY TO ACHIEVE MIN. 18" COVER OVER INSULATION.



YARD PIPING PLAN – WEST

SCALE : 1" = 40'

North

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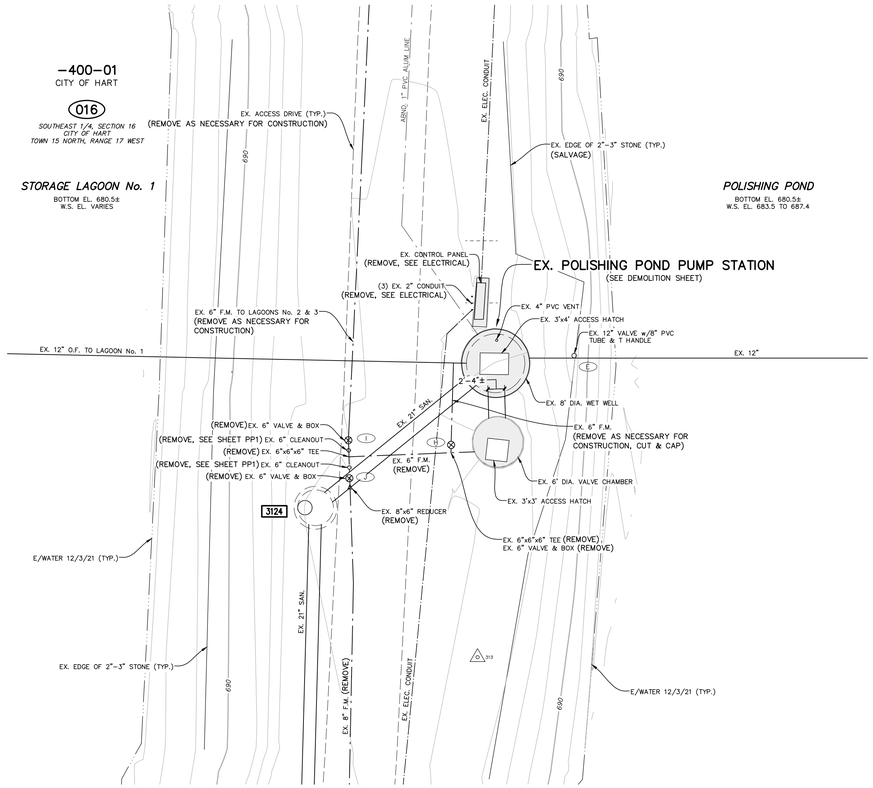
WASTEWATER SYSTEM IMPROVEMENTS
BIOPURE TREATMENT FACILITY

YARD PIPING PLAN – WEST

PROJECT NO. 2211159
SHEET NO. C6 OF C25

BENCHMARK EL. 695.32
N 88TH AVENUE & W POLK ROAD
2015'± W & 1405'± N OF C/L "X", FOUND RR SPIKE SET IN N SIDE OF POWER POLE 210' S OF EX. VALVE CHAMBER (0.8' A/GROUND)

CONTROL POINT TABLE			
POINT No.	NORTHING	EASTING	ELEVATION
313	805113.529	1260018.000	693.63



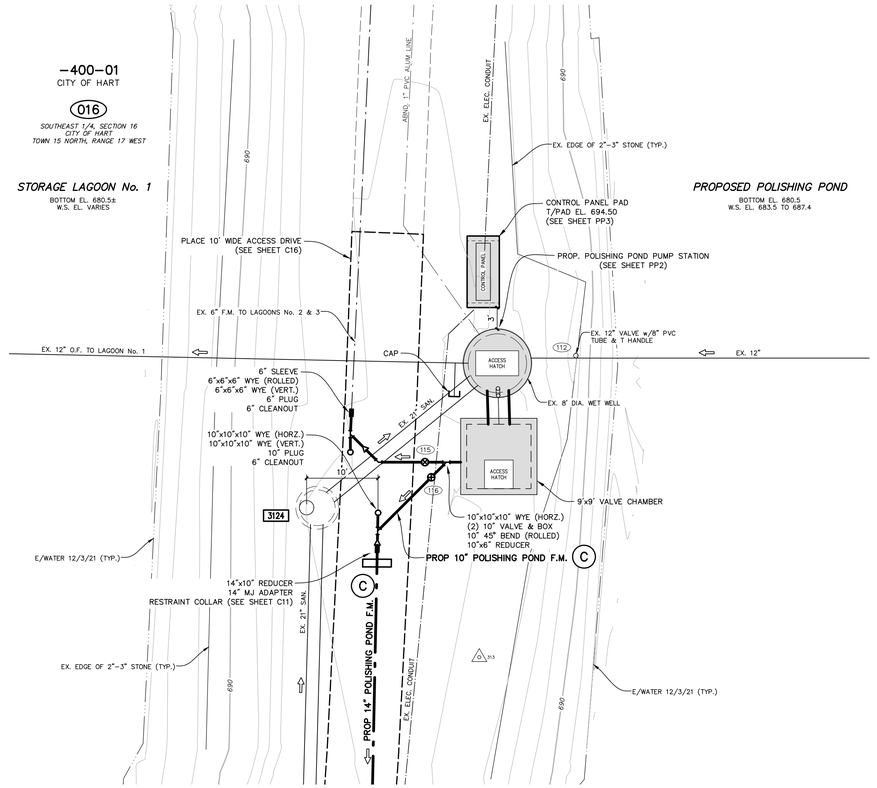
ALTERNATE No. 2 – EXISTING YARD PIPING DETAIL

SCALE : 1" = 10'

North

EXISTING STRUCTURE UNDERGROUND INFORMATION

ID	DESCRIPTION
3124	5' DIA. M.H. (PC) RIM 694.02 21" NE I.E. 684.52 (PVC) 21" S I.E. 684.57 (PVC)



ALTERNATE No. 2 – PROPOSED YARD PIPING DETAIL

SCALE : 1" = 10'

North

POLISHING POND BERM NOTES

1. CONTRACTOR SHALL MINIMIZE DISTURBANCE OF EXISTING COMPACTED CLAY. IF ENTIRE BERM IS CLAY, STOCKPILE, REINSTALL, AND COMPACT TO MATCH EXISTING GRADES. IF BERM HAS CLAY LINER, REMOVE AS NECESSARY AND REPLACE WITH NEW CLAY LINER (MIN. 24" THICK).
2. CONTRACTOR SHALL REMOVE EXISTING 2"–3" STONE FROM POLISHING POND BERM AS NECESSARY FOR CONSTRUCTION. PROVIDE NEW 4"–8" RIP RAP OVER NON–WOVEN GEOTEXTILE FABRIC ON ALL DISTURBED SLOPES BELOW EL. 693.0± PER THE TYPICAL BERM SECTION DETAIL.

CONSTRUCTION NOTES

1. BASED ON AVAILABLE RECORD PLANS, CENTERLINE OF PROPOSED 10" FORCE MAIN IS 1.25 FEET BELOW CENTERLINE OF EXISTING 6" FORCE MAIN. FIELD VERIFY ELEVATIONS PRIOR TO CONSTRUCTION. 6" 45° BEND AND 6"x6"x6" WYE SHALL BE ROLLED AS NECESSARY TO MAKE CONNECTIONS.
2. CLEANOUTS SHALL BE INSTALLED WITHOUT MANHOLE FRAME AND COVER. CLEANOUT PLUGS AND VALVE BOX COVERS SHALL BE INSTALLED 1" BELOW FINISHED GRADE.

DATUM NOTE

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YARD PIPING PROFILE LEGEND

- (A) 16" SOUTH AERATION INLET
- (B) 24" AIR HEADER
- (C) 10"/14" POLISHING POND F.M. (ALTERNATE No. 2)
- (D) 6" W.A.S.
- (E) 6" DECANT F.M.
- (F) 24" AERATION OUTLET
- (G) 8" BIOSOLIDS TRANSFER/DECANT
- (H) 12" STORM (ALTERNATE No. 1)
- (I) 16" F.M./RAW (ALTERNATE No. 1)
- (J) 8" DRAIN (ALTERNATE No. 1)
- (K) 4" N.P.W. (ALTERNATE No. 1)

ALTERNATE No. 2

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DATE MAY '23

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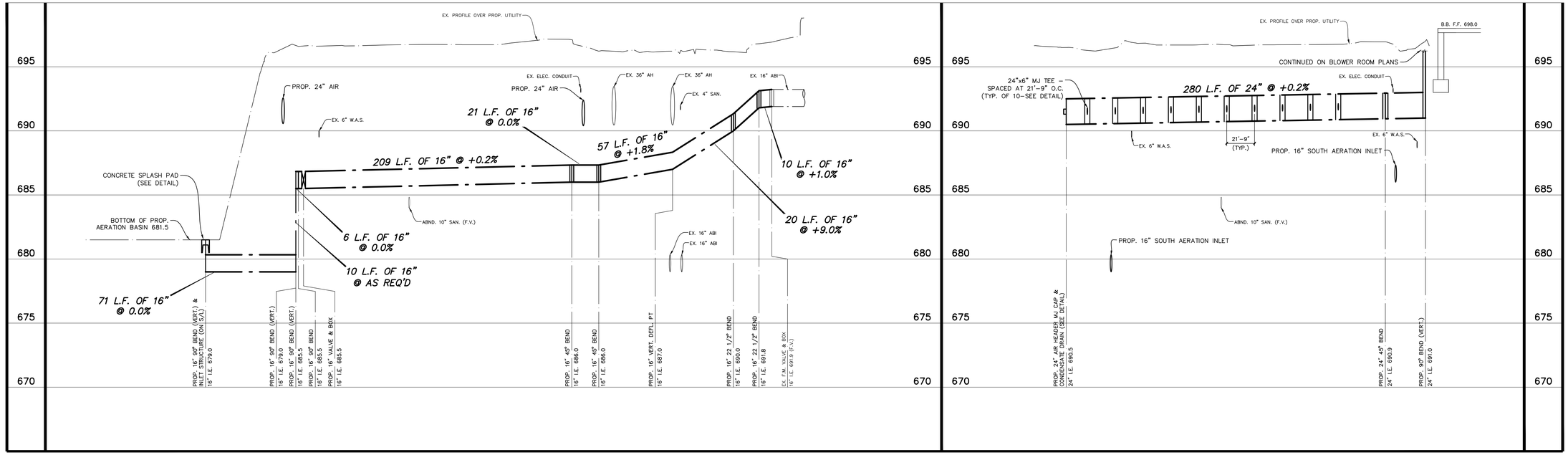
CITY OF HART
OCEANA COUNTY, MICHIGAN
WASTEWATER SYSTEM IMPROVEMENTS
BIOPURE TREATMENT FACILITY
YARD PIPING DETAIL – WEST

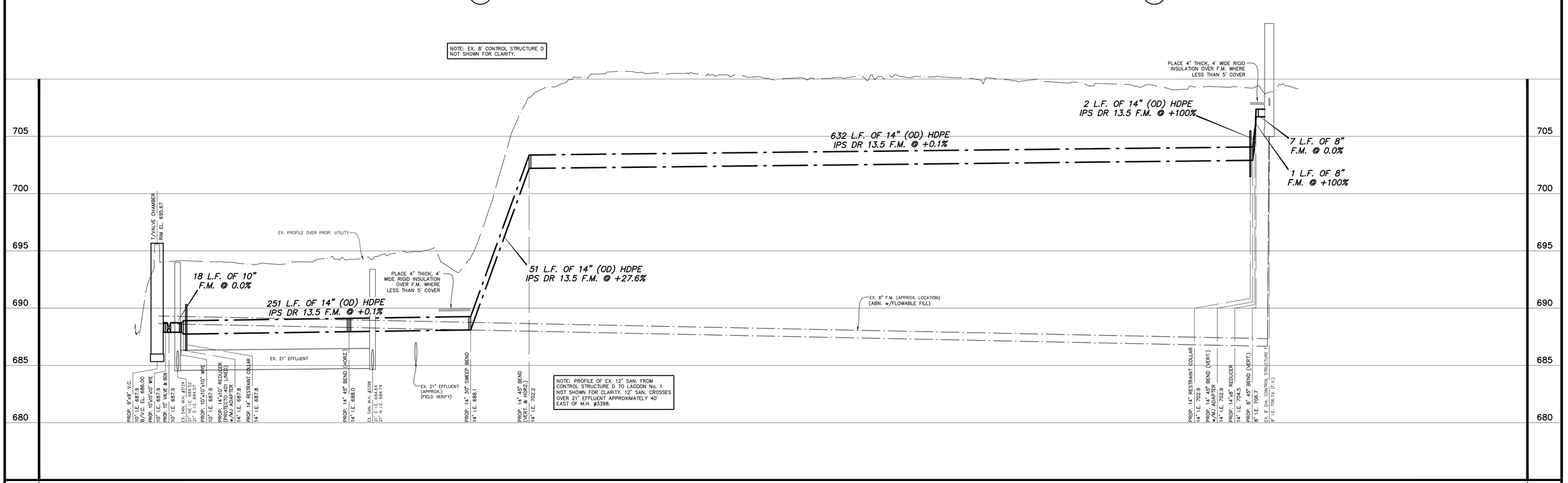
PROJECT NO. 2211159
SHEET NO. C7 OF C25

I:\CIVIL\0 PROJECTS\2021\2211159_HART_WWTP\4_PROD\CA HEADWORKS LAGOON SPLITS AND POLISHING POND PS\2211159_CA_10" DETAIL WEST.DWG - ISSTRENG - May 23 2023 - 11:32am - Prein&Newhof



PROFILE (A) – SOUTH AERATION INLET

PROFILE (B) – 24" AIR HEADER



PROFILE (C) – 10"/14" POLISHING POND F.M. – ALTERNATE No. 2

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SCALES : 1" = 40' HORZ. (CONTOURS AT ONE FOOT INTERVALS)
1" = 4' VERT.

0' 40' 80' 120'

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DATE MAY '23
CHECKED P.W.B.
DATE MAY '23

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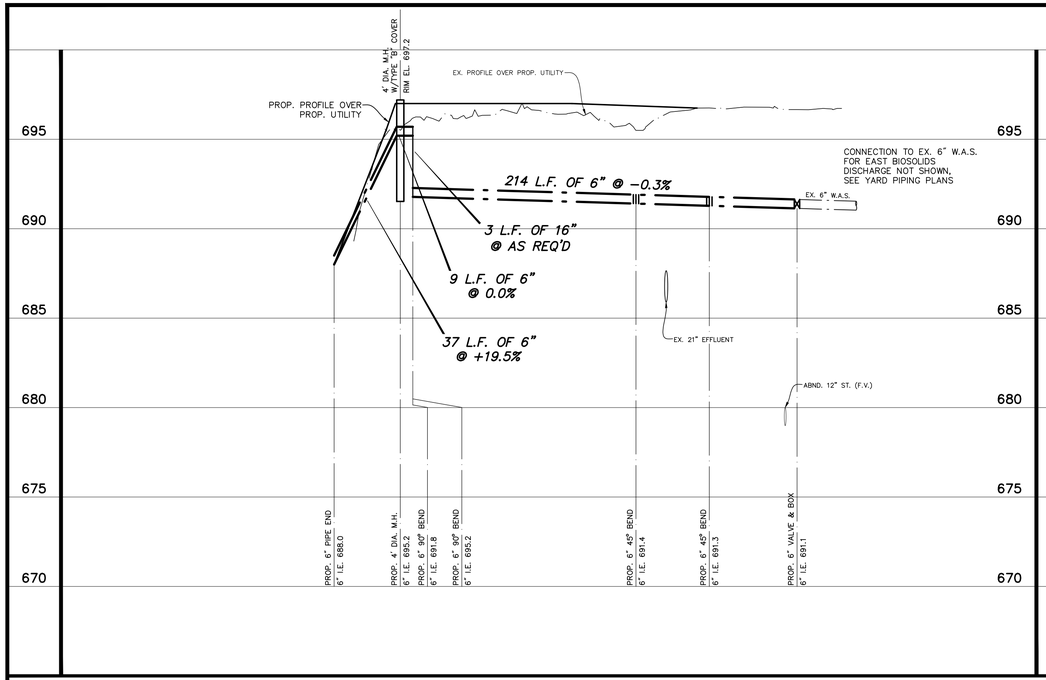
OCEANA COUNTY, MICHIGAN

WASTEWATER SYSTEM IMPROVEMENTS
BIOPURE TREATMENT FACILITY

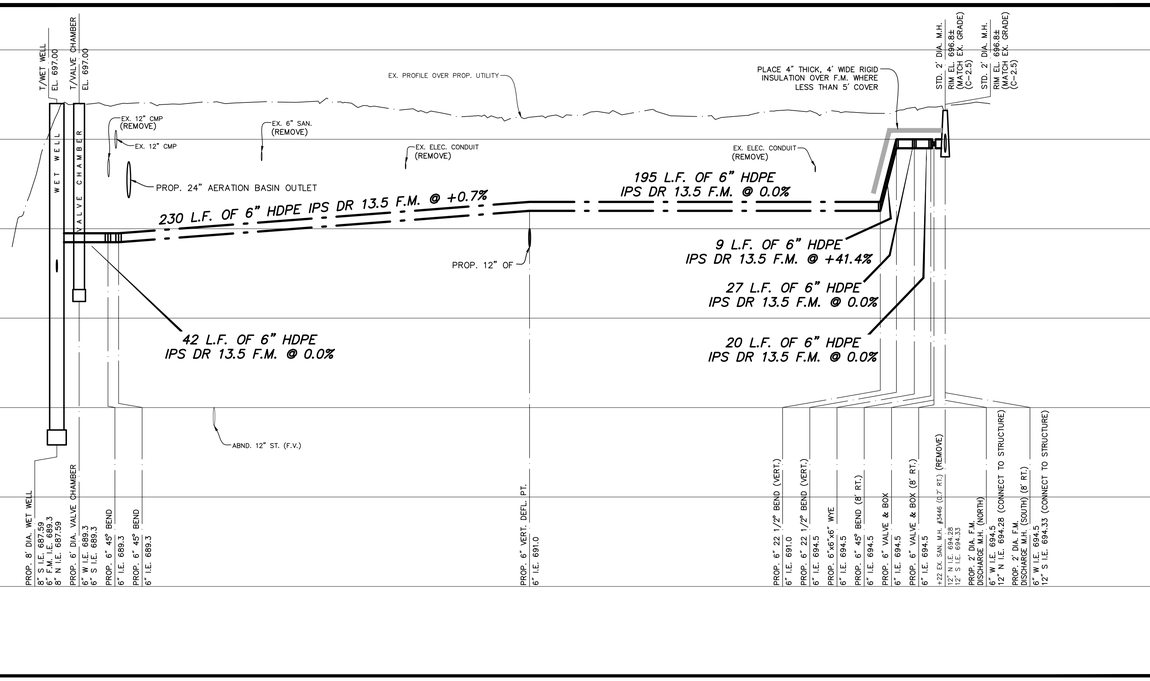
YARD PIPING PROFILES

PROJECT NO. 2211159
SHEET NO. C8 OF C25

T:\CIVIL3D PROJECTS\2021\2211159_HART_WWTP\4_PROD\04 HEADWORKS LAGOON SPLITS AND POLISHING POND PS\2211159_C4_YP PROFILES.DWG – RSTRNG – May. 22 2023 – 11:42am – PreinNewhof



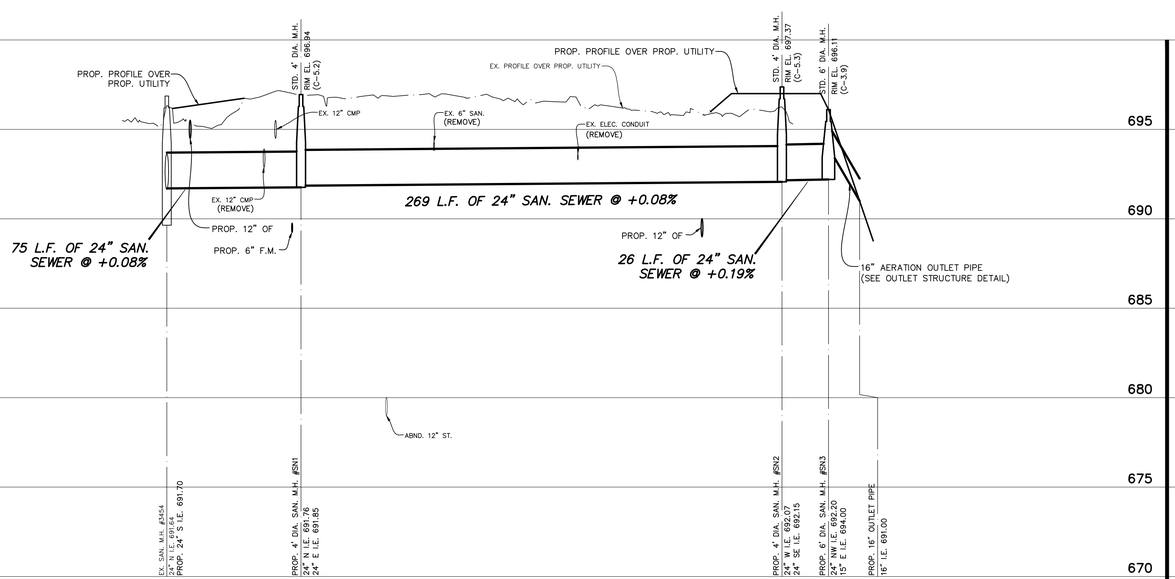
PROFILE (D) – 6" W.A.S.



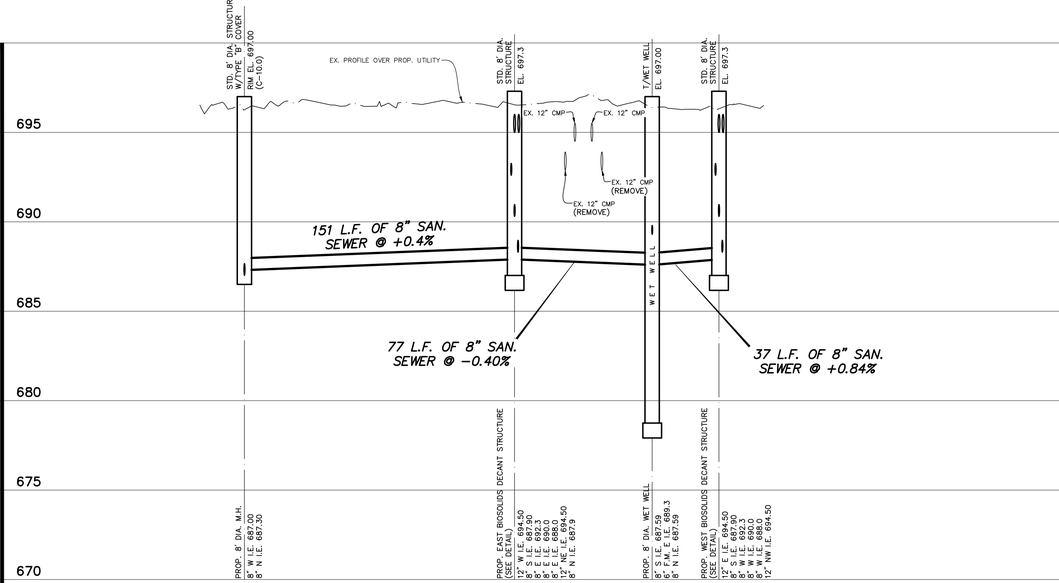
PROFILE (E) – 6" DECANT FORCE MAIN

NOTE

NORTH DECANT FORCE MAIN DISCHARGE LOCATION DEPICTED ABOVE. SOUTH DECANT FORCE MAIN DISCHARGE INCLUDES ADDITIONAL 45 BEND AS SHOWN ON YARD PIPING PLAN, BUT SHALL DISCHARGE INTO ITS 2' DIA. STRUCTURE AT SAME ELEVATION AS NORTH DISCHARGE



PROFILE (F) – 24" AERATION OUTLET



PROFILE (G) – 8" BIOSOLIDS TRANSER/DECANT

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SCALES : 1" = 40' HORZ. (CONTOURS AT ONE FOOT INTERVALS)
1" = 4' VERT.

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DATE MAY '23

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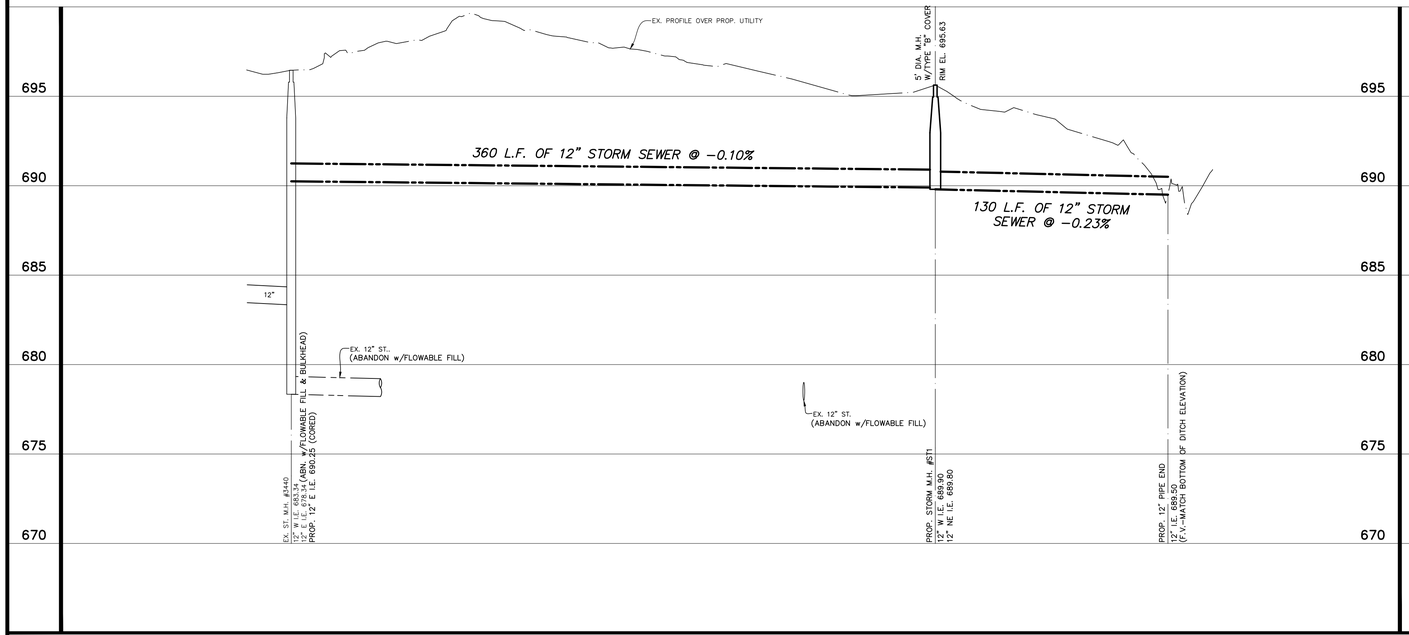
WASTEWATER SYSTEM IMPROVEMENTS
BIOPURE TREATMENT FACILITY

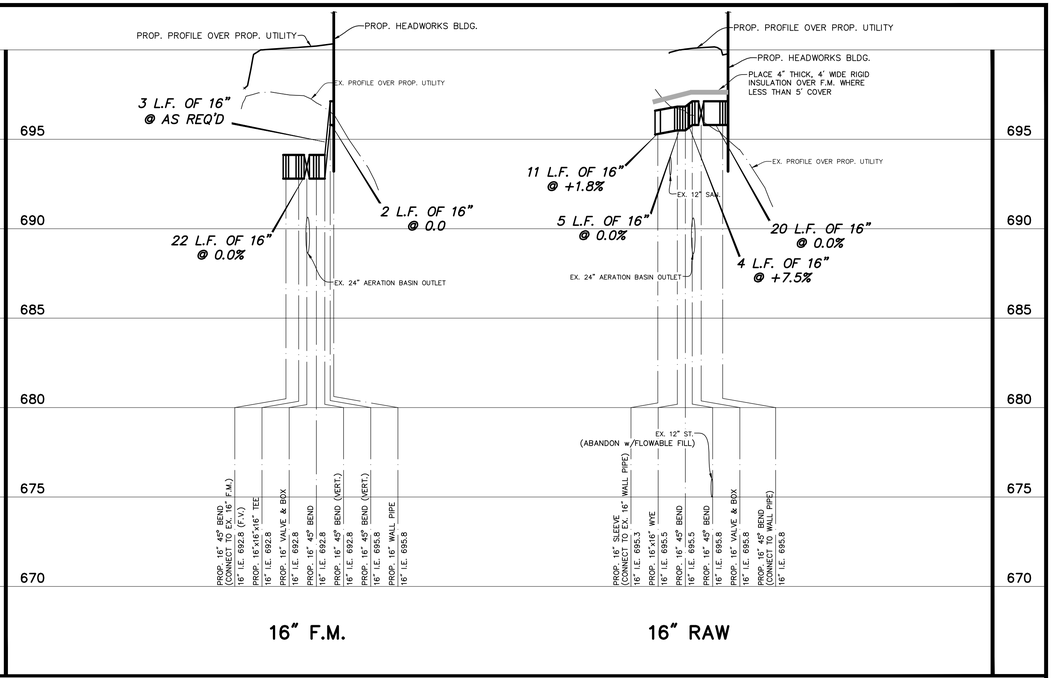
YARD PIPING PROFILES

PROJECT NO. 2211159
SHEET NO. C9 OF C25

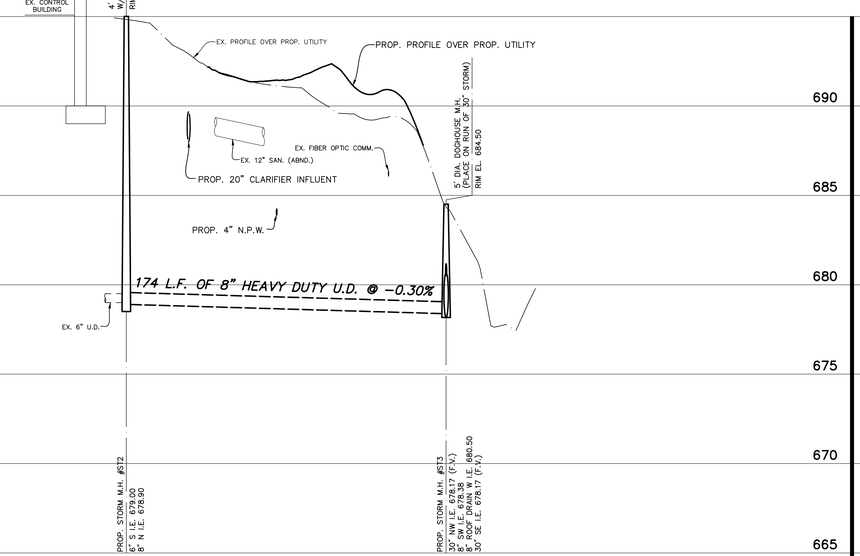
I:\CIVIL3D PROJECTS\2021\2211159_HART_WWTP\4_PROD\04 HEADWORKS LAGOON SPLITS AND POLISHING POND PS\2211159_C4_YP PROFILES.DWG – RSTRENG – May, 22 2023 – 02:25pm – PrestMinehof



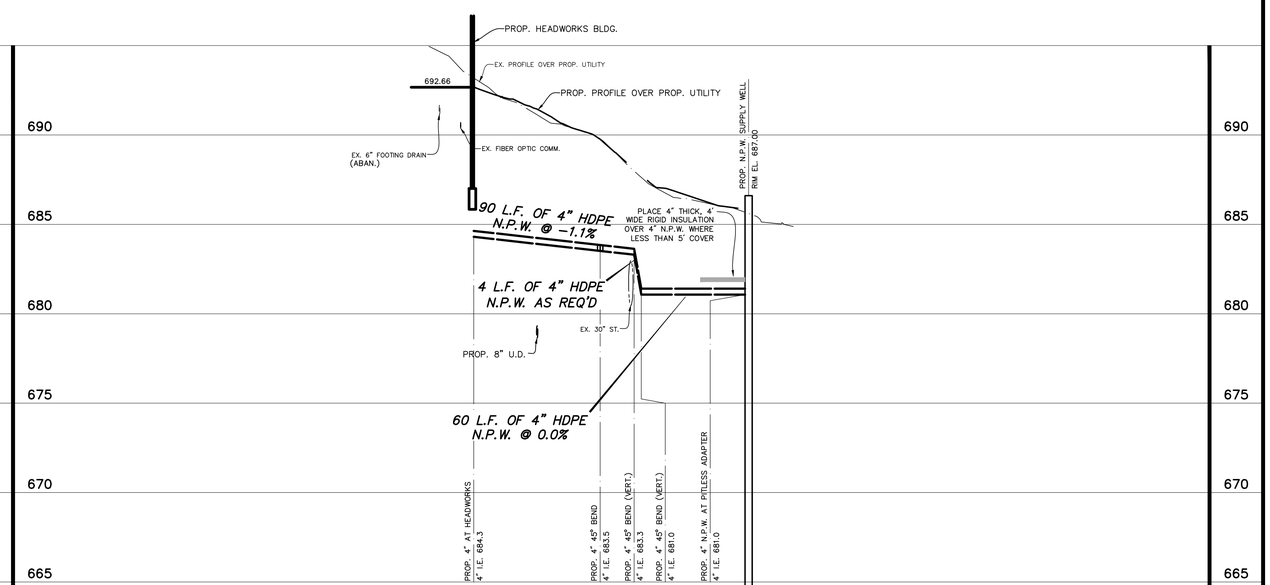
PROFILE (H) – 12" STORM – ALTERNATE No. 1



PROFILE (I) – 16" FORCE MAIN & 16" RAW – ALTERNATE No. 1



PROFILE (J) – 8" DRAIN – ALTERNATE No. 1



PROFILE (K) – 4" N.P.W. – ALTERNATE No. 1

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1" = 4' VERT.

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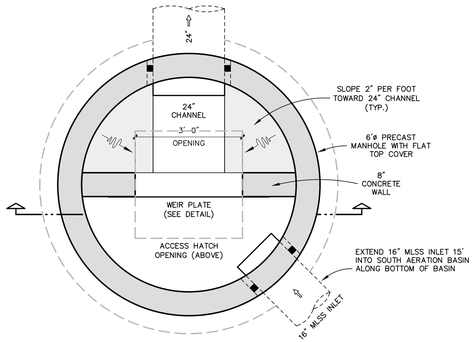
WASTEWATER SYSTEM IMPROVEMENTS
BIOPURE TREATMENT FACILITY

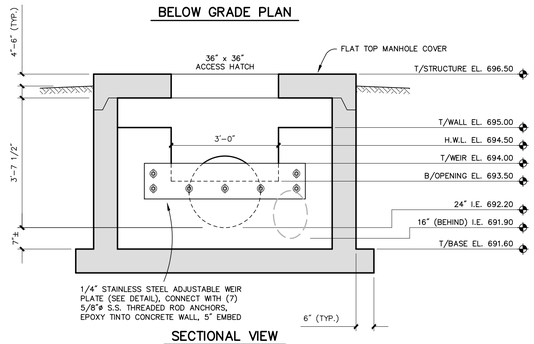
YARD PIPING PROFILES

PROJECT NO. 2211159
SHEET NO. C10 OF C25

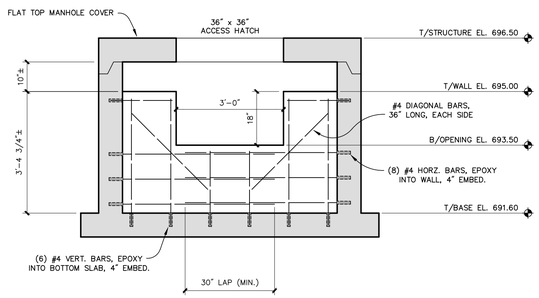
T:\CIVIL3D PROJECTS\2021\2211159_HART_WWTP\4_PROD\CAD HEADWORKS LAGOON SPLITS AND POLISHING POND PS\2211159_C4_YP PROFILES.DWG – RSTRNG – May, 22 2023 – 02:25pm – PreinNewhof



BELOW GRADE PLAN



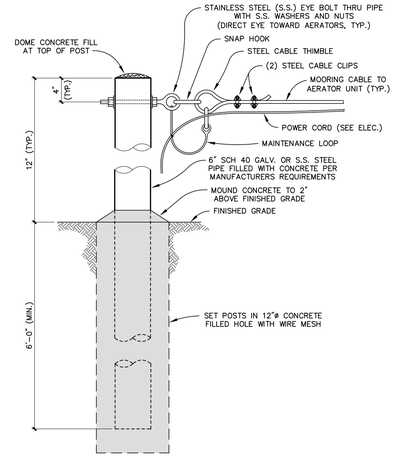
SECTIONAL VIEW



STRUCTURAL SECTIONAL VIEW

SOUTH AERATION OUTLET STRUCTURE

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

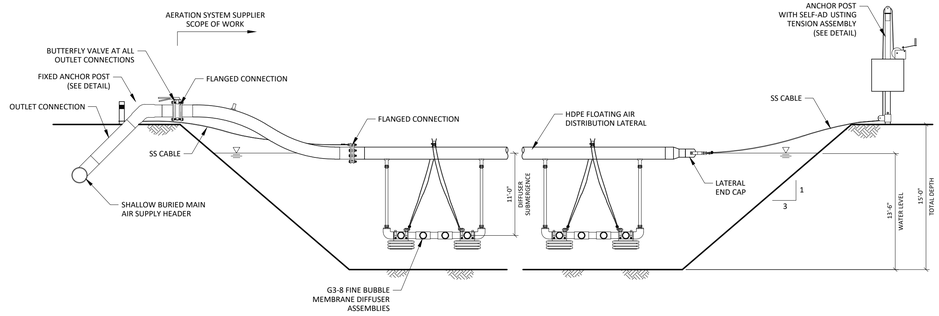


FLOATING AERATOR MOORING POST DETAIL

SCALE : NONE

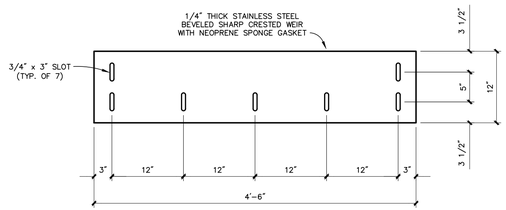
NOTE

CONTRACTOR SHALL REFER TO MANUFACTURER BASIC CABLE MOORING INSTALLATION INSTRUCTIONS FOR DETAILS ON MOORING CABLE INSTALLATION AND CONNECTIONS.



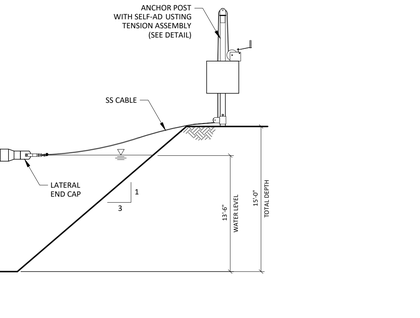
AERATED LAGOON SECTION

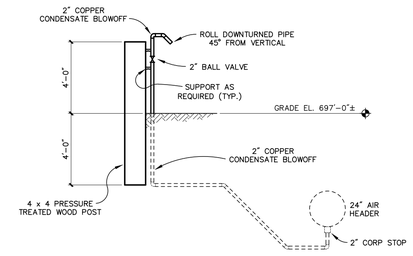
SCALE : NONE



WEIR PLATE DETAIL

SCALE : 1" = 1'-0"





AIR HEADER CONDENSATE RELEASE DETAIL

SCALE : NONE

NOTE

CONDENSATE RELEASE CORP STOP SHALL BE INSTALLED AS CLOSE TO THE END OF THE HEADER PIPE AS POSSIBLE WHILE STILL ALLOWING ROOM FOR REMOVAL AND REPLACEMENT OF THE 24" CAP.

NO.	REVISIONS	BY	DATE

DRAWN: SMYTH
DATE: MAY '23
CHECKED: P.W.B.
DATE: MAY '23

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CITY OF HART
OCEANA COUNTY, MICHIGAN

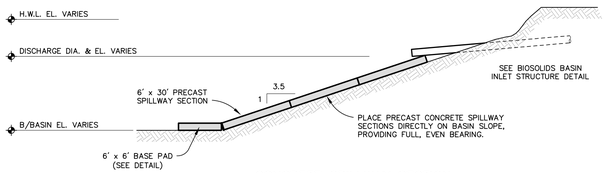
WASTEWATER SYSTEM IMPROVEMENTS
BIOPURE TREATMENT FACILITY

YARD PIPING DETAILS

PROJECT NO. 2211159

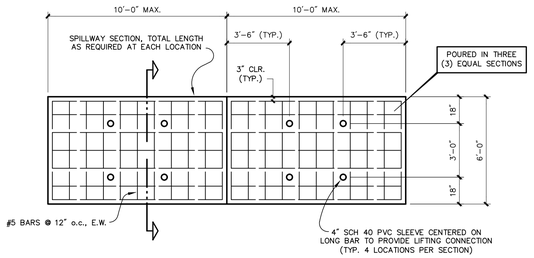
SHEET NO. C11 OF C25

T:\CIVIL3D PROJECTS\2021\2211159_HART_WWTP\4_PROD\C4 HEADWORKS LAGOON SPLITS AND POLISHING POND FS\2211159_04_XP DETAILS.DWG - MSMYTH - May, 22 2023 - 10:04am - PreinNewhof



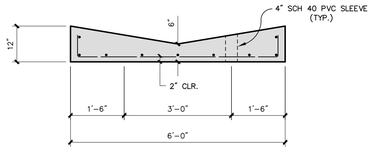
CONCRETE SPILLWAY SECTION

SCALE : NONE



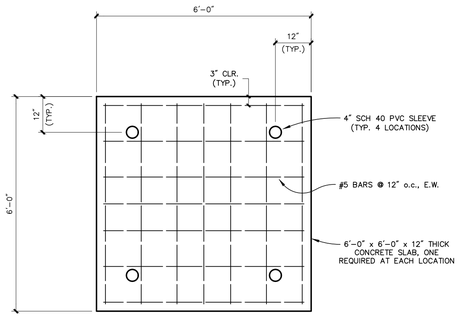
PRECAST SPILLWAY – PLAN

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



PRECAST SPILLWAY SECTIONAL VIEW

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



PRECAST SPILLWAY BASE PAD PLAN VIEW

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

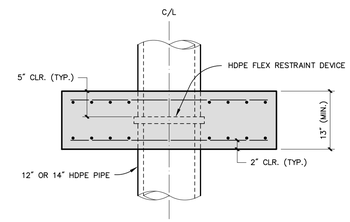
CONCRETE SPILLWAY DETAIL

(TYPICAL OF 4)

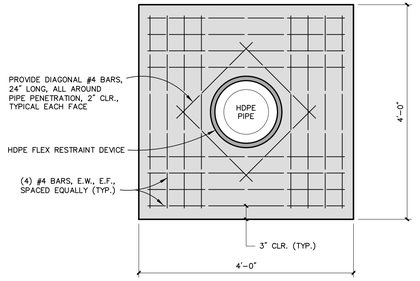
NOTE

CONTRACTOR MAY PROPOSE CAST IN PLACE SPILLWAYS WITH SIMILAR REINFORCEMENT

ALTERNATE No. 2



PLAN VIEW



SECTIONAL VIEW

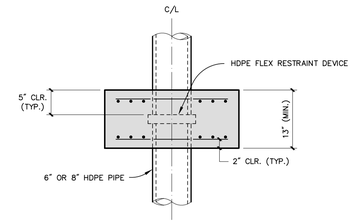
12" OR 14" RESTRAINT DETAIL

(HDPE PIPE, DR 13.5, CLASS 160)

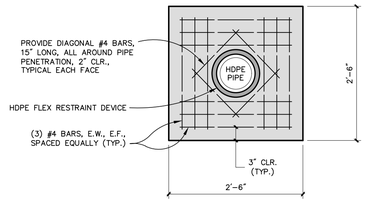
SCALE : NONE

NOTE

CONCRETE f'c = 4,000 PSI MINIMUM



PLAN VIEW



SECTIONAL VIEW

6" OR 8" RESTRAINT DETAIL

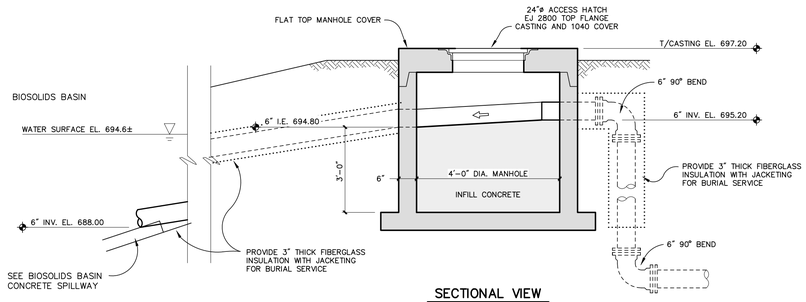
(HDPE PIPE, DR 11, CLASS 160)

SCALE : NONE

NOTE

CONCRETE f'c = 4,000 PSI MINIMUM

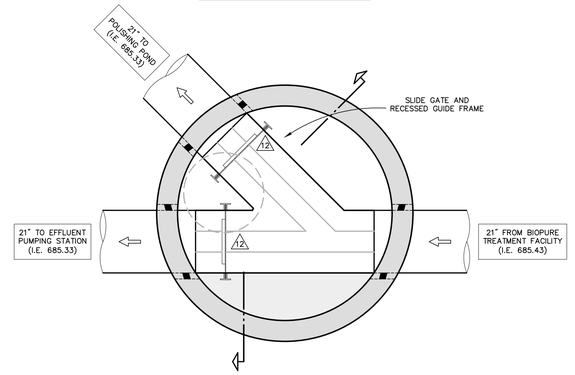
BELOW GRADE PLAN



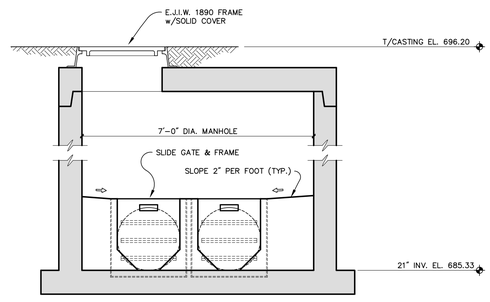
SECTIONAL VIEW

BIOSOLIDS BASIN INLET STRUCTURE

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



BELOW GRADE PLAN



SECTIONAL VIEW

EFFLUENT DIVERSION MANHOLE

SCALE : NONE

NO.	REVISIONS	BY	DATE

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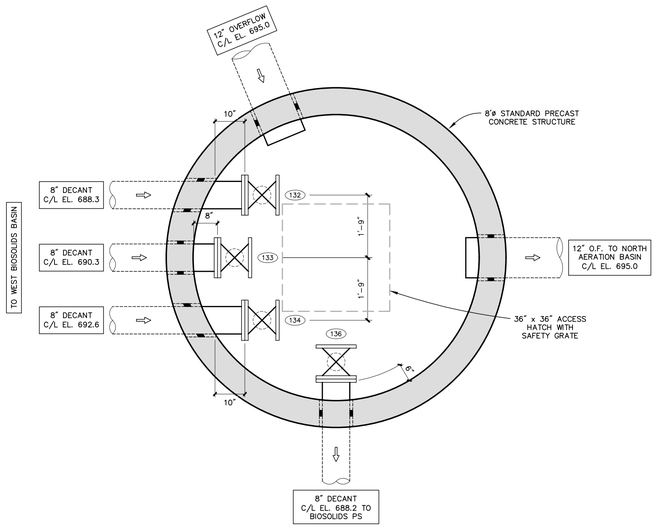
WASTEWATER SYSTEM IMPROVEMENTS
BIOPURE TREATMENT FACILITY

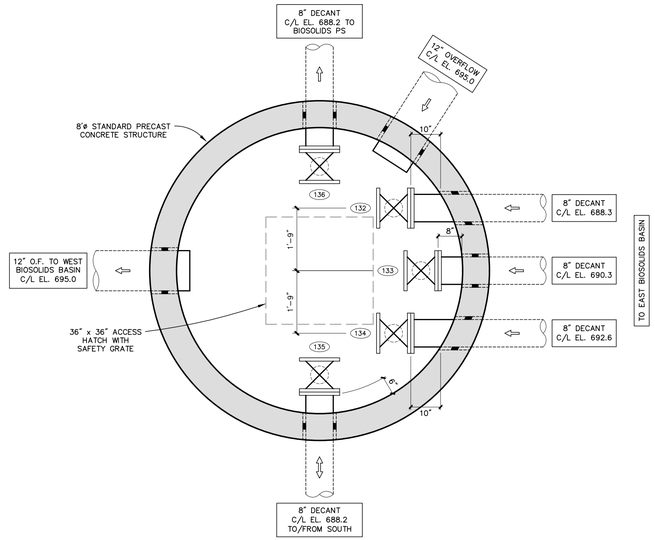
YARD PIPING DETAILS

PROJECT NO. 2211159
SHEET NO. C12 OF C25

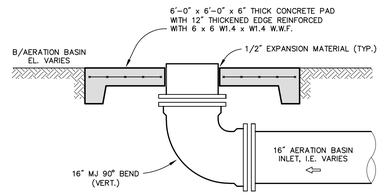
T:\CIVIL3D PROJECTS\2021\2211159_HART_WWTP\4_PROD\C4 HEADWORKS LAGOON SPLITS AND POLISHING POND FS\2211159_C4_YP DETAILS.DWG - WSMYTH - May, 22 2023 - 10:04am - PreinNewhof



BELOW GRADE PLAN

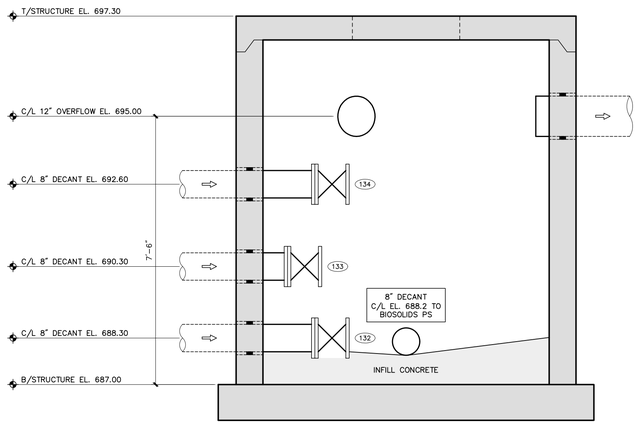


BELOW GRADE PLAN



AERATION BASIN INLET STRUCTURE

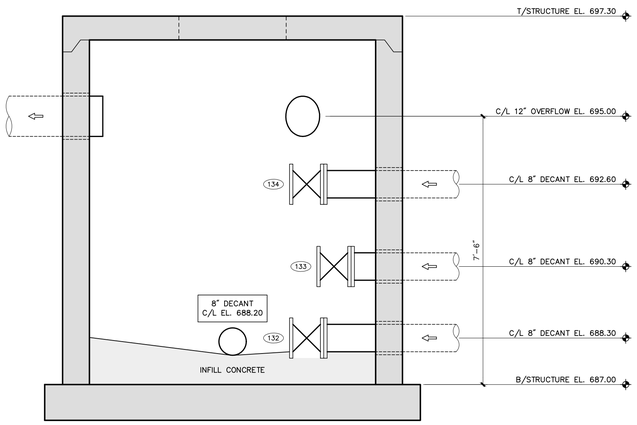
SCALE : NONE



SECTIONAL VIEW

WEST BIOSOLIDS DECANT CHAMBER

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



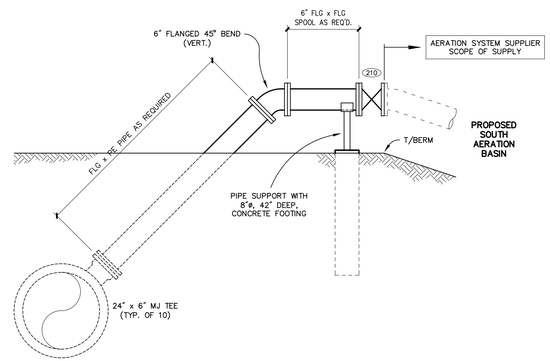
SECTIONAL VIEW

EAST BIOSOLIDS DECANT CHAMBER

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

NOTE

ALL VALVES IN THE WEST AND EAST BIOSOLIDS DECANT CHAMBERS SHALL BE ECCENTRIC PLUG VALVES AS SPECIFIED IN SECTIONS 33 31 23 SANITARY FORCE MAIN AND 40 05 51 PROCESS VALVES. VALVE EXTERIOR SHALL BE COATED WITH COAL TAR EPOXXY. EACH VALVE SHALL BE PROVIDED WITH A HANDWHEEL ACTUATOR MOUNTED TO THE TOP SLAB WITH STEM EXTENDING THROUGH A SLEEVE CAST IN THE SLAB.



AIR LATERAL CONNECTION DETAIL

(TYPICAL OF 10)

SCALE : NONE

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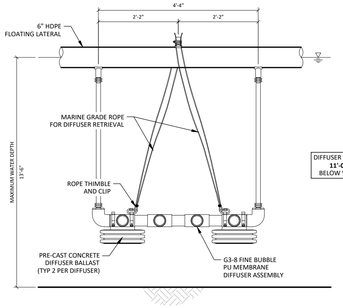
WASTEWATER SYSTEM IMPROVEMENTS
BIOPURE TREATMENT FACILITY

YARD PIPING DETAILS

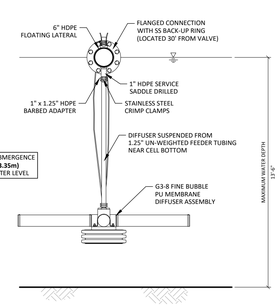
PROJECT NO. 2211159

SHEET NO. C13 OF C25



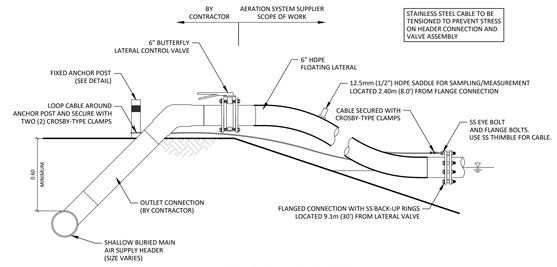
LATERAL DETAIL - ELEVATION

SCALE : NONE



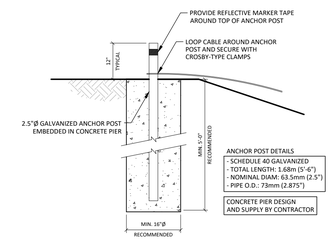
LATERAL DETAIL - SECTION

SCALE : NONE



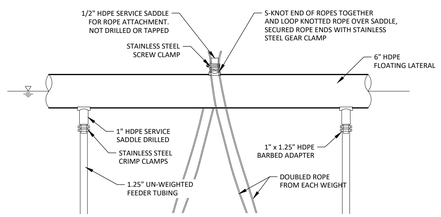
LATERAL DETAIL AT HEADER

SCALE : NONE



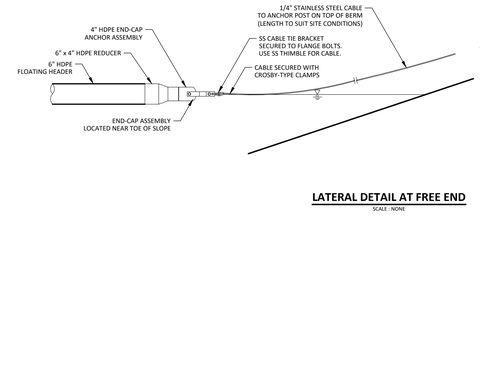
FIXED ANCHOR POST AT HEADER DETAIL

SCALE : NONE



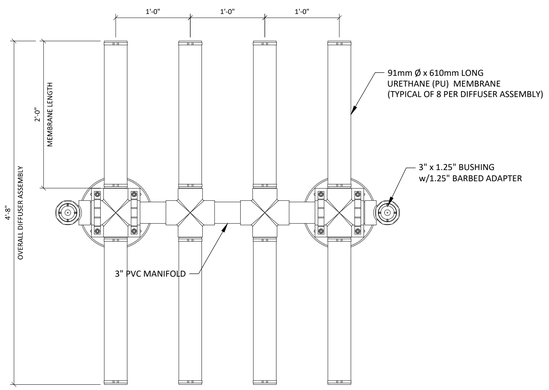
UPPER CONNECTION DETAIL

SCALE : NONE



LOWER CONNECTION DETAIL

SCALE : NONE

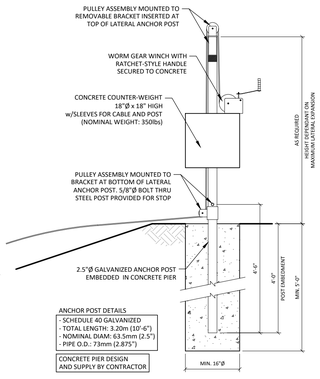


G3-8 DIFFUSER - PLAN

SCALE : NONE

LATERAL DETAIL AT FREE END

SCALE : NONE



DRAWING SOURCE

DRAWING SOURCE PER NEXOM TECHNOLOGIES FOR CLEANER WATER, 5 BURKS WAY, NAVIN, MANITOBA, CANADA, PRE-SHOP DRAWINGS, FILE #CD10634.02, OPTAER SYSTEM, AERATION LAYOUT, TYPICAL SECTIONS AND DETAILS

NO.	REVISIONS	BY	DATE

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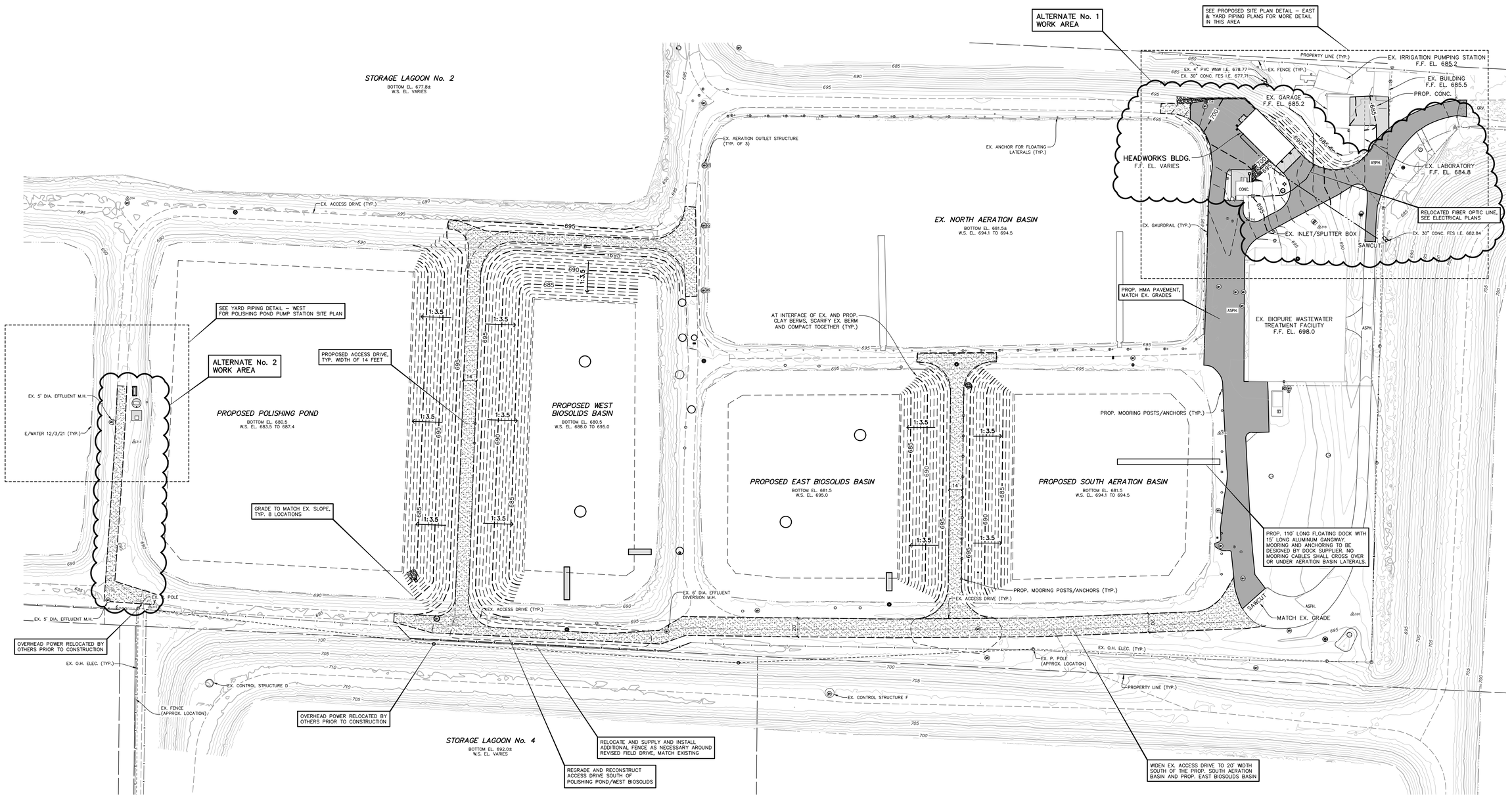
WASTEWATER SYSTEM IMPROVEMENTS
BIOPURE TREATMENT FACILITY

YARD PIPING DETAILS

PROJECT NO. 2211159
SHEET NO. C14 OF C25



PROPOSED SITE PLAN

SCALE : 1" = 50'

North

PROPOSED BERM NOTE

THE PROPOSED BERMS IN THE EXISTING BIOSOLIDS BASN AND THE EXISTING POLISHING POND MAY BE CONSTRUCTED OF COMPACTED SAND OR CLAY, BUT A MINIMUM OF 2' THICKNESS OF COMPACTED CLAY MUST BE PLACED AT FINISHED GRADES.

811 Know what's below. Call before you dig.

UTILITY LOCATIONS ARE DERIVED FROM ACTUAL MEASUREMENTS OR AVAILABLE RECORDS. THEY SHOULD NOT BE INTERPRETED TO BE EXACT LOCATIONS NOR SHOULD IT BE ASSUMED THAT THEY ARE THE ONLY UTILITIES IN THIS AREA.

NO.	REVISIONS	BY	DATE

DRAWN R.P.S.
DATE MAY '23
CHECKED P.W.B.
DATE MAY '23

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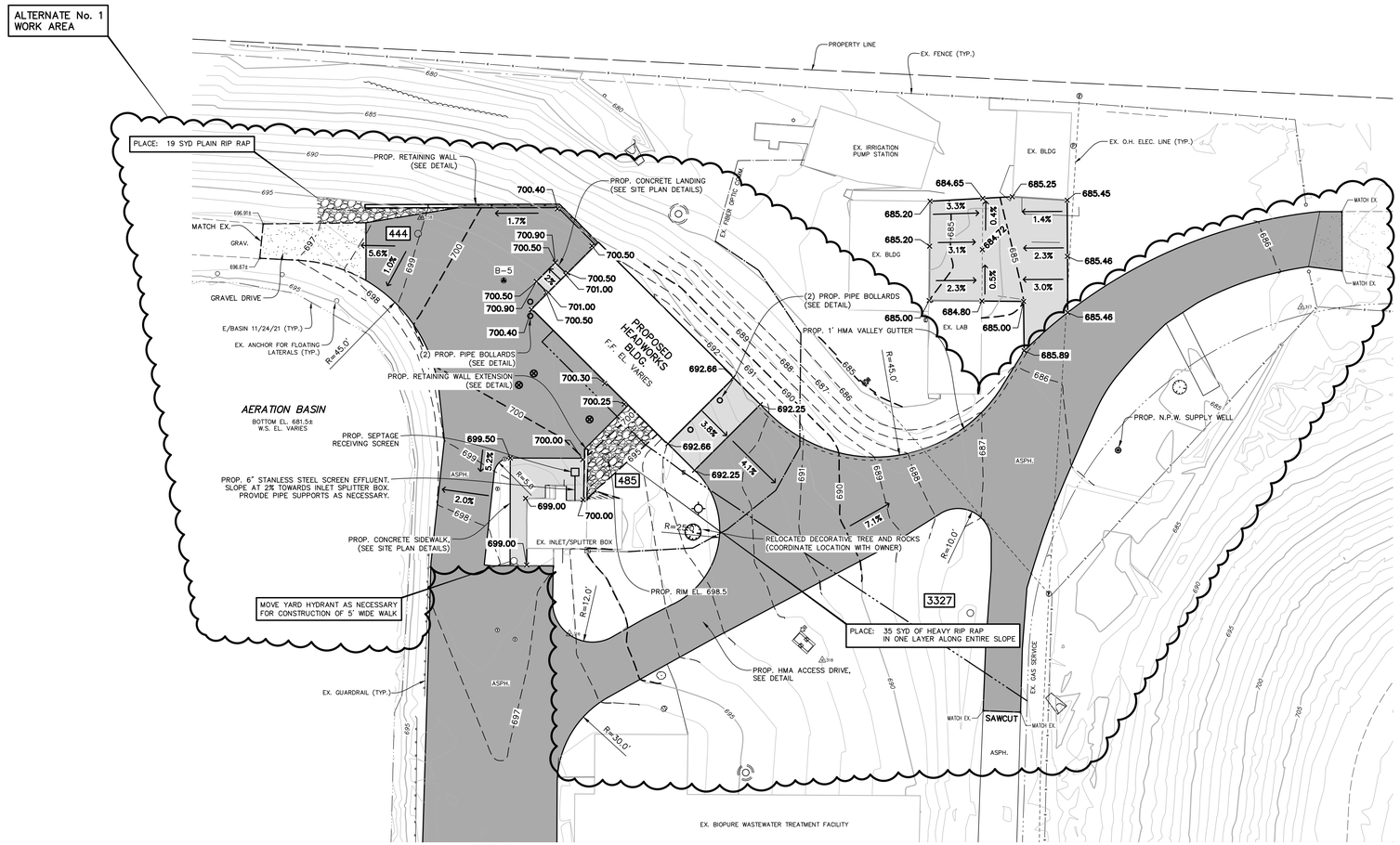
WASTEWATER SYSTEM IMPROVEMENTS
BIOPURE TREATMENT FACILITY

PROPOSED SITE PLAN

PROJECT NO. 2211159
SHEET NO. C15 OF C25

I:\CIVIL3D PROJECTS\2021\2211159_HART_WWTP\4_PROD\C4 HEADWORKS LAGOON SPLITS AND POLISHING POND PS\2211159_C4_SITE PROP.DWG - RSTRENG - May. 23 2023 - 11:38am - PrintAllNewhof



PROPOSED PAVEMENT LEGEND

- PROPOSED HMA
- PROPOSED CONCRETE
- PROPOSED GRAVEL
- PROPOSED RIP RAP

EXISTING STRUCTURE UNDERGROUND INFORMATION

ID	DESCRIPTION
444	5' DIA. M.H. (PC) RIM 696.71 24" W I.E. 688.80 (F.V.) 24" SE I.E. 688.70 (F.V.)
485	5' DIA. M.H. (PC) RIM 694.81 24" NW I.E. 689.42 (F.V.) 24" S I.E. 689.32 (F.V.) 12" W I.E. 692.91 (F.V.)
3327	5' DIA. M.H. (PC) RIM 685.63 36" NW I.E. 680.93 (CONC) 36" SE I.E. 680.93 (CONC)

PROPOSED SITE PLAN DETAIL – EAST

SCALE : 1" = 20'

North

UTILITY LOCATIONS ARE DERIVED FROM ACTUAL MEASUREMENTS OR AVAILABLE RECORDS. THEY SHOULD NOT BE INTERPRETED TO BE EXACT LOCATIONS NOR SHOULD IT BE ASSUMED THAT THEY ARE THE ONLY UTILITIES IN THIS AREA.

811 Know what's below. Call before you dig.

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DRAWN: R.P.S.
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WASTEWATER SYSTEM IMPROVEMENTS
BIOPURE TREATMENT FACILITY

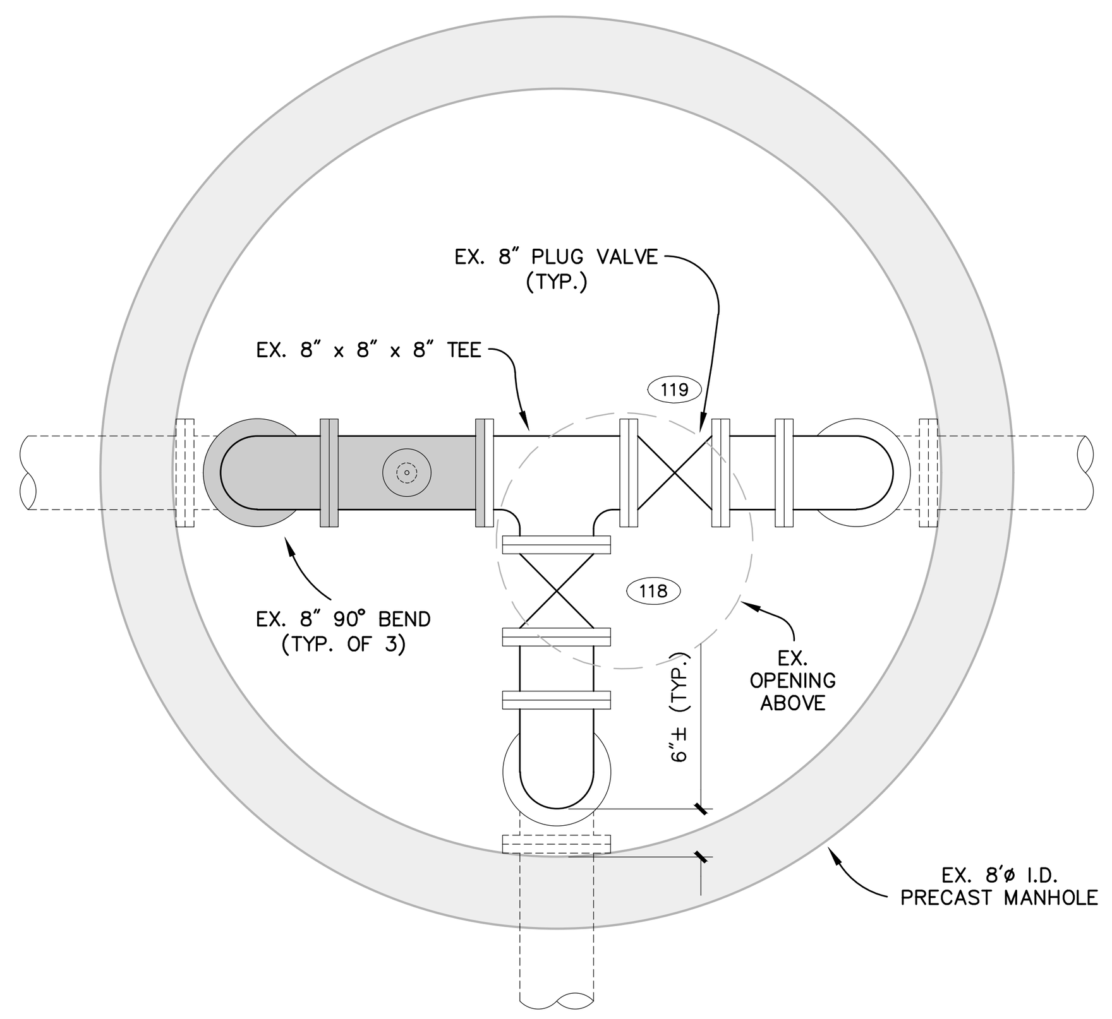
PROPOSED SITE PLAN DETAIL – EAST

PROJECT NO. 2211159

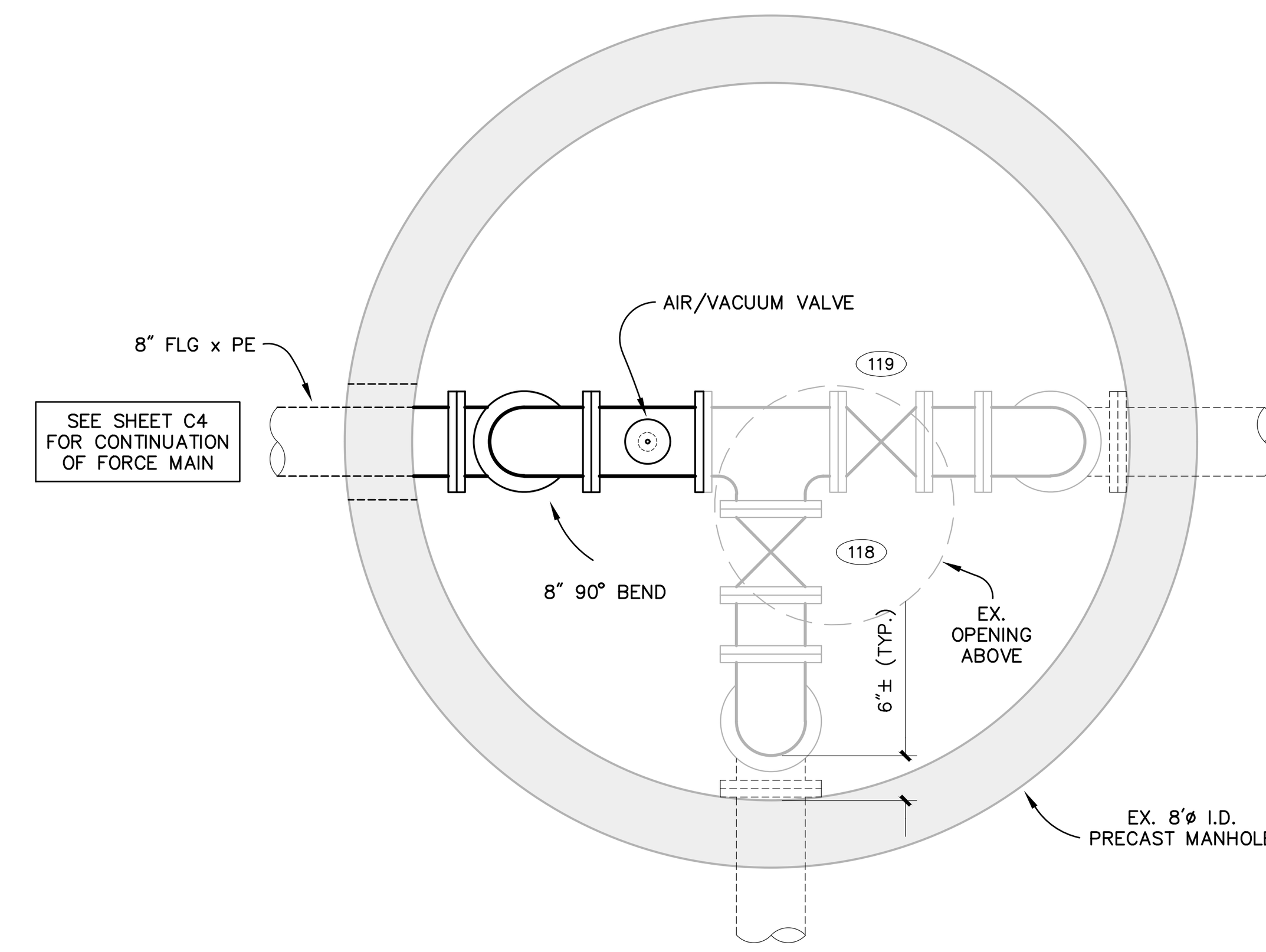
SHEET NO. C16 OF C25

T:\CIVIL3D PROJECTS\2021\2211159_HART_WWTP\4_PROD\C4 HEADWORKS LAGOON SPLITS AND POLISHING POND PS\2211159_C4_PROP SITE PLAN DETAIL-EAST.DWG - RSTRONG - May, 23 2023 - 11:43am - PrintMinehof

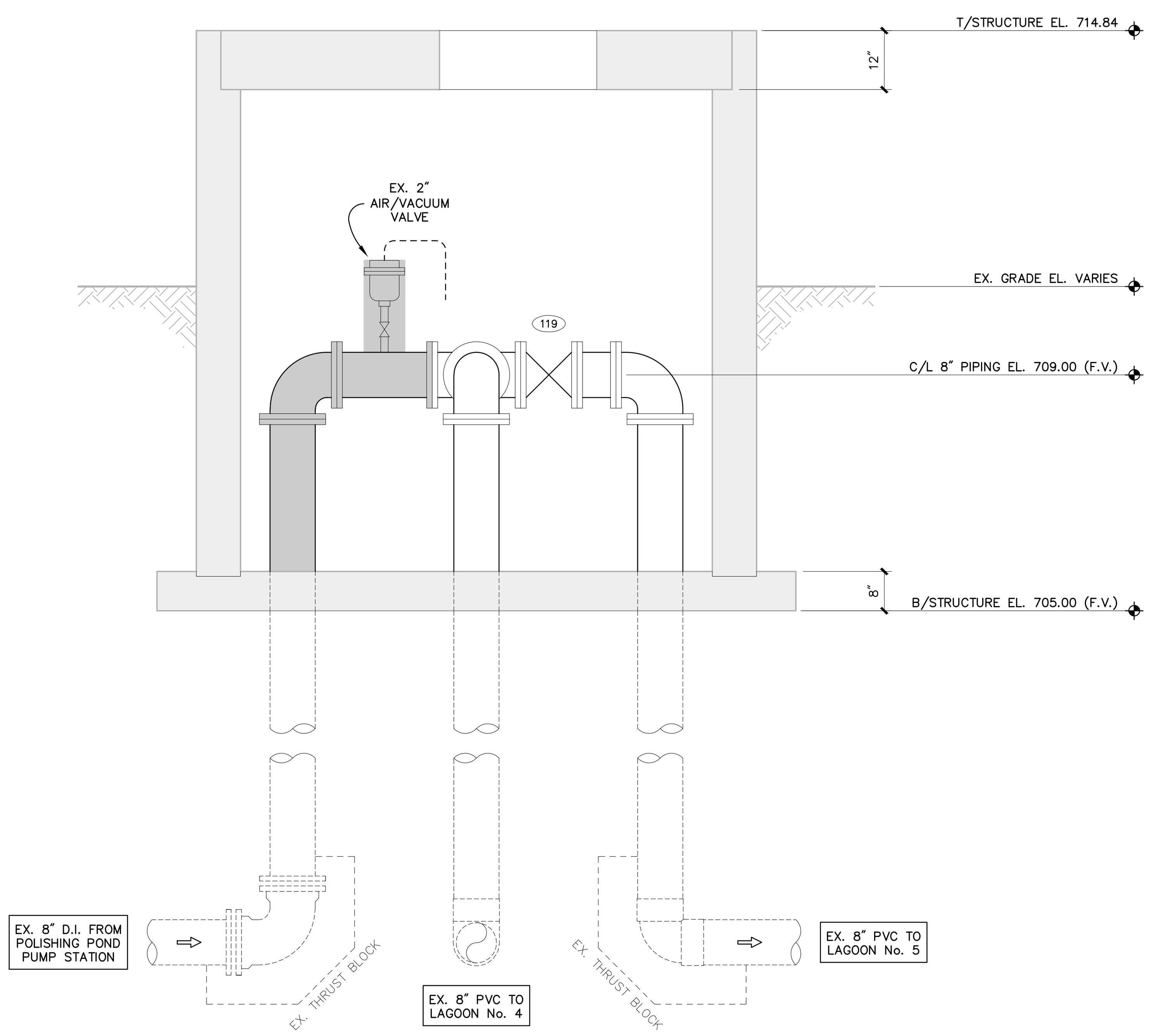
ALTERNATE No. 2



BELOW GRADE PLAN North



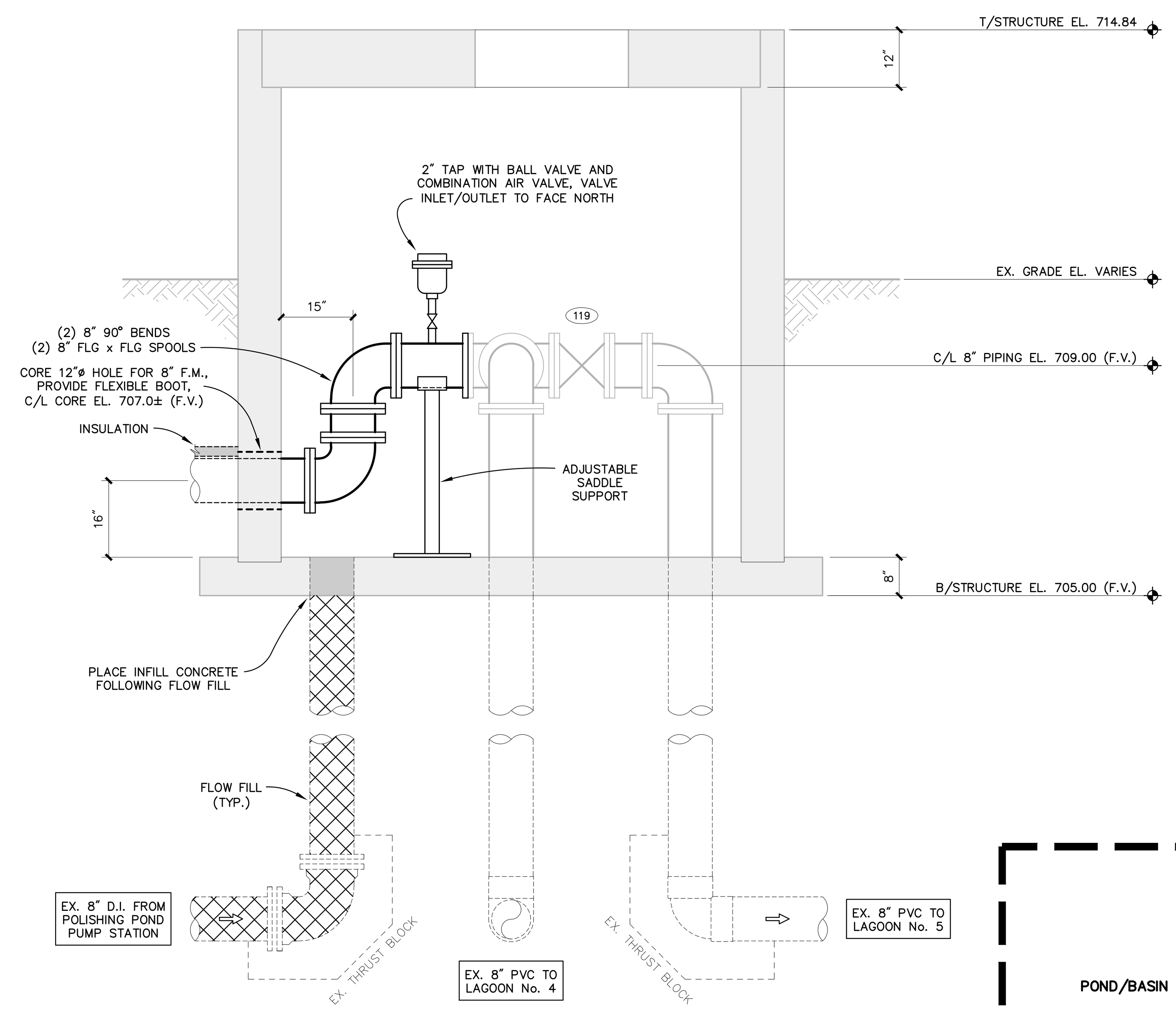
BELOW GRADE PLAN North



SECTIONAL VIEW

EXISTING CONTROL STRUCTURE F DETAIL

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



SECTIONAL VIEW

PROPOSED CONTROL STRUCTURE F DETAIL

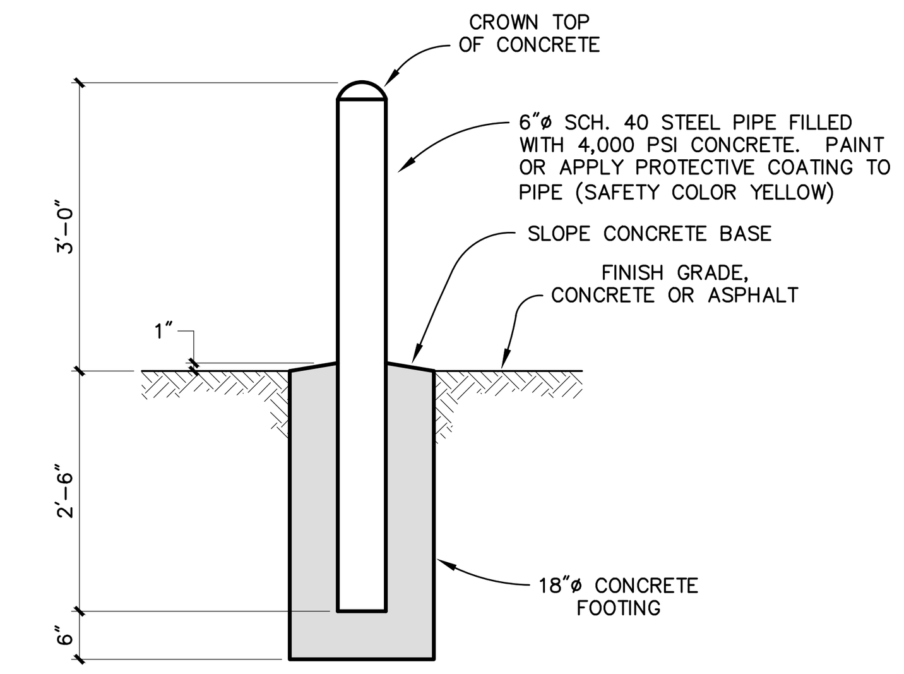
SCALE : 1/2" = 1'-0"

REMOVAL LEGEND

REMOVE EX. AIR-VACUUM VALVE, BALL VALVE, 8" SPOOL PIECE, AND 8" 90° BEND AS SHOWN. REMOVE EX. 8" PIPE THROUGH CONTROL STRUCTURE FLOOR AS NECESSARY FOR CONSTRUCTION OF PROPOSED 8" PIPING.

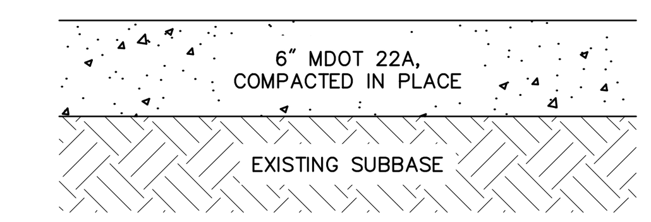
CONTROL STRUCTURE F NOTES

1. FIELD VERIFY ELEVATION OF EXISTING STRUCTURE AND PIPING PRIOR TO CONSTRUCTION TO CONFIRM CORE ELEVATION AND PIPE LENGTHS REQUIRED.
2. PROVIDE STAINLESS STEEL HARDWARE FOR PROPOSED FLANGE CONNECTIONS INSIDE CONTROL STRUCTURE.
3. REMOVE EXISTING PIPE INSULATION AND PROVIDE NEW FOR ALL EXPOSED DUCTILE IRON FORCE MAIN INSIDE CONTROL STRUCTURE.
4. CONTRACTOR MAY REMOVE EXISTING LID FROM CONTROL STRUCTURE AS NECESSARY FOR CONSTRUCTION. EXISTING LID O-RING MAY BE REUSED IF CONSIDERED IN EXCELLENT CONDITION BY OWNER AND ENGINEER. PROVIDE NEW O-RING OR BUTYL SEALANT AS REQUIRED.



PIPE BOLLARD DETAIL

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

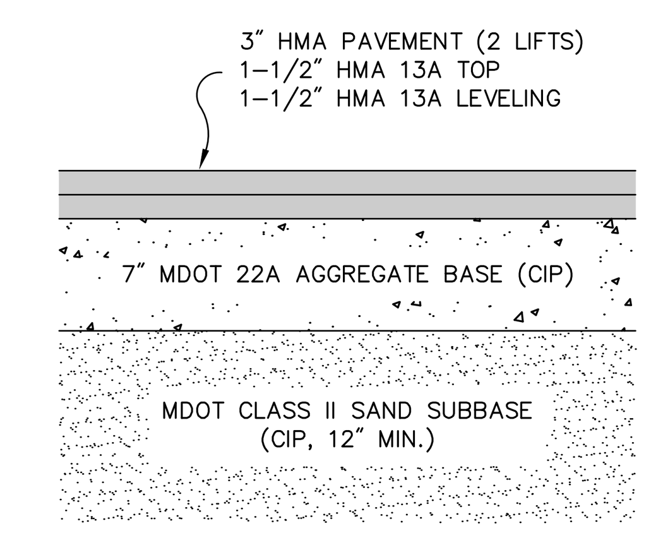


ACCESS DRIVE SECTION

SCALE : NONE

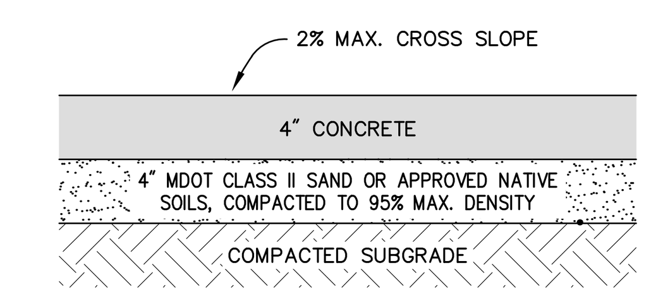
NOTE

RECONSTRUCTED FIELD DRIVES SHALL MATCH THE EXISTING WIDTH PRIOR TO CONSTRUCTION, OR 10 FEET, WHICHEVER IS GREATER.



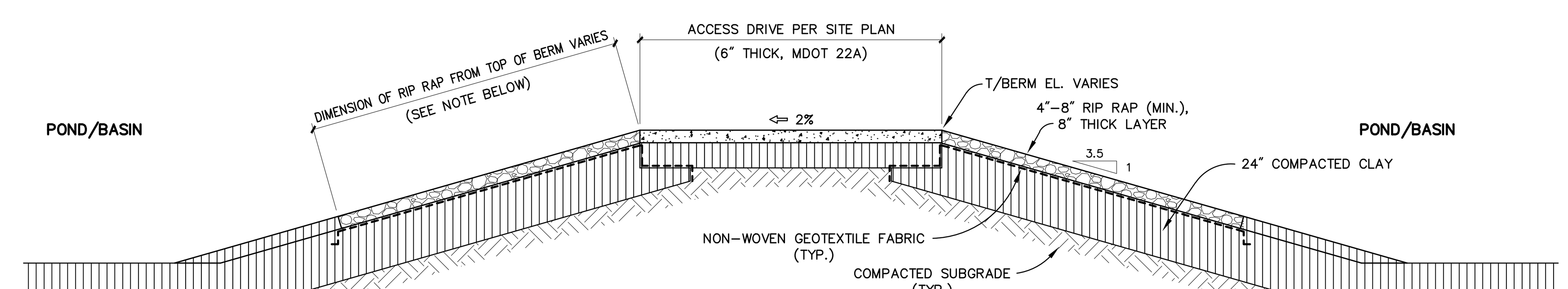
DRIVEWAY PAVEMENT SECTION

SCALE : NONE



CONCRETE WALKWAY/PAVEMENT DETAIL

SCALE : NONE



PROPOSED BERM SECTION

SCALE : NONE

NOTES

1. RIP RAP SHALL BE PLACED ON PROPOSED BERM SLOPES WITH THE FOLLOWING DIMENSIONS FROM TOP OF BERM :
   A. SOUTH AERATION BASIN – 18 FEET
   B. EAST AND WEST BIOSOLIDS BASIN – 33 FEET
2. WHERE CONNECTING 24" CLAY LINER TO EXISTING CLAY LINERS, CONTRACTOR SHALL SHAPE AND COMPACT THE CLAY TO CONNECT THE LINERS TO FORM A CONTINUOUS LINER.
3. COMPACTED CLAY BELOW ACCESS DRIVE SHALL BE PLACED, COMPACTED, AND TESTED PER SPECIFICATIONS.

DRAWING SOURCE

1989 WILLIAMS & WORKS CONSTRUCTION DRAWINGS, CITY OF HART, WASTEWATER TREATMENT PLANT IMPROVEMENTS, CONTRACT No. 1, SHEET 7

DATUM NOTE

SITE PLAN AND PROPOSED ELEVATIONS ARE BASED ON NAVD '88 UNLESS INDICATED OTHERWISE. DATUM USED FOR RECORD PLANS IS UNKNOWN, AND DIFFERENCE BETWEEN RECORD PLAN ELEVATIONS AND PROPOSED ELEVATIONS MAY VARY. FIELD VERIFY ALL ELEVATIONS AS NECESSARY FOR CONSTRUCTION.

NO.	REVISIONS	BY	DATE

DRAWN: SMYTH
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DATE: MAY '23

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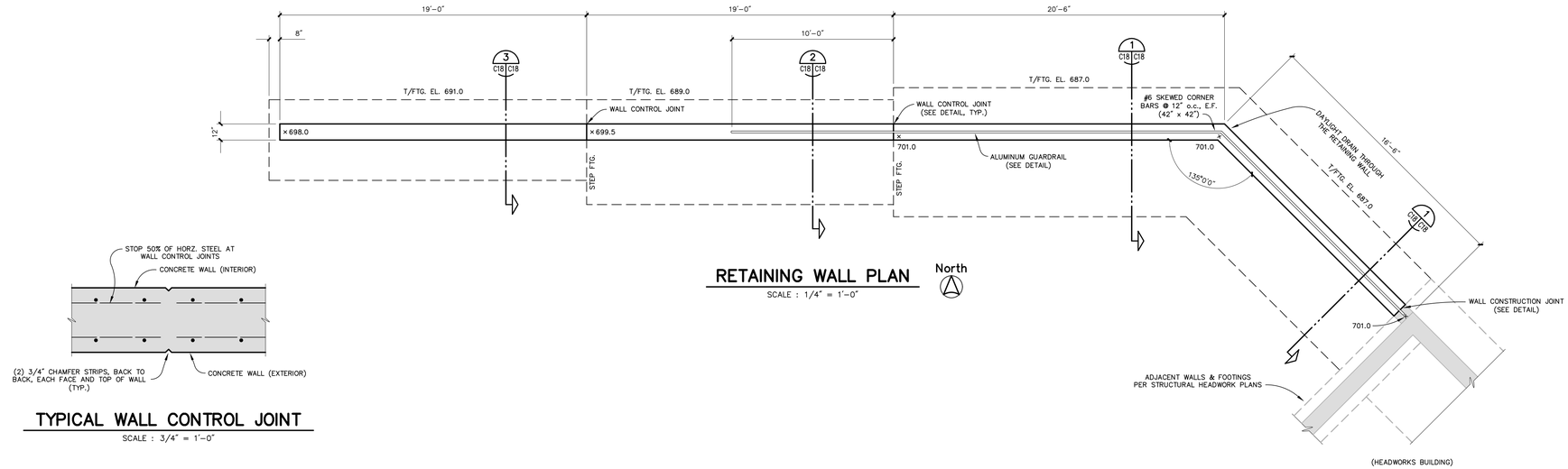
OCEANA COUNTY, MICHIGAN

WASTEWATER SYSTEM IMPROVEMENTS
BIOPURE TREATMENT FACILITY

SITE PLAN DETAILS

PROJECT NO. 2211159

SHEET NO. C17 OF C25



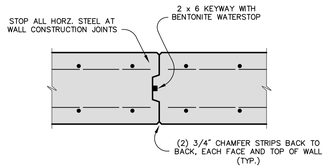
RETAINING WALL PLAN

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

North

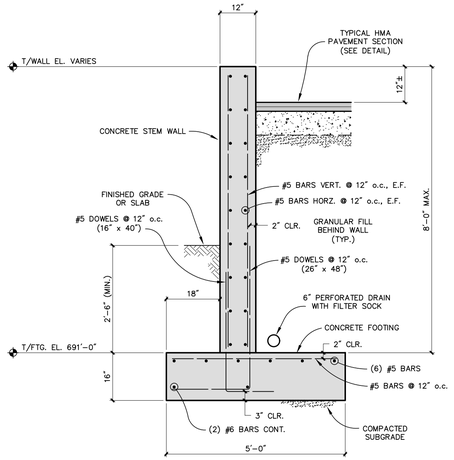
TYPICAL WALL CONTROL JOINT

SCALE : 3/4" = 1'-0"



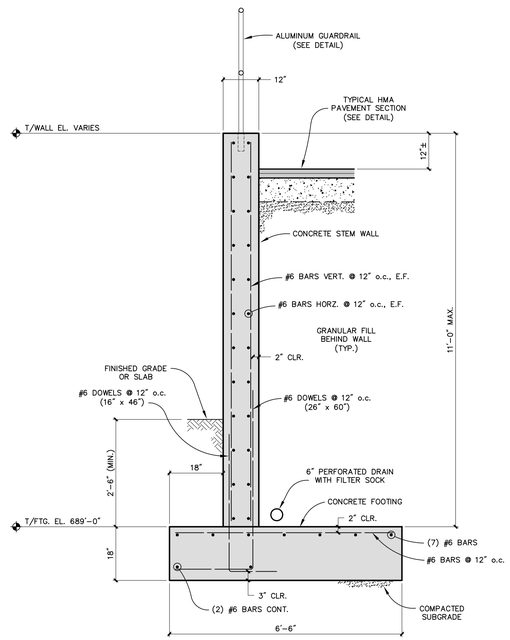
TYPICAL WALL CONSTRUCTION JOINT

SCALE : 3/4" = 1'-0"



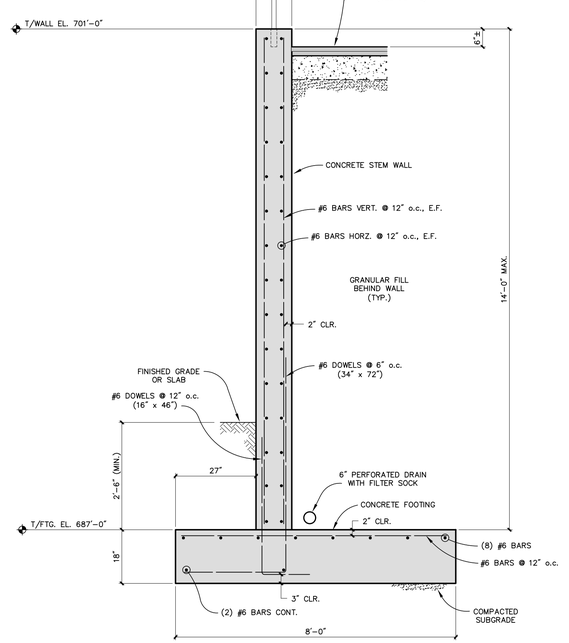
CONCRETE RETAINING WALL SECTION 3 C18 C18

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



CONCRETE RETAINING WALL SECTION 2 C18 C18

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



CONCRETE RETAINING WALL SECTION 1 C18 C18

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

ALTERNATE No. 1

NO.	REVISIONS	BY	DATE

DRAWN: SMYTH
DATE: MAY '23
CHECKED: D.A.B.
DATE: MAY '23

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CITY OF HART
OCEANA COUNTY, MICHIGAN

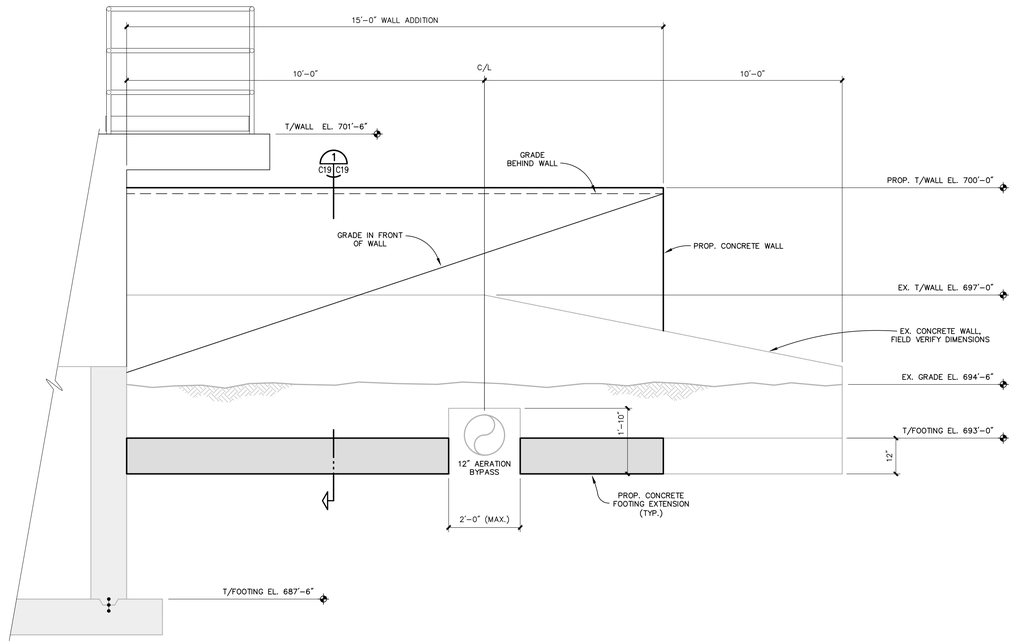
WASTEWATER SYSTEM IMPROVEMENTS
CONTRACT 4 – BIOPURE TREATMENT FACILITY

SITE STRUCTURAL DETAILS

PROJECT NO. 2211159

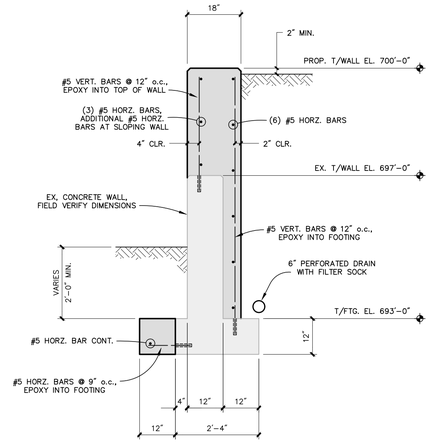
SHEET NO. C18 OF C25

T:\DWG3D PROJECTS\2021\2211159_HART_WWTP\4_PROD\C4 HEADWORKS LAGOON SPLITS AND POLISHING POND PS\2211159_C4_SITE STRUCTURAL.DWG – KSMITH – May, 22 2023 – 10:09am – PrintMinehof



EAST ELEVATION CONCRETE RETAINING WALL

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



PROPOSED WALL SECTION

1
C19 C19

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

ALTERNATE No. 1

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WASTEWATER SYSTEM IMPROVEMENTS
CONTRACT 4 – BIOPURE TREATMENT FACILITY

SITE STRUCTURAL DETAILS

PROJECT NO. 2211159

SHEET NO. C19 OF C25

T:\DWG\3D PROJECTS\2021\2211159_HART_WWTP\4_PROD\C4 HEADWORKS LAGOON SPLITS AND POLISHING POND PS\2211159_C4_SITE STRUCTURAL.DWG – MSMYTH – May, 22 2023 – 10:08am – PrintMNewhof

POWER LEGEND

- JUNCTION BOX, FLUSH WALL MOUNTED.
- JUNCTION BOX SURFACE MOUNTED.
- INDICATES CONNECTION TO EQUIPMENT AS REQUIRED.
- SINGLE CONVENIENCE RECEPTACLE IN FLUSH WALL MOUNTED OUTLET BOX, 18" AFF.
- DUPLEX CONVENIENCE RECEPTACLE IN FLUSH, WALL MOUNTED OUTLET BOX, 18" AFF.
- DUPLEX CONVENIENCE RECEPTACLE IN FLUSH, WALL MOUNTED OUTLET BOX, SPLIT WIRED, 18" AFF.
- FOUR-PLEX (DOUBLE DUPLEX) CONVENIENCE RECEPTACLE IN ONE FLUSH, WALL MOUNTED OUTLET BOX, 18" AFF.
- SINGLE 3 PHASE RECEPTACLE, MOUNTED 18" A.F.F.
- DUPLEX CONVENIENCE RECEPTACLE IN FLUSH, WALL MOUNTED OUTLET BOX, WITH INTERNAL GROUND FAULT INTERRUPTOR, 42" AFF.
- DUPLEX CONVENIENCE RECEPTACLE, IN FLOOR MOUNTED PEDESTAL, OR FLUSH IN FLOOR OUTLET BOX. SUBSCRIPT 'C' IDENTIFIES RECEPTACLE MOUNTED IN THE CEILING.
- TWO DUPLEX CONVENIENCE RECEPTACLES BACK TO BACK, IN FLOOR MOUNTED PEDESTAL, ON FLUSH IN FLOOR OUTLET BOX.
- IN-FLOOR PVC FLUSH MOUNT OUTLET BOX, 2 COMPARTMENT, (2) DUPLEX POWER RECEPTACLES, (1) DUAL PORT DATA/PHONE OUTLET BOX SHALL HAVE BRUSHED ALUMINUM FLANGE AND COVER PLATES PER THE SPECIFICATION
- DUPLEX CONVENIENCE RECEPTACLE IN FLUSH, FLOOR MOUNTED OUTLET BOX.
- PUSH BUTTON STATION WITH PUSH BUTTONS, SELECTOR SWITCHES OR PILOT LIGHTS MOUNTED 48" AFF.
- SURFACE MULTI-OUTLET RACEWAY WITH RECEPTACLES IN RACEWAY 24" ON CENTER, ON FLUSH WALL MOUNTED OUTLET BOX, 42" AFF.
- PANELBOARD, ADJACENT LINE INDICATES FRONT OF PANEL.
- SWITCHBOARD OR MOTOR CONTROL CENTER
- (2) MOTOR STARTER, NEMA SIZE AS NOTED.
- (1) COMBINATION MOTOR STARTER, WITH 'MCP', NEMA SIZE AS NOTED.
- (2) COMBINATION MOTOR STARTER, 2 SPEED, WITH 'MCP', NEMA SIZE AS NOTED.
- (2) COMBINATION AUTO TRANSFORMER REDUCED VOLTAGE STARTER, NEMA SIZE AS NOTED.
- (2) WYE-DELTA REDUCED VOLTAGE COMBINATION STARTER, NEMA SIZE AS NOTED.
- VFD VARIABLE FREQUENCY DRIVE
- LR LINE REACTOR (EXTERNAL) – VARIABLE FREQUENCY DRIVE
- SS SOLID STATE COMBINATION STARTER (SOFT-START)
- SW MANUAL MOTOR STARTING SWITCH, MOUNTED 42" A.F.F.
- 30A F SAFETY (DISCONNECT) SWITCH, HORSE POWER RATED, MOUNT ON WALL 48" AFF, OR ON EQUIPMENT 36" AFF. RATING AS NOTED.
  "F" – FUSED BLANK – NO CIRCUIT PROTECTION
  "C" – CIRCUIT BREAKER
- MD MOTORIZED DAMPER
- ½ MOTOR, SINGLE PHASE, NUMBER INDICATES HP.
- 5 MOTOR, 3 PHASE, NUMBER INDICATES HP.
- UNDERFLOOR DUCT RACEWAY WITH THREE SEPARATE RACEWAYS PER DUCT RUN, AND FLUSH IN FLOOR JUNCTION BOX.
- – – E – – EXISTING CONDUIT.
- CONDUIT EXPOSED ON WALL OR CEILING.
- – — – CONDUIT CONCEALED IN FLOOR SLAB OR UNDERGROUND.
- CIRCUIT HOME RUN FROM ELECTRICAL DEVICES AND EQUIPMENT TO ELECTRICAL DISTRIBUTION AND CONTROL EQUIPMENT. SEE ASSOCIATED SHEET 'CONDUIT & WIRE SCHEDULE'.
- H REINFORCED FIBERGLASS HANDHOLE
- M PRECAST CONCRETE MANHOLE

SINGLE LINE DIAGRAM LEGEND

- 1 / E NEMA SIZE MOTOR STARTER CONTACT WITH SOLID STATE ADJUSTABLE OVERLOAD RELAY. NUMBER REPRESENTS NEMA SIZE OF CONTACTOR.
- VFD VARIABLE FREQUENCY DRIVE MCP, HORSEPOWER RATING AND MCP RATING NOTED.
- LR LINE REACTOR (EXTERNAL) – VARIABLE FREQUENCY DRIVE
- 400AF / 400AT / 3P CIRCUIT BREAKER (C.B.), FRAME AND TRIP UNIT RATING, AND NO. OF POLES NOTED.
- 30AS / 3P / 30AF FUSIBLE DISCONNECT SWITCH, SWITCH AND FUSE RATING, AND NO. OF POLES NOTED.
- 30A / 3P DISCONNECT SWITCH, AMPACITY OF SWITCH AND NO. OF POLES NOTED.
- 30A F FUSED SAFETY (DISCONNECT) SWITCH, HORSE POWER RATED,
  "F" – FUSED
  "C" – CIRCUIT BREAKER
  BLANK – NO CIRCUIT PROTECTION
- 30A POWER OR CONTROL FUSE, AMPACITY AS NOTED.
- ½ MOTOR, SINGLE PHASE, NUMBER INDICATES HP.
- 5 MOTOR, 3 PHASE, NUMBER INDICATES HP.
- ELECTRICAL POWER GROUND
- 800/5 / 3 CURRENT TRANSFORMER
- 200/5 / 3 CURRENT TRANSFORMER
- DMM DIGITAL MULTI METER
- POTENTIAL OR CONTROL TRANSFORMER
- POWER TRANSFORMER AS REQUIRED (REFER TO SPECIFICATIONS). REFER TO DRAWING FOR VOLTAGES, CONFIGURATION, NO. OF PHASES (1 OR 3) AND KVA RATING.
  WINDING CONFIGURATIONS:
  - △ – DELTA CONNECTION, UNGROUNDED
  - Y – WYE CONNECTION, UNGROUNDED
  - Y – WYE CONNECTION, SOLIDLY GROUNDED
  - Y – WYE CONNECTION, RESISTANCE GROUNDED
- K MECHANICAL KEY OPERATED INTERLOCK FOR CIRCUIT BREAKERS
- 3 PHASE POWER RECEPTACLE, (REFER TO SPECIFICATIONS). AMPACITY, VOLTAGE AND NO. OF WIRES NOTED ON DRAWING.
- POWER FACTOR CORRECTION CAPACITOR BANK, kVAR AND VOLTAGE RATING AS NOTED.
- 52 MEDIUM VOLTAGE CIRCUIT BREAKER, (52 = INDENTIFICATION NO.) REFER TO SPECIFICATION FOR BREAKER TYPE.
- 50/51 / 3 PHASE TIME AND INSTANTANEOUS OVERCURRENT RELAY
- LINE SURGE ARRESTOR
- DRAW-OUT STABS FOR REMOVABLE EQUIPMENT IN SUBSTATIONS.

MISCELLANEOUS ELECTRICAL LEGEND

- H HUMIDISTAT OUTLET FLUSH WALL MOUNTED, 5'-0" AFF.
- T THERMOSTAT OUTLET FLUSH WALL MOUNTED, 5'-0" AFF.
- XXX / XXX INSTRUMENT IDENTIFICATION AND NUMBER
- OHD OVERHEAD DOOR OPERATOR
- ES ACCESS CONTROL SYSTEM – ELECTRIC DOOR STRIKE
- DS ACCESS CONTROL SYSTEM – DOOR SWITCH
- CR ACCESS CONTROL SYSTEM – CARD READER
- TELEPHONE OUTLET FLUSH WALL MOUNTED OUTLET BOX, 5'-0" AFF UNLESS NOTED OTHERWISE.

LIGHTING LEGEND

- A FLUORESCENT FIXTURE, SURFACE OR PENDANT MOUNTED. "A" INDICATES FIXTURE TYPE SHOWN ON THE FIXTURE SCHEDULE.
- INCANDESCENT, FLUORESCENT OR H.I.D. FIXTURE, RECESS OR PENDANT MOUNTED, WITH OUTLET BOX. SEE FIXTURE SCHEDULE FOR TYPE.
- INCANDESCENT, FLUORESCENT OR H.I.D. FIXTURE, RECESS OUTLET BOX, WALL MOUNTED. SEE FIXTURE SCHEDULE FOR TYPE.
- J LIGHT FIXTURE WITH REMOTE MOUNTED JUNCTION BOX. OUTLET BOX CONCEALED ABOVE ACCESSIBLE CEILING. PROVIDE FLEXIBLE CONDUIT CONNECTION, 3/4" MINIMUM, FROM JUNCTION BOX TO FIXTURE. PROVIDE CONDUCTORS IN CONDUIT QUANTITY, AS REQUIRED FOR INDICATED CIRCUITS AND SWITCHING CONTROLS, #12 (AWG) MINIMUM. SEE FIXTURE SCHEDULE FOR TYPE.
- SINGLE ARM LIGHTING STANDARD, POLE MOUNTED LUMINAIRE AND POLE SUPPORT BASE. LETTER DENOTES FIXTURE TYPE. SEE FIXTURE SCHEDULE FOR POLE AND FIXTURE TYPE.
- DOUBLE ARM LIGHTING STANDARD, TWO POLE ARM MOUNTED LUMINAIRES SUPPORT BASE. LETTER DENOTES FIXTURE TYPE. SEE FIXTURE SCHEDULE FOR POLE AND FIXTURE TYPE.
- LIGHT FIXTURE ON LIGHT TRACK CEILING MOUNTED, WITH FLUSH OUTLET BOX. SEE FIXTURE SCHEDULE FOR TYPE.
- SINGLE-FACE OR DOUBLE-FACE EXIT SIGN, MOUNTED ON RECESS CEILING OUTLET BOX. ARROW INDICATES DIRECTIONAL ARROW ON EXIT SIGN FACE. SEE FIXTURE SCHEDULE FOR TYPE.
- SINGLE-FACE EXIT SIGN MOUNTED ON FLUSH WALL MOUNTED OUTLET BOX, 7'-6" AFF. SEE FIXTURE SCHEDULE FOR TYPE.
- REMOTE MOUNT EMERCENCY FIXTURE HEAD. SEE FIXTURE SCHEDULE FOR TYPE.
- EMERGENCY OR NIGHT LIGHT (SUBSCRIPTED "E"), INCANDESCENT FLUORESCENT OR HID, CEILING OR WALL MOUNTED.
- FIXTURE WITH LAMPS ON EMERGENCY OR NIGHT LIGHT (SUBSCRIPTED "E") CIRCUIT, PROVIDE SEPARATE LAMP BALLASTS AS REQUIRED.
- SINGLE POLE TOGGLE SWITCH 42" AFF IN FLUSH WALL MOUNTED OUTLET BOX. INSTALL MULTIPLE SWITCHES UNDER COMMON COVER PLATE. SUBSCRIPT AT SWITCH SYMBOL INDICATES THE FOLLOWING:
  2 – DOUBLE POLE P – PILOT LIGHT F – FUSED
  3 – THREE WAY K – KEY OPERATED M – MANUAL MOTOR
  4 – FOUR WAY D – DIMMER STYLE STARTER
  a,b,c,d, ETC. – IDENTIFICATION OF OUTLET CONTROLLED.
- PE PHOTOELECTRIC CONTROLLER (PHOTO-EYE)
- OCCUPANCY SENSOR SWITCH IN FLUSH CEILING MOUNTED OUTLET BOX.
- OCCUPANCY SENSOR SWITCH IN FLUSH WALL MOUNTED OUTLET BOX. 42" AFF.

ABBREVIATIONS

A, AMP	AMPERE	M.C.	MECHANICAL CONTRACTOR
AC	ABOVE COUNTER, ALTERNATING CURRENT	MCP	MAIN CONTROL PANEL, MOTOR CIRCUIT PROTECTOR
AFF	ABOVE FINISHED FLOOR	MPR	MOTOR PROTECTION RELAY
AG	ABOVE GRADE	OL or O/L	OVERLOAD
AM, AS	AMP METER, AMP METER SWITCH	PROVIDE	FURNISH, INSTALL AND CONNECT.
CT	CURRENT TRANSFORMER	PROP.	PROPOSED
DC	DIRECT CURRENT	PT	VOLTAGE TRANSFORMER
E, EX	EXISTING EQUIPMENT TO REMAIN	(SS)	SURGE SUPPRESSION TYPE DEVICE
E.C.	ELECTRICAL CONTRACTOR	T.C.C.	TEMPERATURE CONTROL CONTRACTOR
ETM	ELAPSED TIME METER	V	VOLTS
G.C.	GENERAL CONTRACTOR	VM, VS	VOLTMETER, VOLTMETER SWITCH
GFCI	GROUND FAULT CURRENT INTERRUPTER	WH	WATT-HOUR METER
GND	GROUND	WP	WEATHER PROOF
HOA	HAND-OFF-AUTO SELECTOR SWITCH	2C#16SH	1 PAIR OF #16 TWISTED, SHIELDED
HP	HORSEPOWER	20AF	20 AMP FUSES
KVA	KILOVOLT AMPERES	3C/#18	3 CONDUCTOR #18 AWG WIRE
KW	KILOWATT	30AS	30 AMP SWITCH
		3P, 1P	THREE POLE, SINGLE POLE

SCHEMATIC LEGEND

- OFF / HAND / AUTO / X00 / 00X 3-POSITION SELECTOR SWITCH X = SWITCH POSITION TO CLOSE CONTACT
- XXXX / XXXX / X0 / 0X 2-POSITION SELECTOR SWITCH X = SWITCH POSITION TO CLOSE CONTACT
- R PUSH-TO-TEST PILOT LIGHT
- PUSHBUTTON, NORMALLY OPEN
- PUSHBUTTON, NORMALLY CLOSED
- LEVEL SWITCH, NORMALLY OPEN
- LEVEL SWITCH, NORMALLY CLOSED
- LIMIT SWITCH, NORMALLY OPEN
- LIMIT SWITCH, NORMALLY CLOSED
- PRESSURE SWITCH, NORMALLY OPEN
- PRESSURE SWITCH, NORMALLY CLOSED
- FLOW SWITCH, NORMALLY OPEN
- FLOW SWITCH, NORMALLY CLOSED
- ON-DELAY TIMING CONTACT, NORMALLY OPEN
- CR CONTROL RELAY
- TD TIME DELAY RELAY
- ON-DELAY TIMING CONTACT, NORMALLY CLOSED
- OFF-DELAY TIMING CONTACT, NORMALLY OPEN
- OFF-DELAY TIMING CONTACT, NORMALLY CLOSED
- TEMPERATURE SWITCH NORMALLY OPEN
- TEMPERATURE SWITCH NORMALLY CLOSED
- LEVEL PROBE (CAPACITIVE, ULTRASONIC, ETC.)
- RELAY CONTACT, NORMALLY OPEN
- RELAY CONTACT, NORMALLY CLOSED
- TERMINAL BLOCK
- FUSE
- SOLENOID VALVE (WIRING DIAGRAM)
- 480V / 120V / 50VA CONTROL TRANSFORMER
- GROUND
- CAPACITOR
- MD MOTORIZED DAMPER
- M MOTOR CONTACTOR

MEANINGS OF INSTRUMENT IDENTIFICATION LETTERS

	FIRST LETTER		SUCCEEDING LETTERS		
	MEASURED OR INITIATING VARIABLE	MODIFIER	READOUT OR PASSIVE FUNCTION	OUTPUT FUNCTION	MODIFIER
A	ANALYSIS		ALARM		
B	BURNER FLAME		USER'S CHOICE	USER'S CHOICE	USER'S CHOICE
C	CONDUCTIVITY			CONTROL	
D	DENSITY (MASS) OR SPECIFIC GRAVITY	DIFFERENTIAL			
E	VOLTAGE (EMF)		PRIMARY ELEMENT		
F	FLOW RATE	RATIO (FRACTION)			
G	GAGING (DIM.)		GLASS		
H	HAND (MANUALLY INITIATED)				HIGH
I	CURRENT		INDICATE		
J	POWER	SCAN			
K	TIME OR TIME SCHEDULE			CONTROL STATION	
L	LEVEL		LIGHT (PILOT)		LOW
M	MOISTURE OR HUMIDITY				MIDDLE OR INTERMEDIATE
N	USER'S CHOICE		USER'S CHOICE	USER'S CHOICE	USER'S CHOICE
O	USER'S CHOICE		ORIFICE (RESTRICTION)		
P	PRESSURE OR VACUUM		POINT (TEST CONNECTION)		
Q	QUANTITY OR EVENT	INTEGRATE OR TOTALIZE			
R	RADIOACTIVITY		RECORD OR PRINT		
S	SPEED OR FREQUENCY	SAFETY		SWITCH	
T	TEMPERATURE			TRANSMIT	
U	MULTIVARIABLE		MULTIFUNCTION	MULTIFUNCTION	MULTIFUNCTION
V	VISCOSITY			VALVE, DAMPER OR LOUVER	
W	WEIGHT OR FORCE		WELL		
X	UNCLASSIFIED		UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED
Y	USER'S CHOICE			RELAY OR COMPUTE	
Z	POSITION			DRIVE, ACTUATE OR UNCLASSIFIED FINAL ELEMENT	

NOTE:
ALL SYMBOLS NOT NECESSARILY USED ON THESE PLANS, ALL SYMBOL DESCRIPTIONS ARE SUBJECT TO MODIFICATION AS NOTED ON THE DRAWINGS.

NO.	REVISIONS	BY	DATE

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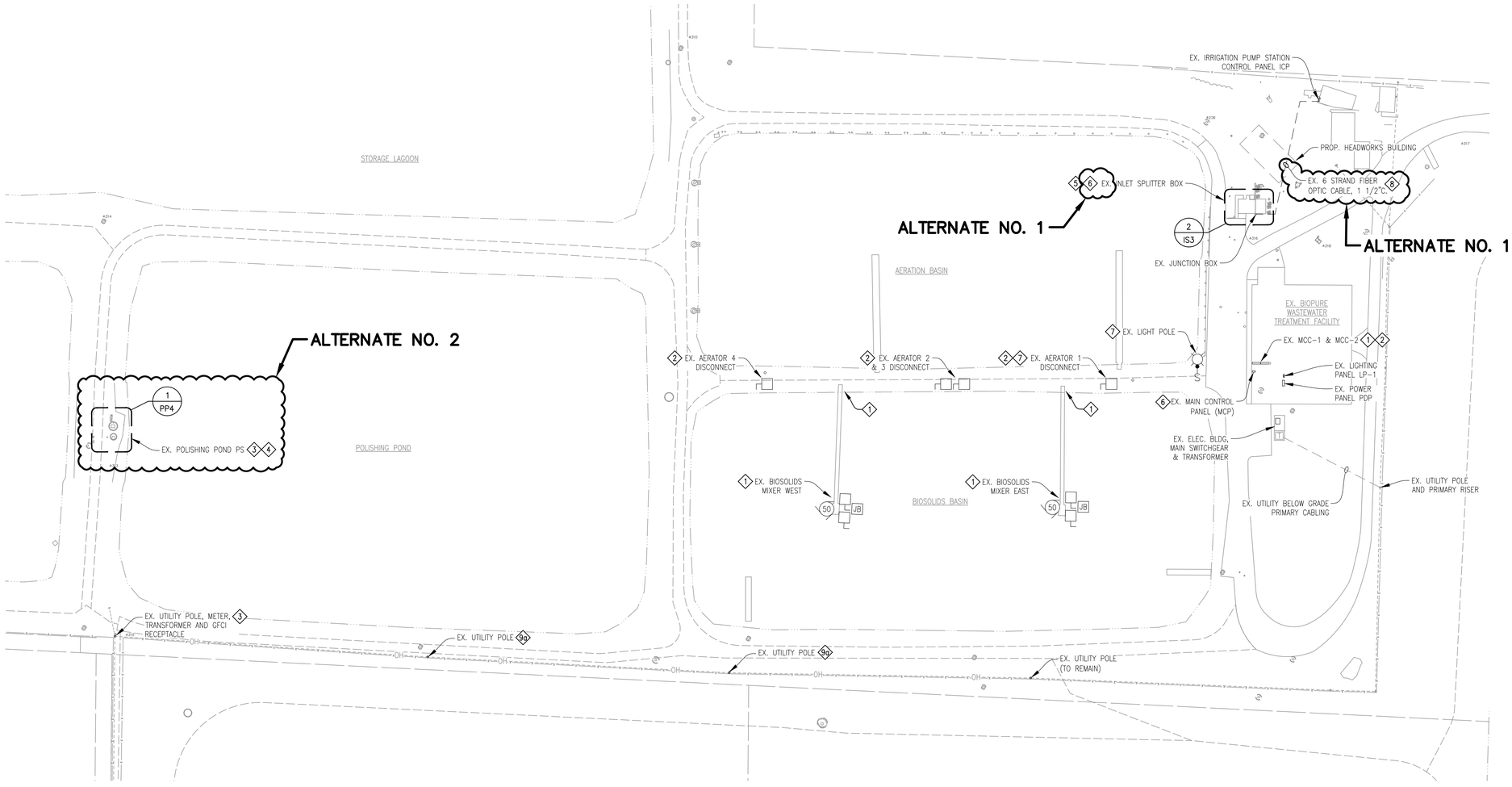
WASTEWATER SYSTEM IMPROVEMENTS
BIOPURE TREATMENT FACILITY
ELECTRICAL LEGEND

PROJECT NO. 2211159
SHEET NO. C20 OF C25



ELECTRICAL SITE PLAN – EXISTING

North

SCALE : 1" = 60'

GENERAL NOTES:

1. WASTEWATER TREATMENT FACILITY MUST REMAIN OPERATIONAL DURING ALL DEMOLITION AND CONSTRUCTION ACTIVITIES. COORDINATE ALL DEMOLITION WORK WITH THE OWNER AND OTHER TRADES.
2. FILL ALL UNUSED CONDUIT PENETRATIONS FROM DEMOLISHED CONDUITS THROUGH WALLS, FLOORS AND BELOW GRADE CONCRETE STRUCTURES WITH NON-SHRINKING GROUT.

DEMOLITION NOTES: ◇ – (SYMBOL DENOTES PLAN NOTE)

1. DEMOLISH BIOSOLIDS MIXER MOTOR FEEDER CONDUCTORS FROM MOTOR CONTROL CENTERS TO DISCONNECT SWITCHES NEAR BIOSOLIDS MIXER MOTORS AT BIOSOLIDS BASIN AND DISPOSE. DEMOLISH BIOSOLIDS MIXER HEATER CONDUCTORS FROM LIGHING PANEL LP-1 TO DISCONNECT SWITCHES NEAR BIOSOLIDS MIXER MOTORS AT BIOSOLIDS BASIN AND DISPOSE. DEMOLISH CONDUITS AND MIXER MOTOR AND HEATER DISCONNECT SWITCHES FROM MIXER MECHANISM BRIDGE AND DISPOSE. AT SHORE NEAR BIOSOLIDS MIXER BRIDGE CUT CONDUITS 24" BELOW GRADE, CAP AND ABANDON IN PLACE. SEE "MCC-1 & MCC-2 SINGLE LINE DIAGRAMS" FOR ADDITIONAL DEMOLITION REQUIREMENTS.
2. DEMOLISH AERATOR FEEDER CONDUCTORS FROM MOTOR CONTROL CENTERS TO POST MOUNTED DISCONNECTS NEAR BIOSOLIDS BASIN SHORE AND DISPOSE. AT AERATOR DISCONNECTS CUT 1 1/2" CONDUITS 24" BELOW GRADE, CAP AND ABANDON IN PLACE. DEMOLISH DISCONNECT MOUNTING POSTS AND DISPOSE. SEE "MCC-1 & MCC-2 SINGLE LINE DIAGRAMS" FOR ADDITIONAL INFORMATION.
3. COORDINATE WITH UTILITY TO DISCONNECT PUMP STATION CONTROL PANEL SERVICE FEEDER AT UTILITY POLE METER. DEMOLISH FEEDER CONDUCTORS FROM METER SOCKET TO POLISHING POND PUMP STATION CONTROL PANEL AND DISPOSE. CUT FEEDER CONDUIT TO POLISHING POND PUMP STATION 24" BELOW GRADE, CAP AND ABANDON IN PLACE. SALVAGE UTILITY METER & SOCKET, 480V-120V SINGLE PHASE TRANSFORMER AND GFCI RECEPTACLE MOUNTED ON UTILITY POLE FOR REUSE.
4. SEE POLISHING PONDS "ELECTRICAL PLANS & DETAILS" SHEET FOR ADDITIONAL DEMOLITION REQUIREMENTS.
5. SEE INLET SPLITTER BOX "ELECTRICAL PLANS AND DETAILS" SHEET FOR DEMOLITION REQUIREMENTS..
6. DISCONNECT AND SALVAGE GRINDER "RUNNING" AND "FAILURE" STATUS WIRING FROM GRINDER CONTROL PANEL LOCATED ON INLET SPLITTER BOX STRUCTURE AND AT MAIN CONTROL PANEL (MCP) LOCATED IN WASTEWATER TREATMENT FACILITY.
7. AT AERATOR 1 DISCONNECT SWITCH DEMOLISH BELOW GRADE CONDUIT AND CONDUCTORS FROM DISCONNECT SWITCH TO LIGHT SWITCH ON LIGHT POLE LOCATED ACROSS DRIVE NORTHEAST OF THE DISCONNECT LOCATION. SALVAGE LIGHT POLE, LIGHT SWITCH AND LIGHT FIXTURE FOR REUSE.
8. COORDINATE WITH OTHER TRADES TO LOCATE EX. FIBER OPTIC CABLING TO PREVENT DAMAGE DURING CONSTRUCTION OF THE PROP. HEADWORKS BUILDING AND RELOCATION OUT OF THE HEADWORKS BUILDING FOOTPRINT. ABANDON EX. 1 1/2"C FROM SOUTHWEST CORNER OF PROP. HEADWORKS BUILDING TO EX. IRRIGATION PUMP STATION CONTROL PANEL ICP. SEE "ELECTRICAL SITE PLAN – PROPOSED" AND "SITE SCADA COMMUNICATION RISER" FOR PROPOSED CONDUIT AND CABLING REROUTING AND ADDITIONAL REQUIREMENTS.
9. COORDINATE WITH CITY OF HART HYDRO DEPARTMENT, MIKE SCHILLER 231-873-5367 FOR ALL EX. ELECTRIC OVERHEAD AND UNDERGROUND PRIMARY CABLING RELOCATION:
   a. EX. UTILITY POLES SHALL BE RELOCATED APPROXIMATELY 20' TO THE SOUTH OF THEIR CURRENT LOCATION TO ALLOW FOR THE ROAD AND POLISHING POND BERM TO BE RELOCATED TO THE SOUTH. SEE "ELECTRICAL SITE PLAN – PROPOSED" FOR ADDITIONAL INFORMATION.

811 Know what's below. Call before you dig.

UTILITY LOCATIONS ARE DERIVED FROM ACTUAL MEASUREMENTS OR AVAILABLE RECORDS. THEY SHOULD NOT BE INTERPRETED TO BE EXACT LOCATIONS NOR SHOULD IT BE ASSUMED THAT THEY ARE THE ONLY UTILITIES IN THIS AREA.

NO.	REVISIONS	BY	DATE

DRAWN RBD/KCT
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WASTEWATER SYSTEM IMPROVEMENTS
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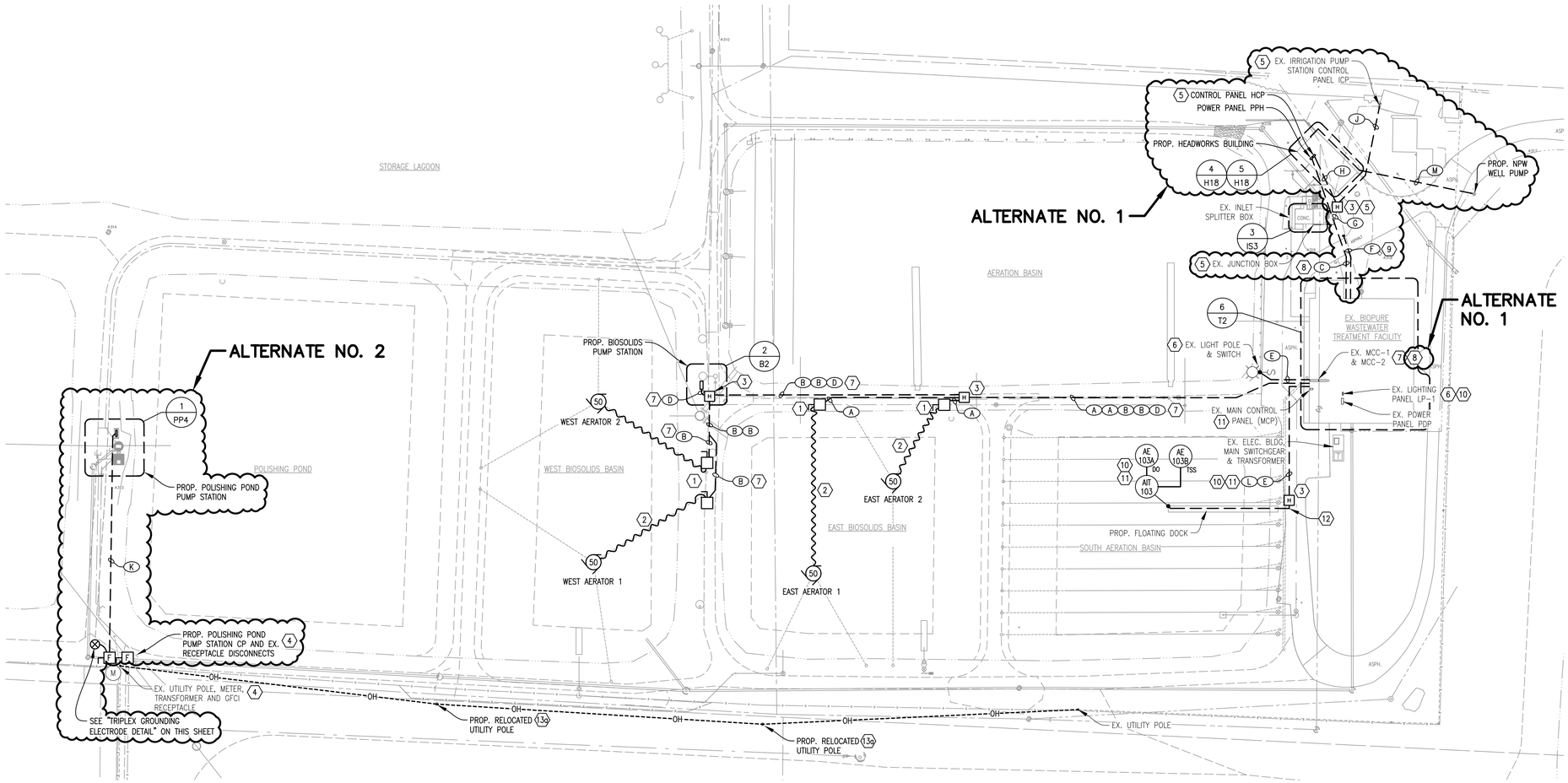
ELECTRICAL SITE PLAN – EXISTING

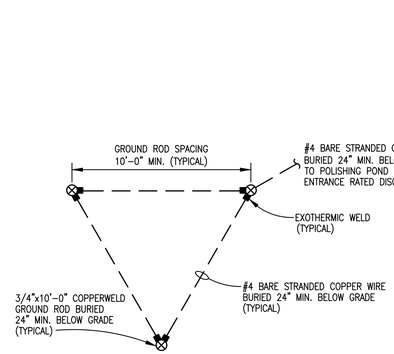
PROJECT NO. 2211159
SHEET NO. C21 OF C25



ELECTRICAL SITE PLAN – PROPOSED

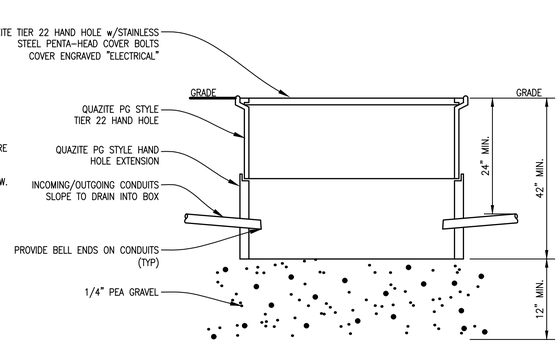
North

SCALE : 1" = 60'



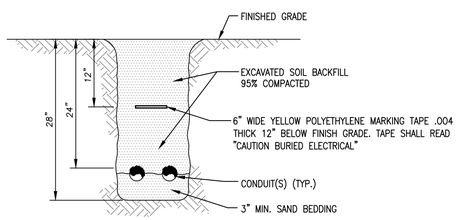
TRIPLEX GROUNDING ELECTRODE DETAIL

SCALE : NONE



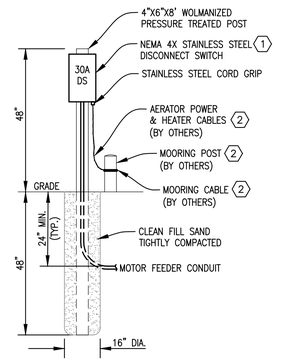
HAND HOLE INSTALLATION DETAIL

SCALE : NONE



TRENCHING DETAIL

SCALE : NONE



AERATOR DISCONNECT SWITCH MOUNTING DETAIL

SCALE : NONE

GENERAL NOTES:

1. SEE MCC-1 & MCC-2 SINGLE LINE DIAGRAMS FOR ADDITIONAL INFORMATION ASSOCIATED WITH 480VAC LOADS SHOWN ON THIS SHEET.
2. ENGRAVED EQUIPMENT NAMEPLATES (WHITE PHENOLIC WITH BLACK LETTERS) SHALL BE FURNISHED AND INSTALLED BY THE ELECTRICAL CONTRACTOR FOR NEW AND EXISTING ELECTRICAL EQUIPMENT AS NOTED. LETTER SIZES: 1" HIGH FOR INDIVIDUAL ELECTRICAL POWER DISTRIBUTION AND SERVICE EQUIPMENT. LETTER SIZES: 1/4" HIGH FOR INDIVIDUAL ELECTRICAL MOTOR CONTROL CENTER UNITS, VFD ENCLOSURES, SAFETY DISCONNECTS, COMBINATION STARTERS AND PROCESS INSTRUMENTATION.
3. PROVIDE THESE CONDUIT TYPES IN THE FOLLOWING LOCATIONS:
   a. RGS – ALL OUTDOOR AND INDOOR EXPOSED AREAS UNLESS NOTED OTHERWISE.
   b. PVC COATED RGS – OUTDOOR EXPOSED AT INLET SPLITTER BOX & SOUTH AERATION BASIN FLOATING DOCK.
   c. SCH. 40 PVC – BELOW GRADE, IN-SLAB AND ENTRANCE TO WET WELL.
4. PROVIDE PVC COATED RGS CONDUIT ELBOWS BELOW GRADE AND FOR STUB UPS TO EQUIPMENT FOR TRANSITION FROM CONCEALED/BELOW GRADE TO EXPOSED/ABOVE GRADE CONDUIT INSTALLATIONS. PROVIDE SCH. 40 PVC SLEEVES FOR ALL CONDUITS EXTENDING UP THROUGH CONCRETE SLABS.
5. INSTALL BELOW GRADE CONDUITS A MINIMUM OF 24" BELOW GRADE. PROVIDE YELLOW RIBBON MARKED "BURIED ELECTRIC" 12" BELOW GRADE ABOVE CONDUITS. PROVIDE RMC ELBOWS IN ALL BELOW GRADE CONDUIT INSTALLATIONS
6. ALL INSTRUMENTATION DEVICES SHOWN ARE INSTALLED BY THE ELECTRICAL CONTRACTOR. ELECTRICAL CONTRACTOR SHALL PROVIDE FIELD WIRING, CONDUIT & TERMINATIONS FOR THOSE DEVICES AS REQUIRED.
7. CORE HOLES FOR CONDUITS INTO CONCRETE STRUCTURES AS NEEDED. PATCH ALL CONDUIT PENETRATIONS INTO CONCRETE STRUCTURES WITH NON-SHRINKING GROUT.

PLAN NOTES: (#) (SYMBOL DENOTES PLAN NOTE)

1. PROVIDE 100 AMP, HEAVY DUTY, 6 POLE, NEMA 4X STAINLESS STEEL DISCONNECT SWITCH WITH AUXILIARY CONTACTS FOR EACH AERATOR. MOUNT DISCONNECT SWITCHES ON A WOLMANIZED POST AS SPECIFIED ON THE "AERATOR DISCONNECT SWITCH MOUNTING DETAIL" LOCATED ON THIS SHEET.
2. THE AERATOR POWER AND HEATER CABLES SHALL BE SUPPORTED FROM THE MOORING CABLE AT MAXIMUM INTERVALS OF 6'-0" BETWEEN SUPPORTS. SUPPORT DEVICE SHALL BE A STAINLESS STEEL BOLT-CLOSE STYLE CONDUIT CLAMP, ERICO #CD SERIES OR EQUAL BY MINERALLAC, SIZE TO FIT DIAMETER OF CABLES, CABLES SUPPLIED WITH AERATORS. AT MOORING POST ATTACH POWER AND HEATER CABLES TO MOORING CABLE LOOP WITH STAINLESS STEEL 1/2" U-BOLT CLAMPS AND KELLEMS/HUBBELL GRIPS. AT AERATOR FLOATING FRAME ATTACH POWER AND HEATER CABLES TO FRAME WITH STAINLESS STEEL 1/2" U-BOLT CLAMPS AND KELLEMS/HUBBELL GRIPS.
3. PROVIDE ADEQUATELY SIZED STACKABLE, OPEN BOTTOM, TIER 15 HAND HOLES AND COVERS MARKED "ELECTRIC" OR "FIBER OTPIC". NO SPLICING ALLOWED IN HAND HOLES. INSTALL HAND HOLES A MINIMUM OF 3'-0" OFF ALL ROADWAYS AND DRIVEWAYS. AT EACH HAND HOLE FURNISH A PRO-MARK FLEXIBLE UTILITY MARKER, MODEL PM-301 (OR EQUAL), RED IN COLOR, LABELING TO READ "ELECTRICAL HAND HOLE" OR "FIBER OPTIC HAND HOLE. SEE "HAND HOLE INSTALLATION DETAIL" ON THIS SHEET.
4. PROVIDE 200A, NEMA 3R, FUSIBLE, HD, SERVICE ENTRANCE RATED DISCONNECT SWITCH W/NEUTRAL KIT TO FEED PROPOSED POLISHING POND PUMP STATION CONTROL PANEL. PROVIDE 30A, NEMA 3R, FUSIBLE, HD, DISCONNECT TO REFEED EX. 480/120V TRANSFORMER AND EX. GFCI RECEPTACLE. MOUNT DISCONNECT SWITCHED ON EX. UTILITY POLE. SEE "POLISHING POND CONTROL PANEL WIRING DIAGRAM".
5. TEMPORARILY PULL FIBER OPTIC CABLE FROM IRRIGATION PUMP STATION CONTROL PANEL ICP BACK TO JUNCTION BOX AT INLET SPLITTER BOX. INTERCEPT EX. 1 1/2" CONDUIT FIBER OPTIC CABLE WAS INSTALLED IN APPROXIMAETELY 48" FROM SOUTHWEST CORNER OF HEADWORKS BUILDING AND PROVIDE ADEQUATELY SIZED HAND HOLE. PROVIDE 1 1/2" CONDUIT FROM HAND HOLE TO CONTROL PANEL ICP ROUTED AROUND HEADWORKS BUILDING FOOTPRINT AND REINSTALL FIBER OPTIC CABLE TO CONTROL PANEL ICP. PROVIDE 1 1/2" CONDUIT FROM HAND HOLE TO HEADWORKS CONTROL PANEL HCP DURING HEADWORKS BUILDING CONSTRUCTION FOR ROUTING FIBER OPTIC CABLE FROM CONTROL PANEL ICP TO CONTROL PANEL HCP. COORDINATE DISCONNECTION AND RECONNECTION OF EX. FIBER OPTIC CABLING AT CONTROL PANEL ICP WITH OWNER.
6. EXTEND CONDUIT AND CONDUCTORS FROM SALVAGED LIGHT SWITCH TO LIGHTING PANEL LP1 LOCATED IN ELECTRICAL ROOM OF WASTEWATER TREATMENT FACILITY. PROVIDE 15A1P BREAKER AT CKT. 35. UPDATE PANEL SCHEDULE AS REQUIRED.
7. AERATOR MOTORS AND BIOSOLIDS PUMP STATION CONDUITS TO MCC-1 & MCC-2. SEE MOTOR CONTROL CENTERS MCC-1 & MCC-2 SINGLE LINE DIAGRAMS.
8. HEADWORKS BUILDING FEEDER CONDUIT FROM MCC-1 TO POWER PANEL PPH. SEE MOTOR CONTROL CENTER MCC-1 SINGLE LINE DIAGRAM. COORDINATE CONDUIT INSTALLATION WITH ASPHALT SAWING CUTTING AND REMOVAL WORK.
9. PROVIDE (1) SPARE 3" CONDUIT FROM EXTERIOR OF WASTEWATER TREATMENT FACILITY TO 2'-0" PAST NORTH EDGE OF ROADWAY AND CAP. AT WASTEWATER TREATMENT FACILITY STUB CONDUIT UP TO 2'-0" ABOVE GRADE AND CAP. COORDINATE CONDUIT INSTALLATION WITH ASPHALT SAW CUTTING AND REMOVAL WORK.
10. ROUTE "CONDUIT AND WIRE SCHEDULE" MARK "E" TO LIGHTING PANEL LP1 LOCATED IN ELECTRICAL ROOM OF WASTEWATER TREATMENT FACILITY TO PROVIDE 120VAC POWER TO THE ANALYZER/TRANSMITTER (AIT). PROVIDE 15A1P BREAKER AT CKT. 33. UPDATE PANEL SCHEDULE AS REQUIRED.
11. ROUTE "CONDUIT AND WIRE SCHEDULE" MARK "L" TO WASTEWATER TREATMENT FACILITY MAIN CONTROL PANEL MCP. CONNECT DISSOLVED OXYGEN (DO) AND TOTAL SUSPENDED SOLIDS (TSS) ANALYZER/TRANSMITTER (AIT) ANALOG OUTPUTS TO SPARE MCP PLC ANALOG INPUTS. COORDINATE WITH MCP PLC POINTS WITH INTEGRATOR. MOUNT ANALYZER/TRANSMITTER (AIT) AND ANALYZER PROBES (AE) TO FLOATING DOCK HANDRAILS AND STRUCTURE USING MOUNTING KITS PROVIDED WITH INSTRUMENTS PER MANUFACTURERS INSTRUCTIONS.
12. PROVIDE FLEXIBLE CONDUIT CONNECTION FOR CONDUIT TRANSITION FROM LAND TO FLOATING DOCK TO ALLOW FOR DOCK MOVEMENT.
13. COORDINATE WITH CITY OF HART HYDRO DEPARTMENT, MIKE SCHILLER 231-873-5367 FOR ALL EX. ELECTRIC OVERHEAD AND UNDERGROUND PRIMARY CABLING RELOCATION:
   a. PROP. UTILITY POLES AND OH ELECTRICAL LINES SHALL BE RELOCATED APPROXIMATELY 20' TO THE SOUTH OF THEIR CURRENT LOCATION TO ALLOW FOR THE EX. ROAD AND POLISHING POND BERM TO BE RELOCATED TO THE SOUTH. COORDINATE EXTENT OF RELOCATION TO THE SOUTH WITH ENGINEER.
   b. PROP. UNDERGROUND PRIMARY CABLING SHALL BE RELOCATED AS SHOWN. FOR UTILITY USE PROVIDE QUANTITY (3) 2 1/2", COLOR RED, SCH. 40, HDPE CONDUITS. PROVIDE 1/8" NYLON PULL STRING IN EACH CONDUIT. INSTALL CONDUITS WITHOUT USING 90 ELBOWS. GRADUALLY SWEEP CONDUITS UP TO EX. UTILITY POLE, EX. TRANSFORMER PRIMARY CABINET AND BELOW GRADE EAST/WEST TO NORTH/SOUTH TRANSITION. COORDINATE WITH OWNER AND ELECTRIC UTILITY TO MINIMIZE PLANT POWER OUTAGE TIME.

CONDUIT AND WIRE SCHEDULE

MARK	DESCRIPTION
(#)	
A	3#1, 3#10 (MOTOR SPACE HTR & DIFFUSER HTR CONTROL), 2#8 (DIFFUSER HTR), 1#4 GND – 2"C
B	3#1/0, 3#10 (MOTOR SPACE HTR & DIFFUSER HTR CONTROL), 2#8 (DIFFUSER HTR), 1#3 GND – 2"C
C	3#1, 1#6 GND – 1 1/2"C
D	3#4, 1#6 GND – 1 1/4"C
E	2#12, 1#12 GND – 3/4"C
F	3"C SPARE
G	(1) EX. 6 STRAND FIBER OPTIC CABLE – EX. 1 1/2"C (EX. CABLE ROUTED FROM EX. MCP TO EX. ICP)
H	(1) 6 STRAND FIBER OPTIC CABLE – 1 1/2"C (CABLE ROUTED FROM PROP. HCP TO EX. ICP)
J	(2) 6 STRAND FIBER OPTIC CABLES – 1 1/2"C (1–EX. CABLE FROM EX. MCP TO EX. ICP & 1–PROP. CABLE FROM PROP. HCP TO EX. ICP)
K	3#1/0, 1#6 GND – 2"C
L	(2) 2C#18 SHIELDED CABLE – 3/4"C
M	3#10, 1#10 GND (PROVIDE XHHW FOR VFD OUTPUT CONDUCTORS) – 1"C
N	(3) 2 1/2"C – COLOR RED, SCH.. 400 HDPE (COORDINATE INSTALLATION WITH UTILITY)

811 Know what's below. Call before you dig.

UTILITY LOCATIONS ARE DERIVED FROM ACTUAL MEASUREMENTS OR AVAILABLE RECORDS. THEY SHOULD NOT BE INTERPRETED TO BE EXACT LOCATIONS NOR SHOULD IT BE ASSUMED THAT THEY ARE THE ONLY UTILITIES IN THIS AREA.

NO.	REVISIONS	BY	DATE

DRAWN RBD/KCT
DATE MAY '23
CHECKED MAT
DATE MAY '23

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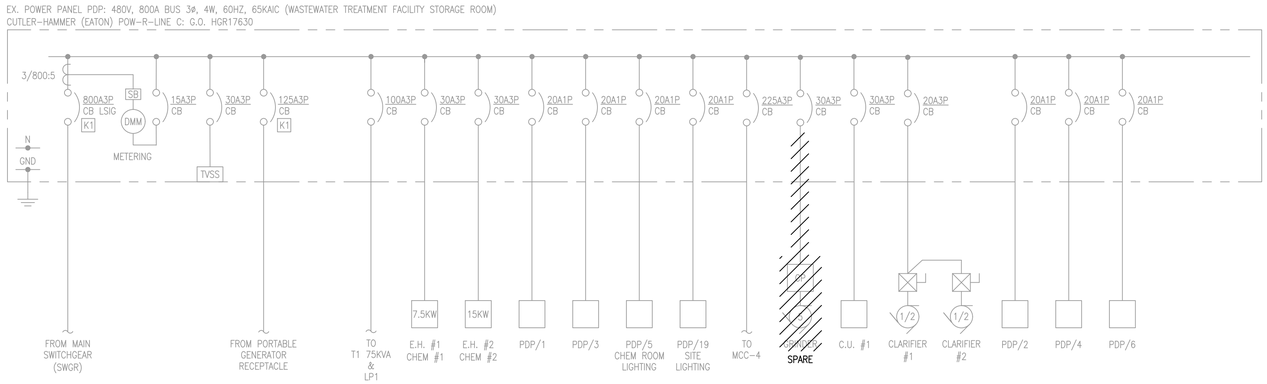
CITY OF HART
OCEANA COUNTY, MICHIGAN

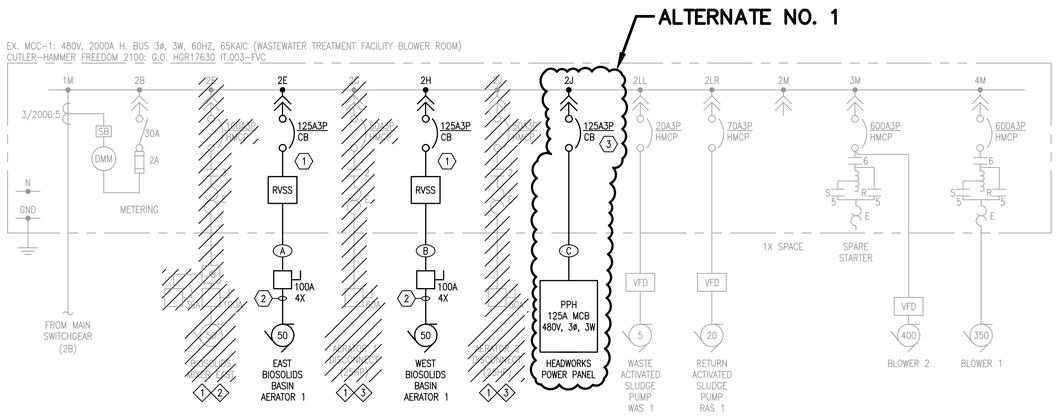
WASTEWATER SYSTEM IMPROVEMENTS
BIOPURE TREATMENT FACILITY

ELECTRICAL SITE PLAN – PROPOSED

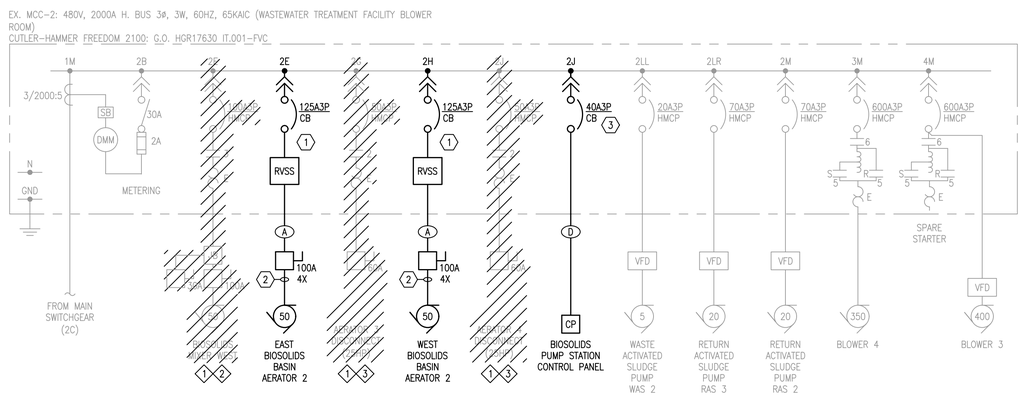
PROJECT NO. 2211159
SHEET NO. C22 OF C25



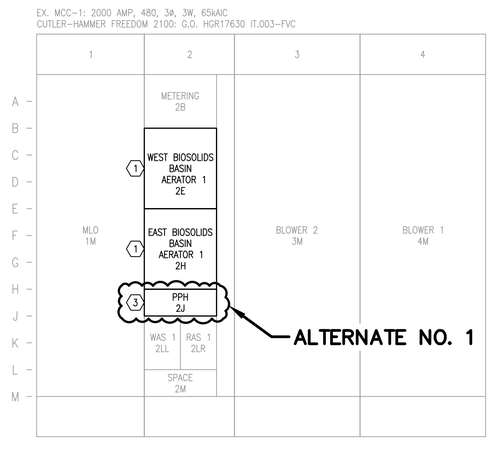
EX. POWER DISTRIBUTION PANEL PDP SINGLE LINE DIAGRAM – PROPOSED



EX. MCC-1 SINGLE LINE DIAGRAM – PROPOSED

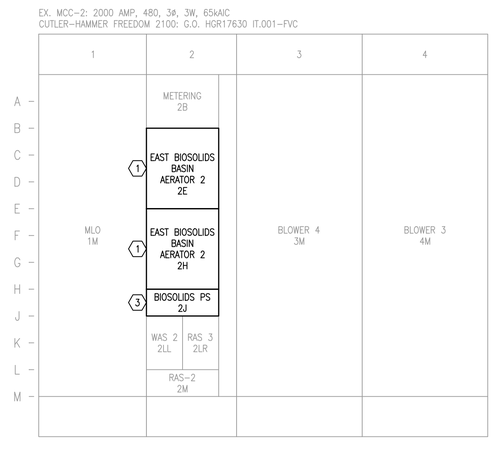


EX. MCC-2 SINGLE LINE DIAGRAM – PROPOSED



EX. MCC-1 FRONT ELEVATION – PROPOSED

SCALE : 3/4" = 1'-0"



EX. MCC-2 FRONT ELEVATION – PROPOSED

SCALE : 3/4" = 1'-0"

GENERAL NOTES:

1. ENGRAVED EQUIPMENT NAMEPLATES (WHITE PHENOLIC WITH BLACK LETTERS) SHALL BE FURNISHED AND INSTALLED BY THE ELECTRICAL CONTRACTOR FOR NEW AND EXISTING ELECTRICAL EQUIPMENT AS NOTED. LETTER SIZES: 1" HIGH FOR INDIVIDUAL ELECTRICAL POWER DISTRIBUTION AND SERVICE EQUIPMENT. LETTER SIZES: 1/4" HIGH FOR INDIVIDUAL ELECTRICAL MOTOR CONTROL CENTER UNITS, VFD ENCLOSURES, SAFETY DISCONNECTS, COMBINATION STARTERS AND PROCESS INSTRUMENTATION.

DEMOLITION NOTES: ⟨#⟩ – (SYMBOL DENOTES DEMOLITION NOTE)

1. REMOVE EXISTING BIOSOLIDS MIXER STARTERS AND AERATOR STARTERS FROM EXISTING MOTOR CONTROL CENTERS AND RETURN TOO OWNER.
2. DEMOLISH BIOSOLIDS MIXER FEEDER CONDUCTORS FROM MOTOR CONTROL CENTERS TO DISCONNECT SWITCHES NEAR BIOSOLIDS MIXER MOTORS AT BIOSOLIDS BASIN AND DISPOSE. AT BIOSOLIDS BASIN SHORE CUT 3" CONDUITS 24" BELOW GRADE, CAP AND ABANDON IN PLACE. SEE "ELECTRICAL SITE PLAN" FOR ADDITIONAL INFORMATION.
3. DEMOLISH AERATOR FEEDER CONDUCTORS FROM MOTOR CONTROL CENTERS TO POST MOUNTED DISCONNECTS NEAR BIOSOLIDS BASIN SHORE AND DISPOSE. AT AERATOR DISCONNECTS CUT 1 1/2" CONDUITS 24" BELOW GRADE, CAP AND ABANDON IN PLACE. DEMOLISH DISCONNECT MOUNTING POSTS AND DISPOSE. SEE "ELECTRICAL SITE PLAN" FOR ADDITIONAL INFORMATION.

NOTES: ⟨#⟩ – (SYMBOL DENOTES PLAN NOTE)

1. PROVIDE MOTOR CONTROL CENTER MOUNTED REDUCED VOLTAGE SOFT STARTER (RVSS), DOORS AND ENGRAVED NAMEPLATES FOR BIOSOLIDS BASIN AERATORS. AERATOR RVSS COMPARTMENTS SHALL BE MAXIMUM 18" IN HEIGHT. REFER TO "BIOSOLIDS BASIN AERATOR WIRING DIAGRAM" AND SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
2. POWER AND HEATER CABLES SUPPLIED WITH AERATORS. ATTACH CABLES TO BOTTOM OF DISCONNECT SWITCH WITH STAINLESS STEEL KELLEM/HUBBEL CORD GRIPS SIZED FOR CABLE DIAMETER.
3. PROVIDE MOTOR CONTROL CENTER MOUNTED MOLDED CIRCUIT BREAKERS, DOORS AND ENGRAVED NAMEPLATES FOR HEADWORKS BUILDING POWER PANEL PP-H AND BIOSOLIDS PUMP STATION CONTROL PANEL. BREAKER COMPARTMENT SHALL BE MAXIMUM 6" IN HEIGHT.

EX. POWER PANEL PDP (STORAGE RM) ELECTRICAL LOAD ESTIMATE			
LOAD TYPE	CONNECTED VA	DEMAND FACTOR	DEMAND VA
LIGHTING	9131	NONE	9131
RECEPTACLE	8460	0.5 FOR OVER 10,000	8460
MISCELLANEOUS	53040	NONE	53040
KITCHEN	0	0.65	0
MOTOR	97826	INCLUDES 1.25x LARGEST	112400
TOTAL	**168457**		**183031**
SYSTEM VOLTAGE:	**480**	TOTAL DEMAND AMPS:	**220**

EX. MCC-1 (BLOWER ROOM) ELECTRICAL LOAD ESTIMATE			
LOAD TYPE	CONNECTED VA	DEMAND FACTOR	DEMAND VA
LIGHTING	801	NONE	801
RECEPTACLE	1800	0.5 FOR OVER 10,000	1800
MISCELLANEOUS	3450	NONE	3450
KITCHEN	0	0.65	0
MOTOR	911298	INCLUDES 1.25x LARGEST	1010323
TOTAL	**917349**		**1016374**
SYSTEM VOLTAGE:	**480**	TOTAL DEMAND AMPS:	**1223**

EX. MCC-2 (BLOWER ROOM) ELECTRICAL LOAD ESTIMATE			
LOAD TYPE	CONNECTED VA	DEMAND FACTOR	DEMAND VA
LIGHTING	0	NONE	0
RECEPTACLE	0	0.5 FOR OVER 10,000	0
MISCELLANEOUS	0	NONE	0
KITCHEN	0	0.65	0
MOTOR	911613	INCLUDES 1.25x LARGEST	1010638
TOTAL	**911613**		**1010638**
SYSTEM VOLTAGE:	**480**	TOTAL DEMAND AMPS:	**1216**

CONDUIT AND WIRE SCHEDULE	
MARK	DESCRIPTION
⟨#⟩	
A	3#1, 3#10 (MOTOR SPACE HTR & DIFFUSER HTR CONTROL), 2#8 (DIFFUSER HTR), 1#4 GND – 2"C
B	3#1/0, 3#10 (MOTOR SPACE HTR & DIFFUSER HTR CONTROL), 2#8 (DIFFUSER HTR), 1#3 GND – 2"C
C	3#1, 1#6 GND – 1 1/2"C
D	3#4, 1#6 GND – 1 1/4"C
E	3#8, 1#10 GND – 3/4"C
F	3#8 (XHHW), 1#10 GND – 3/4"C
G	3#12, 1#12 GND – 3/4"C
H	3#12, 4#14, 1#12 GND – 3/4"C
J	4#4/0, 1#4 GND – 2 1/2"C
K	2#12, 1#12 GND – 3/4"C

NO.	REVISIONS	BY	DATE

DRAWN: RBD/KCT
DATE: MAY '23
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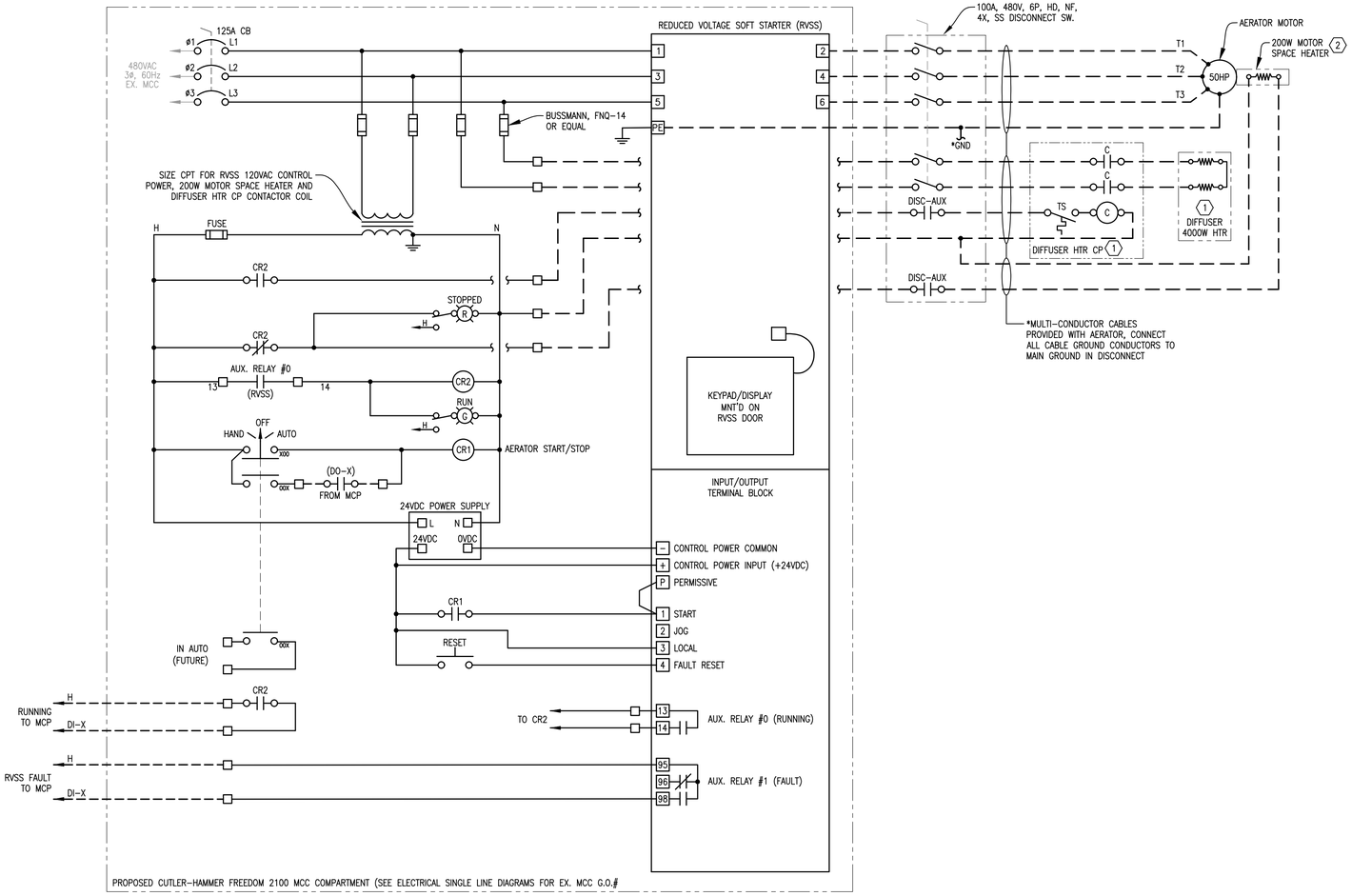
CITY OF HART
OCEANA COUNTY, MICHIGAN
WASTEWATER SYSTEM IMPROVEMENTS
BIOPURE TREATMENT FACILITY
ELECTRICAL SINGLE LINE DIAGRAMS

PROJECT NO. 2211159
SHEET NO. C23 OF C25



NOTES: (#) – (SYMBOL DENOTES PLAN NOTE)

1. 480V, 1-PHASE AERATOR DIFFUSER HEATER AND HEATER CONTROL PANEL PROVIDED BY AERATOR SUPPLIER AND INSTALLED AT MOTOR BY ELECTRICAL CONTRACTOR. HEATER CONTROL PANEL INCLUDES ENCLOSURE, CONTACTOR (C) AND THERMOSTAT (TS). COORDINATE WITH OTHER TRADES AND AERATOR SUBMITTAL DRAWINGS FOR INSTALLATION AND WIRING.
2. MOTOR SPACE HEATER PROVIDED INTEGRAL TO AERATOR MOTOR.

EAST/WEST BIOSOLIDS BASINS AERATOR RVSS WIRING DIAGRAM – TYPICAL OF 4

REDUCED VOLTAGE SOFT STARTERS MOUNTED IN MCC-1 AND MCC-2, SEE MCC ELECTRICAL SINGLE LINE DIAGRAMS & ELEVATIONS

NO.	REVISIONS	BY	DATE

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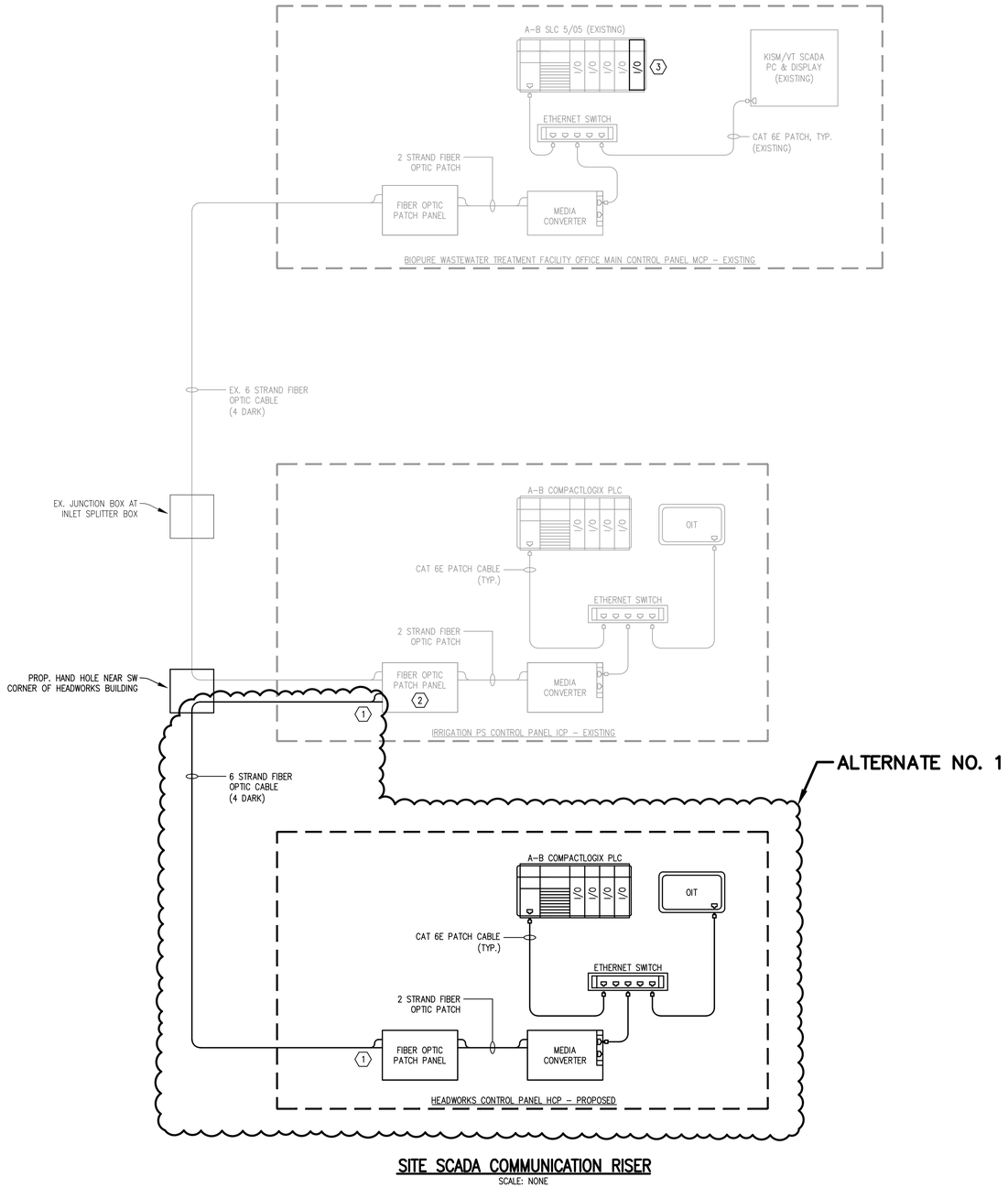
WIRING DIAGRAM

PROJECT NO. 2211159
SHEET NO. C24 OF C25



SITE SCADA COMMUNICATION RISER

SCALE: NONE

GENERAL NOTES:

1. ENGRAVED EQUIPMENT NAMEPLATES (WHITE PHENOLIC WITH BLACK LETTERS) SHALL BE FURNISHED AND INSTALLED BY THE ELECTRICAL CONTRACTOR FOR NEW AND EXISTING ELECTRICAL EQUIPMENT AS NOTED. LETTER SIZES: 1" HIGH FOR INDIVIDUAL ELECTRICAL POWER DISTRIBUTION AND SERVICE EQUIPMENT. LETTER SIZES: 1/4" HIGH FOR INDIVIDUAL ELECTRICAL MOTOR CONTROL CENTER UNITS, VFD ENCLOSURES, SAFETY DISCONNECTS, COMBINATION STARTERS AND PROCESS INSTRUMENTATION.

NOTES: ⟨#⟩ - (SYMBOL DENOTES PLAN NOTE)

1. FURNISH FIBER OPTIC CONNECTORS ON BOTH ENDS OF USED AND SPARE FIBERS.
2. IN IRRIGATION PUMP STATION CONTROL PANEL ICP RECONFIGURE EX. FIBER OPTIC CABLING AS NEEDED IN PATCH PANEL TO CONNECT NEW FIBER OPTIC CABLING TO CONNECT PROP. HEADWORKS CONTROL PANEL HCP INTO THE SCADA NETWORK.
3. PROVIDE AN ALLEN-BRADLEY, 4-POINT, 4-20MA, ANALOG OUTPUT CARD IN SPARE SLOT 11 OF SLC 5/05 IO CHASSIS OF MAIN CONTROL PANEL (MCP). PROVIDE WIRE TERMINALS AT BOTTOM OF THIRD DIN RAIL FROM LEFT AND PROVIDE SHIELDED CABLING FROM ANALOG OUTPUTS TO TERMINALS. COORDINATE WITH INTEGRATOR.
4. IN EX. CONTROL PANEL (MCP) DEMOLISH ALL ALARM PILOT LIGHTS AND LEGENDS FROM DOOR OF MAIN CONTROL PANEL (MCP). DEMOLISH ASSOCIATED PILOT LIGHT WIRING BACK TO RESPECTIVE WIRE TERMINALS. FILL PILOT LIGHT HOLES WITH ADEQUATELY SIZED METALLIC PUSH IN PLUGS. DELETE PLC PROGRAMMING ASSOCIATED WITH DEMOLISHED PILOT LIGHT DIGITAL OUTPUTS MAKING THESE DIGITAL OUTPUTS SPARE. AT SLOT 8 DIGITAL OUTPUT CARD REWIRE IO POINTS 00-12 AS DRY CONTACT RELAY OUTPUTS FOR EXTERNAL SOURCE CONTROL VOLTAGE, PROVIDE ADDITIONAL WIRE TERMINALS AS NEEDED. LEAVE REMAINING SPARED RELAY OUTPUTS WIRED AS IS. SPARED OUTPUTS SHALL BE UTILIZED FOR MOTOR CONTROL ON THIS PROJECT. COORDINATE WITH INTEGRATOR.

NO.	REVISIONS	BY	DATE

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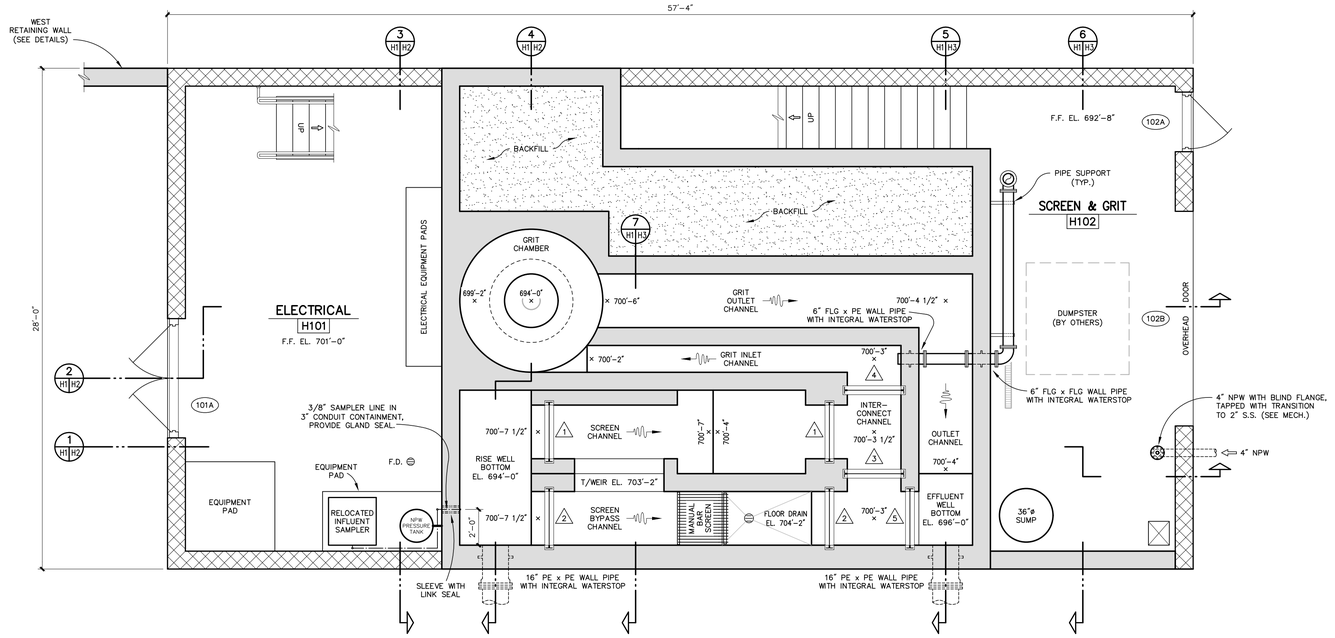
BIOPURE TREATMENT FACILITY
SCADA COMMUNICATION RISER

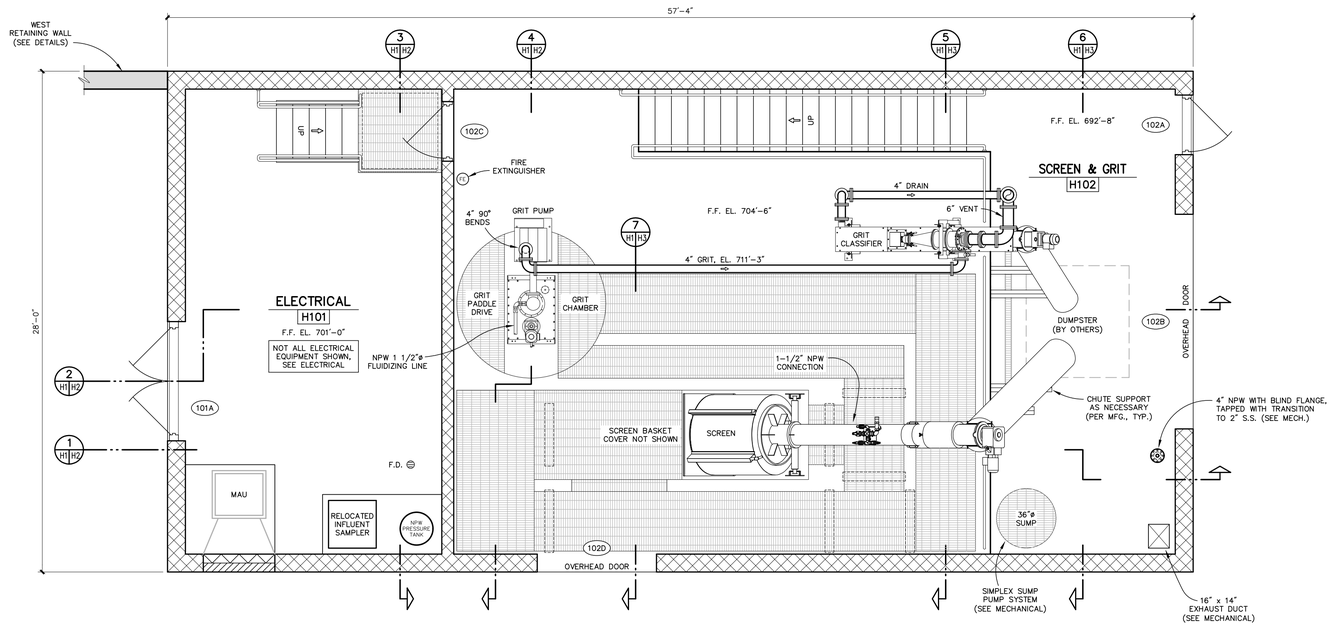
PROJECT NO. 2211159
SHEET NO. C25 OF C25



LOWER PROCESS PLAN

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

North



UPPER PROCESS PLAN

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

North

ALTERNATE No. 1

NO.	REVISIONS	BY	DATE

DRAWN: SMYTH
DATE: MAY '23
CHECKED: N.V.H.
DATE: MAY '23

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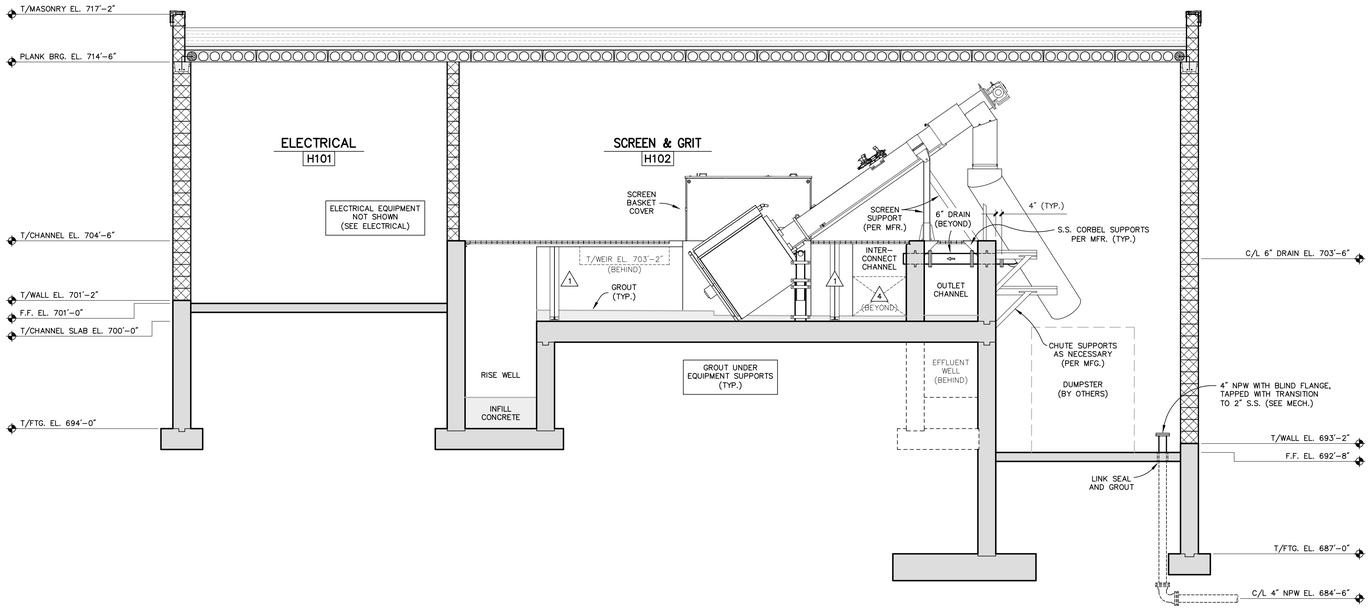
WASTEWATER SYSTEM IMPROVEMENTS
BIOPURE TREATMENT FACILITY

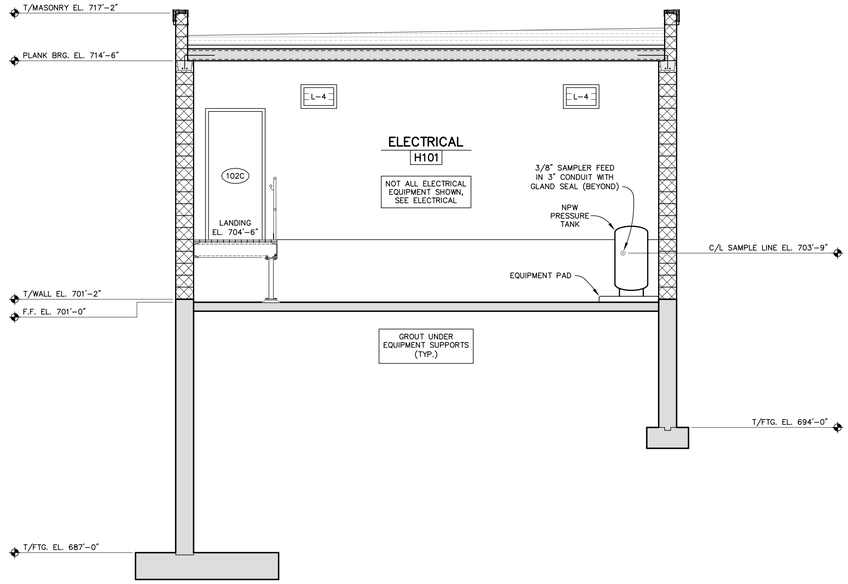
PROCESS PLANS

PROJECT NO. 2211159

SHEET NO. H1 OF H21



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



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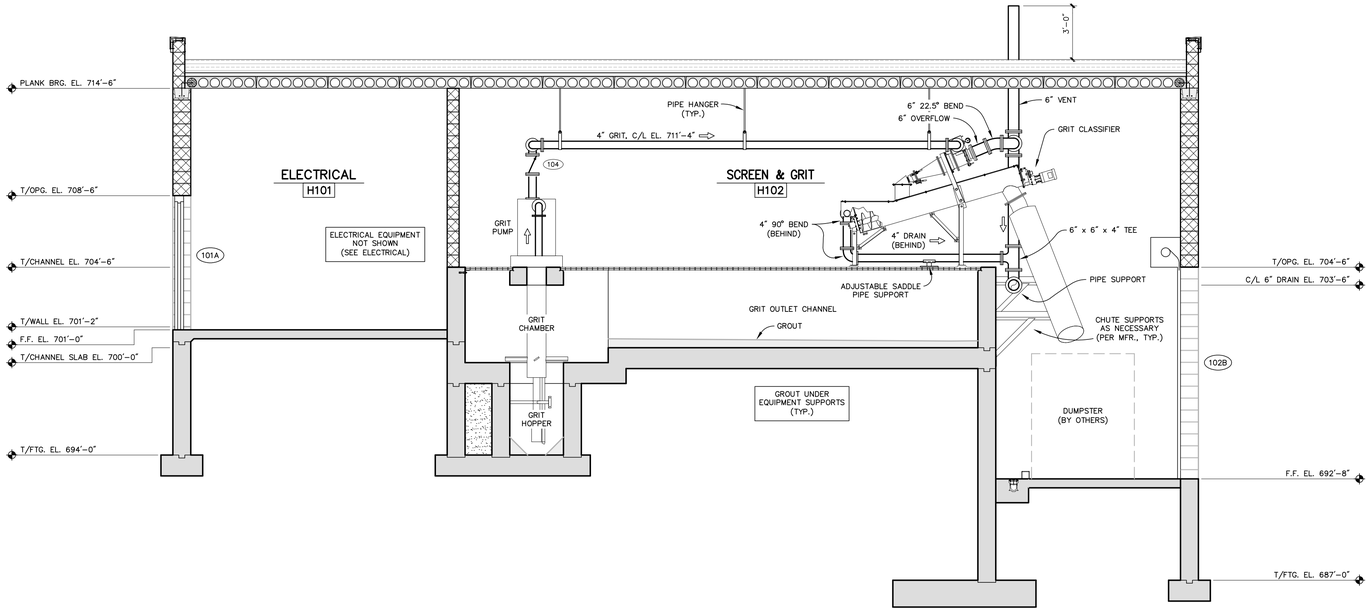

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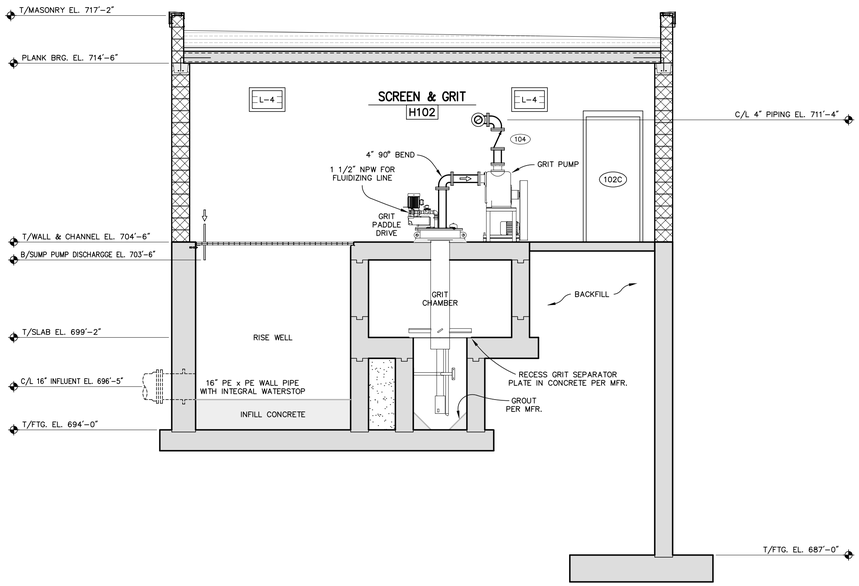

SECTION 4
SCALE : 1/4" = 1'-0"

ALTERNATE No. 1

NO.	REVISIONS	BY	DATE

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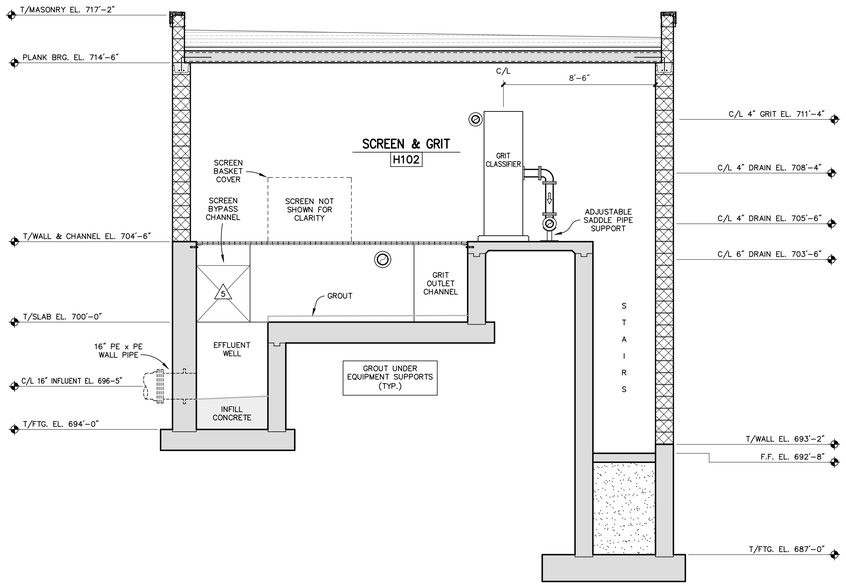
WASTEWATER SYSTEM IMPROVEMENTS
BIOPURE TREATMENT FACILITY

PROCESS SECTIONS

PROJECT NO. 2211159
SHEET NO. H2 OF H21



SECTION 5 (H1 | H3)
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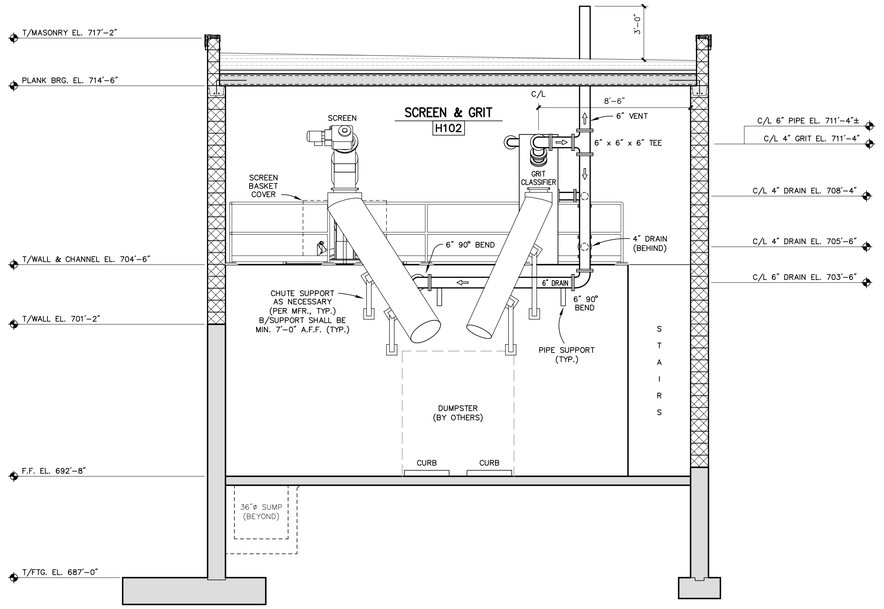

SECTION 6 (H1 | H3)
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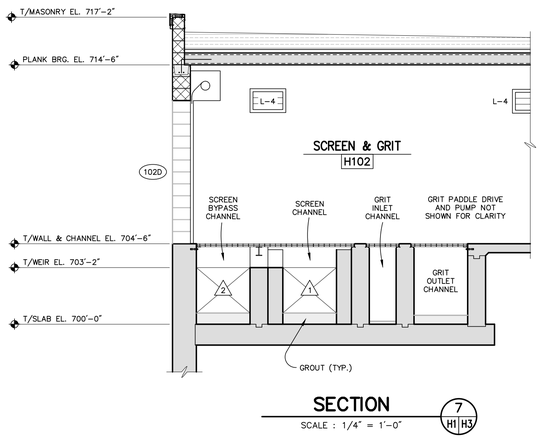

SECTION 7 (H1 | H3)
SCALE : 1/4" = 1'-0"

ALTERNATE No. 1

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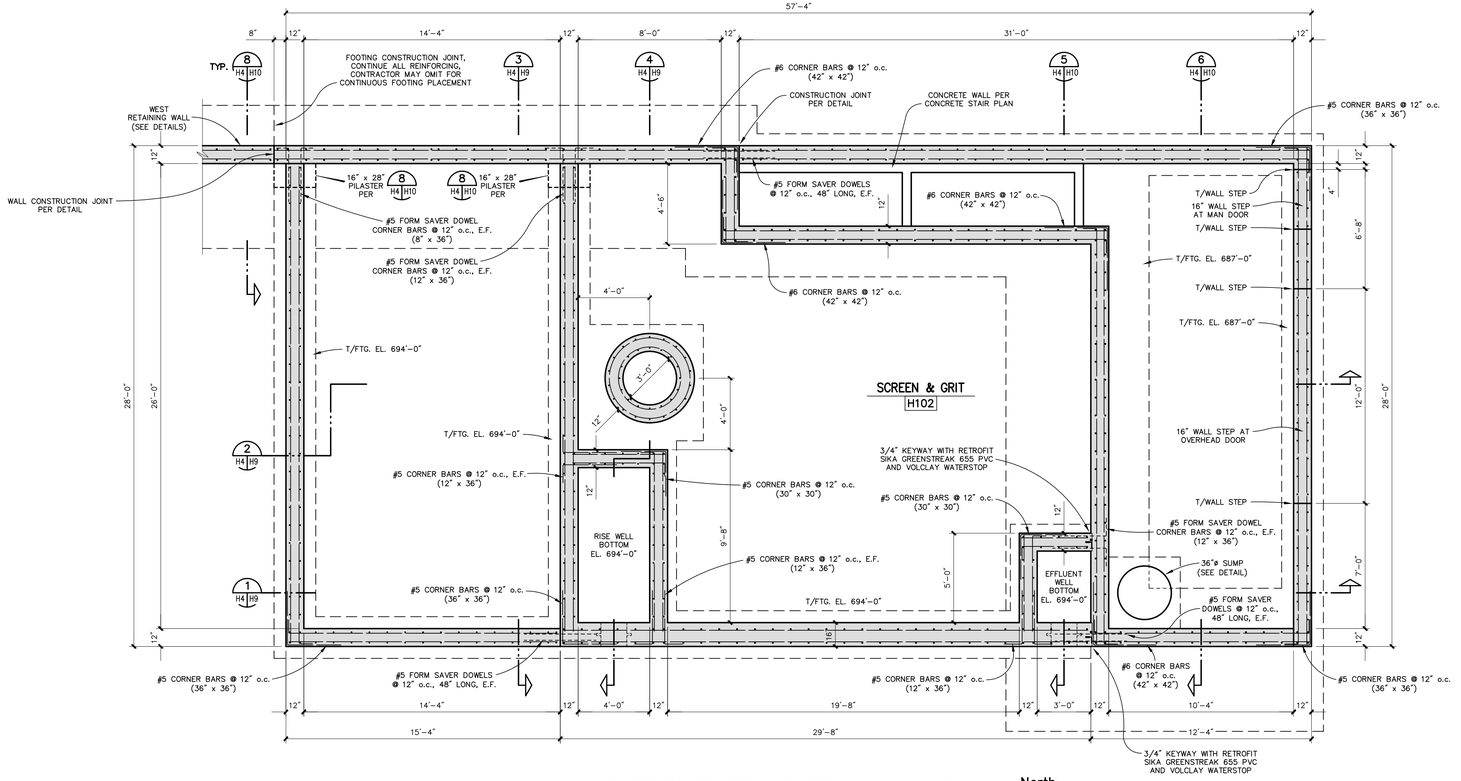
BIOPURE TREATMENT FACILITY

PROCESS SECTIONS

PROJECT NO. 2211159
SHEET NO. H3 OF H21



BASE SLAB, FOUNDATION & WALL PLAN

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

North

NOTE

PLACE FOUNDATION WALL CONSTRUCTION JOINTS AS NEEDED AT APPROVED LOCATIONS SUBMITTED BY CONTRACTOR. CONTINUE REINFORCING AND INSTALL PVC WATERSTOP WHERE CONSTRUCTION JOINTS OCCUR.

DESIGN LOAD SUMMARY

GOVERNING CODE	2015 MICHIGAN BUILDING CODE
STRUCTURE CATEGORY	III
ROOF	
SNOW LOAD	47 psf (ASD)
DEAD LOAD (INCLUDING PLANK)	95 psf (ASD)
LIVE LOAD	20 psf (ASD)
SNOW	
GROUND SNOW LOAD, P_g	60 psf (ASD)
FLAT ROOF SNOW, P_f	47 psf (ASD)
SNOW EXPOSURE, C_e	1.0
SNOW IMPORTANCE, I_s	1.1
THERMAL FACTOR, C_t	1.0
WIND	
WIND SPEED, V	120 mph
EXPOSURE	C
COMPONENTS & CLADDING (ENCLOSED)	
WALLS	+32.4/−35.1 psf (LRFD)
ROOF	+16.0/−32.4 psf (LRFD)
SEISMIC	
SEISMIC IMPORTANCE, I_e	1.25
SOIL SITE CLASSIFICATION	D
MAPPED SPECTRAL RESPONSE ACCELERATION	
S_{DS}	0.063
S_{D1}	0.062
SEISMIC DESIGN CATEGORY	A
SEISMIC-FORCE RESISTING SYSTEM	
A. BEARING WALL SYSTEM	
#9 ORDINARY REINFORCED CMU SHEAR WALLS	
RESPONSE MODIFICATION FACTOR, R	2
DESIGN BASE SHEAR	V=0.010W (ASD)
EQUIVALENT LATERAL FORCE PROCEDURE	

BUILDING CODE DATA

BUILDING AREA	1605 SFT.
BUILDING USE	WASTEWATER FACILITY HEADWORKS
OCCUPANCY	GROUP U ✱
TYPE OF CONSTRUCTION	V – B
NUMBER OF STORIES	1
BUILDING HEIGHT	24'-0"
✱ = NON-ACCESSIBLE PER IBC 1103.2.9	

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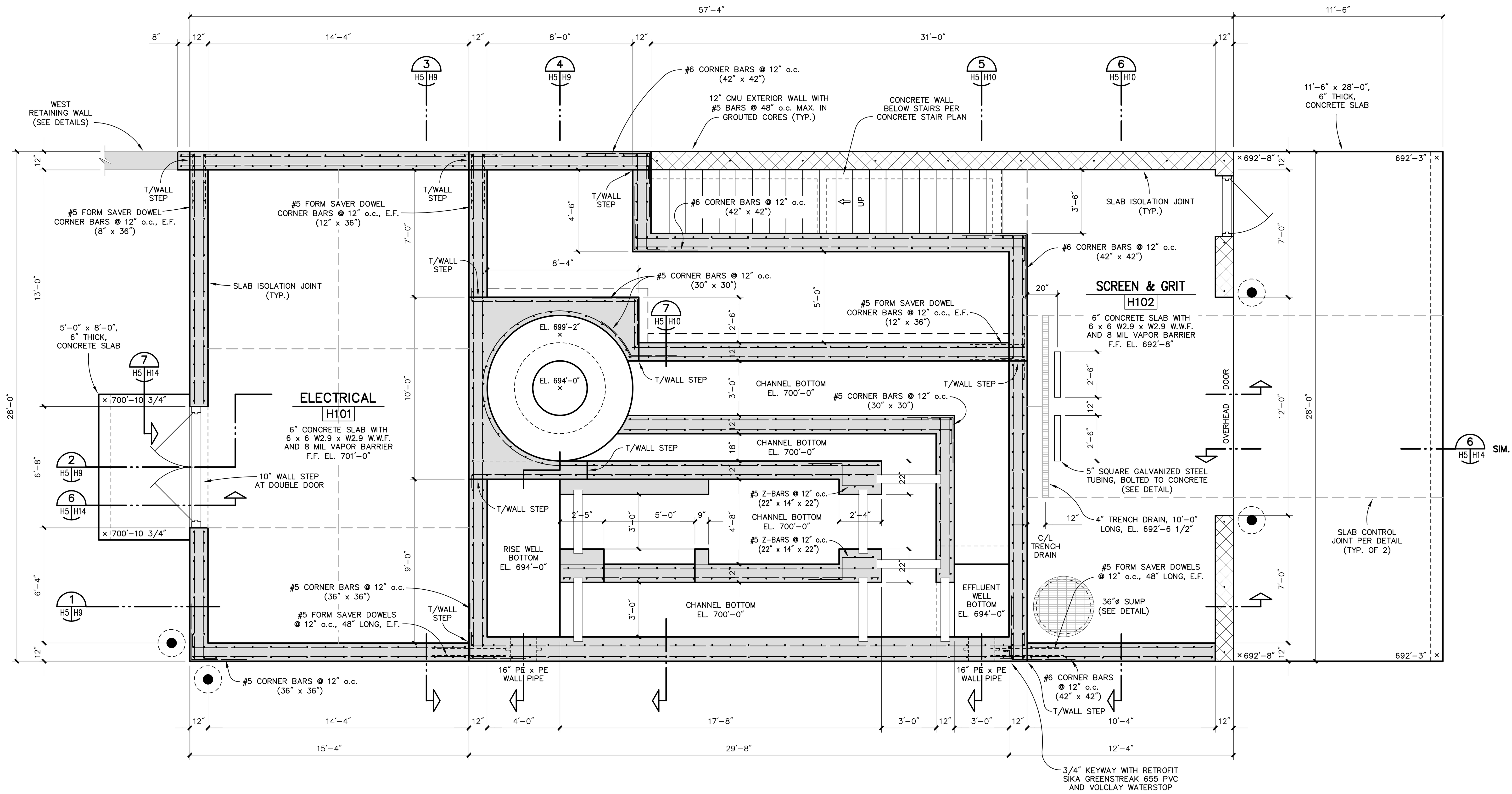
BIOPURE TREATMENT FACILITY

BASE SLAB, FOUNDATION & WALL PLAN

PROJECT NO. 2211159
SHEET NO. H4 OF H21



FLOOR & SLAB PLAN – EL. VARIES

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

INSULATED CONCRETE MASONRY UNIT (CMU) NOTES

1. INSULATED CONCRETE MASONRY UNITS ARE A SINGLE WYTHE WALL ASSEMBLY WITH NO DIRECT CROSS WEBS AND MOLDED EPS INSULATION INSERTS AND SHALL COMPLY WITH PRESCRIPTIVE INSULATION REQUIREMENTS FOR ABOVE GRADE MASS WALL CONSTRUCTION FOR CLIMATE ZONE 6.
2. PROVIDE (1) BAR EACH SIDE OF OPENING AND CONTROLS JOINTS UNLESS NOTED OTHERWISE.
3. GROUT CORES OF CMU AT ALL REINFORCING
4. PROVIDE MOLDED EPS INSULATION INSERTS IN ALL UNGROUTED CELLS.

DOOR SCHEDULE

No.	DOOR				FRAME		DETAIL		HARDWARE GROUP
	SIZE	TYPE	MAT.	FINISH	MAT.	FINISH	HEAD	JAMB	
101A	(2) 3'-0" x 7'-2" x 1 3/4"	SOLID	HM	PAINT	HM	PAINT	H1 H8 H7	J1 H8 H7	GROUP 2
102A	3'-0" x 6'-10" x 1 3/4"	SOLID	HM	PAINT	HM	PAINT	H1 H8 H7	J3 H8 H7	GROUP 1
102B	12'-0" x 11'-10"	COIL	AL	FACTORY	AL	FACTORY		J4 H8 H7	PER MFR.
102C	3'-0" x 7'-0" x 1 3/4"	SOLID	HM	PAINT	HM	PAINT	H2 H9 H7	J2 H9 H7	GROUP 3
102D	8'-0" x 8'-0"	COIL	AL	FACTORY	AL	FACTORY		J4 H8 H7	PER MFR.

NOTES :

1. ALL EXITS ARE TO BE OPERABLE FROM THE INSIDE WITHOUT THE USE OF A KEY OR SPECIAL KNOWLEDGE.
2. ALL OUTSIDE DOOR FITTINGS AND LOCKS SHALL BE CORROSION AND VANDAL RESISTANT WITH STAINLESS STEEL SECURITY FITTINGS AND LOCKS.
3. LOCKS WILL HAVE INTERCHANGEABLE TYPE 316 S.S. CYLINDERS AND WILL BE KEYED TO THE OWNER'S STANDARDS. CONTRACTOR SHALL OBTAIN APPROVAL FROM THE OWNER FOR ALL LOCKS AND DOOR HARDWARE.

STRUCTURAL FINISH SCHEDULE

MARK	FINISH
1	SPLIT FACE (EXTERIOR), PRECISION (INTERIOR) CONCRETE MASONRY UNITS. COLOR – CONSUMERS CONCRETE CORPORATION, OWNER SELECTION FROM MFR. STANDARD COLORS TO MATCH EXISTING TREATMENT BUILDING. MORTAR COLOR TO MATCH BLOCK COLOR INTERIOR FINISH PER MARK 5
2	PARAPET, CAP, TRIM AND DOWNSPOUTS. COLOR – COLORKLAD MANSARD BROWN
3	METAL DOOR AND FRAME COLOR – TNEMEC FLINT HILLS 75BR
4	INTERIOR WALLS AND CEILING COLOR – TNEMEC METEOR SHOWER 22GR
5	EXTERIOR BURIED CONCRETE WALLS. DAMPPROOFING PER 07 11 13.
6	INTERIOR CONCRETE FLOORS (NON-WET WELL, OR TO RECEIVE ANOTHER FINISH). CONCRETE SEALER PER 03 30 00.
7	OVERHEAD COILING DOOR. COLOR – WAYNE DALTON BEIGE
8	GLASS BLOCK, 8" x 8" x 4", SEE DETAILS COLOR – SEVES NUBIO

NOTE : PRODUCTS AND COLORS ABOVE ARE PRELIMINARY AND SHOW PROPOSED COLOR PALETTE. CONTRACTOR TO SUBMIT ALL SELECTED COLOR SAMPLES FOR FINAL OWNER APPROVAL.

ALTERNATE No. 1

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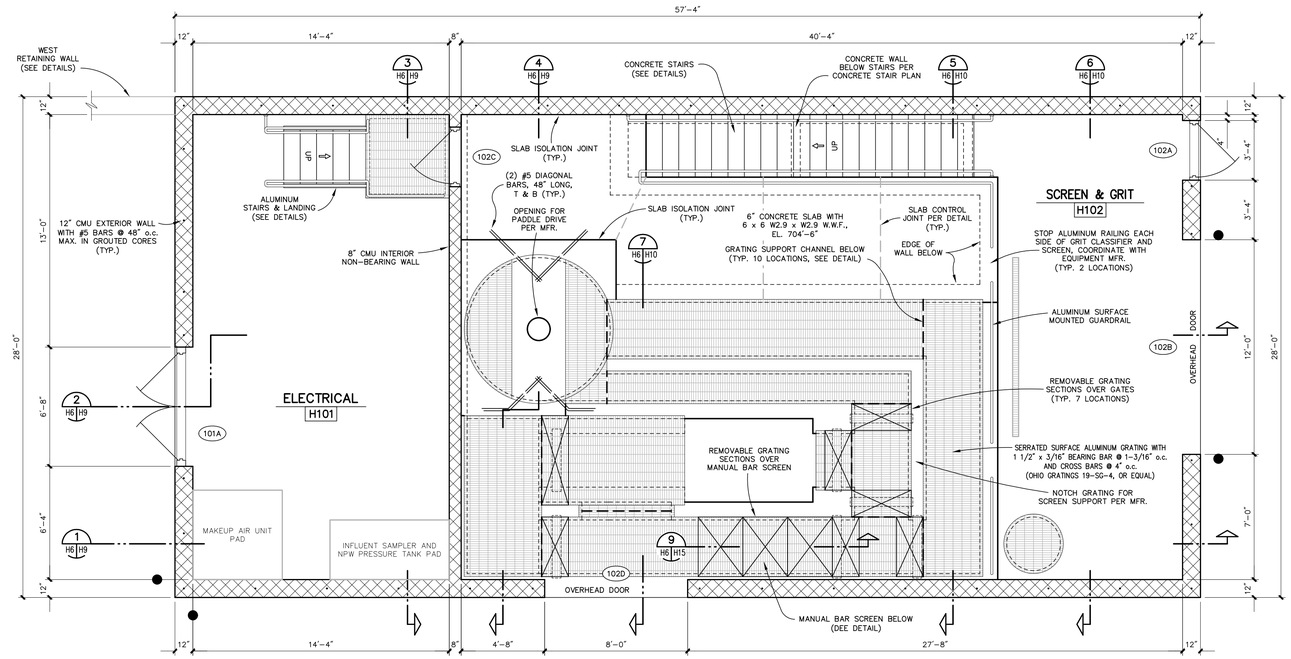
BIOPURE TREATMENT FACILITY

FLOOR & SLAB PLAN – EL. 701'-0"

PROJECT NO. 2211159

SHEET NO. H5 OF H21



FLOOR & SLAB PLAN – EL. 704'-6"

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

North

ALUMINUM GRATING NOTES

1. ALL GRATING OPENING LOCATIONS AND SIZE SHALL BE COORDINATED WITH APPROPRIATE TRADES.
2. ALL GRATING EDGES SHALL BE BANDED.
3. ALL GRATING ANCHORS AND HARDWARE SHALL BE STAINLESS STEEL.
4. MINIMUM AVERAGE WIDTH OF ANY GRATING SECTION SHALL BE 16 INCHES.
5. GRATING SHALL BE ANCHORED PER MANUFACTURERS RECOMMENDATIONS, MINIMUM FOUR (4) LOCATIONS PER GRATING PIECE.
6. ALUMINUM IN CONTACT WITH CONCRETE OR MASONRY SURFACES SHALL BE COATED WITH TNEMEC SERIES 66 EPOXY, 2-4 MILS THICK.

ALTERNATE No. 1

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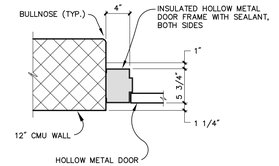
WASTEWATER SYSTEM IMPROVEMENTS
BIOPURE TREATMENT FACILITY

FLOOR & SLAB PLAN – EL. 704'-6"

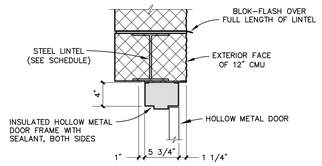
PROJECT NO. 2211159

SHEET NO. H6 OF H21



SECTION J1 (H8 | H7)

SCALE : 1" = 1'-0"



SECTION H1 (H8 | H7)

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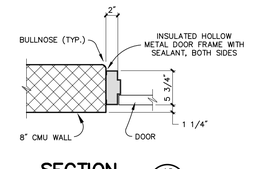
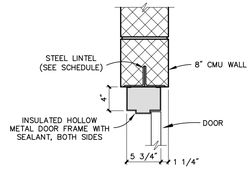


SECTION J2 (H9 | H7)

SCALE : 1" = 1'-0"



SECTION H2 (H9 | H7)

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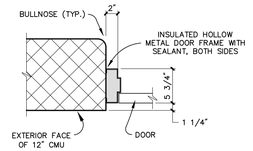

SECTION J3 (H8 | H7)

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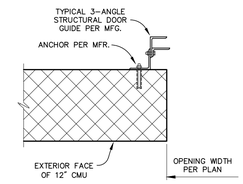

SECTION J4 (H8 | H7)

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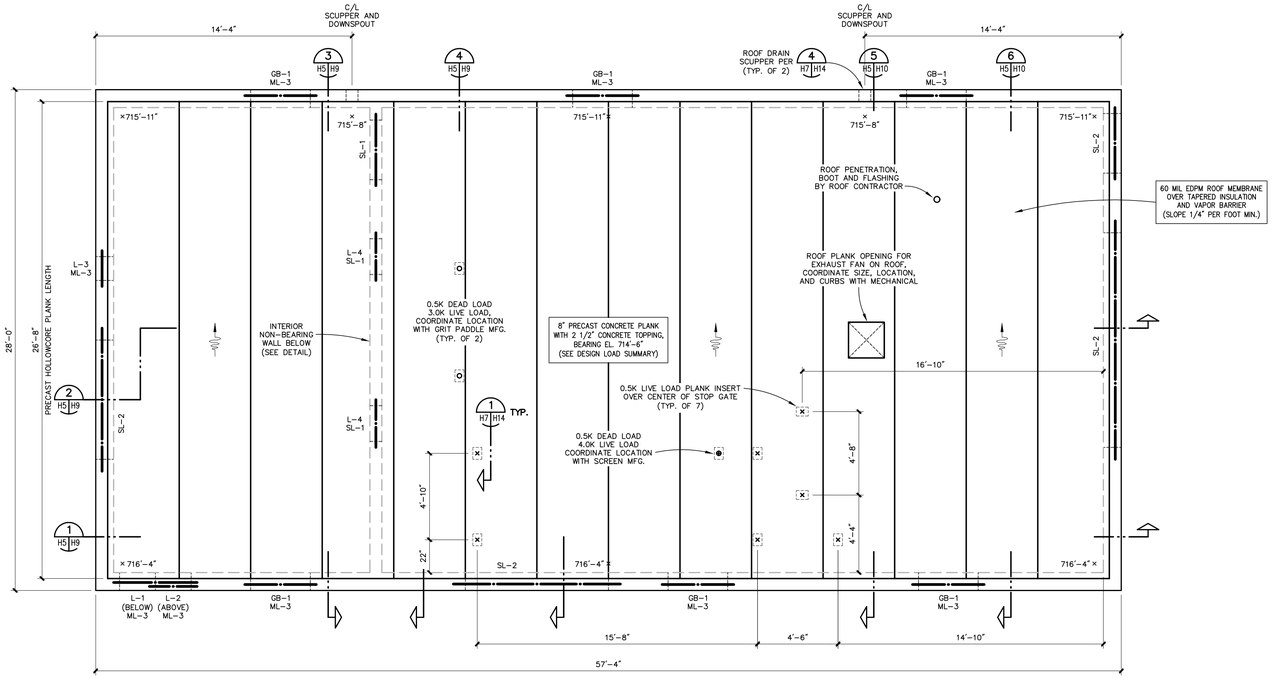

ROOF PLANK PLAN

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

North

NOTE

CONTRACTOR TO COORDINATE LOCATIONS AND LOADS FOR MECHANICAL EQUIPMENT AND WASHER COMPACTOR CHUTE HANGING FROM THE HOLLOW CORE PLANK.

LINTEL SCHEDULE

MARK	S I Z E	CONFIGURATION	REMARKS
SL-1	(2) L 3-1/2" x 3-1/2" x 1/4"		
SL-2	W8 x 18 & 11" x 1/4" PLATE		
ML-3	8" DEEP CMU BOND BEAM		(2) #5 BARS CONT.
NOTE : LINTEL LENGTH = OPENING + 16" (8" MINIMUM BEARING BOTH SIDES)			

LOUVER (MASONRY WALL OPENING) INFORMATION

No.	DESCRIPTION	WIDTH (INCHES)	HEIGHT (INCHES)	T/OPG. (ELEV.)	B/OPG. (ELEV.)	REMARKS
L-1	MECHANICAL LOUVER	48	48	706'-6"	702'-6"	COORDINATE WITH MECHANICAL
L-2	MECHANICAL LOUVER	16	24	713'-2"	711'-2"	COORDINATE WITH MECHANICAL, ABOVE L-1
L-3	MECHANICAL LOUVER	16	24	713'-2"	711'-2"	COORDINATE WITH MECHANICAL
L-4	MECHANICAL LOUVER	24	16	713'-2"	711'-10"	TYP. 2 LOCATIONS, COORDINATE WITH MECHANICAL
GB-1	GLASS BLOCK	40	24	713'-2"	711'-2"	TYP. 6 LOCATIONS

ALTERNATE No. 1

NO.	R E V I S I O N S	BY	DATE

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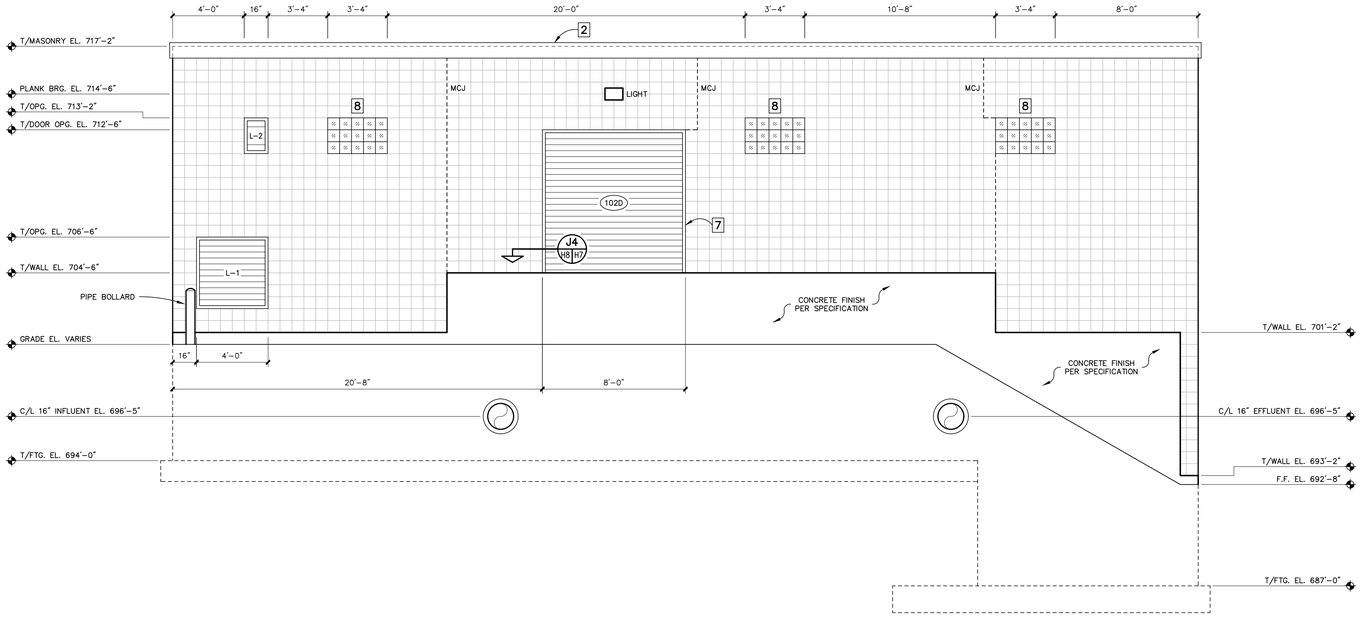
BIOPURE TREATMENT FACILITY

ROOF PLANK PLAN

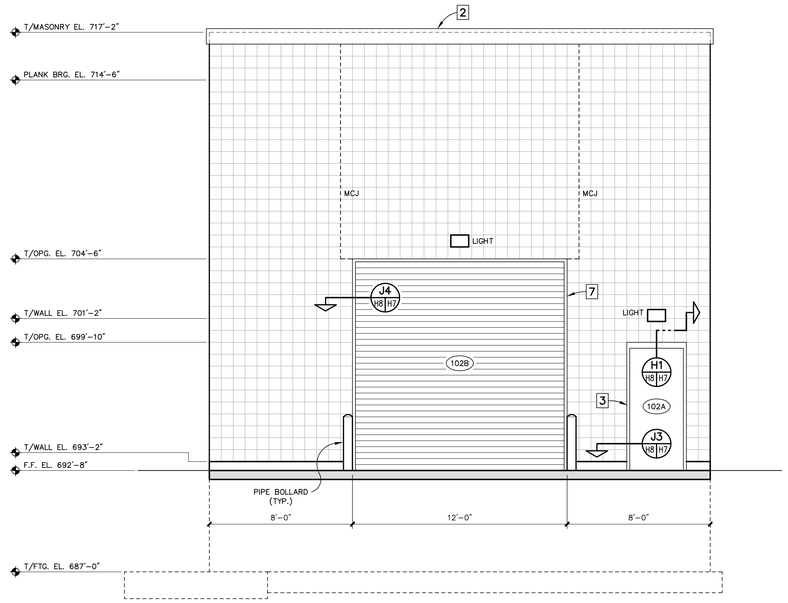
PROJECT NO. 2211159

SHEET NO. H7 OF H21



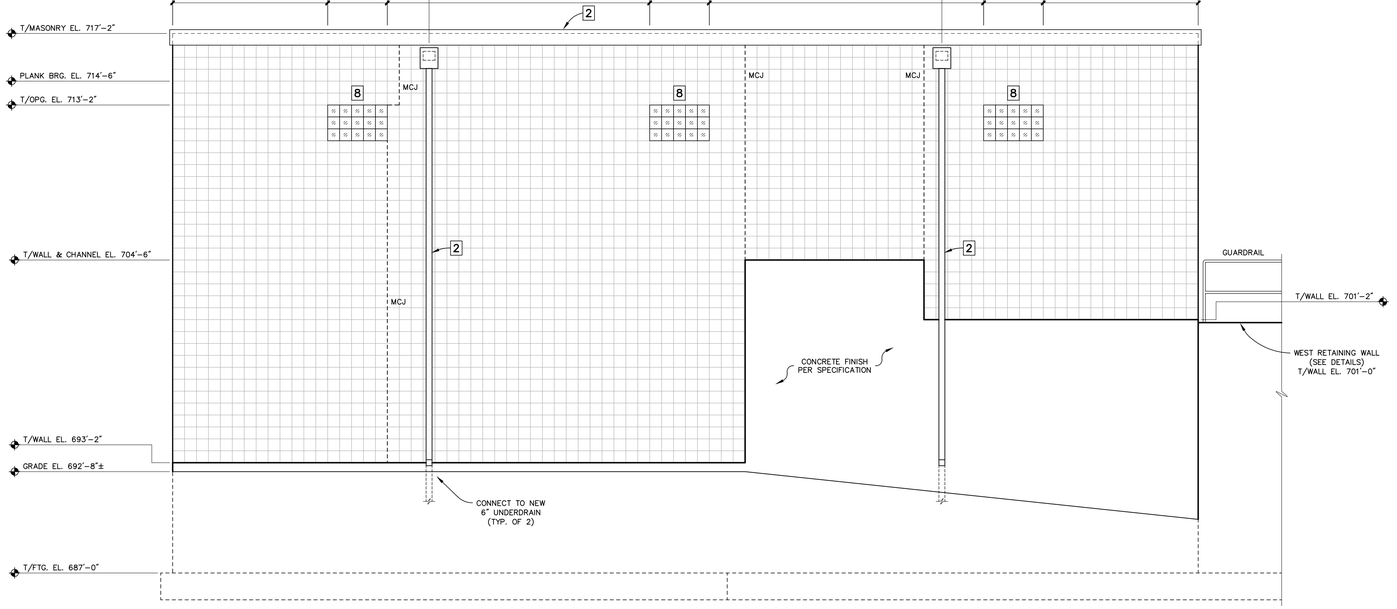
SOUTHWEST ELEVATION

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



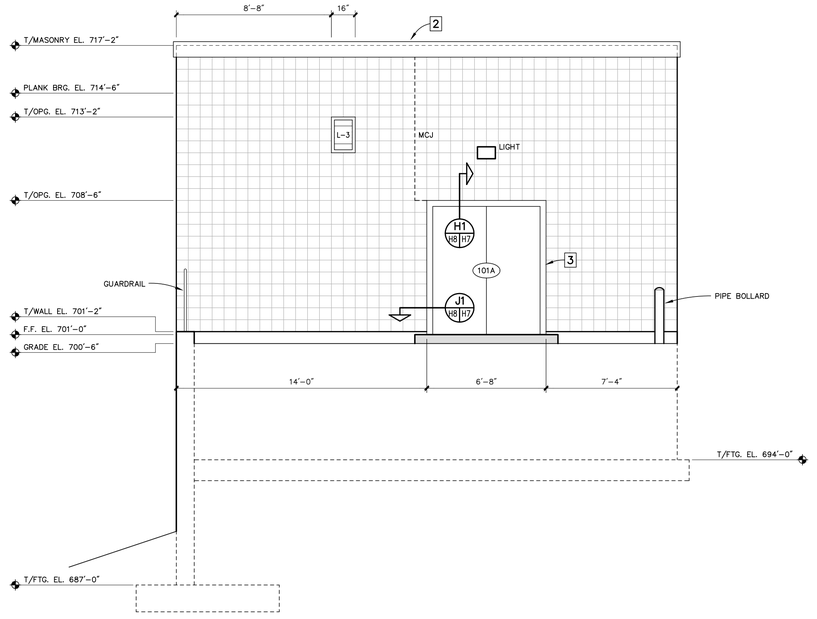
SOUTHEAST ELEVATION

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



NORTHEAST ELEVATION

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



NORTHWEST ELEVATION

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

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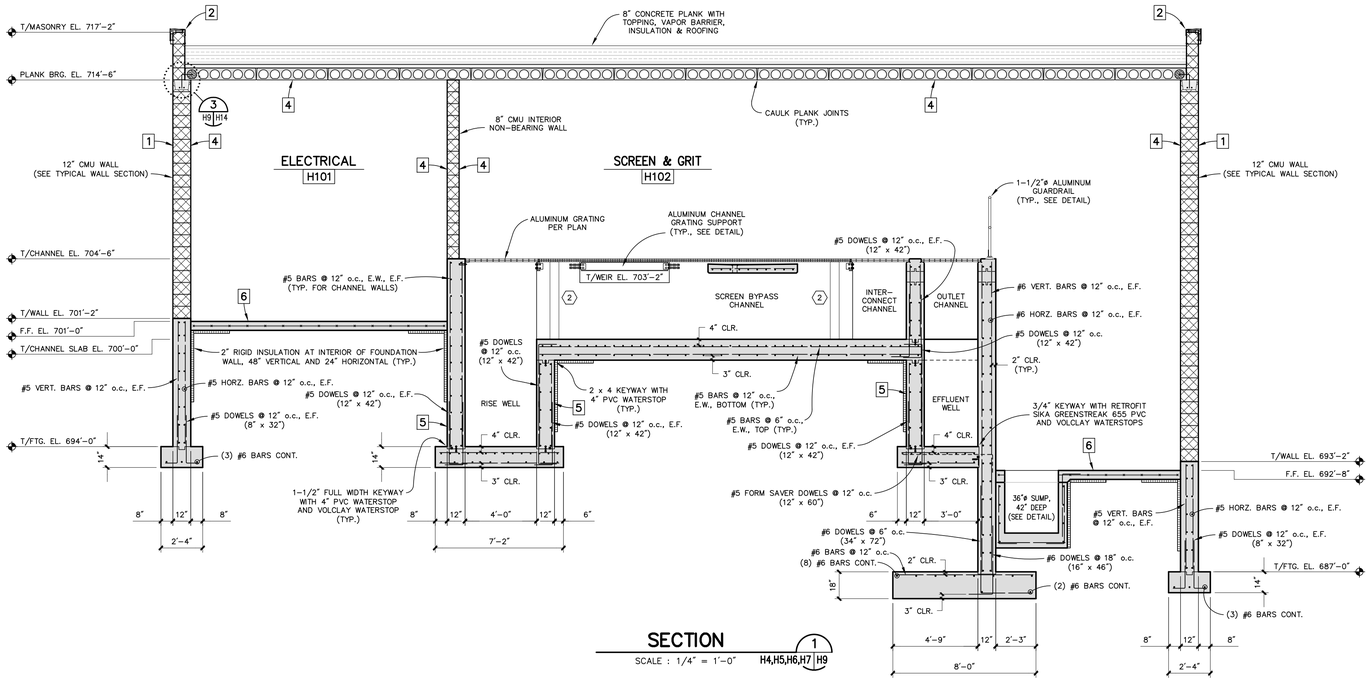
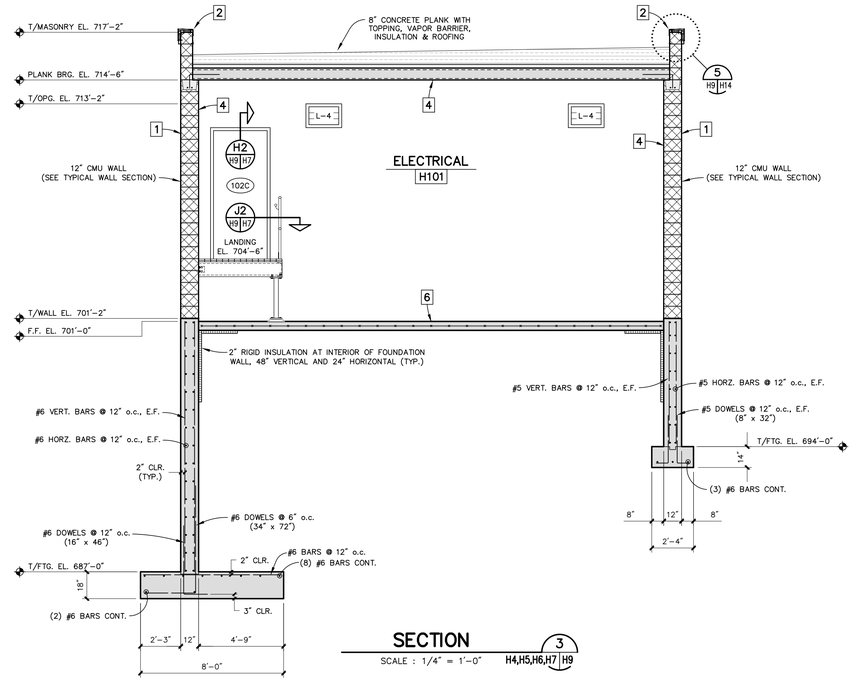
ELEVATIONS

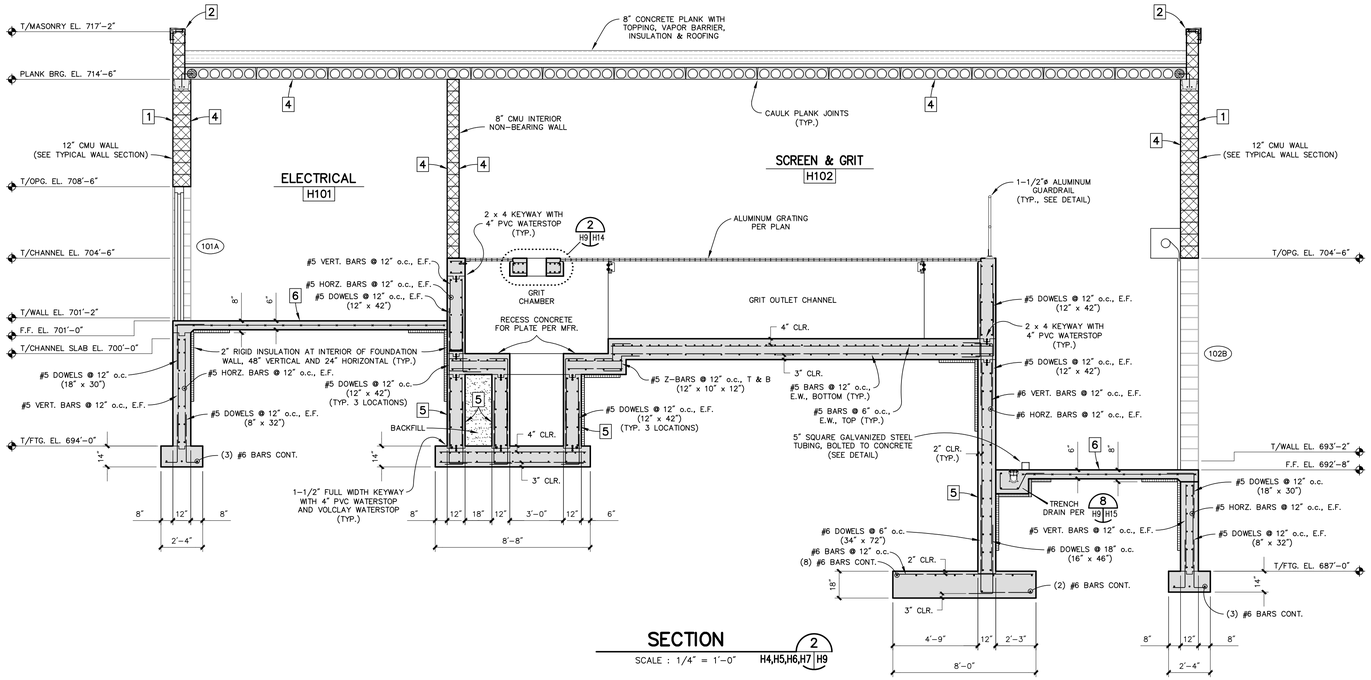
PROJECT NO. 2211159
SHEET NO. H8 OF H21



SECTION
SCALE : 1/4" = 1'-0" — H4,H5,H6,H7 | H9 — 1



SECTION
SCALE : 1/4" = 1'-0" — H4,H5,H6,H7 | H9 — 3



SECTION
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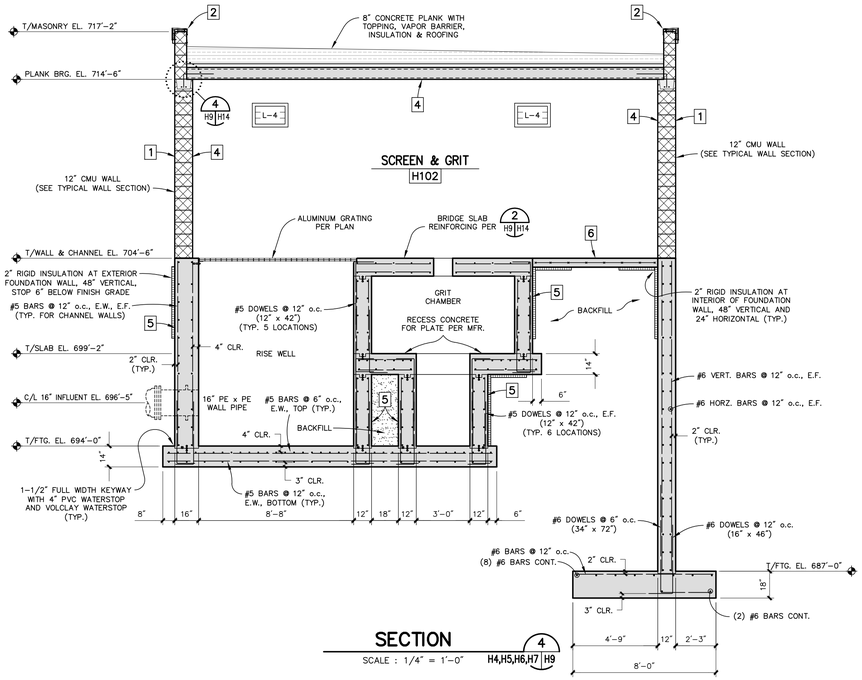

SECTION
SCALE : 1/4" = 1'-0" — H4,H5,H6,H7 | H9 — 4

ALTERNATE No. 1

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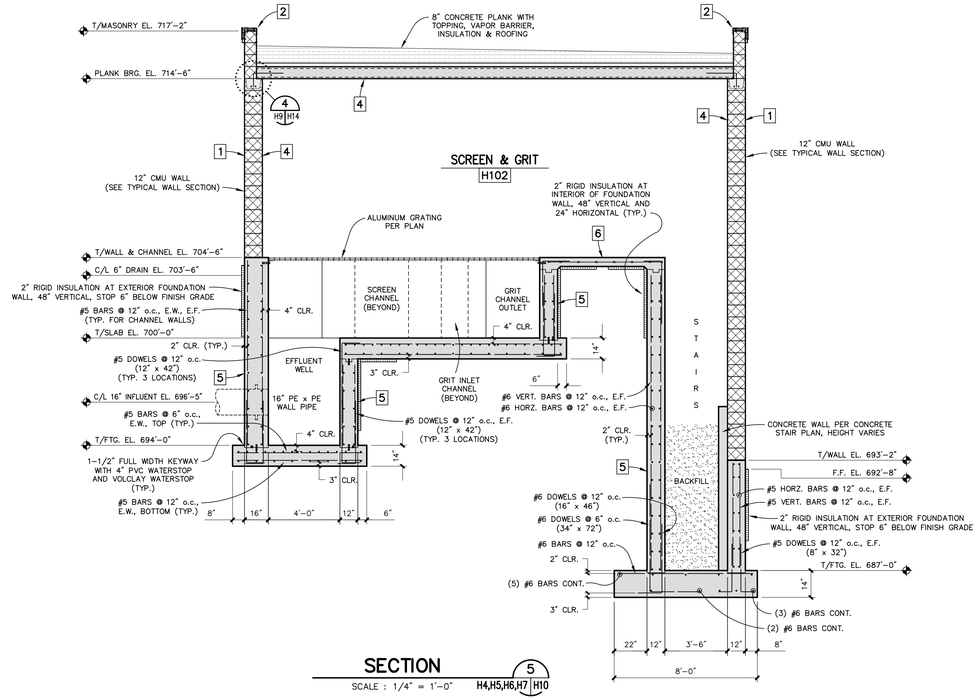
WASTEWATER SYSTEM IMPROVEMENTS
BIOPURE TREATMENT FACILITY

STRUCTURAL SECTIONS

PROJECT NO. 2211159
SHEET NO. H9 OF H21



SECTION 5
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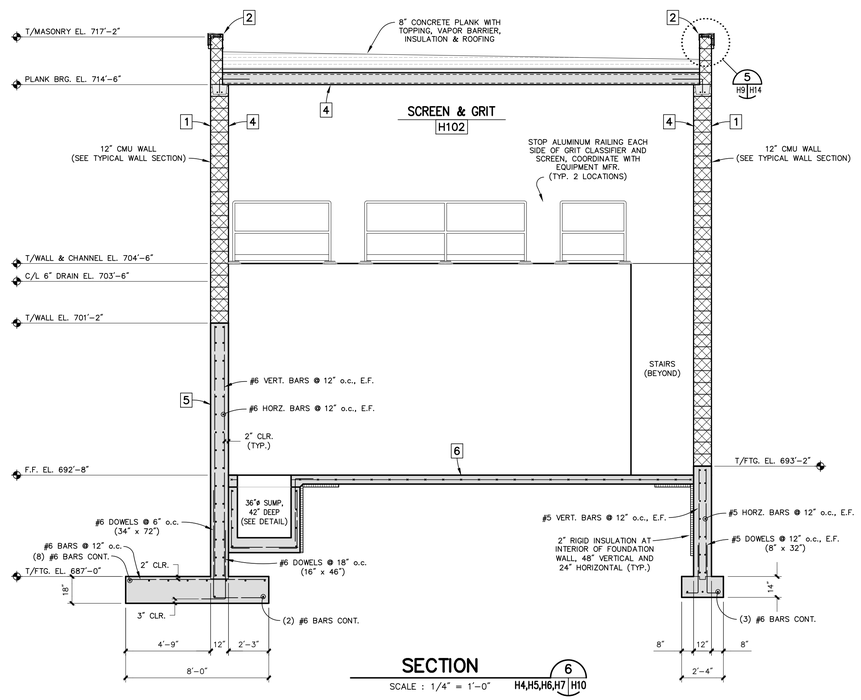
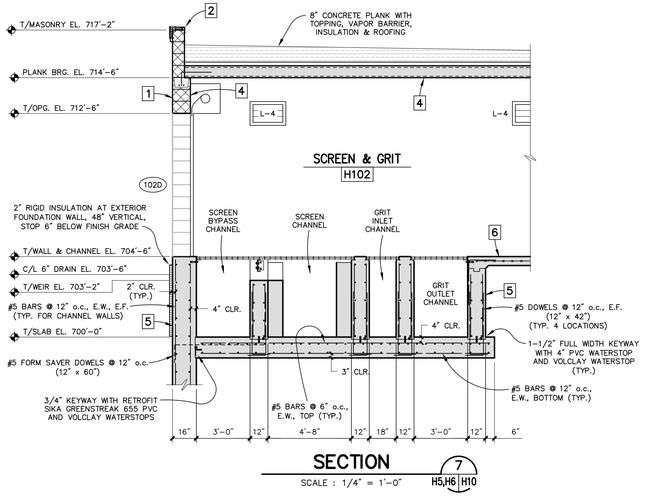
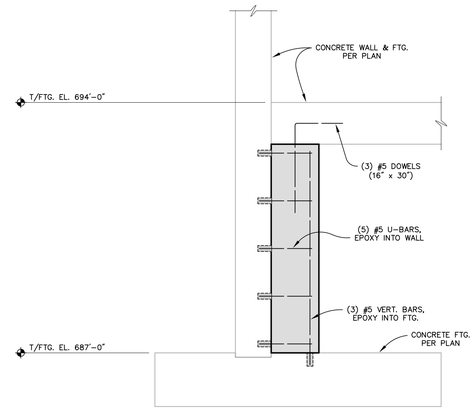


SECTION 6
SCALE : 1/4" = 1'-0" H4,H5,H6,H7 | H10



SECTION 7
SCALE : 1/4" = 1'-0" H5,H6 | H10



PILASTER DETAIL 8
SCALE : 1/2" = 1'-0" H4 | H10

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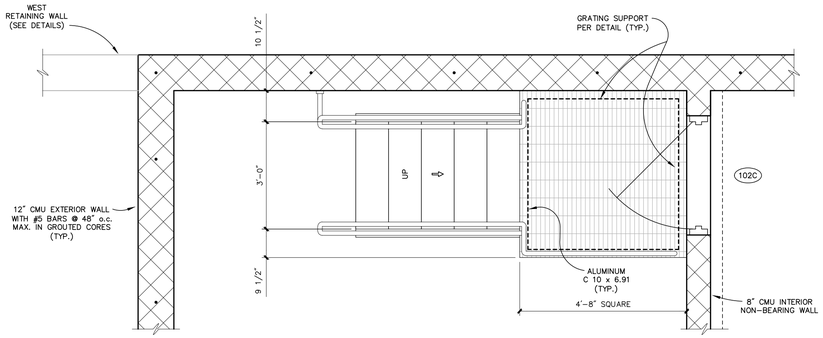
BIOPURE TREATMENT FACILITY

STRUCTURAL SECTIONS

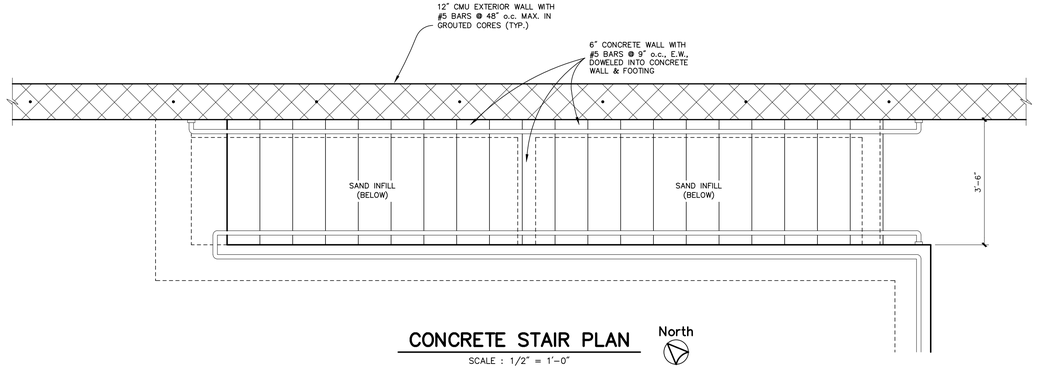
PROJECT NO. 2211159
SHEET NO. H10 OF H21



ALUMINUM STAIR PLAN

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

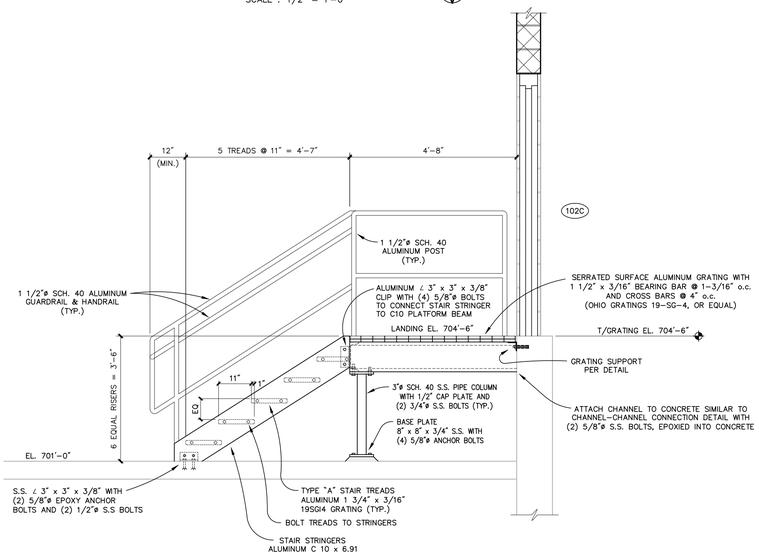
North



CONCRETE STAIR PLAN

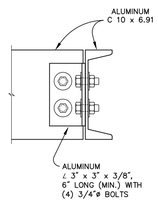
SCALE : 1/2" = 1'-0"

North



ALUMINUM STAIR SECTION

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

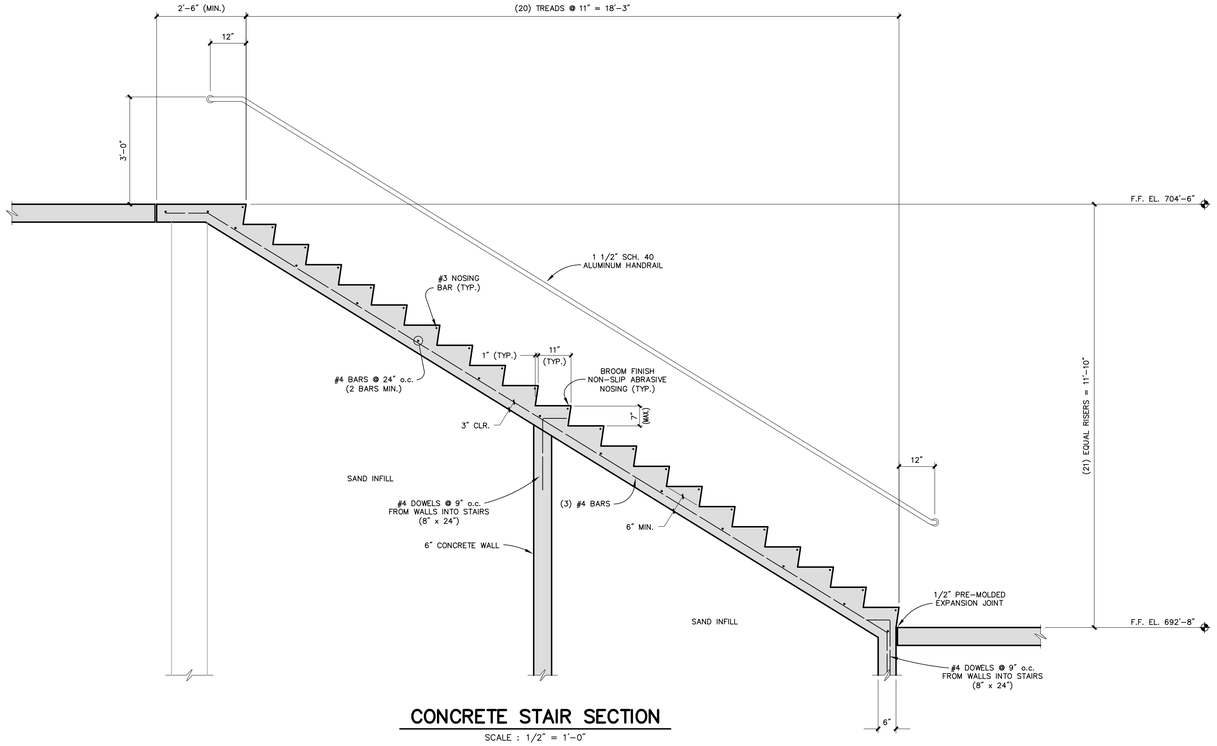


CHANNEL-CHANNEL CONNECTION

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

NOTE

TYPICAL IF ANGLE IN WEB



CONCRETE STAIR SECTION

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

ALTERNATE No. 1

NO.	REVISIONS	BY	DATE

DRAWN: SMYTH
DATE: MAY '23
CHECKED: D.A.B.
DATE: MAY '23

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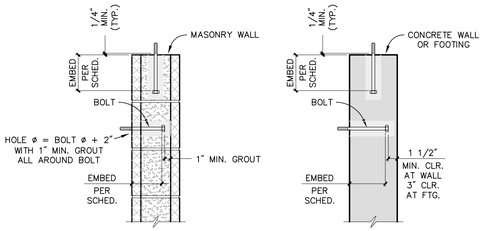
WASTEWATER SYSTEM IMPROVEMENTS
BIOPURE TREATMENT FACILITY

STRUCTURAL STAIRS

PROJECT NO. 2211159

SHEET NO. H11 OF H21

BOLT EMBEDMENT	
BOLT DIAMETER	**EMBEDMENT, UNLESS NOTED**
1/2"	4"
5/8"	4"
3/4"	5"
7/8"	6"
1"	7"
1 1/8"	8"



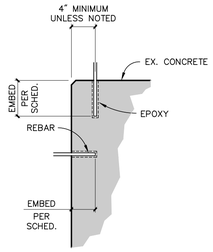
EMBEDDED BOLTS

SCALE : NONE

NOTES

1. FOUNDATION SILL PLATE ANCHOR BOLTS SHALL HAVE A MINIMUM 7" EMBEDMENT.
2. ANCHOR BOLTS LOCATED IN THE TOPS OF COLUMNS SHALL HAVE A MINIMUM OF 2" EMBEDMENT IN ADDITION TO THAT NOTED IN THE ABOVE SCHEDULE.
3. ALL ANCHOR BOLTS SHALL BE SECURELY TIED IN PLACE PRIOR TO AND WHILE PLACING CONCRETE OR GROUT.
4. ANCHOR BOLTS SHALL BE HEADED MACHINE BOLTS.
5. A.S.T.M. A307 QUALITY SHALL BE THE MINIMUM REQUIRED BOLT GRADE.
6. BOLTS SHALL BE PLACED CLEAN AND FREE OF OIL, DIRT, RUST, OR ANY OTHER DELETERIOUS MATERIALS.

REINF. STEEL	
BAR SIZE	**EMBEDMENT, UNLESS NOTED**
#4	4 1/2"
#5	5"
#6	6 3/4"
#7	7 3/4"
#8	9"



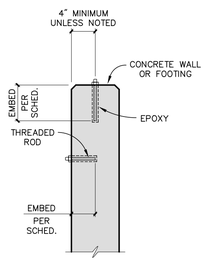
REINFORCING STEEL SET IN EPOXY

SCALE : NONE

NOTES

1. REINFORCING STEEL SHALL BE A.S.T.M. A-615, GRADE 60 UNLESS NOTED OTHERWISE.
2. REINFORCING STEEL SHALL BE PLACED CLEAN AND FREE OF OIL, DIRT, RUST OR ANY OTHER DELETERIOUS MATERIALS.
3. ROUGHEN AND CLEAN HOLE PRIOR TO PLACING EPOXY PER MANUFACTURER'S INSTRUCTIONS.
4. INSTALL EPOXY/REINFORCING STEEL ASSEMBLY USING HILTI HY-200 EPOXY.
5. NO CUTTING OF EXISTING REINFORCEMENT SHALL BE ALLOWED IN THE INSTALLATION OF EPOXY ANCHORS UNLESS APPROVED BY THE ENGINEER OF RECORD.
6. ALL EPOXY ANCHOR INSTALLATIONS SHALL COMPLY WITH THE SPECIFIED MANUFACTURER'S RECOMMENDATIONS AND ICC REPORT.
7. SPECIAL INSPECTION OF REINFORCING STEEL INSTALLATION IS REQUIRED.

THREADED ROD	
ROD DIAMETER	**EMBEDMENT, UNLESS NOTED**
1/2"	4 1/2"
5/8"	5"
3/4"	6 3/4"
7/8"	7 3/4"
1"	9"

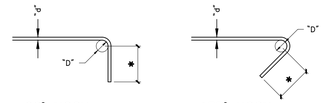


EPOXY ADHESIVE ANCHORS

SCALE : NONE

NOTES

1. THREADED RODS SHALL BE A.S.T.M. A307 (SAE 1018) UNLESS NOTED OTHERWISE.
2. THREADED RODS SHALL BE PLACED CLEAN AND FREE OF OIL, DIRT, RUST OR ANY OTHER DELETERIOUS MATERIALS.
3. ROUGHEN AND CLEAN HOLE PRIOR TO PLACING EPOXY PER MANUFACTURER'S INSTRUCTIONS.
4. INSTALL EPOXY/THREADED ROD ASSEMBLY USING HILTI HY-200 EPOXY.
5. NO CUTTING OF EXISTING REINFORCEMENT SHALL BE ALLOWED IN THE INSTALLATION OF EPOXY ANCHORS UNLESS APPROVED BY THE ENGINEER OF RECORD.
6. ALL EPOXY ANCHOR INSTALLATIONS SHALL COMPLY WITH THE SPECIFIED MANUFACTURER'S RECOMMENDATIONS AND ICC REPORT.
7. SPECIAL INSPECTION OF ANCHOR INSTALLATION IS REQUIRED.

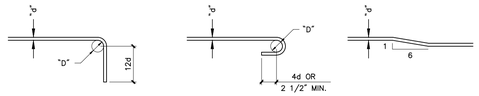


TIE & STIRRUP END HOOKS

SCALE : NONE

NOTE

ALL BENDS SHALL BE MADE COLD



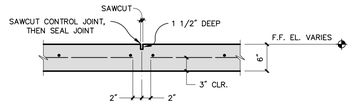
REBAR BENDS & END HOOKS

SCALE : NONE

NOTE

"D" : 6d FOR #3 THRU #8
"D" : 8d FOR #9 THRU #11
"D" : 10d FOR #14 AND #18

ALL BENDS SHALL BE MADE COLD

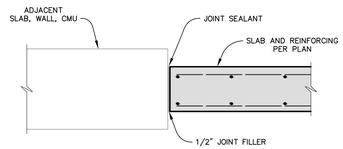


CONTROL/CONSTRUCTION JOINT

SCALE : 3/4" = 1'-0"

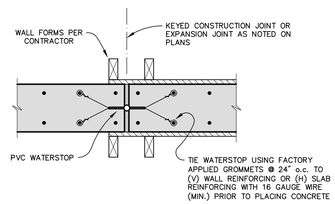
NOTE

SAWCUT WITHIN 12 HOURS OF FINISHING.



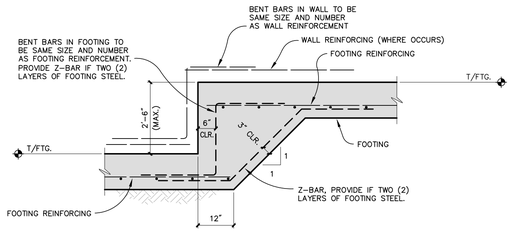
SLAB ISOLATION JOINT DETAIL

SCALE : 3/4" = 1'-0"



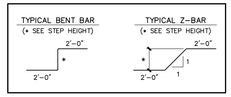
TYPICAL PVC WATERSTOP INSTALLATION

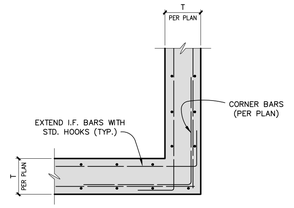
SCALE : 1" = 1'-0"



TYPICAL STEP FOOTING

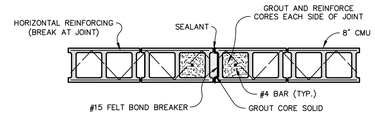
SCALE : NONE





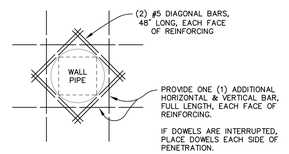
CORNER DETAIL (TWO LAYER)

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



MICHIGAN CONTROL JOINT

SCALE : 3/4" = 1'-0"



TYPICAL WALL STEEL FOR PIPE OR RECTANGULAR PENETRATIONS 12" TO 24"

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

ALTERNATE No. 1

NO.	REVISIONS	BY	DATE

DRAWN: SMYTH
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CHECKED: D.A.B.
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WASTEWATER SYSTEM IMPROVEMENTS
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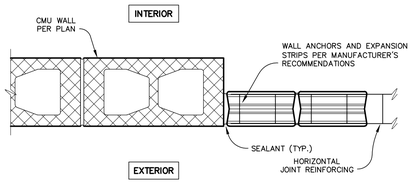
TYPICAL STRUCTURAL DETAILS

PROJECT NO. 2211159
SHEET NO. H12 OF H21



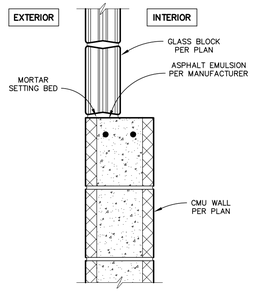
WINDOW JAMB DETAIL

(GLASS BLOCK)

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

NOTE

SIMILAR FOR 12" CMU



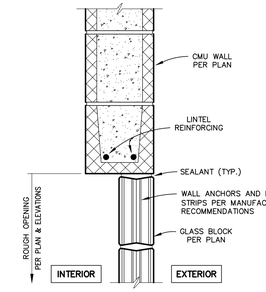
WINDOW SILL DETAIL

(GLASS BLOCK)

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

NOTE

SIMILAR FOR 12" CMU



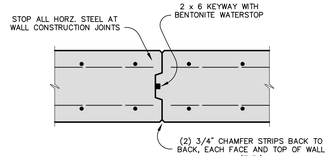
WINDOW HEAD DETAIL

(GLASS BLOCK)

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

NOTE

SIMILAR FOR 12" CMU



TYPICAL WALL CONSTRUCTION JOINT

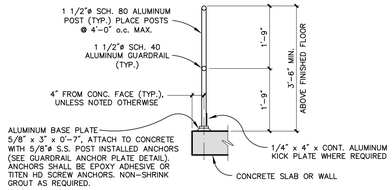
SCALE : 3/4" = 1'-0"

BAR SIZE	f'c = 3,000 psi		f'c = 4,000 psi		f'c = 5,000 psi	
	TOP BARS	OTHER BARS	TOP BARS	OTHER BARS	TOP BARS	OTHER BARS
#3	28"	22"	24"	19"	22"	17"
#4	37"	29"	32"	25"	29"	22"
#5	47"	36"	40"	31"	36"	28"
#6	56"	43"	48"	37"	43"	33"
#7	81"	63"	70"	54"	63"	49"
#8	93"	72"	80"	62"	72"	55"
#9	105"	81"	91"	70"	81"	63"

REINFORCING STEEL LAP SPLICE LENGTHS

NOTES

1. TABLE VALUES ARE FOR ASTM A615 GRADE 60 UNCOATED REINFORCING AND NORMAL WEIGHT CONCRETE.
2. CONCRETE CLEAR COVER 1" OR GREATER AND REINFORCING BAR CENTER TO CENTER SPACING IS AT LEAST THREE (3) BAR DIAMETERS.
3. LAP SPLICE LENGTHS FOR OTHER CONDITIONS INCLUDING LIGHTWEIGHT CONCRETE, EPOXY COATED REINFORCING, AND BUNDLED BARS SHALL BE CALCULATED PER ACI 318.
4. TOP BARS ARE HORIZONTAL BARS WITH MORE THAN 12" OF CONCRETE CAST BELOW THE BARS. HORIZONTAL REINFORCING IN WALLS ARE TOP BARS.



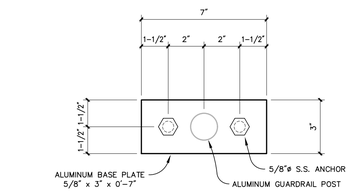
SURFACE MOUNT GUARDRAIL DETAIL

(TWO RAIL SYSTEM)

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

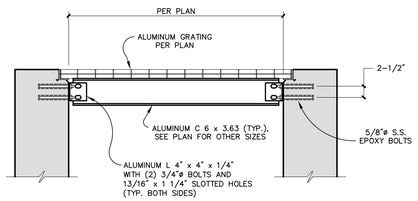
NOTE

WHERE GUARDRAIL IS SUPPORTED BY AN ALUMINUM BEAM OR CHANNEL, WELD OR PROVIDE MECHANICAL ATTACHMENT BETWEEN GUARDRAIL AND BEAM OR CHANNEL.



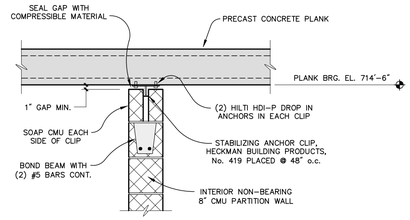
GUARDRAIL ANCHOR PLATE DETAIL

SCALE : 3" = 1'-0"



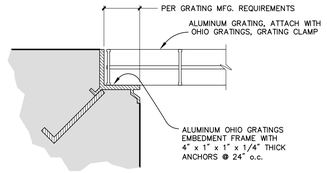
GRATING SUPPORT CHANNEL DETAIL

SCALE : 3/4" = 1'-0"



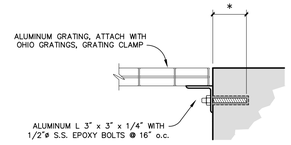
MASONRY NON-BEARING @ PLANK

SCALE : 3/4" = 1'-0"



GRATING BEARING DETAIL

SCALE : 3" = 1'-0"

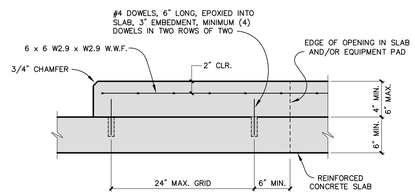


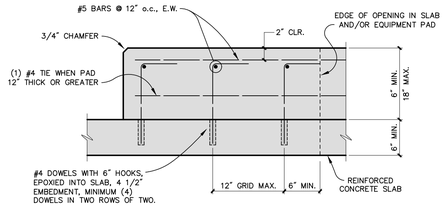
GRATING SUPPORT DETAIL

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

NOTE

* = EMBED PER EPOXY ADHESIVE ANCHOR DETAIL



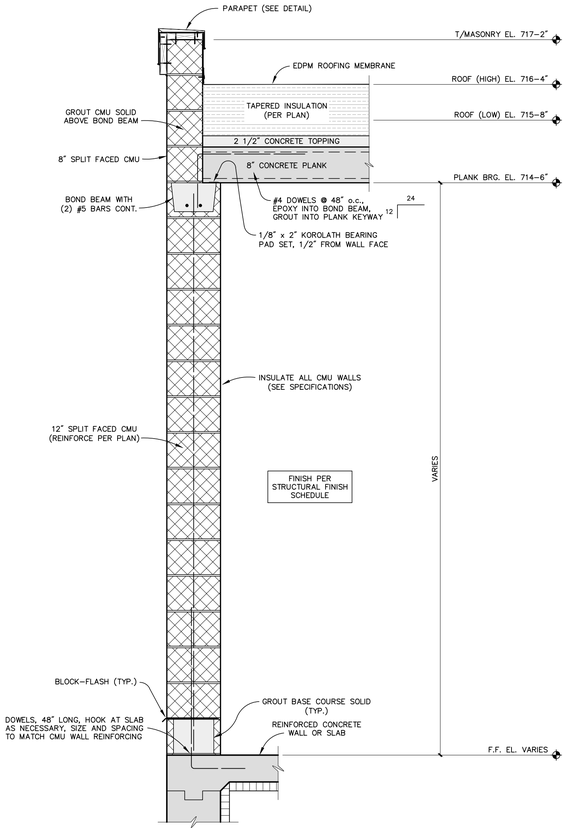


EQUIPMENT PAD DETAILS

SCALE : 1" = 1'-0"

NOTE

NEW SLAB AND EQUIPMENT PAD CONSTRUCTION SHOWN. NEW EQUIPMENT PAD CONSTRUCTION ON EXISTING SLABS SIMILAR. ROUGHEN THE SURFACE OF THE EXISTING CONCRETE SLAB.



TYPICAL WALL SECTION

SCALE : 3/4" = 1'-0"

ALTERNATE No. 1

NO.	REVISIONS	BY	DATE

DRAWN SMYTH
DATE MAY '23
CHECKED D.A.B.
DATE MAY '23

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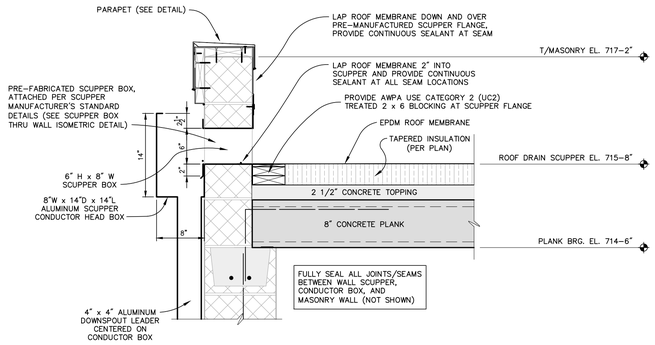
WASTEWATER SYSTEM IMPROVEMENTS
BIOPURE TREATMENT FACILITY

TYPICAL STRUCTURAL DETAILS

PROJECT NO. 2211159

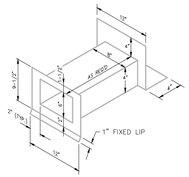
SHEET NO. H13 OF H21

T:\CIVIL3D PROJECTS\2021\2211159_HART_WWTP\4_PROD\C4 HEADWORKS STRUCTURAL.DWG - WSMYTH - May. 22 2023 - 07:59am - PreinNewhof



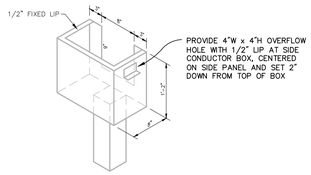
ROOF DRAIN SCUPPER DETAIL 4

SCALE : 1" = 1'-0" H7,H9,H10 H14



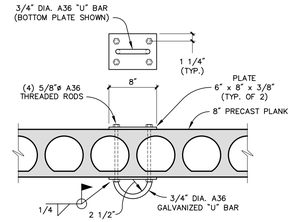
SCUPPER BOX THRU WALL ISOMETRIC

SCALE : NONE



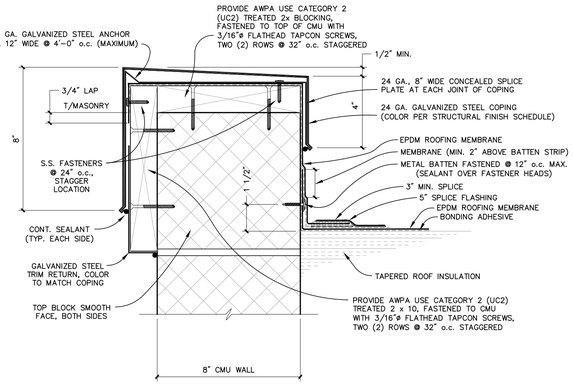
CONDUCTOR HEAD BOX ISOMETRIC

SCALE : NONE



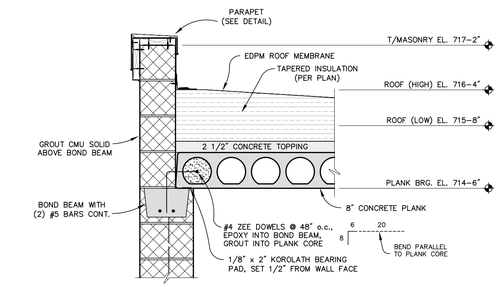
SECTION 1

SCALE : 1" = 1'-0" H7 H14



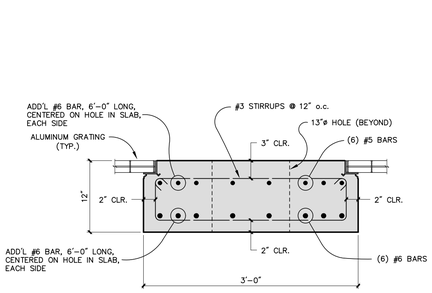
PARAPET DETAIL 5

SCALE : 3" = 1'-0" H9,H10 H14



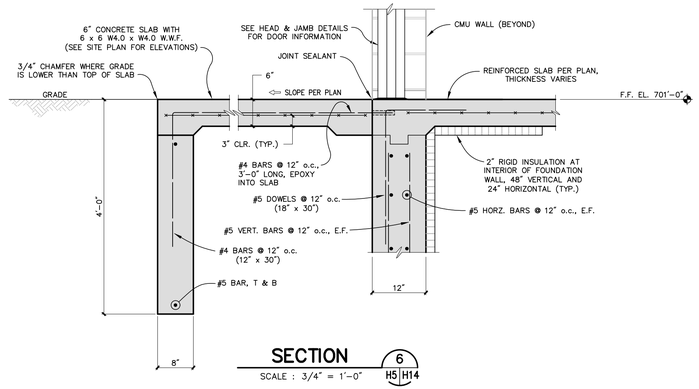
NON-BEARING PLANK DETAIL 3

SCALE : 3/4" = 1'-0" H9 H14



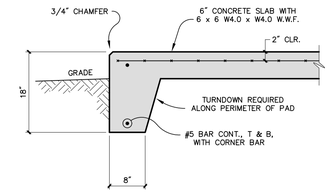
SECTION 2

SCALE : 1" = 1'-0" H9 H14



SECTION 6

SCALE : 3/4" = 1'-0" H5 H14



CONCRETE PAD TURNDOWN 7

SCALE : 3/4" = 1'-0" H5 H14

ALTERNATE No. 1

NO.	REVISIONS	BY	DATE

DRAWN SMYTH
DATE MAY '23
CHECKED D.A.B.
DATE MAY '23

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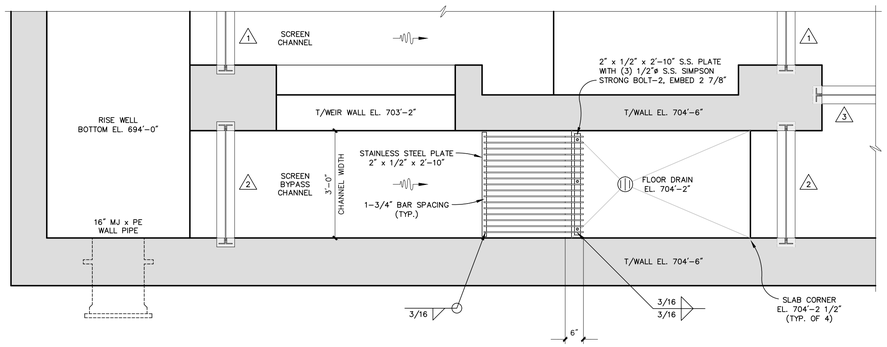
BIOPURE TREATMENT FACILITY

STRUCTURAL DETAILS

PROJECT NO. 2211159
SHEET NO. H14 OF H21

T:\CIVIL3D PROJECTS\2021\2211159-JHART_MWTP\4_PROD\C4 HEADWORKS LAGOON SPLITS AND POLISHING POND PS\2211159_C4_HEADWORKS STRUCTURAL.DWG - KSMYTH - May. 22 2023 - 08:00am - PrintMeNewhof



MANUAL BAR SCREEN – PLAN

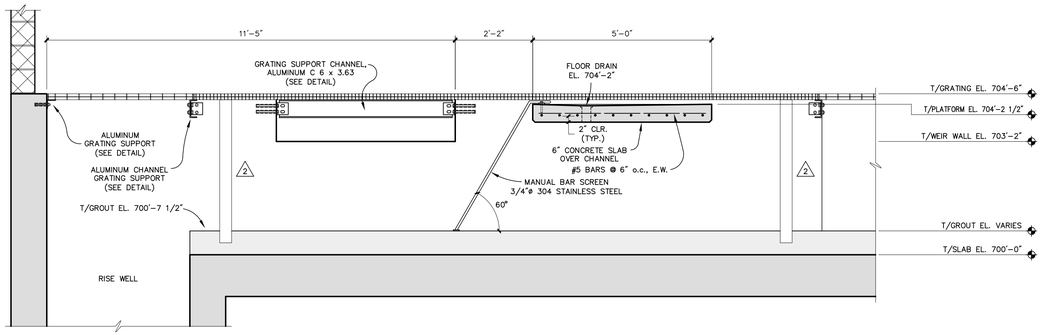
SCALE : 1/2" = 1'-0"

North

NOTES

GRIND ALL SHARP EDGES SMOOTH.

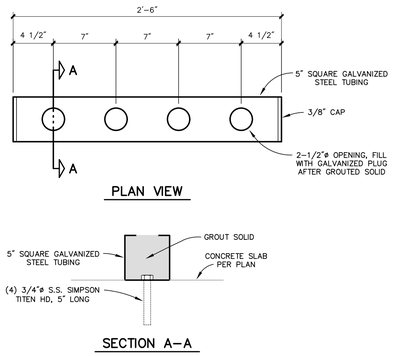
GRATING NOT SHOWN FOR CLARITY.



MANUAL BAR SCREEN – SECTION

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

9 H6 | H15

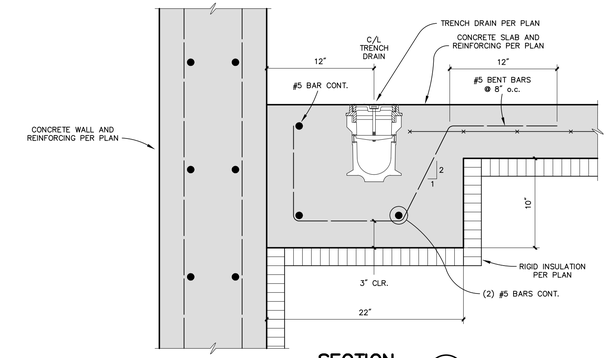


PLAN VIEW

SECTION A–A

DUMPSTER STOP DETAIL

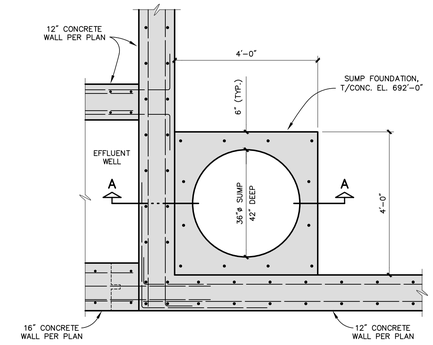
SCALE : 1 1/2" = 1'-0"



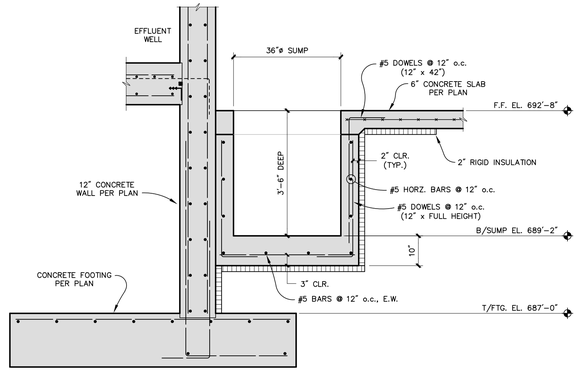
SECTION

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

8 H9 | H15



PLAN VIEW



SECTION A–A

36"ø SUMP DETAIL

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

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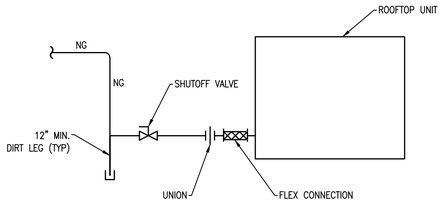
WASTEWATER SYSTEM IMPROVEMENTS
BIOPURE TREATMENT FACILITY

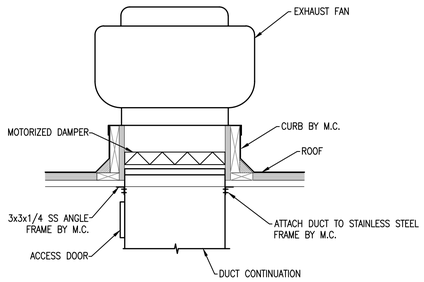
STRUCTURAL DETAILS

PROJECT NO. 2211159

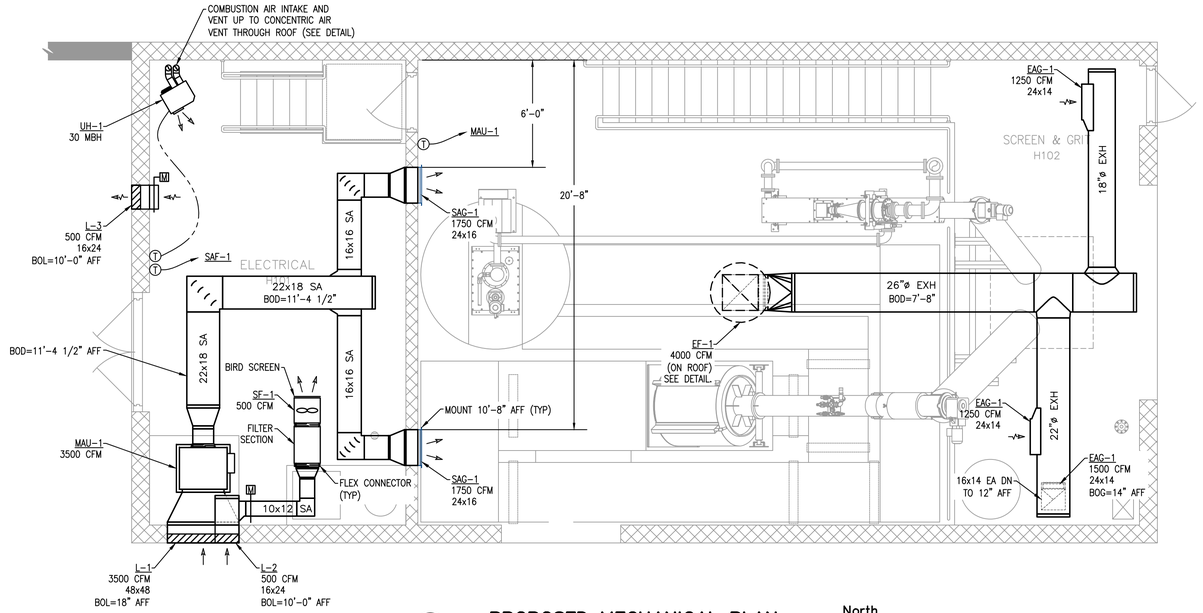
SHEET NO. H15 OF H21



TYPICAL NATURAL GAS CONNECTION
SCALE: NONE



ROOF EXHAUST FAN DETAIL
SCALE: NONE



1 H16 **PROPOSED MECHANICAL PLAN**
SCALE : 1/4" = 1'-0"

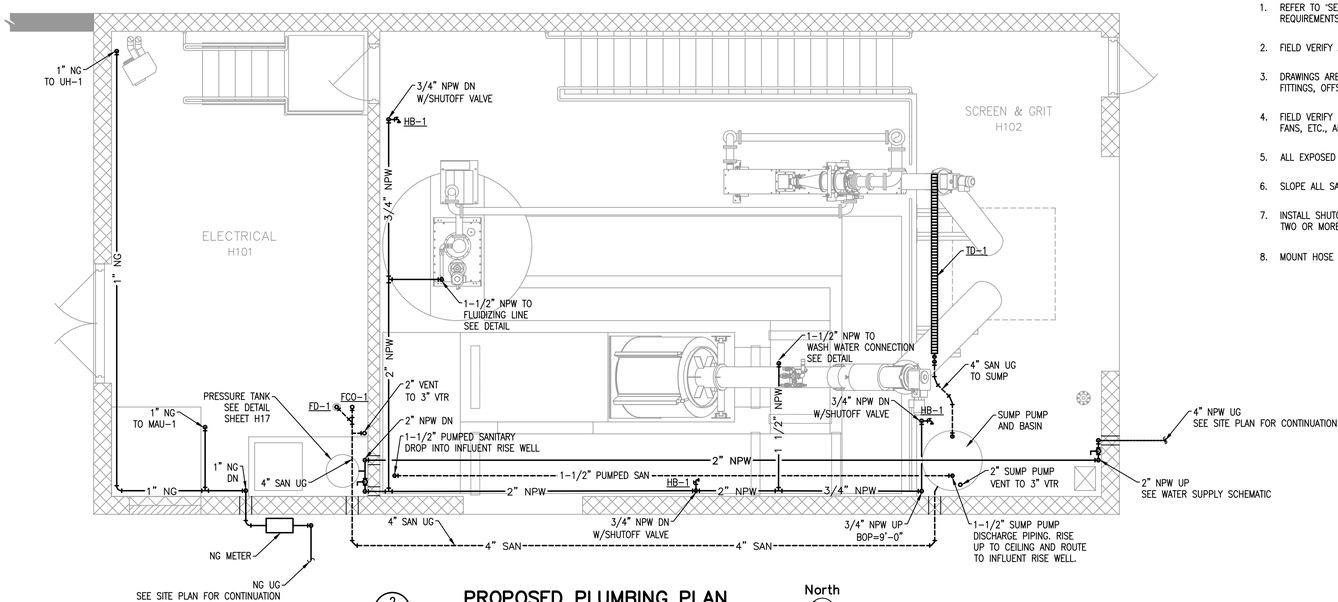
North

MECHANICAL GENERAL NOTES:

1. REFER TO "SECTION 23 00 00 – SUMMARY OF WORK" FOR ADDITIONAL INFORMATION AND WORK REQUIREMENTS.
2. FIELD VERIFY ALL DIMENSIONS.
3. DRAWINGS ARE SCHEMATIC IN NATURE. NOT ALL WORK IS SHOWN. ASSUME ADDITIONAL FITTINGS, OFFSETS, ACCESSORIES, ETC. ARE REQUIRED.
4. FIELD VERIFY EXACT LOCATION AND MOUNTING HEIGHT FOR ALL EQUIPMENT, HEATERS, LOUVERS, FANS, ETC., AND OBTAIN APPROVAL FROM THE ENGINEER PRIOR TO STARTING INSTALLATION.
5. PROVIDE MANUAL BALANCE DAMPERS ON ALL DIFFUSER RUNOUT DUCTS.

PLUMBING LEGEND
NOT ALL SYMBOLS OR ABBREVIATIONS SHOWN IN LEGEND APPEAR ON THE DRAWINGS

CHECK VALVE	SANITARY WASTE ABOVE GROUND
BALL VALVE	SANITARY WASTE UNDERGROUND
BUTTERFLY VALVE	SANITARY VENT
PRESSURE REDUCING VALVE	DOMESTIC COLD WATER
WALL CLEANOUTS	DOMESTIC HOT WATER
RELIEF OR SAFETY VALVE	
STRAINER	
THERMOMETER	AFF ABOVE FINISHED FLOOR
	CL CENTERLINE
	CO CLEANOUT
REDUCED PRESSURE BACKFLOW PREVENTER	CW COLD WATER
	DD DECK DRAIN
RISER UP	EWH ELECTRIC WATER HEATER
RISER DOWN	FD FLOOR DRAIN
BRANCH UP	HB HOSE BIBB
BRANCH DOWN	HD HUB DRAIN
UNION	HW HOT WATER
CAP	LAV LAVATORY
REDUCER	RD ROOF DRAIN
DIRECTION OF FLOW	SA SHOCK ABSORBER
FLOOR DRAIN & P-TRAP	SAN SANITARY
ROOF DRAIN	S SINK
PUMP	ST STORM
	UG UNDERGROUND
CONNECTION OF NEW INTO EXISTING	V VENT
	VTR VENT THROUGH ROOF
	WC WATER CLOSET
	WH WALL HYDRANT



2 H16 **PROPOSED PLUMBING PLAN**
SCALE : 1/4" = 1'-0"

North

PLUMBING GENERAL NOTES:

1. REFER TO "SECTION 22 00 00 – SUMMARY OF WORK" FOR ADDITIONAL INFORMATION AND WORK REQUIREMENTS.
2. FIELD VERIFY ALL DIMENSIONS.
3. DRAWINGS ARE SCHEMATIC IN NATURE. NOT ALL WORK IS SHOWN. ASSUME ADDITIONAL FITTINGS, OFFSETS, ACCESSORIES, ETC. ARE REQUIRED.
4. FIELD VERIFY EXACT LOCATION AND MOUNTING HEIGHT FOR ALL EQUIPMENT, HEATERS, LOUVERS, FANS, ETC., AND OBTAIN APPROVAL FROM THE ENGINEER PRIOR TO STARTING INSTALLATION.
5. ALL EXPOSED NATURAL GAS PIPING IS TO BE PAINTED.
6. SLOPE ALL SANITARY AND VENT PIPING PER CODE.
7. INSTALL SHUTOFF VALVES FOR ALL FIXTURES AND EQUIPMENT AND ON ALL BRANCHES SERVING TWO OR MORE OUTLETS.
8. MOUNT HOSE BIBBS (HB-1) 36" AFF AND PROVIDE SHUTOFF VALVE AT BRANCH TAKE OFF.

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BIOPURE TREATMENT FACILITY
MECHANICAL PLANS

PROJECT NO. 2211159
SHEET NO. H16 OF H21

MAKEUP AIR UNIT SCHEDULE

UNIT INFORMATION						FAN DATA							HEATING					ELECTRICAL	WEIGHT	NOTES
MARK	AREA SERVED	MANUF	MODEL	TYPE	CONFIG	AIRFLOW (CFM)	MIN OA (CFM)	TSP (IN WC)	FAN TYPE	FAN SIZE	FAN RPM	MOTOR HP	BHP	FUEL TYPE	PRESS (IN WC)	TEMP RISE	INPUT (MBH)	OUTPUT (MBH)	V / PH / Hz	(LBS)	
MAU-1	SCREEN & GRIT RM	ABSOLUTAIRE	AA3000-UOX	100% OA DF	INTERIOR VERTICAL	3,500	100%	0.75	SCROLL	910	1393	3	2.84	NAT. GAS	9.5	90	370	340	480/3/60	775	1, 2

NOTES:
1. INTERIOR DIRECT FIRED, CONSTANT VOLUME (CV) , 100% OA, HORIZONTAL DISCHARGE (90° OF CONTROL SIDE) SINGLE WALL INSULATED CABINET, HEAVY DUTY BLOWER WITH EXTENDED GREASE LINES, TEFC MOTOR, UNIT MOUNTED PANEL WITH INDICATOR LIGHTS, DISCHARGE AIR TEMPERATURE CONTROL WITH TEMPERATURE DIAL AT UNIT, MILD WEATHER STAT, HIGH TEMPERATURE AND LOW TEMPERATURE LIMIT SWITCHES, MODULATING NATURAL GAS BURNER, DIRECT SPARK IGNITION FOR GAS MANIFOLD, DIRTY FILTER INDICATOR,CLOGGED FILTER SWITCH, MOTORIZED INLET DAMPER, FILTER SECTION FOR 2 INCH PLEATED FILTERS (PROVIDE 2 SETS TOTAL), HINGED DOORS, EPOXY PAINT ON EXTERIOR, FACTORY NON-FUSED DISCONNECT SWITCH, SUPPLY FAN MOTOR STATER, LOW FIRE START, PURGE TIMER, FURNISH WITH NOMINAL 40" PLENUM BASE WITH 1" THERMAFIBER INSULATION - HEIGHT TO BE VERIFIED BY CONTRACTOR DURING SHOP DRAWING SUBMITTAL.
2. SUPPLY WITH REMOTE EXPLOSION PROOF CORROSION RESISTANT SPACE TEMPERATURE SENSOR FOR INSTALLATION BY ELECTRICAL CONTRACTOR.

LOUVER SCHEDULE

MARK	AREA SERVED	TYPE	MANUF	LOUVER MODEL	DAMPER MODEL	AIRFLOW (CFM)	SP (IN WC)	SIZE (IN) WIDE	SIZE (IN) HIGH	FRAME TYPE	DAMPER ACTUATOR	FINISH	NOTES
L-1	SCREEN & GRIT RM	STATIONARY INTAKE LOUVER WITH MOTORIZED DAMPER	RUSKIN	ELF6375DX	CD50	3500	0.02	48	48	BOX	120V	COLOR ANODIZED	1
L-2	ELECTRICAL RM	STATIONARY INTAKE LOUVER WITH MOTORIZED DAMPER	RUSKIN	ELF6375DX	CD50	500	0.03	16	24	BOX	120V	COLOR ANODIZED	1
L-3	ELECTRICAL RM	STATIONARY EXHAUST LOUVER WITH MOTORIZED DAMPER	RUSKIN	ELF6375DX	CD50	500	0.02	16	24	BOX	120V	COLOR ANODIZED	1

NOTES:
1. COMPLETE WITH ALUMINUM BIRDSCREEN AND EXTENDED SILL.

EXHAUST FAN SCHEDULE

MARK	AREA	TYPE	MANUF	MODEL	AIRFLOW (CFM)	SP (IN WC)	SONES	OVERALL DIMENSIONS (IN)	OUTSIDE CURB CAP (IN)	ROOF OPENING (IN)	DUCT CONN (IN)	MOTORIZED DAMPER	WEIGHT (LBS)	VFD	MOTOR OPP HP	MOTOR MOTOR HP	MOTOR WATTS	FAN RPM	ELECT V / PH / Hz	NOTES
EF-1	SCREEN & GRIT RM	BELT DRIVE	HARTZEL	A88-0-181FE100FGFCI3	4000	0.5	n/a	42-5/16H x 39-1/4 Dia	30 X 30	25.75 X 25.75	24 X 24	NO	261	N/A	1.071	1 1/2	n/a	1390	460/3/60	1, 2, 3, 4

NOTES:
1. PROVIDE WITH NEMA 3R PREWIRED NON-FUSED DISCONNECT.
2. PROVIDE WITH SURFACE MOUNTED BACKDRAFT DAMPER AND FIBERGLASS DAMPER SHELF.
3. PROVIDE WITH 12" PRE FAB CURB, 304SS
4. FIBERGLASS CONSTRUCTION, DIRECT DRIVE, CLASS I / DIV I RATED

DIFFUSER, REGISTER & GRILLE SCHEDULE

MARK	TYPE	MANUF	MODEL	CFM RANGE	FACE SIZE (IN)	VOLUME DAMPER	FINISH	FRAME	NOTES
SAG-1	SIDEWALL MTD SUPPLY	KEES	1A-HC	1750	24x16	NO	MILL FINISH SS	SURFACE MT	1
EAG-1	SIDEWALL MTD EXHAUST	KEES	R0H	1250-1500	24x14	YES	MILL FINISH SS	SURFACE MT	2

NOTES:
1. 304 STAINLESS STEEL CONSTRUCTION, HIGH CAPACITY, SINGLE DEFLECTION, 1-1/2" BLADE CENTERS WITH VERTICALLY ORIENTED BLADES.
2. 304 STAINLESS STEEL CONSTRUCTION, FIXED BLADES ON 3/4 INCH CENTERS, 0 DEGREE DEFLECTION.

SUPPLY FAN SCHEDULE

MARK	AREA	TYPE	MANUF	MODEL	CFM	SP	HP	DUCT CONN	FAN RPM	ELECT V/PH/HZ	WEIGHT (LBS)	NOTES
SF-1	ELECTRICAL RM	INLINE	COOK	90SQ12D	500	0.3	1/6	15x15	1069	115/1/60	104	1,2,3,4,5,6

NOTES:
1. FURNISH WITH SAFETY AUTO RESET THERMAL OVERLOAD PROTECTION, AND FACTORY MOUNTED AND WIRED "FSC" FAN SPEED CONTROL.
2. PROVIDE WITH INLET FLEX DUCT CONNECTION.
3. PROVIDE WITH MERV 8 FILTER BOX.
4. PROVIDE WITH CEILING MOUNTED SPRING ISOLATORS.
5. PROVIDE WITH OUTLET SAFETY SCREEN.
6. SUPPLY WITH THERMOSTAT EQUAL TO PECO TF115-001 FOR INSTALLATION BY ELECTRICAL CONTRACTOR.

PLUMBING FIXTURE SCHEDULE

MARK	MANUF	MODEL	DESCRIPTION	MIN CONNECTION CW	MIN CONNECTION HW	MIN CONNECTION DRAIN
HB-1	WATTS	LFBD-QT	QUARTER-TURN BOILER DRAIN VALVE WITH FORGED BRASS BODY AND ALUMINUM TEE HANDLE. PROVIDE WITH WATTS LF8 HOSE CONNECTION VACUUM BREAKER.	3/4"	-	-
SA-1	JR SMITH	HYDROTROL	WATER HAMMER ARRESTOR SERIES 5000 WITH PERMANENTLY SEALED CUSHION OF AIR. ALL STAINLESS STEEL. SIZE PER PDI INSTITUTE RECOMMENDATIONS.	SEE PLANS	-	-
FD-1	JR SMITH	2210	MEDIUM DUTY CAST IRON FLOOR DRAIN WITH 8.5 INCH ROUND CAST IRON GRATE, SEDIMENT BUCKET AND 4 INCH OUTLET. PROVIDE WITH JR SMITH MODEL 2692 TRAP SEAL DEVICE.	-	-	4"
FCO-1	JR SMITH	4020	CAST IRON FLOOR CLEANOUT FOR FINISHED FLOOR AREAS WITH ADJUSTABLE TOP, SECURED SCORIATED NICKEL BRONZE COVER, BRONZE GASKETED PLUG, AND BOTTOM OUTLET.	-	-	4"
TD-1	ACO POLYMER PRODUCTS	S100K	TRENCH DRAIN. ACO POLYMER CONCRETE S100K POWERDRAIN. LOAD CLASS F, WITH DUCTILE IRON EDGE RAILS, 4 INCH NOMINAL INTERNAL WIDTH, BUILT-IN SLOPE OF 0.5% , AND 4-BOLT IRON GRATE. PROVIDE INLINE CATCH BASIN WITH PLASTIC TRASH BUCKET AT OUTLET WITH DUCTILE IRON SLOTTED HEAVY DUTY GRATE COVER APPROPRIATE FOR THE LOAD CLASS. PROVIDE SUPPORTS, END CAPS, AND OUTLET ADAPTORS AS REQUIRED.	-	-	4"

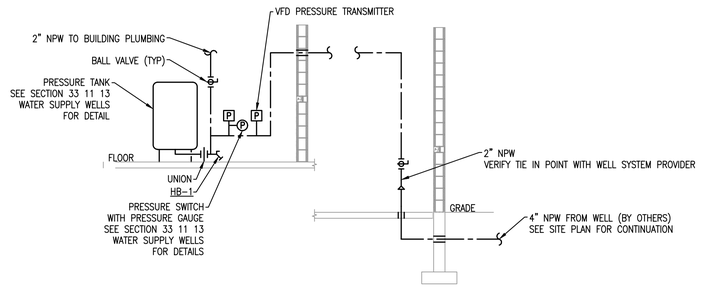
GAS UNIT HEATER SCHEDULE

MARK	LOCATION	MANUF	MODEL	MBH INPUT	MBH OUTPUT	CFM	MOTOR HP	ELECTRICAL WATT/AMP	ELECTRICAL V / PH / Hz	NOTES
UH-1	GENERAL BLDG	REZNOR	UDZ30	24.6	30	456	0.06	-	115/1/60	1, 2

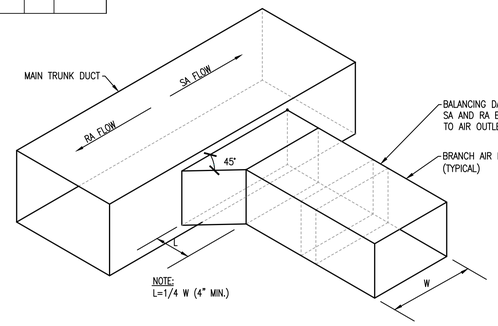
NOTES:
1. PROVIDE WITH STAINLESS STEEL HEAT EXCHANGER, DIRECT SPARK IGNITION, SINGLE STAGE BURNER, FAN HOUSING, VERTICAL CONCENTRIC VENT KIT, CEILING SUSPENSION KIT.
2. SUPPLY WITH THERMOSTAT EQUAL TO PECO TF115-001 FOR INSTALLATION BY ELECTRICAL CONTRACTOR.

SUMP PUMP SCHEDULE

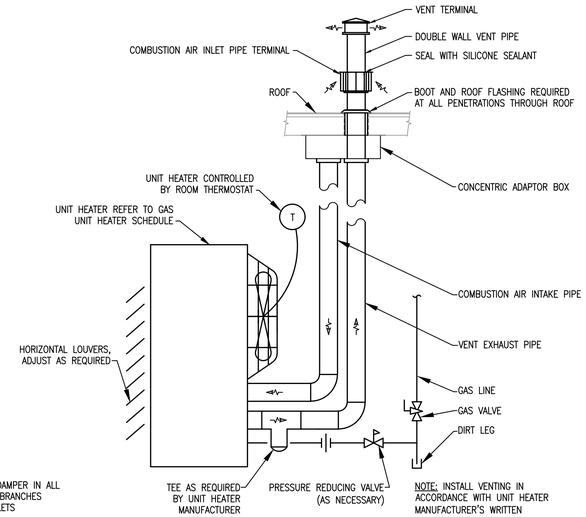
MARK	DESCRIPTION
SP-1	ONE WELL SUMP PUMP SYSTEM, MODEL 1619 WITH 1.5" DIAMETER DISCHARGE, DUTY POINT OF 18 GPM @ 25' TDH, SUMP PUMP BASIN 36" DIAMETER AND 42" DEEP, 40" DIAMETER COVER, BF03 SIMPLEX CONTROL PANEL (NEMA 4X) WITH 3 TETHERED FLOAT SWITCHES (PUMP OFF, PUMP ON, HIGH WATER ALARM). ELEC: 0.5 HP, 460V, 3 PH PROVIDE SECOND, IDENTICAL AND COMPLETE SUMP PUMP FOR OWNER SPARE. PROVIDE WEIL PUMP AND AK INDUSTRIES COVER OR ENGINEER APPROVED EQUAL.



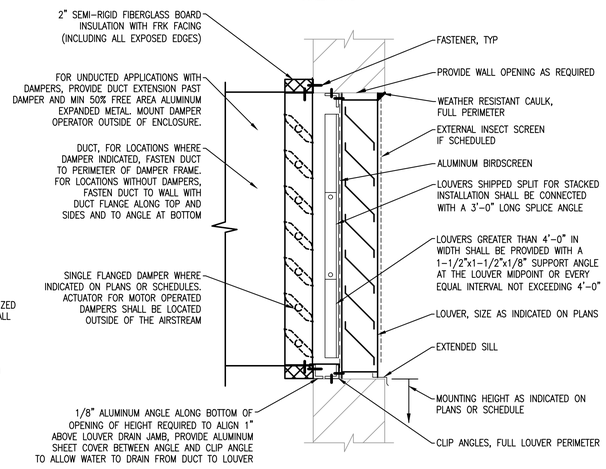
NON-POTABLE WATER SUPPLY SCHEMATIC
SCALE: NONE



SA/RA DUCT CONNECTION DETAIL
SCALE: NONE

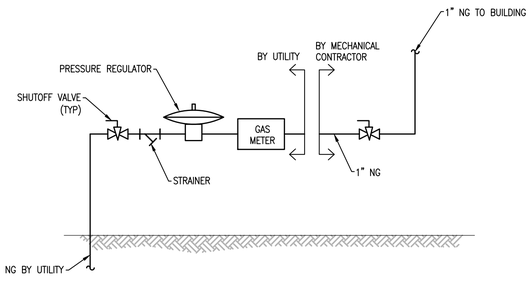


UNIT HEATER PIPING DETAIL
SCALE: NONE

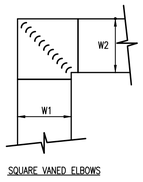


NOTE: ALL FASTENERS SHALL BE OF STAINLESS STEEL CONSTRUCTION

LOUVER DETAIL
SCALE: NONE

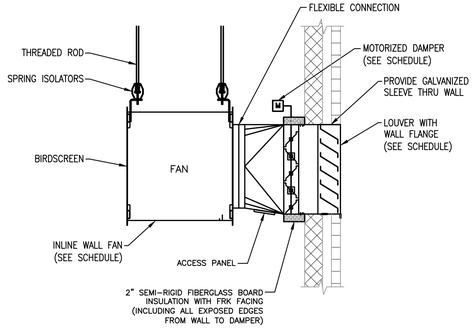


NATURAL GAS METER DETAIL
SCALE: NONE



NOTES:
1. ALL SQUARE ELBOWS SHALL BE VANED AND SHALL BE CONSTRUCTED AND INSTALLED AS DETAILED BY SMACNA.
2. WHEN W1 DOES NOT EQUAL W2 VANE SHALL BE SINGLE VANE TYPE REGARDLESS OF W DIMENSION.
3. ALL SINGLE VANES SHALL HAVE A 2 INCH RADIUS, 1 1/2 INCH MAXIMUM SPACE BETWEEN VANES AND A 3/4 INCH TRAILING EDGE.
4. WHEN W1 EQUALS W2 AND W1 IS GREATER THAN 20 INCHES VANES SHALL BE DOUBLE VANE TYPE.

TYPICAL SQUARE VANED DUCT DETAIL
SCALE: NONE



INLINE FAN INSTALLATION DETAIL
SCALE: NONE

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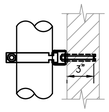
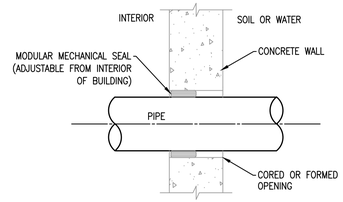


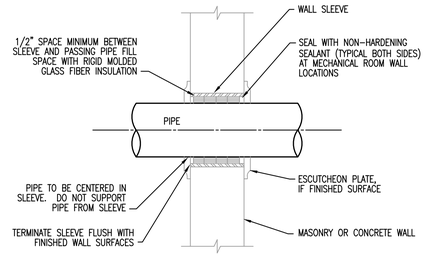
NOTE:
PROVIDE PVC COATED CLAMP AND STAINLESS STEEL HARDWARE IN HAZARDOUS LOCATIONS.

PIPE ANCHOR DETAIL
SCALE: NONE



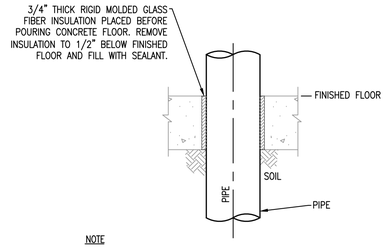
NOTE:
1. USE TYPE 1 WALL PENETRATION FOR ALL PIPING PASSING THROUGH CORED OR FORMED OPENING IN CONCRETE WALLS WITH SOIL OR WATER ON ONE SIDE WHERE NO WALL SLEEVE IS USED.

WALL SLEEVE DETAIL–TYPE 1
SCALE: NONE



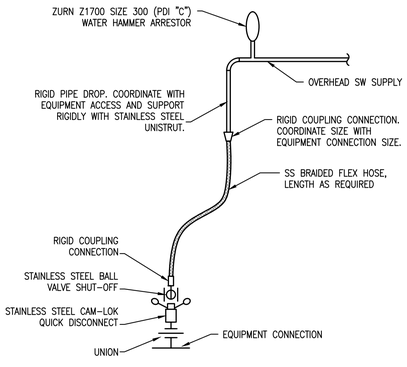
NOTE
1. USE TYPE 6 WALL SLEEVE FOR ALL PIPING PASSING THROUGH NEW INTERIOR NON–FIRE RATED MASONRY OR CONCRETE WALLS.

WALL SLEEVE DETAIL–TYPE 6
SCALE: NONE

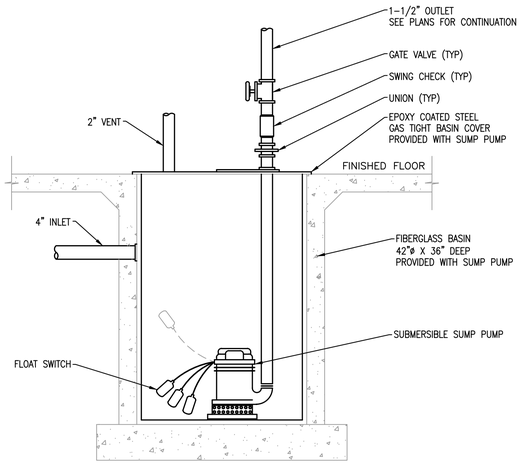


NOTE
1. USE TYPE 4 FLOOR PENETRATION FOR ALL PIPING PASSING THROUGH NEW CAST–IN–PLACE CONCRETE SLAB ON GRADE.

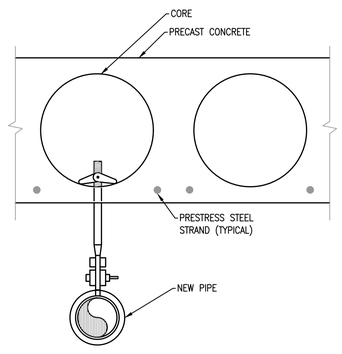
TYPICAL FLOOR SLEEVE DETAIL
SCALE: NONE



EQUIPMENT SERVICE WATER SUPPLY DETAIL
SCALE: NONE



SUMP PUMP DETAIL
SCALE: NONE



NOTE: CONTRACTOR SHALL VERIFY CORE LOCATIONS IN FIELD–DO NOT DAMAGE PRESTRESS STEEL STRANDS

PRECAST CONCRETE PIPE HANGER DETAIL
SCALE: NONE

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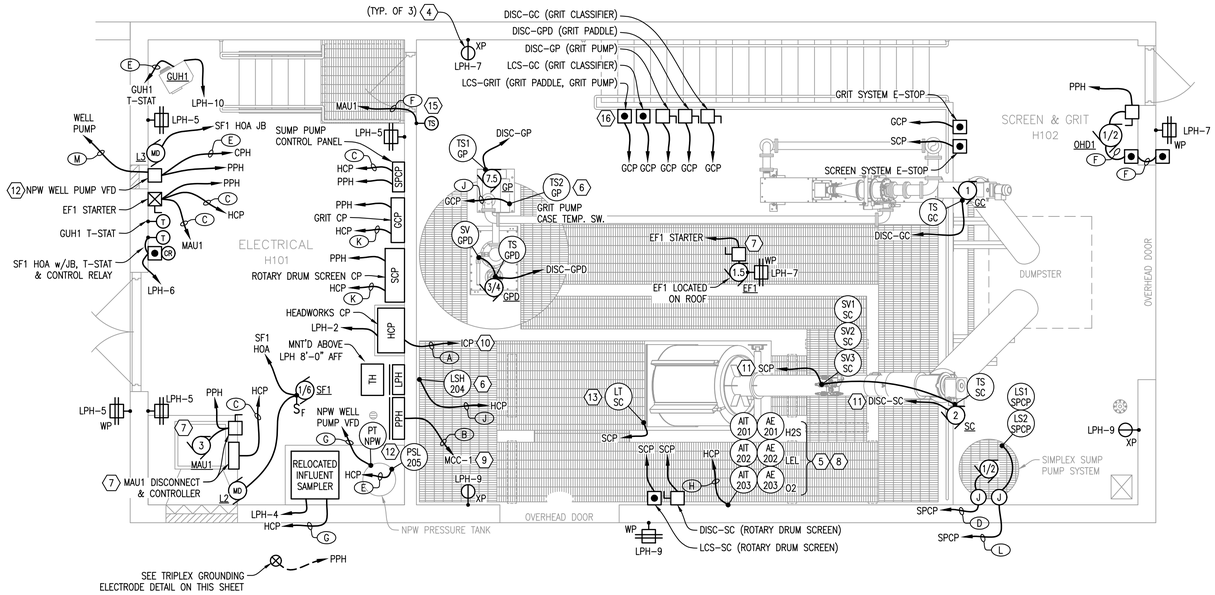
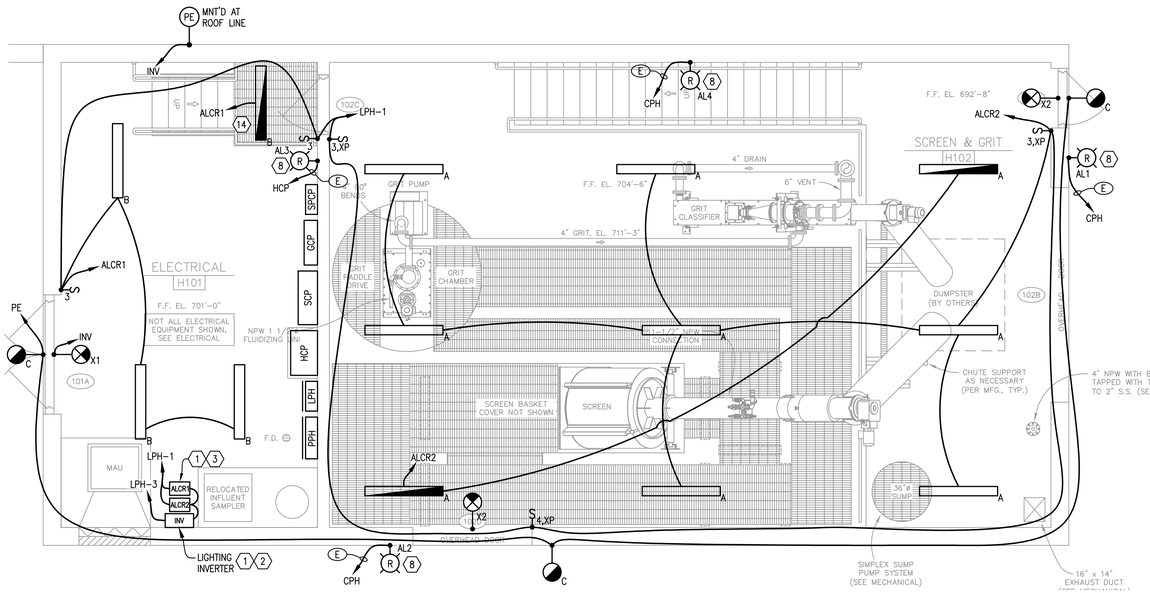
PROJECT NO. 2211159
SHEET NO. H18 OF H21



4 C22 ELECTRICAL POWER PLAN – PROPOSED

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

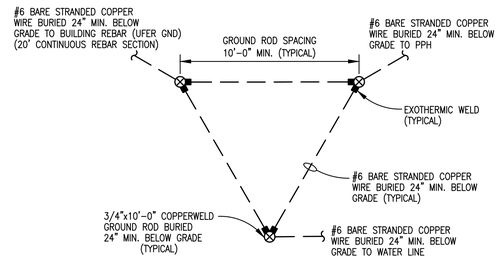
North



5 C22 ELECTRICAL LIGHTING PLAN – PROPOSED

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

North



TRIPLEX GROUNDING ELECTRODE DETAIL

GENERAL NOTES:

1. ENGRAVED EQUIPMENT NAMEPLATES (WHITE PHENOLIC WITH BLACK LETTERS) SHALL BE FURNISHED AND INSTALLED BY THE ELECTRICAL CONTRACTOR FOR NEW AND EXISTING ELECTRICAL EQUIPMENT AS NOTED. LETTER SIZES: 1" HIGH FOR INDIVIDUAL ELECTRICAL POWER DISTRIBUTION AND SERVICE EQUIPMENT. LETTER SIZES: 1/4" HIGH FOR INDIVIDUAL ELECTRICAL MOTOR CONTROL CENTER UNITS, VFD ENCLOSURES, SAFETY DISCONNECTS, COMBINATION STARTERS AND PROCESS INSTRUMENTATION.
2. SEE HEADWORKS "SINGLE LINE DIAGRAM & SCHEDULES" SHEET FOR CONDUIT AND CONDUCTOR SIZES AND QUANTITIES ASSOCIATED WITH 480V LOADS AND CONTROL WIRING ASSOCIATED WITH POWER PANEL PPH, GRIT CONTROL PANEL (GCP) AND ROTARY DRUM SCREEN CONTROL PANEL (SCP) AND FIELD DEVICES NOT SHOWN ON THIS SHEET.
3. ROUTE ALL CONDUITS CONCEALED IN WALLS, IN CONCRETE SLABS OR BELOW CONCRETE SLABS WHERE POSSIBLE. PROVIDE ALL JUNCTION BOXES, COVERS, DEVICES AND LIQUID TIGHT FLEXIBLE CONDUIT CONNECTIONS AS NEEDED.
4. AREA INSIDE OF SCREEN & GRIT ROOM IS CLASS I, DIV. 1, GRP. C, D. USE HAZARDOUS LOCATION WIRING METHODS AND MATERIALS PER NEC ARTICLE 500 REQUIREMENTS. FOR EXPOSED CONDUIT INSTALLATIONS PROVIDE PVC COATED RMC CONDUIT WITH PVC COATED CONDUIT SEALS, PVC COATED HAZARDOUS LOCATION MALLEABLE IRON FITTINGS AND CONDUIT BODIES. PROVIDE STAINLESS STEEL U-CHANNEL, MOUNTING HARDWARE AND FASTENERS. THE LOCATION AND TYPE OF GAS-TIGHT SEALS FOR CABLES, CONDUIT, AND WIRES MUST MEET THE NEC, AND ALLOW FOR EASY DISCONNECTION AND REMOVAL OF PUMPS, EQUIPMENT AND INSTRUMENTS FOR MAINTENANCE.
5. FOR EXPOSED CONDUIT INSTALLATIONS IN GENERAL PURPOSE AREAS PROVIDE RIGID METAL CONDUIT (RMC) WITH MALLEABLE IRON CONDUIT FITTINGS AND CONDUIT BODIES WITH NEMA 12, STEEL, JIC, HINGED COVER JUNCTION BOXES.
6. PROVIDE SCH 40 PVC CONDUIT FOR ALL BELOW CONCRETE SLAB, IN CONCRETE SLAB AND IN WALL INSTALLATIONS.
7. PROVIDE RMC OR PVC COATED RMC, DEPENDENT ON LOCATION, 90° ELBOWS FOR ALL STUB UPS TO EQUIPMENT EXTENDING UP THROUGH CONCRETE SLABS FOR TRANSITION FROM CONCEALED TO EXPOSED INSTALLATIONS.
8. SCREEN & GRIT SYSTEM CONTROL PANELS PROVIDED BY THE EQUIPMENT SUPPLIER AND INSTALLED BY THE CONTRACTOR. SEE "SCREEN SYSTEM CONTROL PANEL (SCP)" AND "GRIT SYSTEM CONTROL PANEL (GCP)" ON HEADWORKS "SINGLE LINE DIAGRAM & SCHEDULES" SHEET FOR POWER, CONTROL AND INSTRUMENTATION CONDUIT AND WIRING REQUIREMENTS. MOUNT PANELS AT 6'-0" TO TOP AFF.
9. HEADWORKS CONTROL PANEL (HCP) PROVIDED BY CONTROLS INTEGRATOR AND INSTALLED BY CONTRACTOR. CONTRACTOR TO PROVIDE ALL EXTERNAL POWER, CONTROL AND INSTRUMENTATION WIRING AS SHOWN ON THE DRAWINGS.
10. INSTALL WALL MOUNTED CONTROL PANELS AT 6'-0" TO TOP AFF. PROVIDE 4" HOUSEKEEPING PADS FOR ALL FREESTANDING CONTROL PANELS. HOUSEKEEPING PAD SIZE BASED ON ACTUAL EQUIPMENT SIZE PLUS 4" ON FRONT AND SIDES.
11. INSTALL WALL MOUNTED THERMOSTATS, TEMPERATURE SENSORS AND PUSHBUTTON CONTROL STATIONS AT 5'-0" TO TOP AFF.
12. INSTALL WALL OR SUPPORT RACK MOUNTED SAFETY DISCONNECT SWITCHES, MOTOR STARTERS AND VFD'S AT 5'-6" TO TOP AFF.
13. UNLESS NOTED OTHERWISE ON THE PLANS ALL 120VAC POWER CIRCUITS TO RECEPTACLES AND OTHER SMALL 120VAC, 1ø LOADS SHALL BE 2#12, 1#12GND IN MINIMUM 3/4" RMC OR PVC COATED RMC, DEPENDENT ON LOCATION.
14. ALL RECEPTACLES MOUNTED AT 42" AFF UNLESS NOTED OTHERWISE.
15. SEE HEADWORKS BUILDING "SINGLE LINE DIAGRAM & SCHEDULES" SHEET H20 FOR "LIGHTING SCHEDULE".

PLAN NOTES: (#) (SYMBOL DENOTES PLAN NOTE)

1. SEE HEADWORKS "WIRING DIAGRAMS" SHEET FOR "EMERGENCY EGRESS LIGHTING WIRING DIAGRAM."
2. WALL MOUNT LIGHTING INVERT AT 7'-0" TO BOTTOM AFF.
3. MOUNT EMERGENCY LIGHTING AUTOMATIC LOAD CONTROL RELAYS ALCR1 & ARCL2 TO 4"-SQUARE BOX AT 4'-0" AFF. MANUFACTURER MYERS, PART# EPC-2 OR APPROVED EQUAL. SEE "EMERGENCY EGRESS LIGHTING WIRING DIAGRAM" ON "WIRING DIAGRAMS" SHEET.
4. PROVIDE CROUSE-HINDS, ARKTITE, CAT# CPS152, 20 AMP, 125V, 1ø, HAZARDOUS LOCATION ANGLED RECEPTACLES, OR APPROVED EQUAL. WITH RECEPTACLES PROVIDE TO OWNER A MATING ASSEMBLY CONSTRUCTED OF A CROUSE-HINDS, ARKTITE, CAT# CPP HAZARDOUS LOCATION PLUG, 3'-0" OF 3C#12 HEAVY DUTY CORD AND NEMA 6-20R HEAVY DUTY FEMALE CORD RECEPTACLE. TYPICAL OF 2 LOCATIONS.
5. MOUNT SENSORS (AE) AT RECOMMENDED HEIGHT PER MANUFACTURER INSTRUCTIONS. TRANSMITTERS (AIT) TO BE MOUNTED AT 5'-0" AFF.
6. DEVICE WIRING IS INTRINSICALLY SAFE. DO NOT COMBINE THIS WIRING WITH OTHER NON-INTRINSICALLY SAFE WIRING. COORDINATE WITH RESPECTIVE CONTROL PANEL SUBMITTAL DRAWINGS FOR INTRINSICALLY SAFE WIRING ENTRY INTO THE CONTROL PANELS.
7. LOCAL DISCONNECTS AND CONTROLLER PROVIDED WITH MAKEUP AIR UNIT MAU1 AND EXHAUST FAN EF1. COORDINATE WITH MECHANICAL CONTRACTOR.
8. GAS DETECTION ENTRY ALARM LIGHTS AL1, AL2 & AL4 SHALL BE MOUNTED 8'-0" TO BOTTOM ABOVE GRADE AND ABOVE FINISHED FLOOR, AL3 SHALL BE MOUNTED 8'-0" TO BOTTOM ABOVE STAIR LANDING DIRECTLY ABOVE LIGHT SWITCH. AT ALARM LIGHTS AL1, AL2 & AL3 PROVIDE ADMITTANCE SIGN, 7"X10", ALUMINUM, RED LETTER ON WHITE BACKGROUND, 'DANGER DO NOT ENTER WHEN LIGHT IS FLASHING', PROVIDE ONE (1) SIGN FOR EACH DOOR ENTRY INTO "SCREEN & GRIT" ROOM. AT ALARM LIGHT AL4 AND GAS DETECTION TRANSMITTER(S) PROVIDE ONE (1) SIGN "DANGER LEAVE AREA WHEN LIGHT IS FLASHING" . ADMITTANCE SIGNS SHALL BE SECURED TO WALL WITH NON-CORROSIVE FASTENERS. SELF-ADHESIVE SIGNS ARE NOT ALLOWED.
9. MAIN FEEDER FROM EX. WASTEWATER TREATMENT FACILITY BLOWER ROOM MCC-1. SEE "ELECTRICAL SITE PLAN – PROPOSED" FOR CONTINUATION.
10. FIBER OPTIC CABLING TO EX. IRRIGATION PUMP STATION CONTROL PANEL ICP. SEE "ELECTRICAL SITE PLAN – PROPOSED" FOR ROUTING.
11. CONTROL DEVICE WIRING (SV & TS) AND MOTOR FEEDER WIRING (SC) ASSOCIATED WITH ROTARY DRUM SCREEN SHALL BE ROUTED IN SEPARATE CONDUITS AS SHOWN. COMBINING VFD PWM OUTPUT WIRING WITH AC CONTROL WIRING IS NOT ACCEPTABLE.
12. NPW WELL PUMP VFD, PRESSURE TRANSMITTER (PT-WP) AND PRESSURE SWITCH (PSL-205) PROVIDED BY WELL DRILLING CONTRACTOR. ELECTRICAL CONTRACTOR TO MOUNT VFD AND PROVIDE CONDUIT AND WIRING AS SHOWN BETWEEN ALL DEVICES AND CONTROL PANEL HCP. COORDINATE WITH WELL DRILLING CONTRACTOR AND OTHER TRADES.
13. ROUTE CONDUIT IN-SLAB INTO INLET CHANNEL BELOW CHANNEL GRATING TO LEVEL TRANSMITTER AND MOUNT LEVEL TRANSMITTER TO WESTSIDE OF ROTARY DRUM SCREEN BASKET OR CHANNEL WALL IN A LOCATION TO MINIMIZE TRIPPING HAZARDS.
14. CHAIN MOUNT FIXTURE 8'-0" ABOVE LANDING.
15. MAKEUP AIR UNIT (MAU1) TEMPERATURE SENSOR (TS) PROVIDED WITH EQUIPMENT, INSTALLED AND WIRED BY CONTRACTOR.
16. PROVIDE SUPPORT RACK CONSTRUCTED OF STAINLESS STEEL U-CHANNEL, HARDWARE AND FASTENERS FOR MOUNTING GRIT SYSTEM LOCAL CONTROL STATIONS (LCS) AND SAFETY DISCONNECT (DISC). ATTACH SUPPORT RACK TO FLOOR AND HANDRAIL.

CONDUIT AND WIRE SCHEDULE

MARK	DESCRIPTION
(#)	
A	(1) 4 STRAND FIBER OPTIC CABLE TO EX. IRRIGATION PUMPS STATION CONTROL PANEL ICP – 1 1/2"C
B	3#1, 1#6 GND – 1 1/2"C TO MCC-1 LOCATED IN FACILITY BLOWER ROOM
C	6#14, 1#14 GND – 3/4"C
D	3#12, 1#12 GND – 3/4"C
E	2#14, 1#14 GND – 3/4"C
F	COORDINATE WIRING REQUIREMENTS WITH EQUIPMENT SUPPLIER SHOP DRAWINGS – 3/4"C
G	(1) 2C#18 SHIELDED CABLE – 3/4"C
H	(3) 3C#18 SHIELDED CABLES – 3/4"C
J	2#14, 1#14 GND – 3/4"C (INTRINSICALLY SAFE WIRING, SHALL NOT BE COMBINED WITH OTHER WIRING)
K	14#14, 1#14 GND – 3/4"C
L	4#14, 1#14 GND – 3/4"C (INTRINSICALLY SAFE WIRING, SHALL NOT BE COMBINED WITH OTHER WIRING)
M	3#10, 1#10 GND (XHHW FOR VFD OUTPUT CONDUCTORS) – 1"C

ALTERNATE NO. 1

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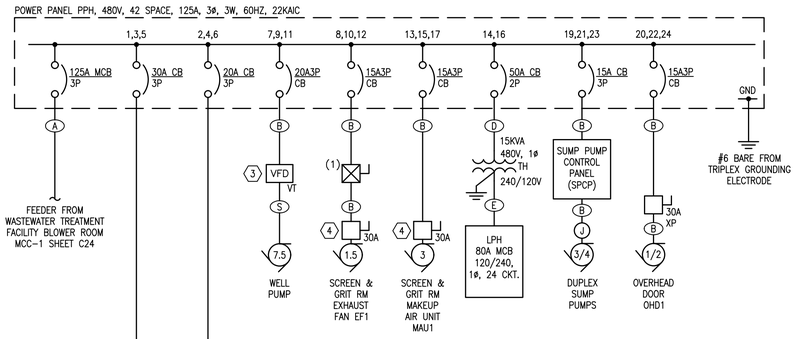
CITY OF HART
OCEANA COUNTY, MICHIGAN
WASTEWATER SYSTEM IMPROVEMENTS
BIOPURE TREATMENT FACILITY
ELECTRICAL PLANS

PROJECT NO. 2211159
SHEET NO. H19 OF H21

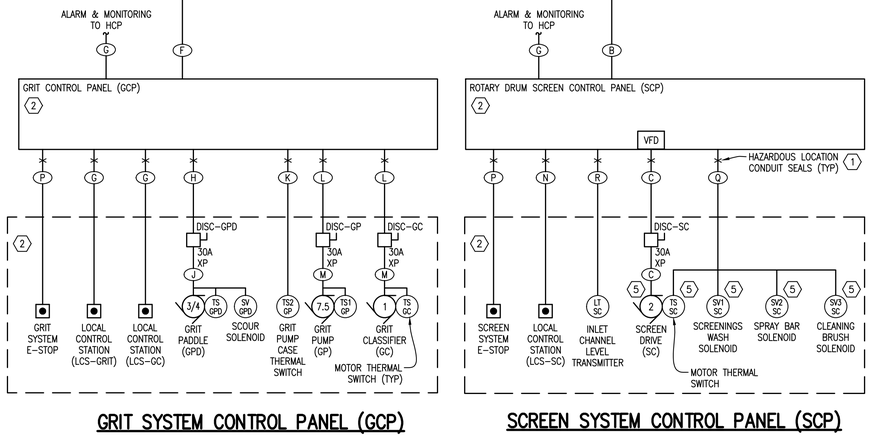


HEADWORKS POWER PANEL PPH SINGLE LINE DIAGRAM

HEADWORKS POWER PANEL PPH ELECTRICAL LOAD ESTIMATE			
LOAD TYPE	CONNECTED VA	DEMAND FACTOR	DEMAND VA
LIGHTING	801	NONE	801
RECEPTACLE	1800	0.5 FOR OVER 10,000	1800
MISCELLANEOUS	3450	NONE	3450
KITCHEN	0	0.65	0
MOTOR	34727	INCLUDES 1.25x LARGEST	37011
TOTAL	**40778**		**43062**
SYSTEM VOLTAGE:	**480**	TOTAL DEMAND AMPS:	**52**

PLAN NOTES: (#) (SYMBOL DENOTES PLAN NOTE)

1. ADDITIONAL HAZARDOUS LOCATION CONDUIT SEALS MAY BE REQUIRED IN GRIT & SCREEN ROOM ASSOCIATED WITH GRIT AND SCREEN SYSTEM POWER AND CONTROL DEVICES AS WELL AS OTHER ELECTRICAL DEVICES AND INSTRUMENTS. REFER TO NEC ARTICLE 500.
2. SCREEN AND GRIT SYSTEM CONTROL PANELS, SAFETY DISCONNECTS, CONTROL STATIONS, INSTRUMENTS AND MOTORS ARE SUPPLIED WITH EQUIPMENT. ELECTRICAL CONTRACTOR SHALL INSTALL CONTROL PANELS, DISCONNECTS AND CONTROL STATIONS. ELECTRICAL CONTRACTOR SHALL PROVIDE ALL INTERCONNECTING CONDUITS AND CONDUCTORS BETWEEN CONTROL PANELS AND FIELD DEVICES AS SHOWN.
3. WELL PUMP VFD SUPPLIED BY WELL DRILLING CONTRACTOR. ELECTRICAL CONTRACTOR SHALL INSTALL VFD AND PROVIDE CONDUIT AND CONDUCTORS AS SHOWN.
4. SAFETY DISCONNECT SWITCHES PROVIDED WITH AIR HANDLING EQUIPMENT. ELECTRICAL CONTRACTOR TO INSTALL DISCONNECTS AND PROVIDE CONDUIT AND CONDUCTORS AS SHOWN.
5. CONTROL DEVICE WIRING (SV & TS) AND MOTOR FEEDER WIRING (SC) ASSOCIATED WITH ROTARY DRUM SCREEN SHALL BE ROUTED IN SEPARATE CONDUITS AS SHOWN. COMBINING VFD PWM OUTPUT WIRING WITH AC CONTROLL WIRING IS NOT ACCEPTABLE.



GRIT SYSTEM CONTROL PANEL (GCP)

SCREEN SYSTEM CONTROL PANEL (SCP)

CITY OF HART SYSTEM IMPROVEMENTS BIOPURE TREATMENT FACILITY	JOB NAME	VOLTS (L-L)	PHASE	WIRE
2211159 / PNM066	JOB NUMBER	240	1	3

NOTES

PANEL NAME	LPH
LOCATION	HEADWORKS BUILDING
MOUNTING	SURFACE
TYPE	NEMA 1
MAINS	80A MCB
AIC	10,000

CKT	LOAD DESCRIPTION	CONNECTED VOLT-AMPERES LIGHTS	RECEPT	MISC	KITCHEN	MOTORS HP	VA	BREAKER AMP	POLE	CKT #	PHASE	CKT #	BREAKER POLE	AMP	CONNECTED VOLT-AMPERES LIGHTS	RECEPT	MISC	KITCHEN	MOTORS HP	VA	LOAD DESCRIPTION	CKT
1	INTERIOR LIGHTING	587						20	1	1	L1	2	20	1			1200				CONTROL PANEL HCP	2
3	INVERTER (EXT & INT EM LTG)	214						20	1	3	L2	4	20	1			900				INFLUENT SAMPLER	4
5	RECEPTS - ELECTRICAL RM / EXT.		720					20	1	5	L1	6	20	1						670	SUPPLY FAN SF1	6
7	RECEPTS - GRIT & SCREEN RM / EXT.		540					20	1	7	L2	8	20	1							SPARE	8
9	RECEPTS - GRIT & SCREEN RM / EXT.		540					20	1	9	L1	10	20	1						260	GAS UNIT HEATER GUH1	10
11	SPARE							20	1	11	L2	12	20	1							SPARE	12
13	SPARE							20	1	13	L1	14	20	1							SPARE	14
15	SPARE							15	1	15	L2	16	15	1							SPARE	16
17	SPACE									17	L1	18									SPACE	18
19	SPACE									19	L2	20									SPACE	20
21	SPACE									21	L1	22									SPACE	22
23	SPACE									23	L2	24									SPACE	24

CONNECTED LOAD	LIGHTS	RECEPT	MISC	KITCHEN	MOTOR	TOTAL	AMPS
L1	587	1,260	1,200	0	930	3,977	33
L2	214	540	900	0	0	1,654	14
TOTAL	801	1,800	2,100	0	930	5,631	23
FACTOR	1	0.5	1	1	1		
DEMAND LOAD	801	1,800	2,100	0	930	5,631	23

LIGHTING SCHEDULE

MARK	DESCRIPTION	MANUFACTURER	MODEL NUMBER	LAMP	EQUALS	COMMENTS	MARK
A	4' HAZARDOUS LOCATION LINEAR LED FIXTURE, CLASS I DIVISION 1 GROUP D RATED	EATON CROUSE-HINDS	XPLA-N-4-UNV1-S891-P	4000K LED 8300 LUMENS 60W 120-277V	AS APPROVED	MOUNT 1'-0" BELOW CEILING TO TOP OF FIXTURE UNLESS NOTED OTHERWISE	A
B1	4' INDUSTRIAL VAPORTIGHT LED 6000 LUMENS	EATON METALUX	4VT2-LD5-6-DR-UNV-L840-CD1-WL-SSL-U VT2-CHAIN/SET-U	4000K LED 6000 LUMENS 51W 120-277V	HOLOPHANE COLUMBIA	CHAIN MOUNT 2'-6" BELOW CEILING TO TOP OF FIXTURE UNLESS NOTED OTHERWISE	B1
B2	4' INDUSTRIAL VAPORTIGHT LED 6000 LUMENS	EATON METALUX	4VT2-LD5-11-DR-W-UNV-L840-CD1-WL-SSL-U VT2-CHAIN/SET-U	4000K LED 11000 LUMENS 83W 120-277V	HOLOPHANE COLUMBIA	CHAIN MOUNT 16'-0" ABOVE GRADE UNLESS NOTED OTHERWISE	B2
B2E	4' INDUSTRIAL VAPORTIGHT LED 6000 LUMENS	EATON METALUX	4VT2-LD5-11-DR-W-UNV-L840-CD1-WL-SSL-U VT2-CHAIN/SET-U-EL10W	4000K LED 11000 LUMENS 83W 120-277V	HOLOPHANE COLUMBIA	CHAIN MOUNT 16'-0" ABOVE GRADE UNLESS NOTED OTHERWISE PROVIDE W/ 10W EM BATTERY PACK	B2E
C	EXTERIOR WALLPACK LED	COOPER LUMARK	AXCS1A-C	5000K LED 1800 LUMENS 14W 120-277V	LITHONIA HUBBELL	MOUNT 10' ABOVE GRADE	C
CE	EXTERIOR WALLPACK LED	COOPER LUMARK	AXCS1A-C-PC1-CBP	5000K LED 1800 LUMENS 14W 120-277V	LITHONIA HUBBELL	MOUNT 10' ABOVE GRADE PROVIDE W/ 10W EM BATTERY PACK AND INTERNAL PHOTOCELL	CE
D	LOW BAY WET LOCATION LED	EATON CROUSE-HIND	PVMA-7.5L-N-2A/UNV1-S831-S903	4000K LED 7700 LUMENS 64W 120-277V	LITHONIA HUBBELL	PENDANT MOUNT 16'-0" ABOVEGRADE	D
X1	THERMOPLASTIC EXIT SIGN BLACK W/ RED LETTERING AC ONLY	COOPER SURE-LITE	APX6RBK	LED <3W 120-277V	LITHONIA DUAL-LITE	MOUNT 1' ABOVE DOOR HEAD	X1
X2	PHOTOLUMINESCENT EXIT SIGN WHITE LETTERING ON RED BACKGROUND	EVERGLOW		N/A	AS APPROVED	MOUNT 1' ABOVE DOOR HEAD	X2
INV	350VA 120V, SINGLE PHASE EMERGENCY LIGHTING INVERTER	MYERS	LV-2-R-1-B2002	N/A	AS APPROVED	WALL MOUNTED 7'-0" TO BOTTOM AFF	INV
AL1 AL2 AL3 AL4	FLASHING COLOR CHANGING LED NEMA 4X, CL. I, DIV 2 RATED POLYCARBONATE LENS GRAY BASE W/ CLEAR LENS	EDWARDS SIGNALING	105XBRi	LED 120VAC		RED/AMBER/GREEN LED COLORS W/ WALL MOUNTING BRACKET	AL1 AL2 AL3 AL4

CONDUIT AND WIRE SCHEDULE

MARK	DESCRIPTION
(E)	
A	3#1, 1#6 GND – 1 1/2"C TO MCC-1 LOCATED IN WASTEWATER TREATMENT FACILITY BLOWER ROOM
B	3#12, 1#12 GND – 3/4"C
C	3#12, 1#12 GND (XHHW FOR VFD OUTPUT CONDUCTORS) – 3/4"C
D	2#6,1#8 GND – 3/4"C
E	3#3, 1#8 GND – 1 1/4"C
F	3#10, 1#10 GND – 3/4"C
G	14#14, 1#14 GND – 3/4"C
H	3#12, 6#14, 1#12 GND – 3/4"C (DISC AUX CONTACT 2#14, TS 2#14, SV 2#14)
J	3#12, 4#14, 1#12 GND – 3/4"C (TS 2#14, SV 2#14)
K	2#14, 1#14 GND – 3/4"C (INTRINSICALLY SAFE WIRING, SHALL NOT BE COMBINED WITH OTHER WIRING)
L	3#12, 4#14, 1#12 GND – 3/4"C (DISC AUX CONTACT 2#14, TS 2#14)
M	3#12, 2#14, 1#12 GND – 3/4"C (TS 2#14)
N	18#14, 1#14 GND – 3/4"C
P	4#14, 1#14 GND – 3/4"C
Q	8#14, 1#14 GND – 3/4"C
R	(1) 2C#18 SHIELDED CABLE – 3/4"C
S	3#10, 1#10 GND (XHHW FOR VFD OUTPUT CONDUCTORS) – 1"C

ALTERNATE NO. 1

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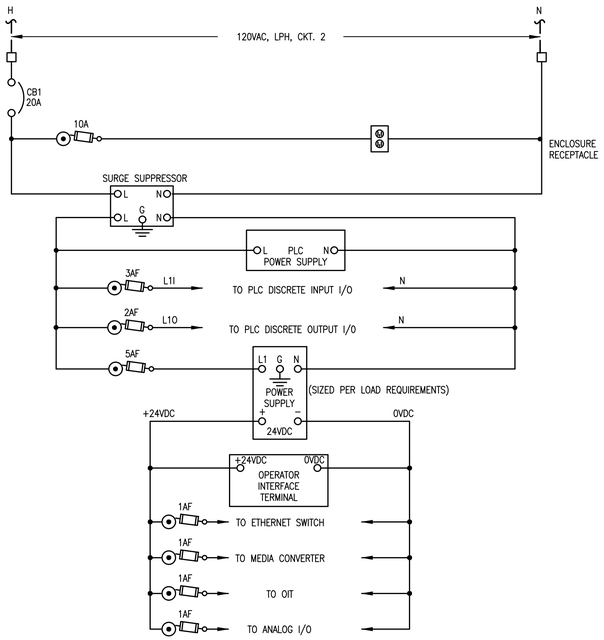
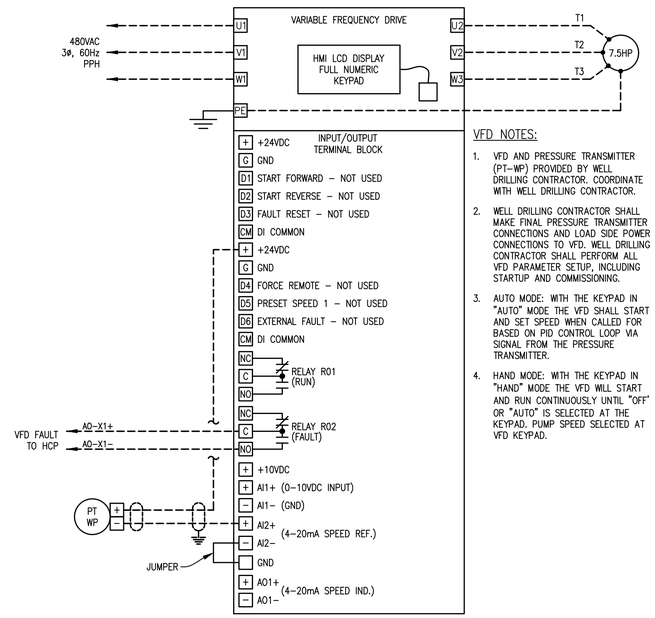
CITY OF HART
OCEANA COUNTY, MICHIGAN
WASTEWATER SYSTEM IMPROVEMENTS
BIOPURE TREATMENT FACILITY
SINGLE LINE DIAGRAM & SCHEDULES

PROJECT NO. 2211159
SHEET NO. H20 OF H21



CONTROL PANEL HCP WIRING DIAGRAM – PARTIAL

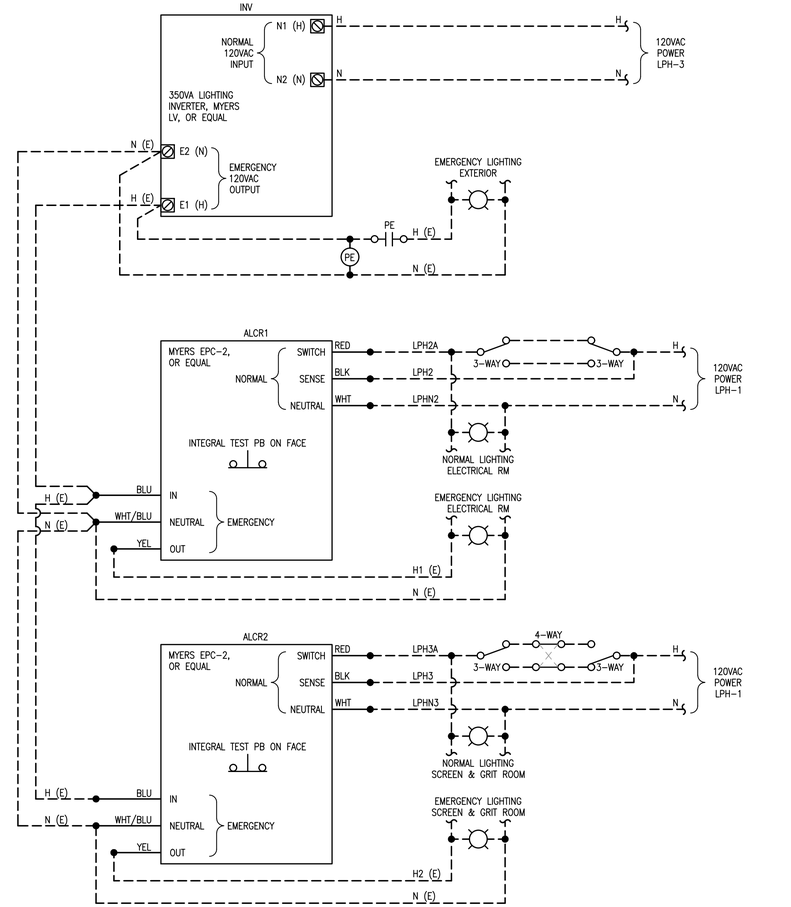
SEE SECTION 40 95 13 FOR PLC & ASSOCIATED HARDWARE, SEE SECTION 40 96 35 APPENDIX B FOR IO SCHEDULE



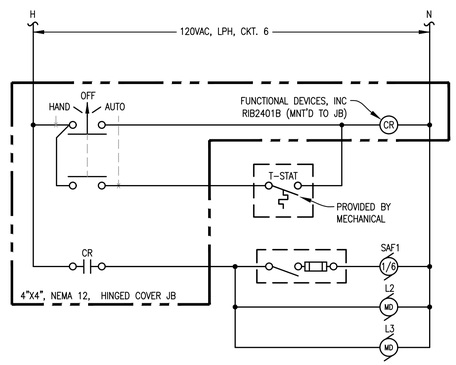
WELL PUMP VFD WIRING DIAGRAM

VFD NOTES:

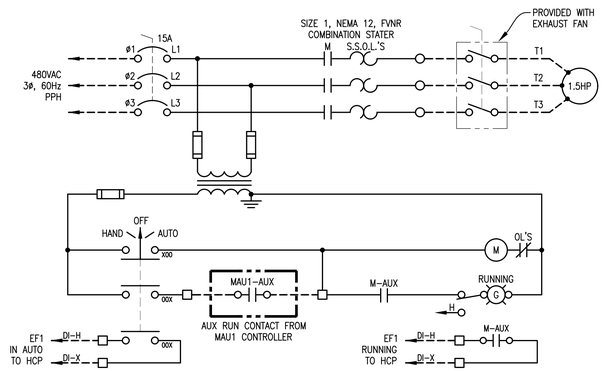
1. VFD AND PRESSURE TRANSMITTER (PT–WP) PROVIDED BY WELL DRILLING CONTRACTOR. COORDINATE WITH WELL DRILLING CONTRACTOR.
2. WELL DRILLING CONTRACTOR SHALL MAKE FINAL PRESSURE TRANSMITTER CONNECTIONS AND LOAD SIDE POWER CONNECTIONS TO VFD. WELL DRILLING CONTRACTOR SHALL PERFORM ALL VFD PARAMETER SETUP, INCLUDING STARTUP AND COMMISSIONING.
3. AUTO MODE: WITH THE KEYPAD IN "AUTO" MODE THE VFD SHALL START AND SET SPEED WHEN CALLED FOR BASED ON PID CONTROL LOOP VIA SIGNAL FROM THE PRESSURE TRANSMITTER.
4. HAND MODE: WITH THE KEYPAD IN "HAND" MODE THE VFD WILL START AND RUN CONTINUOUSLY UNTIL "OFF" OR "AUTO" IS SELECTED AT THE KEYPAD. PUMP SPEED SELECTED AT VFD KEYPAD.



EMERGENCY EGRESS LIGHTING WIRING DIAGRAM



SUPPLY AIR FAN SAF1 WIRING DIAGRAM



EXHAUST FAN EF1 WIRING DIAGRAM – SCREEN & GRIT ROOM

ALTERNATE NO. 1

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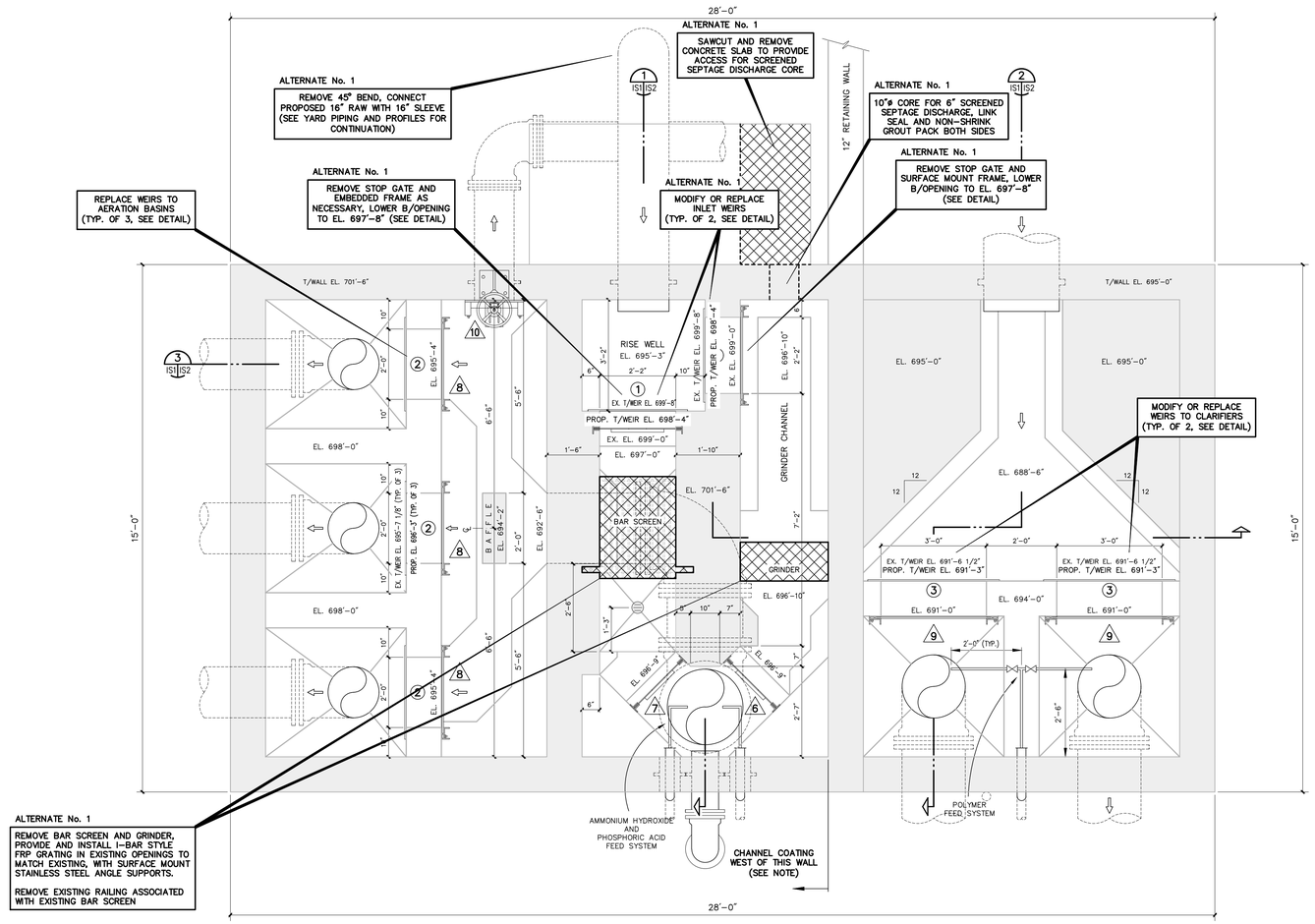
WASTEWATER SYSTEM IMPROVEMENTS
BIOPURE TREATMENT FACILITY

WIRING DIAGRAMS

PROJECT NO. 2211159
SHEET NO. H21 OF H21



INLET SPLITTER BOX MODIFICATIONS – PLAN VIEW

North

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

NOTE

STRUCTURES, EQUIPMENT, HANDRAILS ABOVE 701'-6" NOT SHOWN FOR CLARITY.

INLET SPLITTER BOX COATING NOTE

DURING BYPASS OF THE INLET SPLITTER BOX, CONTRACTOR SHALL PREPARE ALL CONCRETE SURFACES, IN THE AREA SHOWN ON THIS SHEET, IN THE INTERIOR OF ALL CHANNELS BELOW FLOOR LEVEL. SURFACE PREPARATION SHALL INCLUDE CLEANING AND FILLING OF ALL VOIDS AND SPALLS. APPLY EPOXY COATING TO ALL SURFACES PER SPECIFICATIONS.

WEIR PLATE GENERAL NOTES

WEIR PLATES SHALL :

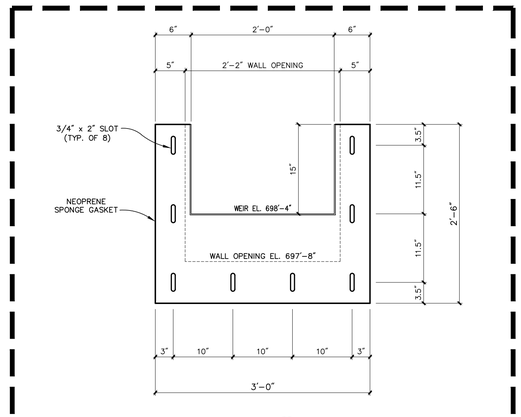
- BE OF 316 STAINLESS STEEL CONSTRUCTION.
- HAVE A MINIMUM THICKNESS OF 1/4".
- HAVE A BEVELED SHARP CREST PER DETAIL.
- BE MOUNTED WITH 1/4" NEOPRENE SPONGE GASKET OVER ENTIRE BEARING SURFACE.

ALL MOUNTING HARDWARE SHALL BE STAINLESS STEEL.

INLET SPLITTER BOX SEQUENCING NOTE

RAS FLOW SHALL BE MAINTAINED TO THE AERATION BASIN DURING CONSTRUCTION ACTIVITIES IN THE INLET SPLITTER BOX. CONTRACTOR SHALL PROVIDE TEMPORARY PIPING AND FITTINGS AS NECESSARY TO ROUTE RAS FLOWS FROM THE EXISTING DISCHARGE AT THE SOUTH END OF THE INLET SPLITTER BOX TO THE AERATION BASIN. TEMPORARY PIPING SHALL BE PROPERLY SUPPORTED. ANY TEMPORARY PIPING CROSSING ACCESS DRIVES OR ROADS SHALL BE ROUTED AND/OR TEMPORARILY COVERED SUCH THAT ACCESS IS MAINTAINED FOR PLANT AND CONTRACTOR STAFF. THE DISCHARGE TO THE AERATION BASIN SHALL BE NEAR THE CENTER OF THE EAST BANK OF THE AERATION BASIN AND SUPPORTED IN A WAY TO PREVENT ANY EROSION.

ALTERNATE No. 1

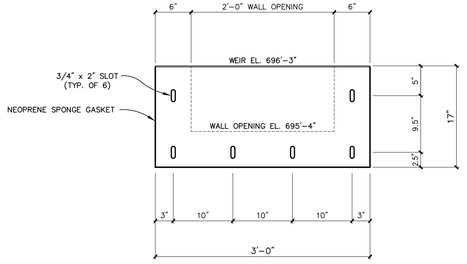


WEIR PLATE ① DETAIL

(TYPICAL OF 2)
SCALE : 1" = 1'-0"

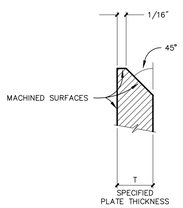
WEIR PLATE 1 NOTE

CONTRACTOR MAY ELECT TO REMOVE EXISTING WEIR PLATES, MACHINE TO INDICATED SIZE, BEVEL PER DETAIL, AND RE-INSTALL WITH NEW GASKETS AND HARDWARE IN LIEU OF PROVIDING A NEW FABRICATED WEIR PLATE.



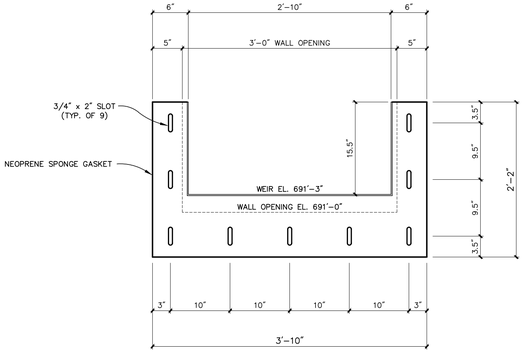
WEIR PLATE ② DETAIL

(TYPICAL OF 3)
SCALE : 1" = 1'-0"



BEVELED SHARP CRESTED WEIR DETAIL

SCALE : NONE



WEIR PLATE ③ DETAIL

(TYPICAL OF 2)
SCALE : 1" = 1'-0"

WEIR PLATE 3 NOTE

CONTRACTOR MAY ELECT TO REMOVE EXISTING WEIR PLATES, MACHINE TO INDICATED SIZE, BEVEL PER DETAIL, AND RE-INSTALL WITH NEW GASKETS AND HARDWARE IN LIEU OF PROVIDING A NEW FABRICATED WEIR PLATE.

NO.	REVISIONS	BY	DATE

DRAWN: SMYTH
DATE: APR. '23
CHECKED: P.W.B.
DATE: APR. '23

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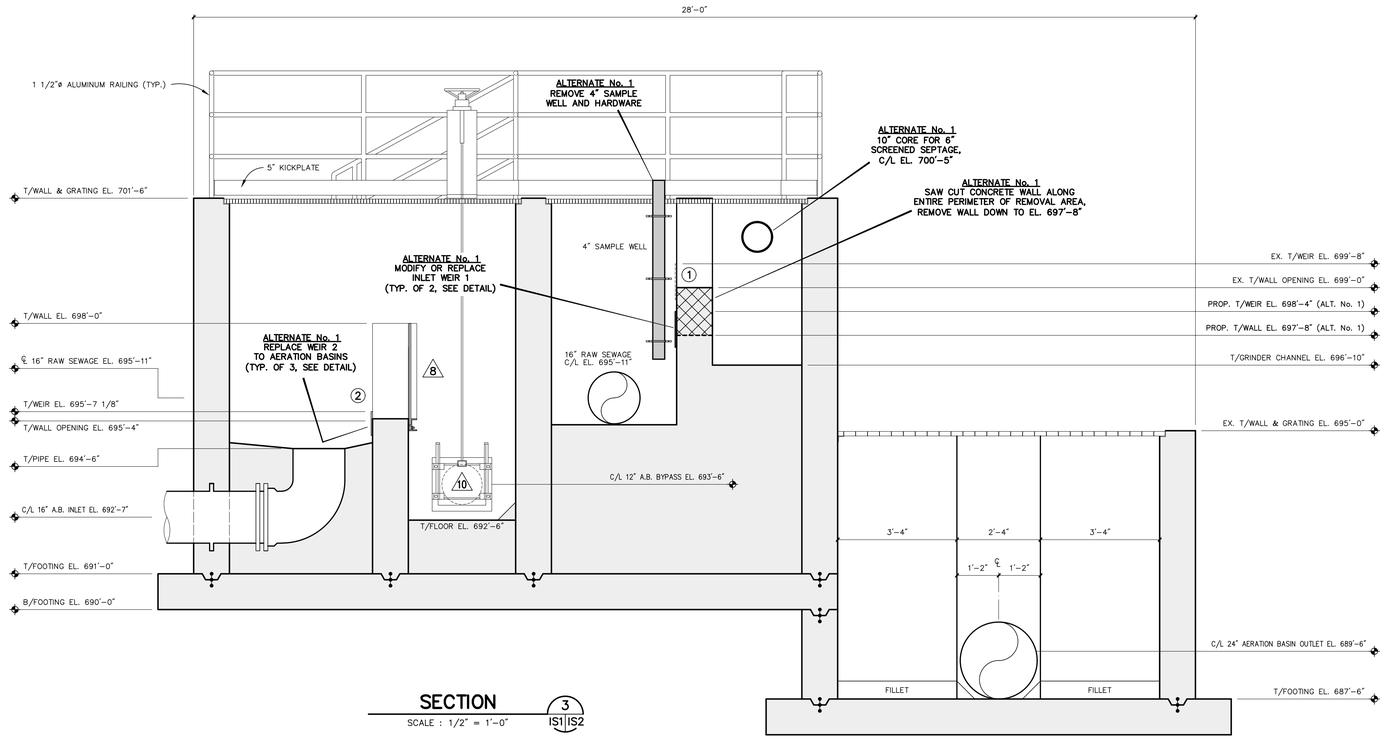
CITY OF HART
OCEANA COUNTY, MICHIGAN

WASTEWATER SYSTEM IMPROVEMENTS
CONTRACT 4 – BIOPURE TREATMENT FACILITY

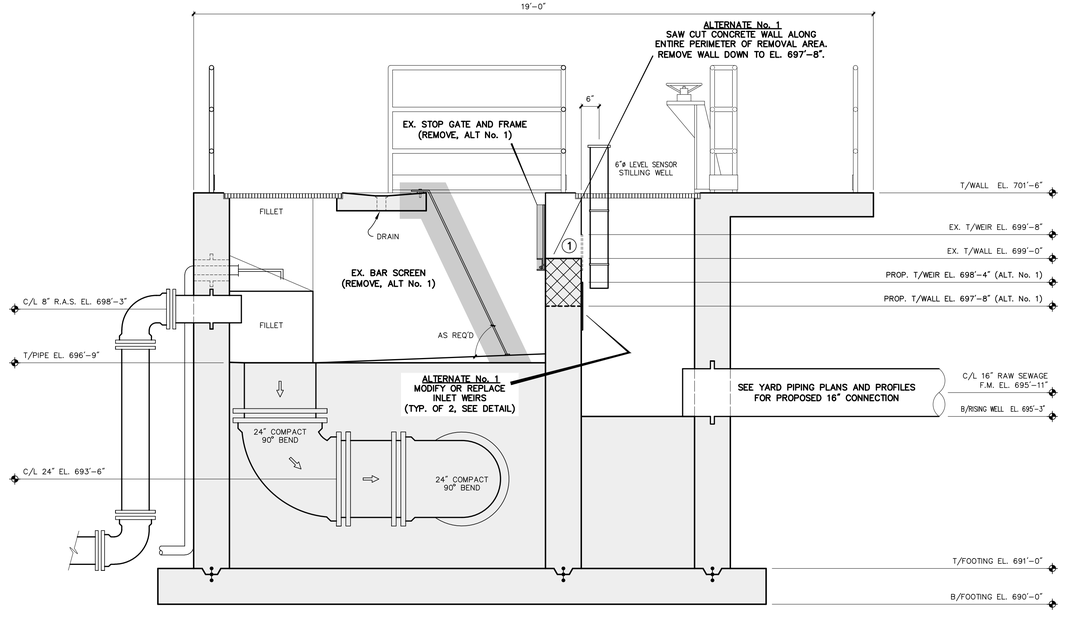
PLAN & DETAILS

PROJECT NO. 2211159
SHEET NO. IS1 OF IS3



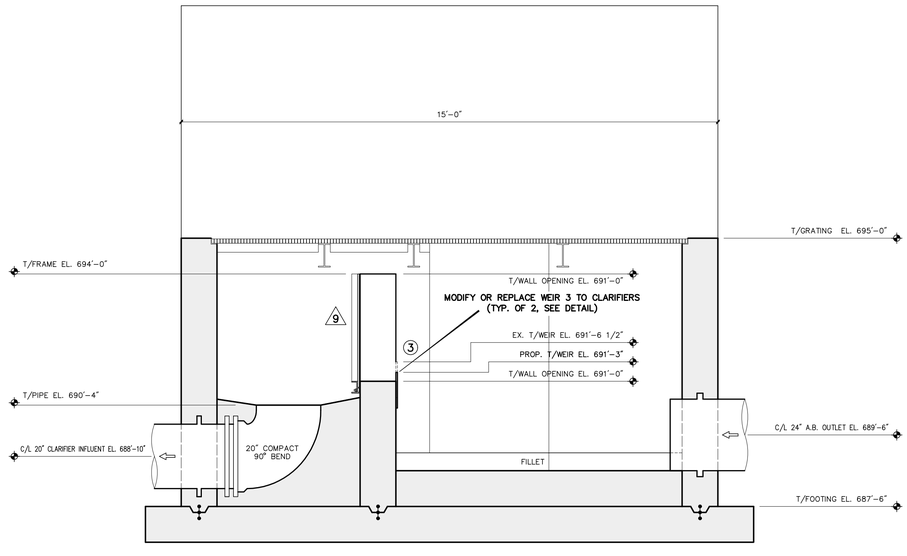
SECTION 3 IS1 IS2

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



SECTION 1 IS1 IS2

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



SECTION 2 IS1 IS2

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

CONCRETE REMOVAL NOTE

WHERE CONCRETE SAWCUTTING AND REMOVAL IS CALLED FOR, SAW CUTS SHALL BE SQUARE WITH NO OVERCUT. COMPLETE CONCRETE REMOVAL IN CORNERS BY CHIPPING CONCRETE. DRILL EXPOSED STEEL REINFORCEMENT 2.5" DEEP. FILL WITH NON-SHRINK GROUT.

NO.	REVISIONS	BY	DATE

DRAWN: SMYTH
DATE: APR. '23
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OCEANA COUNTY, MICHIGAN

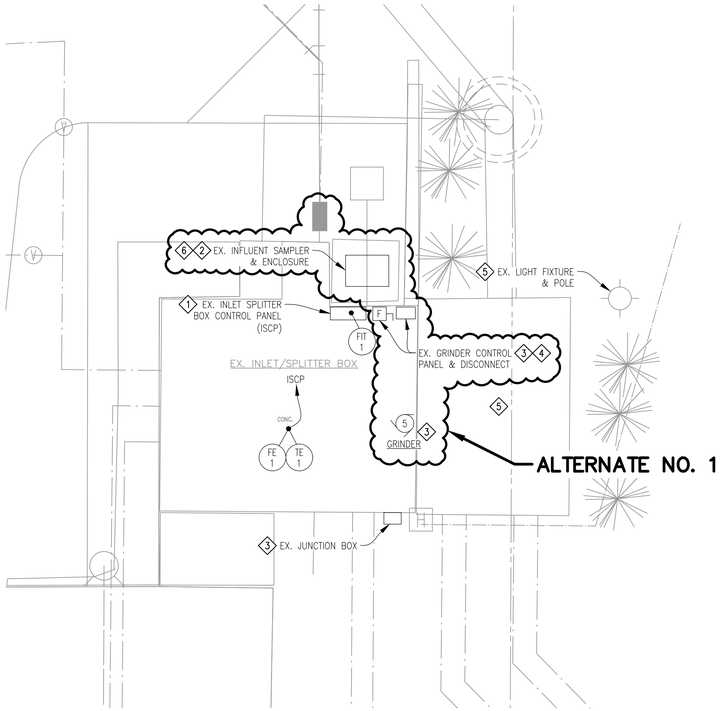
WASTEWATER SYSTEM IMPROVEMENTS
CONTRACT 4 – BIOPURE TREATMENT FACILITY

SECTIONS & DETAILS

PROJECT NO. 2211159

SHEET NO. IS2 OF IS3

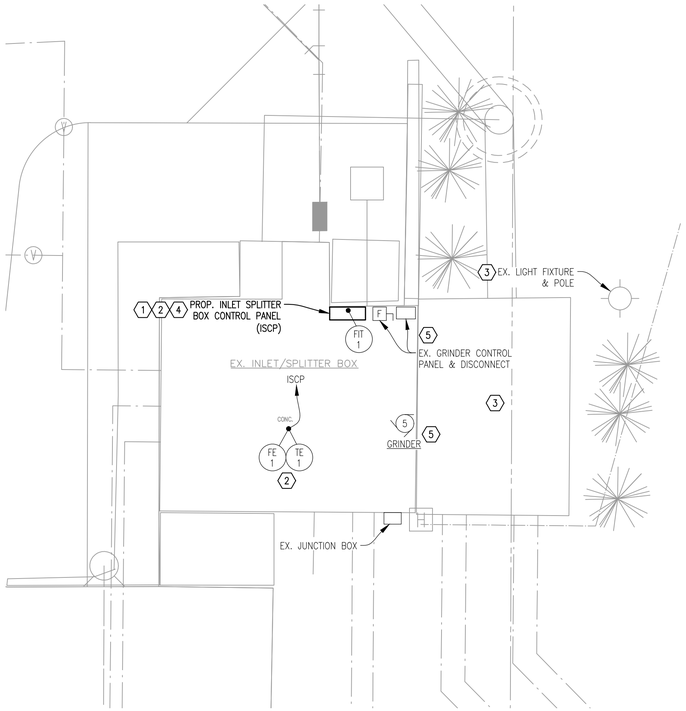
T:\CIVIL3D PROJECTS\2021\2211159_HART_WWTP\4_PROD\C4 HEADWORKS LAGOON SPLITS AND POLISHING POND PS\2211159_C4_SPLITTER BOX.DWG - WSMYTH - May. 22, 2023 - 08:05am - PrintMeNewhof



2 C22 INLET SPLITTER BOX ELECTRICAL PLAN – EXISTING

SCALE : 1" = 5'

North



3 C23 INLET SPLITTER BOX ELECTRICAL PLAN – PROPOSED

SCALE : 1" = 5'

North

GENERAL NOTES:

1. ENGRAVED EQUIPMENT NAMEPLATES (WHITE PHENOLIC WITH BLACK LETTERS) SHALL BE FURNISHED AND INSTALLED BY THE ELECTRICAL CONTRACTOR FOR NEW AND EXISTING ELECTRICAL EQUIPMENT AS NOTED. LETTER SIZES: 1" HIGH FOR INDIVIDUAL ELECTRICAL POWER DISTRIBUTION AND SERVICE EQUIPMENT. LETTER SIZES: 1/4" HIGH FOR INDIVIDUAL ELECTRICAL MOTOR CONTROL CENTER UNITS, VFD ENCLOSURES, SAFETY DISCONNECTS, COMBINATION STARTERS AND PROCESS INSTRUMENTATION.
2. WASTEWATER TREATMENT FACILITY MUST REMAIN OPERATIONAL DURING ALL DEMOLITION AND CONSTRUCTION ACTIVITIES. COORDINATE ALL DEMOLITION WORK WITH THE OWNER AND OTHER TRADES.
3. PROVIDE THESE CONDUIT TYPES IN THE FOLLOWING LOCATIONS:
   a. RGS – OUTDOOR ABOVE GRADE.
   b. SCH. 40 PVC – BELOW GRADE – MINIMUM 24" COVER.
4. PROVIDE RGS CONDUIT AND ELBOWS BELOW GRADE FOR ALL STUB UPS TO EQUIPMENT EXTENDING UP THRU CONCRETE SLABS FOR TRANSITION FROM CONCEALED/BELOW GRADE TO EXPOSED/ABOVE GRADE CONDUIT INSTALLATIONS. PROVIDE SCH. 40 PVC SLEEVES FOR ALL CONDUITS EXTENDING UP THROUGH CONCRETE SLABS.
5. INSTALL BELOW GRADE CONDUITS A MINIMUM OF 24" BELOW GRADE. PROVIDE YELLOW RIBBON MARKED "BURIED ELECTRIC" 12" BELOW GRADE ABOVE CONDUITS. PROVIDE RMC ELBOWS IN ALL BELOW GRADE CONDUIT INSTALLATIONS.
6. ALL INSTRUMENTATION DEVICES SHOWN ARE INSTALLED BY THE ELECTRICAL CONTRACTOR. ELECTRICAL CONTRACTOR SHALL PROVIDE FIELD WIRING, CONDUIT & TERMINATIONS FOR THOSE DEVICES AS REQUIRED.
7. ALL INSTRUMENTATION DEVICES SHOWN ARE INSTALLED BY THE ELECTRICAL CONTRACTOR. ELECTRICAL CONTRACTOR SHALL PROVIDE FIELD WIRING, CONDUIT & TERMINATIONS FOR THOSE DEVICES AS REQUIRED.
8. CORE HOLES FOR CONDUITS INTO CONCRETE STRUCTURES AS NEEDED. PATCH ALL NEW AND UNUSED CONDUIT PENETRATIONS INTO EX. AND PROP. CONCRETE STRUCTURES WITH NON-SHRINKING GROUT.

DEMOLITION NOTES: ⟨#⟩ – (SYMBOL DENOTES PLAN NOTE)

1. DEMOLISH INLET SPLITTER BOX CONTROL PANEL ENCLOSURE AND DISPOSE. SALVAGE CONTROL PANEL BACKPLATE AND COMPONENTS FOR REUSE. SALVAGE CONDUITS AND WIRING ENTERING/EXITING CONTROL PANEL FOR REWORK AND REUSE. SALVAGE 120VAC CONTROL PANEL POWER FOR REUSE.
2. IDENTIFY AND DISCONNECT GENERAL PURPOSE POWER AND LIGHTING CIRCUITS IN INFLUENT SAMPLER ENCLOSURE. DEMOLISH LIGHT FIXTURE, LIGHT SWITCHES AND RECEPTACLES AND DISPOSE. DEMOLISH ASSOCIATED UNUSED CONDUITS BACK TO FIRST IN USE JUNCTION BOX AND UNUSED CONDUCTORS BACK TO SOURCE AND DISPOSE. SALVAGE INFLUENT SAMPLER FOR RELOCATION TO PROPOSED HEADWORKS BUILDING. SAMPLER ENCLOSURE TO BE DEMOLISHED BY OTHER TRADES.
3. DEMOLISH GRINDER (MUFFIN MONSTER) CONTROL PANEL AND DISPOSE. DEMOLISH GRINDER DISCONNECT SWITCH AND RETURN TO OWNER. DEMOLISH CONDUIT AND CONDUCTORS FROM CONTROL PANEL TO GRINDER MOTOR AND TO JUNCTION BOX ON SOUTH SIDE OF INLET SPLITTER BOX AND DISPOSE. DISCONNECT 480V POWER CONDUCTORS FROM POWER PANEL PDP LOCATED IN WASTEWATER TREATMENT FACILITY ELECTRICAL ROOM AND MARK BREAKER AS SPARE. COIL 480V POWER CONDUCTORS AT INLET SPLITTER BOX JUNCTION BOX AND IN POWER PANEL PDP AND MARK WIRING AS SPARE WITH ORIGIN/DESTINATION LABEL. SEE "ELECTRICAL SITE PLAN" FOR POWER PANEL PDP LOCATION.
4. DISCONNECT AND SALVAGE GRINDER "RUNNING" AND "FAILURE" STATUS CONDUITS AND WIRING FROM GRINDER CONTROL PANEL AND AT MAIN CONTROL PANEL (MCP).
5. DURING DEMOLITION WORK AT INLET SPLITTER BOX IDENTIFY GENERAL POWER AND LIGHTING CIRCUITS FEEDING THE AT GRADE STRUCTURE CONNECTED TO THE EAST SIDE OF THE INLET SPLITTER BOX AND POLE MOUNTED SITE LIGHT LOCATED ON THE NORTHEAST CORNER OF STRUCTURE AND SALVAGE FOR REUSE IF ROUTED THROUGH DEMOLISHED INLET SPLITTER BOX CONTROL PANEL, GRINDER DISCONNECT OR GRINDER CONTROL PANEL.
6. DISCONNECT 4–20mA ANALOG SIGNAL AT INFLUENT SAMPLER FROM FLOW TRANSMITTER (FIT–1) LOCATED IN INLET SPLITTER BOX CONTROL PANEL (ISCP) AND RECONNECT FLOW TRANSMITTER 4–20MA ANALOG SIGNAL IN CONTROL PANEL TO MAIN CONTROL PANEL (MCP).

PLAN NOTES: ⟨#⟩ (SYMBOL DENOTES PLAN NOTE)

1. PROVIDE 30"Hx30"Wx10"D NEMA 4X, STAINLESS STEEL ENCLOSURE, HOFFAMN OR EQUAL, AND INSTALL SALVAGED INLET SPLITTER BOX CONTROL PANEL BACKPLATE INTO ENCLOSURE. PROVIDE VIEWING WINDOW IN DOOR OF ENCLOSURE POSITIONED FOR VIEWING FLOW TRANSMITTER DISPLAY. PROVIDE SUPPORT RACK CONSTRUCTED OF 1–5/8"x1–5/8" STAINLESS STEEL U–CHANNEL, HARDWARE AND FASTENERS AND MOUNT CONTROL PANEL. COORDINATE CONTROL PANEL MOUNTING LOCATION WITH OWNER.
2. EXTEND SALVAGED FLOW ELEMENT (FE) AND TEMPERATURE ELEMENT (TE) CONDUITS AND WIRING TO CONTROL PANEL, RECONNECT ALL SALVAGED CONTROL AND ANALOG WIRING AND VERIFY OPERATION AND SIGNALING BACK TO EX. PLANT SCADA SYSTEM.
3. EXTEND CONDUITS AND CONDUCTORS AS NEEDED FOR GENERAL POWER AND LIGHTING CIRCUITS FEEDING THE AT GRADE STRUCTURE CONNECTED TO THE EAST SIDE OF THE INLET SPLITTER BOX AND POLE MOUNTED SITE LIGHT LOCATED ON THE NORTHEAST CORNER OF STRUCTURE.
4. EXTEND SALVAGED GRINDER "RUNNING" AND "FAILURE" STATUS CONDUIT AND WIRING INTO CONTROL PANEL AND MARK WIRING AS SPARE WITH ORIGIN/DESTINATION LABEL IN INLET SPLITTER BOX CONTROL PANEL AND MAIN CONTROL PANEL (MCP) LOCATED IN WASTEWATER TREATMENT FACILITY.
5. GRINDER STATION REMAINS IF ALTERNATE NO. 1 IS NOT INCLUDED IN CONTRACT.

811 Know what's below. Call before you dig.

UTILITY LOCATIONS ARE DERIVED FROM ACTUAL MEASUREMENTS OR AVAILABLE RECORDS. THEY SHOULD NOT BE INTERPRETED TO BE EXACT LOCATIONS NOR SHOULD IT BE ASSUMED THAT THEY ARE THE ONLY UTILITIES IN THIS AREA.

NO.	REVISIONS	BY	DATE

DRAWN: RBD/KCT
DATE: MAY '23
CHECKED: MAT
DATE: MAY '23

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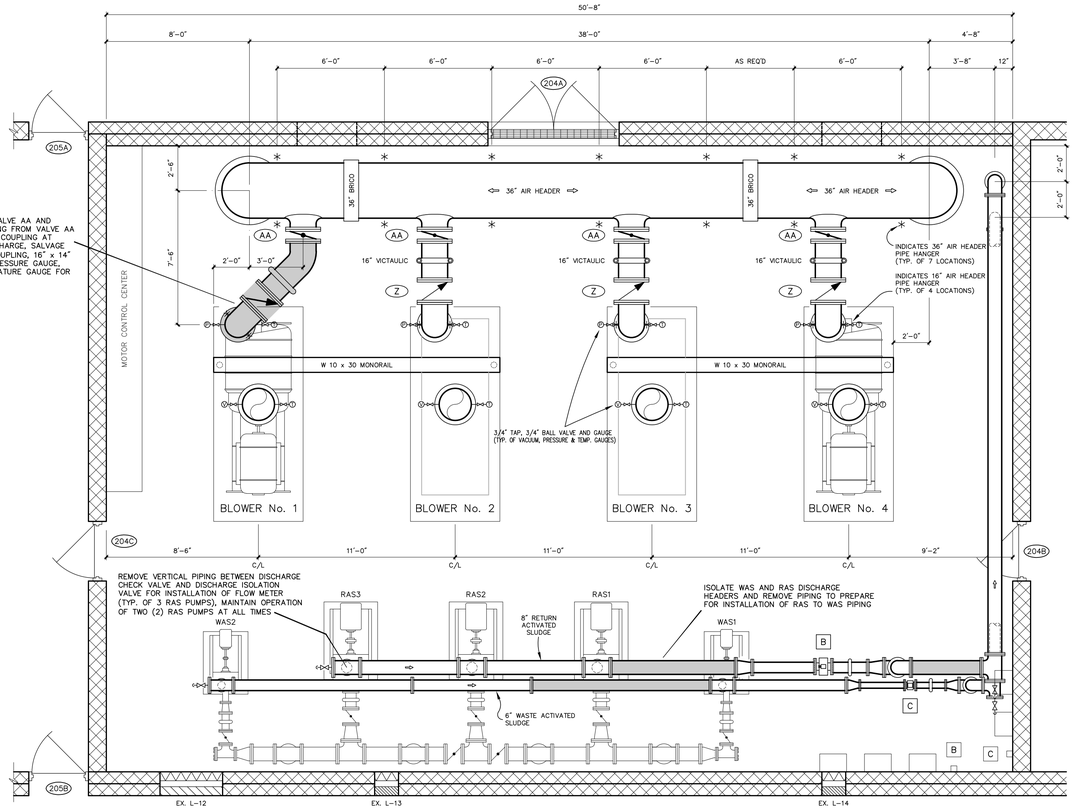
CITY OF HART
OCEANA COUNTY, MICHIGAN

WASTEWATER SYSTEM IMPROVEMENTS
BIOPURE TREATMENT FACILITY

ELECTRICAL PLANS & DETAILS

PROJECT NO. 2211159

SHEET NO. IS3 OF IS3



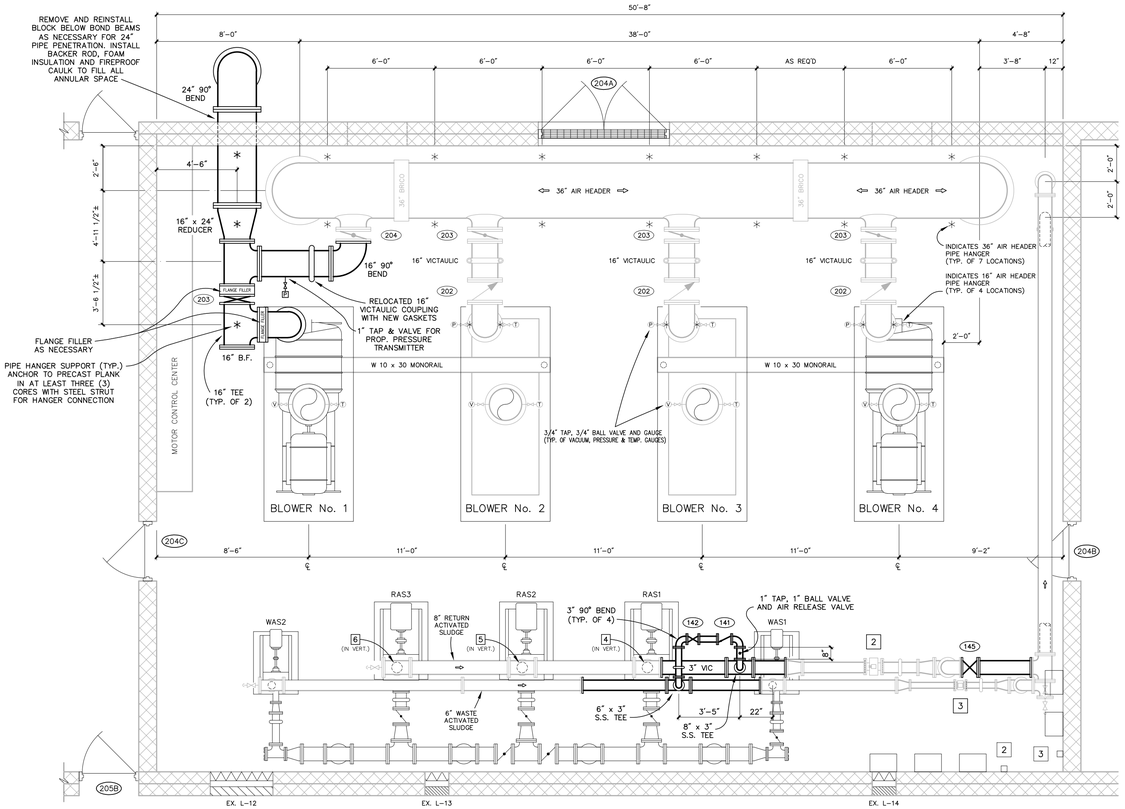
DEMOLITION PLAN – 12' A.F.F.

North

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

NOTE

36" AIR HEADER SHALL BE STEEL



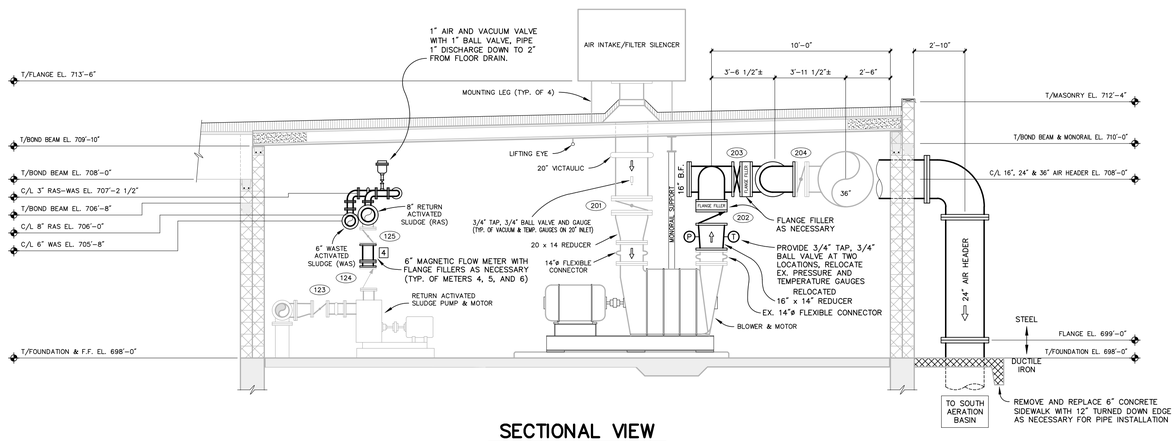
AIR & SLUDGE PIPING PLAN – 12' A.F.F.

North

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

NOTES

1. 36" AIR HEADER SHALL BE STEEL.
2. FLANGED PIPING AND FITTINGS LESS THAN 4" DIAMETER SHALL BE STAINLESS STEEL. TEES WITH A 3" CONNECTION MAY BE DUCTILE IRON OR STAINLESS STEEL.
3. RELOCATE EXISTING WATER, DWV, AND OTHER PIPING AS NECESSARY FOR MODIFICATIONS TO SLUDGE PIPING.

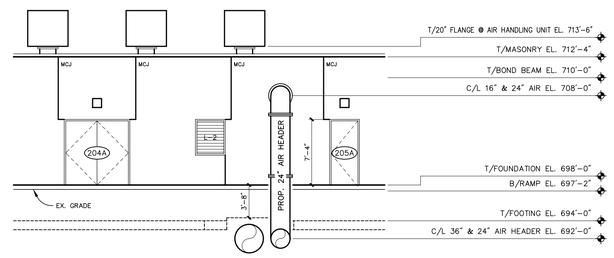


SECTIONAL VIEW

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

NOTES

1. BLOWER OUTLET PIPING AND 24" AIR HEADER SHALL BE STEEL.
2. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS.
3. CONTRACTOR MAY PROPOSE SOME JOINTS BE WELDED WHERE SHOWN AS FLANGED FOR ENGINEER REVIEW AND APPROVAL.



PARTIAL WEST BUILDING ELEVATION

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

NO.	REVISIONS	BY	DATE

DRAWN: SMYTH
DATE: MAY '23
CHECKED: P.W.B.
DATE: MAY '23

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OCEANA COUNTY, MICHIGAN

WASTEWATER SYSTEM IMPROVEMENTS
CONTRACT 4 – BIOPURE TREATMENT FACILITY

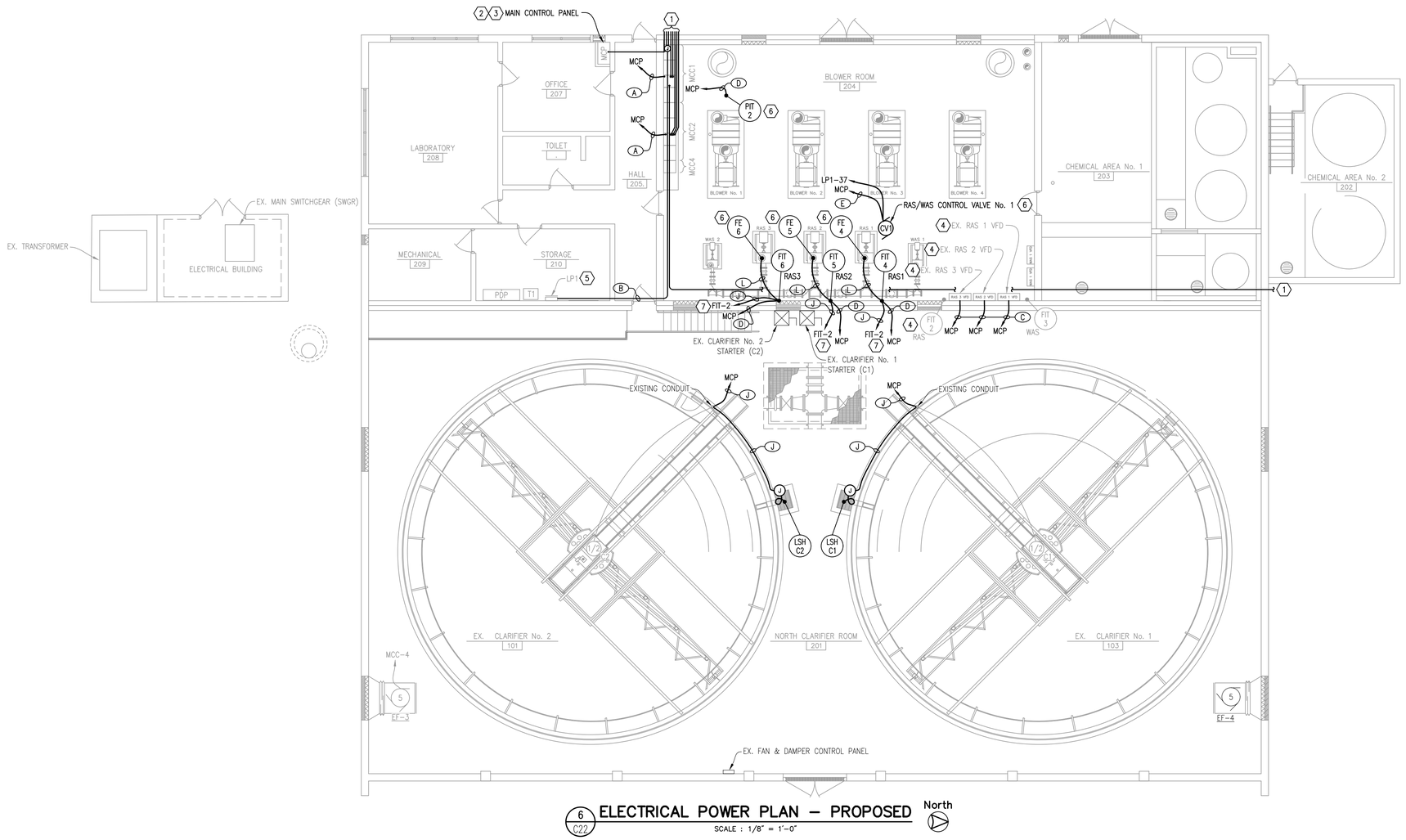
AIR SUPPLY PLANS & SECTIONS

PROJECT NO. 2211159

SHEET NO. T1 OF T3

CONDUIT AND WIRE SCHEDULE

MARK	DESCRIPTION
(#)	
A	12#14, 1#14 GND – 1"C
B	4#12, 1#12 GND – 3/4"C (120V POWER TO EXISTING SITE LIGHT & AIT–103)
4 C	2C#18 SHIELDED CABLE – (ROUTE CABLE IN EXISTING ANALOG CONDUIT FROM EACH ENCLOSURE TO MCP)
D	2C#18 SHIELDED CABLE – 3/4"C
E	(2) 2C#18 SHIELDED CABLE – 3/4"C
F	2#12, 1#12 GND – 3/4"C
G	8#14, 1#14 GND – 3/4"C
H	4#14, 1#14 GND – 3/4"C
J	2#14, 1#14 GND – 3/4"C
K	COORDINATE WIRING REQUIREMENTS WITH EQUIPMENT SUPPLIER SHOP DRAWINGS – 3/4"C
L	MANUFACTURES FLOW SENSOR CABLE, 1#10 GND – 1"C
M	6 STRAND FIBER OPTIC CABLE – 1 1/2"C



6 C22 **ELECTRICAL POWER PLAN – PROPOSED**

SCALE : 1/8" = 1'–0"

North

GENERAL NOTES:

1. ENGRAVED EQUIPMENT NAMEPLATES (WHITE PHENOLIC WITH BLACK LETTERS) SHALL BE FURNISHED AND INSTALLED BY THE ELECTRICAL CONTRACTOR FOR NEW AND EXISTING ELECTRICAL EQUIPMENT AS NOTED. LETTER SIZES: 1" HIGH FOR INDIVIDUAL ELECTRICAL POWER DISTRIBUTION AND SERVICE EQUIPMENT. LETTER SIZES: 1/4" HIGH FOR INDIVIDUAL ELECTRICAL MOTOR CONTROL CENTER UNITS, VFD ENCLOSURES, SAFETY DISCONNECTS, COMBINATION STARTERS AND PROCESS INSTRUMENTATION.
2. SEE "ELECTRICAL SINGLE LINE DIAGRAMS" FOR EX. MOTOR CONTROL CENTERS MCC–1 & MCC–2 FOR CONDUIT AND CONDUCTOR SIZES AND QUANTITIES ASSOCIATED WITH 480V LOADS AND MCC–1 & MCC–2 MODIFICATION REQUIREMENTS.
3. IN PROP. SOUTH CLARIFIER ROOM ROUTE ALL CONDUITS CONCEALED IN WALLS, IN CONCRETE SLABS OR BELOW CONCRETE SLABS WHERE POSSIBLE. PROVIDE ALL JUNCTION BOXES, COVERS, DEVICES AND LIQUID TIGHT FLEXIBLE CONDUIT CONNECTIONS AS NEEDED.
4. PROVIDE SCH 40 PVC CONDUIT FOR ALL BELOW CONCRETE SLAB, IN CONCRETE SLAB AND IN WALL INSTALLATIONS.
5. PROVIDE RMC OR PVC COATED RMC, DEPENDENT ON LOCATION, 90° ELBOWS FOR ALL STUB UPS TO EQUIPMENT EXTENDING UP THROUGH CONCRETE SLABS FOR TRANSITION FROM CONCEALED TO EXPOSED INSTALLATIONS.
6. FOR EXPOSED, ABOVE CEILING AND DAMP LOCATIONS (NORTH & SOUTH CLARIFIER ROOMS) CONDUIT INSTALLATIONS PROVIDE RIGID METAL CONDUIT (RMC) WITH MALLEABLE IRON CONDUIT FITTINGS AND CONDUIT BODIES WITH NEMA 12, STEEL, JIC, HINGED COVER JUNCTION BOXES AND GALVANIZED SUPPORTS AND HARDWARE. STAMPED STEEL 4–SQUARE BOXES ARE ACCEPTABLE FOR 3/4" AND 1" CONDUITS AND 10' AFF IN DAMP LOCATIONS.
7. FOR EXPOSED CONDUIT INSTALLATIONS IN CHEMICAL ROOMS PROVIDE PVC SCH. 80 CONDUIT WITH PVC CONDUIT FITTINGS AND CONDUIT BODIES AND STAINLESS STEEL SUPPORTS AND HARDWARE.
8. TREATMENT BUILDING CONTROL PANEL (TCP) PROVIDED BY CONTROLS INTEGRATOR AND INSTALLED BY CONTRACTOR. CONTRACTOR TO PROVIDE ALL EXTERNAL POWER, CONTROL AND INSTRUMENTATION WIRING AS SHOWN ON THE DRAWINGS.
9. INSTALL WALL MOUNTED CONTROL PANELS AT 6'–0" TO TOP AFF. PROVIDE 4" HOUSEKEEPING PADS FOR ALL FREESTANDING CONTROL PANELS. HOUSEKEEPING PAD SIZE BASED ON ACTUAL EQUIPMENT SIZE PLUS 4" ON FRONT AND SIDES.
10. INSTALL WALL MOUNTED THERMOSTATS, TEMPERATURE SENSORS AND PUSHBUTTON CONTROL STATIONS AT 5'–0" TO TOP AFF.
11. INSTALL WALL OR SUPPORT RACK MOUNTED SAFETY DISCONNECT SWITCHES, MOTOR STARTERS AND VFD'S AT 5'–6" TO TOP AFF.
12. ALL RECEPTACLES MOUNTED AT 42" AFF UNLESS NOTED OTHERWISE.
13. UNLESS NOTED OTHERWISE ON THE PLANS ALL 120VAC POWER CIRCUITS TO RECEPTACLES AND OTHER SMALL 120VAC, 1Ø LOADS SHALL BE 2#12, 1#12GND IN MINIMUM 3/4" RMC OR PVC COATED RMC, DEPENDENT ON LOCATION.
14. PROVIDE #12 TO NON–SWITCHED SIDE OF LOCAL LIGHTING CIRCUIT FOR ALL EMERGENCY BATTERY PACK LUMENAIRES.
15. SEE HEADWORKS BUILDING "SINGLE LINE DIAGRAM & SCHEDULES" SHEET H20 FOR "LIGHTING SCHEDULE"

PLAN NOTES: (#) (SYMBOL DENOTES PLAN NOTE)

1. SEE "ELECTRICAL SITE PLAN – PROPOSED" AND "CONDUIT AND WIRE SCHEDULE" FOR BRANCH CIRCUIT, MOTOR FEEDER AND ANALOG WIRING CONDUIT CONTINUATION, CONDUIT AND CONDUCTORS SIZES AND QUANTITIES. PROVIDE WALL PENETRATIONS FOR CONDUITS AS NEEDED. PATCH PENETRATIONS WITH NON–SHRINKING GROUT, GROUT SHALL EXTEND THE FULL DEPTH OF THE PENETRATION.
2. PROVIDE AN ALLEN–BRADLEY, 4–POINT, 4–20mA, ANALOG OUTPUT CARD IN SPARE SLOT 11 OF SLC 5/05 IO CHASSIS OF MAIN CONTROL PANEL (MCP). PROVIDE WIRE TERMINALS AT BOTTOM OF THIRD DIN RAIL FROM LEFT AND PROVIDE SHIELDED CABLING FROM ANALOG OUTPUTS TO TERMINALS. COORDINATE WITH INTEGRATOR.
3. DEMOLISH ALL ALARM PILOT LIGHTS AND LEGENDS FROM DOOR OF MAIN CONTROL PANEL (MCP). DEMOLISH ASSOCIATED PILOT LIGHT WIRING BACK TO RESPECTIVE WIRE TERMINALS. FILL PILOT LIGHT HOLES WITH ADEQUATELY SIZED METALLIC PUSH IN PLUGS. DELETE PLC PROGRAMMING ASSOCIATED WITH DEMOLISHED PILOT LIGHT DIGITAL OUTPUTS MAKING THESE DIGITAL OUTPUTS SPARE. AT SLOT 8 DIGITAL OUTPUT CARD REWIRE IO POINTS 00–12 AS ISOLATED DRY CONTACT RELAY OUTPUTS, REMAINING SPARED RELAY OUTPUTS TO MAINTAIN EX. NON–ISOLATED OUTPUT WIRING. PROVIDE ADDITIONAL WIRE TERMINALS AS NEEDED. SPARED OUTPUTS SHALL BE UTILIZED FOR MOTOR CONTROL ON THIS PROJECT. SEE SECTION 40 96 35 APPENDIX B & APPENDIX C. COORDINATE WITH INTEGRATOR.
4. SEE "EX. RETURN ACTIVATED SLUDGE PUMP RAS 1 VFD WIRING DIAGRAM – PROPOSED" ON SHEET T3 FOR CONTROL WIRING MODIFICATIONS AND OPERATIONAL PROGRAMMING REQUIREMENTS FOR EX. RAS 1, RAS 2 AND RAS 3 VFD'S.
   a. IN EX. RAS VFD 3 ENCLOSURE DEMOLISH 4–20mA ANALOG SIGNAL SPLITTER. DEMOLISH SHIELDED CABLING FROM SPLITTER TO FLOW TRANSMITTER FIT–2, RAS VFD 1, RAS VFD 2 AND RAS VFD 3.
   b. PROVIDE (1) 2C#18 SHIELDED CABLE FROM EACH VFD ENCLOSURE TO MAIN CONTROL PANEL (MCP) FOR VFD SPEED REFERENCE. UTILIZE EX. ANALOG CONDUITS FROM VFD ENCLOSURES TO MAIN CONTROL PANEL (MCP).
   c. AT EACH VFD ENCLOSURE UTILIZE SPARE #14 CONTROL CONDUCTORS FROM VFD ENCLOSURES TO MAIN CONTROL PANEL (MCP) FOR VFD REMOTE START/STOP CONTROL. PROVIDE (1) 120VAC DPDT CONTROL RELAY AND RELAY BASE IN EACH VFD ENCLOSURE FOR VFD REMOTE START/STOP CONTROL. UTILIZE SPARED NON–ISOLATED DIGITAL OUTPUT TO ENERGIZE VFD ENCLOSURE MOUNTED CONTROL RELAY.
   d. AT FLOW TRANSMITTER FIT–2 RECONNECT EX. SHIELDED CABLE FROM FLOW TRANSMITTER 4–20mA OUTPUT TO MAIN CONTROL PANEL (MCP).
5. PROVIDE BREAKERS IN SPARE CIRCUIT SPACES IN LIGHTING PANEL LP1 TO FEED ANALYZER/TRANSMITTER AIT–103 (15A1P), RAS/WAS VALVE No. 1 (20A1P), EX. SITE LIGHT (15A1P), (2) 30A2P BREAKERS IN SPACES 36, 38, 40, 42 SHALL BE REMOVED DURING EX. BIOSOLIDS MIXER HEATER DEMOLITION. REVISE PANEL LP1 SCHEDULE AS REQUIRED.
6. INSTRUMENT INSTALLED IN PROCESS PIPING. COORDINATE LOCATION WITH MECHANICAL.
7. EXTEND 120V, 1ø POWER CIRCUIT FROM FIT–2 TO NEW FLOW METERS.

NO.	REVISIONS	BY	DATE

DRAWN RBD/KCT
DATE MAY '23
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DATE MAY '23

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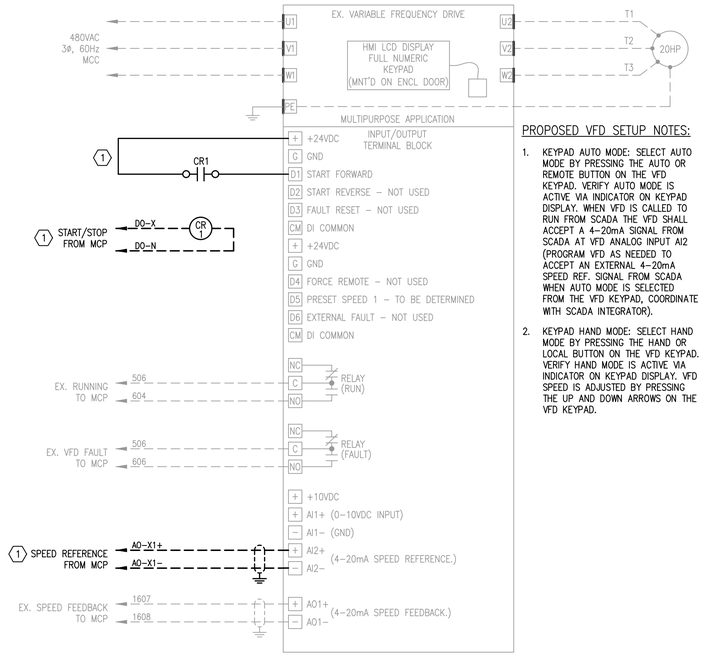
CITY OF HART
OCEANA COUNTY, MICHIGAN

WASTEWATER SYSTEM IMPROVEMENTS
BIOPURE TREATMENT FACILITY

ELECTRICAL PLAN – PROPOSED

PROJECT NO. 2211159
SHEET NO. T2 OF T3



PROPOSED VFD SETUP NOTES:

1. KEYPAD AUTO MODE: SELECT AUTO MODE BY PRESSING THE AUTO OR REMOTE BUTTON ON THE VFD KEYPAD. VERIFY AUTO MODE IS ACTIVE VIA INDICATOR ON KEYPAD DISPLAY. WHEN VFD IS CALLED TO RUN FROM SCADA THE VFD SHALL ACCEPT A 4–20mA SIGNAL FROM SCADA AT VFD ANALOG INPUT AI2 (PROGRAM VFD AS NEEDED TO ACCEPT AN EXTERNAL 4–20mA SPEED REF. SIGNAL FROM SCADA WHEN AUTO MODE IS SELECTED FROM THE VFD KEYPAD, COORDINATE WITH SCADA INTEGRATOR).
2. KEYPAD HAND MODE: SELECT HAND MODE BY PRESSING THE HAND OR LOCAL BUTTON ON THE VFD KEYPAD. VERIFY HAND MODE IS ACTIVE VIA INDICATOR ON KEYPAD DISPLAY. VFD SPEED IS ADJUSTED BY PRESSING THE UP AND DOWN ARROWS ON THE VFD KEYPAD.

EX. RETURN ACTIVATED SLUDGE PUMP RAS 1 VFD WIRING DIAGRAM – PROPOSED

TYPICAL FOR RAS 2 & RAS 3

PLAN NOTES: ⟨#⟩ (SYMBOL DENOTES PLAN NOTE)

1. SEE "EX. RETURN ACTIVATED SLUDGE PUMP RAS 1 VFD WIRING DIAGRAM – PROPOSED" ON THIS SHEET FOR CONTROL WIRING MODIFICATIONS AND OPERATIONAL PROGRAMMING REQUIREMENTS FOR EX. RAS 1, RAS 2 AND RAS 3 VFD'S.
   a. IN EX. RAS VFD 3 ENCLOSURE DEMOLISH 4–20mA ANALOG SIGNAL SPLITTER. DEMOLISH SHIELDED CABLING FROM SPLITTER TO FLOW TRANSMITTER FIT–2, RAS VFD 1, RAS VFD 2 AND RAS VFD 3.
   b. PROVIDE (1) 2C#18 SHIELDED CABLE FROM EACH VFD ENCLOSURE TO MAIN CONTROL PANEL (MCP) FOR VFD SPEED REFERENCE. UTILIZE EX. ANALOG CONDUITS FROM VFD ENCLOSURES TO MAIN CONTROL PANEL (MCP).
   c. AT EACH VFD ENCLOSURE UTILIZE SPARE #14 CONTROL CONDUCTORS FROM VFD ENCLOSURES TO MAIN CONTROL PANEL (MCP) FOR VFD REMOTE START/STOP CONTROL. PROVIDE (1) 120VAC DPDT CONTROL RELAY AND RELAY BASE IN EACH VFD ENCLOSURE FOR VFD REMOTE START/STOP CONTROL. UTILIZE SPARED NON–ISOLATED DIGITAL OUTPUT TO ENERGIZE VFD ENCLOSURE MOUNTED CONTROL RELAY.
   d. AT FLOW TRANSMITTER FIT–2 RECONNECT EX. SHIELDED CABLE FROM FLOW TRANSMITTER 4–20mA OUTPUT TO MAIN CONTROL PANEL (MCP).

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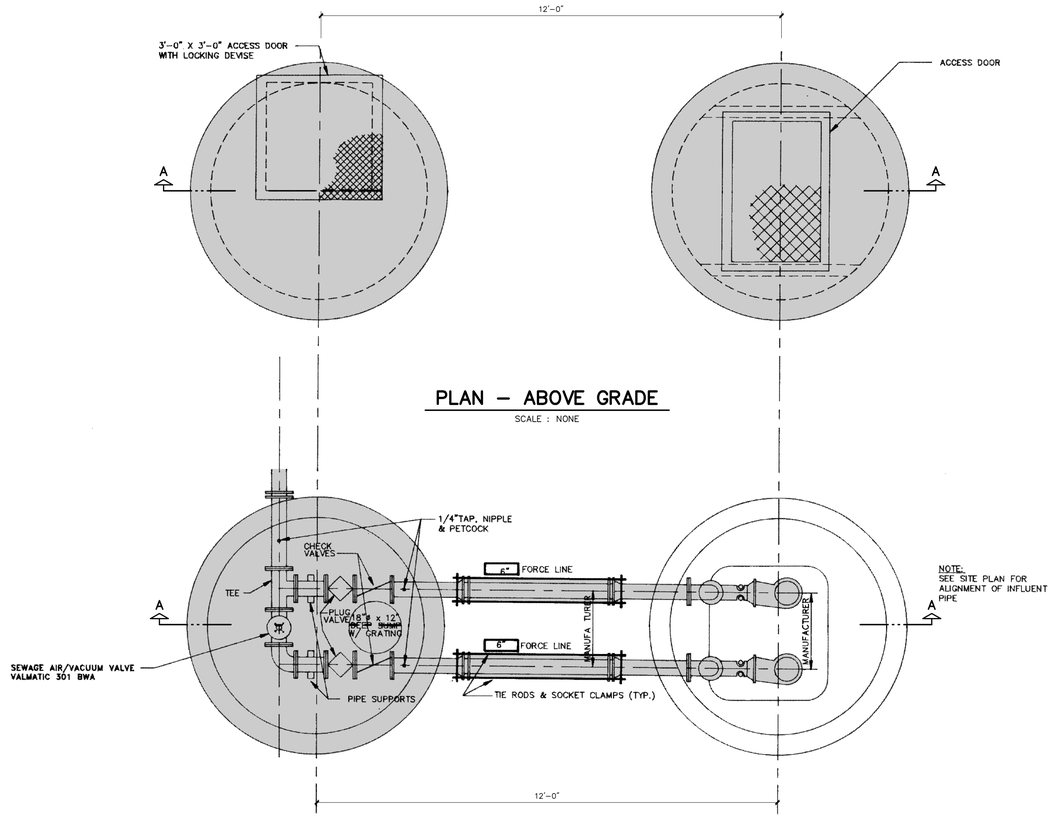
WASTEWATER SYSTEM IMPROVEMENTS
BIOPURE TREATMENT FACILITY

ELECTRICAL WIRING DIAGRAMS & DETAILS

PROJECT NO. 2211159

SHEET NO. T3 OF T3

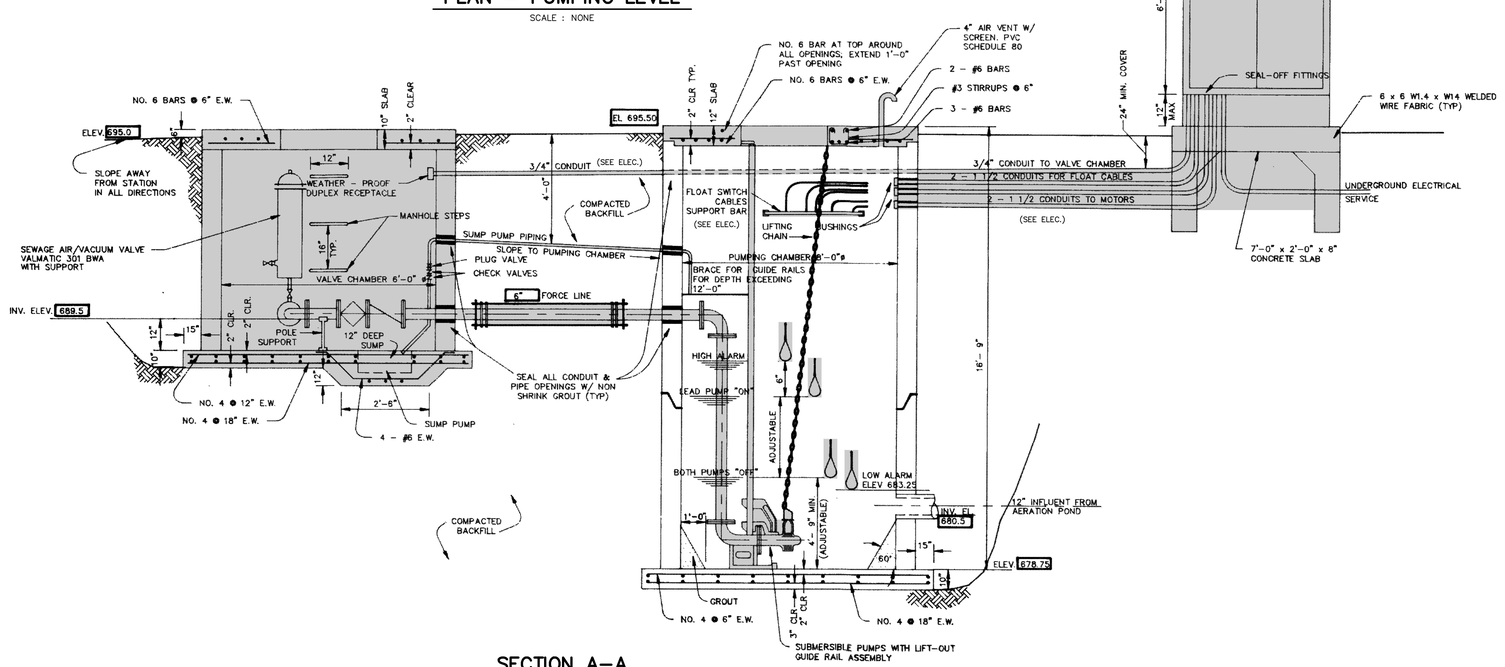


PLAN – ABOVE GRADE

SCALE : NONE

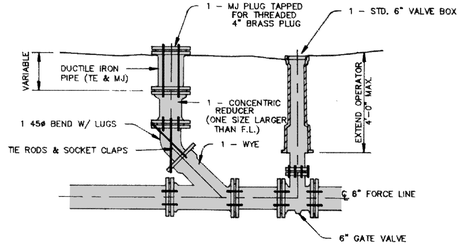
PLAN – PUMPING LEVEL

SCALE : NONE



SECTION A–A

SCALE : NONE



CLEANOUT & VALVE BOX

SCALE : NONE

DEMOLITION NOTES

1. ALL DRAWINGS ARE A REPRESENTATION OF ACTUAL CONDITIONS. SOME ITEMS ARE NOT SHOWN FOR CLARITY. THE CONTRACTOR IS RESPONSIBLE TO FIELD VERIFY ALL OF THE INFORMATION PRIOR TO BID.
2. THE OWNER HAS THE FIRST RIGHT OF REFUSAL ON ALL ITEMS TO BE REMOVED. THE CONTRACTOR SHALL COORDINATE ITEMS TO BE SALVAGED WITH THE OWNER.
3. THE CONTRACTOR SHALL REMOVE ALL INTERNAL EQUIPMENT IN THE WET WELL AND VALVE CHAMBER. REINSTALL PVC SLEEVES FOR PUMP CABLES (NOT SHOWN).
4. SEE ELECTRICAL DRAWINGS FOR ADDITIONAL DEMOLITION INFORMATION.
5. THE CONTRACTOR SHALL REMOVE AND PROPERLY DISPOSE OF ALL DEBRIS IN THE WET WELL.

REMOVAL LEGEND

CONTRACTOR TO REMOVE AND SALVAGE ALL COMPONENTS IDENTIFIED.
NOTE : MISCELLANEOUS PIPING, CONDUIT & FITTINGS NOT SHOWN.

DRAWING SOURCE

1989 WILLIAMS & WORKS CONSTRUCTION DRAWINGS, CITY OF HART, WASTEWATER TREATMENT PLANT IMPROVEMENTS, CONTRACT No. 1, SHEET 7

DATUM NOTE

DATUM USED FOR RECORD PLANS IS UNKNOWN. FIELD VERIFY ALL ELEVATIONS AS NECESSARY FOR CONSTRUCTION.

ALTERNATE No. 2

NO.	REVISIONS	BY	DATE

DRAWN: SMYTH
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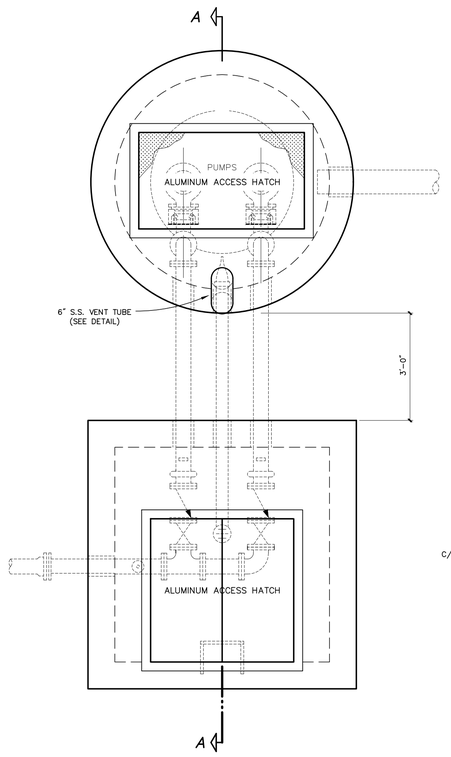
OCEANA COUNTY, MICHIGAN
WASTEWATER SYSTEM IMPROVEMENTS
BIOPURE TREATMENT FACILITY
POLISHING POND PS DEMOLITION

PROJECT NO. 2211159
SHEET NO. PP1 OF PP5

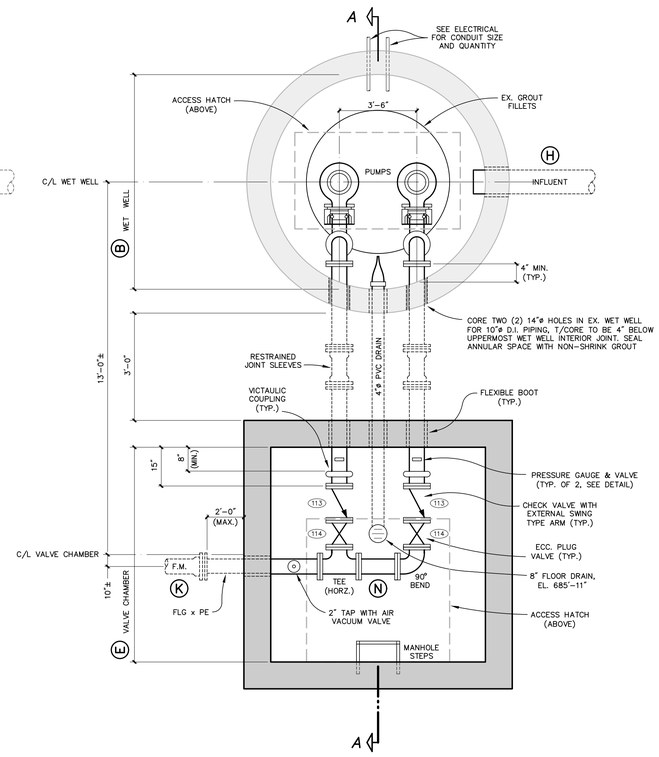
WET WELL NOTES

1. FIELD VERIFY EXISTING WET WELL LID JOINT. SAW CUT AS NECESSARY. SEAL PROPOSED JOINT WITH DOUBLE ROW OF BUTYL SEALANT.
2. FIELD VERIFY ELEVATION OF EXISTING WET WELL JOINT AT DISCHARGE PIPING PENETRATIONS AND PROVIDE TO ENGINEER TO CONFIRM CORE ELEVATIONS.



PLAN – ABOVE GROUND

SCALE : NONE

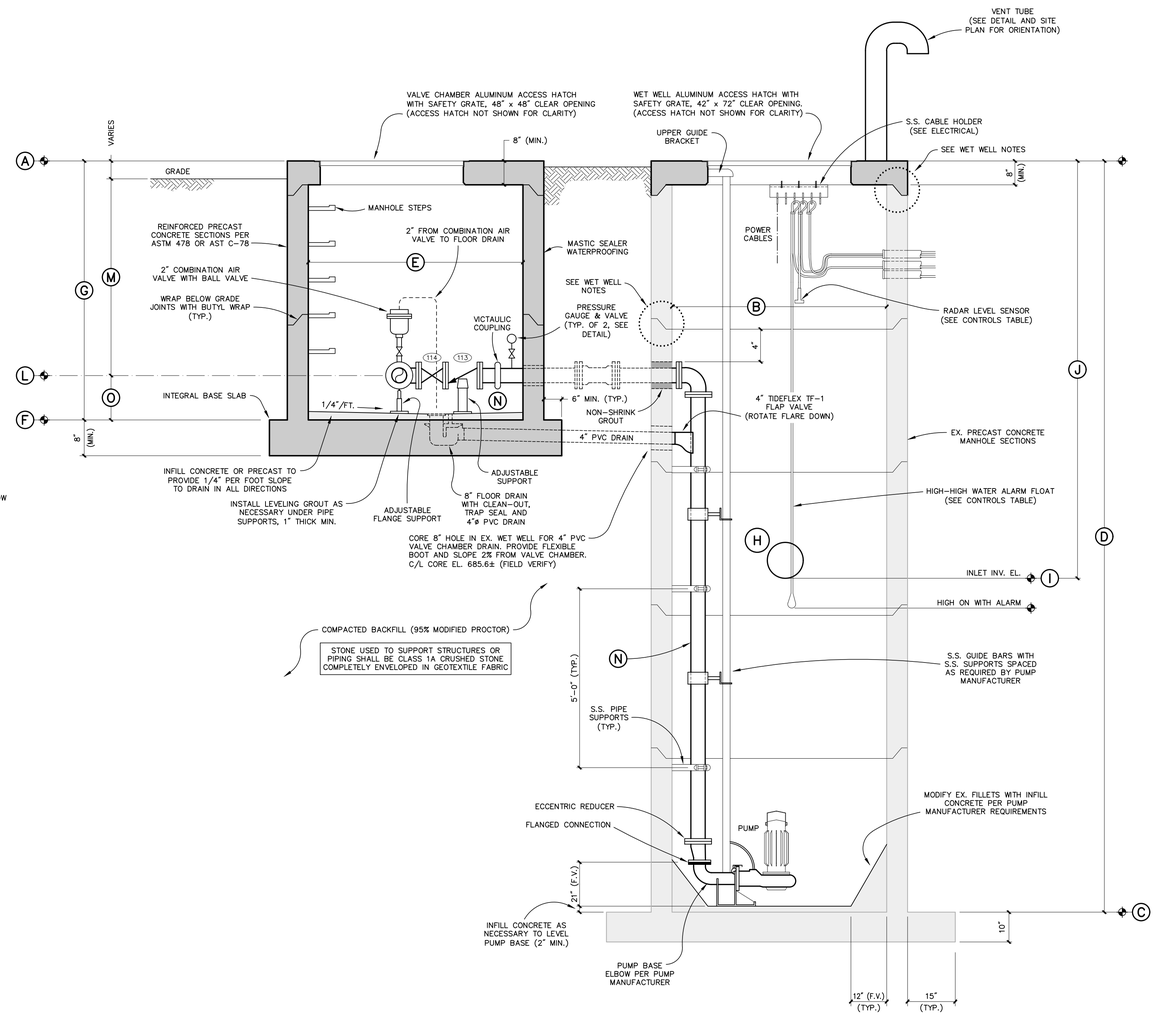


PLAN – BELOW GRADE

SCALE : NONE

NOTE

EX. 21" SANITARY AND EX. 12" OVERFLOW TO LAGOON No. 1 NOT SHOWN FOR CLARITY.



SECTION A–A

SCALE : NONE

PROPOSED DIMENSION INFORMATION

ITEM	DESCRIPTION	
A	PROPOSED WET WELL & VALVE CHAMBER LID ELEVATION (FT) *	695.67
B	EX. WET WELL DIAMETER (FT)	8
C	BOTTOM OF EX. WET WELL ELEVATION (FT) *	678.75
D	DEPTH TO BOTTOM OF EX. WET WELL (FT)	16.92
E	VALVE CHAMBER LENGTH x WIDTH (FT)	9 x 9
F	BOTTOM OF VALVE CHAMBER ELEVATION (FT) *	686.00
G	DEPTH TO BOTTOM OF VALVE CHAMBER (FT)	9.67
H	EX. INFLUENT SANITARY SEWER DIAMETER (IN)	12
I	EX. INFLUENT INVERT ELEVATION (FT) *	680.50
J	EX. DEPTH TO INFLUENT INVERT (FT)	15.17
K	F.M. DIAMETER (IN) (DI/HDPE)	10/14
L	FORCE MAIN (F.M.) CENTERLINE ELEVATION (FT)*	688.50
M	DEPTH TO F.M. CENTERLINE (FT)	7.17
N	STATION PIPING DIAMETER (IN)	10
O	HEIGHT OF F.M. ABOVE VALVE CHAMBER FLOOR (FT)	2.50

NOTES : ALL DEPTHS ARE RELATIVE TO THE PROPOSED WET WELL & VALVE CHAMBER LID ELEVATION.
* ELEVATION BASED ON RECORD PLANS. FIELD VERIFY.

PROPOSED PUMP STATION CONTROLS TABLE

PUMP CONTROL DESCRIPTION	* ELEVATION (FT)	DEPTH TO BOT/WW (FT)
HIGH-HIGH WATER ALARM (FLOAT – BACKUP CONTROL ON)	687.00	8.25
HIGH WATER ALARM	686.75	8.00
LAG PUMP ON	686.50	7.75
LEAD PUMP ON (FULL SPEED)	685.00	6.25
LEAD PUMP ON (MINIMUM SPEED)	684.50	5.75
PUMPS OFF (POLISHING POND LOW WATER LEVEL)	683.50	4.75
LOW WATER ALARM (TOP OF PUMPS)	682.50	3.75
INFLUENT INVERT ELEVATION	680.50	1.75
BOTTOM OF WET WELL	678.75	–
DESIGN FIRM CAPACITY (GPM)	1,200	
DESIGN TOTAL DYNAMIC HEAD (FT)	66	
MINIMUM FLOW FOR 2 ft/sec IN 14" (O.D.) HDPE F.M. (GPM)	690	

NOTES : CONFIRM CONTROL ELEVATIONS WITH OWNER AT PUMP STATION STARTUP.
* ELEVATIONS BASED ON RECORD PLANS. FIELD VERIFY.

DATUM NOTE

SITE PLAN AND PROPOSED ELEVATIONS ARE BASED ON NAVD '88 UNLESS INDICATED OTHERWISE. DATUM USED FOR RECORD PLANS IS UNKNOWN, AND DIFFERENCE BETWEEN RECORD PLAN ELEVATIONS AND PROPOSED ELEVATIONS MAY VARY. FIELD VERIFY ALL ELEVATIONS AS NECESSARY FOR CONSTRUCTION.

ALTERNATE No. 2

NO.	REVISIONS	BY	DATE

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CHECKED: W.C.T.
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OCEANA COUNTY, MICHIGAN

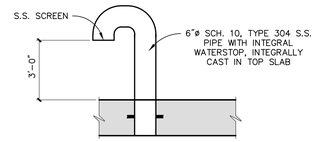
WASTEWATER SYSTEM IMPROVEMENTS
BIOPURE TREATMENT FACILITY

POLISHING POND PS DETAILS

PROJECT NO. 2211159

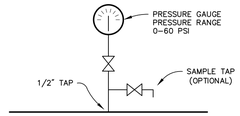
SHEET NO. PP2 OF PP5

T:\DWJB\ PROJECTS\2021\2211159-HART_MWTP\4_PROD\C4 HEADWORKS LAGOON SPLITS AND POLISHING POND PS\2211159_C4_POLISHING POND PS DETAILS.DWG - WSMYTH - May. 22, 2023 - 10:47am - PreinANewhof



VENT TUBE DETAIL

SCALE : NONE

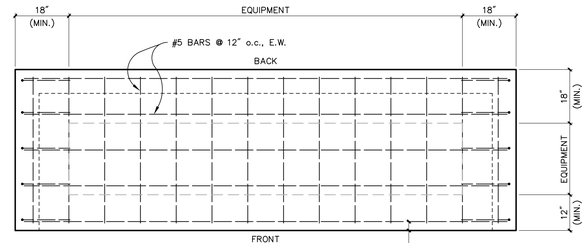


PRESSURE GAUGE CONNECTION DETAIL

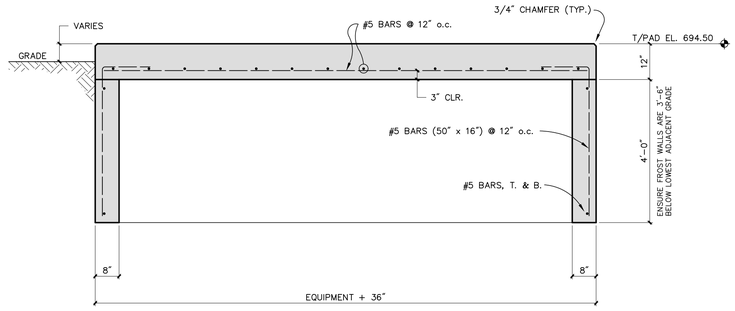
SCALE : NONE

NOTE

ALL PIPING AND BALL VALVES, 1/2", STAINLESS STEEL.



PLAN VIEW



SECTIONAL VIEW

EQUIPMENT PAD DETAIL

North

SCALE : NONE

NOTES

1. PROVIDE SLEEVES FOR ALL PENETRATIONS THROUGH CONCRETE PAD. SEE ELECTRICAL FOR CONDUIT SIZE AND QUANTITY. CONFIRM EQUIPMENT PAD SIZE AND SLEEVE LOCATION WITH ENGINEER BASED ON SHOP DRAWINGS.
2. THE PAD CONSISTS OF TWO (2) FROST WALLS AND A TOP SLAB. THE CONTRACTOR MAY PROPOSE TO ALLOW A MONOLITHIC CONCRETE POUR.

ALTERNATE No. 2

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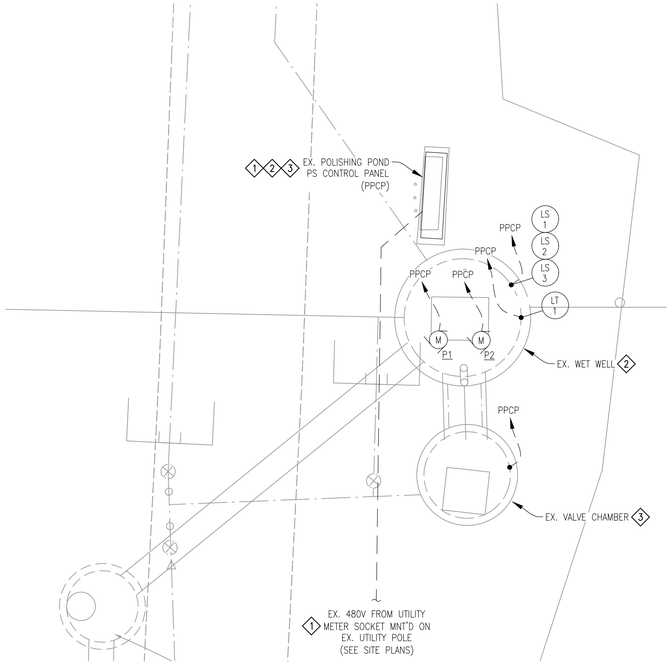
WASTEWATER SYSTEM IMPROVEMENTS
BIOPURE TREATMENT FACILITY

POLISHING POND PS DETAILS

PROJECT NO. 2211159

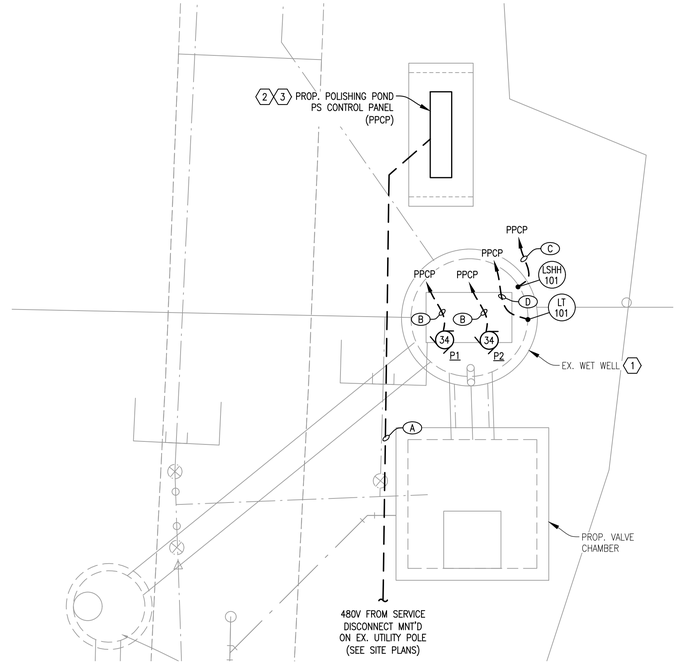
SHEET NO. PP3 OF PP5

T:\DWLD\ PROJECTS\2021\2211159_HART_WWTP\4_PROD\C4 HEADWORKS LAGOON SPLITS AND POLISHING POND PS\2211159_C4_POLISHING POND PS SITE DETAILS.DWG - WSMYTH - May. 22 2023 - 10:48am - PreinANewhof



1 C21 **POLISHING PONDS PS ELECTRICAL PLAN – EXISTING** North

SCALE : 1" = 5'



1 C22 **POLISHING PONDS PS ELECTRICAL PLAN – PROPOSED** North

SCALE : 1" = 5'

GENERAL NOTES:

1. ENGRAVED EQUIPMENT NAMEPLATES (WHITE PHENOLIC WITH BLACK LETTERS) SHALL BE FURNISHED AND INSTALLED BY THE ELECTRICAL CONTRACTOR FOR NEW AND EXISTING ELECTRICAL EQUIPMENT AS NOTED. LETTER SIZES: 1" HIGH FOR INDIVIDUAL ELECTRICAL POWER DISTRIBUTION AND SERVICE EQUIPMENT. LETTER SIZES: 1/4" HIGH FOR INDIVIDUAL ELECTRICAL MOTOR CONTROL CENTER UNITS, VFD ENCLOSURES, SAFETY DISCONNECTS, COMBINATION STARTERS AND PROCESS INSTRUMENTATION.
2. WASTEWATER TREATMENT FACILITY MUST REMAIN OPERATIONAL DURING ALL DEMOLITION AND CONSTRUCTION ACTIVITIES. COORDINATE ALL DEMOLITION WORK WITH THE OWNER AND OTHER TRADES.
3. PROVIDE THESE CONDUIT TYPES IN THE FOLLOWING LOCATIONS:
   a. RGS – OUTDOOR ABOVE GRADE.
   b. SCH. 40 PVC – BELOW GRADE – MINIMUM 24" COVER.
2. PROVIDE RGS CONDUIT AND ELBOWS BELOW GRADE FOR ALL STUB UPS TO EQUIPMENT EXTENDING UP THRU CONCRETE SLABS FOR TRANSITION FROM CONCEALED/BELOW GRADE TO EXPOSED/ABOVE GRADE CONDUIT INSTALLATIONS. PROVIDE SCH. 40 PVC SLEEVES FOR ALL CONDUITS EXTENDING UP THROUGH CONCRETE SLABS.
6. INSTALL BELOW GRADE CONDUITS A MINIMUM OF 24" BELOW GRADE. PROVIDE YELLOW RIBBON MARKED "BURIED ELECTRIC" 12" BELOW GRADE ABOVE CONDUITS. PROVIDE RMC ELBOWS IN ALL BELOW GRADE CONDUIT INSTALLATIONS.
7. ALL INSTRUMENTATION DEVICES SHALL BE INSTALLED BY THE CONTRACTOR. CONTRACTOR SHALL PROVIDE ALL FIELD WIRING, CONDUIT & TERMINATIONS FOR THOSE DEVICES AS REQUIRED.
8. CORE HOLES FOR CONDUITS INTO CONCRETE STRUCTURES AS NEEDED. PATCH ALL NEW AND UNUSED CONDUIT PENETRATIONS WITH NON-SHRINKING GROUT, GROUT SHALL EXTEND THE FULL DEPTH OF THE PENETRATION.

DEMOLITION NOTES: ⟨#⟩ – (SYMBOL DENOTES PLAN NOTE)

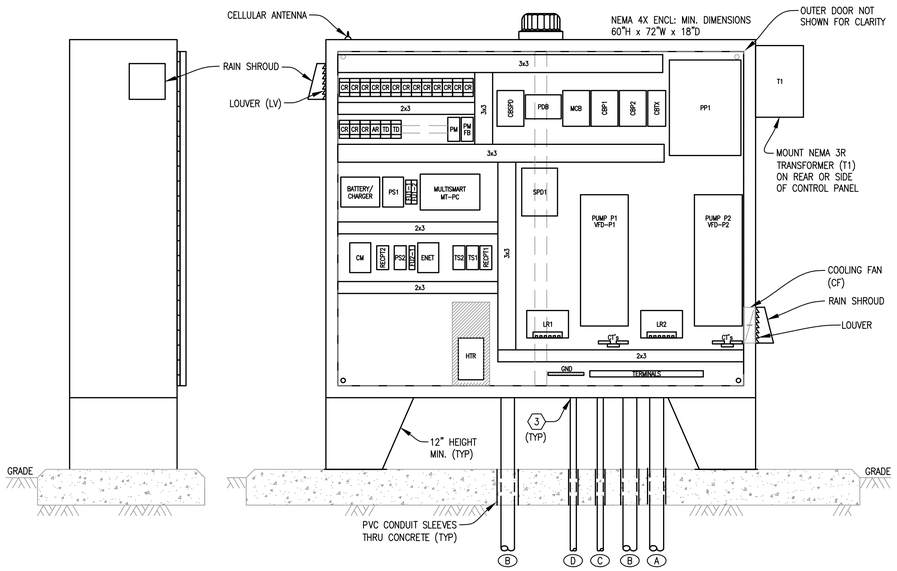
1. COORDINATE WITH UTILITY TO DISCONNECT PUMP STATION CONTROL PANEL SERVICE FEEDER AT UTILITY POLE METER. DEMOLISH FEEDER CONDUCTORS FROM METER SOCKET TO POLISHING POND PUMP STATION CONTROL PANEL AND DISPOSE. CUT FEEDER CONDUIT AT POLISHING POND PUMP STATION CONTROL PANEL AND UTILITY POLE 24" BELOW GRADE, CAP AND ABANDON IN PLACE.
2. DISCONNECT WET WELL PUMP CABLES AND LEVEL CONTROL DEVICES FROM CONTROL PANEL. DEMOLISH FLOAT SWITCHES FROM WET WELL AND DISPOSE. REMOVE LEVEL TRANSMITTER FROM WET WELL AND RETURN TO OWNER. DEMOLISH CONTROL PANEL AND DISPOSE. COORDINATE WITH OWNER TO REMOVE USABLE SPARE PARTS FROM CONTROL PANEL PRIOR TO DISPOSAL.
3. DEMOLISH ALL EXISTING CONDUIT AND WIRING FROM VALVE CHAMBER TO CONTROL PANEL AND DISPOSE.

PLAN NOTES: ⟨#⟩ (SYMBOL DENOTES PLAN NOTE)

1. SEE "WET WELL CABLE SUPPORT DETAIL" ON THIS SHEET FOR ADDITIONAL CABLE INSTALLATION REQUIREMENTS.
2. CONTROL PANEL ACCESS DOORS SHALL FACE ROADWAY. CONTROL PANEL FACE SHALL BE SET A MINIMUM OF 3'-0" OFF EDGE OF ROADWAY.
3. PROVIDE AND PACK ALL CONDUITS ENTERING THE CONTROL PANEL WITH DUCT SEALING COMPOUND.

CONDUIT AND WIRE SCHEDULE

MARK	DESCRIPTION	SEAL Y/N
⟨#⟩		
A	3#1/0, 1#6 GND – 2"C	N
B	MANUFACTURERS PUMP CABLE w/POWER AND SENSOR CONDUCTORS – 2"C	N
C	MANUFACTURERS FLOAT SWITCH CABLE – 3/4"C	N
D	MANUFACTURERS LEVEL TRANSMITTER CABLE – 3/4"C	N

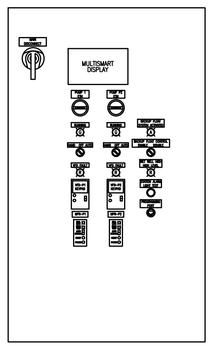


SIDE VIEW

FRONT VIEW – BACK PANEL LAYOUT

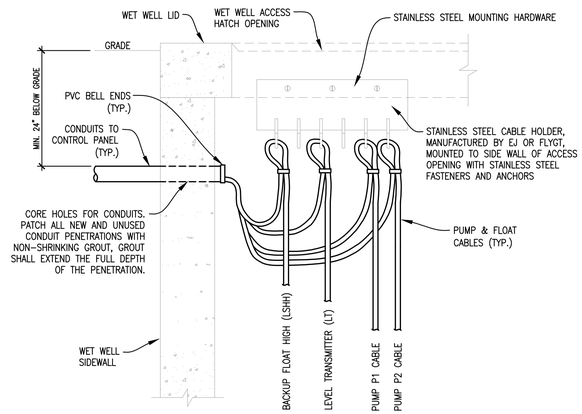
POLISHING POND PS CONTROL PANEL ELEVATION

SCALE : NONE



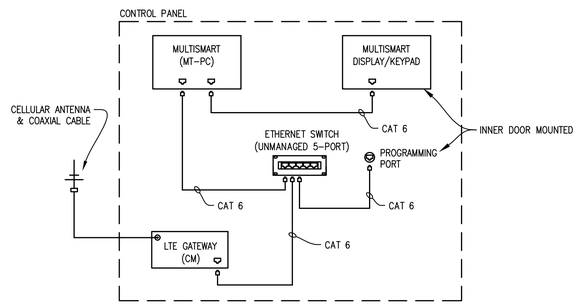
INNER DOOR PANEL LAYOUT

(RIGHT SIDE) – NOT TO SCALE



WET WELL CABLE SUPPORT DETAIL

SCALE : NONE



CONTROL PANEL COMMUNICATIONS RISER DIAGRAM

SCALE : NONE

ALTERNATE NO. 2

811 Know what's below. Call before you dig.

UTILITY LOCATIONS ARE DERIVED FROM ACTUAL MEASUREMENTS OR AVAILABLE RECORDS. THEY SHOULD NOT BE INTERPRETED TO BE EXACT LOCATIONS NOR SHOULD IT BE ASSUMED THAT THEY ARE THE ONLY UTILITIES IN THIS AREA.

NO.	REVISIONS	BY	DATE

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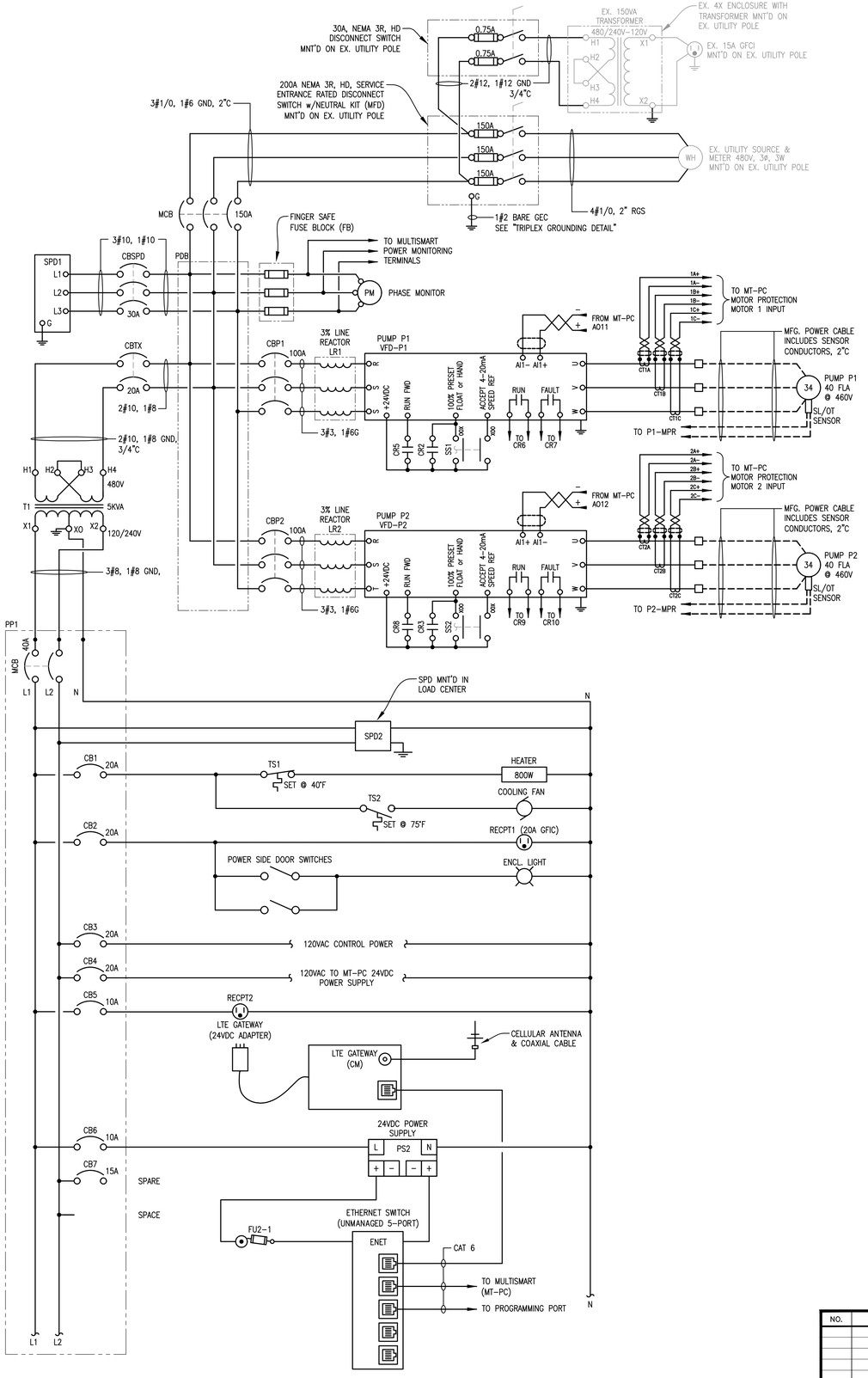
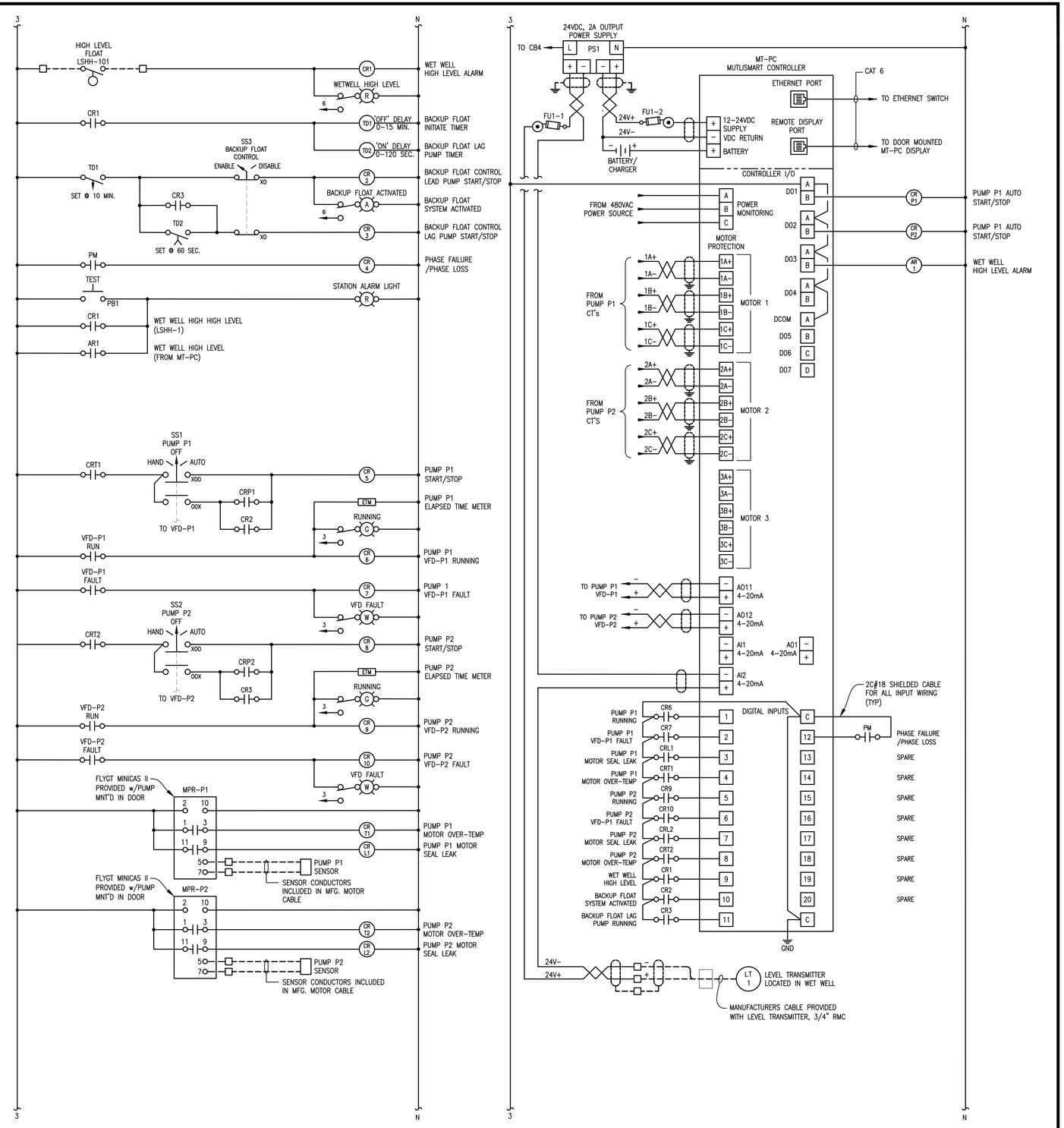
WASTEWATER SYSTEM IMPROVEMENTS
BIOPURE TREATMENT FACILITY

ELECTRICAL PLANS & DETAILS

PROJECT NO. 2211159

SHEET NO. PP4 OF PP5





POLISHING POND PS CONTROL PANEL WIRING DIAGRAMS

SCALE : NONE

ALTERNATE NO. 2

NO.	REVISIONS	BY	DATE

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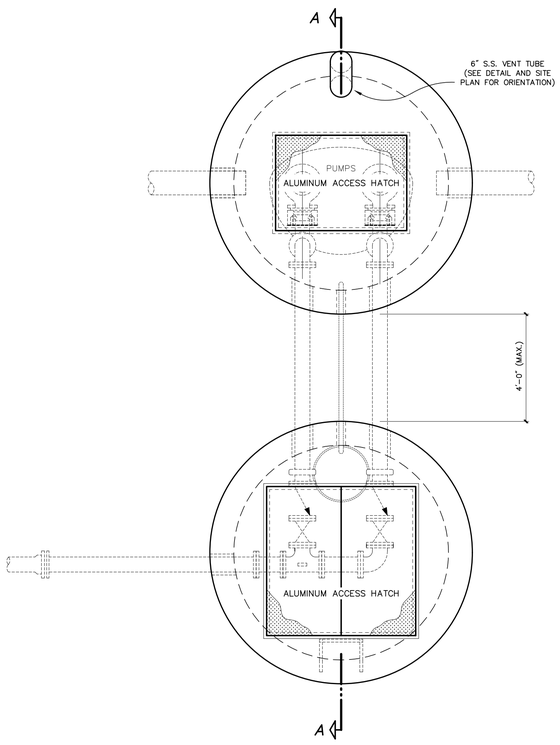
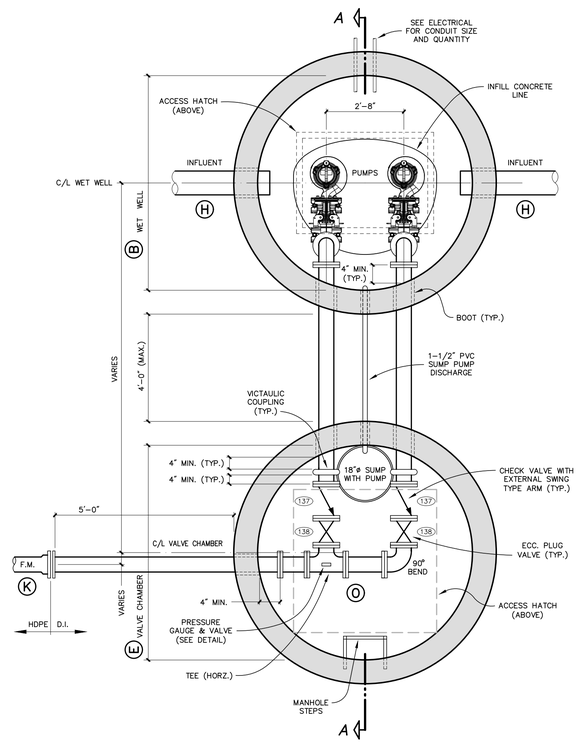
WIRING DIAGRAMS

PROJECT NO. 2211159
SHEET NO. PP5 OF PP5



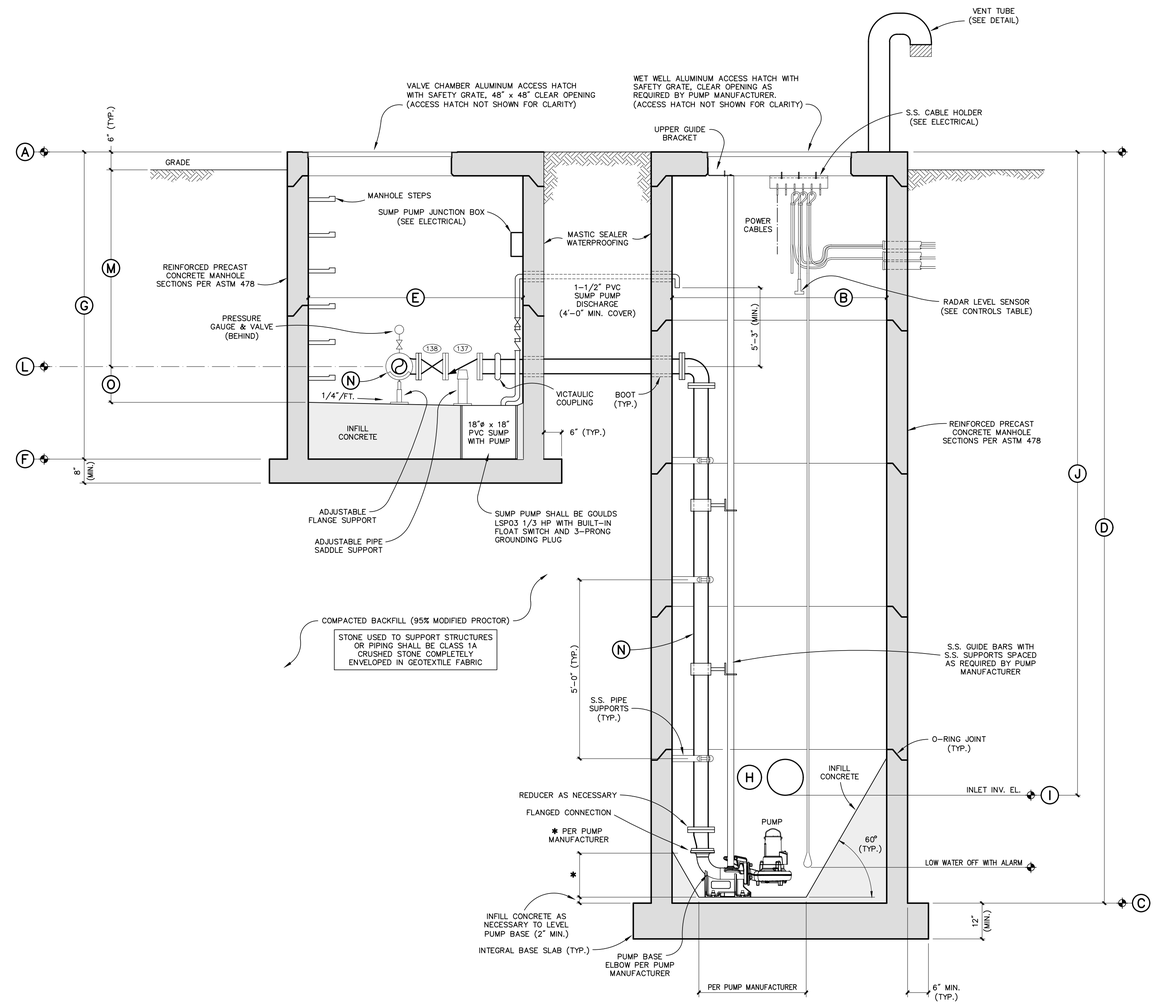
PLAN – ABOVE GROUND

SCALE : NONE



PLAN – BELOW GRADE

SCALE : NONE



SECTION A–A

SCALE : NONE

PROPOSED DIMENSION INFORMATION

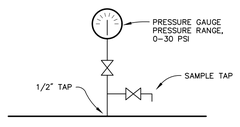
ITEM	PUMP CONTROL DESCRIPTION	
A	PROPOSED SLAB ELEVATION (FT)	697.00
B	WET WELL DIAMETER (FT)	8
C	BOTTOM OF WET WELL ELEVATION (FT)	685.00
D	DEPTH TO BOTTOM OF WET WELL (FT)	12.00
E	VALVE CHAMBER DIAMETER (FT)	6
F	BOTTOM OF VALVE CHAMBER ELEVATION (FT)	687.75
G	DEPTH TO BOTTOM OF VALVE CHAMBER (FT)	9.25
H	INFLUENT SANITARY SEWER DIAMETER (IN)	8
I	INFLUENT INVERT ELEVATION (FT)	687.59
J	DEPTH TO INFLUENT INVERT (FT)	9.41
K	F.M. DIAMETER (IN)	6
L	FORCE MAIN (F.M.) CENTERLINE ELEVATION (FT)	689.50
M	DEPTH TO F.M. CENTERLINE (FT)	7.50
N	STATION PIPING DIAMETER (IN)	6
O	HEIGHT OF F.M. ABOVE VALVE CHAMBER FLOOR (FT)	1.50
P	APPROXIMATE WATER TABLE ELEVATION (FT)	N/A
Q	APPROXIMATE DEPTH TO WATER TABLE (FT)	N/A

NOTES : ALL DEPTHS ARE RELATIVE TO THE PROPOSED SLAB ELEVATION.

PROPOSED LIFT STATION CONTROLS TABLE

PUMP CONTROL DESCRIPTION	ELEVATION (FT)	DEPTH TO BOT/WW (FT)
INFLUENT INVERT	687.70	2.70
LOW WATER ALARM (PUMPS OFF)	687.00	2.00
BOTTOM OF WET WELL	685.00	–
FIRM CAPACITY (GPM)	200	
DESIGN TOTAL DYNAMIC HEAD (FT)	12	
MINIMUM FLOW FOR 2 ft/sec IN F.M. (GPM)	190	

NOTE : CONFIRM CONTROL ELEVATIONS WITH OWNER AT LIFT STATION STARTUP.

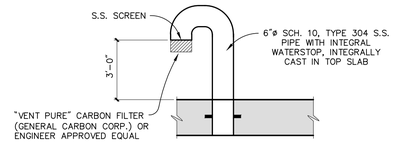


PRESSURE GAUGE CONNECTION DETAIL

SCALE : NONE

NOTE

ALL PIPING AND BALL VALVES, 1/2", STAINLESS STEEL.



VENT TUBE DETAIL

SCALE : NONE

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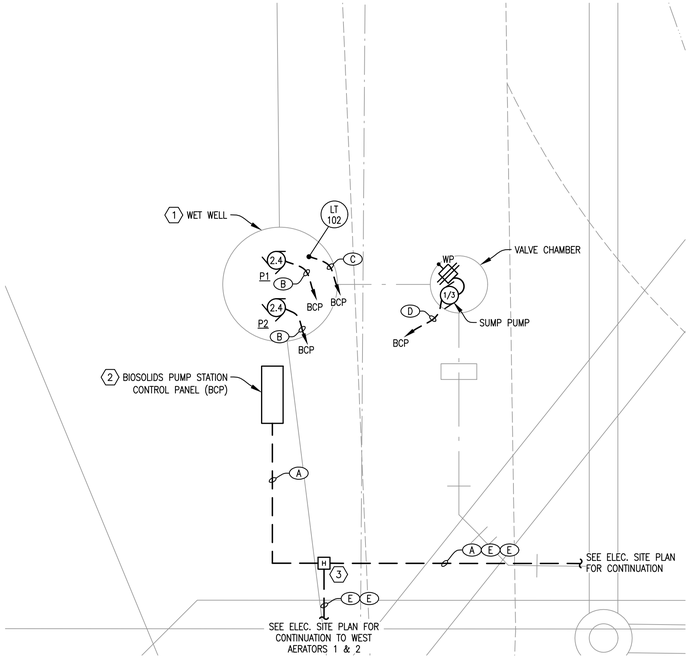
WASTEWATER SYSTEM IMPROVEMENTS
BIOPURE TREATMENT FACILITY

BIOSOLIDS PS DETAILS

PROJECT NO. 2211159

SHEET NO. B1 OF B3

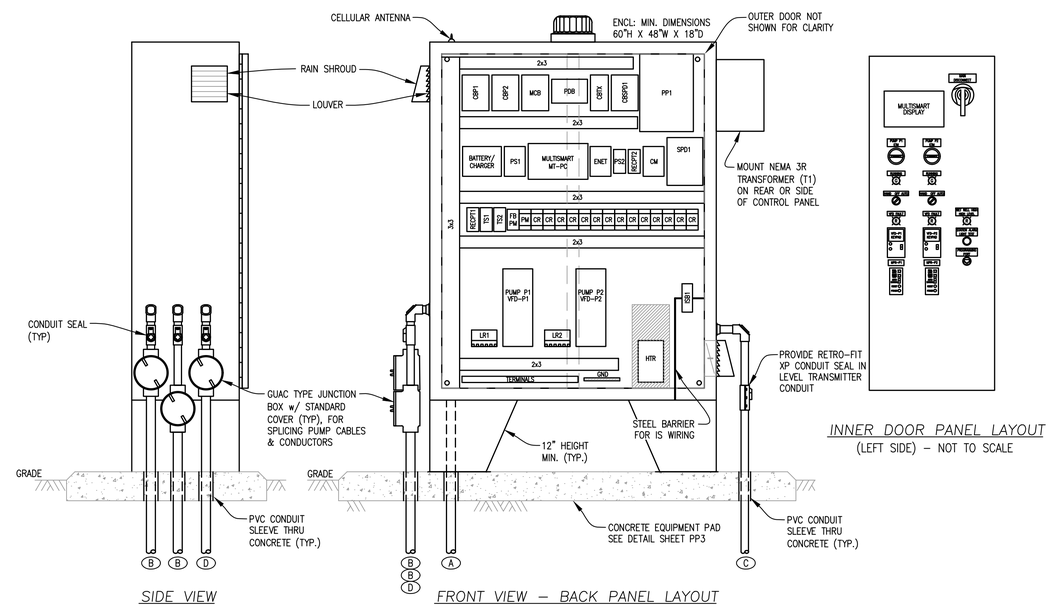
T:\DWG\3D PROJECTS\2021\2211159_HART_WWTP\4_PROD\C4 HEADWORKS LAGOON SKIDS AND POLISHING POND PS\2211159_C4_BIOSOLIDS PS.DWG - WSMYTH - May, 22 2023 - 10:53am - PreinNewhof



2/C23 BIOSOLIDS PS ELECTRICAL SITE PLAN – PROPOSED

North

SCALE : 1" = 5'



BIOSOLIDS PS CONTROL PANEL ELEVATION

SCALE : NONE

GENERAL NOTES:

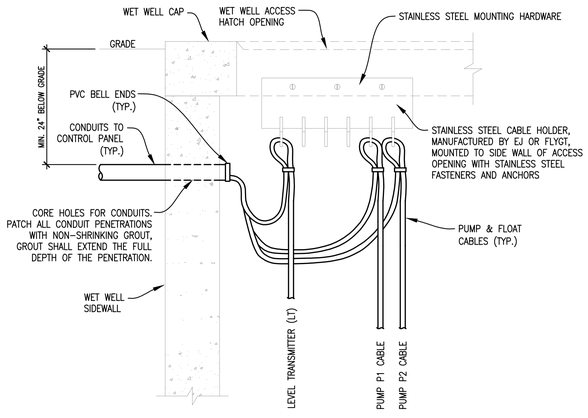
1. ENGRAVED EQUIPMENT NAMEPLATES (WHITE PHENOLIC WITH BLACK LETTERS) SHALL BE FURNISHED AND INSTALLED BY THE ELECTRICAL CONTRACTOR FOR NEW AND EXISTING ELECTRICAL EQUIPMENT AS NOTED. LETTER SIZES: 1" HIGH FOR INDIVIDUAL ELECTRICAL POWER DISTRIBUTION AND SERVICE EQUIPMENT. LETTER SIZES: 1/4" HIGH FOR INDIVIDUAL ELECTRICAL MOTOR CONTROL CENTER UNITS, VFD ENCLOSURES, SAFETY DISCONNECTS, COMBINATION STARTERS AND PROCESS INSTRUMENTATION.
2. PROVIDE THESE CONDUIT TYPES IN THE FOLLOWING LOCATIONS:
   a. RGS – OUTDOOR ABOVE GRADE.
   b. SCH. 40 PVC – BELOW GRADE – MINIMUM 24" COVER.
3. INSTALL BELOW GRADE CONDUITS A MINIMUM OF 24" BELOW GRADE. PROVIDE YELLOW RIBBON MARKED "BURIED ELECTRIC" 12" BELOW GRADE ABOVE CONDUITS. PROVIDE RMC ELBOWS IN ALL BELOW GRADE CONDUIT INSTALLATIONS.
4. PROVIDE RGS CONDUIT AND ELBOWS BELOW GRADE AND FOR ALL STUB UPS TO EQUIPMENT EXTENDING UP THRU CONCRETE SLABS FOR TRANSITION FROM CONCEALED/BELOW GRADE TO EXPOSED/ABOVE GRADE CONDUIT INSTALLATIONS. PROVIDE SCH. 40 PVC SLEEVES FOR ALL CONDUITS EXTENDING UP THROUGH CONCRETE SLABS.
5. THE FOLLOWING LOCATIONS, IN ACCORDANCE WITH NEC AND NFPA 820, SHALL BE CONSIDERED AS CLASS I, DIVISION 1, GROUP D HAZARDOUS AND CORROSIVE LOCATIONS:
   a. INSIDE LIFT STATION WET WELL.
   b. AREAS DESCRIBED AS HAZARDOUS BY NEC AND NFPA 820.
6. THE FOLLOWING LOCATIONS, IN ACCORDANCE WITH NEC AND NFPA 820, SHALL BE CONSIDERED AS CLASS I, DIVISION 2, GROUP D HAZARDOUS AND CORROSIVE LOCATIONS:
   a. INSIDE VALVE CHAMBER.
   b. AREAS DESCRIBED AS HAZARDOUS BY NEC AND NFPA 820.
7. ALL WORK IN HAZARDOUS LOCATIONS SHALL BE IN ACCORDANCE WITH ARTICLE 500 OF THE NATIONAL ELECTRICAL CODE. EQUIPMENT INSTALLED IN THESE LOCATIONS SHALL BE EXPLOSION-PROOF OR UTILIZE INTRINSICALLY SAFE CIRCUITRY. PROVIDE SEAL-OFF FITTINGS FOR ALL WIRING THAT ENTERS/LEAVES HAZARDOUS LOCATIONS. EQUIPMENT INSTALLED IN CORROSIVE AREAS SHALL BE CONSTRUCTED OF CORROSION-RESISTANT MATERIALS. THE LOCATION AND TYPE OF GAS-TIGHT SEALS FOR CABLES, CONDUIT, AND WIRES MUST MEET THE NEC, AND ALLOW FOR EASY DISCONNECTION AND REMOVAL OF PUMPS AND INSTRUMENTS FOR MAINTENANCE.
8. ALL INSTRUMENTATION DEVICES SHOWN ARE INSTALLED BY THE ELECTRICAL CONTRACTOR. ELECTRICAL CONTRACTOR SHALL PROVIDE FIELD WIRING, CONDUIT & TERMINATIONS FOR THOSE DEVICES AS REQUIRED.
9. CORE HOLES FOR CONDUITS INTO CONCRETE STRUCTURES AS NEEDED. PATCH ALL CONDUIT PENETRATIONS WITH NON-SHRINKING GROUT, GROUT SHALL EXTEND THE FULL DEPTH OF THE PENETRATION.

PLAN NOTES: (#) (SYMBOL DENOTES PLAN NOTE)

1. SEE "WET WELL CABLE SUPPORT DETAIL" ON THIS SHEET FOR ADDITIONAL CABLE INSTALLATION REQUIREMENTS.
2. CONTROL PANEL ACCESS DOORS SHALL FACE ROADWAY. CONTROL PANEL FACE SHALL BE SET A MINIMUM OF 3'-0" OFF EDGE OF ROADWAY.
3. PROVIDE ADEQUATELY SIZED STACKABLE, OPEN BOTTOM, TIER 15 HAND HOLES AND COVERS MARKED "ELECTRIC" OR "FIBER OTPIC". NO SPLICING ALLOWED IN HAND HOLES. INSTALL HAND HOLES A MINIMUM OF 3'-0" OFF ALL ROADWAYS AND DRIVEWAYS. AT EACH HAND HOLE FURNISH A PRO-MARK FLEXIBLE UTILITY MARKER, MODEL PM-301 (OR EQUAL), RED IN COLOR, LABELING TO READ "ELECTRICAL HAND HOLE" OR "FIBER OPTIC HAND HOLE. SEE "HAND HOLE INSTALLATION DETAIL" ON "ELECTRICAL SITE PLAN".

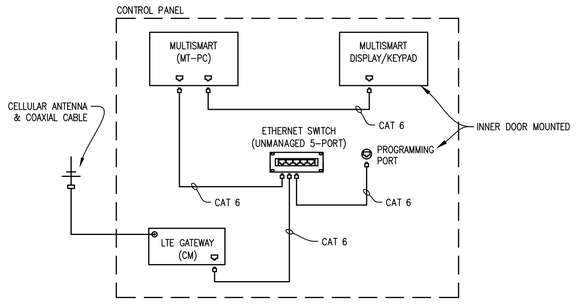
CONDUIT AND WIRE SCHEDULE

MARK	DESCRIPTION	SEAL Y/N
(#)		
A	3#4, 1#6 GND – 1 1/4"C	N
B	MANUFACTURERS PUMP CABLE w/POWER AND SENSOR CONDUCTORS – 1 1/4"C	Y
C	MANUFACTURERS LEVEL TRANSMITTER CABLE – 3/4"C	Y
D	2#12, 1#12 GND – 3/4"C	Y
E	3#1/0, 3#10 (MOTOR SPACE HTR & DIFFUSER HTR CONTROL), 2#8 (DIFFUSER HTR), 1#3 GND – 2"C	N



WET WELL CABLE SUPPORT DETAIL

SCALE : NONE



CONTROL PANEL COMMUNICATIONS RISER DIAGRAM

SCALE : NONE

811 Know what's below. Call before you dig.

UTILITY LOCATIONS ARE DERIVED FROM ACTUAL MEASUREMENTS OR AVAILABLE RECORDS. THEY SHOULD NOT BE INTERPRETED TO BE EXACT LOCATIONS NOR SHOULD IT BE ASSUMED THAT THEY ARE THE ONLY UTILITIES IN THIS AREA.

NO.	REVISIONS	BY	DATE

DRAWN RBD/KCT
DATE MAY '23
CHECKED MAT
DATE MAY '23

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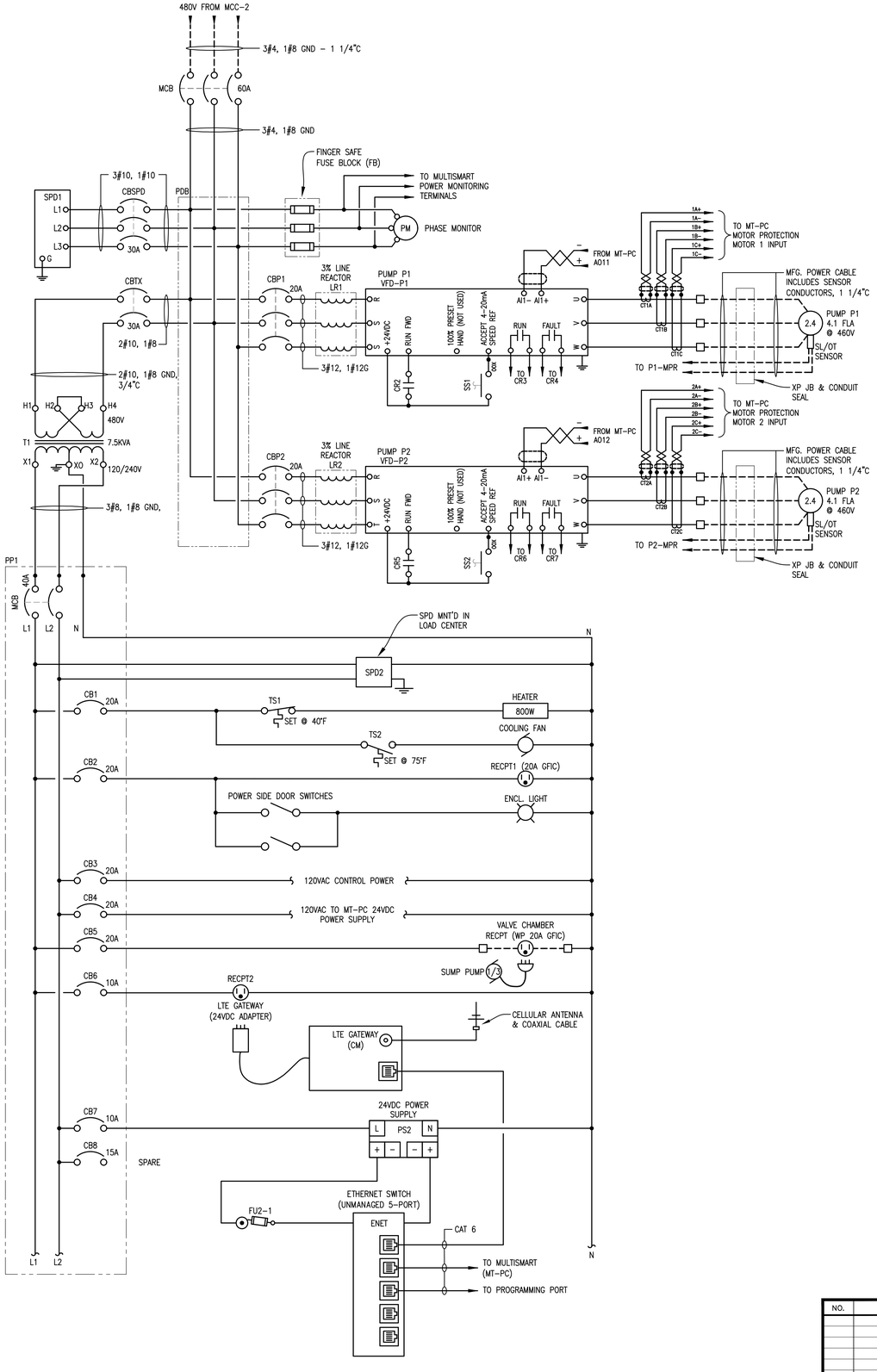
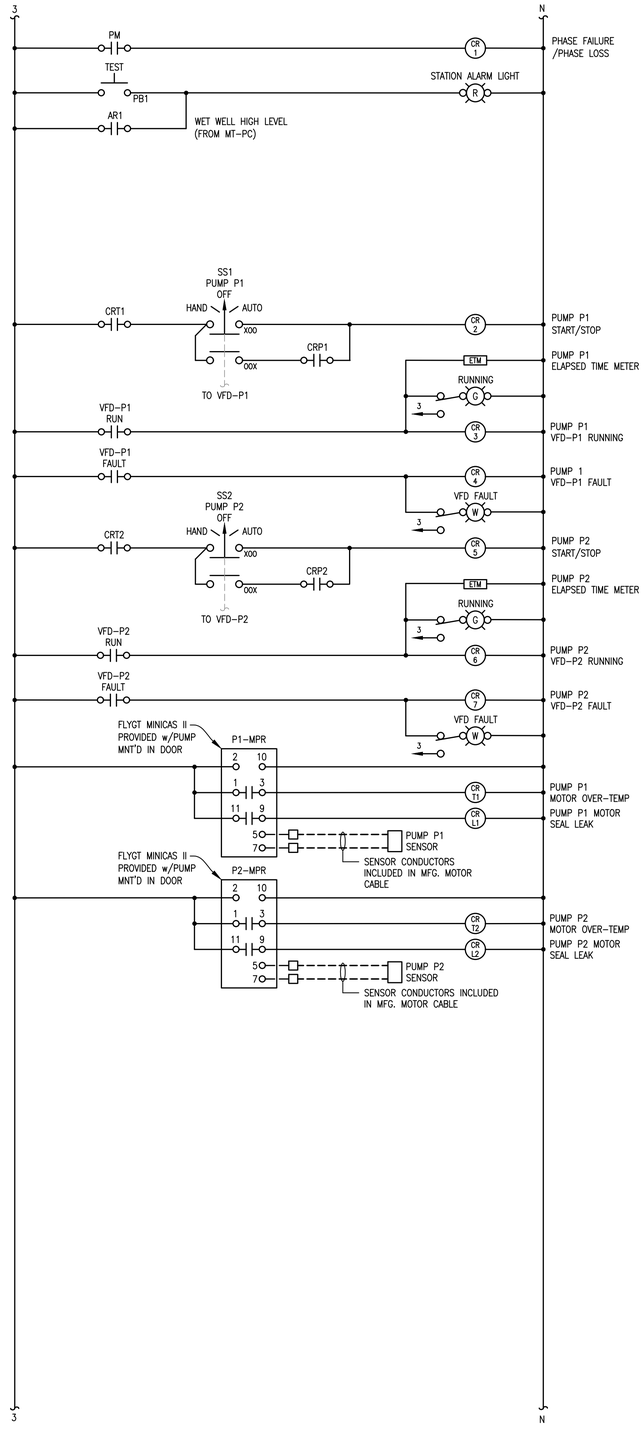
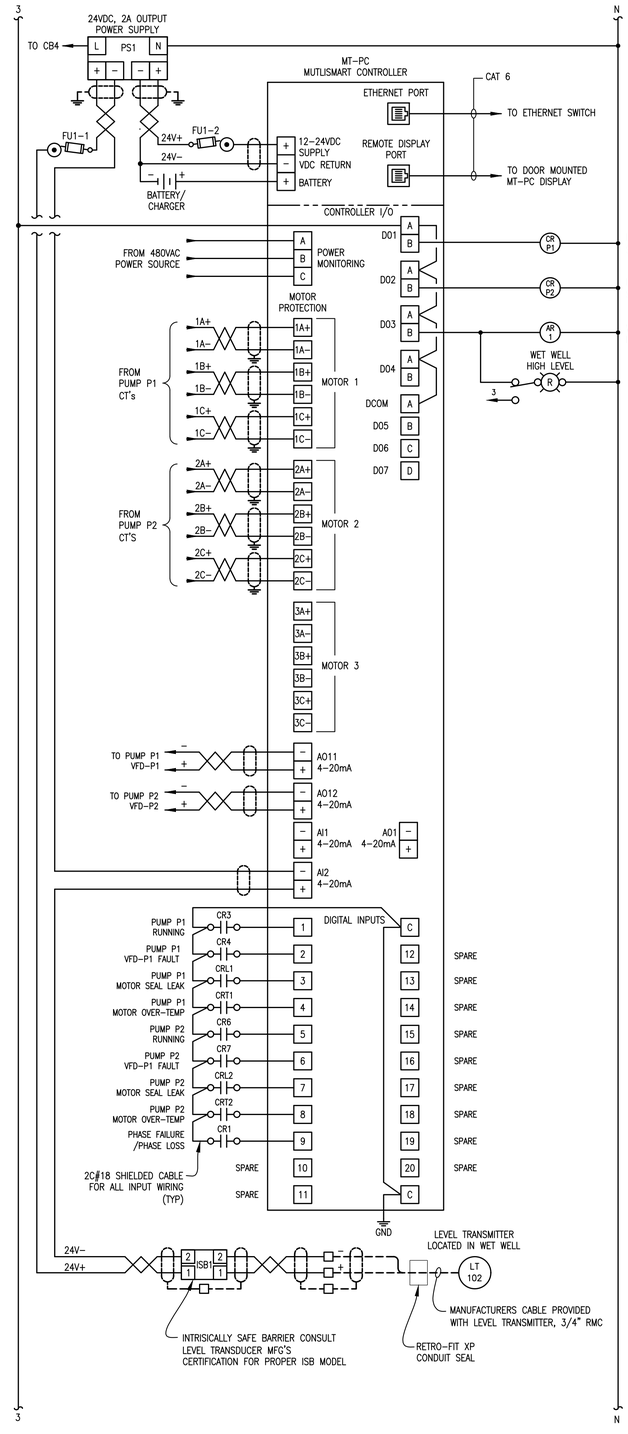
WASTEWATER SYSTEM IMPROVEMENTS
BIOPURE TREATMENT FACILITY
ELECTRICAL PLAN & DETAILS

PROJECT NO. 2211159
SHEET NO. B2 OF B3







BIOSOLIDS PS CONTROL PANEL WIRING DIAGRAMS

SCALE : NONE

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CHECKED: MAT
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WASTEWATER SYSTEM IMPROVEMENTS
BIOPURE TREATMENT FACILITY

WIRING DIAGRAMS

PROJECT NO. 2211159

SHEET NO. B3 OF B3

PARTIAL VALVE SCHEDULE (EXISTING)

No.	QTY.	SIZE, IN.	TYPE	FUNCTION	CONTROL	REMARKS
A	1	16	PLUG	INLET/SPLITTER BOX ISOLATION	MANUAL	ABANDONED (BY OTHERS)
B	3	16	PLUG	NORTH AERATION BASIN – CLOSE INLET	MANUAL	DESIGNATE AS 107
C	3	16	PLUG	NORTH AERATION BASIN – FAR INLET	MANUAL	DESIGNATE NORTH & SOUTH INLET VALVES AS 108, DESIGNATE CENTER INLET VALVE AS 109
D	2	16	PLUG	CLARIFIER EFFLUENT ISOLATION	MANUAL	DESIGNATE AS 111
E	1	12	PLUG	POLISHING POND P.S. SUCTION ISOLATION	MANUAL	DIRECT BURY, MJ ENDS, DESIGNATE AS 112
F	2	6	CHECK	POLISHING POND P.S. PUMP CHECK	–	REMOVE
G	2	6	PLUG	POLISHING POND P.S. PUMP DISCHARGE ISOLATION	MANUAL	REMOVE
H	1	6	PLUG	POLISHING POND P.S. FORCE MAIN GRAVITY BYPASS	MANUAL	REMOVE
I	1	6	PLUG	POLISHING POND P.S. FORCE MAIN LAGOON 2 DISCHARGE ISOLATION	MANUAL	REMOVE
J	1	6	PLUG	POLISHING POND P.S. FORCE MAIN DISCHARGE ISOLATION	MANUAL	REMOVE
K	1	8	PLUG	POLISHING POND P.S. FORCE MAIN LAGOON 4 DISCHARGE ISOLATION	MANUAL	IN STRUCTURE "B", DESIGNATE AS 116
L	1	8	PLUG	POLISHING POND P.S. FORCE MAIN LAGOON 5 DISCHARGE ISOLATION	MANUAL	IN STRUCTURE "B", DESIGNATE AS 117
M	1	8	PLUG	NORTH CLARIFIER SLUDGE ISOLATION	MANUAL	DESIGNATE AS 118
N	1	8	PLUG	NORTH CLARIFIER DRAIN ISOLATION	MANUAL	DESIGNATE AS 119
O	1	8	PLUG	SOUTH CLARIFIER SLUDGE ISOLATION	MANUAL	DESIGNATE AS 120
P	1	8	PLUG	SOUTH CLARIFIER DRAIN ISOLATION	MANUAL	DESIGNATE AS 121
Q	2	8	PLUG	RAS2 SOURCE SELECTION	MANUAL	DESIGNATE AS 122
R	3	6	PLUG	RAS PUMP SUCTION ISOLATION	MANUAL	DESIGNATE AS 123
S	3	6	CHECK	RAS PUMP CHECK	–	DESIGNATE AS 124
T	3	6	PLUG	RAS PUMP DISCHARGE ISOLATION	MANUAL	DESIGNATE AS 125
U	2	4	PLUG	WAS SUCTION LINE ISOLATION	MANUAL	DESIGNATE AS 126
V	2	4	CHECK	WAS PUMP CHECK	–	DESIGNATE AS 127
W	2	4	PLUG	WAS PUMP DISCHARGE ISOLATION	MAUNAL	DESIGNATE AS 128
X	2	6	PLUG	BIOSOLIDS BASIN INLET ISOLATION	MANUAL	DESIGNATE AS 129
Y	4	20	B'FLY	BLOWER INLET CONTROL ISOLATION	MANUAL	DESIGNATE AS 201
Z	4	16	CHECK	BLOWER CHECK	–	REMOVE BLOWER 1 CHECK, DESIGNATE BLOWERS 2–4 AS 202
AA	4	16	B'FLY	BLOWER DISCHARGE ISOLATION	MANUAL	DESIGNATE B2–B4 VALVES AS 203, DESIGNATE B1 DISCHARGE ISOLATION VALVE AS 204
BB	1	36	B'FLY	NORTH AIR HEADER ISOLATION	MANUAL	DESIGNATE AS 205
CC	1	36	B'FLY	SOUTH AIR HEADER ISOLATION	MANUAL	DESIGNATE AS 206
DD	2	6	B'FLY	AIR HEADER LATERAL ISOLATION	MANUAL	DIRECT BURY, MJ ENDS, DESIGNATE AS 207
EE	24	8	B'FLY	AIR HEADER LATERAL ISOLATION	MANUAL	DIRECT BURY, MJ ENDS, DESIGNATE AS 208
FF	2	6	B'FLY	AIR HEADER CONDENSATE RELEASE	MANUAL	DIRECT BURY, MJ ENDS, DESIGNATE AS 209

PARTIAL VALVE SCHEDULE (PROPOSED)

No.	QTY.	SIZE, IN.	TYPE	FUNCTION	CONTROL	REMARKS
101	–	16	GATE	FORCE MAIN TAPPING VALVE	MANUAL	BY OTHERS
102	–	12	GATE	RAW FORCE MAIN BYPASS TO AERATION	MANUAL	BY OTHERS
103	1	16	PLUG	HEADWORKS INLET ISOLATION	MANUAL	DIRECT BURY, MJ ENDS
104	1	4	DUCKBILL CHECK	GRIT PUMP DISCHARGE CHECK	–	
105	1	16	PLUG	HEADWORKS BYPASS	MANUAL	DIRECT BURY, MJ ENDS
106	1	16	PLUG	HEADWORKS OUTLET ISOLATION	MANUAL	DIRECT BURY, MJ ENDS
107	–	16	PLUG	NORTH AERATION BASIN – CLOSE INLET	MANUAL	(3) EXISTING VALVES B
108	–	16	PLUG	NORTH AERATION BASIN – FAR INLET	MANUAL	(2) EXISTING VALVES C
109	–	16	PLUG	SOUTH AERATION BASIN INFLUENT ISOLATION	MANUAL	(1) EXISTING VALVE C
110	1	16	PLUG	SOUTH AERATION BASIN INLET	MANUAL	DIRECT BURY, MJ ENDS
111	–	16	PLUG	CLARIFIER EFFLUENT ISOLATION	MANUAL	(2) EXISTING VALVES D
112	–	12	PLUG	POLISHING POND P.S. SUCTION ISOLATION	MANUAL	EXISTING VALVE E
113	2	10	CHECK	POLISHING POND P.S. PUMP CHECK	–	–
114	2	10	PLUG	POLISHING POND P.S DISCHARGE ISOLATION	MANUAL	–
115	1	10	GATE	POLISHING POND P.S FORCE MAIN LAGOON 2 DISCHARGE ISOLATION	MANUAL	DIRECT BURY, MJ ENDS
116	1	10	GATE	POLISHING POND P.S FORCE MAIN DISCHARGE ISOLATION	MANUAL	DIRECT BURY, MJ ENDS
117	1	12	GATE	POLISHING POND – LAGOON 2 TRANSFER	MANUAL	IN BERM, DIRECT BURY, MJ ENDS
118	–	8	PLUG	POLISHING POND P.S. FORCE MAIN LAGOON 4 DISCHARGE ISOLATION	MANUAL	EXISTING VALVE K
119	–	8	PLUG	POLISHING POND P.S. FORCE MAIN LAGOON 5 DISCHARGE ISOLATION	MANUAL	EXISTING VALVE L
120	–	8	PLUG	CLARIFIER SLUDGE ISOLATION	MANUAL	(1) EXISTING VALVE M, (1) EXISTING VALVE O
121	–	8	PLUG	CLARIFIER DRAIN ISOLATION	MANUAL	(1) EXISTING VALVE N, (1) EXISTING VALVE P
122	–	8	PLUG	RAS2 SOURCE SELECTION	MANUAL	(2) EXISTING VALVES Q
123	–	6	PLUG	RAS PUMP SUCTION ISOLATION	MAUNAL	(3) EXISTING VALVES R
124	–	6	CHECK	RAS PUMP CHECK	–	RUBBER FLAPPER CHECK, (3) EXISTING VALVES S
125	–	6	PLUG	RAS PUMP DISCHARGE ISOLATION	MANUAL	(3) EXISTING VALVES T
126	–	4	PLUG	WAS SUCTION LINE ISOLATION	MANUAL	(2) EXISTING VALVES U
127	–	4	CHECK	WAS PUMP CHECK	–	(2) EXISTING VALVES V
128	–	4	PLUG	WAS PUMP DISCHARGE ISOLATION	MANUAL	(2) EXISTING VALVES W
129	–	6	PLUG	SOUTH AERATION – BIOSOLIDS INLET ISOLATION	MANUAL	(2) EXISTING VALVES X
130	1	6	PLUG	EAST BIOSOLIDS BASIN INLET	MANUAL	DIRECT BURY, MJ ENDS
131	1	6	PLUG	WEST BIOSOLIDS BASIN INLET	MANUAL	DIRECT BURY, MJ ENDS
132	2	8	PLUG	BIOSOLIDS DECANT – LOW DRAWOFF	MANUAL	IN BIOSOLIDS DECANT STRUCTURE, VALVE SHAFT EXTENSION WITH HANDWHEEL ACTUATOR ABOVE GRADE
133	2	8	PLUG	BIOSOLIDS DECANT – MID DRAWOFF	MANUAL	IN BIOSOLIDS DECANT STRUCTURE, VALVE SHAFT EXTENSION WITH HANDWHEEL ACTUATOR ABOVE GRADE
134	2	8	PLUG	BIOSOLIDS DECANT – HIGH DRAWOFF	MANUAL	IN BIOSOLIDS DECANT STRUCTURE, VALVE SHAFT EXTENSION WITH HANDWHEEL ACTUATOR ABOVE GRADE
135	1	8	PLUG	EAST BIOSOLIDS – WEST BIOSOLIDS TRANSFER	MANUAL	IN BIOSOLIDS DECANT STRUCTURE, VALVE SHAFT EXTENSION WITH HANDWHEEL ACTUATOR ABOVE GRADE
136	2	8	PLUG	BIOSOLIDS P.S. INFLUENT ISOLATION	MANUAL	IN BIOSOLIDS DECANT STRUCTURE, VALVE SHAFT EXTENSION WITH HANDWHEEL ACTUATOR ABOVE GRADE
137	2	6	CHECK	BIOSOLIDS P.S. PUMP CHECK	–	–
138	2	6	PLUG	BIOSOLIDS P.S. PUMP DISCHARGE ISOLATION	MANUAL	–
139	1	6	PLUG	BIOSOLIDS FORCE MAIN DISCHARGE ISOLATION – NORTH	MANUAL	DIRECT BURY, MJ ENDS
140	1	6	PLUG	BIOSOLIDS FORCE MAIN DISCHARGE ISOLATION – SOUTH	MANUAL	DIRECT BURY, MJ ENDS
141	1	3	CHECK	RAS TO WAS CHECK	–	RUBBER FLAPPER CHECK
142	1	3	PLUG	RAS TO WAS MODULATING VALVE	ELECTRIC	ELECTRIC MODULATING ACTUATOR FOR FLOW CONTROL WITH MANUAL OVERRIDE
143	1	8	PLUG	RAS DISCHARGE VALVE	MANUAL	–
201	–	20	B'FLY	BLOWER INLET CONTROL ISOLATION	MANUAL	(4) EXISTING VALVES Y
202	1	16	CHECK	BLOWER CHECK	–	B2–B4 (3) EXISTING VALVE Z, B1 CHECK REPLACED
203	1	16	B'FLY	BLOWER DISCHARGE ISOLATION	CHAINWHEEL	B2–B4 (3) EXISTING VALVE AA, B1 VALVE REPLACED
204	–	16	B'FLY	SOUTH AERATION BASIN STANDBY AIR SUPPLY ISOLATION	MANUAL	EXISTING VALVE AA
205	–	36	B'FLY	NORTH AIR HEADER ISOLATION	MANUAL	EXISTING VALVE BB
206	–	36	B'FLY	SOUTH AIR HEADER ISOLATION	MANUAL	EXISTING VALVE CC
207	–	6	B'FLY	NORTH AERATION BASIN AIR HEADER LATERAL ISOLATION	MANUAL	(2) EXISTING VALVES DD
208	–	8	B'FLY	NORTH AERATION BASIN AIR HEADER LATERAL ISOLATION	MANUAL	(24) EXISTING VALVES EE
209	–	6	B'FLY	AIR HEADER CONDENSATE RELEASE	MANUAL	(2) EXISTING VALVES FF
210	10	6	B'FLY	EAST AERATION BASIN AIR HEADER LATERAL ISOLATION	MANUAL	ABOVE GRADE

ALTERNATE No. 1

ALTERNATE No. 1

ALTERNATE No. 2

PARTIAL STOP GATE SCHEDULE (EXISTING)

No.	QTY.	TYPE	OPENING SIZE (INCHES, W x H)	FUNCTION	FRAME		REMARKS
					WALL MOUNT	CAST IN PLACE	
A	1	SLIDE GATE	26 x 27	GRINDER INLET ISOLATION @ INLET/SPLITTER BOX	X		REMOVE
B	1	SLIDE GATE	26 x 27	BAR SCREEN ISOLATION @ INLET/SPLITTER BOX		X	REMOVE
C	1	SLIDE GATE	24 x 24	GRINDER OUTLET ISOLATION @ INLET/SPLITTER BOX	X		DESIGNATE AS 6
D	1	SLIDE GATE	24 x 24	BAR SCEEN ISOLATION @ INLET/SPLITTER BOX	X		DESIGNATE AS 7
E	3	SLIDE GATE	24 x 24	AERATION BASIN INLET CONTROL @ INLET/SPLITTER BOX	X		DESIGNATE AS 8
F	2	SLIDE GATE	36 x 24	CLARIFIER INLET CONTROL @ INLET/SPLITTER BOX	X		DESIGNATE AS 9
G	1	SLUICE GATE	12" D.I. PIPE	AERATION BASIN BYPASS @ INLET/SPLITTER BOX	X	X	DESIGNATE AS 10
H	2	SLIDE GATE	–	EFFLUENT DIVERSION MANHOLE		X	DESIGNATE AS 11
I	1	SLIDE GATE	–	EAST BIOSOLIDS BASIN OUTLET		X	REMOVE
J	1	SLIDE GATE	–	WEST BIOSOLIDS BASIN OUTLET		X	REMOVE

PARTIAL GATE SCHEDULE (PROPOSED)

No.	QTY.	TYPE	OPENING SIZE (W=WIDTH, H=HEIGHT)	FUNCTION	FRAME		REMARKS
					WALL MOUNT	CAST IN PLACE	
1	2	STOP GATE	36"W x H VARIES	MECHANICAL SCREEN CHANNEL ISOLATION		X	36" x 30.5" GATE SIZE, PLATES SHARED WITH GATE 2
2	2	STOP GATE	36"W x H VARIES	MECHANICAL SCREEN BYPASS CHANNEL ISOLATION		X	36" x 30.5" GATE SIZE, PLATES SHARED WITH GATE 1
3	1	STOP GATE	36"W x 51"H	INTERCONNECT CHANNEL ISOLATION		X	36" x 16" GATE SIZE
4	1	STOP GATE	36"W x 51"H	GRIT CHAMBER INFLUENT CHANNEL ISOLATION		X	36" x 28" GATE SIZE, PLATE SHARED WITH GATE 5
5	1	STOP GATE	36"W x 51"H	EFFLUENT WELL ISOLATION		X	36" x 28" GATE SIZE, PLATE SHARED WITH GATE 4
6	–	STOP GATE	24"W	EAST INFLUENT CHANNEL ISOLATION	X		EXISTING GATE C
7	–	STOP GATE	24"W	WEST INFLUENT CHANNEL ISOLATION	X		EXISTING GATE D
8	–	STOP GATE	24"W	AERATION BASIN INLET CONTROL @ INLET/SPLITTER BOX	X		(3) EXISTING GATE E
9	–	STOP GATE	36"W	CLARIFIER INLET CONTROL @ INLET/SPLITTER BOX	X		(2) EXISTING GATE F
10	–	SLUICE GATE	12" D.I. PIPE	AERATION BASIN BYPASS @ INLET/SPLITTER BOX	X	X	EXISTING GATE G
11	–	STOP GATE	–	EFFLUENT DIVERSION MANHOLE – WEST BIOSOLIDS		X	(2) EXISTING GATE H
12	2	STOP GATE	21"W	EFFLUENT DIVERSION MANHOLE – POLISHING POND		X	26" HEIGHT

FLOW METER SCHEDULE (EXISTING)

No.	QTY.	TYPE	SIZE, IN.	FUNCTION	REMARKS
A	1	ULTRASONIC	–	RAW WASTEWATER @ INLET/SPLITTER BOX	DESIGNATE AS 1
B	1	MAGNETIC	6"	RETURN ACTIVATED SLUDGE	DESIGNATE AS 2
C	1	MAGNETIC	3"	WASTE ACTIVATED SLUDGE	DESIGNATE AS 3

FLOW METER SCHEDULE (PROPOSED)

No.	QTY.	TYPE	SIZE, IN.	FUNCTION	REMARKS
1	–	ULTRASONIC	–	RAW WASTEWATER @ INLET/SPLITTER BOX	EXISTING, RECALIBRATE
2	–	MAGNETIC	6	RETURN ACTIVATED SLUDGE	EXISTING
3	–	MAGNETIC	3	WASTE ACTIVATED SLUDGE	EXISTING
4	1	MAGNETIC	6	CLARIFIER No. 1 RAS	–
5	1	MAGNETIC	6	CLARIFIER No. 1/2 RAS	–
6	1	MAGNETIC	6	CLARIFIER No. 2 RAS	–

NO.	REVISIONS	BY	DATE

DRAWN: SMYTH
DATE: MAY '23
CHECKED: P.W.B.
DATE: MAY '23

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CITY OF HART
OCEANA COUNTY, MICHIGAN

WASTEWATER SYSTEM IMPROVEMENTS
BIOPURE TREATMENT FACILITY

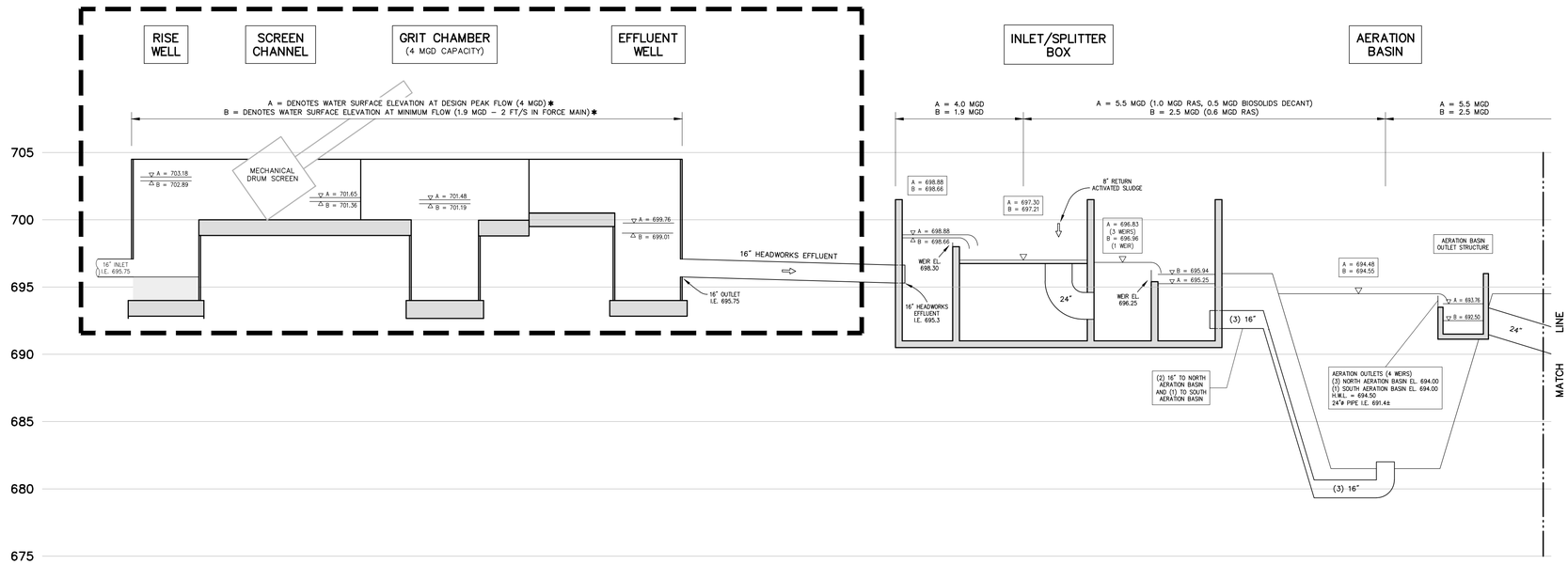
SCHEDULES

PROJECT NO. 2211159

SHEET NO. P1 OF P4

T:\CIVIL3D PROJECTS\2021\2211159_HART_WWTP\4_PROD\C4 HEADWORKS LAGOON SPLITS AND POLISHING POND PDS\2211159_C4_SITE PROCESSING - WSMYTH - May. 22, 2023 - 11:12am - PrestoNewhof

ALTERNATE No. 1



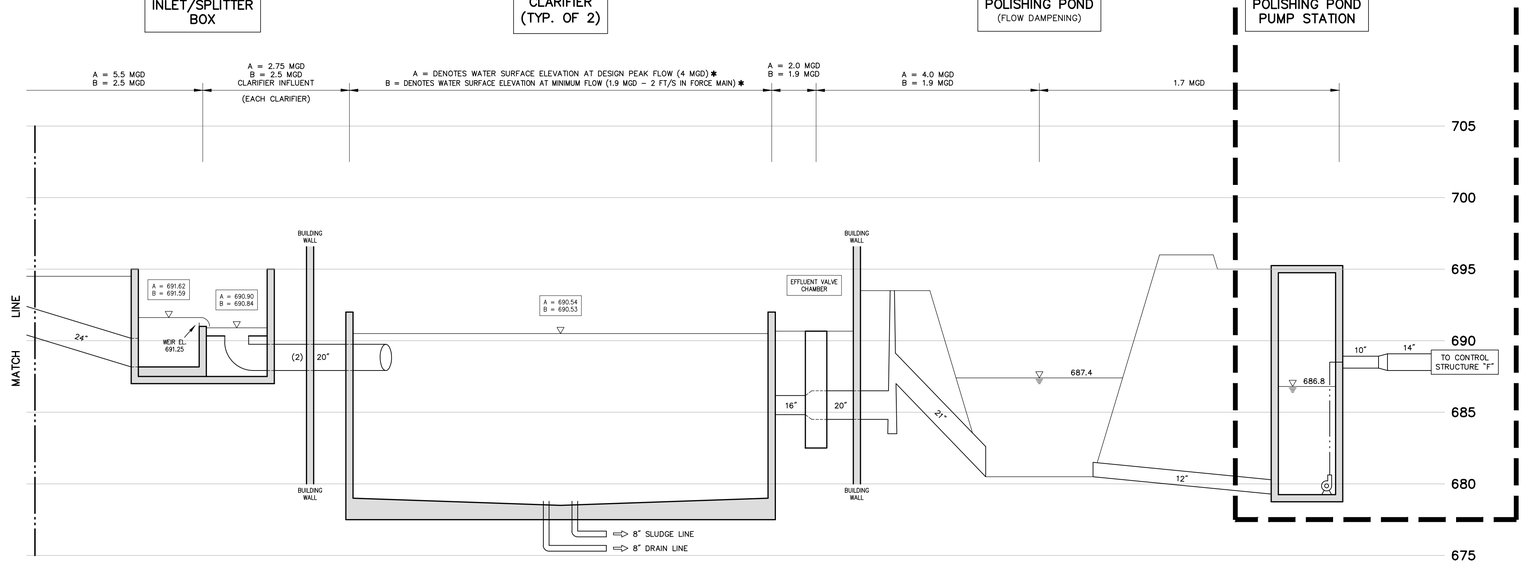
PARTIAL HYDRAULIC PROFILE – PROPOSED

SCALES : HORZ. NONE
VERT. 1" = 5'

NOTE

✱ BASED ON TWO (2) CLARIFIERS AND BOTH AERATION BASINS IN OPERATION AT PEAK FLOW AND ONE (1) CLARIFIER AND ONLY THE SOUTH AERATION BASIN IN OPERATION AT 1.9 MGD.

ALTERNATE No. 2



PARTIAL HYDRAULIC PROFILE – PROPOSED

SCALES : HORZ. NONE
VERT. 1" = 5'

NOTE

✱ BASED ON TWO (2) CLARIFIERS AND BOTH AERATION BASINS IN OPERATION AT PEAK FLOW AND ONE (1) CLARIFIER AND ONLY THE SOUTH AERATION BASIN IN OPERATION AT 1.9 MGD.

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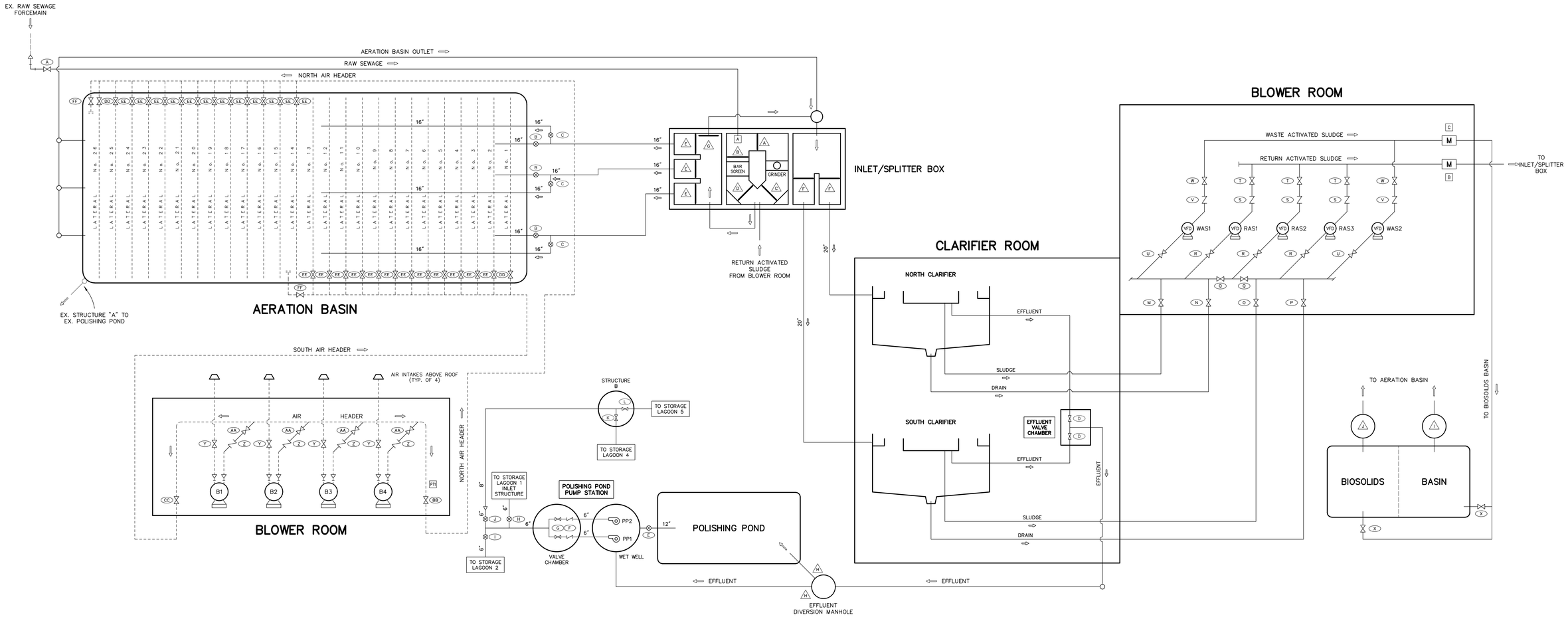
WASTEWATER SYSTEM IMPROVEMENTS
BIOPURE TREATMENT FACILITY

HYDRAULIC PROFILE

PROJECT NO. 2211159
SHEET NO. P2 OF P4



PROCESS SCHEMATIC – EXISTING

SCALE : NONE

LEGEND

————	LIQUID PIPING
- - - - - - - - -	AIR PIPING

BLOWER & PUMP LEGEND

BLOWERS	
BLOWER No. 1	B1
BLOWER No. 2	B2
BLOWER No. 3	B3
BLOWER No. 4	B4
RETURN ACTIVATED SLUDGE (RAS)	
RAS PUMP No. 1	RAS1
RAS PUMP No. 2	RAS2
RAS PUMP No. 3	RAS3
WASTE ACTIVATED SLUDGE (WAS)	
WAS PUMP No. 1	WAS1
WAS PUMP No. 2	WAS2
POLISHING POND PUMP STATION	
PUMP No. 1	PP1
PUMP No. 2	PP2

NO.	REVISIONS	BY	DATE

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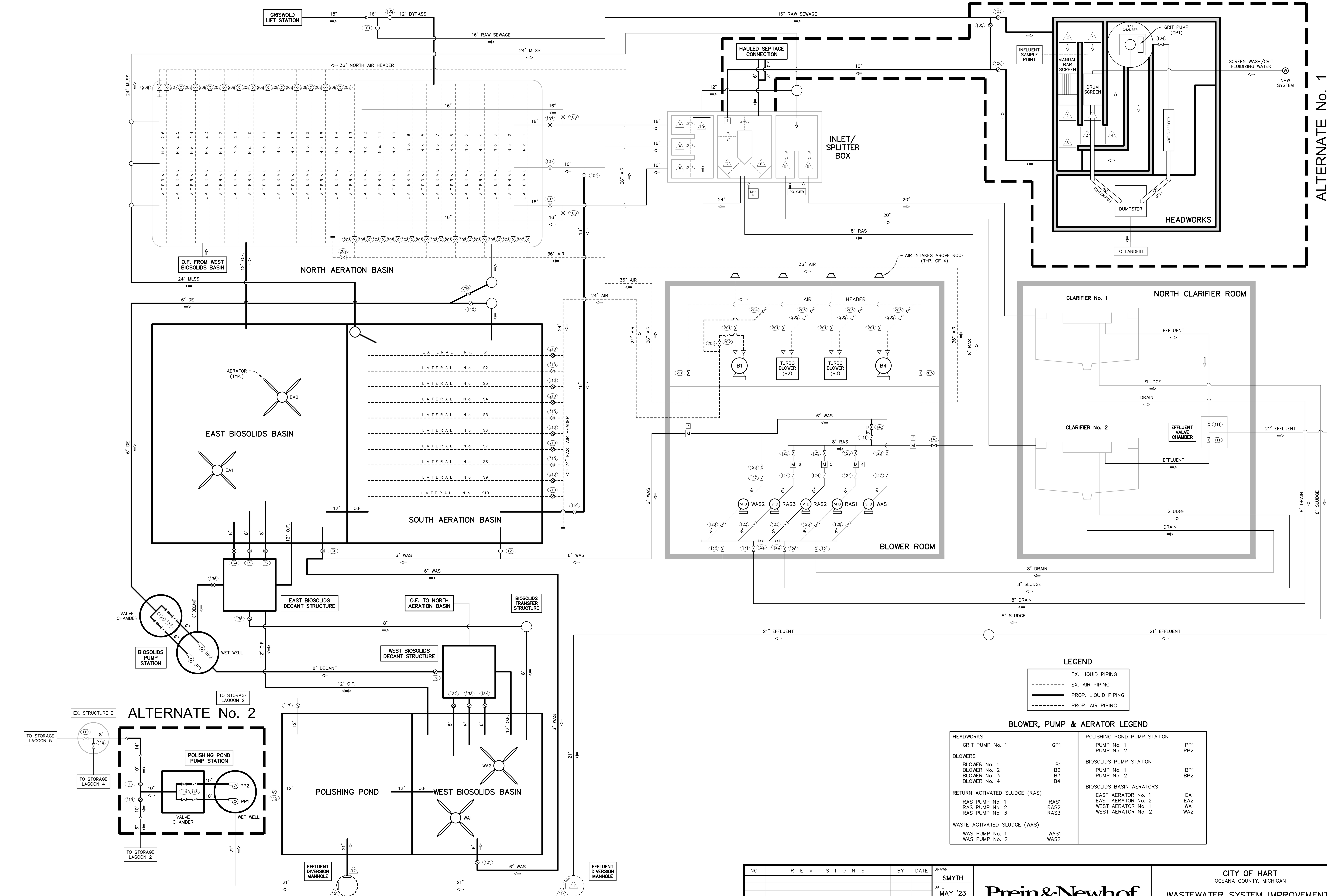
WASTEWATER SYSTEM IMPROVEMENTS
BIOPURE TREATMENT FACILITY

EXISTING PROCESS SCHEMATIC

PROJECT NO. 2211159
SHEET NO. P3 OF P4



LEGEND

———	EX. LIQUID PIPING
- - - - -	EX. AIR PIPING
━━━	PROP. LIQUID PIPING
-----	PROP. AIR PIPING

BLOWER, PUMP & AERATOR LEGEND

HEADWORKS		POLISHING POND PUMP STATION	
GRIT PUMP No. 1	GP1	PUMP No. 1	PP1
		PUMP No. 2	PP2
BLOWERS		BIOSOLIDS PUMP STATION	
BLOWER No. 1	B1	PUMP No. 1	BP1
BLOWER No. 2	B2	PUMP No. 2	BP2
BLOWER No. 3	B3	BIOSOLIDS BASIN AERATORS	
BLOWER No. 4	B4	EAST AERATOR No. 1	EA1
RETURN ACTIVATED SLUDGE (RAS)		EAST AERATOR No. 2	EA2
RAS PUMP No. 1	RAS1	WEST AERATOR No. 1	WA1
RAS PUMP No. 2	RAS2	WEST AERATOR No. 2	WA2
RAS PUMP No. 3	RAS3		
WASTE ACTIVATED SLUDGE (WAS)			
WAS PUMP No. 1	WAS1		
WAS PUMP No. 2	WAS2		

NO.	REVISIONS	BY	DATE

DRAWN SMYTH
DATE MAY '23
CHECKED P.W.B.
DATE MAY '23

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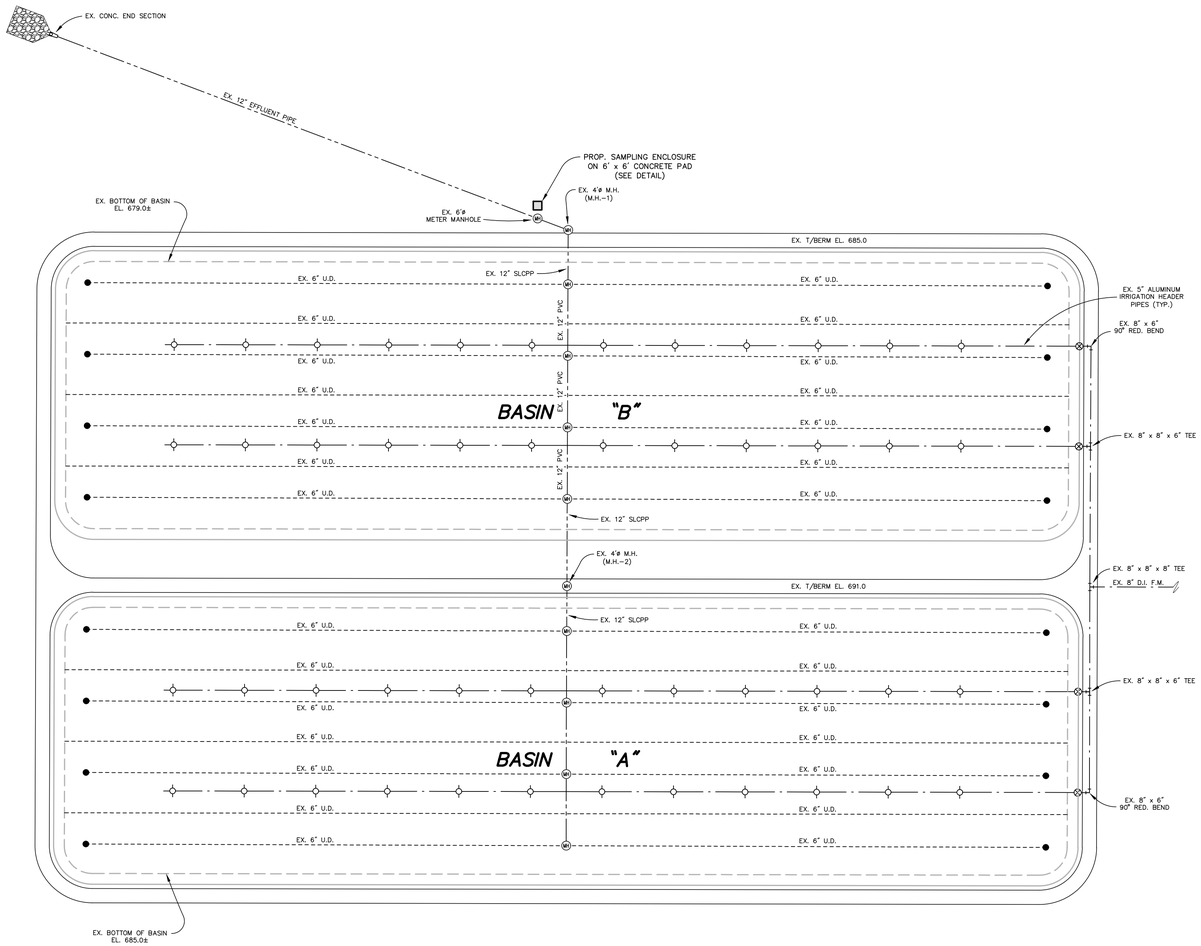
OCEANA COUNTY, MICHIGAN

WASTEWATER SYSTEM IMPROVEMENTS
BIOPURE TREATMENT FACILITY

PROPOSED PROCESS SCHEMATIC

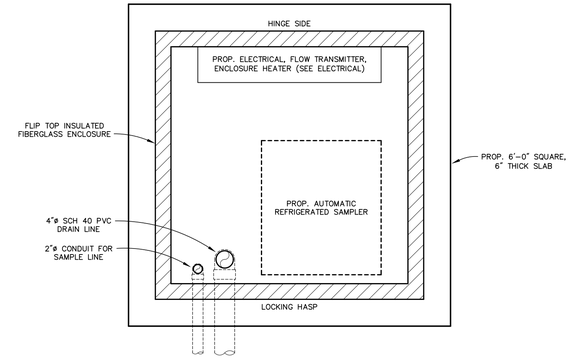
PROJECT NO. 2211159

SHEET NO. P4 OF P4



RAPID INFILTRATION BASIN (RIB) – SITE PLAN

SCALE : 1" = 50'



SAMPLER & METER ENCLOSURE SCHEMATIC – PLAN VIEW

North

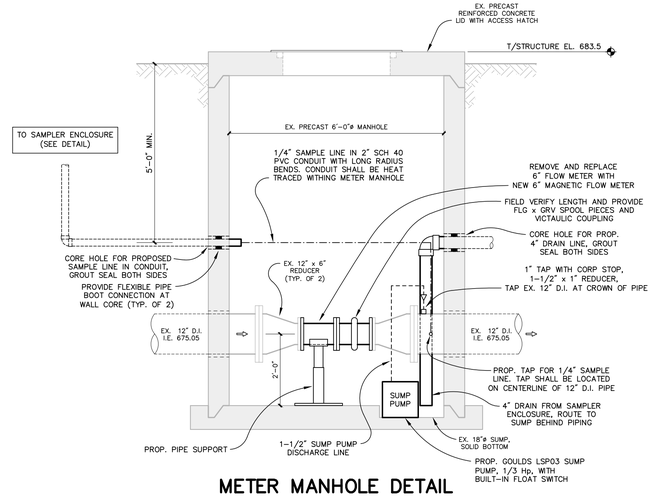
SCALE : NONE

NOTES

1. CONDUITS FOR SAMPLE LINES SHALL BE LOCATED AT SOUTH END OF ENCLOSURE TO MINIMIZE LENGTH OF SAMPLE LINE REQUIRED.
2. SAMPLES SHALL BE SECURED DOWNSTREAM OF THE METER.
3. PROVIDE 3/4" CHAMFERED EDGES ON ALL EXPOSED CONCRETE SLABS.
4. SAMPLER AND METER ENCLOSURE SLAB SHALL BE REINFORCED WITH 6 x 6 W2.9 x W2.9 W.W.F. PLACED IN THE UPPER THIRD OF THE SLAB.

SAMPLER AND METER ENCLOSURE NOTES

1. PLACE (1) 2"ø PVC (SCH 40) CONDUIT WITH LONG RADIUS BEND TO ROUTE SAMPLER LINE FROM METER MANHOLE TO SAMPLER AND METER ENCLOSURE.
2. 4"ø PVC DRAIN LINE WITH TRAP FROM ENCLOSURE TO METER MANHOLE SUMP.
3. SEE ELECTRICAL FOR CONDUIT TO ACCOMMODATE MANUFACTURER'S CABLE FOR METER.



METER MANHOLE DETAIL

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

SOURCE

CITY OF HART, 1992 WASTEWATER TREATMENT PLANT IMPROVEMENTS, CONTRACT No. 2, PROJECT No. 89245, SHEET 5 OF 5, WW ENGINEERING & SCIENCE

NO.	REVISIONS	BY	DATE

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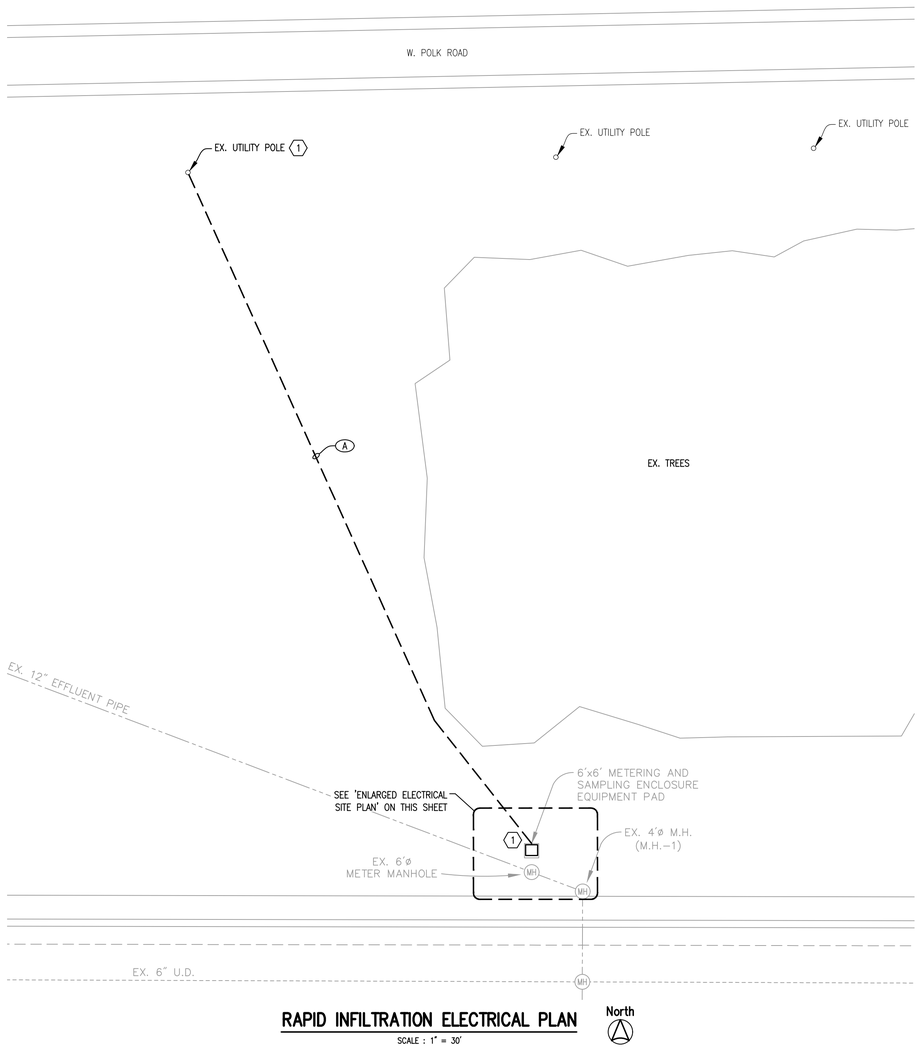
CITY OF HART
OCEANA COUNTY, MICHIGAN
WASTEWATER SYSTEM IMPROVEMENTS
BIOPURE TREATMENT FACILITY
RAPID INFILTRATION BASIN (RIB)

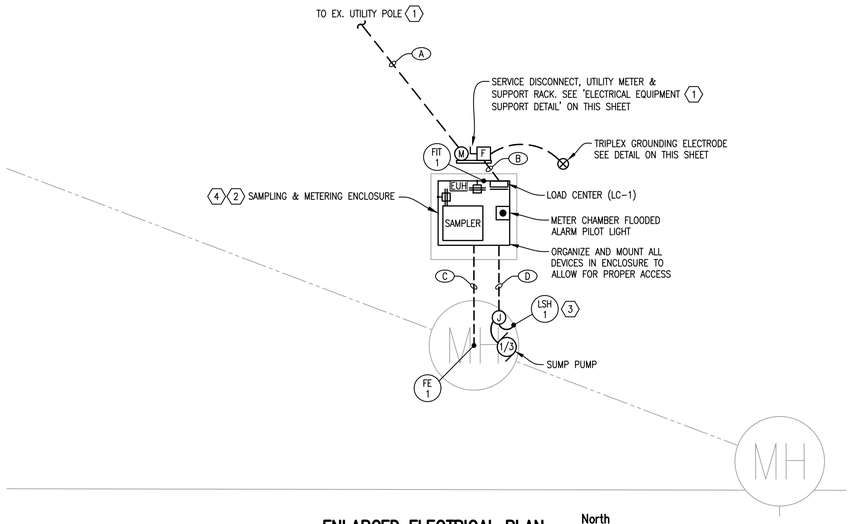
PROJECT NO. 2211159
SHEET NO. R1 OF R2



RAPID INFILTRATION ELECTRICAL PLAN

SCALE : 1" = 30'

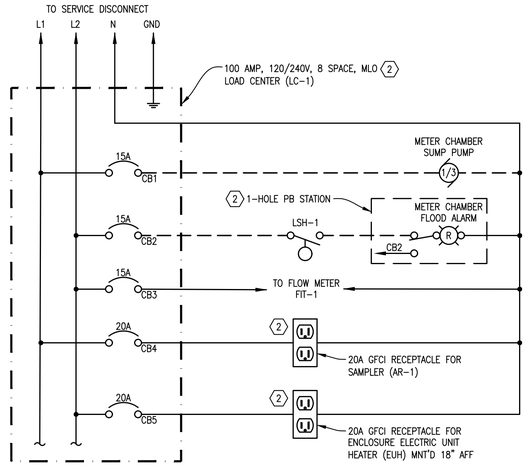
North



ENLARGED ELECTRICAL PLAN

SCALE : 1" = 5'

North



SAMPLING & METERING ENCLOSURE POWER WIRING DIAGRAM

SCALE : NONE

GENERAL NOTES:

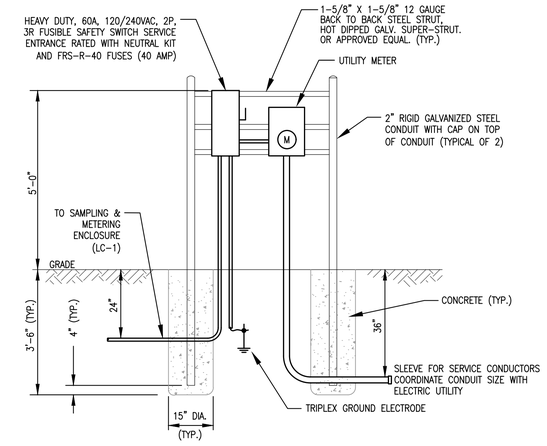
1. ENGRAVED EQUIPMENT NAMEPLATES (WHITE PHENOLIC WITH BLACK LETTERS) SHALL BE FURNISHED AND INSTALLED BY THE ELECTRICAL CONTRACTOR FOR NEW AND EXISTING ELECTRICAL EQUIPMENT AS NOTED. LETTER SIZES: 1" HIGH FOR INDIVIDUAL ELECTRICAL POWER DISTRIBUTION AND SERVICE EQUIPMENT. LETTER SIZES: 1/4" HIGH FOR INDIVIDUAL ELECTRICAL MOTOR CONTROL CENTER UNITS, VFD ENCLOSURES, SAFETY DISCONNECTS, COMBINATION STARTERS AND PROCESS INSTRUMENTATION.
2. PROVIDE THESE CONDUIT TYPES IN THE FOLLOWING LOCATIONS:
   a. RGS – OUTDOOR ABOVE GRADE.
   b. SCH. 40 PVC – BELOW GRADE – MINIMUM 24" COVER.
3. INSTALL BELOW GRADE CONDUITS A MINIMUM OF 24" BELOW GRADE UNLESS NOTED OTHERWISE. PROVIDE YELLOW RIBBON MARKED "BURIED ELECTRIC" 12" BELOW GRADE ABOVE CONDUITS. PROVIDE RMC ELBOWS IN ALL BELOW GRADE CONDUIT INSTALLATIONS.
4. PROVIDE RGS CONDUIT AND ELBOWS BELOW GRADE AND FOR ALL STUB UPS TO EQUIPMENT EXTENDING UP THRU CONCRETE SLABS FOR TRANSITION FROM CONCEALED/BELOW GRADE TO EXPOSED/ABOVE GRADE CONDUIT INSTALLATIONS. PROVIDE SCH. 40 PVC SLEEVES FOR ALL CONDUITS EXTENDING UP THROUGH CONCRETE SLABS.
6. THE FOLLOWING LOCATIONS, IN ACCORDANCE WITH NEC AND NFPA 820, SHALL BE CONSIDERED AS CLASS I, DIVISION 2, GROUP D HAZARDOUS AND CORROSIVE LOCATIONS:
   a. INSIDE METER CHAMBER.
   b. AREAS DESCRIBED AS HAZARDOUS BY NEC AND NFPA 820.
7. ALL WORK IN HAZARDOUS LOCATIONS SHALL BE IN ACCORDANCE WITH ARTICLE 500 OF THE NATIONAL ELECTRICAL CODE. EQUIPMENT INSTALLED IN THESE LOCATIONS SHALL BE EXPLOSION-PROOF OR UTILIZE INTRINSICALLY SAFE CIRCUITRY. PROVIDE SEAL-OFF FITTINGS FOR ALL WIRING THAT ENTERS/LEAVES HAZARDOUS LOCATIONS. EQUIPMENT INSTALLED IN CORROSIVE AREAS SHALL BE CONSTRUCTED OF CORROSION-RESISTANT MATERIALS. THE LOCATION AND TYPE OF GAS-TIGHT SEALS FOR CABLES, CONDUIT, AND WIRES MUST MEET THE NEC, AND ALLOW FOR EASY DISCONNECTION AND REMOVAL OF PUMPS AND INSTRUMENTS FOR MAINTENANCE.
8. ALL INSTRUMENTATION DEVICES SHOWN ARE INSTALLED BY THE ELECTRICAL CONTRACTOR. ELECTRICAL CONTRACTOR SHALL PROVIDE FIELD WIRING, CONDUIT & TERMINATIONS FOR THOSE DEVICES AS REQUIRED.
9. CORE HOLES FOR CONDUITS INTO CONCRETE STRUCTURES AS NEEDED. PATCH ALL CONDUIT PENETRATIONS WITH NON-SHRINKING GROUT, GROUT SHALL EXTEND THE FULL DEPTH OF THE PENETRATION.
10. UNLESS NOTED OTHERWISE ON THE PLANS ALL 120VAC POWER CIRCUITS TO RECEPTACLES AND OTHER SMALL 120VAC, 1Ø LOADS SHALL BE 2#12, 1#12GND IN MINIMUM 3/4" RMC OR PVC COATED RMC, DEPENDENT ON LOCATION

PLAN NOTES: (#) (SYMBOL DENOTES PLAN NOTE)

1. PROVIDE PVC SCH 80 CONDUIT SLEEVE AT UTILITY METER AND RISER AT UTILITY POLE. COORDINATE REQUIRED CONDUIT SIZE AND RISER HEIGHT REQUIREMENT WITH ELECTRIC UTILITY. COORDINATE WITH MATT ASHBAUGH, GREAT LAKES ENERGY, 888-458-2537 x8522.
2. PROVIDE EQUIPMENT PAD MOUNTED GALVANIZED U-CHANNEL SUPPORT INSIDE OF 'SAMPLING & METERING ENCLOSURE' TO SUPPORT INSTRUMENTS AND ELECTRICAL COMPONENTS. MOUNTING AND CONDUIT PENETRATIONS THROUGH 'SAMPLING & METERING ENCLOSURE' SHELL ARE UNACCEPTABLE.
3. MOUNT AND SECURE FLOAT SWITCH TO TRIP AT 6" ABOVE METER CHAMBER FLOOR.
4. REFER TO SECTION 40 91 13.12 FOR SAMPLING AND METERING ENCLOSURE REQUIREMENTS.

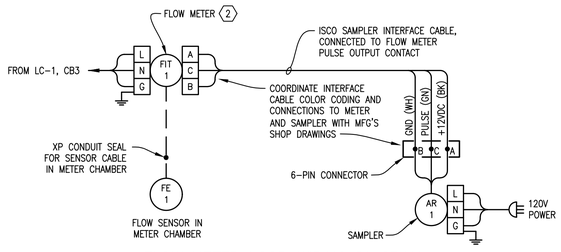
CONDUIT AND WIRE SCHEDULE

MARK	DESCRIPTION	SEAL Y/N
(F)		
A	SERVICE CONDUCTORS – COORDINATE CONDUIT SIZE AT UTILITY METER & POLE WITH ELECTRIC UTILITY	N
B	3#8, 1#10 GND – 3/4"C	N
C	MANUFACTURERS FLOW SENSOR CABLE, 1#10 GND – 1"C	Y
D	2#12 (SUMP PUMP), 2#14 (FLOAT SWITCH), 1#12 GND – 3/4"C	Y



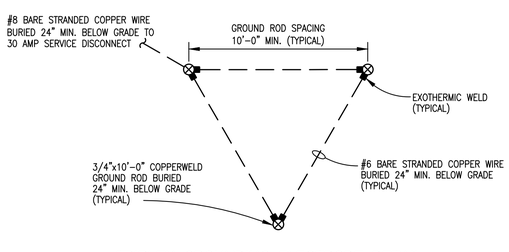
ELECTRICAL EQUIPMENT SUPPORT DETAIL

SCALE : NONE

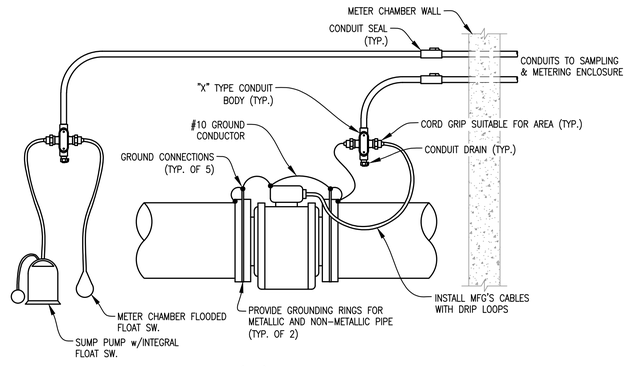


FLOW METER LOOP WIRING DIAGRAM

SCALE : NONE



TRIPLEX GROUNDING ELECTRODE DETAIL



FLOW ELEMENT (FE) INSTALLATION DETAIL

LOCATED IN METER CHAMBER SCALE: NONE

Know what's below. Call before you dig.

UTILITY LOCATIONS ARE DERIVED FROM ACTUAL MEASUREMENTS OR AVAILABLE RECORDS. THEY SHOULD NOT BE INTERPRETED TO BE EXACT LOCATIONS NOR SHOULD IT BE ASSUMED THAT THEY ARE THE ONLY UTILITIES IN THIS AREA.

NO.	REVISIONS	BY	DATE
	–	–	–

DRAWN RBD/KCT
DATE MAY '23
CHECKED MAT
DATE MAY '23

CENTURY A&E
Facilities Design
277 Crahen Avenue NE - Grand Rapids, MI 49525
Telephone: (616) 456-5227 / Fax: (616) 456-5228 / Web: www.centuryae.com

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CITY OF HART
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ELECTRICAL PLANS & DETAILS

PROJECT NO. 2211159
SHEET NO. R2 OF R2