

ASHLEIGH KNOLLS SHARED SEWAGE DISPOSAL FACILITY

HOWARD COUNTY, MARYLAND

DEPARTMENT OF PUBLIC WORKS

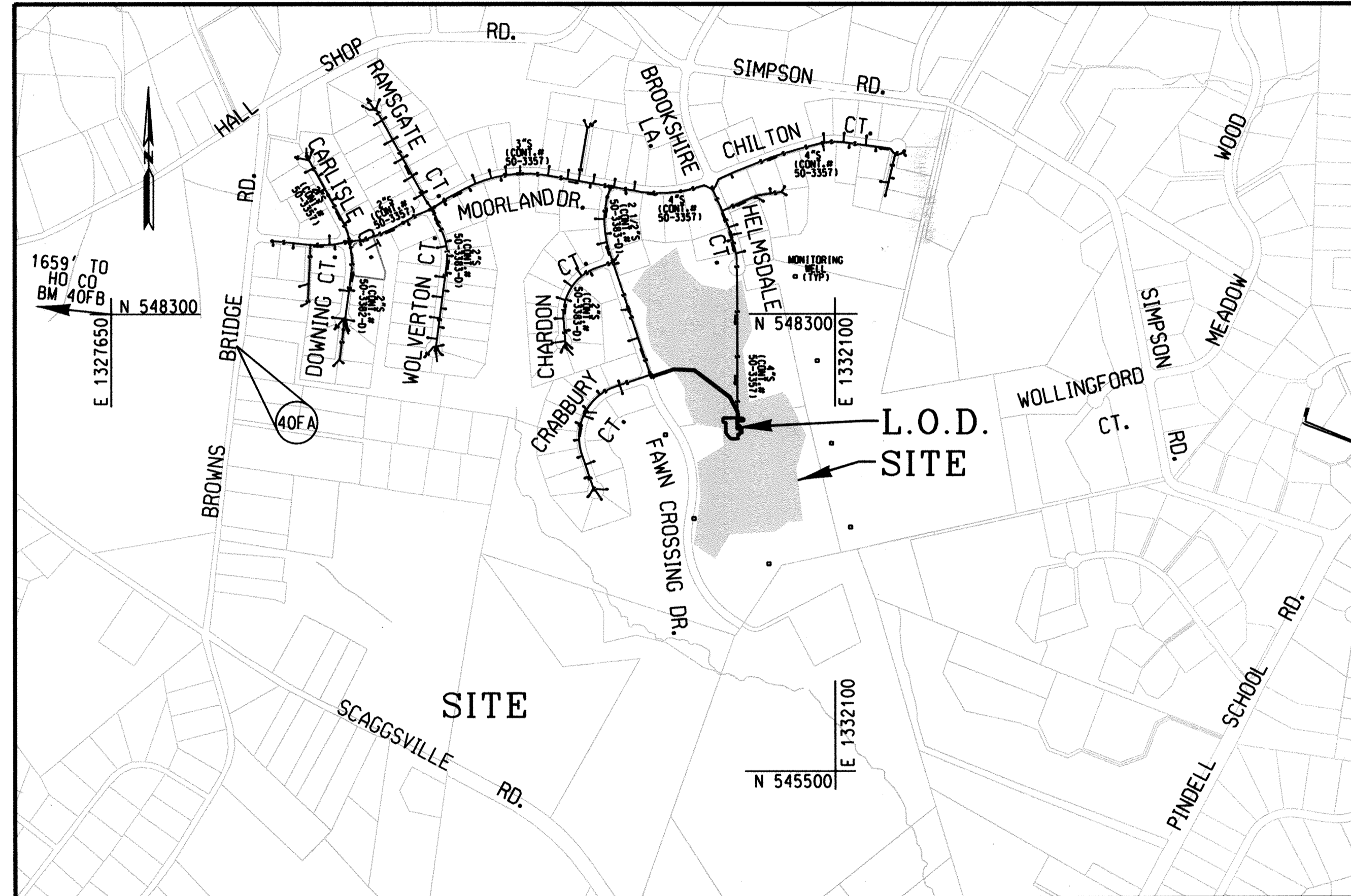
CAPITAL PROJECT No. S-6269

CONTRACT No. 50-4972

GENERAL NOTES

1. APPROXIMATE LOCATION OF EXISTING UTILITIES ARE SHOWN. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO PROTECT EXISTING UTILITIES AND SERVICES AND MAINTAIN UNINTERRUPTED SERVICE. ANY DAMAGE INCURRED SHALL BE REPAIRED IMMEDIATELY TO THE SATISFACTION OF THE ENGINEER AT THE CONTRACTOR'S EXPENSE.
2. EXISTING FEATURES ON THESE PLANS HAVE BEEN DEVELOPED BY KCI TECHNOLOGIES USING PLANS FOR THE ASHLEIGH KNOLLS WASTEWATER COLLECTION, TREATMENT AND DISPOSAL SYSTEM (CONTRACT NO. 50-3357) DATED AUGUST 1994. NO TOPOGRAPHIC SURVEY WAS CONDUCTED FOR THIS CONTRACT. THE DATUM ON THE AS BUILT (CONTRACT NO. 50-3357): THE HORIZONTAL DATUM IS BASED ON MARYLAND STATE COORDINATES NAD 83/91. THE VERTICAL DATUM IS BASED ON U.S.G.S NGVD 29.
3. ALL PIPE ELEVATIONS SHOWN ARE INVERT ELEVATIONS UNLESS OTHERWISE NOTED ON THE PLANS.
4. CLEAR ALL UTILITIES BY A MINIMUM OF 12".
5. FOR DETAILS NOT SHOWN ON THE DRAWINGS, AND FOR MATERIALS AND CONSTRUCTION METHODS, USE HOWARD COUNTY DESIGN MANUAL, VOLUME IV, STANDARD SPECIFICATIONS AND DETAILS FOR CONSTRUCTION (LATEST EDITION). THE CONTRACTOR SHALL HAVE A COPY OF VOLUME IV ON THE JOB.
6. CONTRACTOR SHALL NOTIFY THE FOLLOWING UTILITY COMPANIES OR AGENCIES AT LEAST FIVE WORKING DAYS BEFORE STARTING WORK SHOWN ON THESE PLANS:

AT&T.....	1-800-252-1133
BGE (CONSTRUCTION SERVICES).....	410-637-8713 / 800-233-1854
BGE (EMERGENCY).....	800-685-0123
BUREAU OF UTILITIES (OPW).....	410-313-4900
COLONIAL PIPELINE CO.	410-795-1390 / 800-926-2728
MISS UTILITY.....	1-800-257-7777
STATE HIGHWAY ADMINISTRATION.....	410-313-7450 / 410-582-5650
VERIZON.....	1-800-743-0033 / 410-224-9210
7. TREES AND SHRUBS ARE TO BE PROTECTED FROM DAMAGE TO THE MAXIMUM EXTENT. TREES AND SHRUBS LOCATED WITHIN THE CONSTRUCTION STRIP ARE NOT TO BE REMOVED OR DAMAGED BY THE CONTRACTOR.
8. CONTRACTOR SHALL REMOVE TREES, STUMPS AND ROOTS ALONG LINE OF EXCAVATION. PAYMENT FOR SUCH REMOVAL SHALL BE INCLUDED IN THE UNIT PRICE BID FOR CONSTRUCTION OF THE MAIN.
9. EXCEPT AS INDICATED ON THE PLANS AND NOTED ABOVE, ALL PUBLIC WATER MAINS SHALL BE POLYVINYLCHLORIDE (PVC) PIPE MEETING THE REQUIREMENTS OF AWWA C900 DR18, PRESSURE CLASS 150 AND THE HOWARD COUNTY DESIGN MANUAL, VOLUME IV, STANDARD SPECIFICATIONS AND DETAILS FOR CONSTRUCTION AND ALL SUBSEQUENT AMENDMENTS THERETO.
10. THE CONTRACTOR SHALL NOT OPERATE ANT STATION EQUIPMENT ON THE EXISTING TREATMENT SYSTEM. THE CONTRACTOR SHALL NOTIFY THE BUREAU OF UTILITIES HOWARD COUNTY, 15 DAYS PRIOR TO WATER MAIN SHUT DOWNS.
11. THE CONTRACTOR SHALL PROVIDE SURVEY CONSTRUCTION STAKEOUT FOR ALL NECESSARY LINES, GRADES AND ELEVATION OF THE PROPOSED FACILITIES.
12. THE CONTRACTOR SHALL PROVIDE STAGING/STORAGE AREA.
13. ALL EXCAVATION SHALL BE KEPT FREE OF WATER UNTIL BACKFILL IS PROPERLY TAMPED IN PLACE TO FINISHED GRADE.
14. THE CONTRACTOR SHALL COORDINATE WITH THE EXISTING SYSTEM, ALL CONNECTIONS TO THE EXISTING SYSTEM SHALL BE PERFORMED DURING LOW WASTEWATER FLOW CONDITION, AS APPROVED BY THE COUNTY, TO MINIMIZE THE DISRUPTION TO THE OPERATION OF THE EXISTING SYSTEM.



VICINITY MAP

SCALE: 1" = 600'

DIRECTIONS: FROM I-95 SOUTH TO ROUTE 216 WEST, MAKE A RIGHT ONTO BROWN BRIDGE ROAD, RIGHT ON MOORLAND DRIVE AND A RIGHT ON FAWN CROSSING DRIVE, SITE ENTRANCE ROAD ON LEFT.

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OWNER'S ADDRESS

HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
BUREAU OF UTILITIES
8250 OLD MONTGOMERY ROAD
COLUMBIA MARYLAND, 21045

OWNERS / DEVELOPER CERTIFICATION

"I/WE CERTIFY THAT ALL CLEARING, GRADING, CONSTRUCTION OR DEVELOPMENT WILL BE DONE PURSUANT TO THIS APPROVED EROSION AND SEDIMENT CONTROL PLAN, INCLUDING INSPECTING AND MAINTAINING CONTROLS, AND THAT THE RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF TRAINING AT A MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) APPROVED TRAINING PROGRAM FOR THE CONTROL OF EROSION AND SEDIMENT PRIOR TO THE BEGINNING OF THE PROJECT. I CERTIFY RIGHT-OF-ENTRY FOR PERIODIC ON-SITE EVALUATION BY HOWARD COUNTY, THE HOWARD SOIL CONSERVATION DISTRICT AND/OR MDE."

Amy Hart 3-23-17
OWNER'S / DEVELOPER'S SIGNATURE DATE

Project Manager
PRINTED NAME & TITLE

DESIGN CERTIFICATION

"I HEREBY CERTIFY THAT THIS PLAN HAS BEEN DESIGNED IN ACCORDANCE WITH CURRENT MARYLAND EROSION AND SEDIMENT CONTROL LAWS, REGULATIONS AND STANDARDS, THAT IT REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE, AND THAT IT WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT."

Jiahua Wang
DESIGNER'S SIGNATURE DATE
GUIHUA WANG
PRINTED NAME

MD REGISTRATION NO. 31363
(P.E.) R.L.S. OR R.L.A. (CIRCLE ONE)

TYPE OF BUILDING:	UTILITY
NUMBER OF PARCELS:	109
NUMBER OF WATER HOUSE CONNECTIONS:	0
NUMBER OF SEWER HOUSE CONNECTIONS:	0
DRAINAGE AREA:	NOT APPLICABLE
TREATMENT PLANT:	ASHLEIGH KNOLLS

HORIZONTAL AND VERTICAL CONTROL USED IN CONTRACT NO. 50-3357
BASED ON MARYLAND NAD 83/91 (HORIZONTAL) AND NGVD 29 (VERTICAL) DATUM.
HOWARD COUNTY GEODETIC SURVEY CONTROL NUMBERS:

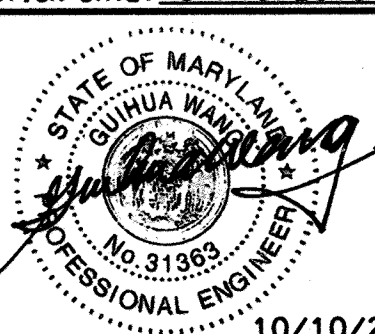
NO. 40FA	NO. 40FB
N 548106.87	N 548478.32
E 1328421.4	E 132600.81
ELEV. 497.648	ELEV. 505.297

HOWARD SOIL CONSERVATION DISTRICT CERTIFICATION

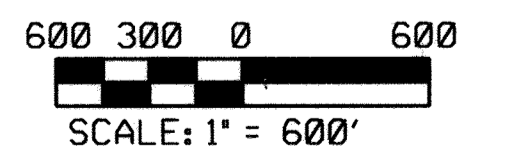
THIS PLAN IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT.

Chak Selig 3/28/17
HOWARD SOIL CONSERVATION DISTRICT DATE
EP-16-04

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. 31363 EXPIRATION DATE: 01/16/2018



GRAPHIC SCALE



DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND	
<i>Ray K</i> 2/1/17 DIRECTOR OF PUBLIC WORKS DATE	<i>Thomas R. Butler</i> 2/3/17 CHIEF, BUREAU OF ENGINEERING DATE
<i>Stacy</i> 1/25/17 CHIEF, BUREAU OF UTILITIES DATE	<i>Stacy</i> 2/17 CHIEF, UTILITY DESIGN DIVISION DATE

KCI TECHNOLOGIES
ENGINEERS
PLANNERS
SCIENTISTS
CONSTRUCTION MANAGERS
936 RIDGEBROOK ROAD
SPRING, MARYLAND 21152
TELEPHONE (410) 316-7800
FAX (410) 316-7818
www.kci.com

DES: KFJ					
DRN: KFJ					
CHK: GW					
DATE: 10/10/2016	BY: NO.	REVISION	DATE	600' SCALE MAP NO. 40-41	BLOCK NO. 12

**ASHLEIGH KNOLLS
SHARED SEWAGE DISPOSAL FACILITY**
CAPITAL PROJECT No. S-6269
CONTRACT No. 50-4972

ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

G-1
SCALE AS SHOWN
SHEET
1 OF 43

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DESIGN CRITERIA

WASTEWATER FLOW:
 AVERAGE DAILY FLOW: 24,525 GPD
 MAXIMUM DAILY FLOW (PERMIT): 32,700 GPD

EQUALIZATION TANK:
 USE EXISTING SEDIMENTATION TANKS #1 & #2
 EFFECTIVE EQUALIZATION VOLUME: 6,400 GALLON

SBR INFLUENT TRANSFER PUMPS:
 NO. OF PUMPS: 2 (ONE DUTY, ONE STANDBY)
 DESIGN POINT: 17.03 GPM @ 10.6 FT
 34.06 GPM @ 15.1 FT

SBR DESIGN CRITERIA:
 DESIGN FLOW: 24,545 GPD
 MAX DAY FLOW: 49,050 GPD
 TEMPERATURE: 25 C (SUMMER)
 12 C (WINTER)
 AMBIENT TEMPERATURE: 38 C (SUMMER)
 -18 C (WINTER)

SBR INFLUENT CHARACTERISTICS:
 BOD₅: 200 MG/L
 TSS: 50 MG/L
 TKN: 51 MG/L
 NH₄⁺-N: 43 MG/L
 NO₃⁻-N: 0.1 MG/L
 TP: 7.4 MG/L

* BASED ON THE SAMPLE AFTER THE FIRST SEDIMENTATION TANK.

SBR EFFLUENT DESIGN CRITERIA:
 BOD₅: 20 MG/L
 TSS: 20 MG/L
 TN: 8 MG/L

SBR SYSTEM DESIGN:
 NO. OF BASIN: 1
 MLSS: 2,500 MG/L
 SRT (SBR): 19 DAYS
 SRT (SBR + SAM): 23 DAYS
 HRT (SBR): 14.5 HRS

CYCLE TIME @ ADF
 FILL: 0.37 HRS
 AERATION: 1.93 HRS
 ANOXIC: 2.27 HRS
 SETTLE: 0.75 HRS
 DECANT: 0.68 HRS

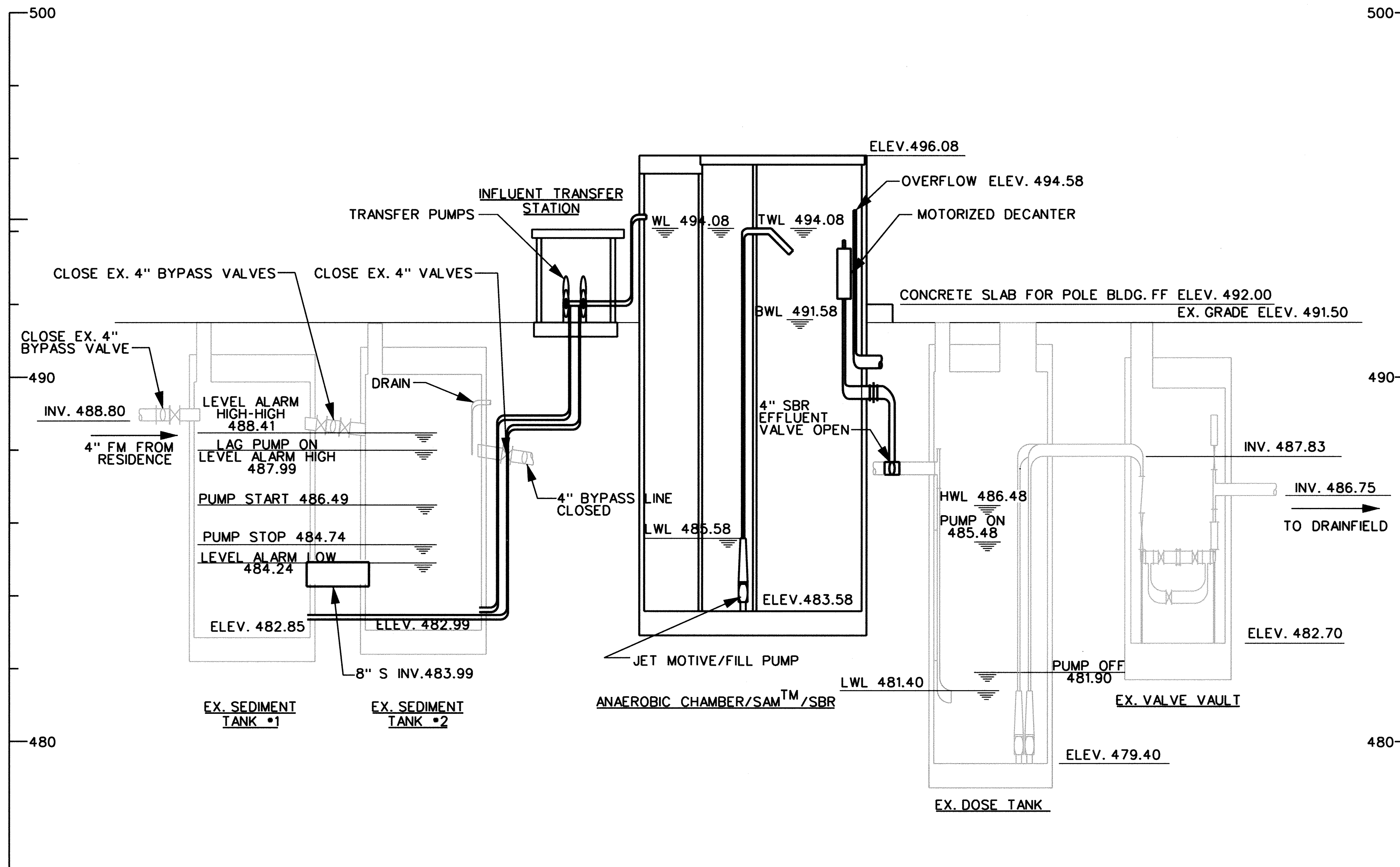
CYCLE TIME @ MAX DAY FLOW
 FILL + AERATION: 3.45 HRS
 ANOXIC: 1.12 HRS
 SETTLE: 0.75 HRS
 DECANT: 0.68 HRS

STANDARD OXYGEN REQUIRED @ ADF: 69 LBS/DAY
STANDARD OXYGEN REQUIRED @ MAX DAY FLOW: 104 LBS/DAY
 DECANT FLOW: 150 GPM
 EX. DOSING PUMP FLOW RATE: 330 GPM

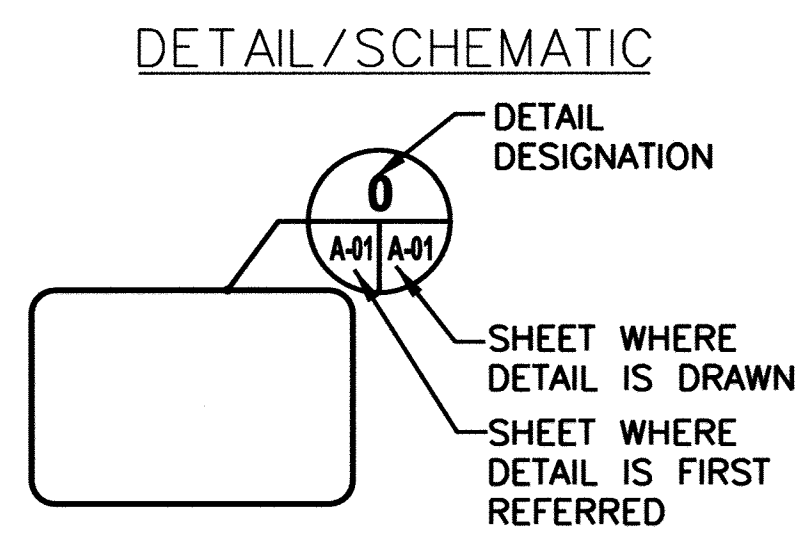
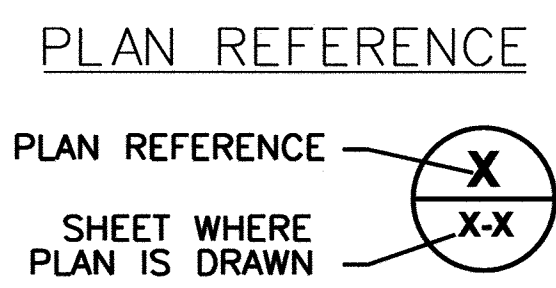
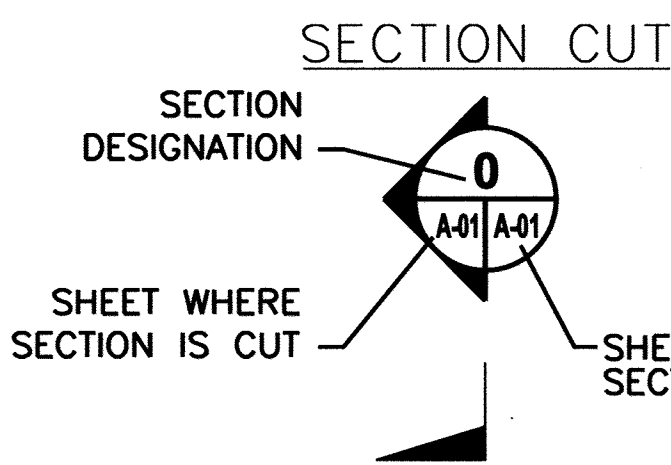
CHEMICAL DOSING PUMPS
 MICRO-C PUMP: DESIGN FLOW 0.25 L/HR @ 5 PSIG
 CAUSTIC (25% NaOH) PUMP: DESIGN FLOW 0.14 L/HR @ 5 PSIG
 SODIUM HYPOCHLORITE PUMP: DESIGN FLOW 0.14 L/HR @ 50 PSIG

UNITS OF EACH TYPE CHEMICAL PUMP: ONE DUTY, ONE SHELF SPARE

pH CONTROLLER SET POINT: pH = 6.5 (FOR CAUSTIC ADDITION)



1 PROFILE
 G-2 SCALE: HORZ.- 1" = 10'
 VERT.- 1" = 2'



A DRAWING SYMBOLS
 G-2 SCALE: NONE

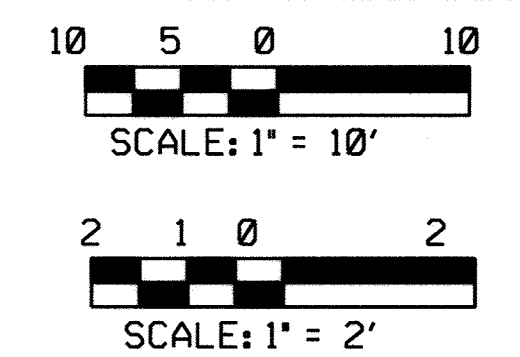
LEGEND

- EXISTING FEATURES
- PROPOSED FEATURES

ABBREVIATIONS

- ADF AVERAGE DAILY FLOW
- BWL BOTTOM WATER LEVEL
- D.I.P. DUCTILE IRON PIPE
- EX. EXISTING
- FM FORCE MAIN
- HRT HYDRAULIC RETENTION TIME
- HWL HIGH WATER LEVEL
- INV INVERT
- SAM™ SURGE/ANOXIC/MIX
- SBR SEQUENCING BATCH REACTOR
- SRT SLUDGE RETENTION TIME
- WL WATER LEVEL
- TWL TOP WATER LEVEL

GRAPHIC SCALE



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. 31363 EXPIRATION DATE: 01/16/2018

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DEPARTMENT OF PUBLIC WORKS
 HOWARD COUNTY, MARYLAND

Director Signature
 DIRECTOR OF PUBLIC WORKS DATE

Chief Signature
 CHIEF, BUREAU OF UTILITIES DATE

Chief Signature
 CHIEF, UTILITY DESIGN DIVISION DATE

ENGINEERS
 PLANNERS
 SCIENTISTS
 CONSTRUCTION MANAGERS

KCI
 TECHNOLOGIES

936 RIDGEBROOK ROAD
 SPARKS, MARYLAND 21152
 TELEPHONE: (410) 316-7800
 FAX: (410) 316-7818
 WWW.KCI.COM

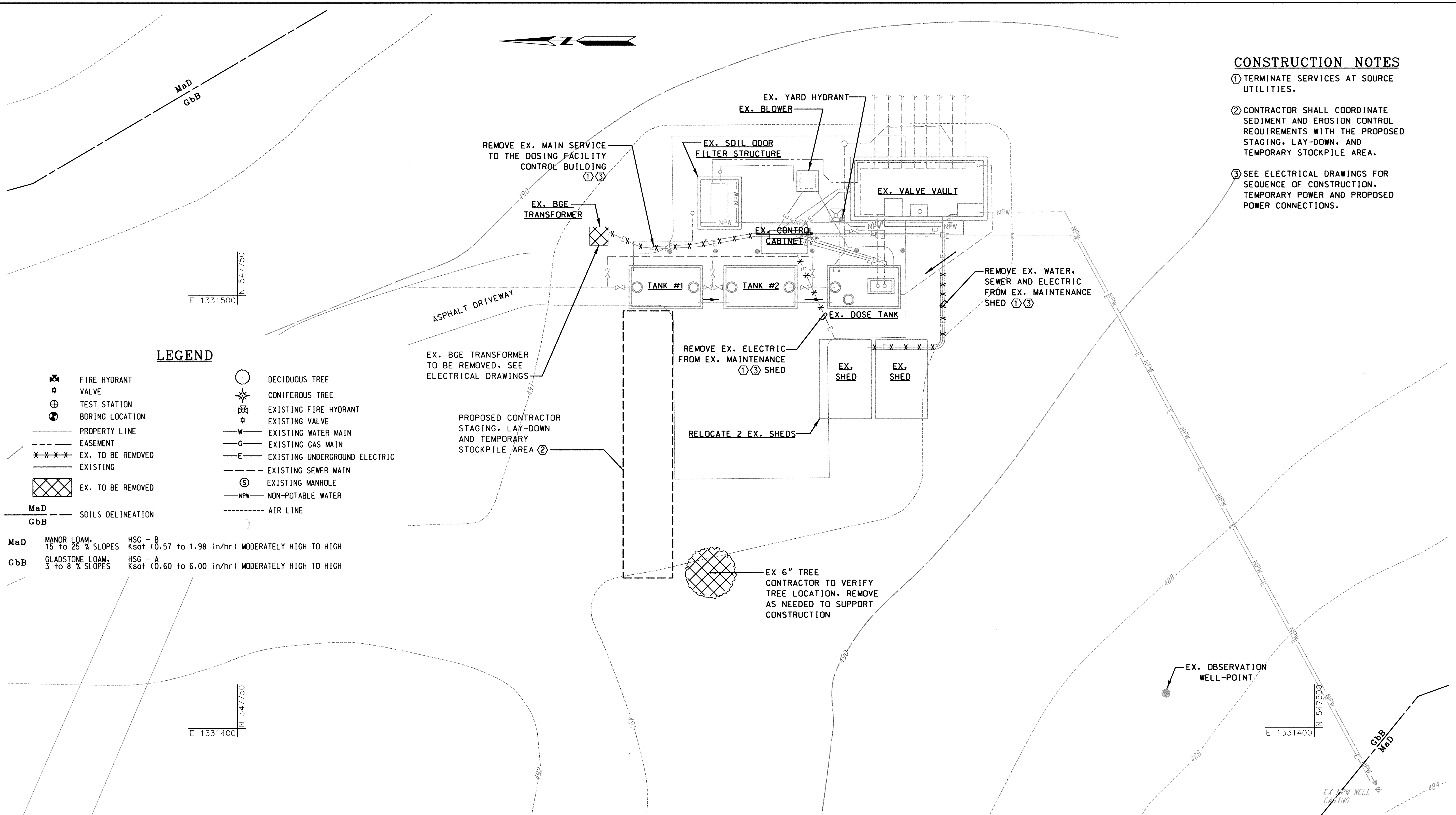
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DRN: KfJ					
CHK: GW					
DATE: 2016	BY	NO.	REVISION	DATE	

HYDRAULIC PROFILE

600' SCALE MAP NO. 40-41 BLOCK NO. 12

ASHLEIGH KNOLLS
 SHARED SEWAGE DISPOSAL FACILITY
 CAPITAL PROJECT No. S-6269
 CONTRACT No. 50-4972

ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND



CONSTRUCTION NOTES

- ① TERMINATE SERVICES AT SOURCE UTILITIES.
- ② CONTRACTOR SHALL COORDINATE SEDIMENT AND EROSION CONTROL REQUIREMENTS WITH THE PROPOSED STAGING, LAY-DOWN, AND TEMPORARY STOCKPILE AREA.
- ③ SEE ELECTRICAL DRAWINGS FOR SEQUENCE OF CONSTRUCTION, TEMPORARY POWER AND PROPOSED POWER CONNECTIONS.

LEGEND

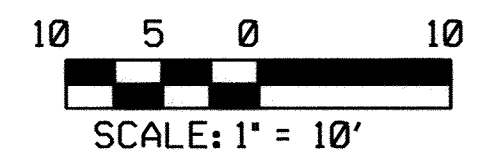
- FIRE HYDRANT
- VALVE
- TEST STATION
- BORING LOCATION
- PROPERTY LINE
- EASEMENT
- EX. TO BE REMOVED
- EXISTING
- EX. TO BE REMOVED
- MaD** SOILS DELINEATION
- GbB** SOILS DELINEATION
- DECIDUOUS TREE
- CONIFEROUS TREE
- EXISTING FIRE HYDRANT
- EXISTING VALVE
- EXISTING WATER MAIN
- EXISTING GAS MAIN
- EXISTING UNDERGROUND ELECTRIC
- EXISTING SEWER MAIN
- EXISTING MANHOLE
- NON-POTABLE WATER
- AIR LINE

MaD MANOR LOAM, 15 to 25 % SLOPES HSG - B Ksat (0.57 to 1.98 in/hr) MODERATELY HIGH TO HIGH

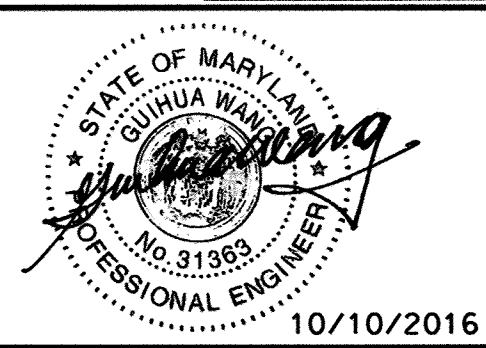
GbB GLADSTONE LOAM, 3 to 8 % SLOPES HSG - A Ksat (0.60 to 6.00 in/hr) MODERATELY HIGH TO HIGH

NOTE:
THERE ARE NO STEEP AND HIGHLY ERODIBLE SOILS WITHIN THE WORK SITE AREA.

① EXISTING SITE PLAN
C-1 SCALE: 1"=10'



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KCI TECHNOLOGIES
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936 RIDGEBROOK ROAD
SHARPS, MARYLAND 21152
TELEPHONE: (410) 316-7800
FAX: (410) 316-7818
www.kci.com

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DRN:	KFJ				
CHK:	GW				
DATE:	AUG. 2016	BY	NO.	REVISION	DATE

EXISTING SITE PLAN & SOILS MAP
600' SCALE MAP NO. 40-41 BLOCK NO. 12

ASHLEIGH KNOLLS SHARED SEWAGE DISPOSAL FACILITY
CAPITAL PROJECT No. S-6269
CONTRACT No. 50-4972
ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

C-1
SCALE AS SHOWN
SHEET 3 OF 43

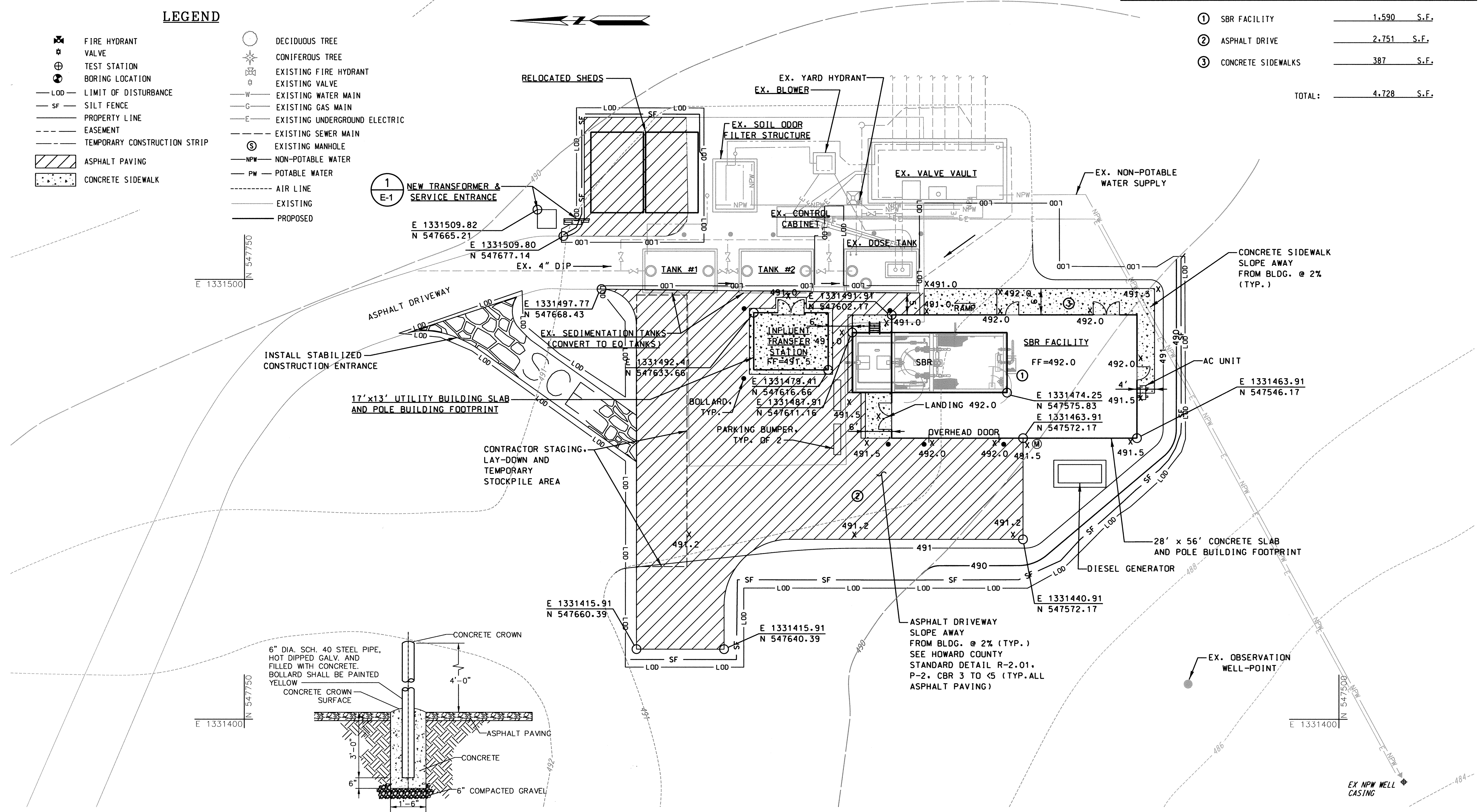
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ADDITIONAL IMPERVIOUS AREA CALCULATIONS

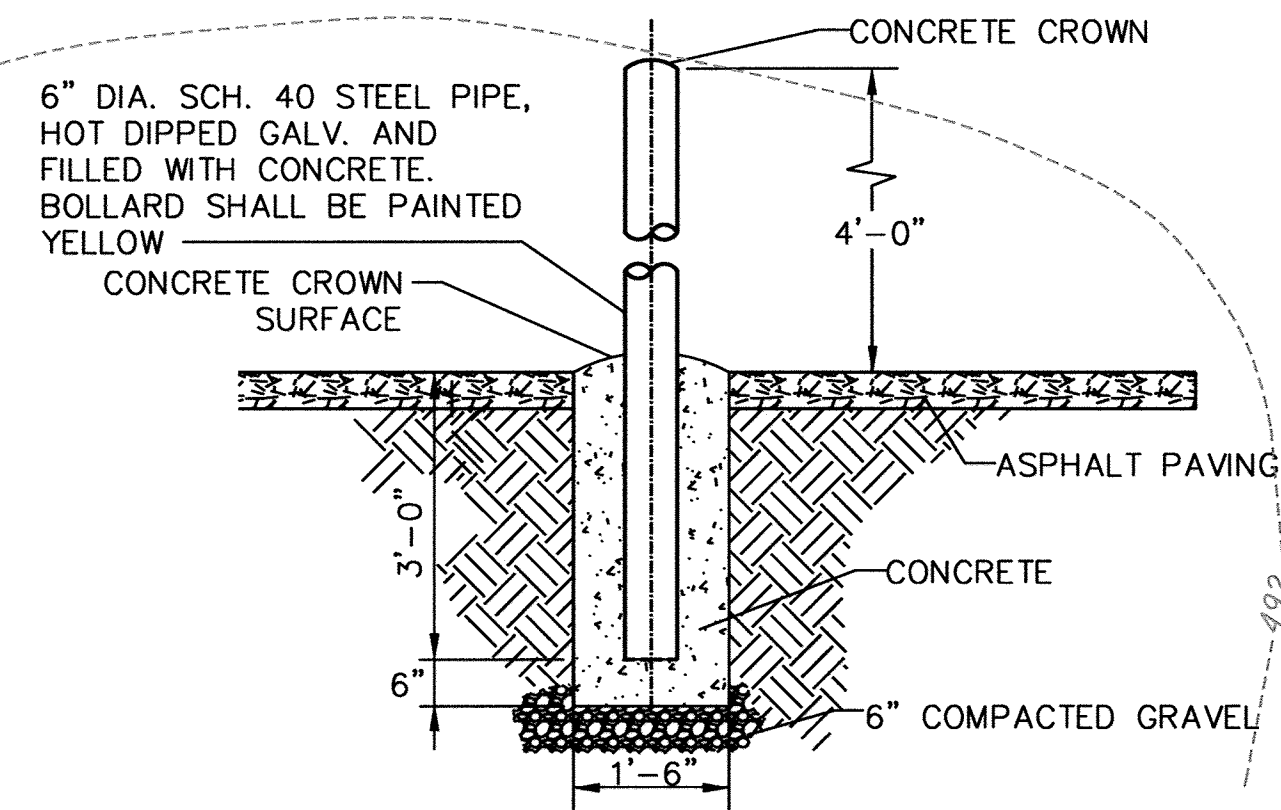
①	SBR FACILITY	1.590	S.F.
②	ASPHALT DRIVE	2.751	S.F.
③	CONCRETE SIDEWALKS	387	S.F.
TOTAL:		4.728	S.F.

LEGEND

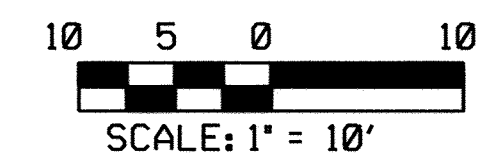
- | | | | |
|--|------------------------------|--|-------------------------------|
| | FIRE HYDRANT | | DECIDUOUS TREE |
| | VALVE | | CONIFEROUS TREE |
| | TEST STATION | | EXISTING FIRE HYDRANT |
| | BORING LOCATION | | EXISTING VALVE |
| | LIMIT OF DISTURBANCE | | EXISTING WATER MAIN |
| | SILT FENCE | | EXISTING GAS MAIN |
| | PROPERTY LINE | | EXISTING UNDERGROUND ELECTRIC |
| | EASEMENT | | EXISTING SEWER MAIN |
| | TEMPORARY CONSTRUCTION STRIP | | EXISTING MANHOLE |
| | ASPHALT PAVING | | NON-POTABLE WATER |
| | CONCRETE SIDEWALK | | POTABLE WATER |
| | | | AIR LINE |
| | | | EXISTING |
| | | | PROPOSED |



A BOLLARD DETAIL
C-1



1 SITE PLAN
C-2
SCALE: 1"=10'



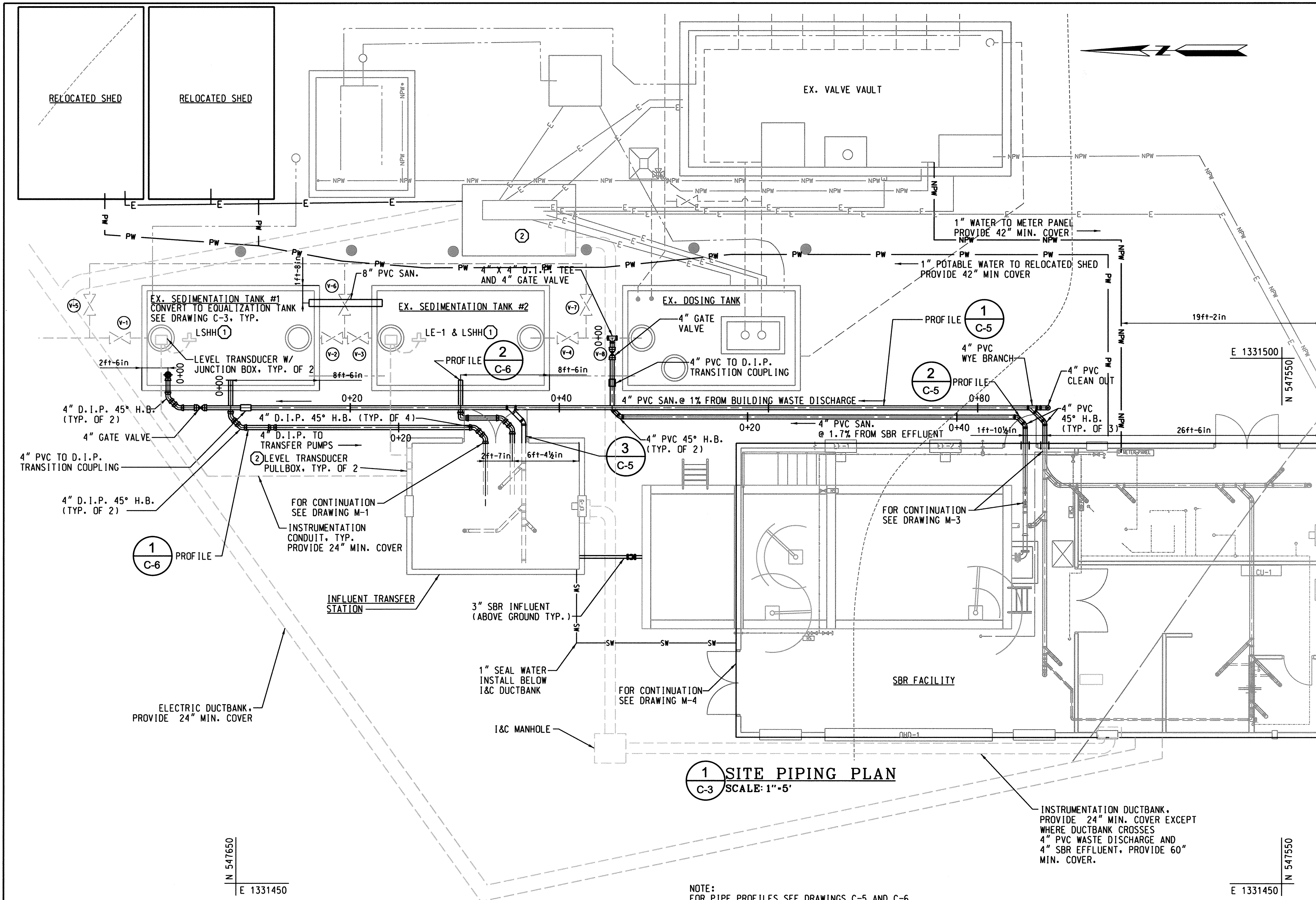
CONSTRUCTION NOTES:
 1. PROVIDE MINIMUM 42" OF COVER WHEN INSTALLING THE NPW SUPPLY
 2. SEE UTILITY TRENCHING DETAILS FOR MINIMUM SUBSURFACE INSTALLATION REQUIREMENTS.

OWNER'S ADDRESS
 HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
 BUREAU OF UTILITIES
 8250 OLD MONTGOMERY ROAD
 COLUMBIA MARYLAND, 21045

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DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND Director of Public Works: <i>John C. ...</i> 2/17/17 Chief, Bureau of Utilities: <i>John C. ...</i> 12/20/16	Thomas E. Butler 2/13/17 Chief, Bureau of Engineering Chief, Utility Design Division: <i>John ...</i> 2/13/17	 ENGINEERS PLANNERS SCIENTISTS CONSTRUCTION MANAGERS 936 RIDGEBROOK ROAD SEWAS, MARYLAND 21152 TELEPHONE: (410) 316-7800 FAX: (410) 316-7818 www.kci.com	 PROFESSIONAL ENGINEER 10/10/2016	DES: KFJ DRN: KFJ CHK: GW DATE: AUG. 2016 BY: NO. REVISION:	PROPOSED SITE PLAN & SEDIMENT AND EROSION CONTROL PLAN 600' SCALE MAP NO. 40-41 BLOCK NO. 12	ASHLEIGH KNOLLS SHARED SEWAGE DISPOSAL FACILITY CAPITAL PROJECT No. S-6269 CONTRACT No. 50-4972 ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND	SCALE AS SHOWN SHEET 4 OF 43
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LEGEND

	FIRE HYDRANT		DECIDUOUS TREE
	VALVE		CONIFEROUS TREE
	TEST STATION		EXISTING FIRE HYDRANT
	BORING LOCATION		EXISTING VALVE
	L.O.D. - LIMIT OF DISTURBANCE		EXISTING WATER MAIN
	S.F. - SILT FENCE		EXISTING GAS MAIN
	PROPERTY LINE		EXISTING UNDERGROUND ELECTRIC
	EASEMENT		EXISTING SEWER MAIN
	TEMPORARY CONSTRUCTION STRIP		EXISTING MANHOLE
	ASPHALT		EXISTING NON-POTABLE WATER
	CONCRETE SIDEWALK		EXISTING AIR LINE
	VALVE ID		PROPOSED SEWER PIPE
			PROPOSED NON-POTABLE WATER
			PROPOSED SEAL WATER
			PROPOSED POTABLE WATER
			PROPOSED UNDERGROUND ELECTRIC

SUGGESTED SEQUENCE OF CONSTRUCTION FOR BUILDING AND UTILITY WORK

1. PREPARE THE SITE AND PERFORM CONSTRUCTION STAKEOUT.
2. INSTALL EROSION AND SEDIMENT CONTROL DEVICES. SEE SEQUENCE OF CONSTRUCTION ON DRAWING NO. C-7.
3. CONVERT EXISTING SEDIMENTATION TANKS INTO AN EQUALIZATION TANK IN ACCORDANCE WITH THE SEQUENCE SHOWN ON DRAWING NO. C-4.
4. INSTALL PROGRESSIVE CAVITY TRANSFER PUMPS AND ITS HOUSING SHED.
5. INSTALL SBR AND THE ASSOCIATED PIPING/EQUIPMENT.
6. INSTALL THE FACILITY BUILDING, HVAC, ELECTRICAL EQUIPMENT, AND PLUMBING.
7. COMPLETE THE SITE WORKS INCLUDING PAVEMENT AND SEEDING.
8. DURING NIGHT WHEN WATER CONSUMPTION IS LOW, CONNECT THE SBR EFFLUENT PIPE TO THE EXISTING 4-INCH DIP AS SHOWN ON DRAWING NO. C-3.
9. PROGRAM SBR SYSTEM IN ACCORDANCE WITH THE SPECIFICATION AND MANUFACTURER'S RECOMMENDATION. SEED THE SBR REACTOR WITH NITRIFYING/DENITRIFYING SLUDGE. AERATE.
10. TO START UP THE SBR SYSTEM, CLOSE V-2, V-3, AND V-4 (SHEET C-4) TO ALLOW INFLUENT INTO SBR.
11. REMOVE EROSION AND SEDIMENT CONTROL DEVICES. SEE SEQUENCE OF CONSTRUCTION ON DRAWING NO. C-7.

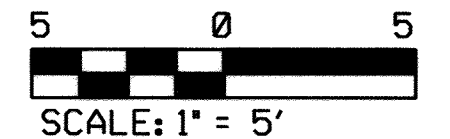
CONSTRUCTION NOTES

1. LOCATE ULTRASONIC LEVEL TRANSDUCER LEVEL FLOATS BELOW TANK ACCESS MANHOLE WITH RELATED JUNCTION BOX AND STAINLESS STEEL MOUNTING HARDWARE.
2. SEE INSTRUMENTATION SITE PLAN FOR DETAILED I&C DUCTBANKS AND FIELD INSTRUMENT TERMINATION.
2. SEE ELECTRICAL DRAWINGS FOR DETAILED ELECTRICAL SERVICE DUCTBANKS AND SERVICE ENTRANCE DETAILS.

BYPASS OPTIONS

1. NORMAL OPERATION:
CLOSE V-2, V-3, V-4, V-5, V-6, V-7
OPEN V-1, V-8
1. TREATMENT FACILITY BYPASS:
CLOSE V-1, V-4, V-6, V-8
OPEN V-5, V-7
2. SBR FACILITY BYPASS:
OPEN V-1, V-2, V-3, V-4
CLOSE V-5, V-6, V-7, V-8
3. EQUALIZATION TANK #1 BYPASS:
OPEN V-3, V-5, V-6, V-8
CLOSE V-1, V-2, V-4, V-7
4. EQUALIZATION TANK #2 BYPASS:
OPEN V-1, V-8
CLOSE: V-5, V-2, V-3, V-4, V-6, V-7

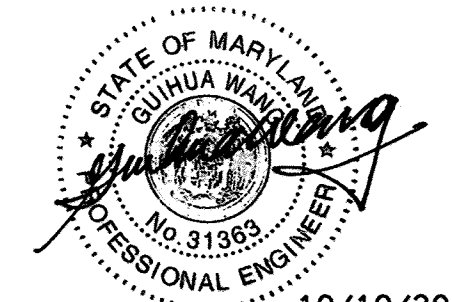
GRAPHIC SCALE



1 SITE PIPING PLAN
C-3 SCALE: 1"=5'

NOTE:
FOR PIPE PROFILES SEE DRAWINGS C-5 AND C-6

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. 31363 EXPIRATION DATE: 01/16/2018



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SHARPS, MARYLAND 21152
TELEPHONE: (410) 316-7800
FAX: (410) 316-7818
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DRN: K F J					
CHK: G W					
DATE: AUG. 2016	BY	NO.	REVISION	DATE	

SITE PIPING PLAN
600' SCALE MAP NO. 40-41 BLOCK NO. 12

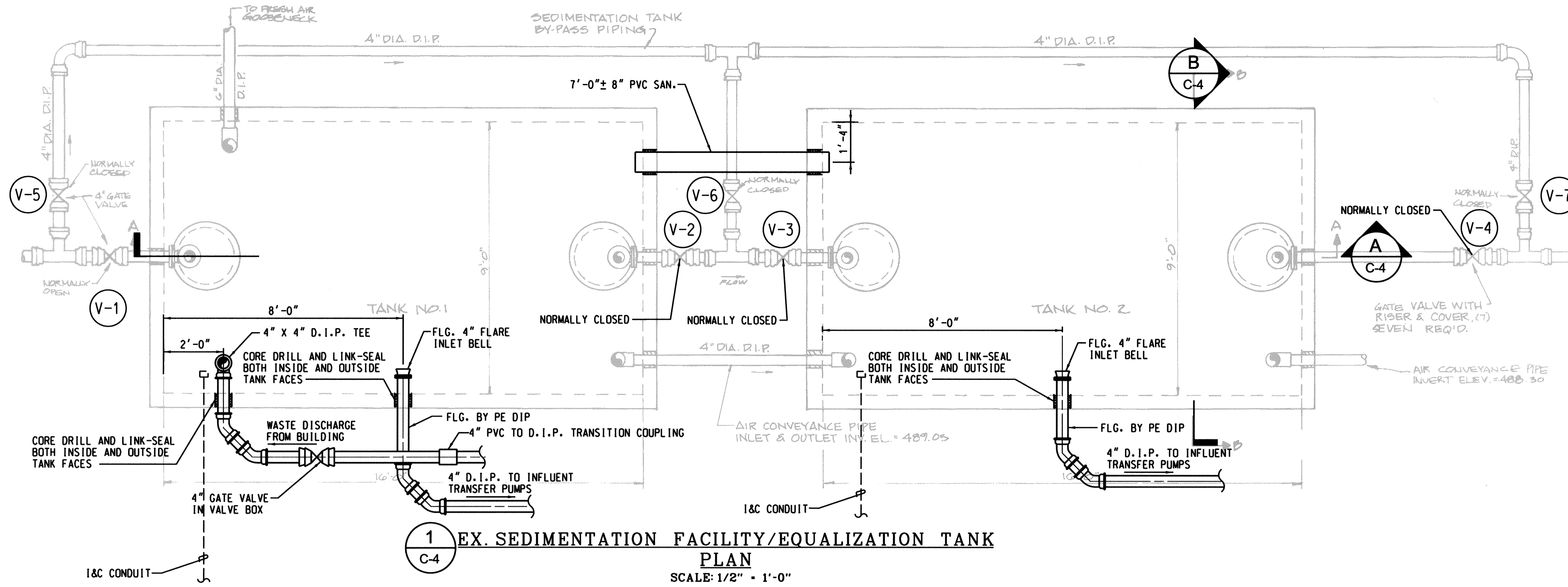
**ASHLEIGH KNOLLS
SHARED SEWAGE DISPOSAL FACILITY**
CAPITAL PROJECT No. S-6289
CONTRACT No. 50-4972
ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

C-3
SCALE AS SHOWN
SHEET 5 OF 43

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 BY: MUSE/NAME
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HOWARD COUNTY, MARYLAND

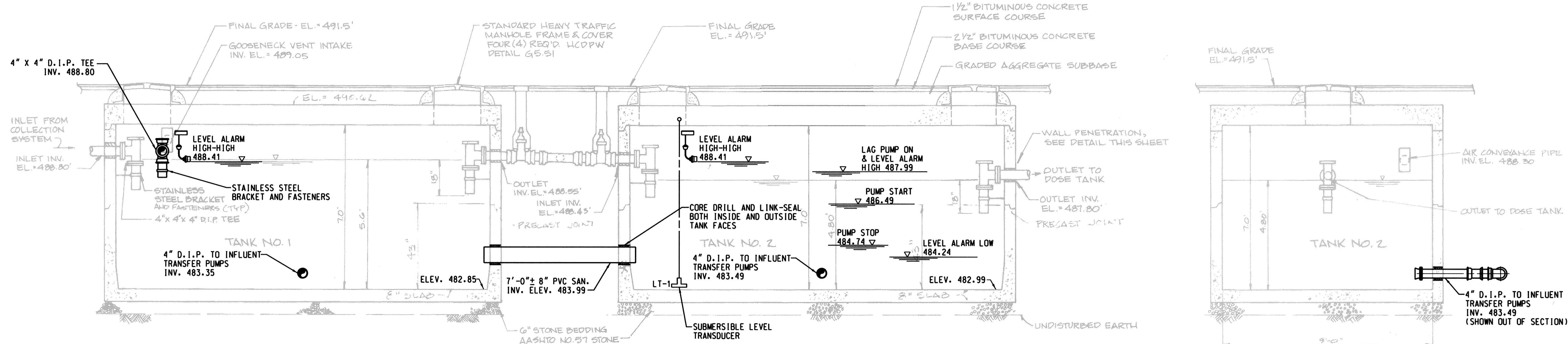
	2/7/17		2/3/17
DIRECTOR OF PUBLIC WORKS	DATE	CHIEF, BUREAU OF ENGINEERING	DATE
	1/25/10		2/13/17
CHIEF, BUREAU OF UTILITIES	DATE	CHIEF, UTILITY DESIGN DIVISION	DATE



- SUGGESTED SEQUENCE OF CONSTRUCTION**
1. CLOSE V-3 AND V-4, OPEN V-6 AND V-7 ALLOWING SEWERAGE TO USE BYPASS PIPING.
 2. DEWATER EX. TANK NO.2 AND DISPOSE THE SEWAGE PROPERLY.
 3. INSTALL ASSOCIATED PIPING AND INFLUENT TRANSFER PUMPS. PLUG DISCHARGE PIPES UNTIL PREPARED TO ATTACH TO NEW SBR.
 4. PREPARE TANK NO.2 FOR INSTALLATION OF NEW 8" PVC PIPE IN ORDER TO CONVERT BOTH TANKS TO EQUALIZATION TANK.
 5. CLOSE V-1, V-6 AND OPEN V-5. ALLOW SEWERAGE TO USE BYPASS PIPING.
 6. DEWATER EX. TANK NO.1 AND DISPOSE THE SEWAGE PROPERLY.
 7. INSTALL 8" PVC PIPE IN ORDER TO CONVERT TANK NO. 1 AND TANK NO. 2 TO AN EQUALIZATION TANK.
 8. OPEN V-1, V-2, V-3 AND V-4. CLOSE V-5, V-6 AND V-7. ALLOW SYSTEM TO OPERATE AS NORMAL (PRIOR TO THE COMPLETION OF NEW SYSTEM).
 9. INSTALL SBR FACILITY AND ASSOCIATED PIPING, EQUIPMENT, AND ELECTRICAL CONDUIT.
 10. UNPLUG THE DISCHARGE PIPES OF INFLUENT TRANSFER PUMPS. CLOSE V-2, V-3, AND V-4. BRING SBR FACILITY ONLINE.

NOTES:
1. SEE HIGH PERFORMANCE COATING SPECIFICATION FOR THE COATING REQUIREMENT FOR THE EQUALIZATION TANKS.

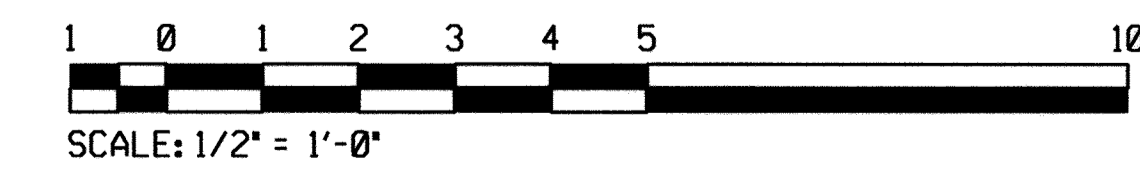
1 EX. SEDIMENTATION FACILITY/EQUALIZATION TANK PLAN
SCALE: 1/2" = 1'-0"



A EX. SEDIMENTATION FACILITY/EQUALIZATION TANK SECTION A-A
SCALE: 1/2" = 1'-0"

B EX. SEDIMENTATION FACILITY/EQUALIZATION TANK SECTION B-B
SCALE: 1/2" = 1'-0"

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La. J. H. 2/7/17
DIRECTOR OF PUBLIC WORKS DATE

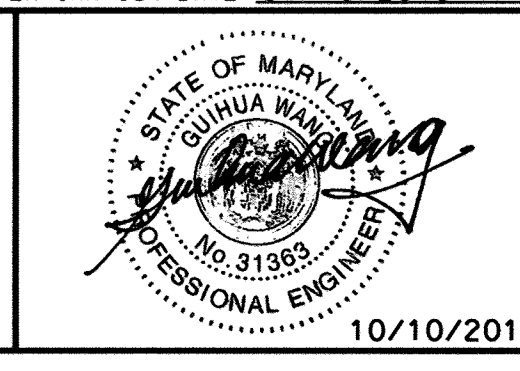
Thomas R. Butler 2/7/17
CHIEF, BUREAU OF ENGINEERING DATE

John C. Cunn 1/25/17
CHIEF, BUREAU OF UTILITIES DATE

John C. Cunn 2/17/17
CHIEF, UTILITY DESIGN DIVISION DATE

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DRN: KFJ					
CHK: GW					
DATE: 10/10/2016	BY: NO.	NO.	NO.	NO.	NO.
AUG. 2016					

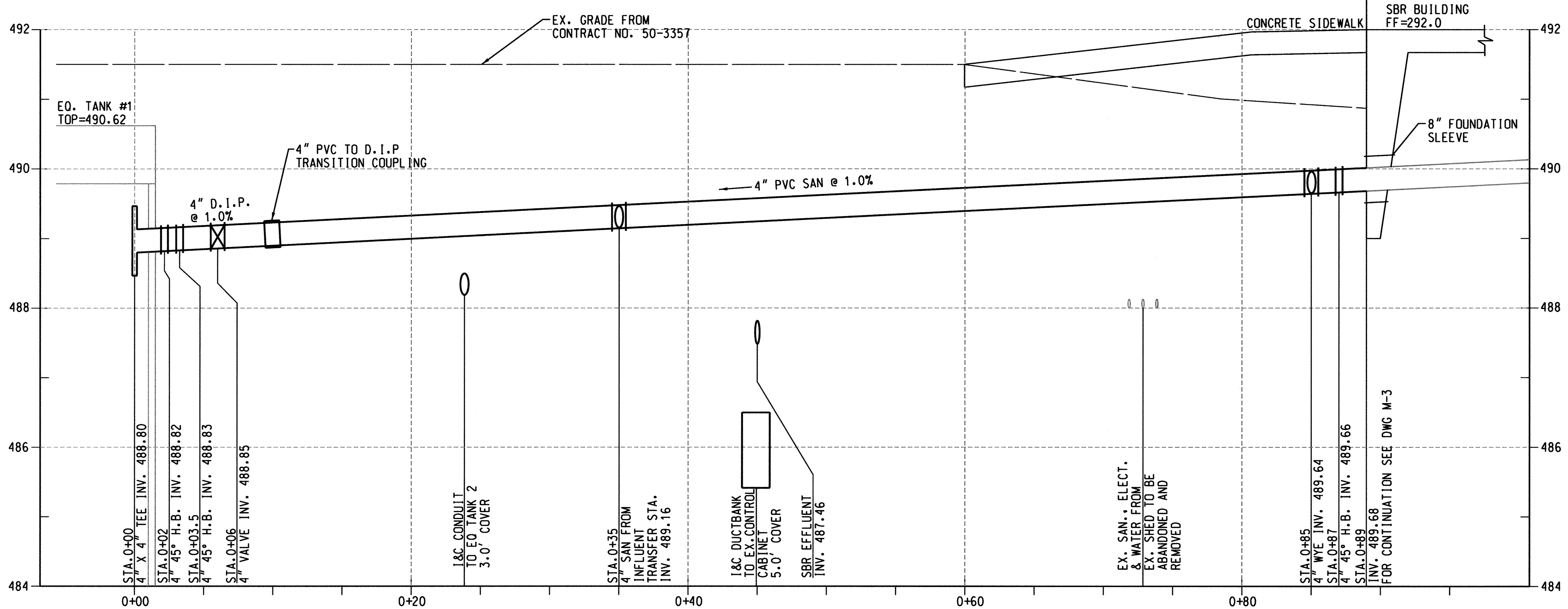
EQUALIZATION TANK

DATE: 600' SCALE MAP NO. 40-41 BLOCK NO. 12

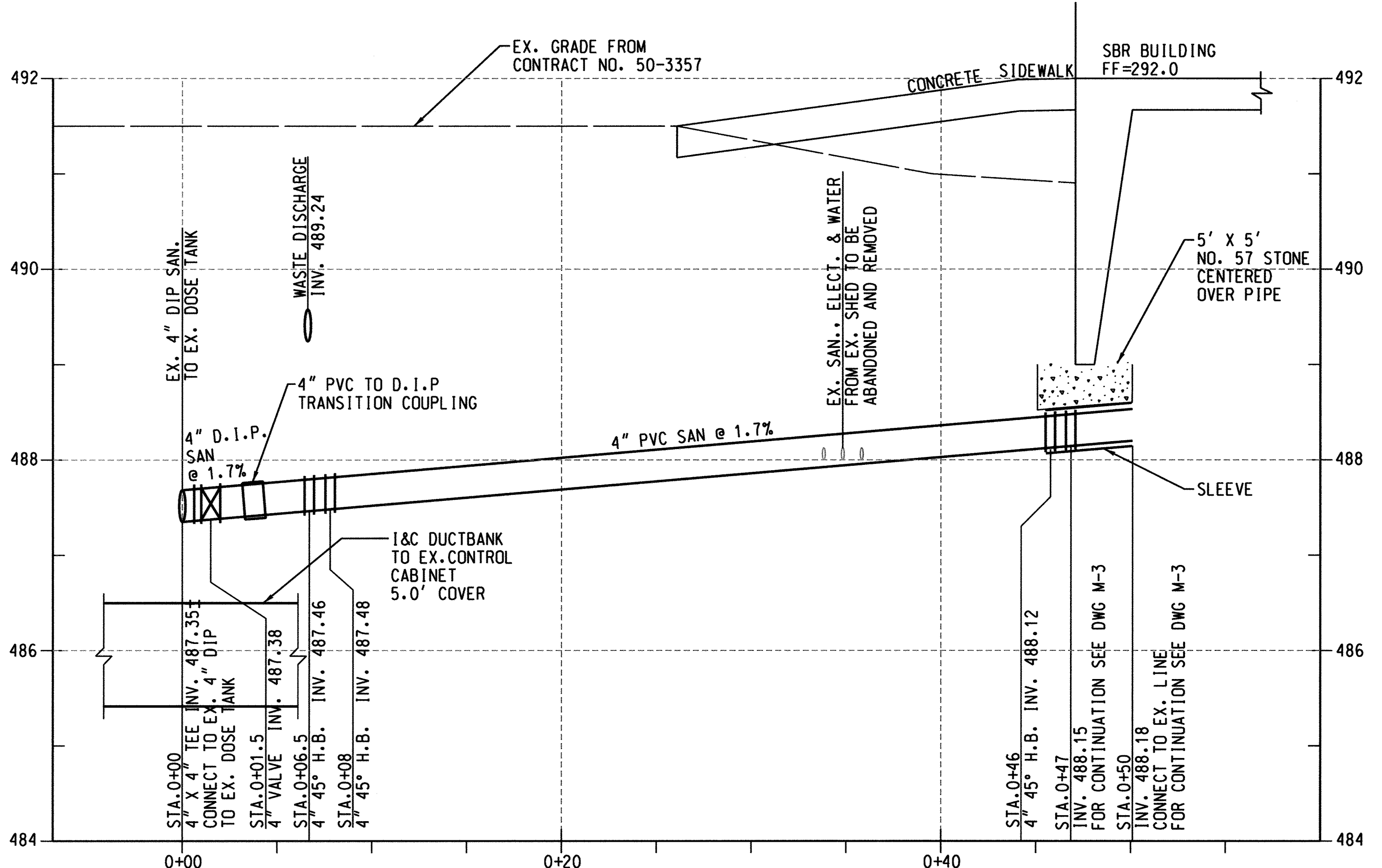
ASHLEIGH KNOLLS SHARED SEWAGE DISPOSAL FACILITY
CAPITAL PROJECT No. S-6269
CONTRACT No. 50-4972

ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

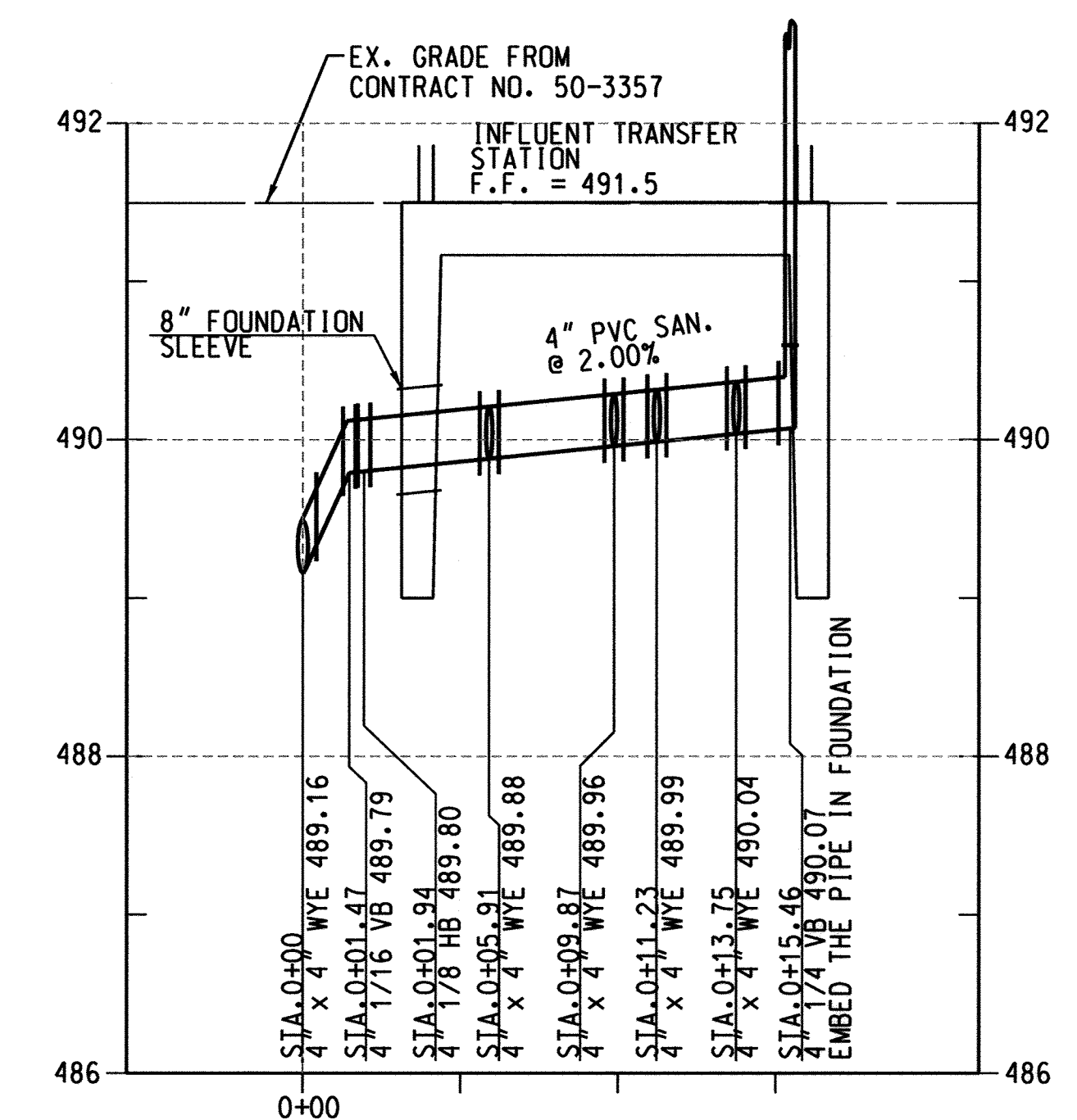
C-4
SCALE AS SHOWN
SHEET
6 OF 43



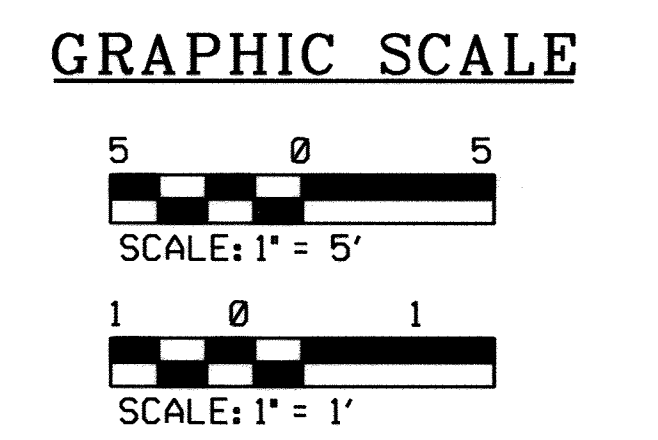
1 PROFILE - WASTE DISCHARGE
 SCALE: HORIZ. 1" = 5'
 VERT. 1" = 1'



2 PROFILE - SBR EFFLUENT
 SCALE: HORIZ. 1" = 5'
 VERT. 1" = 1'



3 PROFILE - INFLUENT TRANSFER STATION
 SCALE: HORIZ. 1" = 5'
 VERT. 1" = 1'



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James A. ... 2/16/17
 DIRECTOR OF PUBLIC WORKS DATE

Thomas E. Butler 2/16/17
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... 2/16/17
 CHIEF, UTILITY DESIGN DIVISION DATE

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STATE OF MARYLAND
 PROFESSIONAL ENGINEER
 No. 31363
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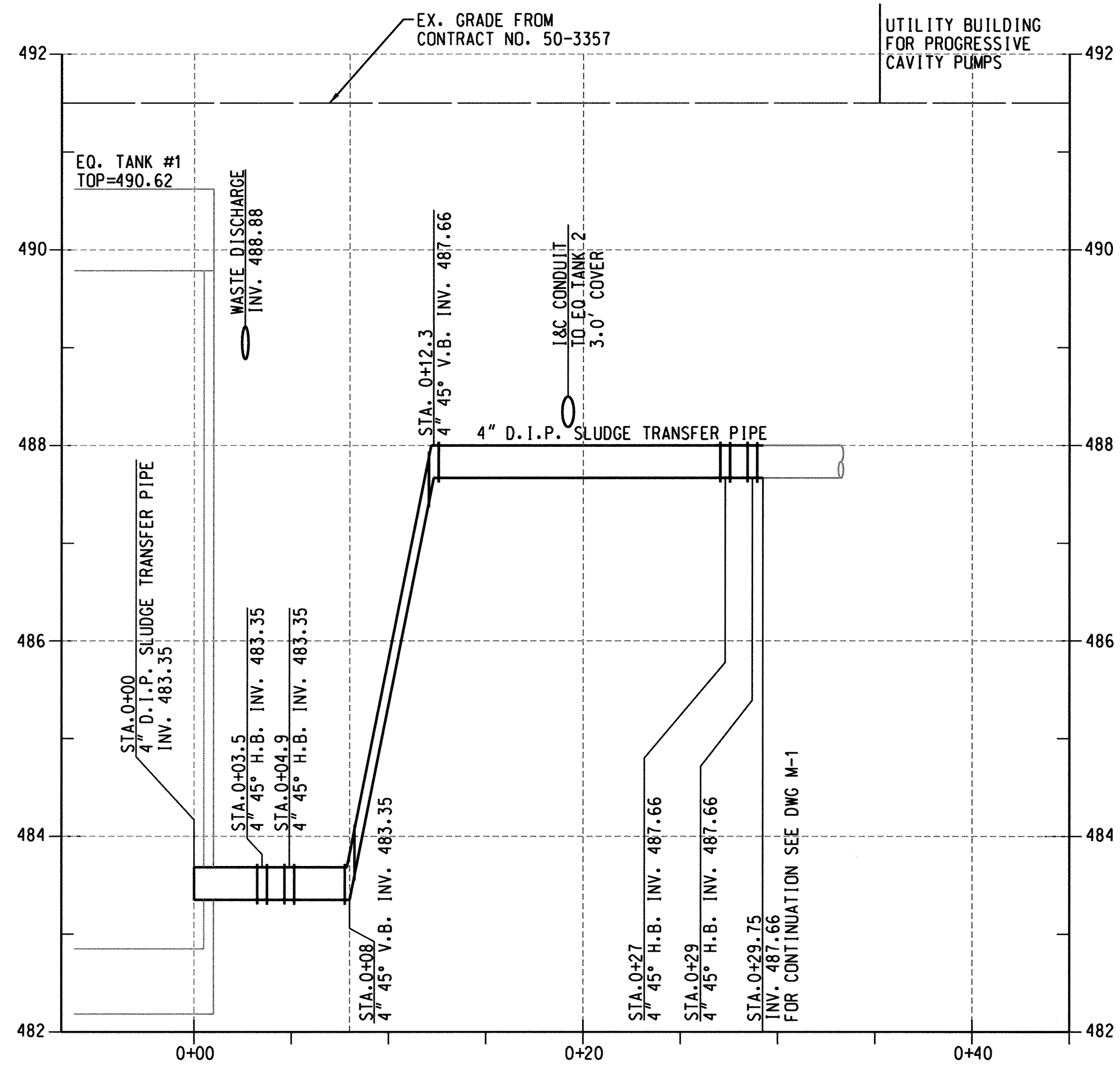
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DRN: Kfj			
CHK: GW			
DATE: AUG. 2016	BY NO.	REVISION	DATE

SITE PIPING PROFILES

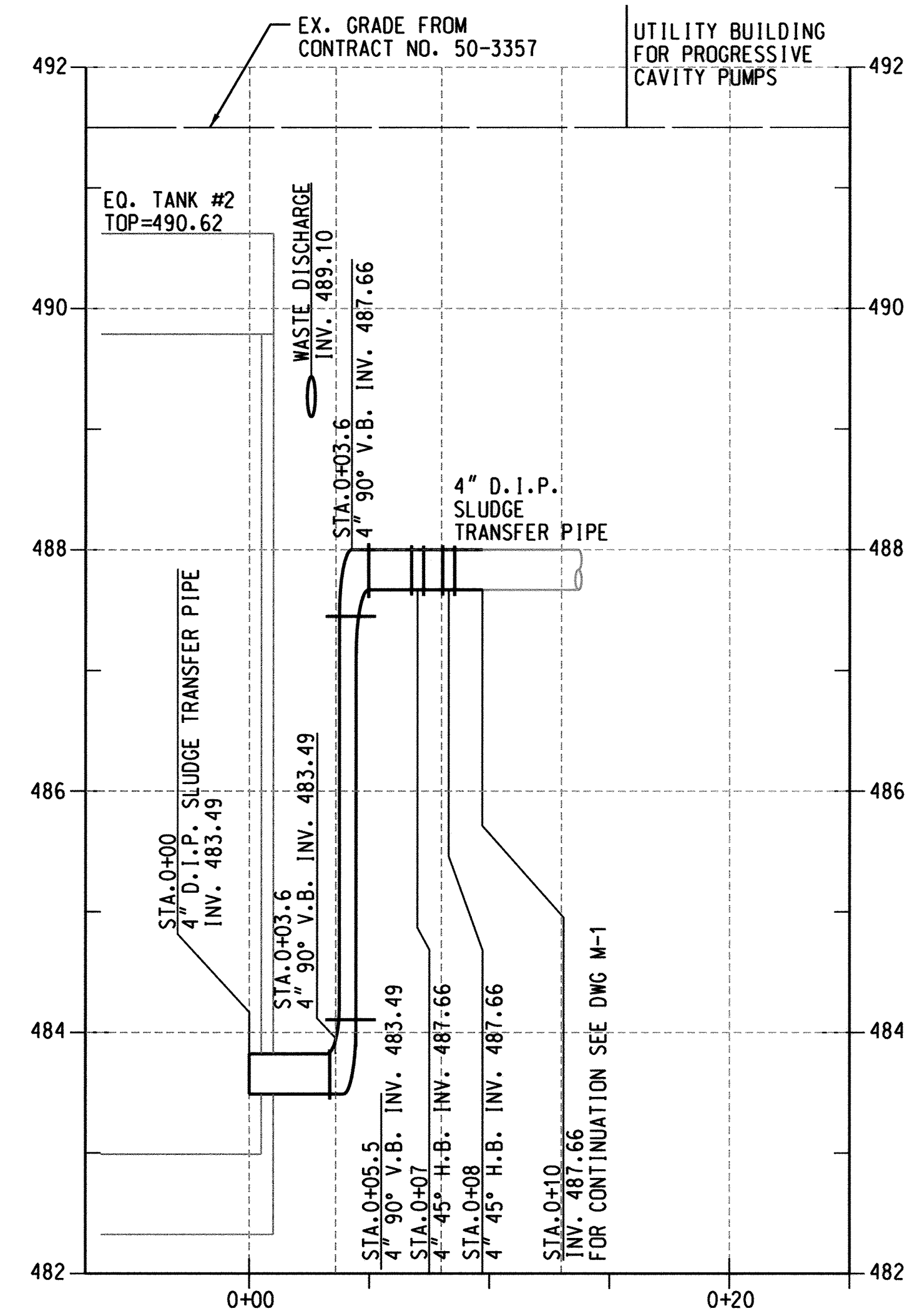
ASHLEIGH KNOLLS
 SHARED SEWAGE DISPOSAL FACILITY
 CAPITAL PROJECT No. S-6269
 CONTRACT No. 50-4972

ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

C-5
 SCALE AS SHOWN
 SHEET 7 OF 43



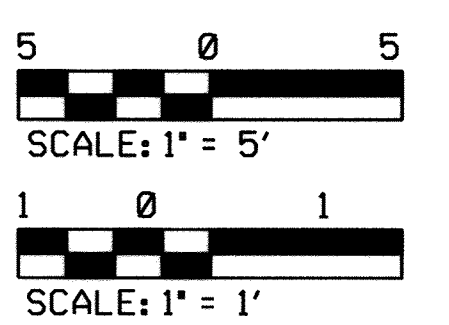
1 PROFILE - INFLUENT TRANSFER PIPE - EQ. TANK #1
 C-6 SCALE: HORIZ. 1" = 5'
 VERT. 1" = 1'



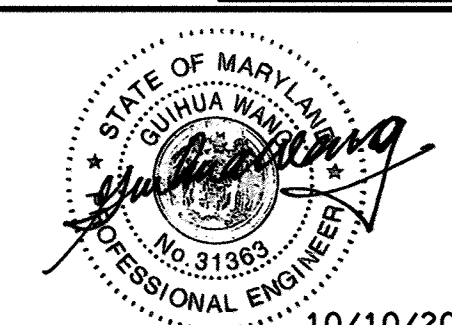
2 PROFILE - INFLUENT TRANSFER PIPE - EQ. TANK #2
 C-6 SCALE: HORIZ. 1" = 5'
 VERT. 1" = 1'

NOTE:
 ALL PIPE JOINTS AND
 PIPE FITTINGS MUST
 BE RESTRAINED JOINT
 TYPE

GRAPHIC SCALE



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SITE PIPING PROFILES

600' SCALE MAP NO. 40-41 BLOCK NO. 12

ASHLEIGH KNOLLS
 SHARED SEWAGE DISPOSAL FACILITY
 CAPITAL PROJECT No. S-6269
 CONTRACT No. 50-4972

ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

C-6
 SCALE AS SHOWN
 SHEET 8 OF 43

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 CHIEF, BUREAU OF UTILITIES DATE

[Signature] 2/3/17
 CHIEF, BUREAU OF ENGINEERING DATE

[Signature] 2/3/17
 CHIEF, UTILITY DESIGN DIVISION DATE

LOUVER ID	MECHANICAL ID	WIDTH	HEIGHT	AFF
LV1	EF-1	36"	36"	8'-0"
LV1	EF-2	36"	36"	8'-0"
LV2	EF-3 (BDD)	24"	24"	9'-0"
LV3	EF-4 (SHUTTER VENT)	6"	6"	9'-0"
LV2	EF-5	24"	24"	7'-0"
---	HVAC-1	---	---	---
LV5	MOD-1	48"	60"	3'-6"
LV5	MOD-2	48"	60"	3'-6"
LV2	MOD-3 (SF-1)	24"	24"	8'-0"
LV2	MOD-4	24"	24"	9'-0"
LV2	MOD-5	24"	24"	7'-0"
LV2	EXHAUST LOUVER (MECH. RM.)	24"	24"	8'-0"

DOOR ID	FRAME MATERIAL	DOOR MATERIAL	WIDTH	HEIGHT	FIRE RATING	REMARKS
D1	HOLLOW METAL	HOLLOW METAL	3'-0"	7'-0"	N/A	WEATHER PROOF THRESHOLD, PANIC EXIT BAR, DOOR WINDOW
D2	HOLLOW METAL	HOLLOW METAL	6'-0"	7'-0"	N/A	WEATHER PROOF THRESHOLD, PANIC EXIT BAR, DOOR WINDOW
D3	HOLLOW METAL	HOLLOW METAL	6'-0"	7'-0"	N/A	BASIC DOOR, PANIC EXIT BAR, DOOR WINDOW
D4	HOLLOW METAL	HOLLOW METAL	3'-0"	7'-0"	N/A	BASIC DOOR, PANIC EXIT BAR, DOOR WINDOW
D5	HOLLOW METAL	HOLLOW METAL	2'-8"	7'-0"	N/A	BASIC DOOR WITH INLET GRILL, LOCK

NOTES
 1. WEATHER SEALS ARE NOT REQUIRED ON INTERIOR DOORS.
 2. NO WINDOWS ON TOILET ROOM DOOR.
 3. PANIC EXIT BAR IS NOT REQUIRED ON INTERIOR DOORS.

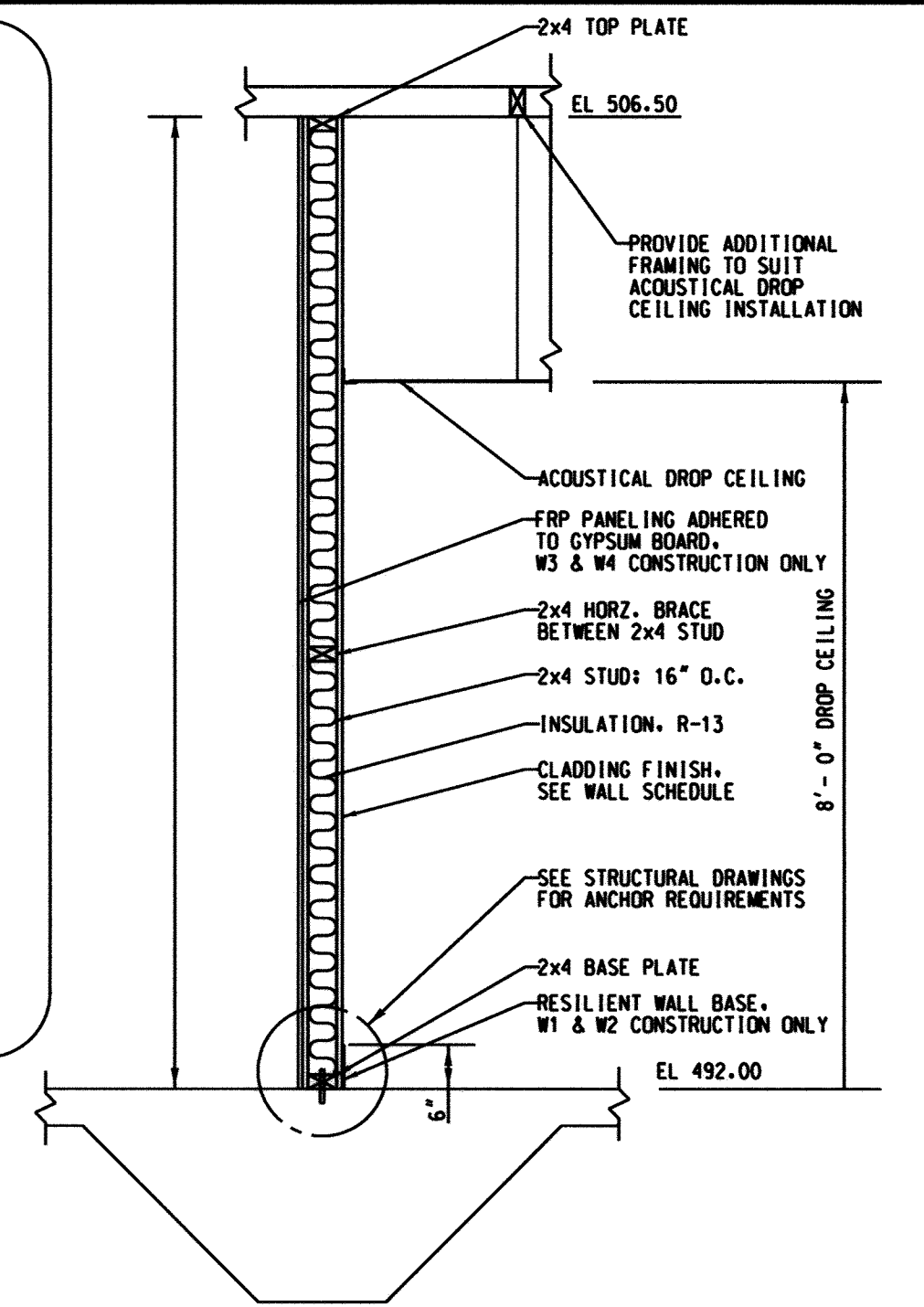
WALL ID	INSULATION RATING	INTERIOR CLADDING	INTERIOR FINISH
W1	R-20	GYPSUM BOARD	SYSTEM NO. 10
W2	R-13	GYPSUM BOARD	SYSTEM NO. 10
W3	R-20	GYPSUM BOARD	FRP PANELING ADHERED TO GYPSUM
W4	R-13	GYPSUM BOARD	FRP PANELING ADHERED TO GYPSUM

PROJECT INFORMATION

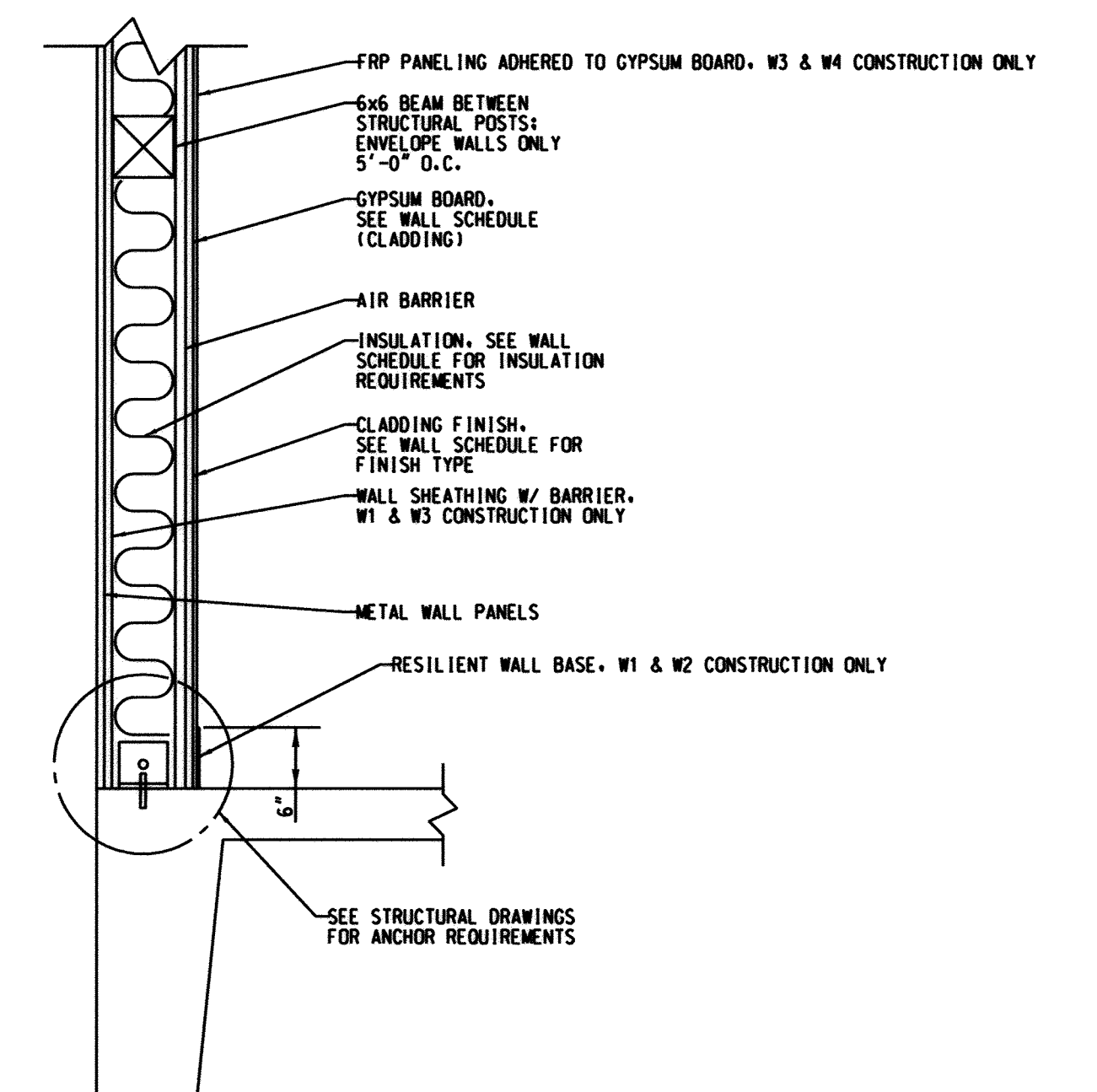
PROJECT NAME/ADDRESS:
 ASHLEIGH KNOLLS SHARED SEWAGE DISPOSAL FACILITY
 HOWARD COUNTY, MARYLAND

APPLICABLE CODES:
 INTERNATIONAL BUILDING CODE 2015
 NFPA 101 LIFE SAFETY CODE 2015
 INTERNATIONAL MECHANICAL CODE 2015
 NEC - NATIONAL ELECTRIC CODE WITH LOCAL AMENDMENTS (NFPA 70) 2015

- USE AND OCCUPANCY: FACTORY, GROUP F-2
- TYPE OF CONSTRUCTION: IV
- ALLOWABLE BUILDING HEIGHTS AND AREA (TABLE 504.4 & 506.2)
 AREA = 21,000 SF
 HEIGHT = 5 STORY
 ACTUAL HEIGHT: BUILDING 1: 20'-8"
 BUILDING 2: 13'-2"
 ACTUAL FLOOR AREA:
 TOTAL BUILDING FOOTPRINT = BUILDING 1: 1,568 S.F.
 BUILDING 2: 221 S.F.
- FIRE RESISTANCE RATING FOR BUILDING ELEMENTS
 STRUCTURAL FRAME: 0 HOUR
 BEARING WALLS: 0 HOUR
 NON-BEARING WALL (INT): 0 HOUR
 FLOOR CONSTRUCTION: 0 HOUR
 ROOF CONSTRUCTION: 0 HOUR
 FIRE SEPARATION DISTANCE: 0 HOUR (TABLE 602) (EXEMPT BECAUSE BUILDINGS ARE ON SAME PROPERTY)
 FIRE PROTECTION SYSTEM: NOT-SPRINKLERED
- ACTUAL OCCUPANT LOAD (NFPA 101, SECTION 7.3.1.2)
 N/A
- EGRESS WIDTH PER OCCUPANT SERVED
 DOORS (SECTION 1008.1.1) = 32 INCHES
- MINIMUM NUMBER OF EXITS REQUIRED (NFPA 101, SECTION 7.4.1.2)
 : 2 EXITS, MINIMUM TWO (2) ON FIRST FLOOR
- MAXIMUM ACCESS TRAVEL DISTANCE: (NFPA 101, SECTION 39.2.6.2)
 ALLOWABLE: 200'-0" (NO SPRINKLER SYSTEM)
 ACTUAL: 30'-0" MAXIMUM
- CHEMICAL STORAGE TYPE & MAXIMUM VOLUME (IBC 2015, TABLE 307.1)
 OXIDIZER CLASS II; MAXIMUM LIQUID GALLONS (POUNDS): (250)
 (USE CLOSED SYSTEM)
 ACTUAL: 25 GALLONS (243 lbs.)
 CORROSIVES: MAXIMUM LIQUID GALLONS (POUNDS): (500)
 (USE CLOSED SYSTEM)
 ACTUAL: 50 GALLONS (400 lbs.)

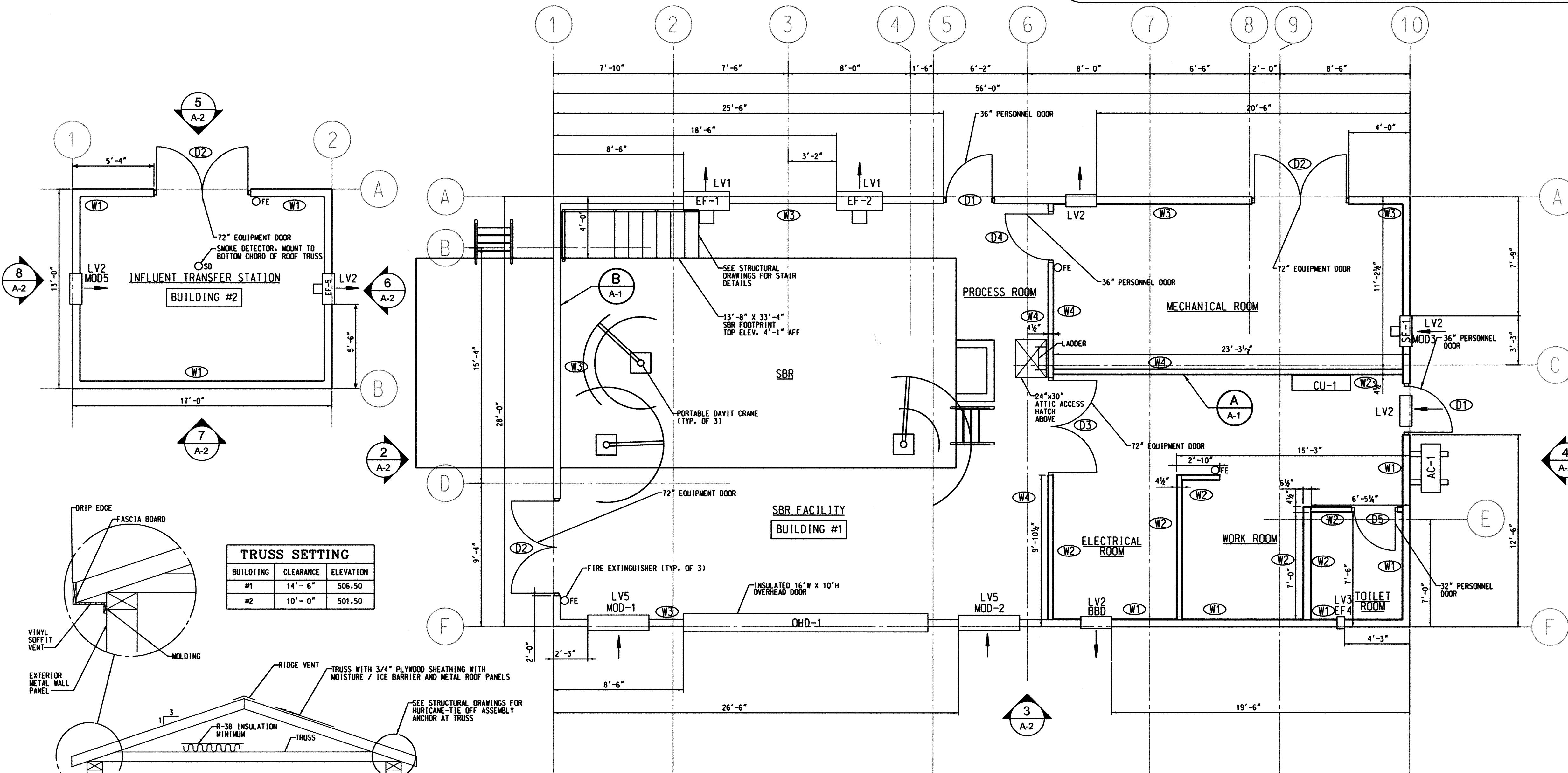
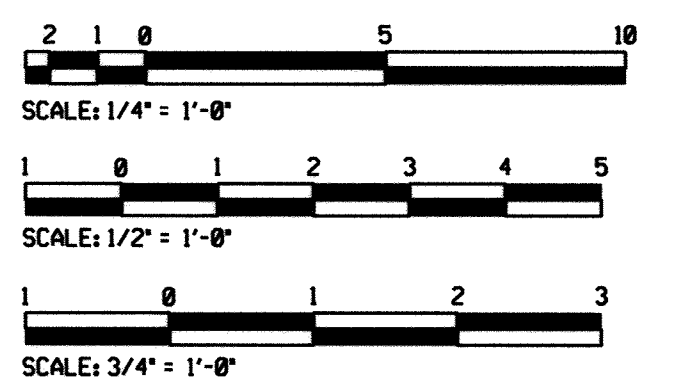


A INTERIOR WALL CONSTRUCTION DETAIL
 SCALE: 1/2" = 1'-0"



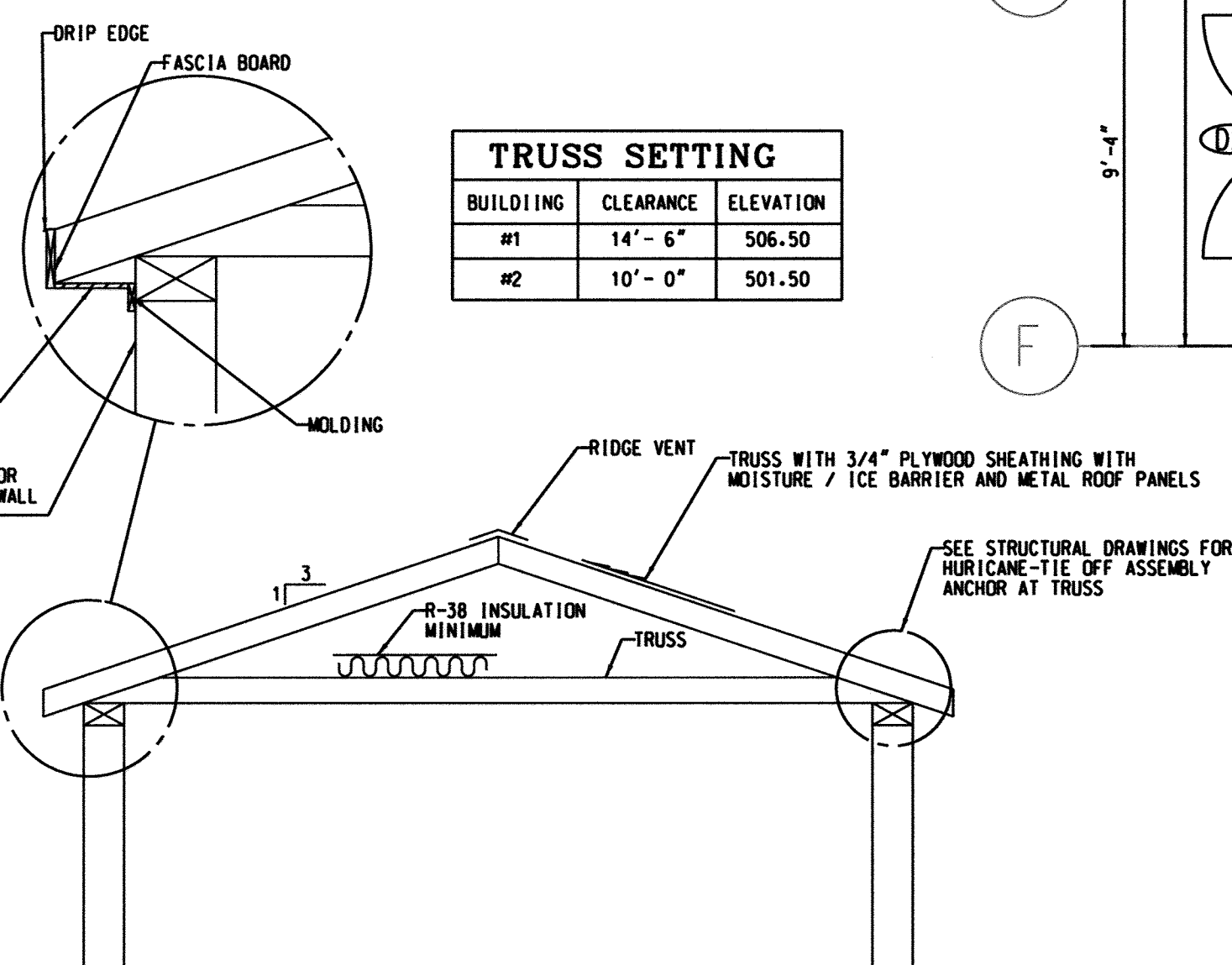
B PERIMETER WALL CONSTRUCTION DETAIL
 SCALE: 3/4" = 1'-0"

GRAPHIC SCALES



1 FLOOR PLAN
 A-1 SCALE: 1/4" = 1'-0"

BUILDING	CLEARANCE	ELEVATION
#1	14'-6"	506.50
#2	10'-0"	501.50



C TYPICAL ROOF TRUSS ASSEMBLY
 A-1 SCALE: NONE

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 SPARKS, MARYLAND 21152
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STATE OF MARYLAND
 ENGINEERING AND SURVEYING BOARD
 LICENSE NO. 33925
 PROFESSIONAL ENGINEER
 10/10/2016

DES:	KFJ
DRN:	KFJ
CHK:	SEA
DATE:	AUG. 2016
BY:	NO.
REVISION:	
DATE:	

600' SCALE MAP NO.	40-41
BLOCK NO.	12

ASHLEIGH KNOLLS
 SHARED SEWAGE DISPOSAL FACILITY
 CAPITAL PROJECT No. S-6269
 CONTRACT No. 50-4972
 ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

A-1
 SCALE AS SHOWN
 SHEET 10 OF 43

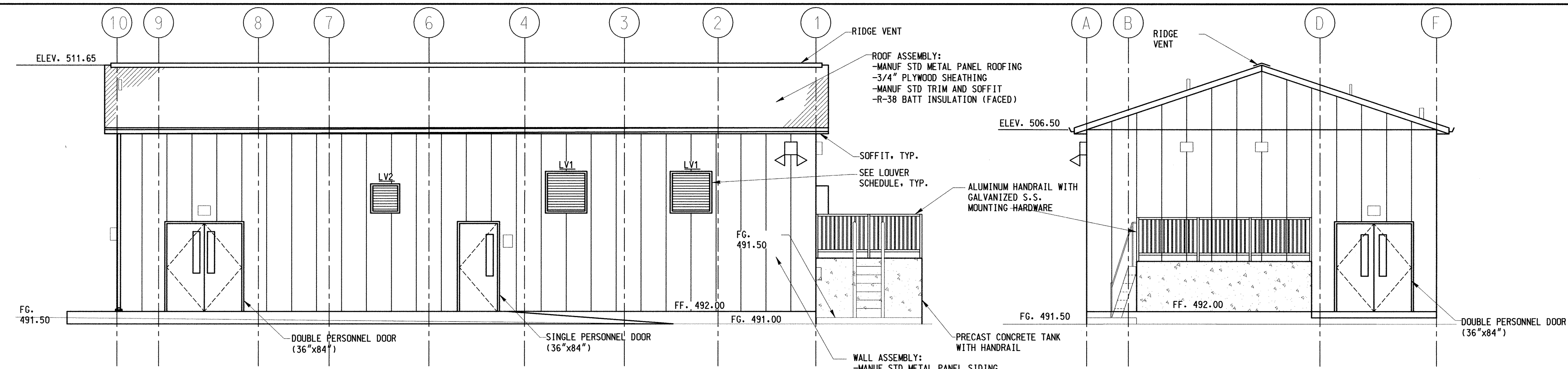
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 BY: BUSEFINAMES
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DEPARTMENT OF PUBLIC WORKS
 HOWARD COUNTY, MARYLAND

Director of Public Works: [Signature] DATE: 10/17/16
 Chief, Bureau of Engineering: [Signature] DATE: 10/17/16
 Chief, Bureau of Utilities: [Signature] DATE: 10/17/16
 Chief, Utility Design Division: [Signature] DATE: 10/17/16

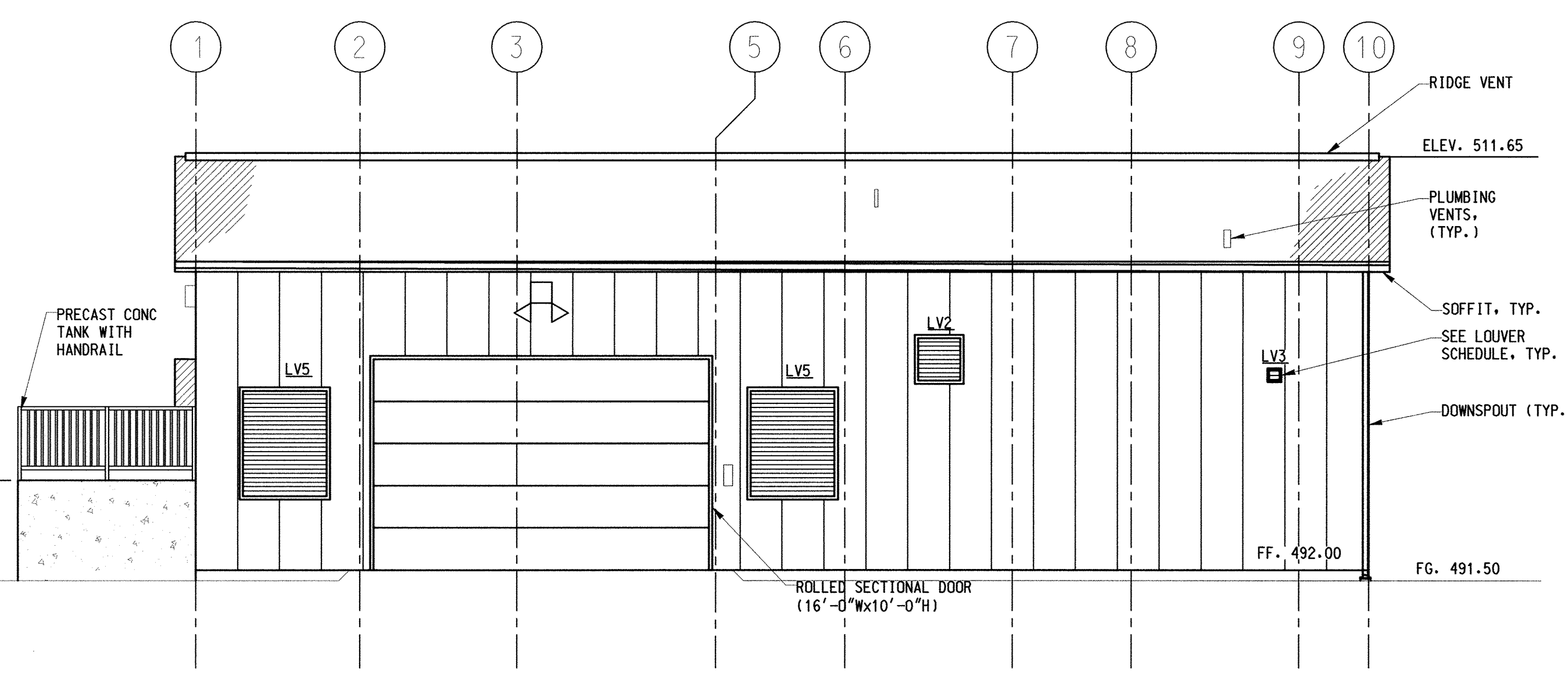
BASIS OF DESIGN

- SHEET METAL FLASHING AND TRIM**
 - MATERIALS:**
 - GALVANIZED STEEL SHEET: ASTM A 526, G90, COMMERCIAL QUALITY OR ASTM A 527 G90, LOCK-FORMING QUALITY, HOT DIPPED GALVANIZED STEEL SHEET WITH 0.20 PERCENT COPPER, MILL PHOSPHATIZED WHERE INDICATED FOR PAINTING, NOT LESS THAN 0.0396 INCH THICK, UNLESS OTHERWISE NOTED.
 - BASE FLASHING: GALVANIZED STEEL, 0.0276 INCH THICK.
 - COUNTERFLASHING: GALVANIZED STEEL, 0.0217 INCH THICK.
 - CONDUCTOR HEADS: GALVANIZED STEEL, 0.0276 INCH THICK.
 - FASTENERS: SAME METAL AS SHEET METAL FLASHING OR OTHER NON-CORROSIVE METAL AS RECOMMENDED BY SHEET METAL MANUFACTURER. MATCH FINISH OF EXPOSED METAL HEADS WITH MATERIAL BEING FASTENED.
- SEALANTS AND CAULKING**
 - COMPATIBILITY:** PROVIDE JOINT SEALERS, JOINT FILLERS, AND OTHER RELATED MATERIALS THAT ARE COMPATIBLE WITH ONE ANOTHER AND WITH JOINT SUBSTRATES UNDER CONDITIONS OF SERVICE APPLICATIONS. PROVIDE COLORS TO MATCH ADJACENT SURFACES. PROVIDE BLACK OR OTHER NEUTRAL COLOR WHERE NO OTHER COLOR IS AVAILABLE.
 - MATERIALS:**
 - ONE-COMPONENT, POLYSULFIDE BASED, ONE PART ELASTOMERIC SEALANT: COMPLY WITH FS-TT-5-00230, CLASS A, TYPE II (NON-SAG). FOR JOINTS AT PENETRATIONS THROUGH EXTERIOR WALLS, PROVIDE COMPOUND BEARING THE THIOCOL CHEMICAL CORPORATION SEAL OF APPROVAL. USE ONE OF THE FOLLOWING PRODUCTS/MANUFACTURERS OR AN APPROVED EQUAL:
 - FLEXISEAL 900 SERIES BY DAP, INC.
 - HORNIFLEX ONE-COMPONENT BY W.R. GRACE & CO.
 - ONE-COMPONENT, ACRYLIC SEALANT: ACRYLIC TERPOLYMER, SOLVENT-BASED ONE-PART THERMOPLASTIC SEALANT COMPOUND, SOLIDS NOT LESS THAN 95% ACRYLIC. COMPLY WITH FS-TT-5-00230, CLASS B, TYPE II FOR PERIMETER OF METAL WINDOW AND DOOR FRAMES, THRESHOLDS AT EXTERIOR DOORS, AND PIPE SLEEVES THROUGH EXTERIOR WALLS AND FLOOR SLABS. USE ONE OF THE FOLLOWING PRODUCTS/MANUFACTURERS OR AN APPROVED EQUAL:
 - DAP ACRYLIC BY DAP, INC.
 - GACO AS-3 BY GATES ENGINEERING/SMC.
 - OLEO-RESIN CAULKING COMPOUND: COMPLY WITH FS-TT-C-598, NON-STAINING, NON-BLEEDING, PAINTABLE, FOR PERIMETER OF INTERIOR DOOR AND WINDOW FRAMES, USE ONE OF THE FOLLOWING PRODUCTS/MANUFACTURERS OR AN APPROVED EQUAL:
 - VULCATEX BY W.R. GRACE & CO.
- HOLLOW METAL DOORS AND FRAMES**
 - CODES AND STANDARDS:**
 - STEEL DOOR INSTITUTE "RECOMMENDED SPECIFICATIONS FOR STANDARD STEEL DOOR AND FRAMES" (SDI 100)
 - ANSI A115 "SPECIFICATIONS FOR MINIMUM MATERIALS AND CONSTRUCTION REQUIREMENTS."
 - SUBMITTALS:**
 - SHOP DRAWINGS FOR FABRICATION AND ERECTION OF HOLLOW METAL DOORS AND FRAMES, INCLUDING DETAILS OF EACH FRAME TYPE, ELEVATIONS OF DOOR DESIGN TYPES, CONDITIONS AT OPENINGS, DETAILS OF CONSTRUCTION, LOCATION AND INSTALLATION REQUIREMENTS OF FINISH HARDWARE AND REINFORCEMENT, AND DETAILS OF JOINTS AND CONNECTIONS. SHOW ANCHORAGE AND ACCESSORY ITEMS.
 - MATERIALS:**
 - HOT-ROLLED SHEET AND STRIP: ASTM A 569 AND ASTM A 568, COMMERCIAL QUALITY CARBON STEEL, PICKLED AND OILED.
 - COLD-ROLLED STEEL SHEETS: ASTM A 366 AND ASTM A 568, COMMERCIAL QUALITY CARBON STEEL.
 - INSERTS, BOLTS, AND FASTENERS: MANUFACTURER'S STANDARD UNITS TO COMPLY WITH ASTM A 153, CLASS C OR D AS APPLICABLE.
 - SHOP APPLIED PAINT: FOR STEEL SURFACES, A RUST-INHIBITIVE ENAMEL OR PAINT, EITHER AIR-DRYING OR BAKING, SUITABLE AS A BASE FOR SPECIFIED FINISH PAINTS.
 - INSTALLATION:**
 - SUPPORTS AND ANCHORS SHALL BE FABRICATED OF STEEL NOT LESS THAN 16 GAUGE.
 - HOLLOW METAL UNITS TO BE RIGID, NEAT IN APPEARANCE, AND FREE FROM DEFECTS, WARP OR BUCKLE. WHERE PRACTICAL, FIT AND ASSEMBLE UNITS IN MANUFACTURER'S PLANT.
 - WELD EXPOSED JOINTS CONTINUOUSLY, GRIND, AND DRESS TO MAKE SURFACE SMOOTH AND FLUSH. METALLIC FILLER TO CONCEAL MANUFACTURING DEFECTS IS NOT ACCEPTABLE.
 - UNLESS OTHERWISE INDICATED, PROVIDE COUNTERSUNK FLAT PHILLIPS OR JACKSON HEADS FOR EXPOSED SCREWS AND BOLTS.
 - PREPARE HOLLOW METAL UNITS TO RECEIVE MORTISED AND CONCEALED HARDWARE, INCLUDING CUT-OUTS, REINFORCING, DRILLING, AND TAPPING IN ACCORDANCE WITH FINAL FINISH HARDWARE SCHEDULE AND ANSI A115.
 - PROVIDE REINFORCING AT HINGES IN HOLLOW METAL UNITS TO BE 7 GAUGE x 10-1/2 INCHES x WIDTH REQUIRED.
 - GYPSUM DRYWALL SYSTEM**
 - MATERIALS:** FOR ALL GYPSUM DRYWALL SYSTEMS THROUGHOUT THE PROJECT, PROVIDE ALL DRYWALL MATERIALS, INCLUDING ACCESSORIES AND FASTENERS, PRODUCED BY ONE MANUFACTURER. PROVIDE GYPSUM DRYWALL SYSTEMS MANUFACTURED BY ONE OF THE FOLLOWING, OR AN APPROVED EQUAL:
 - AMERICAN GYPSUM CO.
 - CERTAINTEED CORP.
 - GEORGIA-PACIFIC GYPSUM LLC
 - STUDS AND TRACK: ASTM C 645, SCREW TYPE.
 - JOINT TAPES: ASTM C 475, IN DRY POWDER FORM OR PRE-MIXED READY FOR APPLICATION.
 - DRYWALL FASTENERS: SIZE AND TYPE RECOMMENDED BY DRYWALL MANUFACTURER FOR THE APPLICATION SHOWN.
 - INSTALLATION:**
 - TOLERANCES FOR DRYWALL WORK: DO NOT EXCEED VARIATION OF 3/16" IN 8'-0" FROM PLUMB, LEVEL, AND FLAT IN ALL DIRECTIONS. DO NOT EXCEED 1/8" OFFSET OF PLANES AND JOINTS BETWEEN PANELS. SHIM PANELS AS NEEDED TO COMPLY WITH TOLERANCE REQUIREMENTS.
 - AT EXPOSED WALLBOARD EDGES AND AROUND OPENINGS, PROVIDE SQUARE-NOSE METAL CASING BEAD WITH EITHER KNURLED AND PERFORATED OR EXPANDED FLANGES FOR NAILING OR STAPLING, AND BEADED FOR CONCEALMENT OF FLANGES IN JOINT COMPOUND.
 - APPLY JOINT COMPOUND IN THREE COATS (NOT INCLUDING PREFILL OR OPENING IN BASE). SAND BETWEEN EACH COAT AND AFTER LAST COAT.

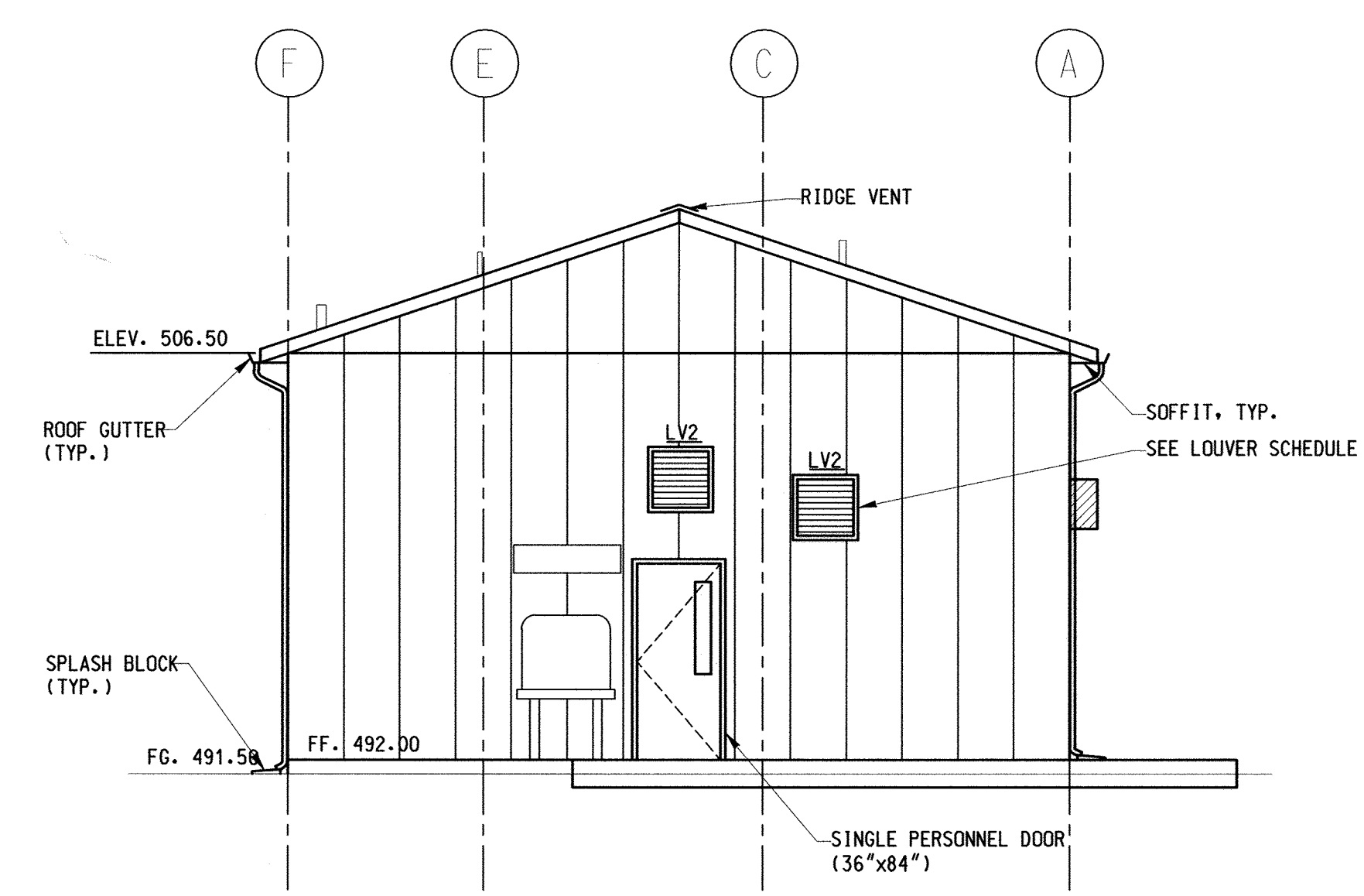


1 EAST ELEVATION
A-2 SCALE: 3/16"=1'-0"

2 NORTH ELEVATION
A-2 SCALE: 3/16"=1'-0"

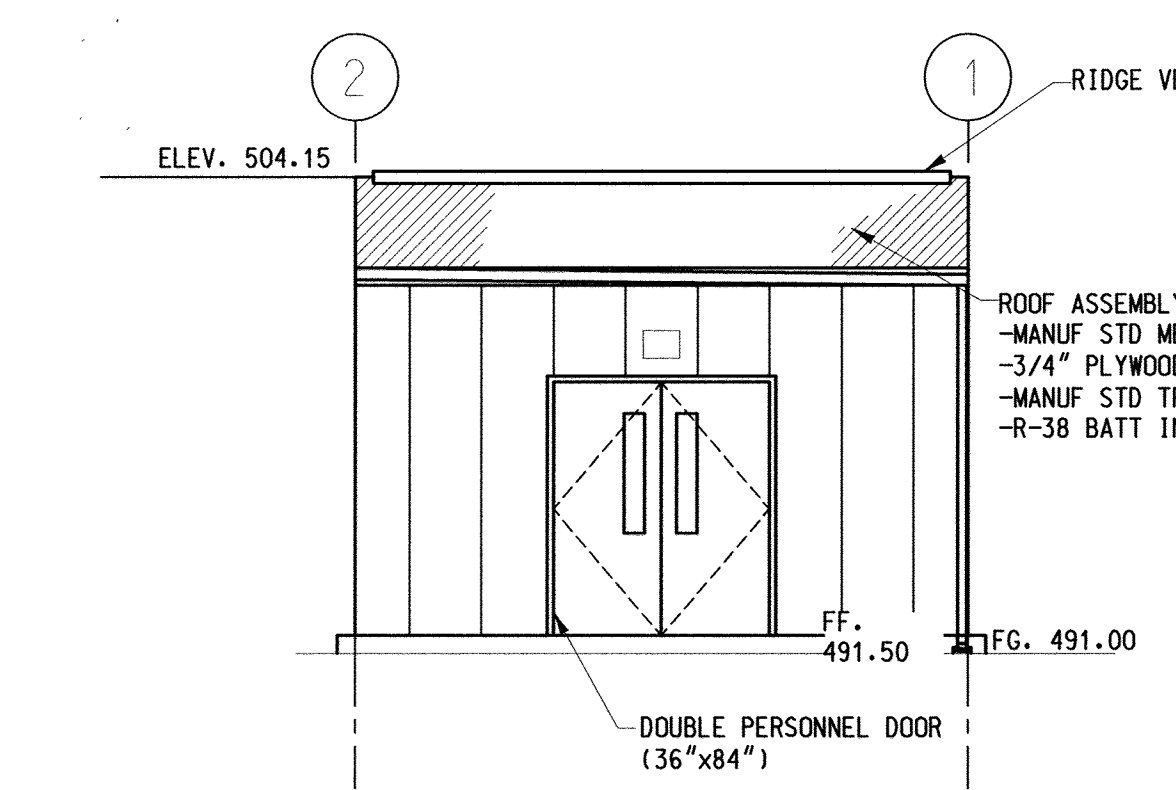


3 WEST ELEVATION
A-2 SCALE: 3/16"=1'-0"

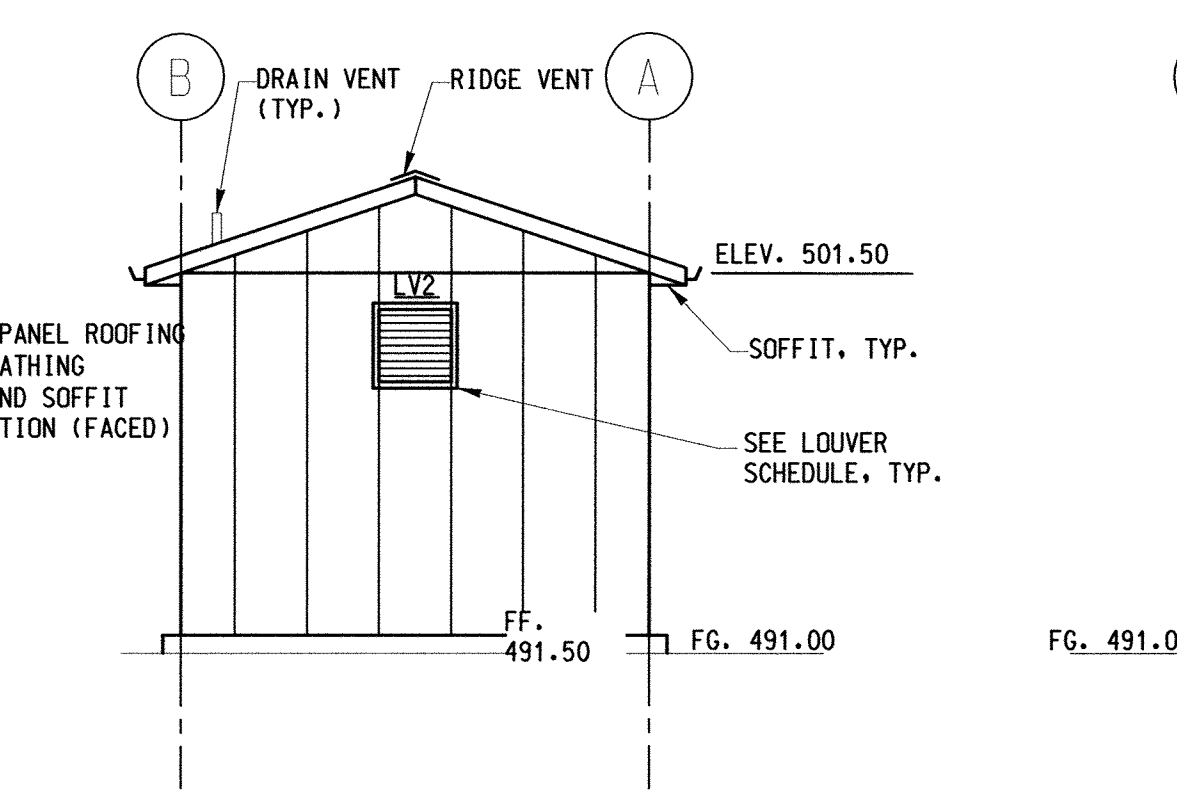


4 SOUTH ELEVATION
A-2 SCALE: 3/16"=1'-0"

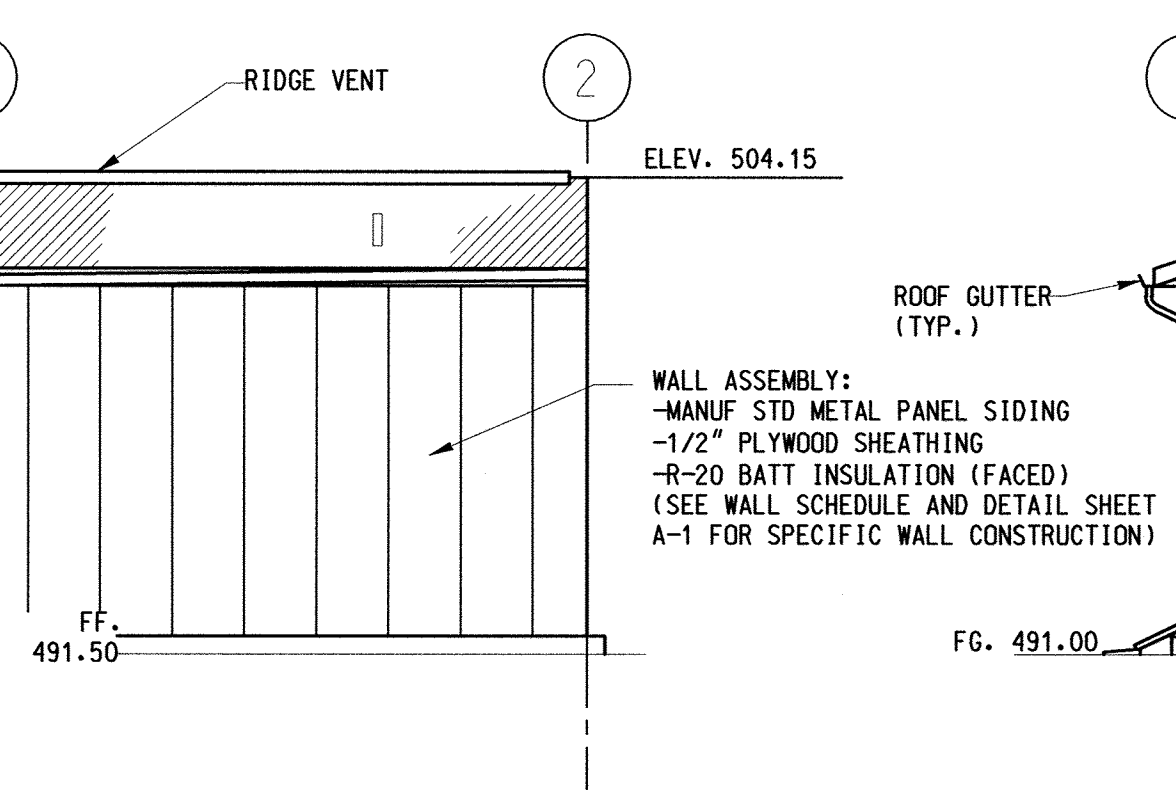
BUILDING NO.1



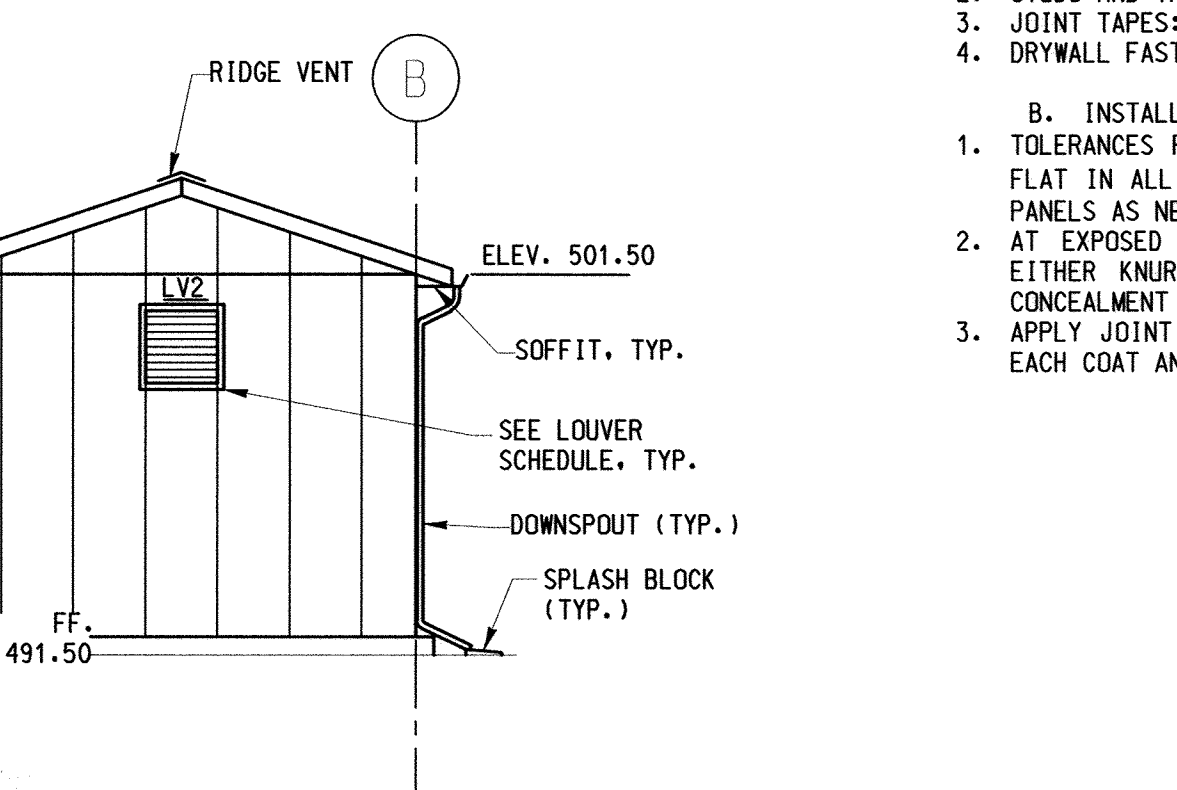
5 EAST ELEVATION
A-2 SCALE: 3/16"=1'-0"



6 SOUTH ELEVATION
A-2 SCALE: 3/16"=1'-0"



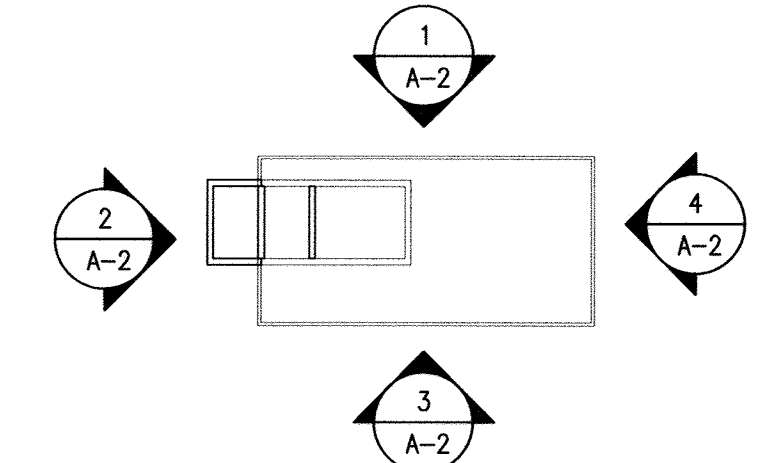
7 WEST ELEVATION
A-2 SCALE: 3/16"=1'-0"



8 NORTH ELEVATION
A-2 SCALE: 3/16"=1'-0"

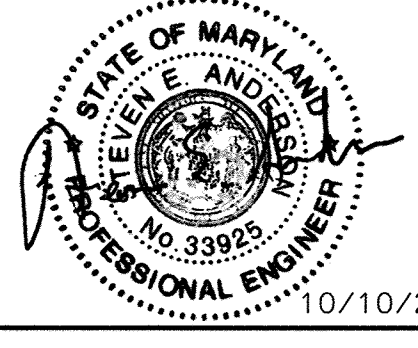
BUILDING NO.2

KEY PLAN:



NOTE:
1. SEE SPECIFICATIONS FOR GUTTER AND DOWNSPOUT FABRICATION AND INSTALLATION REQUIREMENTS.

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. 33925 EXPIRATION DATE: 01/15/2017



ENGINEERS PLANNERS SCIENTISTS CONSTRUCTION MANAGERS
KCI TECHNOLOGIES
936 RIDGEBROOK ROAD
SPRINGFIELD, MARYLAND 21152
TELEPHONE: (410) 316-7800
FAX: (410) 316-7818
www.kci.com

DES: JFW	DRN: KFJ	CHK: SEA	DATE: AUG, 2016	BY: NO.	REVISION	DATE
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BUILDING ELEVATIONS	
600' SCALE MAP NO. 40-41	BLOCK NO. 12

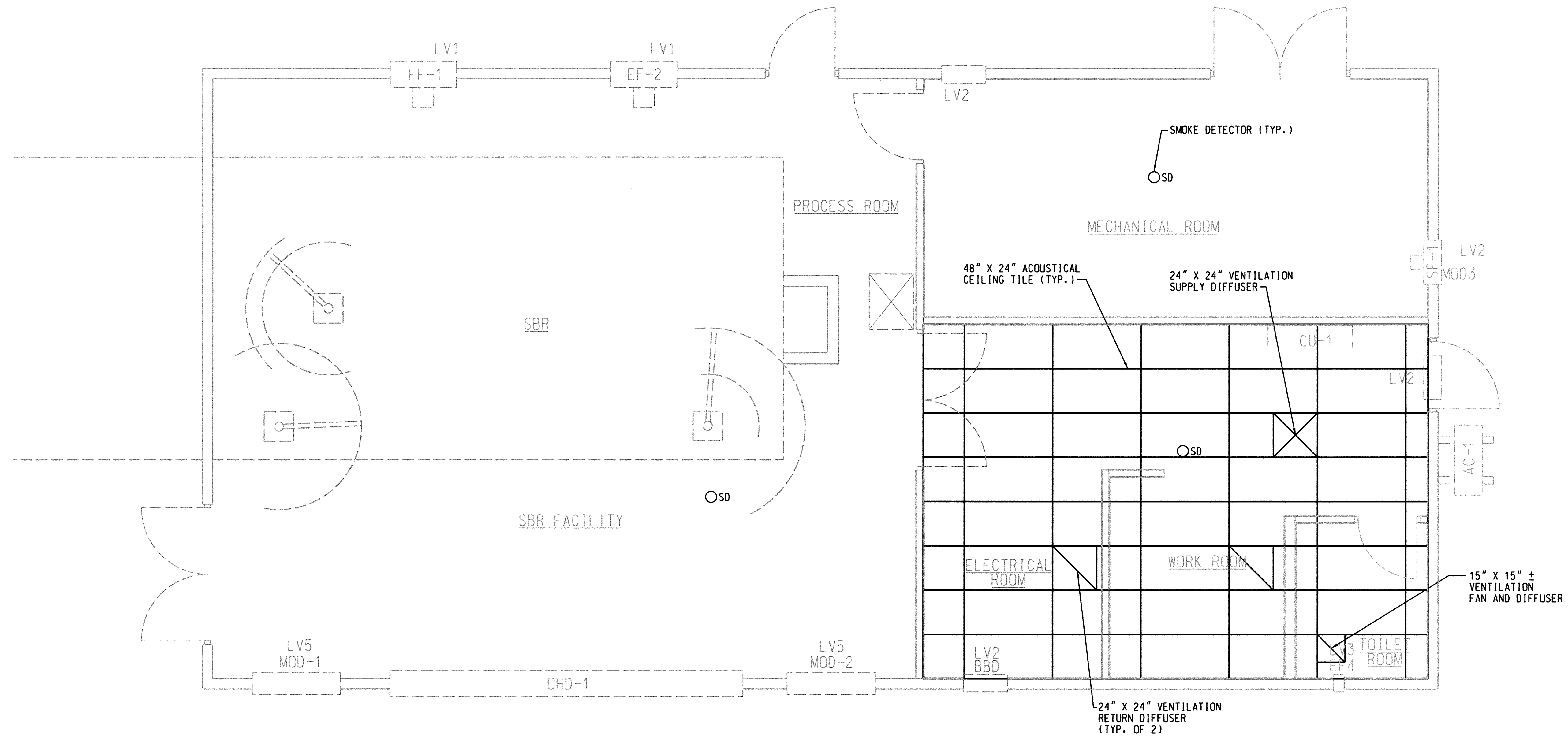
ASHLEIGH KNOLLS SHARED SEWAGE DISPOSAL FACILITY
CAPITAL PROJECT No. S-6269
CONTRACT No. 50-4972
ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

A-2
SCALE AS SHOWN
SHEET
11 OF 43

Oct 06, 2016 - 10:22am
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DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

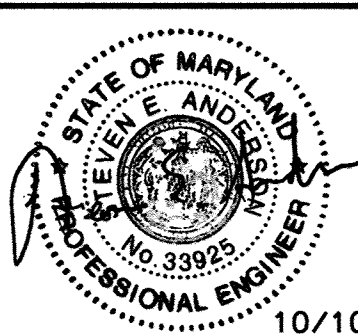
Director of Public Works: *J. G. ...* 2/13/17
 Chief, Bureau of Engineering: *Thomas E. Butler* 2/13/17
 Chief, Bureau of Utilities: *...* 12/26/17
 Chief, Utility Design Division: *...* 2/13/17



1 REFLECTED CEILING PLAN
 A-3 SCALE: 3/8" = 1'-0"



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KCI TECHNOLOGIES
 ENGINEERS PLANNERS SCIENTISTS CONSTRUCTION MANAGERS
 936 RIDGEBROOK ROAD
 SPARKS, MARYLAND 21152
 TELEPHONE: (410) 316-7800
 FAX: (410) 316-7818
 www.kci.com

DES:	KFJ				
DRN:	KFJ				
CHK:	SEA				
DATE:	AUG. 2016	BY	NO.	REVISION	DATE

REFLECTED CEILING PLAN

ASHLEIGH KNOLLS SHARED SEWAGE DISPOSAL FACILITY
 CAPITAL PROJECT No. S-6269
 CONTRACT No. 50-4972
 ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

A-3
 SCALE AS SHOWN
 SHEET 12 OF 43

PLOTTER: 10:26 AM on Thursday, October 06, 2016
 BY: KJESPERMAN
 FILE: \\A2007\01071378.06\Drawings\A0107137806-A-003_Ceiling_Plan.dgn

DEPARTMENT OF PUBLIC WORKS
 HOWARD COUNTY, MARYLAND

[Signature] 2/7/17
 DIRECTOR OF PUBLIC WORKS DATE

[Signature] 2/7/17
 CHIEF, BUREAU OF UTILITIES DATE

[Signature] 2/7/17
 CHIEF, BUREAU OF ENGINEERING DATE

[Signature] 2/7/17
 CHIEF, UTILITY DESIGN DIVISION DATE

BUILDING CODES

- A. THE 2015 INTERNATIONAL BUILDING CODE (IBC) AND ALL SUBSEQUENT SUPPLEMENTS
B. GOVERNING LOCAL BUILDING CODE

DESIGN LOADS

- A. IN ADDITION TO SELF WEIGHT, THE BUILDING IS DESIGNED FOR THE FOLLOWING LOADS:

Table with 3 columns: LOAD TYPE, LIVE LOAD, SUPERIMPOSED DEAD LOAD. Rows include SLAB ON GRADE, ELEVATED PLATFORM AND STAIR, ROOF.

- B. ROOF SNOW LOAD DESIGN CRITERIA (RISK CATEGORY III):

Table with 2 columns: LOAD TYPE, VALUE. Rows include GROUND SNOW LOAD (Pg), FLAT ROOF SNOW LOAD (Pf), EXPOSURE FACTOR (Ce), IMPORTANCE FACTOR (I), THERMAL FACTOR (Ct).

- C. WIND LOAD DESIGN CRITERIA (RISK CATEGORY III):

Table with 2 columns: WIND LOAD TYPE, VALUE. Rows include BASIC WIND SPEED (Vw), WIND EXPOSURE (C), INTERNAL PRESSURE COEFFICIENT (Cp), IMPORTANCE FACTOR (I).

- D. EARTHQUAKE LOAD DESIGN CRITERIA (RISK CATEGORY III):

Table with 2 columns: EARTHQUAKE LOAD TYPE, VALUE. Rows include EQUIVALENT LATERAL FORCE PROCEDURE, SEISMIC USE GROUP, SEISMIC DESIGN CATEGORY, IMPORTANCE FACTOR (I), MAPPED SPECTRAL RESPONSE ACCELERATIONS, DESIGN SPECTRAL RESPONSE COEFFICIENTS, SOIL SITE CLASS, SEISMIC RESPONSE COEFFICIENT (Cs), RESPONSE MODIFICATION FACTOR (R), SEISMIC RESISTING SYSTEM, DESIGN BASE SHEAR (V).

- E. THE CONTRACTOR SHALL NOT STORE ANY CONSTRUCTION MATERIALS OR UNDERTAKE ANY CONSTRUCTION OPERATION WHICH WILL EXCEED THE DESIGN LIVE LOADINGS NOTED.

- F. THE STABILITY OF THE STRUCTURE IS DEPENDENT UPON THE DIAPHRAGM ACTION OF THE FLOORS AND ROOF. THE CONTRACTOR IS COMPLETELY RESPONSIBLE FOR THE METHOD OF CONSTRUCTION AND SHALL PROVIDE ALL TEMPORARY BRACING AND SHORING REQUIRED TO MAINTAIN THE STABILITY OF THE STRUCTURE AND TO SUPPORT CONSTRUCTION LOADS DURING CONSTRUCTION, INCLUDING SOILS ON WALLS FROM BACKFILLING PRIOR TO PLACING SLABS ON GRADE. DESIGN OF ALL BRACING IS THE CONTRACTOR'S RESPONSIBILITY.

- G. THE FRAMING HAS BEEN DESIGNED FOR THE WEIGHT OF EQUIPMENT SHOWN ON THE STRUCTURAL DRAWINGS. IF ACTUAL WEIGHT OF EQUIPMENT EXCEEDS THAT SHOWN OR IF EQUIPMENT NOT SHOWN EXCEEDS 500 POUNDS, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER.

- H. ALL STAIRS, RAILINGS, STUD WALLS, GLASS STORE FRONT, AND EXTERIOR CEILINGS AND SOFFITS SHALL BE DESIGNED FOR THE LOADS INDICATED OR SPECIFIED BY THE BUILDING CODE.

EXISTING STRUCTURE

- A. THE CONTRACTOR SHALL PROVIDE ALL TEMPORARY BRACING AND SHORING REQUIRED TO MAINTAIN THE STABILITY OF THE EXISTING STRUCTURE DURING CONSTRUCTION. THE DESIGN OF ALL TEMPORARY BRACING AND SHORING IS THE CONTRACTOR'S RESPONSIBILITY.

- B. THE CONTRACTOR SHALL MONITOR THE EXISTING STRUCTURE DURING CONSTRUCTION. IMMEDIATELY NOTIFY THE ENGINEER OF AREAS EXHIBITING DISTRESS OR FAILURE.

SPREAD FOOTING FOUNDATIONS

- A. REFER TO "CAST IN PLACE CONCRETE" FOR APPLICABLE CODES AND STANDARDS.

- B. ASSUMED PARAMETERS FOR SPREAD FOOTING DESIGN ARE AS FOLLOWS:

- 1. MINIMUM DEPTH TO BOTTOM OF EXTERIOR FOOTINGS FOR FROST PROTECTION = 30 IN BELOW GRADE
2. ASSUMED NET ALLOWABLE BEARING CAPACITY = 2000 PSF

- D. THE ALLOWABLE SOIL BEARING PRESSURE SHALL BE FIELD VERIFIED BY A REGISTERED GEOTECHNICAL ENGINEER AND APPROVED PRIOR TO PLACING FOUNDATIONS. SHOULD THE ACTUAL SOIL BEARING PRESSURE BE LESS THAN 2000 PSF, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER.

- E. ALL EXCAVATION AND BACKFILLING OPERATIONS WITHIN THE BUILDING FOOTPRINT, INCLUDING ALL COMPACTION TESTS AND INSPECTIONS, SHALL BE DONE UNDER THE DIRECTION AND SUPERVISION OF A REGISTERED GEOTECHNICAL ENGINEER.

- F. THE CONTRACTOR SHALL INFORM THE ENGINEER FOR SUBGRADE INSPECTION RESULTS FOR TANK AND BUILDING FOUNDATIONS. IF THE SUBGRADE IS DEEMED UNSUITABLE, THE CONTRACTOR WILL BE DIRECTED TO PLACE GEO-TEXTILE AND ADDITIONAL STONE BEDDING.

- G. ALL EXISTING SOIL CONTAINING GRAVEL, CONSTRUCTION OR DEMOLITION DEBRIS, ORGANIC SUBSTANCES, OR OTHER FOREIGN OBJECTS SHALL BE REMOVED FROM THE REGION WITHIN THE FOOTPRINT OF THE STRUCTURE.

- H. CONTRACTOR SHALL LIMIT CUT-FILL OPERATIONS TO EXTENT POSSIBLE. STRUCTURAL BACKFILL SHALL CONSIST OF MAXIMUM 8-INCH LIFTS AND BE COMPACTED TO A MINIMUM 95% DRY DENSITY IN ACCORDANCE WITH GEOTECHNICAL ENGINEER'S RECOMMENDATIONS.

DRILLED PIER FOUNDATIONS

- A. REFER TO "CAST IN PLACE CONCRETE" FOR APPLICABLE CODES AND STANDARDS. IN ADDITION, COMPLY WITH THE FOLLOWING:

- 1. ACI 336.1 "STANDARD SPECIFICATION FOR THE CONSTRUCTION OF END BEARING DRILLED PIERS"

- B. DESIGN PROPERTIES ASSUMED ARE AS FOLLOWS. ALL SITE PREPARATIONS AND FIELD TESTING SHALL BE COMPLETED UNDER THE DIRECTION OF A REGISTERED GEOTECHNICAL ENGINEER.

- 1. DRILLED PIERS TO BEAR ON UNDISTURBED SOIL WITH NET ALLOWABLE BEARING CAPACITY OF 3000 KSF
2. BEARING ELEVATIONS OF DRILLED PIER FOUNDATIONS AS INDICATED ON DRAWINGS ARE APPROXIMATE.
3. SOIL BEARING PRESSURE SHALL BE FIELD VERIFIED BY A REGISTERED GEOTECHNICAL ENGINEER. CONTRACTOR SHALL NOTIFY THE STRUCTURAL ENGINEER IF VARIATIONS OCCUR.

- J. ALL CAST IN PLACE CONCRETE DRILLED PIERS SHALL CONSIST OF CONCRETE WITH A 28 DAY MINIMUM COMPRESSIVE STRENGTH OF fc = 5000 PSI. ALL REINFORCING SHALL BE ASSEMBLED AND TIED TOGETHER TO FORM A SINGLE UNIT PRIOR TO PLACEMENT IN THE PILE EXCAVATION.

CONSTRUCTION TOLERANCES:

- 1. PERMISSIBLE VARIATION OF CENTER OF SHAFT NOT MORE THAN 3 INCHES OF PLAN LOCATION, MEASURED AT THE GROUND SURFACE.
2. SHAFTS OUT OF PLUMB NOT MORE THAN 1 INCH PER 40 FEET OF DEPTH.
3. IF TOLERANCES ARE EXCEEDED, CONTRACTOR SHALL PROVIDE CORRECTIVE CONSTRUCTION TO COMPENSATE FOR EXCESSIVE ECCENTRICITY AS APPROVED BY ENGINEER.

- E. DRILLED PIER FOUNDATIONS SHALL BE DRILLED WITHOUT DISTURBING THE SURROUNDING SOIL AND SHALL BE KEPT FREE OF WATER INFILTRATION UNTIL CONCRETE CAN BE PLACED.

RETAINING WALLS

- A. REFER TO "CAST IN PLACE CONCRETE" (AND "PRECAST STRUCTURAL CONCRETE") SECTIONS FOR APPLICABLE CODES AND STANDARDS.

- B. ASSUMED PARAMETERS FOR SPREAD FOOTING DESIGN ARE AS FOLLOWS:

- 1. MINIMUM DEPTH TO BOTTOM OF EXTERIOR FOOTINGS FOR FROST PROTECTION = 30 IN BELOW GRADE
2. ASSUMED NET ALLOWABLE BEARING CAPACITY = 2000 PSF
3. EQUIVALENT FLUID LATERAL EARTH PRESSURE FOR CANTILEVERED WALLS = 42 PCF

- C. CONTRACTOR TO SUPPLY OR VERIFY BACKFILL MATERIALS WITH THE FOLLOWING CHARACTERISTICS:

- 1. SATURATED SOIL DENSITY: 125 PCF
2. INTERNAL FRICTION ANGLE: 30 DEGREES
3. COHESION (C): 0
4. COULOMB ACTIVE PRESSURE CONSTANT (Ka): 0.33

- D. ALL RETAINING WALLS ARE DESIGNED USING THE FOLLOWING FACTORS OF SAFETY:

- 1. SLIDING = 1.5
2. OVERTURNING = 2.0

- E. THE ALLOWABLE SOIL BEARING PRESSURE SHALL BE FIELD VERIFIED BY A REGISTERED GEOTECHNICAL ENGINEER AND APPROVED PRIOR TO PLACING FOUNDATIONS. SHOULD THE ACTUAL SOIL BEARING PRESSURE BE LESS THAN 2000 PSF, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER.

- F. ALL RETAINING WALLS SHALL BE BRACED AND SHORED AS REQUIRED DURING BACKFILLING. BOTH SUPPORTING ELEMENTS SHALL BE IN PLACE AND DEVELOPING FULL REQUIRED STRENGTH PRIOR TO BACK FILLING OF WALLS SUPPORTED AT TOP AND BOTTOM.

CAST IN PLACE CONCRETE

- A. CODES AND STANDARDS:

- 1. ACI 308 "SPECIFICATIONS FOR STRUCTURAL CONCRETE FOR BUILDINGS"
2. ACI 318 "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE"
3. ACI 117 "SPECIFICATIONS FOR TOLERANCES FOR CONCRETE CONSTRUCTION AND MATERIALS"
4. ACI 305 "RECOMMENDED PRACTICE FOR HOT WEATHER CONCRETING"
5. ACI 306 "RECOMMENDED PRACTICE FOR COLD WEATHER CONCRETING"
6. ACI 347 "RECOMMENDED PRACTICE FOR CONCRETE FORM WORK"
7. ACI 315 "DETAILS AND DETAILING OF CONCRETE REINFORCEMENT"
8. CRSI "MANUAL OF STANDARD PRACTICE"

- B. REINFORCING MATERIALS:

- 1. STEEL REINFORCEMENT: ASTM A 615, GRADE 60, DEFORMED
2. PLAIN-STEEL WELDED WIRE REINFORCEMENT: ASTM A 185

- C. CONCRETE MATERIALS:

- 1. PORTLAND CEMENT: ASTM C 150, TYPE I/II
2. FLY ASH: ASTM C 618, CLASS F
3. GROUND GRANULATED BLAST FURNACE SLAG: ASTM C 989, GRADE 120
4. NORMAL WEIGHT AGGREGATES: ASTM C 33
a. MAXIMUM COARSE AGGREGATE SIZE: 1 INCH NOMINAL
b. FINE AGGREGATE SHALL BE FREE OF MATERIAL WITH DELETERIOUS REACTIVITY TO ALKALI IN CEMENT.
5. WATER: ASTM C 94, POTABLE

- D. ADMIXTURES:

- 1. AIR ENTRAINMENT: ASTM C 260
2. WATER-REDUCER: ASTM C 494
3. SILICA FUME: ASTM C 1240
4. NO ADMIXTURES CONTAINING CALCIUM CHLORIDE SHALL BE PERMITTED.

- E. CONCRETE MIXTURES:

- 1. FLY ASH, POZZOLAN, GROUND GRANULATED BLAST FURNACE SLAG, AND SILICA FUME MAY BE USED AS NEEDED TO REDUCE THE TOTAL AMOUNT OF PORTLAND CEMENT WHICH WOULD OTHERWISE BE USED BY NOT MORE THAN 40 PERCENT.
a. MAXIMUM SUBSTITUTION OF FLY ASH SHALL BE 20 PERCENT.
b. MAXIMUM SUBSTITUTION OF SILICA FUME SHALL BE 10 PERCENT.

- F. PROPORTION NORMAL WEIGHT CONCRETE MIXES AS FOLLOWS:

Table with 5 columns: LOCATION, 28 DAY STRENGTH (fc), WATER-CEMENTIOUS RATIO, SLUMP LIMIT, AIR CONTENT. Rows include FOUNDATIONS, SLABS ON GRADE.

- G. ALL CONCRETE MIX DESIGNS, INCLUDING CEMENT CONTENT, WATER CEMENT RATIO, FINE AND COARSE AGGREGATE CONTENT AND ALL ADMIXTURES, SHALL BE REVIEWED BY ENGINEER PRIOR TO PLACING FIRST CONCRETE.

- H. ALL CONCRETE SHALL BE SAMPLED AND TESTED BY THE TESTING AGENCY. THE CONTRACTOR SHALL NOTIFY THE TESTING AGENCY 48 HOURS PRIOR TO THE PLACING OF ANY CONCRETE.

- I. MINIMUM COVER FOR ALL REINFORCING SHALL BE AS FOLLOWS UNLESS OTHERWISE INDICATED:

Table with 2 columns: LOCATION, THICKNESS. Rows include FOUNDATIONS, SLABS ON GRADE.

PRECAST STRUCTURAL CONCRETE

- A. REFER TO "CAST IN PLACE CONCRETE" SECTION FOR APPLICABLE CODES AND STANDARDS.

- B. REFER TO "DESIGN LOADS" FOR STRUCTURAL PERFORMANCE REQUIREMENTS OF STRUCTURAL CONCRETE UNITS AND CONNECTIONS.

- C. SUBMITTALS:

- 1. DESIGN MIXTURES FOR EACH PRECAST CONCRETE MIX, INCLUDING COMPRESSIVE STRENGTH AND WATER-ABSORPTION TESTS
2. COMPLETE DESIGN CALCULATIONS AND SHOP DRAWINGS SIGNED AND SEALED BY A REGISTERED PROFESSIONAL ENGINEER

- D. ALL PRECAST CONCRETE ELEMENTS SHALL HAVE A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 5000 PSI. HIGHER STRENGTH CONCRETE MAY BE USED IF REQUIRED BY DESIGN.

- E. TOPPING SLABS FOR ALL PRECAST FLOOR AND ROOF SYSTEMS SHALL HAVE A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 5000 PSI.

- F. THE CONTRACTOR SHALL NOT CUT ANY OPENINGS INTO THE PRECAST CONCRETE ELEMENTS WITHOUT THE APPROVAL OF THE STRUCTURAL ENGINEER AND PRECAST MANUFACTURER.

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. 18 323 EXPIRATION DATE: 07-05-2017

STRUCTURAL AND MISCELLANEOUS STEEL

- A. CODES AND STANDARDS:

- 1. AISC "STEEL CONSTRUCTION MANUAL", 13TH EDITION.
2. AISC 303 "CODE OF STANDARD PRACTICE FOR BUILDINGS AND BRIDGES"
3. AISC 360 "SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS"
4. RCSC "SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM A 325 OR A 490 BOLTS"
5. AWS D1.1 "STRUCTURAL WELDING CODE"
6. AISC "SPECIFICATION FOR ARCHITECTURALLY EXPOSED STRUCTURAL STEEL"

- B. SUBMITTALS:

- 1. SHOP DRAWINGS INDICATING THE SIZES, EXTENT, AND LOCATION OF ALL STRUCTURAL AND MISCELLANEOUS STEEL FRAMING INCLUDING ALL CONNECTIONS, FASTENERS, AND BEARINGS.

- C. MATERIALS:

- 1. W-SHAPES: ASTM A 992
2. CHANNELS, ANGLES, PLATES: ASTM A 36
3. HOLLOW STRUCTURAL SECTIONS (HSS): ASTM A 500, GRADE B
4. STEEL PIPE: ASTM A 53, TYPE E OR S, GRADE B
5. PRIMER: FABRICATOR'S STANDARD LEAD AND CHROMATE FREE, NONSPHALTIC, RUST INHIBITING, COMPLY WITH MPI#79
6. NON-METALLIC, SHRINKAGE RESISTANT GROUT: ASTM C 1107 WITH MINIMUM COMPRESSIVE STRENGTH OF 5000 PSI AT 28 DAYS
7. GALVANIZE: HOT-DIP ZINC COATING, ASTM A 123

- D. CONNECTIONS:

- 1. WELDED CONNECTIONS: E70XX ELECTRODES
2. HIGH-STRENGTH BOLTS: ASTM A 325, TYPE 1, HEAVY-HEX STEEL STRUCTURAL BOLTS

- E. INSTALLATION:

- 1. ALL CONNECTIONS, UNLESS OTHERWISE NOTED, SHALL BE DOUBLE ANGLE OR SINGLE PLATE SHEAR CONNECTIONS DESIGNED AND DETAILED IN ACCORDANCE WITH AISC MANUAL OF STEEL CONSTRUCTION.
a. MINIMUM EDGE DISTANCE: 1 1/2 INCHES
b. BOLT SPACING: 3 INCHES
2. BEAM CONNECTIONS SHALL USE NO LESS THAN TWO 3/4" DIAMETER ASTM A 325N OR A 490 HIGH STRENGTH BOLTS.
3. ALL SHOP AND FIELD WELDS SHALL BE PERFORMED BY CERTIFIED WELDERS.
4. WELDS SHALL DEVELOP THE FULL STRENGTH OF MATERIALS BEING WELDED UNLESS OTHERWISE INDICATED.
5. THE CONTRACTOR SHALL NOT SPLICE OR CUT OPENINGS IN STEEL MEMBERS NOT SHOWN ON CONTRACT DRAWINGS WITHOUT THE PERMISSION OF THE STRUCTURAL ENGINEER.

METAL GRATING

- A. REFER TO "STRUCTURAL STEEL" SECTION FOR APPLICABLE CODES AND STANDARDS. IN ADDITION, COMPLY WITH THE FOLLOWING:

- 1. NAAMM - MBG 531 "METAL BAR GRATING MANUAL"

- B. SUBMITTALS:

- 1. SHOP DRAWINGS INDICATING LAYOUT, MATERIAL PROPERTIES OR LOAD TABLES, ANCHORAGE DETAILS, PANS, AND ACCESSORIES.
2. PRODUCT DATA AND STRUCTURAL LOAD TABLES FOR GRATING.
3. PRODUCT DATA AND STRUCTURAL LOAD TABLES OF MECHANICAL FASTENERS, IF APPLICABLE.

- C. MATERIALS:

- 1. GALVANIZED AND PRIME PAINTED STEEL BAR GRATING: ASTM A 653, STRUCTURAL STEEL, GRADE 33, 60 ZINC COATING.
2. ALUMINUM EXTRUDED BARS AND SHAPES: ASTM B2.21, ALLOYS 6061-76 OR 6063-16 FOR BEARING BARS ALLOY 6061-T1 FOR CROSS BAR
3. FASTENER: TYPE 316 STAINLESS STEEL

- D. INSTALLATION:

- 1. COMPLY WITH RECOMMENDATIONS OF REINFORCED STANDARDS AND MANUFACTURER'S WRITTEN INSTRUCTIONS.
2. ATTACH REMOVABLE UNITS TO SUPPORTING MEMBERS BY WELDING UNLESS OTHERWISE NOTED.

ALUMINUM STAIRS

- A. REFER TO ARCHITECTURAL DRAWINGS FOR RISERS, TREADS, AND LANDING REQUIREMENTS.

- B. SUBMITTALS:

- 1. THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS, SIGNED AND SEALED BY A REGISTERED PROFESSIONAL ENGINEER FOR ALL STEEL STAIRS.

- C. STRUCTURAL PERFORMANCE REQUIREMENTS:

- 1. ALL STAIR FRAMING SHALL BE DESIGNED BY THE CONTRACTOR TO SUPPORT ALL DEAD LOADS PLUS A MINIMUM LIVE LOADING OF 100 PSF.

- D. INSTALLATION:

- 1. THE CONTRACTOR SHALL PROVIDE ALL STEEL HANGERS, CLIP ANGLES ETC., AS REQUIRED TO SUPPORT THE STAIR FRAMING.

WOOD FRAMING

- A. CODES AND STANDARDS:

- 1. "NATIONAL DESIGN SPECIFICATIONS" PUBLISHED BY THE NATIONAL FOREST PRODUCTS ASSOCIATION.
2. NIST'S VOLUNTARY PRODUCT STANDARD DOC PS 20 "AMERICAN SOFTWOOD LUMBER STANDARD"
3. NIST'S VOLUNTARY PRODUCT STANDARD DOC PS 2 "PERFORMANCE STANDARD FOR WOOD BASED STRUCTURAL PANELS"
4. TRUSS PLATE INSTITUTE'S "DESIGN SPECIFICATIONS FOR LIGHT METAL PLATE CONNECTED WOOD TRUSSES"
5. AMERICAN WOOD PROTECTION ASSOCIATION (APWA) STANDARD

- B. MATERIALS (UNADJUSTED VALUES FOR 12" DEPTH):

- 1. DIMENSION LUMBER: NO. 2 HEM-FIR AT 19 PERCENT MOISTURE CONTENT OR APPROVED EQUAL
Fb : Fv : Fc(parper) : Fc(paralle) : Ft : E :
850 PSI 150 PSI 405 PSI 1300 PSI 525 PSI 1300 KSI

- 2. ENGINEERED WOOD PRODUCTS:

Table with 5 columns: LAMINATED VENEER LUMBER (LVL), Fb, Fv, Fc(perp), Fc(paralle), Ft, E. Values: 2800 PSI, 285 PSI, 750 PSI, 2510 PSI, 1555 PSI, 1900 KSI

Table with 5 columns: LAMINATED STRAND LUMBER (LSL), Fb, Fv, Fc(perp), Fc(paralle), Ft, E. Values: 2600 PSI, 400 PSI, 880 PSI, 2380 PSI, 1825 PSI, 1700 KSI

Table with 5 columns: PARALLEL STRAND LUMBER (PSL), Fb, Fv, Fc(perp), Fc(paralle), Ft, E. Values: 2900 PSI, 290 PSI, 750 PSI, 2900 PSI, 2025 PSI, 2000 KSI

- 3. PRESERVATIVE TREATMENT BY PRESSURE PROCESS (P.T.) LUMBER: AWPA U1
a. INTERIOR CONSTRUCTION NOT IN CONTACT WITH GROUND: USE CATEGORY UC2
b. EXTERIOR CONSTRUCTION NOT IN CONTACT WITH GROUND: USE CATEGORY UC3B
c. ALL CONSTRUCTION IN CONTACT WITH GROUND: USE CATEGORY UCA4

- 4. ROOF SHEATHING: EXTERIOR, STRUCTURAL I PLYWOOD OR OSB SHEATHING, FOR SPANS SHOWN ON DRAWINGS

SUBMITTALS:

- 1. SHOP DRAWINGS AND DESIGN CALCULATIONS FOR ALL WOOD TRUSSES AND BUILDING MEMBERS INCLUDING MEMBER LAYOUT, WOOD SPECIES AND GRADE, MEMBER SIZES, TRUSS BEARING CONNECTION DETAILS, CAPACITY OF CONNECTOR PLATES AND THE SIZE AND LOCATION OF ALL REQUIRED BRIDGING, SIGNED AND SEALED BY A REGISTERED PROFESSIONAL ENGINEER.
2. WOOD PRESERVATIVE TREATMENT DATA, INCLUDING CERTIFICATION BY TREATING PLANT THAT MATERIALS COMPLY WITH REQUIREMENTS.
3. MATERIAL CERTIFICATES FOR LUMBER SPECIFIED TO COMPLY WITH MINIMUM ALLOWABLE UNIT STRESSES.
4. TECHNICAL DATA FOR FASTENERS, INCLUDING GAUGE, FINISH, AND STRUCTURAL LOAD CAPACITY.

- D. FASTENERS

- 1. WHERE WOOD FRAMING IS EXPOSED TO WEATHER, IN GROUND CONTACT, OR PRESSURE-PRESERVATIVE TREATED, PROVIDE FASTENERS WITH HOT-DIP ZINC COATING COMPLYING WITH ASTM A 153.
2. WOOD FRAMING CONNECTIONS REQUIRING STEEL FASTENERS AND HANGERS SHALL CONSIST OF A MINIMUM 16 GA. GALVANIZED STEEL. ALL CONNECTIONS SHALL DEVELOP THE LOAD CAPACITY OF BASIS OF DESIGN PRODUCTS INDICATED.
3. NAILING OF ALL WOOD FRAMING SHALL MEET THE MINIMUM RECOMMENDED REQUIREMENTS PROVIDED IN THE FASTENING SCHEDULE OF THE IBC BUILDING CODE.

- E. INSTALLATION:

- 1. PROVIDE DOUBLE JOISTS OR HEADERS ALONG EACH SIDE OF FLOOR OR ROOF OPENINGS, UNDER THE CENTERLINE OF PARTITION WALLS PARALLEL TO JOIST SPANS, AND ABOVE ALL WALL OPENINGS UNLESS OTHERWISE INDICATED.
a. ALL DOUBLE JOISTS OR HEADERS SHALL BE NAILED TOGETHER WITH TWO ROWS OF 10d NAILS SPACED AT 16 INCHES ON CENTER UNLESS OTHERWISE INDICATED.
2. WOOD BEAMS MADE UP OF THREE OR MORE MEMBERS SHALL BE BOLTED TOGETHER WITH TWO ROWS OF 1/2 INCH DIA. BOLTS SPACED AT 32 INCHES ON CENTER.
3. ALL WOOD MEMBERS BEARING DIRECTLY ON MASONRY OR CONCRETE SHALL HAVE A PRESERVATIVE TREATMENT.
a. PROVIDE A MINIMUM 3" BEARING LENGTH OF ALL WOOD MEMBERS BEARING ON MASONRY OR CONCRETE.
4. THE CONTRACTOR SHALL CUT OR NOTCH THE WOOD FRAMING ONLY AS SHOWN ON THE CONTRACT DRAWINGS OR MANUFACTURER SPECIFICATIONS FOR ENGINEERED WOOD PRODUCTS.
5. UNLESS OTHERWISE INDICATED, PROVIDE DOUBLE WALL STUDS AT ALL CORNERS, SIDES OF OPENINGS, AND BENEATH ALL WOOD BEAMS AND LINTELS.
6. PROVIDE SOLID BLOCKING AT MAXIMUM SPACING OF 4'-0" OC, VERTICAL, FOR ALL WALL STUDS.

PRE ENGINEERED WOOD POST-FRAME BUILDINGS

- A. REFER TO "WOOD FRAMING" SECTION FOR APPLICABLE CODES IN ADDITION, COMPLY WITH THE FOLLOWING:
1. NFBA'S "ACCEPTED PRACTICES FOR POST-FRAME BUILDING CONSTRUCTION FRAMING PRACTICES"

- B. SUBMITTALS:

- 1. SHOP DRAWINGS FOR ALL WOOD POST FRAME BUILDING COMPONENTS INCLUDING ANCHORAGE DEVICES, LATERAL LOAD BRACING, AND ALL MISCELLANEOUS, SIGNED AND SEALED BY A REGISTERED PROFESSIONAL ENGINEER.
2. DESIGN CALCULATIONS FOR ALL ACCESSORIES BUILDING COMPONENTS INCLUDING ANCHOR AGE DEVICES, LATERAL LOAD BRACING, AND ALL MISCELLANEOUS ACCESSORIES, SIGNED AND SEALED BY A REGISTERED PROFESSIONAL ENGINEER.
a. INCLUDE ALL SERVICE LOAD REACTIONS TO FOUNDATION, AND INDICATE DESIGN LIVE, DEAD, AND COLLATERAL LOADS, AND ALL WIND, SNOW, AND SEISMIC CRITERIA AS REQUIRED BY IBC 2015.

- C. STRUCTURAL PERFORMANCE REQUIREMENTS:

- 1. WOOD POST FRAMING BUILDING SYSTEMS SHALL BE DESIGNED, FABRICATED, AND ERECTED BY THE CONTRACTOR TO SUPPORT LOADS INDICATED IN "DESIGN LOADS" SECTION.
2. DEFLECTION LIMITS:
a. ROOF TRUSSES: VERTICAL DEFLECTION OF L/240.
b. GIRTS: HORIZONTAL DEFLECTION OF L/240.
c. WOOD ROOF PANELS: VERTICAL DEFLECTION OF L/240.
d. WOOD WALL PANELS: HORIZONTAL DEFLECTION OF L/240.
3. DRIFT LIMITS:
a. MAXIMUM OF L/200 OF THE BUILDING HEIGHT.

- D. FOUNDATION REQUIREMENTS:

- 1. FOUNDATIONS SHOWN ON THE CONTRACT DRAWINGS HAVE BEEN DESIGNED FOR THE DEAD AND LIVE LOADS INDICATED AND FOR ASSUMED PINNED COLUMN BASE CONNECTIONS. SHOULD DIFFERENT LOADING CONDITIONS OR FIXED COLUMN BASE CONNECTIONS BE REQUIRED, THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS AND DESIGN CALCULATIONS FOR THE NEW FOUNDATIONS, SIGNED AND SEALED BY A REGISTERED PROFESSIONAL ENGINEER.

MISCELLANEOUS

- A. THE CONTRACTOR SHALL LOCATE ALL UTILITIES IN THE AREA OF CONSTRUCTION AND PREVENT DAMAGE TO THEM. SHOULD DAMAGE OCCUR TO ANY UTILITIES, THE CONTRACTOR IS REQUIRED TO REPAIR THE DAMAGE TO THE SATISFACTION OF THE OWNER AT HIS OWN EXPENSE.

- B. SHOP DRAWINGS FOR ALL STRUCTURAL ELEMENTS SHOWN ON THE CONTRACT DOCUMENTS MUST BE SUBMITTED BY THE CONTRACTOR OR OWNER FOR REVIEW BY THE ENGINEER. IF THE CONTRACTOR OR OWNER FAILS TO SUBMIT THE SHOP DRAWINGS, THE ENGINEER WILL NOT BE RESPONSIBLE FOR STRUCTURAL CERTIFICATION AND DESIGN OF THE PROJECT. THE SHOP DRAWINGS SHALL INDICATE ANY DEVIATIONS OR OMISSIONS FROM THE CONTRACT DOCUMENTS. THE GENERAL CONTRACTOR SHALL REVIEW ALL SHOP DRAWINGS PRIOR TO SUBMISSION AND MAKE ALL CORRECTIONS DEEMED NECESSARY.

- C. THE CONTRACTOR SHALL REVIEW THE ARCHITECTURAL, CIVIL, MECHANICAL AND ELECTRICAL DRAWINGS FOR LOCATION AND DIMENSION OF CHASES, INSERTS, OPENINGS, SLEEVES, DEPRESSIONS AND OTHER PROJECT REQUIREMENTS WHICH IMPACT THE STRUCTURAL COMPONENTS.

- D. THE CONTRACTOR SHALL CHECK AND VERIFY ALL DIMENSIONS SHOWN ON THE CONTRACT DRAWINGS BEFORE PROCEEDING WITH CONSTRUCTION.

- E. THE CONTRACTOR SHALL NOT SUBMIT REPRODUCTIONS OF THE STRUCTURAL CONTRACT DOCUMENTS AS SHOP DRAWINGS.

- F. SCALES SHOWN ON THE STRUCTURAL CONTRACT DRAWINGS ARE FOR GENERAL INFORMATION ONLY. DIMENSIONAL INFORMATION SHALL NOT BE OBTAINED BY SCALING THE DRAWINGS.

Oct 06, 2016 - 11:02am User: kathy.johnson File: \\s01\1378\08\Drawings\Structural\10107137806_S-0.dwg

DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND

Signature of Director of Public Works, dated 2/6/17

Signature of Chief, Bureau of Engineering, dated 2/6/17

KCI TECHNOLOGIES logo and contact information: 936 RIDGEBROOK ROAD, SPARKS, MARYLAND 21152, TEL: (410) 315-7800, FAX: (410) 315-7818, www.kclic.com

Professional Engineer Seal for Kevin J. Deil, License No. 18 323, State of Maryland, expires 07-05-2017.

Table with 4 columns: DES, DRN, CHK, DATE. Values: NB, PB, LH, AUG, 2016

Table with 4 columns: REVISION, DATE. Values: 10-10-16, 600' SCALE MAP NO. 40-41, BLOCK NO. 12

GENERAL NOTES

ASHLEIGH KNOLLS SHARED SEWAGE DISPOSAL FACILITY CAPITAL PROJECT No. S-6269 CONTRACT No. 50-4972 ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

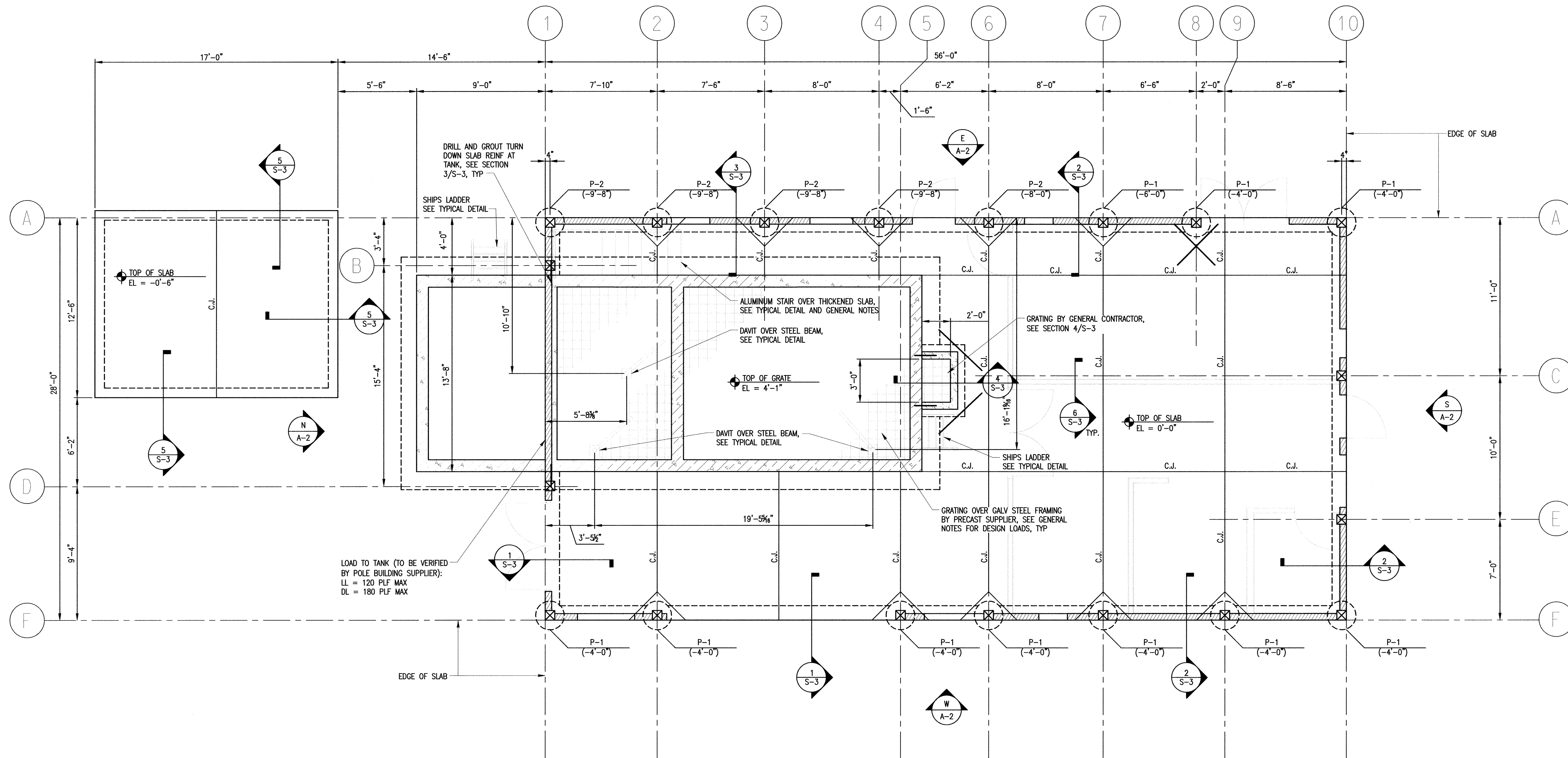
S-0

SCALE

AS SHOWN

SHEET

13 OF 43



SLAB ON GRADE AND FOUNDATION PLAN

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



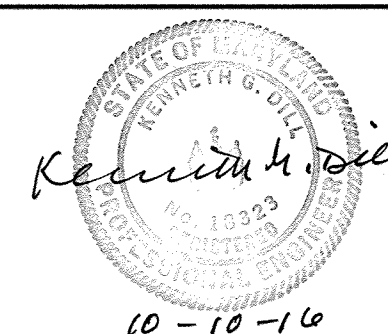
DRILLED CONCRETE PIER SCHEDULE
ASSUMED ALLOWABLE END BEARING = 3000 PSF

MARK	SIZE	PIER REINFORCING	TIES
P-1	24" DIA	8-#5	#3 @ 16"
P-2	24" DIA	8-#7	#3 @ 16"

FOUNDATION AND SLAB ON GRADE NOTES

- SCOPE OF WORK IS TO PLACE FOUNDATIONS FOR PRECAST CONCRETE TANK, PARTIALLY BURIED; PRE-ENGINEERED WOOD POLE STRUCTURE; AND PRE-ENGINEERED WOOD BEARING WALL STRUCTURE. PRECAST TANK SHALL INCLUDE CONCRETE LID (EXTERIOR) AND METAL GRATE WITH SUPPORTS (INTERIOR) IN ACCORDANCE WITH SPECIFICATIONS. COORDINATE CONNECTION DETAILS FOR ALL THREE STRUCTURES WITH MANUFACTURER PRIOR TO INSTALLATION.
- SLAB ON GRADE SHALL CONSIST OF 5" THICK NORMAL WEIGHT CONCRETE REINFORCED WITH 6"x6" - W2.9x2.9 WELDED WIRE FABRIC (WWF). PLACE SLAB ON GRADE OVER MINIMUM 6" CRUSHED #57 STONE AND 10 MIL VAPOR BARRIER.
- TYPICAL TOP OF SLAB ELEVATION = 492.00' (DATUM 0'-0")
- TYPICAL DRILLED CONCRETE PIERS ARE INDICATED ON PLAN THUS: P-X. REFER TO PIER SCHEDULE AND TYPICAL DETAILS FOR MORE INFORMATION.
- TYPICAL TOP OF PIER ELEVATION IS 0'-0". BOTTOMS OF PIERS ARE NOTED ON PLAN THUS (X'-X") AND MEASURED FROM DATUM 0'-0".
- CONTROL JOINTS ARE INDICATED ON PLAN THUS: C.J. REFER TO TYPICAL SLAB ON GRADE DETAILS FOR MORE INFORMATION.
- FOUNDATIONS ARE DESIGNED FOR PRELIMINARY SERVICE LOADS. CONTRACTOR SHALL SUBMIT REACTIONS FOR COLUMNS PRIOR TO PLACEMENT OF FOUNDATIONS.

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. 18323 EXPIRATION DATE: 07-05-2017



DES: NB					
DRN: PB					
CHK: LH					
DATE: AUG, 2016	BY	NO.	REVISION	DATE	
					600' SCALE MAP NO. 40-41 BLOCK NO. 12

SLAB ON GRADE AND FOUNDATION PLAN

ASHLEIGH KNOLLS
SHARED SEWAGE DISPOSAL FACILITY
CAPITAL PROJECT No. S-6269
CONTRACT No. 50-4972
ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

S-1
SCALE AS SHOWN
SHEET
14 OF 43

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 User: Kevin Jackson
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DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

2/3/17
 DIRECTOR OF PUBLIC WORKS DATE

2/3/17
 CHIEF, BUREAU OF ENGINEERING DATE

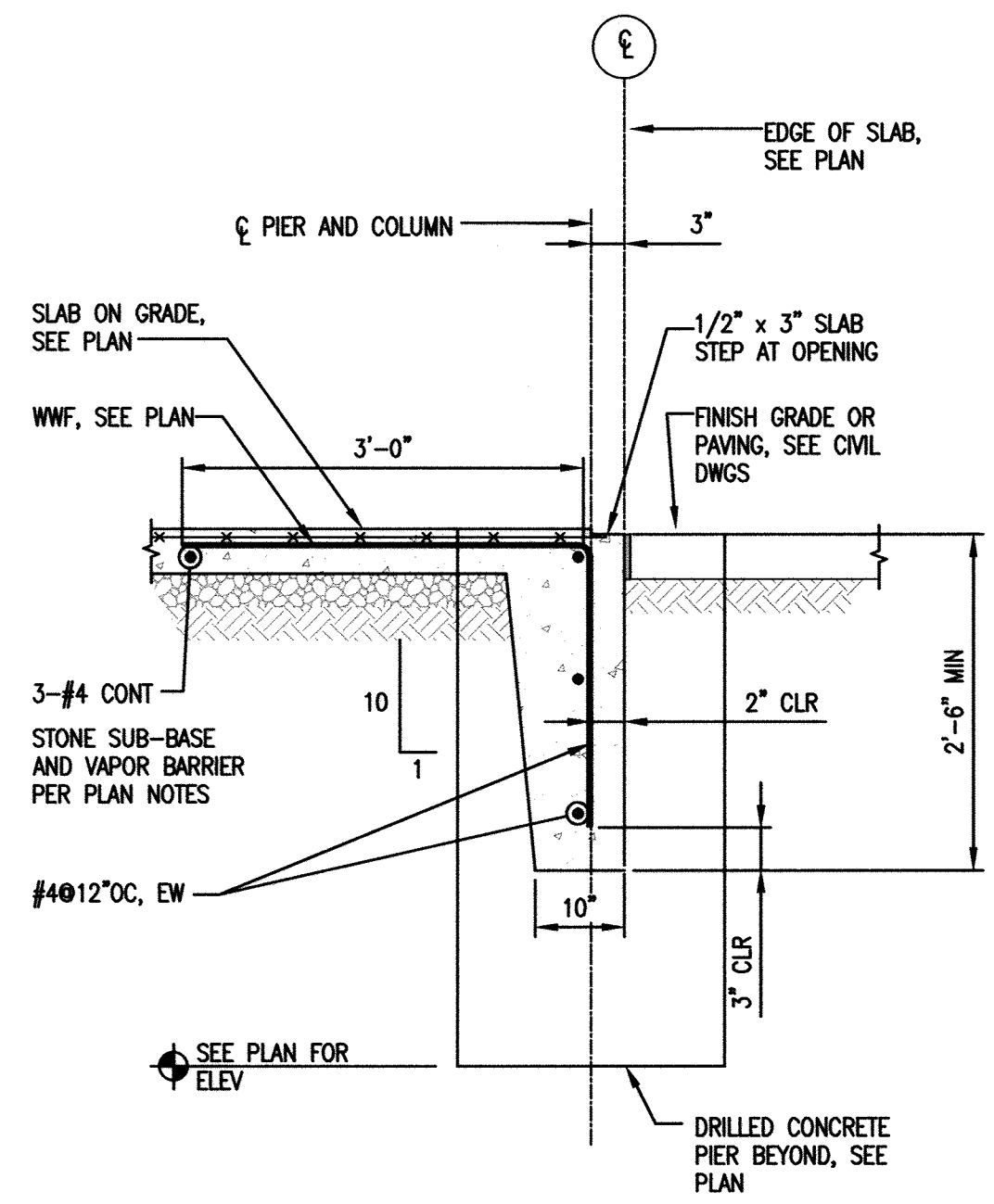
1/23/17
 CHIEF, BUREAU OF UTILITIES DATE

2/3/17
 CHIEF, UTILITY DESIGN DIVISION DATE

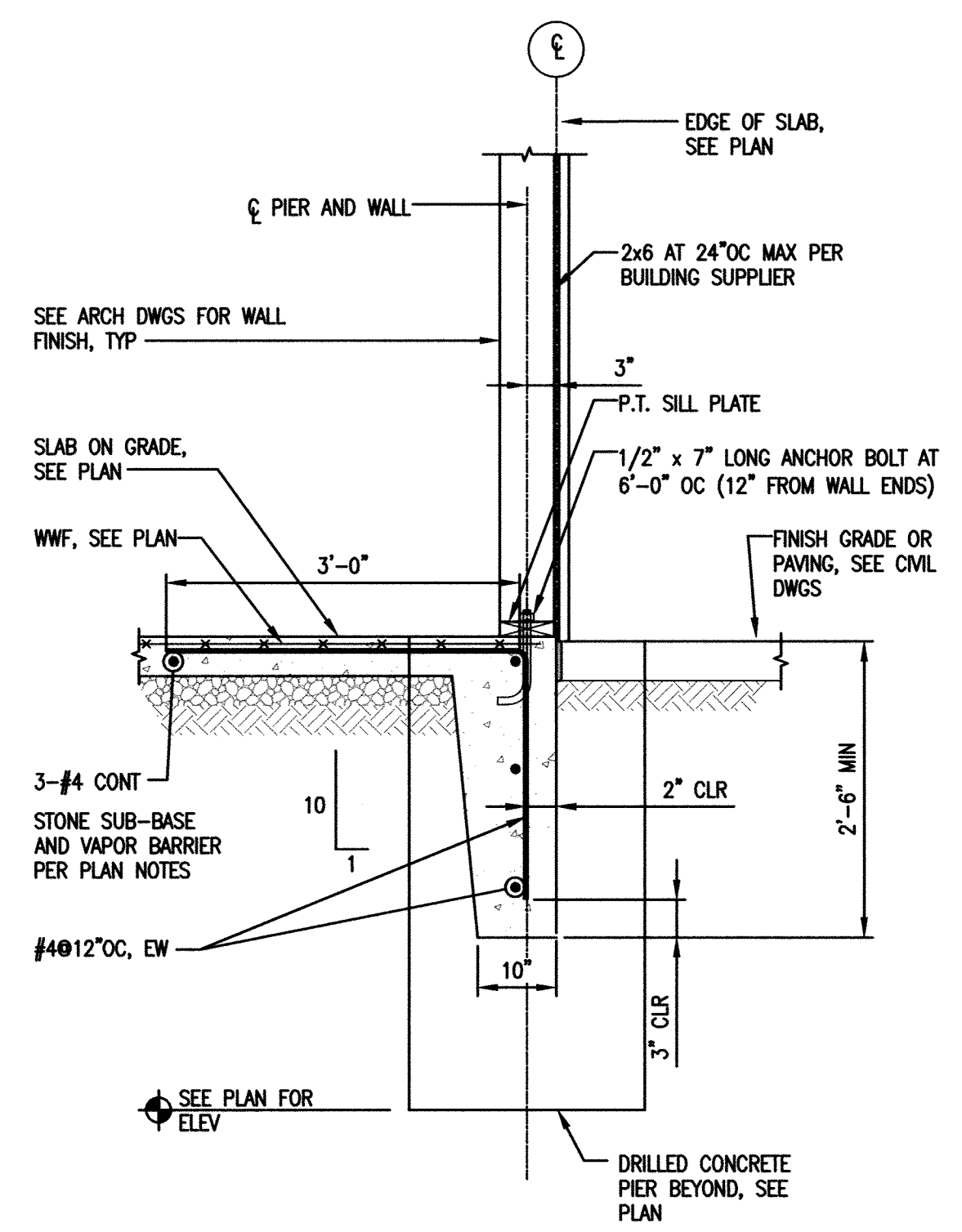
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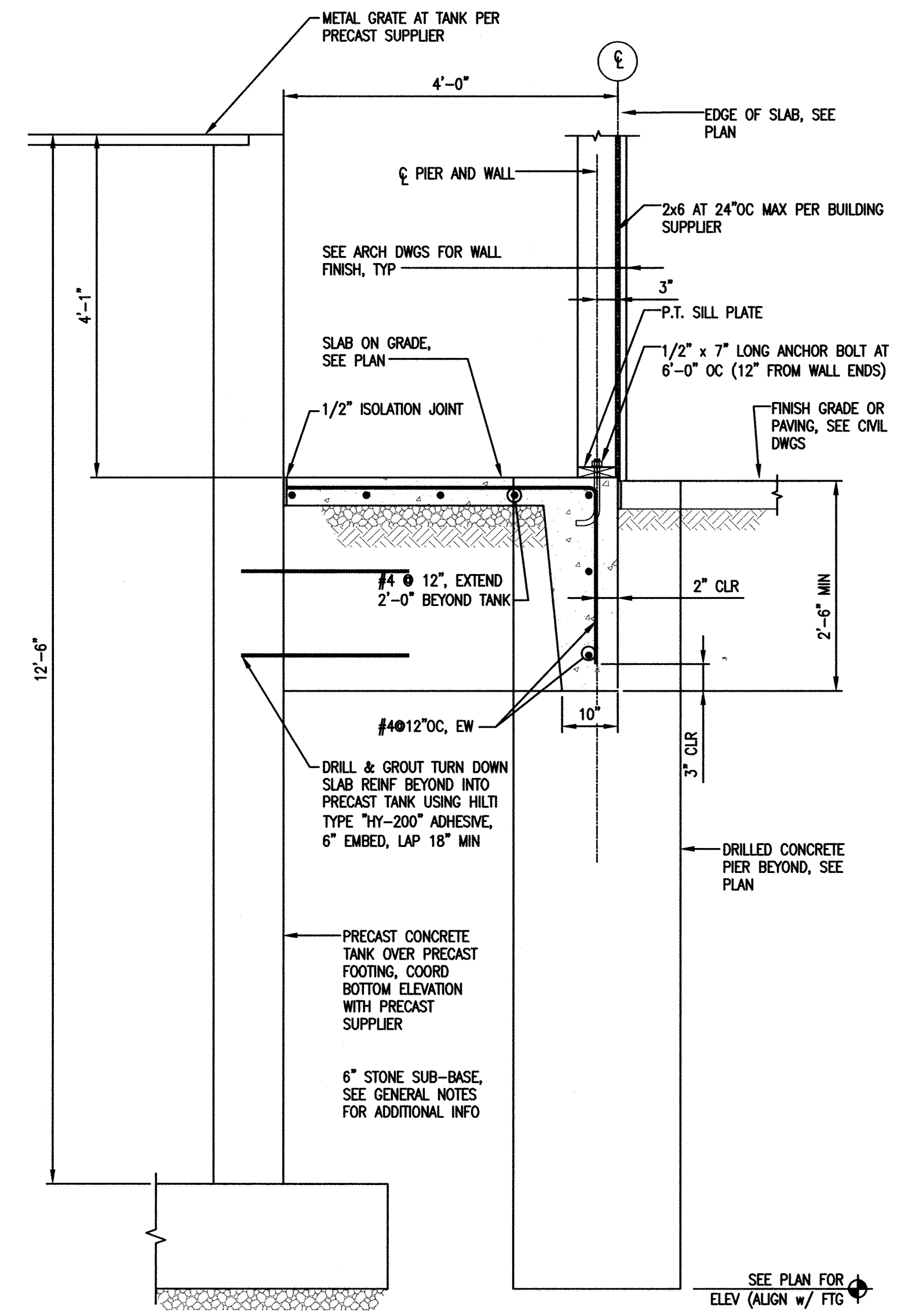
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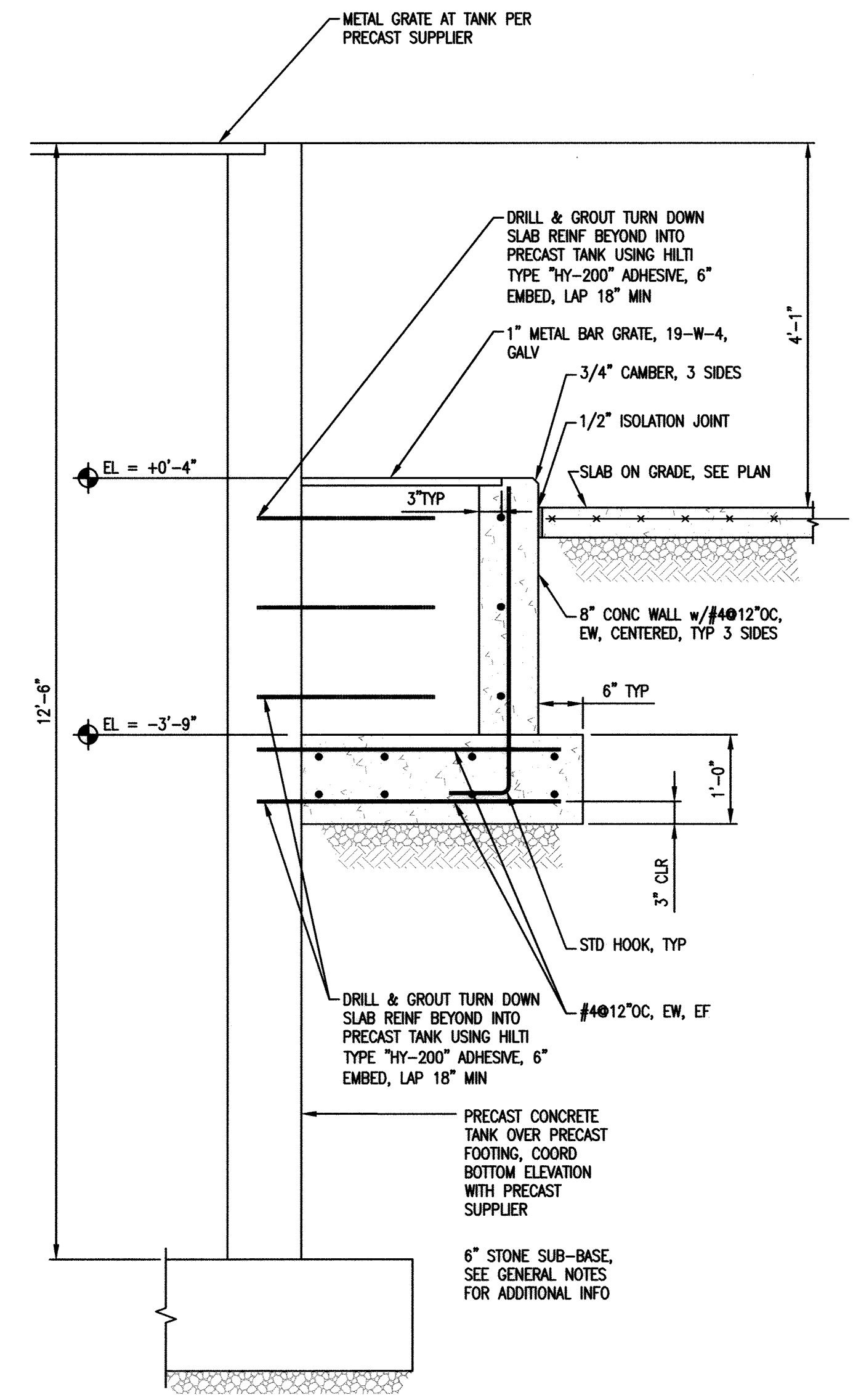
1 SECTION AT OPENING
SCALE: 3/4"=1'-0"



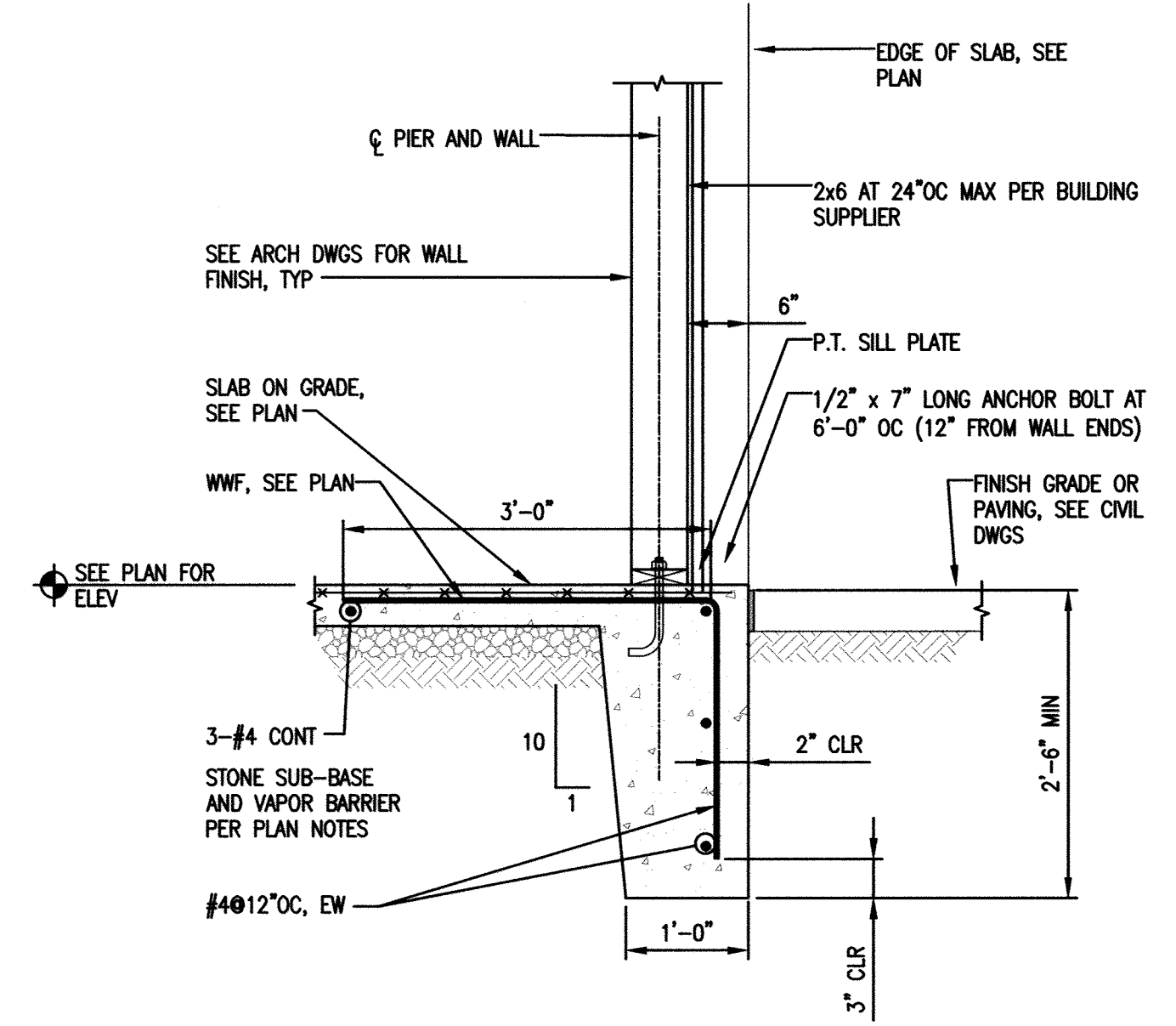
2 SECTION AT WALL
SCALE: 3/4"=1'-0"



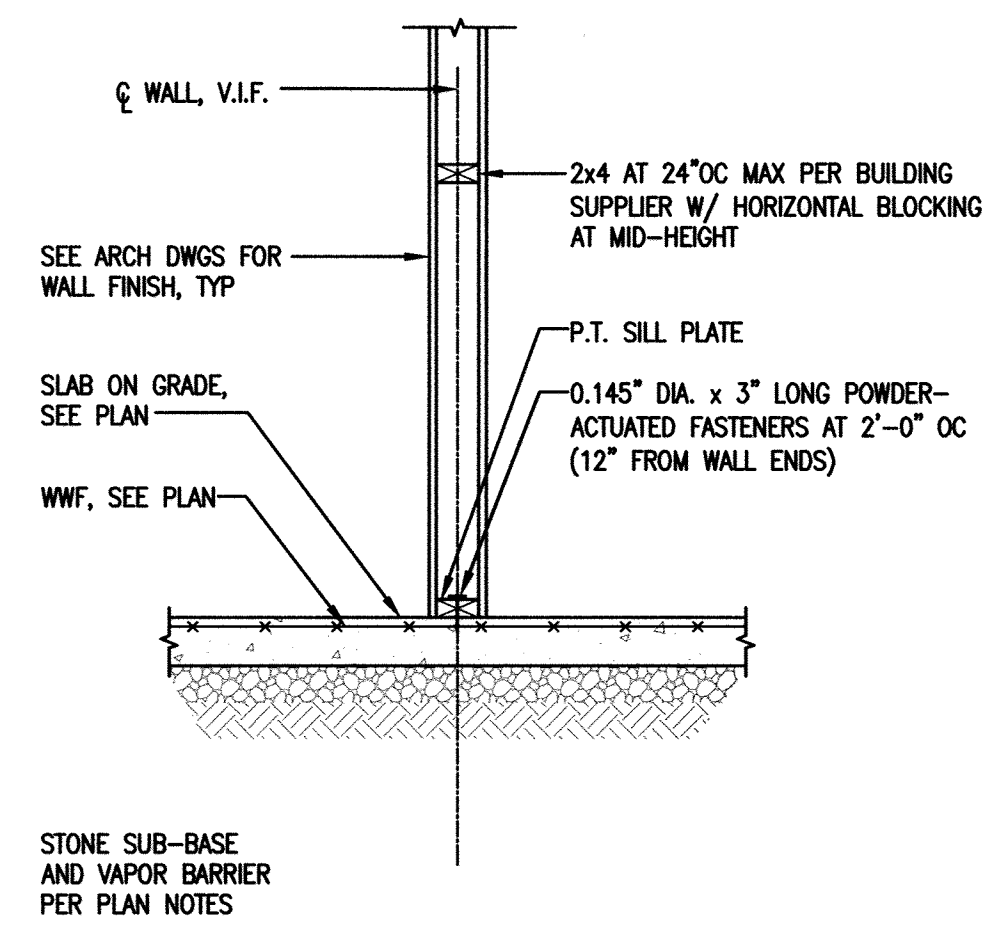
3 SECTION AT TANK
SCALE: 3/4"=1'-0"



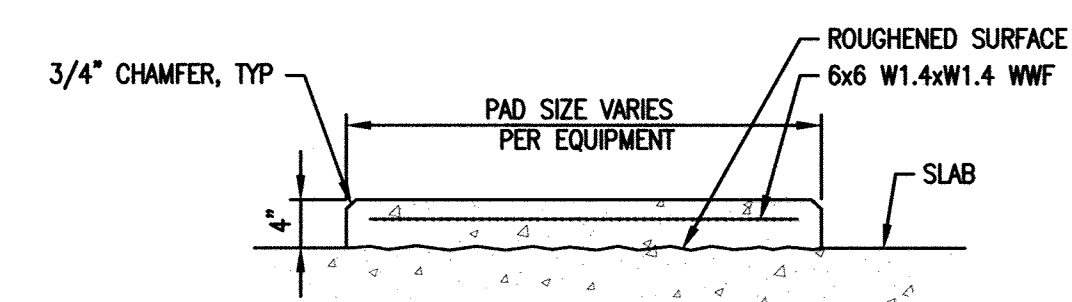
4 SECTION AT SUMP PIT
SCALE: 3/4"=1'-0"



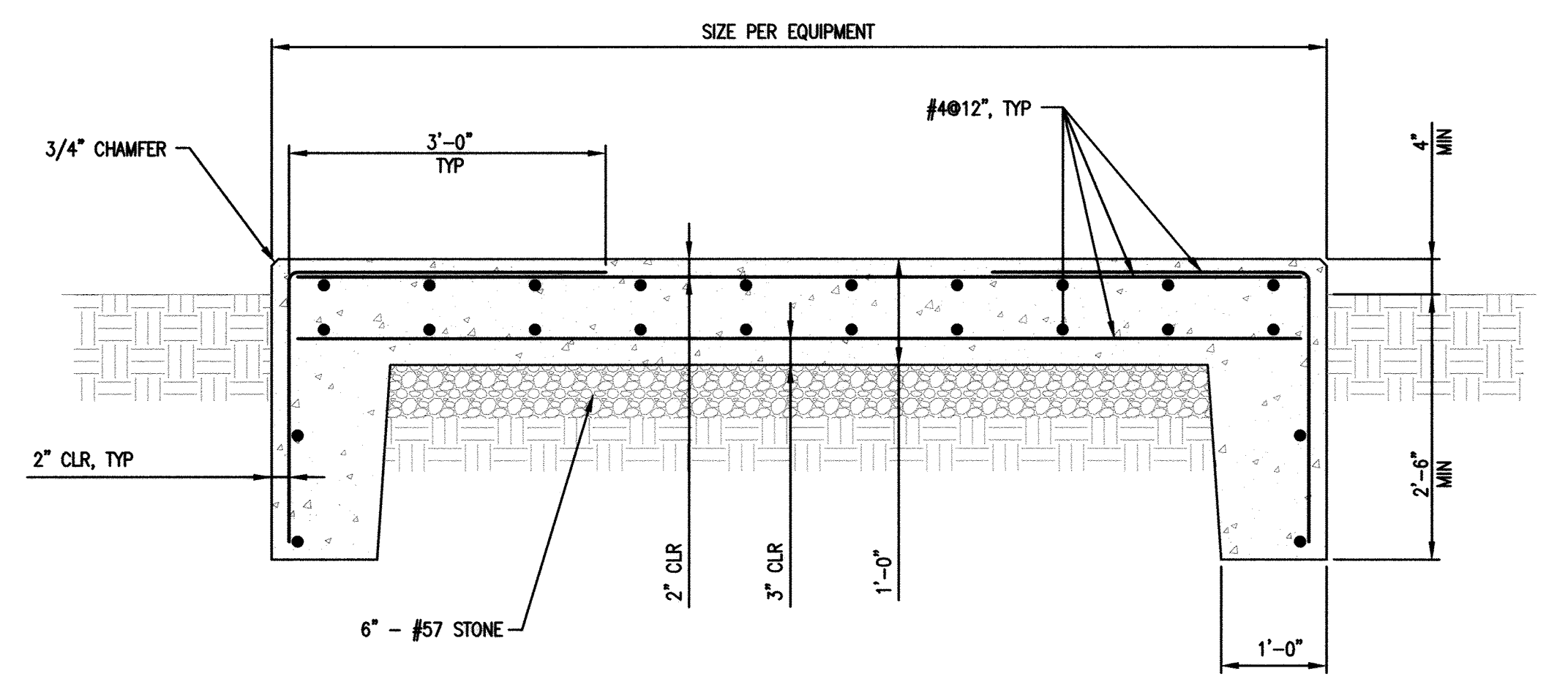
5 SECTION AT WALL
SCALE: 3/4"=1'-0"



6 SECTION AT WALL
SCALE: 3/4"=1'-0"



7 EQUIPMENT PAD DETAIL
SCALE: 3/4"=1'-0"



8 EXTERIOR GENERATOR PAD
SCALE: 3/4"=1'-0"

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. 18322 EXPIRATION DATE: 07-02-2017

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 User: Kevin Johnson
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DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND		 ENGINEERS PLANNERS SCIENTISTS CONSTRUCTION MANAGERS 936 RIDGEBROOK ROAD SPARKS, MARYLAND 21152 TELEPHONE: (410) 316-7800 FAX: (410) 316-7818 www.kci.com
 DIRECTOR OF PUBLIC WORKS DATE: 2/1/17	 CHIEF, UTILITY DESIGN DIVISION DATE: 2/3/17	

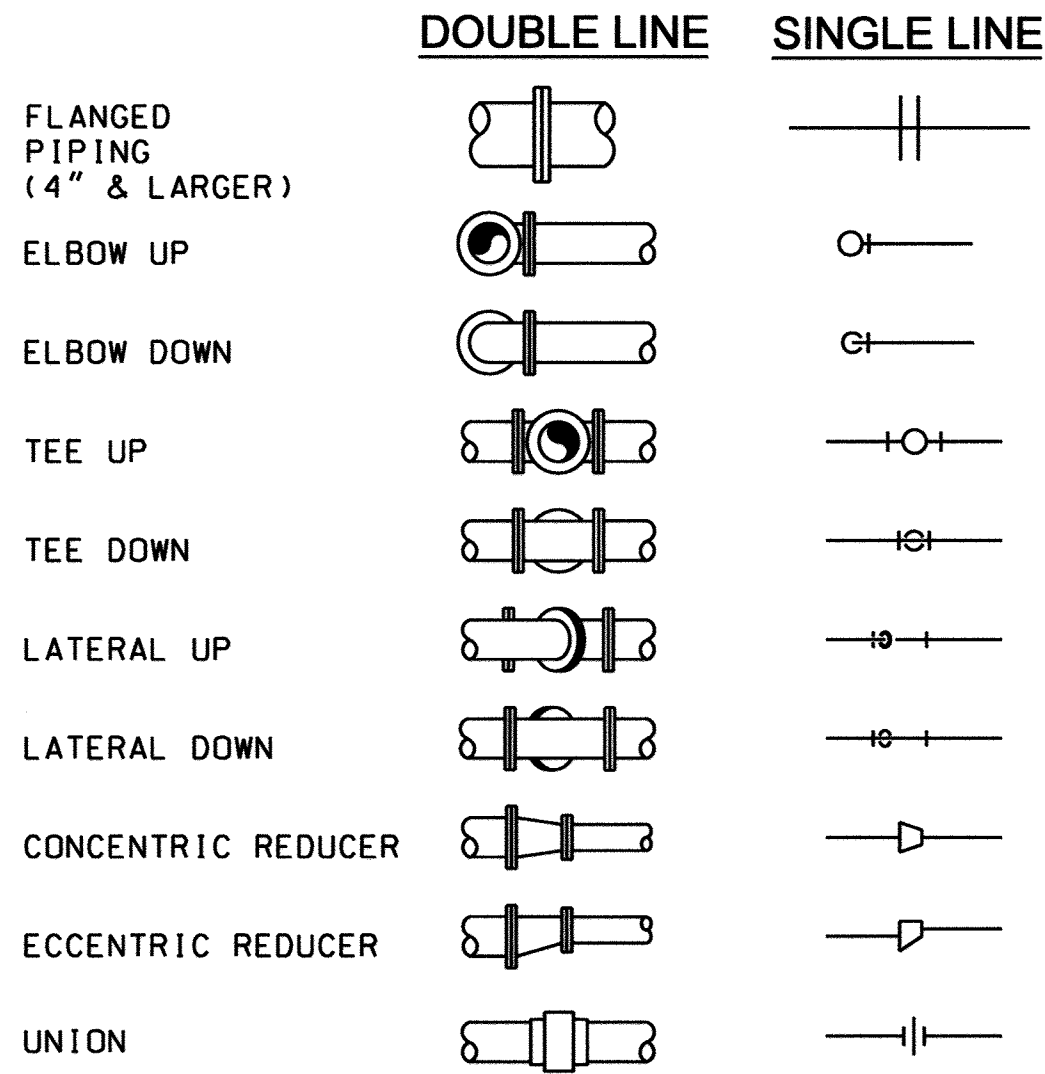
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NO.	REVISION	DATE

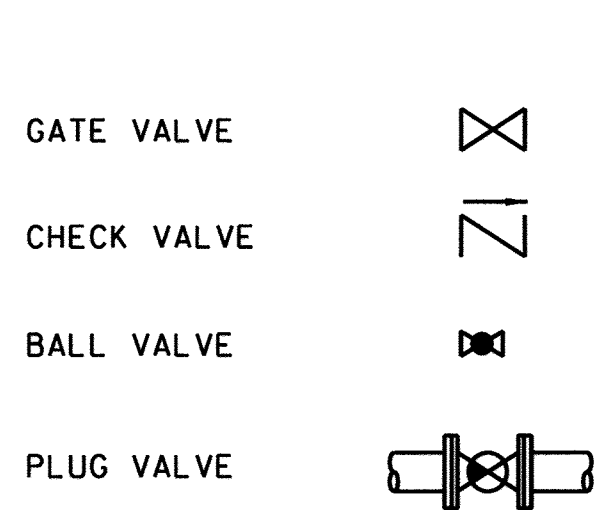
600' SCALE MAP NO. 40-41 BLOCK NO. 12

ASHLEIGH KNOLLS SHARED SEWAGE DISPOSAL FACILITY CAPITAL PROJECT No. S-6269 CONTRACT No. 50-4972 ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND	S-3 SCALE AS SHOWN SHEET 16 OF 43
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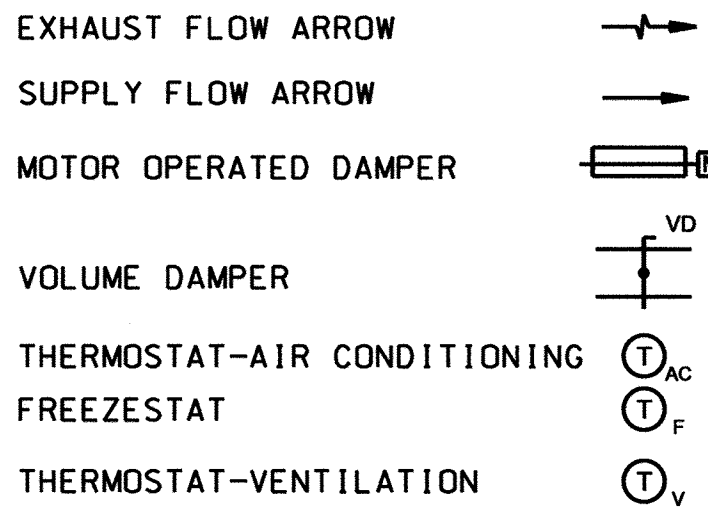
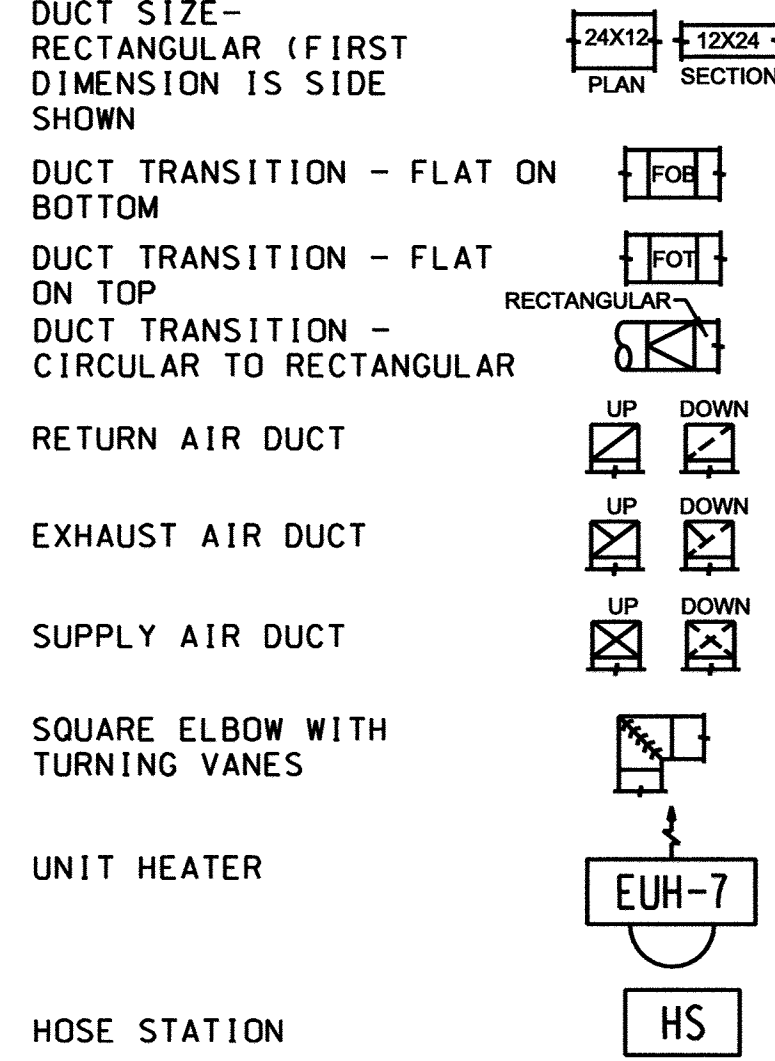
PROCESS PIPING SYMBOLS



VALVE SYMBOLS



HVAC SYMBOLS

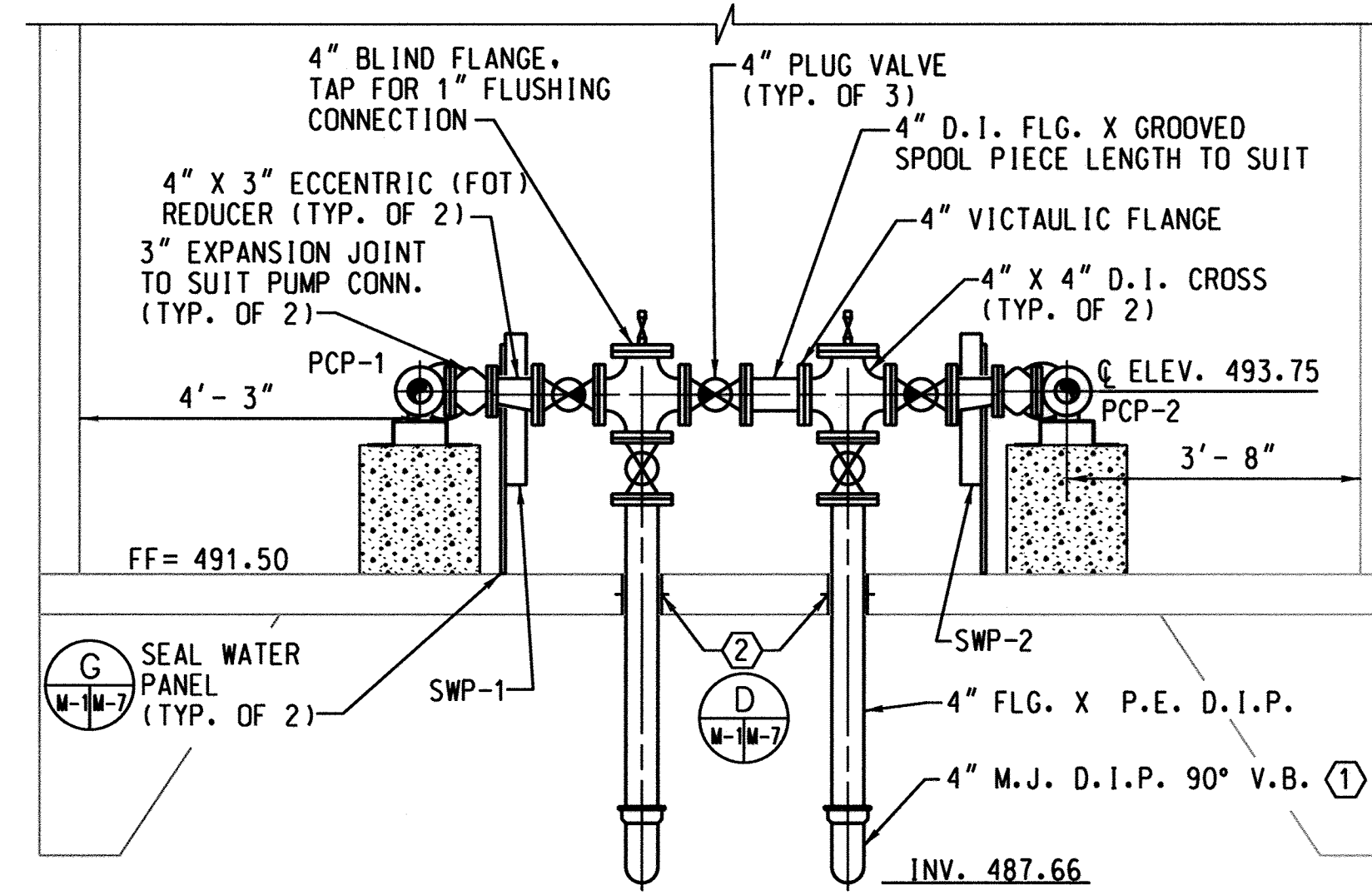


ABBREVIATIONS

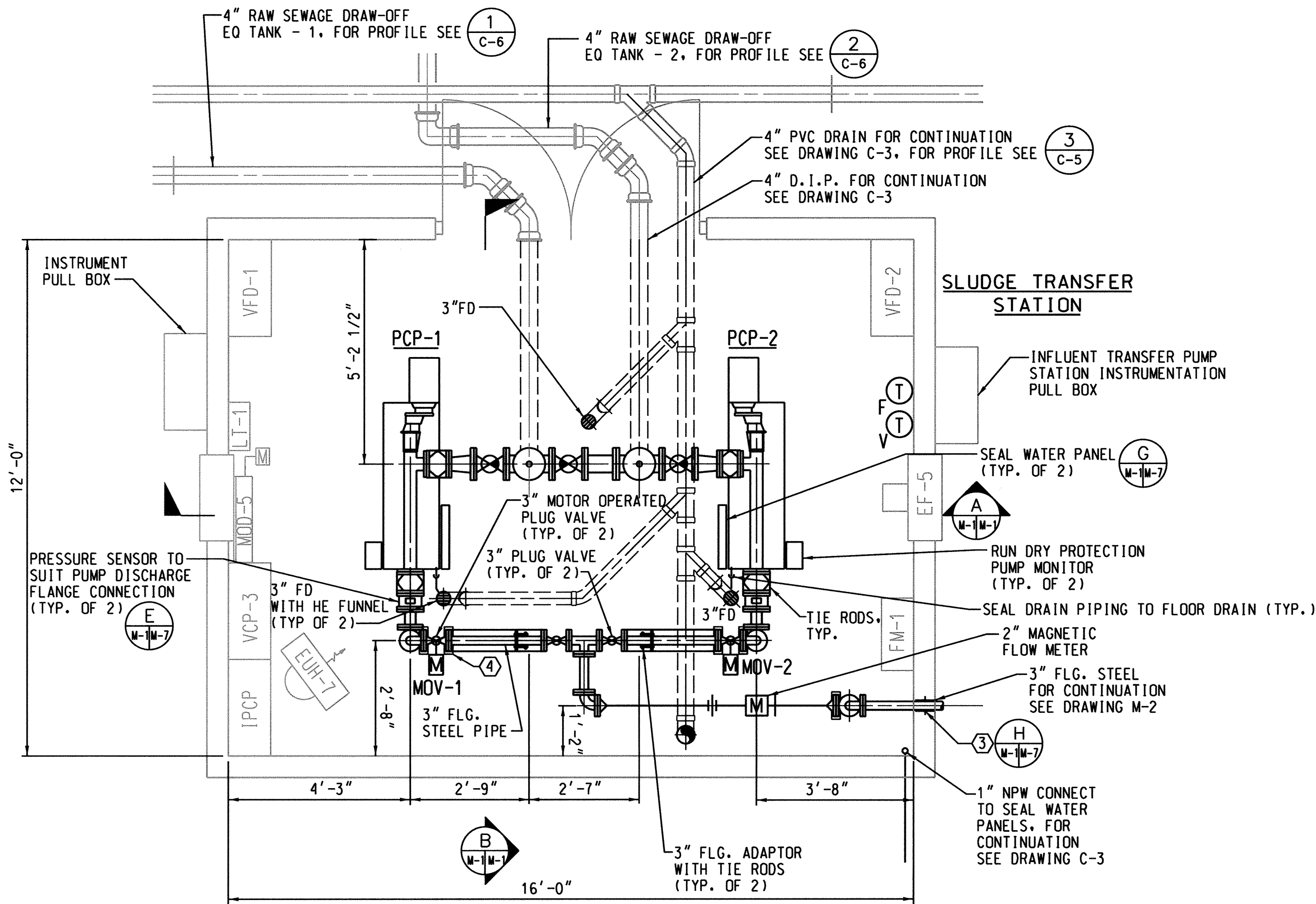
EF	EXHAUST FAN
MOD	MOTOR OPERATED DAMPER
BDD	BACK DRAFT DAMPER
SF	SUPPLY FAN

GENERAL MECHANICAL NOTES

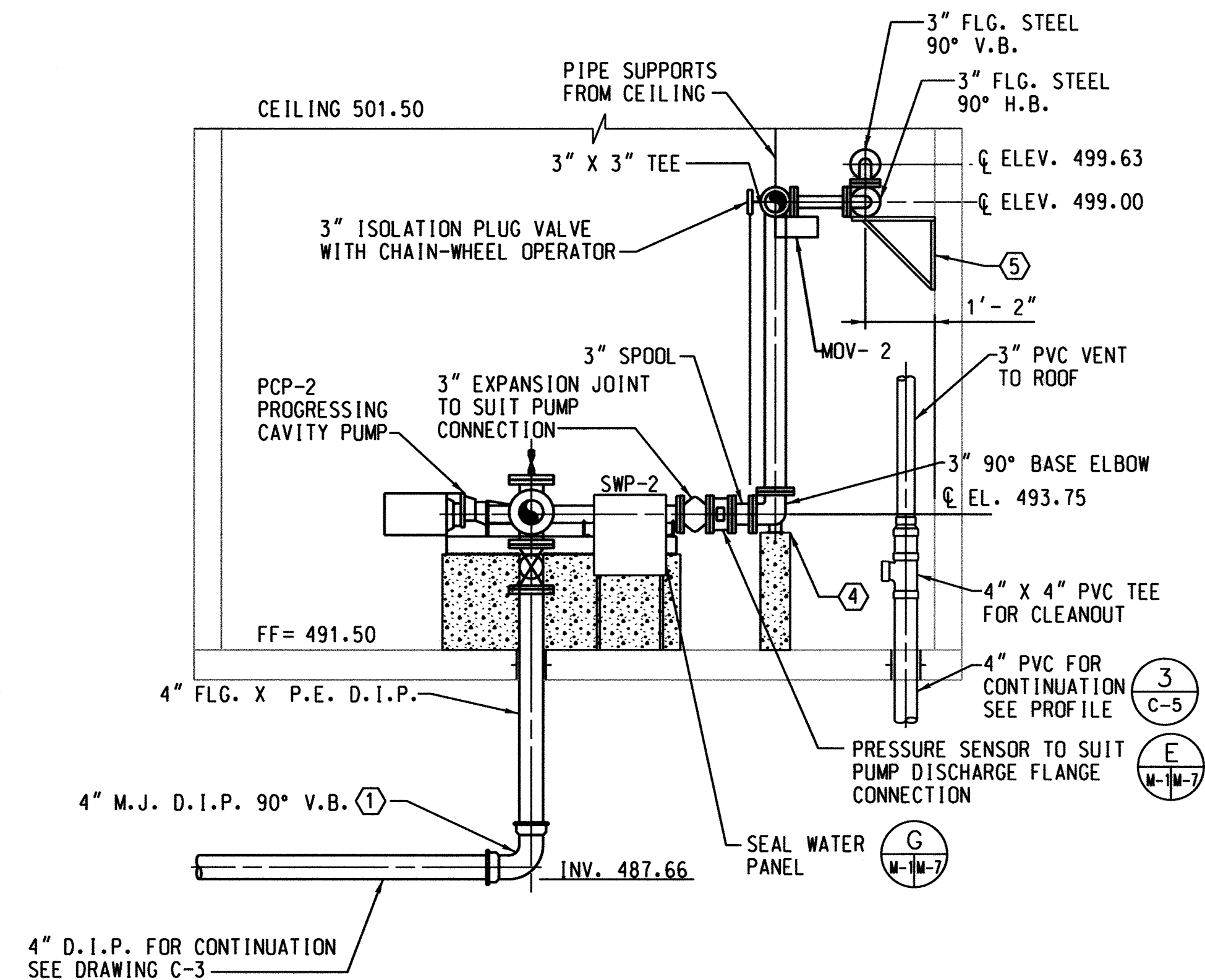
- THESE NOTES APPLY TO ALL MECHANICAL DRAWINGS
- UNLESS OTHERWISE NOTED, WALL PIPES AND SLEEVES SHALL HAVE A WATERSTOP COLLAR POSITIONED IN THE CENTER OF THE WALL OR FLOOR. SEE TYPICAL DETAILS FOR CONFIGURATION. WALL PIPES AND SLEEVES SHALL BE INSTALLED AND PROPERLY SECURED PRIOR TO CONCRETE POUR.
- PIPING SMALLER THAN 3" HAS BEEN SCHEMATICALLY SHOWN ON PLAN AND SECTION DRAWINGS. PROVIDE PIPE ROUTING AND ALL APPURTENANCES IN ACCORDANCE WITH RESPECTIVE SCHEMATICS. PROVIDE ALL NECESSARY FITTINGS TO MAKE CONNECTIONS. UNIONS, BUSHING AND/OR REDUCING INSERTS, ETC. NOT SHOWN ON DRAWINGS BUT REQUIRED FOR INSTALLATION SHALL BE FURNISHED AND INSTALLED.
- SCHEMATIC DRAWINGS SHOW PROCESS CONNECTIONS AND NOT SPATIAL ORIENTATION.
- THE SIZE OF THE PIPE CONNECTIONS AT THE PROCESS EQUIPMENT ARE SHOWN TO DEMONSTRATE INTENT. SIZES MAY VARY FROM WHAT IS SHOWN. COORDINATE THE SIZE OF CONNECTIONS TO ALL APPROVED PROCESS EQUIPMENT.
- SIZE OF FITTINGS SHOWN SHALL CORRESPOND TO ADJACENT STRAIGHT RUN OF PIPE, UNLESS OTHERWISE INDICATED.
- UNLESS OTHERWISE NOTED, MINIMUM SLOPE FOR DRAINS SHALL BE 1/4 INCH PER LINEAR FOOT.
- VALVES ARE NORMALLY OPEN (N.O.) UNLESS NOTED AS NORMALLY CLOSED (N.C.).
- COORDINATE THE LOCATION OF VALVE SUPPORTS SO THAT ACCESS TO VALVE BEARINGS IS NOT RESTRICTED.



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



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



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

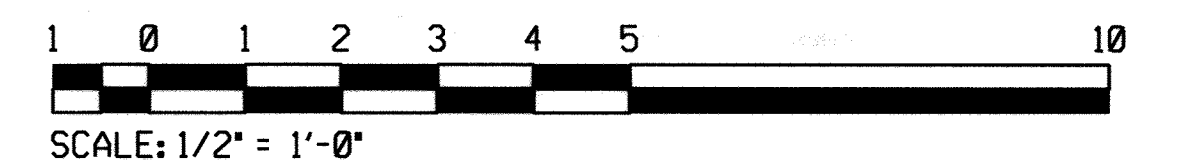
EQUIPMENT NAMES

EF-X	EXHAUST FAN
EUH-X	ELECTRIC UNIT HEATER
IPCP	INFLUENT PUMP CONTROL PANEL
MOD-X	MOTOR OPERATED DAMPER
MOV-X	MOTOR OPERATED VALVE
PCP-X	PROGRESSING CAVITY PUMP
VFD-X	VARIABLE FREQUENCY DRIVE
VCP	VENTILATION CONTROL PANEL
SWP-X	SEAL WATER PANEL

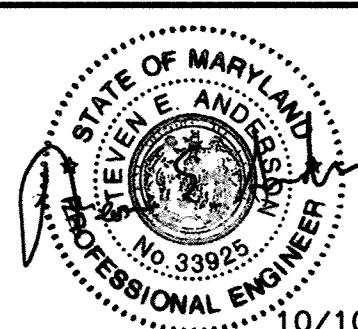
CONSTRUCTION NOTES

- ALL BURIED M.J. PIPING JOINTS SHALL BE RESTRAINED.
- SLEEVE FLOOR, GROUT AND MAKE WATERTIGHT.
- SLEEVE WALL TO SUIT PIPE PENETRATION. SEAL AND MAKE WATERTIGHT WITH MECHANICAL SEAL.
- TYPICAL PIPE SUPPORT SHALL BE AN ADJUSTABLE PIPE STANCHION OR CONCRETE PIER TO SUIT HEIGHT REQUIREMENTS.
- PROVIDE WALL BRACKET STYLE PIPE SUPPORT.
- NOT ALL PLUMBING AND HVAC SHOWN FOR CLARITY.

GRAPHIC SCALE



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DES: Kfj
DRN: Kfj
CHK: SEA
DATE: AUG. 2016

REVISION	DATE	BY	NO.

**INFLUENT TRANSFER STATION
PLAN AND SECTIONS**

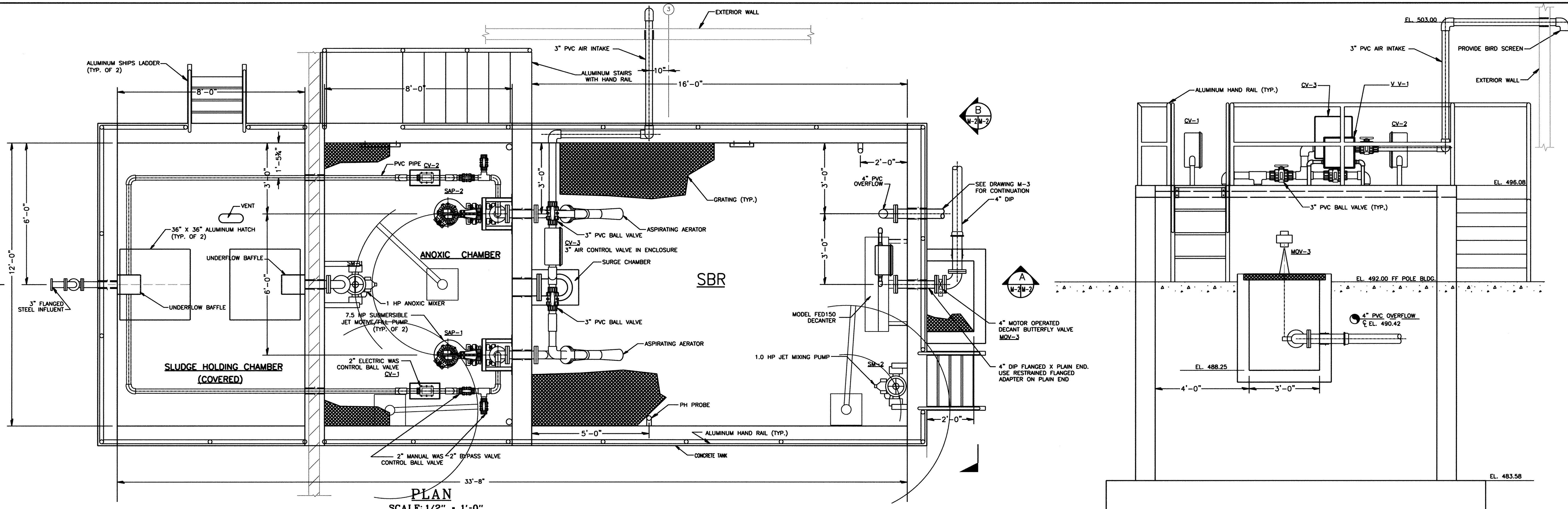
**ASHLEIGH KNOLLS
SHARED SEWAGE DISPOSAL FACILITY**
CAPITAL PROJECT No. S-6269
CONTRACT No. 50-4972
ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

M-1
SCALE AS SHOWN
SHEET 17 OF 43

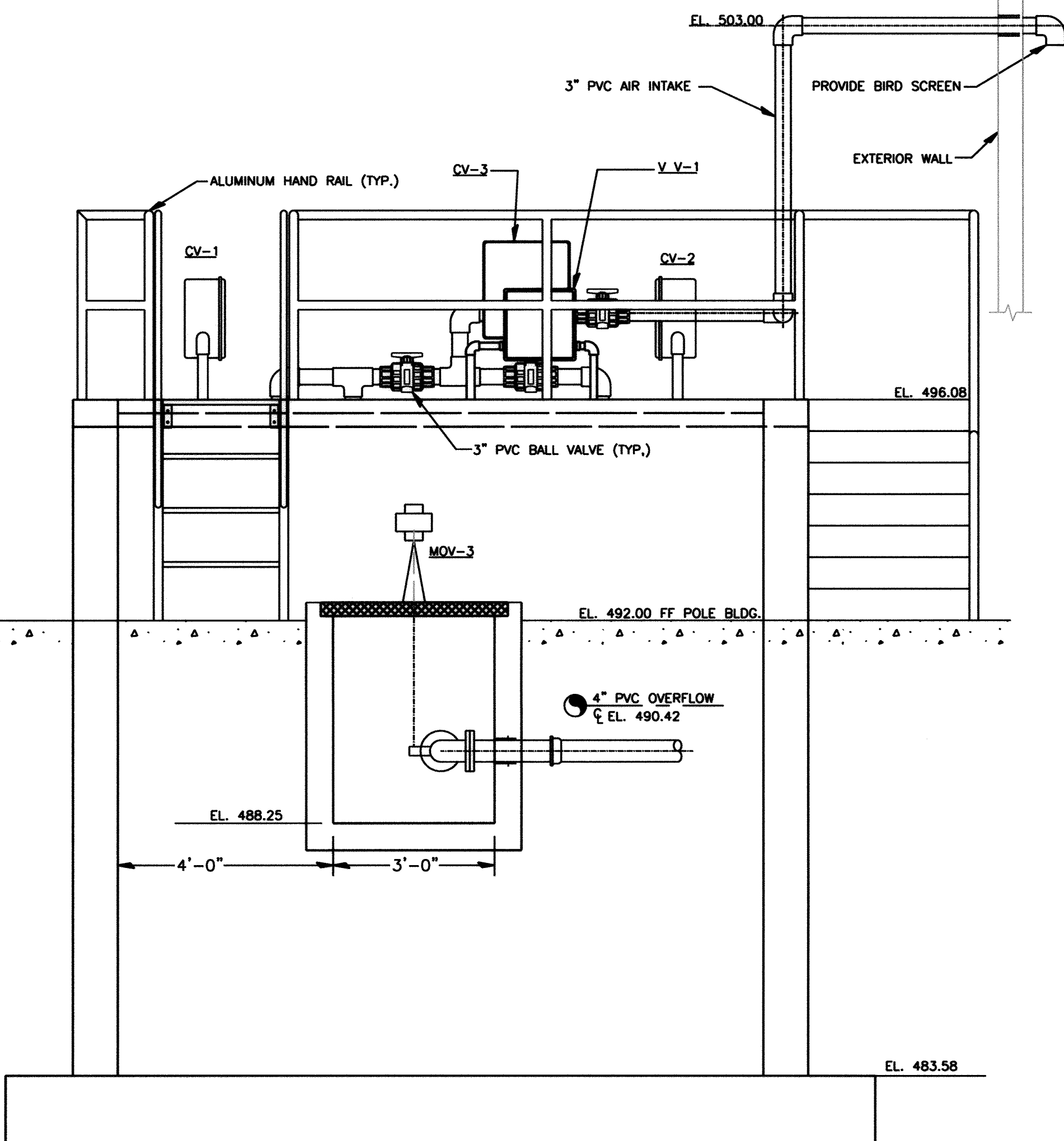
DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

John A. ... 2/13/17
DIRECTOR OF PUBLIC WORKS
Thomas S. Butler 2/13/17
CHIEF, BUREAU OF ENGINEERING
... 2/13/17
CHIEF, UTILITY DESIGN DIVISION

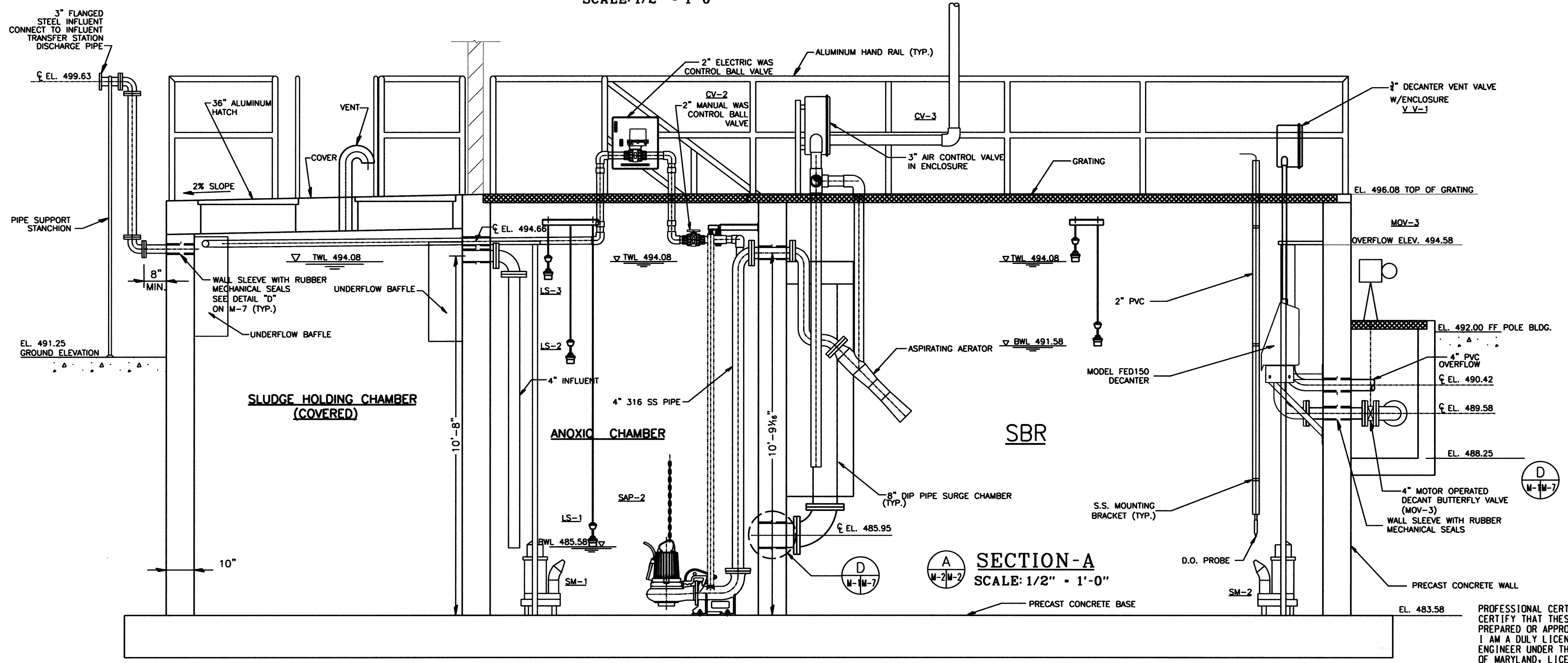
KCI TECHNOLOGIES
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CONSTRUCTION MANAGERS
936 RIDGEBROOK ROAD
SPARKS, MARYLAND 21152
TELEPHONE: (410) 316-7800
FAX: (410) 316-7818
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PLAN
SCALE: 1/2" = 1'-0"

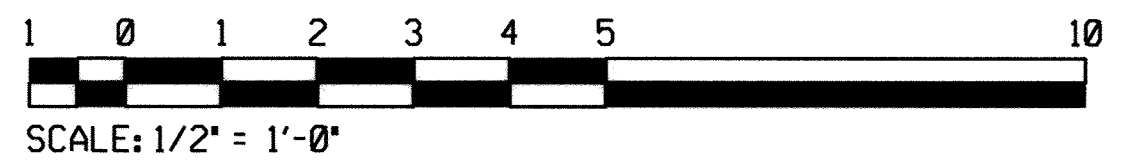


SECTION-B
SCALE: 1/2" = 1'-0"



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

- NOTE:
1. SEE HIGH PERFORMANCE COATING SPECIFICATION FOR THE COATING REQUIREMENT FOR THE SLUDGE HOLDING CHAMBER.
 2. COORDINATE DAVIT CRANE LOCATIONS TO SUIT EQUIPMENT REMOVAL LOCATIONS.
 3. COORDINATE WITH WOOD POST FRAME BUILDING MANUFACTURER FOR PIPE PENETRATIONS AT THE BUILDING.



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. 31363 EXPIRATION DATE: 01/16/2018

PLOTTED: 10:02 PM on Thursday, October 06, 2016
 BY: BUSENARAEZ
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DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND	
 DIRECTOR OF PUBLIC WORKS DATE: 2/3/17	 CHIEF, BUREAU OF ENGINEERING DATE: 2/3/17
 CHIEF, UTILITY DESIGN DIVISION DATE: 2/3/17	 ENGINEERS PLANNERS SCIENTISTS CONSTRUCTION MANAGERS 936 RIDGEBROOK ROAD SPARKS, MARYLAND 21152 TELEPHONE: (410) 316-7800 FAX: (410) 316-7818 www.kci.com

	DATE: 10/10/2016
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DES: K F J	
DRN: K F J	
CHK: G W	
DATE: AUG. 2016	
BY: NO.	
REVISION	

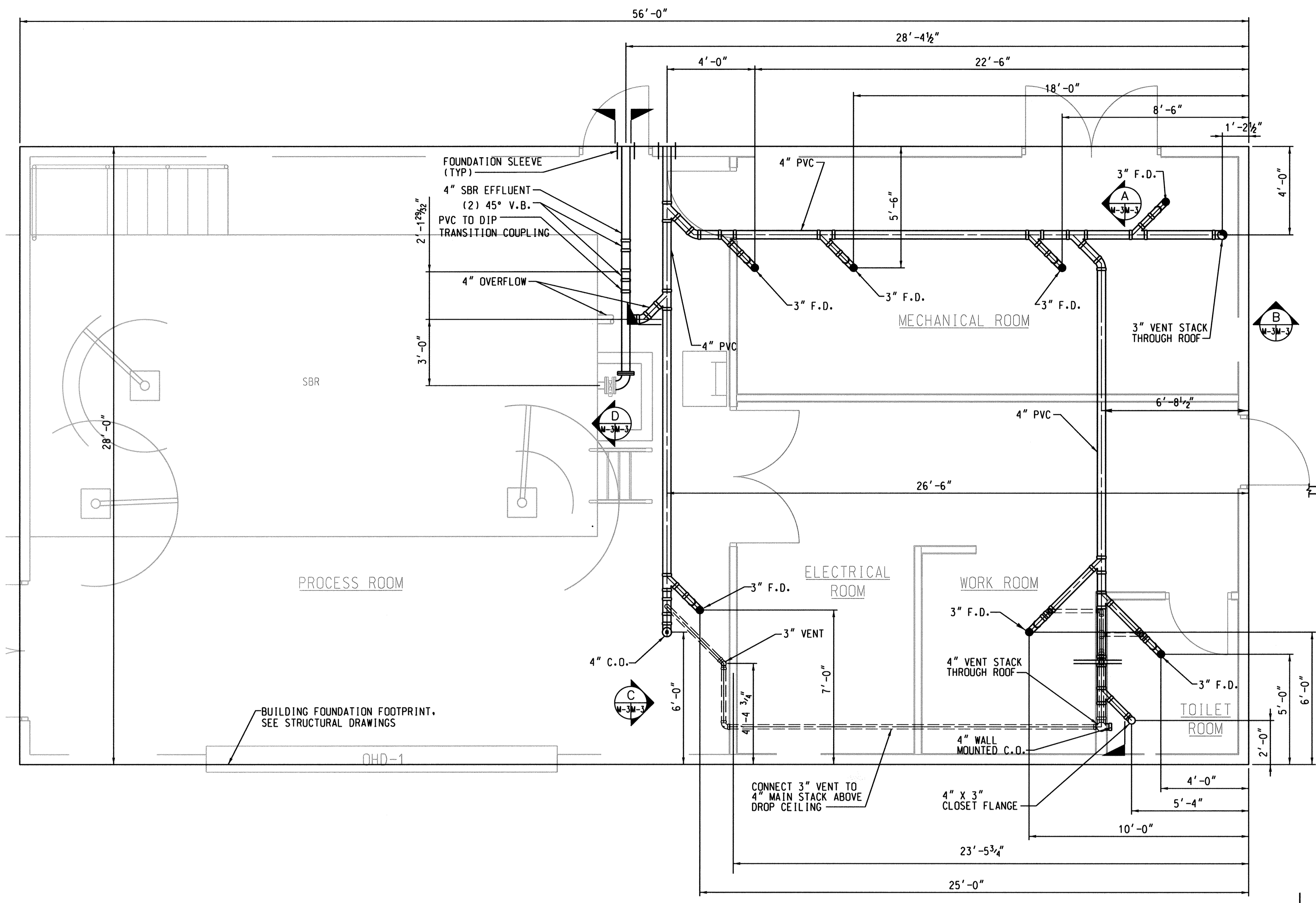
SEQUENCING BATCH REACTOR
 600' SCALE MAP NO. 40-41 BLOCK NO. 12

ASHLEIGH KNOLLS SHARED SEWAGE DISPOSAL FACILITY
 CAPITAL PROJECT No. S-6289
 CONTRACT No. 50-4972
 ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

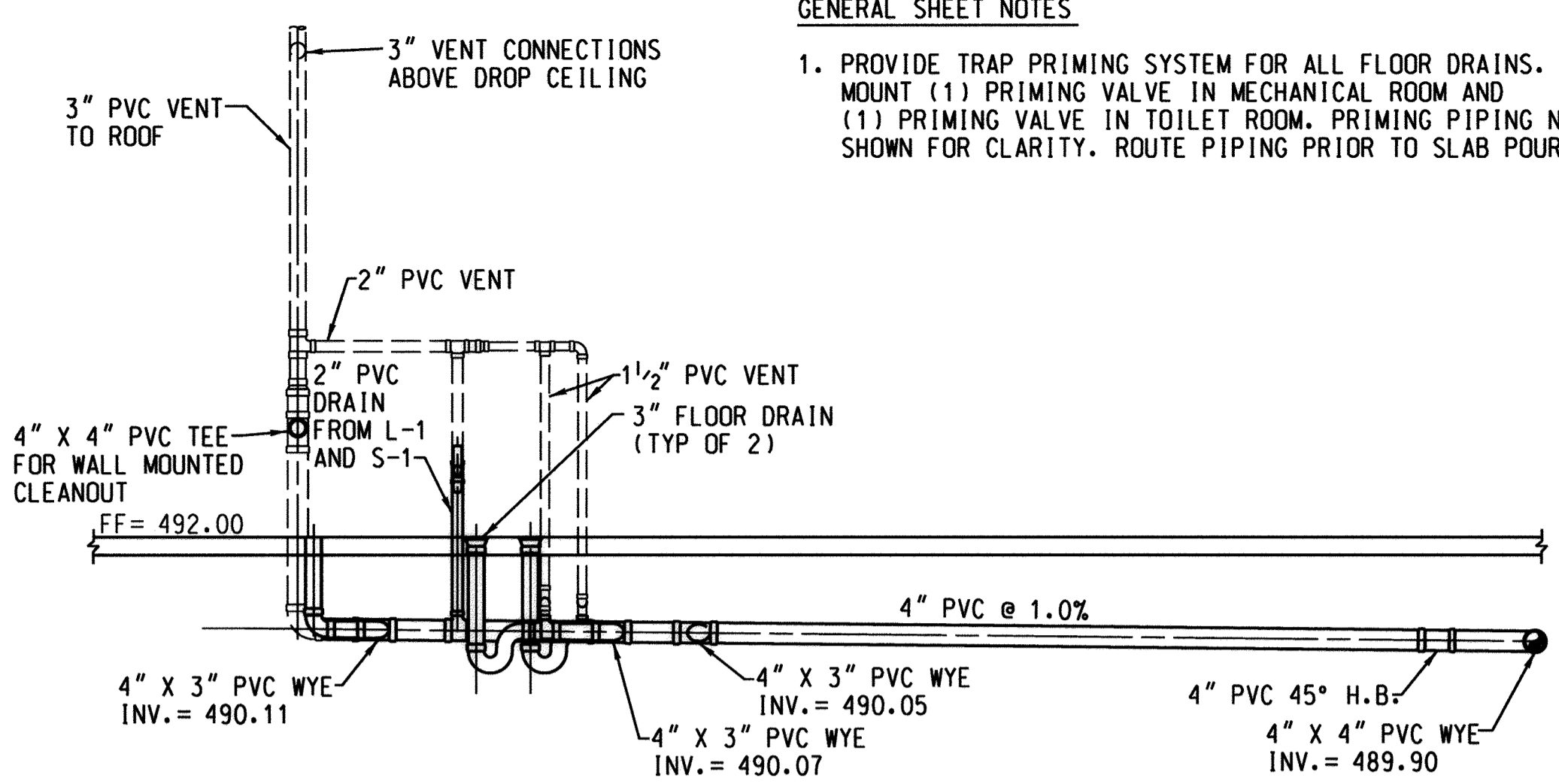
M-2
 SCALE AS SHOWN
 SHEET 18 OF 43

GENERAL SHEET NOTES

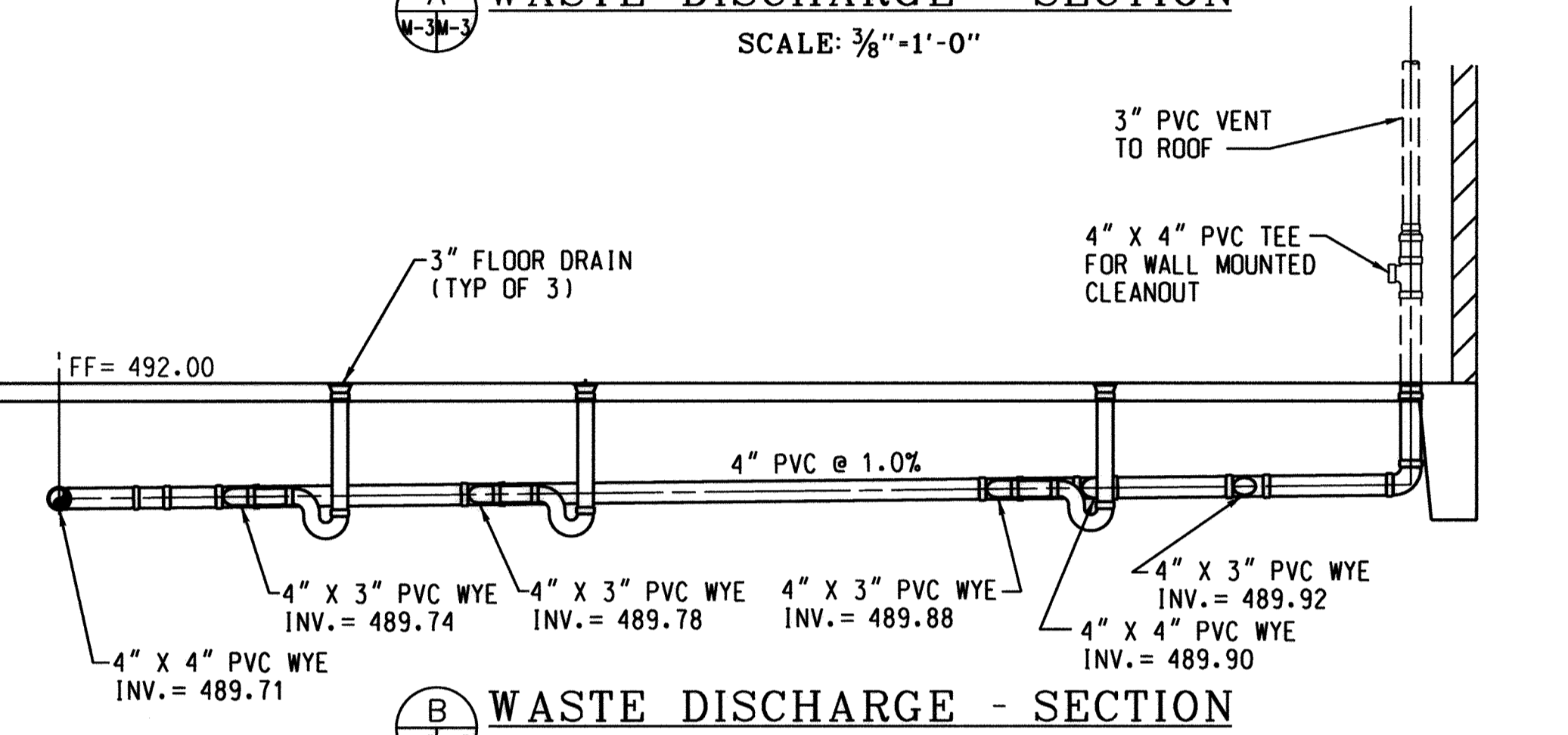
1. PROVIDE TRAP PRIMING SYSTEM FOR ALL FLOOR DRAINS. MOUNT (1) PRIMING VALVE IN MECHANICAL ROOM AND (1) PRIMING VALVE IN TOILET ROOM. PRIMING PIPING NOT SHOWN FOR CLARITY. ROUTE PIPING PRIOR TO SLAB POUR.



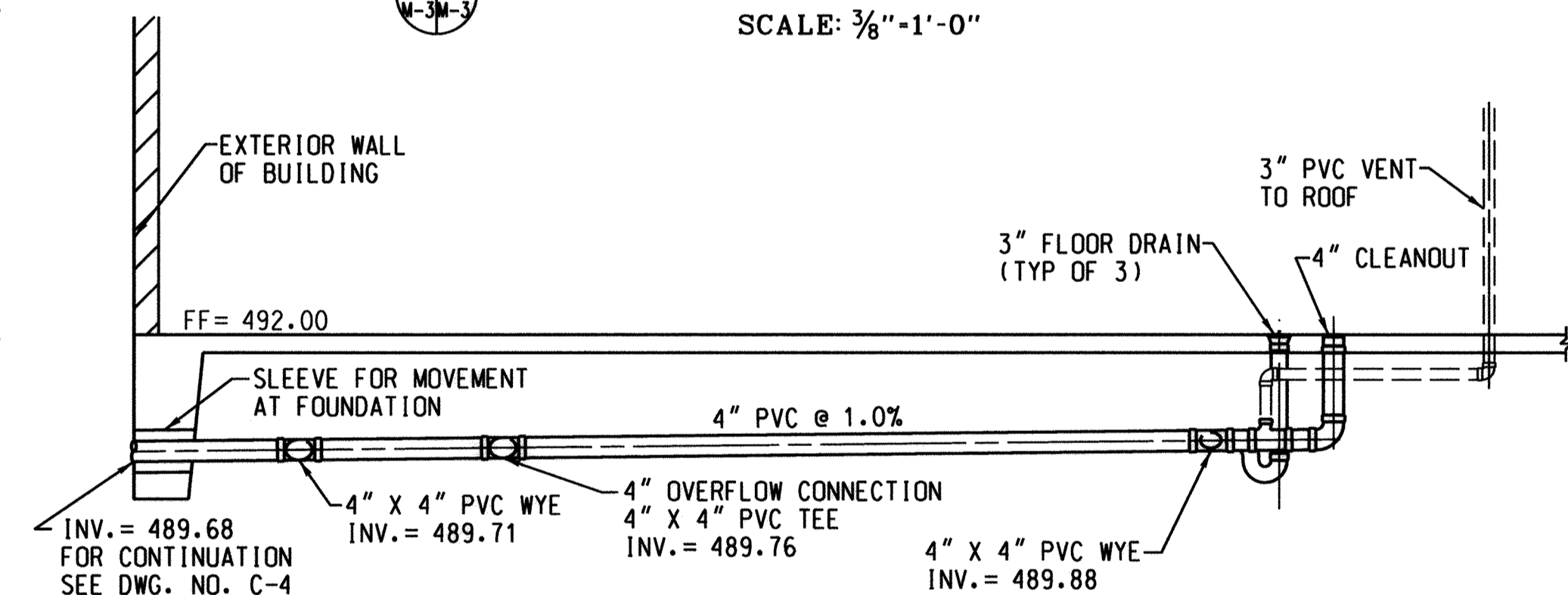
1 WASTE DISCHARGE - PLAN
SCALE: 3/8" = 1'-0"



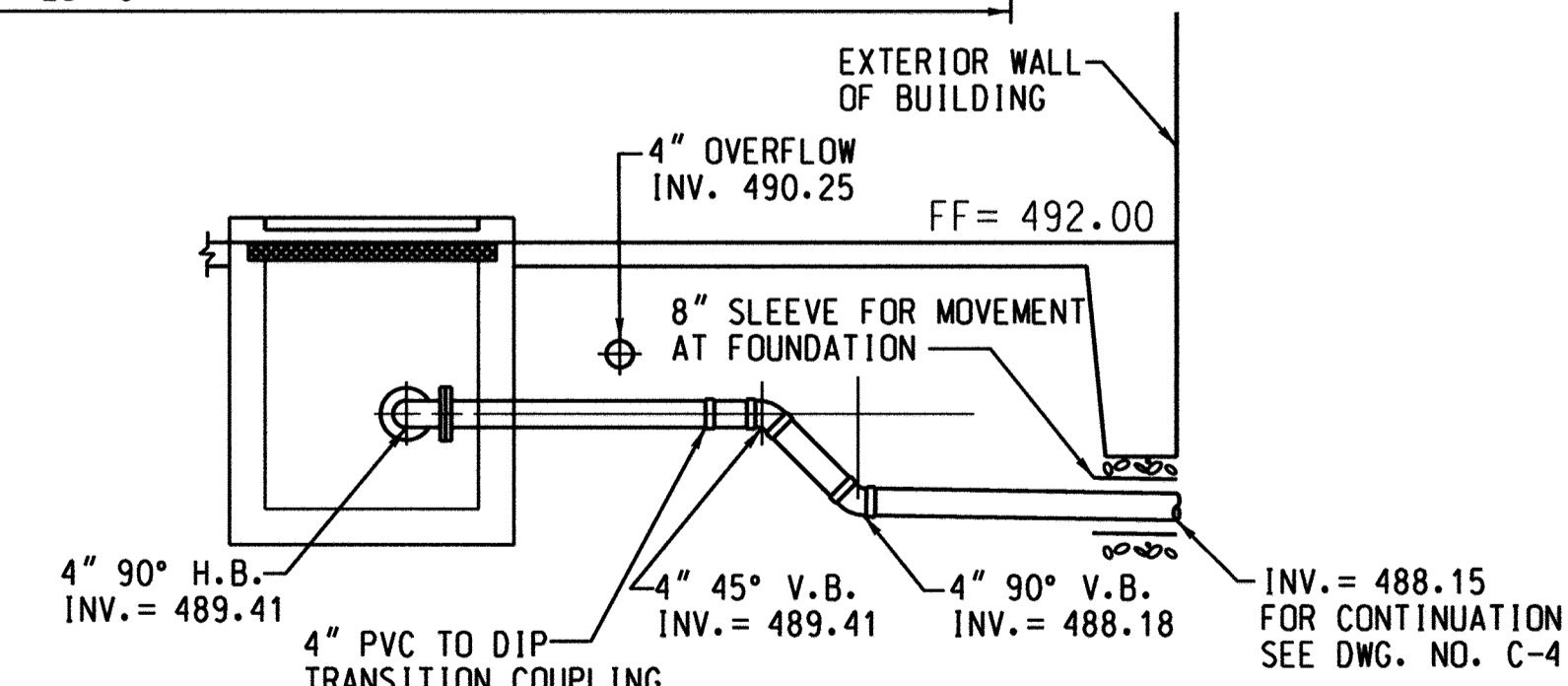
A WASTE DISCHARGE - SECTION
SCALE: 3/8" = 1'-0"



B WASTE DISCHARGE - SECTION
SCALE: 3/8" = 1'-0"

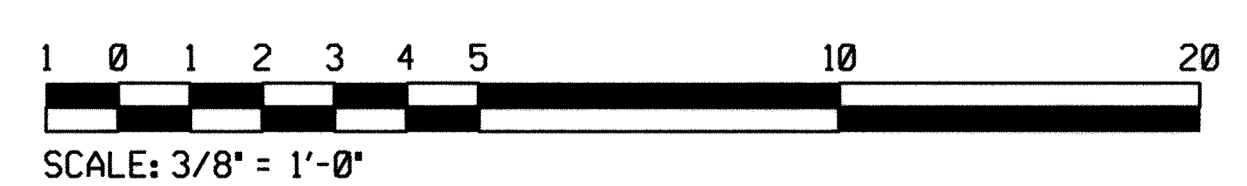


C WASTE DISCHARGE - SECTION
SCALE: 3/8" = 1'-0"



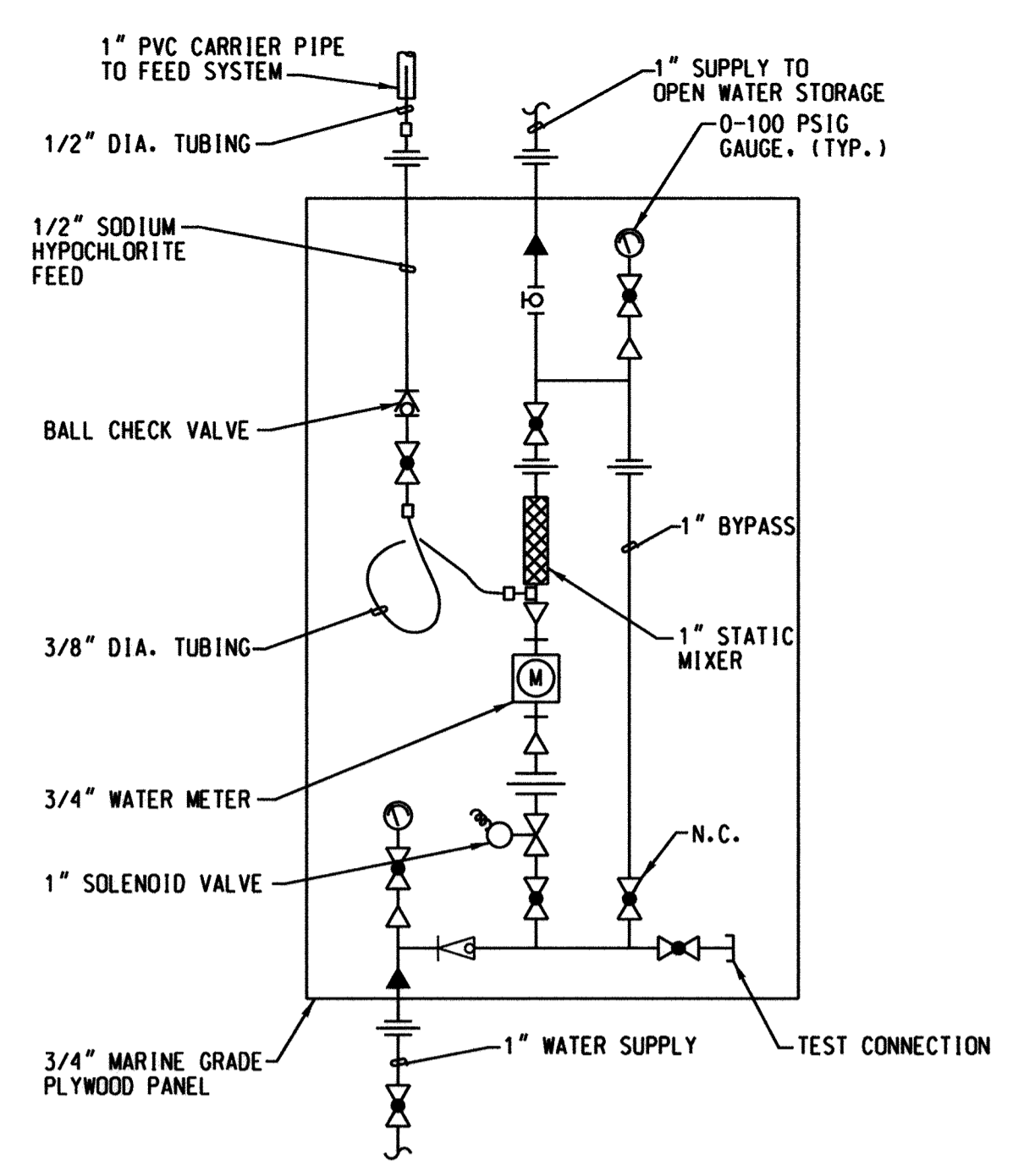
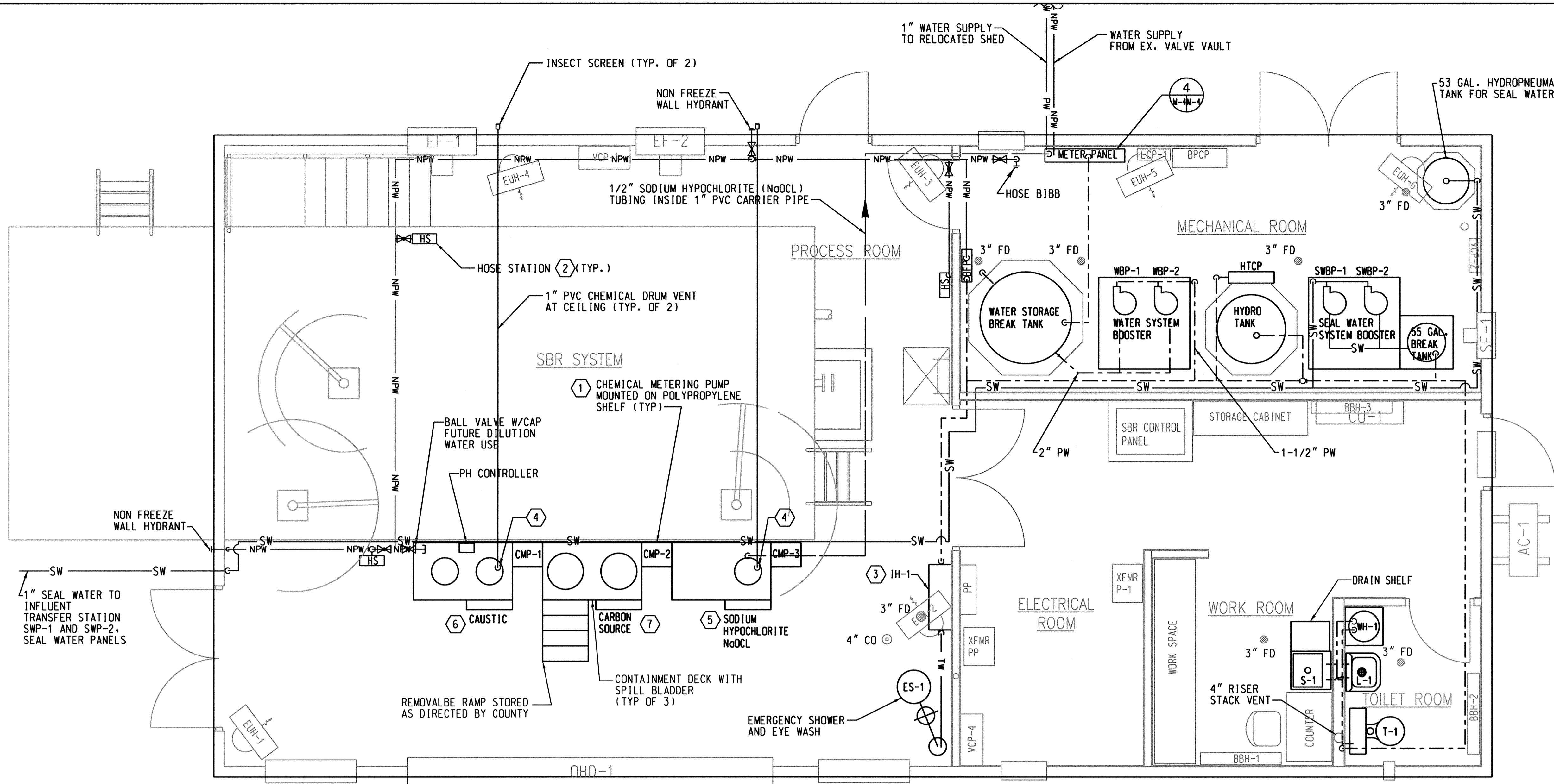
D SBR EFFLUENT - SECTION
SCALE: 3/8" = 1'-0"

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. 33925 EXPIRATION DATE: 01/15/2017



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DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND		ENGINEERS PLANNERS SCIENTISTS CONSTRUCTION MANAGERS 936 RIDGEBROOK ROAD SPARKS, MARYLAND 21152 TELEPHONE: (410) 316-7800 FAX: (410) 316-7818 www.kci.com	DES: KFJ DRN: KFJ CHK: SEA DATE: AUG. 2016	BY: NO.	REVISION	DATE	600' SCALE MAP NO. 40-41 BLOCK NO. 12	ASHLEIGH KNOLLS SHARED SEWAGE DISPOSAL FACILITY CAPITAL PROJECT No. S-6269 CONTRACT No. 50-4972 ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND	SCALE AS SHOWN SHEET 19 OF 43
Director of Public Works DATE: 2/3/17	Chief, Bureau of Engineering DATE: 2/3/17		Chief, Utility Design Division DATE: 2/3/17	10/10/2016	AUG. 2016	600' SCALE MAP NO. 40-41 BLOCK NO. 12	ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND	SCALE AS SHOWN SHEET 19 OF 43	
Chief, Bureau of Utilities DATE: 1/25/17	Chief, Utility Design Division DATE: 2/3/17		Chief, Utility Design Division DATE: 2/3/17	10/10/2016	AUG. 2016	600' SCALE MAP NO. 40-41 BLOCK NO. 12	ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND	SCALE AS SHOWN SHEET 19 OF 43	



4 METER PANEL DETAIL
SCALE: NONE

CONSTRUCTION NOTES

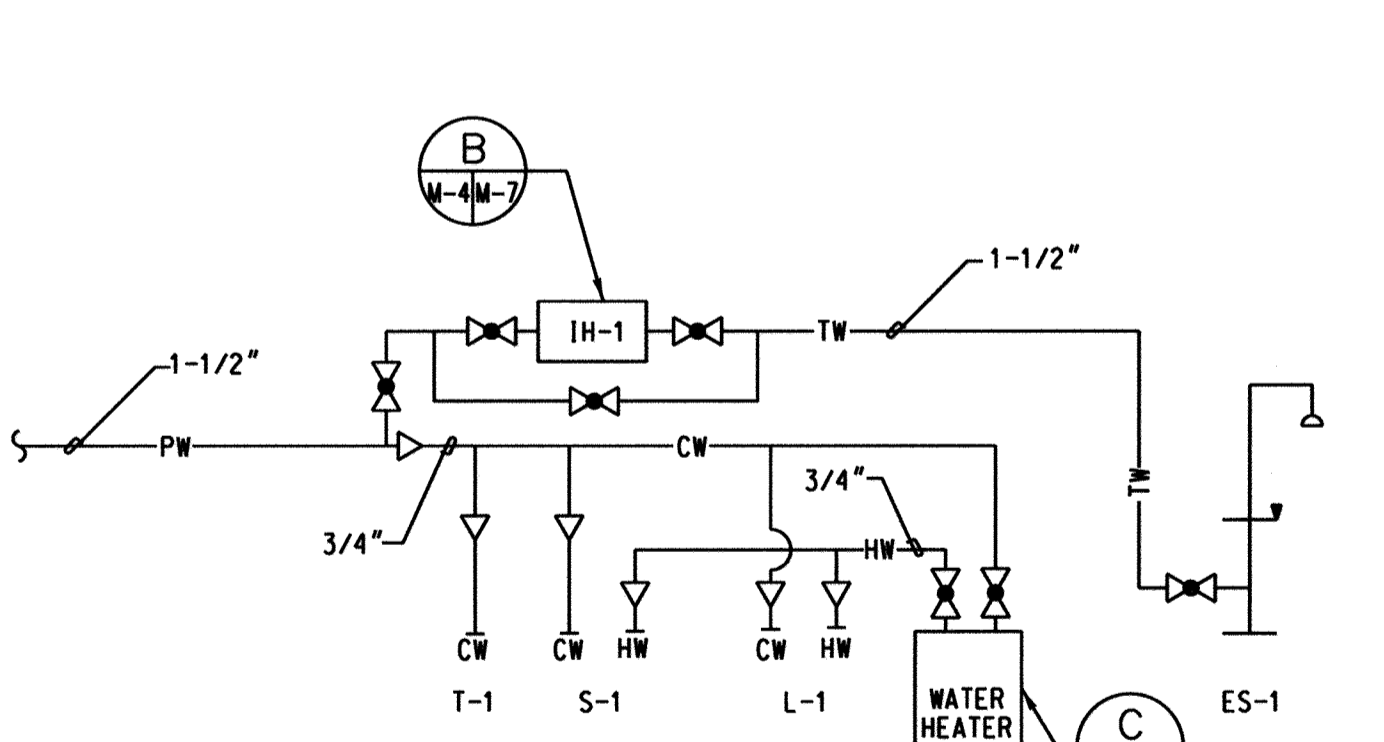
- 1 SHELF BY PUMP MANUFACTURER. SIZE TO SUIT PUMP.
- 2 PROVIDE S.S. FRAMING CHANNEL MOUNTING STAND W/BASE FITTINGS.
- 3 IN NEMA 4X ENCLOSURE.
- 4 PROVIDE 2' OF 1" FLEXIBLE TUBING WITH CONNECTION BUNG AT DRUM.
- 5 MAXIMUM 25 GAL. STORAGE.
- 6 MAXIMUM 50 GAL. STORAGE.
- 7 2 X 50 GAL. STORAGE.

LEGEND

— SW —	— SW —	SEAL WATER
— PW —	— PW —	POTABLE WATER
— NPW —	— NPW —	NON POTABLE WATER
—	—	HOT WATER
—	—	COLD WATER
—	—	SODIUM HYPOCHLORITE (CARRY PIPE)
—	—	EXISTING WATER SYSTEM
—	—	SIGNAL COMMUNICATIONS
— TW —	— TW —	TEMPERED WATER
—	—	PROP. FEATURES

EQUIPMENT NAMES

IH	INSTANTANEOUS HEATER
HS	HOSE STATION
BFP	BACKFLOW PREVENTER
WBP	WATER BOOSTER PUMP



NOTE: SEE DETAILS FOR SPECIALTY VALVES, GAUGES, RELIEF DEVICES AND RELATED APPURTENANCES.

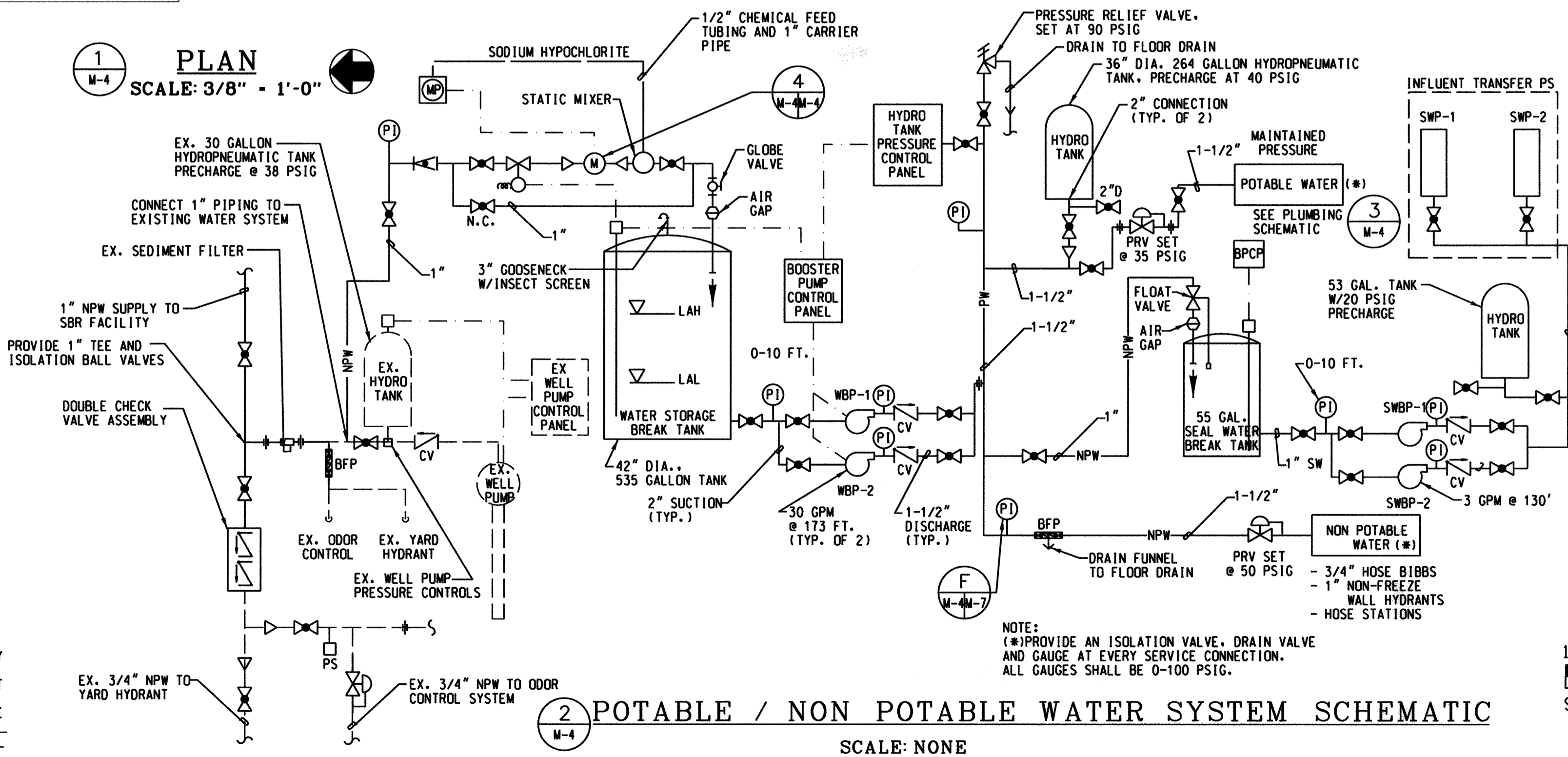
FIXTURE SCHEDULE			
I.D.	DESCRIPTION	HW	CW
S-1	SERVICE SINK	1/2"	1/2"
L-1	LAVATORY	1/2"	1/2"
T-1	TOILET	-	1/2"

IH-1 INSTANTANEOUS WATER HEATER 79 KW, 480 VAC, 3-PHASE, 23° TEMPERATURE RISE @ 23 GPM
 ES-1 EMERGENCY SHOWER/EYEWASH 1-1/4" CONNECTION, 23 GPM @ 30 PSIG
 WH-1 10 GALLON WATER HEATER, 1650W, 120 VAC, 1 PHASE, 8 GPH RECOVERY RATE @ 90°F RISE

3 PLUMBING SCHEMATIC
SCALE: NONE

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



2 POTABLE / NON POTABLE WATER SYSTEM SCHEMATIC
SCALE: NONE



PLOT: 10:08 PM on Thursday, October 06, 2016
BY: MUSEFERNIAZ
FILE: M:\2007\01071378.DWG

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

James A. De... 2/1/17
DIRECTOR OF PUBLIC WORKS DATE

Thomas A. Butler 2/1/17
CHIEF, BUREAU OF ENGINEERING DATE

... 1/25/17
CHIEF, BUREAU OF UTILITIES DATE

... 2/1/17
CHIEF, UTILITY DESIGN DIVISION DATE

ENGINEERS
PLANNERS
SCIENTISTS
CONSTRUCTION MANAGERS

KCI TECHNOLOGIES

936 RIDGEBROOK ROAD
SPRINGFIELD, MARYLAND 21152
TELEPHONE: (410) 316-7800
FAX: (410) 316-7818
www.kci.com

STATE OF MARYLAND
REGISTERED PROFESSIONAL ENGINEER
NO. 33925
10/10/2016

DES:	KFJ
DRN:	KFJ
CHK:	SEA
DATE:	AUG. 2016
BY:	NO.
REVISION:	
DATE:	

**PLUMBING-
POTABLE & NON POTABLE
WATER SYSTEM**

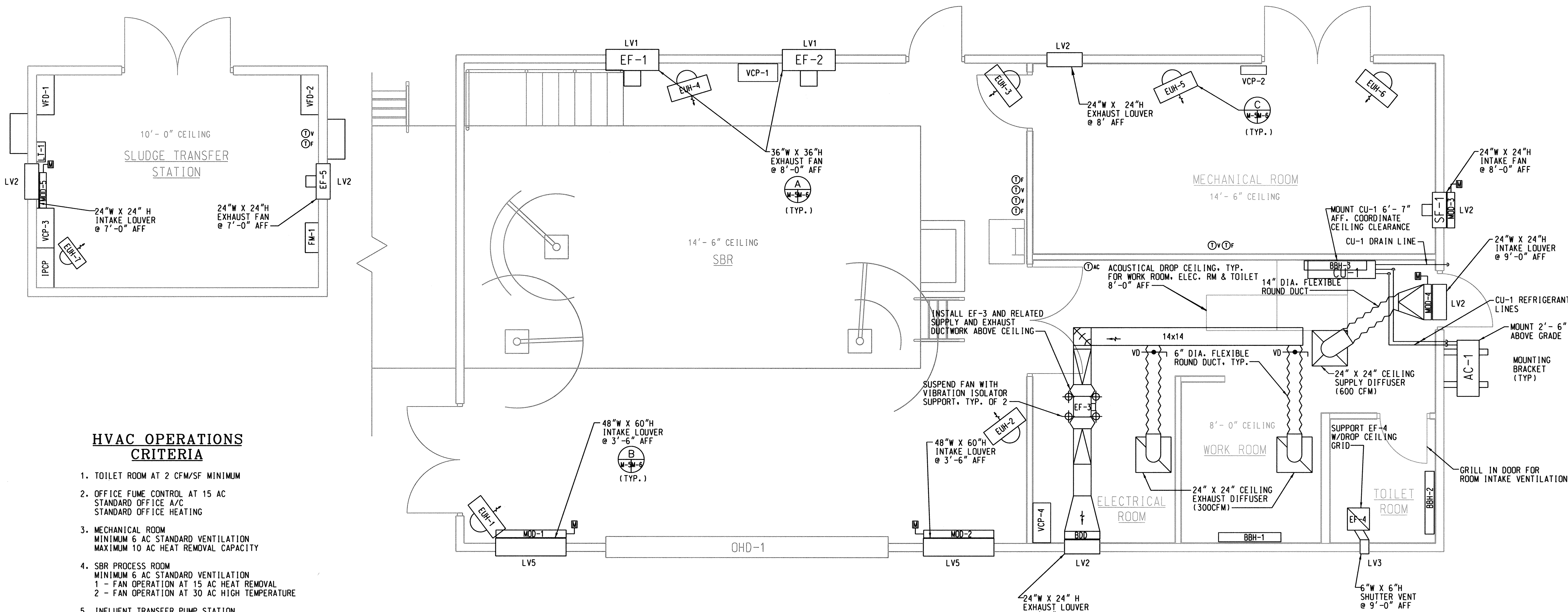
600' SCALE MAP NO. 40-41 BLOCK NO. 12

**ASHLEIGH KNOLLS
SHARED SEWAGE DISPOSAL FACILITY**

CAPITAL PROJECT No. S-6269
CONTRACT No. 50-4972

ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

SCALE AS SHOWN
SHEET 20 OF 43



HVAC OPERATIONS CRITERIA

- TOILET ROOM AT 2 CFM/SF MINIMUM
- OFFICE FUME CONTROL AT 15 AC STANDARD OFFICE A/C STANDARD OFFICE HEATING
- MECHANICAL ROOM
MINIMUM 6 AC STANDARD VENTILATION
MAXIMUM 10 AC HEAT REMOVAL CAPACITY
- SBR PROCESS ROOM
MINIMUM 6 AC STANDARD VENTILATION
1 - FAN OPERATION AT 15 AC HEAT REMOVAL
2 - FAN OPERATION AT 30 AC HIGH TEMPERATURE
- INFLUENT TRANSFER PUMP STATION
MINIMUM 6 AC STANDARD VENTILATION
MAXIMUM 20 AC HEAT REMOVAL CAPACITY
- NFPA 820 REVIEW: SBR PROCESS IS PROCEEDED BY A PRELIMINARY TREATMENT PROCESS TANK LOCATED OUTSIDE. THEREFORE THE PRELIMINARY TREATMENT PROCESS IS CLASSIFIED CLASS-1 DIVISION-1, WHILE THE INTERIOR PROCESS TANKS ARE NON-CLASSIFIED SPACES. THE SBR PROCESS ROOM IS 1-HOUR FIRE RATED AND CLASSIFIED NEMA-4X BY NEC GUIDELINES

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

HVAC DESIGN CRITERIA

- STANDARDS
MDE/TEN STATES STANDARDS
NFPA 820 CLASSIFICATIONS
- SPACE CONDITIONS
OFFICE A/C AT 75°F
OFFICE HEAT AT 70°F
STANDARD HEATING AT 60°F
STANDARD VENTILATION AT 90°F
- VENTILATION RATES
MINIMUM RATE AT 6 AIR CHANGES (AC)
HEAT REMOVAL TO MAINTAIN 90°F
PURGE VENTILATION AT 30 AIR CHANGES (AC)
FUME CONTROL AT 15 AIR CHANGES (AC)

CONSTRUCTION NOTES

- SEE ARCHITECTURAL LOUVER SCHEDULE FOR BUILDER OPENING COORDINATION

EQUIPMENT NAMES
 BBH: BASE BOARD HEATER
 BDD: BACK DRAFT DAMPER
 EF: EXHAUST FAN
 EUH: ELECTRIC UNIT HEATER
 MOD: MOTOR OPERATED DAMPER
 SF: SUPPLY FAN
 CU: CASSETTE UNIT
 AC: AIR COOLED CONDENSING UNIT



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PLOTTED: 11/12/16 PM on Thursday, October 06, 2016
FILE: W:\2017\1071378\06\Drawings\107137806_M-005_HVAC.dwg

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

James H. ... 2/16/17
DIRECTOR OF PUBLIC WORKS DATE

Thomas A. ... 2/16/17
CHIEF, BUREAU OF ENGINEERING DATE

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ENGINEERS PLANNERS SCIENTISTS CONSTRUCTION MANAGERS
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TELEPHONE: (410) 316-7800
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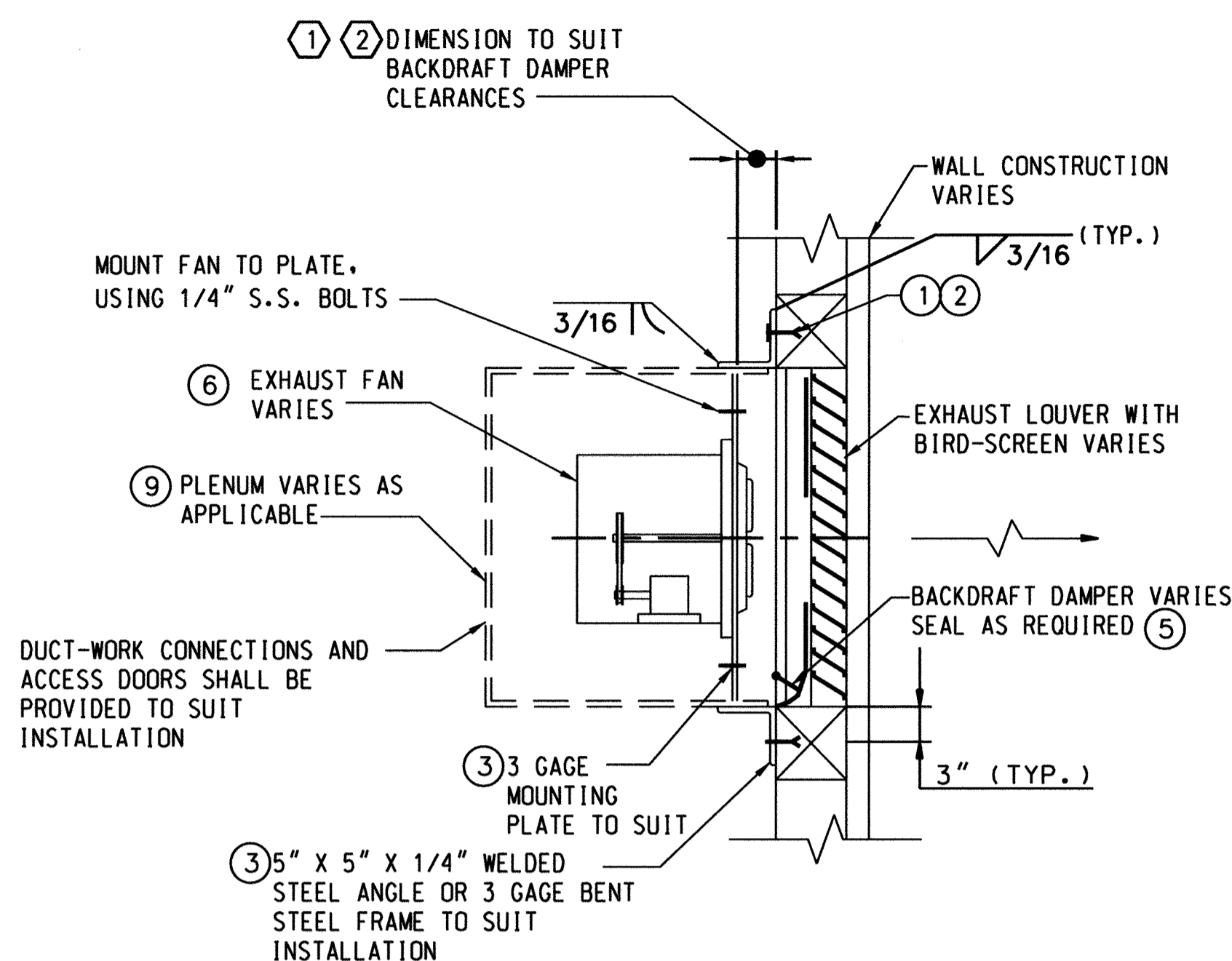
DES: Kfj					
DRN: Kfj					
CHK: SEA					
DATE: AUG. 2016	BY	NO.	REVISION	DATE	

HVAC PLAN AND CRITERIA

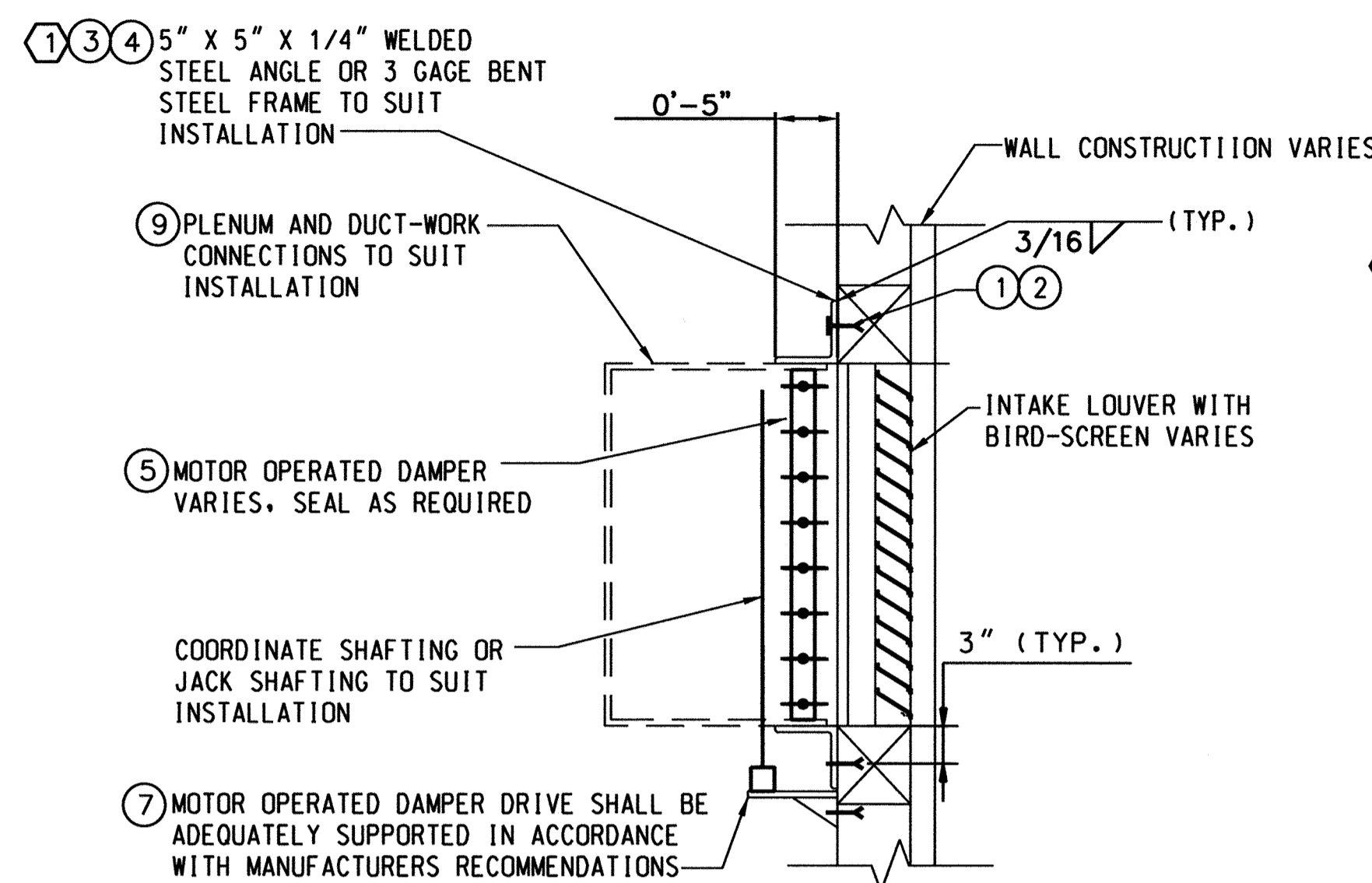
ASHLEIGH KNOLLS
SHARED SEWAGE DISPOSAL FACILITY
 CAPITAL PROJECT No. S-6269
 CONTRACT No. 50-4972

ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

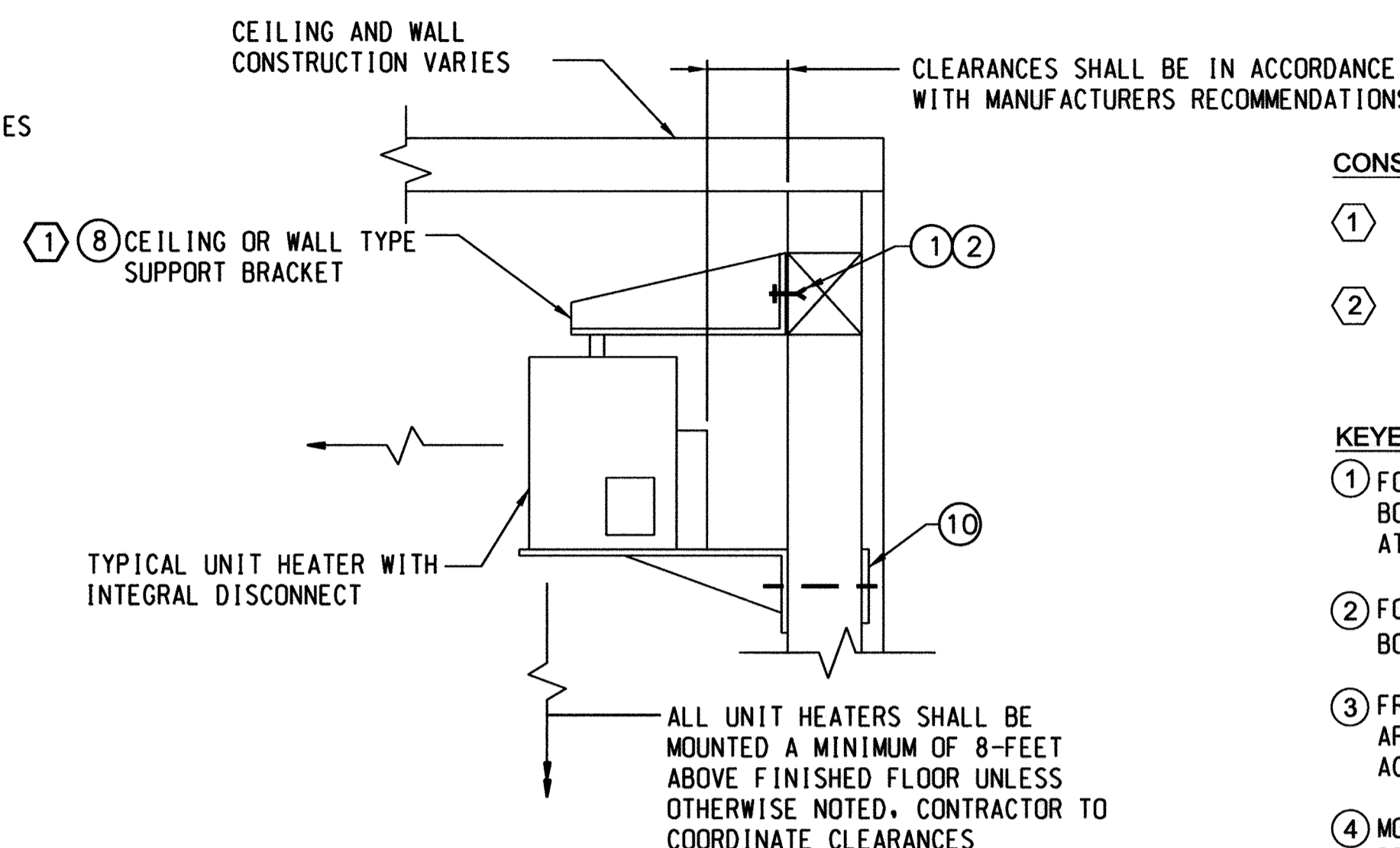
M-5
SCALE AS SHOWN
SHEET 21 OF 43



A TYPICAL EXHAUST FAN DETAIL
SCALE: NONE



B TYPICAL INTAKE DETAIL
SCALE: NONE



C TYPICAL UNIT HEATER DETAIL
SCALE: NONE

- CONSTRUCTION NOTES:**
- ① SEE RESPECTIVE HEATING, VENTILATION AND MECHANICAL PLANS AND SECTIONS FOR INSTALLATION REFERENCES.
 - ② SEE DAMPER CLEARANCE TABLE.

- KEYED NOTES:**
- ① FOR WOOD FRAMING ANCHORING USE 3/8" DIA. S.S. LAG BOLTS WITH 3-INCH EMBEDMENT, OR APPROVED EQUAL SPACED AT 12-INCHES ON-CENTER.
 - ② FOR METAL STUD WALL ANCHORING USE 3/8" DIA. S.S. LAG BOLTS WITH 1-1/2" EMBEDMENT AT 12 INCHES ON-CENTER.
 - ③ FRAME AND MOUNTING PLATE SHALL BE HOT-DIP GALVANIZED AFTER FABRICATION. SQUARE-CORNER FRAME CONSTRUCTION IS ACCEPTABLE. MITERED CORNERS ARE NOT REQUIRED.
 - ④ MOTOR-OPERATED AND BACK DRAFT DAMPER FRAMES SHALL BE REQUIRED. INSTALLATIONS SHALL BE IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS.
 - ⑤ ALL DAMPERS SHALL MATCH IN NOMINAL SIZE WITH THEIR RESPECTIVE LOUVERS UNLESS OTHERWISE INDICATED ON THE CONTRACT DRAWINGS. WHERE MULTIPLE FANS SHARE A LOUVER, THE BACK DRAFT DAMPERS SHALL BE PARTITIONED FOR EACH RESPECTIVE FAN. THE DAMPER SHALL BE FAN FRAME MOUNTED OR WALL MOUNTED TO SUIT FIELD CONDITIONS.
 - ⑥ ALL BELT DRIVEN FANS SHALL BE FURNISHED WITH MOTOR/BELT GUARD PROTECTIVE SCREENS, UNLESS THE FAN IS INSIDE OF A PLENUM, OR OTHERWISE SPECIFIED.
 - ⑦ CONTRACTOR SHALL COORDINATE M.O.D. SHAFTING ARRANGEMENTS WITH SUITABLE FRAME.
 - ⑧ CONTRACTOR SHALL PROVIDE ADDITIONAL SUPPORT CHANNELS, RODS AND S.S. HARDWARE TO SUIT CEILING INSTALLATION.
 - ⑨ PLENUM CONNECTIONS TO WALL FRAMES SHALL BE SUITABLE FOR MATERIALS OF CONSTRUCTION AND SHALL BE SELF-SUPPORTING IN ACCORDANCE WITH SMACNA STANDARDS.
 - ⑩ UNIT HEATERS IN EXCESS OF 200 LBS. UTILIZING SHELF OR BRACKET SUPPORTS, SHALL REQUIRE THRU-BOLTS WITH 3/8-INCH THICK BEARING PLATES SPANNING HORIZONTAL BOLT CENTERS. CONTRACTOR TO COORDINATE ADDITIONAL SUPPORT FRAMING.

HEATING SCHEDULE						
UNIT I.D.	KW	AMPS	CFM	THROW (FT.)	VOLTS/PH/HERTZ	REMARKS
EUH-1	5.0	6.0	405	12	480 VAC. 3 - PH	DISCONNECT AND INTEGRAL THERMOSTAT
EUH-2	5.0	6.0	405	12	480 VAC. 3 - PH	DISCONNECT AND INTEGRAL THERMOSTAT
EUH-3	5.0	6.0	405	12	480 VAC. 3 - PH	DISCONNECT AND INTEGRAL THERMOSTAT
EUH-4	5.0	6.0	405	12	480 VAC. 3 - PH	DISCONNECT AND INTEGRAL THERMOSTAT
EUH-5	3.0	10.8	280	8	277 VAC. 1 - PH	DISCONNECT AND INTEGRAL THERMOSTAT
EUH-6	3.0	10.8	280	8	277 VAC. 1 - PH	DISCONNECT AND INTEGRAL THERMOSTAT
EUH-7	5.0	6.0	405	8	480 VAC. 3 - PH	DISCONNECT AND INTEGRAL THERMOSTAT
BBH-1	1.0	3.8	-	-	277 VAC. 1 - PH	INTEGRAL THERMOSTAT
BBH-2	1.0	3.8	-	-	277 VAC. 1 - PH	INTEGRAL THERMOSTAT
BBH-3	1.0	3.8	-	-	277 VAC. 1 - PH	INTEGRAL THERMOSTAT

DUCTLESS SPLIT SYSTEM AIR CONDITION - CRITERIA	
CASSETTE FAN CFM	775 DRY CFM
CASSETTE FAN FLA	0.36
MAX. CASSETTE FAN MOTOR POWER	56W
TOTAL COOLING BTUH	24,000
SENSIBLE COLLING BTUH	18,500
CONDENSER COIL EDB	93F
EVAPORATOR COIL EDB/EWB	75/62F
ELECTRICAL CHARACTERISTICS VOLT/PH/HZ	208V/1-PHASE/60HZ

DAMPER CLEARANCES	
FAN SIZE	CLEARANCE
12"	6"
16"	8"
18"	8"
20"	10"
24"	12"
30"	12"
36"	14"

- PACKAGE SYSTEM NOTES:**
1. SPACE DESIGN CONDITIONS: 75°F DB 45% RH (COOLING).
 2. PROVIDE EVAPORATOR COIL AND FIN COATINGS SUITABLE FOR BLEACH FUMES AND ACIDIC CORROSIVE REACTIONS.
 3. AIR CONDITIONING SYSTEM SHALL UTILIZE GREEN REFRIGERANT R-410A.

VENTILATION SCHEDULE									
UNIT I.D.	TYPE	DRIVE	TOTAL CAPACITY (CFM)	TOTAL S.P. (IN.Hg)	FAN RPM	MAX. MOTOR H.P.	VOLTS/PH/HERTZ	DAMPER TYPE	REMARKS
EF-1	P	BD	3000	0.375	1163	1/2	480 VAC. 3 - PH	BDD	(3)
EF-2	P	BD	3000	0.375	1163	1/2	480 VAC. 3 - PH	BDD	(3)
EF-3	C	BD	600	0.5	1454	0.25	115 VAC. 1 - PH	BDD	(3) FUME CONTROL
EF-4	P	D	150	0.375	900	0.13	115 VAC. 1 - PH	BDD	(3) LIGHT SWITCH CONTROL
EF-5	P	D	600	0.375	1404	0.25	115 VAC. 1 - PH	BDD	(3) RHEOSTAT
SF-1	P	D	600	0.375	1404	0.25	115 VAC. 1 - PH	M.O.D.	(2) RHEOSTAT

- NOTE:**
1. COORDINATE CONTROLS AND INSTALLATION DETAILS AS SHOWN ON THE CONTRACT DRAWINGS
 2. ALL SUPPLY FANS REQUIRE AN EXHAUST M.O.D.
 3. ALL EXHAUST FANS REQUIRE AN INTAKE M.O.D.

FAN TYPE:
 BD = BELT DRIVE
 C = CENTRIFUGAL INLINE
 D = DIRECT DRIVE
 P = PROPELLER WALL MOUNTED

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DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

James H. ... 2/16/17
DIRECTOR OF PUBLIC WORKS DATE

Thomas & Butler 2/16/17
CHIEF, BUREAU OF ENGINEERING DATE

... 1/25/10
CHIEF, BUREAU OF UTILITIES DATE

... 2/17
CHIEF, UTILITY DESIGN DIVISION DATE

ENGINEERS
PLANNERS
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CONSTRUCTION MANAGERS

KCI
TECHNOLOGIES

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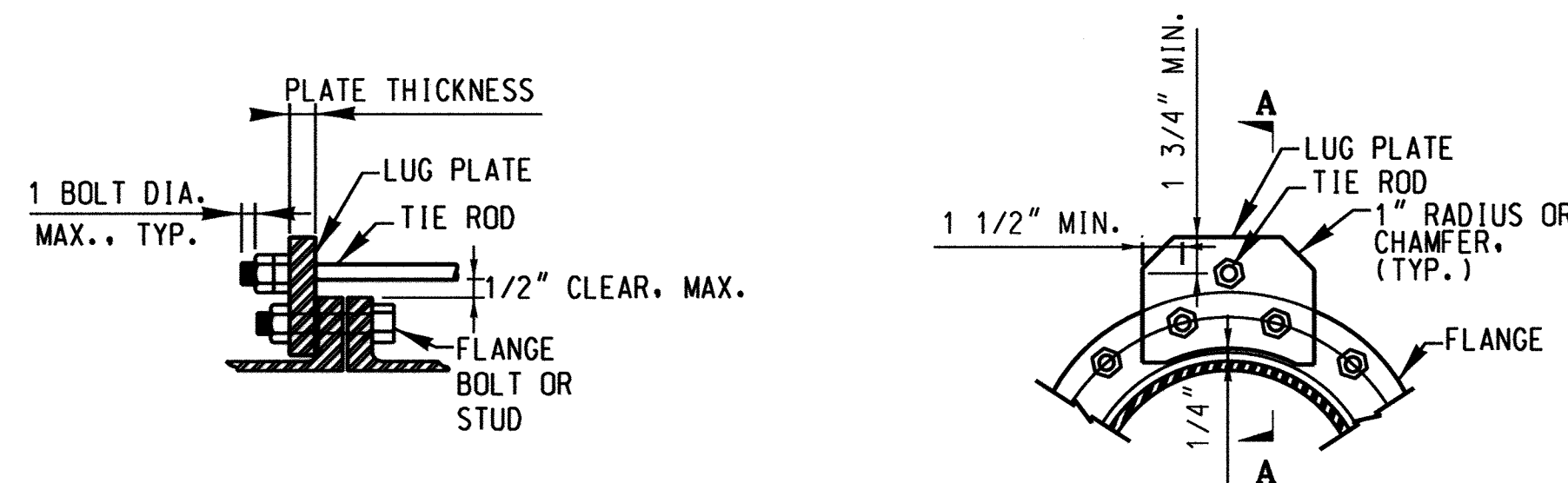
DES:	KFJ				
DRN:	KFJ				
CHK:	SEA				
DATE:	AUG. 2016	BY	NO.	REVISION	DATE

HVAC SCHEDULES
AND DETAILS

600' SCALE MAP NO. 40-41 BLOCK NO. 12

ASHLEIGH KNOLLS
SHARED SEWAGE DISPOSAL FACILITY
CAPITAL PROJECT No. S-6269
CONTRACT No. 50-4972

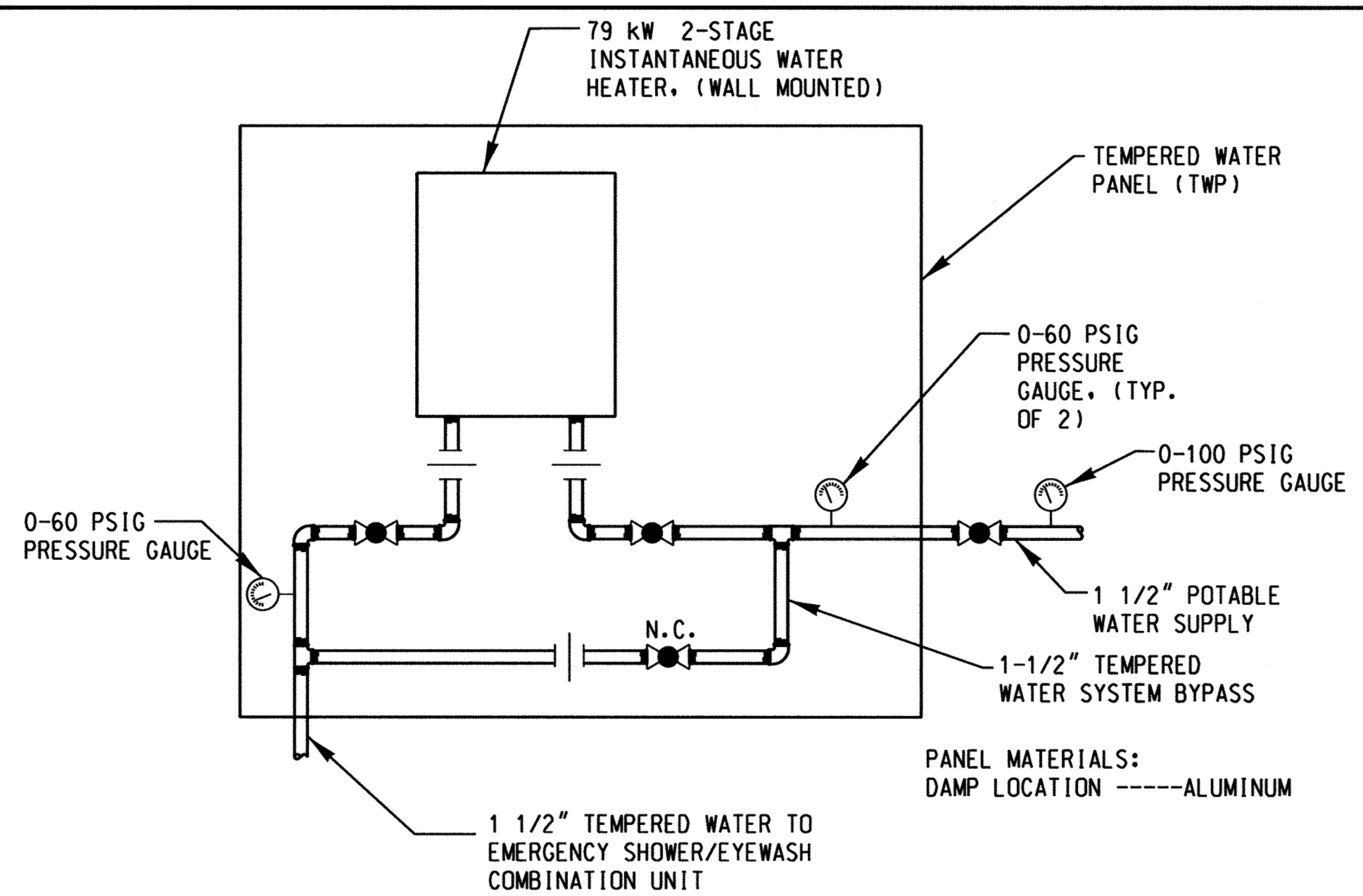
ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND



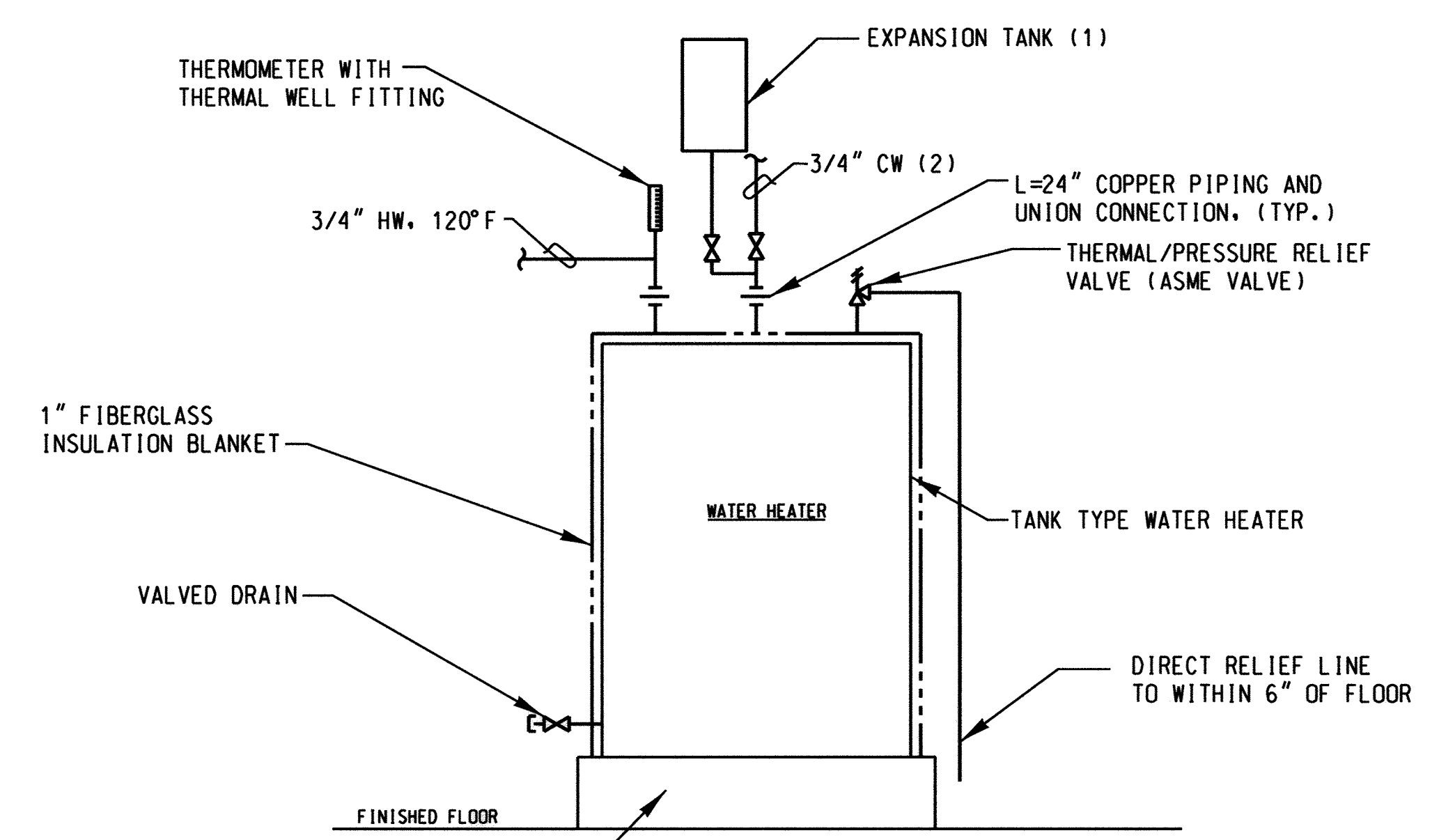
SECTION A-A

PIPE SIZE	NUMBER OF RODS	DIAMETER OF RODS	PLATE THICKNESS	PIPE SLEEVE (IF REQUIRED)	DESIGN PRESSURE (PSI)
3"	2	3/4"	3/4"	7/8"	150
4"	2	3/4"	3/4"	7/8"	150

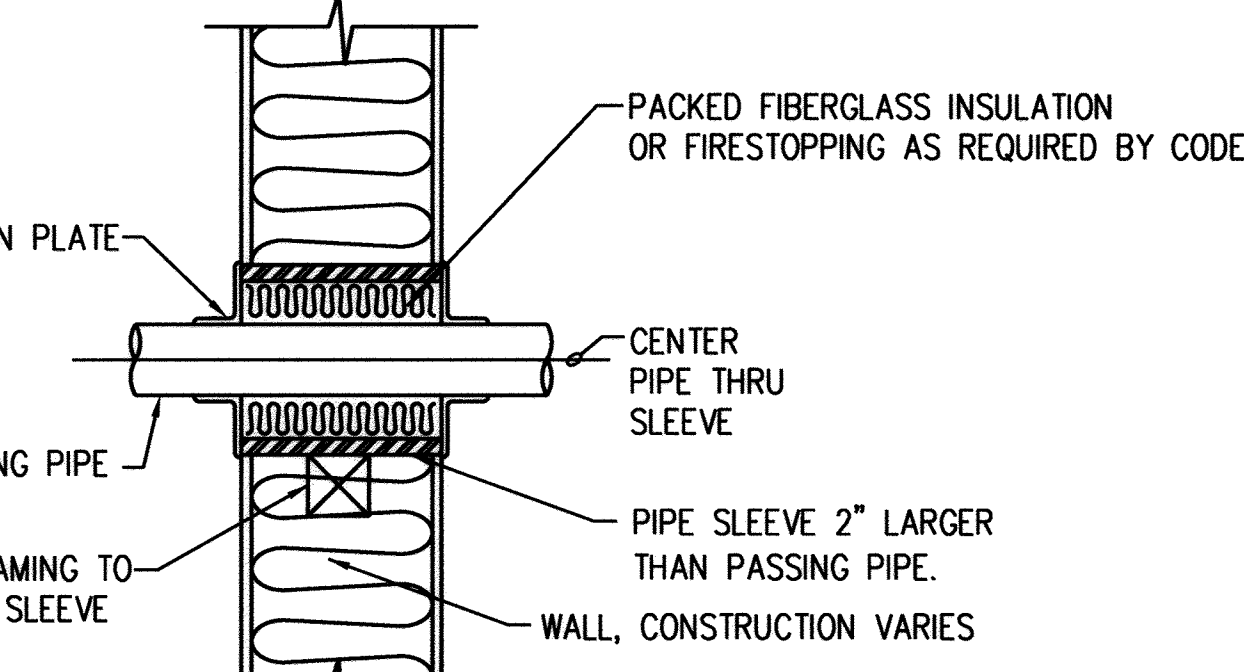
NOTES:
 FLANGE SURFACE IN CONTACT WITH THE LUG PLATE SHALL BE GROUND SMOOTH TO CLEAR THE CASTING IRREGULARITY AND EMBOSSED LETTERING. CONTACT SURFACE OF LUG PLATE SHALL BE MACHINED TO A ONE DEGREE TAPER FOR PIPE DIAMETERS 12-INCH AND LARGER.
 ROD MATERIAL - ASTM A588
 PLATE MATERIAL - ASTM A36
 SLEEVE MATERIAL - SCHEDULE 40 STEEL PIPE



TEMPERED WATER PANEL DETAIL
SCALE: NONE

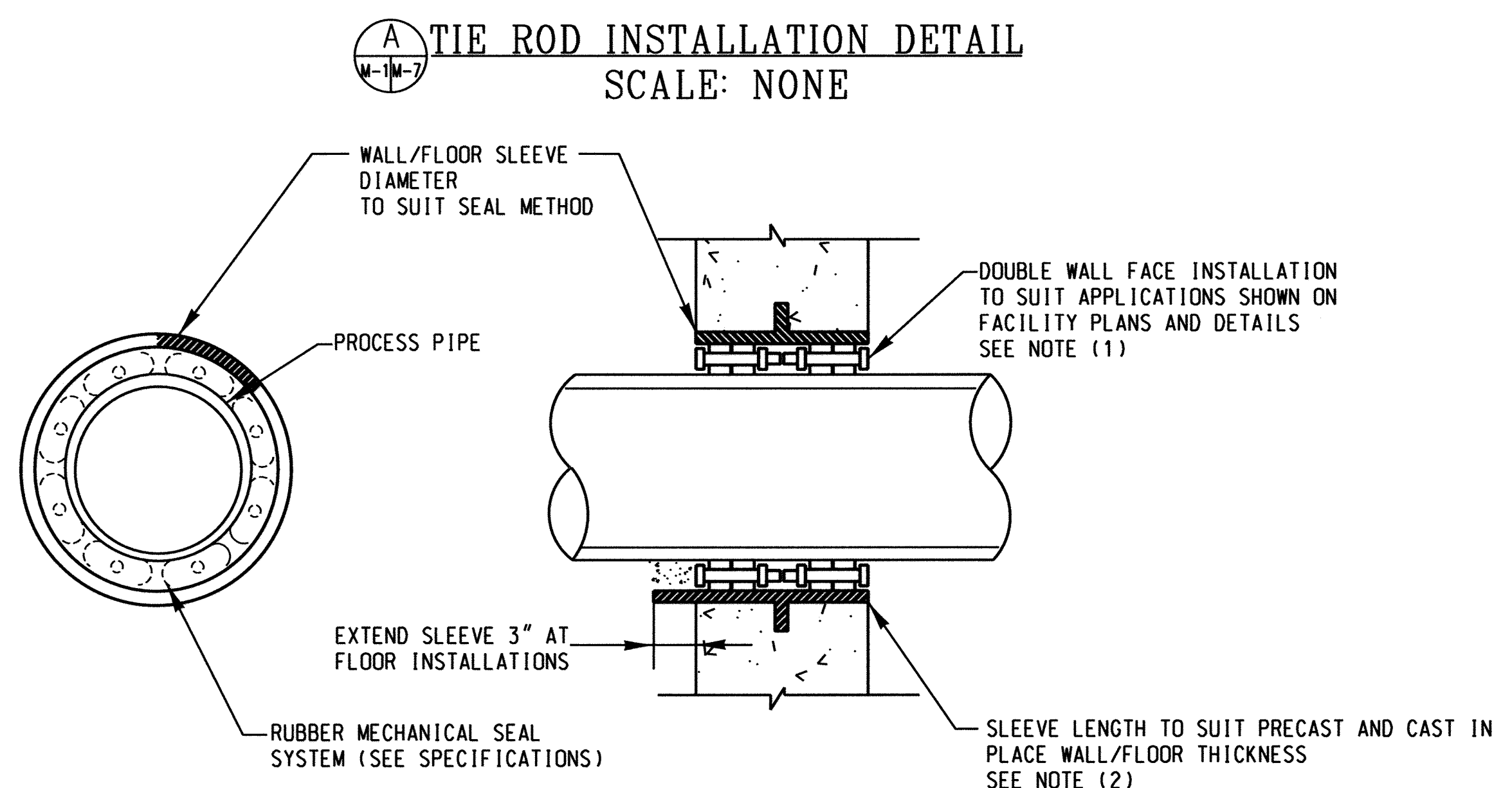


ELECTRIC WATER HEATER DETAIL
SCALE: NONE



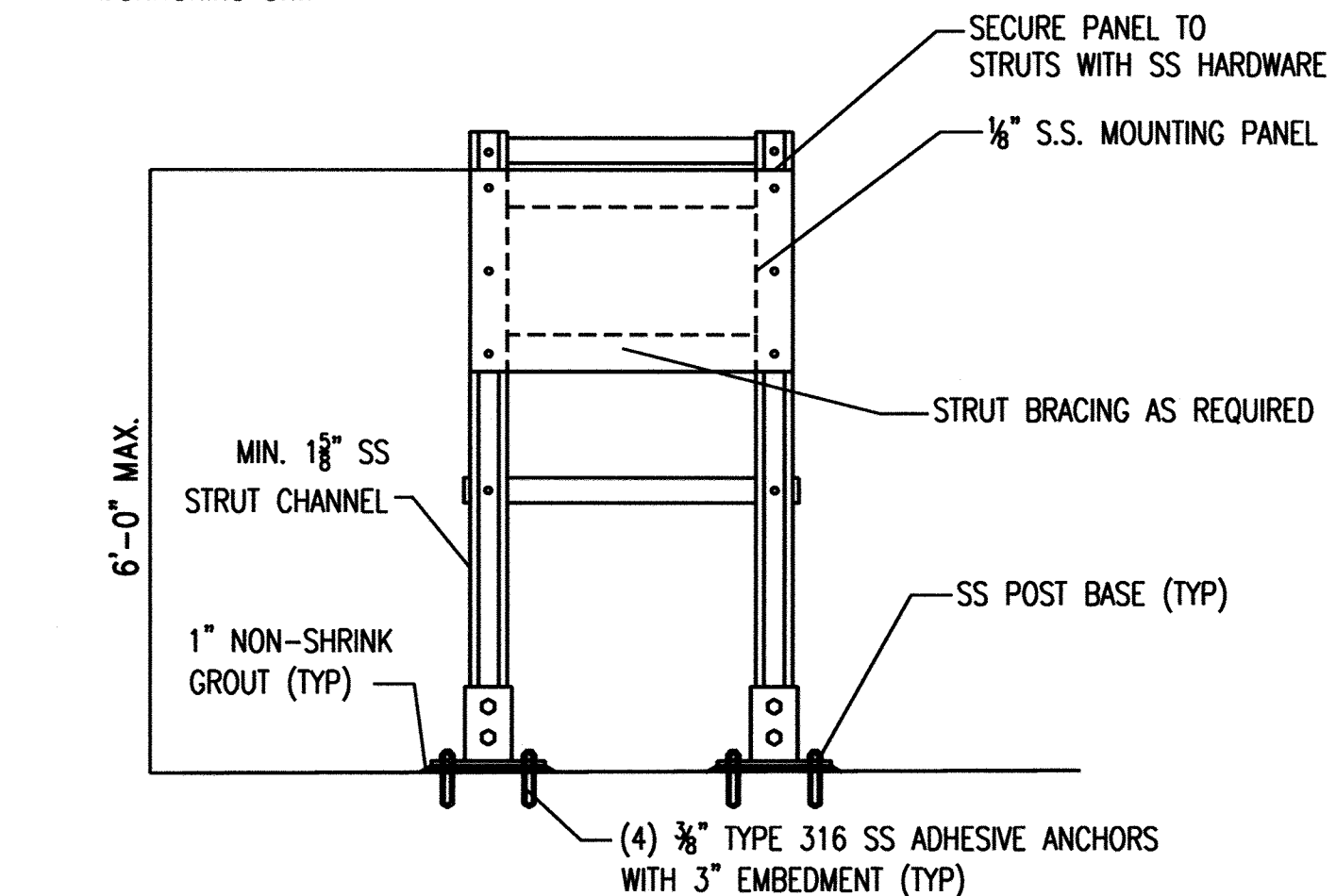
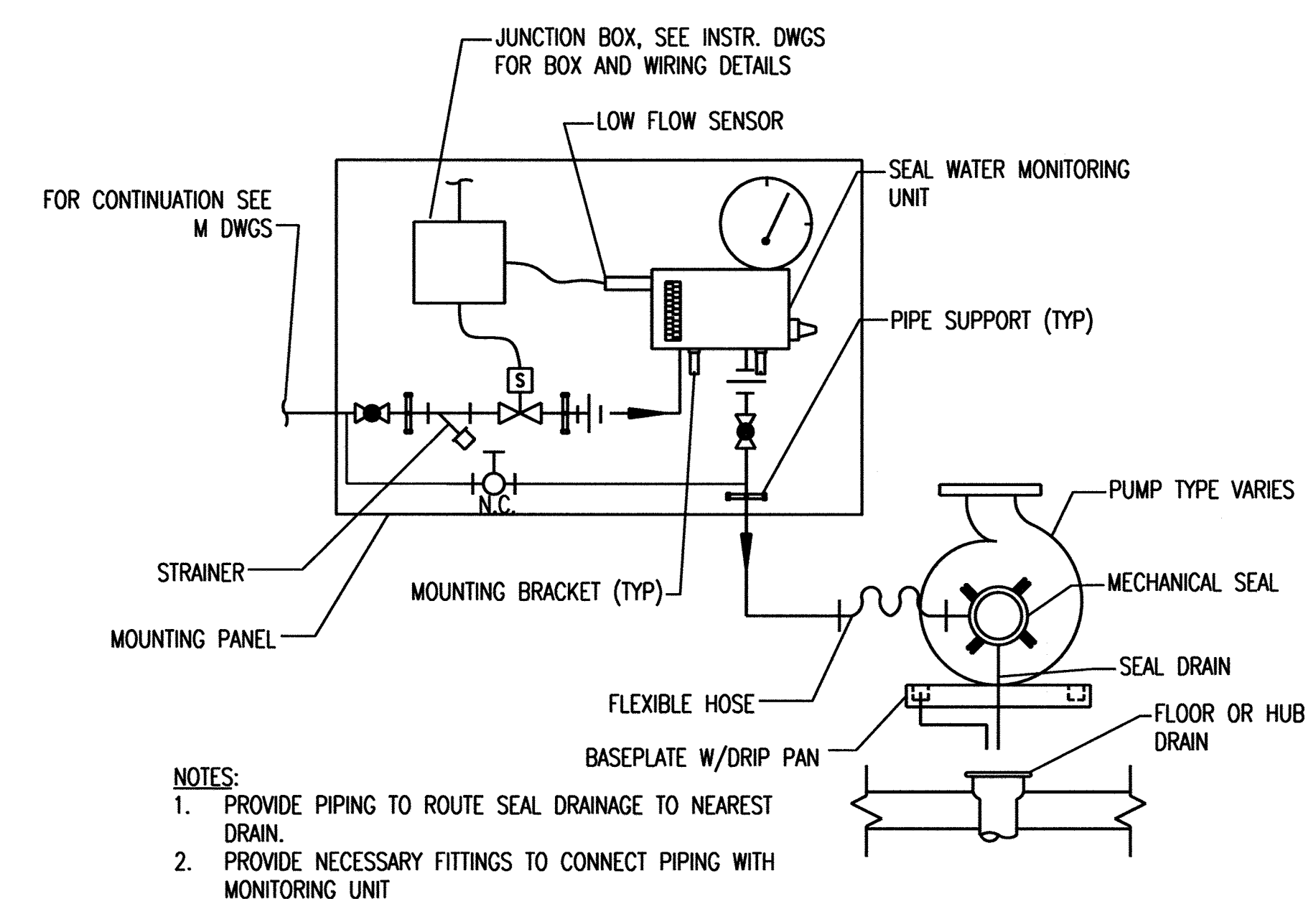
NOTES:
 1. SET SLEEVE IN WALL AS WORK PROGRESSES.
 2. SLEEVE LENGTH TO SUIT WALL CONSTRUCTION.
 3. APPLY WATER PROOF SILICONE SEALANT TO EXTERIOR WALL PENETRATIONS.

PIPE SLEEVE-WOOD FRAME WALL DETAIL
SCALE: NONE

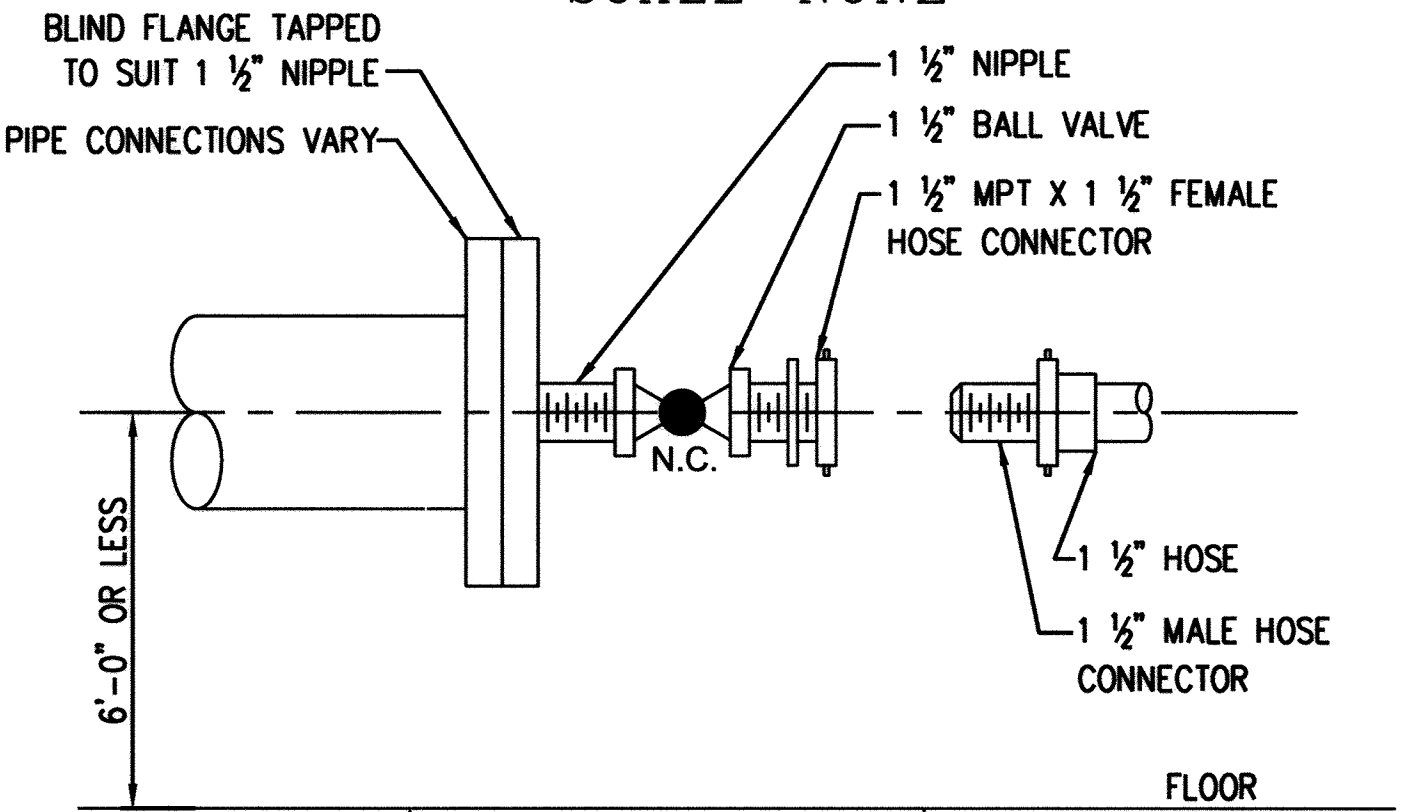


NOTES:
 (1) PROVIDE NON SHRINK GROUT SEAL AT FLOOR SLEEVE LOCATIONS.
 (2) EXISTING WALL AND FLOOR CORES DO NOT REQUIRE SLEEVE INSTALLATION.

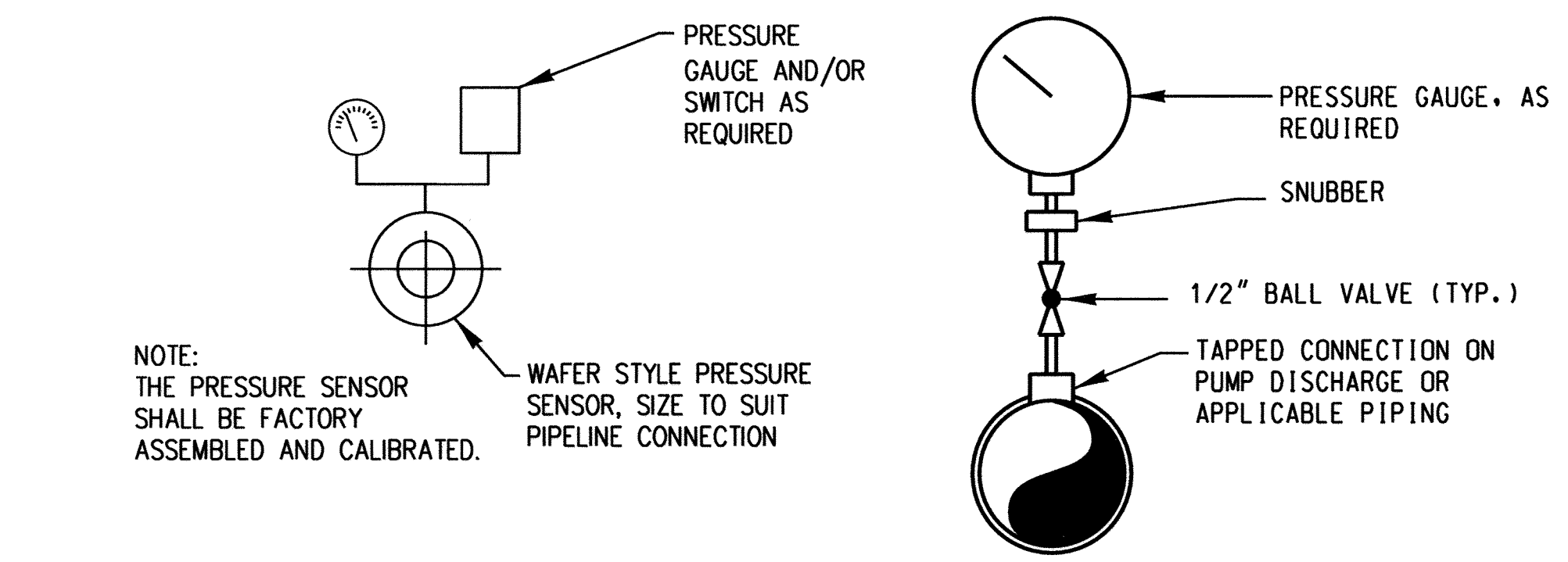
PIPE THROUGH WALL/FLOOR DETAIL
SCALE: NONE



SEAL WATER PANEL DETAIL
SCALE: NONE



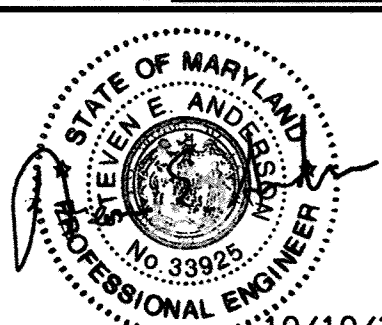
FLUSHING CONNECTION DETAIL
SCALE: NONE



SEWAGE/SLUDGE PRESSURE SENSOR DETAIL
SCALE: NONE

PW/NPW PRESSURE GAUGE DETAIL
SCALE: NONE

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. 33925 EXPIRATION DATE: 01/15/2017



DEPARTMENT OF PUBLIC WORKS
 HOWARD COUNTY, MARYLAND
 Director of Public Works: [Signature] 2/17/17
 Chief, Bureau of Engineering: [Signature] 2/13/17
 Chief, Utility Design Division: [Signature] 2/13/17

ENGINEERS
 PLANNERS
 SCIENTISTS
 CONSTRUCTION MANAGERS
KCI
 TECHNOLOGIES
 936 RIDGEBROOK ROAD
 SPARKS, MARYLAND 21152
 TELEPHONE: (410) 316-7800
 FAX: (410) 316-7818
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DES: KFJ
 DRN: KFJ
 CHK: SEA
 DATE: AUG. 2016
 REVISION

MECHANICAL DETAILS

ASHLEIGH KNOLLS
 SHARED SEWAGE DISPOSAL FACILITY
 CAPITAL PROJECT No. S-6269
 CONTRACT No. 50-4972
 ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

M-7
 SCALE AS SHOWN
 SHEET 23 OF 43

PLOTTED: 10:15 AM on Thursday, October 06, 2016
 BY: BISENARDES
 FILE: M:\2007\01071378.05\Drawings\0107137806-M-007_MechanicalDetails.dgn

GENERAL DRAWING NOTES
(THESE NOTES APPLY TO ALL ELECTRICAL DRAWINGS)

- VERIFY ALL CONDITIONS AND MEASUREMENTS ON SITE PRIOR TO THE INSTALLATION OF ANY EQUIPMENT.
- INSTALL WORK IN ACCORDANCE WITH THE LATEST NATIONAL ELECTRICAL CODE AND EQUIPMENT, UFC GUIDELINES, LATEST VERSION OF THE NFPA, AND MANUFACTURER'S RECOMMENDED INSTRUCTIONS.
- PROVIDE MATERIALS THAT ARE NEW, OF THE BEST OF THEIR RESPECTIVE KINDS, WITHOUT IMPERFECTIONS OR BLEMISHES, AND PROTECTED FROM THE ELEMENTS PRIOR TO CONSTRUCTION.
- CONTACT THE UTILITY COMPANIES PRIOR TO BEGINNING WORK.
- COMPLY WITH OWNER'S USE OF PREMISES AND SAFETY REGULATIONS.
- SECURE ALL PERMITS REQUIRED FOR ELECTRICAL WORK. SCHEDULE INSPECTIONS OF THE ELECTRICAL SYSTEMS. ELECTRICAL INSPECTIONS WILL BE PERFORMED BY THE AUTHORITIES HAVING JURISDICTION.
- ALL EXISTING ELECTRICAL SYSTEMS (INCLUDING LIGHTING, POWER, SECURITY, FIRE ALARM, AND EMERGENCY) MUST REMAIN OPERATIONAL. COORDINATE AND SCHEDULE ALL REQUIRED OUTAGES WITH CONSTRUCTION MANAGER WITH A MINIMUM OF 14 DAYS ADVANCE NOTICE. CONFIRM WITH CONSTRUCTION MANAGER ALL CONDITIONS/INSTANCES WHERE EXISTING EQUIPMENT WILL BE REQUIRED TO BE DE-ENERGIZED TO MAKE NEW CONNECTIONS. THIS APPLIES TO ALL ELECTRICAL EQUIPMENT. CONFIRMATION SHALL INCLUDE THE PROPER PROCEDURES (ADMINISTRATIVE AND SAFETY) REQUIRED TO COORDINATE AND SCHEDULE WITH CONSTRUCTION MANAGER ALL REQUIRED POWER OUTAGES.
- FIELD VERIFY DEMOLITION REQUIREMENTS AND EXISTING CONDITIONS.
- THE DRAWINGS DO NOT INDICATE PULL/SPLICE BOXES. INSTALL BOXES TO MEET JOB CONDITIONS AND NEC REQUIREMENTS.
- COORDINATE ALL DEVICE LOCATIONS WITH OWNER'S FINAL EQUIPMENT LAYOUT, FURNITURE LAYOUT, CABINET LAYOUT, ETC. PRIOR TO ROUGH-IN.
- CENTER EQUIPMENT OR DEVICES LOCATED ABOVE OPENINGS SUCH AS DOORS, LOUVERS, ETC. ABOVE THE OPENING. THIS NOTE REFERS TO, BUT IS NOT LIMITED TO, EXIT LIGHTS, EXTERIOR LIGHT FIXTURES OVER REQUIRED MEANS OF EXIT DISCHARGE, ETC.
- COORDINATE LOCATIONS OF ALL ELECTRICAL EQUIPMENT AND LOCATION/ROUTING OF ALL ELECTRICAL FEEDERS (AND ASSOCIATED PULLBOXES) AND BRANCH CIRCUITS WITH ALL OTHER UTILITIES (EXISTING AND NEW), WITH STRUCTURE, AND WITH BUILDING ELEMENTS.
- UNLESS NOTED OTHERWISE, EVERY CONDUIT CONTAINING 120V OR GREATER WIRING SHALL CONTAIN A SEPARATE INSULATED GROUND WIRE RATED FOR 600V.
- PROVIDE SEPARATE UNSHARED NEUTRAL CONDUCTOR(S) FOR ALL BRANCH CIRCUITS UTILIZING A NEUTRAL (I.E. 120V, 277V, ETC.). PROVIDE SEPARATE UNSHARED NEUTRAL CONDUCTOR(S) FOR ALL FEEDERS REQUIRING A NEUTRAL (I.E. 1 PHASE-3 WIRE, 3 PHASE-4 WIRE FEEDERS). SHARING OF NEUTRAL CONDUCTORS BETWEEN ANY CIRCUIT (BRANCH OR FEEDER) IS NOT PERMITTED. MULTI-WIRE BRANCH CIRCUITS ARE NOT PERMITTED.
- PROVIDE STRUCTURAL FRAME SUPPORTS AS REQUIRED FOR DISCONNECT SWITCHES, MOTOR STARTERS, PANELBOARDS, TRANSFORMERS, CONTACTORS, ETC. (IF DISCONNECT SWITCHES OR STARTERS ARE LOCATED ON EQUIPMENT HOUSINGS, COORDINATE LOCATIONS WITH EQUIPMENT SUPPLIER TO ENSURE SWITCHES/STARTERS ARE NOT INSTALLED ON EQUIPMENT ACCESS PANELS). MAINTAIN PROPER NATIONAL ELECTRICAL CODE CLEARANCES. IN ADDITION, MAINTAIN PROPER MECHANICAL WORKING CLEARANCES FOR SERVICING OF EQUIPMENT.
- UNLESS INDICATED OTHERWISE, PROVIDE ALL REQUIRED EQUIPMENT CONNECTIONS. THIS INCLUDES WIRING AND CONDUIT FROM LOCAL DISCONNECTING MEANS TO MOTOR TERMINALS OF ALL EQUIPMENT (GENERAL CONSTRUCTION, HVAC, PLUMBING, FIRE PROTECTION, OWNER FURNISHED EQUIPMENT, ETC.).
- COORDINATE ROOF PENETRATIONS FOR MECHANICAL EQUIPMENT WITH WORK OF MECHANICAL CONTRACT.
- REFER TO ARCHITECTURAL AND STRUCTURAL DRAWINGS FOR LOCATIONS OF ALL BUILDING EXPANSION JOINTS. PROVIDE CONDUIT EXPANSION-JOINT FITTINGS AS SPECIFIED.
- PROVIDE UNSWITCHED HOT CONDUCTOR TO ALL EXIT SIGNS (LIFE SAFETY NORMAL EMERGENCY APPLICATIONS). UNLESS INDICATED OTHERWISE, PROVIDE (2)#12, (1)#12G-3/4" C TO EACH EXIT SIGN.
- UNLESS INDICATED OTHERWISE, CONNECT EMERGENCY BATTERY PACKS TO THE NORMAL LIGHTING CIRCUIT LOCATED IN THE SAME SPACE AS THE BATTERY PACKS. CONNECT BATTERY PACKS AHEAD OF SWITCHING, UNLESS INDICATED OTHERWISE, WIRING AND CONDUIT SHALL CONSIST OF (2)#12, (1)#12G-3/4" C.
- 12VDC WIRING FROM ALL EMERGENCY BATTERY PACKS TO ASSOCIATED REMOTE HEADS SHALL BE A MINIMUM OF (2)#12 AWG IN 3/4" CONDUIT (FROM EMERGENCY BATTERY PACK TO END DEVICE). FURNISH AND INSTALL INCREASED CONDUCTOR SIZES AS REQUIRED TO MAINTAIN 4 PERCENT VOLTAGE DROP OVER ENTIRE CIRCUIT LENGTH (FROM EMERGENCY BATTERY PACK TO END DEVICE). INCREASE CONDUIT SIZE AS REQUIRED FOR INCREASED CONDUCTOR SIZES. USE THE FOLLOWING FORMULA TO CALCULATE PERCENT VOLTAGE DROP FOR DC SYSTEM:

$$\%VD = \frac{22 \times I \times W \times 100}{CM \times V^2}$$

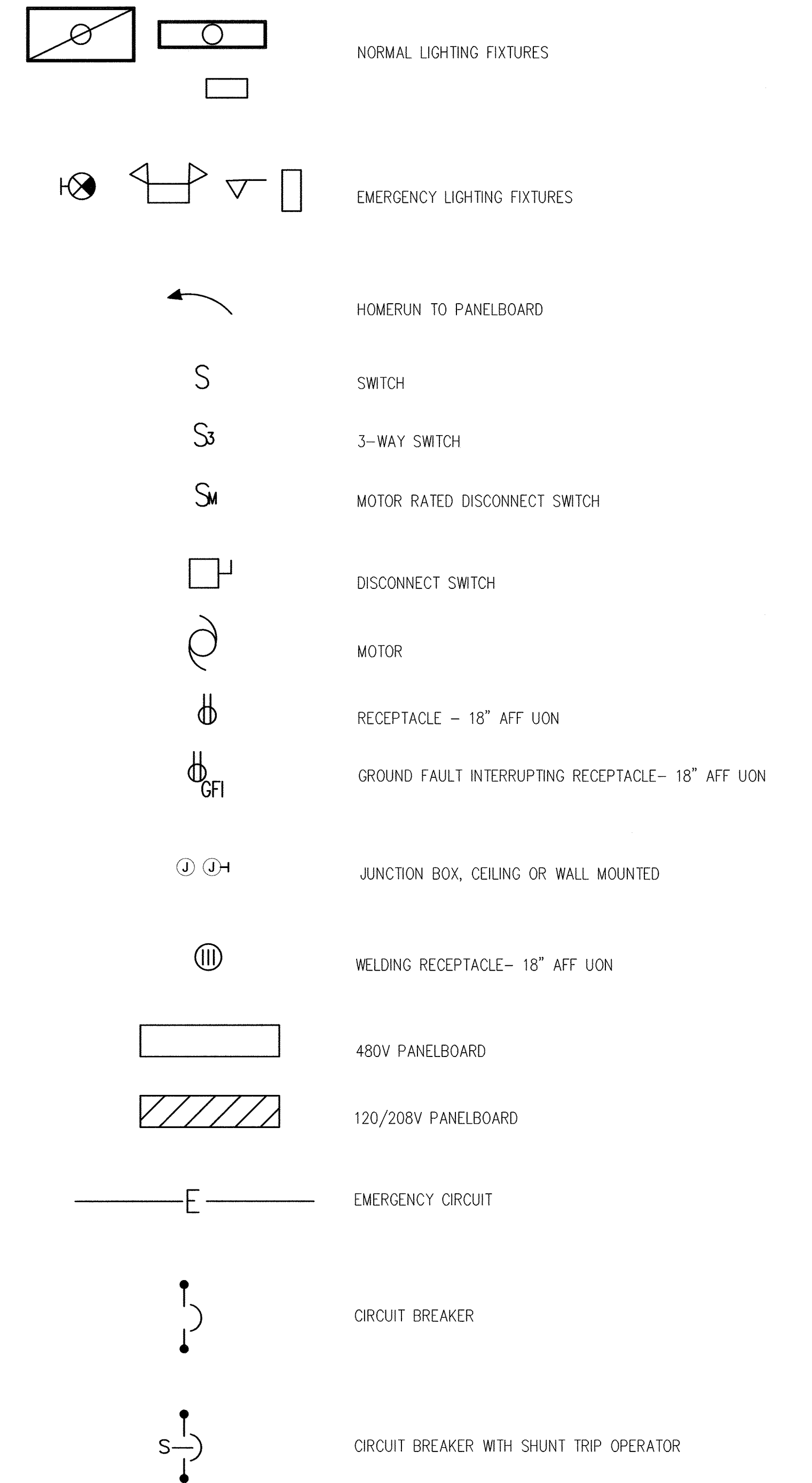
%VD = PERCENT VOLTAGE DROP
 L = CIRCUIT LENGTH IN FEET
 W = LOAD IN WATTS
 V = VOLTAGE OF HEADS
- SIZE SUPPORTS FOR MULTIPLE RACEWAY INSTALLATIONS SO CAPACITY CAN BE INCREASED BY A MINIMUM 25 PERCENT IN THE FUTURE OR GREATER AS INDICATED.
- PAINT ALL PLYWOOD BACKBOARDS (MINIMUM 2 COATS FIRE RETARDANT PAINT) TO MATCH WALL FINISH.
- CONFIRM ALL EQUIPMENT LOCATIONS AND PLUG TYPES PRIOR TO RECEPTACLE INSTALLATION. PROVIDE RECEPTACLE TYPES TO MATCH PLUG TYPES AND NEMA CONFIGURATION. THIS INCLUDES THE USE OF TWISTLOCK DEVICES.
- CONFIRM ALL WIRING DEVICE, DATA/VOICE BOXES, AND OWNER EQUIPMENT LOCATIONS PRIOR TO COMMENCING WORK.
- SUPPORT ALL LOW VOLTAGE CABLING ABOVE ACCESSIBLE CEILINGS WITH J-HOOKS SPACED AT MAXIMUM 4'-0" INTERVALS.

- INCLUDE THE FOLLOWING ADDITIONAL EQUIPMENT AND DEVICES IN THE COST FOR THE PROJECT FOR INSTALLATION AS DIRECTED BY AUTHORITY HAVING JURISDICTION REVIEW: UNIVERSAL EXIT SIGNS - FIVE (5) OF EACH STYLE FIRE ALARM HORN/STROBE - FIVE (5)
- PROVIDE ALL CUTTING, PATCHING, AND ACCESS PANELS REQUIRED FOR ELECTRICAL WORK. REPAIR AND REFINISH DISTURBED FINISH MATERIALS AND OTHER SURFACES TO MATCH ADJACENT UNDISTURBED SURFACES.
- ALL EXISTING OR NEW EXPOSED CONDUIT SHALL BE PAINTED THE SAME COLOR OF THE CEILING OR WALL. CONTRACTOR SHALL COORDINATE WITH ARCHITECTURAL PLANS FOR PROPER PAINT COLORS.
- WHERE EXISTING CONSTRUCTION ALLOWS WALLS TO BE "FISHED," INSTALL WIRING CONCEALED IN WALL CONSTRUCTION WITH CONDUIT. WHERE EXISTING CONSTRUCTION DOES NOT ALLOW WALLS TO BE "FISHED," AND WHERE SPECIFICALLY APPROVED BY THE ENGINEER, SURFACE METAL RACEWAY MAY BE UTILIZED TO EXTEND WIRING FROM THE SURFACE MOUNTED DEVICE VERTICALLY TO ABOVE ACCESSIBLE CEILING. WHERE SURFACE METAL RACEWAY IS UTILIZED, PROVIDE COMPATIBLE OUTLET BOXES BY THE SAME MANUFACTURER AS THE SURFACE METAL RACEWAY.

ELECTRICAL ABBREVIATIONS

A	- AMPERE
ACI	- AMERICAN CONCRETE INSTITUTE
AFF	- ABOVE FINISHED FLOOR
AHJ	- ABOVE FINISHED GRADE
AIC	- AUTHORITY HAVING JURISDICTION
ANSI	- AMPERE INTERRUPTING CAPACITY
APPROX	- AMERICAN NATIONAL STANDARDS INSTITUTE
AUX	- APPROXIMATE
AVG	- AUXILIARY
AWG	- AVERAGE
BOT	- AMERICAN WIRE GAUGE
C	- BOTTOM
CB	- CENTERLINE
CKT	- CONDUIT
COMPR	- CIRCUIT BREAKER
CR	- CIRCUIT
DB	- COMPRESSOR
DIA	- CONTROL RELAY
DISC	- DIRECT BURIED, DRY BULB
DW	- DIAMETER
DWG	- DISCONNECT
EC	- DOWN
EF	- DRAWING
EMT	- ELECTRICAL CONTRACTOR
ENT	- EXHAUST FAN
ETR	- ELECTRICAL METALLIC TUBING
EWT	- ENTERING
EX	- EXISTING TO REMAIN
FDR	- ENTERING WATER TEMPERATURE
FLA	- EXISTING
FSS	- FEEDER
FT	- FULL LOAD AMPS
G, GND, GRD, GRN	- FUSED SAFETY SWITCH
GA	- FEET
GALV	- GROUND
GE	- GAGE, GAUGE
GEC	- GALVANIZED
GFI	- GENERAL ELECTRIC
GFCI	- GROUNDING ELECTRODE CONDUCTOR
H-0-A	- GROUND FAULT INTERRUPTING
HP	- GROUND FAULT CURRENT INTERRUPTING
HVAC	- HAND-OFF-AUTOMATIC SWITCH
HZ	- HEAT PUMP, HORSE POWER
JB	- HEATING, VENTILATION, AND AIR CONDITIONING
KCM	- HERTZ
KVA	- JUNCTION BOX
KW	- THOUSAND CIRCULAR MILS
LF	- KILOVOLT AMPERES
LG	- KILOWATT
MAX	- LINEAR FEET
MC	- LENGTH
MCP	- MAXIMUM
MH	- MECHANICAL CONTRACTOR
MIN	- MECHANICAL, ELECTRICAL, AND PLUMBING
MS	- MOUNTING HEIGHT
MTD	- MINIMUM MINUTE
MTR	- MAIN SWITCHGEAR, MOTOR STARTER
<N>	- MOUNTED
NEC	- MOTOR
NC	- NEW
NEMA	- NATIONAL ELECTRICAL CODE
NF	- NORMALLY CLOSED, NOISE CRITERIA
NFPA	- NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
NFSS	- NON-FUSED
NO	- NATIONAL FIRE PROTECTION ASSOCIATION
NTS	- NON-FUSED SAFETY SWITCH
OC	- NORMALLY OPEN, NUMBER
OH	- NOT TO SCALE
OZ	- ON CENTER
PH	- OVERHEAD
PNL	- OCCUPATIONAL SAFETY AND HEALTH ASSOCIATION
POC	- OUNCE
PVC	- PURGE, PUMP
QTY	- PHASE
RGS	- PANEL
RX	- POINT OF CONNECTION
SCH	- POLYVINYLCHLORIDE DUCT (SIZE NOTED)
SECT	- QUANTITY
SST	- RIGID GALVANIZED STEEL
STL	- REMOVE EXISTING
SW	- SCHEDULE
SYM	- SECTION
THK	- STAINLESS STEEL
TTB	- STEEL
TVSS	- SWITCH, SOCKET WELD
TYP	- SYMMETRICAL
UDS	- THICK(NESS)
UF	- TELEPHONE TERMINAL BOARD
UC	- TRANSIENT VOLTAGE SURGE SUPPRESSOR
UL	- TYPICAL
UON	- UTILITY DISTRIBUTION SYSTEM
V	- UNDERFLOOR
VA	- UNDERGROUND
W	- UNDERWRITERS LABORATORIES, INC.
W/	- UNLESS OTHERWISE NOTED
WP	- VOLT
XFMR	- VOLT AMPERE
	- WIRE, WATT
	- WITH
	- WEATHERPROOF EQUIPMENT
	- TRANSFORMER

ELECTRICAL SYMBOLS



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Oct 11, 2016 - 8:10am User: d46c-huabho V:\projects\2017\01071317\01071317.dwg Electrical in Acad B:\24-2015\01071317\01071317.dwg

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

[Signature] 2/13/17
DIRECTOR OF PUBLIC WORKS DATE

[Signature] 2/13/17
CHIEF, BUREAU OF ENGINEERING DATE

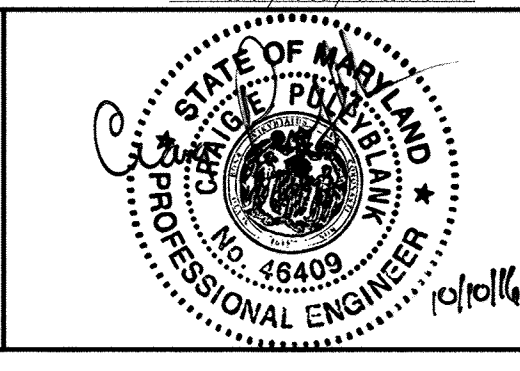
[Signature] 2/13/17
CHIEF, UTILITY DESIGN DIVISION DATE

[Signature] 2/13/17
CHIEF, BUREAU OF UTILITIES DATE

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TELEPHONE: (410) 316-7800
FAX: (410) 316-7818
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DES: SB					
DRN: SB					
CHK: CEP					
DATE: AUG, 2016	BY	NO.	REVISION	DATE	

ELECTRICAL GENERAL
NOTES, SYMBOLS
AND ABBREVIATIONS

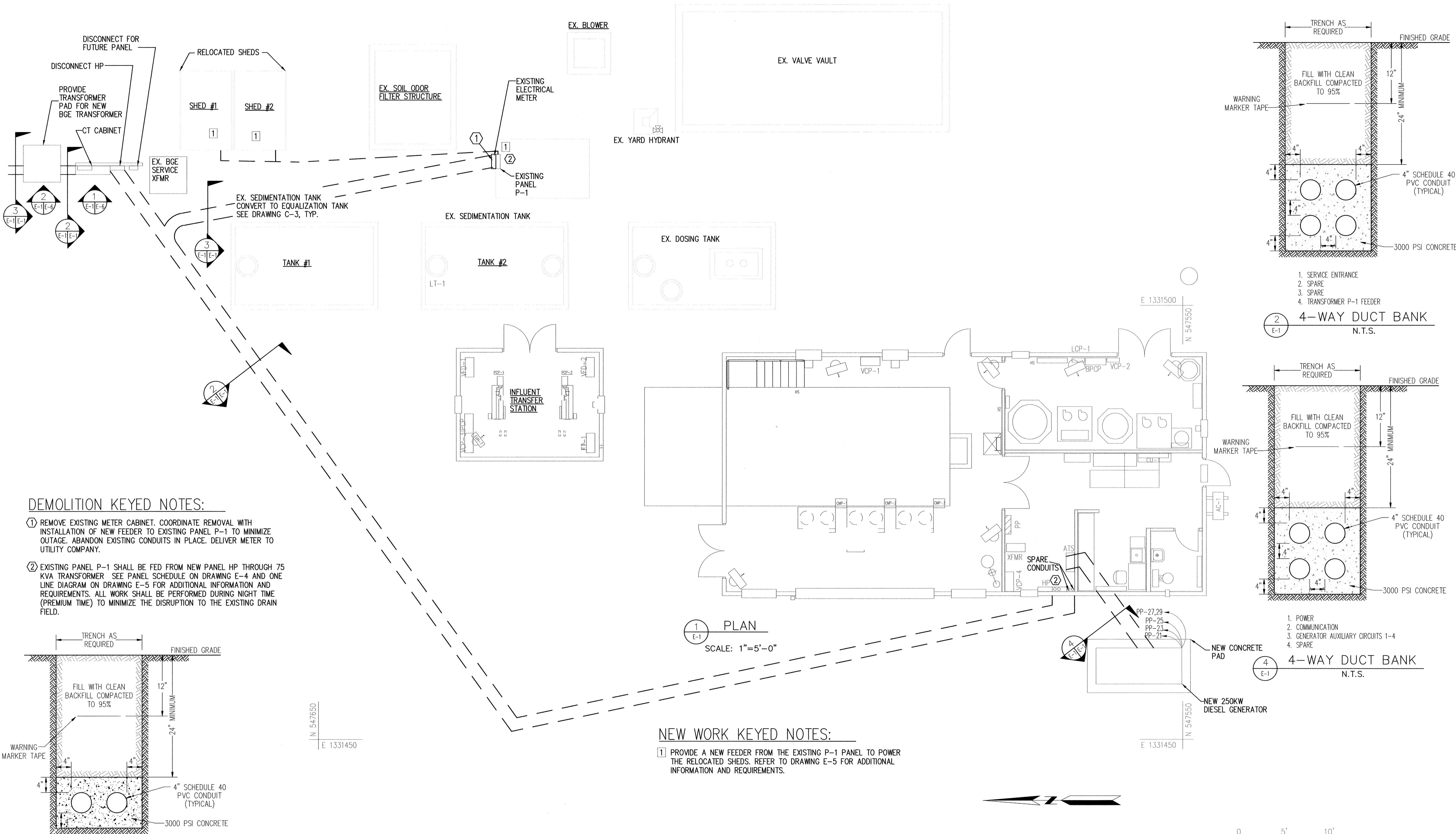
600' SCALE MAP NO. 40-41 BLOCK NO. 12

ASHLEIGH KNOLLS
SHARED SEWAGE DISPOSAL FACILITY

CAPITAL PROJECT No. S-6269
CONTRACT No. 50-4972

ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

E-0
SCALE
AS SHOWN
SHEET
24 of 43



DEMOLITION KEYED NOTES:

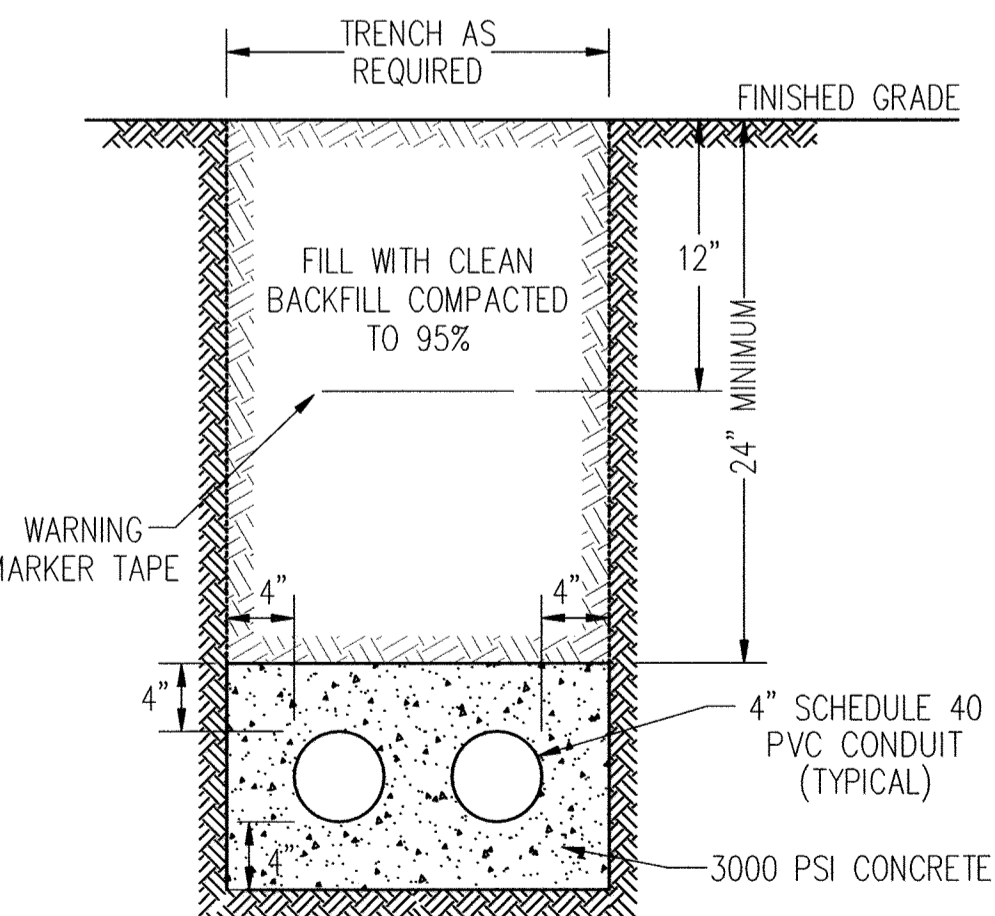
- ① REMOVE EXISTING METER CABINET. COORDINATE REMOVAL WITH INSTALLATION OF NEW FEEDER TO EXISTING PANEL P-1 TO MINIMIZE OUTAGE. ABANDON EXISTING CONDUITS IN PLACE. DELIVER METER TO UTILITY COMPANY.
- ② EXISTING PANEL P-1 SHALL BE FED FROM NEW PANEL HP THROUGH 75 KVA TRANSFORMER. SEE PANEL SCHEDULE ON DRAWING E-4 AND ONE LINE DIAGRAM ON DRAWING E-5 FOR ADDITIONAL INFORMATION AND REQUIREMENTS. ALL WORK SHALL BE PERFORMED DURING NIGHT TIME (PREMIUM TIME) TO MINIMIZE THE DISRUPTION TO THE EXISTING DRAIN FIELD.

NEW WORK KEYED NOTES:

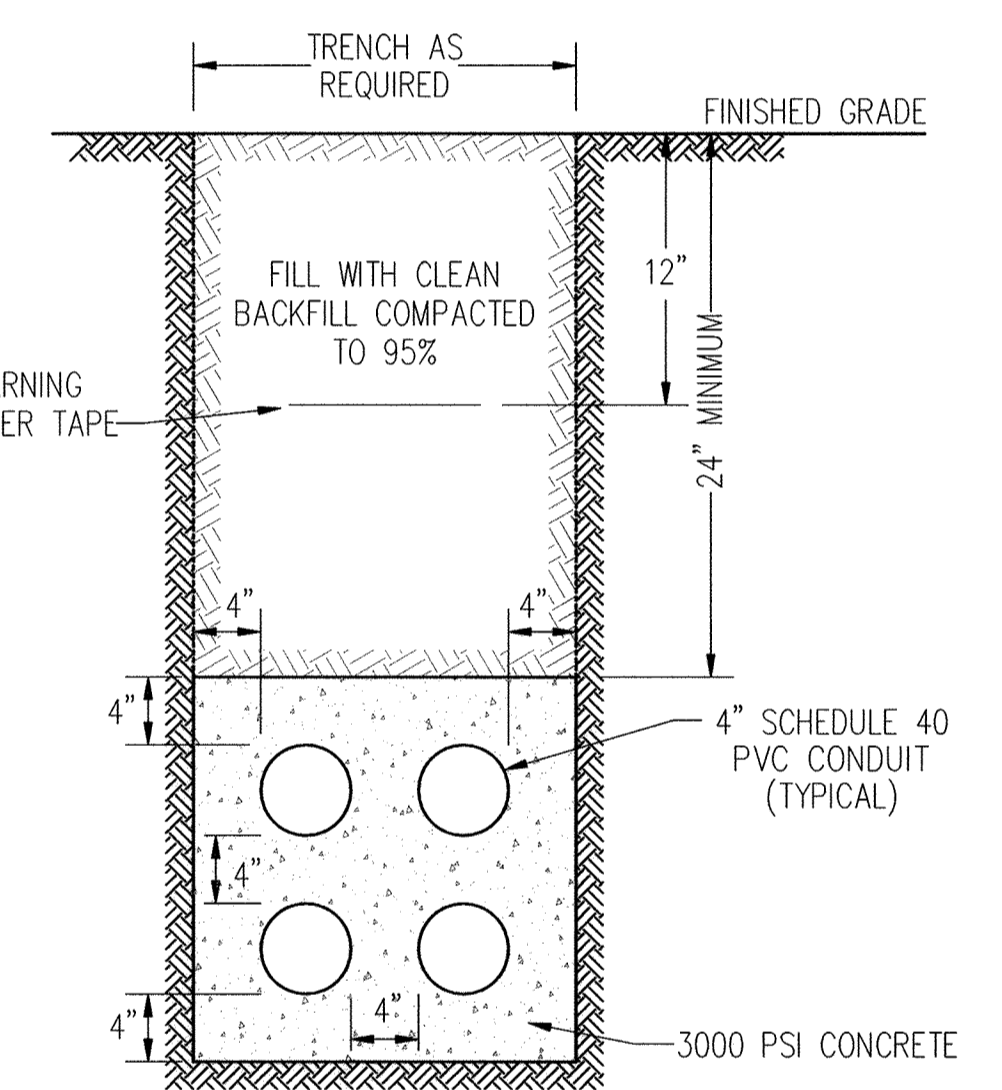
- ① PROVIDE A NEW FEEDER FROM THE EXISTING P-1 PANEL TO POWER THE RELOCATED SHEDS. REFER TO DRAWING E-5 FOR ADDITIONAL INFORMATION AND REQUIREMENTS.

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Oct 11, 2016 - 7:59am User: Ashli.Wartha
 MA:2007.010713786.00 Drawings/Electrical in Acad - 24-2015.0107137866_E-001 Site Electrical.dwg



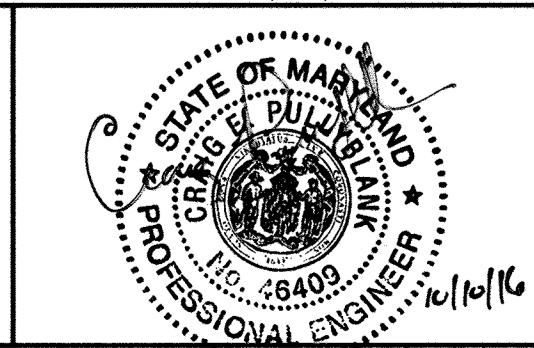
③ 2-WAY DUCT BANK
N.T.S.



④ 4-WAY DUCT BANK
N.T.S.

DEPARTMENT OF PUBLIC WORKS
 HOWARD COUNTY, MARYLAND
 Director of Public Works: [Signature] DATE: 2/17/17
 Chief, Bureau of Utilities: [Signature] DATE: 2/17/17
 Chief, Utility Design Division: [Signature] DATE: 2/17/17

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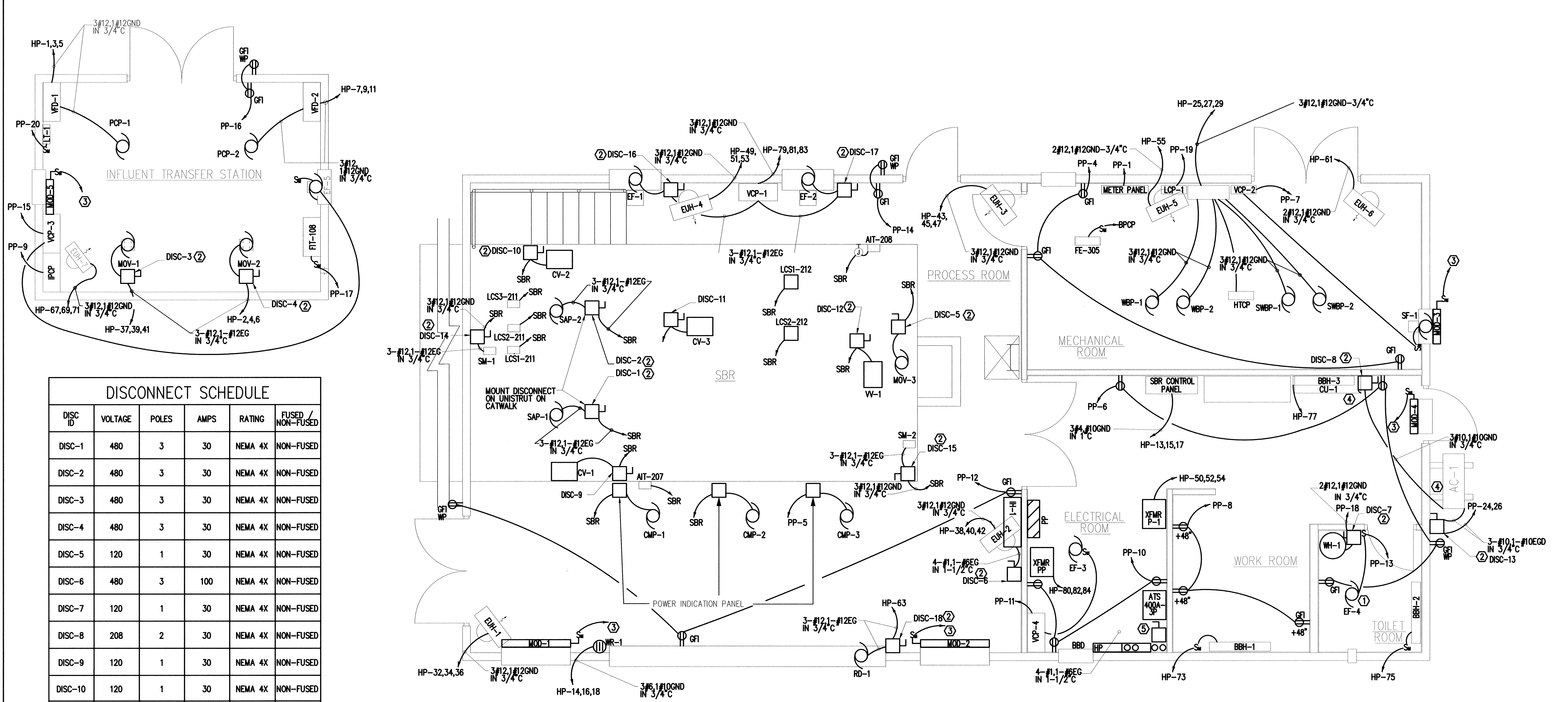


DES: SB	DATE: AUG, 2016
DRN: SB	BY: NO.
CHK: CEP	REVISION
DATE: AUG, 2016	DATE: 600' SCALE MAP NO. 40-41 BLOCK NO. 12

SITE ELECTRICAL PLAN

ASHLEIGH KNOLLS
 SHARED SEWAGE DISPOSAL FACILITY
 CAPITAL PROJECT No. S-6269
 CONTRACT No. 50-4972
 ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

E-1
SCALE AS SHOWN
SHEET 25 OF 43

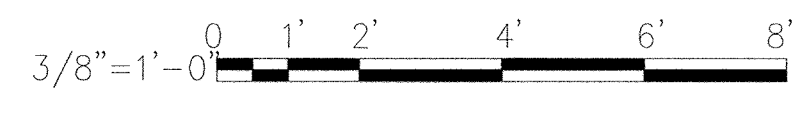


DISCONNECT SCHEDULE					
DISC ID	VOLTAGE	POLES	AMPS	RATING	FUSED / NON-FUSED
DISC-1	480	3	30	NEMA 4X	NON-FUSED
DISC-2	480	3	30	NEMA 4X	NON-FUSED
DISC-3	480	3	30	NEMA 4X	NON-FUSED
DISC-4	480	3	30	NEMA 4X	NON-FUSED
DISC-5	120	1	30	NEMA 4X	NON-FUSED
DISC-6	480	3	100	NEMA 4X	NON-FUSED
DISC-7	120	1	30	NEMA 4X	NON-FUSED
DISC-8	208	2	30	NEMA 4X	NON-FUSED
DISC-9	120	1	30	NEMA 4X	NON-FUSED
DISC-10	120	1	30	NEMA 4X	NON-FUSED
DISC-11	120	1	30	NEMA 4X	NON-FUSED
DISC-12	120	1	30	NEMA 4X	NON-FUSED
DISC-13	208	2	60	NEMA 4X	NON-FUSED
DISC-14	480	3	30	NEMA 4X	NON-FUSED
DISC-15	480	3	30	NEMA 4X	NON-FUSED
DISC-16	480	3	30	NEMA 4X	NON-FUSED
DISC-17	480	3	30	NEMA 4X	NON-FUSED
DISC-18	480	3	30	NEMA 4X	NON-FUSED

GENERAL NOTES:
 1. REFER TO SHEET E-0 FOR ADDITIONAL INFORMATION.
 2. ALL RACEWAYS: 2-#12, 1#12GND, IN 3/4" C, UNLESS OTHERWISE NOTED.

KEYED NOTES:
 ① CONNECT EXHAUST FAN EF-4 TO NEAREST SWITCH VIA A RELAY.
 ② SEE DISCONNECT SCHEDULE FOR SIZING INFORMATION.
 ③ 2#12,1#12G -3/4" C. TO VCP CONTROL PANEL.
 ④ CU-1 SHALL BE FED FROM AC-1, PROVIDE WIRING IN CONDUIT AS PER MANUFACTURER'S RECOMMENDATION.
 ⑤ PROVIDE A 200A FRAME 125A FUSED DISCONNECT SWITCH TO FEED EQUIPMENT IN-1 PROVIDE A JUNCTION BOX AS NECESSARY TO TAP THE NORMAL FEEDER ENTERING THE BUILDING PRIOR TO NORMAL LUGS OF THE TRANSFER SWITCH, REFER TO ONE LINE DIAGRAM ON DRAWING E-5 FOR ADDITIONAL INFORMATION.

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

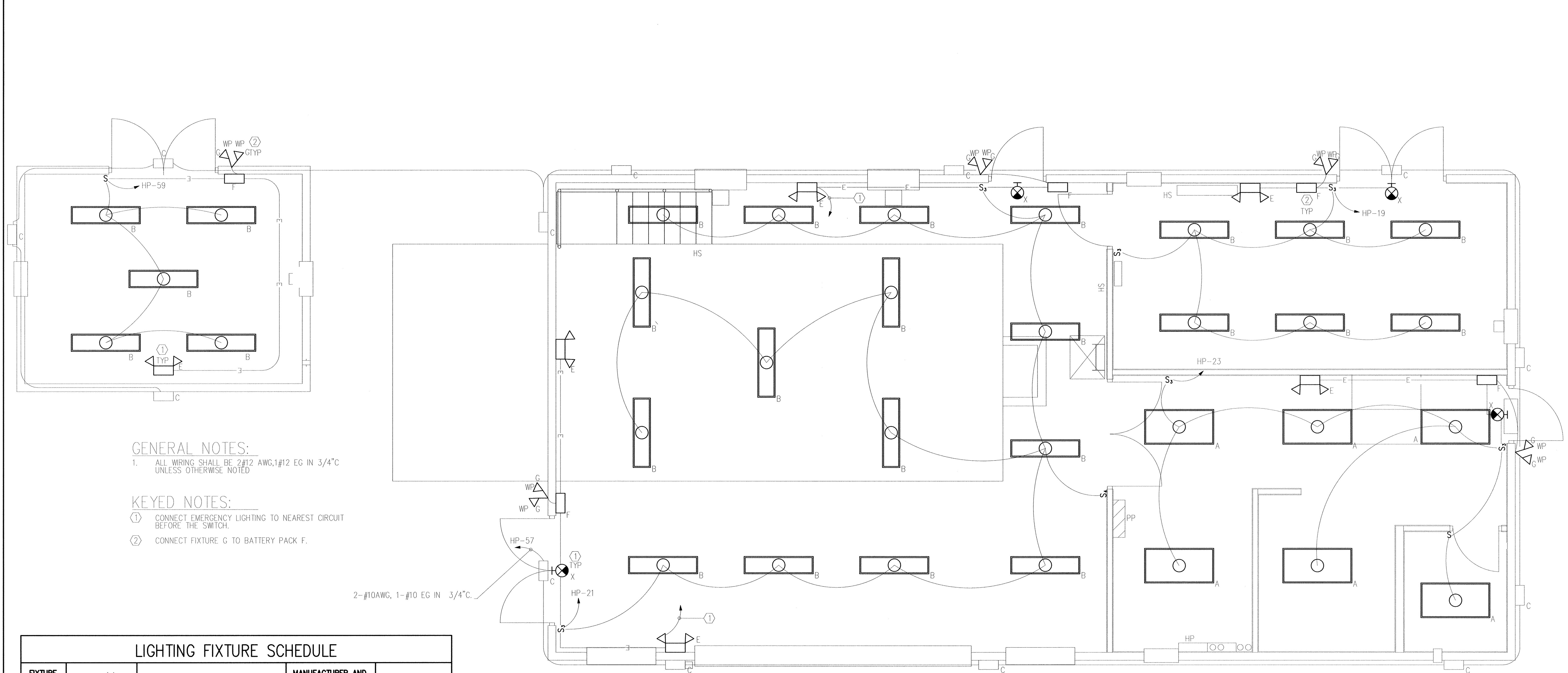


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Oct 11, 2016 - 8:27am User: Ashleigh Knolls MA2007.0107.376.05.D:\mwp\g\electrical\in Acad 6-24-2015\0107.37600_E-002_Power Layout.dwg

DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND		ENGINEERS PLANNERS SCIENTISTS CONSTRUCTION MANAGERS 936 RIDGEBROOK ROAD SIMES, MARYLAND 21152 TELEPHONE: (410) 316-7800 FAX: (410) 316-7818 www.kci.com	DES: SB DRN: SB CHK: CEP DATE: AUG, 2016	BY NO. _____ REVISION _____ DATE _____	600' SCALE MAP NO. 40-41 BLOCK NO. 12	ASHLEIGH KNOLLS SHARED SEWAGE DISPOSAL FACILITY CAPITAL PROJECT No. S-6269 CONTRACT No. 50-4972 ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND	SCALE AS SHOWN SHEET 26 OF 43
DATE 2/17/17 CHIEF, BUREAU OF UTILITIES	DATE 2/17/17 CHIEF, UTILITY DESIGN DIVISION						

E-2



GENERAL NOTES:

- 1. ALL WIRING SHALL BE 2#12 AWG, #12 EG IN 3/4" C UNLESS OTHERWISE NOTED

KEYED NOTES:

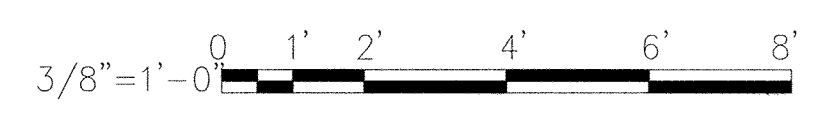
- ① CONNECT EMERGENCY LIGHTING TO NEAREST CIRCUIT BEFORE THE SWITCH.
- ② CONNECT FIXTURE G TO BATTERY PACK F.

2-#10AWG, 1-#10 EG IN 3/4" C.

LIGHTING FIXTURE SCHEDULE

FIXTURE ID	LAMP(S)	DESCRIPTION	MANUFACTURER AND CATALOG NUMBER	MTD
A	(3) 32-WATT FLUORESCENT TB	2'X4' RECESSED, 3 LAMP, A12 LENS, ELECTRONIC BALLAST	LITHONIA 2SP8 G 3 32 A12 277 GEB10IS	9'-0" GRID MTD
B	(2) 32-WATT FLUORESCENT TB	4' WET LOCATION ENCLOSURE, 2 LAMP 50% DR HIGH ACRYLIC LENS	LITHONIA DMW 2 32 277 GEB10IS	13'-0" AFF PENDANT MTD
C	LED	WALL MOUNTED EXTERIOR BUILDING LIGHT WITH INTEGRAL PHOTOCELL	LITHONIA TRIPLED 10C 700 50K T3M 277 PE DDBXD	9'-0" AFG WALL MTD
E	(2) 12-WATT INCANDESCENT	EMERGENCY LIGHTING WITH BATTERY BACKUP	LITHONIA TITAN ELT125	13'-0" AFF WALL MTD
F	NONE	BATTERY PACK FOR REMOTE HEADS	LITHONIA TITAN ELT125 RO H1212	13'-0" AFF WALL MTD
G	(1) 12V 12-WATT PAR36	EMERGENCY REMOTE HEAD	LITHONIA ELA NX H1212	9'-0" AFG WALL MTD
X	RED LED	RED LED EXIT SIGN WITH BATTERY BACKUP	LITHONIA EXR EL M6	10'-0" AFF WALL MTD

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



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Oct 11, 2016 - 8:27am User: aehp\mshelton M:\2007\01071376\06\Drawings\Electrical in Acad 6-24-2015\0107137600_E-003 Lighting Layout.dwg

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

James D. ... 2/17
DIRECTOR OF PUBLIC WORKS DATE

Thomas P. Bullen 2/17
CHIEF, BUREAU OF ENGINEERING DATE

... 2/17
CHIEF, UTILITY DESIGN DIVISION DATE

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936 RIDGEBROOK ROAD
SINNERS, MARYLAND 21152
TELEPHONE: (410) 316-7800
FAX: (410) 316-7818
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DRN: SB					
CHK: CEP					
DATE: AUG, 2016	BY	NO.	REVISION	DATE	

ELECTRICAL LIGHTING
BUILDING LAYOUT

600' SCALE MAP NO. 40-41 BLOCK NO. 12

**ASHLEIGH KNOLLS
SHARED SEWAGE DISPOSAL FACILITY**

CAPITAL PROJECT No. S-6269
CONTRACT No. 50-4972

ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

E-3
SCALE AS SHOWN
SHEET
27 OF 43

PANELBOARD ID		HP	SECT.	1 PROJ. AHSLEIGH KNOLLS			Line /Phase	PANEL ()	POWER & DISTRIBUTION									
LOCATION		ELEC RM	MTG	SURF	MAIN	400A-3P	BUS 400A	VOLTS	480 /277	TYPE: (X)	GROUND BUS							
PROTECTIVE DEVICES		MCB		AIC		65,000		()		ISOLATED GROUND BUS								
FEED-THROUGH LUGS		YES		OPT: SERVICE ENTRANCE RATED.		()		()		INTERGRAL TVSS								
										() 200% NEUTRAL								
DESCRIPTION	REC	LIGHT	VOLT-AMP			BKR		CIR/POLE		CIR/POLE		BKR		VOLT-AMP			REC	DESCRIPTION
VFD-1, PCP-1			A	B	C	AMP	POLE	NUMBER	NUMBER	AMP	POLE	A	B	C	LIGHT	REC	MOV-2	
-			2100	2100		20	3	/1	/2	20	3	134						
-								/3	/4								134	
-								/5	/6								134	
VFD-2, PCP-2			2100			20	3	/7	/8	20	3						SPARE	
-								/9	/10									
-								/11	/12									
SBR			4210			60	3	/13	/14	60	3	15000					WR-1	
-								/15	/16				15000					
-								/17	/18								15000	
MECH RM LIGHTS	L		340			20	1	/19	/20								SPACE	
PROCES LTS	L			851		20	1	/21	/22								SPACE	
ELECT RM LTS	L				255	20	1	/23	/24								SPACE	
BPCP			1911			15	3	/25	/26	20	3						SPACE	
-								/27	/28									
-								/29	/30									
SPARE						20	3	/31	/32	20	3	1662					EUH-1	
-								/33	/34				1662					
-								/35	/36					1662				
MOV-1				134		20	3	/37	/38	20	3	1662					EUH-2	
-								/39	/40				1662					
-					134			/41	/42					1662				

PANELBOARD ID		HP	SECT.	2 PROJ. AHSLEIGH KNOLLS			Line /Phase	PANEL ()	POWER & DISTRIBUTION									
LOCATION		ELEC RM	MTG	SURF	MAIN	MLO	BUS 400A	VOLTS	480 /277	TYPE: (X)	GROUND BUS							
PROTECTIVE DEVICES		MLO						()		ISOLATED GROUND BUS								
								()		INTERGRAL TVSS								
								()		200% NEUTRAL								
DESCRIPTION	REC	LIGHT	VOLT-AMP			BKR		CIR/POLE		CIR/POLE		BKR		VOLT-AMP			REC	DESCRIPTION
EUH-3			A	B	C	AMP	POLE	NUMBER	NUMBER	AMP	POLE	A	B	C	LIGHT	REC	HVAC-1	
-			1662			20	3	/43	/44	20	3	1266						
-								/45	/46					1266				
-								/47	/48								1266	
EUH-4			1662			20	3	/49	/50	125	3	15,000					75KVA XFMR-2, P-1	
-								/51	/52					15000				
-								/53	/54						15000			
EUH-5			2991			20	1	/55	/56	20	1	1755					EXTERIOR LTS	
EXT LTS	L					20	1	/57	/58	20	1		284				UTILITY BLDG LTS	
UTILITY LTS	L					284	20	1	/59	/60							SPACE	
EUH-6			2991			20	1	/61	/62								SPACE	
SPACE								/63	/64								SPACE	
SPACE								/65	/66	20	1						SPACE	
EUH-7			1666			20	3	/67	/68	20	3						SPACE	
-								/69	/70									
-								/71	/72									
BBH-1			1000			20	1	/73	/74	20	3	2105					RD-1 ROLLUP DOOR	
BBH-2						20	1	/75	/76				2105					
BBH-3						20	1	/77	/78					2105				
VCP-1			700			20	3	/79	/80	50	3	9972					30 KVA XFMR-1, PP	
-								/81	/82					9972				
-								/83	/84						9972			

GENERAL NOTES:
 1. CONTRACTOR SHALL OBTAIN AVAILABLE SHORT CIRCUIT CURRENT FROM UTILITY AND VERIFY AIC RATING OF EQUIPMENT PRIOR TO PURCHASING.

PANELBOARD ID		PP	SECT.	PROJ. AHSLEIGH KNOLLS			Line /Phase	PANEL ()	POWER & DISTRIBUTION									
LOCATION		ELEC RM	MTG	SURF	MAIN	100A-3P	BUS	100	VOLTS	208 /120	TYPE: (X)	GROUND BUS						
PROTECTIVE DEVICES		MCB		AIC		22,000		()		ISOLATED GROUND BUS								
								()		INTERGRAL TVSS								
								()		200% NEUTRAL								
DESCRIPTION	REC	LIGHT	VOLT-AMP			BKR		CIR/POLE		CIR/POLE		BKR		VOLT-AMP			REC	DESCRIPTION
METER PANEL			A	B	C	AMP	POLE	NUMBER	NUMBER	AMP	POLE	A	B	C	LIGHT	REC		
CMP-2			120			20	1	/1	/2									
CMP-3						20	1	/3	/4	20	1			540			MECH RM RECPT	
VCP-2			50			20	1	/5	/6	20	1			540			STORAGE RECPT	
VCP-3						20	1	/7	/8	20	1						WORK AERA RECEIPT	
VCP-4						20	1	/9	/10	20	1			540			ELECT. RM RECPT	
EF-4						20	1	/11	/12	20	1						RECEPT.	
IPCPC						20	1	/13	/14	20	1	280					RECEPT.	
FT-1						20	1	/15	/16	20	1			400			RECEPT.	
LCP-1						20	1	/17	/18	20	1			1600			WH-1	
GENERATOR AUXILIARY CIRCUIT 1						20	1	/19	/20	20	1	180					LT-1	
GENERATOR AUXILIARY CIRCUIT 2						20	1	/21	/22	20	1						SPARE	
GENERATOR AUXILIARY CIRCUIT 3						20	1	/23	/24	25	2			2400			AC-1	
GENERATOR AUXILIARY CIRCUIT 4						20	1	/25	/26			2400						
SPARE						40	2	/27	/28	20	1						SPARE	
SPARE								/29	/30	20	1						SPARE	
SPARE						20	1	/31	/32	20	1						SPARE	
SPARE						20	1	/33	/34	20	1						SPARE	
SPARE						20	1	/35	/36	20	1						SPARE	
SPARE						20	1	/37	/38	20	1						SPARE	
SPARE								/39	/40								SPACE	
SPARE								/41	/42								SPACE	

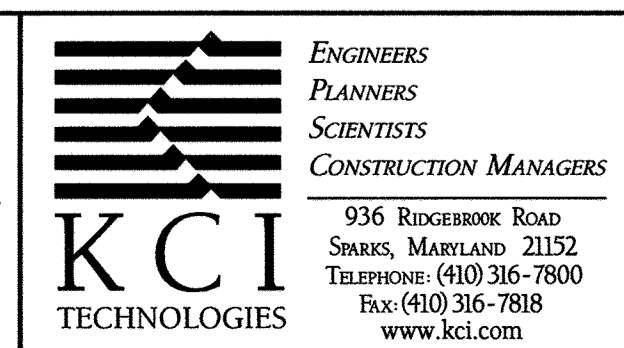
PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 46409 EXPIRATION DATE: 01/23/2017

Oct 11, 2016 - 8:10am User: Admin\muhitza File: V:\2017\01\07\1378\06\Drawings\Invest\Electrical - Access 6-24-2015\01\07\1378\06 - E-004 - Electrical - Details.dwg

DEPARTMENT OF PUBLIC WORKS
 HOWARD COUNTY, MARYLAND

James P. Butler 2/13/17
 CHIEF, BUREAU OF ENGINEERING

James P. Butler 2/13/17
 CHIEF, UTILITY DESIGN DIVISION



DES: SB
 DRN: SB
 CHK: CEP
 DATE: AUG, 2016

ELECTRICAL SCHEDULES

600' SCALE MAP NO. 40-41 BLOCK NO. 12

ASHLEIGH KNOLLS
 SHARED SEWAGE DISPOSAL FACILITY
 CAPITAL PROJECT No. S-6269
 CONTRACT No. 50-4972
 ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

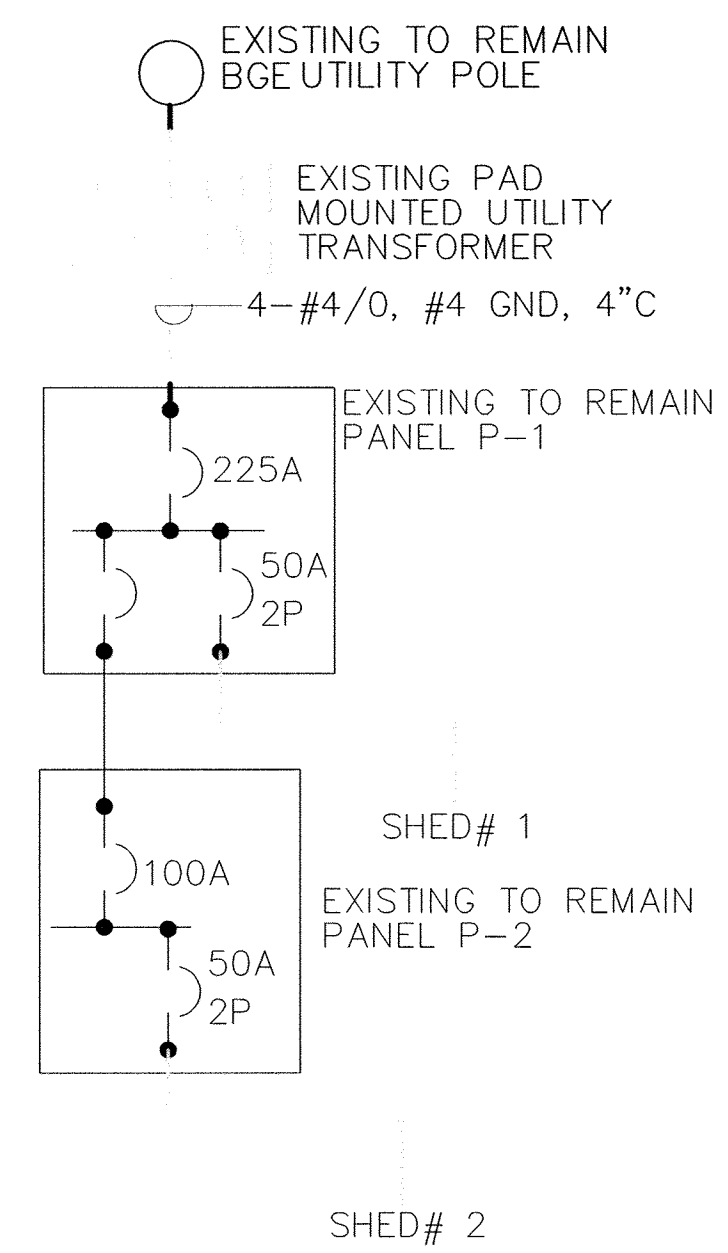
E-4
 SCALE AS SHOWN
 SHEET 28 OF 43

GENERAL NOTES:

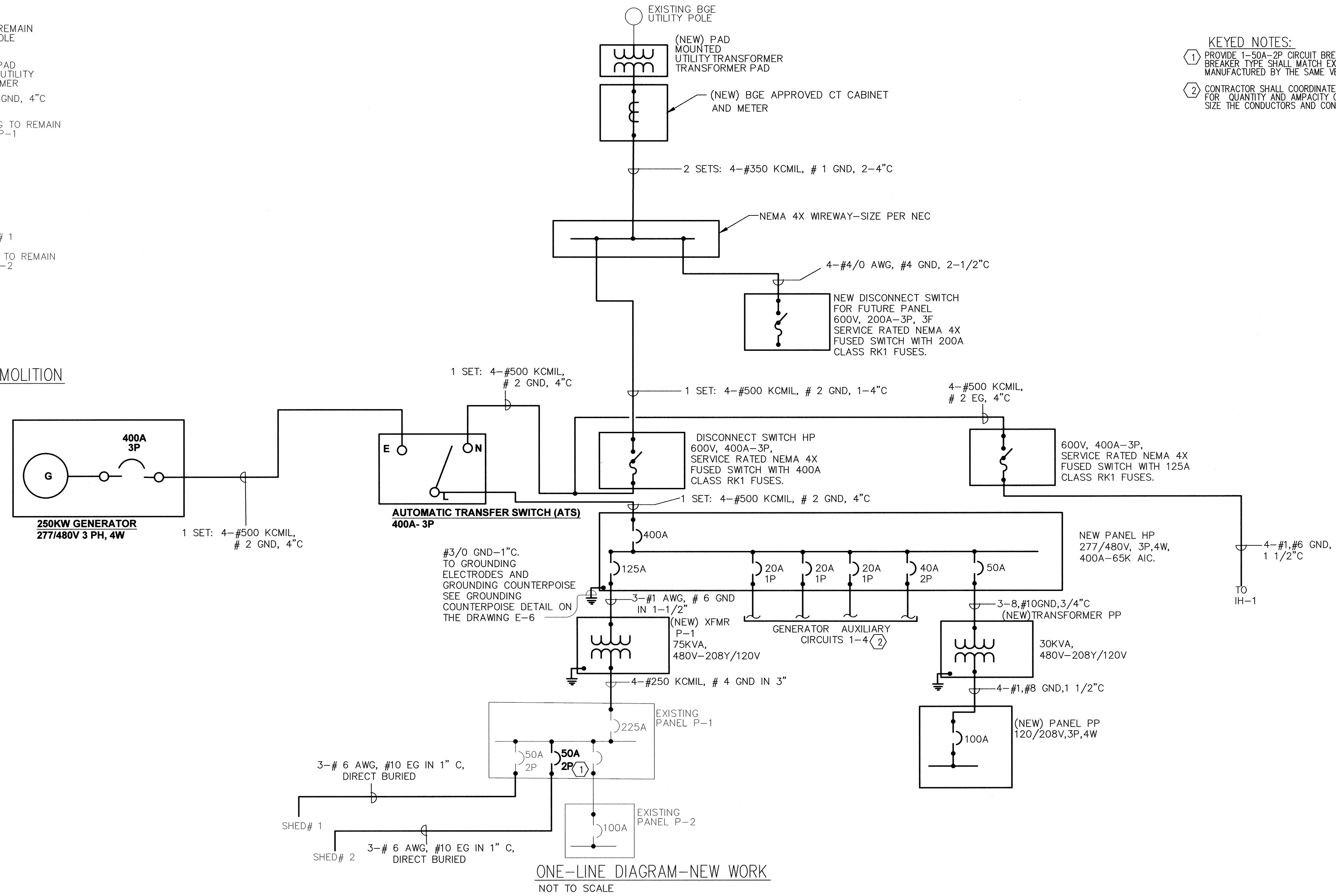
- CONTRACTOR SHALL OBTAIN AVAILABLE SHORT CIRCUIT CURRENT FROM UTILITY AND VERIFY AIC RATING OF EQUIPMENT PRIOR TO PURCHASING.

KEYED NOTES:

- PROVIDE 1-50A-2P CIRCUIT BREAKER IN EXISTING PANEL P-1. NEW BREAKER TYPE SHALL MATCH EXISTING BREAKER A.I.C. RATING AND BE MANUFACTURED BY THE SAME VENDOR AS THE EXISTING PANEL.
- CONTRACTOR SHALL COORDINATE WITH THE GENERATOR MANUFACTURER FOR QUANTITY AND AMPACITY OF THE GENERATOR AUXILIARY CIRCUITS. SIZE THE CONDUCTORS AND CONDUITS AS PER NEC.



ONE-LINE DIAGRAM-DEMOLITION
NOT TO SCALE



ONE-LINE DIAGRAM-NEW WORK
NOT TO SCALE

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Oct 11, 2016 - 8:10am User: Ashleigh Knolls M:\2017\07\1317\Drawings\Electrical - Acad - 24-2016\01\01\1317266_E-005_Electrical_Details.dwg

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

[Signature] 2/17/17
DIRECTOR OF PUBLIC WORKS DATE

[Signature] 2/17/17
CHIEF, BUREAU OF UTILITIES DATE

[Signature] 2/17/17
CHIEF, UTILITY DESIGN DIVISION DATE

ENGINEERS
PLANNERS
SCIENTISTS
CONSTRUCTION MANAGERS

KCI
TECHNOLOGIES

936 RIDGEBROOK ROAD
SHARPS, MARYLAND 21152
TELEPHONE: (410) 316-7800
FAX: (410) 316-7818
www.kci.com

STATE OF MARYLAND
OFFICE OF PROFESSIONAL ENGINEERS
NO. 46409
10/16

DES: SB	DRN: SB	CHK: CEP	DATE: AUG, 2016	BY	NO.	REVISION	DATE	600' SCALE MAP NO. 40-41	BLOCK NO. 12
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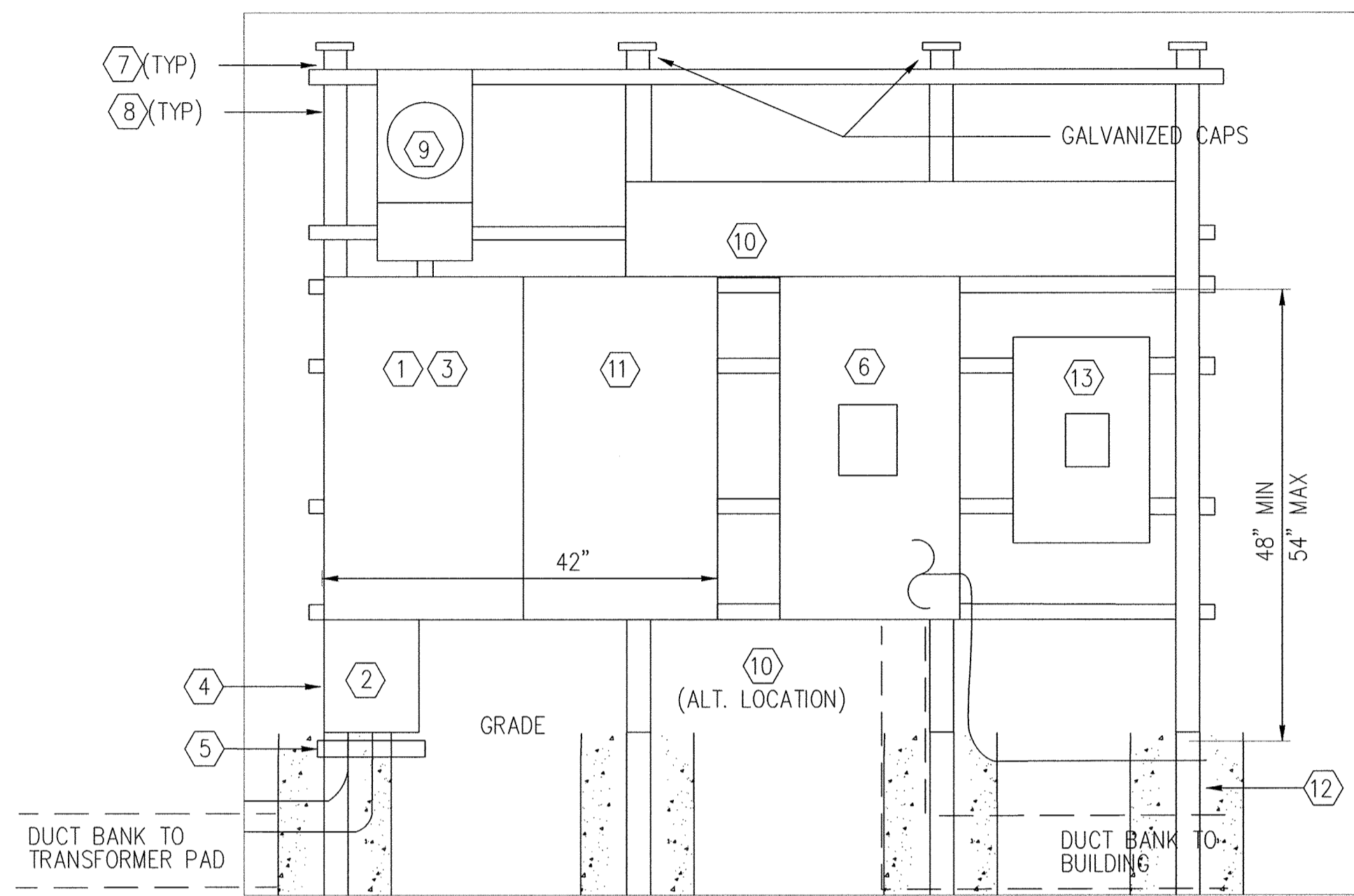
ELECTRICAL
ONE-LINE

ASHLEIGH KNOLLS
SHARED SEWAGE DISPOSAL FACILITY

CAPITAL PROJECT No. S-6269
CONTRACT No. 50-4972

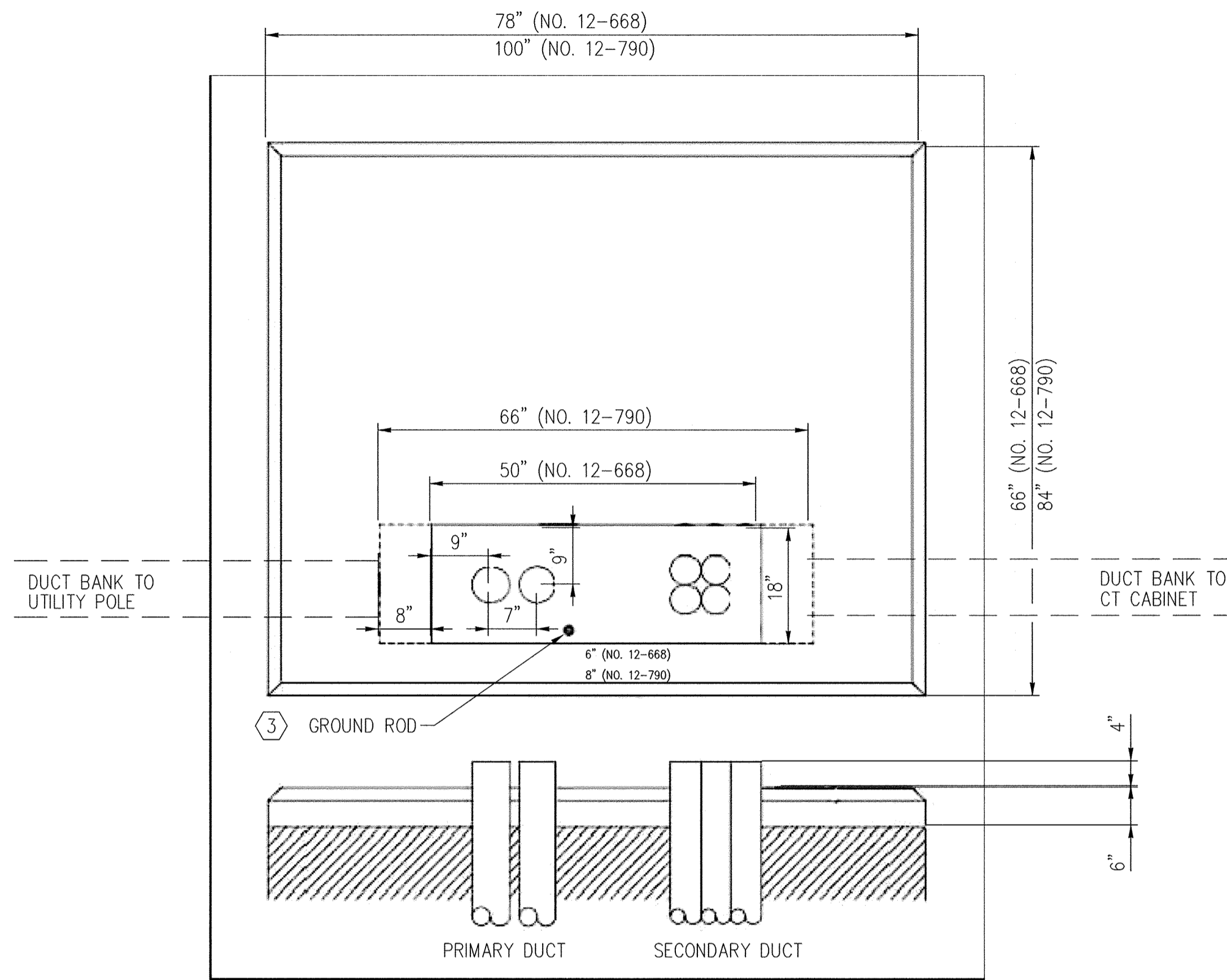
ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

E-5
SCALE AS SHOWN
SHEET 29 OF 43



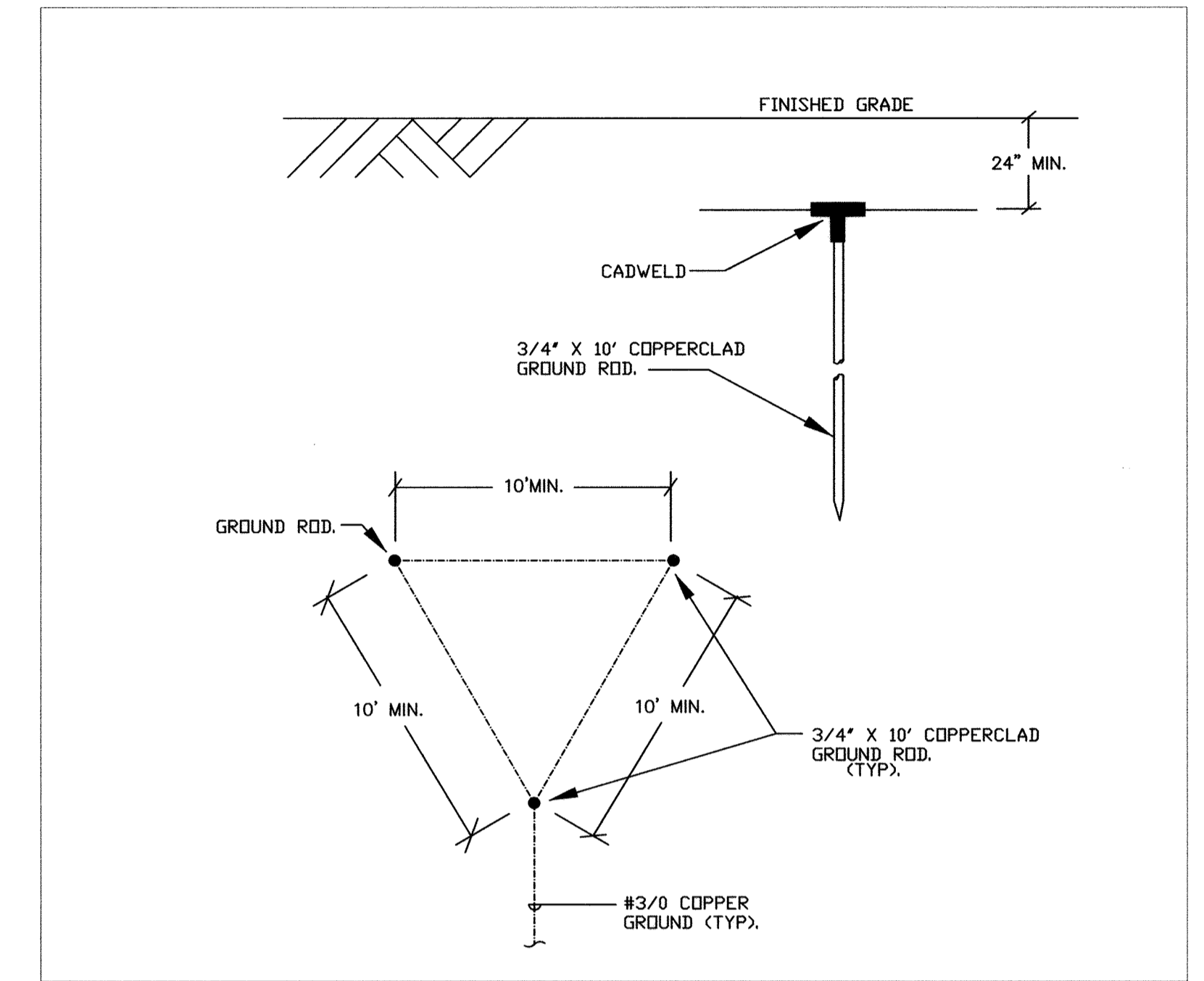
1 METER RACK
NOT TO SCALE

- 1 PROVIDE BGE APPROVED CT CABINET.
- 2 PROVIDE BGE APPROVED 3-SIDED TROUGH.
- 3 PROVIDE 60" OF EACH LOAD CONDUCTOR IN CT CABINET FOR BGE TO SPLICE.
- 4 STUB CONDUITS 4" ABOVE GRADE.
- 5 4" CONCRETE PAD FOR RODENT CONTROL.
- 6 DISCONNECT HP.
- 7 2-1/2" MINIMUM GALVANIZED PIPE.
- 8 1-1/2" GALVANIZED KINDORF
- 9 UTILITY COMPANY FURNISHED AND INSTALLED METER SOCKET.
- 10 NEMA 3R TROUGH (SIZE PER NEC) SECURED AND BONDED TO CT CABINET FOR COMPANY CT WIRING.
- 11 CT CABINET SHALL NOT BE ENTERED THROUGH BACK OR EITHER SIDE WALL.
- 12 PROVIDE 3/4" X 10'-0" COPPERCLAD STEEL GROUND ROD AND CONNECT TO DISCONNECT.
- 13 DISCONNECT FOR FUTURE PANEL.



2 TRANSFORMER PAD
NOT TO SCALE

- 1 COORDINATE PAD PLACEMENT WITH BGE.
- 2 COORDINATE DUCT BANK PLACEMENT WITH BGE.
- 3 PROVIDE 1/2" X 8' COPPERCLAD GROUND ROD AND MAKE CONNECTION TO EQUIPMENT.
- 4 PRECAST PADS AVAILABLE AT BGE: 410-470-7813.



3 COUNTERPOISE GROUNDING DETAIL
NOT TO SCALE

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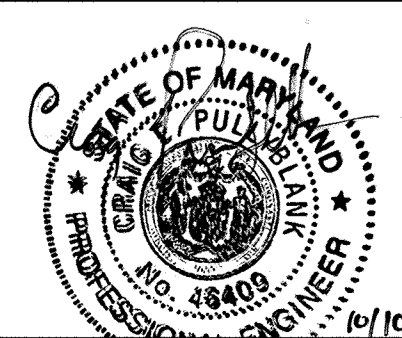
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DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

Joseph De... 2/3/17
DIRECTOR OF PUBLIC WORKS DATE

Thomas A. Butler 2/3/17
CHIEF, BUREAU OF ENGINEERING DATE

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DES: SB					
DRN: SB					
CHK: CEP					
DATE: AUG, 2016	BY	NO.	REVISION	DATE	

ELECTRICAL DETAILS

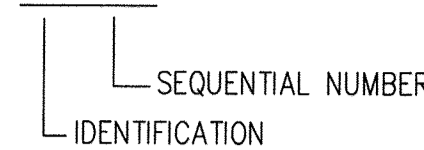
600' SCALE MAP NO. 40-41 BLOCK NO. 12

**ASHLEIGH KNOLLS
SHARED SEWAGE DISPOSAL FACILITY**
CAPITAL PROJECT No. S-6269
CONTRACT No. 50-4972
ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

E-6
SCALE AS SHOWN
SHEET 30 OF 43

EQUIPMENT LEGEND

ABC-X



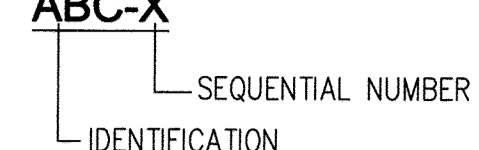
EQUIPMENT

- AE ANALYZER ELEMENT
- BDD BACK DRAFT DAMPER
- BFP BACK FLOW PREVENTER
- CGD COMBUSTIBLE GAS DETECTOR
- CV CONTROL VALVE
- EF EXHAUST FAN
- EUH ELECTRIC UNIT HEATER
- FCV FLOW CONTROL VALVE
- FE FLOW ELEMENT
- FI FLOW INDICATE TRANSMITTER
- IB INTRINSIC BARRIER
- IWH INSTANTANEOUS WATER HEATER
- LE LEVEL ELEMENT
- LIT LEVEL INDICATE TRANSMITTER
- LS LEVEL SWITCH
- MCC MOTOR CONTROL CENTER
- ME MIST ELIMINATOR
- MM MOTOR MONITOR
- MOD MOTOR OPERATED DAMPER
- MOV MOTOR OPERATED VALVE
- NFHB NON-FREEZE HOSE BIB
- PCP PROGRESSIVE CAVITY PUMP
- PLC PROGRAMMABLE LOGIC CONTROLLER
- SAP SUBMERSIBLE AERATION PUMP
- SF SUPPLY FAN
- SMX SUBMERSIBLE MIXER
- VFD VARIABLE FREQUENCY DRIVE
- VV VENT VALVE
- WWP WASTE WATER PUMP
- XFMR TRANSFORMER

NOTE: SEE INSTRUMENTATION SYMBOLS FOR ADDITIONAL PROCESS NOMENCLATURE.

P & I PANEL LEGEND

ABC-X

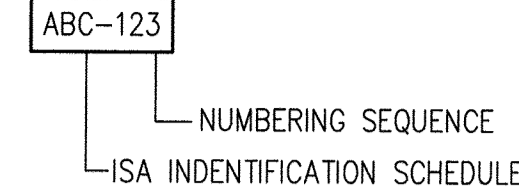


PANEL LEGEND

- BPCP-X BOOSTER PUMP CONTROL PANEL
- HOA-X HAND-OFF-AUTO CONTROL PANEL
- LC LOCAL CONTROL
- MCC-X MOTOR CONTROL CENTER
- SBR-X SEQUENCE BATCH REACTOR
- VCP-X VENTILATION CONTROL PANEL
- VFD-X VARIABLE FREQUENCY DRIVE
- IPCP INFLUENT PUMP CONTROL PANEL
- RDP RUN DRY PROTECTION
- SWP SEAL WATER PANEL

P&ID LEGEND

ABC-123



P&ID NUMBERING SEQUENCE

- 100 SERIES INFLUENT PUMPING
- 200 SERIES SBR SYSTEMS
- 300 SERIES AUXILIARY SYSTEMS
- 400 SERIES GENERATOR

GENERAL ABBREVIATIONS

- AUTO AUTOMATIC
- ATS AUTOMATIC TRANSFER SWITCH
- CB CIRCUIT BREAKER
- DC DIRECT CURRENT
- DPDT DOUBLE POLE-DOUBLE THROW
- ECD ELECTRICAL CONTROL DIAGRAM
- ETM ELAPSED TIME METER
- GND GROUND
- HMI HUMAN MACHINE INTERFACE
- I/O INPUT/OUTPUT
- JB JUNCTION BOX
- MB MAIN BREAKER
- OIT OPERATOR INTERFACE TERMINAL
- P&ID PROCESS AND INSTRUMENTATION DIAGRAM
- PM PHASE MONITOR
- SI SYSTEM(S) INTEGRATOR
- TB TERMINAL BOARD
- TVSS TRANSIENT VOLTAGE SURGE SUPPRESSION
- VAC VOLTS/ALTERNATING CURRENT
- VFD VARIABLE FREQUENCY DRIVE
- XFMR TRANSFORMER

INSTRUMENT, EXAMPLES

- FI FLOW INDICATING TRANSMITTER
- PII PRESSURE INDICATING TRANSMITTER
- ZS POSITION SWITCH

PROCESS LEGEND

- D DRAIN
- NPW NON-POTABLE WATER
- PW POTABLE WATER
- S SANITARY
- WW WASTE WATER

CONSTRUCTION NOTES

- 1 SEE MECHANICAL DRAWINGS FOR DETAILED PROCESS PIPING AND INSTRUMENT LOCATIONS.
- 2 THE I&C DRAWINGS DEPICT SBR AND COUNTY SYSTEMS INTEGRATOR SCOPE.

(ISA) INSTRUMENT IDENTIFICATION SCHEDULE

FIRST LETTER	SUCCEEDING LETTER				
	VARIABLE	MODIFIER	PASSIVE FUNCTION	OUTPUT FUNCTION	MODIFIER
A	ANALYSIS		ALARM		AUTOMATIC
B	BREAKER		USER'S CHOICE	CLOSE OR STOP	BYPASS/REVERSE
C	COMMUNICATIONS			CONTROL	
D	DENSITY	DIFFERENTIAL		OPEN OR START	
E	VOLTAGE (EMF)		PRIMARY ELEMENT	SENSOR	
F	FLOW RATE	RATIO	FAIL	FAIL	FAIL/INCOMPLETE
G	GAUGING		GLASS		LOCAL/MANUAL/HAND
H	HAND				HIGH OR OPEN
I	CURRENT		INDICATE		INTERMEDIATE
J	POWER	SCAN			
K	TIME	TIME RATE		CONTROL STATION	
L	LEVEL		LIGHT		LOW OR CLOSE
M	MOTOR	MOMENTARY		MOTOR	MIDDLE
N	STATUS		INPUT	FORWARD	ON OR OPERATE
O			OFF		OVERLOAD
P	PRESSURE	PNEUMATIC	POINT (TEST)	POSITION	
Q	QUALITY OR EVENT	TOTALIZE		EMERGENCY/ABNORMAL	
R	RADIOACTIVITY		RECORD OR PRINT	REMOTE	RUN/FORWARD
S	SPEED OR FREQUENCY	SUM	SWITCH	SWITCH	STOP
T	TEMPERATURE			TRANSMIT	
U	MULTIVARIABLE		MULTIFUNCTION	MULTIFUNCTION	MULTIFUNCTION
V	VARIABLE OR VISCOSITY			VALVE OR DAMPER	VFD/VALVE
W	WEIGHT OR FORCE	TORQUE	WELL		UNCLASSIFIED
X	MOD. LIGHT OR VALVE		UNCLASSIFIED	UNCLASSIFIED	RESET
Y	INTERLOCK			RELAY OR COMPUTE	
Z	POSITION			DRIVE OR ACTUATOR	

LEGEND

- EX. FEATURES
- EX. PHONELINE
- POWER
- DIGITAL SIGNALS
- NEW FEATURES
- ANALOG SIGNALS
- HIGH SPEED COMM-LINK

GENERAL NOTES

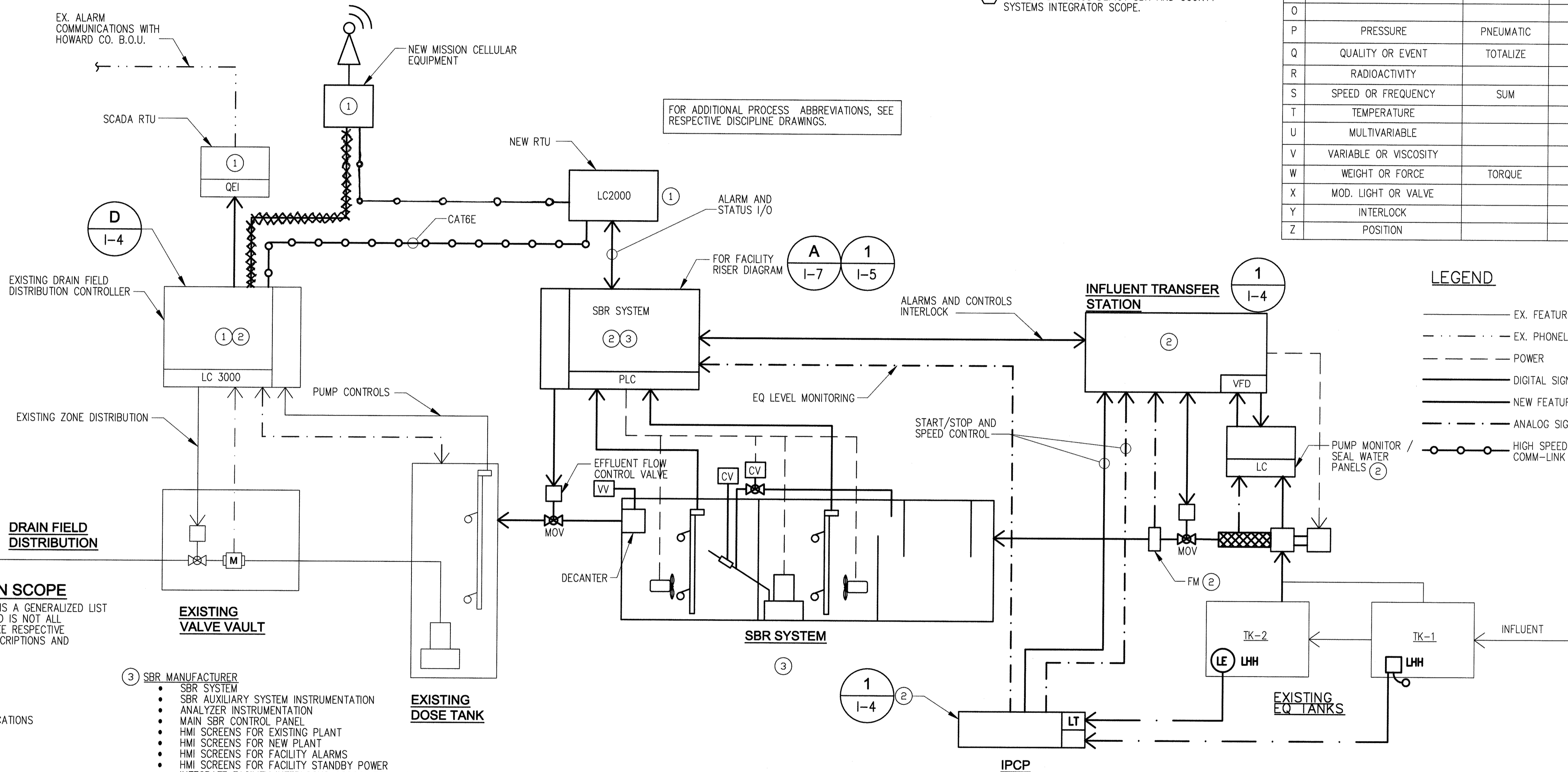
1. SEE MECHANICAL DRAWINGS FOR CONTROL AND FIELD INSTRUMENT LOCATIONS.
2. FOR P&ID AND ECD SYMBOLS, SEE SHEET I-2.
3. FOR POWER DISTRIBUTION AND DISCONNECT REQUIREMENTS, SEE ELECTRICAL DRAWINGS.

CONDUIT (CONDUCTOR FILL) SCHEDULE

SIZE	#12 THHN	#14 THHN	#16 TFS
3/4"	10	20	5
1"	15	30	8
1 1/2"	35	70	18
2"	80	120	30
3"	125	250	60
4"	200	400	100

NOTES:

1. MAXIMUM FILL QUANTITIES SHOWN.
2. CONTRACTOR SHALL COMPLY WITH NEC STANDARDS AND MANUFACTURER'S RECOMMENDATIONS WHEN DETERMINING CONDUIT SIZES AND CONDUCTOR GROUPINGS WITHIN EACH CONDUIT.



SBR FACILITY INTERGRATION SCOPE

NOTE: THE FOLLOWING "SCOPE SUMMARY" IS A GENERALIZED LIST OF CONTRACTOR'S INTEGRATION SCOPE, AND IS NOT ALL INCLUSIVE TO THE ITEMS LISTED BELOW. SEE RESPECTIVE SPECIFICATIONS FOR COMPLETE SCOPE DESCRIPTIONS AND RESPONSIBILITIES.

- 1 COUNTY SCADA SYSTEMS INTEGRATOR
 - LC3000 INTEGRATION
 - LC2000 REMOTE I/O INTEGRATION
 - MISSION CELLULAR INTEGRATION
 - PRE-STARTUP TERMINATION VERIFICATIONS
 - COORDINATE WITH PROJECT SI
 - STARTUP AND TESTING
 - TRAINING
 - AS-BUILTS
- 2 PROJECT SYSTEMS INTEGRATOR
 - COORDINATE WITH ALL SUPPLIERS
 - SBR SYSTEM INTEGRATION
 - INFLUENT PUMP STATION CONTROLS
 - PUMP MONITOR SEAL WATER PANEL
 - FLOW METER (INFLUENT)
 - PUMP MONITORING INSTRUMENTATION
 - INFLUENT STORAGE TANK LEVEL CONTROLS
 - SMOKE DETECTOR SYSTEM
 - CAUSTIC AND CARBON ADDITION SYSTEMS LOCAL CONTROLS
 - SODIUM HYPOCHLORITE SYSTEM LOCAL CONTROLS
 - VENTILATION SYSTEM AND CONTROLS
 - PRE-STARTUP TERMINATION VERIFICATIONS
 - STARTUP AND TESTING
 - TRAINING
 - COMPLETE PROJECT WIRING TERMINATION DRAWINGS
 - COORDINATE AND FURNISH PROJECT AS-BUILTS
- 3 SBR MANUFACTURER
 - SBR SYSTEM
 - SBR AUXILIARY SYSTEM INSTRUMENTATION
 - ANALYZER INSTRUMENTATION
 - MAIN SBR CONTROL PANEL
 - HMI SCREENS FOR EXISTING PLANT
 - HMI SCREENS FOR NEW PLANT
 - HMI SCREENS FOR FACILITY ALARMS
 - HMI SCREENS FOR FACILITY STANDBY POWER
 - INTEGRATE FACILITY INTERLOCKS ASSOCIATED WITH INFLUENT AND EFFLUENT PUMPING STATIONS
 - STARTUP AND TESTING
 - TRAINING
 - COORDINATION WITH PROJECT SYSTEMS INTEGRATOR
 - COORDINATION WITH COUNTY SCADA SYSTEMS INTEGRATOR
 - AS-BUILTS
- 4 MECHANICAL CONTRACTOR
 - PACKAGED PW / NPW / SEAL WATER SYSTEMS
 - MOTORIZED VALVES
 - FANS
 - ALL CHEMICAL SYSTEM PUMPS, TANKS, CONTAINMENTS, RAMPS, PH CONTROLLER AND SYSTEM COMPONENTS
- 5 ELECTRICAL CONTRACTOR
 - POWER
 - LIGHTING
 - STANDBY POWER
 - ALL POWER AND SIGNAL CONDUIT AND CONDUCTORS
 - AS-BUILTS

1 ASHLEIGH KNOLLS TREATMENT SYSTEM COMMUNICATIONS DIAGRAM I-1

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. 33925 EXPIRATION DATE: 01/15/19

User: jordan.welle Date: 11/12/2016 File: I-1 - Instrumentation Legend.dwg

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

[Signature] 2/16/17
DIRECTOR OF PUBLIC WORKS DATE

[Signature] 2/16/17
CHIEF, BUREAU OF UTILITIES DATE

[Signature] 2/16/17
CHIEF, BUREAU OF ENGINEERING DATE

[Signature] 2/16/17
CHIEF, UTILITY DESIGN DIVISION DATE

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STATE OF MARYLAND
ENGINEERING PROFESSIONAL ENGINEER

[Signature] 02/16/17

DES: JFW					
DRN: JFW					
CHK: SEA					
DATE: AUG, 2016					
BY	NO.	REVISION	DATE	600' SCALE MAP NO.	40-41 BLOCK NO. 12

**ASHLEIGH KNOLLS
SHARED SEWAGE DISPOSAL FACILITY**

CAPITAL PROJECT No. S-6269
CONTRACT No. 50-4972

ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

INSTRUMENTATION LEGEND

SCALE AS SHOWN

SHEET 31 OF 43

PROCESS AND INSTRUMENTATION SYMBOLS

- EXISTING PROCESS FEATURES
- DIGITAL SIGNALS
- EQUIPMENT GROUPED AS A GROUPING TYPICAL TYPICAL ARRANGEMENT OF MULTIPLES OF THE SAME PROCESS.
- ETHERNET COMMUNICATIONS
- ELECTRICAL SIGNAL
- SOFTWARE OR COMMUNICATIONS DATA SIGNAL
- ANALOG SIGNALS
- VENT
- PNEUMATIC SIGNAL (COMPRESSED AIR)
- ELECTRICAL SERVICE
- PROCESS FLOW
- ↑ ANALOG INPUT
- ↓ ANALOG OUTPUT
- ↑ DIGITAL INPUT
- ↓ DIGITAL OUTPUT
- (X) X = A DESIGNATED CONTINUATION NUMBER WITH RESPECT TO A SPECIFIC SIGNAL. E.G.
- ① --- →
- ② --- →
- TS 112 CONTROL LOGIC I/O INTERFACE
- TS 112 FIELD-MOUNTED DEVICE
- AIT 110 PANEL-MOUNTED DEVICE
- ABC 123 X INDICATING LAMP - X INDICATES LENS COLOR:
R = RED G = GREEN
W = WHITE A = AMBER
- AH 110 PLC OR REMOTE INPUT/OUTPUT
- AH 123 TELEMETRY/SCADA SYSTEM INPUT/OUTPUT
- SB (X) SIGNAL BOOSTER/ISOLATOR (X) PANEL LOCATION
- LE XXX SUBMERSIBLE TRANSDUCER
- LE XXX ULTRASONIC LEVEL INSTRUMENT
- LE XXX RADAR LEVEL INSTRUMENT
- I (X) INTERPOSING RELAY (X) PANEL LOCATION
- SEE X-XX PROCESS CONTINUATION
- ABC-123

ABC - LETTERS INDICATE FUNCTION ACCORDING TO IDENTIFICATION ASSOCIATED WITH ISA SCHEDULE.
123 - DIGITS INDICATE SEQUENTIAL EQUIPMENT

PROCESS AND INSTRUMENTATION SYMBOLS

- PRESSURE SWITCH
- LIMIT SWITCH
- FLOW SWITCH
- FLOAT SWITCH
- RECEPTACLE
- EXTERIOR PLUG CONNECTION
- TERMINAL BOARD
- TERMINAL ENCLOSURE OR J - JUNCTION
- ELECTRICAL DISCONNECT
- JUNCTION BOX, HAZARDOUS LOCATION
- JUNCTION BOX, NON-HAZARDOUS LOCATION
- EXPLOSION PROOF SEAL-OFF

HAND SWITCHES

- HS (XXX) 123 SELECTOR SWITCH OR PUSH BUTTON (MAINTAINED CONTACTS)
- HK (XXX) 123 HAND CONTROL STATION
- HMS (XXX) 123 MOMENTARY SELECTOR SWITCH

HAND SWITCH NOTES (XXX)

- ACK = ACKNOWLEDGE PUSHBUTTON
- CL = CLOSE (PUSHBUTTON)
- ES = EMERGENCY STOP (PUSHBUTTON)
- HOA = HAND OFF AUTOMATIC (SELECTOR SWITCH)
- LO = LOCKOUT STOP (PUSHBUTTON)
- LR = LOCAL/REMOTE (SELECTOR SWITCH)
- MA = MANUAL/AUTOMATIC (SELECTOR SWITCH)
- OP = OPEN (PUSHBUTTON)
- POT = POTENTIOMETER (HAND CONTROL)
- RES = RESET (PUSHBUTTON)
- SEL = SELECTOR
- SP = STOP (PUSHBUTTON)
- ST = START (PUSHBUTTON)

ANALYZERS

- AE XXX XXX-INDICATES: CH4 - METHANE

EQUIPMENT SYMBOLS

- AIR RELEASE VALVE
- BALL CHECK VALVE
- BALL VALVE
- CENTRIFUGAL PUMP
- CHECK VALVE
- EXPANSION JOINT
- FLEXIBLE HOSE
- FLOAT
- FLOW METER (MAGNETIC)
- GATE VALVE
- HOSE BIBB
- MOTOR
- MOTOR ACTUATOR
- PRESSURE REGULATING VALVE
- PRESSURE RELIEF VALVE
- SUBMERSIBLE MIXER
- PUMP (AUXILIARY)
- REDUCER OR INCREASER
- SLUICE GATE
- SOLENOID VALVE
- TWO-WAY-THREE PORT VALVE, OR THREE WAY VALVE
- TRUCK QUICK CONNECTION
- UNION

ELECTRICAL CONTROL DIAGRAM SYMBOLS (ECD)

- INCOMING LINE
- OUTGOING LINE
- CIRCUIT BREAKER
- CONTACTS - NORMALLY CLOSED
- CONTACTS - NORMALLY OPEN
- CONTROL POWER TRANSFORMER
- CONTROL RELAY (SEQUENTIAL)
- DISCONNECT SWITCH
- ELAPSED TIME METER
- FLOAT SWITCH - NORMALLY OPEN, CLOSE ON LEVEL DROP
- FLOAT SWITCH - NORMALLY OPEN, CLOSE ON LEVEL RISE
- FUSE
- GROUND (GND)
- HEAT TRACE
- HAND-OFF AUTOMATIC SWITCH
- INDICATING LAMP INTEGRAL WITH HOA SELECTOR
- LIMIT SWITCH - NORMALLY OPEN
- MANUAL MOTOR STARTER, SINGLE-POLE
- OVERCURRENT ELEMENT THERMOSTAT
- PHASE MONITOR
- PLC OUTPUT (RTU OUTPUT)
- PRESSURE SWITCH - NORMALLY OPEN - CLOSES ON PRESSURE DROP
- PRESSURE SWITCH - NORMALLY OPEN - CLOSES ON PRESSURE RISE
- PUSH-BUTTON - MOMENTARY CONTACT
- PUSH-BUTTON - MOMENTARY CONTACT START/STOP
- PUSH-PULL BUTTON - MAINTAINED CONTACT
- X INDICATES LENS COLOR:
R = RED (RUN) B = BLUE (POSITION)
G = GREEN (STOP) Y = YELLOW (POSITION)
W = WHITE (POWER) A = AMBER (ALARM)
- REPEAT CYCLE TIMER
- SOLENOID

ELECTRICAL CONTROL DIAGRAM SYMBOLS (ECD)

- STARTER OR CONTACT COIL - DESIGNATION AS INDICATED
- START-STOP PUSHBUTTON - MAINTAINED CONTACT
- THERMOSTAT, NORMALLY CLOSED
- TIMER
- NOTC NCTO
- TORQUE SWITCH - N.O. - CLOSES ON HIGH TORQUE

ELECTRICAL CONTROL DIAGRAM LEGEND (ECD)

- REMOTE
- AT PLC CABINET
- △ AT LOCAL PANEL
- ▲ AT MOTOR CONTROL CENTER
- ⊙ AT PANEL BOARD
- ⊗ AT VFD PANEL

ELECTRICAL CONTROL DIAGRAM TERMINALS (ECD)

- PANEL WIREWAY TERMINATIONS
- WIRING CONNECTIONS
- REMOTE TERMINATIONS
- ⊕ POWER SUPPLY CONNECTION
- PANEL CONNECTIONS
- REMOTE CONNECTIONS

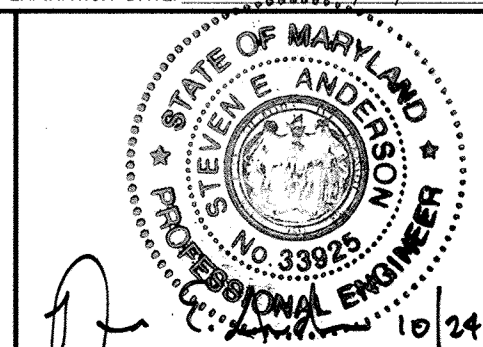
RISER DIAGRAM SYMBOLS

- ABC-123 ISA P&ID NUMBERS
- DISCRETE SIGNAL/CONDUIT
- ANALOG SIGNAL/CONDUIT
- ETHERNET COMMUNICATIONS

NOTE: FOR RISER DIAGRAM SYMBOLS SEE P&ID SYMBOLS AND EQUIPMENT SYMBOLS ON THIS SHEET.

User: jordan.welle Date: 10/24/16 8:57am Path: \\030101071318\05_Visual\030101071318_Visual\Instrumentation_Symbols.dwg

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. 33925 EXPIRATION DATE: 07/15/17



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 ENGINEERS PLANNERS SCIENTISTS CONSTRUCTION MANAGERS
 936 RIDGEBROOK ROAD
 SHARPS, MARYLAND 21152
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 FAX: (410) 316-7818
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DES: JFW					
DRN: JFW					
CHK: SEA					
DATE: AUG, 2016	BY	NO.	REVISION	DATE	

INSTRUMENTATION SYMBOLS	
600' SCALE MAP NO.	40-41
BLOCK NO.	12

ASHLEIGH KNOLLS SHARED SEWAGE DISPOSAL FACILITY
 CAPITAL PROJECT No. S-6269
 CONTRACT No. 50-4972
 ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

CONSTRUCTION NOTES:

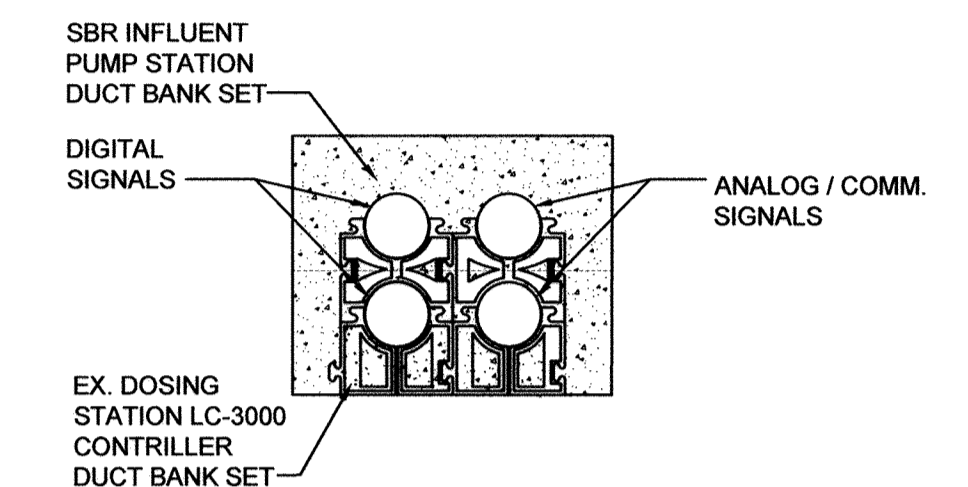
- ① INSTRUMENTATION PULL BOXES SHALL BE ABOVE GRADE NEMA-4X S.S. ENCLOSURES SIZED TO SUIT 2-WAY CONDUIT ENTRY FROM THE BOTTOM WITH BACK-PANEL EXIT INTO STRUCTURES SHOWN.
- ② SEE RISER DIAGRAMS FOR BURIED CONDUIT AND DUCT BANK CONDUCTOR QUANTITIES.

ABBREVIATIONS:

- IMH - INSTRUMENTATION MANHOLE
- IPB - INSTRUMENTATION PULL BOX
- UE - UNDERGROUND ELECTRIC

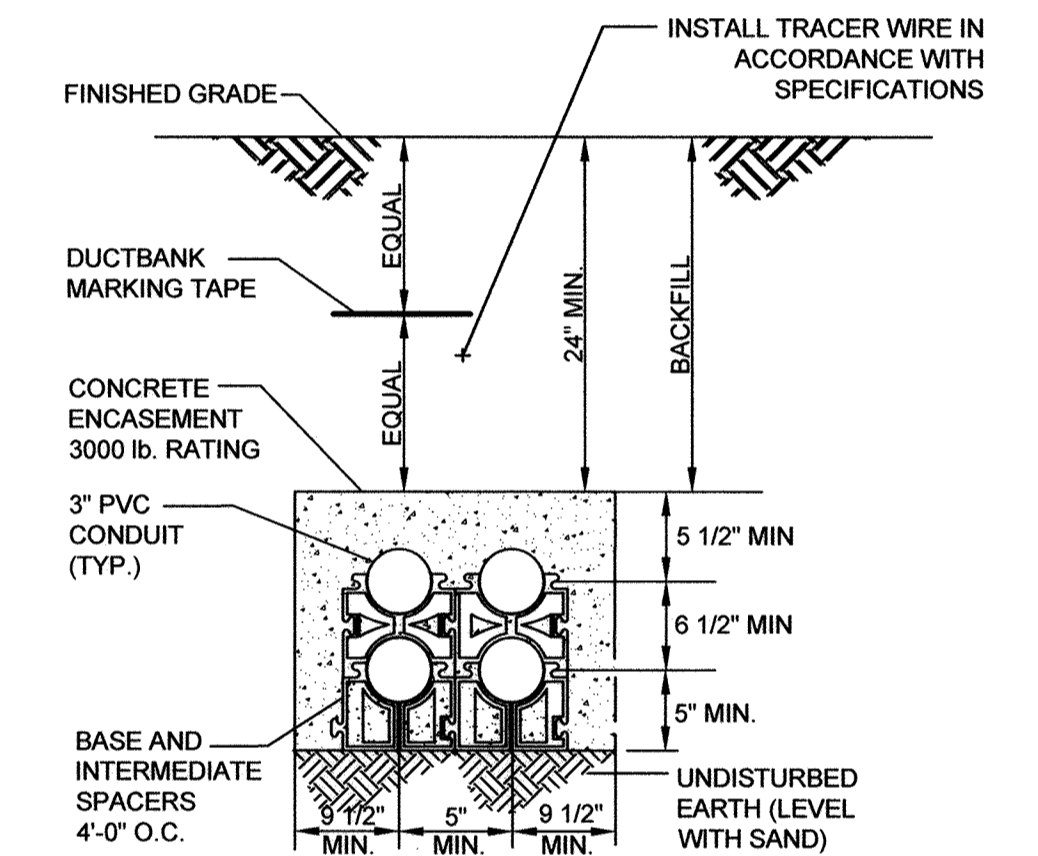
LEGEND

- EXISTING
- INSTRUMENTATION
- INSTRUMENTATION DUCT BANK

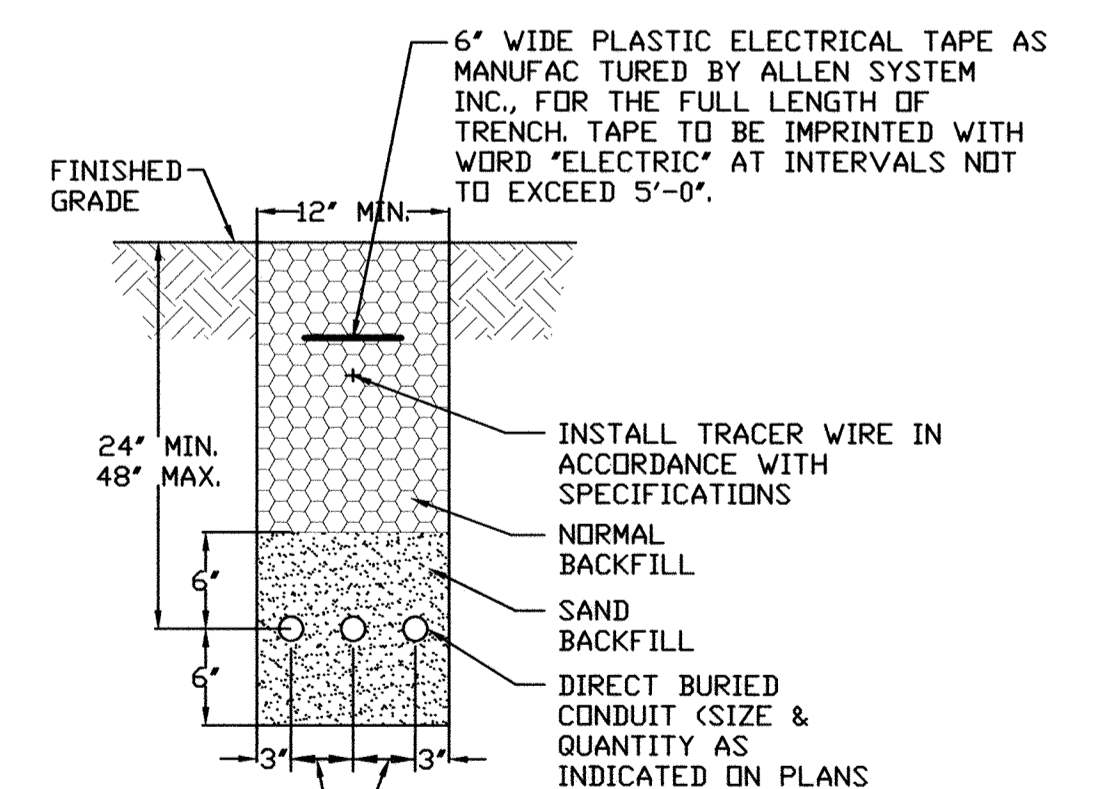


CONDUIT ASSIGNMENTS

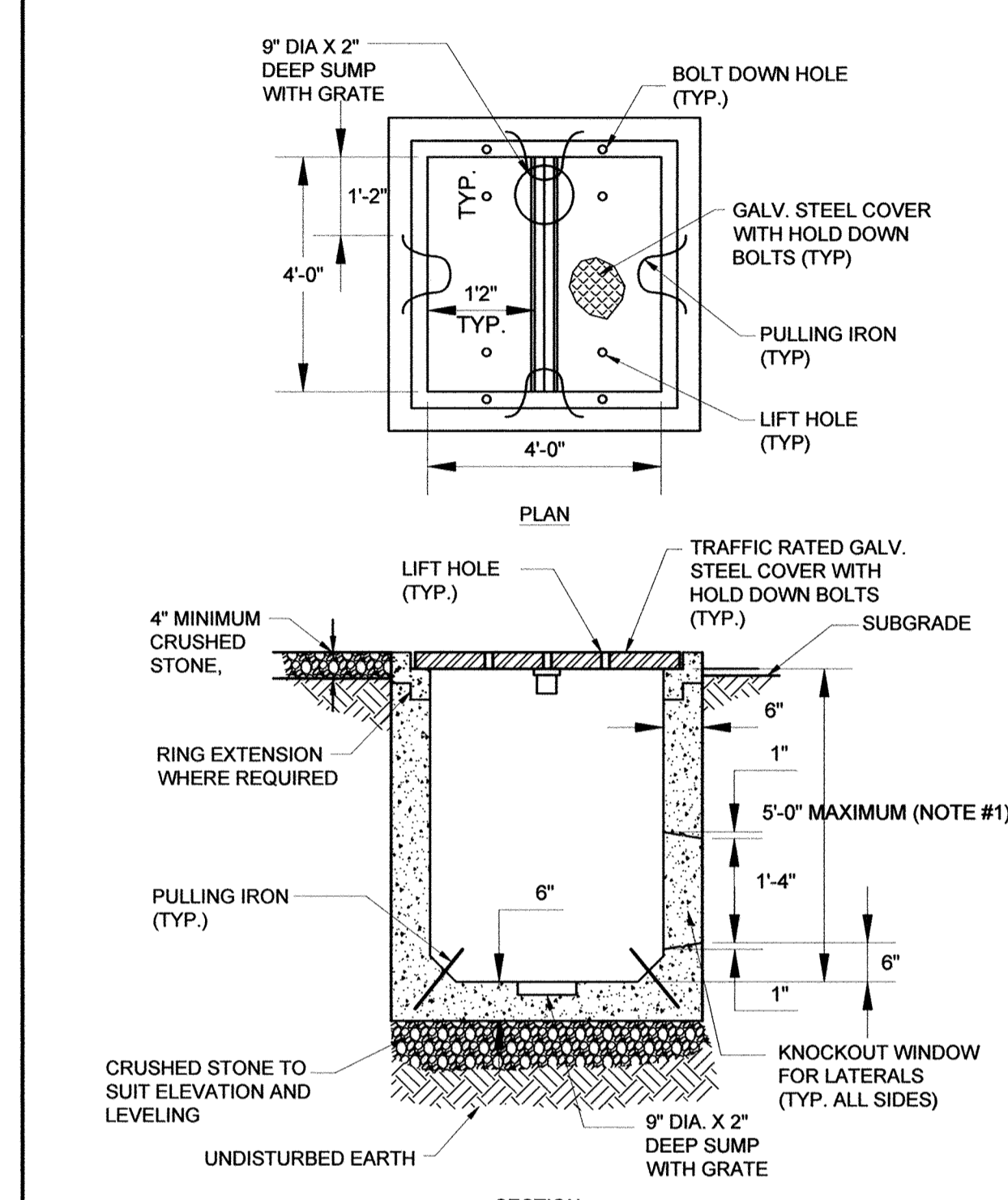
NOTE: SEE INSTRUMENT RISER DIAGRAM ON SHEET I-7.



C 4-WAY CONCRETE ENCASED DUCT BANK
SCALE: 1"=1'-0"

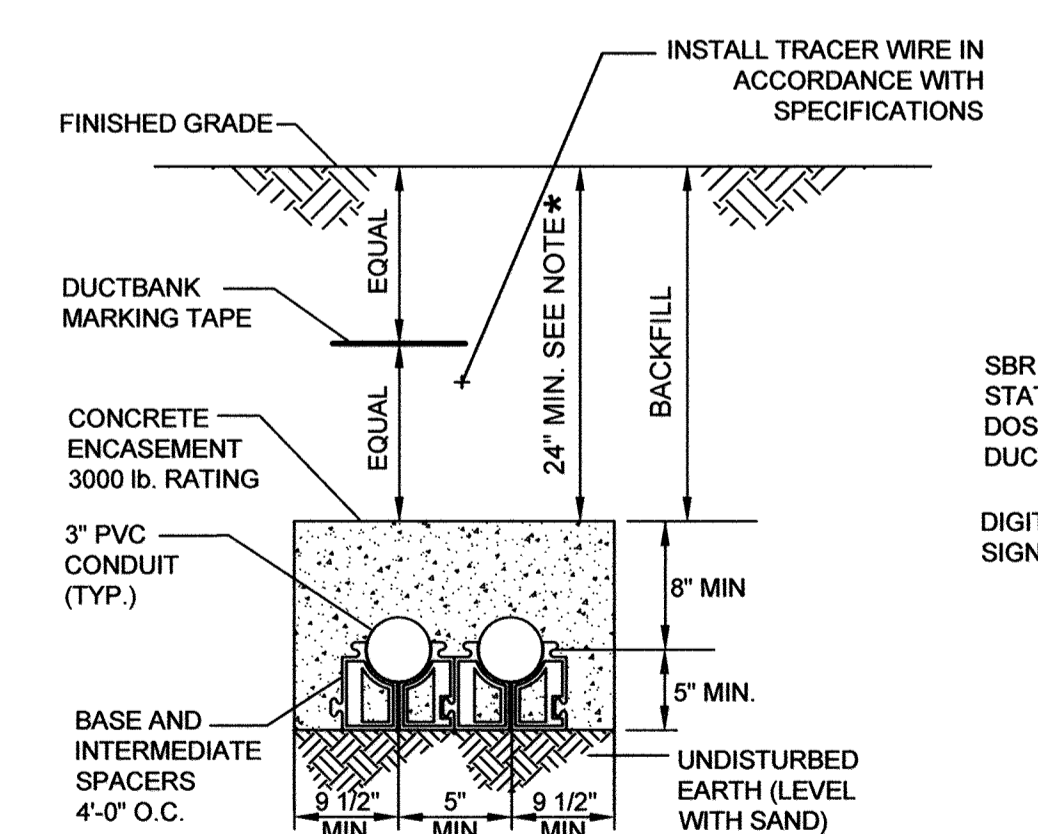


D DIRECT BURIED CONDUIT INSTALLATION DETAIL
SCALE: 1"=1'-0"

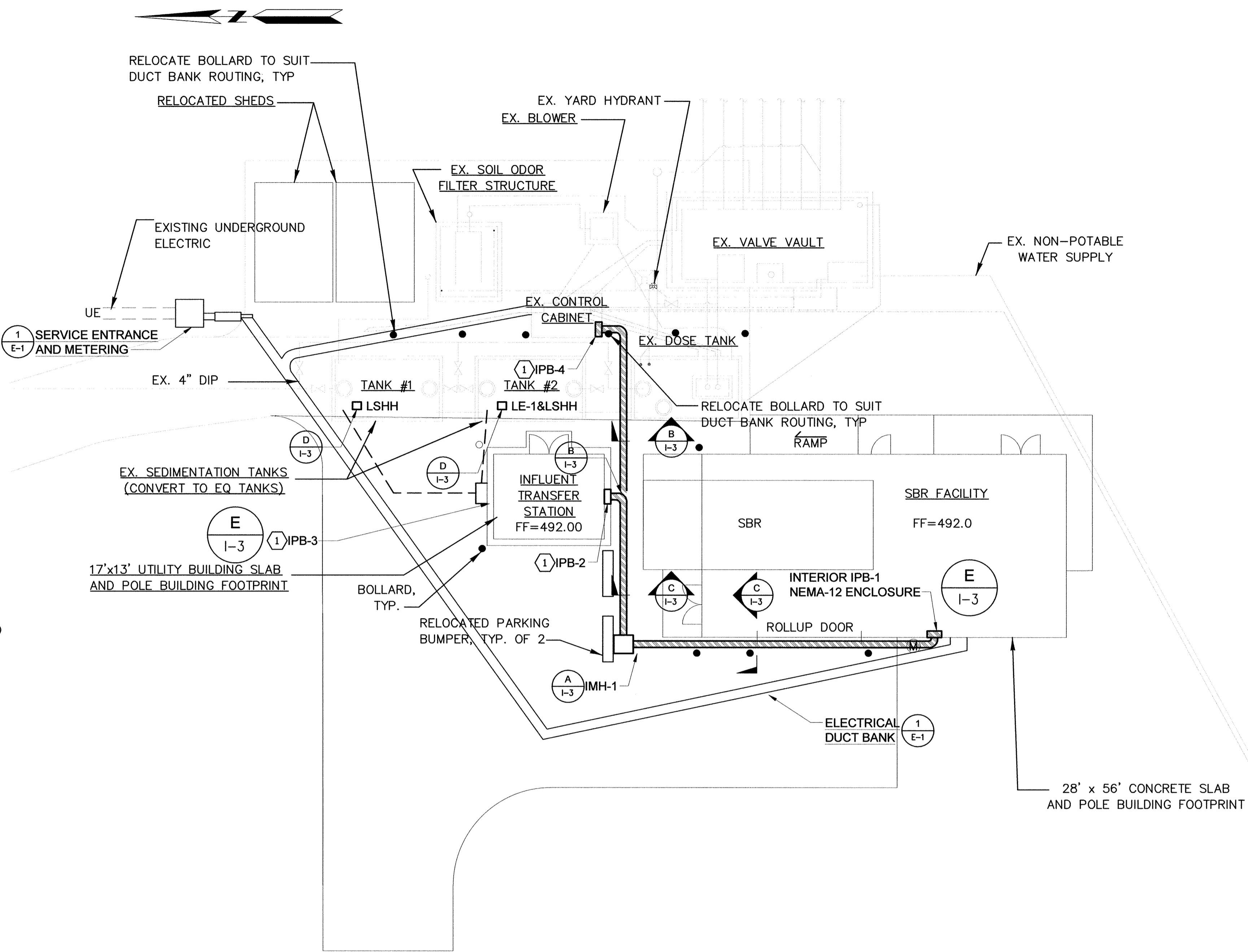


- NOTES:**
- 1. HANDHOLE SIZING TO SUIT PROPER INSTALLATION OF REQUIRED DUCTBANK PENETRATIONS.
 - 2. CONTRACTOR COORDINATE MANHOLE DEPTH TO SUIT FIELD ROUTING OF DUCTBANK.

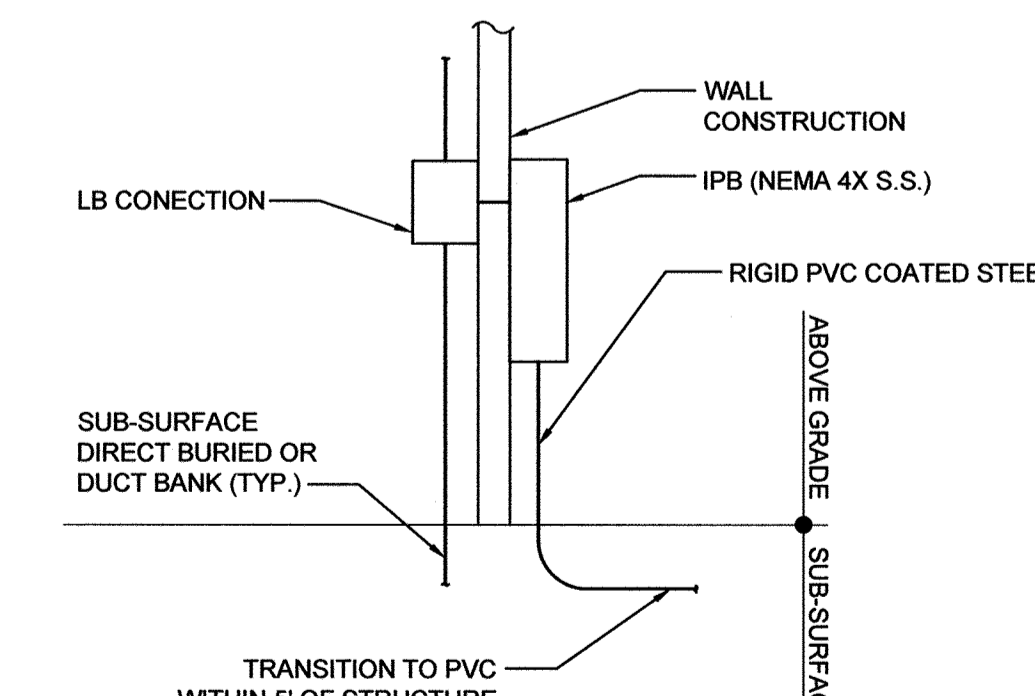
A PRECAST INSTRUMENTATION MANHOLE DETAIL
SCALE: 1"=1'-0"



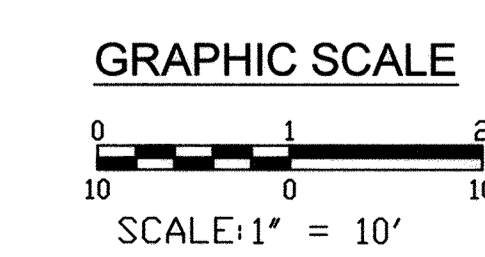
B 2-WAY CONCRETE ENCASED DUCT BANK
SCALE: 1"=1'-0"



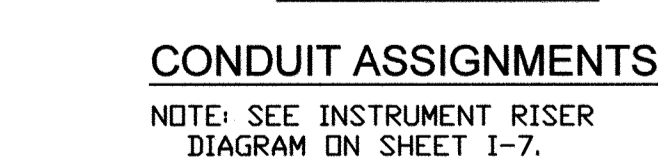
1 INSTRUMENTATION SITE PLAN
SCALE: 1"=10'-0"



E INSTRUMENT PULL BOX (IPB)
SCALE: NONE



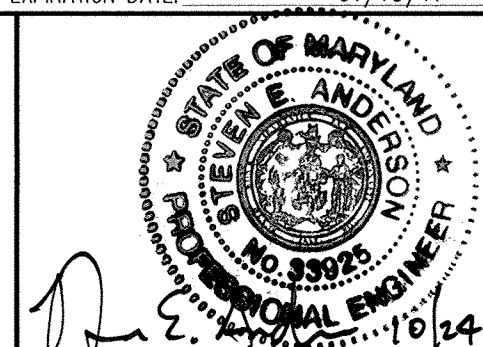
NOTE: MINIMUM COVER SHALL BE 24" TRANSITIONING TO 60" DEEP TO CLEAR PROCESS UTILITIES.



CONDUIT ASSIGNMENTS

NOTE: SEE INSTRUMENT RISER DIAGRAM ON SHEET I-7.

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. 33925 EXPIRATION DATE: 01/15/17



DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

John G. De... 2/1/17
DIRECTOR OF PUBLIC WORKS DATE

Thomas E. Butler 2/1/17
CHIEF, BUREAU OF ENGINEERING DATE

... 2/1/17
CHIEF, UTILITY DESIGN DIVISION DATE

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CHK:	SEA				
DATE:	AUG. 2016	BY:	NO.	REVISION	

INSTRUMENTATION SITE PLAN

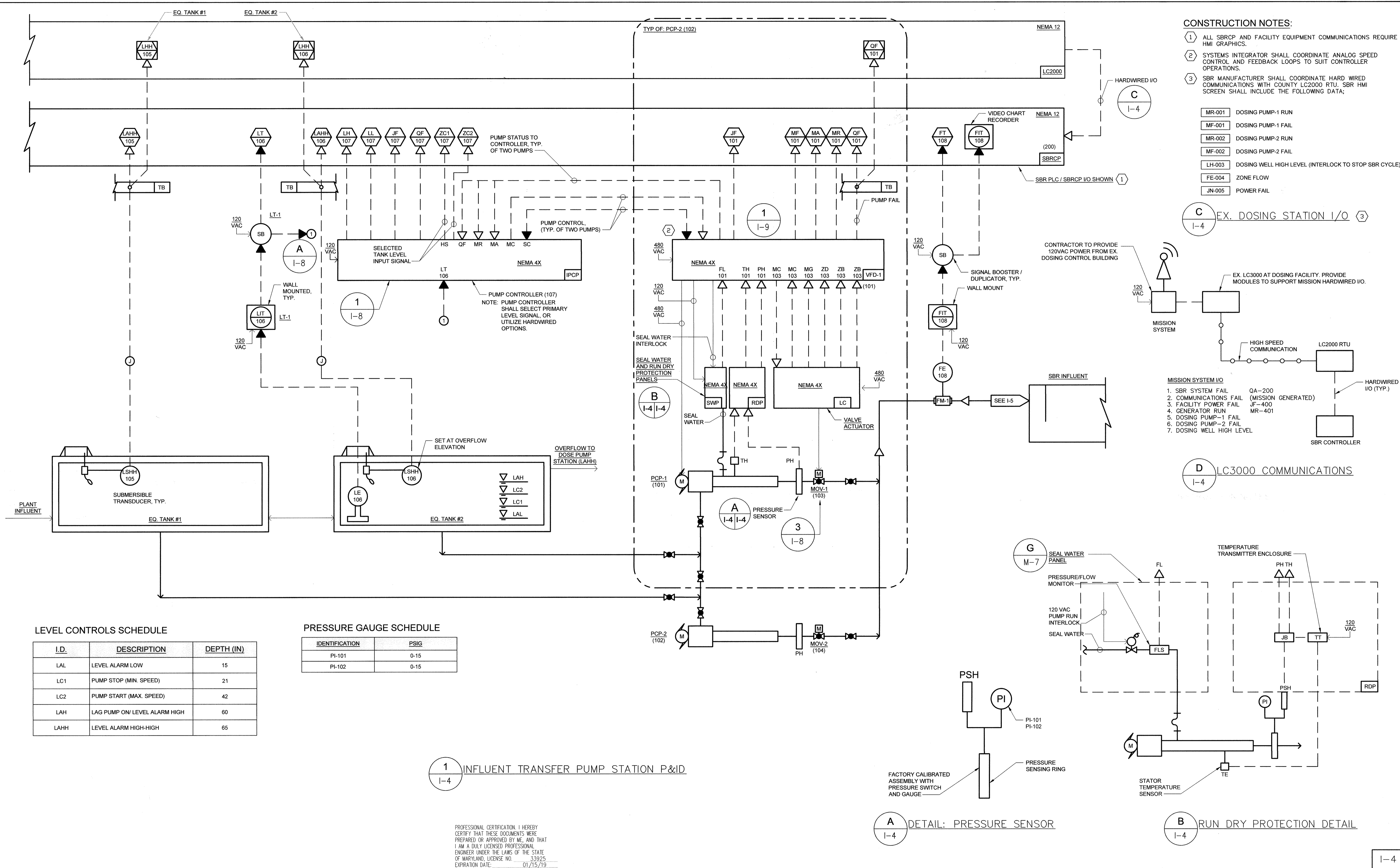
600' SCALE MAP NO. 40-41 BLOCK NO. 12

**ASHLEIGH KNOLLS
SHARED SEWAGE DISPOSAL FACILITY**

CAPITAL PROJECT No. S-6269
CONTRACT No. 50-4972

ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

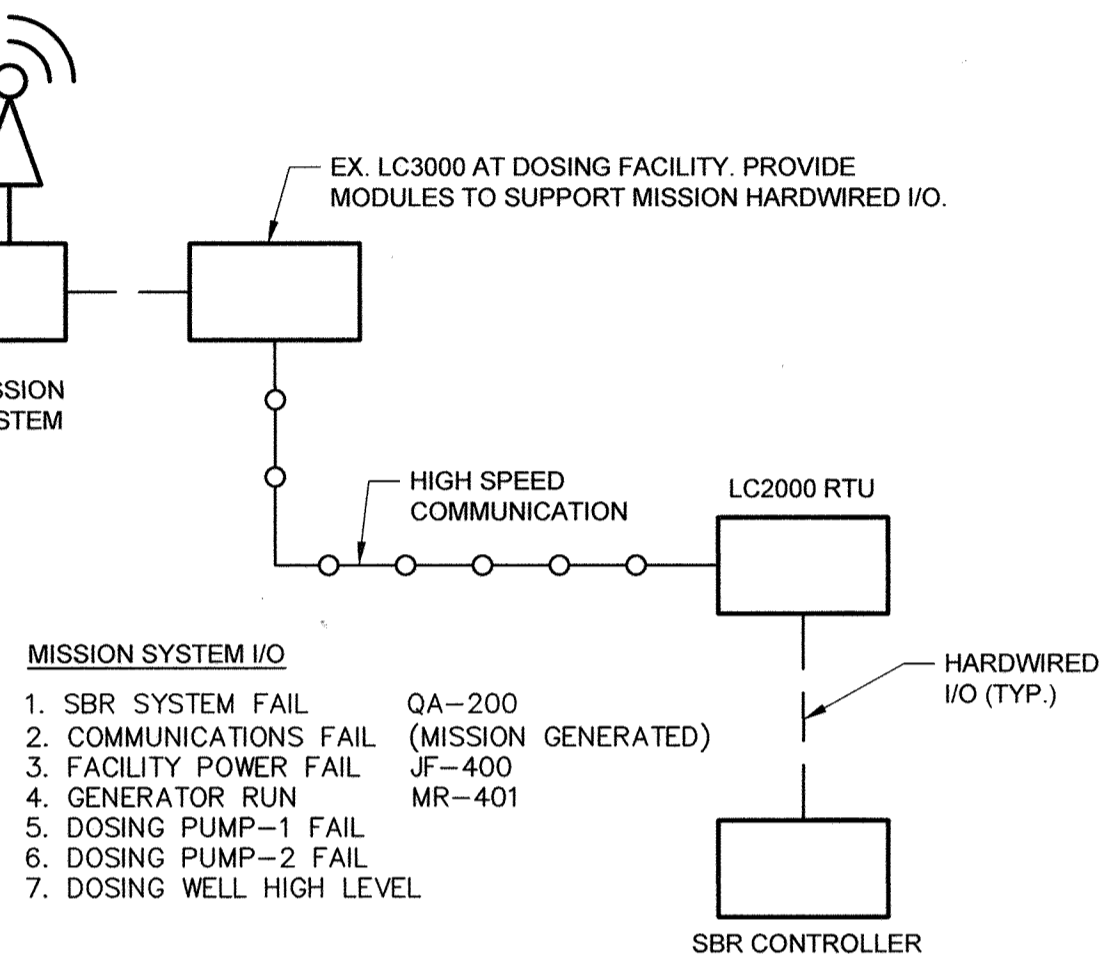
1-3
SCALE
AS SHOWN
SHEET
33 OF 43



- CONSTRUCTION NOTES:**
- 1 ALL SBRCP AND FACILITY EQUIPMENT COMMUNICATIONS REQUIRE HMI GRAPHICS.
 - 2 SYSTEMS INTEGRATOR SHALL COORDINATE ANALOG SPEED CONTROL AND FEEDBACK LOOPS TO SUIT CONTROLLER OPERATIONS.
 - 3 SBR MANUFACTURER SHALL COORDINATE HARD WIRED COMMUNICATIONS WITH COUNTY LC2000 RTU. SBR HMI SCREEN SHALL INCLUDE THE FOLLOWING DATA:

- MR-001 DOSING PUMP-1 RUN
- MF-001 DOSING PUMP-1 FAIL
- MR-002 DOSING PUMP-2 RUN
- MF-002 DOSING PUMP-2 FAIL
- LH-003 DOSING WELL HIGH LEVEL (INTERLOCK TO STOP SBR CYCLE)
- FE-004 ZONE FLOW
- JN-005 POWER FAIL

C EX. DOSING STATION I/O



D LC3000 COMMUNICATIONS

LEVEL CONTROLS SCHEDULE

I.D.	DESCRIPTION	DEPTH (IN)
LAL	LEVEL ALARM LOW	15
LC1	PUMP STOP (MIN. SPEED)	21
LC2	PUMP START (MAX. SPEED)	42
LAH	LAG PUMP ON/ LEVEL ALARM HIGH	60
LAHH	LEVEL ALARM HIGH-HIGH	65

PRESSURE GAUGE SCHEDULE

IDENTIFICATION	PSIG
PI-101	0-15
PI-102	0-15

1 INFLUENT TRANSFER PUMP STATION P&ID

A DETAIL: PRESSURE SENSOR

B RUN DRY PROTECTION DETAIL

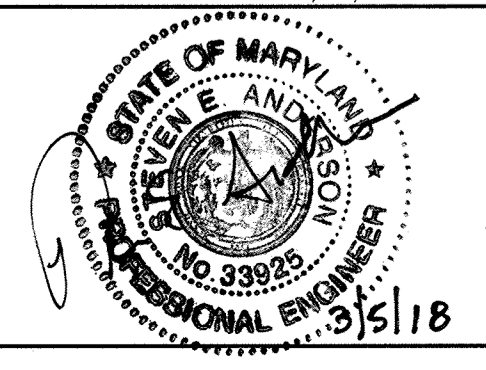
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HOWARD COUNTY, MARYLAND

James R. Butler 3/14/18
CHIEF, BUREAU OF ENGINEERING

Charles S. King 3-14-18
CHIEF, BUREAU OF UTILITIES

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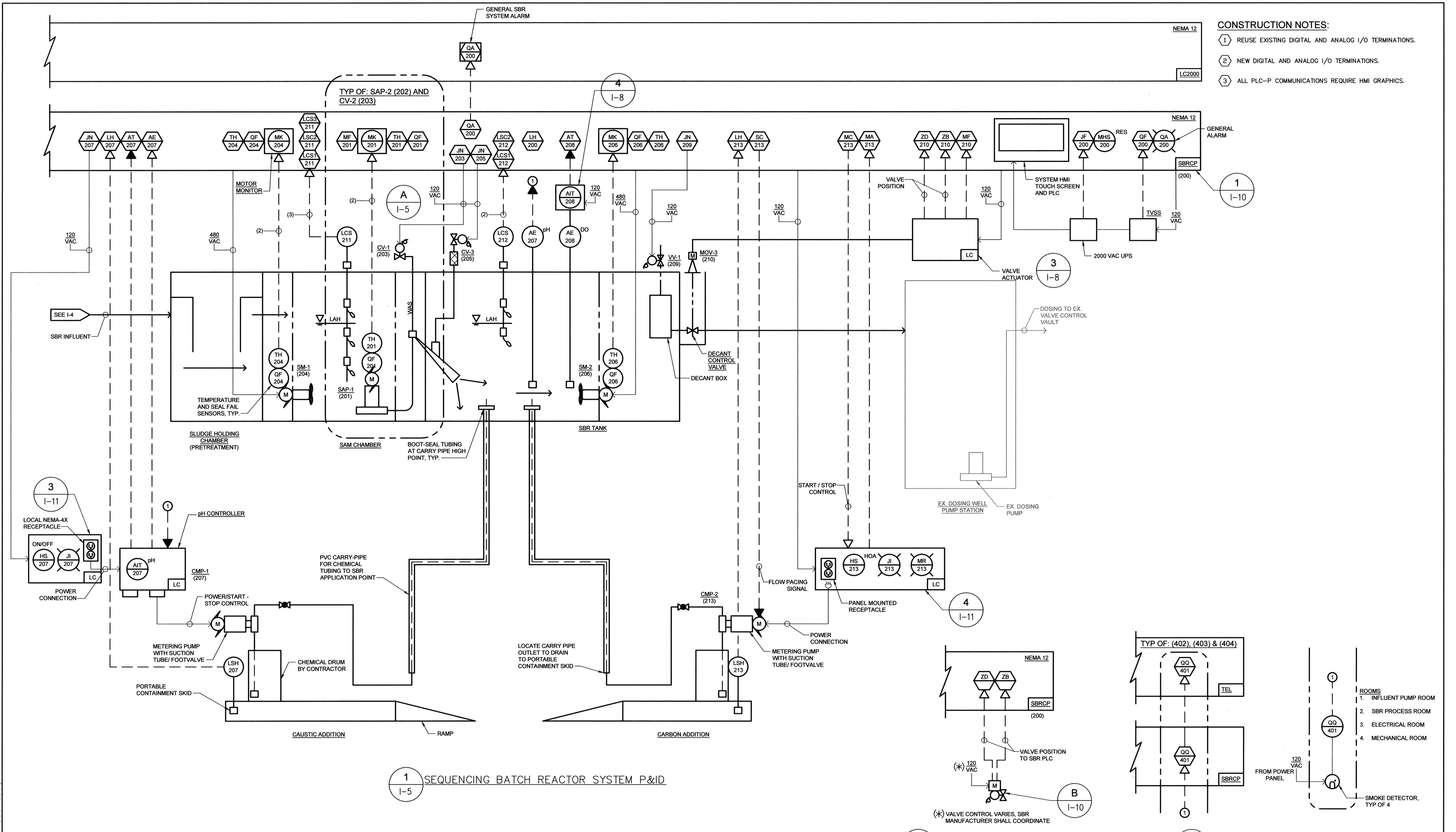
DES: JFW	BY: NO.	REVISION
DRN: JFW	DATE: AUG, 2016	
CHK: SEA		

INFLUENT TRANSFER PUMP STATION P&ID

600' SCALE MAP NO. 40-41 BLOCK NO. 12

ASHLEIGH KNOLLS
SHARED SEWAGE DISPOSAL FACILITY
CAPITAL PROJECT No. S-6269
CONTRACT No. 50-4972
ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

1-4
SCALE AS SHOWN
SHEET
34 OF 43



- CONSTRUCTION NOTES:**
- ① REUSE EXISTING DIGITAL AND ANALOG I/O TERMINATIONS.
 - ② NEW DIGITAL AND ANALOG I/O TERMINATIONS.
 - ③ ALL PLC-P COMMUNICATIONS REQUIRE HMI GRAPHICS.

1 SEQUENCING BATCH REACTOR SYSTEM P&ID
1-5

A TYPICAL CONTROL VALVE
1-5

B TYPICAL SMOKE DETECTOR
1-5

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DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

James G. De... 2/6/17
DIRECTOR OF PUBLIC WORKS DATE

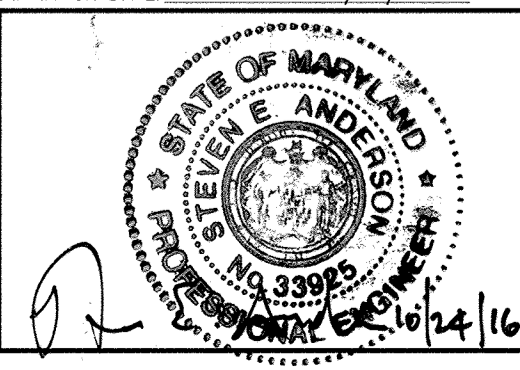
Thomas S. Butler 2/6/17
CHIEF, BUREAU OF ENGINEERING DATE

... 2/3/17
CHIEF, UTILITY DESIGN DIVISION DATE

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DATE: AUG, 2016	BY: NO.	REVISION	DATE	600' SCALE MAP NO. 40-41	BLOCK NO. 12

SEQUENCING BATCH REACTOR
P&ID

ASHLEIGH KNOLLS
SHARED SEWAGE DISPOSAL FACILITY

CAPITAL PROJECT No. S-6269
CONTRACT No. 50-4972

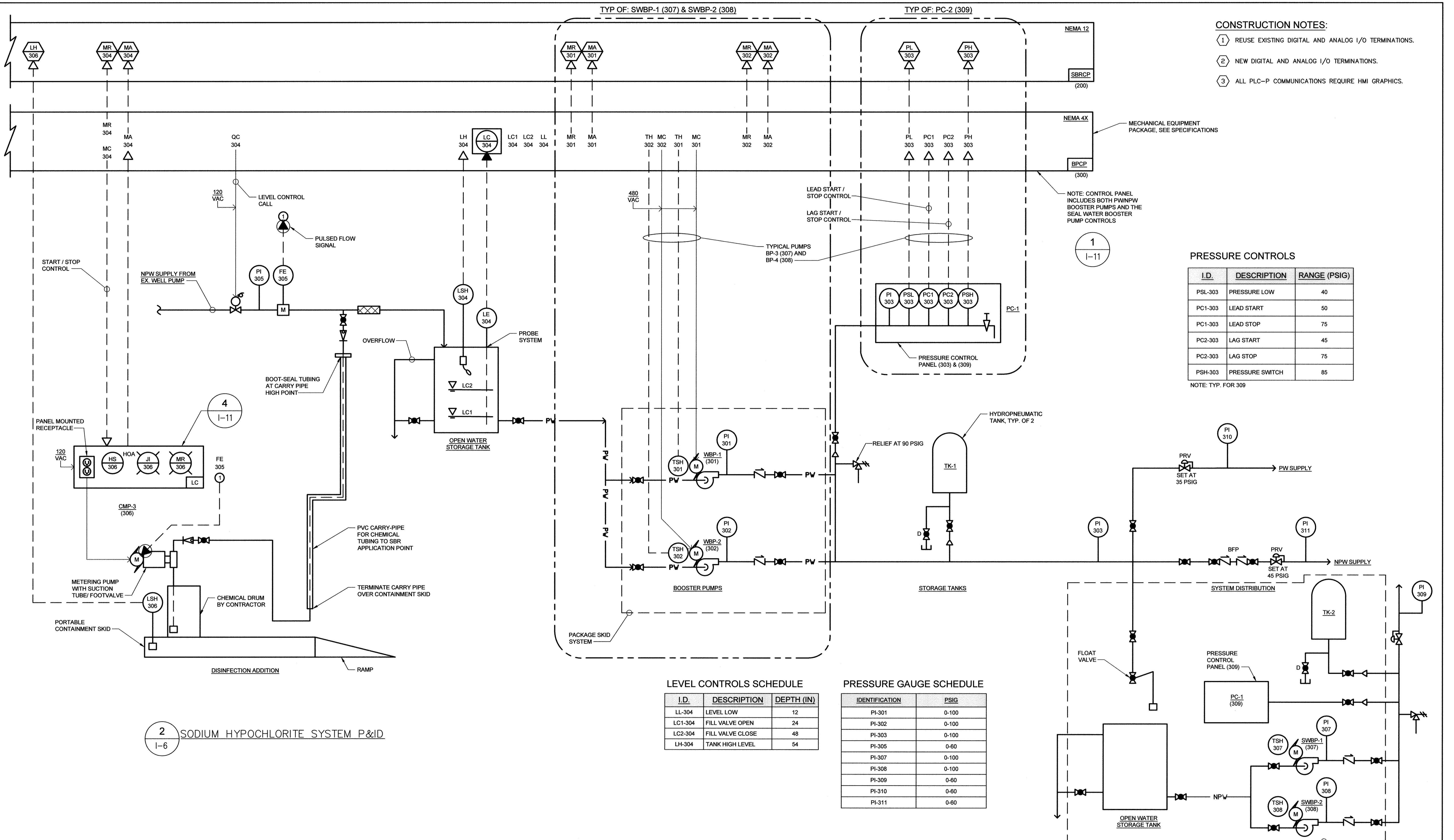
ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

ROOMS
1. INFLUENT PUMP ROOM
2. SBR PROCESS ROOM
3. ELECTRICAL ROOM
4. MECHANICAL ROOM

SMOKE DETECTOR, TYP OF 4

SCALE AS SHOWN
SHEET 35 OF 43

Oct 24, 2016 - 10:00am User: Jordan White
 V:\2016\010713\F&ID\Sequencing Batch Reactor P&ID.dwg



- CONSTRUCTION NOTES:**
- 1 REUSE EXISTING DIGITAL AND ANALOG I/O TERMINATIONS.
 - 2 NEW DIGITAL AND ANALOG I/O TERMINATIONS.
 - 3 ALL PLC-P COMMUNICATIONS REQUIRE HMI GRAPHICS.

PRESSURE CONTROLS

I.D.	DESCRIPTION	RANGE (PSIG)
PSL-303	PRESSURE LOW	40
PC1-303	LEAD START	50
PC1-303	LEAD STOP	75
PC2-303	LAG START	45
PC2-303	LAG STOP	75
PSH-303	PRESSURE SWITCH	85

NOTE: TYP. FOR 309

LEVEL CONTROLS SCHEDULE

I.D.	DESCRIPTION	DEPTH (IN)
LL-304	LEVEL LOW	12
LC1-304	FILL VALVE OPEN	24
LC2-304	FILL VALVE CLOSE	48
LH-304	TANK HIGH LEVEL	54

PRESSURE GAUGE SCHEDULE

IDENTIFICATION	PSIG
PI-301	0-100
PI-302	0-100
PI-303	0-100
PI-305	0-60
PI-307	0-100
PI-308	0-100
PI-309	0-60
PI-310	0-60
PI-311	0-60

2 SODIUM HYPOCHLORITE SYSTEM P&ID
I-6

1 POTABLE AND NON-POTABLE WATER SYSTEM P&ID
(MECHANICAL EQUIPMENT PACKAGE)
I-6

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Thomas E. ... 2/17/17
CHIEF, BUREAU OF UTILITIES DATE

Thomas E. ... 2/17/17
CHIEF, UTILITY DESIGN DIVISION DATE

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STATE OF MARYLAND
LICENSE NO. 33925
EXPIRES 01/15/17

DES: JFW	BY: NO.	REVISION	DATE
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DATE: AUG, 2016			

AUXILIARY SYSTEMS P&ID

600' SCALE MAP NO. 40-41 BLOCK NO. 12

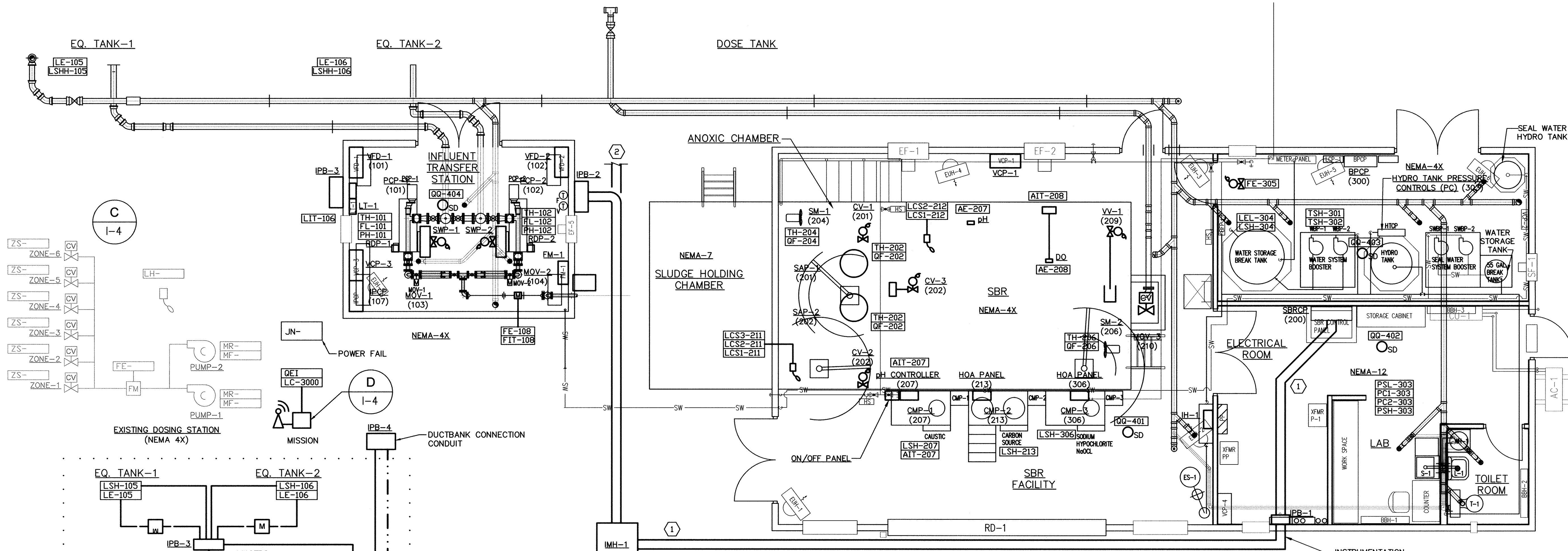
**ASHLEIGH KNOLLS
SHARED SEWAGE DISPOSAL FACILITY**

CAPITAL PROJECT No. S-6269
CONTRACT No. 50-4972

ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

SCALE AS SHOWN
SHEET 36 OF 43

01/24/2016 1:00 PM User: jordan.mcf...
 V:\2007\01071378\05\Drawings\1-06_AUX_SYSTEMS_P&ID.dwg



- GENERAL NOTES:**
- PROVIDE 24-INCHES SLACK WIRE AT EACH END OF ALL SPARE INSTRUMENTATION WIRES.
 - SEE SYSTEM P&ID DIAGRAMS AND ECD DETAILS FOR CONTROL WIRE IDENTIFICATIONS.
 - CONDUIT CONTAINING #16 TPS (4-20mA) WIRE SHALL BE LOCATED 6-INCHES (MINIMUM) AWAY FROM CONDUIT CONTAINING POWER CONDUCTORS AND CONDUIT CONTAINING #14 OR #12 POWER AND DIGITAL SIGNAL WIRE.
 - ALL CONDUIT SHALL BE 3/4-INCH IN SIZE UNLESS OTHERWISE NOTED ON INSTRUMENT RISER DIAGRAMS.
 - SYSTEM INTEGRATOR SHALL VERIFY ALL APPROVED EQUIPMENT AND TERMINATIONS PRIOR TO INSTALLATION. THE SYSTEMS INTEGRATOR SHALL VERIFY ALL WIRE COUNTS AND INCLUDE SPARES AS SHOWN HERE IN AND ASSEMBLE INSTRUMENT RISERS FOR CONSTRUCTION. THE RISERS SHALL BE SUBMITTED FOR APPROVAL AS A SHOP DRAWING.
 - SYSTEMS INTEGRATOR SHALL COORDINATE ANALOG SIGNAL CONDUIT QUANTITIES IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

- CONSTRUCTION NOTE:**
- SIGNAL CONDUITS SHALL BE SUB-SURFACED FROM SBRCP TO IPB-1. A 4-WAY DUCT BANK SHALL BE FURNISHED IN ACCORDANCE WITH I-3 INSTRUMENTATION SITE PLAN.
 - A 2-WAY DUCT BANK SHALL BE FURNISHED IN ACCORDANCE WITH I-3 DETAILS.
 - SBR MANUFACTURER SHALL COORDINATE HIGH SPEED COMMUNICATIONS WITH THE COUNTY LC3000 AND LC2000 RTU.

CONDUIT LEGEND:

A#14-B C (C)

A - QUANTITY OF CONDUCTORS
B - SIZE OF CONDUIT (LARGER THAN 3/4-INCH)
C - QUANTITY OF SPARE CONDUCTORS INCLUDED IN TOTAL COUNT (ITEM-A)

LEGEND:

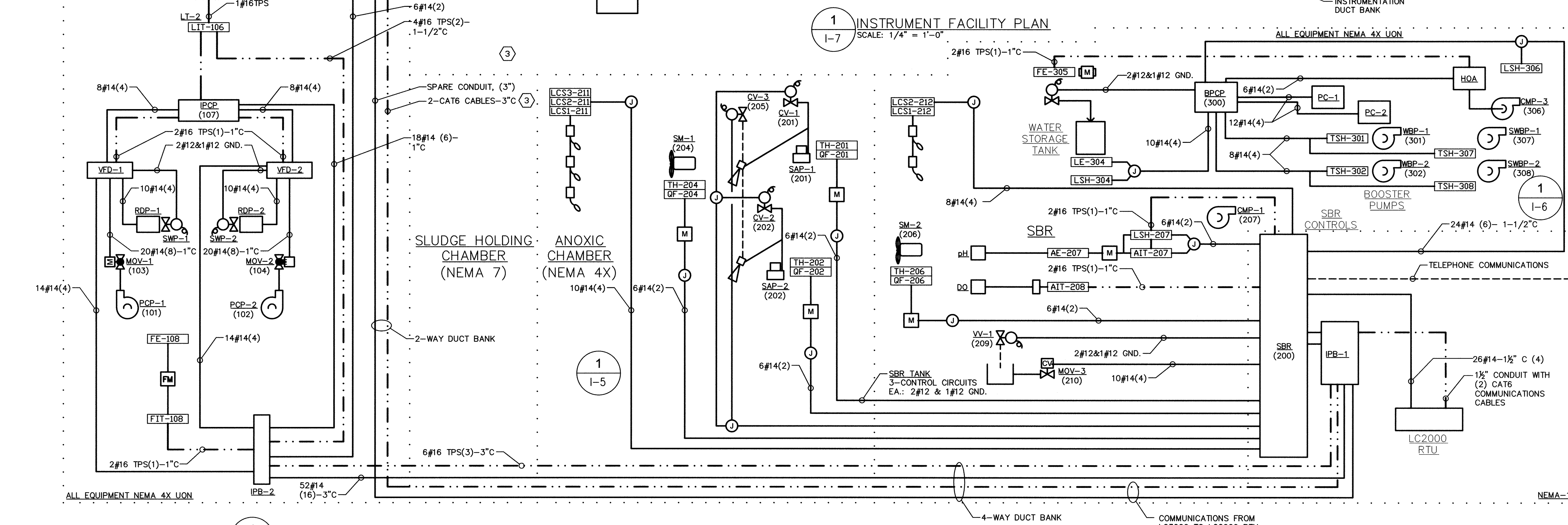
— INSTRUMENTATION (DISCRETE SIGNALS)
- - - ANALOG SIGNAL CONDUIT
— EXISTING WORK
- - - TELEPHONE COMMUNICATION LINK
M MANUFACTURER'S CABLE

PANEL LEGEND:

MFSF METHANOL FILL STATION PANEL
MSCP METHANOL SYSTEM CONTROL PANEL

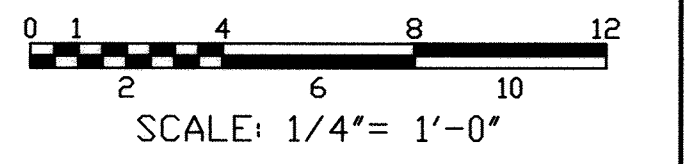
EQUIPMENT LEGEND:

ESP EMERGENCY SHOWER PACKAGE
FV-X FILL VALVE
MMP-X METHANOL METERING PUMP



ALL EQUIPMENT NEMA 4X UON

2#16 TPS(1)-1°C
2#12&1#12 GND.
6#14(2)
12#14(4)
10#14(4)
8#14(4)
2#16 TPS(1)-1°C
6#14(2)
2#16 TPS(1)-1°C
6#14(2)
2#12&1#12 GND.
10#14(4)
26#14-1 1/2" C (4)
1 1/2" CONDUIT WITH (2) CAT6 COMMUNICATIONS CABLES



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. 33925 EXPIRATION DATE: 01/15/17

A INSTRUMENT RISER DIAGRAM
1-7

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

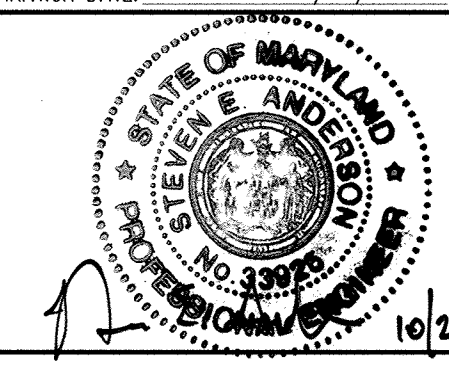
Jan 7, 2017
DIRECTOR OF PUBLIC WORKS
DATE

Thomas R. Suttler 2/3/17
CHIEF, BUREAU OF ENGINEERING
DATE

Steve C. ... 1/25/17
CHIEF, BUREAU OF UTILITIES
DATE

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DES: JFW	BY: NO.	REVISION
DRN: JFW	DATE: 10/24/16	
CHK: SEA		

INSTRUMENT PLAN AND RISER DETAILS

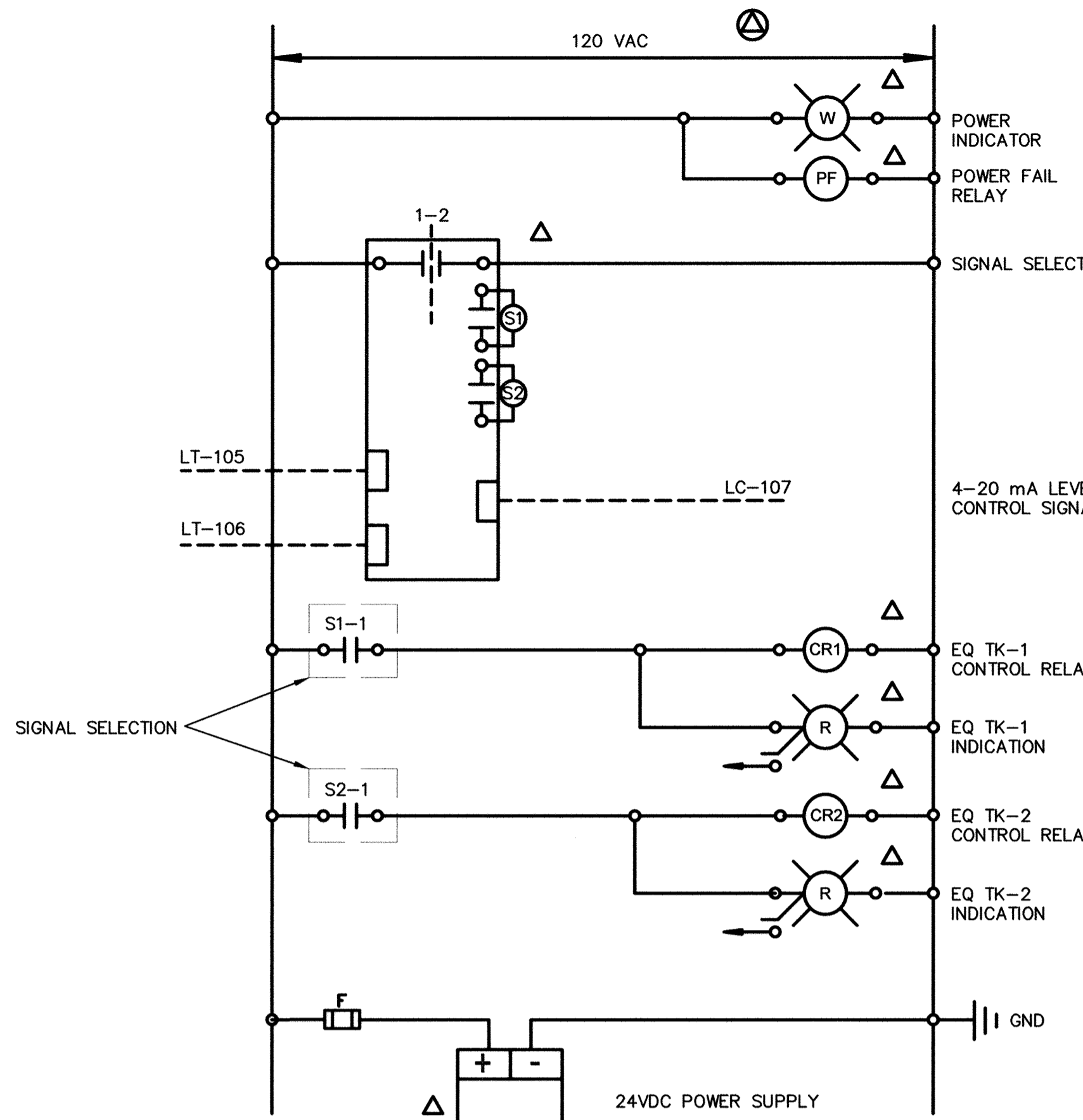
600' SCALE MAP NO. 40-41 BLOCK NO. 12

ASHLEIGH KNOLLS
SHARED SEWAGE DISPOSAL FACILITY

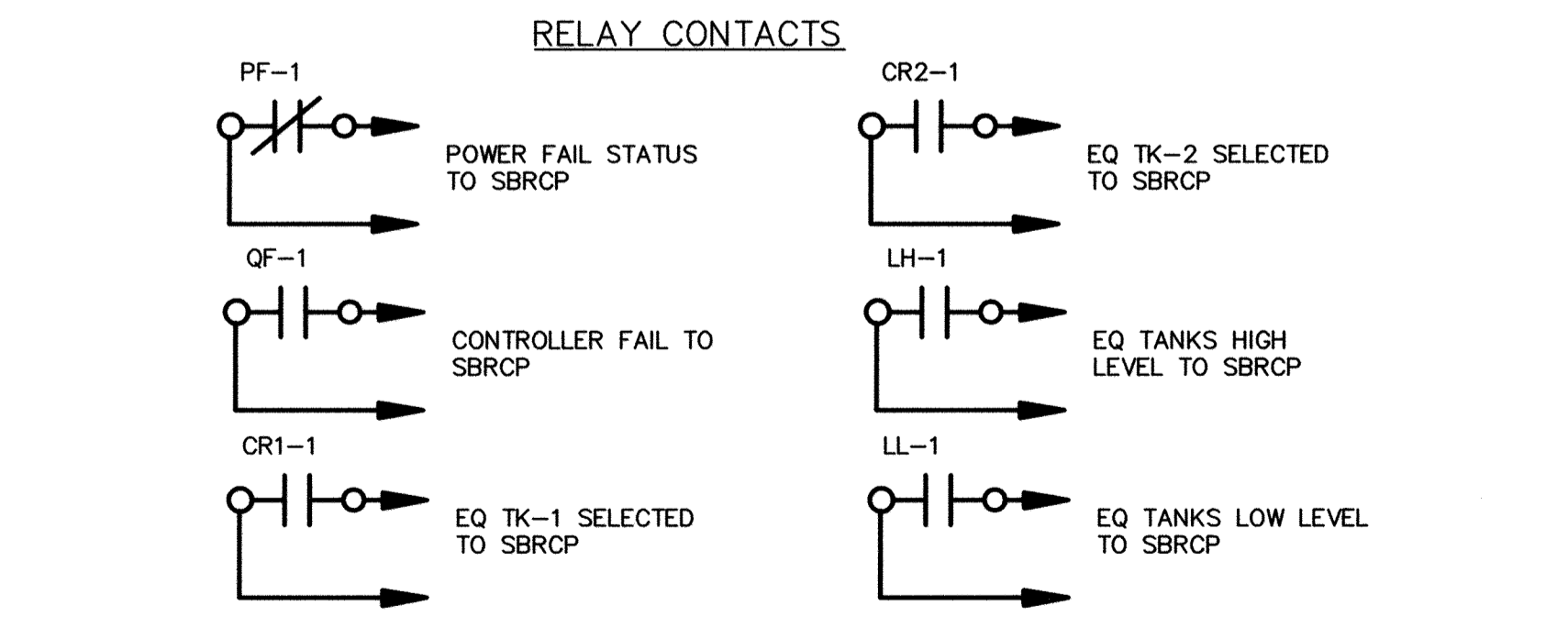
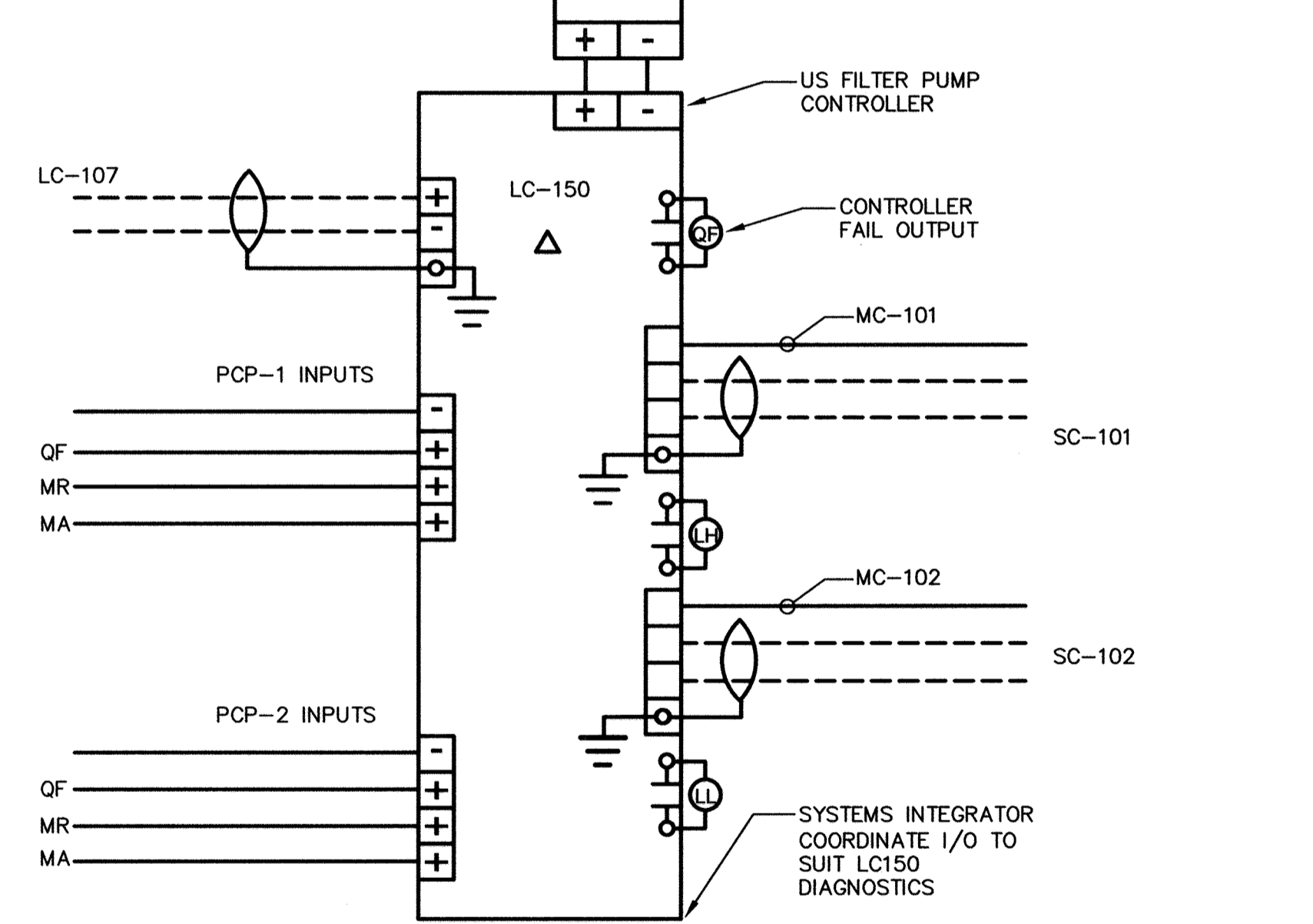
CAPITAL PROJECT No. S-6269
CONTRACT No. 50-4972

ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

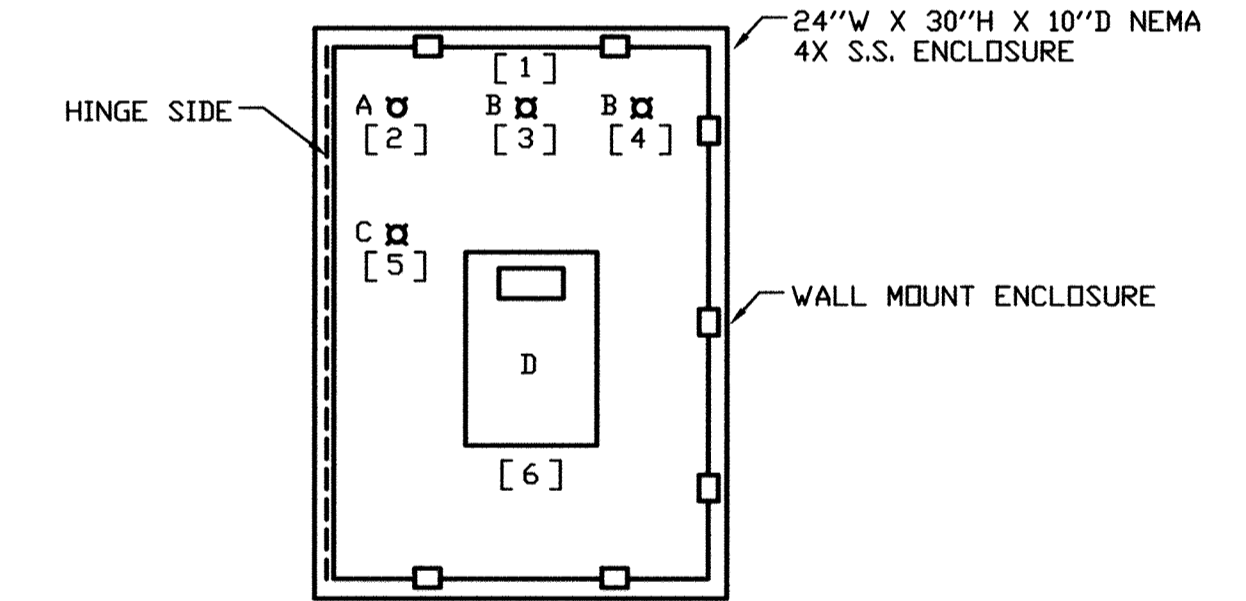
SCALE AS SHOWN
SHEET 37 OF 43



COORDINATE SIGNAL SELECTOR W/ PUMP CONTROLLER FUNCTIONS



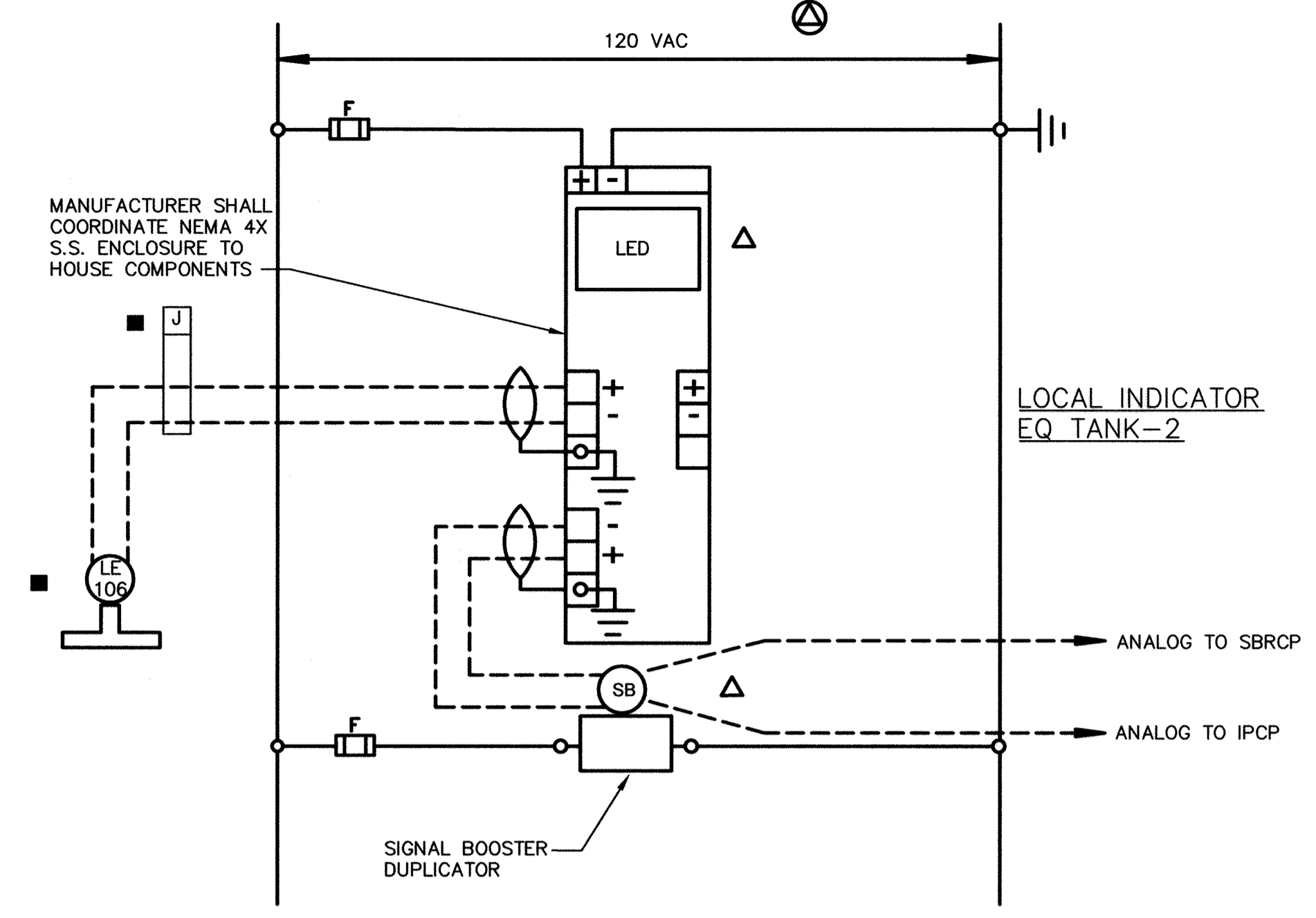
1 IPCP DIAGRAM
1-8



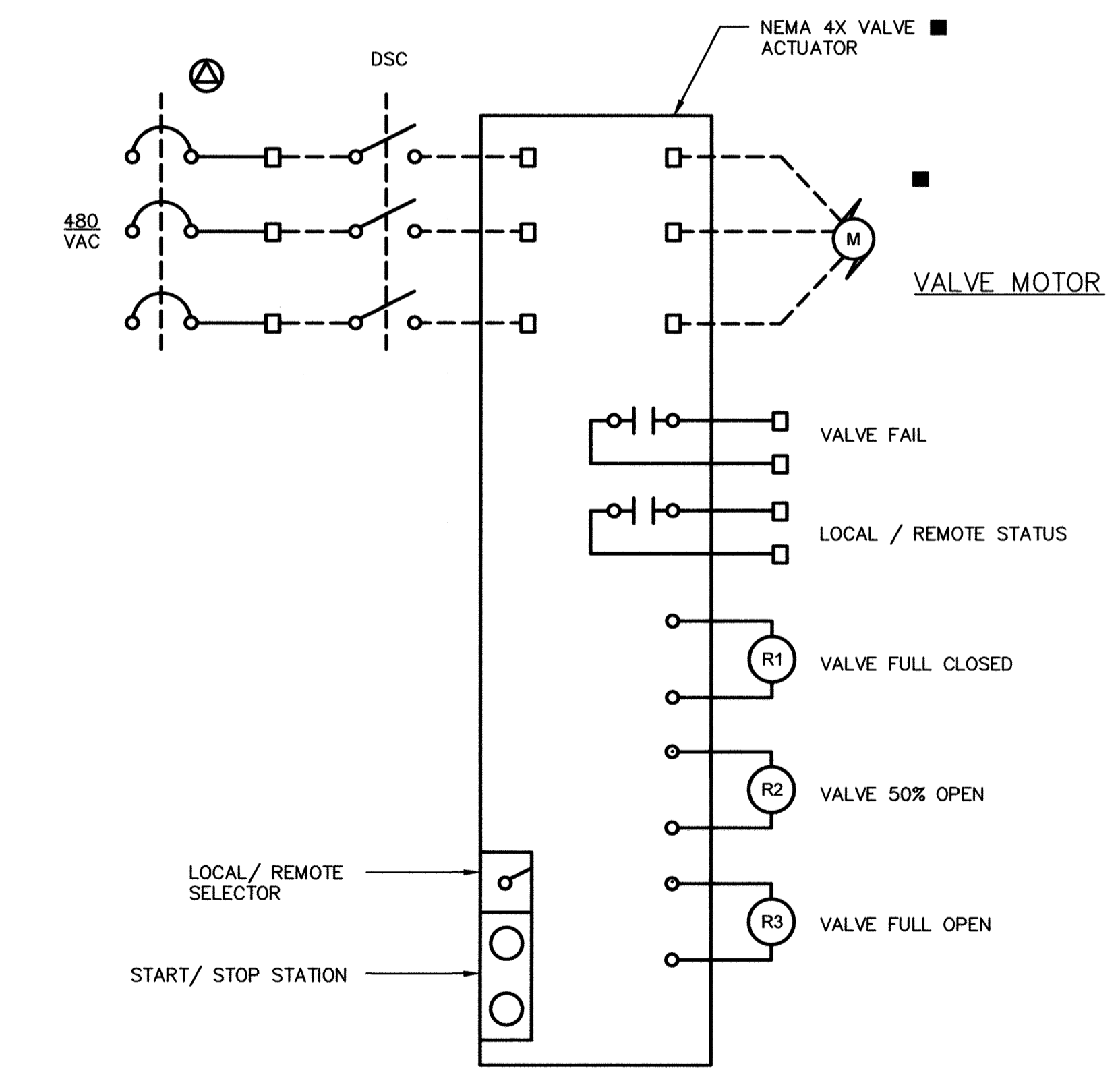
DEVICE LEGEND	NAMEPLATE LEGEND
A 2-POSITION SELECTOR SWITCH	1 INFLUENT PUMP CONTROL PANEL
B INDICATOR LAMP (RED)	2 EQ TANK SELECTOR
C INDICATOR LAMP (WHITE)	3 EQ TANK-1
D LC150 CONTROLLER	4 EQ TANK-2
	5 POWER IND.
	6 PUMP CONTROLLER

A IPCP ELEVATION
1-8 SCALE 1 - 1/2" = 1'-0"

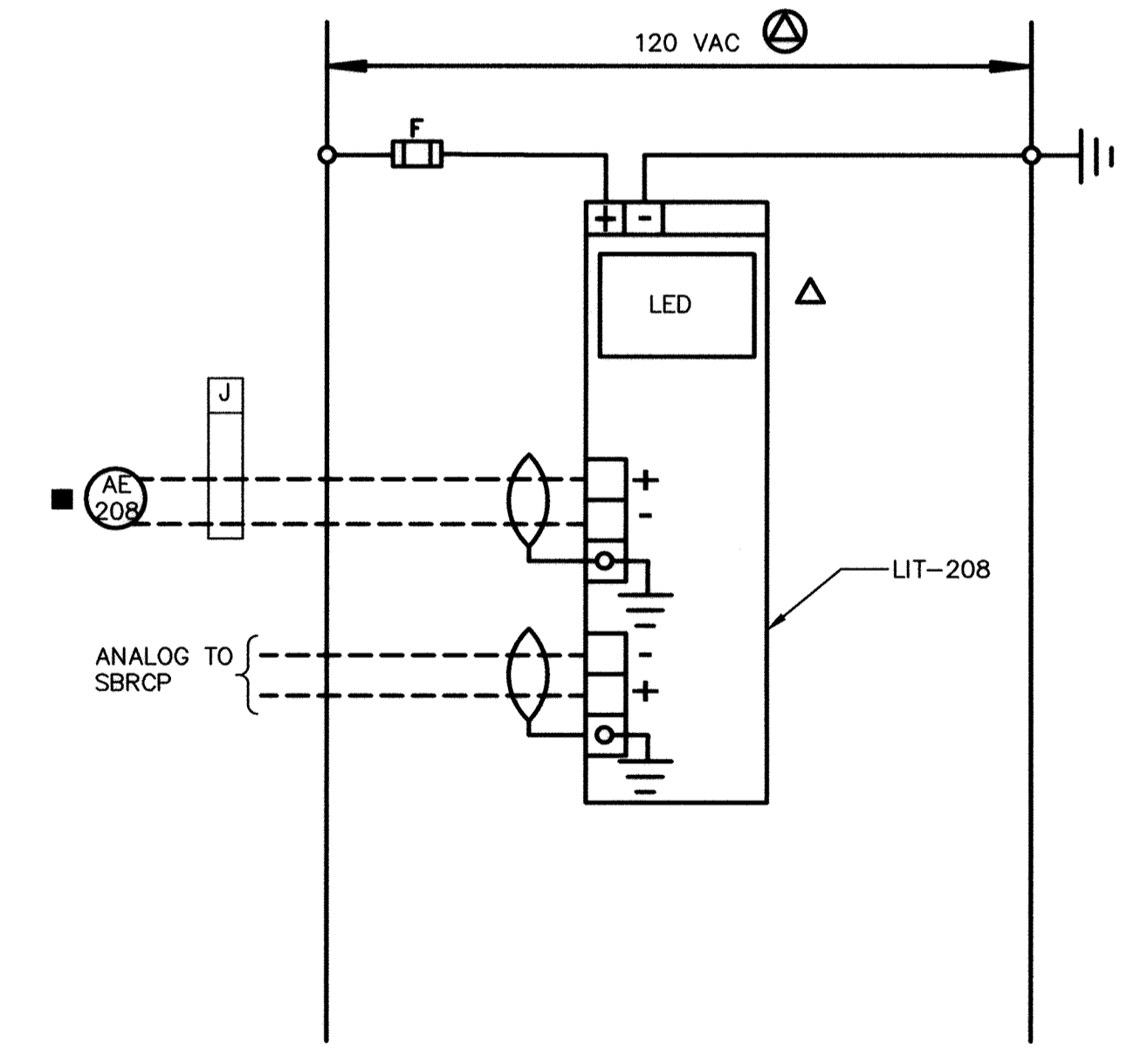
PROFESSIONAL CERTIFICATION: I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 33925 EXPIRATION DATE: 01/15/17



2 TRANSMITTER DETAIL (LT-1)
1-8



3 TYPICAL MOTOR OPERATED VALVE (MOV)
1-8



4 DO-ANALYZER
1-8 TYPICAL: LT-1(105)

- GENERAL NOTES:**
- SEE SYSTEM P&I DIAGRAMS FOR PROCESS CONTROL IDENTIFICATIONS.
- CONSTRUCTION NOTES:**
- ALL RELAYS SHALL HAVE L.E.D.S.
 - ALL FUSES AND BREAKERS SHALL BE SIZED IN ACCORDANCE WITH THE ELECTRICAL DRAWINGS AND THE MCC MANUFACTURERS RECOMMENDATIONS.
 - VFD SHALL SELECT 4-20mA SPEED REFERENCE INPUT BASED ON HIGH/ LOW CURRENT VALVE. PLC-IP1 SHALL BE PRIMARY AND PLC-IP2 SHALL BE SECONDARY. SYSTEMS INTEGRATOR COORDINATE VFD PROGRAMMING FOR CURRENT LEVEL SELECTION OR DIGITAL ONLINE STATUS FROM PLC-IP1 AND PLC-IP2.
 - ALL SBRCP COMMUNICATIONS REQUIRE HMI GRAPHICS.
 - SYSTEMS INTEGRATOR SHALL COORDINATE ANALOG SPEED CONTROL AND FEEDBACK LOOPS TO SUIT CONTROLLER OPERATIONS.

ELECTRICAL CONTROL DIAGRAM LEGEND (ECD):

- REMOTE
- AT PLC CABINET
- △ AT LOCAL PANEL
- ▲ AT MOTOR CONTROL PANEL (VFD)
- ⊙ PANEL BOARD
- ⊕ AT SYSTEM CONTROL PANEL

ELECTRICAL CONTROL DIAGRAM TERMINALS (ECD):

- PANEL WIREWAY TERMINATIONS
- WIRING CONNECTIONS
- REMOTE TERMINATIONS
- PANEL CONNECTIONS
- - - REMOTE CONNECTIONS
- ⊕ POWER SUPPLY CONNECTION

DATE: 01/15/17 BY: JFW

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

James G. ... 2/7/17
DIRECTOR OF PUBLIC WORKS DATE

Thomas R. ... 2/17/17
CHIEF, BUREAU OF ENGINEERING DATE

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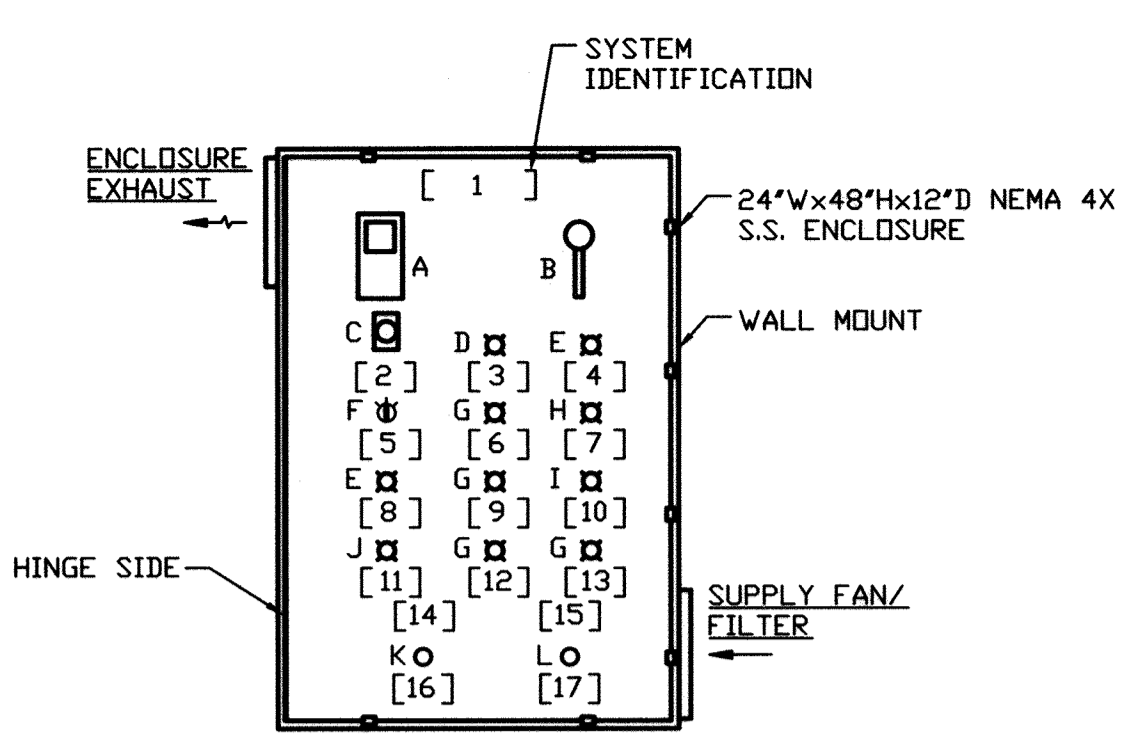
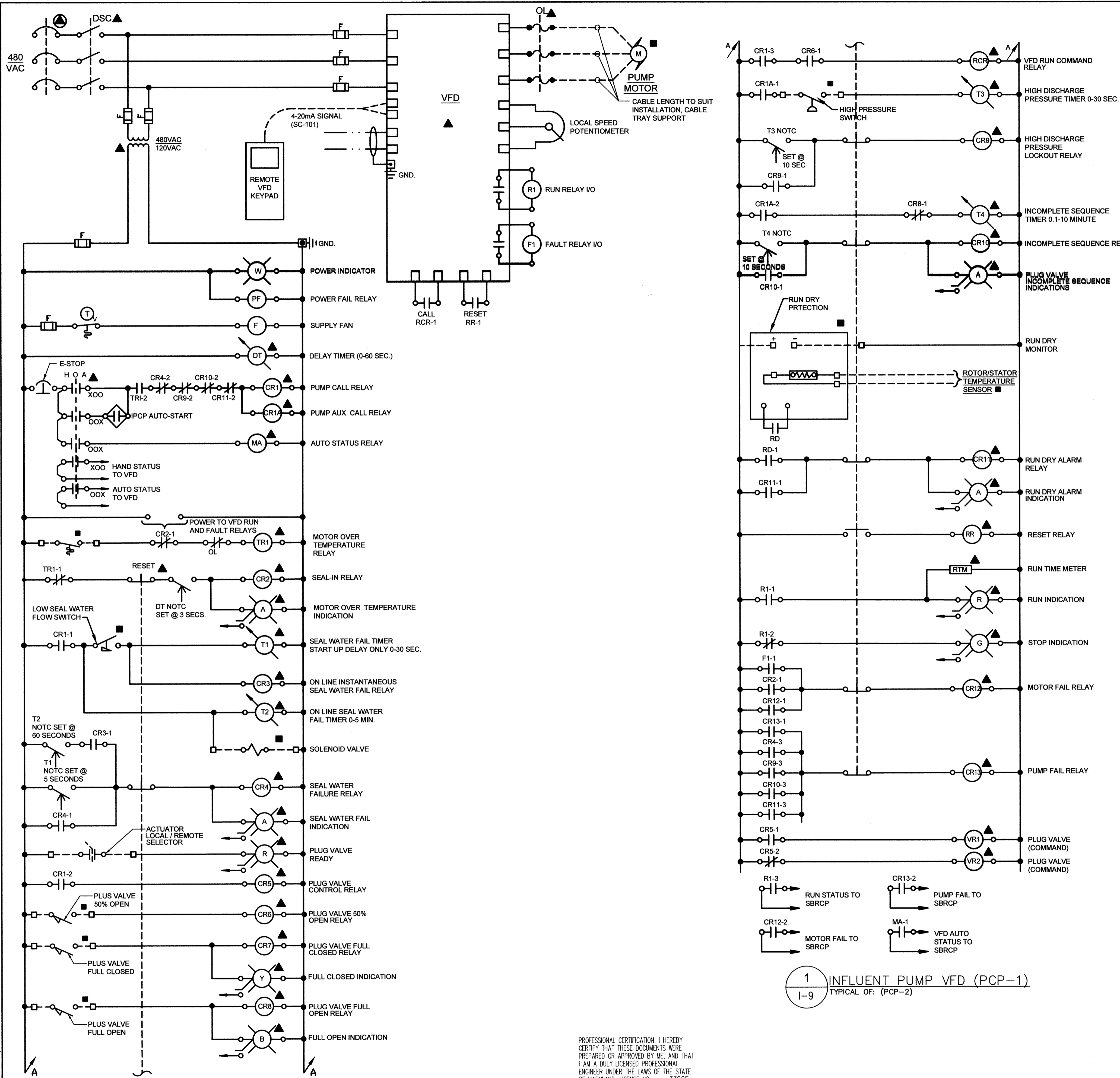
DES: JFW					
DRN: JFW					
CHK: SEA					
DATE: AUG, 2016	BY: NO.	REVISION	DATE	600' SCALE MAP NO. 40-41	BLOCK NO. 12

WIRING DIAGRAM - 1

ASHLEIGH KNOLLS
SHARED SEWAGE DISPOSAL FACILITY

CAPITAL PROJECT No. S-6269
CONTRACT No. 50-4972
ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

1-8
SCALE
AS SHOWN
SHEET
38 OF 43



NAMEPLATE LEGEND:		DEVICE LEGEND:	
1	INFLUENT PUMP VFD-1	A	VFD KEYPAD
2	RUN-HOURS	B	MAIN BREAKER
3	POWER	C	ETM-ELAPSED TIME METER
4	VALVE READY	D	IND. LAMP (WHITE)
5	HOA	E	IND. LAMP (RED)
6	MOTOR FAIL	F	3-POSITION SELECTOR SWITCH
7	VALVE CLOSED	G	IND. LAMP (AMBER)
8	PUMP RUN	H	IND. LAMP (YELLOW)
9	SEAL-WATER FAIL	I	IND. LAMP (BLUE)
10	VALVE OPEN	J	IND. LAMP (GREEN)
11	PUMP STOP	K	MOMENTARY PUSHBUTTON
12	RUN DRY ALARM	L	MAINTAIN PUSH-PULL BUTTON
13	INCOMPLETE SEQUENCE		
14	VFD		
15	MOTORIZED PLUG VALVE		
16	RESET		
17	E-STOP		

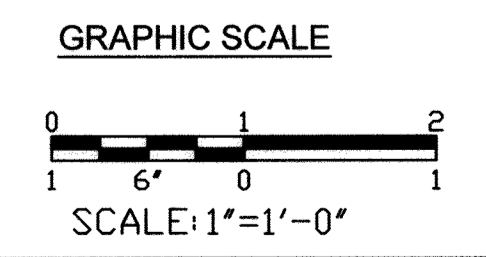
A PCP VFD CONTROL PANEL ELEVATION
 1-9 TYPICAL OF: (INFLUENT PUMP VFD-2)
 SCALE: 1"=1'-0"

- GENERAL NOTES:**
- SEE SYSTEM P&I DIAGRAMS FOR PROCESS CONTROL IDENTIFICATIONS.
- CONSTRUCTION NOTES:**
- ALL RELAYS SHALL HAVE L.E.D.S.
 - ALL FUSES AND BREAKERS SHALL BE SIZED IN ACCORDANCE WITH THE ELECTRICAL DRAWINGS AND THE MCC MANUFACTURERS RECOMMENDATIONS.
 - AT THE INTEGRATORS OPTIONS, PERMISSIVE ALARM SEQUENCES CAN BE INCLUDED WITHIN THE VFD PROCESSOR. VFD CONTROLS SHALL BE COORDINATED WITH ALL EXTERNAL INSTRUMENTS AND SEQUENCED EQUIPMENT FOR PROPER OPERATIONS.

- ELECTRICAL CONTROL DIAGRAM LEGEND (ECD):**
- REMOTE
 - AT PLC CABINET
 - ▲ AT LOCAL PANEL
 - ▲ AT MOTOR CONTROL PANEL (VFD)
 - ⊙ PANEL BOARD
 - ⊙ AT SYSTEM CONTROL PANEL
- ELECTRICAL CONTROL DIAGRAM TERMINALS (ECD):**
- PANEL WIREWAY TERMINATIONS
 - WIRING CONNECTIONS
 - REMOTE TERMINATIONS
 - PANEL CONNECTIONS
 - - - REMOTE CONNECTIONS
 - ⊕ POWER SUPPLY CONNECTION

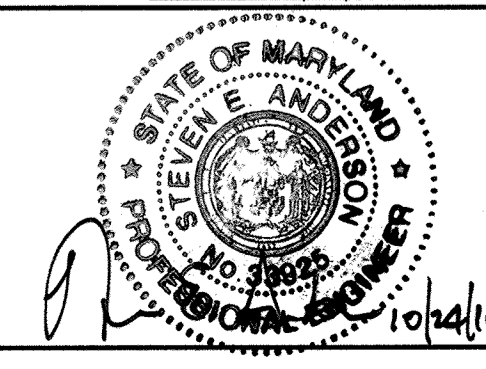
NOTE:
 VFD CONTROLS INCLUDING SEAL WATER AND RUN DRY PROTECTION INTEGRATION SHALL BE APPROVED BY THE PUMP MANUFACTURER TO MAINTAIN EQUIPMENT WARRANTY.

1 INFLUENT PUMP VFD (PCP-1)
 1-9 TYPICAL OF: (PCP-2)



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. 33925, EXPIRATION DATE: 01/15/17

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DES:	JFW					
DRN:	JFW					
CHK:	SEA					
DATE:	AUG, 2016	BY:	NO.	REVISION	DATE	

WIRING DIAGRAM -2
 600' SCALE MAP NO. 40-41 BLOCK NO. 12

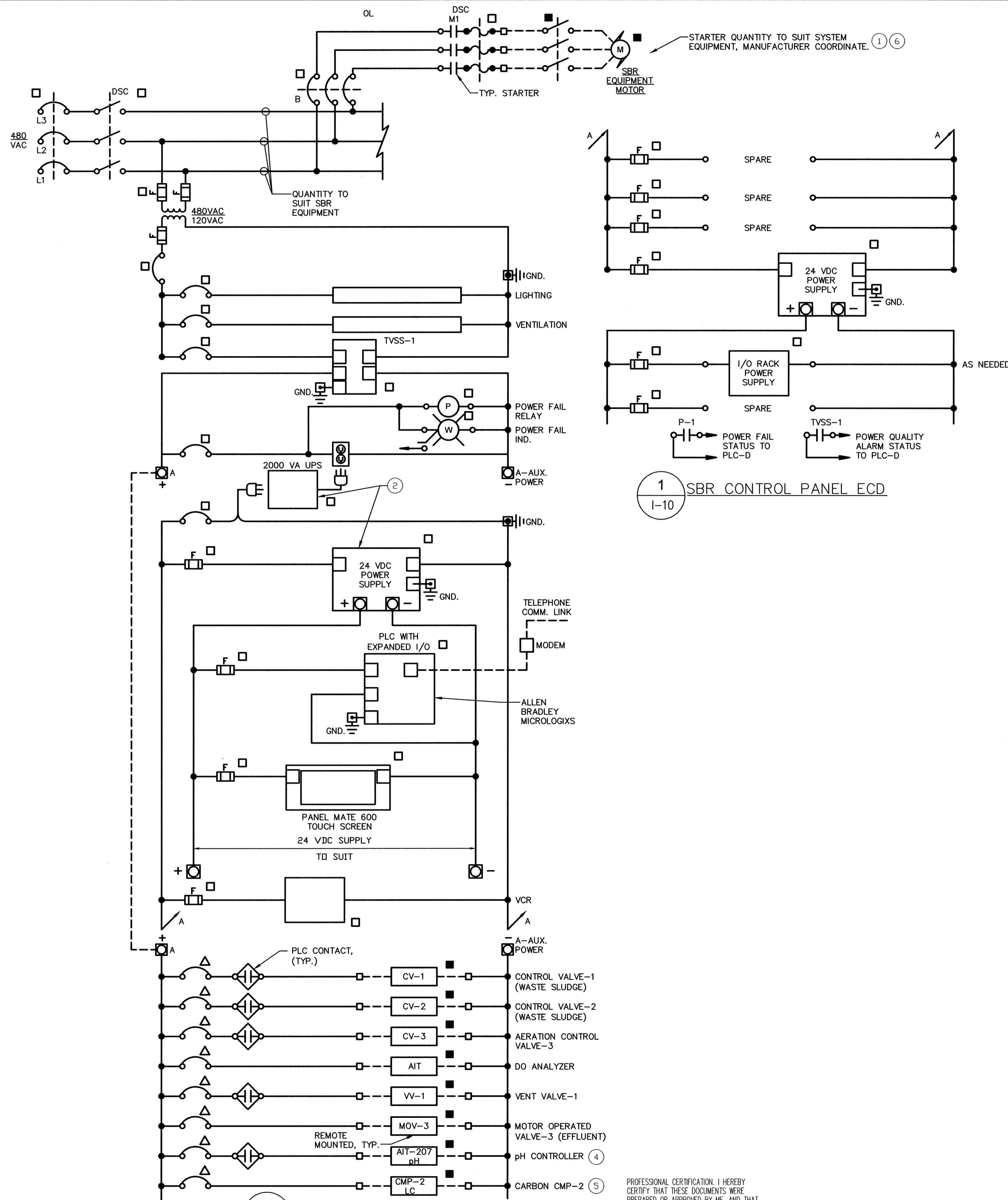
**ASHLEIGH KNOLLS
 SHARED SEWAGE DISPOSAL FACILITY**
 CAPITAL PROJECT No. S-6269
 CONTRACT No. 50-4972
 ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

DEPARTMENT OF PUBLIC WORKS
 HOWARD COUNTY, MARYLAND

[Signature] 2/7/17
 DIRECTOR OF PUBLIC WORKS DATE

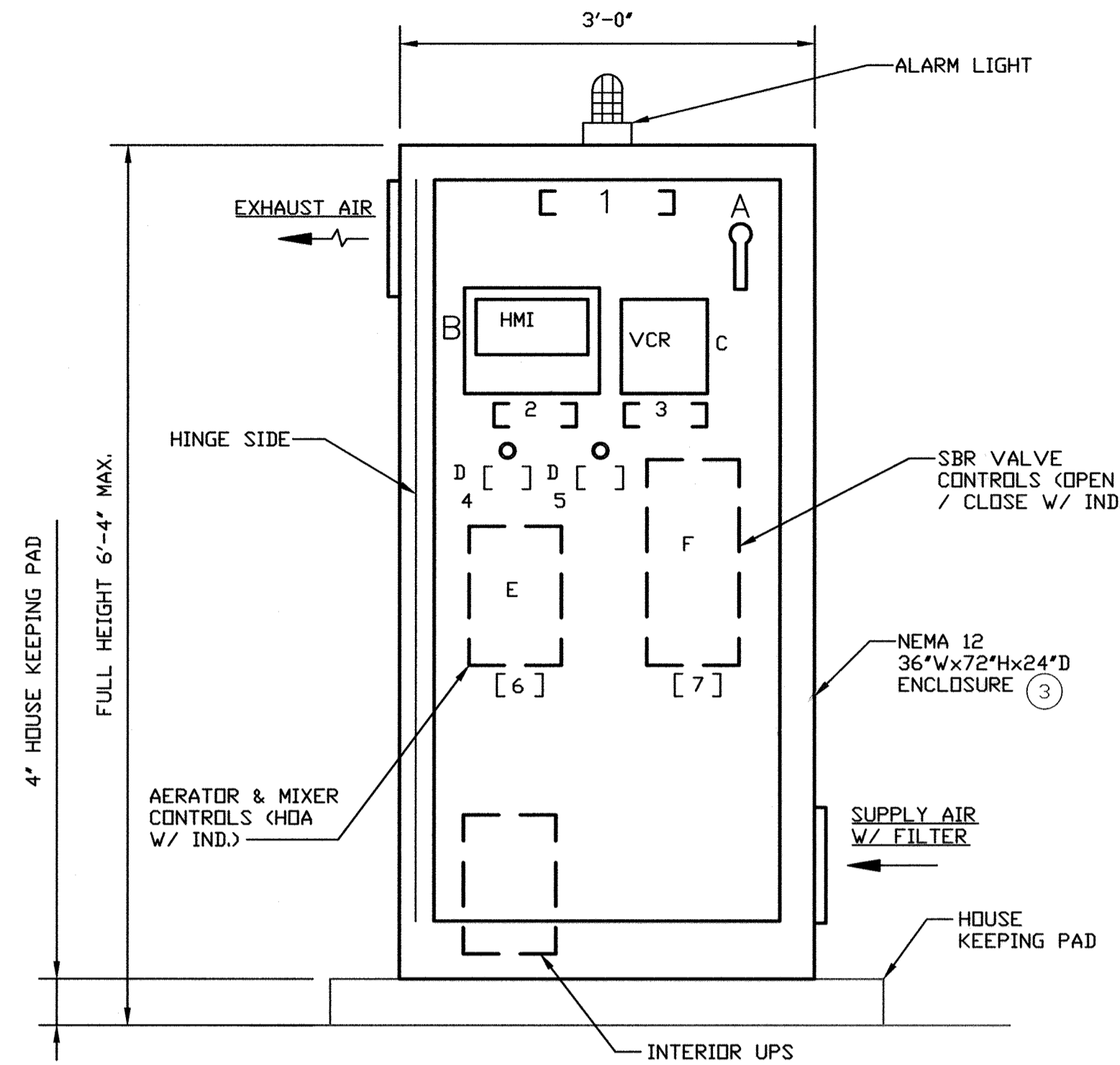
[Signature] 2/3/17
 CHIEF, BUREAU OF ENGINEERING DATE

[Signature] 2/3/17
 CHIEF, UTILITY DESIGN DIVISION DATE

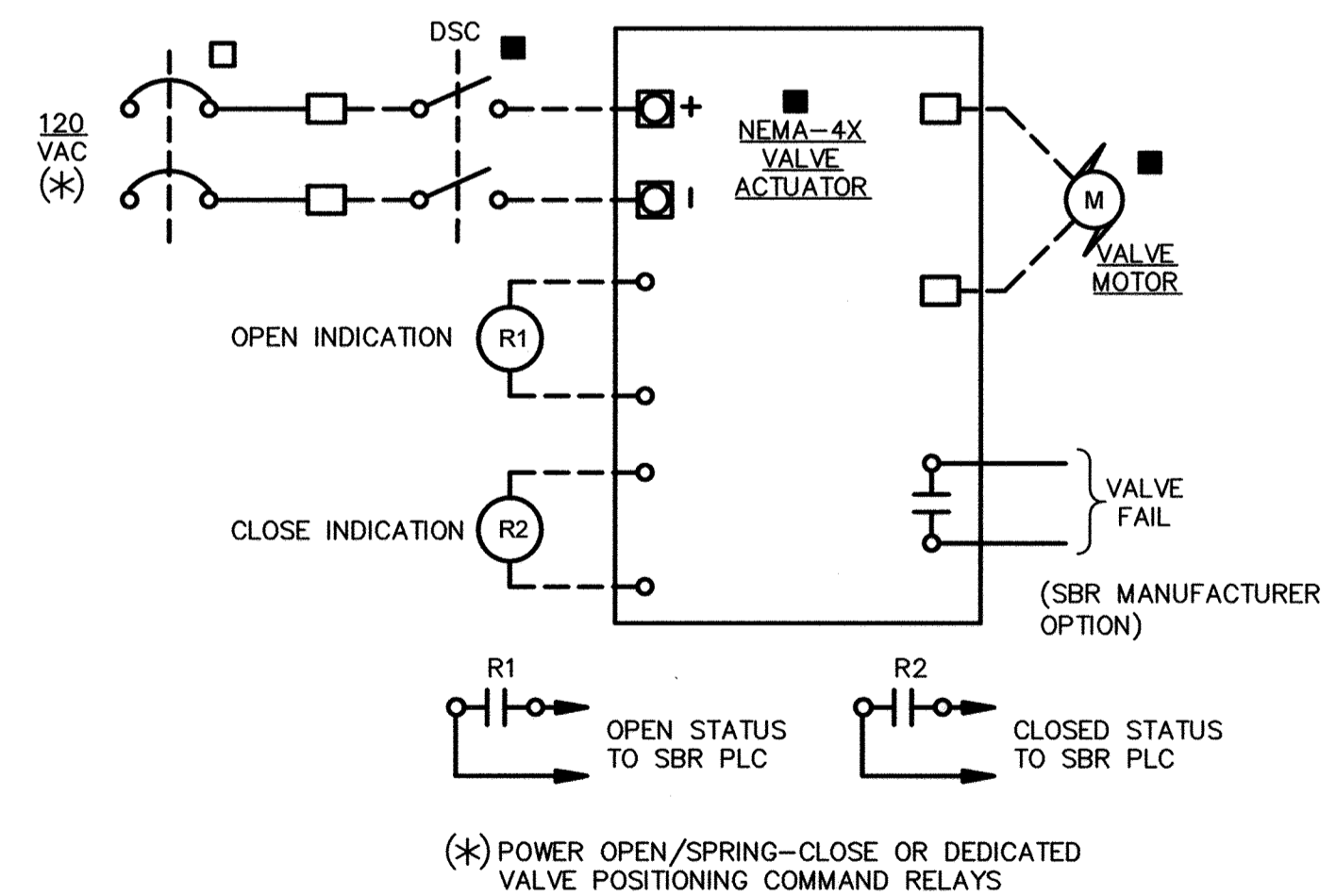


2 AUXILIARY POWER ECD
I-10

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. 33925 EXPIRATION DATE: 01/15/17



- NAMEPLATE LEGEND:**
- 1 SBR CONTROL PANEL
 - 2 SYSTEM SCREEN
 - 3 PROCESS RECORDER
 - 4 RESET
 - 5 ACKNOWLEDGE
 - 6 SBR EQUIPMENT
 - 7 SBR CONTROL VALVES
- DEVICE LEGEND:**
- A MAIN PANEL BREAKER
 - B HMI TOUCH SCREEN
 - C VIDEO CHART RECORDER
 - D MOMENTARY PUSH-BUTTON
 - E AERATOR / MIXER CONTROLS
 - F VALVE CONTROLS



- GENERAL NOTES:**
- SEE SYSTEM P&I DIAGRAMS FOR PROCESS CONTROL IDENTIFICATIONS.
- CONSTRUCTION NOTES:**
- ALL RELAYS SHALL HAVE L.E.D.S.
 - ALL FUSES AND BREAKERS SHALL BE SIZED IN ACCORDANCE WITH THE ELECTRICAL DRAWINGS AND THE MCC MANUFACTURERS RECOMMENDATIONS.

ELECTRICAL CONTROL DIAGRAM LEGEND (ECD):

- REMOTE
- AT PLC CABINET
- △ AT LOCAL PANEL
- ▲ AT MOTOR CONTROL PANEL (VFD)
- ⊙ PANEL BOARD
- ⊕ AT SYSTEM CONTROL PANEL

ELECTRICAL CONTROL DIAGRAM TERMINALS (ECD):

- PANEL WIREWAY TERMINATIONS
- WIRING CONNECTIONS
- REMOTE TERMINATIONS
- PANEL CONNECTIONS
- - - REMOTE CONNECTIONS
- ⊕ POWER SUPPLY CONNECTION

- NOTES**
- INDIVIDUAL STARTER ALARMS IDENTIFIED ON THE P&I'S SHALL BE TERMINATED FOR COUNTY USE AS SHOWN.
 - SBR MANUFACTURER SHALL CUSTOMIZE THE BACKUP POWER AND I/O MODULE POWER/ISOLATION RELAYS TO SUIT PLC EQUIPMENT PROVIDED.
 - THE SBR CONTROL PANEL ELEVATION DETAILS MINIMUM LAYOUT AND INDICATIONS REQUIRED FOR OPERATOR INTERFACE AND FACILITY HMI. RESPECTIVE MANUFACTURER'S SHALL CUSTOMIZE THIS PANEL TO SUIT THEIR SYSTEM COMPONENTS.
 - SBR POWER SHALL BE FURNISHED TO THE ANALYZER HOA/RECEPTICAL PANEL, SEE SHEET I-11 DETAILS.
 - SBR POWER SHALL BE FURNISHED TO THE CARBON METERING PUMP HOA/RECEPTICAL PANEL, SEE SHEET I-11 DETAILS.
 - SBR MANUFACTURER SHALL PROVIDE EQUIPMENT LABELS FOR ALL BREAKERS.

04/24/2016 - 10:00am - User: jfw - File: SBR Control Panel ECD.dwg
 04/20/2017 01:17:38 AM - User: jfw - File: SBR Control Panel ECD.dwg

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

John De 2/16/17
DIRECTOR OF PUBLIC WORKS DATE

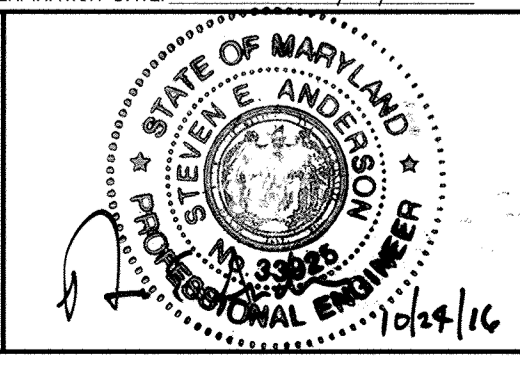
Thomas J. Buller 2/16/17
CHIEF, BUREAU OF ENGINEERING DATE

Tommy 2/16/17
CHIEF, UTILITY DESIGN DIVISION DATE

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DES: JFW					
DRN: JFW					
CHK: SEA					
DATE: AUG, 2016	BY: NO.	REVISION:	DATE:	600' SCALE MAP NO. 40-41	BLOCK NO. 12

WIRING DIAGRAMS-3

ASHLEIGH KNOLLS
SHARED SEWAGE DISPOSAL FACILITY

CAPITAL PROJECT No. S-6269
CONTRACT No. 50-4972

ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

I-10 SCALE AS SHOWN SHEET 40 OF 43

GENERAL NOTES:

1. SEE SYSTEM P&I DIAGRAMS FOR PROCESS CONTROL IDENTIFICATIONS.

CONSTRUCTION NOTES:

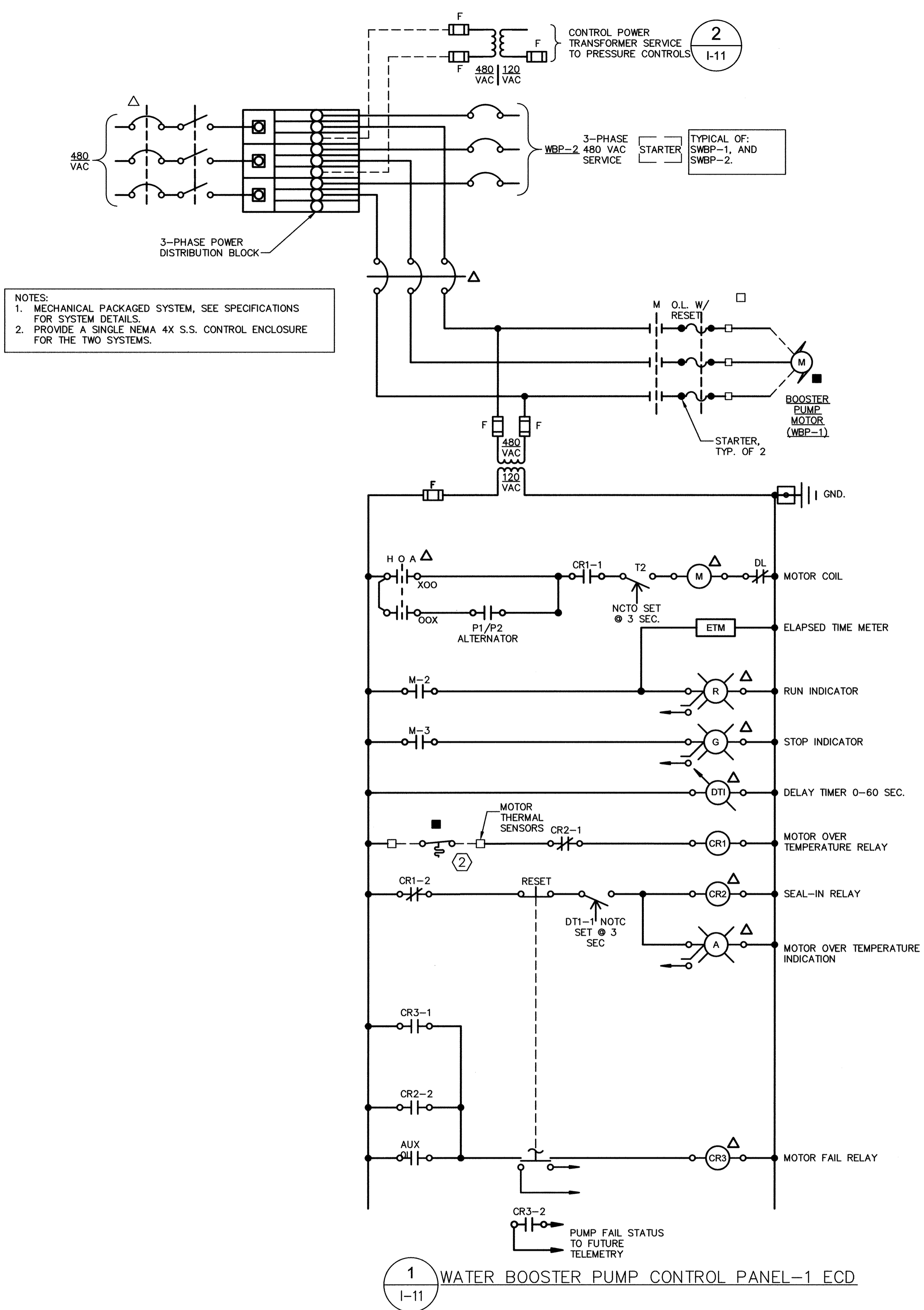
- (1) ALL RELAYS SHALL HAVE L.E.D.S.
- (2) ALL FUSES AND BREAKERS SHALL BE SIZED IN ACCORDANCE WITH THE ELECTRICAL DRAWINGS AND THE MCC MANUFACTURERS RECOMMENDATIONS.

ELECTRICAL CONTROL DIAGRAM LEGEND (ECD):

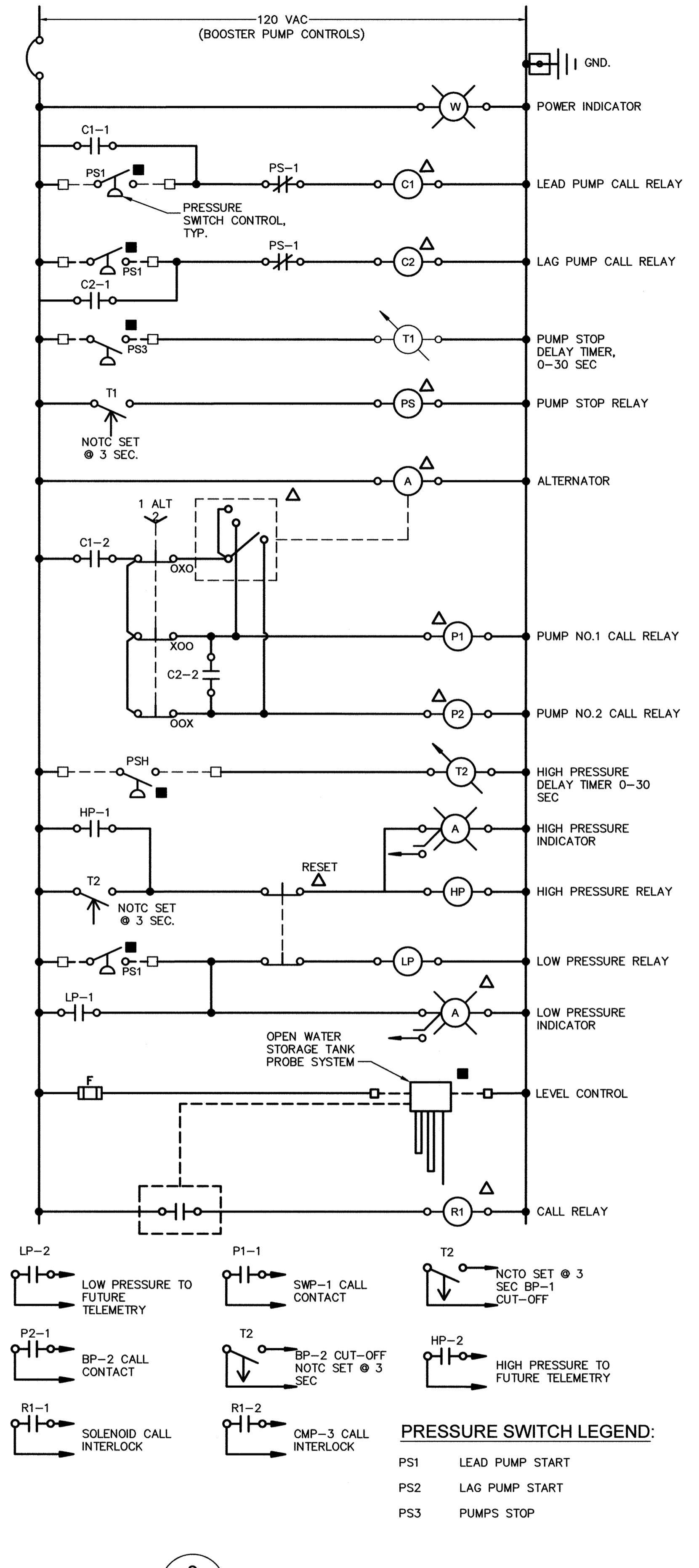
- REMOTE
- AT PLC CABINET
- △ AT LOCAL PANEL
- ▲ AT MOTOR CONTROL PANEL (VFD)
- ⊙ PANEL BOARD
- ⊗ AT SYSTEM CONTROL PANEL

ELECTRICAL CONTROL DIAGRAM TERMINALS (ECD):

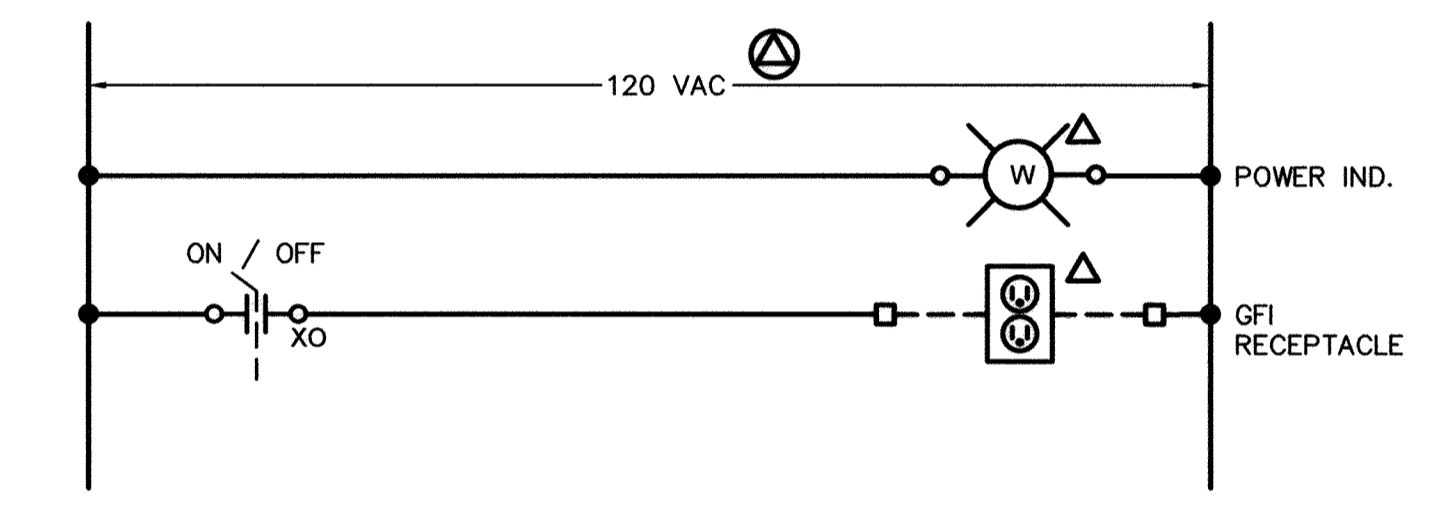
- PANEL WIREWAY TERMINATIONS
- WIRING CONNECTIONS
- REMOTE TERMINATIONS
- PANEL CONNECTIONS
- - - REMOTE CONNECTIONS
- ⊕ POWER SUPPLY CONNECTION



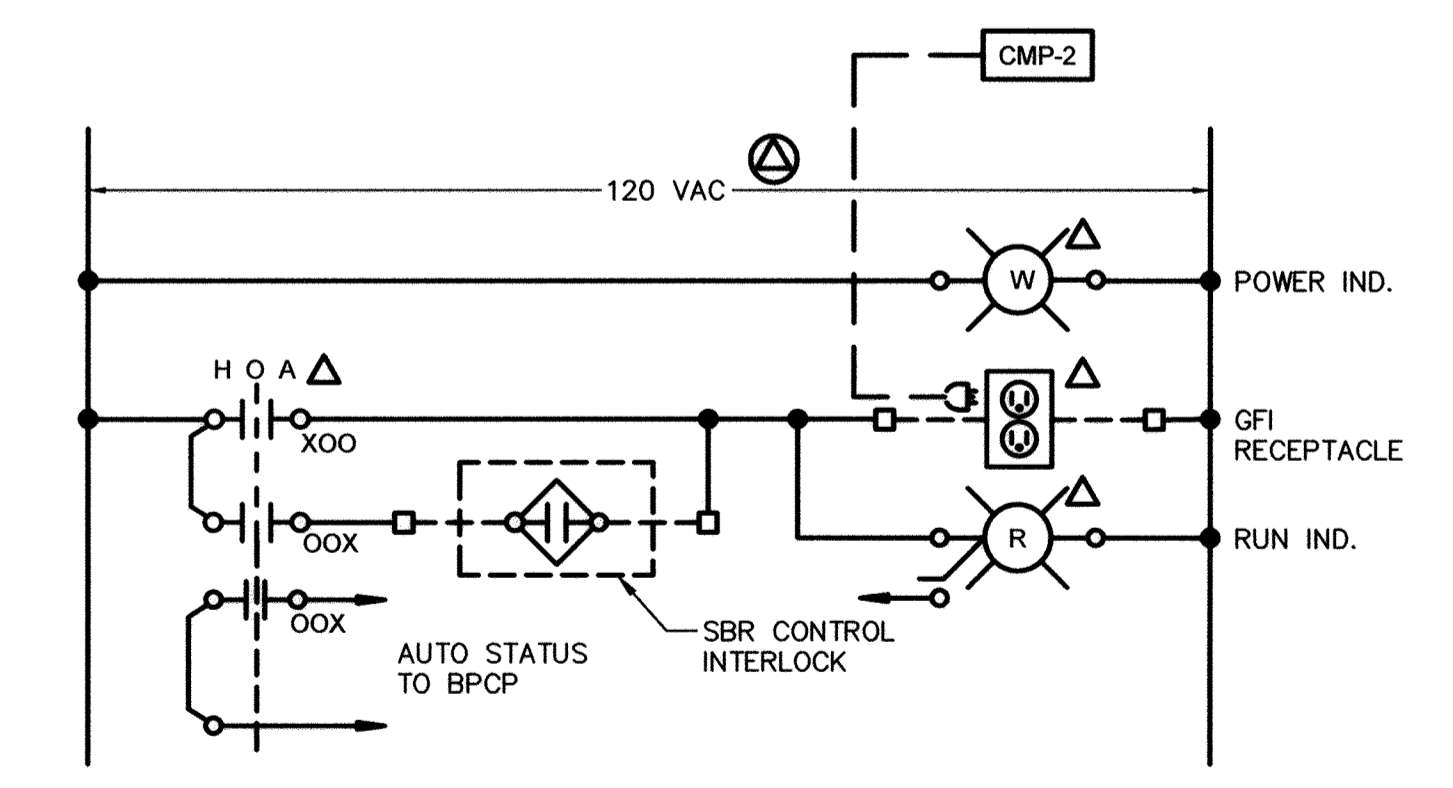
1 WATER BOOSTER PUMP CONTROL PANEL-1 ECD
I-11



2 TYPICAL PRESSURE CONTROLS
I-11 (PC-1 & PC-2)

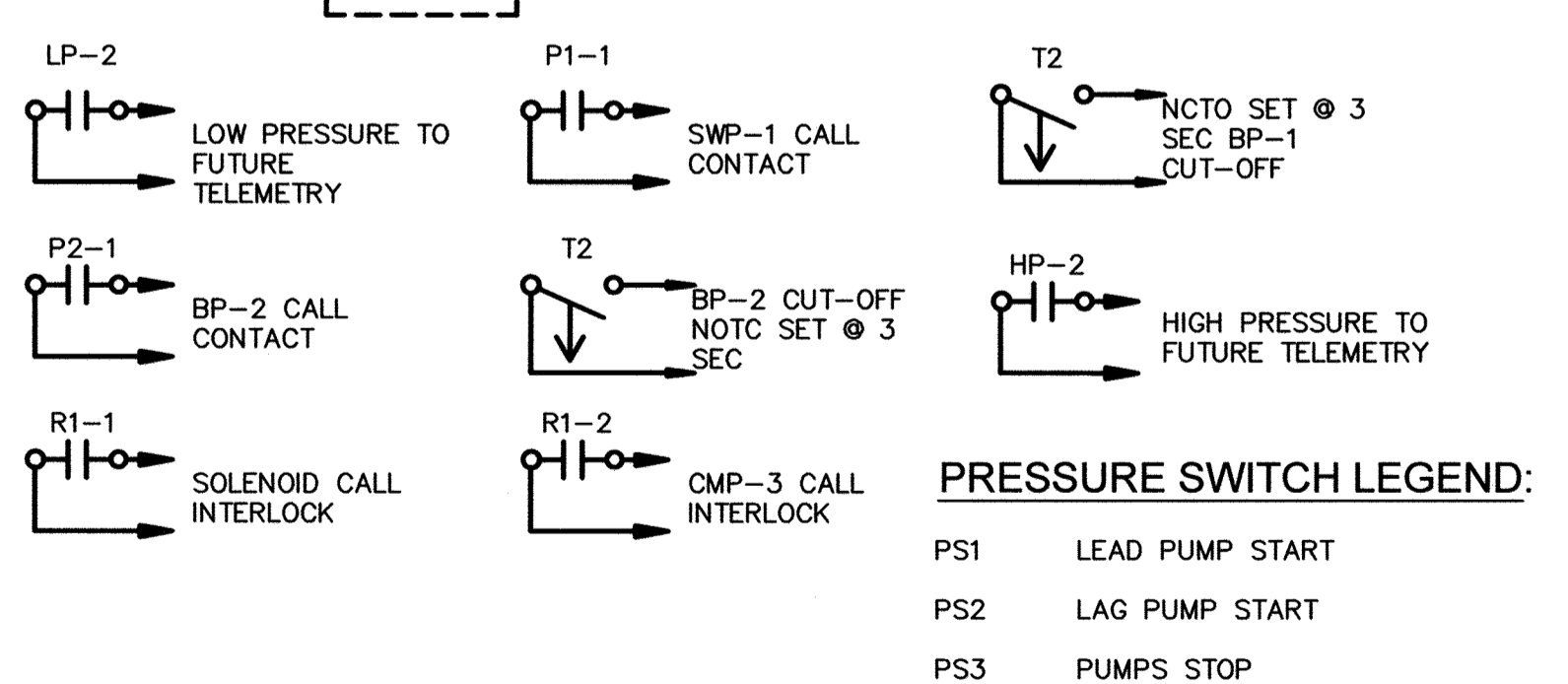


3 CMP-1 CONTROL ECD
I-11



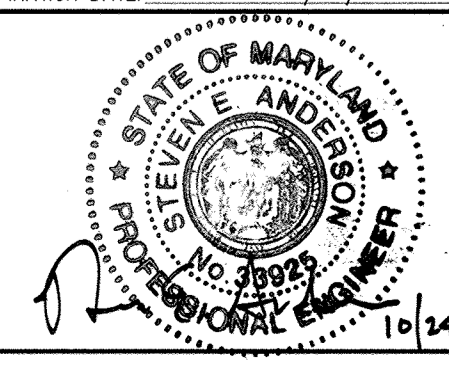
4 CMP-2 CONTROL ECD
I-11 (TYP. CMP-3)

NOTE:
1. FOR CMP-3 BOOSTER SYSTEM INTERLOCK (R1-2).



PRESSURE SWITCH LEGEND:
PS1 LEAD PUMP START
PS2 LAG PUMP START
PS3 PUMPS STOP

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. 33925 EXPIRATION DATE: 01/15/17



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HOWARD COUNTY, MARYLAND

James J. ... 2/3/17
DIRECTOR OF PUBLIC WORKS DATE

Thomas J. Butler 2/3/17
CHIEF, BUREAU OF UTILITIES DATE

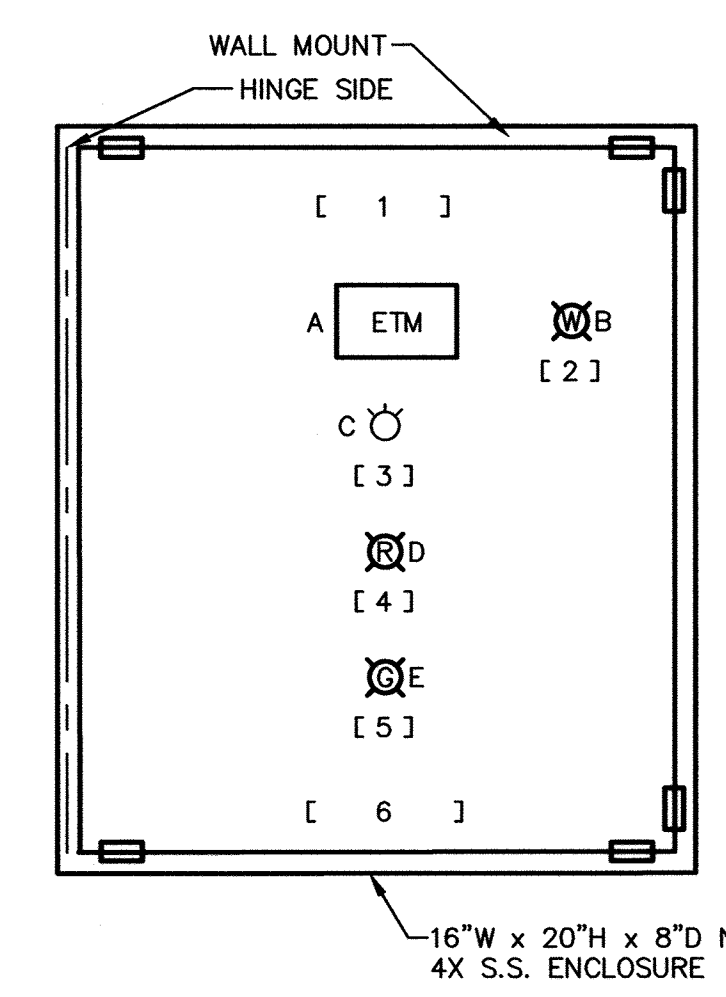
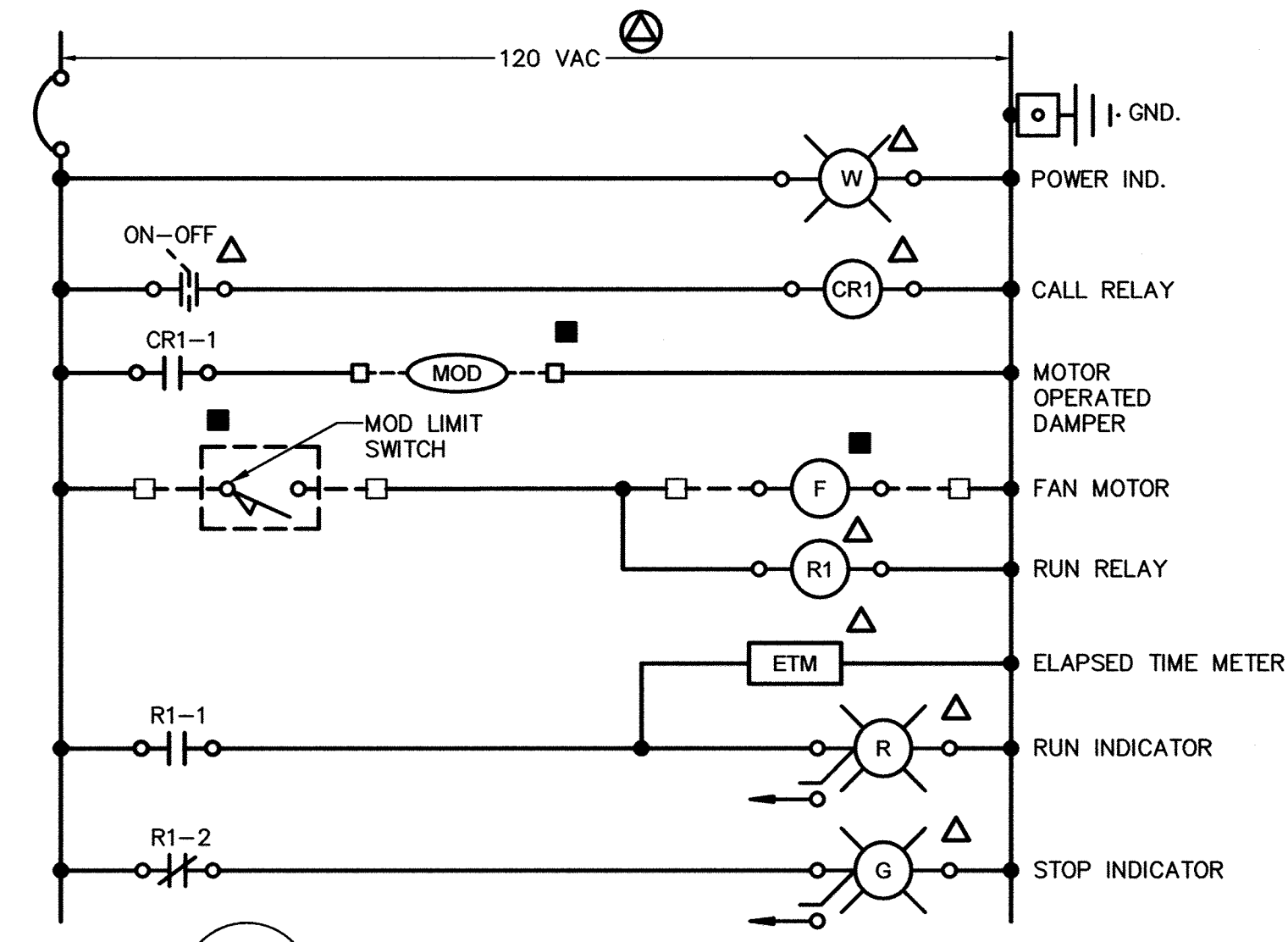
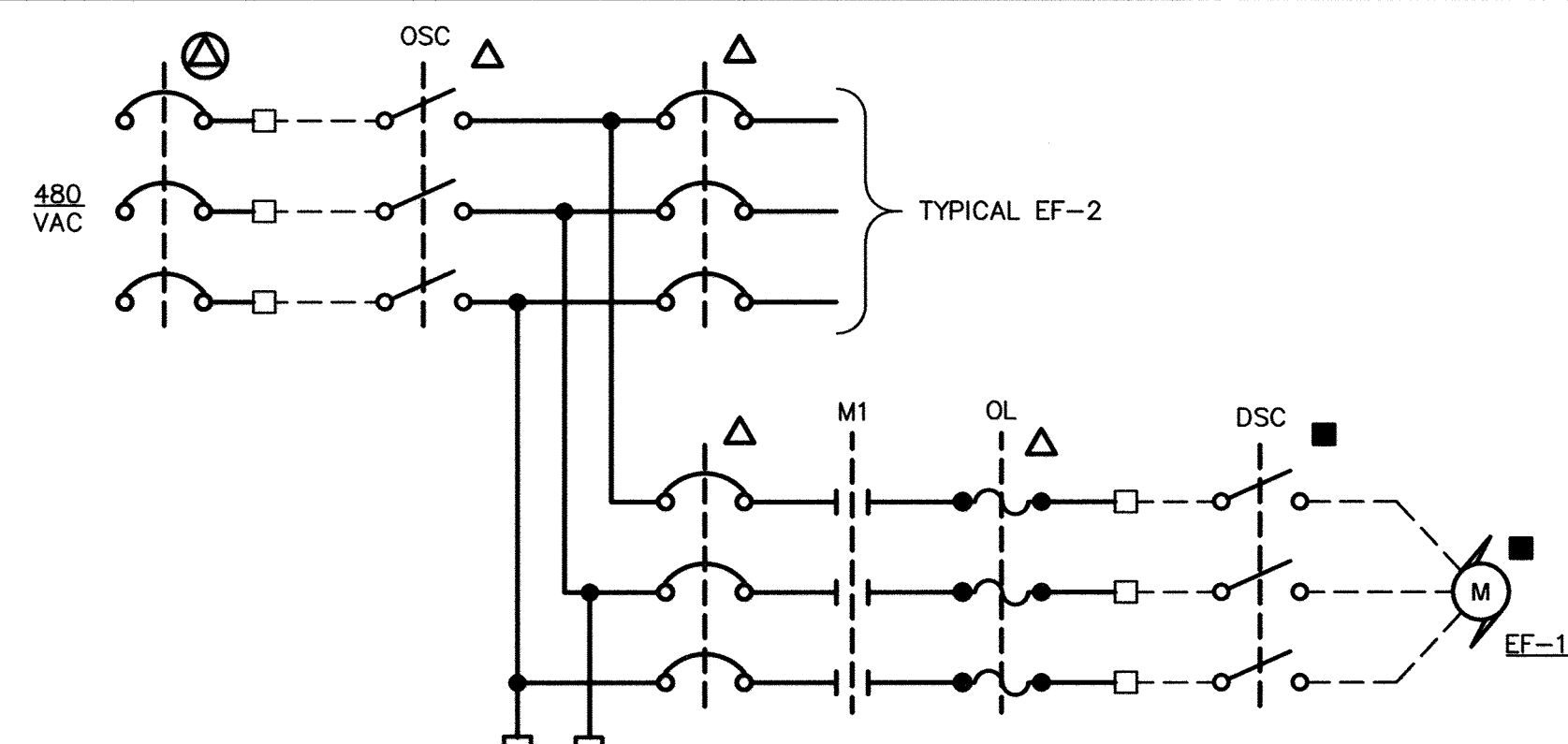
Thomas J. Butler 2/3/17
CHIEF, UTILITY DESIGN DIVISION DATE

DES: JFW	DRN: JFW	CHK: SEA	DATE: AUG, 2016	BY: NO.	NO.	REVISION	DATE	600' SCALE MAP NO. 40-41	BLOCK NO. 12
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WIRING DIAGRAMS-4

ASHLEIGH KNOLLS SHARED SEWAGE DISPOSAL FACILITY
CAPITAL PROJECT No. S-6269
CONTRACT No. 50-4972
ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

I-11
SCALE AS SHOWN
SHEET 41 OF 43



GENERAL NOTES:

1. SEE SYSTEM P&I DIAGRAMS FOR PROCESS CONTROL IDENTIFICATIONS.

CONSTRUCTION NOTES:

- ① ALL RELAYS SHALL HAVE L.E.D.S.
- ② ALL FUSES AND BREAKERS SHALL BE SIZED IN ACCORDANCE WITH THE ELECTRICAL DRAWINGS AND THE MCC MANUFACTURERS RECOMMENDATIONS.

ELECTRICAL CONTROL DIAGRAM LEGEND (ECD):

- REMOTE
- AT PLC CABINET
- △ AT LOCAL PANEL
- ▲ AT MOTOR CONTROL PANEL (VFD)
- ⊙ PANEL BOARD
- ⊕ AT SYSTEM CONTROL PANEL

ELECTRICAL CONTROL DIAGRAM TERMINALS (ECD):

- PANEL WIREWAY TERMINATIONS
- WIRING CONNECTIONS
- ◻ REMOTE TERMINATIONS
- PANEL CONNECTIONS
- REMOTE CONNECTIONS
- ⊕ POWER SUPPLY CONNECTION

DEVICE LEGEND:

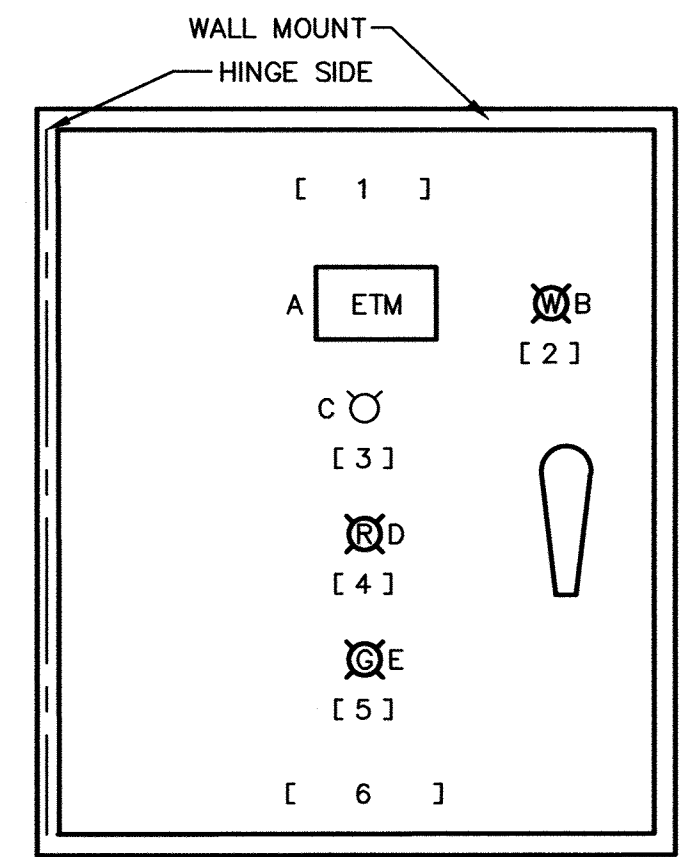
- A ELAPSED TIME METER
- B INDICATION LAMP (WHITE)
- C 3-POSITION SELECTOR SWITCH
- D INDICATION LAMP (RED)
- E INDICATION LAMP (GREEN)

NAMEPLATE LEGEND:

- 1 VENTILATION CONTROL PANEL
- 2 POWER
- 3 HOA
- 4 RUN
- 5 STOP
- 6 FAN I.D. (VARIES)

NOTE: MODIFY DEVICES TO SUIT VENTILATION ECD

B TYPICAL SINGLE PHASE VCP-2 & 3 ELEVATION



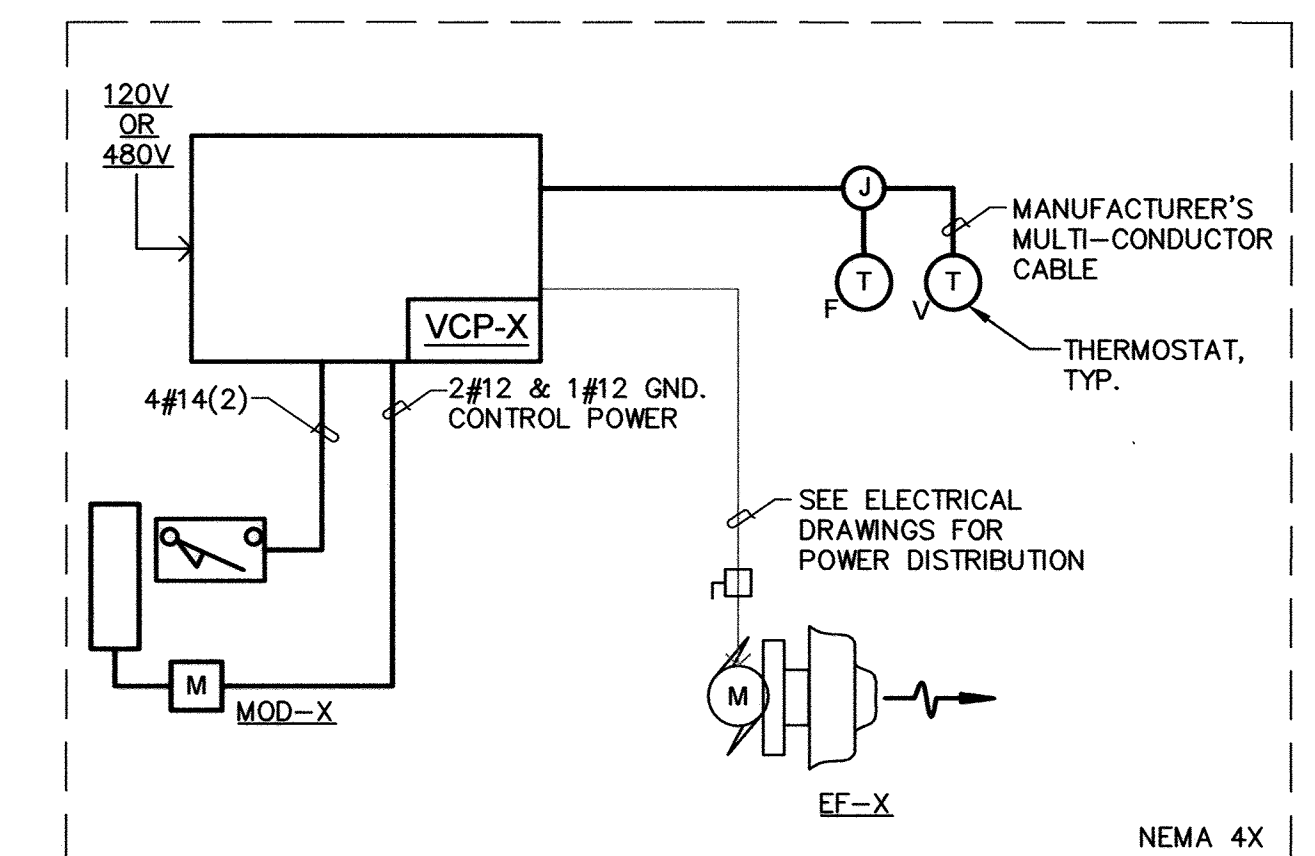
DEVICE LEGEND:

- A ELAPSED TIME METER
- B INDICATION LAMP (WHITE)
- C 2-POSITION SELECTOR SWITCH
- D INDICATION LAMP (RED)
- E INDICATION LAMP (GREEN)

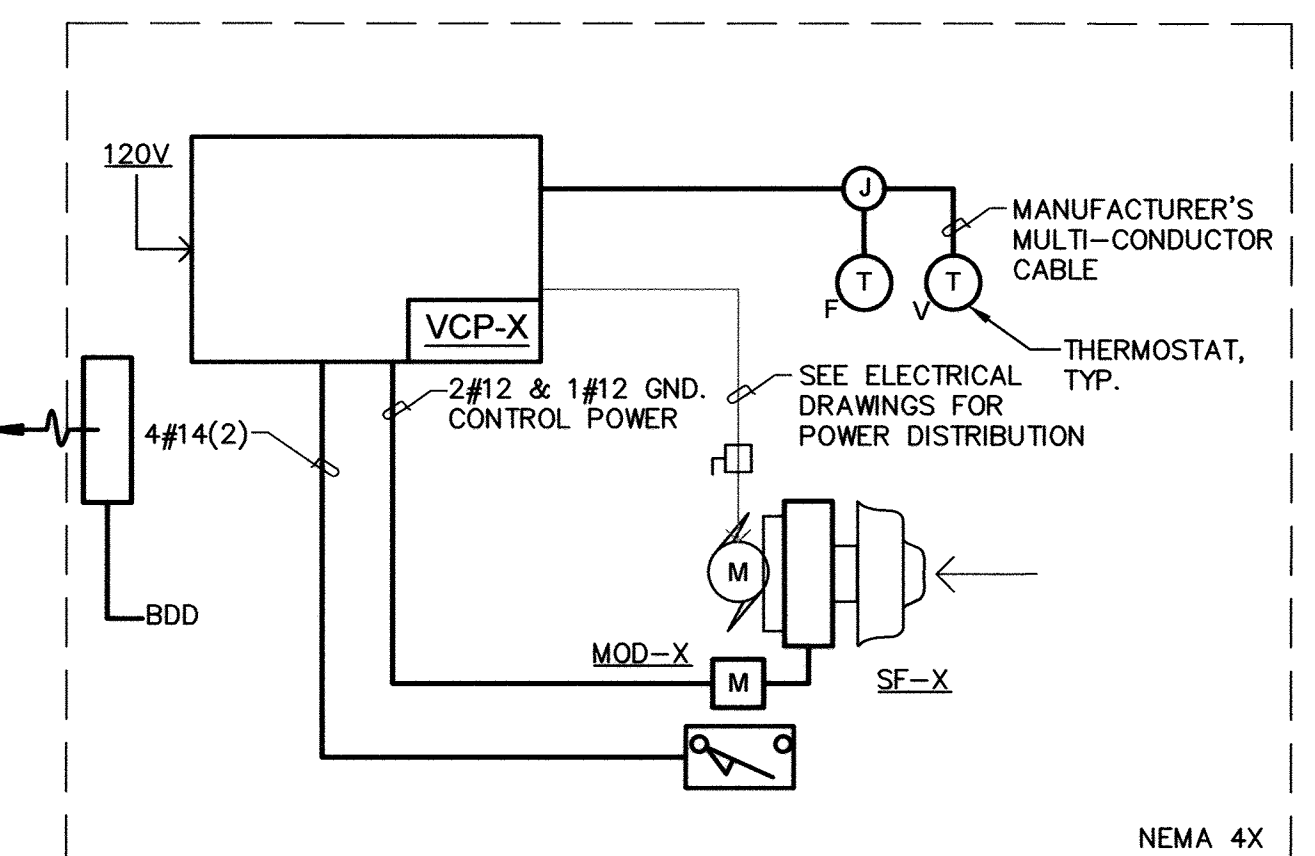
NAMEPLATE LEGEND:

- 1 FUME CONTROL VENTILATION
- 2 POWER
- 3 ON-OFF
- 4 RUN
- 5 STOP
- 6 EXHAUST FAN-3

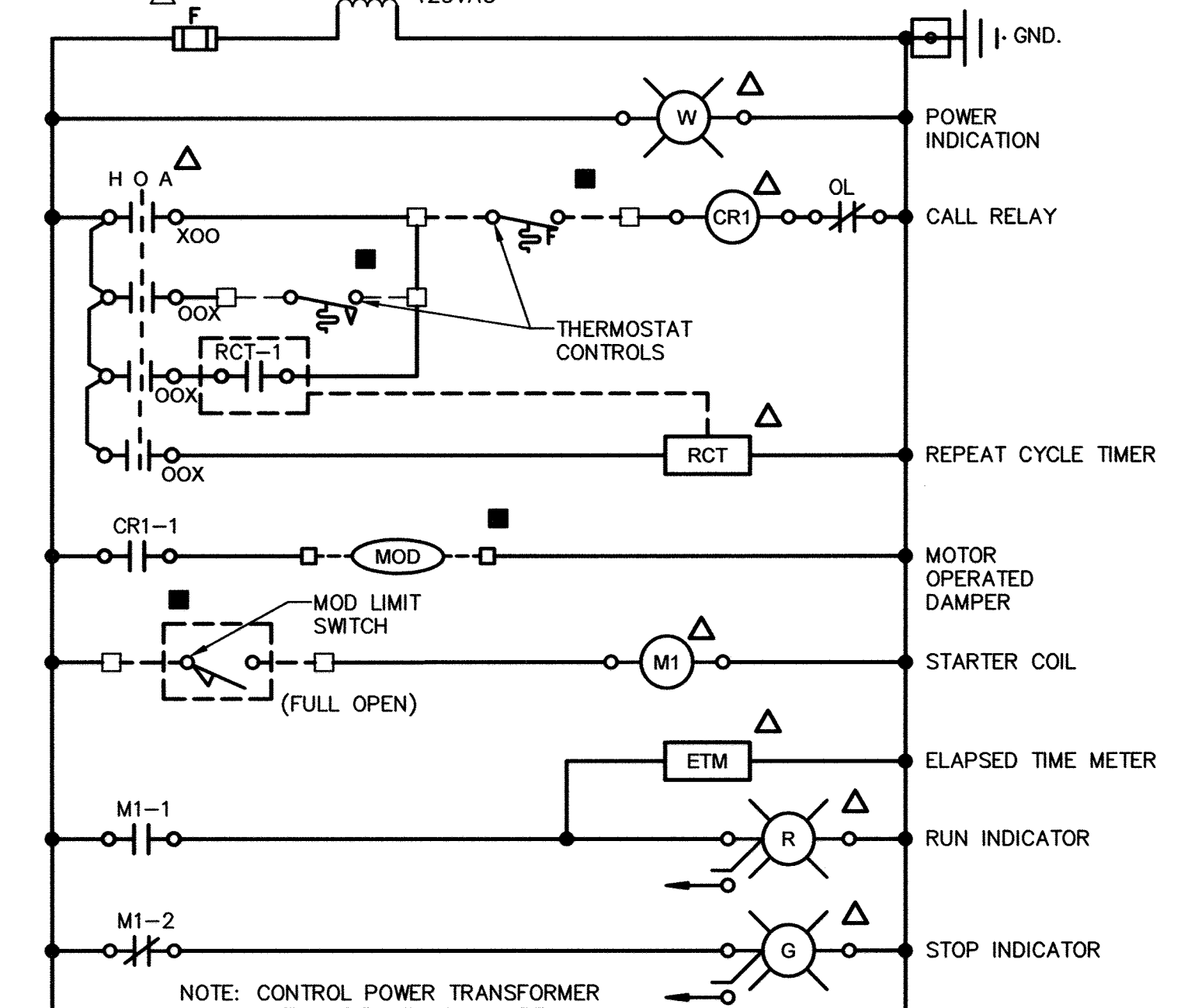
C FUME CONTROL VCP-4 ELEVATION



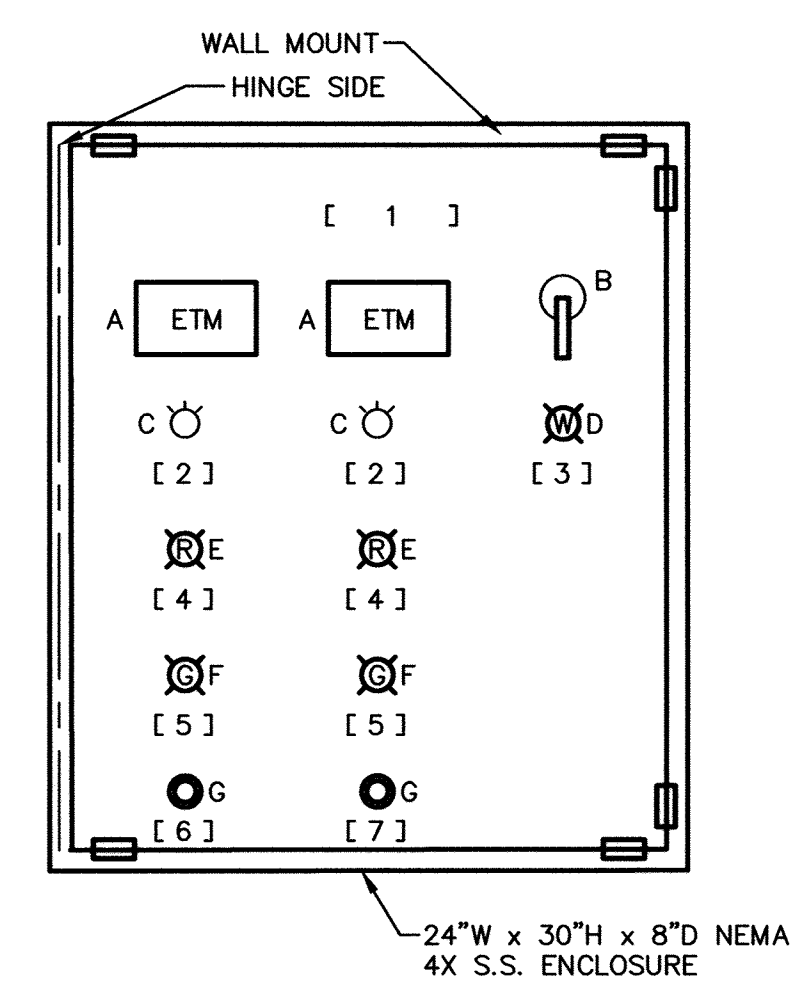
D TYPICAL EXHAUST RISER DIAGRAM (SIMILAR NEMA-12 ARRANGEMENT FOR THE FUME CONTROL SYSTEM)



E TYPICAL SUPPLY RISER DIAGRAM



1 EF-1/EF-2 VENTILATION ECD (VCP-1)



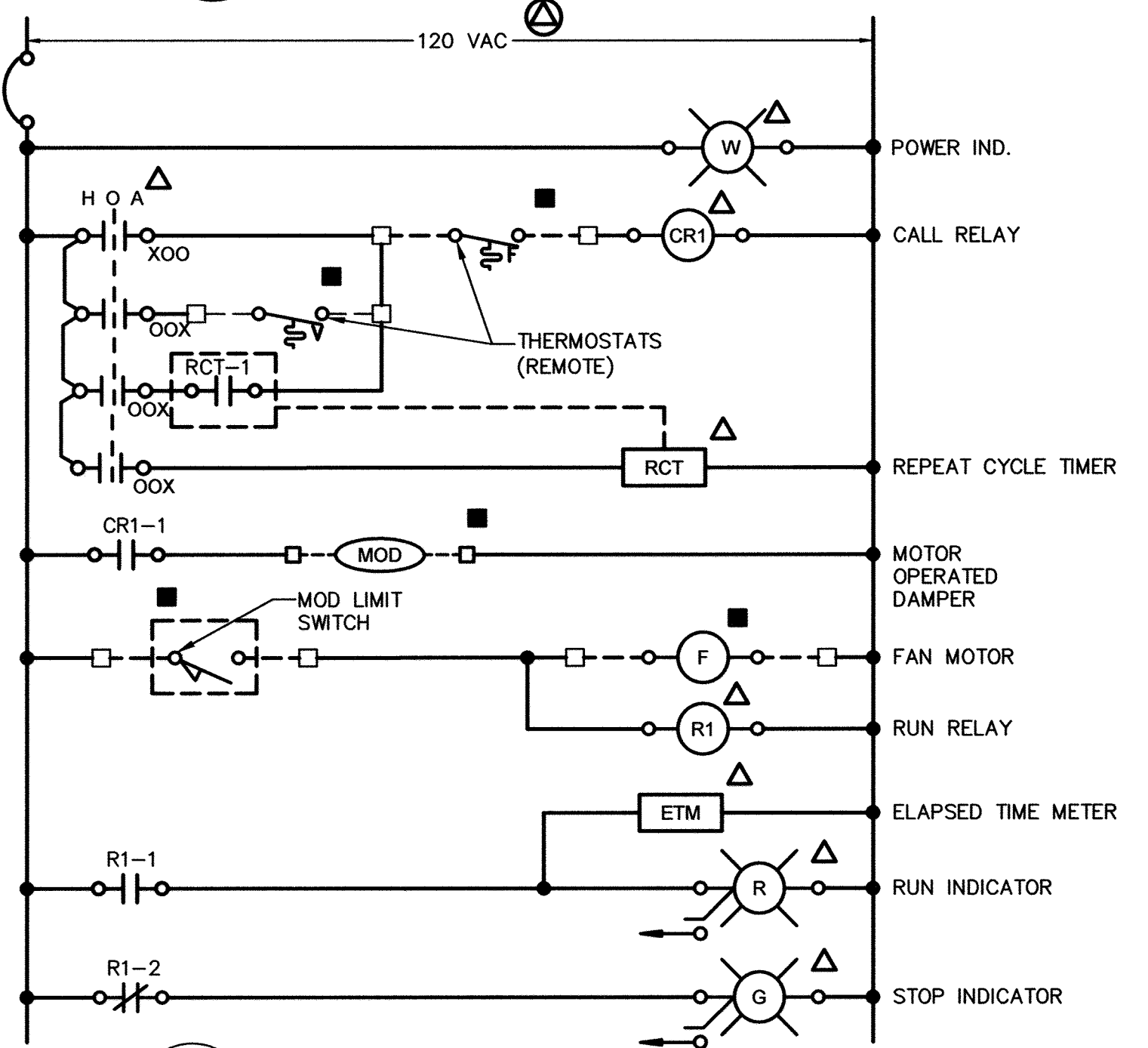
DEVICE LEGEND:

- A ELAPSED TIME METER
- B MAIN PANEL DISCONNECT
- C 3-POSITION SELECTOR SWITCH
- D INDICATION LAMP (WHITE)
- E INDICATION LAMP (RED)
- F INDICATION LAMP (GREEN)
- G STARTER OL-PUSH BUTTON

NAMEPLATE LEGEND:

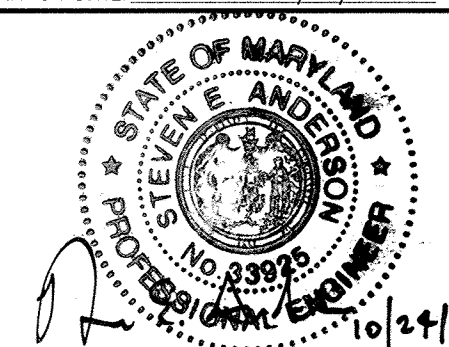
- 1 VENTILATION CONTROL PANEL
- 2 HOA
- 3 POWER
- 4 RUN
- 5 STOP
- 6 EXHAUST FAN-1
- 7 EXHAUST FAN-2

A VCP-1 ELEVATION



2 VCP-2 (SF-1) VENTILATION ECD (TYP. VCP-3 EF-5)

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. 33925, EXPIRATION DATE: 01/15/17



DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

Ray De 2/16/17
DIRECTOR OF PUBLIC WORKS DATE

Thomas R. Smith 2/13/17
CHIEF, BUREAU OF ENGINEERING DATE

John C. Gern 12/5/17
CHIEF, BUREAU OF UTILITIES DATE

John 2/13/17
CHIEF, UTILITY DESIGN DIVISION DATE

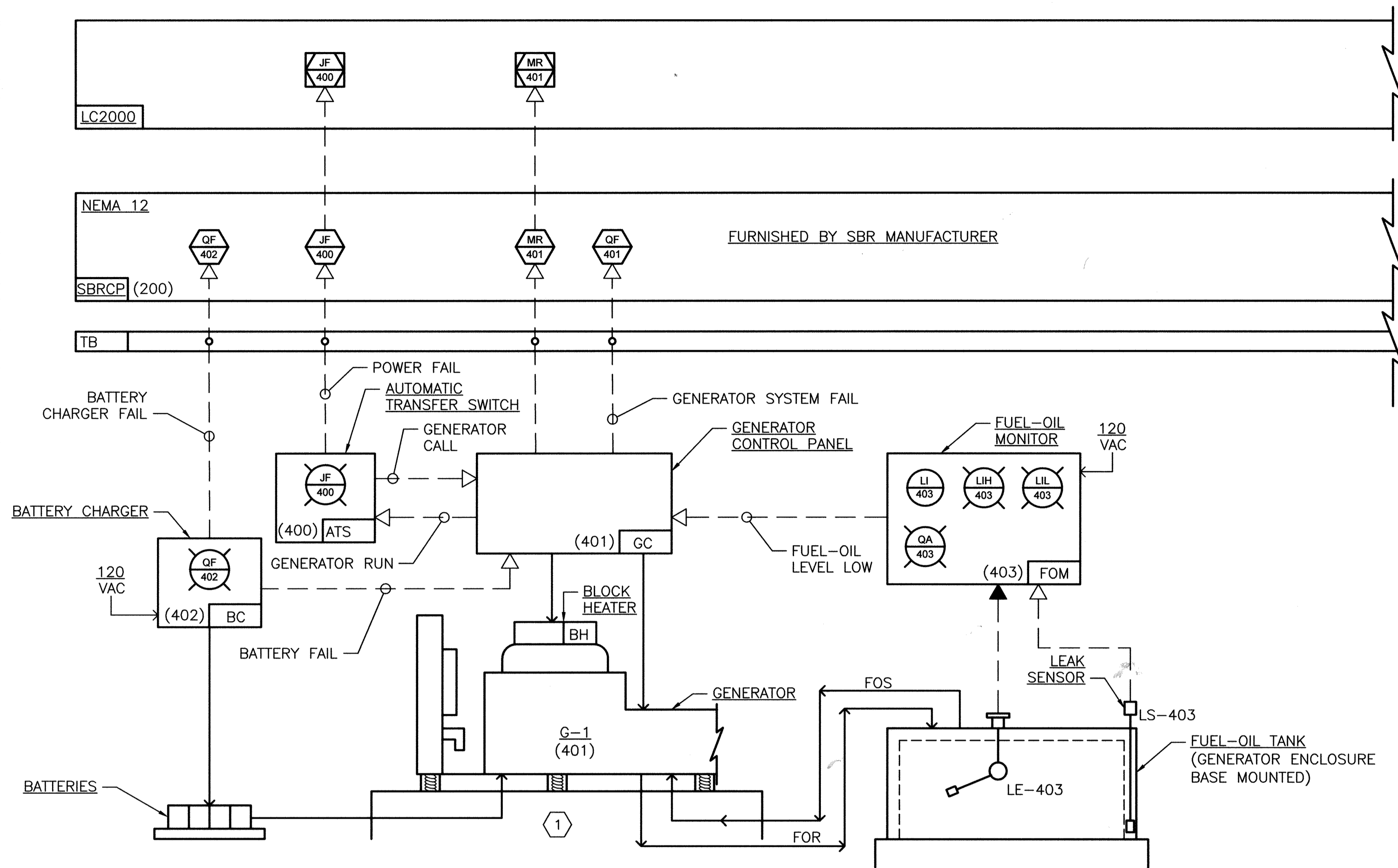
KCI TECHNOLOGIES
ENGINEERS PLANNERS SCIENTISTS CONSTRUCTION MANAGERS
936 RIDGEBROOK ROAD
SPARKS, MARYLAND 21152
TELEPHONE: (410) 316-7800
FAX: (410) 316-7818
www.kci.com

DES: JFW
DRN: JFW
CHK: SEA
DATE: AUG, 2016
BY NO. REVISION DATE

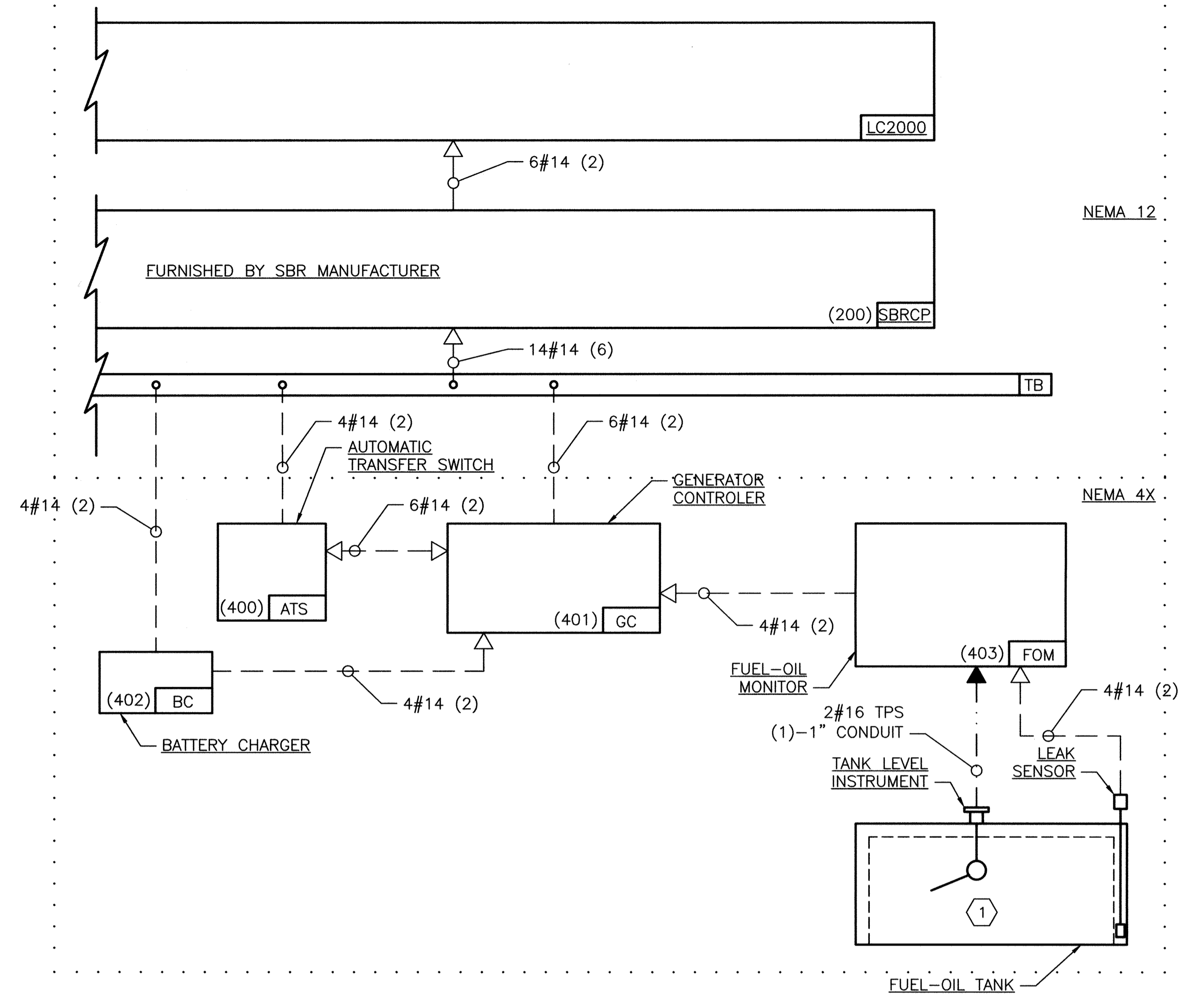
VENTILATION CONTROLS
600' SCALE MAP NO. 40-41 BLOCK NO. 12

ASHLEIGH KNOLLS
SHARED SEWAGE DISPOSAL FACILITY
CAPITAL PROJECT No. S-6269
CONTRACT No. 50-4972
ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

I-12
SCALE AS SHOWN
SHEET 42 OF 43



1 GENERATOR SYSTEM - P&ID
1-13 SCALE: NONE



2 GENERATOR SYSTEM - RISER DIAGRAM
1-13 SCALE: NONE

GENERAL NOTES:

1. PROVIDE 24-INCHES SLACK WIRE AT EACH END OF ALL SPARE INSTRUMENTATION WIRES.
2. SEE SYSTEM P&I DIAGRAMS AND ECD DETAILS FOR CONTROL WIRE IDENTIFICATIONS.
3. CONDUIT CONTAINING #16 STP (4-20mA) WIRE SHALL BE LOCATED 6-INCHES (MINIMUM) AWAY FROM CONDUIT CONTAINING POWER CONDUCTORS AND CONDUIT CONTAINING #14 OR #12 POWER AND DIGITAL SIGNAL WIRE.
4. ALL CONDUIT SHALL BE 3/4-INCH IN SIZE UNLESS OTHERWISE NOTED ON INSTRUMENT RISER DIAGRAMS.
5. SYSTEM INTEGRATOR SHALL VERIFY ALL APPROVED EQUIPMENT AND TERMINATIONS PRIOR TO INSTALLATION. THE SYSTEMS INTEGRATOR SHALL VERIFY ALL WIRE COUNTS AND INCLUDE SPARES AS SHOWN HERE IN AND ASSEMBLE INSTRUMENT RISERS FOR CONSTRUCTION. THE RISERS SHALL BE SUBMITTED FOR APPROVAL AS A SHOP DRAWING.
6. SYSTEMS INTEGRATOR SHALL COORDINATE ANALOG SIGNAL CONDUIT QUANTITIES IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
7. SEE I-001 FOR EQUIPMENT AND PANEL DESIGNATIONS.

CONDUIT LEGEND:

- A#14-B (C)
 A - QUANTITY OF CONDUCTORS
 B - SIZE OF CONDUIT (LARGER THAN 3/4-INCH)
 C - QUANTITY OF SPARE CONDUCTORS INCLUDED IN TOTAL COUNT (ITEM-A)

LEGEND:

- I&C DEVICES
- - - DIGITAL COMMUNICATIONS
- ELECTRICAL
- · - · I&C ANALOG COMMUNICATIONS
- · · · · CLASSIFICATION BOUNDARY

SHEET KEY NOTES:

- ① GENERATOR AND FUEL-OIL STORAGE ARE ACOUSTICAL ENCLOSURE MOUNTED AS A PACKAGE.

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HOWARD COUNTY, MARYLAND

[Signature] 2/17/17
DIRECTOR OF PUBLIC WORKS DATE

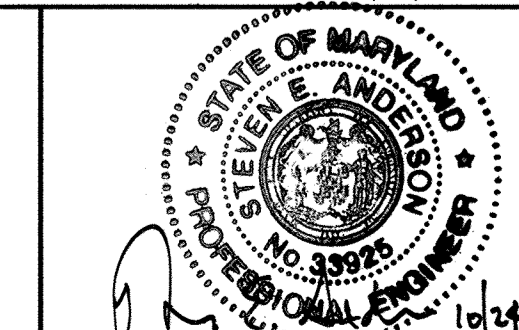
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GENERATOR CONTROLS

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