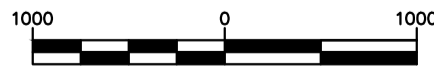


GROUNDWATER TREATMENT
UPGRADES
FOR
NICHOLSON
LANDFILL
KENT COUNTY, MARYLAND



SITE LOCATION MAP



I, Nicholas M. Bran, HEREBY CERTIFY THAT, TO THE BEST OF MY KNOWLEDGE, THE FOUNDATION DESIGN FOR THIS PROJECT MEETS THE PROVISIONS IN TITLE 7 OF THE CODE OF FEDERAL REGULATIONS (CFR), CHAPTER XVII, SECTION 1792.103 THROUGH THE INCORPORATION OF THE SEISMIC DESIGN REQUIREMENTS PRESCRIBED IN AMERICAN SOCIETY OF CIVIL ENGINEER (ASCE) 7-16, MINIMUM DESIGN LOADS AND ASSOCIATED CRITERIA FOR BUILDINGS AND OTHER STRUCTURES. THE ABOVE-GRADE BUILDING STRUCTURE HOUSING THE GROUNDWATER TREATMENT EQUIPMENT WILL BE PREFABRICATED. THE ENGINEERING DESIGN FOR THE BUILDING, TO BE COMPLETED BY THE MANUFACTURER OF THE BUILDING, AND IS NOT PART OF THE PLAN SET; HOWEVER, THE PREFABRICATED BUILDING SPECIFICATIONS, WHICH ARE PART OF THE DESIGN DOCUMENT SET, SPECIFY ASCE 7-16 AS THE REQUIRED BASIS FOR DESIGN OF THE BUILDING AND THUS WILL COMPLY WITH TITLE 7 OF THE CFR, CHAPTER XVII, SECTION 1792.103.

N. M. Bran 9/8/2023
SIGNATURE DATE

SHEET NO.	TITLE
G-001	SITE OVERVIEW
C-001	PROPOSED LAYOUT PLAN
C-002	PROPOSED GRADING PLAN
C-003	PROPOSED UTILITY PLAN
C-004	PROPOSED EROSION AND SEDIMENTATION PLAN
C-005	PLAN DETAILS
C-006	PLAN NOTES
P-001	PROCESS FLOW DIAGRAM
P-002	EXISTING SYSTEMS TO BE REPLACED/REUSED
P-003	GENERAL EQUIPMENT AND SLUDGE HANDLING LAYOUT
P-004	LEGENDS AND SYMBOLS
P-005	P&ID WELL TO EQUALIZATION TANK
P-006	P&ID INORGANIC TREATMENT
P-007	P&ID ABSORPTION, FILTRATION, & DISTRIBUTION
P-008	P&ID SODIUM HYDROXIDE
P-009	P&ID POLYMER SYSTEM
S-001	GENERAL STRUCTURAL NOTES
S-002	SPECIAL INSPECTION TABLES
S-101	FOUNDATION & SLAB JOINT DETAILS
S-102	ASSORTED PLANS
S-201	ELEVATIONS
S-301	SECTIONS 1
S-302	SECTIONS 2
S-501	DETAILS
M-001	HVAC PLAN
M-002	HVAC SPECIFICATIONS
E-001	ELECTRICAL SITE PLAN, NOTES, & ONE-LINE DIAGRAM
E-002	GROUNDING AND LIGHTING PLAN
E-003	POWER PLAN
E-004	CONTROL AND INSTRUMENT PLAN
E-005	EXISTING TREATMENT BUILDING CONTROL PANEL
E-006	CONTROL PANEL
E-007	CONTROL PANEL ELEMENTARY
E-008	VFD ELEMENTARY
E-009	ELECTRICAL DETAILS



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NO.	DATE	DESCRIPTION	CHECKED	DRAWN
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1	4/12/2022	BOX DESIGN EROSION AND SEDIMENT CONTROL UPDATE	CC	CC
2	4/19/2022	FINAL DESIGN TO MOE	CC	CC
3	9/16/2022	ISSUED FOR CONSTRUCTION	CC	CC
4	8/31/2023	ADDITIONAL STATEMENT FOR CFR 1792.103	CC	CC

GROUNDWATER TREATMENT SYSTEM
UPGRADES

FOR
NICHOLSON LANDFILL
CHESTERTOWN TOWNSHIP
KENT COUNTY
MARYLAND

DRAWING TITLE
TITLE SHEET

DATE	5/10/2022
JOB NO.	2000114-00
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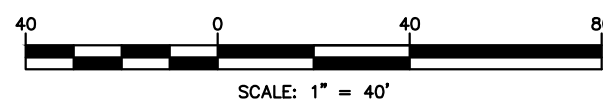
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LEGEND

- x—x—x— EXISTING FENCING
- - - - - EXISTING GRAVEL ROAD
- EXISTING WELL
- EXISTING VENT PIPE



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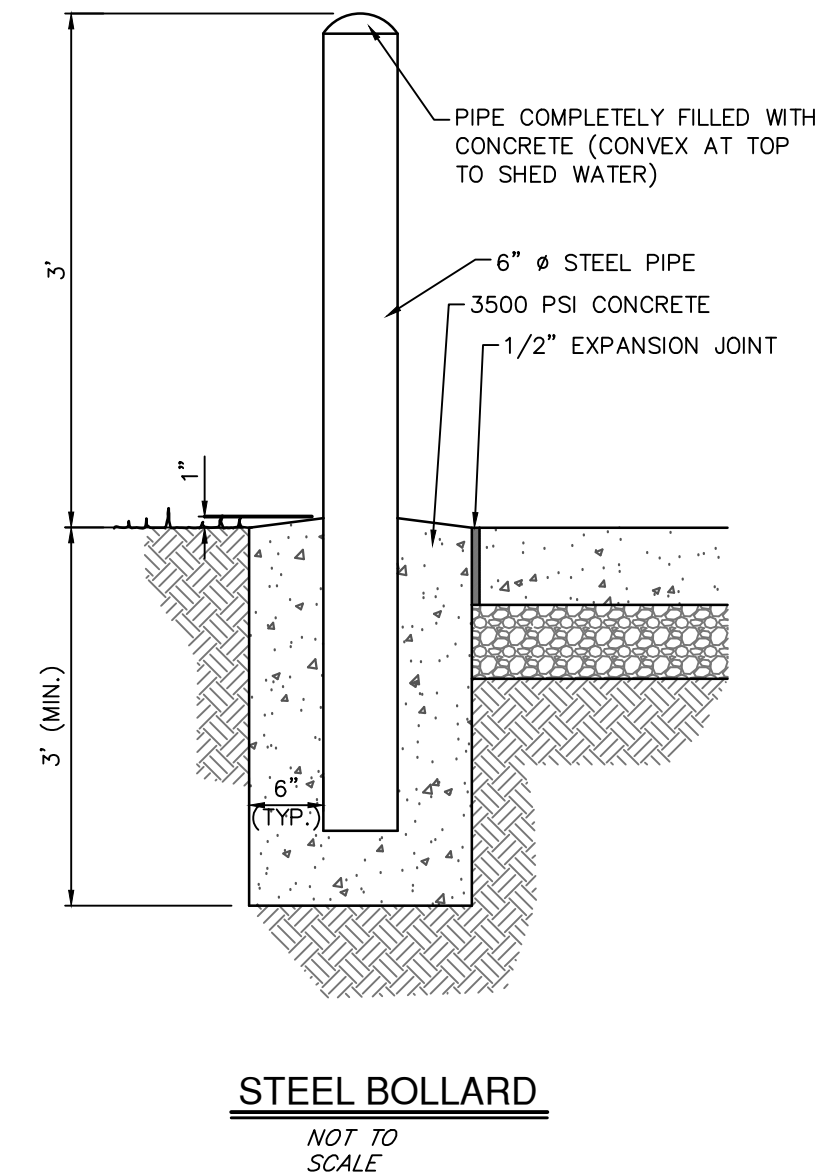
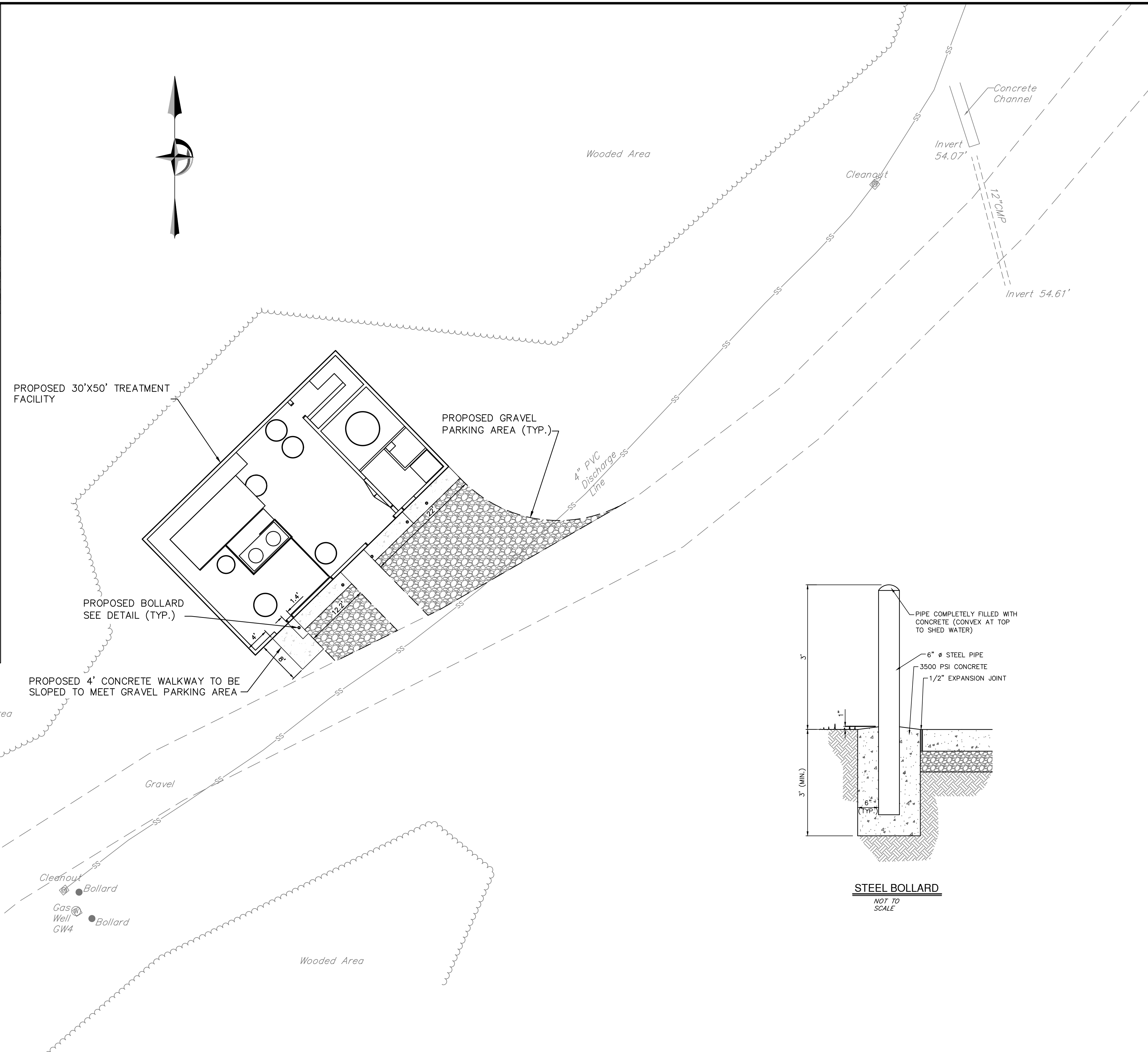
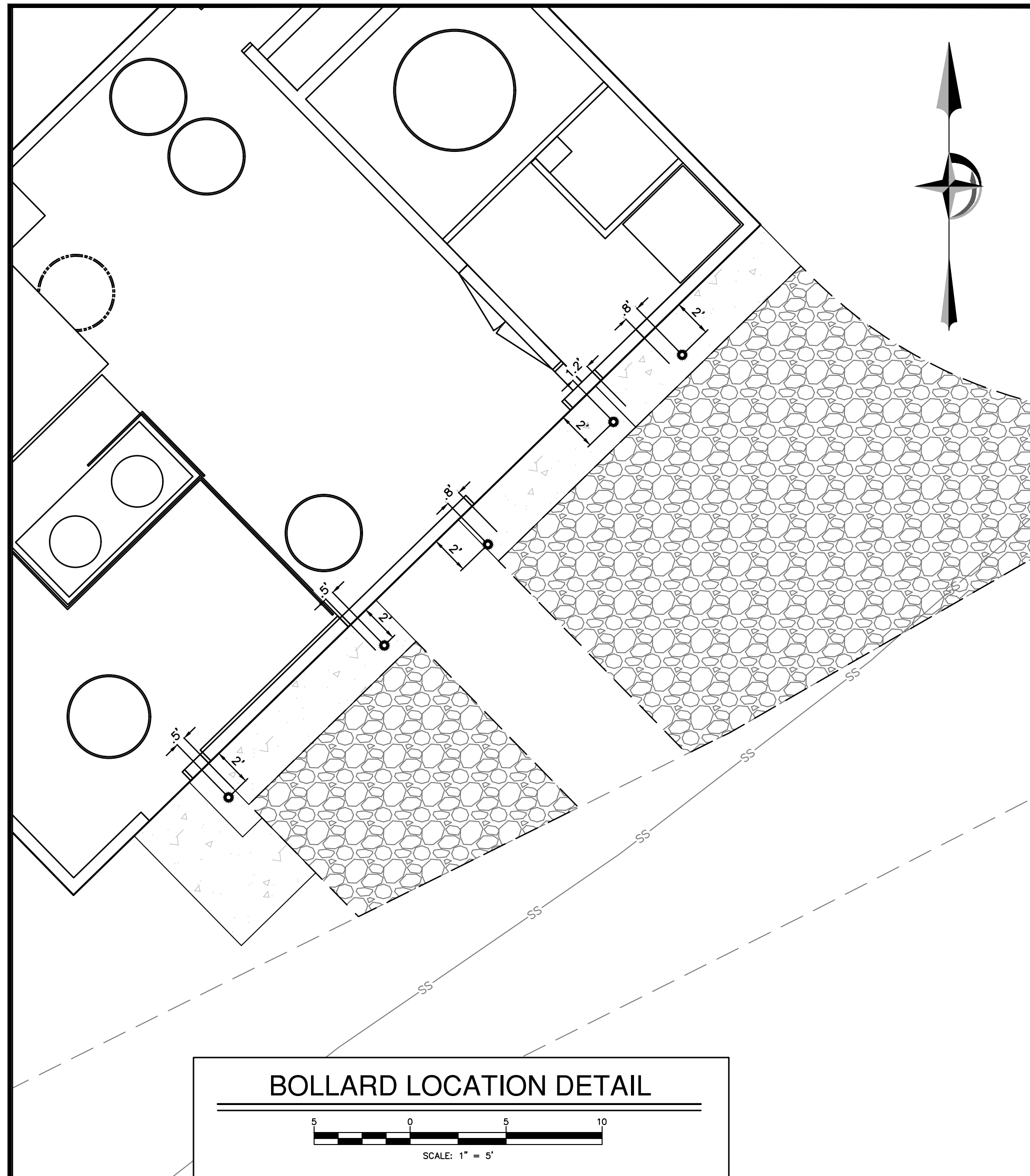


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1	9/16/2022	ISSUED FOR CONSTRUCTION		

GROUNDWATER TREATMENT SYSTEM
UPGRADES
FOR
NICHOLSON LANDFILL
CHESTERTOWN TOWNSHIP
KENT COUNTY MARYLAND

DRAWING TITLE
SITE OVERVIEW

DATE	5/10/2022
JOB NO.	2000114.00
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SHEET NO.	G-001

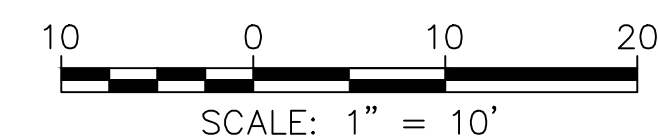


EXISTING LEGEND

	<i>Treeline</i>
	<i>Fencing</i>
	<i>Treatment Discharge Line</i>
	<i>Recovery Well</i>
	<i>Vent Pipe</i>
	<i>Cleanout</i>
	<i>Bollard</i>
	<i>Building</i>
	<i>Storm Sewer Line</i>
	<i>Gravel</i>
	<i>Concrete</i>

PROPOSED LEGEND

	BUILDING
	WALKWAY
	GRAVEL DRIVE



REVISIONS			CHECKED	DRAWN
NO.	DATE	DESCRIPTION	RAN	RAN
A	2/3/2022	PRELIMINARY SITE DESIGN SUBMISSION	BCC	BCC
0	4/4/2022	90% DESIGN SUBMISSION	RAN	BCC
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2	9/16/2022	ISSUED FOR CONSTRUCTION	NMB	RAN

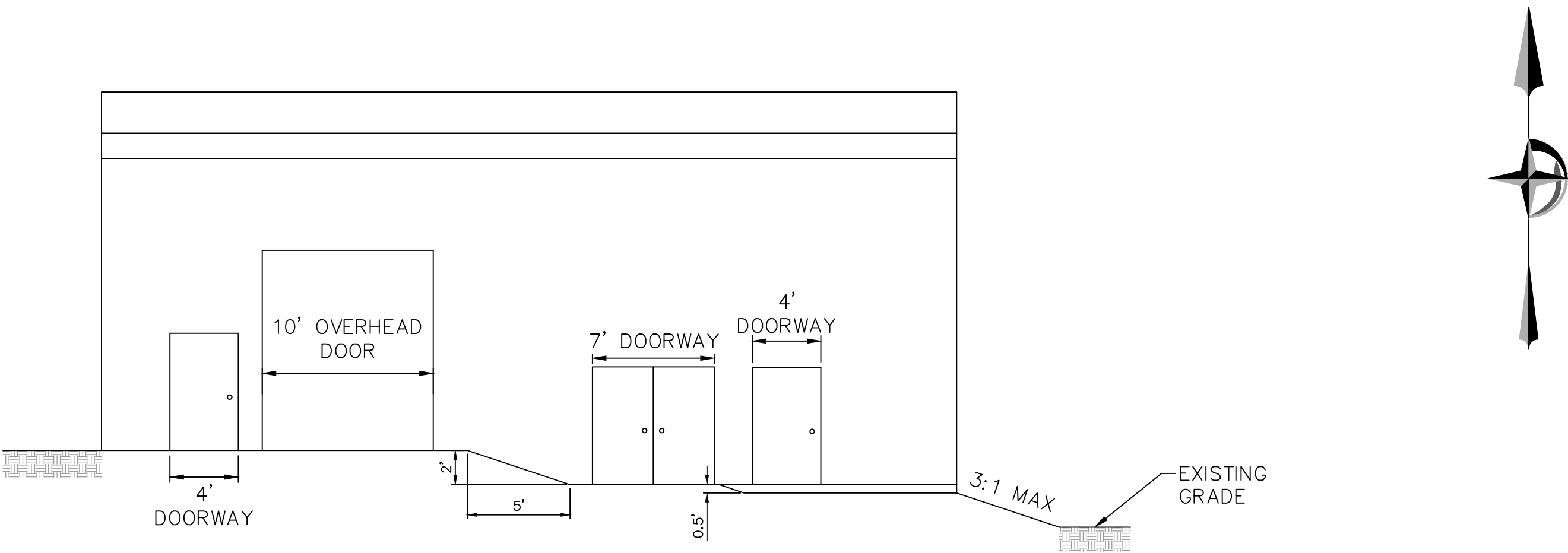
GROUNDWATER TREATMENT SYSTEM
UPGRADES
FOR
NICHOLSON LANDFILL
CHESTERTOWN TOWNSHIP
KENT COUNTY MARYLAND

DRAWING TITLE

PROPOSED
LAYOUT PLAN

DATE	5/10/2022
JOB NO.	2000114.00
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SHEET NO.	C-001

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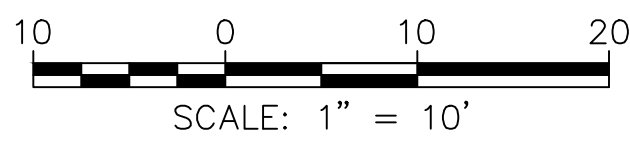


PROFILE OF CROSS SLOPE AREAS
NOT TO SCALE



- EXISTING LEGEND**
- Treeline
 - Fencing
 - Existing 1' Contour
 - Existing 5' Contour
 - Treatment Discharge Line
 - Recovery Well
 - Vent Pipe
 - Cleanout
 - Bollard
 - Building
 - Storm Sewer Line
 - Gravel
 - Concrete

- PROPOSED LEGEND**
- BUILDING
 - WALKWAY
 - RETAINING WALL
 - 1' CONTOUR



GROUNDWATER TREATMENT SYSTEM
UPGRADES
FOR
NICHOLSON LANDFILL
CHESTERTOWN TOWNSHIP
KENT COUNTY MARYLAND

DRAWING TITLE
**PROPOSED
GRADING PLAN**

DATE	5/10/2022
JOB NO.	2000114-00
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CHECKED BY	RAN
SHEET NO.	C-002

NO.	DATE	REVISIONS	CHECKED	DRAWN
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0	4/4/2022	90% DESIGN SUBMISSION	RAN	BCC
1	4/12/2022	90% DESIGN EROSION AND SEDIMENT CONTROL UPDATE	RAN	BCC
2	7/27/2022	REVISED FOR PLANNING AND ZONING COMMENTS	RAN	RAN
3	9/16/2022	ISSUED FOR CONSTRUCTION	NMB	RAN

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NOTES

1. EXTEND DOWNSPOUTS 3 FEET AWAY FROM THE BUILDING FOUNDATION.

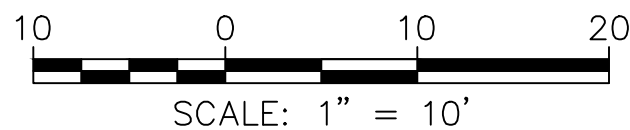
Bollard
Vent Pipe
A'
Bollard
Bollard

EXISTING LEGEND

- ~~~~~ Treeline
-x-x-x-x- Fencing
- - - - - Existing 1' Contour
- - - - - Existing 5' Contour
- - - - - 365
-SS-SS- Treatment Discharge Line
⊙ Recovery Well
○ Vent Pipe
● Cleanout
● Bollard
_____ Building
===== Storm Sewer Line
----- Gravel
===== Concrete

PROPOSED LEGEND

- _____ BUILDING
[Pattern] WALKWAY
===== RETAINING WALL
-SS-SS- DISCHARGE CONNECTION LINE
○ DS DOWNSPOUT

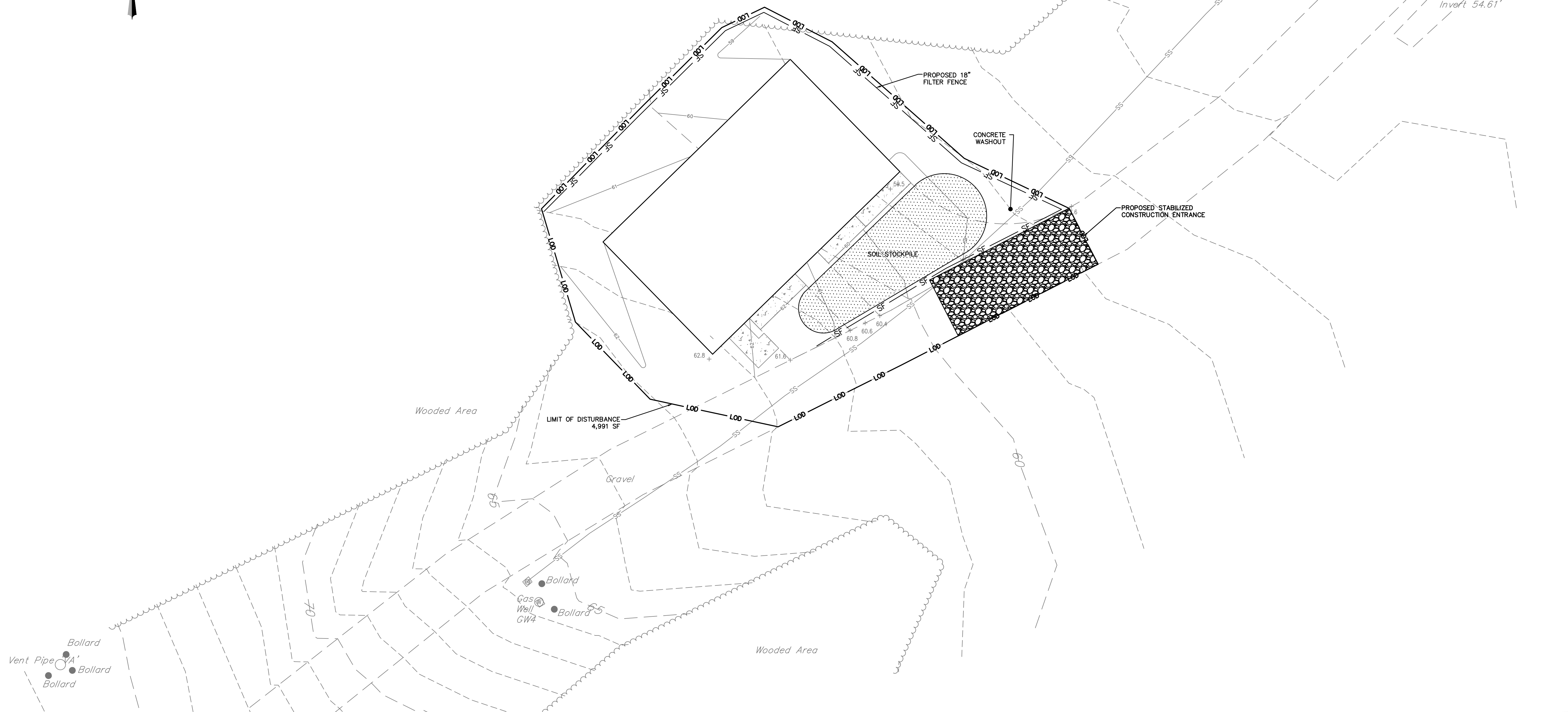


GROUNDWATER TREATMENT SYSTEM
UPGRADES
FOR
NICHOLSON LANDFILL
CHESTERTOWN TOWNSHIP
KENT COUNTY MARYLAND

DRAWING TITLE
PROPOSED
UTILITY PLAN

DATE	5/10/2022
JOB NO.	2000114.00
SCALE	AS NOTED
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CHECKED BY	RAN
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NO.	DATE	REVISIONS DESCRIPTION	CHECKED/DRAWN	
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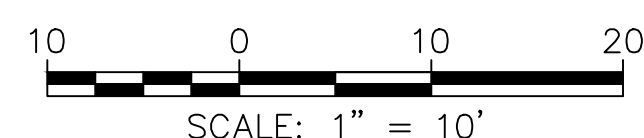


EXISTING LEGEND

- | | |
|--|--------------------------|
| | Treeline |
| | Fencing |
| | Existing 1' Contour |
| | Existing 5' Contour |
| | Treatment Discharge Line |
| | Recovery Well |
| | Vent Pipe |
| | Cleanout |
| | Bollard |
| | Building |
| | Storm Sewer Line |
| | Gravel |
| | Concrete |

PROPOSED LEGEND

-
- BUILDING
 - WALKWAY
 - RETAINING WALL
 - 1' CONTOUR
 - SILT FENCE
 - LIMIT OF DISTURBANCE
 - STABILIZED ENTRANCE



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A	2/3/2022	PRELIMINARY SITE DESIGN SUBMISSION		RAN	BCC
0	4/12/2022	90% DESIGN SUBMISSION		RAN	BCC
1	5/10/2022	KENT SOIL & WATER CONSERVATION DISTR. SUBMISSION		SL	RAN
2	7/27/2022	REVISED FOR PLANNING AND ZONING COMMENTS		RAN	RAN
3	9/16/2022	ISSUED FOR CONSTRUCTION		NMB	RAN

GROUNDWATER TREATMENT SYSTEM UPGRADES

FOR
NICHOLSON LANDFILL

KENT COUNTY MARYLAND

DRAWING TITLE

PROPOSED
EROSION AND
SEDIMENTATION
PLAN

DATE	5/10/2022
JOB NO.	2000114.00
SCALE	AS NOTED
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B-4 STANDARDS AND SPECIFICATIONS

VEGETATIVE STABILIZATION

DEFINITION

USING VEGETATION AS COVER TO PROTECT EXPOSED SOIL FROM EROSION.

PURPOSE

TO PROMOTE THE ESTABLISHMENT OF VEGETATION ON EXPOSED SOIL.

CONDITIONS WHERE PRACTICE APPLIES

ON ALL DISTURBED AREAS NOT STABILIZED BY OTHER METHODS. THIS SPECIFICATION IS DIVIDED INTO SECTIONS ON INCREMENTAL STABILIZATION; SOIL PREPARATION, SOIL AMENDMENTS AND TOPSOILING; SEEDING AND MULCHING; TEMPORARY STABILIZATION; AND PERMANENT STABILIZATION.

EFFECTS ON WATER QUALITY AND QUANTITY

STABILIZATION PRACTICES ARE USED TO PROMOTE THE ESTABLISHMENT OF VEGETATION ON EXPOSED SOIL. WHEN SOIL IS STABILIZED WITH VEGETATION, THE SOIL IS LESS LIKELY TO ERODE AND MORE LIKELY TO ALLOW INFILTRATION OF RAINFALL, THEREBY REDUCING SEDIMENT LOADS AND RUNOFF TO DOWNSTREAM AREAS.

PLANTING VEGETATION IN DISTURBED AREAS WILL HAVE AN EFFECT ON THE WATER BUDGET, ESPECIALLY ON VOLUMES AND RATES OF RUNOFF, INFILTRATION, EVAPORATION, TRANSPIRATION, PERCOLATION, AND GROUNDWATER RECHARGE. OVER TIME, VEGETATION WILL INCREASE ORGANIC MATTER CONTENT AND IMPROVE THE WATER HOLDING CAPACITY OF THE SOIL AND SUBSEQUENT PLANT GROWTH.

VEGETATION WILL HELP REDUCE THE MOVEMENT OF SEDIMENT, NUTRIENTS, AND OTHER CHEMICAL CARRIED BY RUNOFF TO RECEIVING WATERS. PLANTS WILL ALSO HELP PROTECT GROUNDWATER SUPPLIES BY ASSIMILATING THOSE SUBSTANCES PRESENT WITHIN THE ROOT ZONE.

SEDIMENT CONTROL PRACTICES MUST REMAIN IN PLACE DURING GRADING, SEEDBED PREPARATION, SEEDING, MULCHING, AND VEGETATIVE ESTABLISHMENT.

ADEQUATE VEGETATIVE ESTABLISHMENT

INSPECT SEEDED AREAS FOR VEGETATIVE ESTABLISHMENT AND MAKE NECESSARY REPAIRS, REPLACEMENTS, AND RESEEDINGS WITHIN THE PLANTING SEASON.

1. ADEQUATE VEGETATIVE STABILIZATION REQUIRES 95 PERCENT GROUNDCOVER.
2. IF AN AREA HAS LESS THAN 40 PERCENT GROUNDCOVER, RESTABILIZE FOLLOWING THE ORIGINAL RECOMMENDATIONS FOR LIME, FERTILIZER, SEEDBED PREPARATION, AND SEEDING.
3. IF AN AREA HAS BETWEEN 40 AND 94 PERCENT GROUNDCOVER, OVER-SEED AND FERTILIZE USING HALF OF THE RATES ORIGINALLY SPECIFIED.
4. MAINTENANCE FERTILIZER RATES FOR PERMANENT SEEDING ARE SHOWN IN TABLE B.6.

B-4.1 STANDARDS AND SPECIFICATIONS

INCREMENTAL STABILIZATION

DEFINITION

ESTABLISHMENT OF VEGETATIVE COVER ON CUT AND FILL SLOPES.

PURPOSE

TO PROVIDE TIMELY VEGETATIVE COVER ON CUT AND FILL SLOPES AS WORK PROGRESSES.

CONDITIONS WHERE PRACTICE APPLIES

ANY CUT OR FILL SLOPE GREATER THAN 15 FEET IN HEIGHT. THIS PRACTICE ALSO APPLIES TO STOCKPILES.

CRITERIA

- A. INCREMENTAL STABILIZATION - CUT SLOPES
 1. EXCAVATE AND STABILIZE CUT SLOPES IN INCREMENTS NOT TO EXCEED 15 FEET IN HEIGHT. PREPARE SEEDBED AND APPLY SEED AND MULCH ON ALL CUT SLOPES AS THE WORK PROGRESSES.
 2. CONSTRUCTION SEQUENCE EXAMPLE (REFER TO FIGURE B.1):
 - 2.a. CONSTRUCT AND STABILIZE ALL TEMPORARY SWALES OR DIKES THAT WILL BE USED TO CONVEY RUNOFF AROUND THE EXCAVATION.
 - 2.b. PERFORM PHASE 1 EXCAVATION, PREPARE SEEDBED, AND STABILIZE.
 - 2.c. PERFORM PHASE 2 EXCAVATION, PREPARE SEEDBED, AND STABILIZE. OVERSEED PHASE 1 AREAS AS NECESSARY.
 - 2.d. PERFORM FINAL PHASE EXCAVATION, PREPARE SEEDBED, AND STABILIZE. OVERSEED PREVIOUSLY SEEDED AREAS AS NECESSARY.

NOTE: ONCE EXCAVATION HAS BEGUN, THE OPERATION SHOULD BE CONTINUOUS FROM GRUBBING THROUGH THE COMPLETION OF GRADING AND PLACEMENT OF TOPSOIL (IF REQUIRED) AND PERMANENT SEED AND MULCH. ANY INTERRUPTIONS IN THE OPERATION OR COMPLETING THE OPERATION OUT OF THE SEEDING SEASON WILL NECESSITATE THE APPLICATION OF TEMPORARY STABILIZATION.

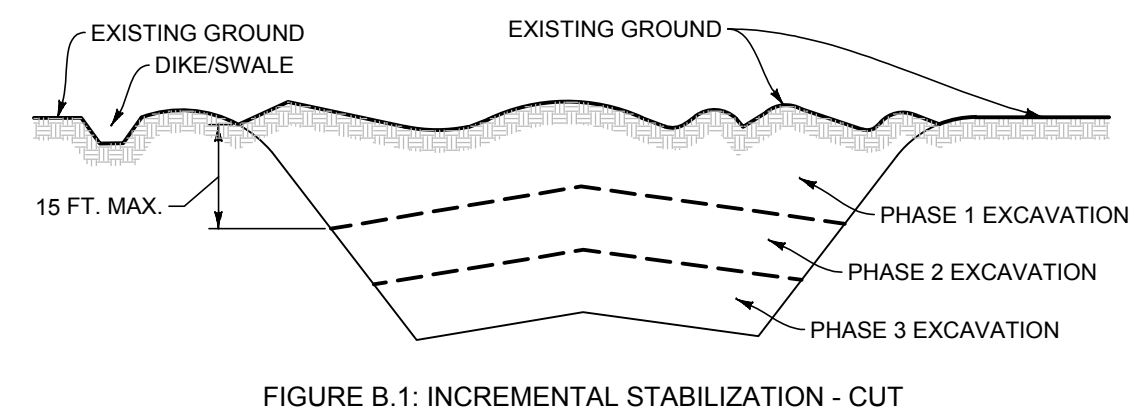


FIGURE B.1: INCREMENTAL STABILIZATION - CUT

B. INCREMENTAL STABILIZATION - FILL SLOPES

1. CONSTRUCT AND STABILIZE FILL SLOPES IN INCREMENTS NOT TO EXCEED 15 FEET IN HEIGHT. PREPARE SEEDBED AND APPLY SEED AND MULCH ON ALL SLOPES AS THE WORK PROGRESSES.
2. STABILIZE SLOPES IMMEDIATELY WHEN THE VERTICAL HEIGHT OF A LIFT REACHES 15 FEET OR WHEN THE GRADING OPERATION CEASES AS PRESCRIBED IN THE PLANS.
3. AT THE END OF EACH DAY, INSTALL TEMPORARY WATER CONVEYANCE PRACTICE(S), AS NECESSARY, TO INTERCEPT SURFACE RUNOFF AND CONVEY IT DOWN THE SLOPE IN A NON-EROSIVE MANNER.
4. CONSTRUCTION SEQUENCE EXAMPLE (REFER TO FIGURE B.2):
 - 4.a. CONSTRUCT AND STABILIZE ALL TEMPORARY SWALES AND DIKES THAT WILL BE USED TO DIVERT RUNOFF AROUND THE FILL. CONSTRUCT SILT FENCE ON LOW SIDE OF FILL UNLESS OTHER METHODS SHOWN ON THE PLANS ADDRESS THIS AREA.
 - 4.b. AT THE END OF THE DAY, INSTALL TEMPORARY WATER CONVEYANCE PRACTICE(S), AS NECESSARY, TO INTERCEPT SURFACE RUNOFF AND CONVEY IT DOWN THE SLOPE IN A NON-EROSIVE MANNER.
 - 4.c. PLACE PHASE 1 FILL, PREPARE SEEDBED, AND STABILIZE.
 - 4.d. PLACE PHASE 2 FILL, PREPARE SEEDBED, AND STABILIZE.
 - 4.e. PLACE FINAL PHASE FILL, PREPARE SEEDBED, AND STABILIZE. OVERSEED PREVIOUSLY SEEDED AREAS AS NECESSARY.

NOTE: ONCE THE PLACEMENT OF FILL HAS BEGUN, THE OPERATION SHOULD BE CONTINUOUS FROM GRUBBING THROUGH THE COMPLETION OF GRADING AND PLACEMENT OF TOPSOIL (IF REQUIRED) AND PERMANENT SEED AND MULCH. ANY INTERRUPTIONS IN THE OPERATION OR COMPLETING THE OPERATION OUT OF THE SEEDING SEASON WILL NECESSITATE THE APPLICATION OF TEMPORARY STABILIZATION.

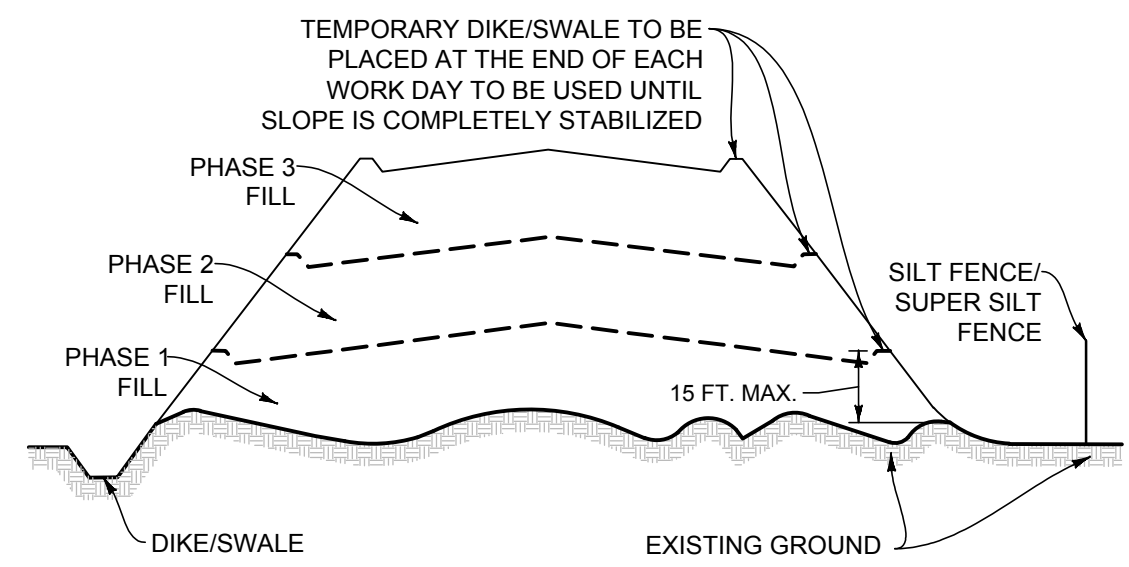


FIGURE B.2: INCREMENTAL STABILIZATION - FILL

B-4.2 STANDARDS AND SPECIFICATIONS

FOR SOIL PREPARATION, TOPSOILING, AND SOIL AMENDMENTS

DEFINITION

THE PROCESS OF PREPARING THE SOILS TO SUSTAIN ADEQUATE VEGETATIVE STABILIZATION.

PURPOSE

TO PROVIDE A SUITABLE SOIL MEDIUM FOR VEGETATIVE GROWTH.

CONDITIONS WHERE PRACTICE APPLIES

WHERE VEGETATIVE STABILIZATION IS TO BE ESTABLISHED.

CRITERIA

- A. SOIL PREPARATION
 1. TEMPORARY STABILIZATION
 - 1.a. SEED PREPARATION CONSISTS OF LOOSENING SOIL TO A DEPTH OF 3 TO 5 INCHES BY MEANS OF SUITABLE AGRICULTURAL OR CONSTRUCTION EQUIPMENT, SUCH AS DISC HARROWS OR CHISEL PLOWS OR RIPPERS MOUNTED ON CONSTRUCTION EQUIPMENT. AFTER SOIL IS LOOSENEED, IT MUST NOT BE ROLLED OR DRAGGED SMOOTH BUT LEFT IN ROUGHENED CONDITION. SLOPES 3:1 OR FLATTER ARE TO BE TRACKED WITH RIDGES RUNNING PARALLEL TO THE CONTOUR OF THE SLOPE.
 - 1.b. APPLY FERTILIZER AND LIME AS PRESCRIBED ON THE PLANS.
 - 1.c. INCORPORATE LIME AND FERTILIZER INTO THE TOP 3 TO 5 INCHES OF SOIL BY DISKING OR OTHER SUITABLE MEANS.
 2. PERMANENT STABILIZATION
 - 2.a. A SOIL TEST IS REQUIRED FOR ANY EARTH DISTURBANCE OF 5 ACRES OR MORE. THE MINIMUM SOIL CONDITIONS REQUIRED FOR PERMANENT VEGETATIVE ESTABLISHMENT ARE:
 - a. SOIL PH BETWEEN 6.0 TO 7.0.
 - b. SOLUBLE SALTS LESS THAN 500 PARTS PER MILLION (PPM).
 - c. SOIL CONTAINS LESS THAN 40 PERCENT CLAY BUT ENOUGH FINE GRAINED MATERIAL (GREATER THAN 30 PERCENT SILT PLUS CLAY) TO PROVIDE THE CAPACITY TO HOLD A MODERATE AMOUNT OF MOISTURE. AN EXCEPTION: IF LOVEGRASS WILL BE PLANTED, THEN A SANDY SOIL (LESS THAN 30 PERCENT SILT PLUS CLAY) WOULD BE ACCEPTABLE.
 - d. SOIL CONTAINS 1.5 PERCENT MINIMUM ORGANIC MATTER BY WEIGHT.
 - e. SOIL CONTAINS SUFFICIENT PORE SPACE TO PERMIT ADEQUATE ROOT PENETRATION.
 - 2.b. APPLICATION OF AMENDMENTS OR TOPSOIL IS REQUIRED IF ON-SITE SOILS DO NOT MEET THE ABOVE CONDITIONS.
 - 2.b. GRADED AREAS MUST BE MAINTAINED IN A TRUE AND EVEN GRADE AS SPECIFIED ON THE APPROVED PLAN, THEN SCARIFIED OR OTHERWISE LOOSENEED TO A DEPTH OF 3 TO 5 INCHES.
 - 2.c. APPLY SOIL AMENDMENTS AS SPECIFIED ON THE APPROVED PLAN OR AS INDICATED BY THE RESULTS OF A SOIL TEST.
 - 2.d. MIX SOIL AMENDMENTS INTO THE TOP 3 TO 5 INCHES OF SOIL BY DISKING OR OTHER SUITABLE MEANS. RAKE SLOPED AREAS TO SMOOTH THE SURFACE, REMOVE LARGE OBJECTS LIKE STONES AND BRANCHES, AND READY THE AREA FOR SEED APPLICATION. LOOSEN SURFACE SOIL BY DRAGGING WITH A HEAVY CHAIN OR OTHER EQUIPMENT TO ROUGHEN THE SURFACE WHERE THE SITE CONDITIONS ARE NOT SUITABLE FOR SEEDING.
 - 2.d. HYDROSEEDING: APPLY SEED UNIFORMLY WITH HYDROSEEDER (SLURRY INCLUDES SEED AND FERTILIZER).
 - a. IF FERTILIZER IS BEING APPLIED AT THE TIME OF SEEDING, THE APPLICATION RATES SHOULD BE EXCEED THE FOLLOWING: NITROGEN, OF SOIL LOOSE AND FRAGILE. 100 POUNDS PER ACRE (NITROGEN, N₂O₃ (PHOSPHOROUS), 200 POUNDS PER ACRE. K₂O (POTASSIUM), 200 POUNDS PER ACRE.
- B. TOPSOILING
 1. TOPSOIL IS PLACED OVER PREPARED SUBSOIL PRIOR TO ESTABLISHMENT OF PERMANENT VEGETATION. THE PURPOSE IS TO PROVIDE A SUITABLE SOIL MEDIUM FOR VEGETATIVE GROWTH. SOILS OF CONCERN HAVE LOW MOISTURE CONTENT, LOW NUTRIENT LEVELS, LOW PH, MATERIALS TOXIC TO PLANTS, AND/OR UNACCEPTABLE SOIL GRAVIMETRY.
 2. TOPSOIL SALVAGED FROM AN EXISTING SITE MAY BE USED PROVIDED IT MEETS THE STANDARDS AS SET FORTH IN THESE SPECIFICATIONS. TYPICALLY, THE DEPTH OF TOPSOIL TO BE SALVAGED FOR A GIVEN SOIL TYPE CAN BE FOUND IN REPRESENTATIVE SOIL PROFILE SECTION IN THE SOIL SURVEY PUBLISHED BY USDA-NRCS.
 3. TOPSOILING IS LIMITED TO AREAS HAVING 2:1 OR FLATTER SLOPES WHERE:
 - 3.a. THE TEXTURE OF THE EXPOSED SUBSOIL/PARENT MATERIAL IS NOT ADEQUATE TO PRODUCE VEGETATIVE GROWTH.
 - 3.b. THE SOIL MATERIAL IS SO SHALLOW THAT THE ROOTING ZONE IS NOT DEEP ENOUGH TO SUPPORT PLANTS OR FURNISH CONTINUING SUPPLIES OF MOISTURE AND PLANT MATERIAL.
 - 3.c. THE ORIGINAL SOIL TO BE VEGETATED CONTAINS MATERIAL TOXIC TO PLANTS AND MULCH.
 - 3.d. THE SOIL IS SO ACIDIC THAT TREATMENT WITH LIMESTONE IS NOT FEASIBLE.
 4. AREAS HAVING SLOPES STEEPER THAN 2:1 REQUIRE SPECIAL CONSIDERATION AND DESIGN.
 5. TOPSOIL SPECIFICATIONS: SOIL TO BE USED AS TOPSOIL MUST MEET THE FOLLOWING CRITERIA:
 - 5.a. TOPSOIL MUST BE A LOAM, SANDY LOAM, CLAY LOAM, SILT LOAM, SANDY CLAY LOAM, OR LOAMY SAND. OTHER SOILS MAY BE USED IF RECOMMENDED BY AN AGRONOMIST OR SOIL SCIENTIST AND APPROVED BY THE APPROPRIATE APPROVAL AUTHORITY. TOPSOIL MUST NOT BE A MIXTURE OF CONTRASTING TEXTURED SUBSOILS AND MUST CONTAIN LESS THAN 5 PERCENT BY VOLUME OF CINDERS, STONES, SLAG, COARSE FRAGMENTS, GRAVEL, STICKS, ROOTS, TRASH, OR OTHER MATERIALS LARGER THAN 1 1/2 INCHES IN DIAMETER.
 - 5.b. TOPSOIL MUST BE FREE OF NOXIOUS PLANTS OR PLANT PARTS SUCH AS BERMUDA GRASS, QUACK GRASS, JOHNSON GRASS, NUT SEDGE, POISON IVY, THISTLE, OR OTHERS AS SPECIFIED.
 - 5.c. TOPSOIL SUBSTITUTES OR AMENDMENTS, AS RECOMMENDED BY A QUALIFIED AGRONOMIST OR SOIL SCIENTIST AND APPROVED BY THE APPROPRIATE APPROVAL AUTHORITY, MAY BE USED IN LIEU OF NATURAL TOPSOIL.
 6. TOPSOIL APPLICATION
 - 6.a. EROSION AND SEDIMENT CONTROL PRACTICES MUST BE MAINTAINED WHEN APPLYING TOPSOIL.
 - 6.b. UNIFORMLY DISTRIBUTE TOPSOIL IN A 5 TO 8 INCH LAYER AND LIGHTLY COMPACT TO A MINIMUM THICKNESS OF 4 INCHES. SPREADING IS TO BE PERFORMED IN SUCH A MANNER THAT SODDING OR SEEDING CAN PROCEED WITH A MINIMUM OF ADDITIONAL SOIL PREPARATION AND TILLAGE. ANY IRREGULARITIES IN THE SURFACE RESULTING FROM TOPSOILING OR OTHER OPERATIONS MUST BE CORRECTED IN ORDER TO PREVENT THE FORMATION OF DEPRESSIONS OR WATER POCKETS.
 - 6.c. TOPSOIL MUST NOT BE PLACED IF THE TOPSOIL OR SUBSOIL IS IN A FROZEN OR MUDDY CONDITION, WHEN THE SUBSOIL IS EXCESSIVELY WET OR IN A CONDITION THAT MAY OTHERWISE BE DETRIMENTAL TO PROPER GRADING AND SEEDBED PREPARATION.
- C. SOIL AMENDMENTS (FERTILIZER AND LIME SPECIFICATIONS)
 1. SOIL TESTS MUST BE PERFORMED TO DETERMINE THE EXACT RATIOS AND APPLICATION RATES FOR BOTH LIME AND FERTILIZER ON SITES HAVING DISTURBED AREAS OF 5 ACRES OR MORE. SOIL ANALYSIS MAY BE PERFORMED BY A RECOGNIZED PRIVATE OR COMMERCIAL LABORATORY. SOIL SAMPLES TAKEN FOR ENGINEERING PURPOSES MAY ALSO BE USED FOR CHEMICAL ANALYSES.
 2. FERTILIZERS MUST BE UNIFORM IN COMPOSITION, FREE FLOWING AND SUITABLE FOR ACCURATE APPLICATION BY APPROPRIATE EQUIPMENT. MANURE MAY BE SUBSTITUTED FOR FERTILIZER WITH PRIOR APPROVAL FROM THE APPROPRIATE APPROVAL AUTHORITY. FERTILIZERS MUST ALL BE DELIVERED TO THE SITE FULLY LABELED ACCORDING TO THE APPLICABLE LAWS AND MUST BEAR THE NAME, TRADE NAME OR TRADEMARK AND WARRANTY OF THE PRODUCER.
 3. LIME MATERIALS MUST BE GROUND LIMESTONE (HYDRATED OR BURNT LIME MAY BE SUBSTITUTED EXCEPT WHEN HYDROSEEDING) WHICH CONTAINS AT LEAST 90 PERCENT TOTAL OXIDE OF CALCIUM PLUS MAGNESIUM OXIDE. LIMESTONE MUST BE GROUND TO SUCH FINENESS THAT AT LEAST 50 PERCENT WILL PASS THROUGH A #100 MESH SIEVE AND 98 TO 100 PERCENT WILL PASS THROUGH A #20 MESH SIEVE.
 4. LIME AND FERTILIZER ARE TO BE EVENLY DISTRIBUTED AND INCORPORATED INTO THE TOP 3 TO 5 INCHES OF SOIL BY DISKING OR OTHER SUITABLE MEANS.
 5. WHERE THE SUBSOIL IS EITHER HIGHLY ACIDIC OR COMPOSED OF HEAVY CLAYS, SPREAD GROUND LIMESTONE AT THE RATE OF 4 TO 8 TONS/ACRE (200-400 POUNDS PER 1,000 SQUARE FEET) PRIOR TO THE PLACEMENT OF TOPSOIL.

B-4.3 STANDARDS AND SPECIFICATIONS

FOR SEEDING AND MULCHING

DEFINITION

THE APPLICATION OF SEED AND MULCH TO ESTABLISH VEGETATIVE COVER.

PURPOSE

TO PROTECT DISTURBED SOILS FROM EROSION DURING AND AT THE END OF CONSTRUCTION.

CONDITIONS WHERE PRACTICE APPLIES

TO THE SURFACE OF ALL PERIMETER CONTROLS, SLOPES, AND ANY DISTURBED AREA NOT UNDER ACTIVE GRADING.

CRITERIA

- A. SEEDING
 1. SPECIFICATIONS
 - 1.a. ALL SEED MUST MEET THE REQUIREMENT OF THE MARYLAND STATE SEED LAW. ALL SEED MUST BE SUBJECT TO RE-TESTING BY A RECOGNIZED SEED LABORATORY. ALL SEED USED MUST HAVE BEEN TESTED WITHIN THE 6 MONTHS IMMEDIATELY PRECEDING THE DATE OF SOWING SUCH MATERIAL ON ANY PROJECT. REFER TO TABLE B.4 REGARDING THE QUALITY OF SEED. SEED TAGS MUST BE AVAILABLE UPON REQUEST TO THE INSPECTOR TO VERIFY TYPE OF SEED AND SEEDING RATE.
 - 1.b. MULCH ALONE MAY BE APPLIED BETWEEN THE FALL AND SPRING SEEDING DATES ONLY IF THE GROUND IS FROZEN. THE APPROPRIATE SEEDING MIXTURE MUST BE APPLIED WHEN THE GROUND THAWS.
 - 1.c. INOCULANTS: THE INOCULANT FOR THE SEEDING LEGUME SEED IN THE SEED MIXTURES MUST BE A PURE CULTURE OF NITROGEN FIXING BACTERIA PREPARED SPECIFICALLY FOR THE SPECIES. INOCULANTS MUST NOT BE USED LATER THAN THE DATE INDICATED ON THE CONTAINER. ADD FRESH INOCULANTS AS DIRECTED ON THE PACKAGE. USE FOUR TIMES THE RECOMMENDED RATE WHEN HYDROSEEDING. NOTE: IT IS VERY IMPORTANT TO KEEP INOCULANT AS COOL AS POSSIBLE UNTIL USED. TEMPERATURES ABOVE 75 TO 80 DEGREES FAHRENHEIT CAN WEAKEN BACTERIA AND MAKE THE INOCULANT LESS EFFECTIVE.
 - 1.d. SOIL AND SEED MUST NOT BE PLACED ON SOIL WHICH HAS BEEN TREATED WITH SOIL STERILANTS OR CHEMICALS USED FOR WEED CONTROL UNTIL SUFFICIENT TIME HAS ELAPSED (14 DAYS MIN.) TO PERMIT DISSIPATION OF PHYTO-TOXIC MATERIALS.
 2. APPLICATION
 - 2.a. DRY SEEDING: THIS INCLUDES USE OF CONVENTIONAL DROP OR BROADCAST SPREADERS.
 - a. INCORPORATE SEED INTO THE SUBSOIL AT THE RATES PRESCRIBED ON TEMPORARY SEEDING TABLE B.1, PERMANENT SEEDING TABLE B.3, OR SITE-SPECIFIC SEEDING SUMMARIES.
 - b. APPLY SEED IN TWO DIRECTIONS, PERPENDICULAR TO EACH OTHER, APPLY HALF THE SEEDING RATE IN EACH DIRECTION. ROLL THE SEEDED AREA WITH A WEIGHTED ROLLER TO PROVIDE GOOD SEED TO SOIL CONTACT.
 - 2.b. DRILL OR CULTIPACKER SEEDING: MECHANIZED SEEDERS THAT APPLY AND COVER SEED WITH SOIL.
 - a. CULTIPACKING SEEDERS ARE REQUIRED TO BURY THE SEED IN SUCH A FASHION AS TO PROVIDE AT LEAST 1/2 INCH OF SOIL COVERING. SEEDBED MUST BE FIRM AFTER PLANTING.
 - b. APPLY SEED IN TWO DIRECTIONS, PERPENDICULAR TO EACH OTHER, APPLY HALF THE SEEDING RATE IN EACH DIRECTION.
 - 2.c. HYDROSEEDING: APPLY SEED UNIFORMLY WITH HYDROSEEDER (SLURRY INCLUDES SEED AND FERTILIZER).
 - a. IF FERTILIZER IS BEING APPLIED AT THE TIME OF SEEDING, THE APPLICATION RATES SHOULD BE EXCEED THE FOLLOWING: NITROGEN, 100 POUNDS PER ACRE (NITROGEN, N₂O₃ (PHOSPHOROUS), 200 POUNDS PER ACRE. K₂O (POTASSIUM), 200 POUNDS PER ACRE.
 - b. LIME: USE ONLY GROUND AGRICULTURAL LIMESTONE (UP TO 3 TONS PER ACRE MAY BE APPLIED BY HYDROSEEDING). NORMALLY, NOT MORE THAN 2 TONS ARE APPLIED BY HYDROSEEDING AT ANY ONE TIME. DO NOT USE BURNT OR HYDRATED LIME WHEN HYDROSEEDING.
 - c. MIX SEED AND FERTILIZER ON SITE AND SEED IMMEDIATELY AND WITHOUT INTERRUPTION.
 - d. WHEN HYDROSEEDING, DO NOT INCORPORATE INTO THE SOIL.
- B. MULCHING
 1. MULCH MATERIALS (IN ORDER OF PREFERENCE)
 - 1.a. STRAW CONSISTING OF THOROUGHLY THRESHED WHEAT, RYE, OAT, OR BARLEY AND REASONABLY BRIGHT IN COLOR. STRAW IS TO BE FREE OF NOXIOUS WEED SEEDS AS SPECIFIED IN THE MARYLAND SEED LAW AND NOT MUSTY, MOLDY, CAKED, DECAYED, OR EXCESSIVELY DUSTY. NOTE: USE ONLY STERILE STRAW MULCH IN AREAS WHERE ONE SPECIES OF GRASS IS DESIRED.
 - 1.b. WOOD CELLULOSE FIBER MULCH (WCFM) CONSISTING OF SPECIALLY PREPARED WOOD CELLULOSE PROCESSED INTO A UNIFORM FIBROUS PHYSICAL STATE.
 - a. WCFM IS TO BE DYED GREEN OR CONTAIN A GREEN DYE IN THE PACKAGE THAT WILL PROVIDE AN APPROPRIATE COLOR TO FACILITATE VISUAL INSPECTION OF THE UNIFORMLY SPREAD SLURRY.
 - b. WCFM, INCLUDING DYE, MUST CONTAIN NO GERMINATION OR GROWTH INHIBITING FACTORS.
 - c. WCFM MATERIALS ARE TO BE MANUFACTURED AND PROCESSED IN SUCH A MANNER THAT THE WOOD CELLULOSE FIBER MULCH WILL REMAIN IN UNIFORM SUSPENSION IN WATER UNDER AGITATION AND WILL BLEND WITH SEED, FERTILIZER AND OTHER ADDITIVES TO FORM A HOMOGENEOUS SLURRY. THE MULCH MATERIAL MUST FORM A BLOTTER-LIKE GROUND COVER, ON APPLICATION, HAVING MOISTURE ABSORPTION AND PERCOLATION PROPERTIES AND MUST COVER AND HOLD GRASS SEED IN CONTACT WITH THE SOIL WITHOUT INHIBITING THE GROWTH OF THE GRASS SEEDLINGS.
 - d. WCFM MATERIAL MUST NOT CONTAIN ELLIMENTS OR COMPOUNDS AT CONCENTRATION LEVELS THAT WILL BY PHYTO-TOXIC.
 - e. WCFM SUBSTITUTES OR AMENDMENTS TO THE FOLLOWING PHYSICAL REQUIREMENTS: FIBER LENGTH OF APPROXIMATELY 10 MILLIMETERS, DIAMETER APPROXIMATELY 1 MILLIMETER, PH RANGE OF 4.0 TO 8.5, ASH CONTENT OF 1.6 PERCENT MAXIMUM AND WATER HOLDING CAPACITY OF 90 PERCENT MINIMUM.
 2. APPLICATION
 - 2.a. APPLY MULCH TO ALL SEEDED AREAS IMMEDIATELY AFTER SEEDING.
 - 2.b. WHEN STRAW MULCH IS USED, SPREAD IT OVER ALL SEEDED AREAS AT THE RATE OF 2 TONS PER ACRE TO A UNIFORM LOOSE DEPTH OF 1 TO 2 INCHES. APPLY MULCH TO ACHIEVE A UNIFORM DISTRIBUTION AND DEPTH SO THAT THE SOIL SURFACE IS NOT EXPOSED. WHEN USING A MULCH ANCHORING TOOL, INCREASE THE APPLICATION RATE TO 2.5 TONS PER ACRE.
 - 2.c. WOOD CELLULOSE FIBER USED AS MULCH MUST BE APPLIED AT A NET DRY WEIGHT OF 100 POUNDS PER ACRE. MIX THE WOOD CELLULOSE FIBER WITH WATER TO ATTAIN A MIXTURE WITH A MAXIMUM OF 50 POUNDS OF WOOD CELLULOSE FIBER PER 100 GALLONS OF WATER.
 3. ANCHORING
 - 3.a. PERFORM MULCH ANCHORING IMMEDIATELY FOLLOWING APPLICATION OF MULCH TO MINIMIZE LOSS BY WIND OR WATER. THIS MAY BE DONE BY ONE OF THE FOLLOWING METHODS (LISTED BY PREFERENCE), DEPENDING UPON THE SIZE OF THE AREA AND EROSION HAZARD:
 - a. A MULCH ANCHORING TOOL IS A TRACTOR DRAWN IMPLEMENT DESIGNED TO PUNCH AND ANCHOR MULCH INTO THE SOIL SURFACE A MINIMUM OF 2 INCHES. THIS PRACTICE IS MOST EFFECTIVE ON LARGE AREAS, BUT IS LIMITED TO FLATTER SLOPES WHERE EQUIPMENT CAN OPERATE SAFELY. IF USED ON SLOPING LAND, THIS PRACTICE SHOULD FOLLOW THE CONTOUR.
 - b. WOOD CELLULOSE FIBER MAY BE USED FOR ANCHORING STRAW. APPLY THE FIBER BINDER AT A NET DRY WEIGHT OF 750 POUNDS PER ACRE.
 - c. WOOD CELLULOSE FIBER WITH WATER AT A MAXIMUM OF 50 POUNDS OF WOOD CELLULOSE FIBER PER 100 GALLONS OF WATER.
 - d. SYNTHETIC BINDERS SUCH AS ACRYLIC DLR (AGRO-TACK), DCA-70, PETROSET, TERRA TACK II, TERRA TACK AR OR OTHER APPROVED EQUAL MAY BE USED. FOLLOW APPLICATION RATES AS SPECIFIED BY THE MANUFACTURER. APPLICATION OF LIQUID BINDERS NEEDS TO BE HEAVIER AT THE EDGES WHERE WIND CATCHES MULCH, SUCH AS IN VALLEYS AND ON CRESTS OF BANKS. USE OF ASPHALT BINDERS IS STRICTLY PROHIBITED.
 - d. LIGHTWEIGHT PLASTIC NETTING MAY BE STAPLED OVER THE MULCH ACCORDING TO MANUFACTURER RECOMMENDATIONS. NETTING IS USUALLY AVAILABLE IN ROLLS 4 TO 15 FEET WIDE AND 300 TO 3,000 FEET LONG.

B-4.4 STANDARDS AND SPECIFICATIONS

FOR TEMPORARY STABILIZATION

DEFINITION

TO STABILIZE DISTURBED SOILS WITH VEGETATION FOR UP TO 6 MONTHS.

PURPOSE

TO USE FAST GROWING VEGETATION THAT PROVIDES COVER ON DISTURBED SOILS.

CONDITIONS WHERE PRACTICE APPLIES

EXPOSED SOILS WHERE GROUND COVER IS NEEDED FOR A PERIOD OF 6 MONTHS OR LESS. FOR LONGER DURATION OF TIME, PERMANENT STABILIZATION PRACTICES ARE REQUIRED.

CRITERIA

- A. APPLY SEED AS OUTLINED IN TABLE B.4. IF SUCH SEED ARE NOT AVAILABLE, SELECT ONE OR MORE OF THE SPECIES LISTED IN TABLE B.1 OF THE MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL. SUBMIT THAT SPECIES ALONG WITH APPLICATION RATES, SEEDING DATES, SEEDING DEPTHS, FERTILIZER RATE, AND LIME RATE TO THE OWNER OR THEIR REPRESENTATIVE FOR APPROVAL.
- B. FOR SITES HAVING SOIL TESTS PERFORMED, USE AND SHOW THE RECOMMENDED RATES BY THE TESTING AGENCY. SOILS TESTS ARE NOT REQUIRED FOR TEMPORARY SEEDING.
- C. WHEN STABILIZATION IS REQUIRED OUTSIDE OF A SEEDING SEASON, APPLY SEED AND MULCH OR STRAW MULCH ALONG AS PRESCRIBED IN SECTION B-4-3-A.1.1B AND MAINTAIN UNTIL THE NEXT SEEDING SEASON.

B-4.5 STANDARDS AND SPECIFICATIONS

FOR PERMANENT STABILIZATION

DEFINITION

TO STABILIZE DISTURBED SOILS WITH PERMANENT VEGETATION.

PURPOSE

TO USE LONG-LIVED PERENNIAL GRASSES AND LEGUMES TO ESTABLISH PERMANENT COVER ON DISTURBED SOILS.

CONDITIONS WHERE PRACTICE APPLIES

EXPOSED SOILS WHERE GROUND COVER IS NEEDED FOR 6 MONTHS OR MORE.

CRITERIA

- A. SEED MIXTURES
 1. GENERAL USE
 - 1.a. APPLY SEED AS OUTLINED IN TABLE B.6. IF SUCH SEED ARE NOT AVAILABLE, SELECT ONE OR MORE OF THE SPECIES OR MIXTURES LISTED IN TABLE B.3 OF THE MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL. SELECT THE SPECIES FOR THE APPROPRIATE PLANT HARDINESS ZONE (7A) AND BASED ON THE SITE CONDITION OR PURPOSE FOUND ON TABLE B.2 OF THE MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL. SUBMIT THAT SPECIES ALONG WITH APPLICATION RATES, SEEDING DATES, SEEDING DEPTHS, FERTILIZER RATE, AND LIME RATE TO THE OWNER OR THEIR REPRESENTATIVE FOR APPROVAL.
 - 1.b. ADDITIONAL PLANTING SPECIFICATIONS FOR EXCEPTIONAL SITES SUCH AS SHORELINES, STREAM BEDS, BANKS, OR DUNES OR FOR SPECIAL PURPOSES SUCH AS WILDLIFE OR AESTHETIC TREATMENT MAY BE FOUND IN USDA-NRCS TECHNICAL FIELD OFFICE GUIDE, SECTION 342 - CRITICAL AREA PLANTING.
 - 1.c. FOR SITES HAVING DISTURBED AREA OVER 5 ACRES, USE AND SHOW THE RATES RECOMMENDED BY THE SOIL TESTING AGENCY.
 - 1.d. FOR AREAS RECEIVING LOW MAINTENANCE, APPLY UREA FORM FERTILIZER (46-0-0) AT 3 1/2 POUNDS PER 1000 SQUARE FEET (150 POUNDS PER ACRE) AT THE TIME OF SEEDING IN ADDITION TO THE SOIL AMENDMENTS SHOWN IN THE PERMANENT SEEDING SUMMARY.
 2. TURFGRASS MIXTURES
 - 2.a. AREAS WHERE TURFGRASS MAY BE DESIRED INCLUDE LAWNS, PARKS, PLAYGROUNDS, AND COMMERCIAL SITES WHICH WILL RECEIVE A MEDIUM TO HIGH LEVEL OF MAINTENANCE.
 - 2.b. SELECT ONE OR MORE OF THE SPECIES OR MIXTURES LISTED BELOW BASED ON THE SITE CONDITIONS OR PURPOSE. ENTER SELECTED MIXTURE(S), APPLICATION RATES, AND SEEDING DATES IN THE PERMANENT SEEDING SUMMARY. THE SUMMARY IS TO BE PLACED ON THE PLAN:
 - a. KENTUCKY BLUEGRASS: FULL SUN TO MEDIUM SHADE. FOR USE IN AREAS THAT RECEIVE INTENSIVE MANAGEMENT. IRRIGATION REQUIRED IN THE AREAS OF CENTRAL MARYLAND AND EASTERN SHORE. RECOMMENDED CERTIFIED KENTUCKY BLUEGRASS CULTIVARS SEEDING RATE: 15 TO 2.0 POUNDS PER 1000 SQUARE FEET. CHOOSE A MINIMUM OF THREE KENTUCKY BLUEGRASS CULTIVARS WITH EACH RANGING FROM 10 TO 35 PERCENT OF TOTAL MIXTURE BY WEIGHT.
 - b. KENTUCKY BLUEGRASS/PERENNIAL RYE: FULL SUN MIXTURE: FOR USE IN FULL SUN AREAS WHERE RAPID ESTABLISHMENT IS REQUIRED. IN AREAS WHERE TURF WILL RECEIVE MEDIUM TO INTENSIVE MANAGEMENT. CERTIFIED PERENNIAL RYEGRASS CULTIVARS/CERTIFIED KENTUCKY BLUEGRASS SEEDING RATE: 2 POUNDS MIXTURE PER 1000 SQUARE FEET. CHOOSE A MINIMUM OF THREE KENTUCKY BLUEGRASS CULTIVARS WITH EACH RANGING FROM 10 TO 35 PERCENT OF THE TOTAL MIXTURE BY WEIGHT.
 - c. TALL FESCUE/KENTUCKY BLUEGRASS: FULL SUN MIXTURE: FOR USE IN DRAUGHT PRONE AREAS AND/OR FOR AREAS RECEIVING LOW TO MEDIUM MAINTENANCE IN FULL SUN TO MEDIUM SHADE. RECOMMENDED MIXTURE INCLUDES: CERTIFIED TALL FESCUE CULTIVARS 95 TO 100 PERCENT, CERTIFIED KENTUCKY BLUEGRASS CULTIVARS 0 TO 5 PERCENT. SEEDING RATE: 5 TO 10 POUNDS PER 1000 SQUARE FEET. ONE OR MORE CULTIVARS MAY BE BLENDED.
 - d. KENTUCKY BLUEGRASS/FINE FESCUE: SHADE MIXTURE: FOR USE IN AREAS WITH SHADE IN BLUEGRASS LAWNS. FOR ESTABLISHMENT IN HIGH QUALITY, INTENSIVELY MANAGED TURF AREA. MIXTURE INCLUDES: CERTIFIED KENTUCKY BLUEGRASS CULTIVARS 90 TO 100 PERCENT AND CERTIFIED FINE FESCUE 60 TO 70 PERCENT. SEEDING RATE: 1 1/2 TO 3 POUNDS PER 1000 SQUARE FEET.

NOTES:

SELECT TURFGRASS VARIETIES FROM THOSE LISTED IN THE MOST CURRENT UNIVERSITY OF MARYLAND PUBLICATION, AGRONOMY MEMO #77, "TURFGRASS CULTIVAR RECOMMENDATIONS FOR MARYLAND".

CHOOSE CERTIFIED MATERIAL. CERTIFIED MATERIAL IS THE BEST GUARANTEE OF CULTIVAR PURITY. THE CERTIFICATION PROGRAM OF THE MARYLAND DEPARTMENT OF AGRICULTURE, TURF AND SEED SECTION, PROVIDES A RELIABLE MEANS OF CONSUMER PROTECTION AND ASSURES A PURE GENETIC LINE.

3. IDEAL TIMES OF SEEDING FOR TURFGRASS MIXTURES
 - WESTERN MARYLAND: MARCH 15 TO JUNE 1, AUGUST 1 TO OCTOBER 1 (HARDINESS ZONES: 5B, 6A)
 - CENTRAL MARYLAND: MARCH 1 TO MAY 15, AUGUST 15 TO OCTOBER 15 (HARDINESS ZONE: 6B)
 - SOUTHERN MD, EASTERN SHORE: MARCH 1 TO MAY 15, AUGUST 15 TO OCTOBER 15 (HARDINESS ZONES: 7A, 7B)

4. TILL AREAS TO RECEIVE SEED BY DISKING OR OTHER APPROVED METHODS TO A DEPTH OF 2 TO 4 INCHES. LEVEL AND RAKE THE AREAS TO PREPARE A PROPER SEEDBED. REMOVE STONES AND DEBRIS OVER 1 1/2 INCHES IN DIAMETER. THE RESULTING SEEDBED MUST BE IN SUCH CONDITION THAT FUTURE MOWING OF GRASSES WILL POSE NO DIFFICULTY.
5. IF SOIL MOISTURE IS DEFICIENT, APPLY NEW SEEDINGS WITH ADEQUATE WATER FOR PLANT GROWTH (1/2 TO 1 INCH EVER 3 TO 4 DAYS DEPENDING ON SOIL TEXTURE) UNTIL THEY ARE FIRMLY ESTABLISHED. THIS IS ESPECIALLY TRUE WHEN SEEDINGS ARE MADE LATE IN THE PLANTING SEASON, IN ABNORMALLY DRY OR HOT SEASONS, OR ON ADVERSE SITES.

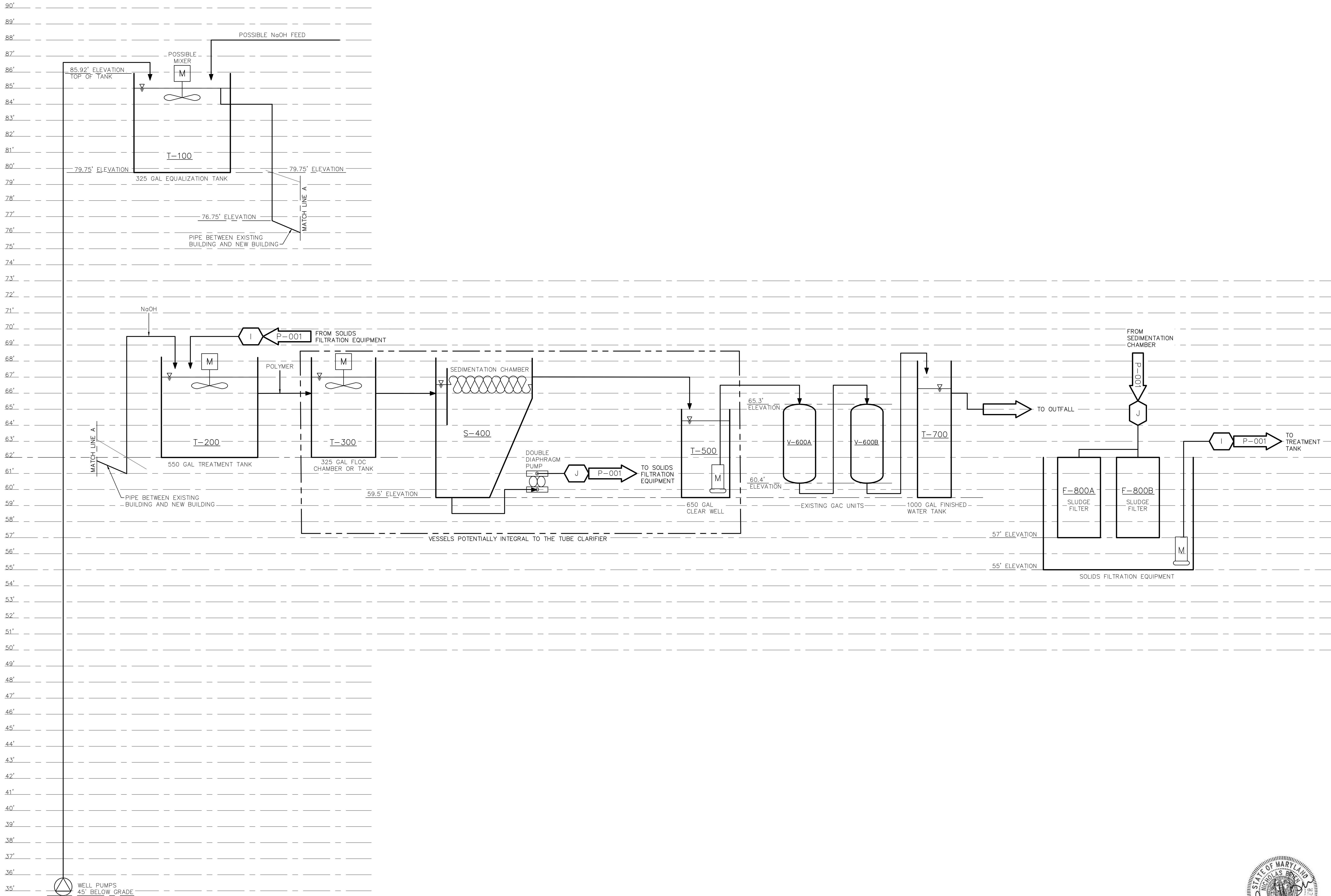
TABLE B.4 - TEMPORARY SEEDING SUMMARY

HARDINESS ZONE:	7A			FERTILIZER RATE (10-20-20)	LIME RATE
SPECIES	APPLICATION RATE(LB/AC)	SEEDING DATES	SEEDING DEPTHS		
ANNUAL RYEGRASS (LILIUM PEREENE SSP. MULTIFLORUM)	40	2/15-4/30 8/15-11/30	1/2"		
WHEAT (TRITICUM AESTIVUM)	120	2/15-4/30 8/15-11/30	1"	436 LB/AC (90 LB/ 1000SF)	2 TONS/AC (90 LB/ 1000SF)
FORTAL MILLET (SETARIA ITALICA)	30	5/1-9/14	1/2"		
PEARL MILLET (PENNISETUM GLAUCUM)	20	5/1-9/14	1/2"		

B. SOD: TO PROVIDE QUICK COVER ON DISTURBED AREAS (2:1 GRADE OR FLATTER).

1. GENERAL SPECIFICATIONS
 - 1.a. CLASS OF TURFGRASS SOD MUST BE MARYLAND STATE CERTIFIED. SOD LABELS MUST BE MADE AVAILABLE TO THE JOB FOREMAN AND INSPECTOR.
 - 1.b. SOD MUST BE MACHINE CUT AT A UNIFORM SOIL THICKNESS OF 3/4 INCHES, PLUS OR MINUS 1/4 INCH, AT THE TIME OF CUTTING. MEASUREMENT FOR THICKNESS MUST EXCLUDE TOP GROWTH AND THAT PATCH, BROKEN PADS AND TORN OR UNEVEN ENDS WILL NOT BE ACCEPTABLE.
 - 1.c. STANDARD SIZE SECTIONS OF SOD MUST BE STRONG ENOUGH TO SUPPORT THEIR OWN WEIGHT AND RETAIN THEIR SIZE AND SHAPE WHEN SUSPENDED VERTICALLY WITH A FIRM GRASP ON THE UPPER 10 PERCENT OF THE SECTION.
 - 1.d. SOD MUST NOT BE HARVESTED OR TRANSPLANTED WHEN MOISTURE CONTENT (EXCESSIVELY DRY OR WET) MAY ADVERSELY AFFECT ITS SURVIVAL.
 - 1.e. SOD MUST BE HAR

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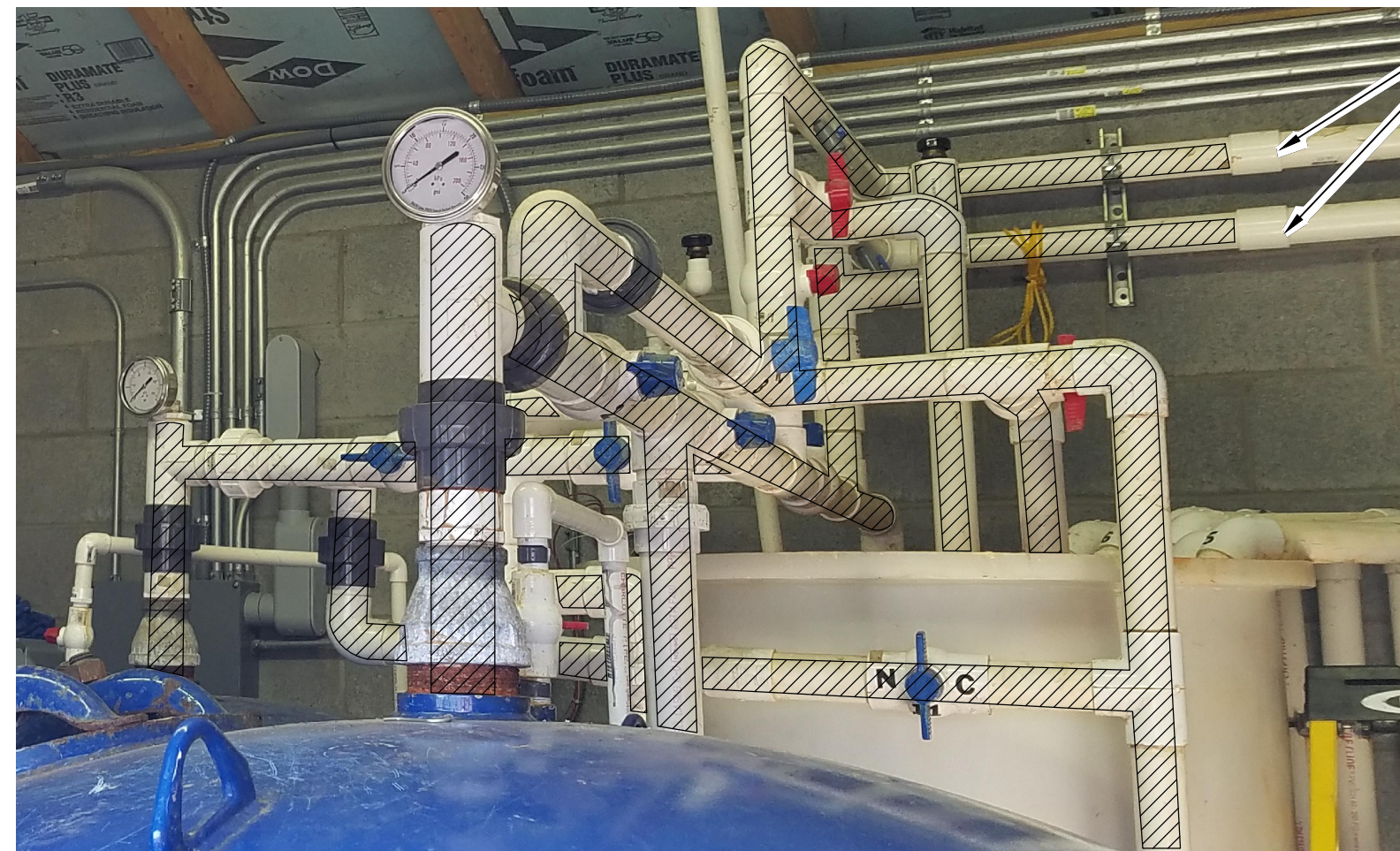
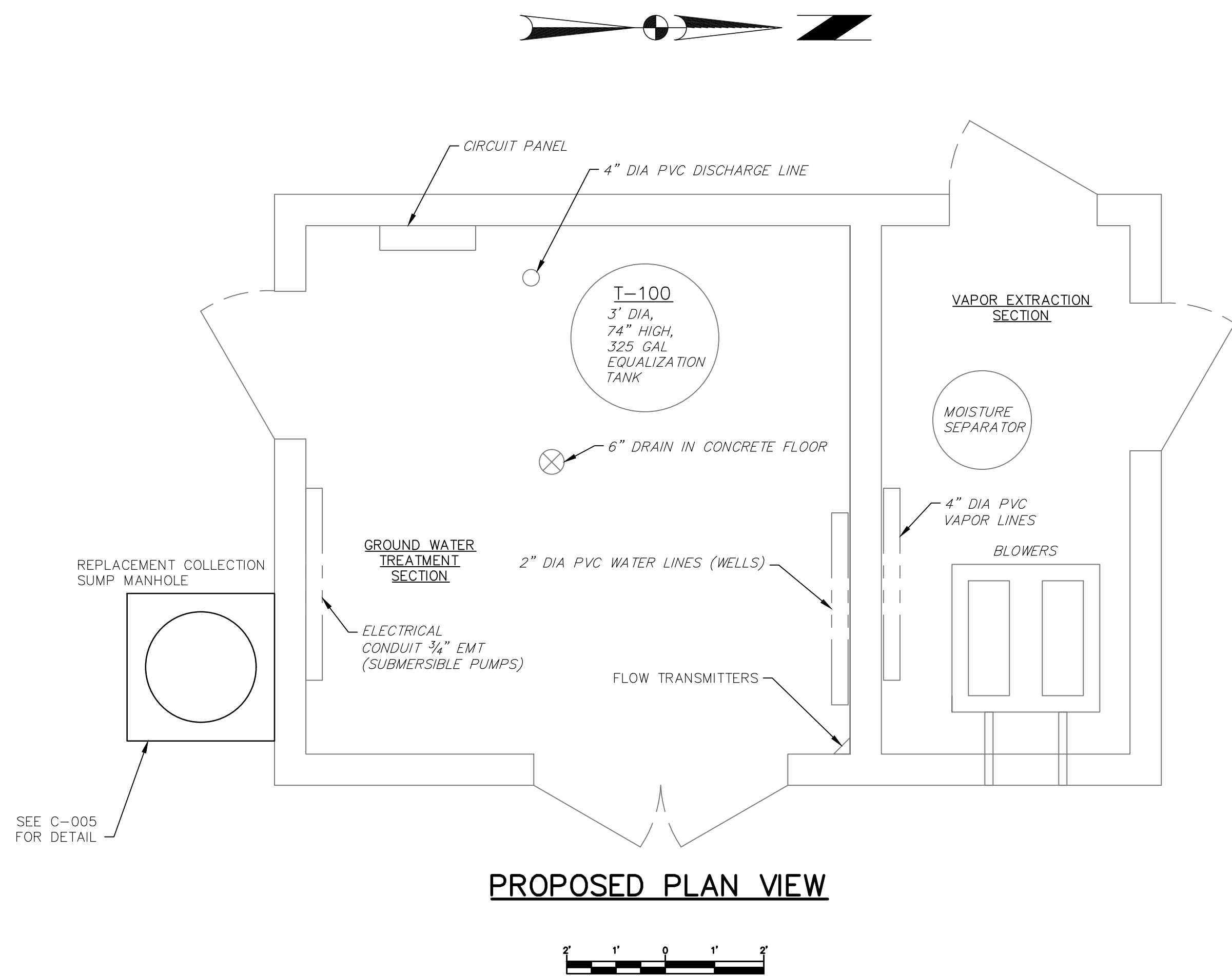
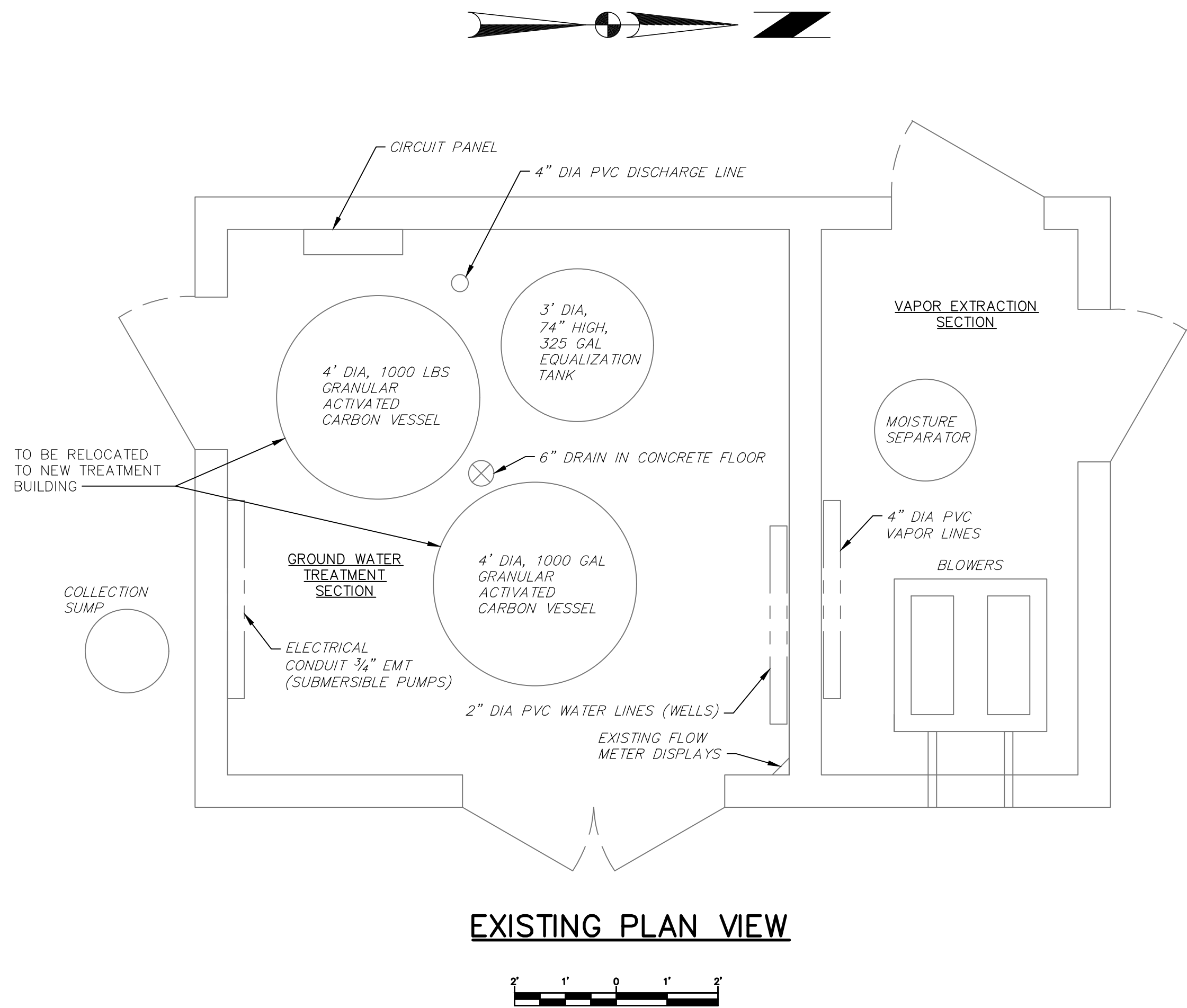
GROUNDWATER TREATMENT SYSTEM
UPGRADES
FOR
NICHOLSON LANDFILL
CHESTERTOWN TOWNSHIP
KENT COUNTY MARYLAND

DRAWING TITLE	
PROCESS FLOW DIAGRAM	
DATE	9/30/2021
JOB NO.	2000114.00
SCALE	Not to Scale
DRAWN BY	BCC
CHECKED BY	RAN
SHEET NO.	P-001

REVISIONS	
NO.	DATE
0	7/19/2021
1	9/29/2021
2	11/19/2021
3	4/04/2022
4	4/19/2022
5	9/16/2022

DESCRIPTION	CHECKED	DRAWN
PRELIMINARY DESIGN SUBMISSION	RAN	VD
REVISED FOR COMMENTS ON PRELIM. SUBMISSION	RAN	VD
REVISED FOR 2ND COMMENTS ON PRELIM. SUBMISSION	RAN	RH
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FINAL DESIGN SUBMISSION TO MDE	NMB	RAN
ISSUED FOR CONSTRUCTION	NMB	RAN

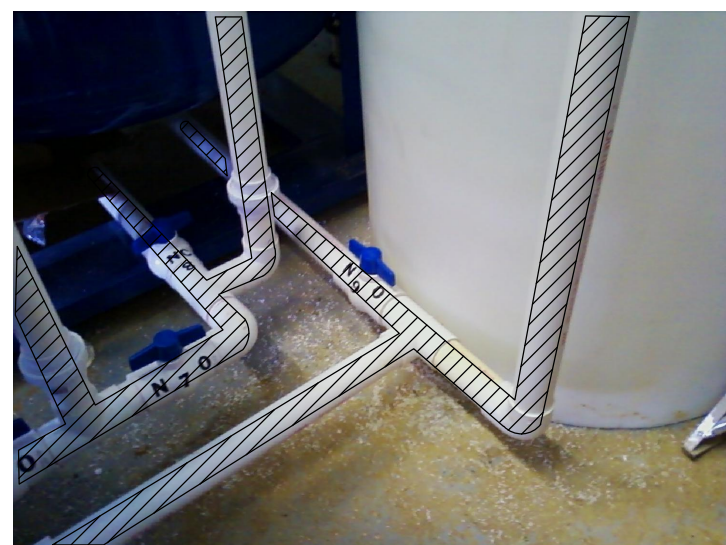
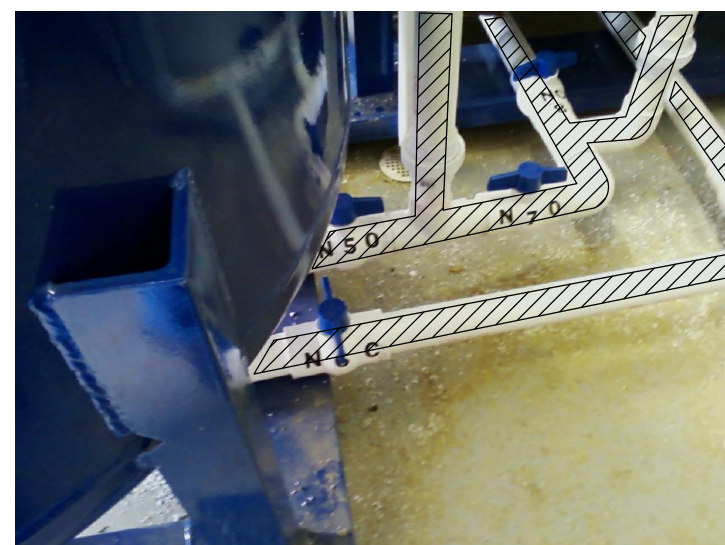
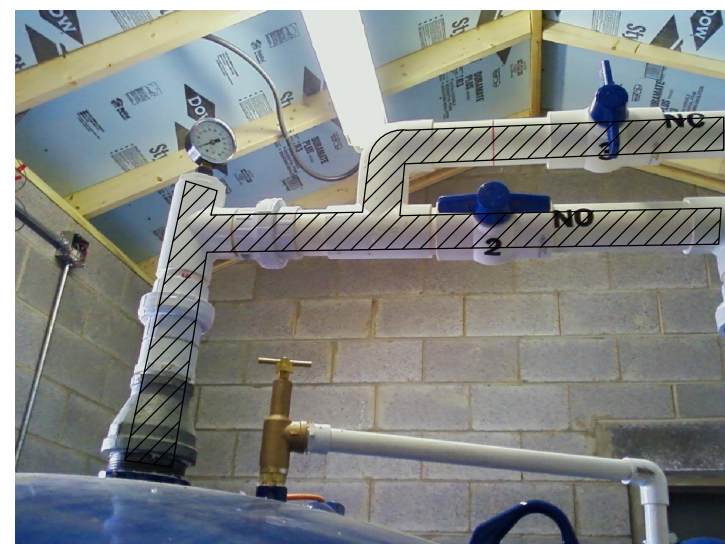
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PIPE DEMOLITION OVERVIEW PICTURES

LEGEND

 PIPES TO BE REMOVED



CARBON MANIFOLD DEMOLITION PICTURES



REVISIONS		DRAWN	
NO.	DATE	DESCRIPTION	
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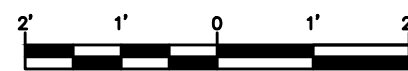
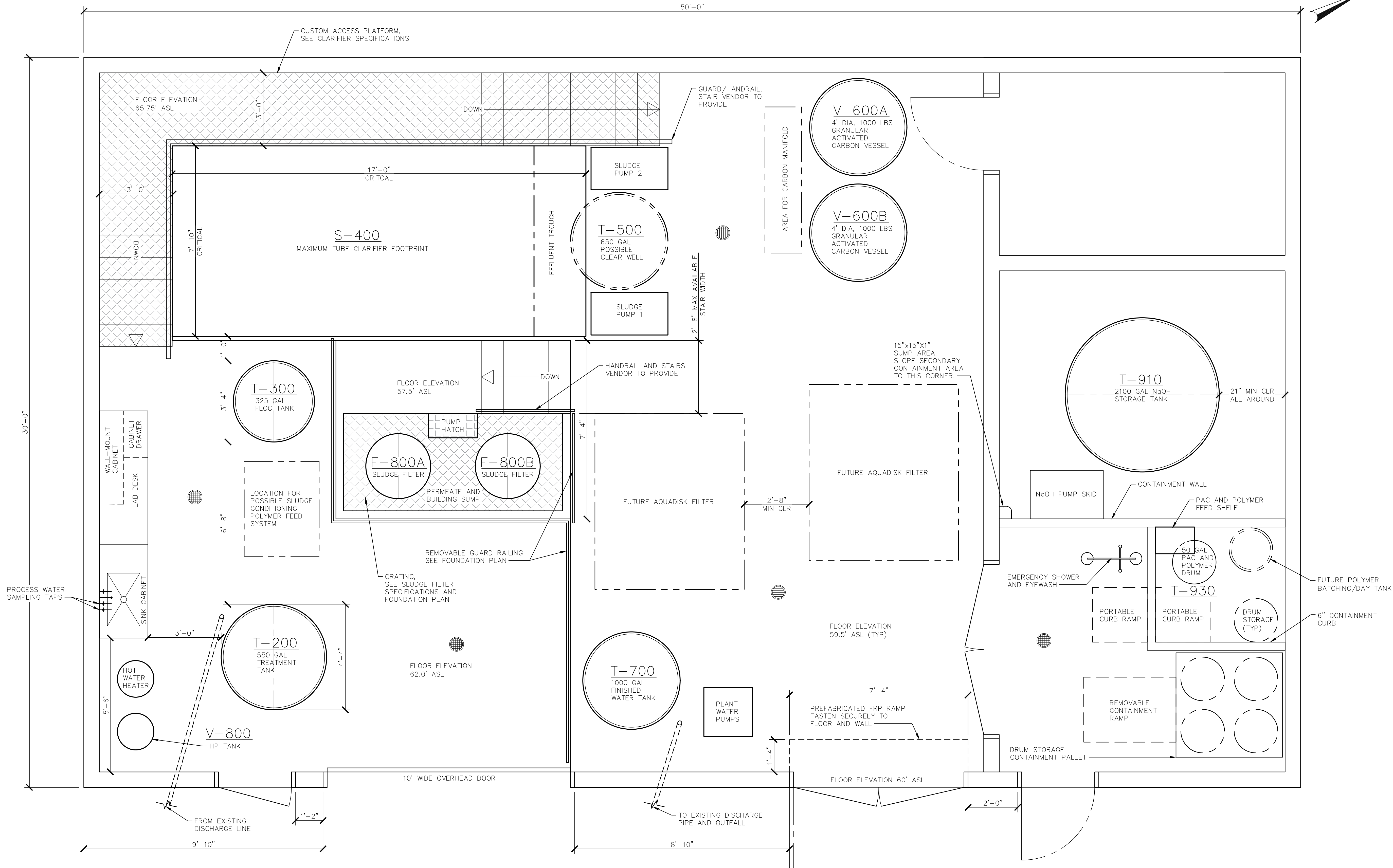
GROUNDWATER TREATMENT SYSTEM
UPGRADES
FOR
NICHOLSON LANDFILL
CHESTERTOWN TOWNSHIP
KENT COUNTY
MARYLAND

DRAWING TITLE	
EXISTING SYSTEMS TO BE REPLACED / REUSED	
DATE	9/30/2021
JOB NO.	2000114.00
SCALE	As Indicated
DRAWN BY	BCC
CHECKED BY	RAN
SHEET NO.	P-002

\\DAWOOD\CC\DATA\PROJECTS\2020\JOBS-2000114-00\LD\PRELIMINARY\DRAWINGS\SH-T_NICH_PLAN
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NOTES

- SEVERAL DIFFERENT INCLINED TUBE/PLATE CLARIFIERS ARE ACCEPTABLE FOR THIS APPLICATION. THE FOOTPRINT DEPICTED HEREIN ACCOUNTS FOR ALL OF THE OPTIONS ALLOWED BY THE SPECIFICATIONS.
- MANY OF THE ACCEPTABLE INCLINED TUBE/PLATE CLARIFIERS WILL CONTAIN AN INTEGRAL CLEAR WELL. THE POSSIBLE CLEAR WELL SHOWN HEREIN PROVIDES A FOOTAGE FOR AN HDPE FLAT BOTTOM CYLINDRICAL TANK WERE A CLARIFIER WITHOUT AN INTEGRAL CLEAR WELL SELECTED.
- SOME OF THE ACCEPTABLE INCLINED TUBE/PLATE QUALIFIERS ARE AVAILABLE WITH PACKAGES THAT WILL INCLUDE SLUDGE TRANSFER PUMPS. SLUDGE TRANSFER PUMPS 1 AND 2 SHOWN HEREIN COULD POTENTIALLY BE LOCATED WITHIN THE MAXIMUM TUBE CLARIFIER FOOTPRINT.
- ALL WATER SPIGOTS IN THE TREATMENT BUILDING MUST BE LABELED AS "NON-POTABLE WATER, DO NOT DRINK".



GROUNDWATER TREATMENT SYSTEM UPGRADES

NICHOLSON LANDFILL

CHESTERTOWN TOWNSHIP
KENT COUNTY
MARYLAND

DRAWING TITLE GENERAL EQUIPMENT AND SLUDGE HANDLING LAYOUT

DATE	6/08/2022
JOB NO.	2000114.00
SCALE	As Indicated
DRAWN BY	VD
CHECKED BY	RAN
SHEET NO.	P-003

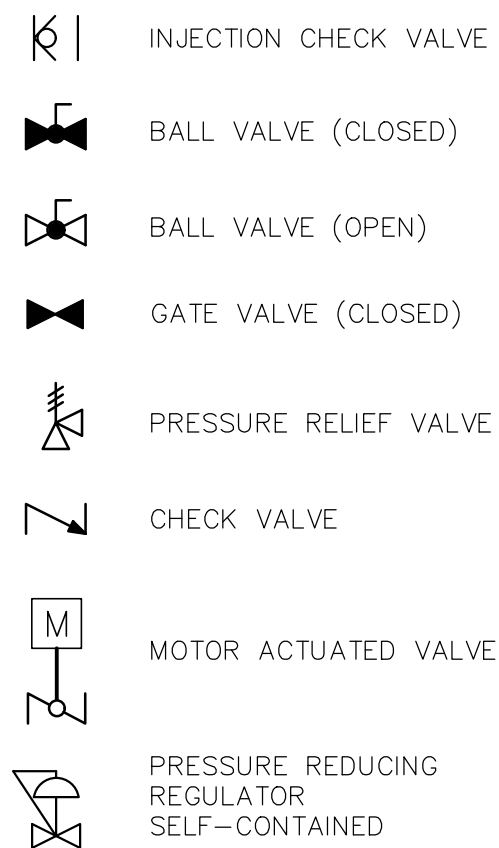
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NO.	DATE	DESCRIPTION	
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1	9/29/2021	REVISED FOR COMMENTS ON PRELIM. SUBMISSION	RAN
2	11/19/2021	REVISED FOR 2ND COMMENTS ON PRELIM. SUBMISSION	RH
3	4/04/2022	90% DESIGN SUBMISSION	VD
4	4/19/2022	FINAL DESIGN SUBMISSION TO IDE	RAN
5	9/16/2022	ISSUED FOR CONSTRUCTION	NMB

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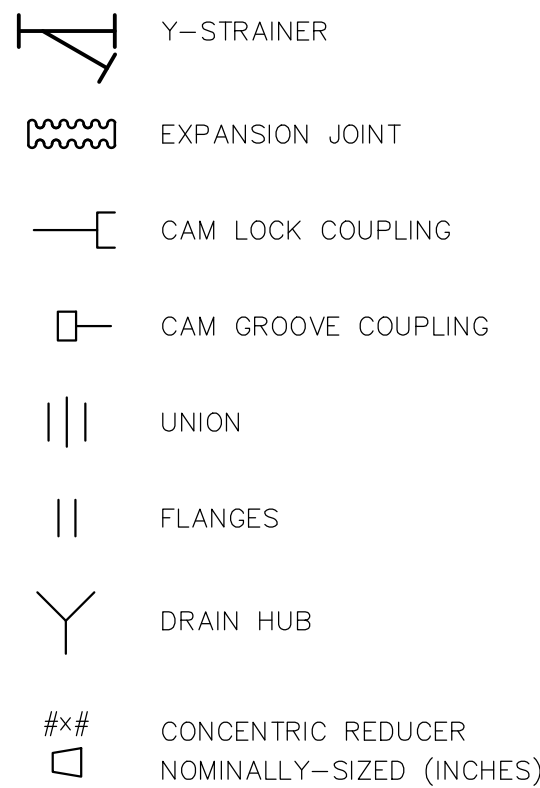


SYMBOLS LEGEND

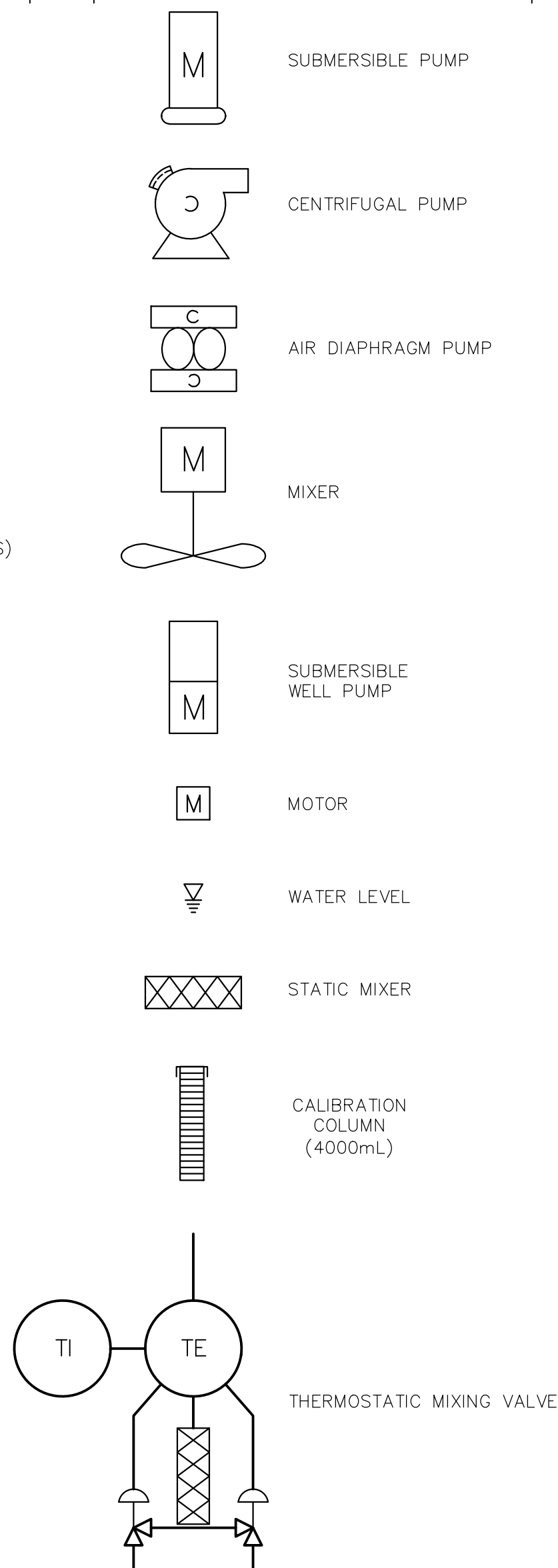
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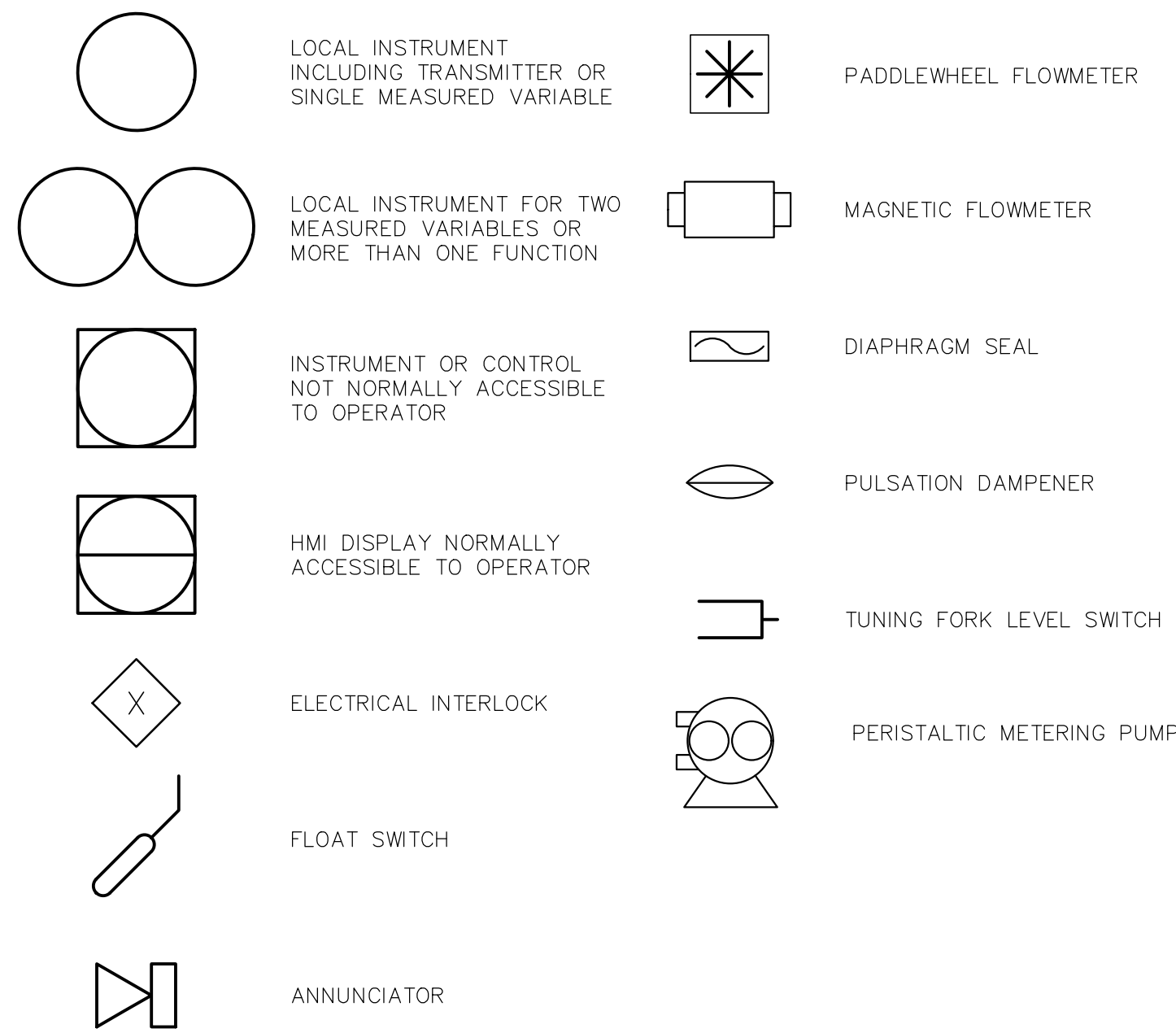
FITTINGS/CONNECTIONS



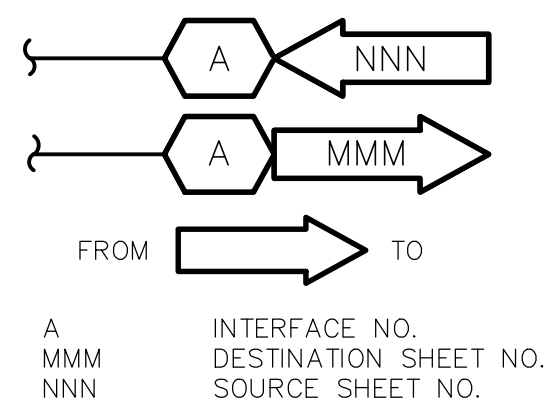
PUMPS/MISCELLANEOUS



INSTRUMENTS



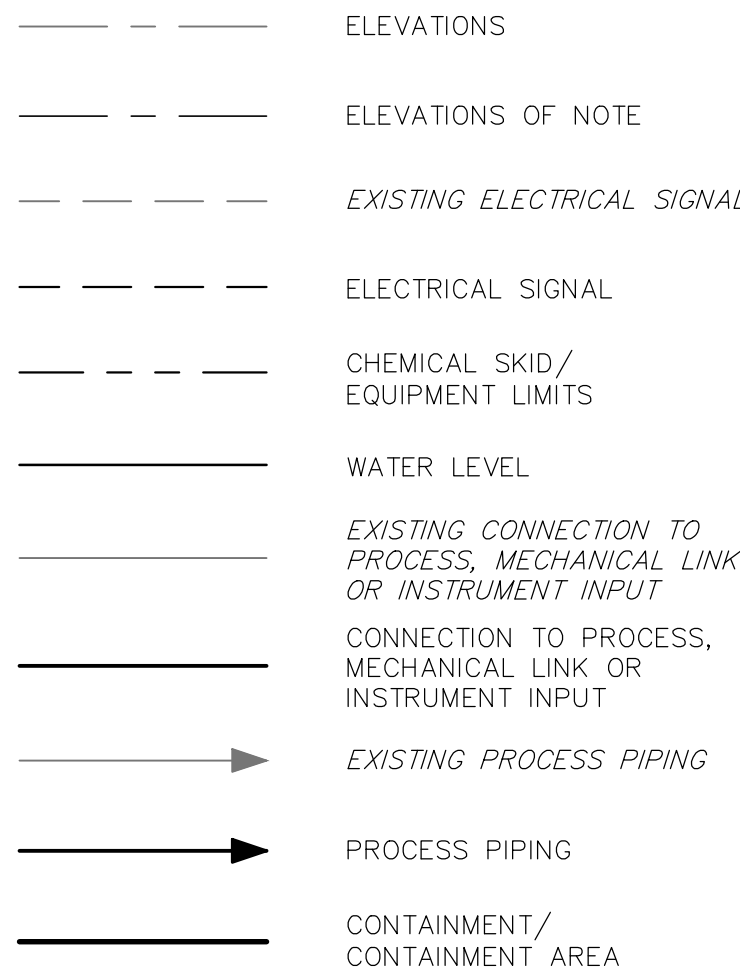
INTERFACE/PROCESS



ABBREVIATIONS

ASL ABOVE SEA LEVEL
D DEEP/DEPTH
FLOC FLOCCULATION
GAL GALLON(S)
HOA HAND-OFF-AUTOMATIC SELECTOR SWITCH
HMI HUMAN MACHINE INTERFACE
HP HYDROPNEUMATIC PRESSURE
NaOH SODIUM HYDROXIDE
PFD PROCESS FLOW DIAGRAM
P&ID PIPING & INSTRUMENTATION DIAGRAM
PVC POLYVINYL CHLORIDE

LINE TYPES



INSTRUMENT SOCIETY OF AMERICA TABLE

LETTER	FIRST LETTER (S)		SUCCEEDING LETTERS		
	PROCESS OR INITIATING VARIABLE	MODIFIER	READOUT OR PASSIVE FUNCTION	OUTPUT FUNCTION	MODIFIER
A	ANALYSIS (t)		ALARM		
B	BURNER COMBUSTION		USERS CHOICE (t)	USERS CHOICE (t)	USERS CHOICE (t)
C	USERS CHOICE (t)			CONTROL	
D	USERS CHOICE (t)	DIFFERENTIAL			
E	VOLTAGE		PRIMARY ELEMENT		
F	FLOW RATE				
G	USERS CHOICE (t)		GLASS		
H	HAND (MANUAL)				HIGH
I	CURRENT		INDICATE		
J	POWER	SCAN			
K	TIME OR SCHEDULE	TIME RATE OF CHANGE		CONTROL STATION	
L	LEVEL		LIGHT (PILOT)		LOW
M	USERS CHOICE (t)	MOMENTARY			MIDDLE
N	USERS CHOICE (t)		USERS CHOICE (t)	USERS CHOICE (t)	USERS CHOICE (t)
O	USERS CHOICE (t)		ORIFICE		
P	PRESSURE OR VACUUM		POINT (TEST CONNECTION)		
Q	QUANTITY	INTEGRATE			
R	RADIOACTIVITY		RECORD OR PRINT		
S	SPEED OR FREQUENCY	SAFETY		SWITCH	
T	TEMPERATURE			TRANSMIT	
U	MULTIVARIABLE (t)		MULTIFUNCTION (t)	MULTIFUNCTION (t)	MULTIFUNCTION (t)
V	VIBRATION			VALVE	
W	WEIGHT OR FORCE		WELL		
X	UNCLASSIFIED (t)	X AXIS	UNCLASSIFIED (t)	UNCLASSIFIED (t)	UNCLASSIFIED (t)
Y	EVENT, STATE, OR PRESSURE	Y AXIS		RELAY OR COMPUTE (t)	
Z	POSITION, DIMENSION	Z AXIS		DRIVE. ACTUATE OR UNCLASSIFIED FINAL CONTROL ELEMENT	

(t) WHEN USED, EXPLANATION IS SHOWN
ADJACENT TO INSTRUMENT SYMBOL.

SPECIAL CASES:
ELAPSED TIME METER

REVISED		CHECKED		DRAWN	
NO.	DATE	DESCRIPTION	RAN	VD	RAN
A	6/04/2021	PROGRESS SET	RAN	VD	RAN
0	7/19/2021	PRELIMINARY DESIGN SUBMISSION	RAN	VD	RAN
1	9/29/2021	REVISED FOR COMMENTS ON PRELIM. SUBMISSION	RAN	VD	RAN
2	11/19/2021	REVISED FOR 2ND COMMENTS ON PRELIM. SUBMISSION	RAN	RH	RAN
3	4/04/2022	90% DESIGN SUBMISSION	RAN	KEM	RAN
4	9/16/2022	ISSUED FOR CONSTRUCTION	NMB	RAN	RAN

GROUNDWATER TREATMENT SYSTEM
UPGRADES

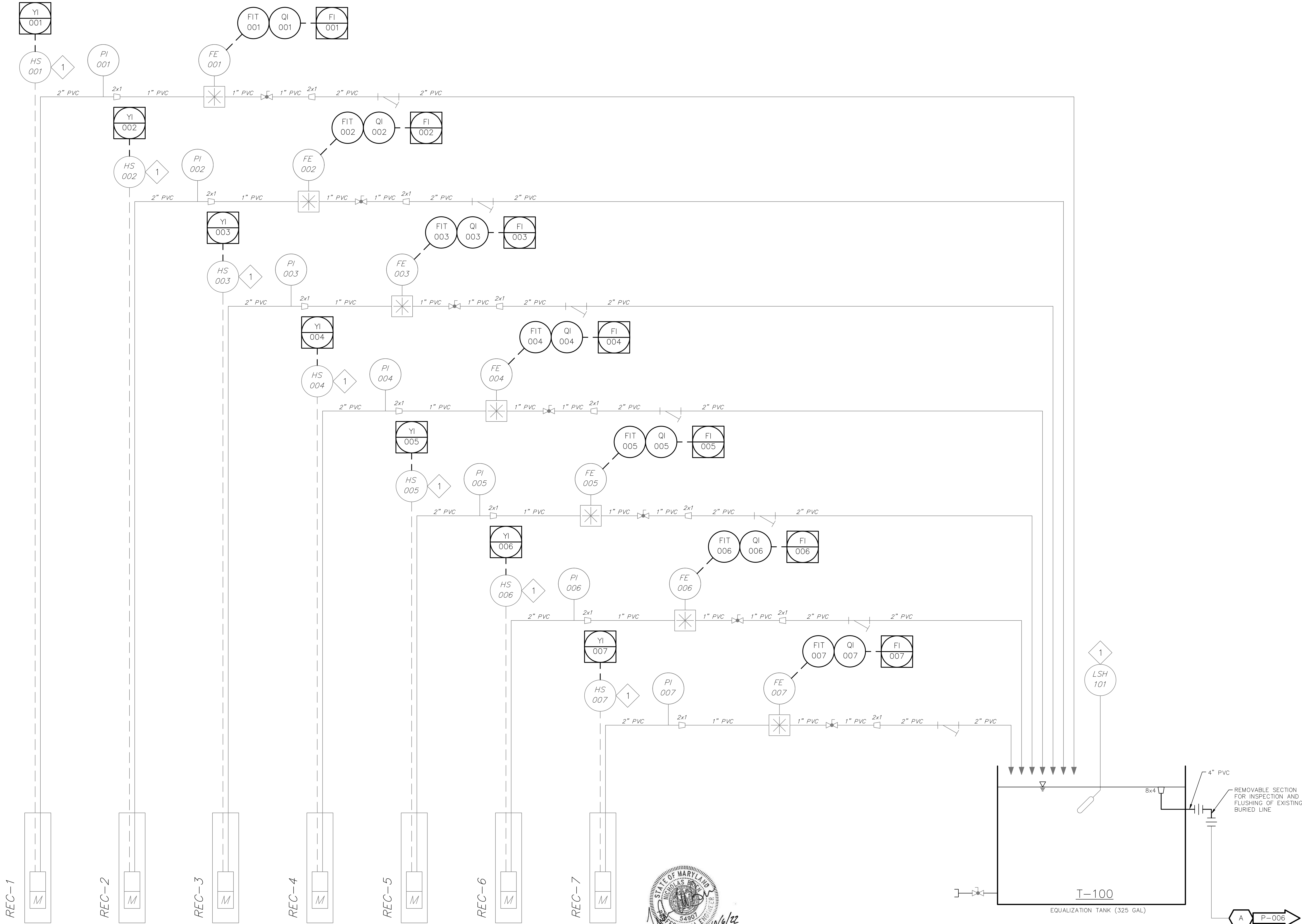
FOR
NICHOLSON LANDFILL

CHESTERTOWN TOWNSHIP
KENT COUNTY
MARYLAND

DRAWING TITLE
LEGENDS
AND
SYMBOLS

DATE	9/30/2021
JOB NO.	2000114.00
SCALE	Not to Scale
DRAWN BY	BCC
CHECKED BY	RAN
SHEET NO.	P-004

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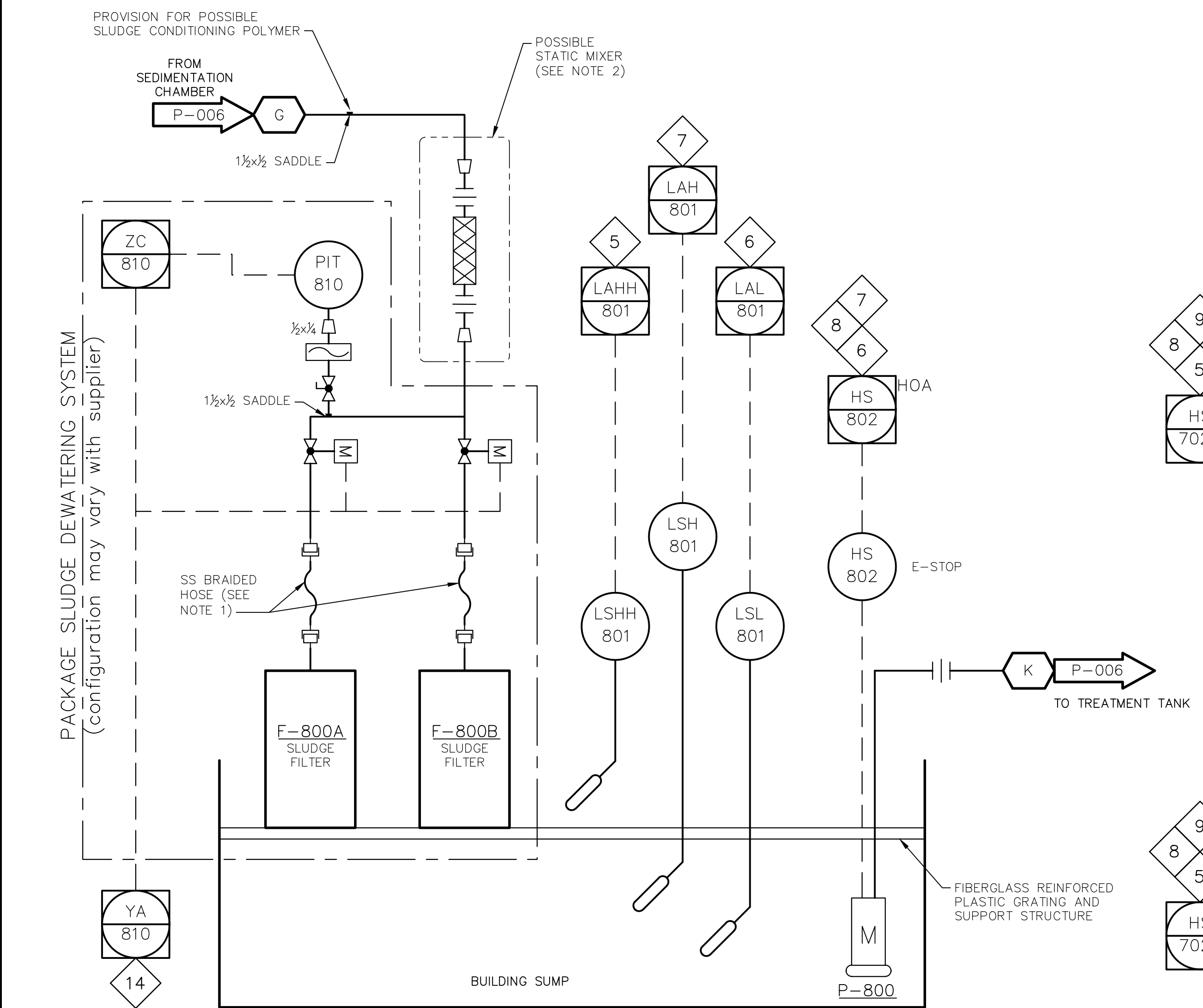
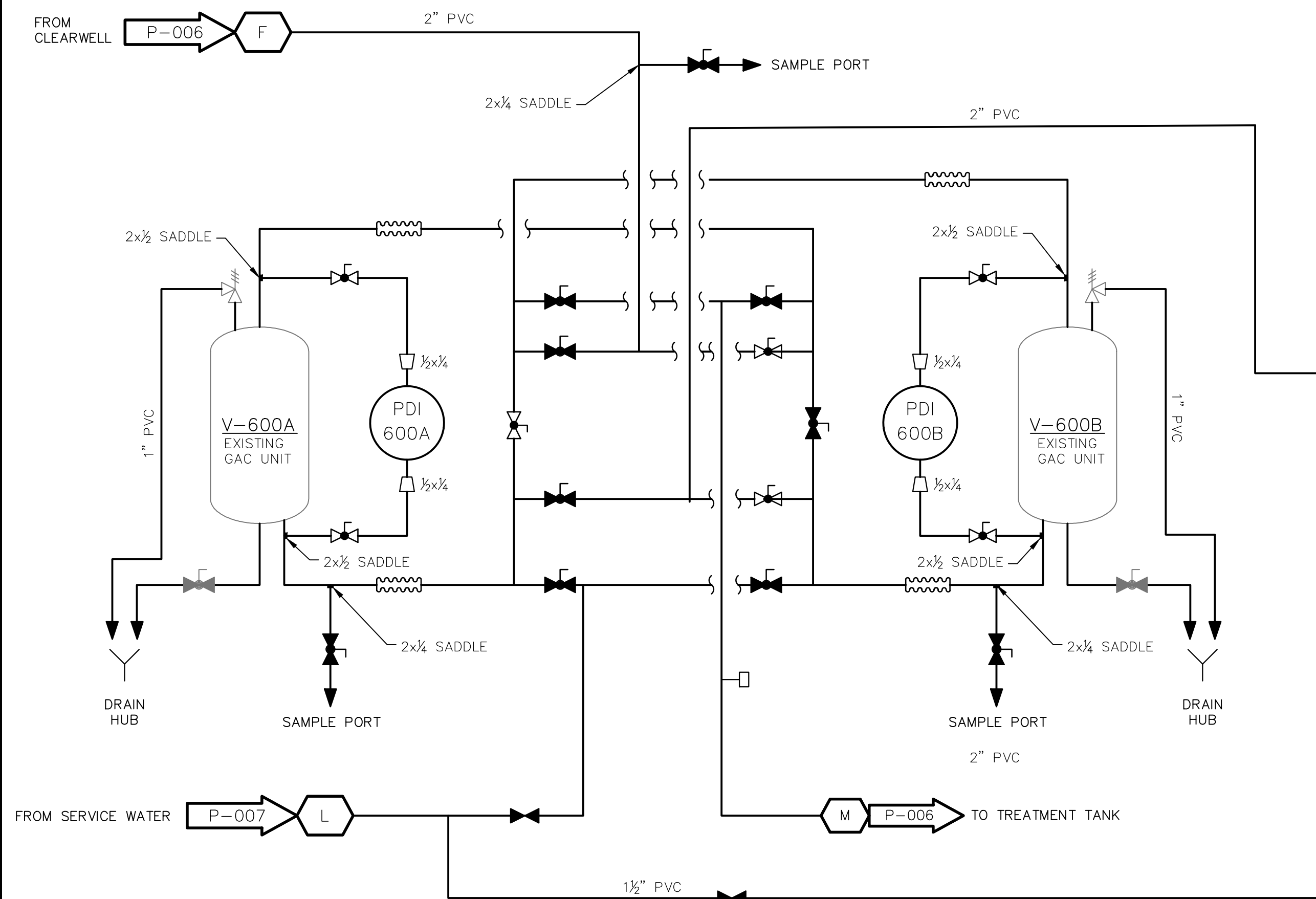
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1	11/19/2021	REVISED FOR 2ND COMMENTS ON PRELIM. SUBMISSION	RH
2	4/04/2022	90% DESIGN SUBMISSION	KEM
3	4/18/2022	REVISED 90% DESIGN SUBMISSION	RAN
4	9/16/2022	ISSUED FOR CONSTRUCTION	NMB

GROUNDWATER TREATMENT SYSTEM
UPGRADES
FOR
NICHOLSON LANDFILL
CHESTERTOWN TOWNSHIP
KENT COUNTY
MARYLAND

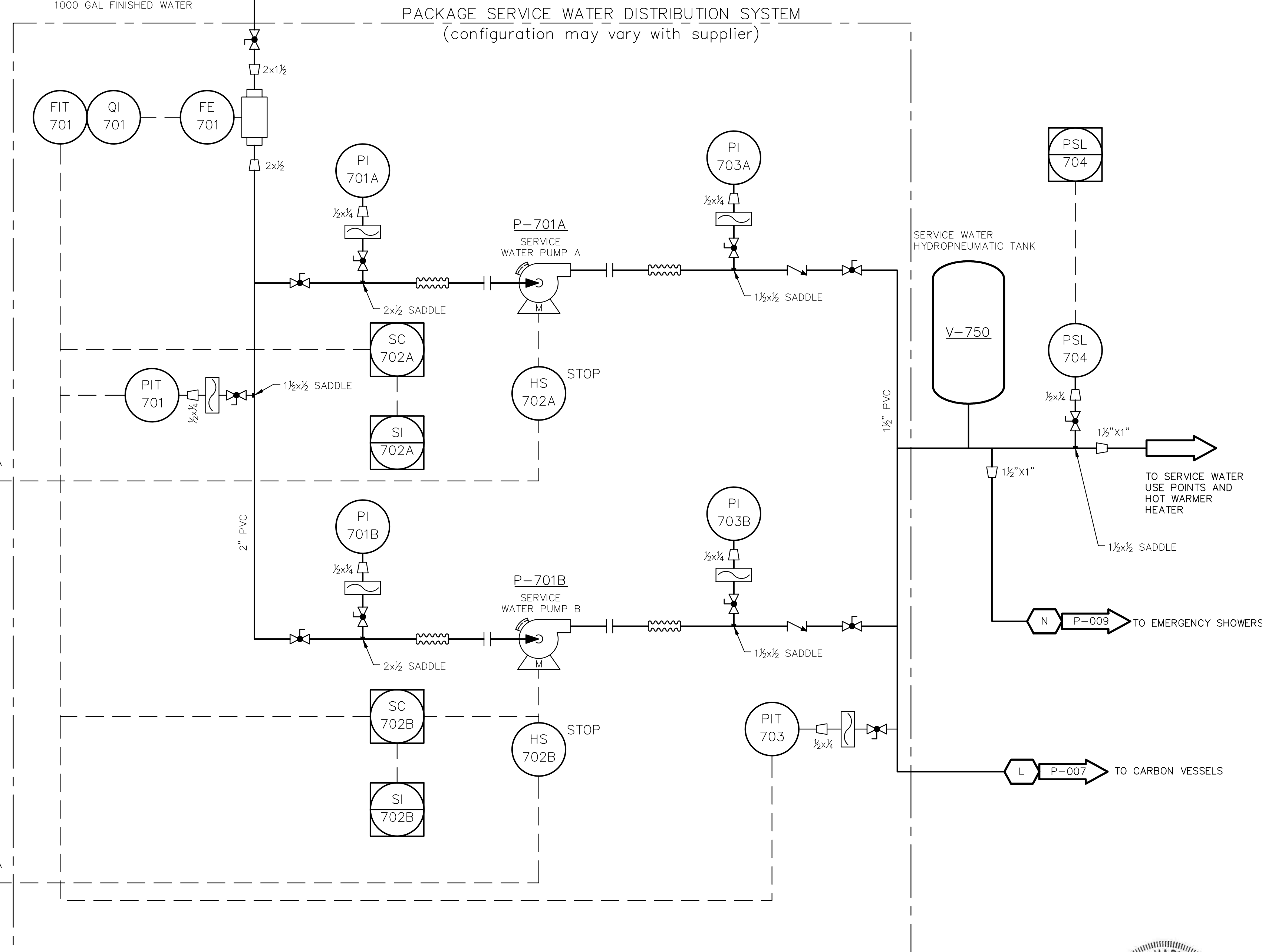
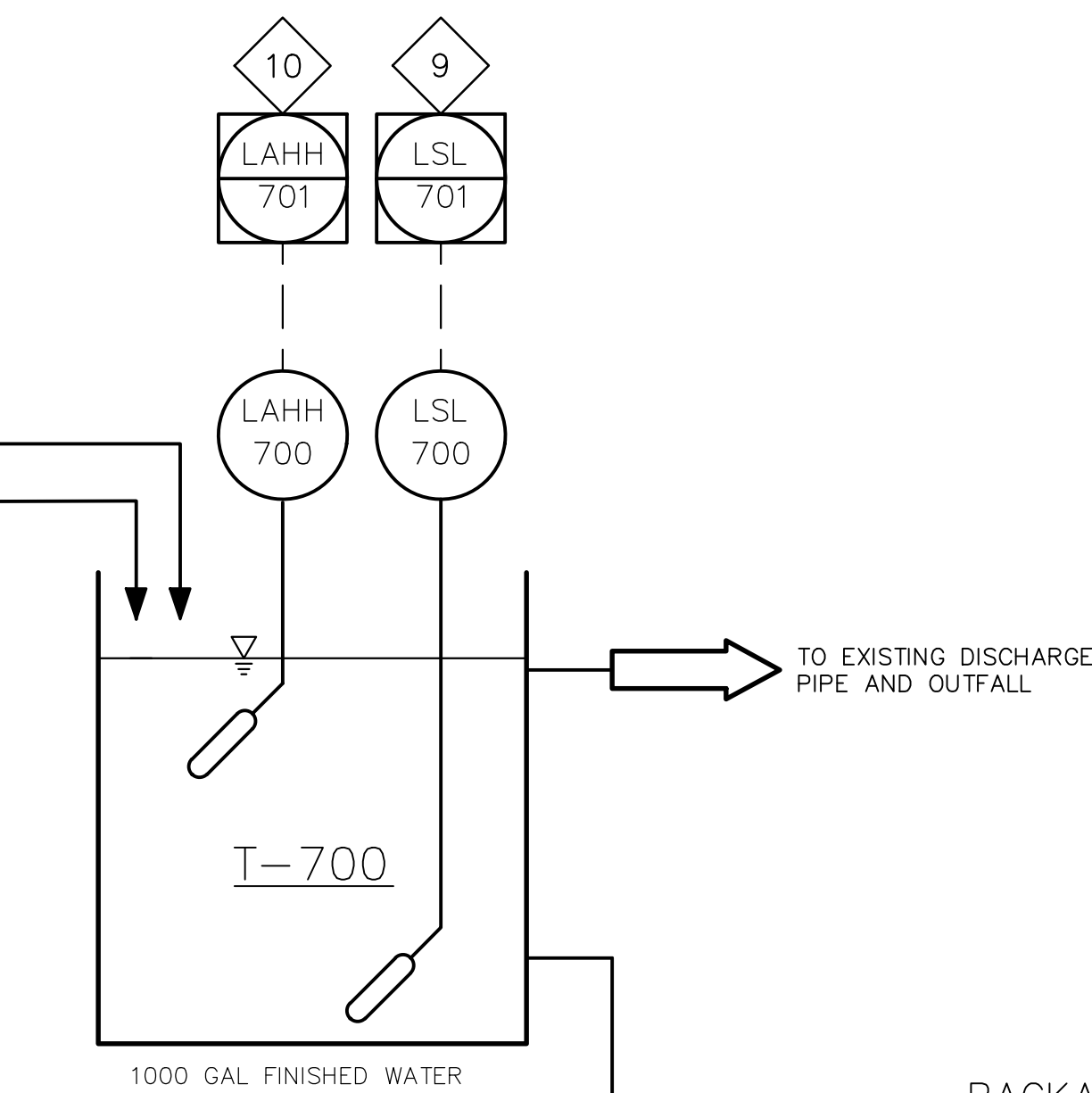
DRAWING TITLE	
P&ID WELL TO EQUALIZATION TANK	
DATE	9/30/2021
JOB NO.	2000114.00
SCALE	Not to Scale
DRAWN BY	BCC
CHECKED BY	RAN
SHEET NO.	P-005



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May/26/2021 2:43 PM



SOLIDS FILTRATION EQUIPMENT



NOTES

- HOSES MUST BE OF ADEQUATE LENGTH TO REACH THE INLET OF A SLUDGE FILTER PLACED ANYWHERE IN THE SUMP.
- IF TESTING DURING START UP DETERMINES POLYMER OR OTHER CHEMICAL ADDITION IS REQUIRED FOR THE SLUDGE FILTERS TO PERFORM AS SPECIFIED, PROVIDE THE ASSOCIATED FEED SYSTEM AND A STATIC MIXER AT NO ADDITIONAL COST TO OWNER.
- REUSE EXISTING DRAIN AND PRESSURE RELEASE VALVES



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3	4/04/2022	90% DESIGN SUBMISSION	RAN
4	9/16/2022	ISSUED FOR CONSTRUCTION	NMB

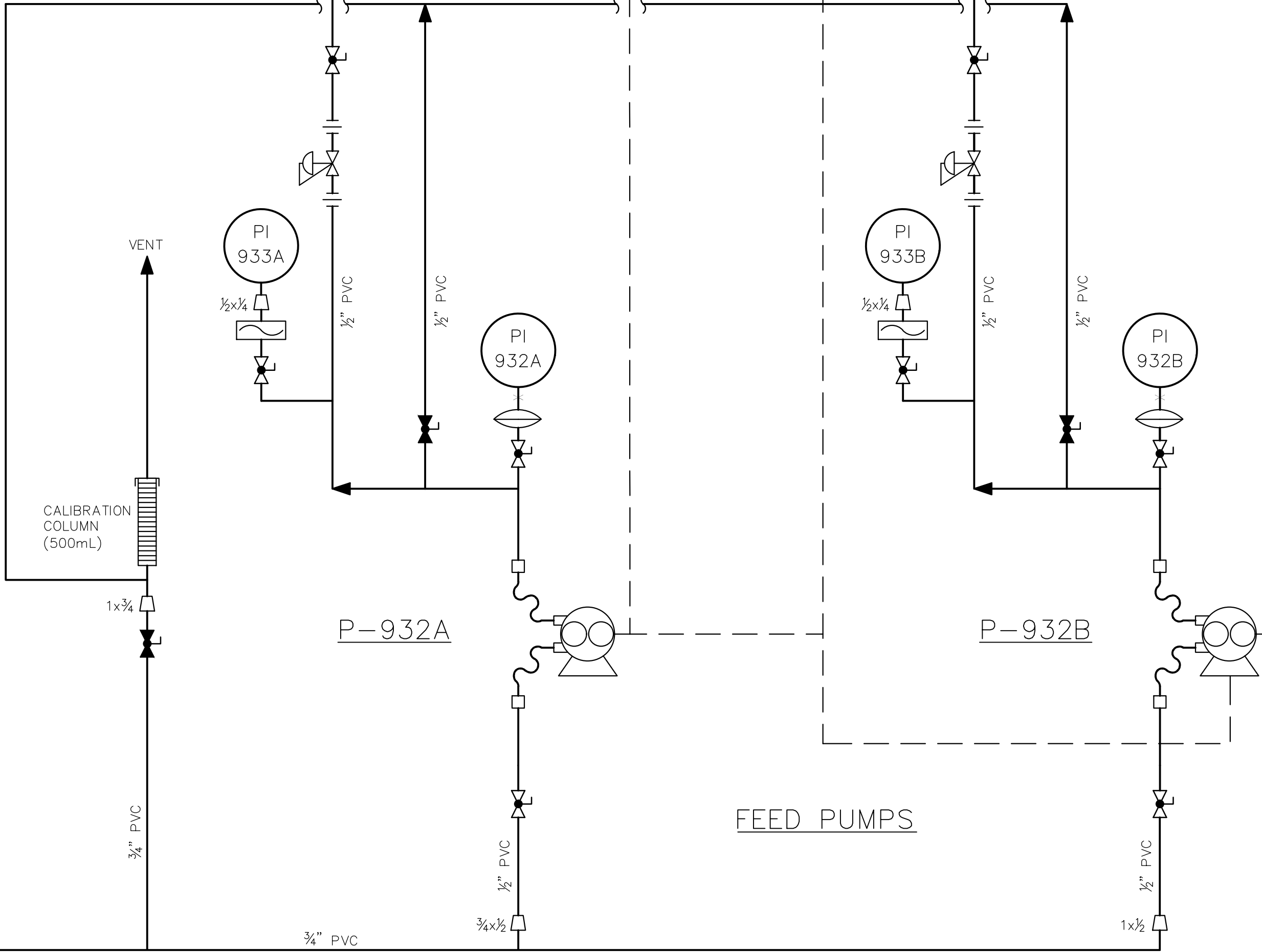
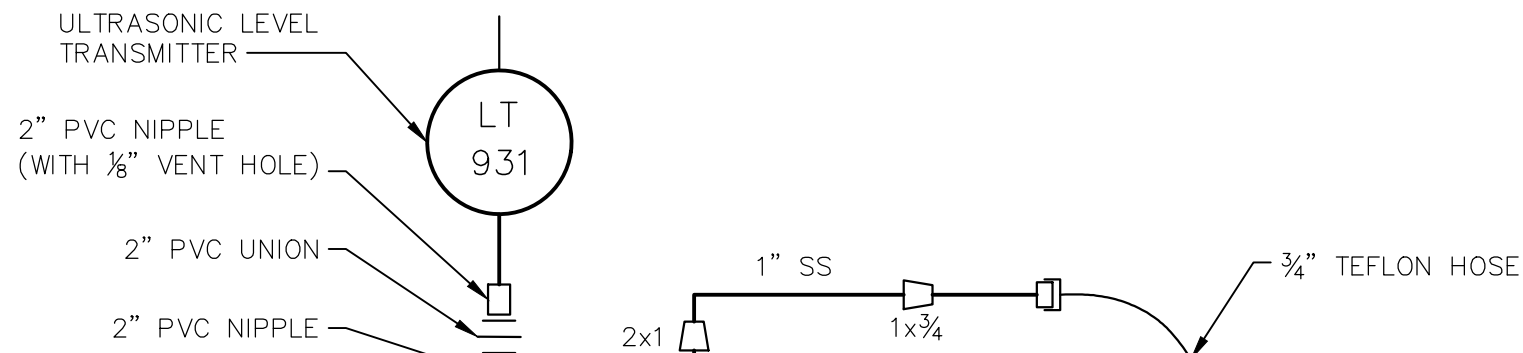
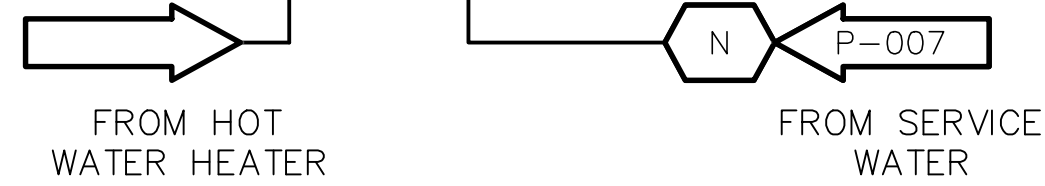
GROUNDWATER TREATMENT SYSTEM
UPGRADES
FOR
NICHOLSON LANDFILL
CHESTERTOWN TOWNSHIP
KENT COUNTY
MARYLAND

DRAWING TITLE
**P&ID
ABSORPTION,
FILTRATION, &
DISTRIBUTION**

DATE 9/30/2021
JOB NO. 2000114.00
SCALE Not to Scale
DRAWN BY BCC
CHECKED BY RAN
SHEET NO. **P-007**



REVISIONS			CHECKED	DRAWN
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1	9/29/2021	REVISED FOR COMMENTS ON PRELIM. SUBMISSION	RAN	VD
2	11/19/2021	REVISED FOR 2ND COMMENTS ON PRELIM. SUBMISSION	RAN	RH
3	4/04/2022	90% DESIGN SUBMISSION	RAN	KEM
		ISSUED FOR CONSTRUCTION	RAN	RAN
	9/16/2022		NMB	RAN



LIMIT OF CHEMICAL FEED ASSEMBLY
(SHOWN FOR ILLUSTRATIVE PURPOSES ONLY)
REFERENCE SKID FABRICATOR'S P&ID FOR ACTUAL CONFIGURATION

REVISIONS			CHECKED	DRAWN
NO.	DATE	DESCRIPTION		
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0	7/19/2021	PRELIMINARY DESIGN SUBMISSION	RAN	VO
1	9/29/2021	REVISED FOR COMMENTS ON PRELIM. SUBMISSION	RAN	VO
2	11/19/2021	REVISED FOR 2ND COMMENTS ON PRELIM. SUBMISSION	RAN	RH
3	4/04/2022	90% DESIGN SUBMISSION	RAN	KEM
4	9/16/2022	ISSUED FOR CONSTRUCTION	NMB	RAN

GROUNDWATER TREATMENT SYSTEM
UPGRADES

FOR

NICHOLSON LANDFILL

CHESTERTOWN TOWNSHIP
KENT COUNTY MARYLAND

DRAWING TITLE

P&ID

POLYMER

SYSTEM

DATE	9/30/202
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JOB NO.	2000114.00
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SCALE	Not to Scale
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CHECKED BY	RAM
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SHEET NO. **000**

P-009

4250 Crums Mill Road
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Harrisburg, PA 17112
t: 888.432.9663
f: 717.732.8596

The logo for DAWOOD features a stylized four-pointed star or compass rose icon to the left of the word "DAWOOD" in a bold, serif, all-caps font.

SCHEDULE OF SPECIAL INSPECTIONS

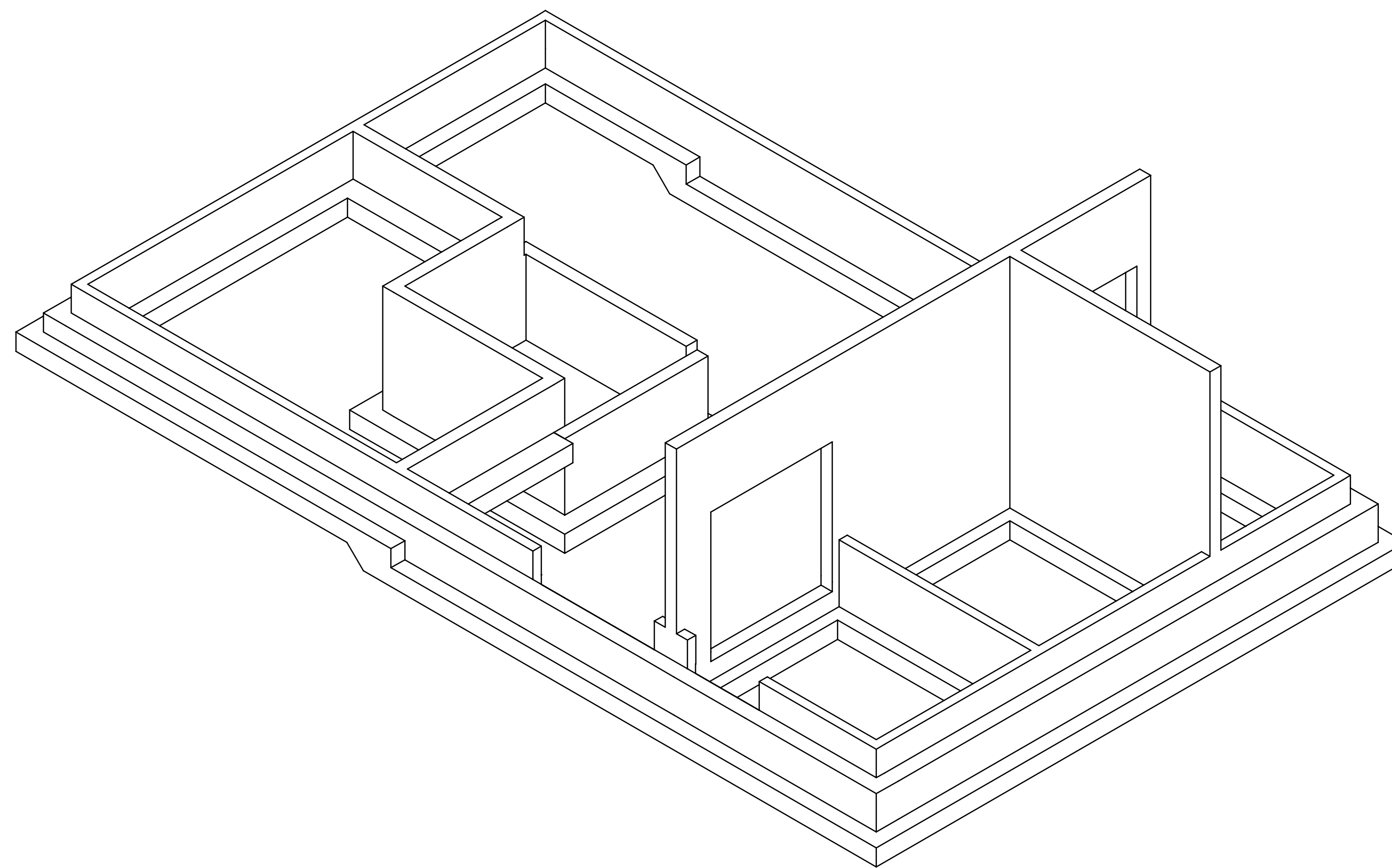
1. THIS DRAWING IS PROVIDED TO OUTLINE THE MINIMUM LEVEL OF SPECIAL INSPECTIONS DURING CONSTRUCTION TO ENSURE CONFORMANCE TO THE REQUIREMENTS OF THE CONTRACT DOCUMENTS. A STATEMENT OF SPECIAL INSPECTIONS WILL BE PREPARED BY A REGISTERED DESIGN PROFESSIONAL AND SUBMITTED WITH THE BUILDING PERMIT APPLICATION.
2. SPECIAL INSPECTIONS WILL BE CONDUCTED IN ACCORDANCE WITH THE REQUIREMENTS SET FORTH IN CHAPTER 17 OF THE INTERNATIONAL BUILDING CODE (IBC).
3. IN ACCORDANCE WITH THE REQUIREMENTS OF CHAPTER 17 OF THE INTERNATIONAL BUILDING CODE, THE OWNER WILL PROVIDE A SPECIAL INSPECTOR (AN APPROVED AGENCY OR AGENCIES, INDEPENDENT FROM THE CONTRACTOR AND EMPLOYING QUALIFIED PERSONNEL) TO PERFORM SPECIAL INSPECTIONS IDENTIFIED IN THE STATEMENT OF SPECIAL INSPECTIONS. THE SPECIAL INSPECTOR WILL FURNISH INSPECTION REPORTS TO THE ENGINEER AND BUILDING OFFICIAL.
4. SPECIAL INSPECTIONS SHALL NOT RELIEVE THE CONTRACTOR OF RESPONSIBILITY FOR QUALITY CONTROL OF THE WORK OR FOR CONFORMANCE TO THE REQUIREMENTS OF THE CONTRACT DOCUMENTS. DETECTION, OR FAILURE TO DETECT DEFECTS IN THE WORK SHALL NOT RELIEVE THE CONTRACTOR OF RESPONSIBILITY TO CORRECT ALL DEFECTS IN THE WORK, WHETHER DETECTED OR NOT, AND OF RESPONSIBILITY FOR CONFORMANCE TO THE REQUIREMENTS OF THE CONTRACT DOCUMENTS.
5. REMOVE AND REPLACE, OR REPAIR, DEFECTS IN THE WORK AND WORK NOT IN CONFORMANCE WITH THE REQUIREMENTS OF THE CONTRACT DOCUMENTS AT NO ADDITIONAL COST TO THE OWNER. CONTRACTOR SHALL BEAR THE COSTS FOR THE INSPECTION OF ANY REPLACED OR REPAIRED PORTIONS OF THE WORK.
6. CONTRACTOR WILL COOPERATE WITH SPECIAL INSPECTIONS BY PROVIDING SUFFICIENT NOTICE FOR THE SCHEDULING OF PERSONNEL AND BY ALLOWING FREE AND SAFE ACCESS TO THE WORK FOR OBSERVATION, VERIFICATION, SAMPLING AND INSPECTIONS. PROVIDE AND PERMIT THE USE OF LADDERS, SCAFFOLDING, INCIDENTAL EQUIPMENT, AND SAFETY EQUIPMENT AS MAY BE REQUIRED TO CONDUCT SPECIAL INSPECTIONS. ALL SUCH PROVISIONS FOR FREE AND SAFE ACCESS AND EQUIPMENT SHALL BE SAFE, IN GOOD WORKING CONDITION, AND ERECTED, MAINTAINED, AND HANDLED BY QUALIFIED PERSONNEL.
7. SPECIAL INSPECTIONS DO NOT APPLY TO CONTRACTOR'S EQUIPMENT, TEMPORARY STRUCTURES USED FOR CONSTRUCTION, MEANS AND METHODS OF CONSTRUCTION, OR SITE SAFETY. CONTRACTOR SHALL REMAIN RESPONSIBLE FOR ADEQUACY AND SAFETY OF EQUIPMENT, TEMPORARY STRUCTURES USED FOR CONSTRUCTION, MEANS, AND METHODS OF CONSTRUCTION, MEANS AND METHODS OF CONSTRUCTION SITE SAFETY.

TABLE 1 - REQUIRED VERIFICATION AND INSPECTIONS OF SOILS (IBC, TABLE 1705.6)

INSPECTION REQUIRED	ITEM NO.	VERIFICATION AND INSPECTION	IBC SECTION	INSPECTION FREQUENCY		REFERENCED STANDARD
				CONTINUOUS	PERIODIC	
X	1	VERIFY MATERIALS BELOW SHALLOW FOUNDATIONS ARE ADEQUATE TO ACHIEVE THE DESIGN BEARING CAPACITY	1705.6	-	X	CONTRACT DOCUMENTS AND GEOTECHNICAL REPORT
X	2	VERIFY EXCAVATIONS ARE EXTENDED TO PROPER DEPTH AND HAVE REACHED PROPER MATERIAL.	1705.6	-	X	
X	3	PERFORM CLASSIFICATION AND TESTING OF COMPACTED FILL MATERIALS.	1705.6	-	X	
X	4	VERIFY USE OF PROPER MATERIALS, DENSITIES AND LIFT THICKNESSES DURING PLACEMENT AND COMPACTION OF COMPACTED FILL.	1705.6	X	-	
X	5	PRIOR TO PLACEMENT OF COMPACTED FILL, INSPECT SUBGRADE AND VERIFY THAT SITE HAS BEEN PREPARED PROPERLY.	1705.6	-	X	

TABLE 2 - REQUIRED VERIFICATION AND INSPECTION OF CONCRETE (IBC, TABLE 1705.3)

INSPECTION REQUIRED**	ITEM NO.	VERIFICATION AND INSPECTION	IBC SECTION	INSPECTION FREQUENCY		REFERENCED STANDARD
				CONTINUOUS	PERIODIC	
X	1	VERIFY MATERIALS BELOW SHALLOW FOUNDATIONS ARE ADEQUATE TO ACHIEVE THE DESIGN BEARING CAPACITY	1908.4	X	-	ACI 318 CH. 20, 25.2, 25.3, 26.6.1- 26.6.3
	2	REINFORCING BAR WELDING: a. VERIFY WELDABILITY OF REINFORCING BARS OTHER THAN ASTM A706; b. INSPECT SINGLE- PASS FILLET WELDS, MAXIMUM 5/16 AND c. INSPECT ALL OTHER WELDS	-	- - -	- - -	AWS D1.4, ACI 318: 26.6.4
X	3	INSPECT ANCHORS CAST IN CONCRETE.	-	X	-	ACI 318: 17.8.2
X	4	INSPECT ANCHORS POST- INSTALLED IN HARDENED CONCRETE MEMBERS. a. ADHESIVE ANCHORS INSTALLED IN HORIZONTALLY OR UPWARDLY INCLINED ORIENTATIONS TO RESIST SUSTAINED TENSION LOADS. b. MECHANICAL ANCHORS AND ADHESIVE ANCHORS NOT DEFINED IN 4.A.	-	X X	- -	ACI 318:17.8.2.4 ACI 318:17.8.2
X	5	VERIFY USE OF REQUIRED DESIGN MIX.	1904.1, 1904.2, 1908.2, 1908.3	-	X	ACI 318: CH. 19, 26.4.3, 26.4.4
X	6	PRIOR TO CONCRETE PLACEMENT, FABRICATE SPECIMENS FOR STRENGTH TESTS, PERFORM SLUMP AND AIR CONTENT TESTS, AND DETERMINE THE TEMPERATURE OF THE CONCRETE.	1908.10	X	-	ASTM C172 ASTM C31 ACI 318: 26.4, 26.12
X	7	INSPECT CONCRETE AND SHOTCRETE PLACEMENT FOR PROPER APPLICATION TECHNIQUES.	1908.6 1908.7 1908.8	X	-	ACI 318: 26.5
X	8	VERIFY MAINTENANCE OF SPECIFIED CURING TEMPERATURE AND TECHNIQUES.	1908.9	-	X	ACI 318: 26.5.3- 26.5.5
	9	INSPECT PRESTRESSED CONCRETE FOR: a. APPLICATION OF PRESTRESSING FORCES; AND b. GROUTING OF BONDED PRESTRESSING TENDONS	-	- -	- -	ACI 318: 26.10
	10	INSPECT ERECTION OF PRECAST CONCRETE MEMBERS.	-	-	-	ACI 318: CH 26.8
	11	VERIFY IN- SITU CONCRETE STRENGTH PRIOR TO STRESSING OF TENDONS IN POST- TENSIONED CONCRETE AND PRIOR TO REMOVAL OF SHORES AND FORMS FROM BEAMS AND STRUCTURAL SLABS.	-	-	-	ACI 318: 26.11.2
X	12	INSPECT FORMWORK FOR SHAPE, LOCATION AND DIMENSIONS OF THE CONCRETE MEMBER BEING FORMED.	-	-	X	ACI 318: 26.11.1.2(b)



① FOOTINGS, FOUNDATIONS, AND INTERIOR WALLS ISOMETRIC
NTS



GROUNDWATER TREATMENT SYSTEM UPGRADES FOR NICHOLSON TREATMENT PLANT CHESTERTOWN TOWNSHIP KENT COUNTY, MARYLAND

DRAWING TITLE

**SPECIAL
INSPECTION
TABLES**

DATE	9/21/2022
JOB NO	2000114.00
SCALE	12" = 1'-0"
DRAWN BY	VD
CHECKED BY	ACJ
SHEET NO	

S002

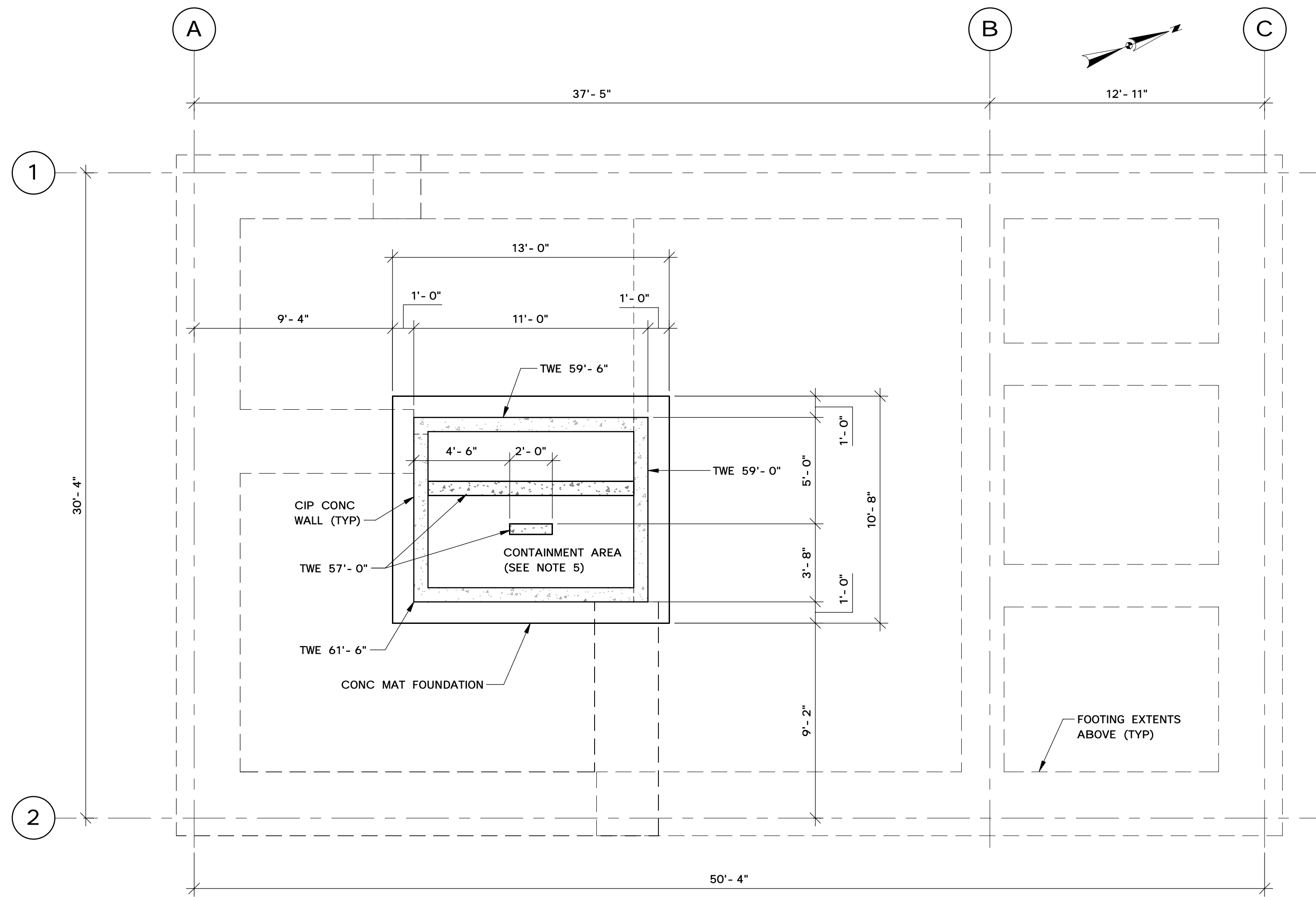
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NO.	DESCRIPTION		
0	ISSUED FOR DESIGN REVIEW		6/03/2022
1	ISSUED FOR CONSTRUCTION		9/21/2022



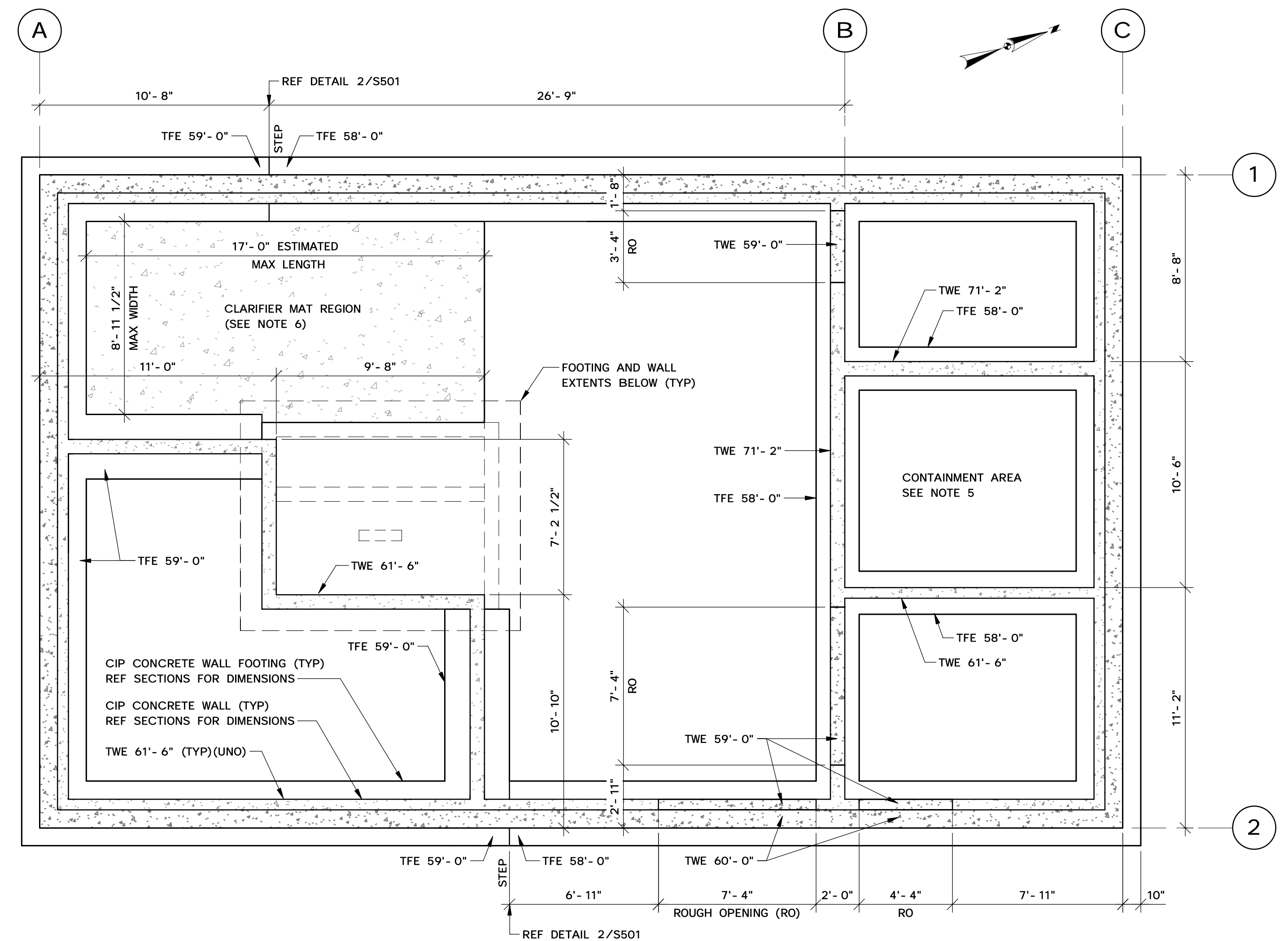
4250 Crums Mill Road
Suite 301
Harrisburg, PA 17112
t: 855.432.9663
f: 717.732.8596

DAWOOD

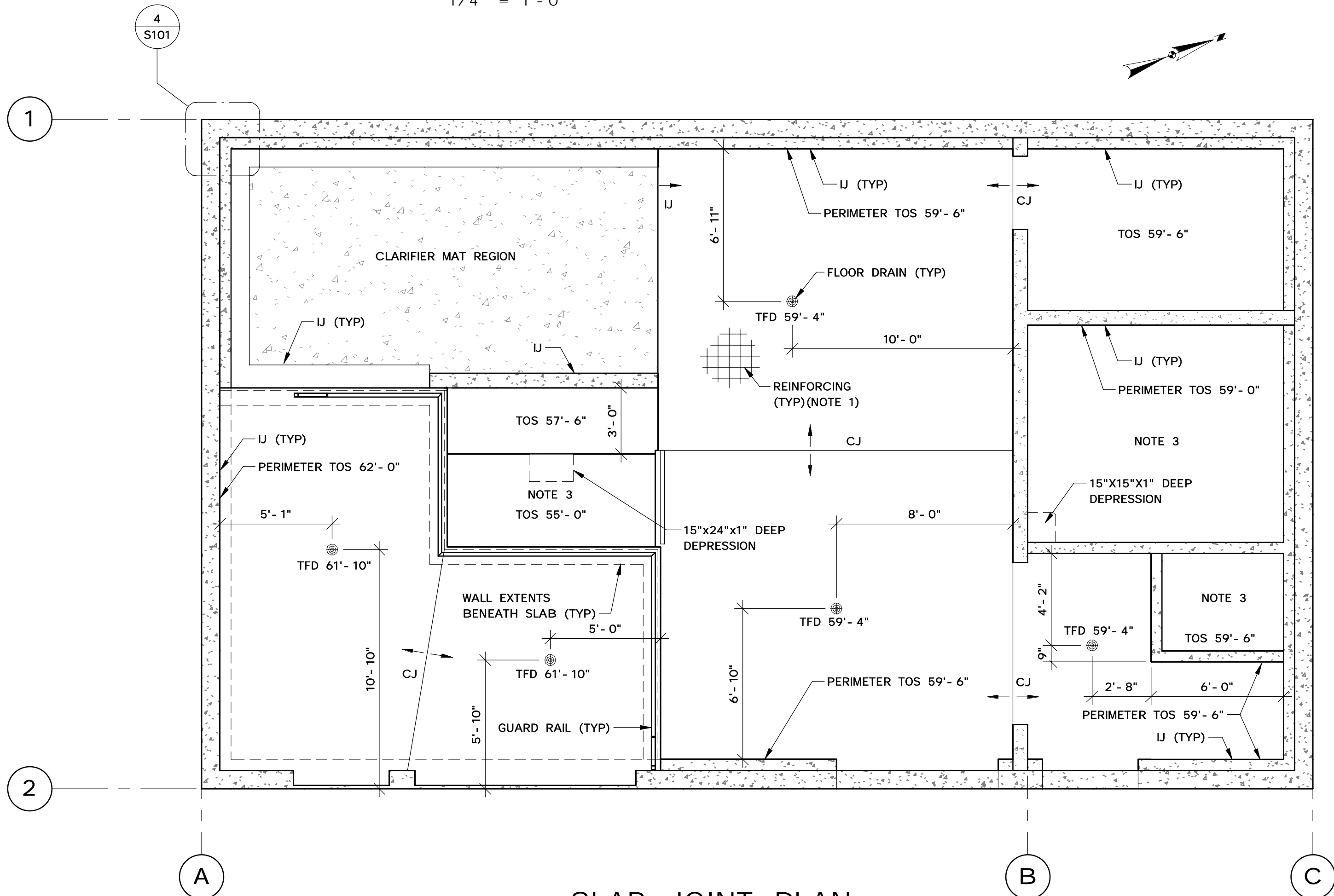
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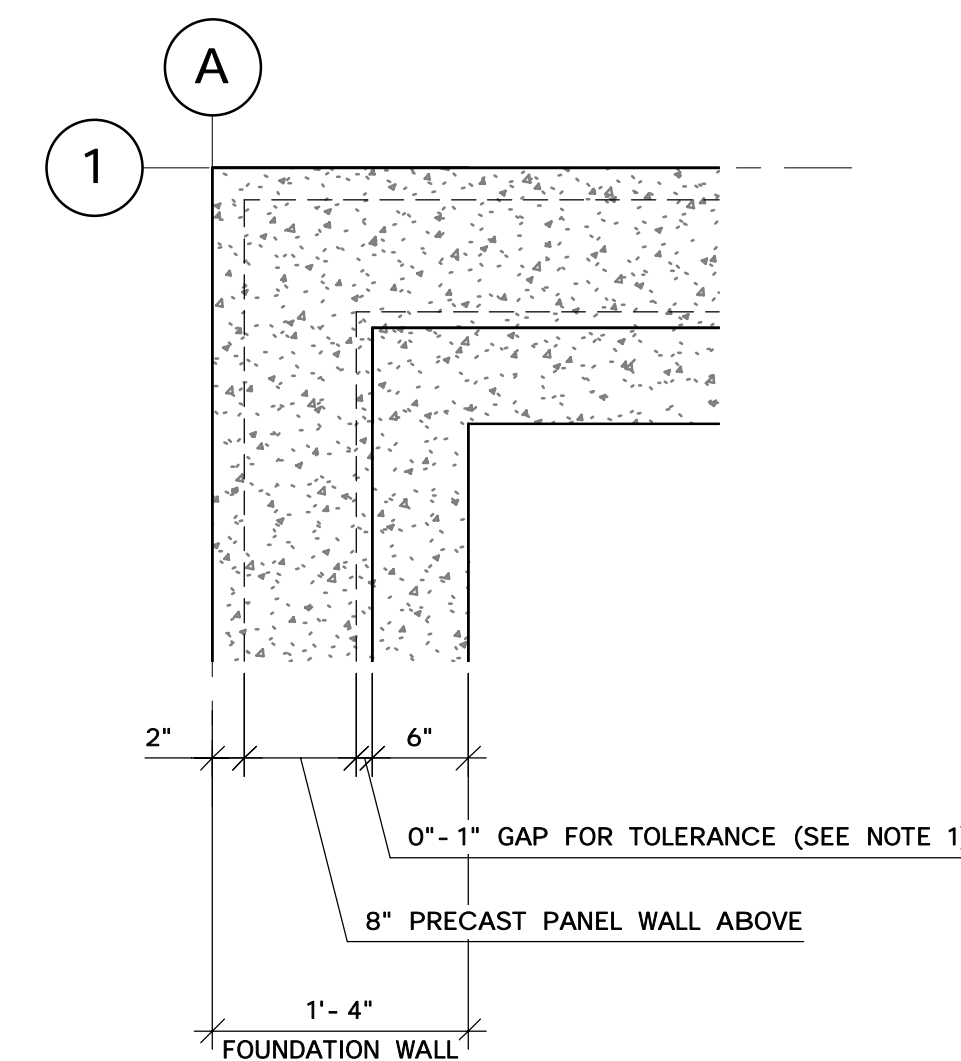
① FOUNDATION PLAN SUMP AREA
1/4" = 1'-0"



② FOUNDATION PLAN GROUND LEVEL
1/4" = 1'-0"



③ SLAB JOINT PLAN
1/4" = 1'-0"



④ GRID REFERENCE DETAIL
1" = 1'-0"

NOTES

1. MINIMUM 6" CONCRETE SLAB. SLOPE CONCRETE MINIMUM 1/8" PER FOOT MIN TO DRAINS AND SUMPS. REINFORCE WITH 6X6-W1.4XW1.4 WELDED WIRE MESH. PLACE 2" BELOW SLAB SURFACE.
2. TFD = TOP OF FLOOR DRAIN ELEVATION
3. SECONDARY CONTAINMENT AREA, FLOOR SLAB, AND WALLS TO RECEIVE EPOXY COATING. SEE SPECIFICATIONS.
4. ARROWS AT CONSTRUCTION JOINT (CJ) INDICATE INTENDED SLAB SLOPE DIRECTION FROM THE JOINT.
5. ENSURE THAT THE FOUR WALLS SURROUNDING AREAS LABELED AS CONTAINMENT ARE POURED MONOLITHICALLY.
6. CLARIFIER FOUNDATION TO BE DESIGNED BY VENDOR'S ENGINEER. DESIGN MAT TO SUPPORT BOTH ACCESS STAIRS AND CLARIFIER. MAT BASE TO BE AT ELEVATION 58'-0". VENDOR'S ENGINEER TO SUBMIT FOUNDATION DESIGN FOR REVIEW BY EOR ONCE COMPLETE. APPROXIMATED DIMENSIONS PROVIDED.



DAWOOD

4250 Chums Mill Road
Suite 301 PA 17112
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F: 717.732.8596

NO.	REVISIONS	DATE	DESCRIPTION
0	ISSUED FOR DESIGN REVIEW	6/03/2022	
1	ISSUED FOR CONSTRUCTION	9/21/2022	

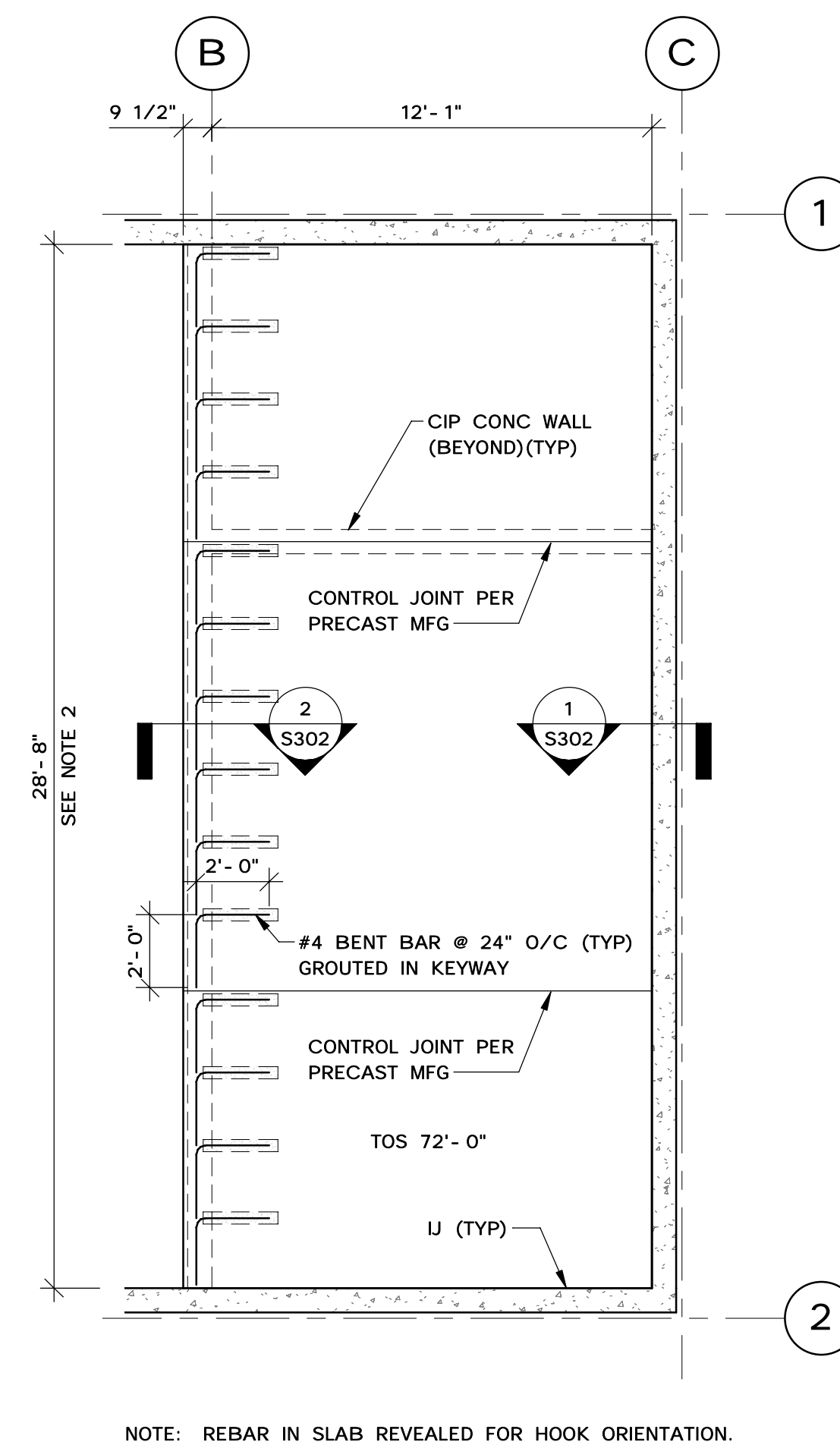
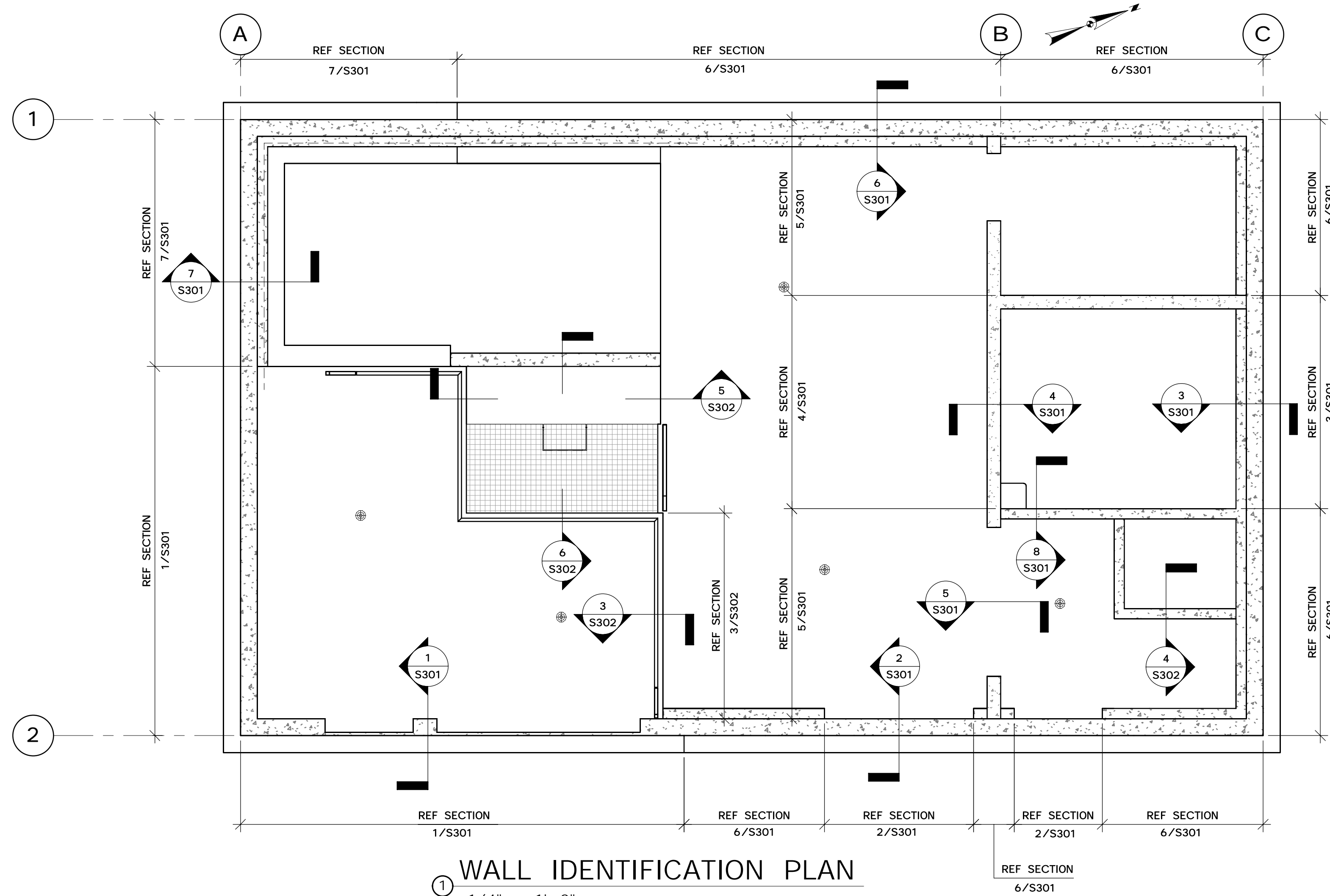
**GROUNDWATER TREATMENT
SYSTEM UPGRADES**

FOR
NICHOLSON TREATMENT PLANT

CHESTERTOWN TOWNSHIP
KENT COUNTY, MARYLAND

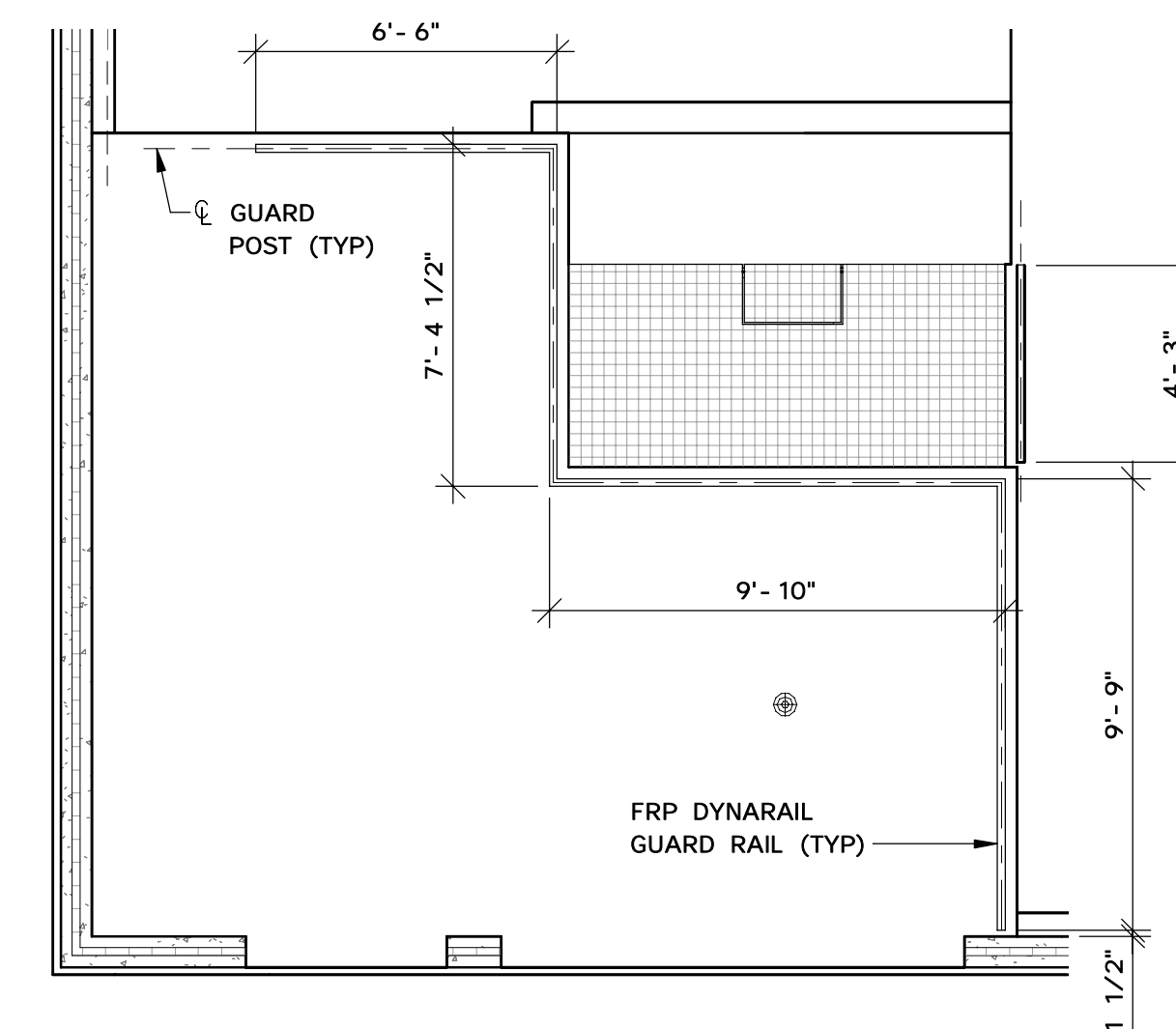
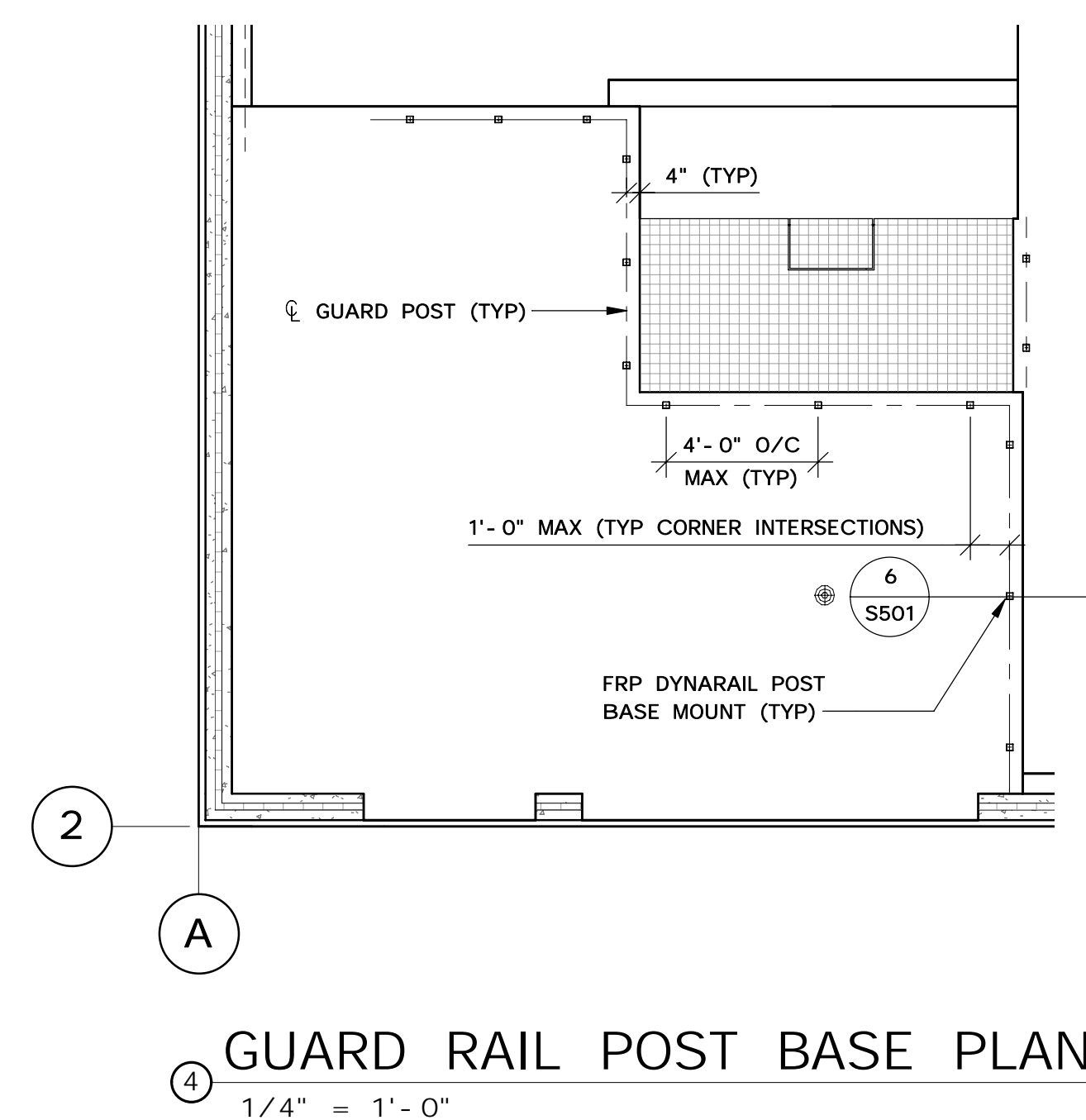
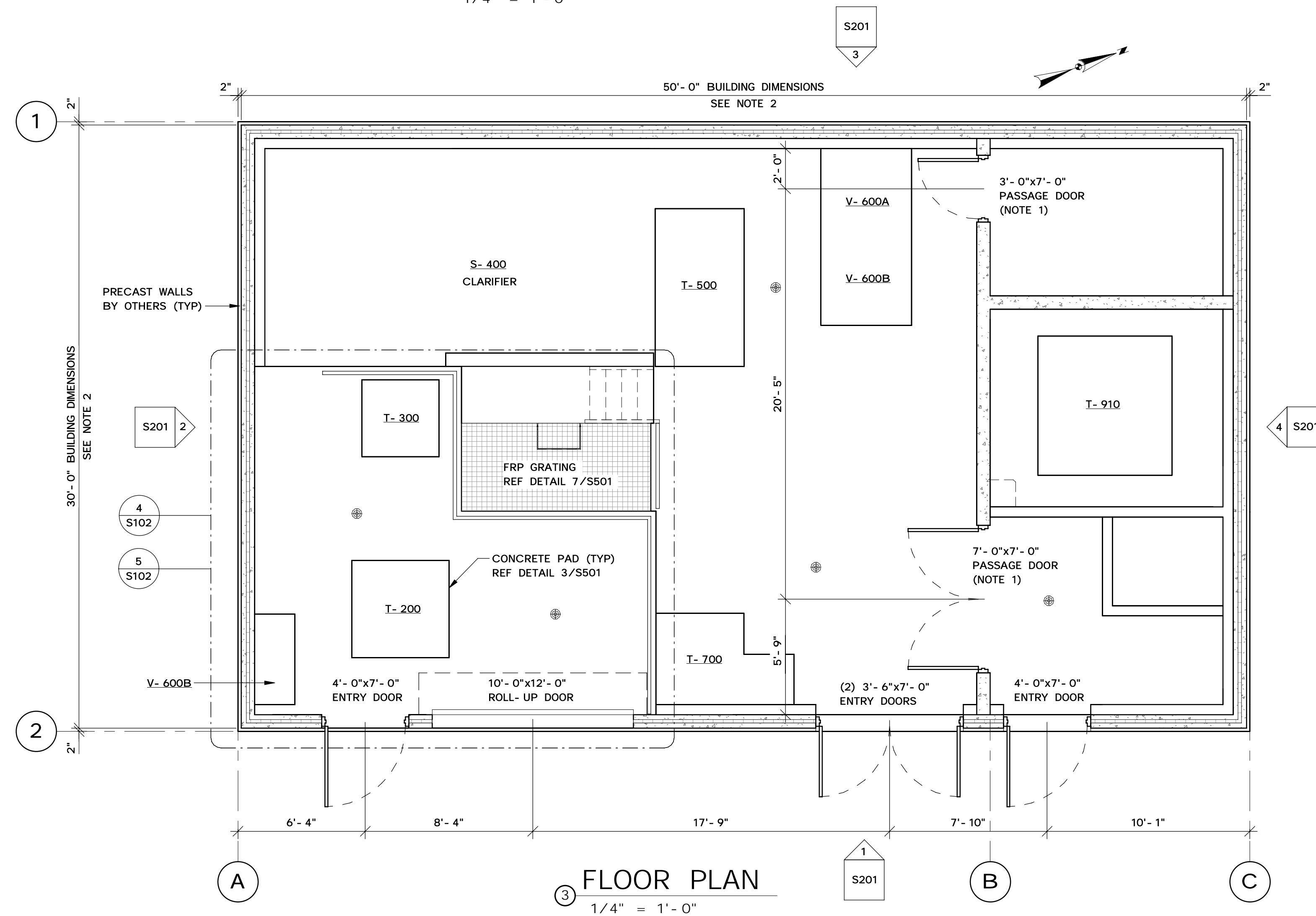
DRAWING TITLE
**FOUNDATION
& SLAB JOINT
PLANS**

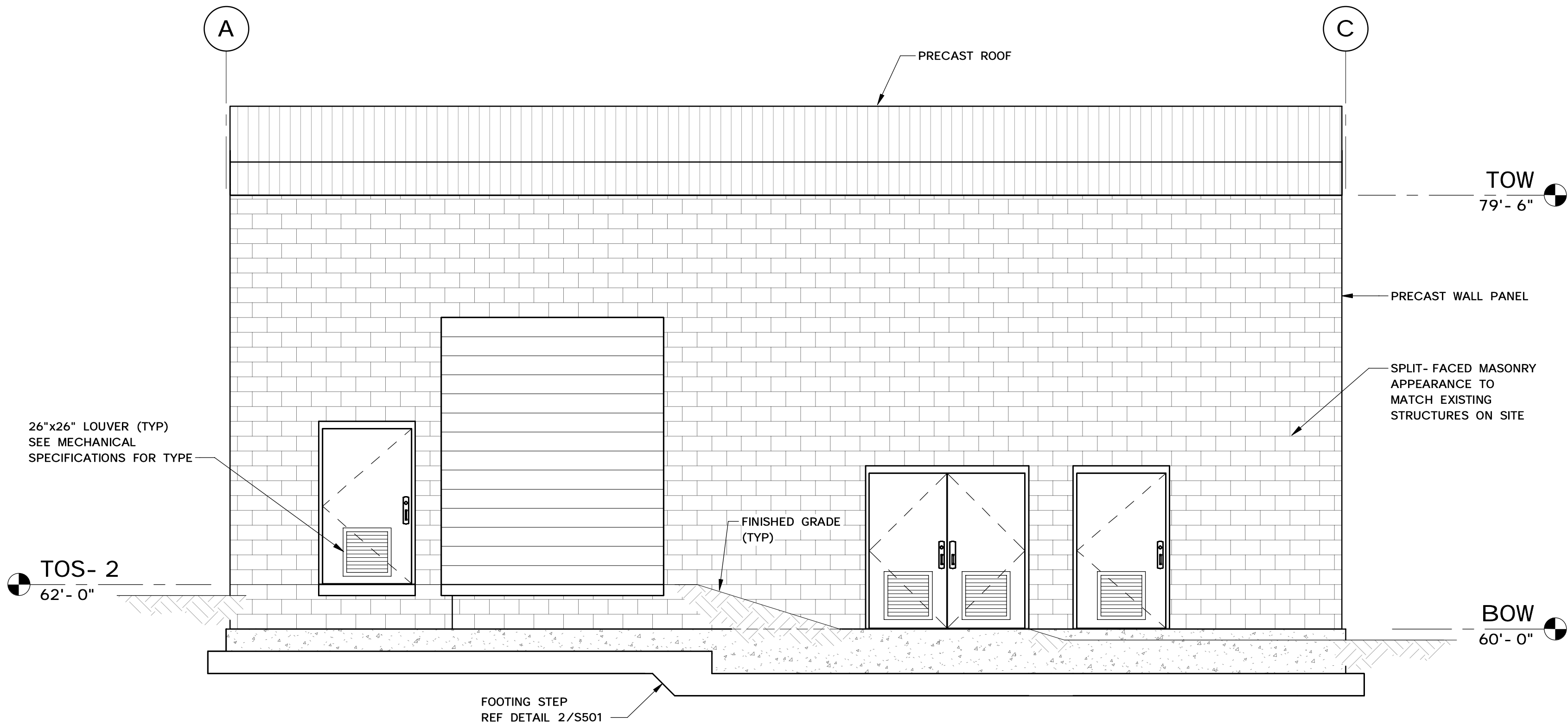
DATE	9/21/2022
JOB NO	2000114.00
SCALE	As indicated
DRAWN BY	VD
CHECKED BY	ACJ
SHEET NO	S101



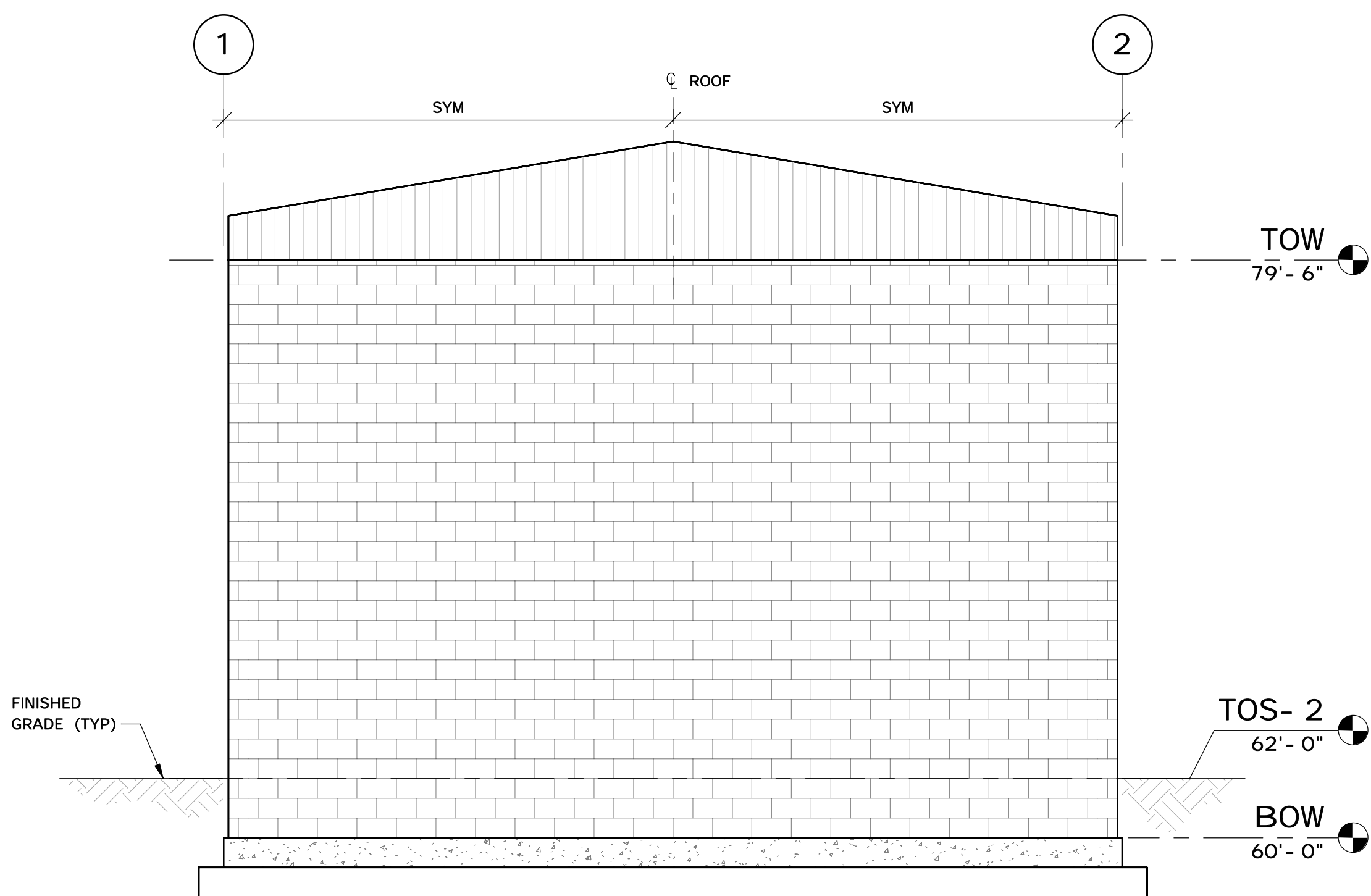
NOTE

1. PRECAST WALL MANUFACTURER TO PROVIDE INTERIOR PASSAGE DOORS AND DOOR HARDWARE FOR THE CAST IN PLACE WALL. SHIP LOOSE FOR FIELD INSTALL.
2. IF ADVANTAGEOUS, THE PRECAST WALL PANEL MANUFACTURER CAN UNIFORMLY INCREASE OVERALL LENGTH AND WIDTH OF BUILDING UP TO 2" TOTAL TO ENSURE PROPER FIT/TOLERANCE ON FOUNDATION. IF BUILDING DIMENSIONS ARE INCREASED, PRECAST WALL MANUFACTURER TO PROVIDE SEALING DETAIL TO ADDRESS NEWLY CREATED ANNULAR CAVITY SPACE BETWEEN PANEL AND FOUNDATION WALL.

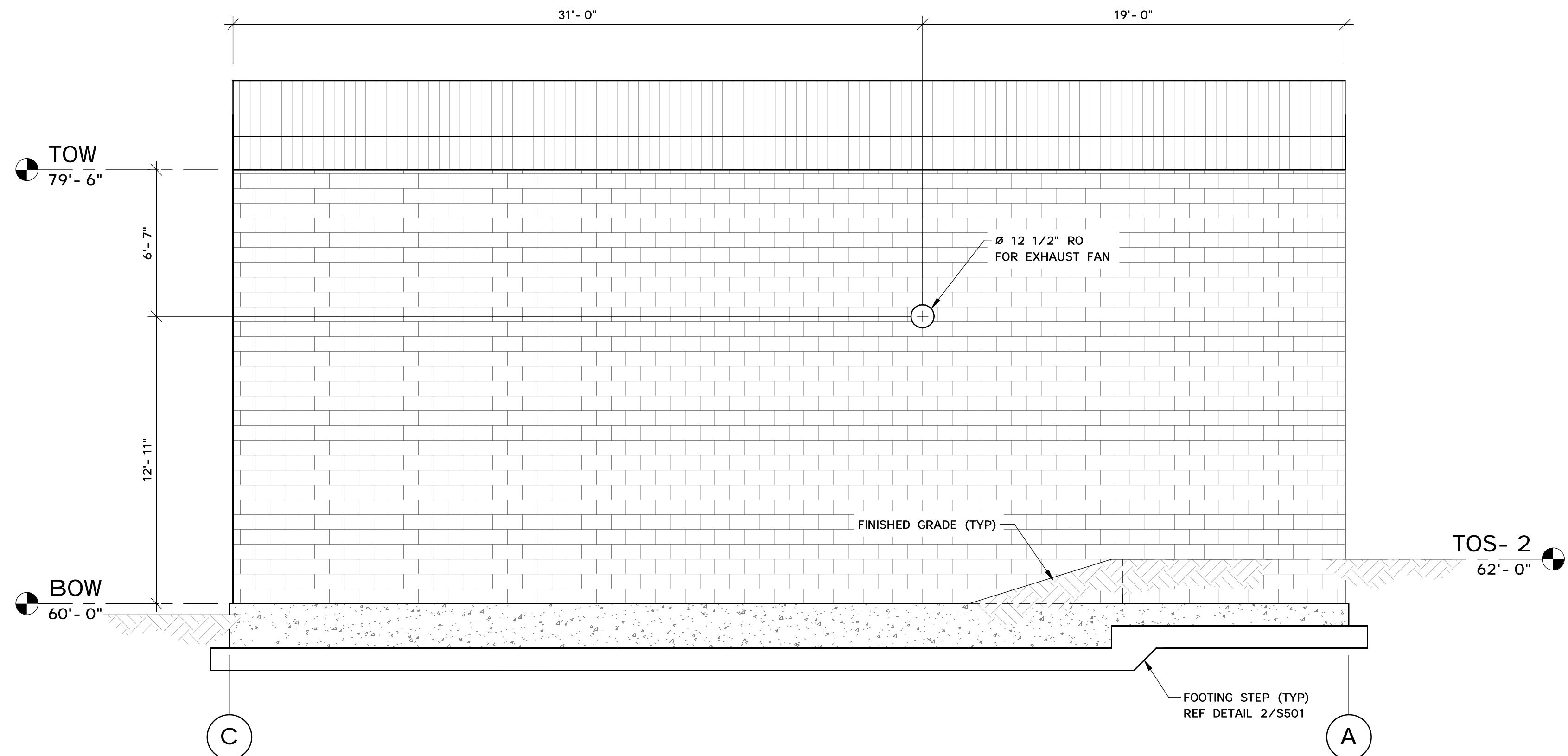




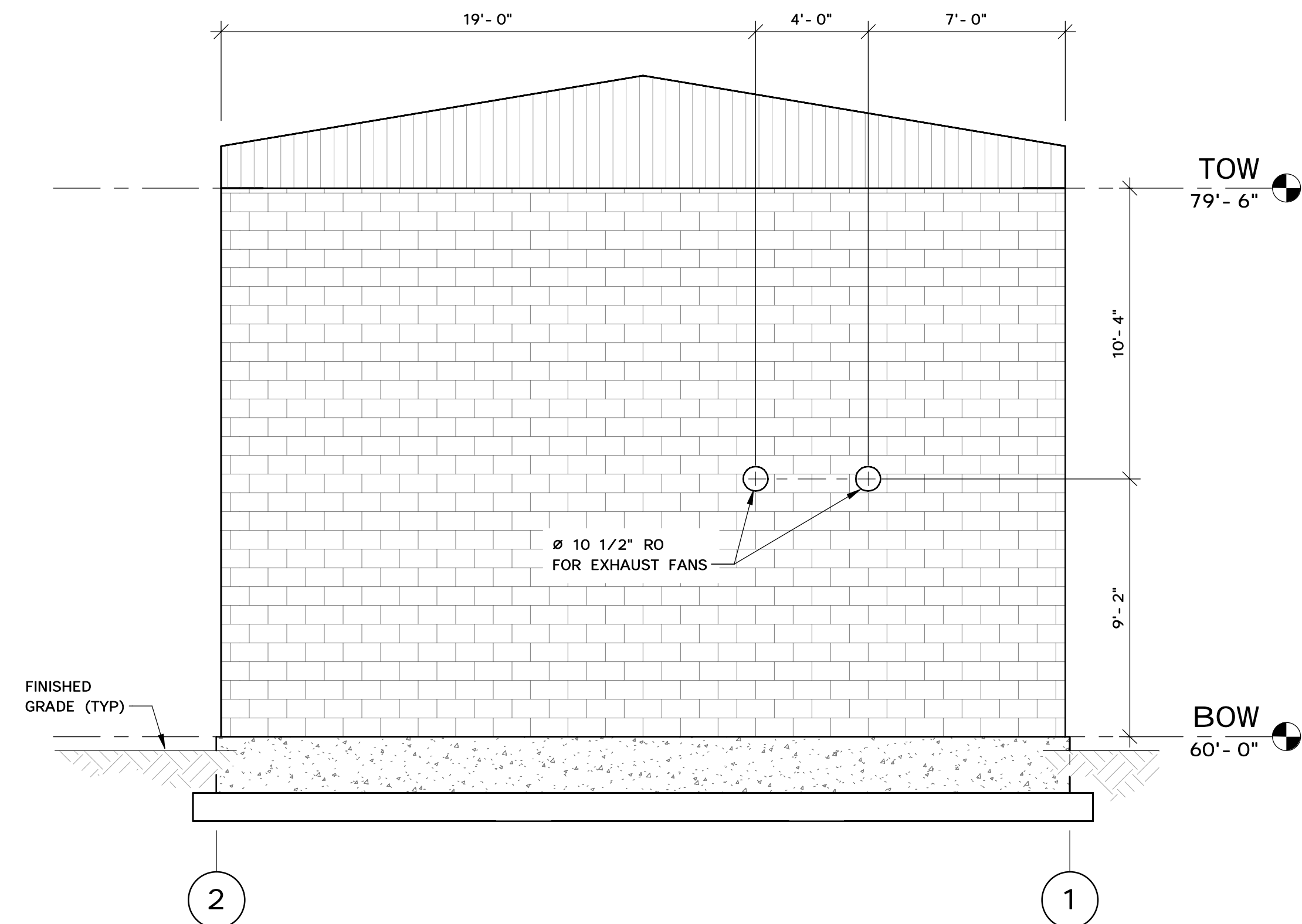
① SOUTH EAST ELEVATION
1/4" = 1'-0"



② SOUTH WEST ELEVATION
1/4" = 1'-0"



③ NORTH WEST ELEVATION
1/4" = 1'-0"



④ NORTH EAST ELEVATION
1/4" = 1'-0"



DAWOOD

4250 Chums Mill Road
Suite 301 - PA 17112
P: 855.432.8663
F: 717.732.8596

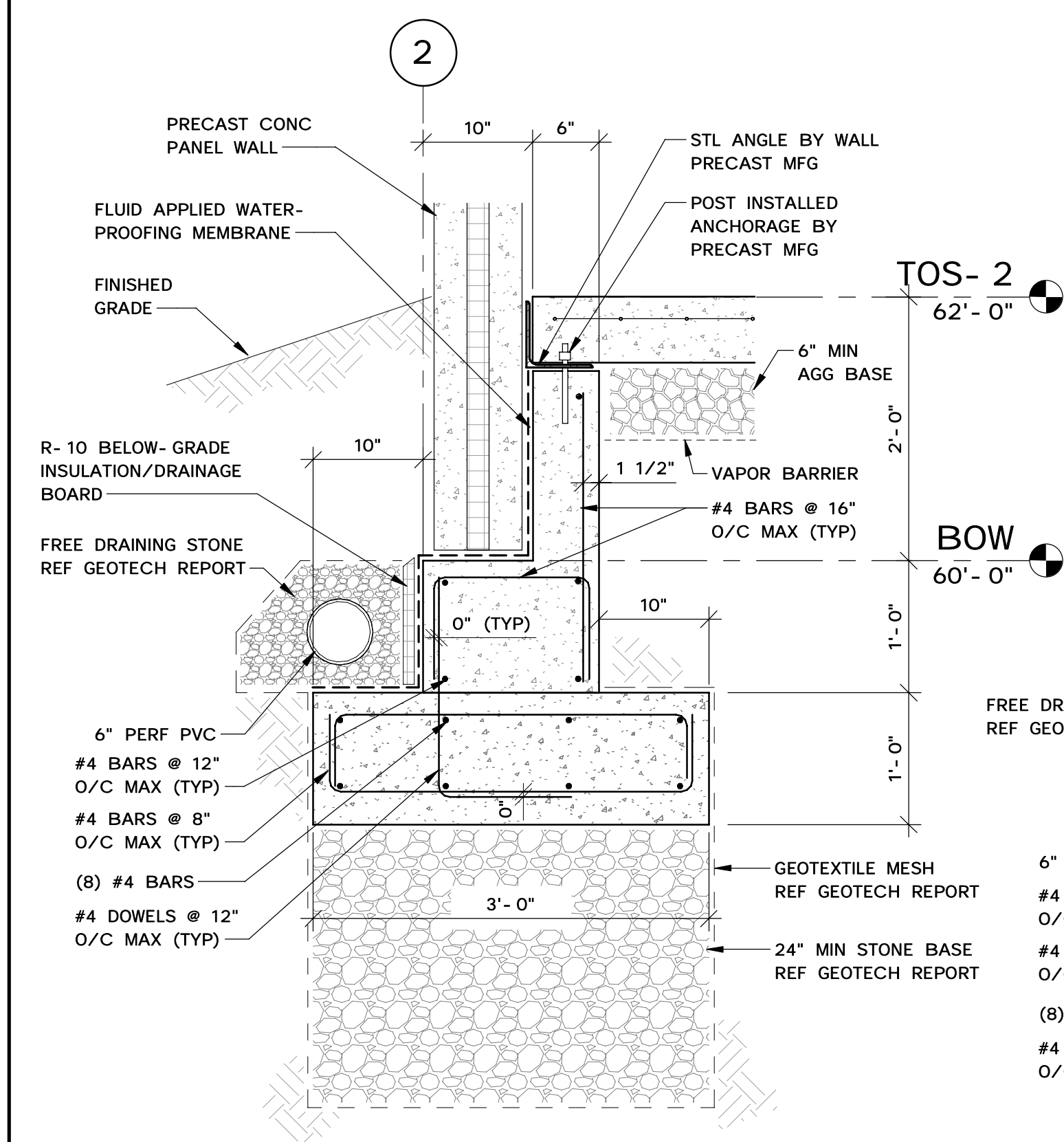
REVISIONS	
NO.	DESCRIPTION
0	ISSUED FOR DESIGN REVIEW
1	ISSUED FOR CONSTRUCTION

GROUNDWATER TREATMENT
SYSTEM UPGRADES
FOR
NICHOLSON TREATMENT PLANT
CHESTERTOWN TOWNSHIP
KENT COUNTY, MARYLAND

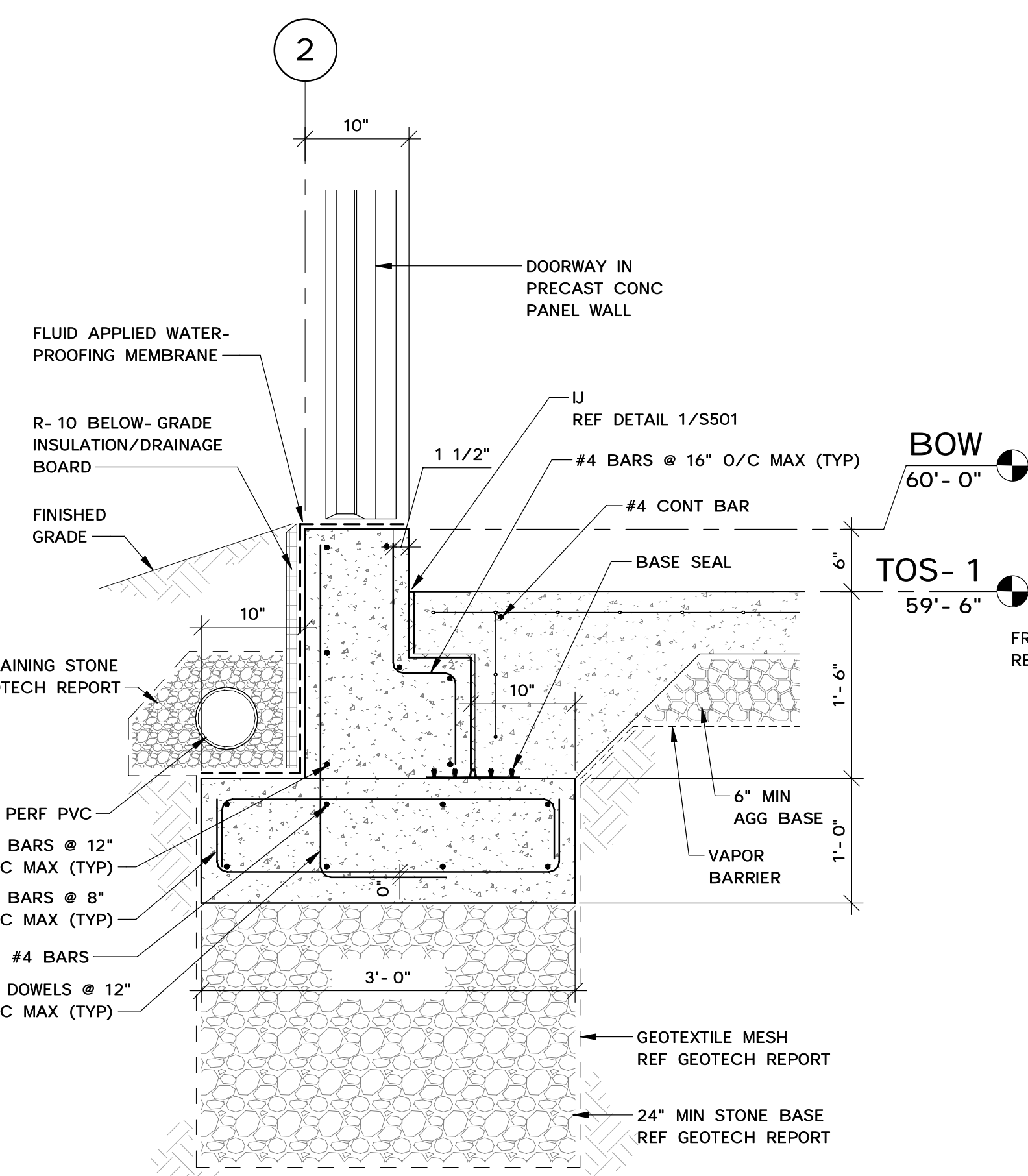
DRAWING TITLE
ELEVATIONS

DATE	9/21/2022
JOB NO	2000114.00
SCALE	1/4" = 1'-0"
DRAWN BY	VD
CHECKED BY	ACJ
SHEET NO	S201

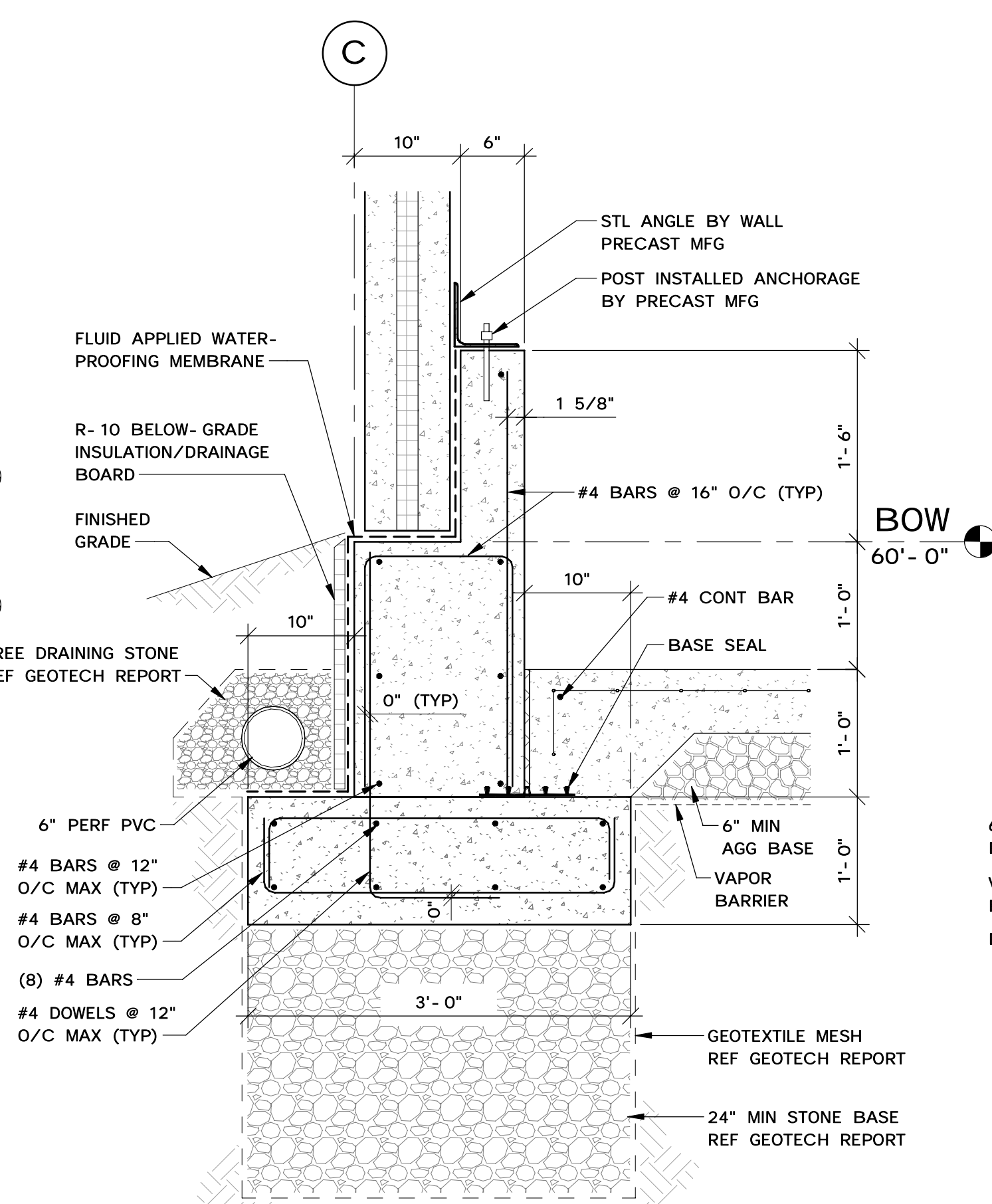
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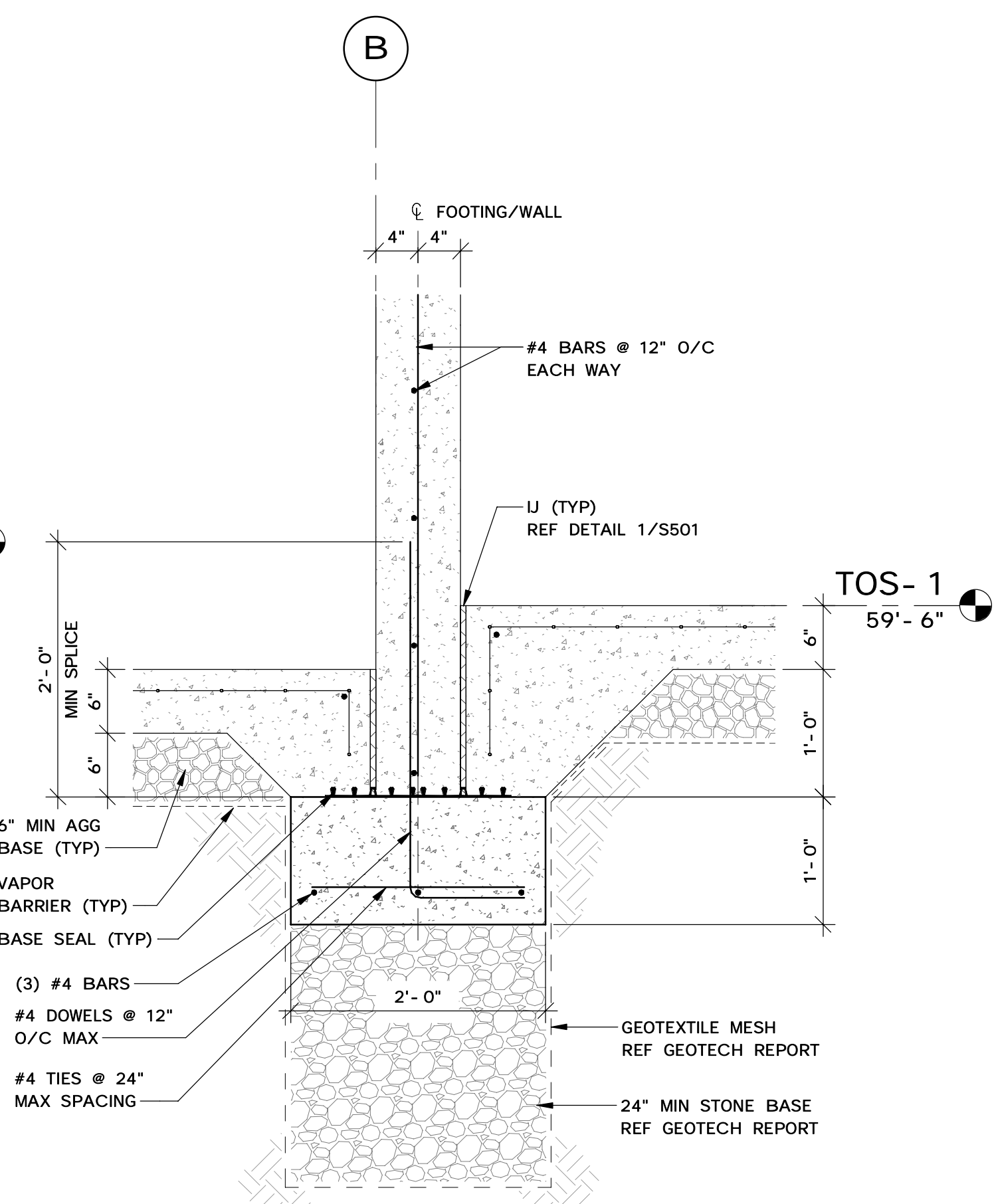
SECTION A-A
1" = 1'-0"



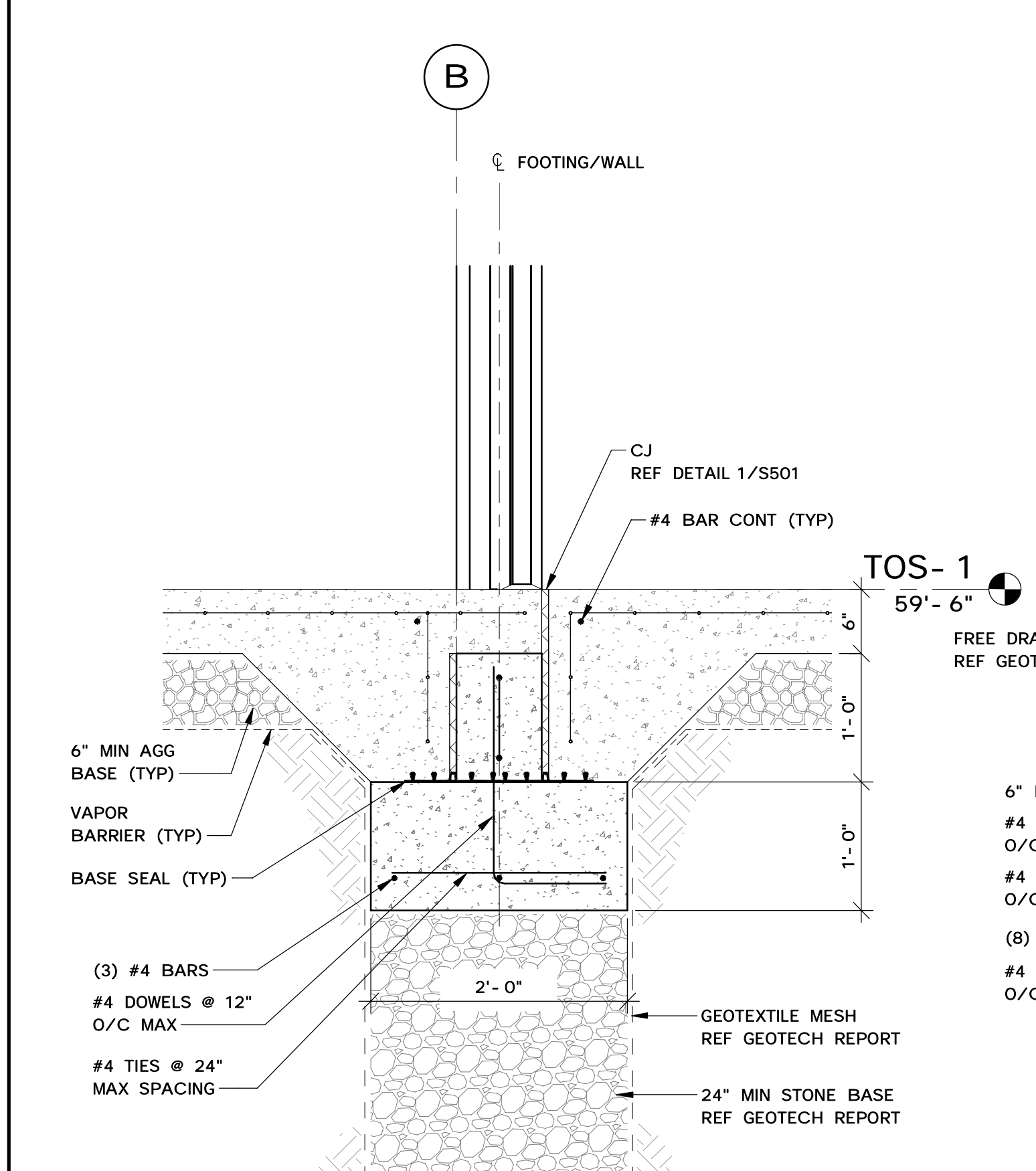
SECTION B-B
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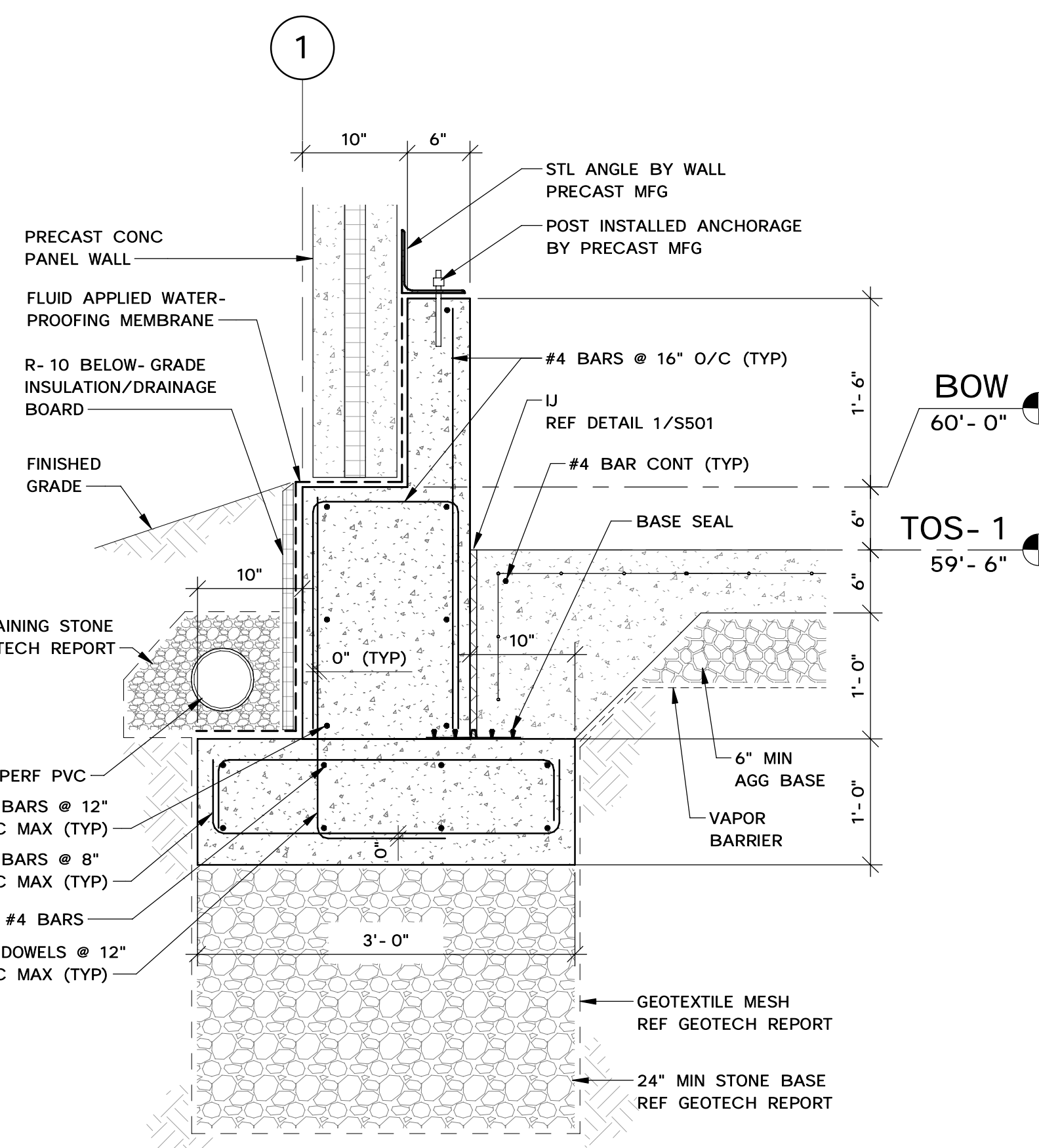
SECTION C-C
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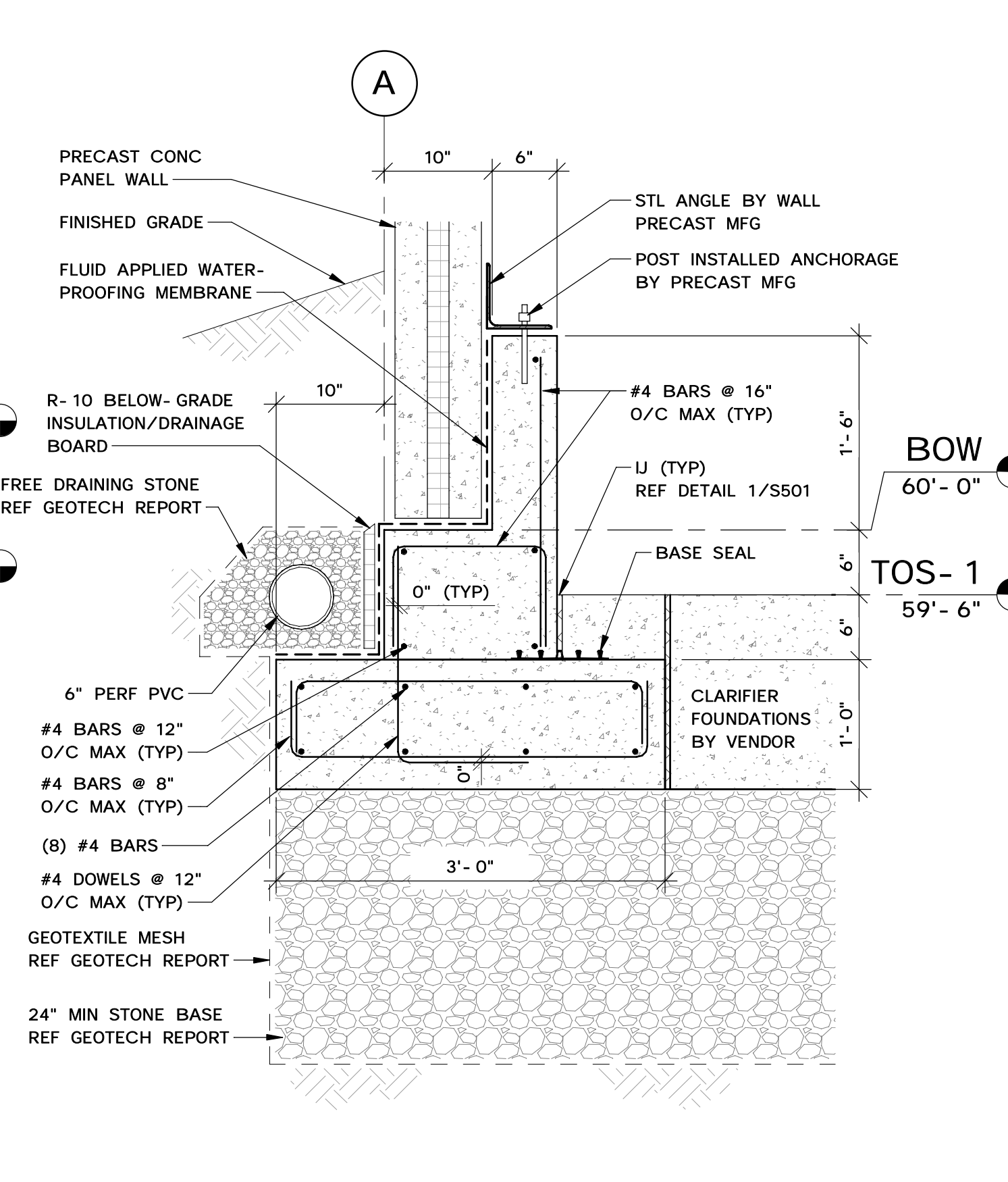
SECTION D-D
1" = 1'-0"



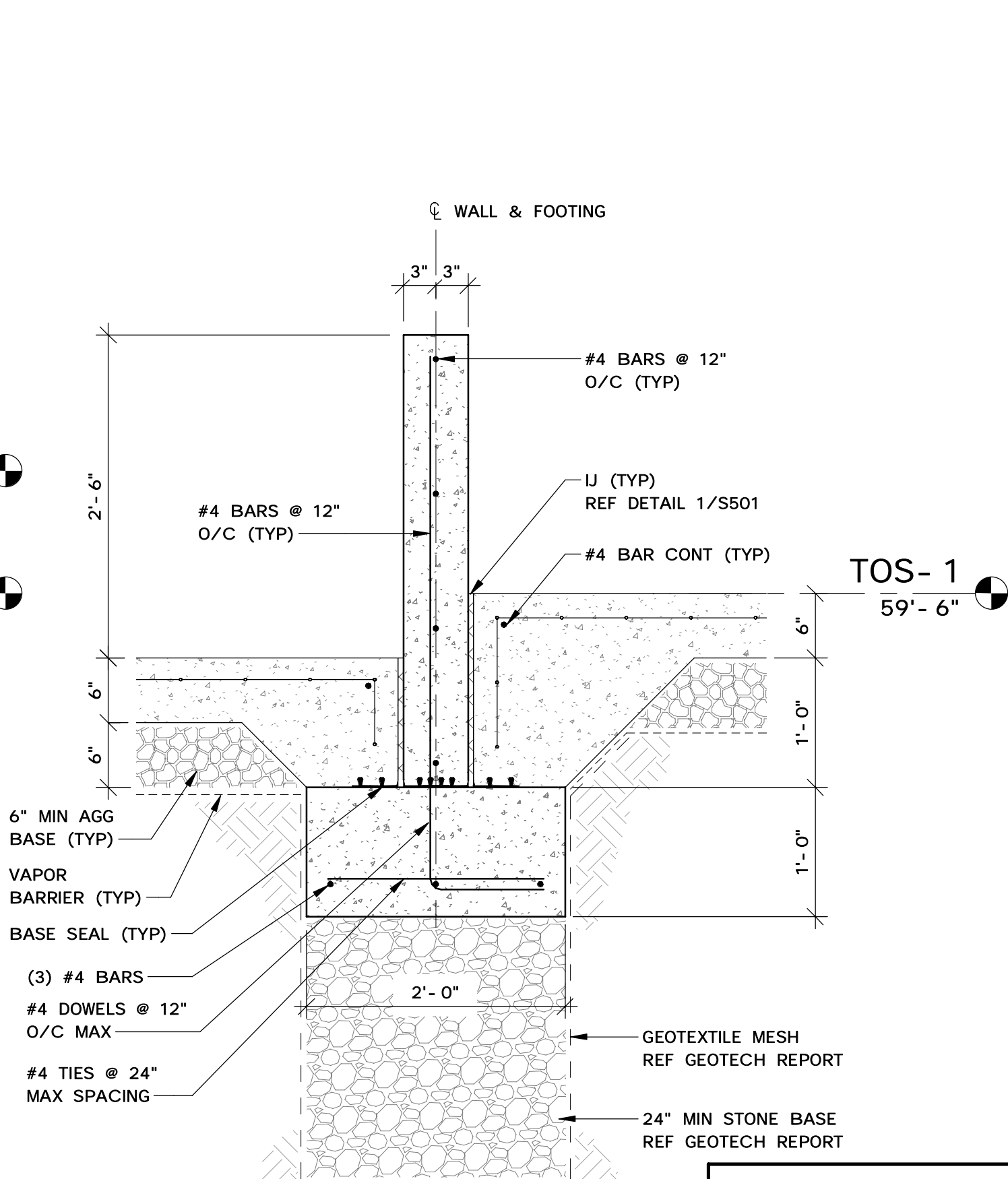
SECTION E-E
1" = 1'-0"



SECTION F-F
1" = 1'-0"



SECTION G-G
1" = 1'-0"



SECTION H-H
1" = 1'-0"



DAWOOD

4250 Chums Mill Road
Suite 301 PA 17112
TEL: 855-432-8663
F: 717-732-8596

REVISIONS	
NO.	DESCRIPTION
0	ISSUED FOR DESIGN REVIEW
1	ISSUED FOR CONSTRUCTION

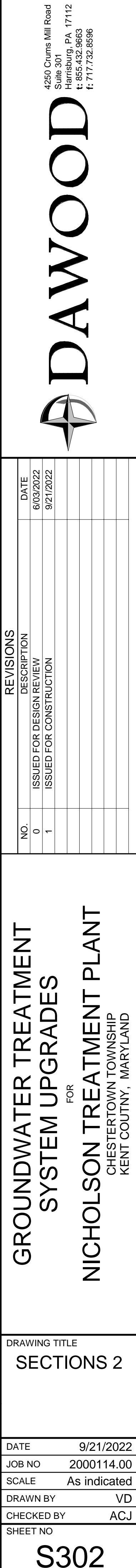
GROUNDWATER TREATMENT
SYSTEM UPGRADES

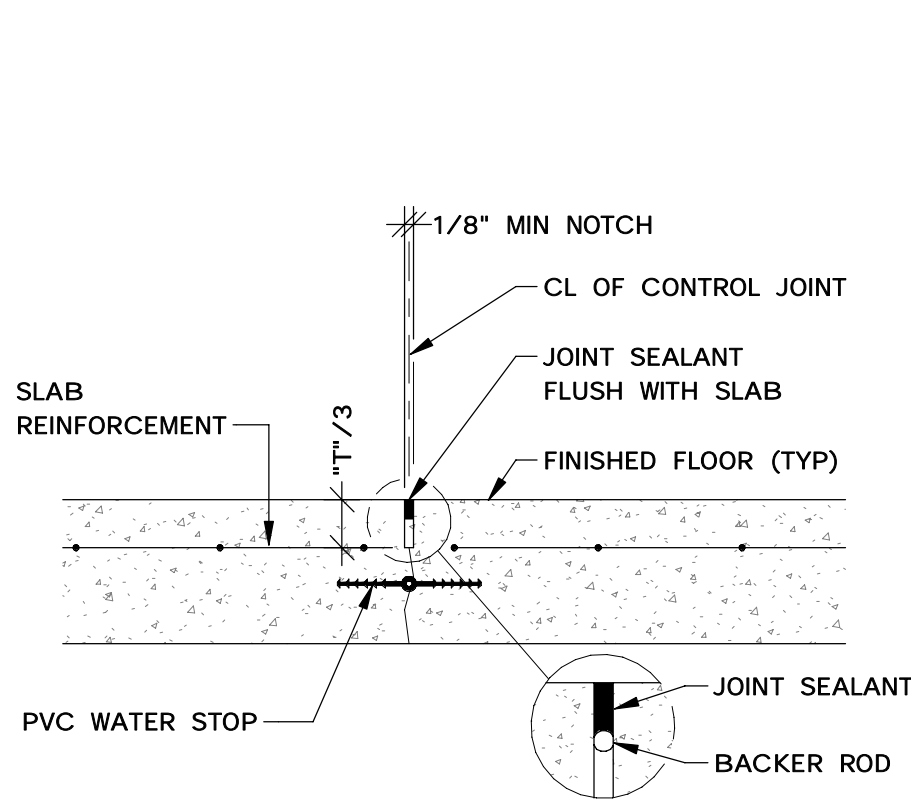
FOR
NICHOLSON TREATMENT PLANT
CHESTERTOWN TOWNSHIP
KENT COUNTY, MARYLAND

DRAWING TITLE

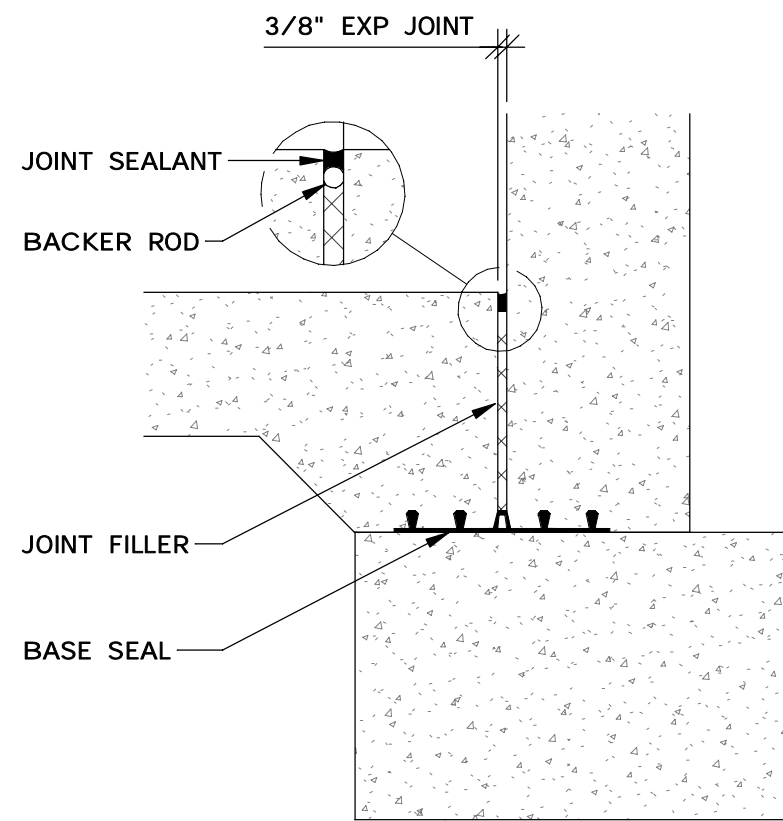
SECTIONS 1

DATE	9/21/2022
JOB NO	2000114.00
SCALE	1" = 1'-0"
DRAWN BY	VD
CHECKED BY	ACJ
SHEET NO	S301

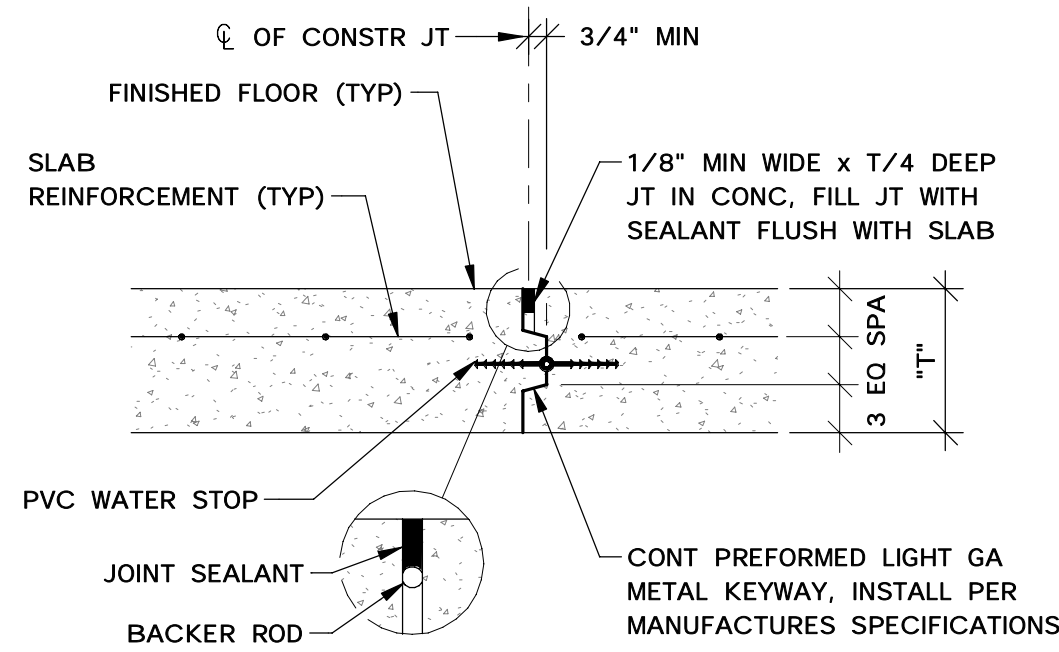




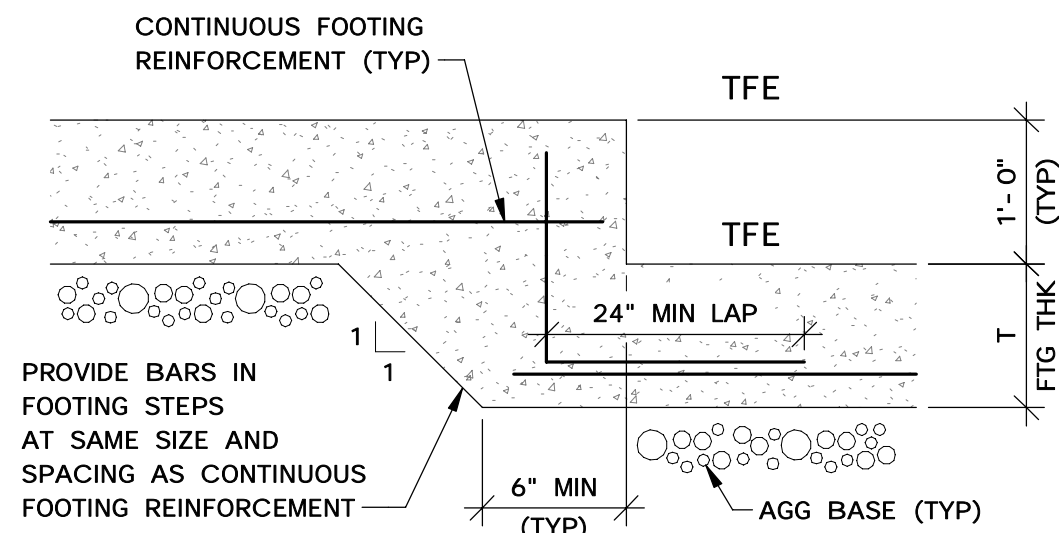
SLAB CONTROL JOINT (CJ)



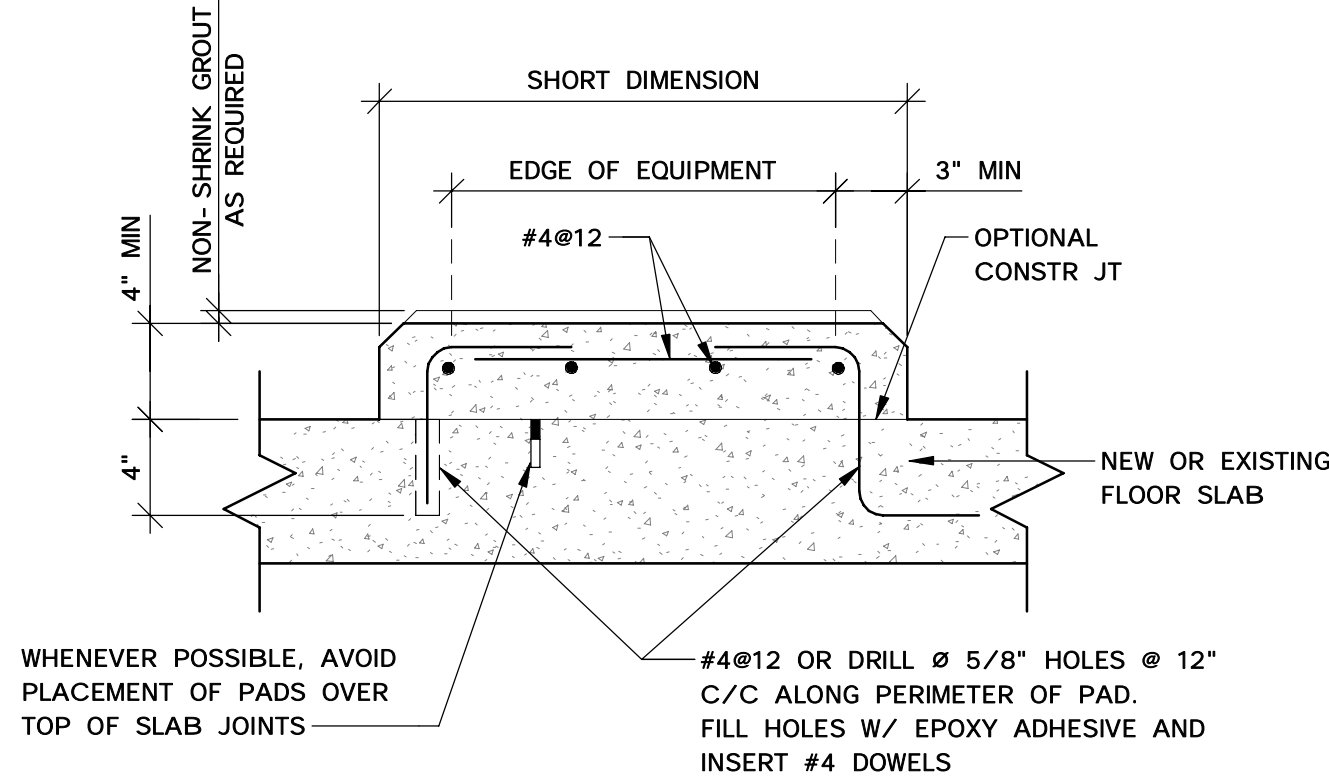
ISOLATION JOINT (IJ)



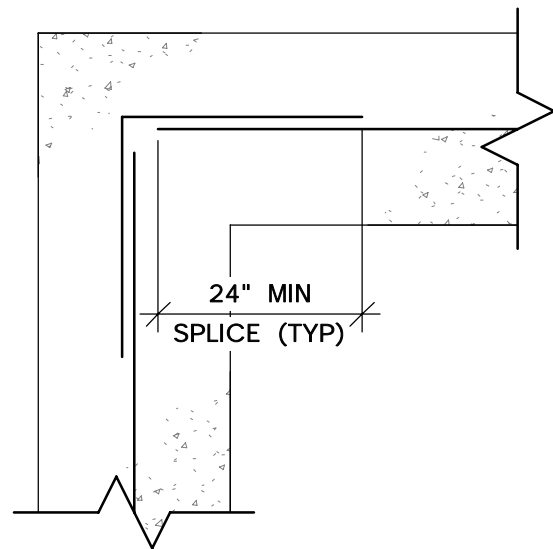
SLAB CONSTR JOINT (KCJ)



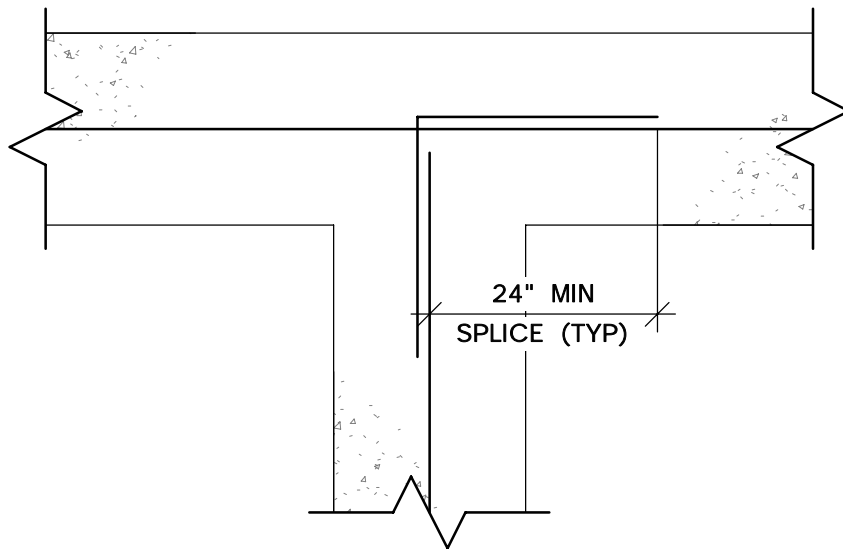
2 TYPICAL FOOTING STEP DETAIL
3/4" = 1'-0"



3 CONCRETE PAD DETAIL
1 1/2" = 1'-0"

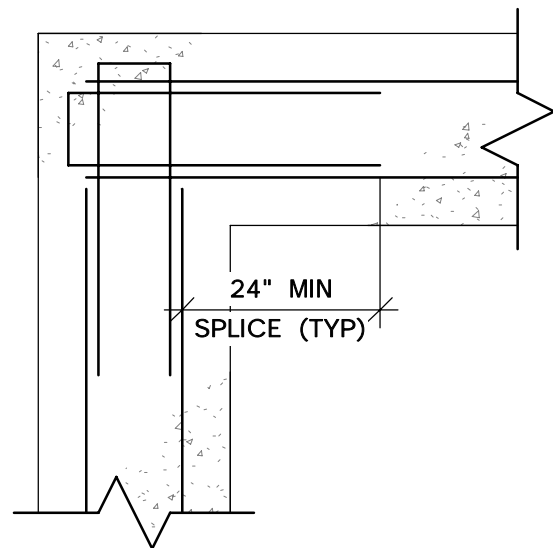


CORNER INTERSECTION

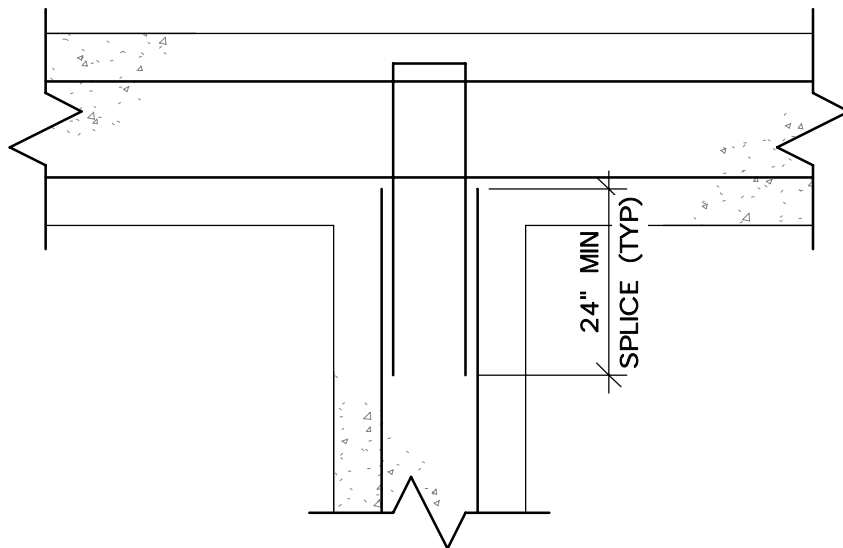


"T" INTERSECTION

SINGLE LAYER REBAR



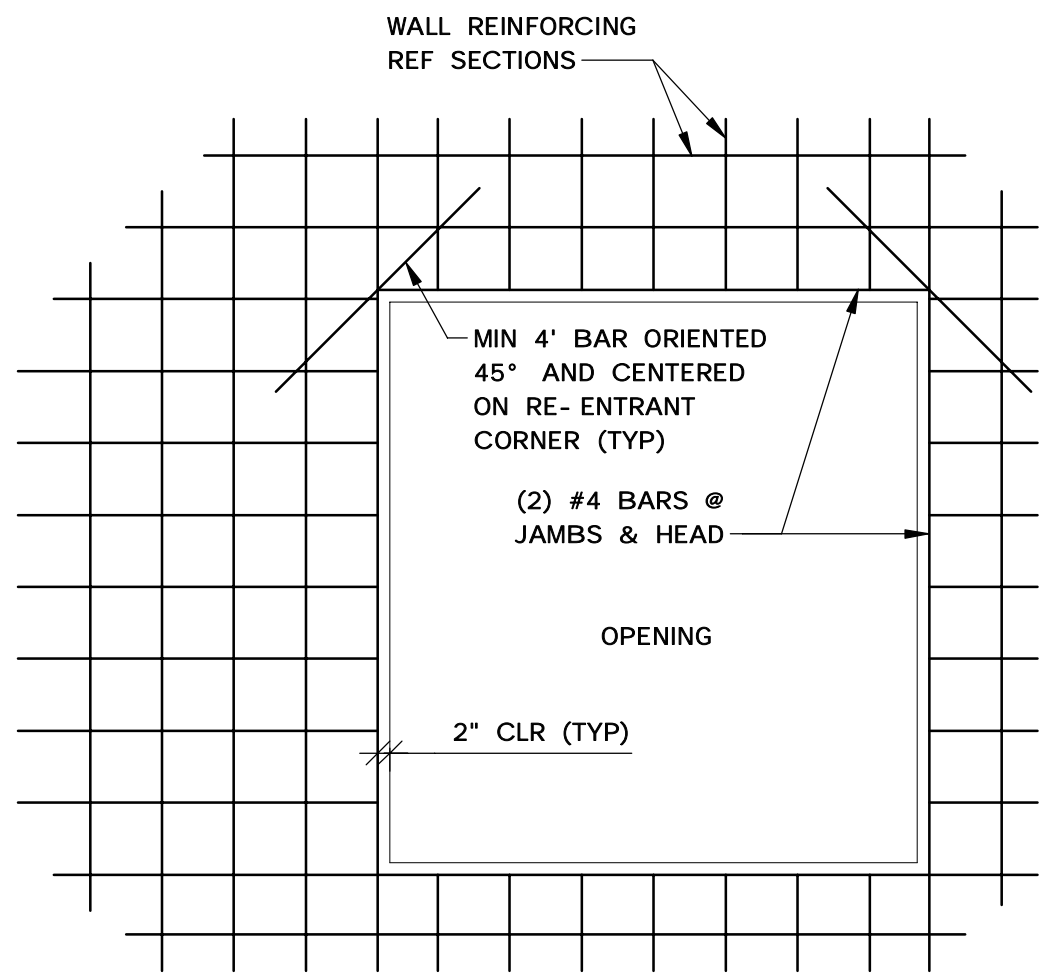
CORNER INTERSECTION



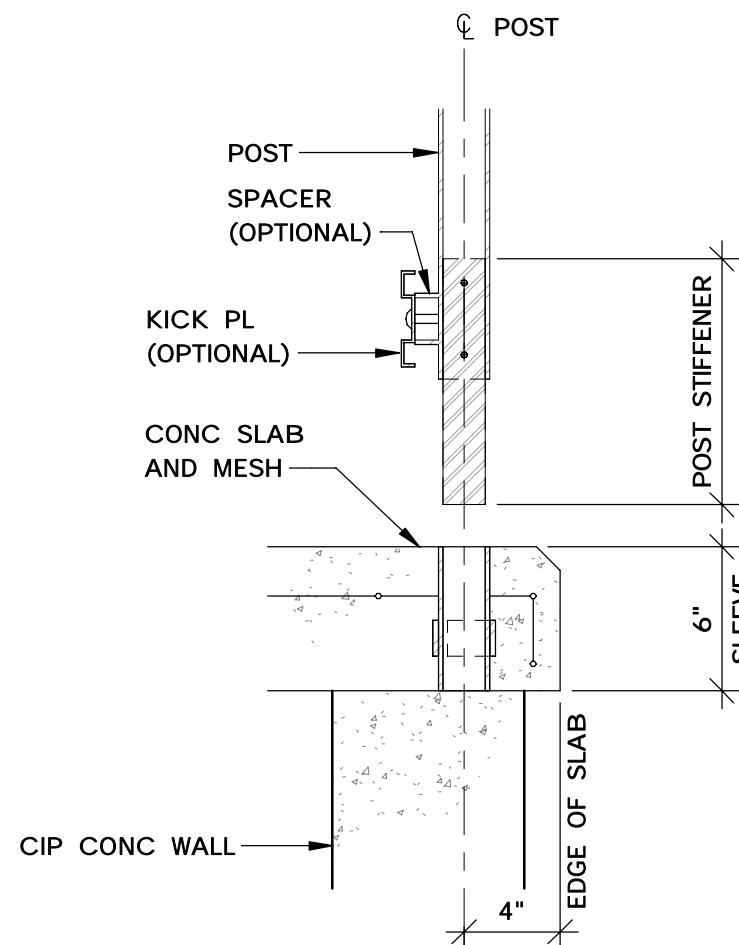
"T" INTERSECTION

DOUBLE LAYER REBAR

4 CONCRETE WALL INTERSECTION DETAILS
1 1/2" = 1'-0"

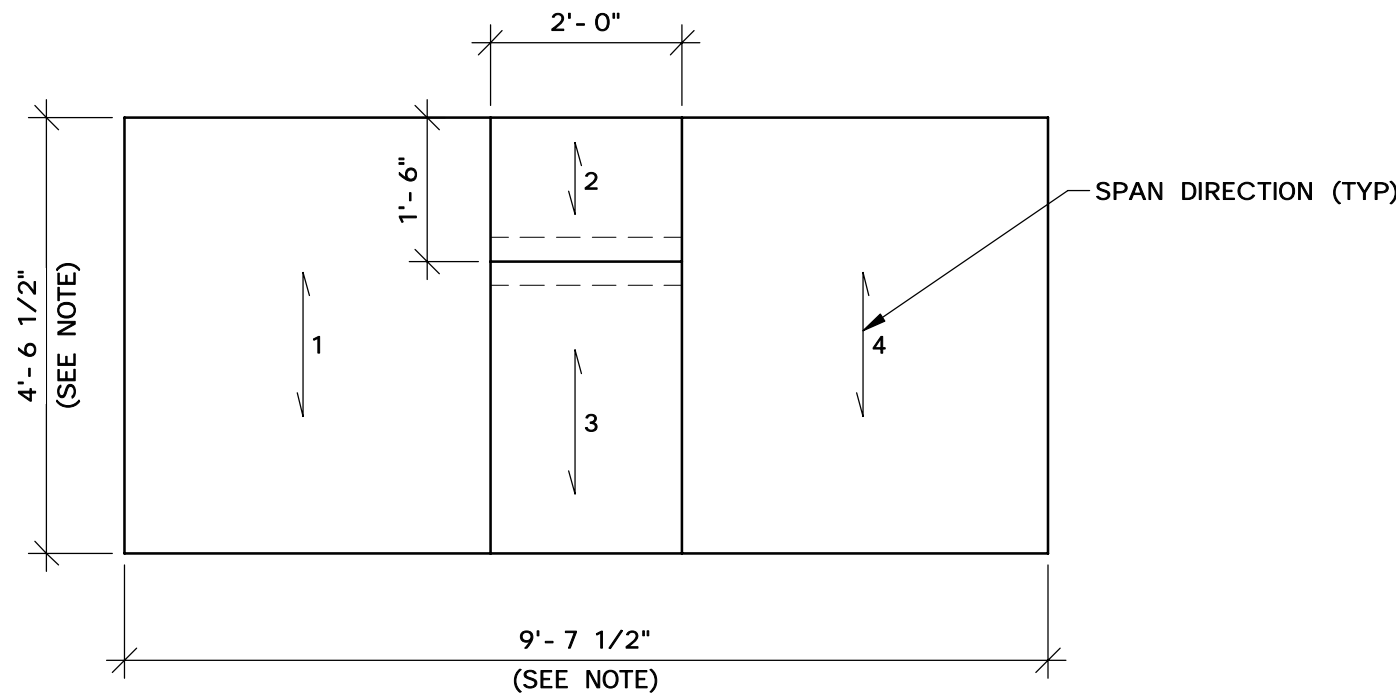


5 TYPICAL CONCRETE WALL AND OPENING DETAIL
NTS



NOTE: REF MFG LITERATURE FOR FURTHER INSTALLATION DETAILS.

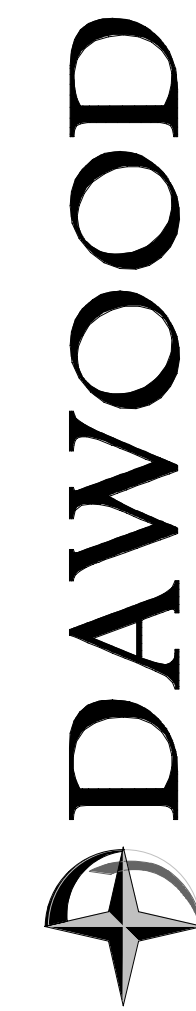
6 GUARD RAIL TYPICAL DETAIL
1 1/2" = 1'-0"



NOTE: MEASUREMENTS INCLUDE A 1/4" CLEARANCE ON ALL EDGES

7 FRP GRATING PLAN
1/2" = 1'-0"

4250 Chums Mill Road
Suite 301 - PA 17112
T: 855-432-8663
F: 717-732-8596



NO.	REVISIONS	DESCRIPTION	DATE
0		ISSUED FOR DESIGN REVIEW	6/03/2022
1		ISSUED FOR CONSTRUCTION	9/21/2022

GROUNDWATER TREATMENT
SYSTEM UPGRADES
FOR
NICHOLSON TREATMENT PLANT
CHESTERTOWN TOWNSHIP
KENT COUNTY, MARYLAND

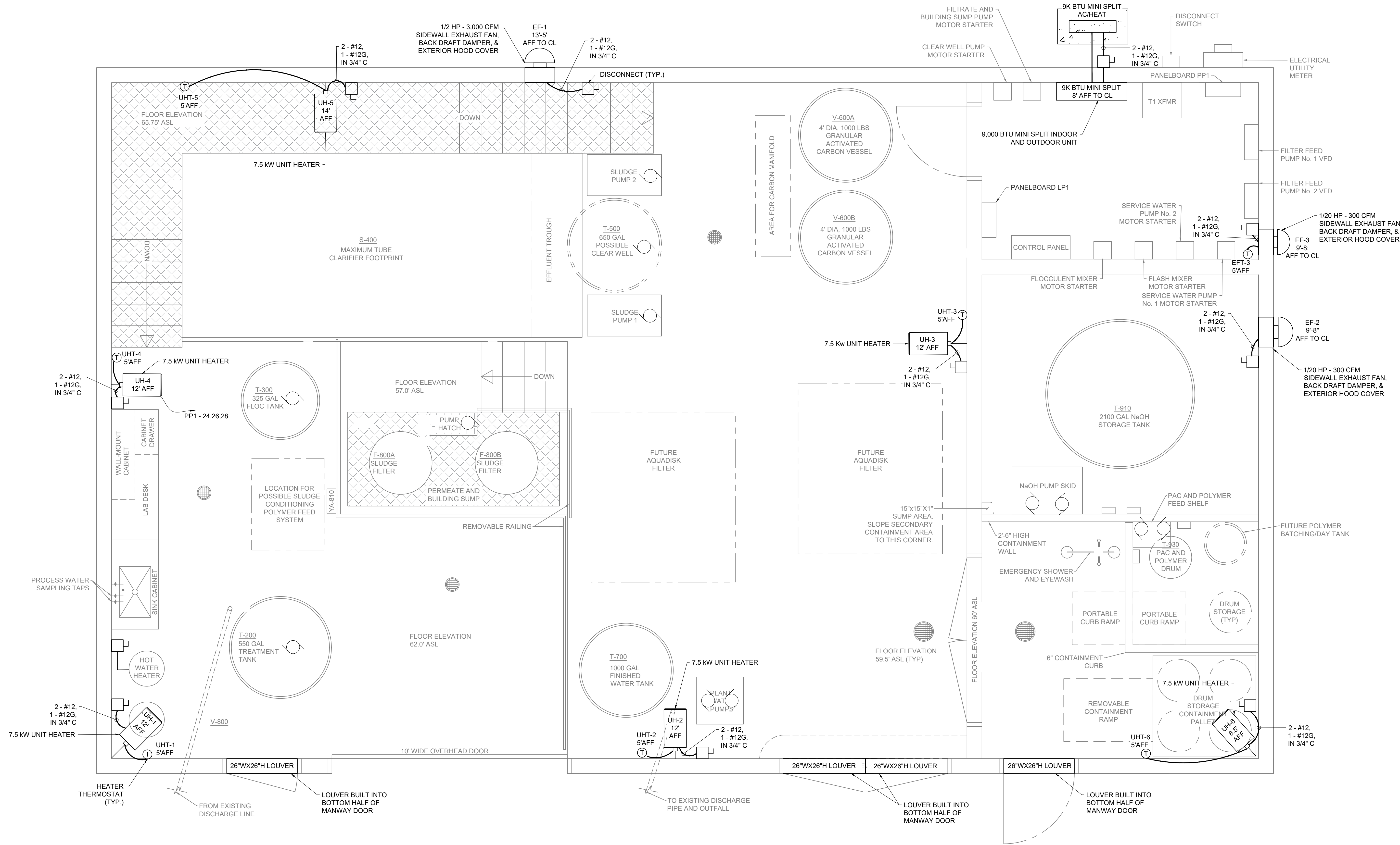
DRAWING TITLE
DETAILS



DATE	9/21/2022
JOB NO	2000114.00
SCALE	As indicated
DRAWN BY	VD
CHECKED BY	ACJ
SHEET NO	

S501

P:\E-PA\1\CG\ANP\PROJECTS\003637401 - KENT COUNTY NICHOLSON LANDFILL WTP\CAD\PRODUCTION\DESIGN\REV ELECTRICAL SHEETS\DWG (A)001\NICHOLSON_LANDFILL_HVAC_Plan.dwg, 9/11/2023 11:07 AM



HVAC PLAN
SCALE: 1" = 2'

NICHOLSON LANDFILL
GROUNDWATER TREATMENT SYSTEM UPGRADES
CHESTER TOWNSHIP

KENT COUNTY, MARYLAND

HVAC PLAN

EA
EA Engineering, Science,
and Technology, Inc., PBC
225 Schilling Circle, Suite 400
Hunt Valley, Maryland 21031
(410) 584-7000
www.eaest.com

0 1' 2' 4'
GRAPHIC SCALE IN FEET

FULL SIZE PLOT: 24" x 36"

DATE: SEPTEMBER 2023

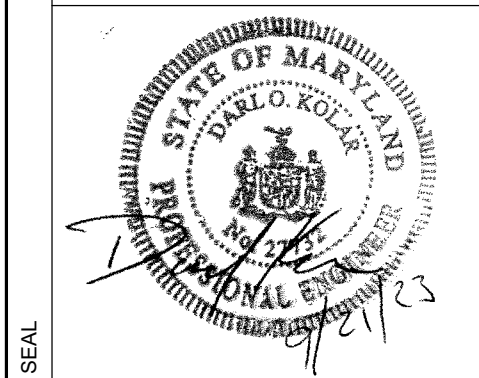
PROJECT NUMBER: 6377401

M-001

REVISIONS		DESCRIPTION
NO.	DATE	BY

DESIGN INFORMATION				
DESIGNED BY:	AJB/NWH	DRAWN BY:	NWH	CHECKED BY:
			DY	PROJECT MANAGER:
				DY/DOK

PROFESSIONAL CERTIFICATION I HEREBY
CERTIFY THAT THESE DOCUMENTS WERE
PREPARED OR APPROVED BY ME, AND THAT
I AM A DULY LICENSED PROFESSIONAL
ENGINEER UNDER THE LAWS OF THE STATE
OF MARYLAND, LICENSE NO. 27732
EXPIRATION DATE: JULY 11, 2024



FILE PATH: \\CGA\NPE\PROJECTS\2023\27401 - KENT COUNTY NICHOLSON LANDFILL WTP\CAD\PRODUCTION\DESIGN\RE\ELECTRICAL SHEET 2.DWG (B-002) \HALLOWELL, ME, 04103\2023 11 07 AM

GENERAL MECHANICAL SPECIFICATIONS

1. ALL WORK AND EQUIPMENT SHALL COMPLY WITH ALL APPLICABLE LAWS, CODES, ETC. OF ALL AUTHORITIES HAVING JURISDICTION, INCLUDING BUT NOT LIMITED TO: THE INTERNATIONAL MECHANICAL CODE, THE LOCAL FIRE MARSHAL, UNDERWRITERS LABORATORY (UL), IRI, FM, OSHA, AND THE NATIONAL ELECTRICAL CODE (NEC). MODIFICATIONS REQUIRED BY THE ABOVE SAID AUTHORITIES TO BRING THE SPACE UNDER CONTRACT UP TO CODE SHALL BE MADE WITHOUT ADDITIONAL CHARGE. WHERE CONTRACT DOCUMENT REQUIREMENTS ARE IN EXCESS OF CODE REQUIREMENTS, THE CONTRACT DOCUMENTS SHALL GOVERN. DEVIATIONS FROM THE CONTRACT DOCUMENTS REQUIRED BY THE ABOVE AUTHORITIES SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW.
2. ALL SPECIFICATIONS AND DRAWINGS, I.E., ARCHITECTURAL, MECHANICAL, PLUMBING, AND ELECTRICAL ARE COMPLIMENTARY AND MUST BE USED IN COMBINATION TO OBTAIN COMPLETE CONSTRUCTION INFORMATION. ANY INFORMATION CONFLICTS WITHIN THE SPECIFICATIONS AND DRAWINGS SHALL BE BROUGHT TO THE ENGINEER'S ATTENTION.
3. CONTRACTOR SHALL VERIFY ALL POINTS OF CONNECTION BEFORE COMMENCING WORK. CONTRACTOR SHALL COORDINATE WORK WITH OTHER TRADES. CONTRACTOR SHALL REMOVE ALL WASTE MATERIALS, DEBRIS, AND RUBBISH FROM SITE AND LEGALLY DISPOSE OF IT. ALL UNUSED EQUIPMENT SERVING THIS AREA SHALL BE REMOVED AND RETURNED TO THE OWNER.
4. CONTRACTOR SHALL CONFIRM THE REQUIREMENTS FOR PREMIUM TIME OR SPECIAL PROCEDURES WITH THE OWNER AND INCLUDE THE COST IN HIS BID PROPOSAL. THE CONTRACTOR, BY SUBMITTING HIS BID PROPOSAL, AGREES TO ACCEPT ALL EXISTING SITE CONDITIONS NOT SPECIFICALLY EXCEPTED. ALL EXCEPTIONS SHALL BE PROVIDED IN WRITING TO THE ARCHITECT AND ENGINEER.
5. CONTRACTOR SHALL COORDINATE, PREPARE, AND SUBMIT SHOP DRAWINGS TO THE ARCHITECT AND ENGINEER FOR THEIR APPROVAL. SHOP DRAWINGS TO BE SUBMITTED INCLUDE: SHEET METAL, DIFFUSERS, GRILLES, REGISTERS, FIRE DAMPERS, AND ALL EQUIPMENT. SHEET METAL SHOP DRAWINGS SHALL BE COORDINATED WITH ALL DISCIPLINES AND SHOW DUCT ELEVATIONS. PROVIDE RISES, DROPS, AND OFFSETS AS REQUIRED. BRING AREAS OF POTENTIAL CONFLICT TO THE ENGINEER'S ATTENTION.
6. A SET OF MEP RECORD/COORDINATION DRAWINGS SHALL BE MAINTAINED IN THE GENERAL CONTRACTOR'S OFFICE AT THE JOB SITE. ACTUAL LOCATIONS OF ALL EQUIPMENT, PIPING, DUCTWORK, ETC., AND ALL DEVIATIONS OF THE WORK FROM THAT SHOWN ON THE CONTRACT DOCUMENTS SHALL BE MARKED ON THE RECORD/COORDINATION DRAWINGS. EACH TRADE SHALL REVIEW THE COORDINATION DRAWINGS AND RESOLVE ANY POTENTIAL CONFLICTS WITH OTHER TRADES PRIOR TO INSTALLING ANY PORTION OF THEIR WORK. CONTRACTOR SHALL NOT CORE, DRILL, OR CUT CONCRETE SLABS FOR ANY REASON WITHOUT THE KNOWLEDGE AND WRITTEN CONSENT OF THE STRUCTURAL ENGINEER AND THE OWNER.
7. WORK SHALL BE EXECUTED IN A GOOD WORKMANLIKE MANNER USING MECHANICS SKILLED IN THEIR RESPECTIVE TRADES. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES FOR COORDINATING THE WORK UNDER THIS CONTRACT. MAINTAIN THE CONSTRUCTION PREMISES IN A NEAT AND ORDERLY CONDITION AT THE END OF EACH WORKING DAY.
8. IN CASES OF DOUBT AS TO THE WORK INTENDED, OR IN THE EVENT OF NEED FOR EXPLANATION THEREOF, THE CONTRACTOR SHALL REQUEST SUPPLEMENTARY INSTRUCTIONS FROM THE ENGINEER. NO CHANGES ARE TO BE MADE TO THE WORK OF THIS CONTRACT WITHOUT PRIOR KNOWLEDGE AND APPROVAL OF THE ENGINEER. THE CONTRACTOR SHALL HOLD THE OWNER AND ITS CONSULTANTS HARMLESS AGAINST ALL CLAIMS AND JUDGMENTS ARISING OUT OF THE CONTRACTOR'S PERFORMANCE OF THE WORK OF THIS CONTRACT. THE CONTRACTOR SHALL NOT PROCEED WITH ANY WORK, WHICH HE EXPECTS ADDITIONAL COMPENSATION FOR BEYOND THE CONTRACT AMOUNT, WITHOUT WRITTEN AUTHORIZATION FROM THE APPROPRIATE AUTHORITY. FAILURE TO OBTAIN SUCH AUTHORIZATION SHALL INVALIDATE ANY CLAIM FOR EXTRA COMPENSATION.
9. CONTRACTOR SHALL VERIFY THAT THE LOCATION OF DIFFUSERS, GRILLES, AND REGISTERS SHOWN ON THE DRAWINGS ARE ACCEPTABLE TO THE ARCHITECT PRIOR TO INSTALLATION.
10. ALL NEW RECTANGULAR DUCTWORK SHALL BE 1 INCH W.G. CONSTRUCTION, CONSTRUCTED OF LOCK FORMING GALVANIZED STEEL IN ACCORDANCE WITH THE LATEST EDITION OF THE "DUCT MANUAL, AND SHEET METAL CONSTRUCTION FOR VENTILATING AND AIR CONDITIONING SYSTEMS," PUBLISHED BY THE SHEET METAL AND AIR CONDITIONING CONTRACTORS NATIONAL ASSOCIATION, INC. (SMACNA). VOLUME DAMPERS SHALL BE PROVIDED IN ALL BRANCH TAKE OFFS, SPIN-INS OR OTHER CONNECTIONS TO INDIVIDUAL AIR DISTRIBUTION DEVICES. ALL 90 DEGREE ELBOWS SHALL BE RADIUS, OR RECTANGULAR WITH TURNING VANES. DUCTWORK SHALL BE HUNG FROM THE BUILDING STRUCTURE WITH HANGER ASSEMBLIES IN ACCORDANCE WITH SMACNA REQUIREMENTS. ALL DUCTWORK SHALL BE SEALED USING HARDCAST TAPE AND ADHESIVE (2 PART SYSTEM). CONTRACTOR SHALL USE APPROPRIATE SYSTEM FOR OUTDOOR OR INDOOR APPLICATION. IRON GRIP MAY BE USED AS AN ALTERNATE FOR SEALING INDOOR DUCTWORK. ALL DUCT, REGARDLESS OF PRESSURE CLASS, SHALL BE SEALED PER SMACNA CLASS A REQUIREMENTS.
11. ALL NEW RIGID SUPPLY, RETURN, AND OUTSIDE AIR DUCTWORK SHALL BE EXTERNALLY INSULATED WITH 1-1/2 INCH THICK FIBERGLASS FLEXIBLE BLANKET INSULATION WITH FACTORY FOIL JACKET (RATED FIRE=25, SMOKE=50) SECURED TO THE DUCTWORK WITH BENJAMIN FOSTER NO. 85-20 ADHESIVE AND PUSH PINS ON 12 INCH CENTERS. EXTERIOR SA AND RA DUCTWORK SHALL BE COVERED WITH ALUMINUM JACKETING OR EQUAL.
12. ALL NEW ROUND SHEET METAL DUCTWORK SHALL BE CONSTRUCTED IN ACCORDANCE WITH FIGURES 3-1 THROUGH 3-56 AND TABLE 3-2 OF THE SMACNA MANUAL. SNAP LOCK LONGITUDINAL SEAMS AND DRAW BAND JOINT CONNECTIONS ARE NOT ACCEPTABLE.
13. ALL AUTOMATIC TEMPERATURE CONTROL SYSTEM WORK AND INSPECTION SHALL BE ACCOMPLISHED BY THIS CONTRACTOR. THERMOSTATS SHALL BE INSTALLED AS SHOWN ON THE DRAWINGS UNDER THIS CONTRACT. STANDARD MOUNTING HEIGHT TO TOP OF THERMOSTAT IS 48" ABOVE FINISHED FLOOR OR AS INDICATED ON THE MECHANICAL DRAWINGS. DO NOT INSTALL THERMOSTATS NEAR DIMMER SWITCHES. WIRING OF ALL MOTORIZED OPERATORS AND THERMOSTATS (REGARDLESS OF VOLTAGE) ARE THE RESPONSIBILITY OF THE MECHANICAL CONTRACTOR.
14. CONTRACTOR SHALL MAKE ALL FINAL EQUIPMENT CONNECTIONS AND PROVIDE THE NECESSARY ADAPTORS, FITTINGS, VALVES, DEVICES, ETC. FOR A COMPLETE AND OPERABLE SYSTEM. COORDINATE REQUIREMENT FOR PROVISION OF MOTOR STARTERS, DISCONNECTS, CONTACTORS, CONTROL WIRING, ETC. AS REQUIRED FOR PROPER FUNCTIONING SYSTEM WITH DIVISION 16.
15. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO INSTALL THE HEATING, VENTILATION, AND AIR CONDITIONING SYSTEM SO AS TO MINIMIZE NOISE. NO VIBRATION OR SOUND SHALL BE TRANSMITTED TO THE BUILDING, STRUCTURE, OR OCCUPIED AREAS. THE DECISION OF THE ENGINEER AS TO THE QUIETNESS OF THE SYSTEM AND EQUIPMENT SHALL BE FINAL. IT SHALL BE THIS CONTRACTOR'S RESPONSIBILITY TO CORRECT OR REPLACE ANY NOISY SYSTEM OR EQUIPMENT AS REQUIRED. NOISE LEVEL SHALL BE BASED ON MANUFACTURES RECOMMENDATIONS FOR EACH SPECIFIC EQUIPMENTS INTENDED USE AND EXPOSURE TO OPERATORS.
16. CONNECTIONS BETWEEN DISSIMILAR PIPING MATERIALS SHALL BE MADE WITH SUITABLE DIELECTRIC INSULATING UNIONS. ISOLATE COPPER PIPING FROM DISSIMILAR METALS, SUCH AS METAL STUDS AND VENT PIPING.
17. PROVIDE VALVES AND UNIONS WHERE NEEDED TO PERMIT DISCONNECTIONS OF EACH PIECE OF EQUIPMENT FOR REPAIRS.
18. ALL DAMPERS AND EQUIPMENT SHALL BE PROPERLY IDENTIFIED. ALL DAMPERS AND VALVES SHALL HAVE THEIR NORMAL (IN OPERATION) POSITION IDENTIFIED, SUCH AS "NORMALLY OPEN" OR "NORMALLY CLOSED."
19. ALL PACKAGED EQUIPMENT SHALL BE INDEPENDENT THIRD PARTY LABELED AS A SYSTEM FOR ITS INTENDED USE BY A NATIONALLY RECOGNIZED TESTING LABORATORY (NRTL) IN ACCORDANCE WITH OSHA FEDERAL REGULATIONS 29CFR1910.303 AND .399, AS WELL AS NFPA PAMPHLET NO. 70, AND THE NATIONAL ELECTRICAL CODE (NEC), ARTICLE 90-7.
20. CLEAN ALL MECHANICAL EQUIPMENT AND DUCTWORK OF ALL CONSTRUCTION DUST AT PROJECT COMPLETION. REPLACE ALL FILTERS PRIOR TO AIR BALANCING. PROVIDE ONE SPARE SET OF FILTERS FOR EACH PIECE OF EQUIPMENT TO THE OWNER.
21. AIR BALANCING SHALL BE PERFORMED BY AN AABC CERTIFIED CONTRACTOR. THIS CONTRACTOR SHALL BE ACCEPTABLE UPON APPROVAL OF THE ENGINEER. GPM'S SHALL BE BALANCED WITHIN 10% OF DESIGN. AFTER ALL AIR SYSTEMS ARE INSTALLED, EACH SUPPLY AIR OUTLET SHALL BE AIR BALANCED TO WITHIN 10% OF THE CFM SHOWN WITH AIR PATTERNS SET AS INDICATED ON DRAWINGS (OR WITHIN 10 CFM WHEN BELOW 100 CFM). FAN RUMPS AND DAMPERS SHALL BE ADJUSTED AND SHAFTS SHALL BE REPLACED AS REQUIRED TO ACHIEVE AIR BALANCE. AABC ASHRAE FORMAT AIR BALANCE REPORTS SHALL BE CERTIFIED BY THE BALANCING AGENCY AND SUBMITTED TO THE ENGINEER. SHOULD THE AIR BALANCE REPORT INDICATE UNACCEPTABLE DUCT LEAKAGE, AS DETERMINED BY THE ENGINEER, THEN DUCT LEAKAGE TEST SHALL BE PERFORMED IN ACCORDANCE WITH AABC STANDARDS. DUCT SHALL BE RESEALED AND/OR REPAIRED AS REQUIRED TO MEET DESIGN REQUIREMENTS. ALL OR PORTIONS OF THE SYSTEM SHALL BE REBALANCED AS REQUIRED UNTIL ALL SYSTEMS ARE WITHIN THE PERFORMANCE STANDARDS LISTED ABOVE.

	Equipment No.	Service	Equipment	Equipment Data
1	D-1	Water Treatment Room #1	Dayton Door Louver, 26 1/8 in x 26 1/4 in, Extruded Aluminum, with Clear Anodized finish	26" x 26" door opening with 2.34 sf free flow area, Inverted V-style blades, 45 degree angle
2	D-2	Water Treatment Room #2	Dayton Door Louver, 26 1/8 in x 26 1/4 in, Extruded Aluminum, with Clear Anodized finish	26" x 26" door opening with 2.34 sf free flow area, Inverted V-style blades, 45 degree angle
3	D-3	Water Treatment Room #3	Dayton Door Louver, 26 1/8 in x 26 1/4 in, Extruded Aluminum, with Clear Anodized finish	26" x 26" door opening with 2.34 sf free flow area, Inverted V-style blades, 45 degree angle
4	D-4	Chemical Feed Room	Dayton Door Louver, 26 1/8 in x 26 1/4 in, Extruded Aluminum, with Clear Anodized finish	26" x 26" door opening with 2.34 sf free flow area, Inverted V-style blades, 45 degree angle
5	EF-1	Water Treatment Room	Greenheck SE1-12-DGEX-QD	1/2 hp, 1800rpm, 1750 frpm, 3,000 cfm @ .25 inwg
6	EF-2	Chemical Feed Room	Greenheck SE1-10-428-PX-QD	1/20 hp, 1550 rpm, 1650 frpm, 300 cfm @ .25inwg
7	EF-3	Chemical Feed Room	Greenheck SE1-10-428-PX-QD	1/20 hp, 1550 rpm, 1650 frpm, 300 cfm @ .25inwg
8	UH-1	Water Treatment Room #1	Dayton, Model 2YU67	Wall or ceiling mounting, 7.5kW, 480v, 3P, provide mounting bracket and remote thermostat w/24V controls
9	UH-2	Water Treatment Room #2	Dayton, Model 2YU67	Wall or ceiling mounting, 7.5kW, 480v, 3P, provide mounting bracket and remote thermostat w/24V controls
10	UH-3	Water Treatment Room #3	Dayton, Model 2YU67	Wall or ceiling mounting, 7.5kW, 480v, 3P, provide mounting bracket and remote thermostat w/24V controls
11	UH-4	Water Treatment Room #4	Dayton, Model 2YU67	Wall or ceiling mounting, 7.5kW, 480v, 3P, provide mounting bracket and remote thermostat w/24V controls
12	UH-5	Water Treatment Room #5	Dayton, Model 2YU67	Wall or ceiling mounting, 7.5kW, 480v, 3P, provide mounting bracket and remote thermostat w/24V controls
13	UH-6	Chemical Feed Room	Dayton, Model 2YU67	Wall or ceiling mounting, 7.5kW, 480v, 3P, provide mounting bracket and remote thermostat w/24V controls
14	IU-1	Electrical Room AC	Mitsubushi Single Zone Deluxe Wall-Mounted Indoor Unit, MSZ-FS09NA	Wall mounted indoor unit, 9,000 BTUH Rated Capacity
15	OU-1	Electrical Room AC	Mitsubushi Single Zone Hyper-Heating Outdoor Unit, MUZ-FS09NA	Outdoor Unit, 9,000 BTUH Rated Capacity

SOO#	SERVICE	EQUIPMENT ID	SEQUENCE OF OPERATION
1	Water Treatment Rom Ventilation	Exhaust Fan 1	System provide continuous operation (24/7/365).
2	Chemical Room Ventilation	Exhaust Fan 2	System provide continuous operation (24/7/365).
3	Electrical Room Ventilation	Exhaust Fan 3	When space thermostat EFT-3 rises above set point of 85 degrees EF-3 turns on. When space thermostat EFT-3 drops below set point of 78 degrees EF-3 turns off.
4	Water Treatment Room Heaters	Unit Heaters 1 to 5	When space thermostats UHT-1 to UHT 5 drops below set point of (55 degrees adjustable) unit heaters will turn on. When temperatures are above set point (55 degrees adjustable) unit heaters will turn off.
5	Chemical Room Heaters	Unit Heater 6	When space thermostats UHT-6 drops below set point of (55 degrees adjustable) unit heater will turn on. When temperatures are above set point (55 degrees adjustable) unit heater will turn off.
6	Electrical Room AC/HEAT	IU-1	When mini split unit thermostat rises above set point of 82 degrees IU-1 Air Conditioning turns on. When mini split unit thermostat rises below set point of 55 degrees IU-1 heat turns on.
7	Electrical Room AC/HEAT	OU-1	n/a

REVISIONS

DESCRIPTION

BY

DATE

NO.

DESIGN INFORMATION

DESIGNED BY: AJB/NWH

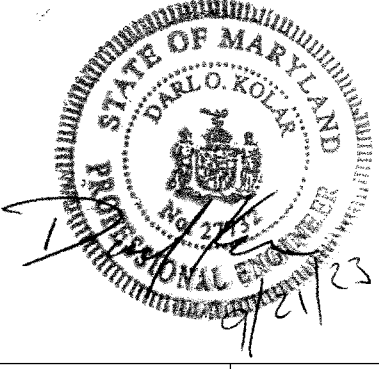
DRAWN BY: NWH

CHECKED BY: NWH

DY


PROJECT MANAGER: DY/DOK

PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 27732 EXPIRATION DATE: JULY 11, 2024



NICHOLSON LANDFILL
GROUNDWATER TREATMENT SYSTEM UPGRADES
CHESTER TOWNSHIP
KENT COUNTY, MARYLAND

HVAC SPECIFICATIONS



EA Engineering, Science, and Technology, Inc., PBC
225 Schilling Circle, Suite 400
Hunt Valley, Maryland 21031
(410) 584-7000
www.eaest.com

FULL SIZE PLOT: 24" x 36"

DATE: SEPTEMBER 2023

PROJECT NUMBER: 6377401

M-002

100% PLANS - FOR CONSTRUCTION

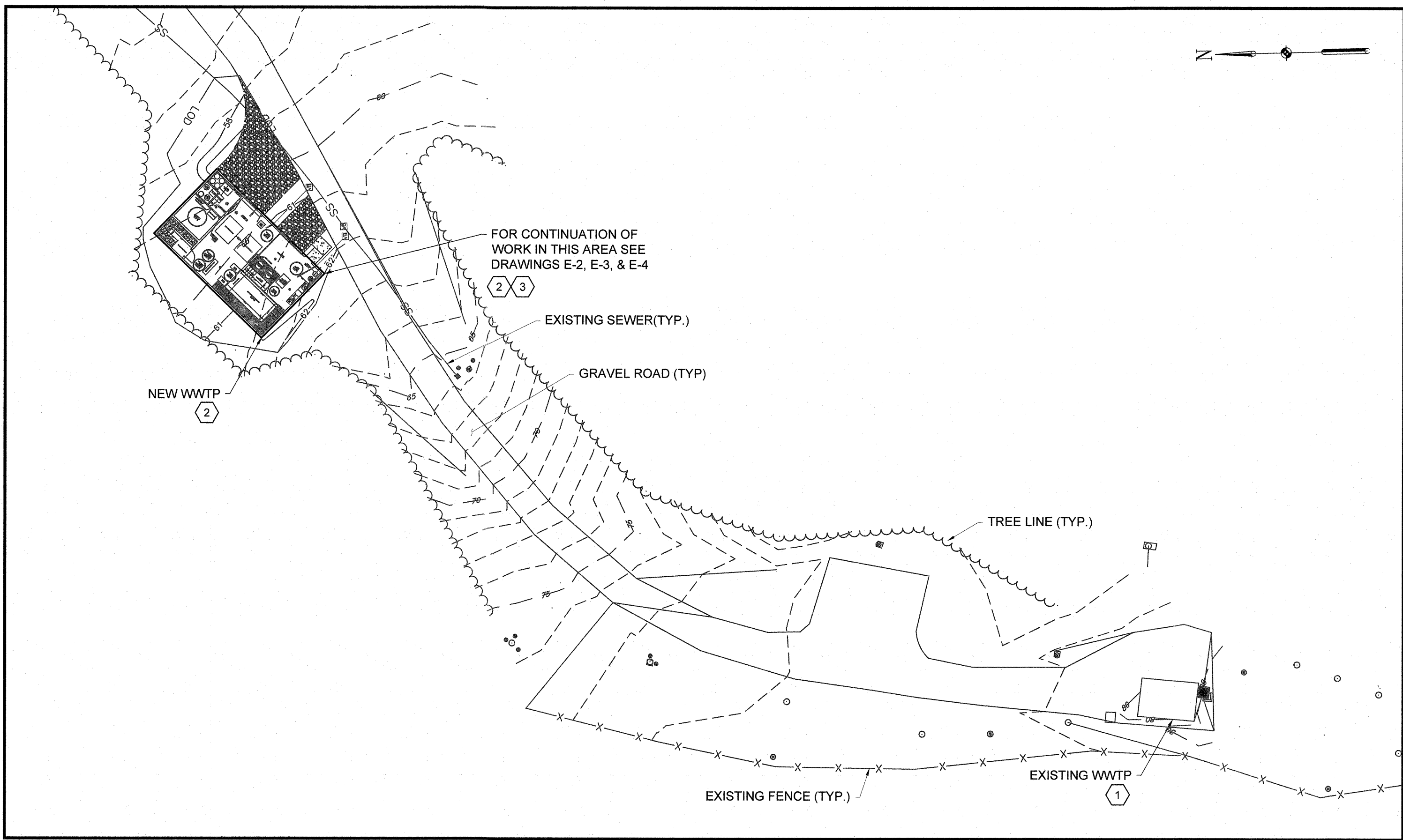
ABBREVIATIONS

LEGEND - PLANS & DETAILS

DESCRIPTION	SYMBOL
CONDUIT EXPOSED	----
CONDUIT CONCEALED	----
CONDUIT DOWN	—C—
CONDUIT UP	—○—
CONDUIT CONTINUATION / BREAK LINE	—{ }—
GROUND GRID	----
UNDERGROUND DUCT BANK	
GROUND ROD	●—
GROUND TEST WELL	●—
GROUND CONNECTION POINT	●
CONDUIT BODY	○
JUNCTION BOX	ⓐ
MOTOR	
HEAT TRACE CABLE	
LIQUID LEVEL SENSOR	ⓕ
LEVEL ELEMENT	Ⓛ
LEVEL SWITCH	ⓁS
PRESSURE SENSOR	Ⓟ
PRESSURE SWITCH	ⓅS
VACUUM SENSOR	ⓋE
LIMIT SWITCH	ⓋS
TERMINAL BOX	ⓉB
SOLENOID VALVE	Ⓢ
ELECTRIC HANDHOLE	ⓗ
ELECTRIC LIGHT POST	⦿
ELECTRIC UTILITY POLE	○—
ELECTRIC OVHD LINE	—OHE— OHE—
ELECTRIC UGND LINE	—E—E—E—E—
CODED NOTE	Ⓝ
HOME RUN TO PANELBOARD	—LP## OR PP##—
AUDIO/VISUAL ALARM	
GROUP OF ITEMS	}
DUCT BANK SECTION MARKER	
EXIT SIGN	
SWITCH	S
FLOOD LIGHT	
RECEPTACLE	Ⓢ
LIGHT	⦿
FLOW CONTROL VALVE	ⓕV

LEGEND - DIAGRAMS & ELEMENTARIES

DESCRIPTION	SYMBOL
CIRCUIT CONNECTION	
CIRCUIT LUG / SCREW CONNECTION	
CIRCUIT CONTINUATION / BREAK LINE	
CIRCUIT BREAKER	
FUSE	
GROUND	
OVERLOAD	
TIMING RELAY	
RELAY CONTACT	
SINGLE SWITCH	
MOMENTARY PUSHBUTTON	
LIMIT SWITCH	
PRESSURE SWITCH	
FLOAT SWITCH	
TEMPERATURE SWITCH	
TIMING RELAY	
RELAY COIL	
INDICATING LIGHT	
INDICATING LIGHT - PUSH-TO-TEST	
REMOTE CONTACT	
REMOTE INSTRUMENTATION SIGNAL	



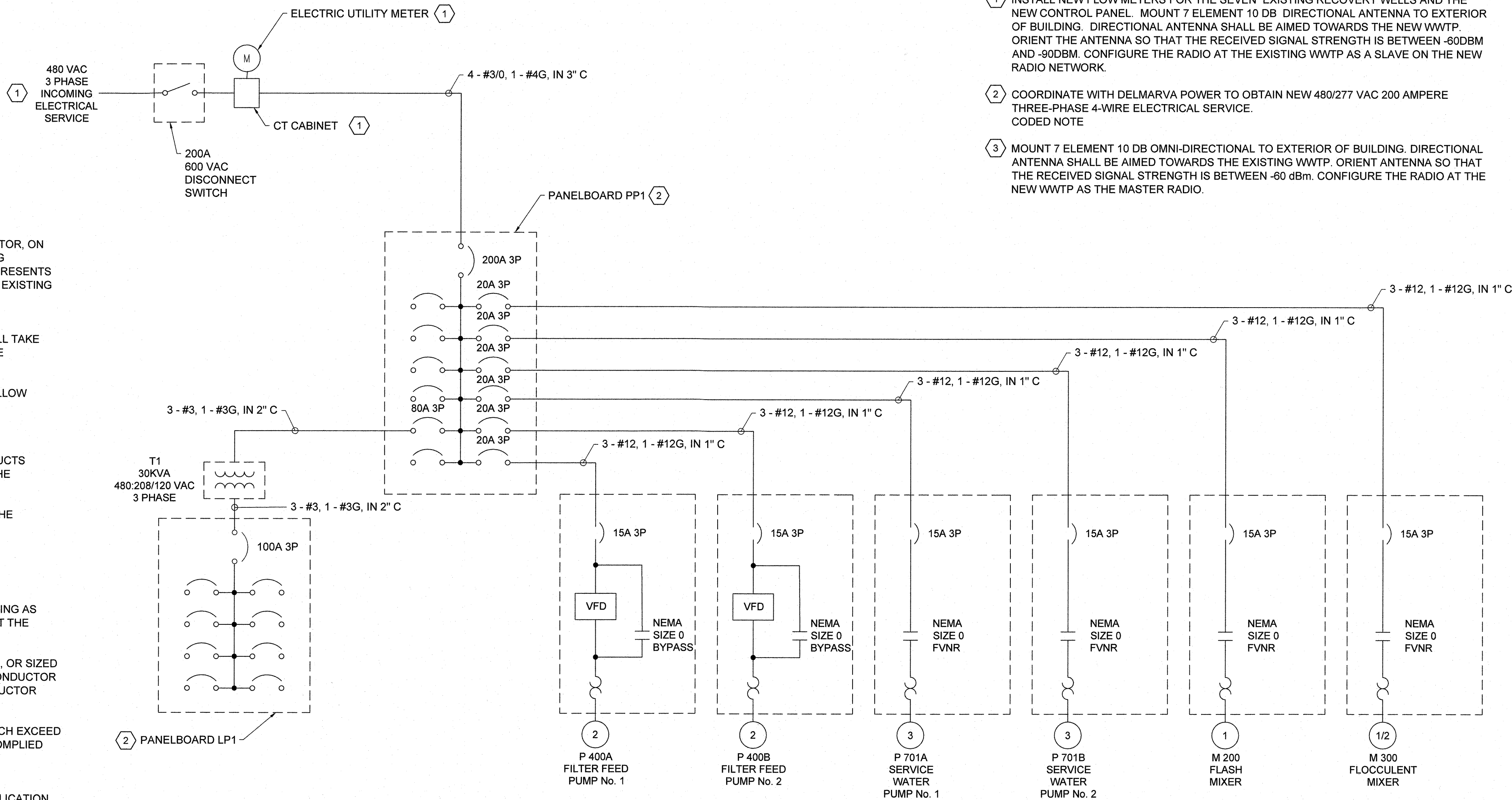
SITE MAP
SCALE: 1" = 30'

SITE PLAN NOTES

1. INSTALL NEW FLOW METERS FOR THE SEVEN EXISTING RECOVERY WELLS AND THE NEW CONTROL PANEL. MOUNT 7 ELEMENT 10 DB DIRECTIONAL ANTENNA TO EXTERIOR OF BUILDING. DIRECTIONAL ANTENNA SHALL BE AIMED TOWARDS THE NEW WWTP. ORIENT THE ANTENNA SO THAT THE RECEIVED SIGNAL STRENGTH IS BETWEEN -60DBM AND -90DBM. CONFIGURE THE RADIO AT THE EXISTING WWTP AS A SLAVE ON THE NEW RADIO NETWORK.
2. COORDINATE WITH DELMARVA POWER TO OBTAIN NEW 480/277 VAC 200 AMPERE THREE-PHASE 4-WIRE ELECTRICAL SERVICE.
CODED NOTE
3. MOUNT 7 ELEMENT 10 DB OMNI-DIRECTIONAL TO EXTERIOR OF BUILDING. DIRECTIONAL ANTENNA SHALL BE AIMED TOWARDS THE EXISTING WWTP. ORIENT ANTENNA SO THAT THE RECEIVED SIGNAL STRENGTH IS BETWEEN -60 dBm. CONFIGURE THE RADIO AT THE NEW WWTP AS THE MASTER RADIO.

GENERAL NOTES

1. ALL WORK IS NEW UNLESS OTHERWISE NOTED AS EXISTING. FOR THE CONVENIENCE OF THE CONTRACTOR, ON DRAWINGS WHICH CONTAIN NEW AND EXISTING FEATURES, A DISTINCTION BETWEEN NEW AND EXISTING MATERIALS, EQUIPMENT, AND STRUCTURES HAS BEEN MADE BY LINE WEIGHT. HEAVY LINE WEIGHT REPRESENTS NEW FEATURES (OR WORK TO BE DONE ON EXISTING FEATURES) AND LIGHT LINE WEIGHT REPRESENTS EXISTING FEATURES.
2. INFORMATION FOR EXISTING UTILITIES IS FROM AVAILABLE RECORDS AND SHALL BE VERIFIED BY THE CONTRACTOR TO HIS OR HER SATISFACTION PRIOR TO CONSTRUCTION ACTIVITIES. CONTRACTOR SHALL TAKE PRECAUTIONS TO PROTECT EXISTING UTILITIES AND STRUCTURES AND ANY DAMAGE TO THEM SHALL BE REPAIRED IMMEDIATELY (WITHIN 24 HOURS) BY THE CONTRACTOR AT NO COST TO THE OWNER.
3. THE CONTRACTOR SHALL MAINTAIN ACCESS TO THE EXISTING TREATMENT FACILITY AT ALL TIMES TO ALLOW COUNTY OPERATIONS AND MAINTENANCE STAFF TO EXECUTE AND COMPLETE ROUTINE DUTIES.
4. ALL WORK SHALL COMPLY WITH APPLICABLE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE.
5. MATERIALS, DEVICES, APPLIANCES, FITTINGS, AND EQUIPMENT INSTALLED SHALL BE LISTED. ALL PRODUCTS SHALL BE USED ONLY IN THE MANNER IN WHICH THEY HAVE BEEN TESTED AND FOUND SUITABLE FOR THE INTENDED USE.
6. EQUIPMENT AND SYSTEMS SHALL BE BONDED AND GROUNDED IN ACCORDANCE WITH ARTICLE 250 OF THE NATIONAL ELECTRICAL CODE, APPLICABLE LOCAL CODES, THE ELECTRICAL UTILITY PROVIDER, AND THE MANUFACTURER'S RECOMMENDATIONS.
7. CONDUIT AND CONDUCTOR SIZES ARE BASED ON COPPER CONDUCTORS UNLESS SPECIFICALLY NOTED OTHERWISE.
8. VOLTAGE DROP CALCULATIONS ARE BASED ON CIRCUIT LOADS AND DISTANCES FOR THE CIRCUIT ROUTING AS SHOWN. IF ALTERNATE CIRCUIT ROUTING, LOADING, OR CONDUCTOR MATERIAL ARE USED, VERIFY THAT THE VOLTAGE DROP IS ACCEPTABLE.
9. UNLESS OTHERWISE NOTED, CONDUCTORS HAVE NOT BEEN DERATED FOR BUNDLING OF CONDUCTORS, OR SIZED FOR MULTIPLE CIRCUITS. IF MULTIPLE CIRCUITS ARE INSTALLED IN A SINGLE RACEWAY, DERATE THE CONDUCTOR AMPACITY IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE, AND PROVIDE THE CORRECT CONDUCTOR AND CONDUIT SIZES.
10. THE CONSTRUCTION CODE REQUIREMENTS OF STATE, COUNTY, OR OTHER POLITICAL SUBDIVISION WHICH EXCEED THE REQUIREMENTS OF NATIONAL CODES, STANDARDS, AND APPROVING BODIES SHALL BE MET AND COMPLIED WITH.
11. THE INSTALLATION OF ALL EQUIPMENT SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS, REQUIREMENTS, AND GUIDELINES AND SHALL CONFORM TO THE PARTICULAR APPLICATION INVOLVED, IN ACCORDANCE WITH DETAILS SHOWN ON THE DRAWINGS. INSTALLATION OF EQUIPMENT CONNECTIONS TO EQUIPMENT SHALL BE COMPLETE IN EVERY DETAIL IN ACCORDANCE WITH APPLICABLE AND ACCEPTED INDUSTRY STANDARDS AND PRACTICES. PRIOR TO ACCEPTANCE OF ALL OR ANY PART OF THE WORK, THE CONTRACTOR SHALL TEST EACH PIECE OF EQUIPMENT AND SUBMIT WRITTEN CERTIFICATION THAT IT HAS BEEN INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S REQUIREMENTS AND IS READY TO BEGIN OPERATION.



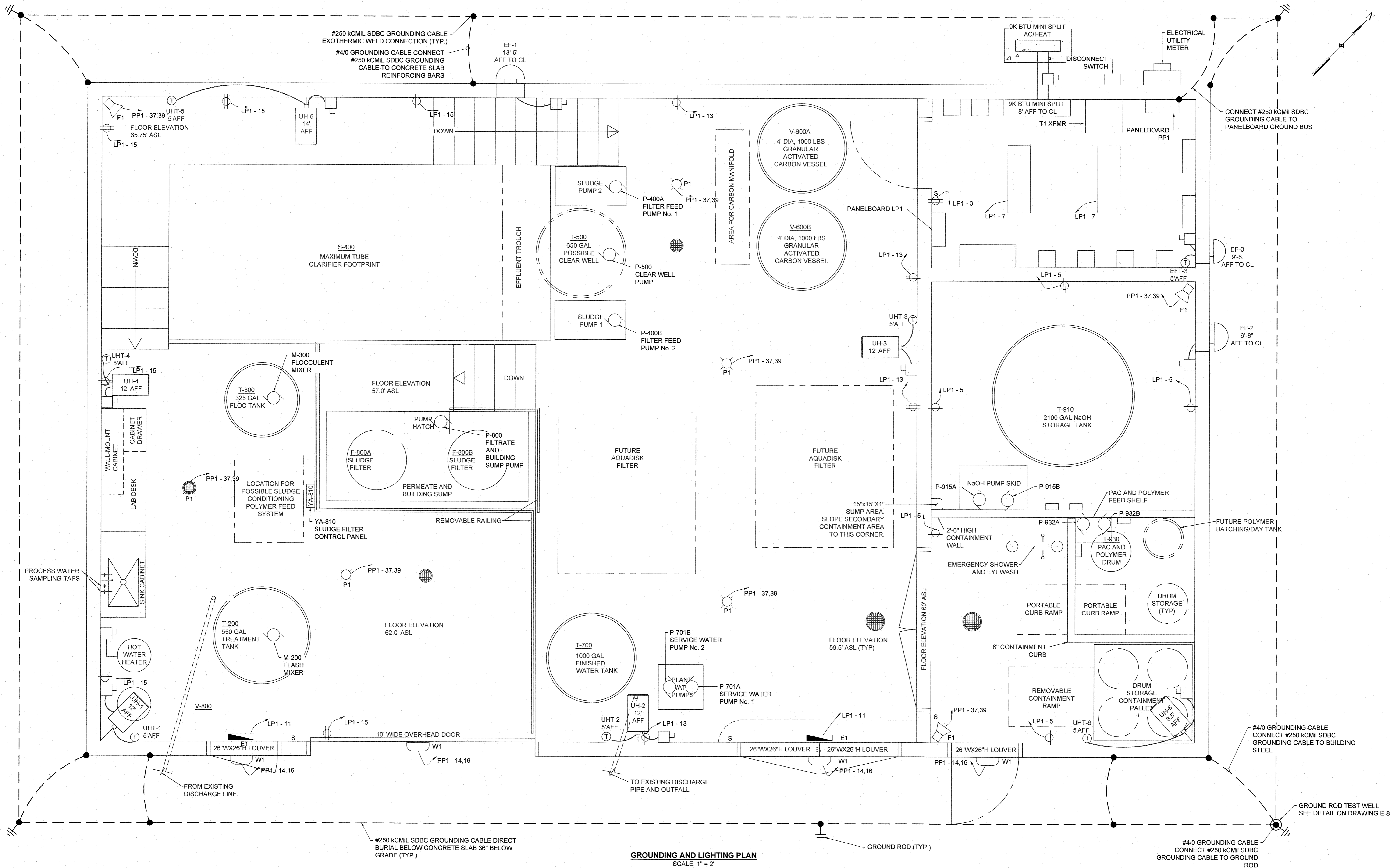
ONE-LINE DIAGRAM NOTES

- ① COORDINATE WITH DELMARVA POWER TO OBTAIN NEW 480 VAC THREE-PHASE 4-WIRE ELECTRICAL SERVICE FOR THE NEW TREATMENT PLANT. INSTALL SERVICE ENTRANCE RATED CIRCUIT BREAKER (65 KAIC, OR AS REQUIRED BY DELMARVA POWER). PROVIDE ANY ADDITIONAL ANCILLARY MATERIALS NECESSARY FOR INSTALLING THE NEW EQUIPMENT AND CONNECTING THE NEW SERVICE.
- ② INSTALL NEW 480 VAC 3-PHASE PANELBOARD PP1 AND NEW 208/120 3-PHASE PANELBOARD LP1. INCLUDE INTEGRATED TVSS IN EACH PANELBOARD.

ONE-LINE DIAGRAM

DESIGN INFORMATION	NO.	DATE	BY	REVISIONS
SEAL	DESIGNED BY: DYN/MWH DRAWN BY: NMW CHECKED BY: DY PROJECT MANAGER: DOK			
	PROFESSIONAL CERTIFICATION I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A FULLY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 20892 EXPIRATION DATE APRIL 24, 2025			
<p style="text-align: center;"> NICHOLSON LANDFILL GROUNDWATER TREATMENT SYSTEM UPGRADES CHESTER TOWNSHIP KENT COUNTY, MARYLAND </p> <p style="text-align: right;">ELECTRICAL SITE PLAN, NOTES, AND ONE-LINE DIAGRAM</p>				

FILE PATH: K:\EAS\PROJECTS\2023\20230627\201 - KENT COUNTY NICHOLSON LANDFILL WTP\CD\GROUNDWATER TREATMENT SYSTEM ELECTRICAL SHEETS.DWG (E-002) NICHOLSON, NIEL 01/20/2023 11:27 AM



GROUNDING AND LIGHTING PLAN
SCALE: 1" = 2'

GROUNDING PLAN NOTES

1. CONNECT THE GROUNDING SYSTEM TO METAL WATER PIPE.
2. ALL CUT ENDS OF CONDUIT AND TUBING SHALL BE REAMED OR OTHERWISE FINISHED TO REMOVE ROUGH EDGES.
3. PROVIDE SWITCHES FOR ALL LIGHT FIXTURES OR LIGHTING EQUIPMENT; SWITCHES SHALL BE LOCATED AT THE ENTRANCE OF THE ROOM OR AREA BEING SERVED.

NICHOLSON LANDFILL
GROUNDWATER TREATMENT SYSTEM UPGRADES
CHESTER TOWNSHIP

KENT COUNTY, MARYLAND

GROUNDING AND LIGHTING PLAN



EA Engineering, Science,
and Technology, Inc., PBC
225 Schilling Circle, Suite 400
Hunt Valley, Maryland 21031
(410) 584-7000

www.eaest.com
0 1' 2' 4'
GRAPHIC SCALE IN FEET

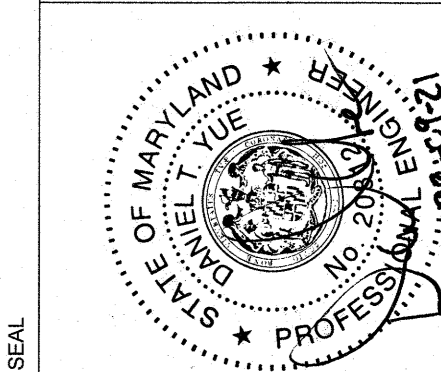
FULL SIZE PLOT: 24" x 36"

DATE: SEPTEMBER 2023

PROJECT NUMBER: 6377401

E-002

PROFESSIONAL CERTIFICATION I HEREBY
CERTIFY THAT THESE DOCUMENTS WERE
PREPARED OR APPROVED BY ME, AND THAT
I AM A DULY LICENSED PROFESSIONAL
ENGINEER UNDER THE LAWS OF THE STATE
OF MARYLAND, LICENSE NO. 20612
EXPIRATION DATE: APRIL 24, 2025

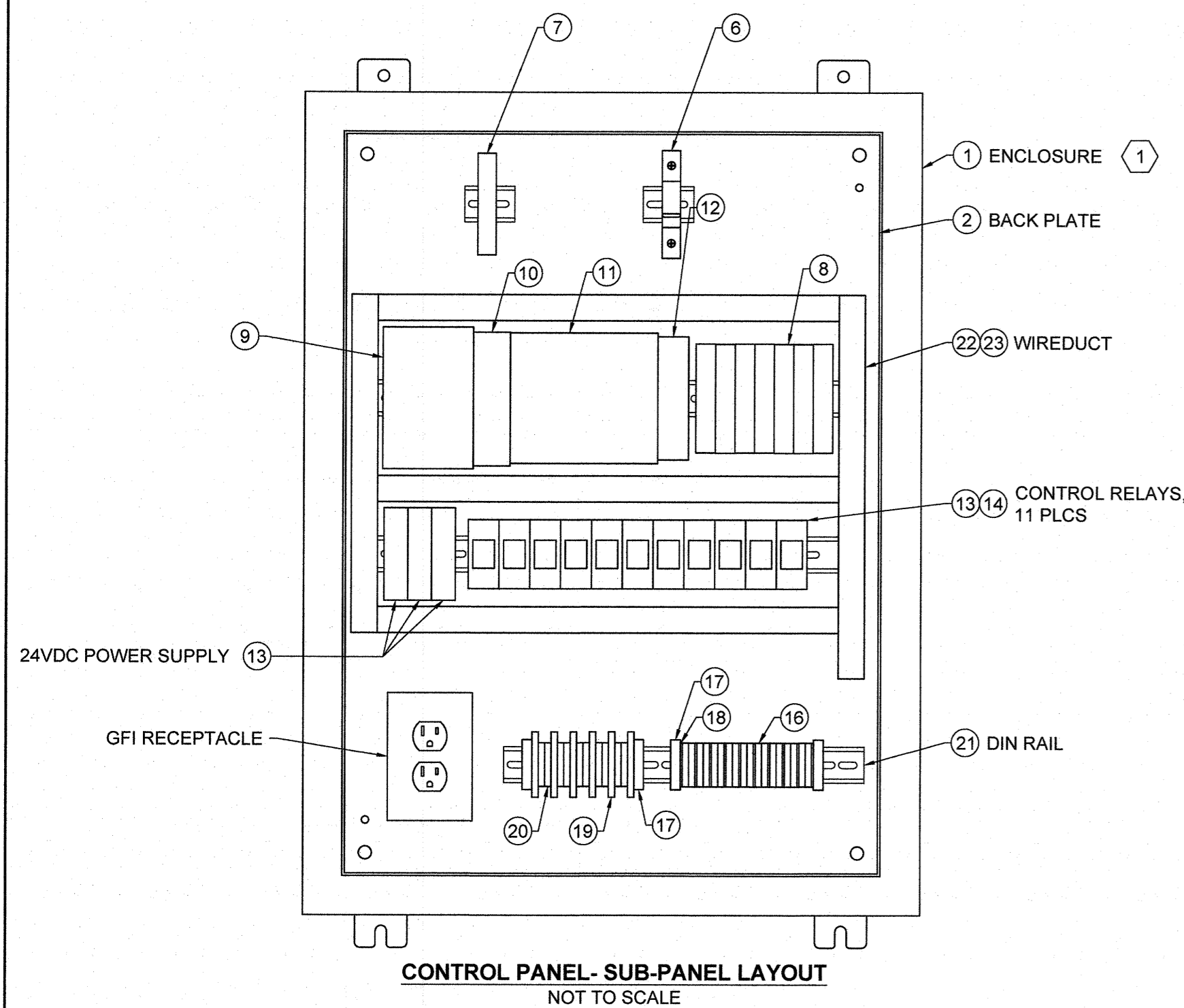
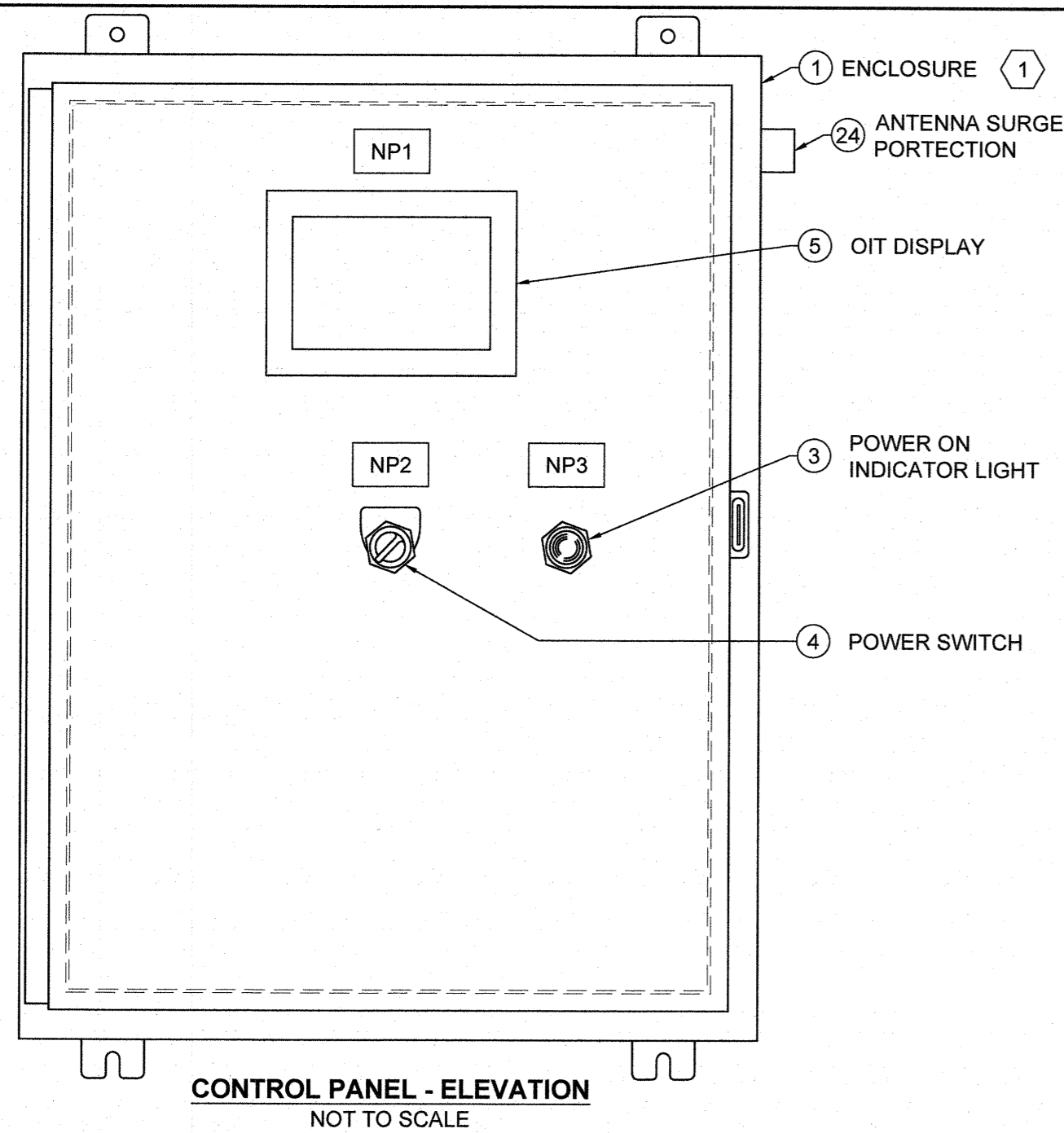


DESIGN INFORMATION
DESIGNED BY: DYNMH
DRAWN BY: NWH
CHECKED BY: DY
PROJECT MANAGER: DOK

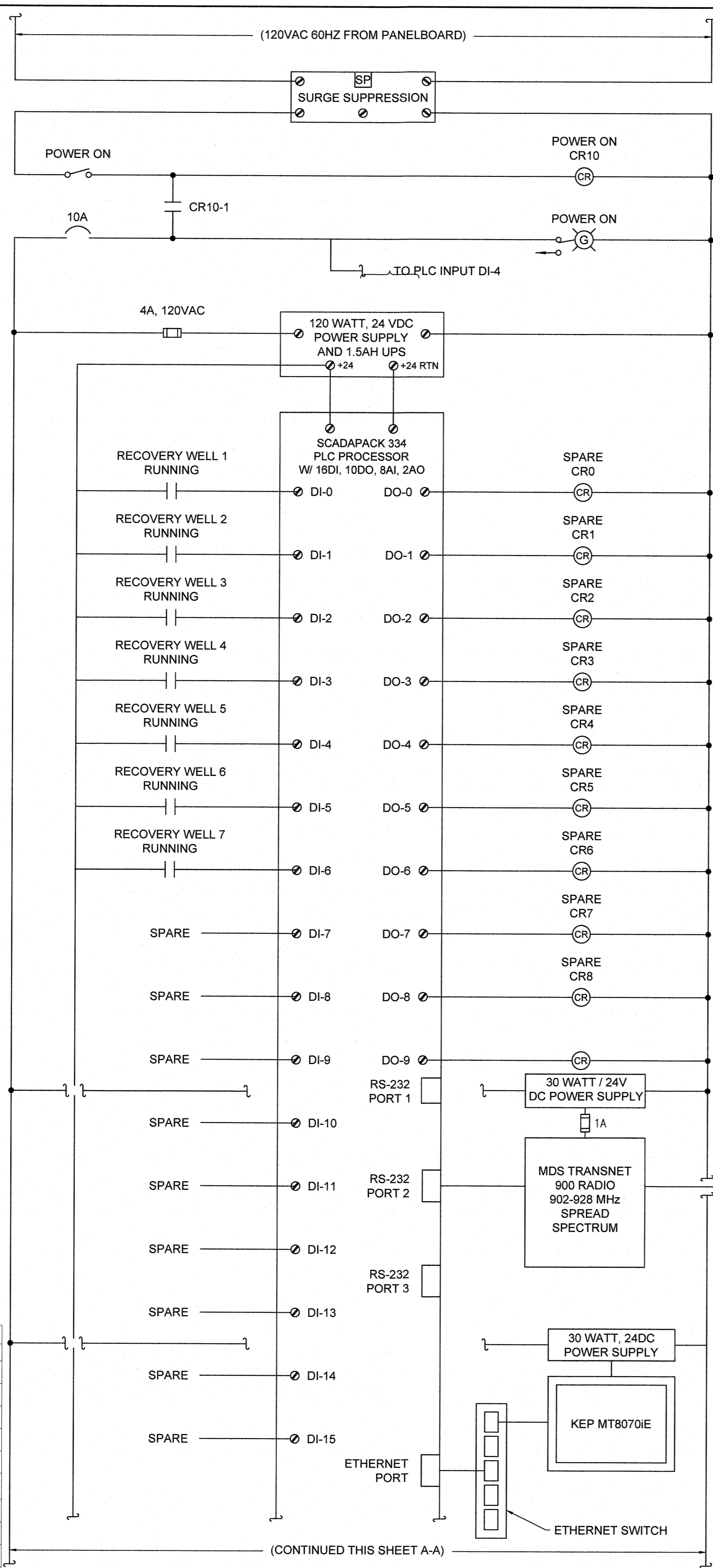
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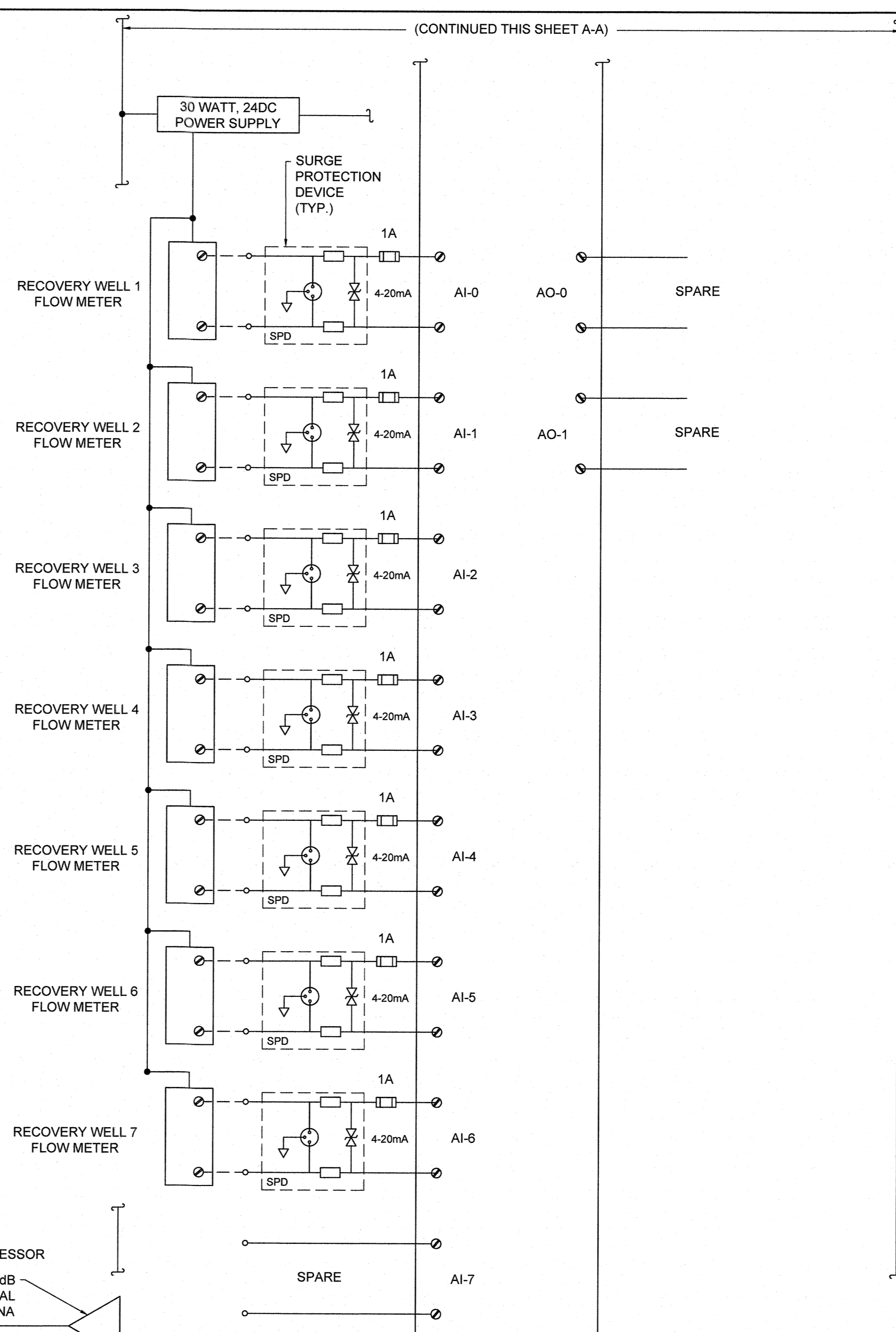
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CONTROL PANEL PARTS LIST				
ITEM #	QUANTITY	MANUFACTURER	PART NUMBER	DESCRIPTION
1	1	HOFFMAN	MAS0806030R5	MILD STEEL SINGLE DOOR ENCLOSURE, NEMA 4, 31.5" x 23.62" x 11.81", 14 GA DOOR
2	1	HOFFMAN		BACK PLATE, 30.31" x 21.65", 16 GA
3	1	ALLEN-BRADLEY	800FP-P4PN5R	PILOT LIGHT, RED, 22.5mm
4	1	ALLEN-BRADLEY	800FM-SM22	SELECTOR SWITCH, 2 POS, MAINTAINED, NON-ILLUMINATED
5	1	WEINTEK KEP	MT8070IE	OIT GRAPHIC INTERFACE, LCD DISPLAY AND TOUCH SCREEN
6	1	ABB	S201U-K10	CIRCUIT BREAKER, 1 POLE 240VAC 10 AMPS, TYPE K TRIP CHAR, U2489
7	1	PHOENIX CONTACT	2907918	SURGE PROTECTION, TYPE 2/TYPE 3, 120VAC
8	7	PHOENIX CONTACT	2906750	SURGE PROTECTION, 4-20mA
9	1	PHOENIX CONTACT	2320254	QUINT-UPS 24VDC, 5A, 1.3AH
10	1	PHOENIX CONTACT	2904600	POWER SUPPLY, 24VDC 5A, 120W QUINT 4 PS/1AC/24VDC/5
11	1	SCHNEIDER ELECTRIC	TBUP334-1A20-AB11	SCADA PACK 334, 32 BIT CONTROLLER, ETHERNET PORT, 3 RS-232 COMMUNICATIONS PORTS, MODBUS PROTOCOL WITH TELEPAGE LADDER LOGIC, 8 ANALOG INPUTS, 16 DIGITAL INPUTS, 10 RELAY OUTPUTS
12	1	PHOENIX CONTACT	2891152	INDUSTRIAL ETHERNET SWITCH, FL SWITCH SFN 5TX 5TP RJ45 PORTS
13	3	PHOENIX CONTACT	2902991	POWER SUPPLY, 24VDC, 1.25A, 30W UNO-PS/1AC/24DC/30W
14	11	IDEC	RH2B-UAC120V	RELAY
15	11	IDEC	SH2B-05	RELAY SOCKET
16	AS REQUIRED	PHOENIX CONTACT	3004362	TERMINAL BLOCK, 6.2mm WIDE, 30-10AWG, GRAY, UK 5 N
17	AS REQUIRED	PHOENIX CONTACT	0800886	END BRACKET, 9.5mm WIDE, GRAY, E/NS 35 N
18	AS REQUIRED	PHOENIX CONTACT	3003020	END BARRIER, COVER, 1.8mm WIDE, GRAY, D-UK 4/10
19	AS REQUIRED	PHOENIX CONTACT	3004100	TERMINAL FUSE BLOCK, 8.2mm WIDE, 26-10AWG, UK 5-NE51
20	AS REQUIRED	PHOENIX CONTACT	2775184	GROUND TERMINAL BLOCK, 6.2mm WIDE, GREEN-YELLOW, 24-10 AWG, UDK 4-PE
21	AS REQUIRED	ALLEN-BRADLEY	199-DR1	DIN RAIL
22	AS REQUIRED	THOMAS AND BETTS	T1X2HDG	WIREDUCT, 1" X 2", GRAY
23	AS REQUIRED	THOMAS AND BETTS	T1CG	WIREDUCT COVER, 1", GRAY
24	1	POLYPHUSER	IS-B50LN-C2	ANTENNA SURGE PROTECTION, 50KA, 125 TO 1,000 mHz



CONTROL PANEL NAME PLATE SCHEDULE		
NAMEPLATE	NAMEPLATE NOMENCLATURE	DESCRIPTION
NP1	CONTROL PANEL	NEMA 4X ENCLOSURE
NP2	POWER	POWER ON SELECTOR SWITCH
NP3	POWER ON	STATUS LIGHT (RED)



CONTROL PANEL ELEMENTARY
NOT TO SCALE

NICHOLSON LANDFILL
GROUNDWATER TREATMENT SYSTEM UPGRADES
CHESTER TOWNSHIP
KENT COUNTY, MARYLAND
EXISTING TREATMENT BUILDING CONTROL PANEL AND ELEMENTARY

EA
EA Engineering, Science,
and Technology, Inc., PBC
225 Schilling Circle, Suite 400
Hunt Valley, Maryland 21031
(410) 584-7000
www.eaest.com

GRAPHIC SCALE IN FEET
0 1' 2' 4'

FULL SIZE PLOT: 24" x 36"
DATE: SEPTEMBER 2023
PROJECT NUMBER: 6377401

E-005

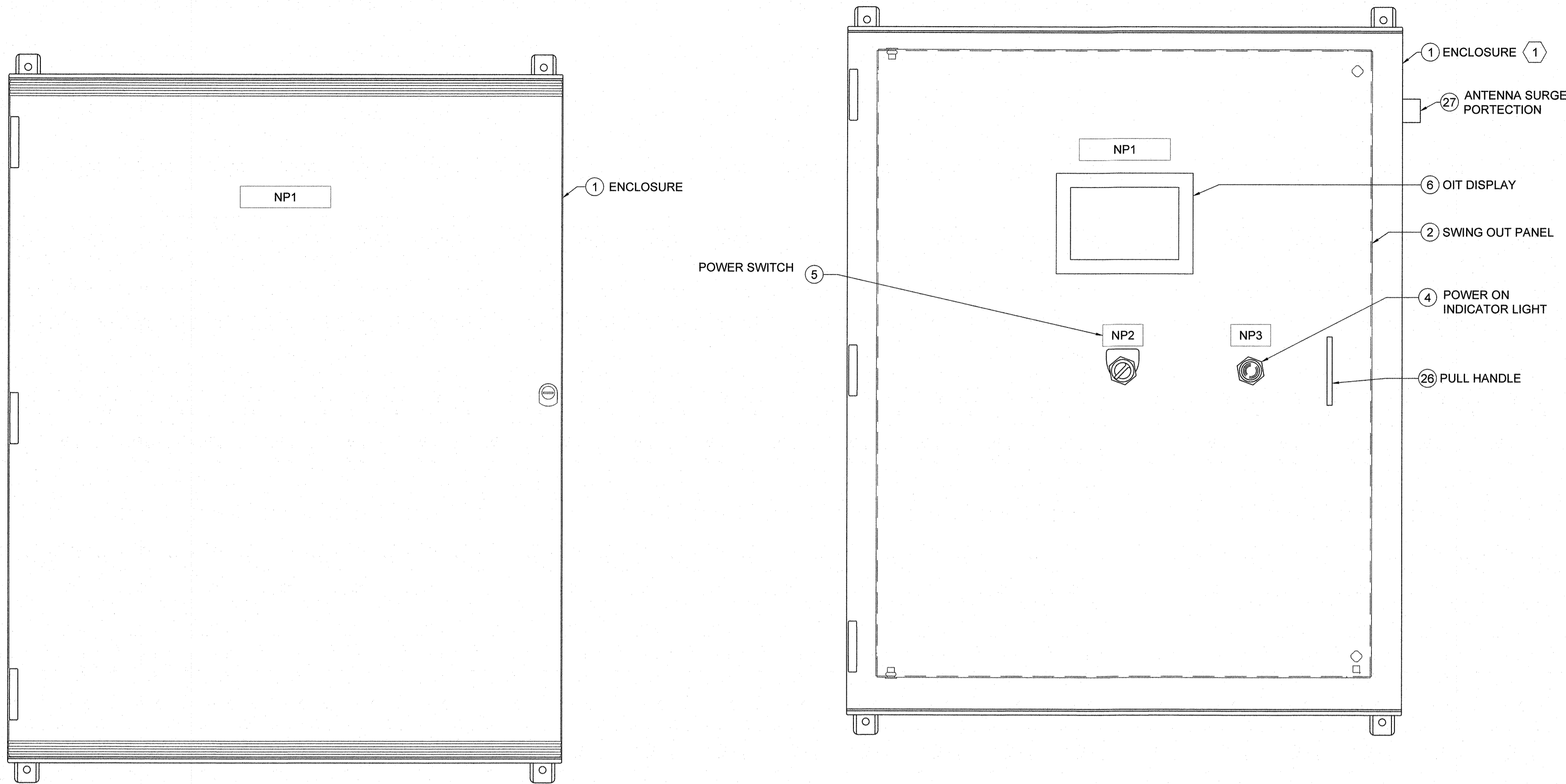
DESIGN INFORMATION
DESIGNED BY: DYN/WH
DRAWN BY: NWH
CHECKED BY: DY
PROJECT MANAGER: DOK

PROFESSIONAL CERTIFICATION I HEREBY
CERTIFY THAT THESE DOCUMENTS WERE
PREPARED OR APPROVED BY ME, AND THAT
I AM A DULY LICENSED PROFESSIONAL
ENGINEER UNDER THE LAWS OF THE STATE
OF MARYLAND, LICENSE NO. 20812
EXPIRATION DATE: APRIL 24, 2025

SEAL
STATE OF MARYLAND
DANIEL T. LUE
PROFESSIONAL ENGINEER
2025

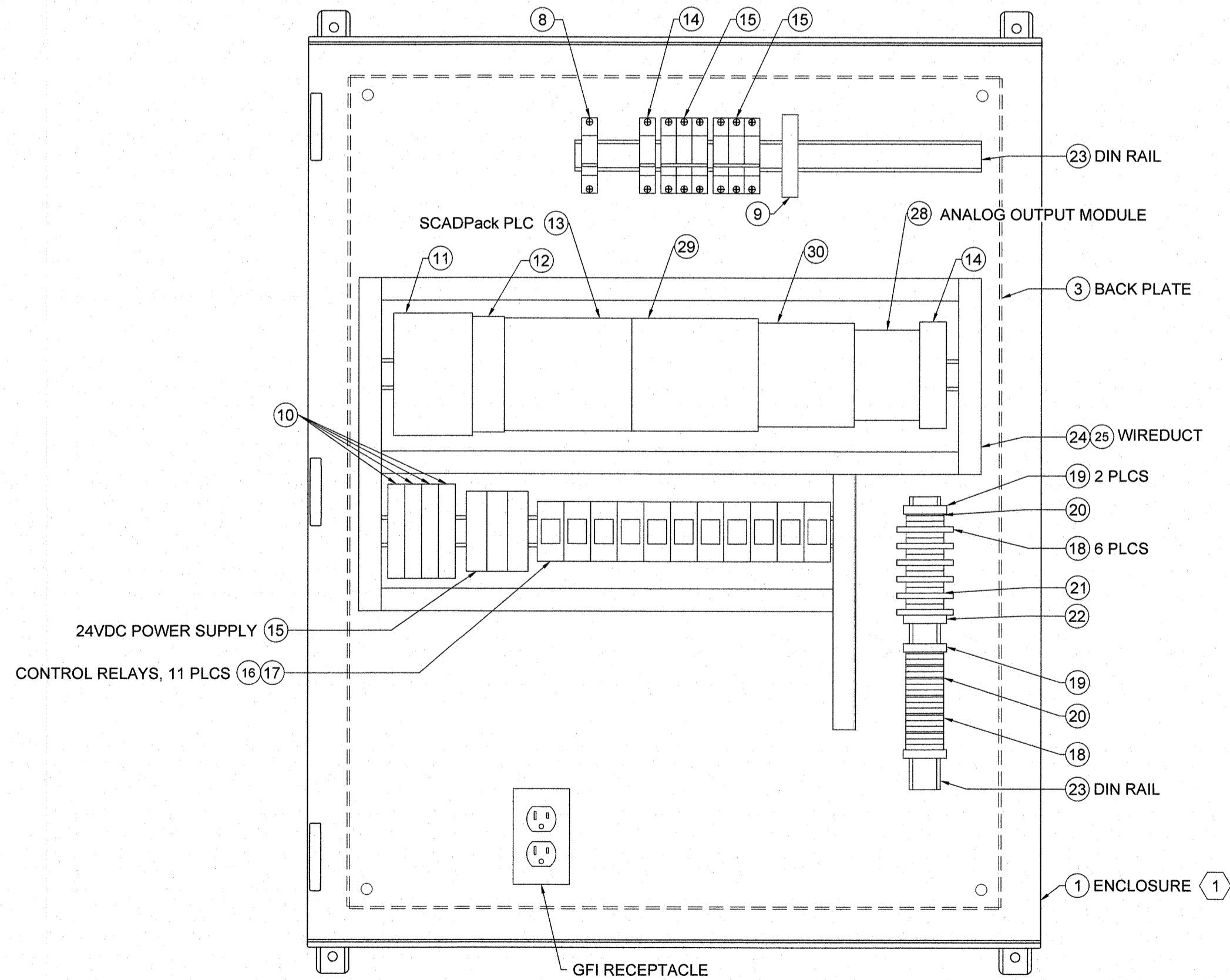
REVISIONS
NO. DATE BY DESCRIPTION

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PUMP CONTROL PANEL - ELEVATION
NOT TO SCALE

PUMP CONTROL PANEL - INNER-DOOR ELEVATION
NOT TO SCALE



PUMP CONTROL PANEL - SUB-PANEL LAYOUT
NOT TO SCALE

NOTES

- 1 ENCLOSURE EXTERIOR DOOR NOT SHOWN FOR CLARITY.
2 FINAL SELECTION OF OVERLOAD DEVICE SHALL BE BASED ON THE ACTUAL NAMEPLATE RATING OF THE MOTOR.

PUMP CONTROL PANEL PARTS LIST				
ITEM #	QUANTITY	MANUFACTURER	PART NUMBER	DESCRIPTION
1	1	HOFFMAN	UU1008030	ULTRX ENCLOSURE, NEMA 4X, 40x32x12 (40.35x32.48x12.64)
2	1	HOFFMAN	UU10080SP	ULTRX SWING-OUT PANEL
3	1	HOFFMAN	A40P30	BACK PLATE, 37 x 29
4	1	ALLEN-BRADLEY	800FP-P4PN5R	PILOT LIGHT, RED, 22.5mm
6	1	ALLEN-BRADLEY	800FM-SM22	SELECTOR SWITCH, 2 POS, MAINTAINED, NON-ILLUMINATED
7	1	WEINTEK KEP	MT8070IE	OIT GRAPHIC INTERFACE, LCD DISPLAY AND TOUCH SCREEN
8	1	ABB	S201U-K10	CIRCUIT BREAKER, 1 POLE 240VAC 10 AMPS, TYPE K TRIP CHAR, U2489
9	1	PHOENIX CONTACT	2907918	SURGE PROTECTION, TYPE 2/TYPE 3, 120VAC
10	4	PHOENIX CONTACT	2906750	SURGE PROTECTION, 4-20mA
11	1	PHOENIX CONTACT	2320254	QUINT-UPS 24VDC, 5A, 1.3AH
12	1	PHOENIX CONTACT	2904600	POWER SUPPLY, 24VDC 5A, 120W QUINT 4 PS/1AC/24VDC/5
13	1	SCHNEIDER ELECTRIC	TP334-1A20-AB11	SCADA PACK 334, 32 BIT CONTROLLER, ETHERNET PORT, 3 RS-232 COMMUNICATIONS PORTS, MODBUS PROTOCOL WITH TELEFACE LADDER LOGIC, 8 ANALOG INPUTS, 16 DIGITAL INPUTS, 10 RELAY OUTPUTS, 2 ANALOG OUTPUTS, 900 MHz SPREAD SPECTRUM RADIO.
14	1	PHOENIX CONTACT	2891152	INDUSTRIAL ETHERNET SWITCH, FL SWITCH SFN 5TX 5TP RJ45 PORTS
15	3	PHOENIX CONTACT	2902991	POWER SUPPLY, 24VDC, 1.25A, 30W UNO-PS/1AC/24DC/30W
16	11	IDEC	RH2B-UAC120V	RELAY
17	11	IDEC	SH2B-05	RELAY SOCKET
18	AS REQUIRED	PHOENIX CONTACT	3004362	TERMINAL BLOCK, 6.2mm WIDE, 30-10AWG, GRAY, UK 5 N
19	AS REQUIRED	PHOENIX CONTACT	0800886	END BRACKET, 9.5mm WIDE, GRAY, E/NS 35 N
20	AS REQUIRED	PHOENIX CONTACT	3003020	END BARRIER, COVER, 1.8mm WIDE, GRAY, D-UK 4/10
21	AS REQUIRED	PHOENIX CONTACT	3004100	TERMINAL FUSE BLOCK, 8.2mm WIDE, 26-10AWG, UK 5-HESI
22	AS REQUIRED	PHOENIX CONTACT	2775184	GROUND TERMINAL BLOCK, 6.2mm WIDE, GREEN-YELLOW, 24-10 AWG, UDK 4-PE
23	AS REQUIRED	ALLEN-BRADLEY	199-DR1	DIN RAIL
24	AS REQUIRED	THOMAS AND BETTS	T1X2HDG	WIREDUCT, 1" X 2", GRAY
25	AS REQUIRED	THOMAS AND BETTS	T1CG	WIREDUCT COVER, 1", GRAY
26	1	GRAINGER	1XNY4	PULL HANDLE
27	1	POLYPHASER	IS-B50LN-C2	ANTENNA SURGE PROTECTION, 50 KA, 125 TO 1,000 mHz
28	2	SCHNEIDER ELECTRIC	TBUX297248	5304 ANALOG OUTPUT MODULE, 4 CHANNELS, 4-20MA
29	1	SCHNEIDER ELECTRIC	TBUX297249	5405 DISCRETE INPUT MODULE, 32 120VAC DIGITAL INPUTS
30	1	SCHNEIDER ELECTRIC	TBUX297126	5407 RELAY OUTPUT MODULE, 8 DRY CONTACT RELAY OUTPUTS

PUMP CONTROL PANEL NAMEPLATE SCHEDULE		
NP#	DESCRIPTION	NAMEPLATE NOMENCLATURE
1	NEMA 4X ENCLOSURE	CONTROL PANEL
2	POWER ON SELECTOR SWITCH	POWER
3	STATUS LIGHT (RED)	POWER ON

NICHOLSON LANDFILL
GROUNDWATER TREATMENT SYSTEM UPGRADES
CHESTER TOWNSHIP

KENT COUNTY, MARYLAND

CONTROL PANEL



EA Engineering, Science,
and Technology, Inc., PBC
225 Schilling Circle, Suite 400
Hunt Valley, Maryland 21031
(410) 584-7000

www.eaest.com

0 1' 2' 4'
GRAPHIC SCALE IN FEET

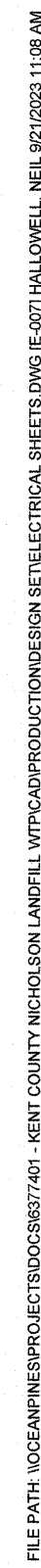
FULL SIZE PLOT: 24" x 36"

DATE: SEPTEMBER 2023

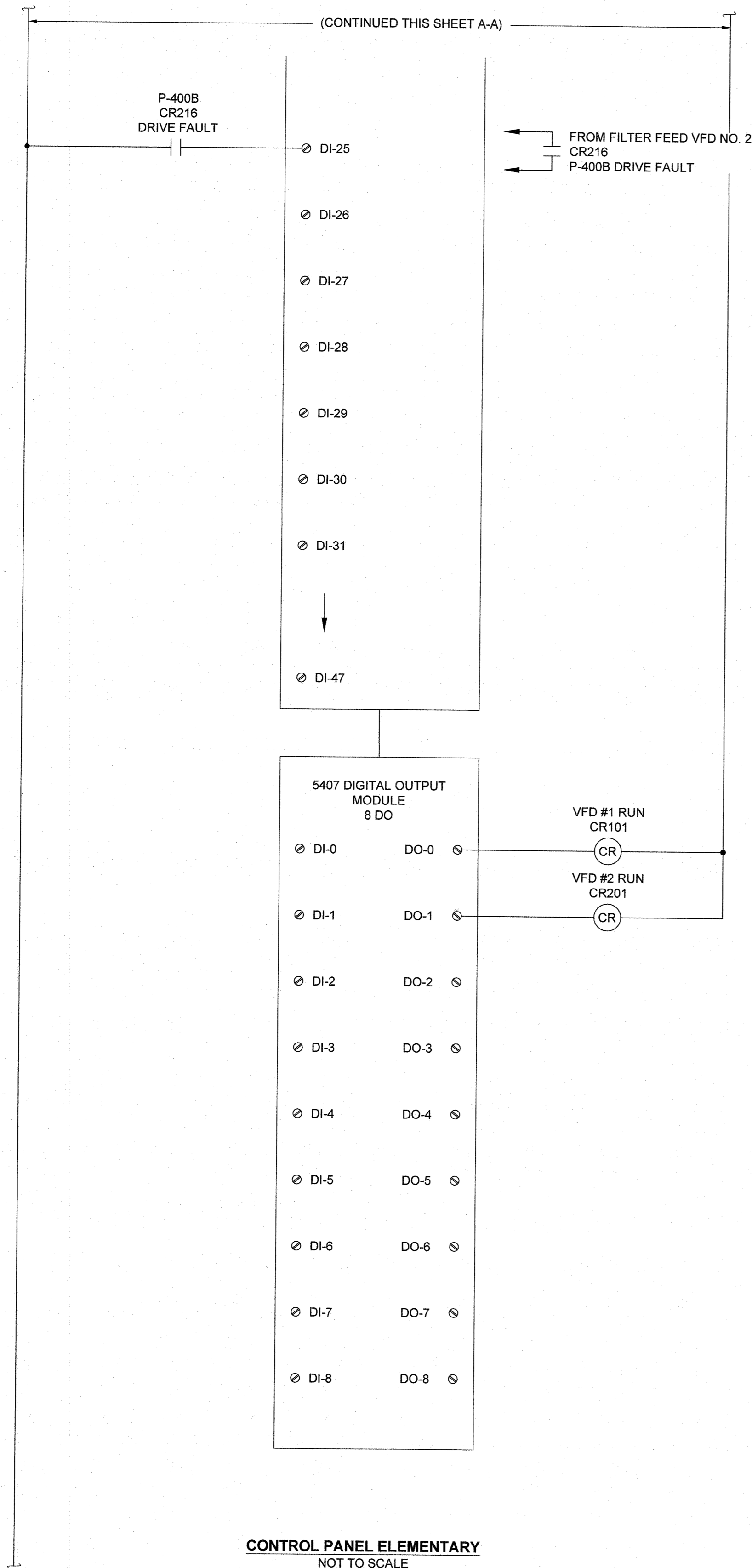
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E-006

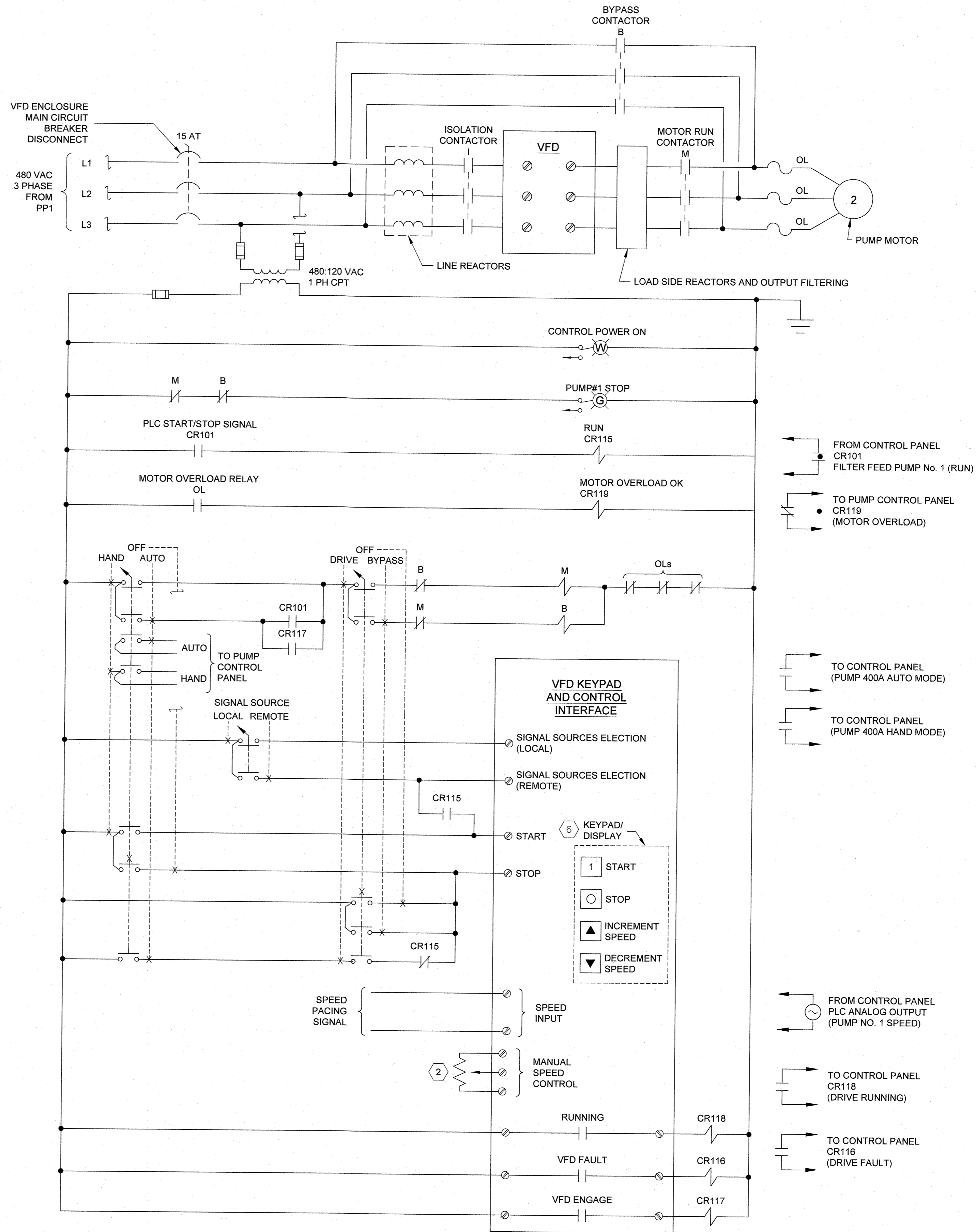
100% PLANS - FOR CONSTRUCTION



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CONTROL PANEL ELEMENTARY
NOT TO SCALE



FILTER FEED PUMP No. 1 VFD ELEMENTARY
NOT TO SCALE

ELEMENTARY NOTES

- PUMP NO. 2 VFD ELEMENTARY SIMILAR, EXCEPT SUBSTITUTE CR201 FOR CR101, CR218 FOR CR118, CR216 FOR CR116, AND CR219 FOR CR119.
- PROVIDE POTENTIOMETER OR SIMILAR SPEED DEVICE.

REVISIONS		DESCRIPTION	
NO.	DATE	BY	

DESIGN INFORMATION	
DESIGNED BY:	DYN/WH
DRAWN BY:	NWH
CHECKED BY:	DY
PROJECT MANAGER:	DOK
PROFESSIONAL CERTIFICATION: I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 20812 EXPIRATION DATE: APRIL 24, 2025	

NICHOLSON LANDFILL
GROUNDWATER TREATMENT SYSTEM UPGRADES
CHESTER TOWNSHIP
KENT COUNTY, MARYLAND

CONTROL PANEL AND VFD ELEMENTARY

EA
EA Engineering, Science,
and Technology, Inc., PBC
225 Schilling Circle, Suite 400
Hunt Valley, Maryland 21031
(410) 584-7000
www.eaest.com

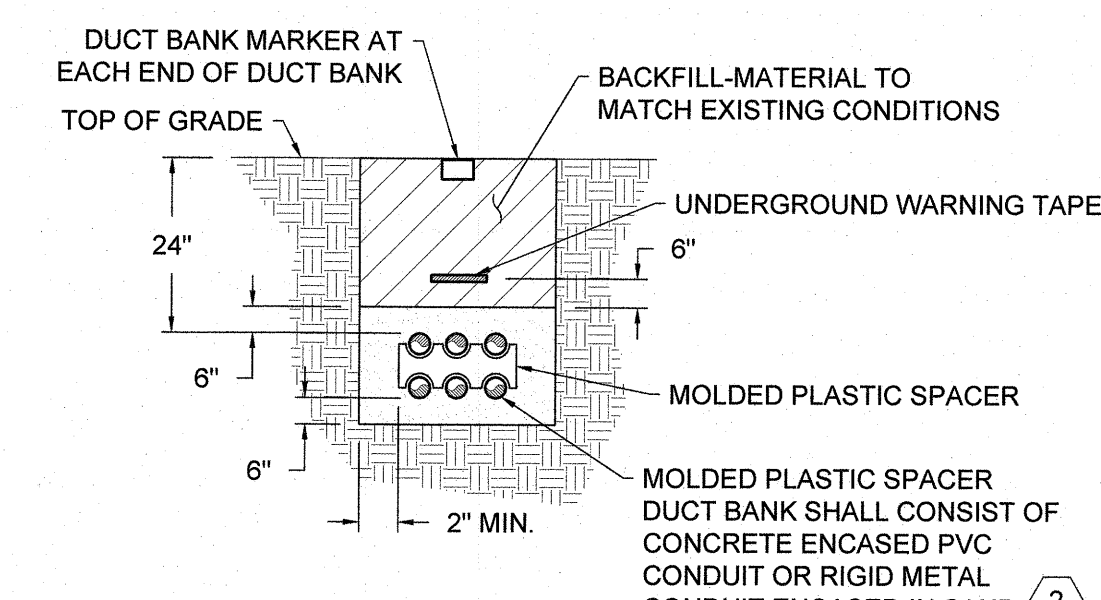
0 1' 2' 4'
GRAPHIC SCALE IN FEET

FULL SIZE PLOT: 24" x 36"

DATE: SEPTEMBER 2023

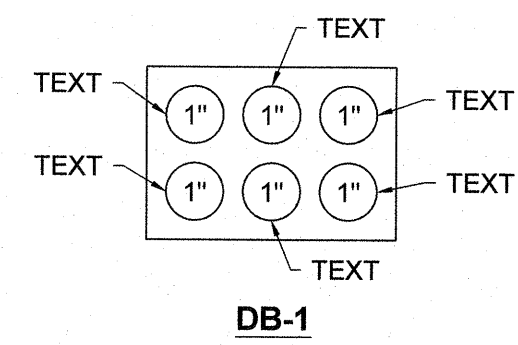
PROJECT NUMBER: 6377401

E-008

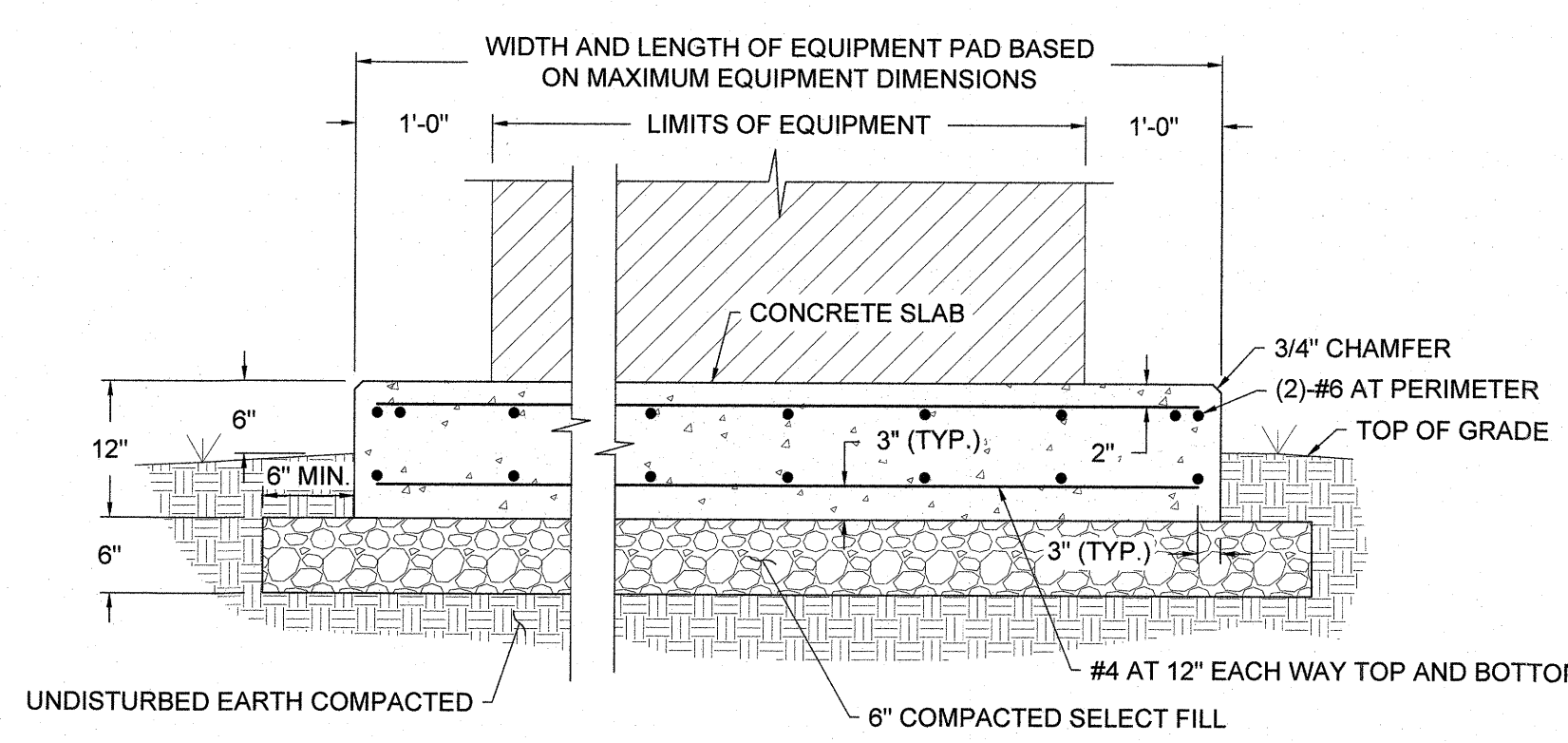


DUCT BANK DETAIL NOTES

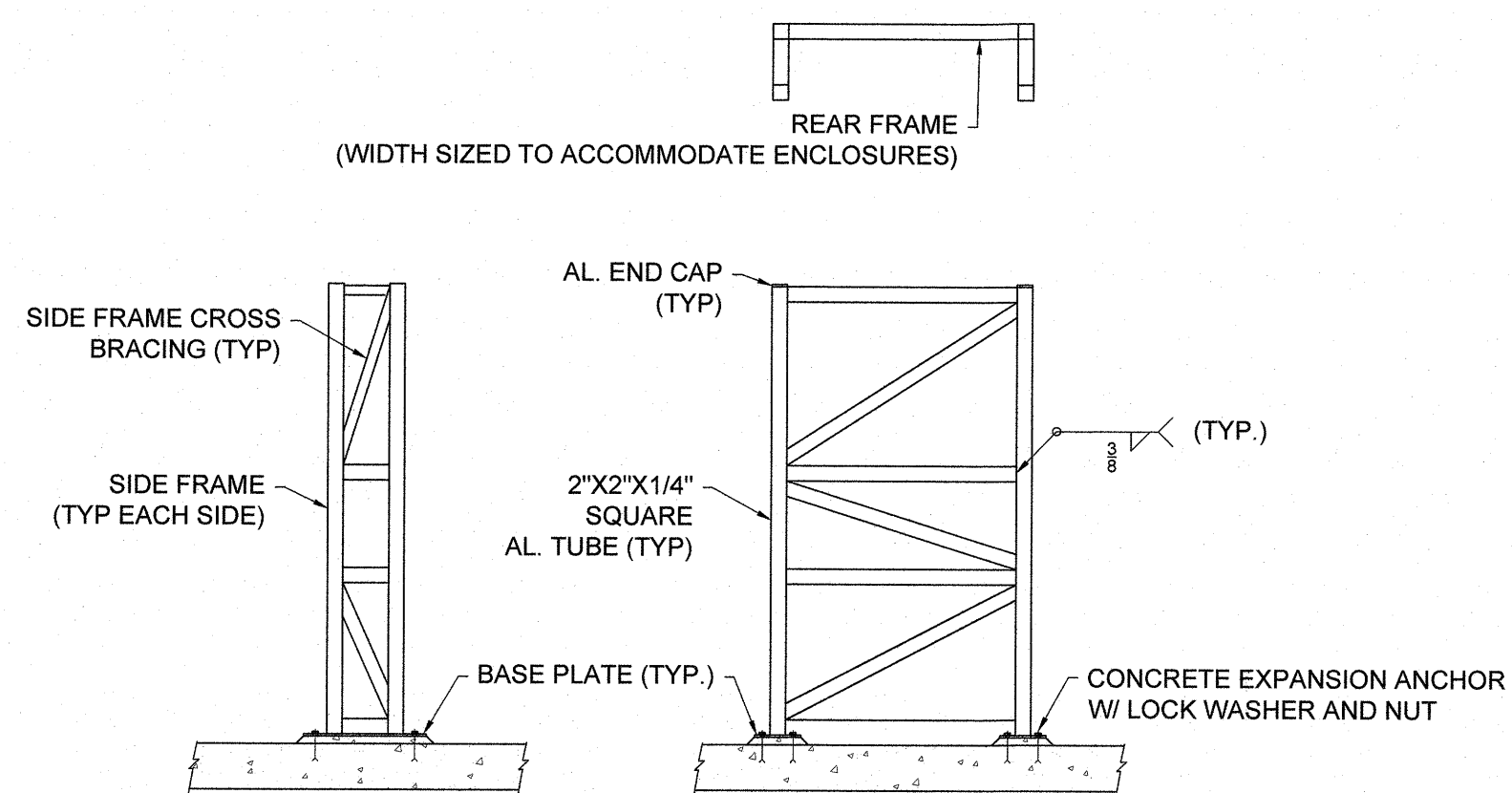
1. TYPICAL DETAIL FOR CONDUIT ARRANGEMENT. EXACT CONFIGURATION OF CONDUITS WITHIN DUCTWILL VARY IN ACCORDANCE WITH CIRCUIT AND EQUIPMENT REQUIREMENTS.
2. UNDER ALL CIRCUMSTANCES, CUNDUITS ASSOCIATED WITH THE VEEDER-ROOT TANK MANAGEMENT SYSTEM SHALL BE RIGID METAL CONDUIT, AS RECOMMENDED BY THE TANK MANAGEMENT SYSTEM MANUFACTURER.



DUCT BANK SECTION DB-1 NOT TO SCALE



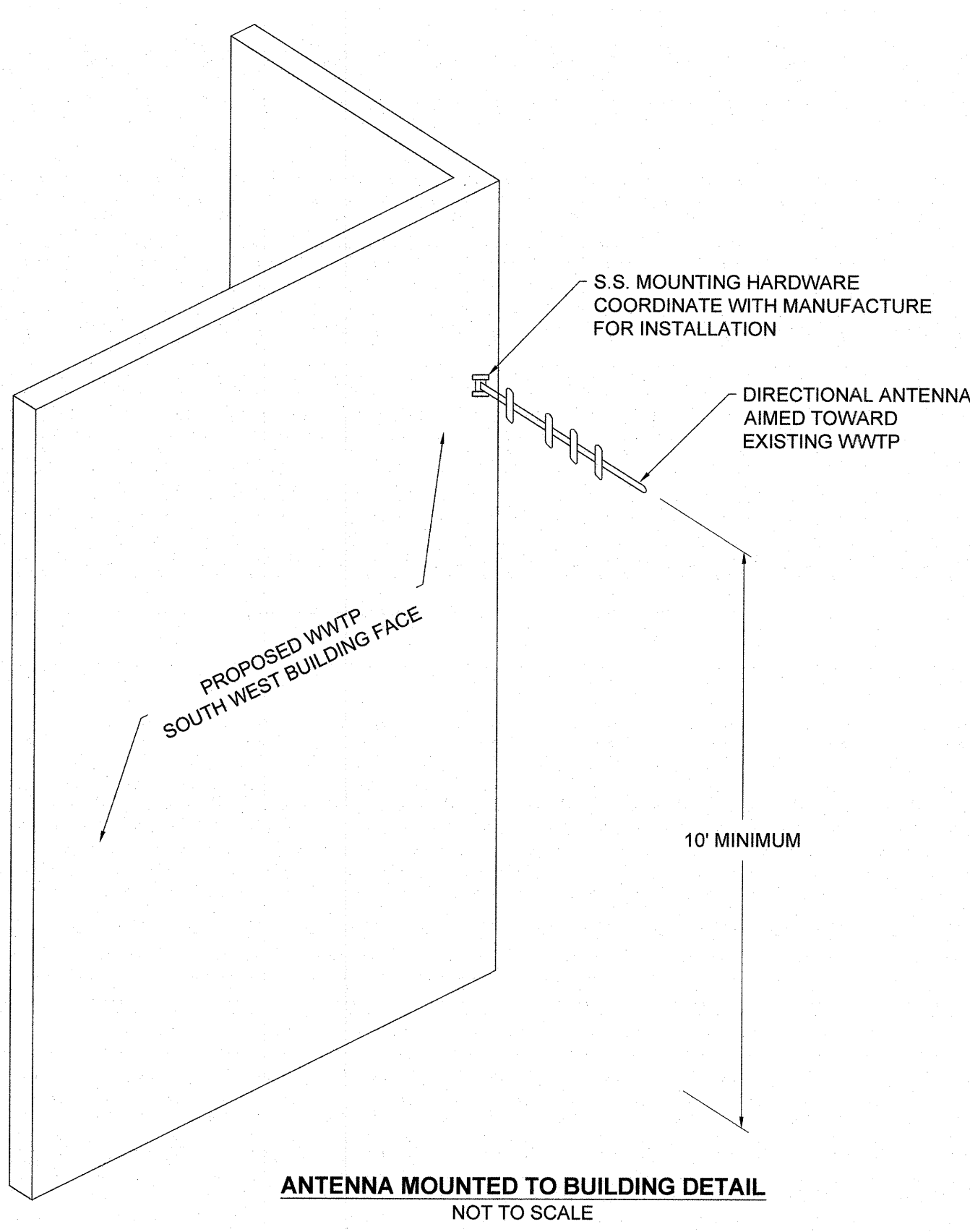
EXTERIOR CONCRETE EQUIPMENT PAD DETAIL NOT TO SCALE



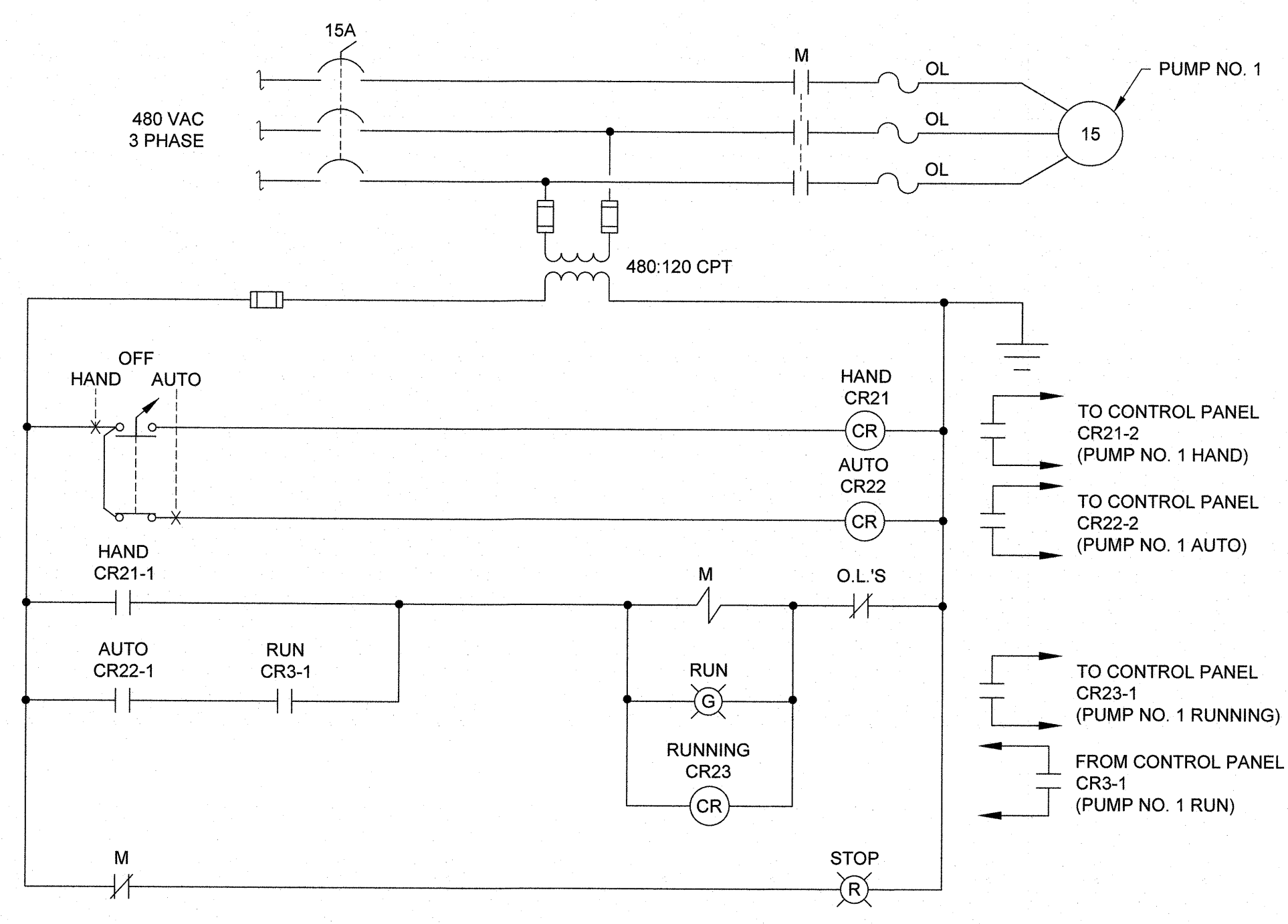
EQUIPMENT MOUNTING RACK DETAIL NOT TO SCALE

EQUIPMENT MOUNTING RACK DETAIL NOTES

1. SIDE FRAME SHALL BE 10" DEEP MINIMUM. THE SIDE FRAME SHALL BE APPROXIMATELY TWO THIRDS THE SIZE OF THE LARGEST ENCLOSURE DEPTH.
2. CROSS BRACING SHALL BE PROVIDED ON THE REAR FRAME ASSEMBLY FOR EMRs 24" WIDE AND LARGER. CROSS BRACING SHALL BE PROVIDED ON THE SIDE FRAME FOR EMRs 18" DEEP OR LARGER.
3. ENCLOSURES HSALL BE MOUNTED USING STAINLESS STEEL HARDWARE. THE EMR SHALL BE FASTENED TO THE CEP WITH CORROSION RESISTANT EXPANSION ANCHORS.



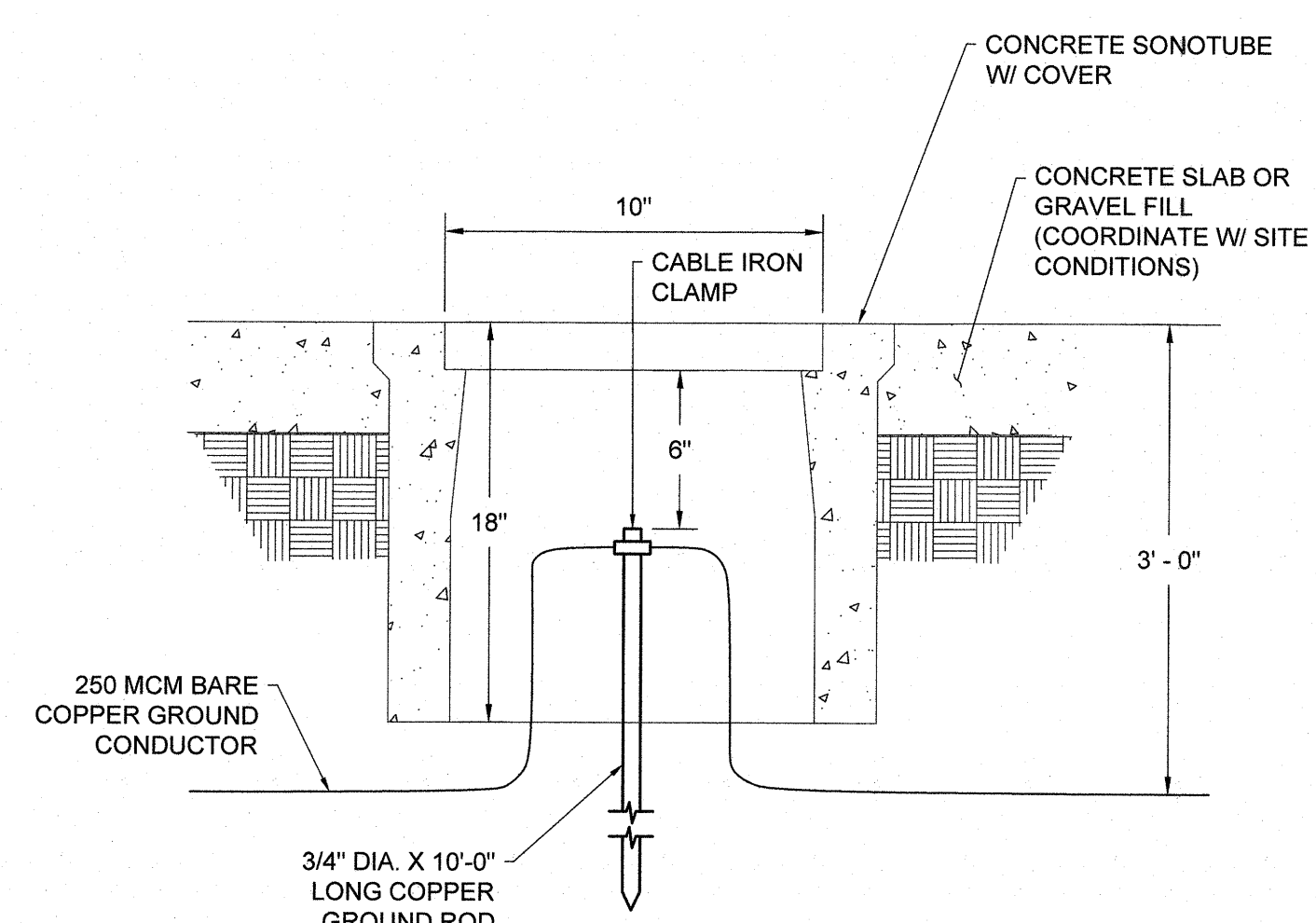
ANTENNA MOUNTED TO BUILDING DETAIL NOT TO SCALE



701A SERVICE WATER PUMP No. 1 - ELEMENTARY NOT TO SCALE

NOTES

1. ELEMENTARY FOR P701A SERVICE WATER PUMP NO. 1 SHOWN. ELEMENTARY FOR P701B SERVICE WATER PUMP NO. 2 SIMILAR, EXCEPT SUBSTITUTE CR4 FOR CR3, CR31 FOR CR21, CR32 FOR CR22, AND CR33 FOR CR23.
2. ELEMENTARY FOR M200 FLASH MIXER SIMILAR, EXCEPT SUBSTITUTE CR0 FOR CR3, CR41 FOR CR21, CR42 FOR CR22, AND CR43 FOR CR23.
3. ELEMENTARY FOR M300 FLOCCULENT MIXER SIMILAR, EXCEPT SUBSTITUTE CR1 FOR CR3, CR51 FOR CR21, CR52 FOR CR22, AND CR53 FOR CR23.



GROUND ROD TEST WELL DETAIL NOT TO SCALE

PANEL SCHEDULE											
PANELBOARD	PP1	LOCATION	ELECTRIC ROOM	INSTALLATION	SURFACE						
RATINGS	225	AMPS,	480/277	VOLTS,	3 PHASE,	PH,	4	WIRE,	50	HZ.,	GRD BAR
MAIN LUGS	-	BKR INTERRUPTING RATING	65,000	RMS. SYMM. AMPS							
MAIN CIRCUIT BREAKER	200	AMPS,	CONNECTED LOAD	-	KVA	PANEL SIZE	42				
DESCRIPTION	NOTES	BKR AMPS	CKT	A	B	C	CKT	BKR AMPS	NOTES	DESCRIPTION	
TRANSFORMER T1 (30kVA)		80A	1	•	•	•	2	20A		FLASH MIXER	
↓			3				4				
HOT WATER HEATER 13.5 kW		30A	5	•	•	•	6	30A		FLOCCULENT MIXER	
↓			7	•	•	•	8	20A			
			9				10				
FILTER FEED PUMP No. 1 P-400A		20A	11	•	•	•	12	30A		EXTERIOR LIGHTS	
↓			13	•	•	•	14	20A			
			15				16				
FILTER FEED PUMP No. 2 P-400B		30A	17	•	•	•	18	25A		ELECTRIC UNIT HEATER 1 & 2	
↓			19	•	•	•	20				
			21				22				
SERVICE WATER PUMP No. 1		20A	23	•	•	•	24	25A		ELECTRIC UNIT HEATER 4 & 5	
↓			25	•	•	•	26				
			27				28				
SERVICE WATER PUMP No. 2		20A	29	•	•	•	30	25A		ELECTRIC UNIT HEATER 3 & 6	
↓			31	•	•	•	32				
			33				34				
PROCESS AREA LIGHTS		30A	35	•	•	•	36	20A		SPARE	
↓			37	•	•	•	38				
			39	•	•	•	40				
		20A	41	•	•	•	42	30A		SPACE	

PANEL SCHEDULE													
PANELBOARD		LP1	LOCATION		ELECTRIC ROOM			INSTALLATION		SURFACE			
RATINGS		225	AMPS,	120/208	VOLTS,	3 PHASE,	PH,	4	WIRE,	50	HZ,	GRD BAR	-
MAIN LUGS		-	BKR INTERRUPTING RATING			14,000			RMS. SYMM. AMPS				
MAIN CIRCUIT BREAKER		100	AMPS,	CONNECTED LOAD			-	KVA	PANEL SIZE		42		
DESCRIPTION				NOTES	BKR AMPS	CKT	A	B	C	CKT	BKR AMPS	NOTES	DESCRIPTION
CONTROL PANEL					20A	1P	1	•		2	20A	1P	CLEAR WELL PUMP P-500
RECEPTACLES					20A	1P	3	•		4	20A	1P	FILTRATE & BUILDING SUMP PUMP P-800
RECEPTACLES					20A	1P	5	•		6	20A	1P	NaOH METERING PUMP No. 1 P-915A
LIGHTS					20A	1P	7	•		8	20A	1P	NaOH METERING PUMP No. 2 P-915B
LIGHTS					20A	1P	9	•		10	20A	1P	PAC POLYMER FEED PUMP P-932A
EMERGENCY LIGHTS					20A	1P	11	•		12	20A	1P	PAC POLYMER FEED PUMP P-932B
RECEPTACLES					20A	1P	13	•		14	20A	1P	EXHAUST FAN 1
RECEPTACLES					20A	1P	15	•		16	20A	1P	ELECTRIC ROOM MINI SPLIT
SLUDGE FILTER CONTROL PANEL					20A	1P	17	•		18	20A	2P	
						19	•			20	20A	1P	EXHAUST FAN 2
						21	•			22	20A	1P	EXHAUST FAN 3
						23	•			24			
						25	•			26			
						27	•			28			
						29	•			30			
						31	•			32			
SPARE					20A	1P	33	•		34	20A	1P	SPARE
SPARE					20A	1P	35	•		36	20A	1P	SPARE
SPARE					20A	1P	37	•		38	20A	1P	SPARE
SPARE					20A	1P	39	•		40	20A	1P	SPARE
SPARE					20A	1P	41	•		42	20A	1P	SPARE

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ELECTRICAL DETAILS

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E-009

100% PLANS - FOR CONSTRUCTION