

**GENERAL NOTES**


# 0.50MG FULTON ELEVATED WATER TANK

## HOWARD COUNTY, MARYLAND

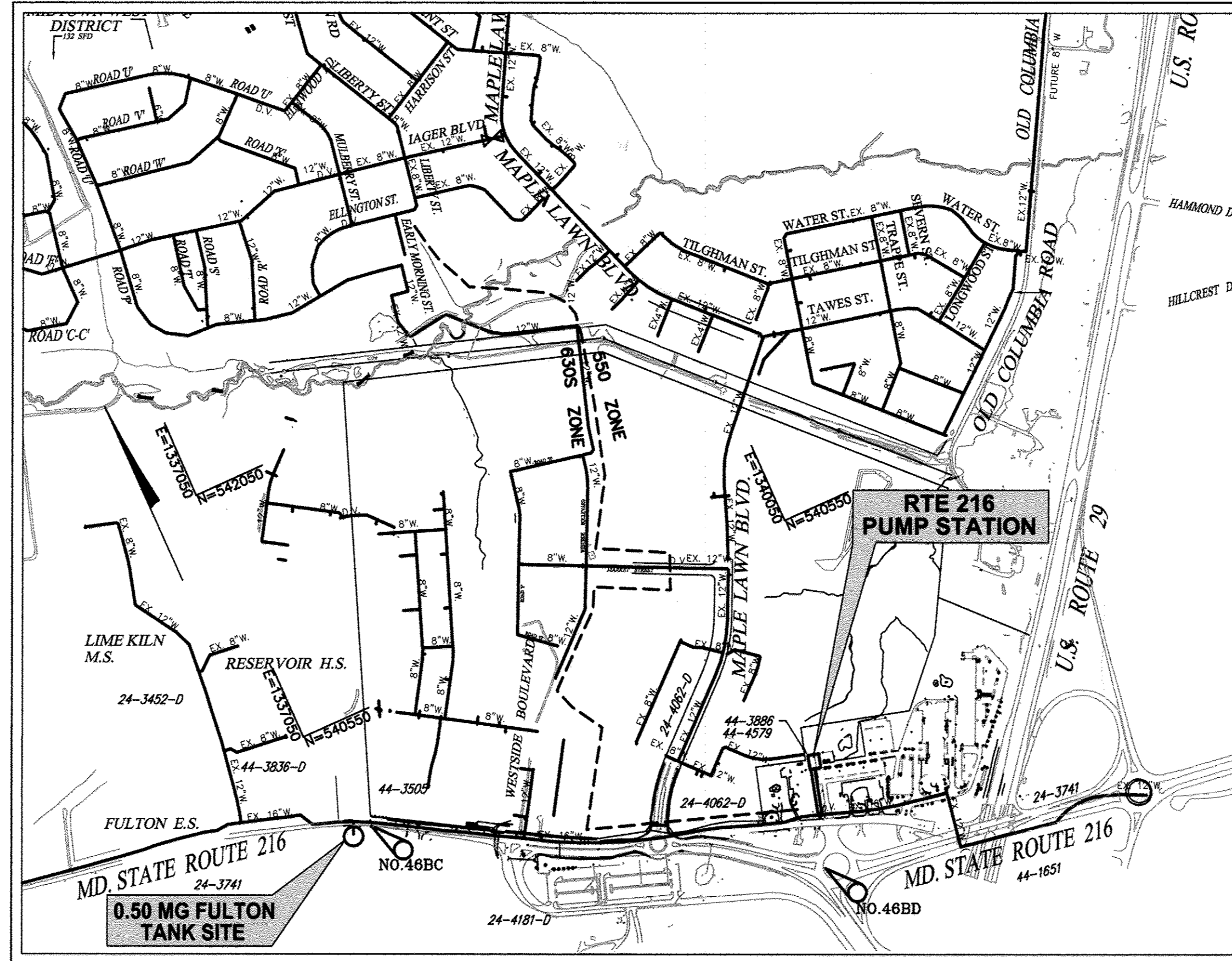
### DEPARTMENT OF PUBLIC WORKS

#### CAPITAL PROJECT No. W8280

#### CONTRACT NO. 44-4517

1. APPROXIMATE LOCATION OF EXISTING UTILITIES ARE SHOWN. THE CONTRACTOR SHALL TAKE ALL PRECAUTIONS TO PROTECT EXISTING STRUCTURES, 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. THE EXISTING TOPOGRAPHY IS TAKEN FROM FIELD SURVEY WITH MAXIMUM 2 FOOT CONTOUR INTERVALS PREPARED BY KCI TECHNOLOGIES DATED FEBRUARY 2008.
3. THE CONTRACTOR SHALL PROVIDE SURVEY CONSTRUCTION STAKEOUT FOR ALL NECESSARY LINES, GRADES AND ELEVATION OF THE PROPOSED FACILITY.
4. ALL PIPE ELEVATIONS SHOWN ARE INVERT ELEVATIONS UNLESS OTHERWISE NOTED ON THE PLANS.
5. ALL EXCAVATION SHALL BE KEPT FREE OF WATER UNTIL BACKFILL IS PROPERLY TAMPED IN PLACE TO FINISHED GRADE.
6. 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 AT THE JOB SITE.
7. WHERE TEST PITS HAVE BEEN MADE ON EXISTING UTILITIES, THEY ARE NOTED BY THE SYMBOL  AT THE LOCATION OF THE TEST PIT. A NOTE OR NOTES CONTAINING THE RESULTS OF THE TEST PIT OR PITS IS INCLUDED ON THE DRAWINGS. EXISTING UTILITIES IN THE VICINITY OF THE PROPOSED WORK FOR WHICH TEST PITS HAVE NOT BEEN DUG SHALL BE LOCATED BY THE CONTRACTOR TWO WEEKS IN ADVANCE OF CONSTRUCTION OPERATIONS AT HIS OWN EXPENSE.
8. 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
BG&E (CONSTRUCTION SERVICES)	410-850-4620
BG&E (EMERGENCY)	410-685-1400
BUREAU OF UTILITIES (DPW)	410-313-4900
COLONIAL PIPELINE CO.	410-795-1390
MISS UTILITY	1-800-257-7777
STATE HIGHWAY ADMINISTRATION	410-531-5533
VERIZON	1-800-743-0033 / 410-224-9210
9. TREES AND SHRUBS ARE TO BE PROTECTED FROM DAMAGE TO THE MAXIMUM EXTENT. TREES AND SHRUBS WITHIN THE CONSTRUCTION AREA ARE NOT TO BE REMOVED UNLESS THEY FALL WITHIN THE LINE OF EXCAVATION.
10. CONTRACTOR SHALL REMOVE TREES, STUMPS AND ROOTS ALONG THE LINE OF EXCAVATION. PAYMENT FOR SUCH REMOVAL SHALL BE INCLUDED IN THE UNIT PRICE BID FOR CONSTRUCTION OF RESPECTIVE FEATURES AND FACILITIES SHOWN HEREIN.
11. THE CONTRACTOR SHALL NOTIFY THE BUREAU OF HIGHWAYS, HOWARD COUNTY, AT (410) 313-7450 AT LEAST FIVE WORKING DAYS BEFORE ANY OPEN CUT OF ANY COUNTY ROAD OR BORING/JACKING OPERATION IN COUNTY ROADS FOR LAYING WATER/SEWER MAINS OR HOUSE CONNECTIONS. THE APPROVAL OF THESE DRAWINGS WILL CONSTITUTE COMPLIANCE WITH DPW REQUIREMENTS PER SECTION 18.114(a) OF THE HOWARD COUNTY CODE.
12. ALL DUCTILE IRON PIPES TO BE USED ON THE PUBLIC WATER SYSTEM SHALL BE CLASS 54. DUCTILE IRON FITTINGS SHALL MEET THE REQUIREMENTS OF THE HOWARD COUNTY DESIGN MANUAL VOLUME IV-STANDARD SPECIFICATIONS AND DETAILS FOR CONSTRUCTION AND SHALL BE INTERIOR AND EXTERIOR EPOXY COATED IN ACCORDANCE WITH AWWA C116.
13. TOPS OF WATER MAIN SHALL HAVE A MINIMUM OF 3'-6" OF COVER UNLESS OTHERWISE NOTED.
14. ALL FITTINGS SHALL BE BUTTRESSED OR ANCHORED WITH CONCRETE IN ACCORDANCE WITH DETAILS UNLESS OTHERWISE PROVIDED FOR ON THE DRAWINGS.
15. FIRE HYDRANTS SHALL BE SET TO THE BURY LINE ELEVATIONS SHOWN OF THE DRAWINGS. ALL FIRE HYDRANTS SHALL BE INSTALLED IN ACCORDANCE WITH STANDARD DETAILS. THE SOIL AROUND THE FIRE HYDRANT SHALL BE COMPACTED IN ACCORDANCE WITH SECTION 1000 AND SECTION 1005 OF THE STANDARD SPECIFICATIONS AND DETAILS FOR CONSTRUCTION.
16. VALVES ADJACENT TO TEES SHALL BE STRAPPED TO TEES.
17. THE CONTRACTOR SHALL NOT OPERATE ANY WATER VALVES ON THE EXISTING WATER SYSTEM. THE CONTRACTOR SHALL NOTIFY THE BUREAU OF UTILITIES, HOWARD COUNTY 15 DAYS PRIOR TO WATER MAIN SHUT DOWNS.
18. CLEAR ALL UTILITIES BY A MINIMUM OF 12". CLEAR ALL POLES BY 5'-0" MINIMUM OR TUNNEL AS REQUIRED UNLESS OTHERWISE NOTED. THE OWNER HAS CONTACTED THE UTILITY COMPANIES AND HAS MADE ARRANGEMENTS FOR BRACING OF POLES AS SHOWN ON THE DRAWINGS. IN THE EVENT THE CONTRACTOR'S WORK REQUIRES THE BRACING OF ADDITIONAL POLES, ANY COST INCURRED BY THE OWNER FOR THE BRACING OF ADDITIONAL POLES OR DAMAGES SHALL BE DEDUCTED FROM MONIES OWED THE CONTRACTOR. THE CONTRACTOR SHALL COORDINATE WITH THE UTILITY COMPANIES TO SCHEDULE THE BRACING OF THE POLES.
19. DISINFECTION OF WATER TANK SHALL BE IN ACCORDANCE WITH AWWA C652-02 METHOD 2.



TYPE OF BUILDING: N/A  
 NUMBER OF PARCELS: N/A  
 DRAINAGE AREA: HAMMOND BRANCH  
 PRESSURE ZONE: 630S

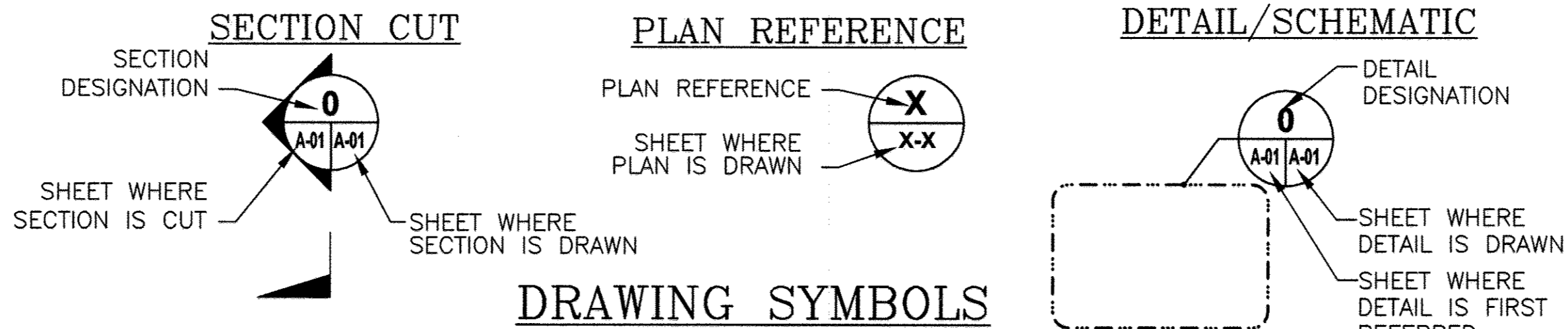
**VICINITY MAP**  
 SCALE: 1" = 600'

NO. OF WHC: 0  
 NO. OF SHC: 0  
 ADC MAP 18, J5,K5

DIRECTIONS: TAKE RTE 216 WEST FROM I-95, PASS OVER US-29, PASS THROUGH TWO TRAFFIC CIRCLES, TANK SITE ON LEFT.

**ADJACENT WATER & SEWER FACILITY CONTRACTS:**

- YR. 1987, 44-1651 MD. RTE.216 ROUTINE WATER EXTENSION
- YR. 1996, 44-3505 WESTERN SCHOOL COMPLEX WATER MAIN EXTENSION
- YR. 1996, 24-3452-D WESTERN ELEMENTARY SCHOOL NO. 2 PARCEL NO. 115 WATER AND SEWER
- YR. 1998, 24-3741 MD. RTE.216 AND US RTE.29 12-INCH WATER AND 8-INCH SEWER RELOCATION
- YR. 2000 44-3886 MD. RTE.216 BOOSTER PUMPING STATION
- YR. 2000 44-3836-D EASTERN HIGH SCHOOL NO. 2 WATER SERVICE
- YR. 2003 24-4062-D MAPLE LAWN FARMS BUSINESS DISTRICT - AREA-1
- YR. 2004 24-4181-D GRACE COMMUNITY CHURCH WATER AND SEWER
- YR. 2009 44-4579 RTE. 216 PUMP STATION UPGRADE



INDEX OF SHEETS	
SHEET NUMBER	SHEET TITLE
G-1	TITLE SHEET
SD-1	SITE DEVELOPMENT PLAN TITLE SHEET
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SD-6	SEDIMENT AND EROSION CONTROL NOTES AND DETAILS
SD-7	STORMWATER MANAGEMENT PLAN AND DETAILS
SD-8	STORMWATER MANAGEMENT NOTES AND DETAILS
SD-9	TEST BORING LOGS
S-1	FOUNDATION DESIGN CRITERIA AND DETAILS
M-1	ELEVATED TANK DESIGN CRITERIA
M-2	ELEVATED TANK PLANS AND SECTIONS
M-3	VALVE VAULT PLANS SECTION AND DETAILS
M-4	MECHANICAL DETAILS AND SCHEDULES
E-1	ONE-LINE DIAGRAM SCHEDULES SYMBOLS AND LEGEND
E-2	POWER AND LIGHTING PLANS AND DETAILS
E-3	ELECTRICAL DETAILS
I-1	INSTRUMENTATION AND CONTROLS LEGEND AND SYMBOLS
I-2	SCADA COMMUNICATIONS DIAGRAM
I-3	PROCESS AND INSTRUMENTATION DIAGRAM RISER DIAGRAM AND DETAILS
I-4	CONTROL DIAGRAMS AND DETAILS

**QUANTITIES**

ITEM	UNIT	ESTIMATE	AS-BUILT	MANUFACTURER
500,000 GAL. TANK	EA	1		
VALVE VAULT	EA	1		
16" GATE VALVE	EA	2		
16" CHECK VALVE	EA	1		
12" ALTITUDE VALVE	EA	1		
12" GATE VALVE	EA	3		
OUTSIDE PIPING				
16" DIP	LF	245		
12" DIP	LF	185		
6" DIP	LF	40		
16" GATE VALVE	EA	1		
6" GATE VALVE	EA	1		
FIRE HYDRANT	EA	1		

NAME OF UTILITY CONTRACTOR: \_\_\_\_\_

CHECKBOX	
AS-BUILT	
DATE	
SURVEY DIVISION	

**AS-BUILT**

DATE 1/4/2012

**GRAPHIC SCALE**

SCALE: 1"=600'

G-1

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

Approved: *John K. Robinson* 4/22/09  
 Date: \_\_\_\_\_  
 Howard S.C.D.

**HORIZONTAL & VERTICAL CONTROL**

HORIZONTAL AND VERTICAL CONTROL IS BASED ON MARYLAND NAD 83/91 (HORIZONTAL) AND NAVD '88 (VERTICAL) DATUM. HOWARD COUNTY GEODETIC SURVEY CONTROL NUMBERS

NO. 46BC	NO. 46BD
N 539925.13	N 538656.76
E 1337205.77	E 1339461.55
ELEV. 472.16	ELEV. 431.17

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. 14364, Expiration Date 03/29/11

<p>DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND</p> <p><i>John K. Robinson</i> 4/22/09 DIRECTOR OF PUBLIC WORKS DATE</p> <p><i>John K. Robinson</i> 4/22/09 CHIEF, BUREAU OF UTILITIES DATE</p>	<p><i>John K. Robinson</i> 4/21/09 CHIEF, BUREAU OF ENGINEERING DATE</p> <p><i>John K. Robinson</i> 4-21-09 CHIEF, UTILITY DESIGN DIVISION DATE</p>
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ENGINEERS  
PLANNERS  
SCIENTISTS  
CONSTRUCTION MANAGERS

KCI

936 Ridgebrook Road  
Sparks, MD 21152  
Phone: (410) 316-7800  
Fax: (410) 316-7935  
www.kci.com

DES: SEA			
DRN: LFN			
CHK: JRK			
DATE: 3/20/09	LFN	AS BUILT	1/4/12
BY NO.		REVISION	DATE

TITLE SHEET	
600' SCALE MAP NO. 46	BLOCK NO. 4

**FULTON ELEVATED WATER TANK**

CAPITAL PROJECT No. W8280  
 CONTRACT No. 44-4517

ELECTION DISTRICT NO.5 HOWARD COUNTY, MARYLAND

SCALE AS SHOWN  
 CONTRACT SHEET  
 1 OF 22

Apr 20, 2009 - 9:44am User: kci\jrobinso\jrobinso.dwg 1:1 TITLE SHEET.dwg

**SITE DEVELOPMENT PLAN NOTES**

- ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE LATEST STANDARDS AND SPECIFICATIONS OF HOWARD COUNTY AND MSHA STANDARDS AND SPECIFICATIONS IF APPLICABLE.
- THE CONTRACTOR SHALL NOTIFY THE DEPARTMENT OF PUBLIC WORKS/BUREAU OF ENGINEERING/CONSTRUCTION INSPECTION DIVISION AT (410) 313-1880 AT LEAST FIVE (5) WORKING DAYS PRIOR TO THE START OF WORK.
- THE CONTRACTOR SHALL NOTIFY "MISS UTILITY" AT 1-800-257-7777 AT LEAST 48 HOURS PRIOR TO ANY EXCAVATION WORK TO BE DONE.
- TRAFFIC CONTROL DEVICES, MARKINGS AND SIGNING SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE MARYLAND MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD). ALL STREET AND REGULATORY SIGNS SHALL BE IN PLACE PRIOR TO THE PLACEMENT OF ANY ASPHALT.
- ALL PLAN DIMENSIONS ARE TO FACE OF CURB UNLESS OTHERWISE NOTED.
- THE EXISTING TOPOGRAPHY IS TAKEN FROM FIELD RUN SURVEY WITH MAXIMUM TWO FOOT CONTOUR INTERVALS PREPARED BY KCI DATED FEBRUARY 2008.
- THE COORDINATES SHOWN HEREON ARE BASED UPON THE HOWARD COUNTY GEODETIC CONTROL, WHICH IS BASED UPON THE MARYLAND STATE PLANE COORDINATE SYSTEM. HOWARD COUNTY MONUMENT NOS. 46BC AND 46BD WERE USED FOR THIS PROJECT.
- WATER IS PUBLIC, AS DEFINED IN CONTRACT NO. 44-3505, DRAINAGE AREA: HAMMOND BRANCH.
- SEWER IS PUBLIC AS DEFINED IN CONTRACT NO. 24-3452-D, DRAINAGE AREA: HAMMOND BRANCH.
- STORMWATER MANAGEMENT SHALL BE REQUIRED. STORMWATER FACILITY IS A LOW HAZARD (CLASS A) BIORETENTION FACILITY, AND SHALL BE MAINTAINED BY THE HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS.
- EXISTING UTILITIES ARE BASED ON CONTRACT NO. 44-3505.
- NO TRAFFIC STUDY IS REQUIRED FOR THIS PROJECT.
- ACCORDING TO A REVIEW OF U.S. FISH & WILDLIFE SERVICES DIGITAL NATIONAL WETLAND INVENTORY DATA (1981-2002) CLARKSVILLE QUAD AND FEMA FLOODPLAIN PANEL 2400440042B (12/4/1986), NO WETLANDS, FLOODPLAINS, STREAMS, OR THEIR BUFFERS OCCUR ON THIS SITE.
- THIS PLAN HAS BEEN PREPARED IN ACCORDANCE WITH SECTION 16.124 OF THE HOWARD COUNTY CODE AND THE LANDSCAPE MANUAL WITH 2 SHADE TREES, 46 EVERGREEN TREES, AND 10 SHRUBS PROVIDED ON THE APPROVED LANDSCAPE PLAN. FINANCIAL SURETY IS NOT REQUIRED FOR THIS PROJECT BECAUSE THIS IS A COUNTY CAPITAL PROJECT.
- THIS PROJECT IS SUBJECT TO THE AMENDED FIFTH EDITION OF THE SUBDIVISION AND LAND DEVELOPMENT REGULATIONS. DEVELOPMENT OR CONSTRUCTION ON THIS PROPERTY MUST COMPLY WITH SETBACK AND BUFFER REGULATIONS IN EFFECT AT THE TIME OF SUBMISSION OF THE SITE DEVELOPMENT PLAN, WAIVER PETITION APPLICATION, OR BUILDING/GRADING PERMIT APPLICATIONS. THE DEVELOPER SHALL APPLY FOR BUILDING PERMITS FOR ALL LOTS AS SHOWN ON THIS SITE DEVELOPMENT PLAN WITHIN ONE YEAR OF SIGNATURE APPROVAL OF THIS PLAN.
- THERE ARE NO BURIAL GROUNDS OR CEMETERY SITES LOCATED ON THE SUBJECT PROPERTY.
- THERE ARE NO HISTORIC STRUCTURES LOCATED ON THE SUBJECT PROPERTY.
- THE SUBJECT PROPERTY IS ZONED RR-DEO PER THE 2/02/04 COMPREHENSIVE ZONING PLAN AND PER THE "COMP LITE" ZONING AMENDMENTS EFFECTIVE 7/28/06.
- ACCORDING TO THE SECTION 128(A)(3)(D) OF THE HOWARD COUNTY ZONING REGULATIONS, THE WATER STORAGE STRUCTURE IS EXEMPT FROM HEIGHT LIMITATIONS WITHIN THE RR ZONING DISTRICT.
- ALL EXTERIOR LIGHT FIXTURES SHALL BE ORIENTED TO DIRECT LIGHT INWARDS AND DOWNWARDS ON-SITE AWAY FROM ALL ADJOINING RESIDENTIAL PROPERTIES AND PUBLIC ROADS AND SHALL BE IN COMPLIANCE WITH THE LIGHT TRESPASS LIMIT OF 0.5 FOOT CANDLES ONTO ANY OTHER ADJOINING PROPERTY ZONED OR USED FOR RESIDENTIAL PURPOSES IN ACCORDANCE WITH SECTION 134 OF THE HOWARD COUNTY ZONING REGULATIONS.
- STREET LIGHT PLACEMENT AND THE TYPE OF FIXTURE AND POLE SHALL BE IN ACCORDANCE WITH THE HOWARD COUNTY DESIGN MANUAL, VOL. III (1993) AND AS MODIFIED BY "GUIDELINES FOR STREET LIGHTS IN RESIDENTIAL DEVELOPMENTS (JUNE 1993)". A MINIMUM SPACING OF 20' SHALL BE MAINTAINED BETWEEN ANY STREETLIGHT AND ANY TREE.
- ALL SIGN POSTS USED FOR TRAFFIC CONTROL SIGNS INSTALLED IN THE COUNTY RIGHT-OF-WAY SHALL BE MOUNTED ON A 2" GALVANIZED STEEL, PERFORATED, SQUARE TUBE POST (14 GAUGE) INSERTED INTO A 2-1/2" GALVANIZED STEEL, PERFORATED, SQUARE TUBE SLEEVE (12 GAUGE) 3' LONG. A GALVANIZED STEEL POLE CAP SHALL BE MOUNTED ON TOP OF EACH POST.
- THIS PROJECT IS EXEMPT FROM FOREST CONSERVATION REQUIREMENTS PER APPENDIX 'O' OF THE FOREST CONSERVATION MANUAL FOR A COUNTY CAPITAL PROJECT LOCATED ON A SINGLE LOT OF ANY SIZE AND DOES NOT RESULT IN THE CUTTING, CLEARING OR GRADING OF MORE THAN 40,000 SF. OF FOREST.

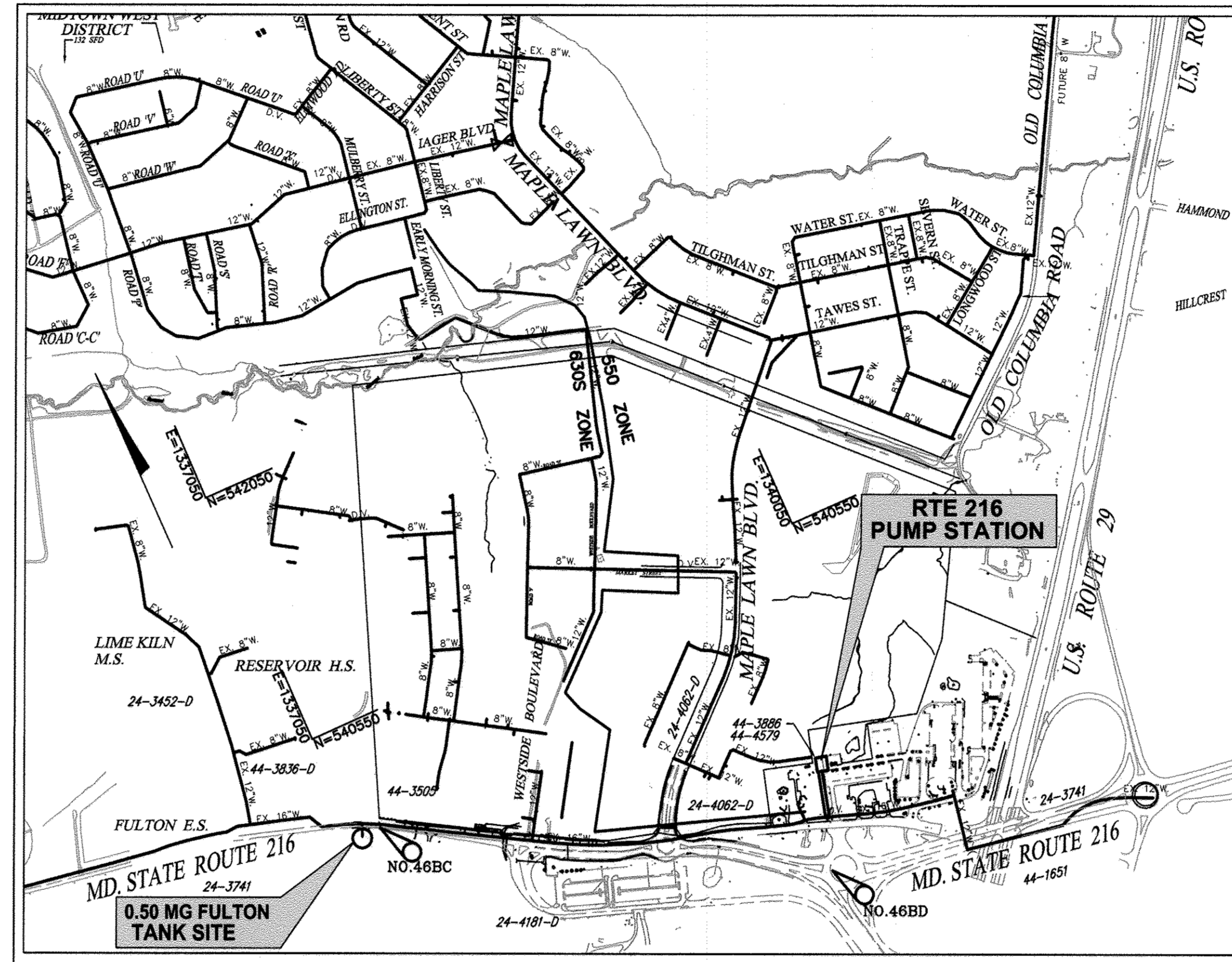
# 0.50MG FULTON ELEVATED WATER TANK

## HOWARD COUNTY, MARYLAND

### DEPARTMENT OF PUBLIC WORKS

#### CAPITAL PROJECT No. W8280

#### CONTRACT NO. 44-4517



TYPE OF BUILDING: N/A  
 NUMBER OF PARCELS: N/A  
 DRAINAGE AREA: HAMMOND BRANCH  
 PRESSURE ZONE: 630S

**VICINITY MAP**  
 SCALE: 1" = 600'

NO. OF WHC: 0  
 NO. OF SHC: 0  
 ADC MAP 18, J5,K5

SITE ANALYSIS DATA CHART	
PROJECT AREA	3.52 ACRES
LIMIT OF DISTURBANCE (LOD)	39,850 SF (0.91 ACRES)
PRESENT ZONING DESIGNATION	RURAL RESIDENTIAL (RR)
PROPOSED PURPOSE	COUNTY ELEVATED WATER STORAGE TANK
TANK FOOT PRINT	707 SF
VALVE VAULT FOOT PRINT	297 SF
ON SITE PARKING	TWO (2) SPACES

ADDRESS CHART	
LOT/PARCEL #	STREET ADDRESS
EXISTING RESIDENCE #282	11475 RTE 216
NEW DPW SITE #389	11515 SCAGGSVILLE RD

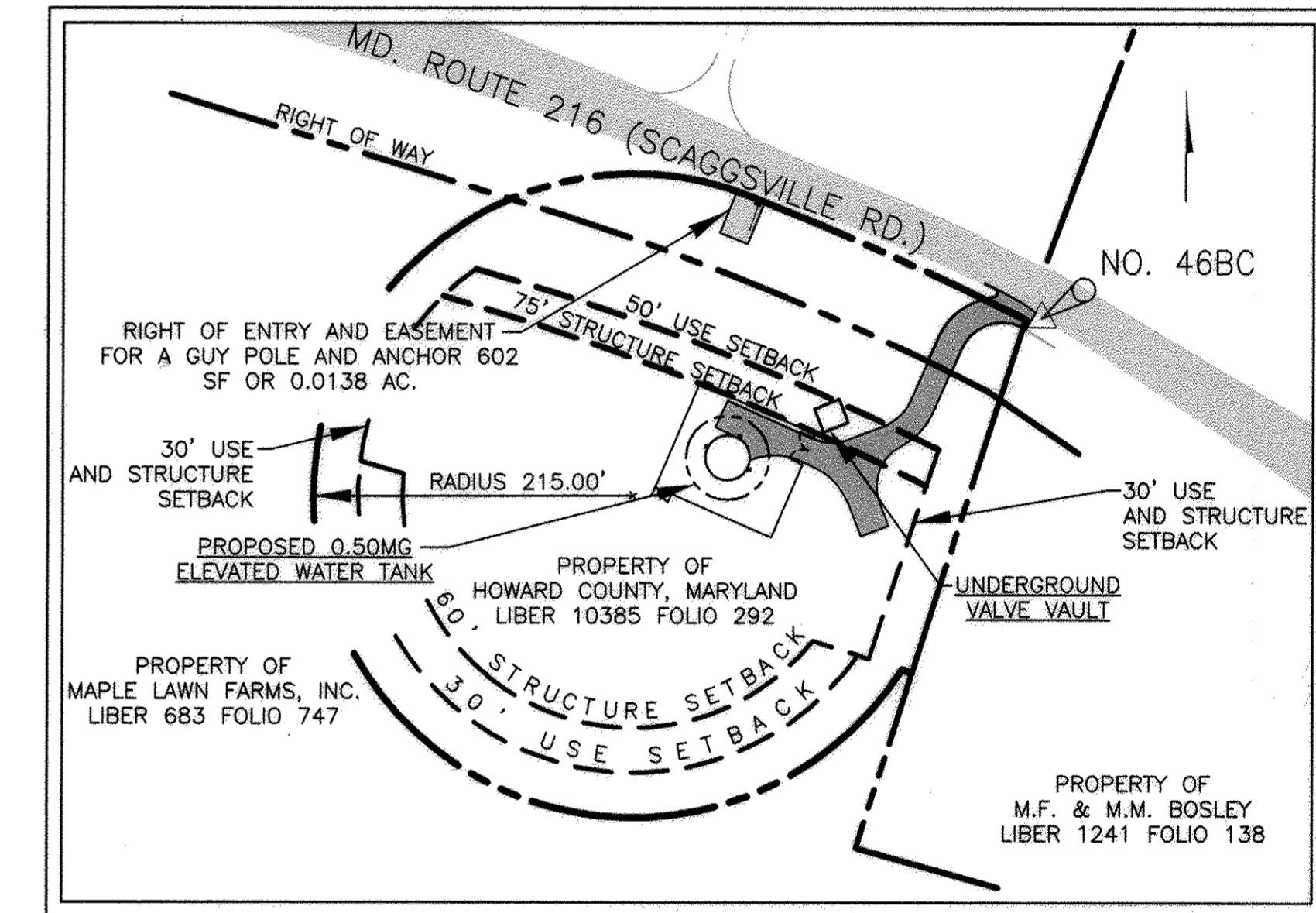
PERMIT INFORMATION CHART					
SUBDIVISION NAME: N/A		SECTION/AREA: N/A		LOT/PARCEL NO. 389	
PLOT # OR L/F	GRID #	ZONING	TAX MAP NO.	ELEC. DISTRICT	CENSUS TRACT
L10385 F292/297	3	RR-DEO	46	5	6051.02

**ADJACENT WATER & SEWER FACILITY CONTRACTS:**

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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. 14364, Expiration Date 03/29/11

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SD-8	STORMWATER MANAGEMENT NOTES AND DETAILS
SD-9	TEST BORING LOGS



**SITE MAP**  
 SCALE: 1" = 100'

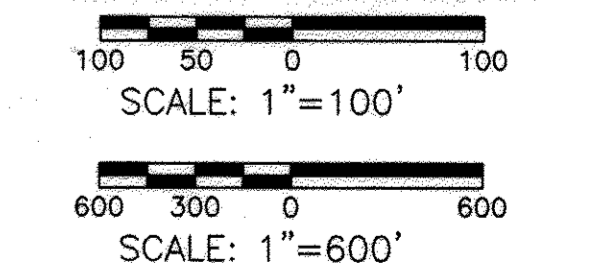
**HORIZONTAL & VERTICAL CONTROL**

HORIZONTAL AND VERTICAL CONTROL IS BASED ON MARYLAND NAVD 83/91 (HORIZONTAL) AND NAVD '88 (VERTICAL) DATUM. HOWARD COUNTY GEODETIC SURVEY CONTROL NUMBERS

NO. 46BC N 539925.13 E 1337205.77 ELEV. 472.16	NO. 46BD N 538656.76 E 1339461.55 ELEV. 431.17	OWNER: DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND 9250 BENDIX ROAD COLUMBIA, MARYLAND PHONE: (410)313-4400
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APPROVED: DEPARTMENT OF PLANNING AND ZONING  
 [Signatures and Dates]

**GRAPHIC SCALES**



**AS-BUILT**  
 DATE: 1/4/2012

TAX MAP 46, SECTION/AREA 3.52 AC, LOT/PARCEL 389, ZONING RR-DEO, GRID 3, LIBER 10385, FOLIO 292/297

DEPARTMENT OF PUBLIC WORKS  
 HOWARD COUNTY, MARYLAND  
 [Signatures and Dates]

KCI TECHNOLOGIES  
 936 Ridgebrook Road  
 Sparks, MD 21152  
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 Fax: (410) 316-7935  
 www.kci.com

STATE OF MARYLAND  
 PROFESSIONAL ENGINEER  
 [Signature and Date]

DES: SEA			
DRN: LFN			
CHK: JRK			
DATE: 3/20/09	LFN	AS BUILT	1/4/12
BY NO.			
	REVISION	DATE	

**SITE DEVELOPMENT PLAN**  
**TITLE SHEET**

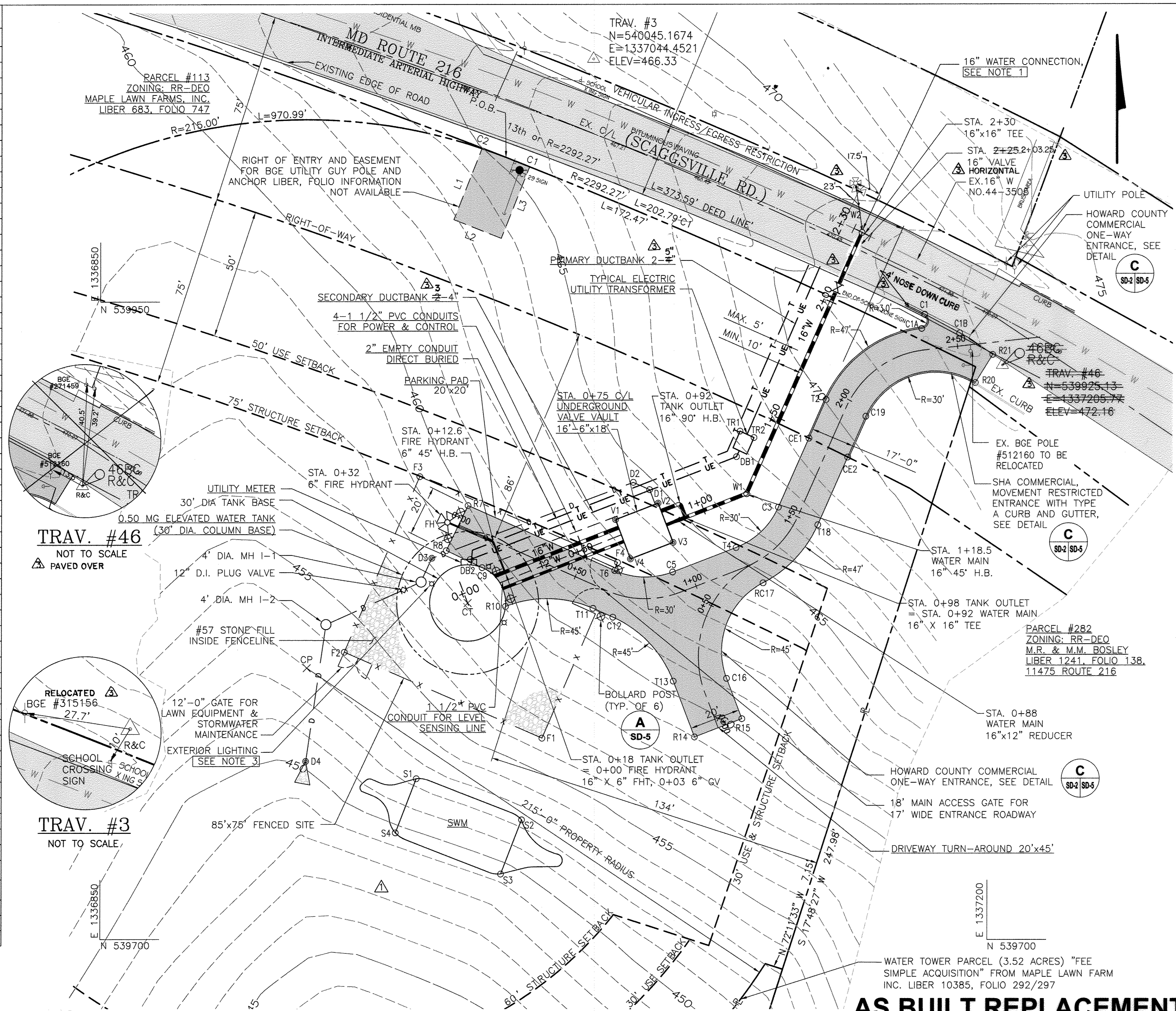
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 CAPITAL PROJECT No. W8280  
 CONTRACT No. 44-4517  
 ELECTION DISTRICT NO.5 HOWARD COUNTY, MARYLAND

**SITE STAKE-OUT COORDINATES**

POINT	DESCRIPTION	NORTH	EAST
CT	CENTER OF TANK	539831.95	1336994.95
CP	CENTER OF PROPERTY	539806.43	1336931.49
F1	TANK SITE FENCE	539778.96	1337024.35
F2	TANK SITE FENCE	539812.65	1336946.32
F3	TANK SITE FENCE	539881.51	1336976.04
F4	TANK SITE FENCE	539847.82	1337054.08
C1	ENTRANCE ROAD	539945.04	1337175.13
C1A	ENTRANCE ROAD	539939.48	1337173.95
C1B	ENTRANCE ROAD	539937.73	1337188.90
T2	ENTRANCE ROAD	539911.66	1337136.24
CE1	CURB END	539896.53	1337129.51
C3	ENTRANCE ROAD	539869.50	1337117.50
T4	ENTRANCE ROAD	539853.67	1337100.81
C5	ENTRANCE ROAD	537844.09	1337075.80
T6	ENTRANCE ROAD	539844.66	1337052.96
R7	ENTRANCE ROAD	539870.18	1336995.08
R8	ENTRANCE ROAD	539852.52	1336986.52
C9	ENTRANCE ROAD	539845.82	1337000.65
R10	ENTRANCE ROAD	539830.59	1337009.89
T11	ENTRANCE ROAD	539829.85	1337044.42
C12	ENTRANCE ROAD	539826.39	1337052.25
T13	ENTRANCE ROAD	539801.31	1337076.12
R14	ENTRANCE ROAD	539779.43	1337084.50
R15	ENTRANCE ROAD	539786.58	1337103.17
C16	ENTRANCE ROAD	539802.40	1337097.12
RC17	ENTRANCE ROAD	539839.83	1337111.47
T18	ENTRANCE ROAD	539862.58	1337133.02
CE2	CURB END	539889.09	1337144.81
C19	ENTRANCE ROAD	539905.09	1337151.92
R20	ENTRANCE ROAD	539918.26	1337195.11
R21	ENTRANCE ROAD	539929.27	1337201.94
V1	VALVE VAULT	539864.67	1337053.26
V2	VALVE VAULT	539871.11	1337070.07
V3	VALVE VAULT	539855.70	1337075.97
V4	VALVE VAULT	539849.26	1337059.17
MH1	MANHOLE 1	539840.18	1336976.61
MH2	MANHOLE 2	539823.46	1336939.06
W1	16" WATER	539874.77	1337105.00
W2	16" WATER	539977.09	1337150.37
D1	DRAIN	539876.40	1337066.69
D2	DRAIN	539879.29	1337060.26
D3	DRAIN	539849.50	1336980.82
D4	DRAIN	539769.84	1336931.10
S1	SWM POND	539763.03	1336974.78
S2	SWM POND	539746.92	1337016.34
S3	SWM POND	539725.67	1337008.10
S4	SWM POND	539741.80	1336966.55
FH	FIRE HYDRANT	539862.26	1336987.06
DB1	DUCT BANK	539889.31	1337100.94
DB2	DUCT BANK	539849.03	1336995.97
TR1	TRANSFORMER	539899.30	1337102.33
TR2	TRANSFORMER	539896.78	1337107.84

**GUY POLE EASEMENT**

LINE TABLE		CURVE TABULATION			
LINE	BEARING	LENGTH	CURVE	BEARING	LENGTH
L1	S 29°52'44" W	30.00'	C1	S 68°27'57" E	11.56'
L2	N 69°07'16" W	20.00'	C2	N 69°44'05" W	8.44'
L3	N 20°52'44" E	30.04'			



- LEGEND:**
- EX. FEATURES
  - PROPOSED FEATURES
  - EXISTING CONTOURS
  - PROPOSED CONTOURS
  - PROPERTY LINE/RIGHT-OF-WAY
  - SETBACK / EASEMENT
  - LOD - LIMIT OF DISTURBANCE
  - STABILIZED CONSTRUCTION ENTRANCE
  - SSF - SUPER SILT FENCE
  - PROPOSED ACCESS DRIVE
  - EXISTING ROADWAY
  - RIP RAP /ARCHITECTURAL STONE (AS NOTED)
  - STORM WATER MANAGEMENT
  - TEMPORARY STONE OUTLET STRUCTURE
  - BIORETENTION PLANTING AREA
  - SWM MAINTENANCE ACCESS
- UTILITIES:**
- PROPOSED WATER
  - UNDERGROUND ELECTRIC
  - TELEPHONE
  - EX. WATER
  - FENCE
  - DRAIN
  - UTILITY POLE
  - GATE VALVE
  - GUY POLE
  - EXTERIOR LIGHT
  - SERVICE HYDRANT
- CIVIL SITE SYMBOLS:**
- TEST PIT
  - SOIL BORING

- NOTES:**
- CONTRACTOR TEST PIT TO LOCATE WATER MAIN. OPEN CUT ROADWAY FOR 16" TEE AND ISOLATION GATE VALVE INSTALLATION. COORDINATE SHUT-DOWN PERIOD WITH COUNTY. COMPLY WITH SHA PERMIT AND TRAFFIC CONTROL REQUIREMENTS.
  - 100 YEAR FLOODPLAIN, WETLANDS, WETLAND BUFFER AND STREAMS ARE NON-EXISTENT ON THE PROPERTY.
  - 70 WATTS PHOTOCELL CONTROLLED EXTERIOR LIGHTING. TYPICAL OF 3. DISTANCE TO RESIDENTIAL PROPERTY IS APPROX. 146'.
  - SEE SHEET SD-3 FOR SOIL BORING LOCATIONS.

**GRAPHIC SCALE**  
SCALE: 1"=20'

**AS BUILT REPLACEMENT SHEET**

APPROVED: DEPARTMENT OF PLANNING AND ZONING  
 Chief, Development Engineering Division  
 Chief, Division of Land Development  
 Director

OWNER:  
 DEPARTMENT OF PUBLIC WORKS  
 HOWARD COUNTY, MARYLAND  
 9250 BENDIX ROAD  
 COLUMBIA, MARYLAND  
 PHONE: (410)313-4400

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 01/15/11

**1 ELEVATED WATER TANK SITE**  
 SCALE 1"=20'

DEPARTMENT OF PUBLIC WORKS  
 HOWARD COUNTY, MARYLAND

Director of Public Works  
 Chief, Bureau of Utilities

Engineers  
 Planners  
 Scientists  
 Construction Managers

**KCI TECHNOLOGIES**  
 936 Ridgebrook Road  
 Sparks, MD 21152  
 Phone: (410) 316-7900  
 Fax: (410) 316-7935  
 www.kci.com

DES: SEA  
 DRN: LFN  
 CHK: JRK  
 DATE: 3/20/09

REVISION

MDR-01, RESPONSE TO RFI-07	9/01/10
AS BUILT	1/04/12
AS BUILT	3/6/12

**TANK SITE STAKE-OUT PLAN**

600' SCALE MAP NO. 46 BLOCK NO. 4

TAX MAP 46, SECTION/AREA 3.52 AC, LOT/PARCEL 389,  
 ZONING RR-DEQ, GRID 3, LIBER 10385, FOLIO 292/297

**FULTON ELEVATED WATER TANK**  
 CAPITAL PROJECT No. W8280  
 CONTRACT No. 44-4517

ELECTION DISTRICT NO.5 HOWARD COUNTY, MARYLAND

SCALE AS SHOWN  
 CONTRACT SHEET 3 OF 22

User: krci, jackson Jan 05, 2012, 9:45am M:\2007\01070460\Drawings\ELEVATED TANK-2\WP1-7\_C-1 (30) FUTURE RT 216 4-LANE EXPANSION.dwg

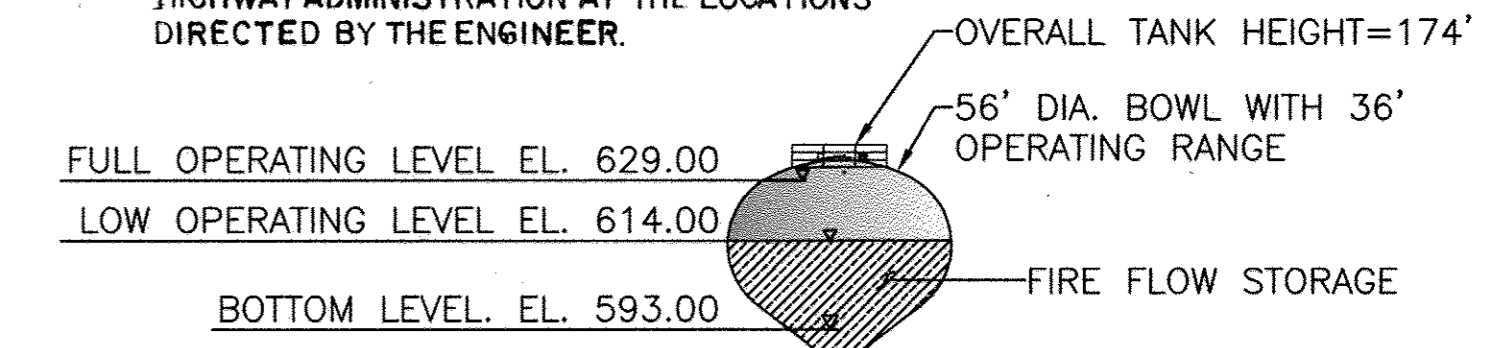
**SEQUENCE OF CONSTRUCTION:**

- 1-WEEK 1. CONTRACTOR SHALL OBTAIN GRADING PERMIT.
2. THE CONTRACTOR SHALL NOTIFY "MISS UTILITY" AT 1-800-257-7777 AND THE HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS/BUREAU OF ENGINEERING/CONSTRUCTION INSPECTION DIVISION (410-313-1880) AT LEAST 5 DAYS PRIOR TO BEGINNING ANY WORK.
- 1-DAY 3. CONTRACTOR SHALL COORDINATE AN ON-SITE PRE-CONSTRUCTION MEETING THAT SHALL INCLUDE, BUT NOT BE LIMITED TO, THE COUNTY PROJECT MANAGER, THE ENGINEER, AND A REPRESENTATIVE FROM HOWARD COUNTY CONSTRUCTION INSPECTION.
- 1-DAY 4. CLEAR AND GRUB THOSE AREAS WITHIN THE LIMIT OF DISTURBANCE REQUIRED TO ESTABLISH THE PROPOSED SEDIMENT CONTROL MEASURES.
- 3-DAYS 5. CONSTRUCT ALL PERIMETER CONTROL DEVICES INCLUDING SILT FENCE AND SEE. NO WORK SHALL BE PERFORMED UNTIL THESE DEVICES ARE APPROVED BY THE HOWARD COUNTY SEDIMENT CONTROL OFFICER.
- 1-DAY 6. COORDINATE SITE POWER WITH BGE, CONTRACTOR SET-UP TEMPORARY POWER. BGE POLE 512160 TO BE RELOCATED.
- 2-DAYS 7. CONNECT TO 16" WATER MAIN. PROVIDE OPEN CUT PROTECTION AND TRAFFIC CONTROL IN ACCORDANCE WITH SHA STANDARDS.
- 28-DAYS 8. EXCAVATE AND INSTALL TANK FOUNDATION.
- 3-DAYS 9. PROVIDE MASS-SITE EXCAVATION AND GRADING. ONLY CONSTRUCT RIPRAP DITCHES TO ELEVATION 455 AND PROVIDE TEMPORARY STONE OUTLET STRUCTURES AT THE END OF EACH DITCH AS SHOWN ON THE PLANS.
- 150-DAYS 10. ERECT ELEVATED TANK.
- 5-DAYS 11. INSTALL VALVE VAULT TEST AND CONNECT TO THE WATER MAINS.
- 5-DAYS 12. PROVIDE TANK POWER, CONTROLS AND TELEMETRY SERVICE.
- 2-DAYS 13. PROVIDE ENTRANCE ROADWAY AND SITE TURN-AROUND DRIVEWAY.
- 2-DAYS 14. FURNISH SITE FINISHED GRADING AND SEEDING.
- 2-DAYS 15. PROVIDE PERMANENT SITE FENCING.
- 5-DAYS 16. AFTER ALL UPSTREAM AREAS HAVE BEEN PERMANENTLY STABILIZED, CONSTRUCT BIORETENTION AREA.
- 3-DAY 17. INSTALL ALL LANDSCAPE PLANTINGS, INCLUDING BIORETENTION PLANTINGS.
- 1-DAY 18. WHEN THE SITE IS STABILIZED AND WITH THE PERMISSION OF THE HOWARD COUNTY SEDIMENT CONTROL INSPECTOR, REMOVE SEDIMENT CONTROL DEVICES AND STABILIZE ANY AREAS DISTURBED BY THIS ACTIVITY.
- 2-DAYS 19. CONTRACTOR DEMOBILIZATION/CONTRACT CLOSE-OUT.

NOTE: PARALLEL EFFORTS ARE NOT DEFINED.

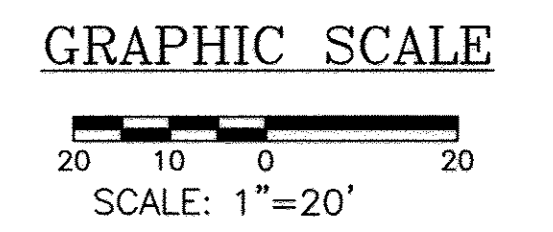
**NOTES:**

1. SEE SHEET SD-2 FOR WATER MAIN DESIGN STATIONING.
2. SEE SHEET SD-2 FOR SITE LEGEND AND UTILITY SYMBOLS.
3. TELEPHONE AND ELECTRIC UTILITIES SHALL BE FIELD RUN WITH A MINIMUM OF 24" COVER.
4. FOR UTILITIES LOCATION SEE STAKEOUT TABLE ON SD-2.
5. STORMWATER FACILITY SHOWN IS A LOW-HAZARD (CLASS A) BIORETENTION FACILITY.
6. STORMWATER FACILITY SHOWN IS OWNED AND SHALL BE MAINTAINED BY THE HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS.
7. THE ENTIRE PROJECT SITE IS CLASSIFIED AS GLENELG SOIL (GgB), A TYPE "B" SOIL, BY THE SOIL CONSERVATION SERVICE HYDROLOGIC SOIL GROUP.
8. THE CONTRACTOR SHALL PROVIDE AND INSTALL A 30-INCH "RIGHT TURN ONLY R3-30" SIGN AND A 30-INCH "NO RIGHT TURN R3-1" SIGN MEETING THE REQUIREMENTS OF THE MARYLAND STATE HIGHWAY ADMINISTRATION AT THE LOCATIONS DIRECTED BY THE ENGINEER.

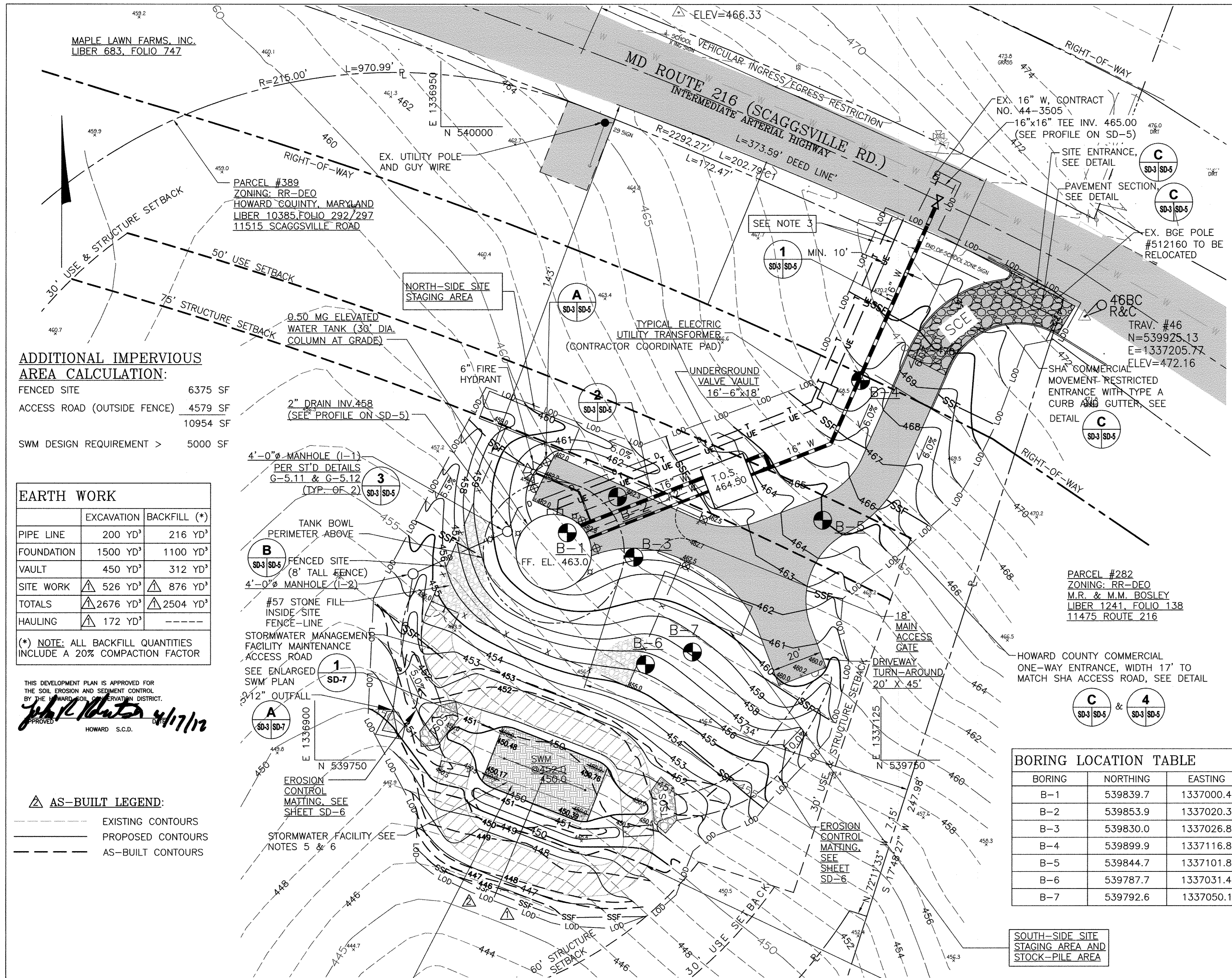


NOTE: ACCORDING TO SECTION 128 OF THE HOWARD COUNTY ZONING REGULATIONS, WATER STORAGE STRUCTURES ARE EXEMPT FROM THE HEIGHT LIMITATIONS IN THE RR ZONING DISTRICT.

**PROPOSED 0.50 MG TANK**  
SCALE: NOT TO SCALE



**AS BUILT REPLACEMENT SHEET**



**ADDITIONAL IMPERVIOUS AREA CALCULATION:**

FENCED SITE	6375 SF
ACCESS ROAD (OUTSIDE FENCE)	4579 SF
	10954 SF
SWM DESIGN REQUIREMENT >	5000 SF

**EARTH WORK**

	EXCAVATION	BACKFILL (*)
PIPE LINE	200 YD <sup>3</sup>	216 YD <sup>3</sup>
FOUNDATION	1500 YD <sup>3</sup>	1100 YD <sup>3</sup>
VAULT	450 YD <sup>3</sup>	312 YD <sup>3</sup>
SITE WORK	526 YD <sup>3</sup>	876 YD <sup>3</sup>
TOTALS	2676 YD <sup>3</sup>	2504 YD <sup>3</sup>
HAULING	172 YD <sup>3</sup>	

(\*) NOTE: ALL BACKFILL QUANTITIES INCLUDE A 20% COMPACTION FACTOR

THIS DEVELOPMENT PLAN IS APPROVED FOR THE SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD COUNTY ENGINEERING DISTRICT.

*John A. ...*  
APPROVED  
HOWARD S.C.D. 4/17/12

**AS-BUILT LEGEND:**

- EXISTING CONTOURS
- PROPOSED CONTOURS
- AS-BUILT CONTOURS

**BORING LOCATION TABLE**

BORING	NORTHING	EASTING
B-1	539839.7	1337000.4
B-2	539853.9	1337020.3
B-3	539830.0	1337026.8
B-4	539899.9	1337116.8
B-5	539844.7	1337101.8
B-6	539787.7	1337031.4
B-7	539792.6	1337050.1

**ELEVATED WATER TANK SITE PLAN**  
SCALE: 1"=20'

OWNER: DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND  
9250 BENDIX ROAD  
COLUMBIA, MARYLAND  
PHONE: (410)313-4400

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 01/15/11

APPROVED: DEPARTMENT OF PLANNING AND ZONING  
*Paul ...* 4/5/12  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION  
*...* 4/5/12  
 CHIEF, DIVISION OF LAND DEVELOPMENT  
*...* 4/5/12  
 DIRECTOR

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

*John A. ...* 3/29/12  
DIRECTOR OF PUBLIC WORKS

*...* 3/21/12  
CHIEF, BUREAU OF UTILITIES

*...* 3/21/12  
CHIEF, UTILITY DESIGN DIVISION

**KCI TECHNOLOGIES**  
ENGINEERS PLANNERS SURVEYORS CONSTRUCTION MANAGERS  
936 Ridgebrook Road Sparks, MD 21152  
Phone: (410) 316-7800 Fax: (410) 316-7935 www.kci.com



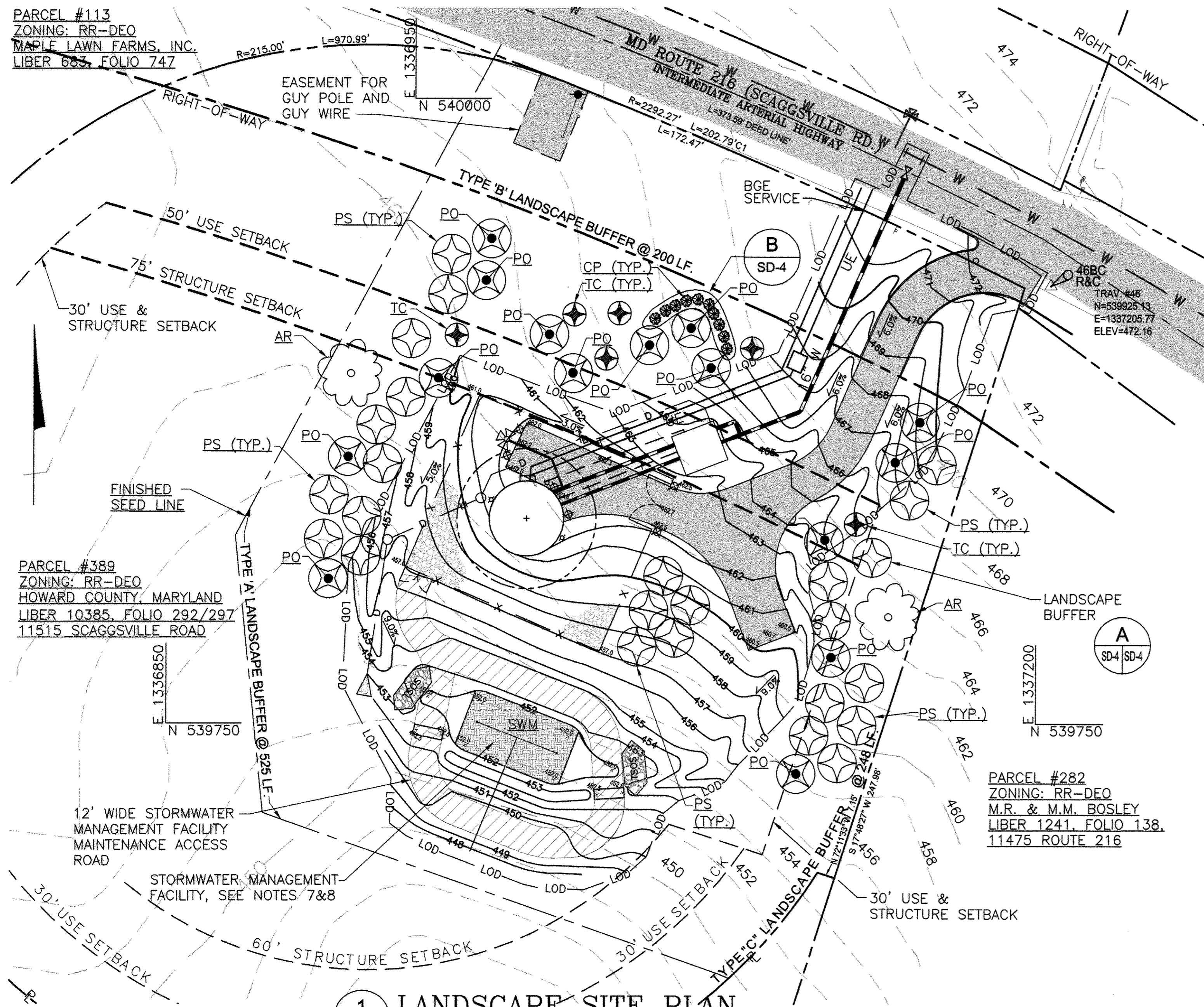
DES: SEA	KFJ	MDR-01, RESPONSE TO RFI-07	9/01/10
DRN: LFN	KFJ	AS BUILT	1/04/12
CHK: JRK	LFN	AS BUILT	3/6/12
DATE: 3/20/09	BY NO.	REVISION	DATE

**SITE DEVELOPMENT PLAN**

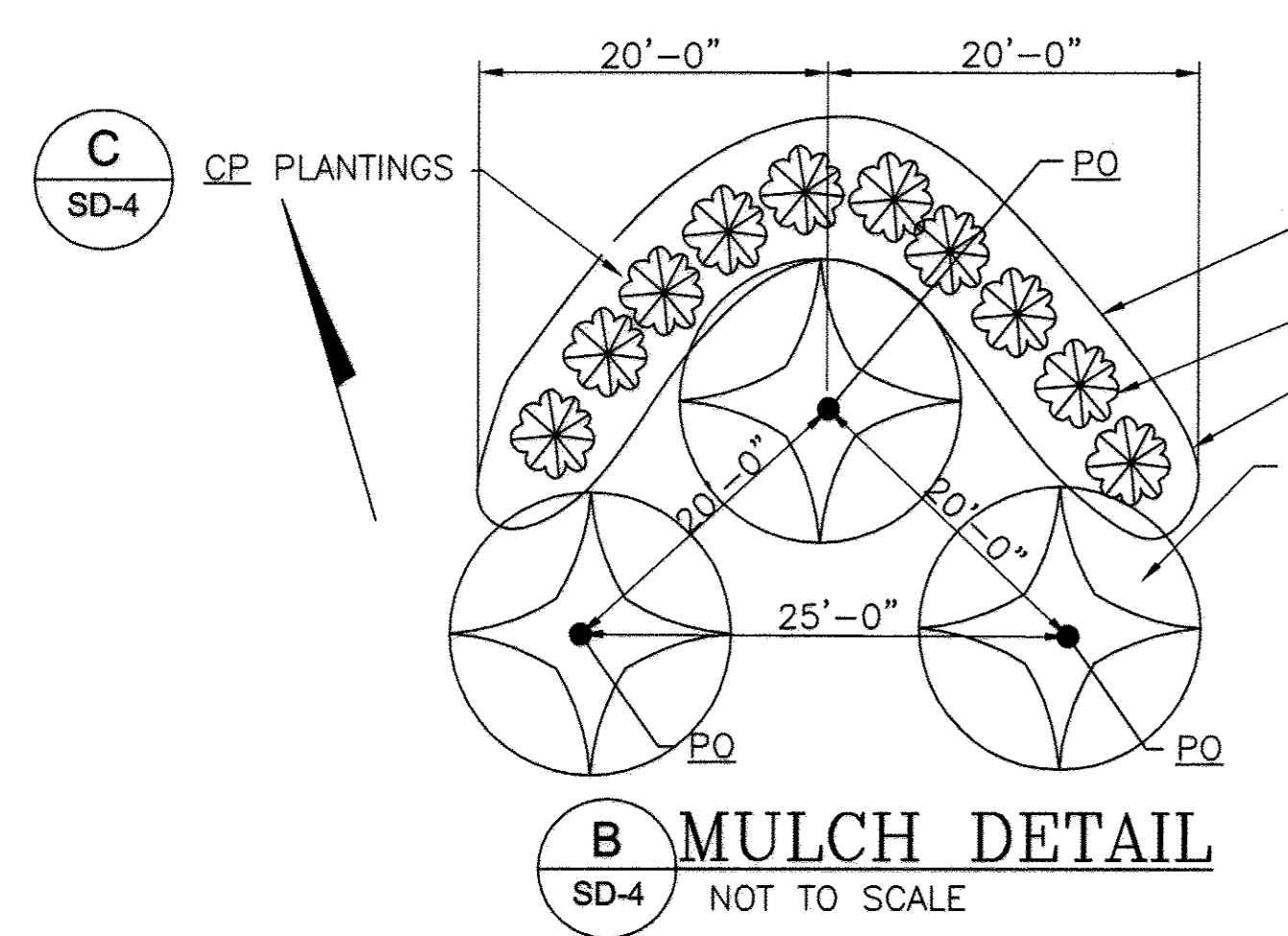
TAX MAP 46, SECTION/AREA 3.52 AC, LOT/PARCEL 389, ZONING RR-DEO, GRID 3, LIBER 10385, FOLIO 292/297

**FULTON ELEVATED WATER TANK**  
CAPITAL PROJECT No. W8280  
CONTRACT No. 44-4517  
ELECTION DISTRICT NO.5 HOWARD COUNTY, MARYLAND

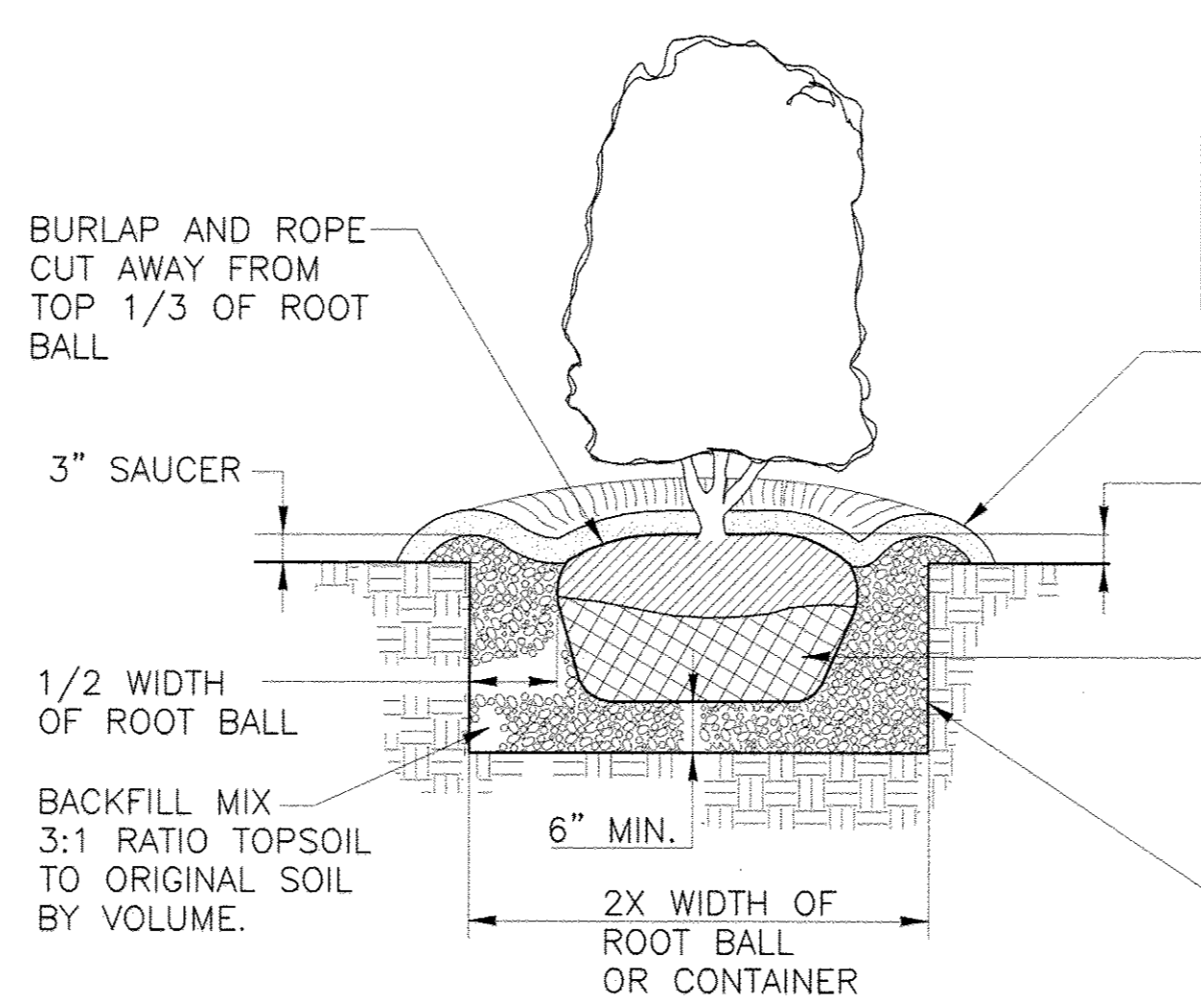
SCALE AS SHOWN  
CONTRACT SHEET  
4 OF 22



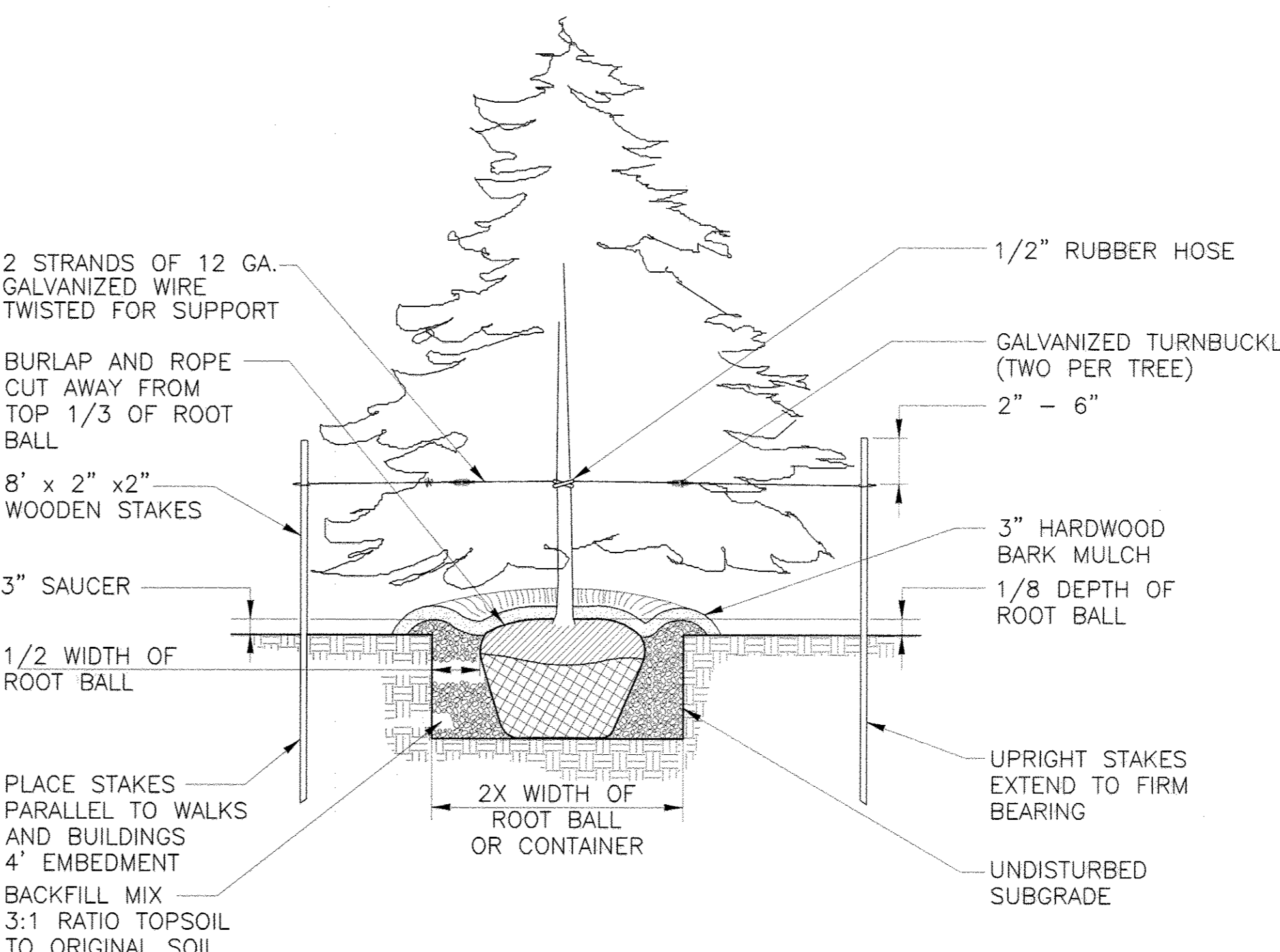
**1 LANDSCAPE SITE PLAN**  
SCALE 1"=30'



**B MULCH DETAIL**  
SD-4 NOT TO SCALE



**C SHRUB PLANTING DETAIL**  
SD-4 NOT TO SCALE



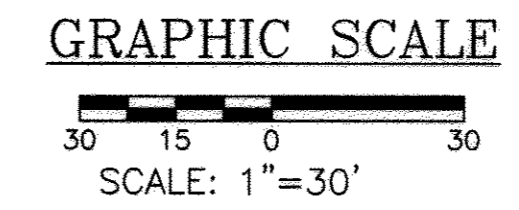
**A TREE PLANTING DETAIL**  
SD-4 NOT TO SCALE

**PLANT LIST** NOTE: QUANTITIES EXCEED PERIMETER LANDSCAPE SCHEDULE WITH PLANT SUBSTITUTIONS AT 1:1, SEE NOTE 1

SYMBOL	QTY.	NAMES (BOTANICAL/SCIENTIFIC)	SIZE	SPACING
<b>SHADE TREES</b>				
AR	2	ACER RUBRUM 'AUTUMN FLAME' AUTUMN FLAME MAPLE	8'-10' HT	20'-0"
SUBTOTAL 2				
<b>EVERGREEN TREES</b>				
PS	25	PINUS STROBUS WHITE PINE	6'-8' HT	16'-0"
PO	15	PICEA OMORIKA SERBIAN SPRUCE	6'-8' HT	15'-0"
TC	6	THUJA OCCIDENTALIS 'NIGRA' NIGRA ARBORVITAE	6'-8' HT	10'-0"
SUBTOTAL 46				
<b>EVERGREEN SHRUBS</b>				
CP	10	CHAMAECYPARIS PISIFERA 'AUREA MOPS' GOLD CYPRESS	1'-2' HT	4'-0"
SUBTOTAL 10				

**CARE OF PLANTS AFTER CONSTRUCTION:**

IF SOILS ARE NOT WET, THE AREA WILL BE WATERED IMMEDIATELY AFTER PLANTING. THE SOIL SUBSTRATE MUST BE KEPT SATURATED DURING PLANTING AND CONTINUED ACCORDING TO CLIMATIC CONDITIONS AND UNTIL PLANTINGS BECOME FULLY ESTABLISHED AS DETERMINED BY THE PROFESSIONAL LANDSCAPER. ALL PLANTS SHALL BE GUARANTEED FOR A PERIOD OF 1-YEAR AFTER FINAL ACCEPTANCE.



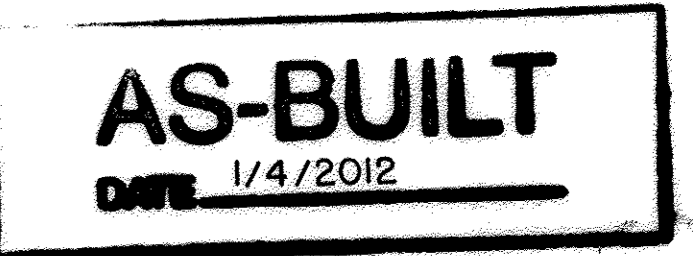
**LANDSCAPE NOTES:**

- THE LANDSCAPE CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS AND UTILITY LOCATIONS SHOWN WITHIN THE PROJECT LIMITS AND SHALL INFORM THE ENGINEER OF ANY DISCREPANCIES OR POTENTIAL PROBLEMS PRIOR TO COMMENCING WORK.
- ALL PLANTING AND MULCHING SHALL BE DONE IN ACCORDANCE WITH HOWARD COUNTY STANDARDS AND MD SHA BOOK OF STANDARDS, HIGHWAY AND INCIDENTAL STRUCTURES, CATEGORY 7 - LANDSCAPING, AND THE 2000 MARYLAND STORM WATER DESIGN MANUAL, VOLUMES 1 AND 2.
- DO NOT PLANT TREES OR SHRUBS WITHIN 5'-0" OF THE CENTERLINE OF UNDERGROUND UTILITY LINES. DO NOT PLANT TREES WITHIN 10'-0" OF THE CENTERLINE OF WATER MAINS OR OVERHEAD UTILITY LINES. THE CONTRACTOR IS RESPONSIBLE FOR CONTACTING 'MISS UTILITY' AT 1-800-257-7777 A MINIMUM OF 72 HOURS PRIOR TO PROCEEDING WITH ANY EXCAVATION FOR PLANT MATERIAL INSTALLATION.
- ALL TREES GREATER THAN OR EQUAL TO 6'-0" IN HEIGHT SHALL BE STAKED PER THE PLANTING DETAILS.
- TREES SHRUBS AND/OR ANY TYPE OF WOODY VEGETATION ARE NOT TO BE PLANTED ON ANY EMBANKMENT COMPRISED OF FILL MATERIAL.
- TREES AND SHRUBS ARE NOT TO BE PLANTED WITHIN 10 FEET OF THE TOE OF SLOPE.
- STORMWATER FACILITY SHOWN IS A LOW-HAZARD (CLASS A) BIORETENTION FACILITY.
- STORMWATER FACILITY SHOWN IS OWNED AND WILL BE MAINTAINED BY THE HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS.
- THE ENTIRE PROJECT SITE IS CLASSIFIED AS GLENELG SOIL (GgB), A TYPE "B" SOIL BY THE SOIL CONSERVATION SERVICES HYDROLOGIC SOIL GROUP.
- AT THE TIME OF PLANT INSTALLATION, ALL TREES AND SHRUBS LISTED AND APPROVED ON THE LANDSCAPE PLAN, SHALL COMPLY WITH THE PROPER HEIGHT REQUIREMENT IN ACCORDANCE WITH THE HOWARD COUNTY LANDSCAPE MANUAL. IN ADDITION, NO SUBSTITUTIONS OR RELOCATIONS OF THE REQUIRED PLANTINGS MAY BE MADE WITHOUT PRIOR REVIEW AND APPROVAL FROM THE DEPARTMENT OF PLANNING AND ZONING. ANY DEVIATION FROM THE APPROVED LANDSCAPE PLAN MAY RESULT IN DENIAL OR DELAY IN THE RELEASE OF LANDSCAPE SURETY UNTIL SUCH TIME AS ALL REQUIRED MATERIALS ARE PLANTED AND/OR REVISIONS ARE MADE TO THE APPLICABLE PLANS.
- THE OWNER, TENANTS AND/OR THEIR AGENTS SHALL BE RESPONSIBLE FOR THE MAINTENANCE OF THE REQUIRED LANDSCAPING INCLUDING BOTH PLANT MATERIALS AND BERMS, FENCES AND WALLS. ALL PLANT MATERIALS SHALL BE MAINTAINED IN GOOD GROWING CONDITION, AND WHEN NECESSARY, REPLACED WITH NEW MATERIALS TO ENSURE CONTINUED COMPLIANCE WITH APPLICABLE REGULATIONS. ALL OTHER REQUIRED LANDSCAPING SHALL BE PERMANENTLY MAINTAINED IN GOOD CONDITION, AND WHEN NECESSARY, REPAIRED OR REPLACED.

**PERIMETER LANDSCAPE SCHEDULE**

CATEGORY	ADJACENT TO PERIMETER PROPERTIES		
	ADJACENT TO ROADWAY	C	A
LANDSCAPE TYPE	B	C	A
LINEAR FEET OF ROADWAY FRONTAGE/PERIMETER	200	248	525
CREDIT FOR EXISTING VEGETATION (YES, NO, LINEAR FEET) (DESCRIBE BELOW IF NEEDED)	NO	NO	NO
CREDIT FOR WALL, FENCE OR BERM (YES, NO, LINEAR FEET) (DESCRIBE BELOW IF NEEDED)	NO	NO	NO
NUMBER OF PLANTS REQUIRED			
SHADE TREES	4	7	9
EVERGREEN TREES	5	13	0
SHRUBS	0	0	0
NUMBER OF PLANTS PROVIDED 1			
SHADE TREES	0	1	1
EVERGREEN TREES REQUIRED	5	13	0
EVERGREEN TREES SUBSTITUTED (1:1 SUBSTITUTION)	4	8	16
SHRUBS (10:1 SUBSTITUTION)	10	0	0

COMMENTS:  
B - PROPERTY FRONTAGE (RTE. 216)  
C - ADJACENT RESIDENTIAL  
A - ADJACENT FARM LAND



NOTE: 1 THE DEPARTMENT OF PLANNING AND ZONING APPROVED A 1:1 SUBSTITUTION RATIO FOR SHADE TREES TO EVERGREEN TREES. WITH A 1:1 RATIO THE COMBINED REQUIRED MINIMUM NUMBER OF SHADE AND EVERGREEN TREES IS 38 TREES. THIS PLAN INCLUDES 2 SHADE TREES, 46 EVERGREEN TREES AND 10 SHRUBS.

APPROVED: DEPARTMENT OF PLANNING AND ZONING  
CHIEF DEVELOPMENT ENGINEERING DIVISION  
CHIEF, DIVISION OF LAND DEVELOPMENT  
DIRECTOR, DEP.

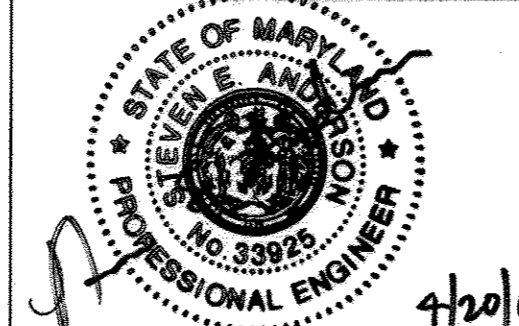
OWNER:  
DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND  
9250 BENDIX ROAD  
COLUMBIA, MARYLAND  
PHONE: (410)313-4400

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 01/15/11

**DEVELOPER'S/OWNERS LANDSCAPE CERTIFICATE**  
I/WE CERTIFY THAT THE LANDSCAPING SHOWN ON THIS PLAN, WILL BE DONE ACCORDING TO THE PLAN, SECTION 16.124 OF THE HOWARD COUNTY CODE AND LANDSCAPE MANUAL. I/WE FURTHER CERTIFY THAT UPON COMPLETION A LETTER OF LANDSCAPE INSTALLATION, ACCOMPANIED BY AN EXECUTED ONE YEAR GUARANTEE OF PLANT MATERIALS, WILL BE SUBMITTED TO THE DEPARTMENT OF PLANNING AND ZONING.

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND  
DIRECTOR OF PUBLIC WORKS  
CHIEF, BUREAU OF UTILITIES

ENGINEERS  
PLANNERS  
SCIENTISTS  
CONSTRUCTION MANAGERS  
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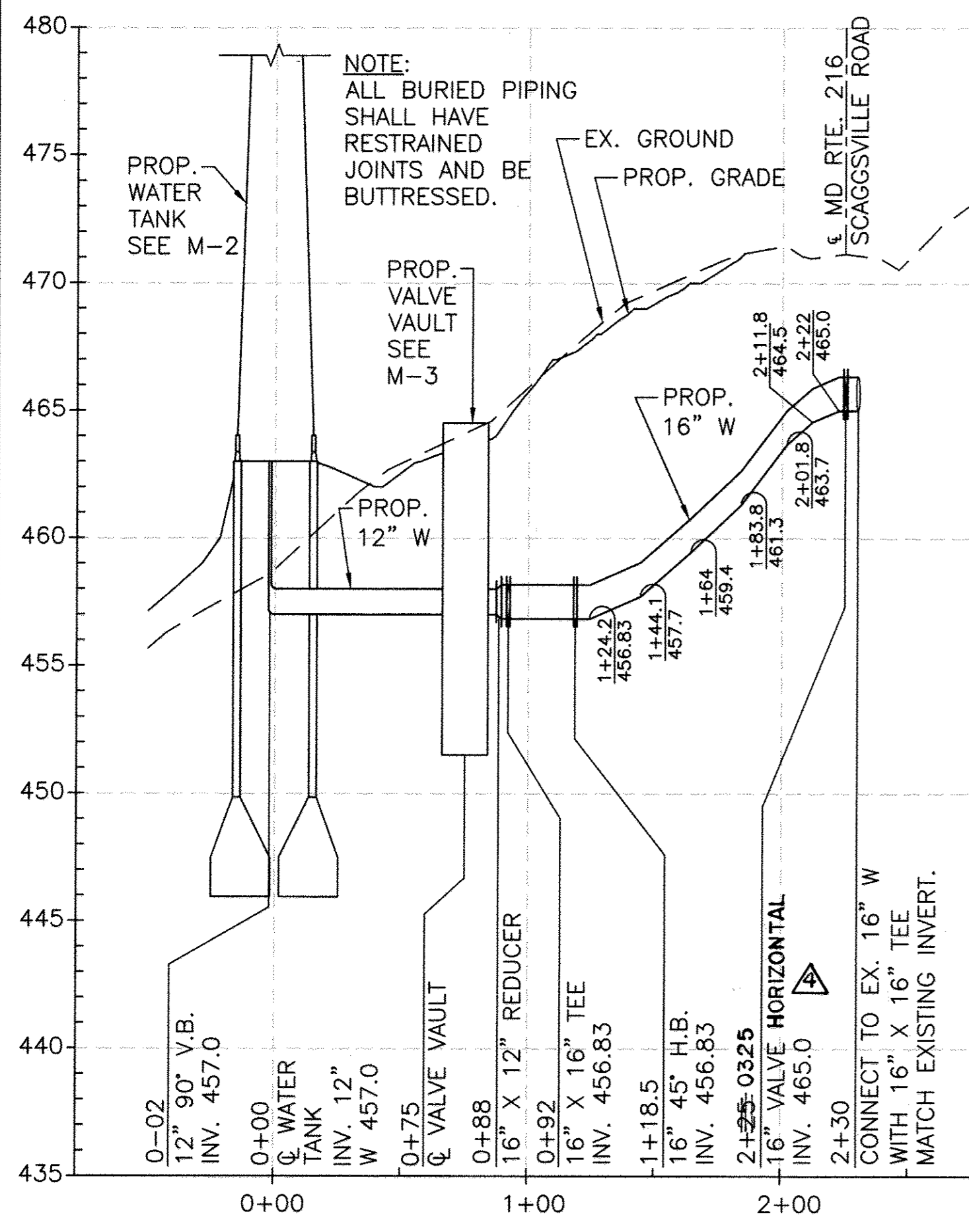


DES: SEA			
DRN: LFN			
CHK: JRK			
DATE: 3/20/09	BY: LFN	AS BUILT	1/4/12
	NO.	REVISION	DATE

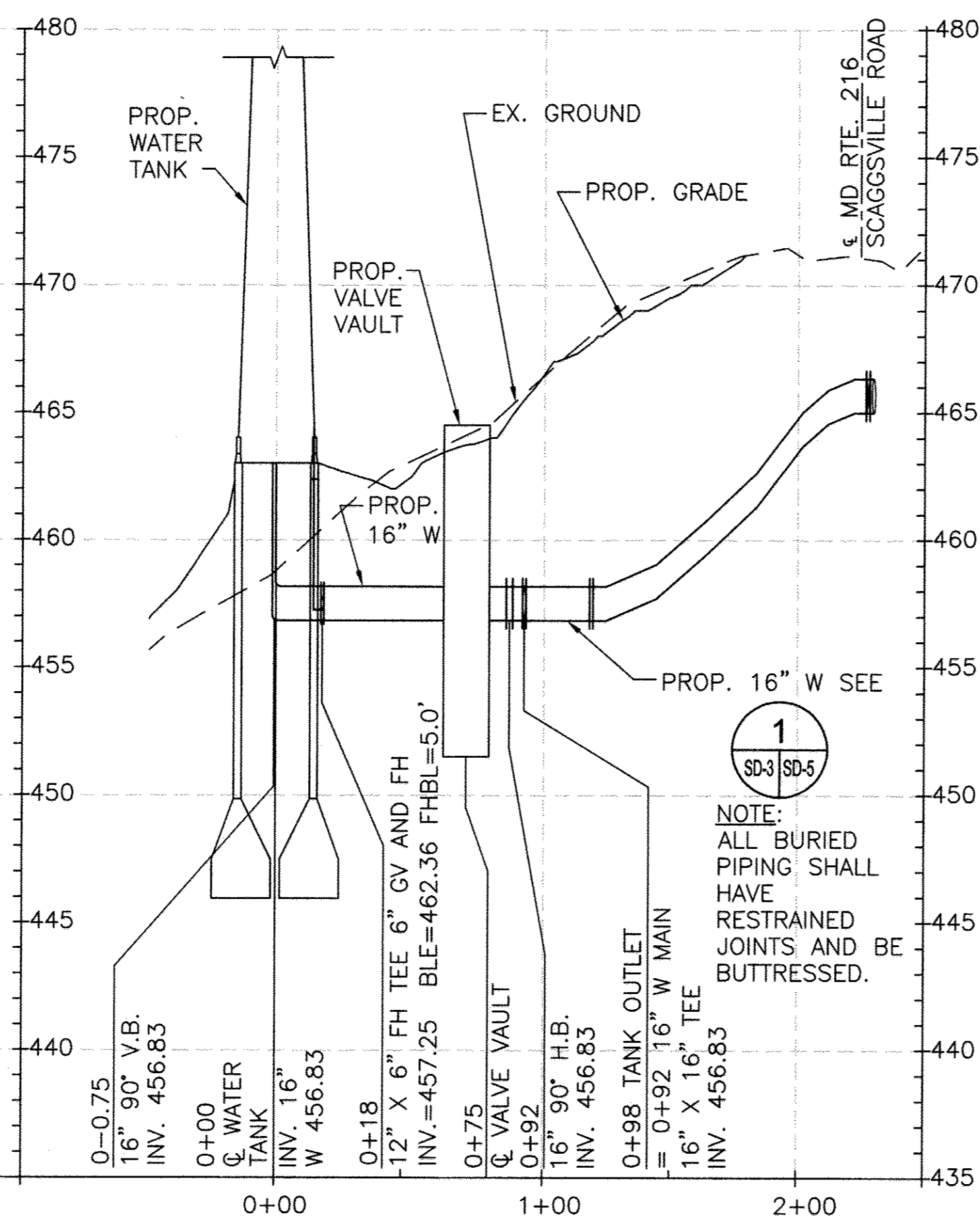
**LANDSCAPE PLAN AND DETAILS**

600' SCALE MAP NO. 46 BLOCK NO. 4

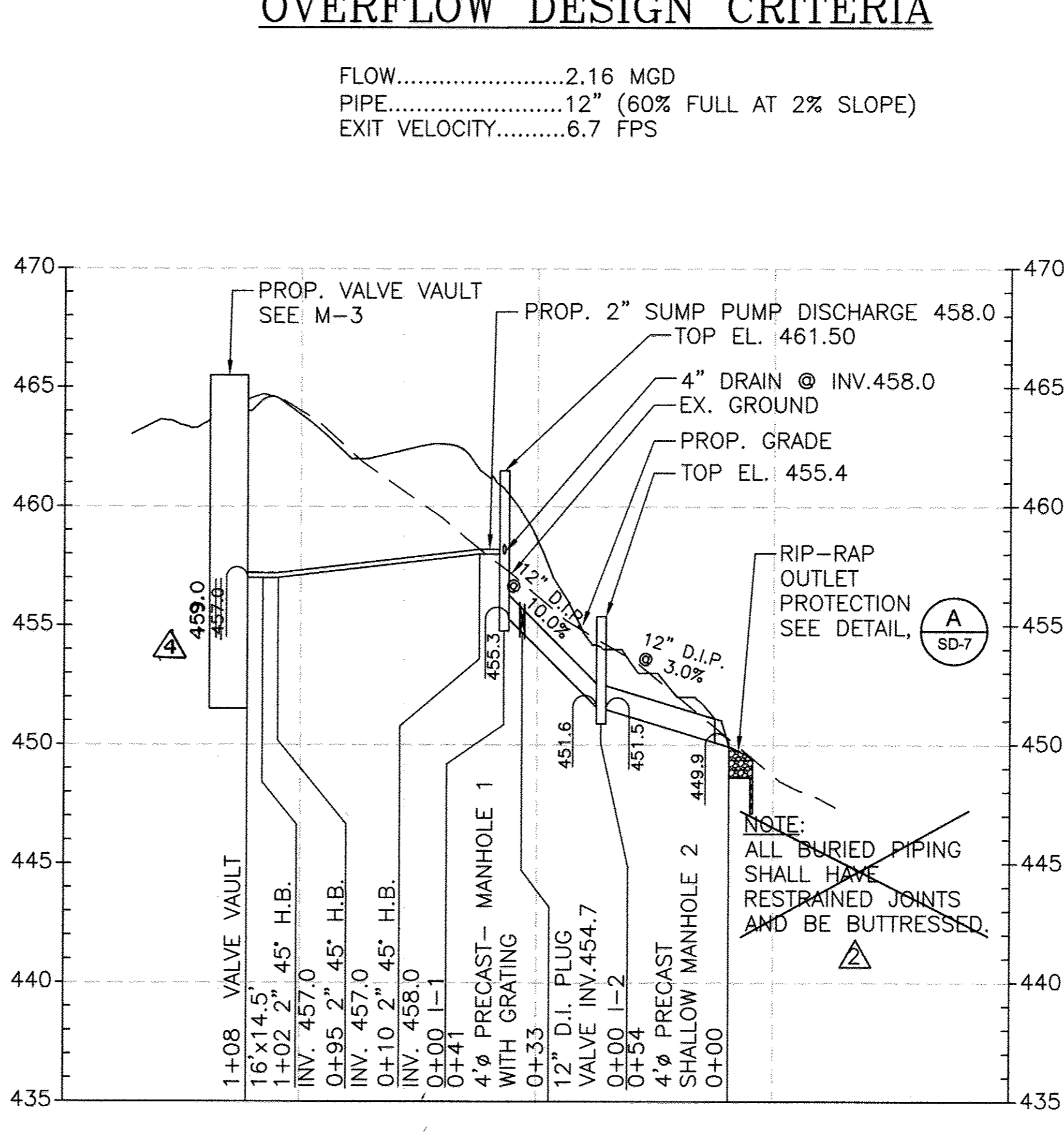
TAX MAP 46, SECTION/AREA 3.52 AC, LOT/PARCEL 389, ZONING RR-DEO, GRID 3, LIBER 10385, FOLIO 292/297  
**FULTON ELEVATED WATER TANK**  
CAPITAL PROJECT No. W8280  
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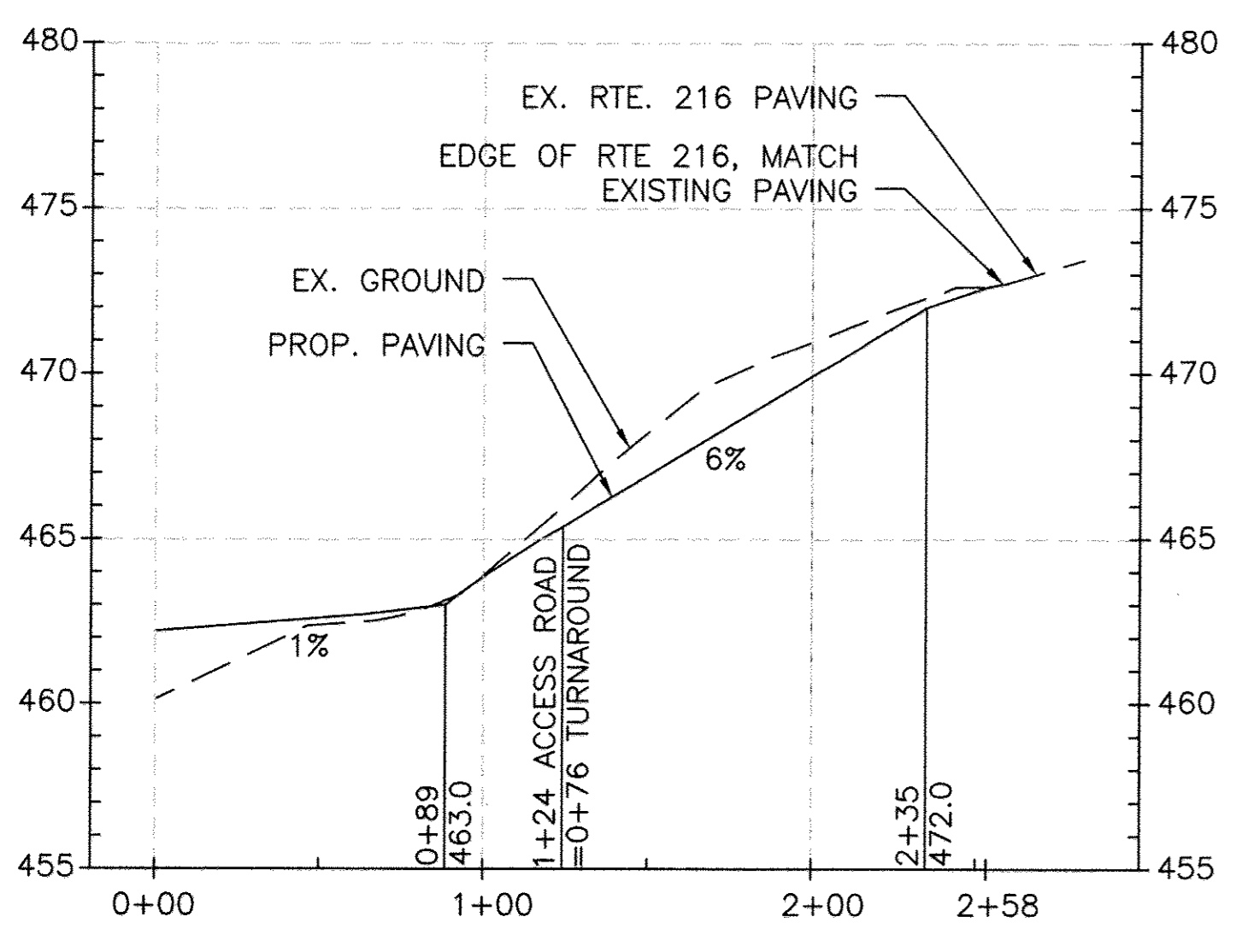
**1 12"-16" WATER MAIN PROFILE**  
 SCALE: HORIZ: 1" = 50'  
 VERT: 1" = 5'



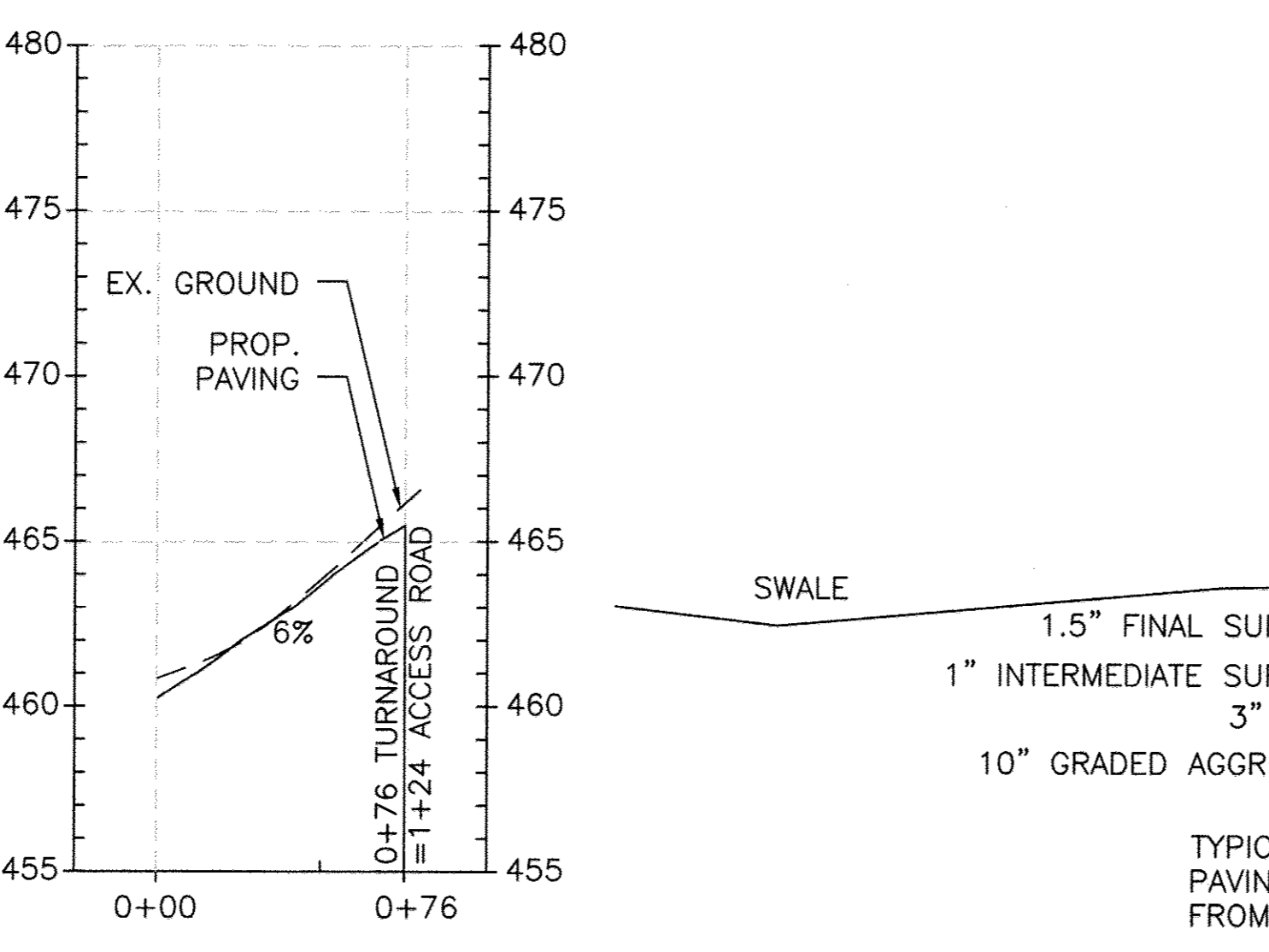
**2 16" TANK OUTLET PROFILE**  
 SCALE: HORIZ: 1" = 50'  
 VERT: 1" = 5'



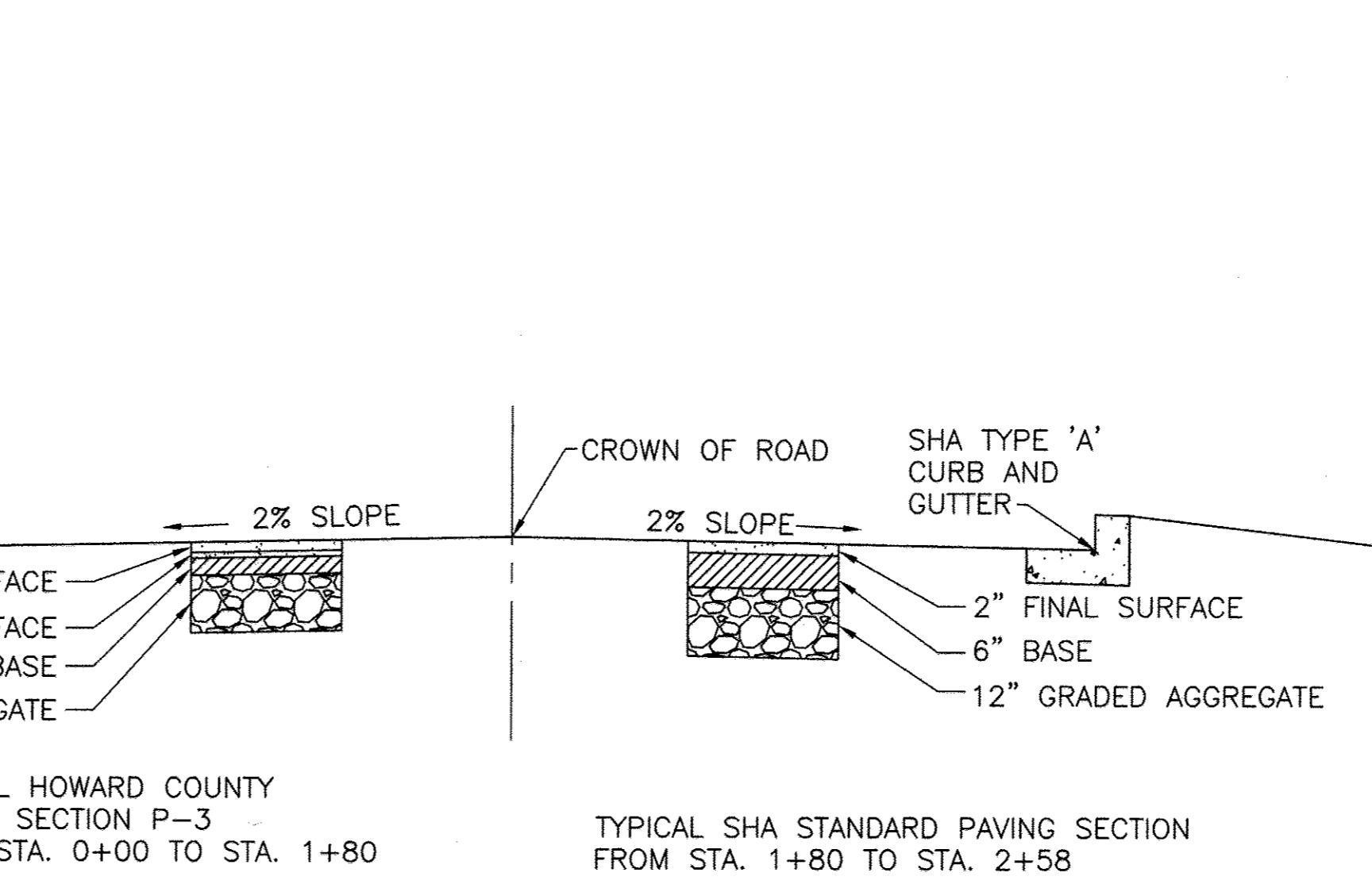
**3 OVERFLOW DRAIN PROFILE**  
 SCALE: HORIZ: 1" = 50'  
 VERT: 1" = 5'



**4 ACCESS ROAD TO TANK**  
 SCALE: HORIZ: 1" = 50'  
 VERT: 1" = 5'



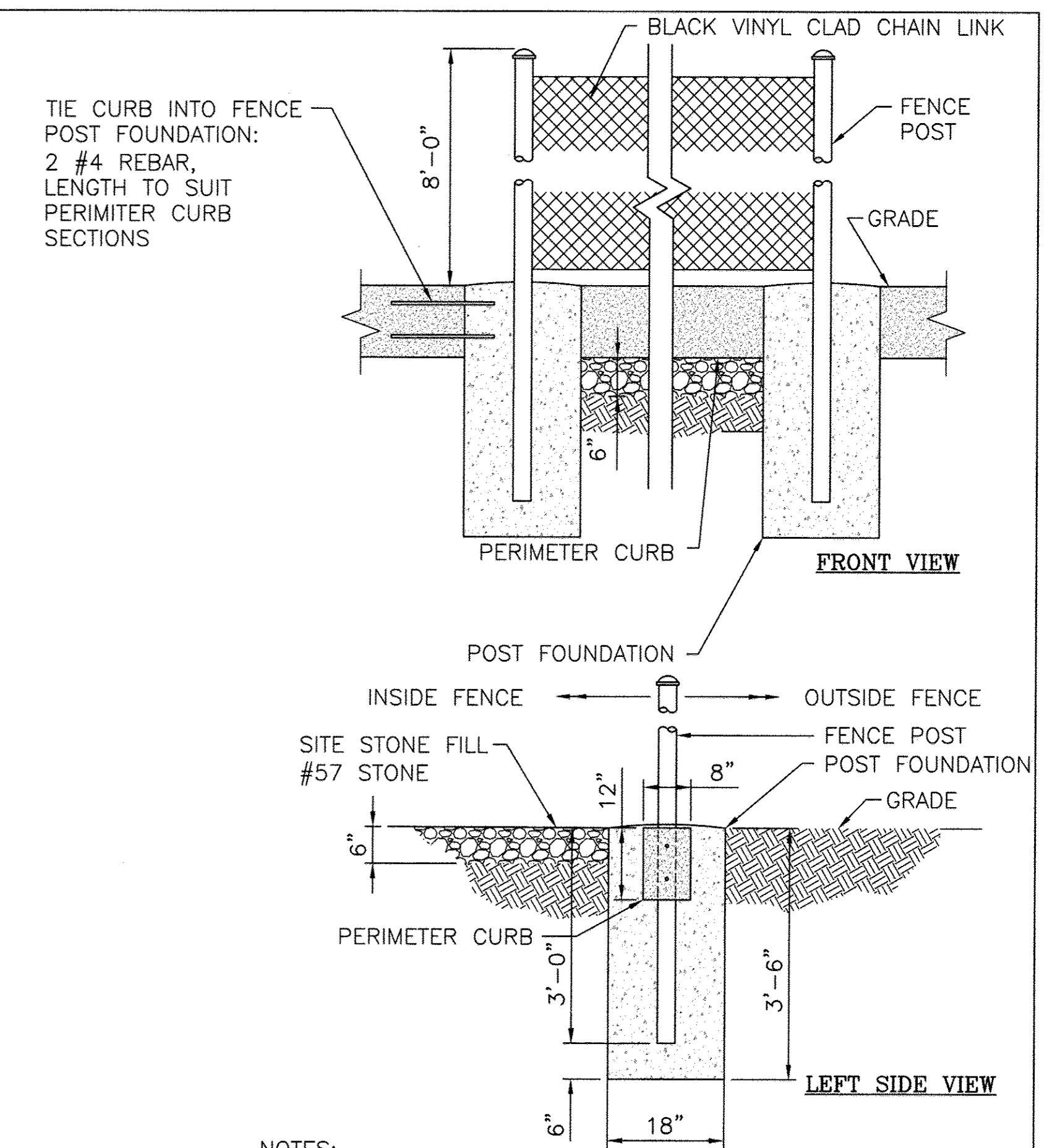
**4 TURNAROUND TO ACCESS ROAD**  
 SCALE: HORIZ: 1" = 50'  
 VERT: 1" = 5'



**C ACCESS ROAD CROSS SECTION**  
 SCALE: NOT TO SCALE

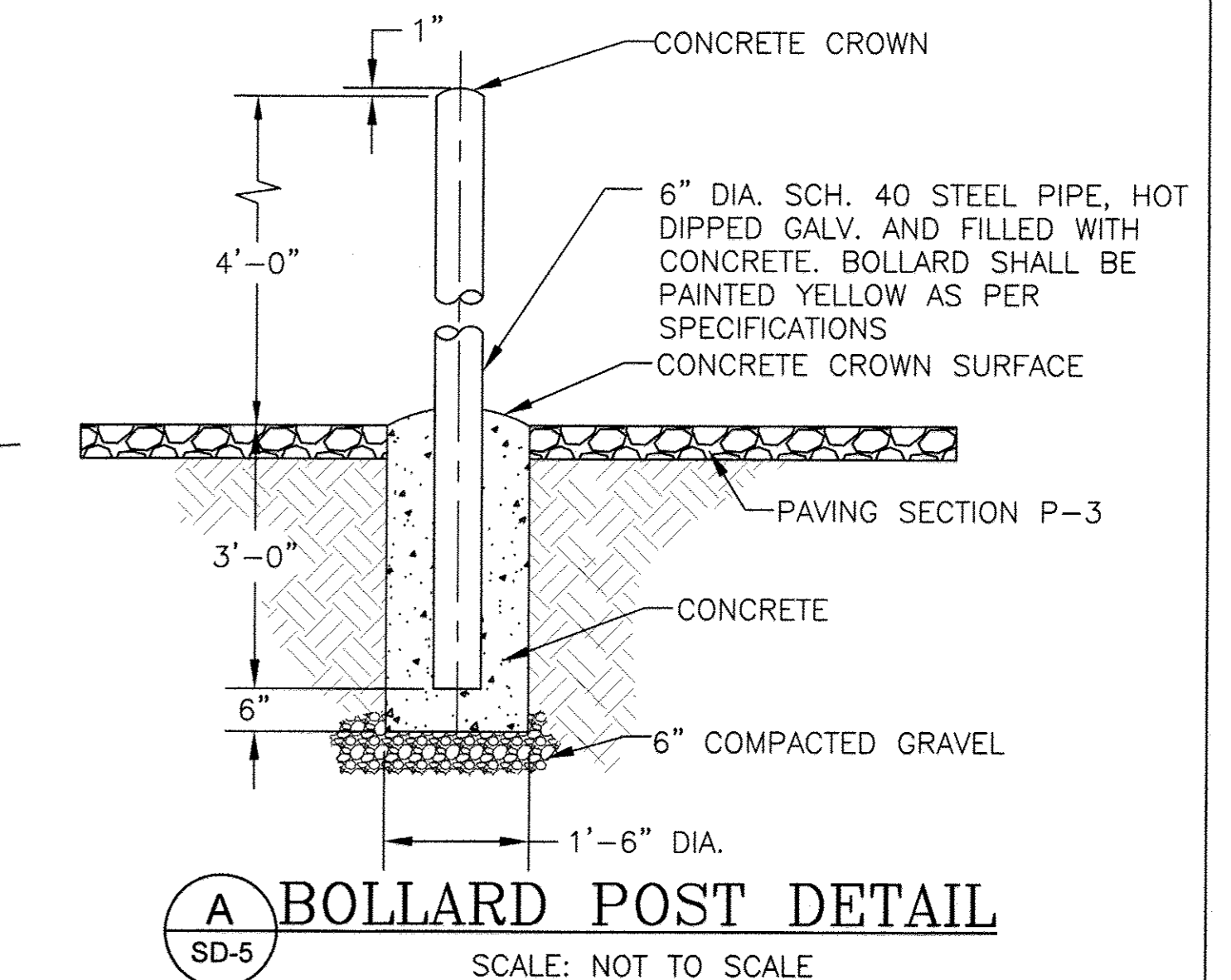
**OVERFLOW DESIGN CRITERIA**

FLOW.....2.16 MGD  
 PIPE.....12" (60% FULL AT 2% SLOPE)  
 EXIT VELOCITY.....6.7 FPS

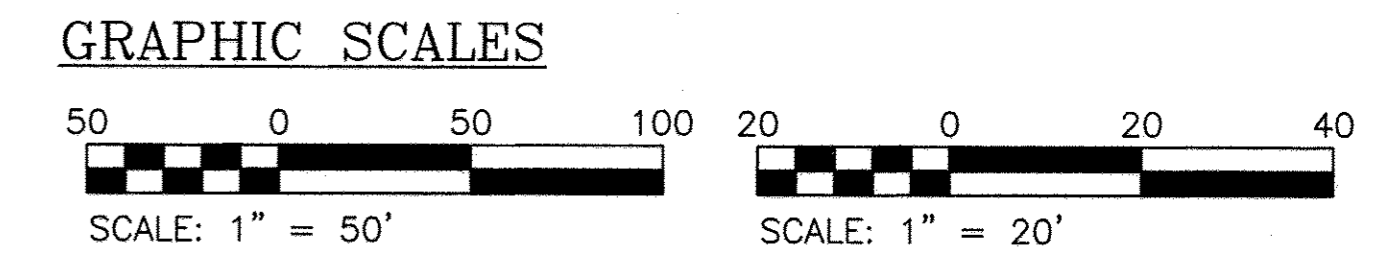


- NOTES:**
- FENCE SHALL BE PROVIDED IN ACCORDANCE WITH HOWARD CO. CHAIN LINK FENCE DETAIL G-7.21 FOR 8' HIGH FENCE.
  - PERIMETER CURB SHALL BE PROVIDED TO CONNECT FENCE POST FOUNDATIONS FOR THE ENTIRE SITE AS SHOWN ON SHEET SD-3.

**B PERIMETER CURB/FENCE POST**  
 SCALE: NOT TO SCALE



**A BOLLARD POST DETAIL**  
 SCALE: NOT TO SCALE



**AS BUILT REPLACEMENT SHEET**

APPROVED: DEPARTMENT OF PLANNING AND ZONING  
 Chief, Development Engineering Division  
 Chief, Division of Land Development  
 Director

OWNER:  
 DEPARTMENT OF PUBLIC WORKS  
 HOWARD COUNTY, MARYLAND  
 9250 BENDIX ROAD  
 COLUMBIA, MARYLAND  
 PHONE: (410)313-4400

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 01/15/11

DEPARTMENT OF PUBLIC WORKS  
 HOWARD COUNTY, MARYLAND  
 Director of Public Works  
 Chief, Bureau of Engineering  
 Chief, Bureau of Utilities

ENGINEERS  
 PLANNERS  
 SCIENTISTS  
 CONSTRUCTION MANAGERS  
**KCI TECHNOLOGIES**  
 936 Ridgebrook Road  
 Sparks, MD 21152  
 Phone: (410) 316-7800  
 Fax: (410) 316-7935  
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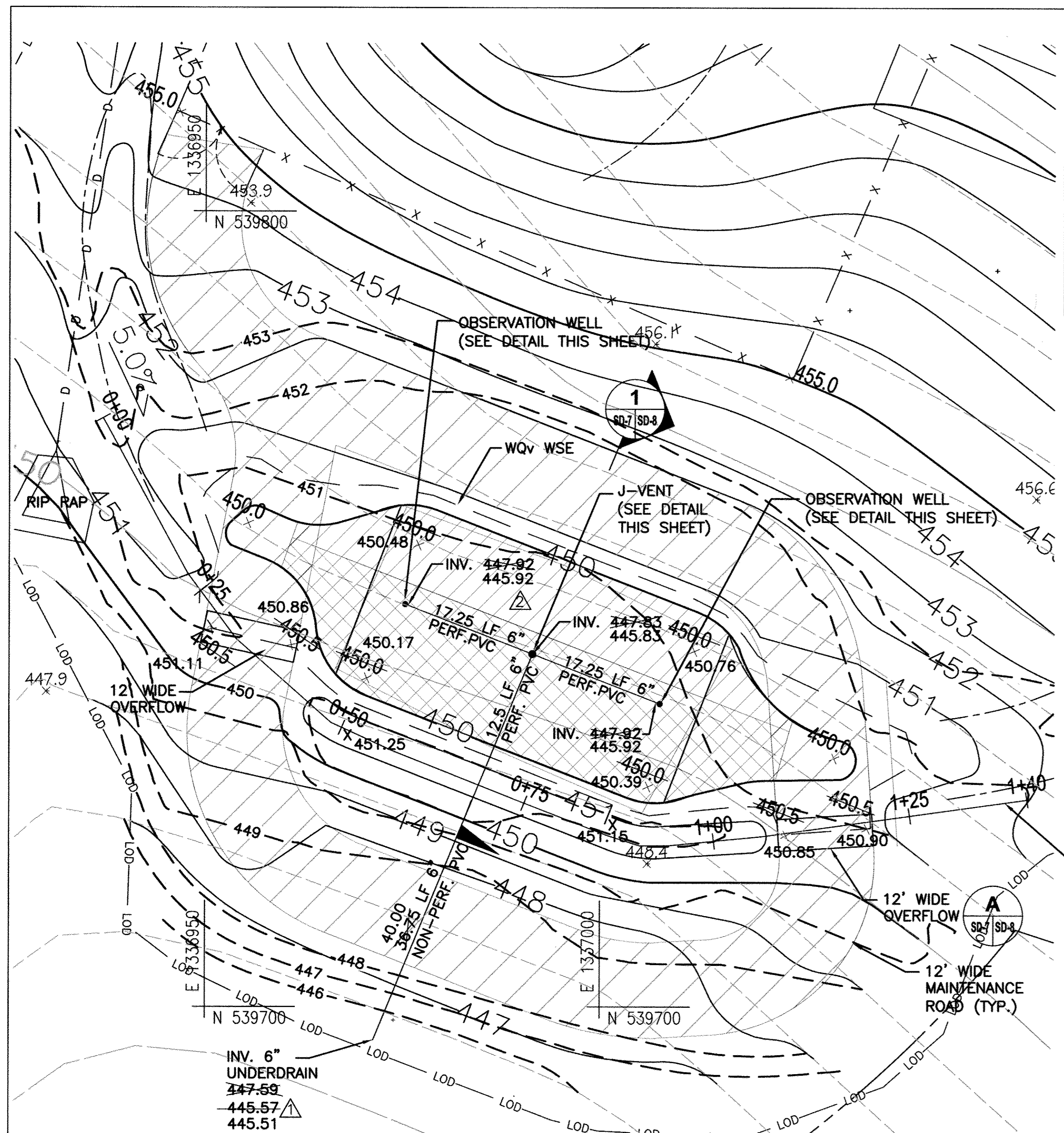
DES: SEA	KFJ	MDR-01, RESPONSE TO RFI-07	9/01/10
DRN: LFN	KFJ	MDR-01, RESPONSE TO RFI-08	9/01/10
CHK: JRK	LFN	AS BUILT	1/04/12
		AS BUILT	3-5-12
DATE: 3/20/09	BY: NO.	REVISION	DATE

PROFILES - ROAD AND SITE DETAILS  
 600' SCALE MAP NO. 46 BLOCK NO. 4

TAX MAP 46, SECTION/AREA 3.52 AC, LOT/PARCEL 389,  
 ZONING RR-DEQ, GRID 3, LIBER 10385, FOLIO 292/297  
**FULTON ELEVATED WATER TANK**  
 CAPITAL PROJECT No. W8280  
 CONTRACT No. 44-4517  
 ELECTION DISTRICT NO.5 HOWARD COUNTY, MARYLAND

SD-5  
 5 OF 9  
 SCALE AS SHOWN  
 CONTRACT SHEET  
 6 OF 22





### BIORETENTION FACILITY PLANT LIST

SYMBOL	QTY.	NAMES (BOTANICAL/SCIENTIFIC)	SIZE	SPACING	FORM
<b>TREES</b>					
▨	3	NYSSA SYLVATICA BLACK GUM	5'-0" HT	7'-0"	CONTAINER
▨	3	DIOSPYROS VIRGINIANA PERSIMMON	5'-0" HT	7'-0"	CONTAINER
▨	3	CHIONANTHUS VIRGINICUS FRINGE-TREE	5'-0" HT	7'-0"	CONTAINER
<b>SHRUBS</b>					
▨	6	ILEX GLABRA INKBERRY HOLLY	3'-0" HT	4'-0"	CONTAINER
▨	6	LINDERA BENZOIN SPICEBUSH	3'-0" HT	4'-0"	CONTAINER
▨	6	CEPHALANTHUS OCCIDENTALIS BUTTONBUSH	3'-0" HT	4'-0"	CONTAINER
▨	13	ILEX GLABRA INKBERRY HOLLY	3'-0" HT	4'-0"	CONTAINER
▨	13	LINDERA BENZOIN SPICEBUSH	3'-0" HT	4'-0"	CONTAINER
▨	13	CEPHALANTHUS OCCIDENTALIS BUTTONBUSH	3'-0" HT	4'-0"	CONTAINER

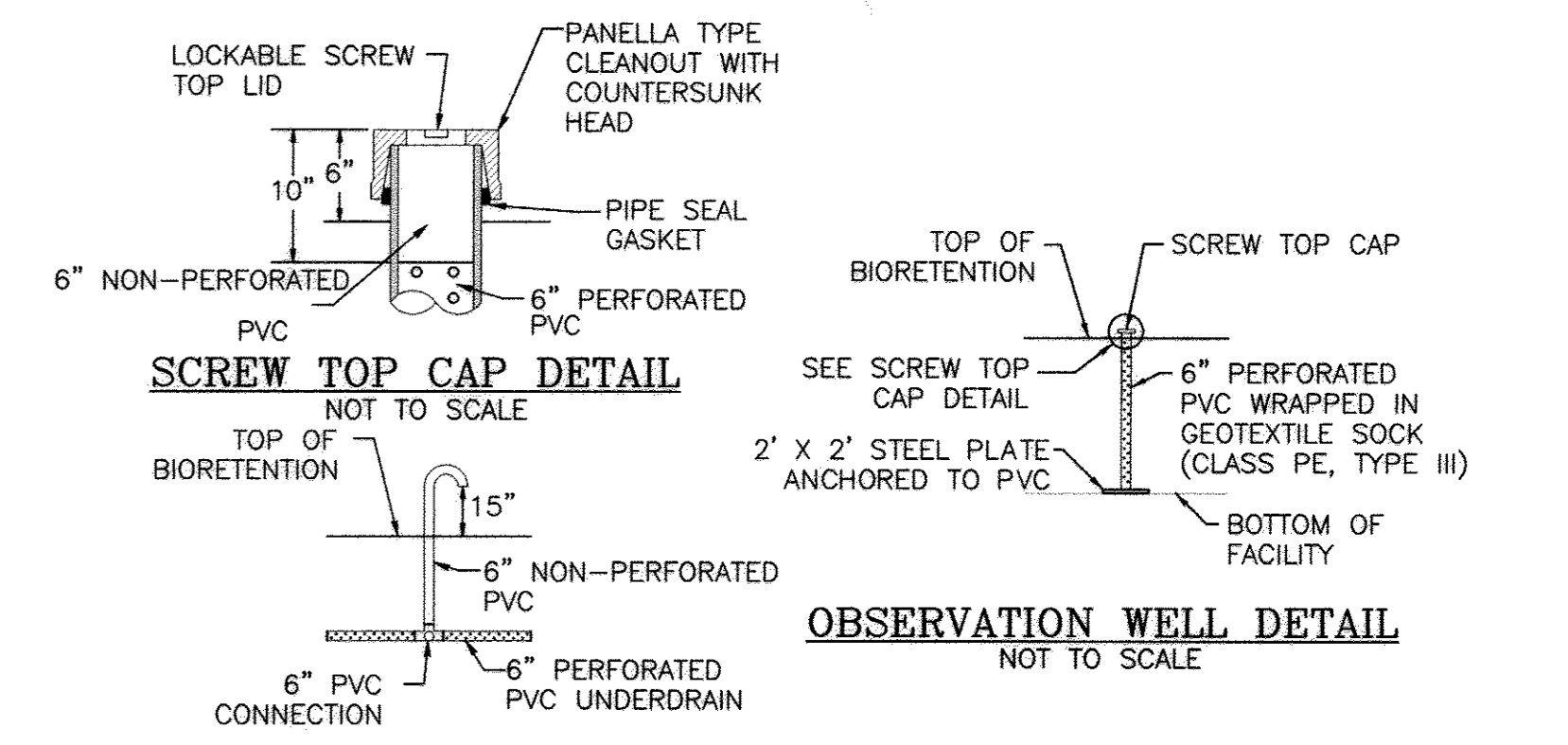
SEE CONTRACT SHEET SD-4 FOR TREE AND SHRUB PLANTING DETAILS. PLACEMENT SHALL BE RANDOM BUT MUST CONFORM TO SPACING ABOVE.

SYMBOL	NAMES (BOTANICAL/SCIENTIFIC)	PERCENT OF MIX	QUANTITY (LBS.)
<b>HERBACEOUS SEED MIX</b>			
1420 SF / 0.03 AC			
▨	ELMYUS VIRGINICUS VIRGINIA WILDRIE	25%	0.375
▨	CAREX VULPINOIDEA FOX SEDGE	25%	0.375
▨	AGROSTIS ALBA REDTOP	25%	0.375
▨	SCIRPUS PUNGENS THREE SQUARE BULRUSH	25%	0.375
TOTAL			1.5

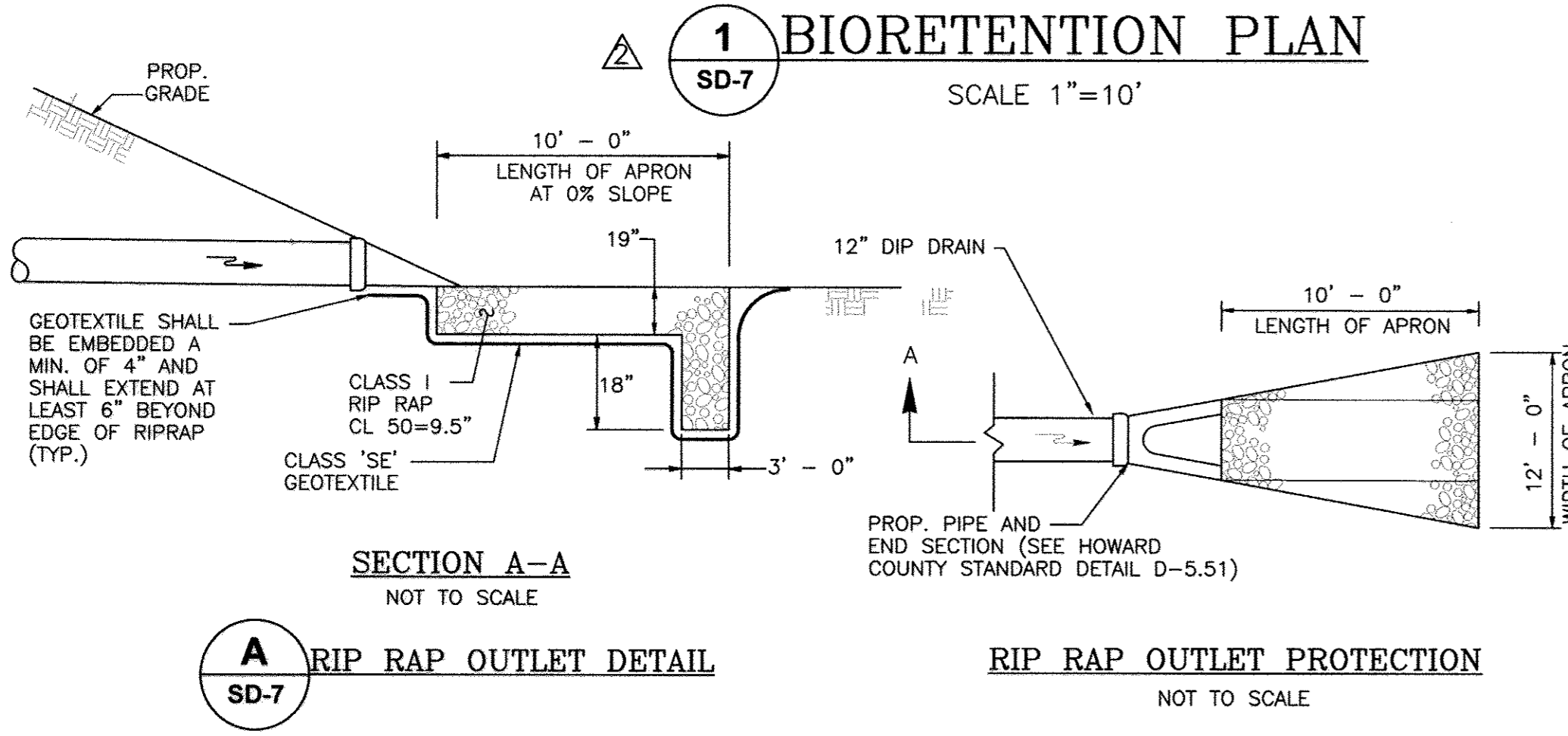
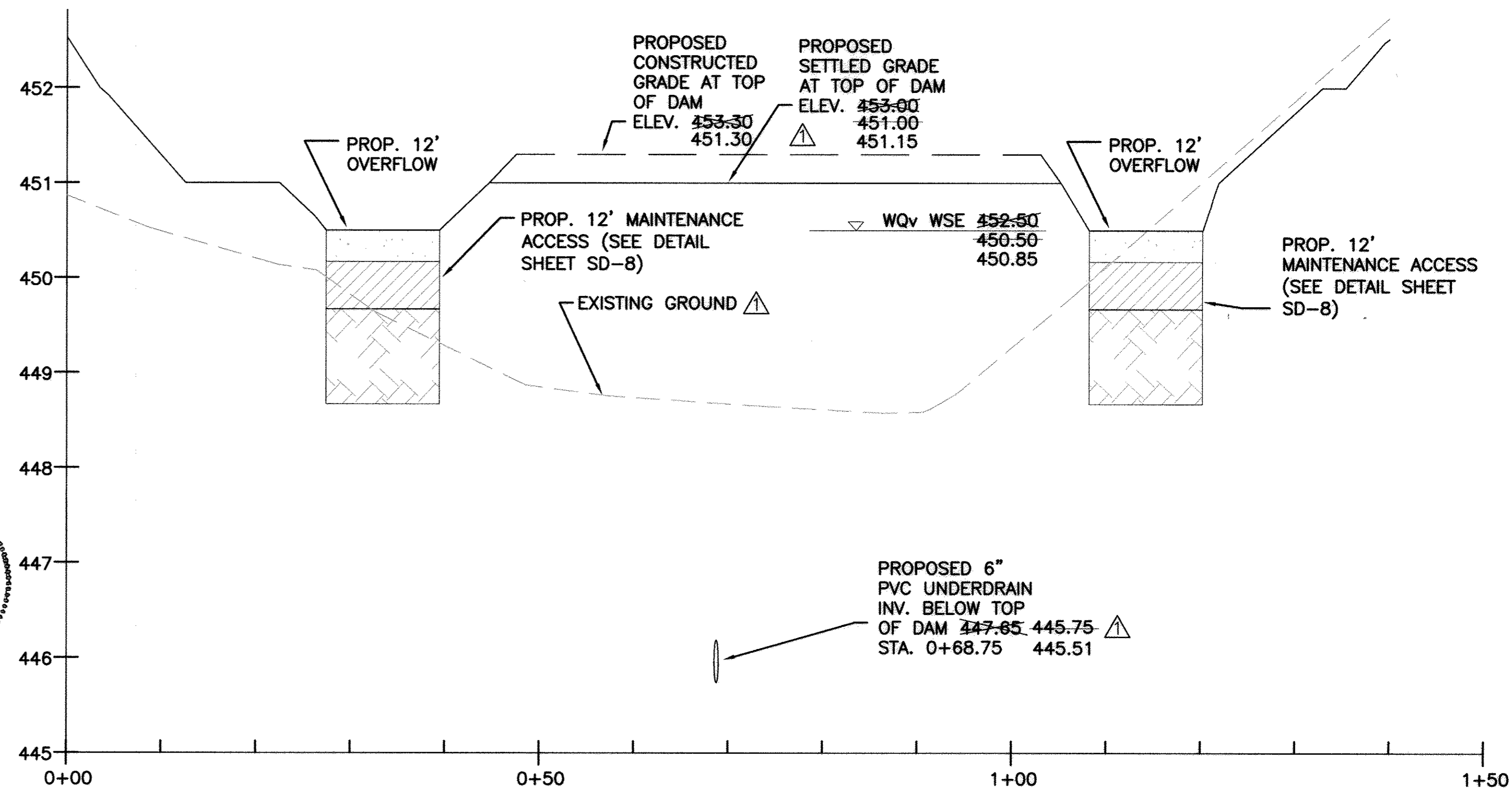
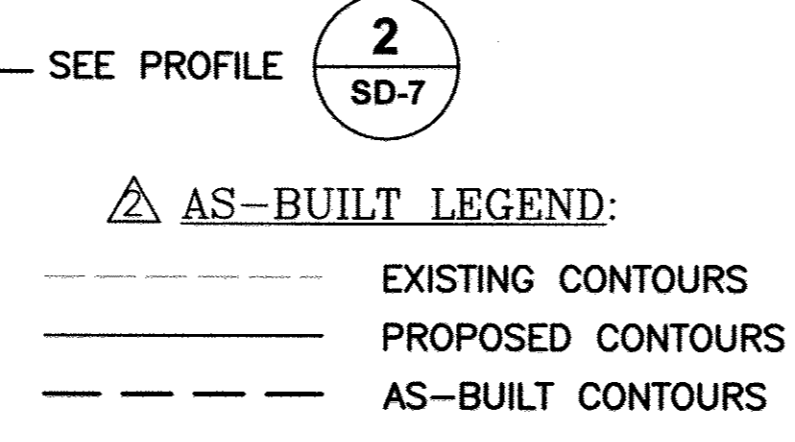
### STORMWATER MANAGEMENT SUMMARY TABLE

STUDY POINT	AREA AC.	WQv. REQ. CF	WQv. PROV. CF	REV. REQ. CF	REV. PROV. CF	Q10 PROP. CFS	Q100 PROP. CFS
1A	1.05	1138	1367	1250	296	296	3.0
1B	1.35	0.0	0.0	0.0	0.0	3.1	6.2

WATER QUALITY WILL BE PROVIDED IN A PROPOSED BIORETENTION AREA. RECHARGE VOLUME WILL BE PROVIDED IN GRASS CHANNELS. CHANNEL PROTECTION VOLUME IS NOT REQUIRED.



- NOTES:**
- FOR OBSERVATION WELL, PROVIDE A TUBE MADE OF NON-CORROSIVE MATERIAL, AT LEAST THREE FEET LONG WITH AN INSIDE DIAMETER OF AT LEAST 6 INCHES.
  - THE TUBE SHALL HAVE A FACTORY ATTACHED CAST IRON OR HIGH IMPACT PLASTIC COLLAR WITH RIBS TO PREVENT ROTATION WHEN REMOVING SCREW TOP LID. THE SCREW TOP LID SHALL BE CAST IRON OR HIGH IMPACT PLASTIC THAT WILL WITHSTAND ULTRA-VIOLET RAYS.
  - THE ENTIRE PROJECT SITE IS CLASSIFIED AS GLENELG SOIL (GgB), A TYPE "B" SOIL BY THE SOIL CONSERVATION SERVICES HYDROLOGIC SOIL GROUP.



- NOTES:**
- SEE SHEET SD-2 FOR LEGEND, UTILITY AND CIVIL SITE SYMBOLS.
  - SEE SHEET SD-8 FOR BIORETENTION TYPICAL CROSS SECTION.
  - STORMWATER FACILITY SHOWN IS A LOW-HAZARD (CLASS A) BIORETENTION FACILITY.
  - STORMWATER FACILITY SHOWN IS OWNED AND WILL BE MAINTAINED BY THE HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS.
  - FOR OVERFLOW DESIGN CRITERIA SEE SHEET SD-5

**"AS-BUILT" CERTIFICATION - SWM BMP**

I HEREBY CERTIFY BY MY SEAL, THAT THE FACILITIES SHOWN ON THIS PLAN WERE CONSTRUCTED AS SHOWN ON THIS "AS-BUILT" PLAN MEET THE APPROVED PLANS AND SPECIFICATIONS.

SIGNATURE: *James Tomlinson* TITLE: **WATER RESOURCES ENGINEER**  
 PRINT NAME: **JAMES TOMLINSON** DATE: **1/12/12** MD LICENSE NUMBER: **31201**

APPROVED: DEPARTMENT OF PLANNING AND ZONING  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION  
 CHIEF, DIVISION OF LAND DEVELOPMENT  
 DIRECTOR

OWNER:  
 DEPARTMENT OF PUBLIC WORKS  
 HOWARD COUNTY, MARYLAND  
 9250 BENDIX ROAD  
 COLUMBIA, MARYLAND  
 PHONE: (410)313-4400

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. 31201, Expiration Date 01/24/11

DEPARTMENT OF PUBLIC WORKS  
 HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS DATE: 3/23/12  
  
 CHIEF, BUREAU OF ENGINEERING DATE: 3/21/12  
  
 CHIEF, UTILITY DESIGN DIVISION DATE: 3/21/12

ENGINEERS PLANNERS SCIENTISTS CONSTRUCTION MANAGERS  
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 Sparks, MD 21152  
 Phone: (410) 316-7800  
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 www.kci.com

DES: MRS K F J  
 DRN: K F J  
 CHK: J R K  
 DATE: 3/20/09  
 BY NO. REVISION DATE

GRAPHIC SCALE  
 1" = 10'  
 0 5 10  
 MDR-01, RESPONSE TO RFI-07 9/01/10  
 AS BUILT 1/04/12  
 STORMWATER MANAGEMENT PLAN AND DETAILS  
 600' SCALE MAP NO. 46 BLOCK NO. 4

## AS BUILT REPLACEMENT SHEET

TAX MAP 46, SECTION/AREA 3.52 AC, LOT/PARCEL 389.  
 ZONING RR-DEO, GRID 3, LIBER 10385, FOLIO 292/297

**FULTON ELEVATED WATER TANK**  
 CAPITAL PROJECT No. W8280  
 CONTRACT No. 44-4517  
 ELECTION DISTRICT NO.5 HOWARD COUNTY, MARYLAND



**SPECIFICATIONS FOR BIORETENTION FACILITY**

**DESCRIPTION.**  
THIS WORK SHALL CONSIST OF INSTALLING BIORETENTION FACILITIES, SMALL LANDSCAPED BASINS THAT PROVIDE WATER QUALITY MANAGEMENT BY FILTERING STORMWATER RUNOFF BEFORE IT IS RELEASED INTO STORMDRAIN SYSTEMS AND WATERWAYS, AS SPECIFIED IN THE CONTRACT DOCUMENTS OR AS DIRECTED BY THE ENGINEER.

**MATERIALS.**  
CONCRETE SAND 901.01  
NO. 57 AGGREGATE 901.01  
NO. 7 AGGREGATE 901.01  
NO. 2 AGGREGATE M-43, NO. 2  
WATER 920.08.01  
GEOTEXTILE, CLASS PE, TYPE III 921  
BIORETENTION SOIL MIXTURE (BSM) 900  
MULCH, SHREDDED HARDWOOD BARK 920.05.03 AND 920.05.04  
PLANT MATERIALS 700 AND 920.07

PIPE, POLYVINYL CHLORIDE PROFILE WALL PIPE (PPWP) AND FITTINGS. THE MATERIAL SHALL HAVE A DIAMETER OF 6 IN. AND INCLUDES PERFORATED AND NON-PERFORATED PIPE. PIPE MATERIALS AND FITTINGS SHALL CONFORM TO M-304. PERFORATIONS SHALL BE SLOTTED. PERFORATED PPWP USED FOR OBSERVATION WELLS SHALL INCLUDE AN APPROPRIATE GEOTEXTILE SOCK AS RECOMMENDED AND SUPPLIED BY THE MANUFACTURER.

BIORETENTION SOIL MIXTURE (BSM). BSM IS A BLENDED MIXTURE OF SAND, MULCH, AND PLANTING SOIL. THE BSM SHALL BE A HOMOGENEOUS MIX, FREE OF STONES, STUMPS, ROOTS OR OTHER SIMILAR OBJECTS LARGER THAN 2 IN. AND SHALL BE FREE FROM ANY PARTS OF BERMUDA GRASS, QUACKGRASS, JOHNSONGRASS, MUGWORT, NUTSEDGE, POISON IVY, CANADIAN THISTLE, TEARthumb, PHRAGMITES, OR OTHER NOXIOUS WEEDS AS SPECIFIED IN COMAR 15.08.01.05. THE BSM SHALL CONSIST OF THE FOLLOWING:

- (A) SAND. THE SAND SHALL COMPOSE 50 PERCENT BY VOLUME OF THE BSM. THE SAND SHALL BE FINE AGGREGATE, SECTION 901.
- (B) MULCH. THE MULCH SHALL COMPOSE 20 PERCENT BY VOLUME OF THE BSM. THE MULCH SHALL BE DOUBLE SHREDDED HARDWOOD BARK CONSISTING OF THE BARK FROM HARDWOOD TREES WHICH HAS BEEN MILLED AND SCREENED TO A MAXIMUM 2 IN. PARTICLE SIZE AND PROVIDE A UNIFORM TEXTURE FREE FROM SAWDUST, TOXIC SUBSTANCES, AND FOREIGN MATERIALS AND SHALL BE AGED AT LEAST 6 MONTHS.
- (C) PLANTING SOIL. THE PLANTING SOIL SHALL COMPOSE 30 PERCENT BY VOLUME OF THE BSM. THE PLANTING SOIL SHALL BE A NATURAL OR FURNISHED, FRIABLE SOIL, UNIFORM IN COLOR AND TEXTURE. THE GRADING ANALYSIS SHALL BE AS FOLLOWS:

ITEM	CRITERIA	TEST METHOD
SAND (2.0 - 0.050 MM)	50 - 85%	T88
SILT (0.050 - 0.002 MM)	0 - 50%	T88
CLAY (LESS THAN 0.002 MM)	5 - 10%	T88
ORGANIC MATTER	1.5 - 10%	T194

THE TEXTURAL ANALYSIS FOR THE PLANTING SOIL SHALL BE AS FOLLOWS:

SIEVE SIZE	MINIMUM PERCENTPASSING BY WEIGHT
2 IN.	100
NO. 4	90
NO. 10	80

MIXING. THE SAND, MULCH, AND PLANTING SOIL SHALL BE HOMOGENOUSLY MIXED AND BLENDED TO CREATE THE BSM TO THE SATISFACTION OF THE ENGINEER. THE BSM SHALL NOT BE BLENDED UNTIL THE REQUIRED PLANTING SOIL HAS BEEN SAMPLED, TESTED, AND APPROVED.

THE BSM SHALL BE SAMPLED AND TESTED. SAMPLING WILL BE COMPLETED IN CONFORMANCE WITH MSMT 356 AND SHALL MEET THE FOLLOWING CRITERIA:

ITEM	CRITERIA	TEST METHOD
PH	5.5 - 7.5	D4972
MAGNESIUM	MINIMUM 35 PPM	*
PHOSPHORUS (PHOSPHATE- P <sub>2</sub> O)	MINIMUM 75 PPM	*
POTASSIUM (K <sub>2</sub> O)	MINIMUM 85 PPM	*
SOLUBLE SALTS	NOT TO EXCEED 500 PPM	*

\* UNIVERSITY OF DELAWARE, COLLEGE OF AGRICULTURE AND NATURAL RESOURCES, SOIL TESTING PROGRAM TEST METHOD

**AMENDMENTS.** ANY BSM NOT MEETING THE ABOVE REQUIREMENTS SHALL BE AMENDED BY THE SUPPLIER. ALL AMENDMENTS SHALL BE MIXED UNIFORMLY INTO THE BSM AS FOLLOWS:

PH. THE PH SHALL BE ADJUSTED WITH DOLOMITIC LIMESTONE OR SULFUR (90%). MAGNESIUM. MAGNESIUM DEFICIENCY SHALL BE AMENDED WITH DOLOMITIC LIMESTONE. POTASSIUM. POTASSIUM DEFICIENCY SHALL BE AMENDED WITH 0-0-60 FERTILIZER.

AMENDED BSM SHALL BE SAMPLED AND TESTED TO ENSURE THE CRITERIA HAS BEEN MET.

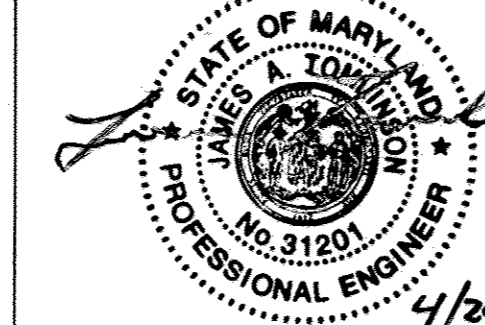
**ADDITIONAL REQUIREMENTS.** AFTER A BSM STOCKPILE HAS BEEN FORMED FOR USE, THE BSM WILL BE SAMPLED AND TESTED AND SHALL MEET THE FOLLOWING GRADING ANALYSIS:

APPROVED: DEPARTMENT OF PLANNING AND ZONING  
CHIEF, DEVELOPMENT ENGINEERING DIVISION  
CHIEF, BUREAU OF LAND DEVELOPMENT  
DIRECTOR

OWNER:  
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HOWARD COUNTY, MARYLAND  
9250 BENDIX ROAD  
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DES: MRS	KFJ	MDR-01, RESPONSE TO RF1-07
DRN: KFJ		
CHK: JRK		
DATE: 3/20/09	LFN	AS BUILT
BY NO.		
		1/4/12
		REVISION
		DATE

STORMWATER MANAGEMENT  
NOTES AND DETAILS  
600' SCALE MAP NO. 46 BLOCK NO. 4

**DEVELOPER'S/LANDOWNER'S CERTIFICATION**

I HEREBY CERTIFY THAT ALL PROPOSED WORK SHOWN ON THESE CONSTRUCTION DRAWING(S) AND ON THE APPROVED SEDIMENT CONTROL DRAWING(S) WILL BE ACCOMPLISHED PURSUANT TO THESE PLANS. I/WE ALSO UNDERSTAND THAT IT IS MY/OUR RESPONSIBILITY TO HAVE THE CONSTRUCTION SUPERVISED AND CERTIFIED, INCLUDING THE SUBMITTAL OF "AS-BUILT" PLANS WITHIN THIRTY (30) DAYS OF COMPLETION, BY A REGISTERED PROFESSIONAL ENGINEER.

*[Signature]*  
SIGNATURE OWNER/DEVELOPER  
DATE 4/20/09

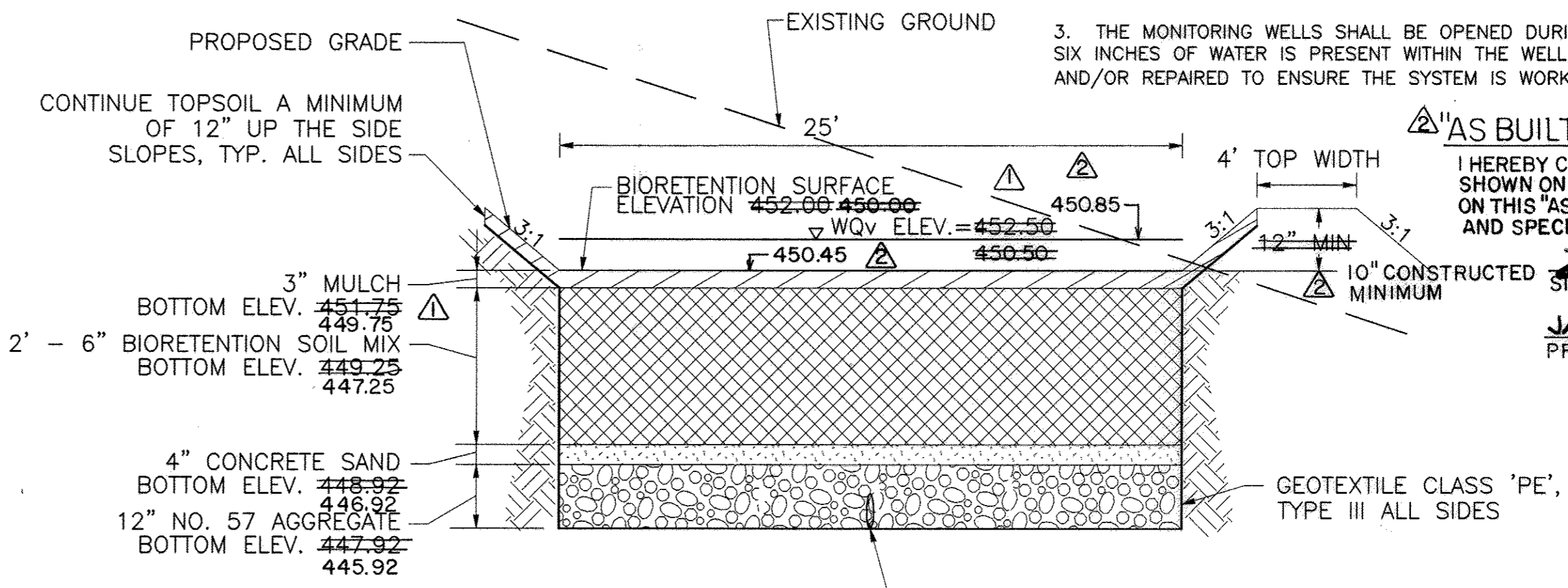
**"AS-BUILT" CERTIFICATION - SWM BMP**

I HEREBY CERTIFY THAT THE FACILITY SHOWN ON THIS PLAN WAS CONSTRUCTED AS SHOWN ON THE "AS-BUILT" PLANS AND MEETS THE APPROVED PLANS AND SPECIFICATIONS.

*[Signature]*  
SIGNATURE  
TITLE  
JAMES A. TOMKINSON  
31201  
PRINT NAME MD LICENSE NUMBER

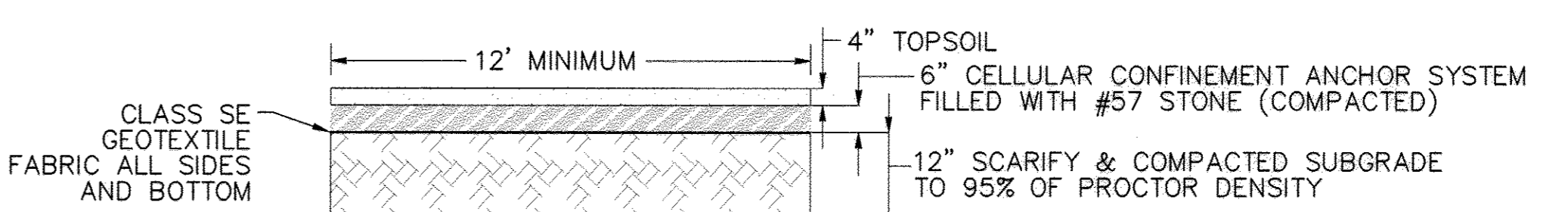
**OPERATION AND MAINTENANCE SCHEDULE**

- ROUTINE MAINTENANCE:**
- FACILITY SHALL BE INSPECTED ON A TRIENNIAL BASIS. INSPECTIONS SHALL BE PERFORMED FOLLOWING AT LEAST 72 HOURS OF DRY WEATHER.
  - TOP AND SIDE SLOPES OF THE EMBANKMENT SHALL BE MOWED ONCE PER YEAR. OTHER SIDE SLOPES AND MAINTENANCE ACCESS SHALL BE MOWED AS NEEDED. THE SURFACE OF THE BIORETENTION AREA SHALL NOT BE MOWED.
  - DEBRIS AND LITTER SHALL BE REMOVED DURING REGULAR MOWING OPERATIONS AND AS NEEDED.
  - VISIBLE SIGNS OF EROSION AT THE INFLOW AREAS AS WELL AS THE OVERFLOW AND OUTLET AREAS SHALL BE REPAIRED AS SOON AS IT IS NOTICED.
  - PLANTINGS SHALL BE REPLACED AS NEEDED TO ENSURE A SIGNIFICANT NUMBER OF SHRUBS ARE PRESENT AND FULL HERBACEOUS COVERAGE EXISTS WITHIN THE FACILITY.
- NON-ROUTINE MAINTENANCE:**
- STRUCTURAL COMPONENTS OF THE FACILITY SUCH AS THE EMBANKMENT, UNDERDRAIN SYSTEM, AND OVERFLOWS SHALL BE REPAIRED UPON DETECTION OF ANY DAMAGE.
  - SEDIMENT SHALL BE REMOVED FROM THE FACILITY IF 25% OR MORE OF THE SURFACE AREA IS COVERED.
  - THE MONITORING WELLS SHALL BE OPENED DURING TRIENNIAL INSPECTIONS. IF MORE THAN SIX INCHES OF WATER IS PRESENT WITHIN THE WELL, THE UNDERDRAIN SYSTEM SHALL BE FLUSHED AND/OR REPAIRED TO ENSURE THE SYSTEM IS WORKING PROPERLY.



**BIORETENTION AREA TYPICAL CROSS SECTION**

SCALE: H: 1"=5', V: 1"=2'



**MAINTENANCE ACCESS ROAD**

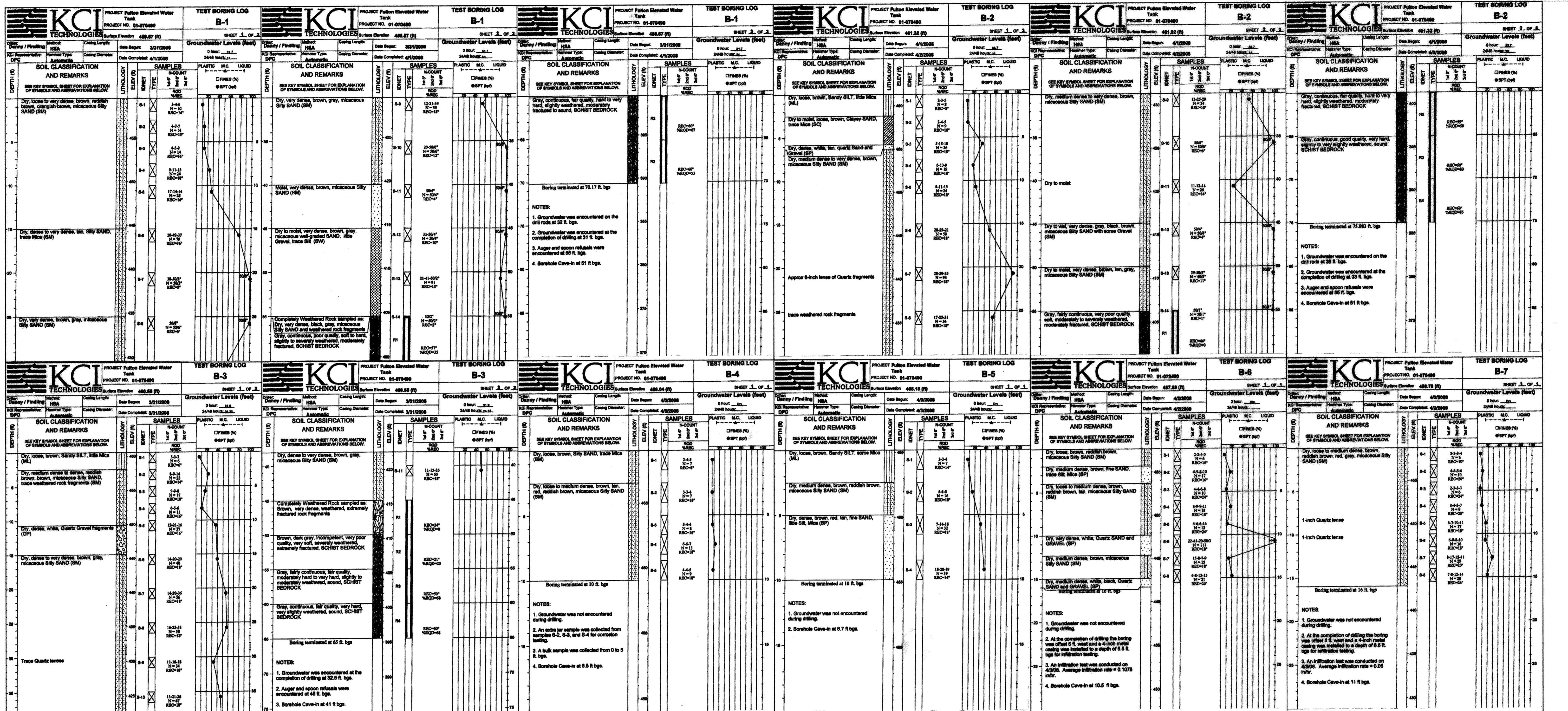
SCALE: NOT TO SCALE

**AS-BUILT**  
DATE 1/4/2012

TAX MAP 46, SECTION/AREA 3.52 AC, LOT/PARCEL 389, ZONING RR-DEO, GRID 3, LIBER 10385, FOLIO 292/297

FULTON ELEVATED WATER TANK  
CAPITAL PROJECT No. W8280  
CONTRACT No. 44-4517  
ELECTION DISTRICT NO.5 HOWARD COUNTY, MARYLAND

User: kwan.jackson Date: 4/20/09 - 9:45am M:\2007\01070460\Drawings\REVISED TANK-2 SW-2 STORMWATER MANAGEMENT NOTES AND DETAILS.dwg



USCS SOIL CLASSIFICATION CHART

MAJOR DIVISIONS		SYMBOLS		TYPICAL DESCRIPTIONS	
		GRAPH	LETTER		
COARSE GRAINED SOILS	GRAVEL AND GRAVELLY SOILS (LITTLE OR NO FINES)		GW	WELL-GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES	
			GP	POORLY-GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES	
			GM	SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES	
	MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE		GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES	
			SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES	
			SP	POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES	
MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	CLEAN SANDS (LITTLE OR NO FINES)		SM	SILTY SANDS, SAND-SILT MIXTURES	
			SC	CLAYEY SANDS, SAND-CLAY MIXTURES	
	SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GM	SILTY SANDS, SAND-SILT MIXTURES	

FINE GRAINED SOILS		LIQUID LIMIT		SYMBOLS		TYPICAL DESCRIPTIONS		
		LESS THAN 50	GREATER THAN 50	GRAPH	LETTER			
MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS	LESS THAN 50	GREATER THAN 50		ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY		
					CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS		
					OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY		
	GREATER THAN 50	SILTS AND CLAYS	LESS THAN 50	GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS	
						CH	INORGANIC CLAYS OF HIGH PLASTICITY	
						OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS	
HIGHLY ORGANIC SOILS		GREATER THAN 50			PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS		

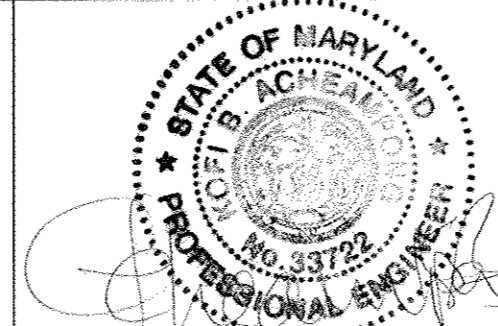
NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

**AS-BUILT**  
DATE 1/4/2012

APPROVED: DEPARTMENT OF PLANNING AND ZONING  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION  
 CHIEF, DIVISION OF LAND DEVELOPMENT  
 DIRECTOR, DEP.

OWNER:  
 DEPARTMENT OF PUBLIC WORKS  
 HOWARD COUNTY, MARYLAND  
 9250 BENDIX ROAD  
 COLUMBIA, MARYLAND  
 PHONE: (410) 313-4400

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. 33722, Expiration Date 12/18/10



DES: KBA  
 DRN: LFN  
 CHK: JRK  
 DATE: 3/20/09  
 BY: LFN  
 NO. AS BUILT  
 REVISION  
 DATE: 6/07/09  
 SCALE: 600' SCALE MAP NO. 46 BLOCK NO. 4

TEST BORING LOGS

TAX MAP 46, SECTION/AREA 3.52 AC, LOT/PARCEL 389,  
 ZONING RR-DEO, GRID 3, LIBER 10385, FOLIO 292/297

FULTON ELEVATED WATER TANK  
 CAPITAL PROJECT No. W8280  
 CONTRACT No. 44-4517  
 ELECTION DISTRICT NO.5 HOWARD COUNTY, MARYLAND

SD-9  
 9 OF 9  
 SCALE AS SHOWN  
 CONTRACT SHEET  
 10 OF 22

# STRUCTURAL GENERAL NOTES

## GENERAL NOTES

- UNLESS OTHERWISE SPECIFIED, ALL MANUALS AND SPECIFICATIONS REFERENCED IN THESE NOTES AND DRAWINGS SHALL BE THE CURRENT EDITION.
- THE CONTRACT DRAWINGS SHALL BE VERIFIED IN THE FIELD BY THE CONTRACTOR. ALL DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER BEFORE PROCEEDING WITH THE WORK.
- THE SIZES AND LOCATIONS OF EQUIPMENT PADS AND PEDESTALS, AS WELL AS EQUIPMENT RELATED FLOOR AND SLAB OPENINGS ARE DEPENDENT UPON THE ACTUAL EQUIPMENT FURNISHED. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO VERIFY AND COORDINATE ALL SUCH ITEMS. NO DIMENSIONS INDICATED ON THESE DRAWINGS SHALL BE ALTERED WITHOUT THE ENGINEER'S APPROVAL. ALL EQUIPMENT PADS AND OTHER EQUIPMENT SUPPORTS REQUIRED MAY NOT HAVE BEEN SHOWN ON THE STRUCTURAL DRAWINGS. REFER TO CIVIL, MECHANICAL AND ELECTRICAL DRAWINGS FOR SIZES AND LOCATIONS OF SUCH PADS AND SUPPORTS.
- LOCATIONS OF BORINGS ARE SHOWN ON CIVIL DRAWINGS. BORING LOGS ARE INCLUDED ON SHEET SD-9 AND IN THE SPECIFICATION.

## CONCRETE NOTES

- ALL CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI AT 28 DAYS.
- REINFORCED CONCRETE SHALL BE DETAILED AND CONSTRUCTED IN ACCORDANCE WITH AMERICAN CONCRETE INSTITUTE (ACI 301) "SPECIFICATION FOR STRUCTURAL CONCRETE."
- ALL REINFORCEMENT SHALL CONFORM TO ASTM SPECIFICATION A615, DEFORMED, GRADE 60.
- WELDED WIRE FABRIC SHALL CONFORM TO ASTM SPECIFICATION A185.
- UNLESS OTHERWISE NOTED ON THE DRAWINGS, CONCRETE COVER FOR REINFORCEMENT SHALL BE AS FOLLOWS:
  - UNIFORM CONCRETE BOTTOM BARS IN SLABS .....3"
  - SLABS EXPOSED TO GROUND, WEATHER OR PROCESS LIQUID AFTER THE REMOVAL OF FORMS .....2"
- ALL EXPOSED CONCRETE EDGES SHALL BE CHAMFERED 3/4" UNLESS OTHERWISE NOTED.
- THE CONTRACTOR SHALL SUBMIT SHOP DETAILS OF REINFORCING STEEL BEFORE PROCEEDING WITH FABRICATION.
- REINFORCING STEEL SHALL BE DETAILED IN ACCORDANCE WITH ACI DETAILING MANUAL.
- CONSTRUCTION JOINTS SHALL BE AS DETAILED ON THE DRAWINGS AND NO ADDITIONAL JOINTS SHALL BE USED NOR ANY OMITTED EXCEPT BY WRITTEN AUTHORIZATION OF THE ENGINEER. ENGINEER APPROVED ADDITIONAL CONSTRUCTION JOINTS SHALL NOT RESULT IN ADDITIONAL EXPENSE TO THE OWNER.
- ANCHOR BOLTS AND EQUIPMENT PEDESTALS SHALL BE SIZED AND LOCATED AS REQUIRED TO SUIT EQUIPMENT FURNISHED.
- SEE CIVIL, MECHANICAL, AND ELECTRICAL DRAWINGS FOR ALL EMBEDDED ITEMS SUCH AS SLEEVES, ANCHORS, ELECTRICAL CONDUITS, OPENINGS, WHICH MAY INTERFERE WITH CONCRETE CONSTRUCTION. ALL PIPING AND OTHER EMBEDDED ITEMS ARE NOT SHOWN ON STRUCTURAL DRAWINGS.

## ALUMINUM NOTES

- ALL STRUCTURAL ALUMINUM IS DESIGNED AND SHALL BE FABRICATED IN ACCORDANCE WITH THE CURRENT SPECIFICATION OF THE ALUMINUM ASSOCIATION.
- ALL STRUCTURAL ALUMINUM SHALL BE ALLOY 6061-T6.
- ALL ALUMINUM IN CONTACT WITH CONCRETE AND DISSIMILAR METALS SHALL, BEFORE ERECTION, BE HEAVILY COATED AS SPECIFIED.

## STRUCTURAL STEEL NOTES

- FABRICATION AND ERECTION OF STRUCTURAL STEEL SHALL CONFORM WITH THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION, AISC "MANUAL OF STEEL CONSTRUCTION."
- THE CONTRACTOR SHALL SUBMIT ERECTION PLANS AND SHOP DETAILS BEFORE PROCEEDING WITH FABRICATION.
- ALL STRUCTURAL STEEL AND PLATE EXCEPT WIDE FLANGE SHAPES AND HOLLOW STRUCTURAL SHAPES SHALL COMPLY WITH ASTM DESIGNATION A36. ALL WIDE FLANGE SHAPES SHALL COMPLY WITH ASTM A992. ALL HOLLOW STRUCTURAL SHAPES (HSS) SHALL COMPLY WITH ASTM A500, GRADE B.
- ANCHOR BOLTS (AB) SHALL COMPLY WITH ASTM A307.
- HIGH STRENGTH BOLTS (HS) SHALL COMPLY WITH ASTM A325.
- ALL WELDING SHALL COMPLY WITH AMERICAN WELDING SOCIETY, (AWS D1.1) "STRUCTURAL WELDING CODE."
- ALL SHOP CONNECTIONS SHALL BE WELDED WITH CLASS E-70 SERIES ELECTRODES. FIELD CONNECTIONS SHALL BE HIGH STRENGTH BOLTED EXCEPT WHERE OTHERWISE NOTED.

## CODES

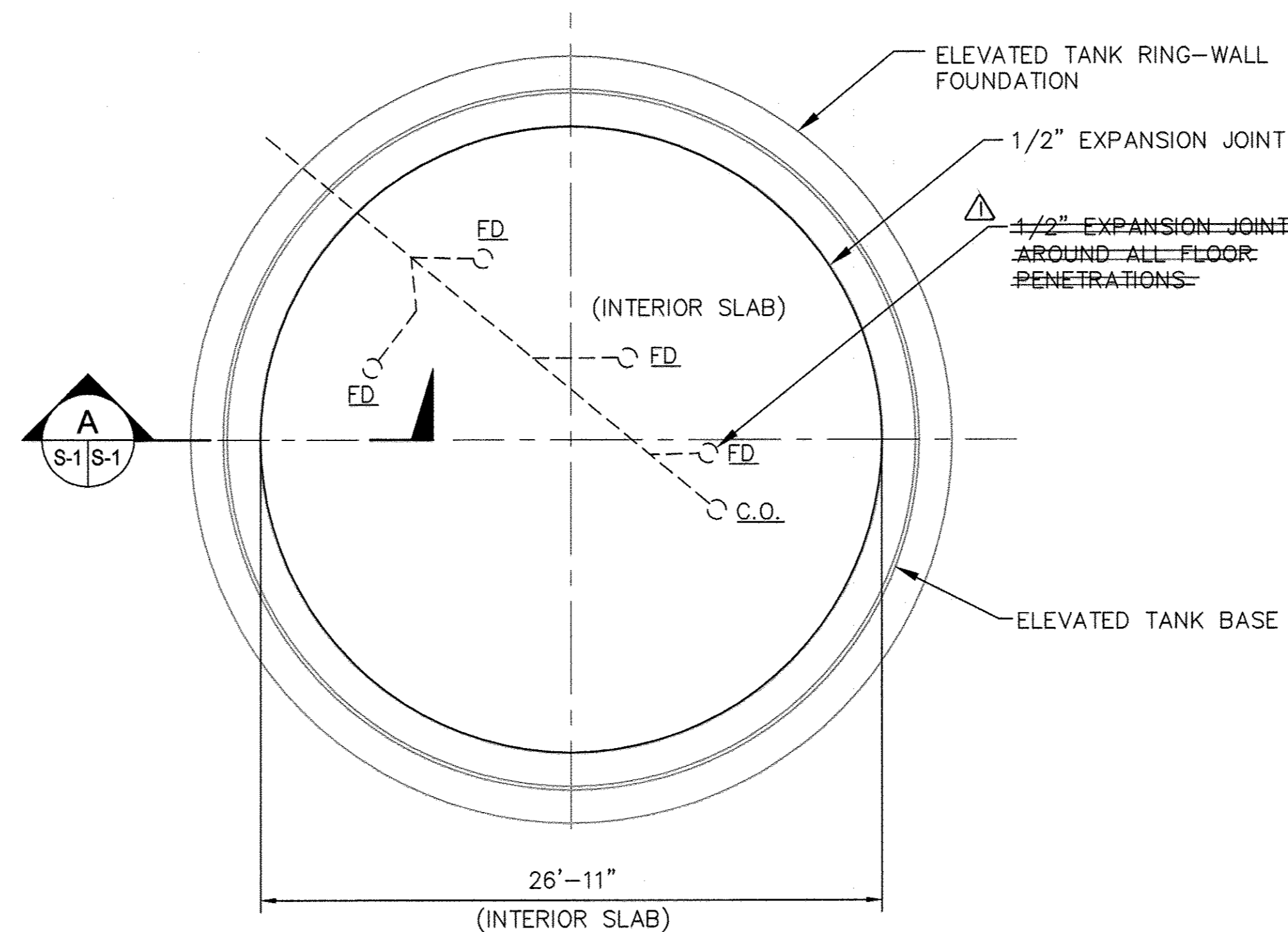
- BUILDING OFFICIALS AND CODE ADMINISTRATORS, "2006 INTERNATIONAL BUILDING CODE."
- AMERICAN INSTITUTE OF STEEL CONSTRUCTION, (AISC) "LOAD AND RESISTANCE FACTOR DESIGN SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS."
- AMERICAN CONCRETE INSTITUTE, (ACI-318) "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE."
- AMERICAN CONCRETE INSTITUTE, (ACI-350) "ENVIRONMENTAL ENGINEERING CONCRETE STRUCTURES."
- AMERICAN CONCRETE INSTITUTE, (ACI-530/ASCE 5/TMS 402) "BUILDING CODE REQUIREMENTS FOR MASONRY STRUCTURES."
- TANK ERECTION CODE AWWA D100.

## DESIGN LOADS

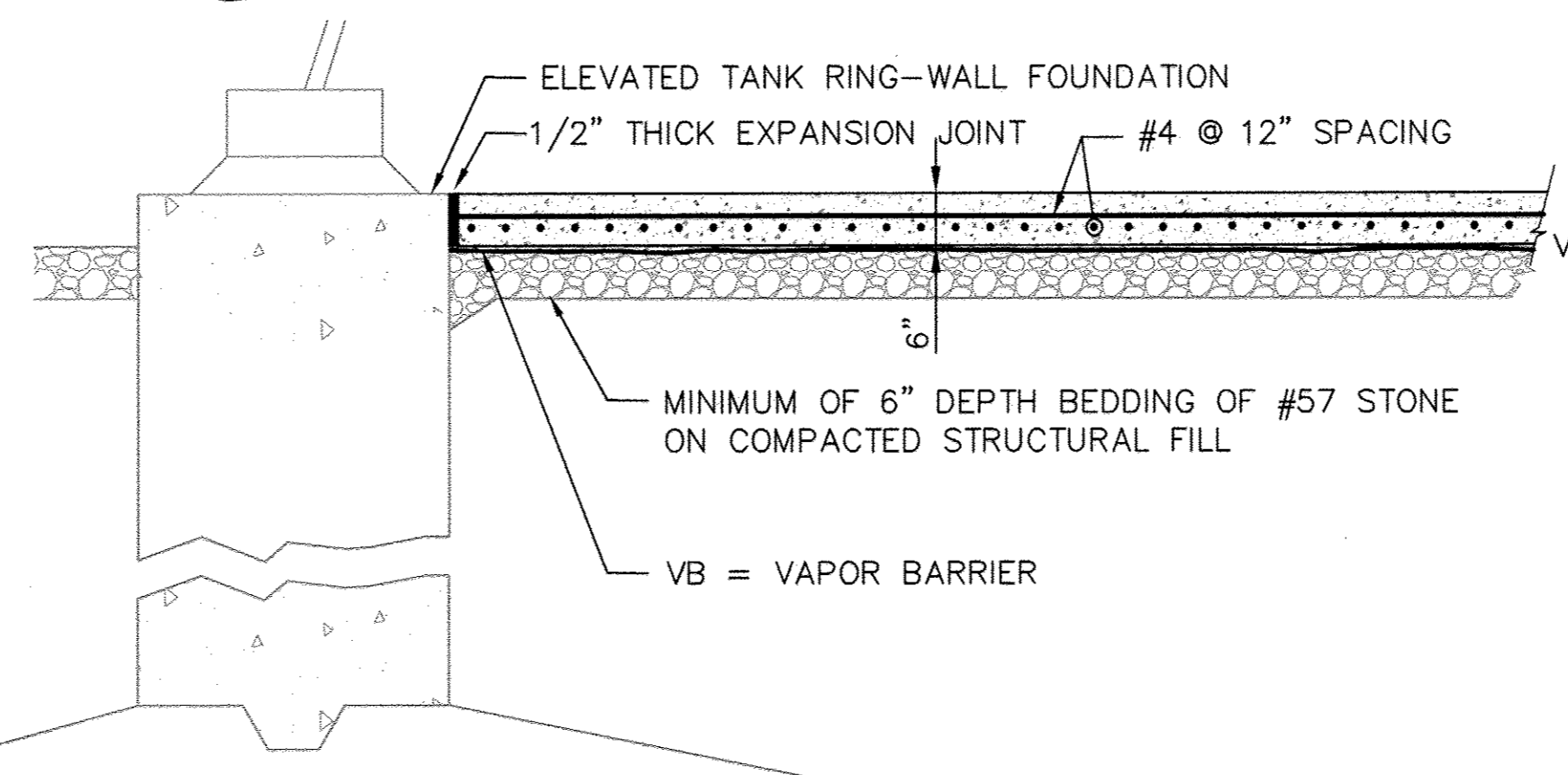
- DEAD LOADS - ACTUAL WEIGHT OF STRUCTURE.  
WEIGHT OF SOIL - 100 PCF TO RESIST UPLIFT 125 PCF DEAD LOAD
- LIVE LOADS - FLOOR - 150 PSF IN AREAS NOT OCCUPIED BY EQUIPMENT OR SUBJECT TO TRUCK LOADING.  
- EQUIPMENT - ACTUAL WEIGHT - 150 PSF MINIMUM  
- TRUCK - H20-44 - AASHTO LOADING  
- WALKWAYS - 150 PSF
- SOIL BEARING PRESSURE - 4000 PSF (UNIFORM), 6000 PSF (MAX TOE PRESSURE)  
PROPOSED BOTTOM OF FOOTING @ EL 450 +/- SEE GEOTECHNICAL MEMORANDUM REPORT AND GEOTECHNICAL ENGINEERING REPORT FOR GEOTECHNICAL ISSUES AND RECOMMENDATIONS.
- SNOW LOAD - GROUND SNOW LOAD - 25 PSF
- WIND LOAD - BASIC WIND SPEED - ~~125~~ 90 MPH (EXPOSURE C)
- SEISMIC LOAD - IN ACCORDANCE WITH AWWA D100-05
- EARTH PRESSURES - LATERAL EARTH PRESSURES ARE BASED ON SOIL BORINGS. BORING LOGS ARE INCLUDED ON SHEET SD-9 AND IN SPECIFICATIONS. BACKFILL MATERIAL SHALL NOT BE PLACED AGAINST FOUNDATION WALLS UNTIL THE UPPER BRACING FLOORS ARE IN PLACE FOR AT LEAST 7 DAYS.
- GROUND WATER ASSUMED AT GRADE ELEVATION.

## FOUNDATION NOTES

- FOR MECHANICAL AND ELECTRICAL WORK TO BE INCORPORATED IN FOUNDATION WORK, SEE MECHANICAL AND ELECTRICAL DRAWINGS.
- ALL EXCAVATION SHALL BE KEPT DRY, STANDING WATER SHALL NOT BE ALLOWED IN EXCAVATIONS.
- REMOVE UNSTABLE SOILS AND UNDESIRABLE MATERIALS WITHIN THE RINGWALL AND REPLACE WITH COMPACTED FILL AND/OR NO. 57 STONE.
- BEFORE PLACING ANY POROUS FILL OR CONCRETE ON SUBGRADE, THE CONTRACTOR SHALL NOTIFY THE ENGINEER.
- PROOF-ROLL FOUNDATION BEARING NATURAL SUBGRADE PRIOR TO PLACING ANY NEW FILL OR CONCRETE.
- A SIX INCH LAYER OF POROUS FILL STONE AND A VAPOR BARRIER SHALL BE PROVIDED UNDER ALL SLABS ON GRADE.
- FILL REQUIREMENTS:
  - FILL MATERIALS PLACEMENT AND COMPACTION SHALL CONFORM TO HOWARD COUNTY STANDARDS. BACKFILL MATERIALS SHALL HAVE USCS CLASSIFICATION OF SW, SM, SP, SC, GP, GW, GM, GC AND MAX PI OF 10 PERCENT, MAX FINES CONTENTS OF 25 PERCENT AND 3-INCH MAX AGGREGATE SIZE.
  - USE NO. 57 STONE AGGREGATE WHERE SATURATED SOIL CONDITIONS OR GROUND WATER IS ENCOUNTERED AT PROPOSED FOUNDATION OR SUBGRADE LEVELS.
  - UNIT WEIGHT OF IN-SITU SOILS = 115 PCF
  - UNIT WEIGHT OF COMPACTED BORROW BACKFILL = 125 PCF
  - COMPACTION TO 95 PERCENT OF AASHTO T-180. MOISTURE CONTENT SHALL BE MAINTAINED WITHIN TWO PERCENTAGE POINTS OF OPTIMUM MOISTURE CONTENT.
- ALL SOIL STOCK-PILE LOCATIONS SHALL BE COVERED TO MAINTAIN SOIL CHARACTERISTICS.



**1 GRADE SLAB PLAN**  
SCALE: 3/16"=1'



**A GRADE SLAB SECTION**  
NOT TO SCALE

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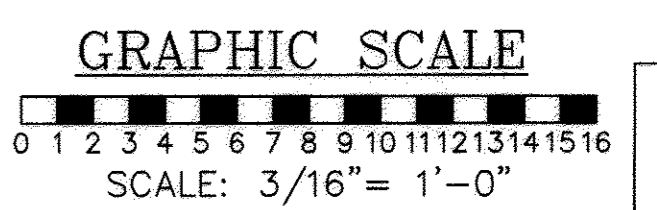


DES:	EM				
DRN:	LFN				
CHK:	TA				
DATE:	3/20/09	LFN	AS BUILT	DATE	1/4/12
		BY	NO.	REVISION	

### FOUNDATION DESIGN CRITERIA AND DETAILS

600' SCALE MAP NO. 46 BLOCK NO. 4

**AS-BUILT**  
DATE 1/4/2012



**FULTON ELEVATED WATER TANK**  
CAPITAL PROJECT No. W8280  
CONTRACT No. 44-4517  
ELECTION DISTRICT NO.5 HOWARD COUNTY, MARYLAND

Apr 20, 2009 - 3:56pm User: kwjackson M:\2007\01\07\0480\Drawings\LEVATED TANK-2\3-1 FOUNDATION DESIGN CRITERIA AND DETAILS.dwg

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HOWARD COUNTY, MARYLAND

*John A. Harbo* 4/21/09  
DIRECTOR OF PUBLIC WORKS DATE

*Steve Clavin* 4/21/09  
CHIEF, BUREAU OF UTILITIES DATE

*Paul J. Parsons* 4/21/09  
CHIEF, BUREAU OF ENGINEERING DATE

*Clayton Lane* 4-21-09  
CHIEF, UTILITY DESIGN DIVISION DATE

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S-1  
SCALE AS SHOWN  
CONTRACT SHEET  
11 OF 22

**GENERAL ABBREVIATIONS**

ADD	AVERAGE DAILY DEMAND
C/L	CENTERLINE (C)
DIA	DIAMETER
EL.	ELEVATION
GPD	GALLONS PER DAY
GPH	GALLONS PER HOUR
GPM	GALLONS PER MINUTE
MDD	MAXIMUM DAILY DEMAND
MG	MILLION GALLONS
ML	MILLILITER
N.C.	NORMALLY CLOSED
OF	OVERFLOW
PSI	POUNDS PER SQUARE INCH
SWM	STORM WATER MANAGEMENT
TYP.	TYPICAL

**SYMBOLS**

	BALL CHECK VALVE
	BALL VALVE
	FLEXIBLE HOSE
	GATE VALVE
	HYDRANT
	PLUG VALVE
	PULSATION DAMPENER
	REDUCER
	SWING CHECK VALVE
	UNION
	CAP
	THERMOSTAT (VENTILATION)
	THERMOSTAT (FREEZE PROTECTON)

**TANK SIZING CRITERIA**

2010 ADD	12,200 GPD
2010 MDD	21,600 GPD
2030 ADD	111,100 GPD
2030 MDD	197,600 GPD
36' OPERATING HEAD RANGE	500,000 GALLONS
16' CONTROL RANGE	250,000 GALLONS
22' FIRE STORAGE	250,000 GALLONS
OVERALL HEIGHT	180 FEET
<b>(* YR. 2030 SIZING CRITERIA)</b>	
2-HOUR FIRE FLOW (1,500 GPM)	180,000 GALLONS TOTAL
20% MAX DAY FLOW (*)	39,520 GALLONS
MINIMUM STORAGE	219,520 GALLONS

**SAMPLE SCHEDULE**

	INFLUENT SMOOTH NOSE SAMPLE TAP
	TANK INLET SMOOTH NOSE SAMPLE TAP
	TANK OUTLET SMOOTH NOSE SAMPLE TAP

**LEGEND:**

- EXISTING FACILITIES
- PROPOSED FACILITIES

**NOTES:**

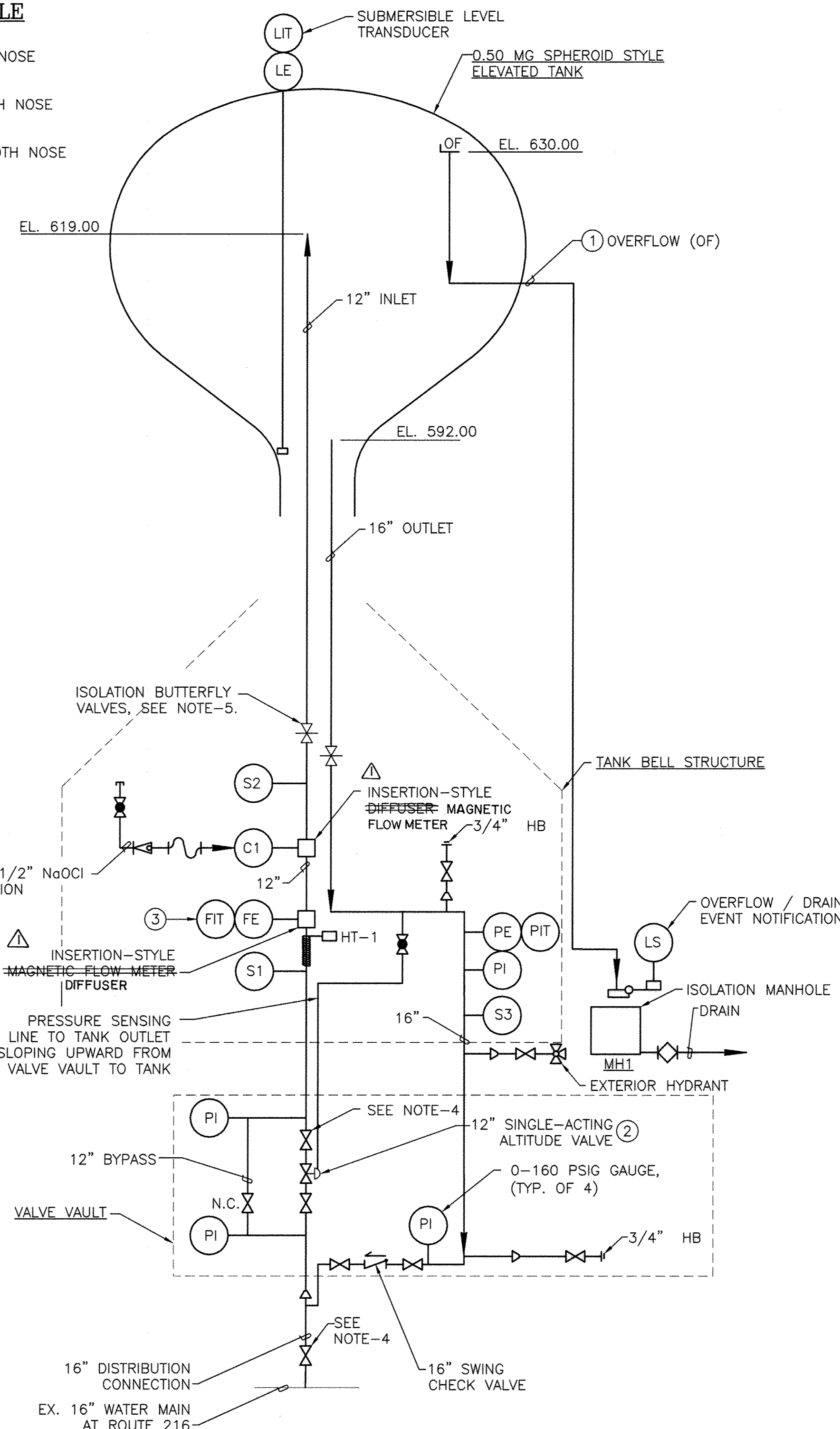
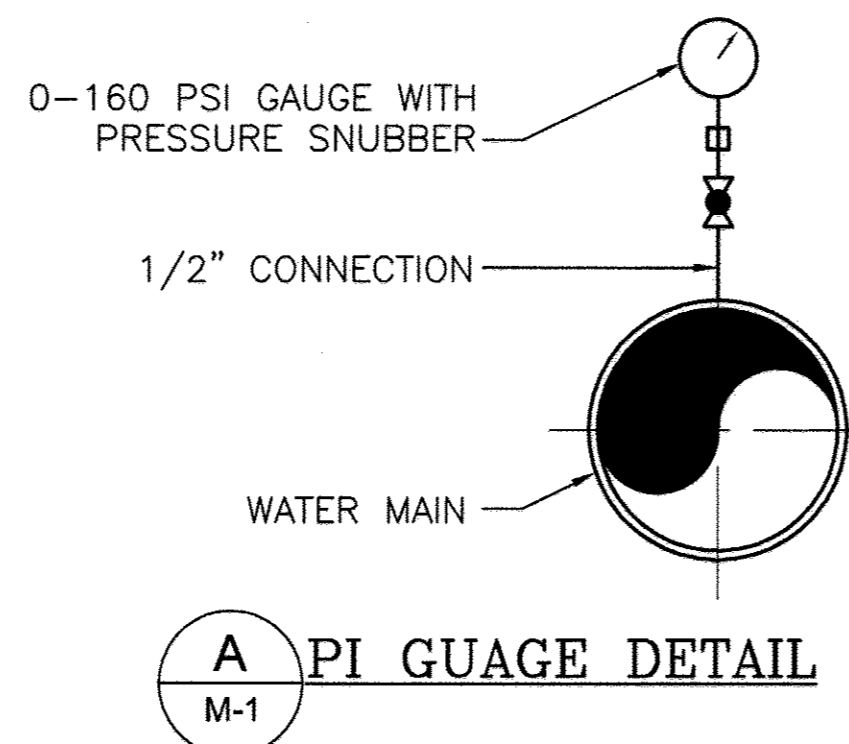
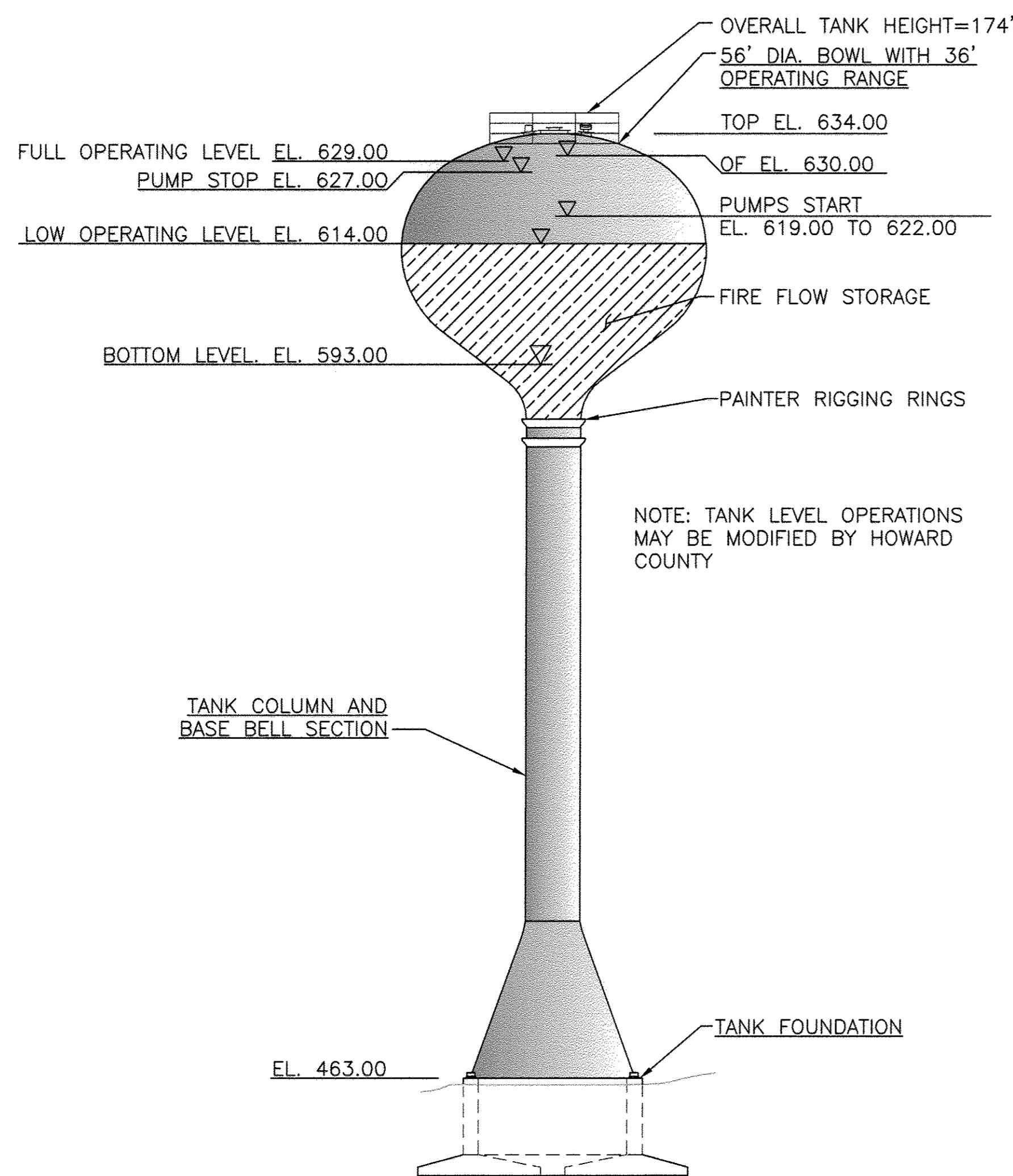
- ① OVERFLOW SIZED BY TANK MANUFACTURER.
- ② THE ALTITUDE VALVE SHALL BE EQUIPPED WITH A MECHANICAL CHECK FEATURE AND REMOTE CLOSING SOLENOID CONTROL.
- ③ FLOW SIGNAL TO TANK RTU.
- ④ ALL BURIED VALVES OR VALVES LOCATED IN UNDERGROUND VAULTS SHALL OPEN TO THE RIGHT, CLOCKWISE. VALVES SHALL BE SPECIFIED IN DIVISION 2 OF THE CONTRACT SPECIFICATIONS.
- ⑤ ALL INTERIOR VALVES SHALL OPEN TO THE LEFT, COUNTER-CLOCKWISE. VALVES SHALL BE SPECIFIED IN DIVISION 15 OF THE CONTRACT SPECIFICATIONS.

**PROCESS ABBREVIATIONS:**

Cx	CHEMICAL APPLICATION (x - POINT NUMBER)
FE/FIT	FLOW ELEMENT / FLOW INDICATE TRANSMIT
HB	HOSE BIB
HT	HEAT TRACE
LE/LIT	LEVEL ELEMENT / LEVEL INDICATE TRANSMIT
LS	LIMIT SWITCH
Mhx	MANHOLE (x - POSITION NUMBER)
N.C.	NORMALLY CLOSED
PE/PIT	PRESSURE ELEMENT / PRESSURE INDICATE TRANSMIT
PI	PRESSURE GAUGE
Sx	SMOOTH NOSE SAMPLE TAP (x - POINT NUMBER)

**EQUIPMENT ABBREVIATIONS**

AVCP	ALTITUDE VALVE CONTROL PANEL
ITP	INSTRUMENTATION TERMINATION PANEL
VCP	VENTILATION CONTROL PANEL
RTU	REMOTE TELEMETRY UNIT



**1 0.50 SPHEROID STYLE TANK ELEVATION**  
SCALE: 1" = 20'

**2 ELEVATED TANK FLOW CONTROL SYSTEM SCHEMATIC**  
NOT TO SCALE

**AS-BUILT**  
DATE 1/4/2012

**GRAPHIC SCALE**  
SCALE: 1"=20'

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. 33929, Expiration Date 01/15/11

Apr 20, 2009 - 9:45am User: kwan.jackson M:\2007\07\04\06\Drawings\ELEVATED TANK-2\M-1 - ELEVATED TANK OPERATIONS.dwg

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

*[Signature]* 4/22/09  
DIRECTOR OF PUBLIC WORKS DATE

*[Signature]* 4/21/09  
CHIEF, BUREAU OF ENGINEERING DATE

*[Signature]* 4-21-09  
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*[Signature]* 4-21-09  
CHIEF UTILITY DESIGN DIVISION DATE

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STATE OF MARYLAND  
REGISTERED PROFESSIONAL ENGINEER  
No. 33929  
4/20/09

DES: SEA					
DRN: LFN					
CHK: JRK					
DATE: 3/20/09	LFN	AS BUILT	1/4/12		
BY NO.					
REVISION					
DATE					

**ELEVATED TANK DESIGN CRITERIA**

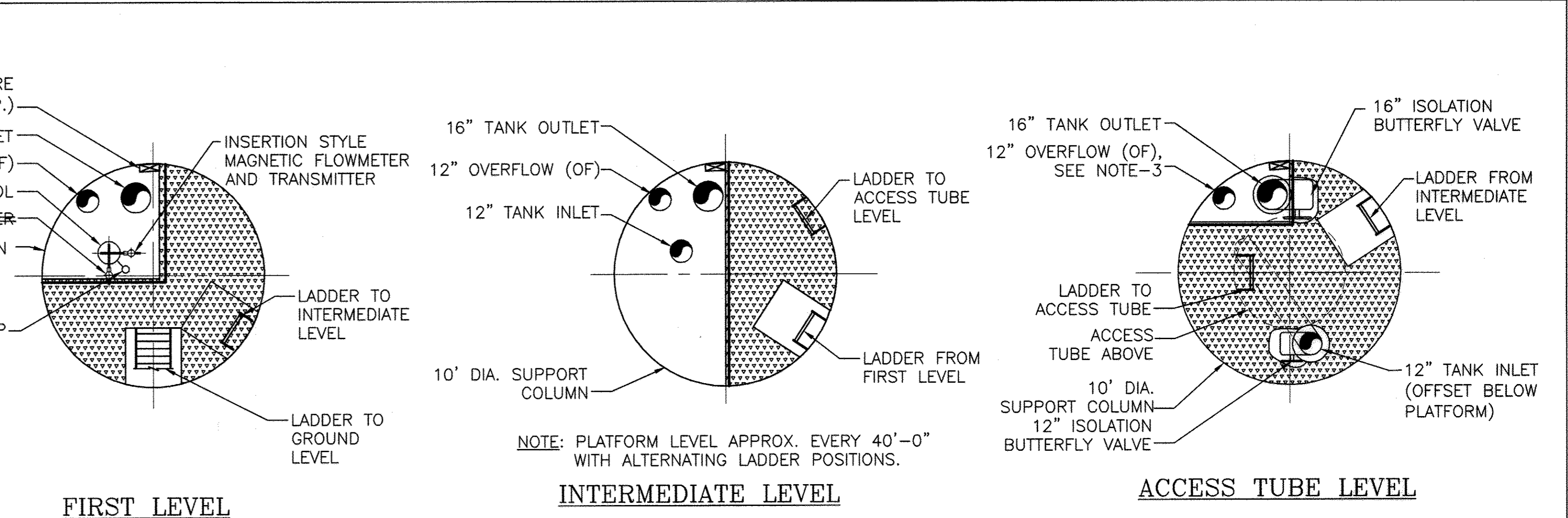
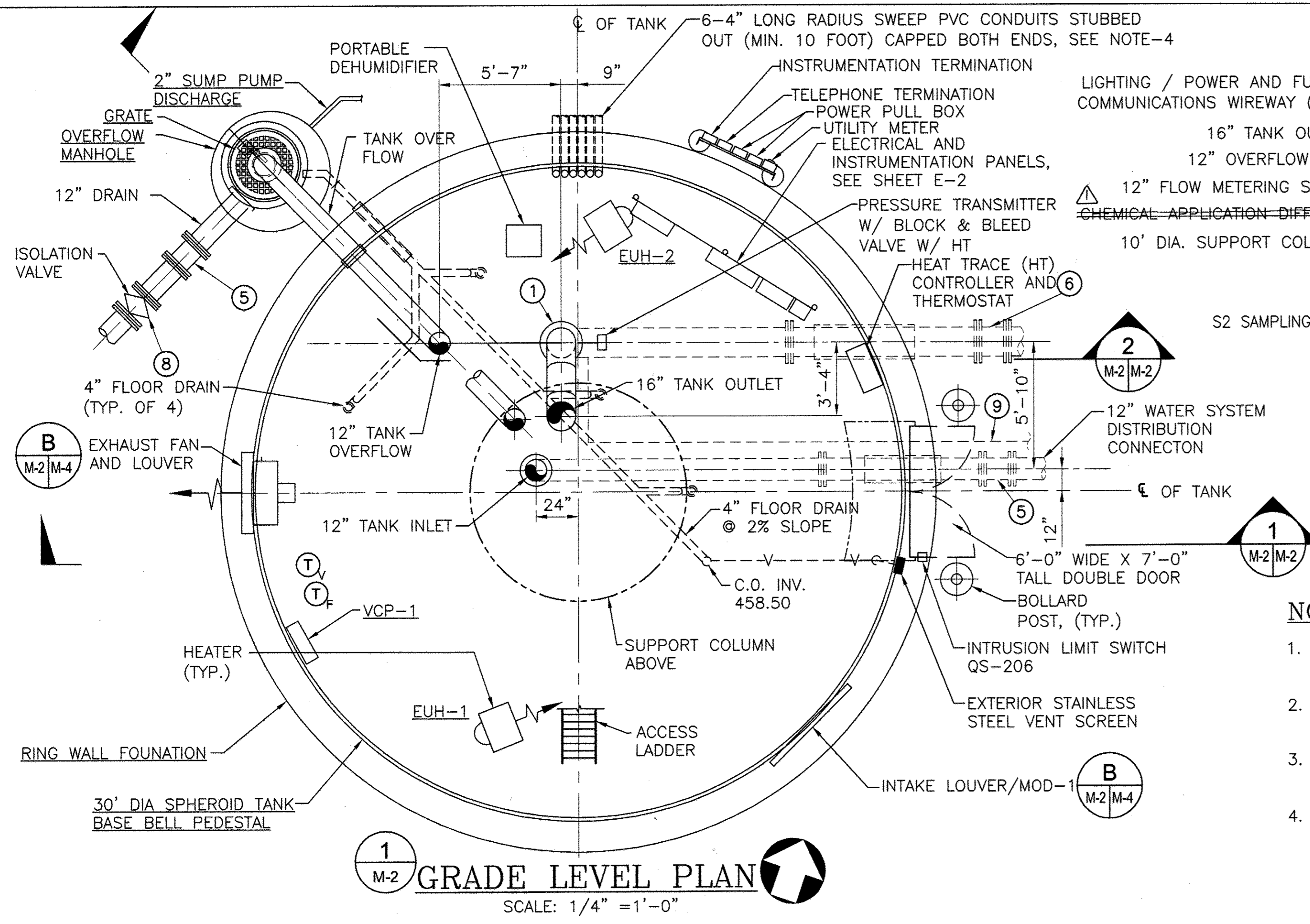
600' SCALE MAP NO. 46 BLOCK NO. 4

**FULTON ELEVATED WATER TANK**

CAPITAL PROJECT No. W8280  
CONTRACT No. 44-4517

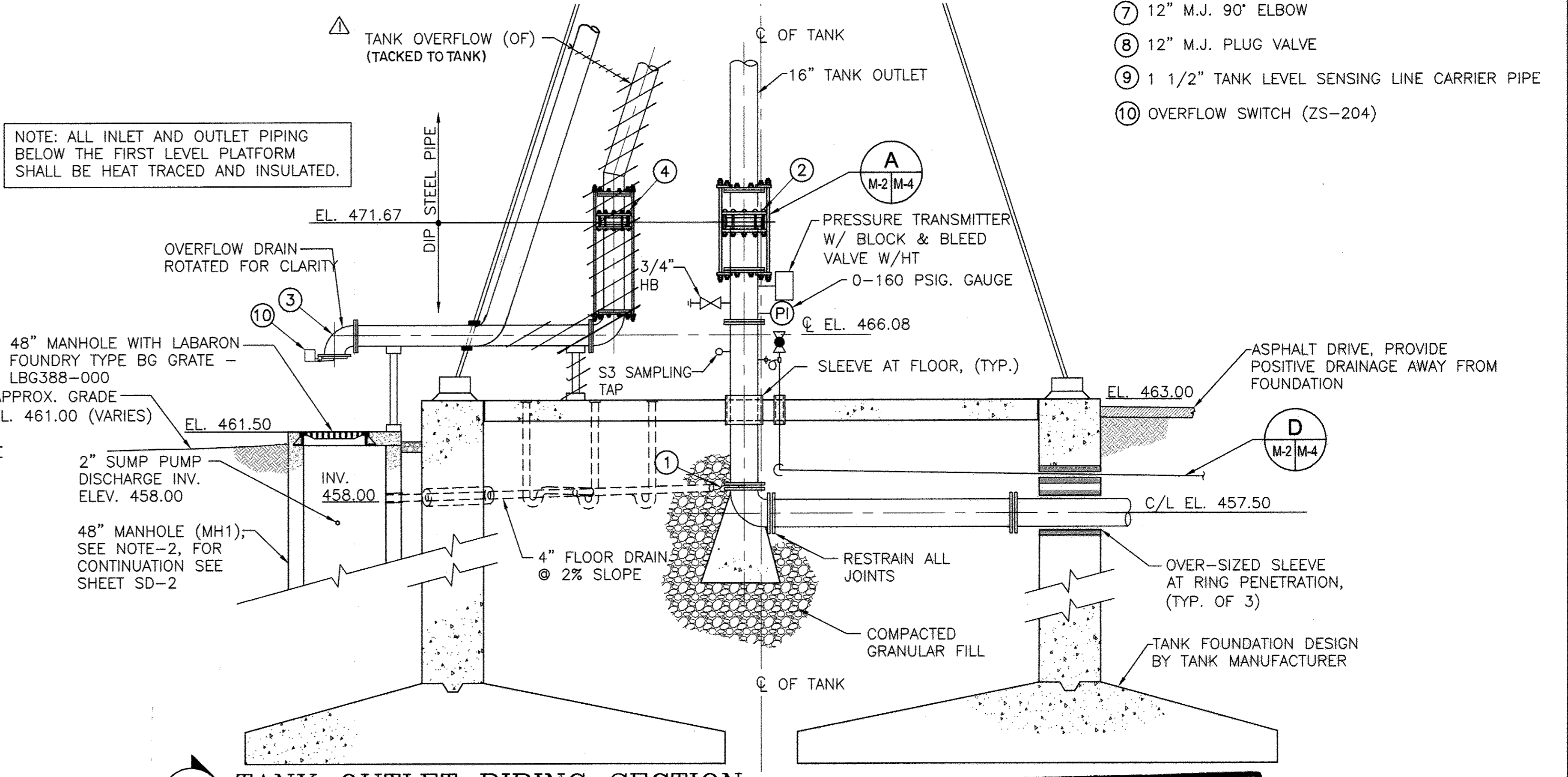
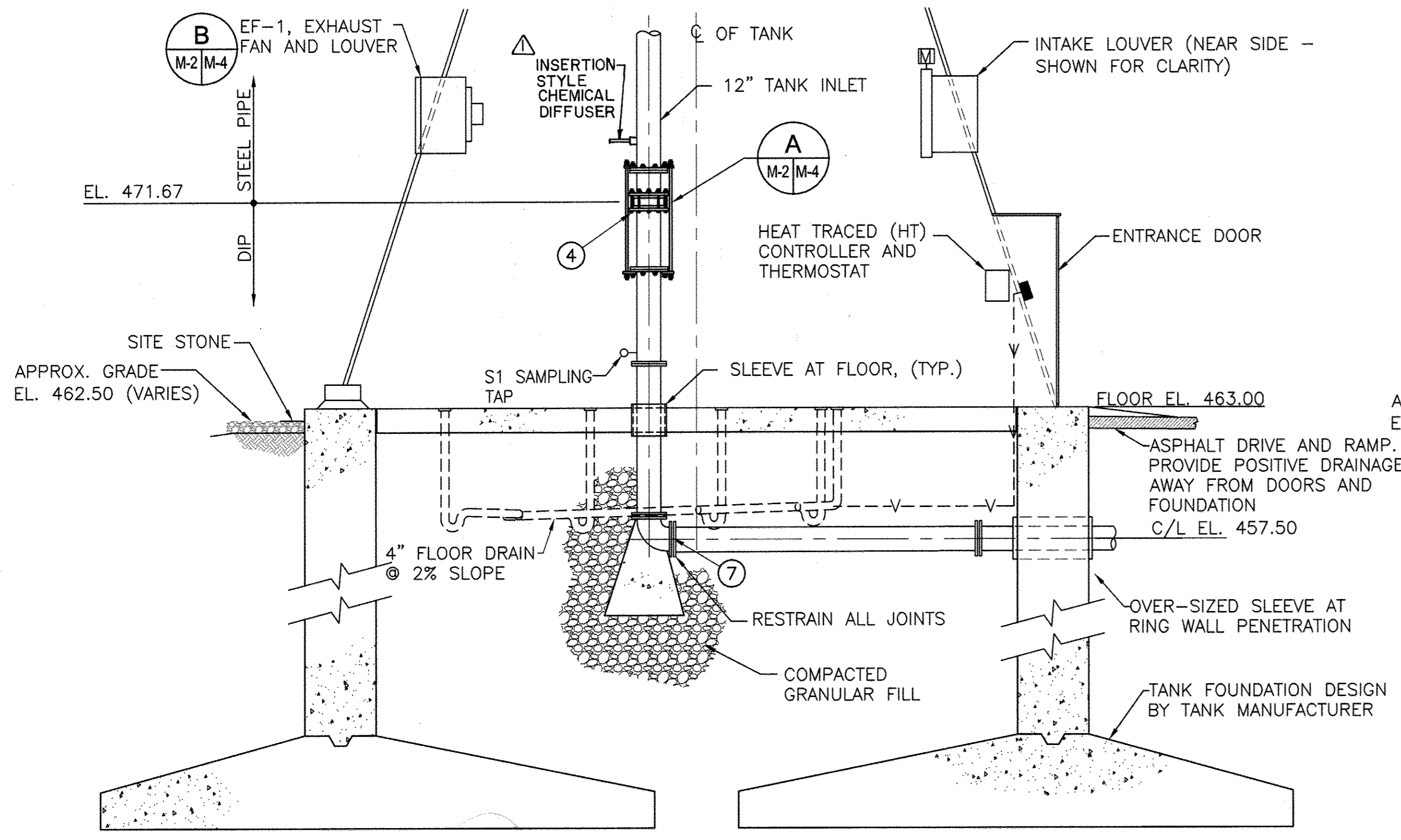
ELECTION DISTRICT NO.5 HOWARD COUNTY, MARYLAND

M-1  
SCALE AS SHOWN  
CONTRACT SHEET  
12 OF 22



- NOTES:**
1. ALTITUDE VALVE SHALL BE PROVIDED WITH REMOTE OVERRIDE SOLENOID CONTROL AND MECHANICAL CHECKING FEATURE.
  2. THE OVERFLOW MANHOLE SHALL BE USED FOR DRAINAGE / OVERFLOW CONTAINMENT IN THE EVENT OF UNSUITABLE DISCHARGE.
  3. THE TANK OVERFLOW PIPE SHALL NOT BE INSIDE OF THE BOWL ACCESS TUBE.
  4. CONTRACTOR TO PROVIDE 6-4" PVC CONDUITS FOR FUTURE THIRD PARTY COMMUNICATIONS CABLES. TANK MANUFACTURER TO PROVIDE BRACKET SUPPORTS FOR WIREWAY TO COLUMN PLATFORMS.

- CODED NOTES:**
- 1 16" M.J. 90° ELBOW
  - 2 16" FLEXIBLE COUPLING AND TIE-RODS
  - 3 12" FLANGED 90° ELBOW
  - 4 12" FLEXIBLE COUPLING WITH TIE-RODS
  - 5 12" M.J. LONG SOLID SLEEVE
  - 6 16" M.J. LONG SOLID SLEEVE
  - 7 12" M.J. 90° ELBOW
  - 8 12" M.J. PLUG VALVE
  - 9 1 1/2" TANK LEVEL SENSING LINE CARRIER PIPE
  - 10 OVERFLOW SWITCH (ZS-204)



**AS-BUILT**  
DATE: 1/4/2012

**GRAPHIC SCALE**  
SCALE: 1/4" = 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. 33925, Expiration Date 01/15/11

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

*Raymond A. Johnson* 4/21/09  
DIRECTOR OF PUBLIC WORKS  
CHIEF, BUREAU OF UTILITIES

*Robert J. Senum* 4/21/09  
CHIEF, BUREAU OF ENGINEERING  
CHIEF, UTILITY DESIGN DIVISION

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STATE OF MARYLAND  
PROFESSIONAL ENGINEER  
NO. 33925  
4/20/09

DES:	SEA				
DRN:	LFN				
CHK:	JRK				
DATE:	3/20/09				
BY:	LFN	AS BUILT		1/4/12	
	NO.				
		REVISION		DATE	

**ELEVATED TANK PLANS AND SECTIONS**

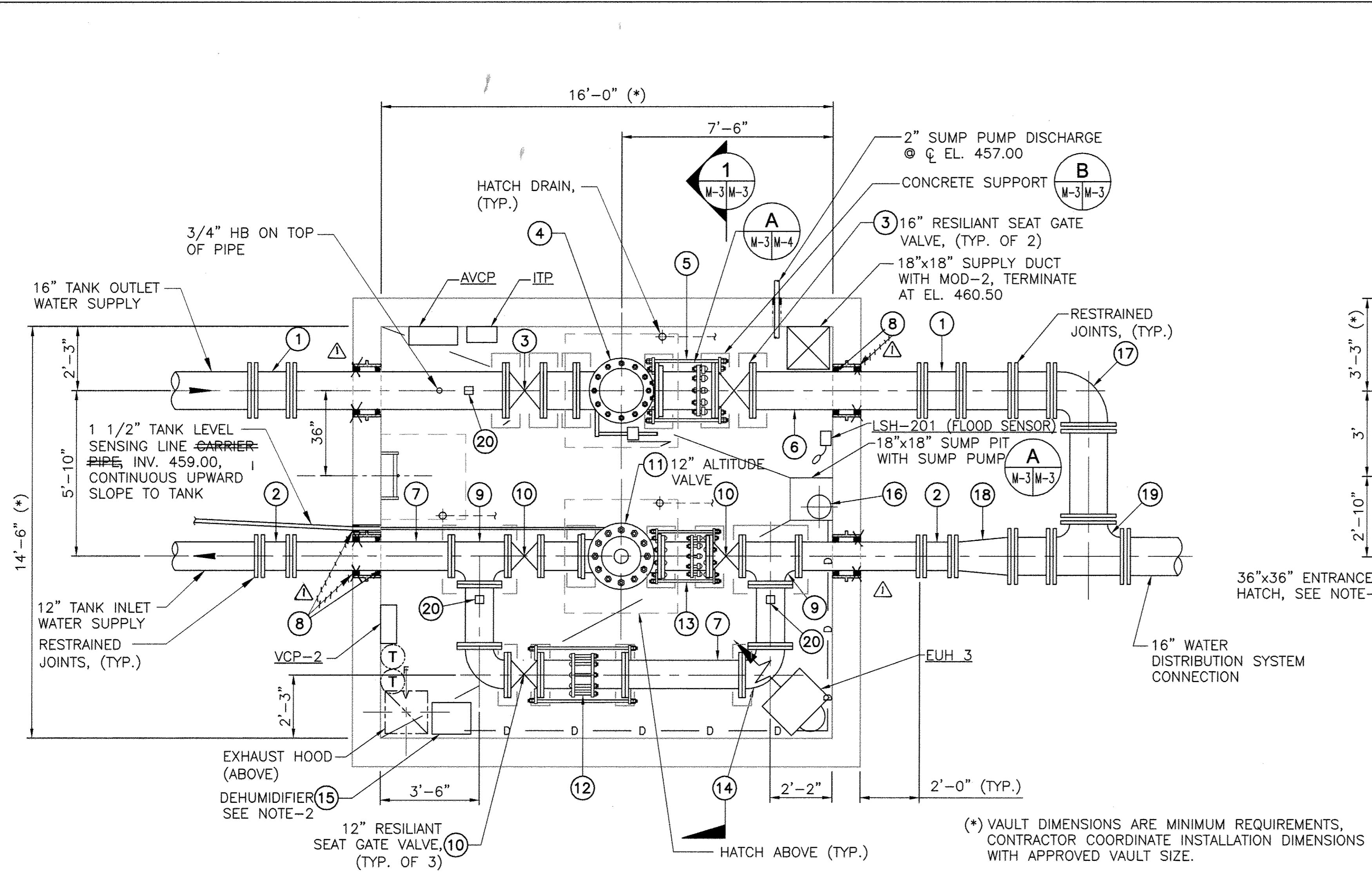
600' SCALE MAP NO. 46 BLOCK NO. 4

**FULTON ELEVATED WATER TANK**

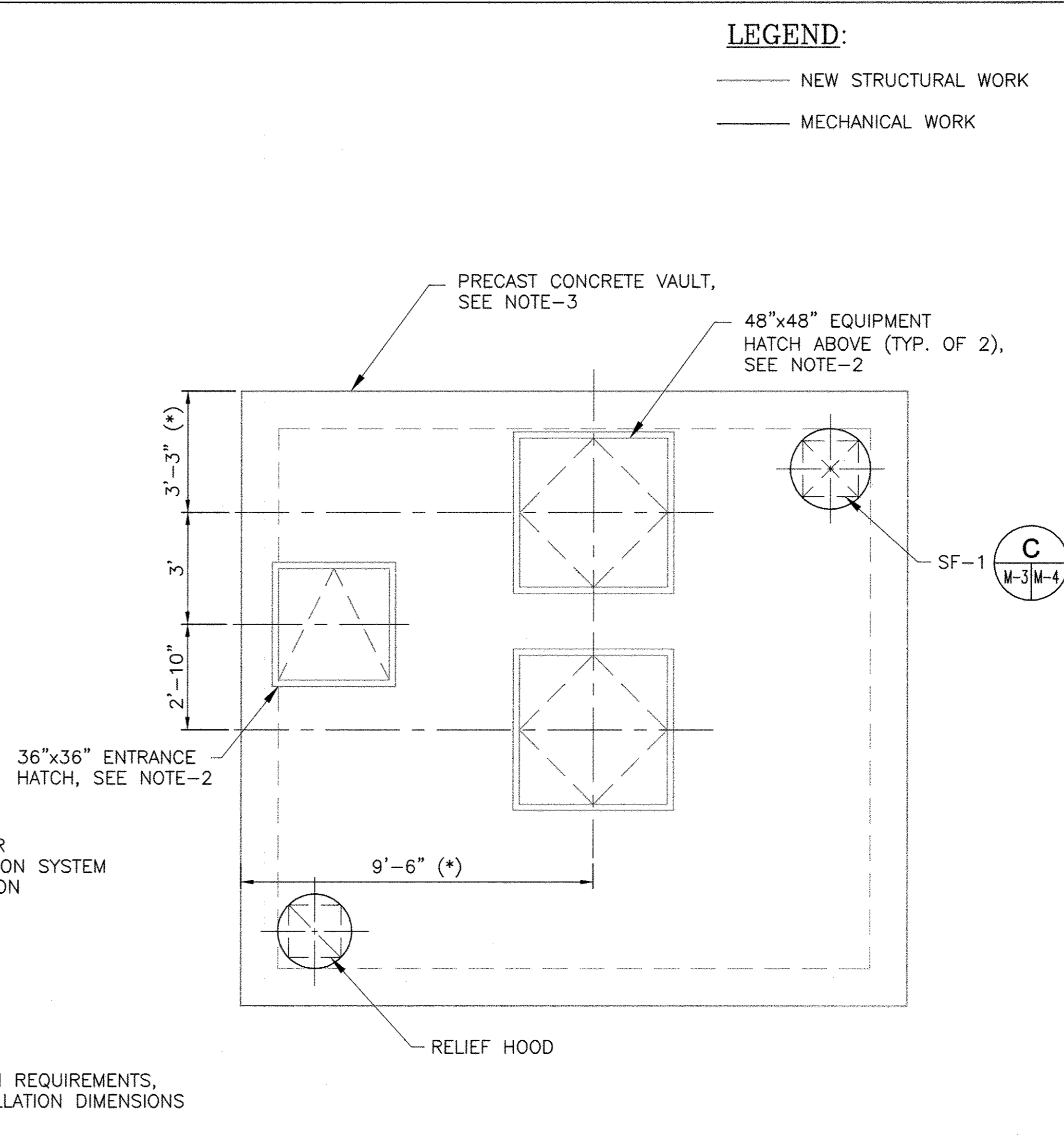
CAPITAL PROJECT No. W8280  
CONTRACT No. 44-4517

ELECTION DISTRICT NO.5 HOWARD COUNTY, MARYLAND

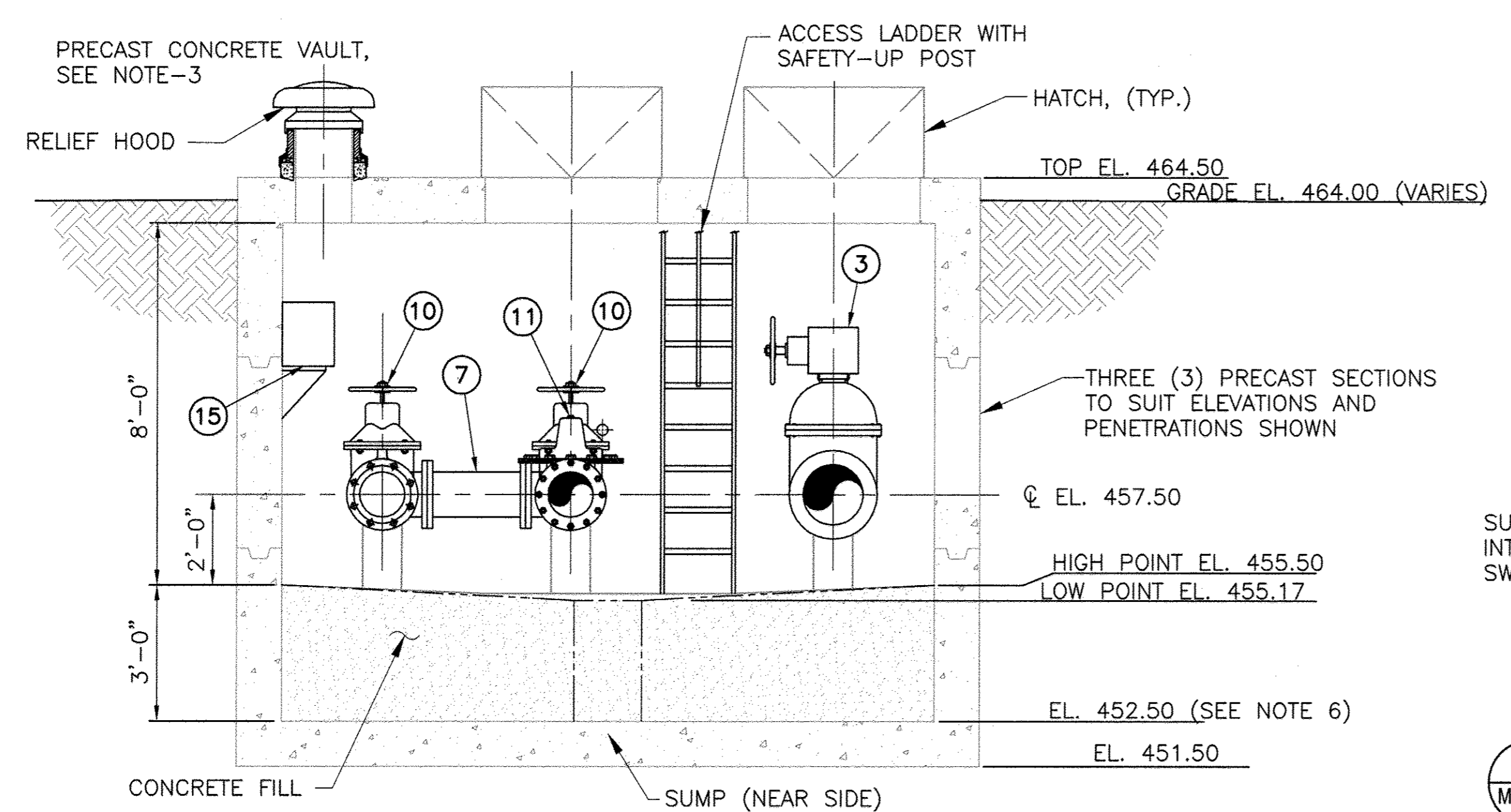
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CONTRACT SHEET 13 OF 22



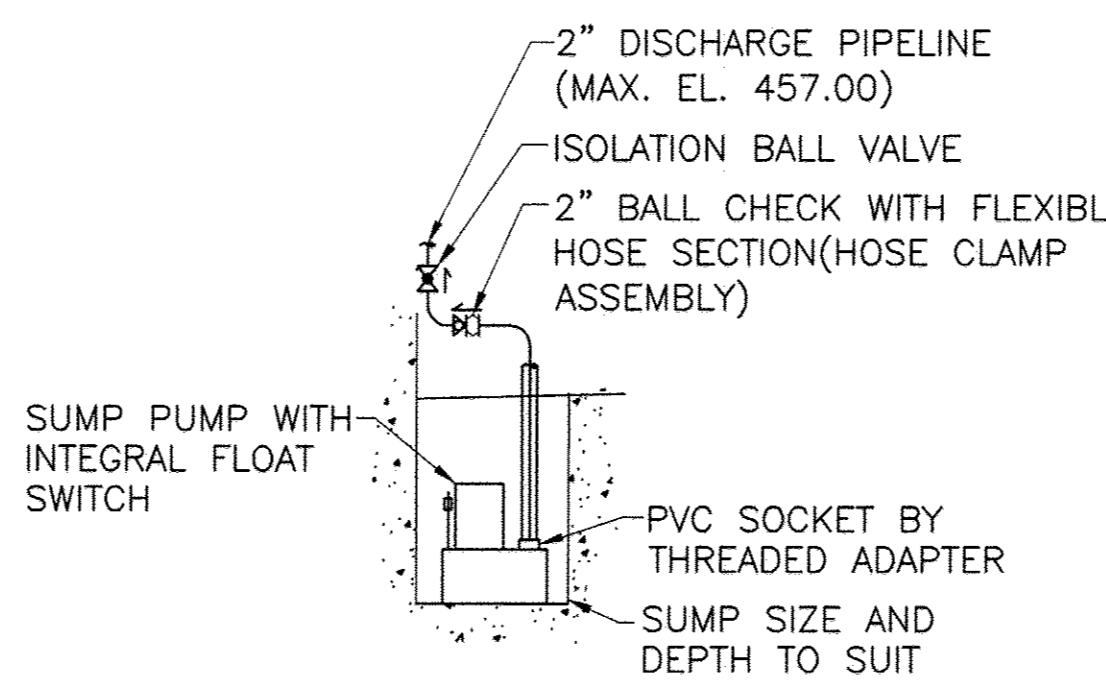
**1 VALVE VAULT - LOWER LEVEL PLAN**  
 SCALE: 3/8" = 1'-0"



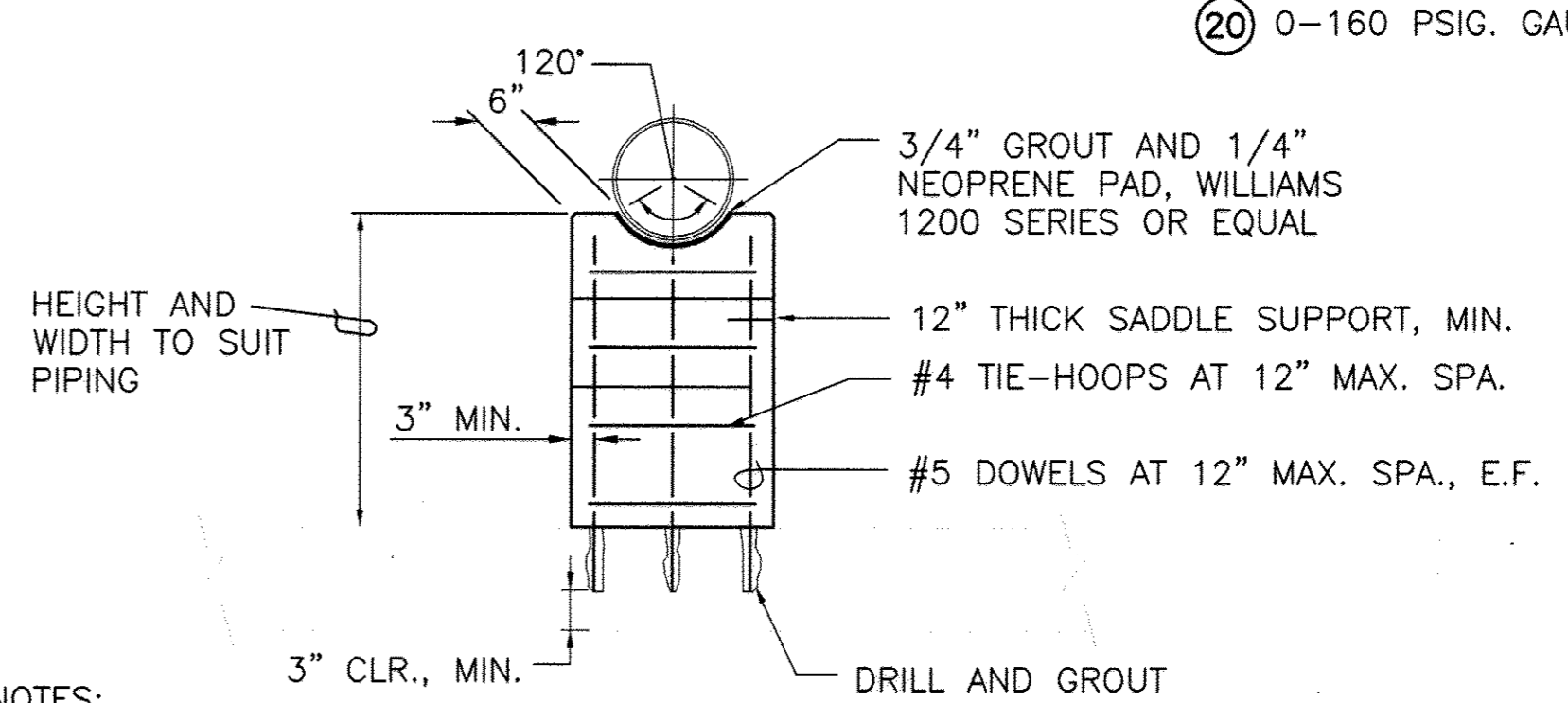
**2 VALVE VAULT - GRADE LEVEL PLAN**  
 SCALE: 3/8" = 1'-0"



**1 VALVE VAULT SECTION**  
 SCALE: 3/8" = 1'-0"



**A SUMP PUMP DETAIL**  
 NOT TO SCALE



**B TYPICAL PIPE AND VALVE SUPPORT**  
 NOT TO SCALE

**LEGEND:**

- NEW STRUCTURAL WORK
- MECHANICAL WORK

**NOTES:**

1. ALL BURIED PIPE SHALL BE RESTRAINED.
2. PROVIDE 1-INCH DRAIN FROM EQUIPMENT CONNECTION TO SUMP. SUPPORT PIPING IN ACCORDANCE WITH SPECIFICATIONS.
3. ALL DIMENSIONS SHOWN ARE MINIMUM REQUIREMENTS, CONTRACTOR COORDINATE INSTALLATION IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
4. IF TIE-ROD LUG AND BOLTING ASSEMBLY CONFLICTS WITH VALVE BODY, CONTRACTOR SHALL USE A MEGA FLANGE.
5. ALL VALVES IN THE VAULT SHALL OPEN CLOCKWISE (RIGHT).
6. CONTRACTOR TO COORDINATE VAULT DEPTH TO SUIT BUOYANCY CALCULATIONS.

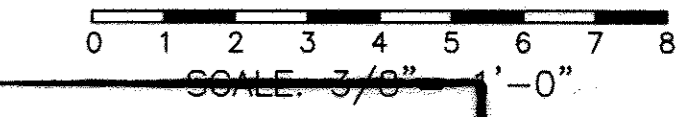
**CODED NOTES:**

- 1 16" M.J. LONG SOLID SLEEVE
- 2 12" M.J. LONG SOLID SLEEVE
- 3 16" FLANGED NRS RESILIENT SEAT GATE VALVE WITH BEVELED GEAR ACTUATOR
- 4 16" SWING CHECK VALVE
- 5 16" FLANGE ADAPTOR WITH TIE-RODS, SEE NOTE-4
- 6 16" PIPING TO SUIT
- 7 12" PIPING TO SUIT
- 8 SLEEVE SIZED TO SUIT PIPE PENETRATION, MAKE WATERTIGHT WITH MECHANICAL SEALS AT OUTSIDE FACE. (TYP.)
- 9 12"x12" FLANGED TEE
- 10 12" FLANGED NRS RESILIENT SEAT GATE VALVE
- 11 12" SINGLE ACTING ALTITUDE VALVE
- 12 12" FLEXIBLE COUPLING WITH TIE-RODS
- 13 12" FLANGE ADAPTOR WITH TIE-RODS, SEE NOTE-4
- 14 12" 90° ELBOW
- 15 PORTABLE DEHUMIDIFIER
- 16 SUMP PUMP, 10 GPM @ 18 FEET TDH
- 17 16" M.J. 90° ELBOW
- 18 16"x12" M.J. BY P.E. REDUCER
- 19 16"x16" M.J. BY M.J. TEE
- 20 0-160 PSIG. GAUGE (TYP.)

**NOTES:**

1. ENGLISH BAR SIZES SHOWN
2. EXCLUDE CRADLE FOR VALVE AND FLANGE SUPPORTS

**GRAPHIC SCALE**



**AS-BUILT**  
 DATE 1/4/2012

Apr 20, 2009 - 9:45am User: Kevin Jackson M:\2007\07070460\Drawings\ELEVATED TANK-2\M-3 ALTITUDE VALVE VAULT.dwg

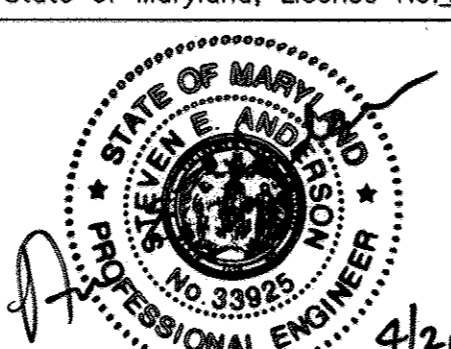
DEPARTMENT OF PUBLIC WORKS  
 HOWARD COUNTY, MARYLAND

*[Signature]* 4/20/09  
 DIRECTOR OF PUBLIC WORKS DATE

*[Signature]* 4/21/09  
 CHIEF, BUREAU OF UTILITIES DATE

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CHK: JRK			
DATE: 3/20/09	LFN	AS BUILT	1/4/12
BY NO.		REVISION	DATE

**VALVE VAULT PLANS SECTION AND DETAILS**

600' SCALE MAP NO. 46 BLOCK NO. 4

**FULTON ELEVATED WATER TANK**

CAPITAL PROJECT No. W8280  
 CONTRACT No. 44-4517

ELECTION DISTRICT NO.5 HOWARD COUNTY, MARYLAND

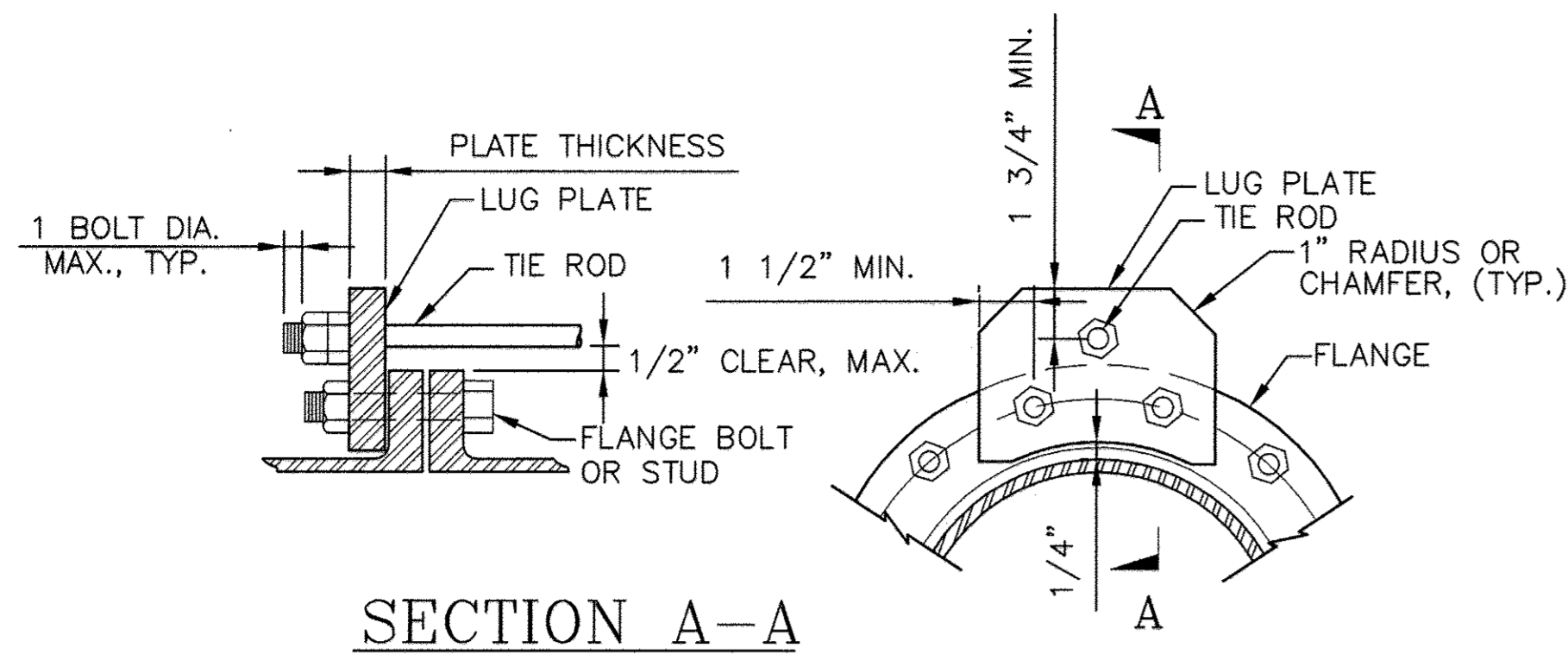
SCALE AS SHOWN  
 CONTRACT SHEET 14 OF 22

**HEATING AND VENTILATION NOMENCLATURE**

DESCRIPTION	ABBREVIATION
BACKDRAFT DAMPER	BDD
BELT DRIVE	B
BRITISH THERMAL UNITS PER HOUR	BTUH
CUBIC FEET PER MINUTE	CFM
DIRECT DRIVE	D
ELECTRIC UNIT HEATER	EUH
EXHAUST FAN	EF
KILOWATT	KW OR KW
MOTOR-OPERATED DAMPER	M.O.D.
PROPELLER (WALL-MOUNTED)	P
ROOF SUPPLY FAN	RSF
SUPPLY FAN	SF

**CONSTRUCTION NOTES:**

1. FRAME SHALL BE HOT-DIP GALVANIZED AFTER FABRICATION.
2. ALL DAMPERS SHALL MATCH IN NOMINAL SIZE WITH THEIR RESPECTIVE LOUVERS, UNLESS OTHERWISE SHOWN.
3. ALL BELT-DRIVEN FANS SHALL BE FURNISHED WITH A MOTOR/BELT GUARD WITH PROTECTIVE SCREEN, UNLESS OTHERWISE SHOWN



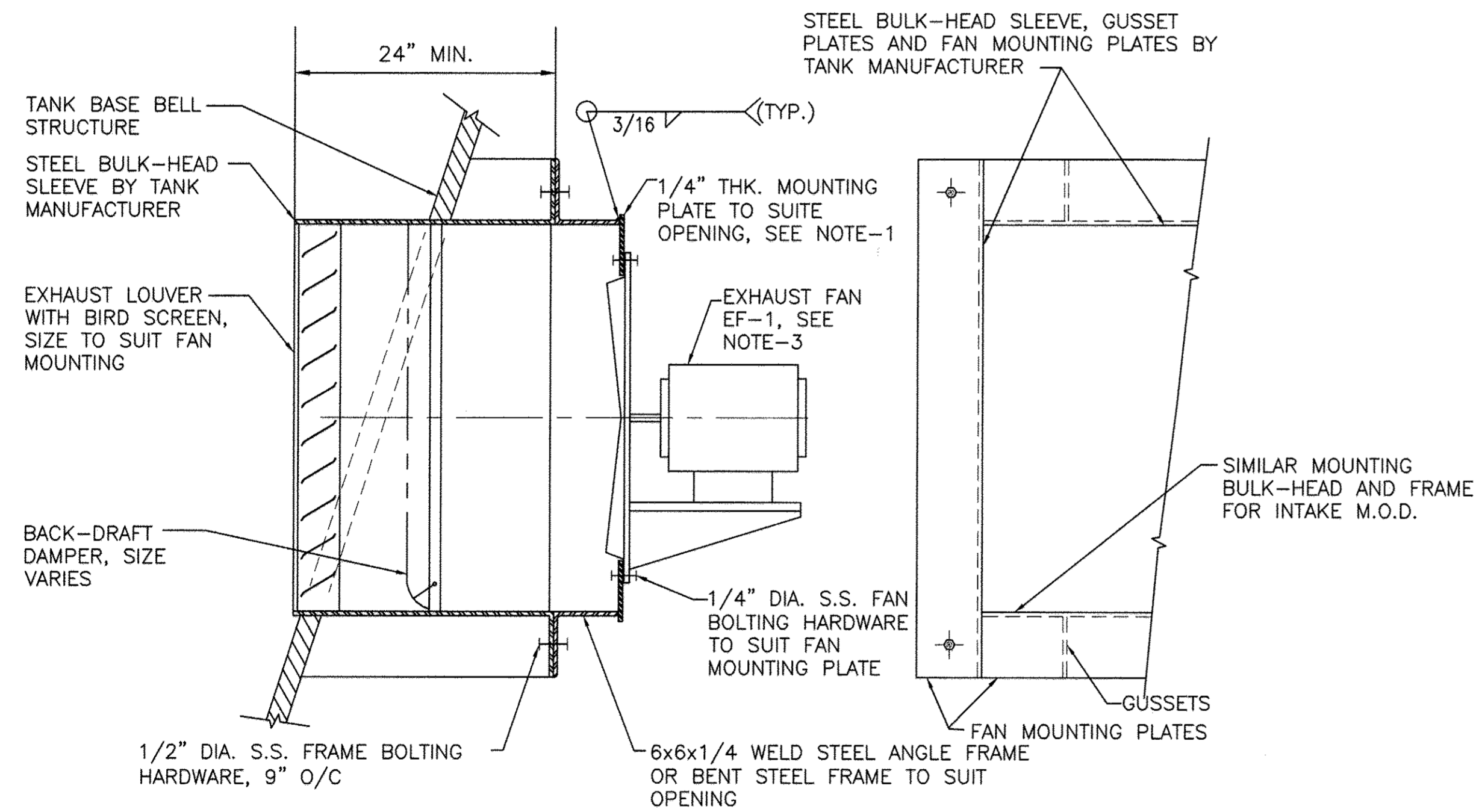
PIPE SIZE	NUMBER OF RODS	DIAMETER OF RODS	PLATE THICKNESS	PIPE SLEEVE (IF REQUIRED)	DESIGN PRESSURE (PSI)
12"	4	3/4"	1 1/8"	7/8"	150
16"	4	7/8"	1 1/4"	1"	150

**NOTES:**

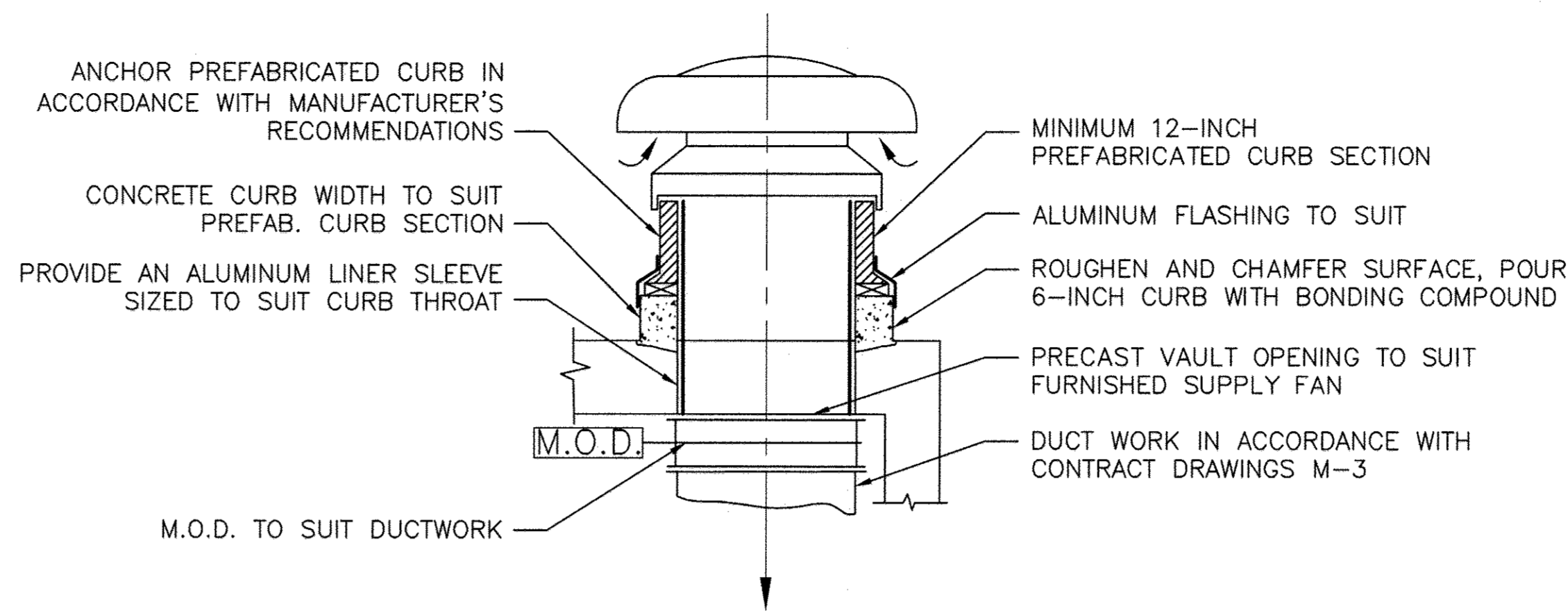
FLANGE SURFACE IN CONTACT WITH THE LUG PLATE SHALL BE GROUND SMOOTH TO CLEAR THE CASTING IRREGULARITY AND EMBOSSED LETTERING. CONTACT SURFACE OF LUG PLATE SHALL BE MACHINED TO A ONE DEGREE TAPER FOR PIPE DIAMETERS 12-INCH AND LARGER.

ROD MATERIAL - ASTM A588  
 PLATE MATERIAL - ASTM A36  
 SLEEVE MATERIAL - SCHEDULE 40 STEEL PIPE

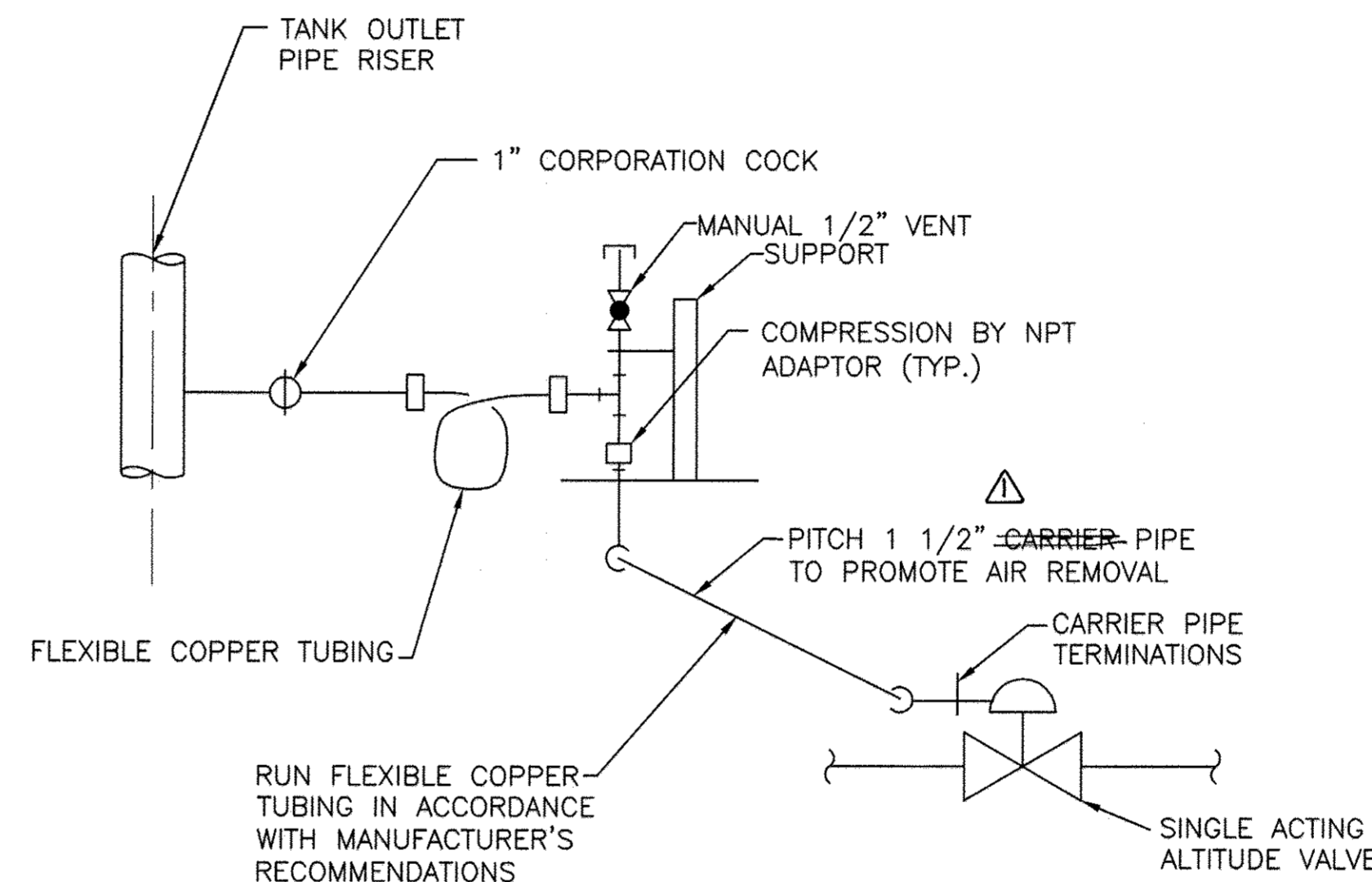
**A TIE ROD INSTALLATION DETAIL**  
 NOT TO SCALE



**B TANK VENTILATION DETAIL**  
 NOT TO SCALE



**C SUPPLY FAN DETAIL**  
 NOT TO SCALE  
 (RELIEF HOOD SIMILAR)



**D TANK LEVEL SENSING**  
 NOT TO SCALE

HEATING SCHEDULE						
UNIT I.D.	KW	AMPS	CFM	THROW (FT.)	VOLTS/PH/HERTZ	REMARKS
EUH-1	7.5	36.1	590	13	208/3/60	INTEGRAL DISCONNECT; WALL-MOUNT
EUH-2	7.5	36.1	590	13	208/3/60	INTEGRAL DISCONNECT; WALL-MOUNT
EUH-3	5	13.9	405	12.5	208/3/60	INTEGRAL DISCONNECT; WALL-MOUNT

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	B	3000	0.375	1010	1/2	208/3/60	BDD	INTAKE w/ M.O.D., 36\"/>
SF-1	RSF	D	600	0.375	1550	1/20	115/1/60	M.O.D.	EXHAUST HOOD w/ BDD

NOTE: THE LOUVERS FOR THE INTAKE WITH AN M.O.D. AND THE EXHAUST FAN SHALL BE 36\"/>

**AS-BUILT**  
 DATE 1/4/2012

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User: hvern.fusion; 4/20/2009 9:45am; M:\000\01070460\01070460.dwg; PLOT: 4/20/2009 9:45am; PLOTTER: HP DesignJet 500; PLOTTING: 4/20/2009 9:45am; PLOTTER: HP DesignJet 500; PLOTTING: 4/20/2009 9:45am

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 License No. 33925  
 4/20/09

DES: SEA			
DRN: LFN			
CHK: JRK			
DATE: 3/20/09	LFN	AS BUILT	1/4/12
BY NO.		REVISION	DATE

**MECHANICAL DETAILS AND SCHEDULES**

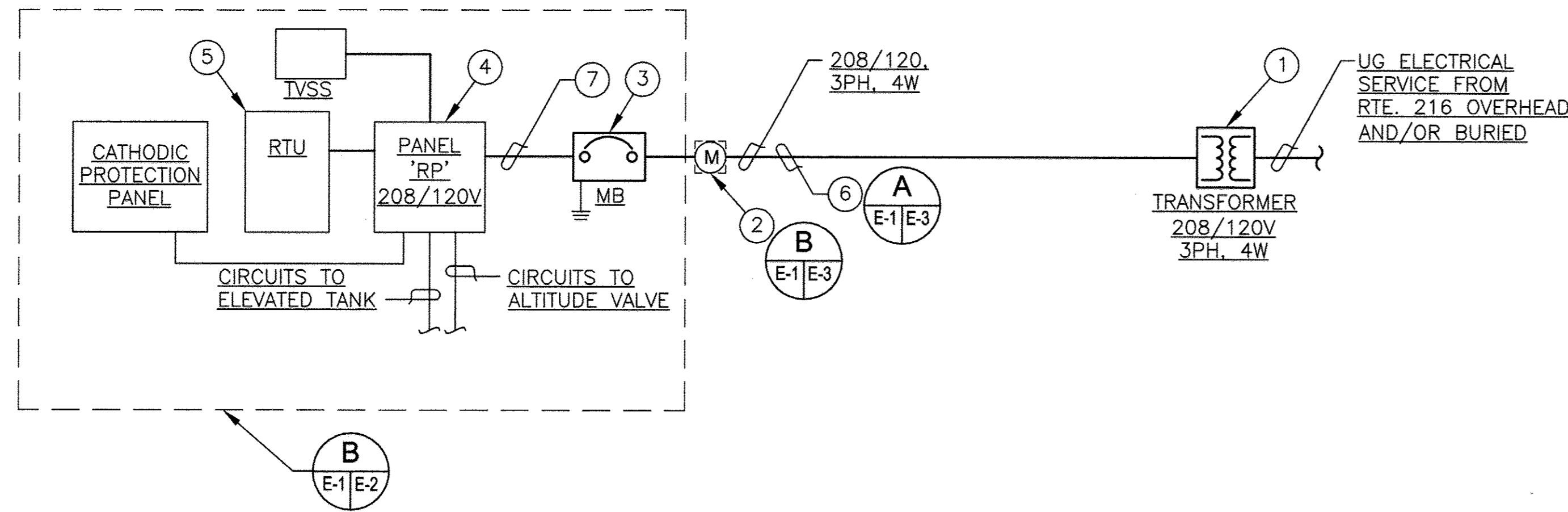
600' SCALE MAP NO. 46 BLOCK NO. 4

**FULTON ELEVATED WATER TANK**

CAPITAL PROJECT No. W8280  
 CONTRACT No. 44-4517

ELECTION DISTRICT NO.5 HOWARD COUNTY, MARYLAND

M-4  
 SCALE AS SHOWN  
 CONTRACT SHEET  
 15 OF 22



ELECTRICAL SINGLE-LINE DIAGRAM

LEGEND:

- UE — PROPOSED UG ELECTRICAL SERVICE
- T — PROPOSED TELEPHONE SERVICE
- - - - UG CONDUIT AS INDICATED
- HOMERUN TO PANELBOARD SEE DRAWING E-2 FOR SIZES OF CONDUCTORS AND CONDUITS.
- ⊙ G.F.I. TYPE RECEPTACLE IN WEATHERPROOF ENCLOSURE WITH COVER PLATE. 125V, 3W, 20A. DUPLEX WITH NEMA 5-20R CONFIGURATION. MOUNT AS NOTED.
- ⊙<sub>x</sub> ⊙<sub>x</sub> SURFACE MOUNTED LIGHT FIXTURE AS SPECIFIED.
- S SINGLE POLE SWITCH IN WEATHERPROOF ENCLOSURE WITH HINGED COVER PLATE. MOUNT AS NOTED.
- ⊙<sub>PC</sub> PHOTO CONTROL
- ⊙<sub>M</sub> UTILITY METER
- EM ⊙ EMERGENCY LIGHT FIXTURE

ABBREVIATIONS:

- AIC AMPERE INTERRUPTING CAPACITY
- A.F.F. ABOVE FINISHED FLOOR
- AFG ABOVE FINISHED GRADE
- AVCP ALTITUDE VALVE CONTROL PANEL
- BRKR BREAKER
- CAP CAPACITY
- CKT CIRCUIT
- C CONDUIT
- DS DISCONNECT SWITCH
- EF EXHAUST FAN
- EUH ELECTRIC UNIT HEATER
- EXT EXTERIOR
- F FUSE
- G GROUNDING
- H.P.S. HIGH PRESSURE SODIUM
- ITP INSTRUMENTATION TERMINATION PANEL
- JB JUNCTION BOX
- M METER
- MB MAIN BREAKER
- MIN MINIMUM
- MLO MAIN LUGS ONLY
- M.O.D MOTOR OPERATED DAMPER
- NEMA NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
- PVC POLYVINYL CHLORIDE
- PH PHASE
- RGS RIGID GALVANIZED STEEL CONDUIT
- RTU REMOTE TELEMETRY UNIT
- SF SUPPLY FAN
- XFMR TRANSFORMER
- TM TANK MANUFACTURER
- TVSS TRANSIENT VOLTAGE SURGE SUPPRESSION
- TYP TYPICAL
- UG UNDERGROUND
- WP WEATHERPROOF
- AV VOLT
- VCP VENTILATION CONTROL PANEL
- W WIRE

CODED NOTES:

- 1 PAD MOUNTED TRANSFORMER, 208/120V, 3PH., WYE 4W BY BGE. PAD TO BE PURCHASED FROM BGE, MATERIAL NO. 12-66B, AND INSTALLED BY ELECTRICAL CONTRACTOR IN ACCORDANCE WITH BGE REQUIREMENTS. **TERMINATE CONDUCTORS ON MAIN BREAKER.**
- 2 UTILITY METER: METER SOCKET FROM BGE INSTALLED BY THE CONTRACTOR. SEE INSTALLATION DETAIL FROM BGE STANDARD #NM206 FOR FREE STANDING OUTDOOR METERING.
- 3 MAIN BREAKER, 208/120V, 3PH., 4W, 125 AMP, 22KAIC, IN NEMA 12 ENCLOSURE RATED FOR SERVICE ENTRANCE. SEE MOUNTING DETAIL SHEET E-2.
- 4 PANEL BOARD 208/120V, 3PH, 4W, 125 AMP MLO. SEE MOUNTING DETAIL SHEET E-2.
- 5 COUNTY STANDARD REMOTE TELEMETRY UNIT (RTU) WITH BACKUP UPS/BATTERY SYSTEM. **4-500 KCML 81/06 IN 2-4" PVC CONDUITS IN DUCT BANK.**
- 6 ~~4#1 & 1#6 G IN 2-4" DUCT BANK~~ SEE DETAIL SHEET E-3.
- 7 4#1 & 1#6 G. IN 2" RGS.

DESCRIPTION	VOLT-AMP			RECEPT	LIGHTS	OTHER	BKR		POLE		BKR		VOLT-AMP			RECEPT	LIGHTS	OTHER	LIGHT	REC	DESCRIPTION
	A	B	C				AMP	POLE	NUMBER	NUMBER	AMP	POLE	A	B	C						
CATHODIC PROTECTION				0	0	500	20	1	/1	/2	20	1	500		0	0	500				RTU
PANEL RECEPTACLE	X			360	0	0	20	1	/3	/4	20	1			0	100	0	100	X		PANEL LIGHT
VALVE VAULT RECEPTACLES	X			360	0	0	20	1	/5	/6	20	3			1700	0	0	1700			UNIT HEATER VALVE VAULT-EUH-3
VALVE VAULT LIGHTS		X		0	200	0	20	1	/7	/8			1700		0	0	1700				
VCP-1				0	0	200	20	3	/9	/10					1700	0	0	1700			
				0	0	200			/11	/12	20	1			500	0	0	500			SUMP PUMP
				0	0	200			/13	/14	20	1			0	0	0	0			SPARE
TANK DEHUMIDIFIER				0	0	500	20	1	/15	/16	20	1			0	0	0	0			SPARE
VALVE VAULT DEHUMIDIFIER				0	0	500	20	1	/17	/18	20	1			500	0	0	500			HEAT TRACE
OUTDOOR LIGHT	X			0	300	0	20	1	/19	/20	20	1	600		0	0	600				ALTITUDE VALVE CONTROLS
INTERIOR LIGHTS-TANK				0	0	900	15	1	/21	/22	20	1			500	0	0	500			VCP-2
SPARE				0	0	0			/24	20	1				0	0	0	0			SPARE
TVSS				0	0	200	60	3	/25	/26	20	1			0	0	0	0			SPARE
				0	0	200			/27	/28	20	1			500	0	0	500			FLOWMETER
				0	0	200			/29	/30					0	0	0	0			SPACE
TANK HEATER-EUH-1				0	0	2500	30	3	/31	/32					0	0	0	0			SPACE
				0	0	2500			/33	/34					0	0	0	0			SPACE
				0	0	2500			/35	/36					0	0	0	0			SPACE
TANK HEATER-EUH-2				0	0	2500	30	3	/37	/38					0	0	0	0			SPACE
				0	0	2500			/39	/40					0	0	0	0			SPACE
				0	0	2500			/41	/42					0	0	0	0			SPACE

CONNECTED LOAD		RECEPTACLES 720 VA		LIGHTING 600 VA		OTHER 26800 VA	
PHASE	A	B	C	RECEPTACLES 720 VA	TOTAL PANEL CONNECT AMPS 78.1		
ODD	6400	7160	6260	LIGHTING 600 VA	LARGEST CONNECT PHASE AMPS 82.9		
EVEN	2800	2800	2700	OTHER 26800 VA	TOTAL DEMAND AMPS 78.1		
TOTAL	9200	9960	8960	TOTAL DMD 28120 VA			
TOTAL KVA	28.1						

TYPE	DESCRIPTION	VOLTAGE	LAMP	MOUNTING	MANUFACTURER
A	VAPORTIGHT INCANDESCENT FIXTURE WITH DIE-CAST ALUMINUM HOUSING, GLASS GLOBE AND CAST ALUMINUM GUARD.	120	100 WATT A-19	SURFACE AS NOTED	STONCO CAT. No. VWXL11GC OR APPROVED EQUAL
B	SUITABLE FOR WET LOCATIONS, DIE-CAST ALUMINUM HOUSING BASE WITH ONE-PIECE POLYCARBONATE FRONT HOUSING. (PROVIDED W/PHOTO CONTROL)	120	70 WATT H.P.S.	SURFACE OUTDOOR 7'-0" AFG	GENERAL ELECTRIC WALLIGHTER 70 CAT. No. WL07SI OR APPROVED EQUAL
EM	EMERGENCY UG UNIT WITH TWO ADJUSTABLE HALOGEN LAMP HEADS, WHITE PLASTIC HOUSING	120	2-5W HIGH OUTPUT HALOGEN	SURFACE 7" AFF	AS MANUFACTURED BY LITHONIA TYPE 6ELMG OR EQUAL
C	FLOURESCENT LIGHT FIXTURE FULLY GASKETED	120	1-32W T8 FLUOR.	SURFACE WALL MTD.	AS MANUFACTURED BY LITHONIA TYPE EIS OR APPROVED EQUAL

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DATE 1/4/2012

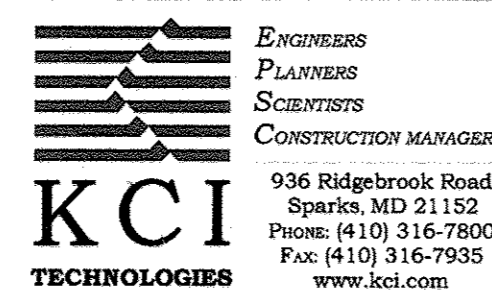
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User: kemjackson 4/20/2009 9:54:58am M:\2009\10101046\Drawings\LEGATED\ITER-2\09-16-09\E-1 ONE-LINE DIAGRAM SCHEDULES AND LEGEND.dwg

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DRN: LFN  
CHK: JRK  
DATE: 3/20/09

BY	NO.	REVISION	DATE
LFN	1	AS BUILT	1/4/12

ONE-LINE DIAGRAM  
SCHEDULES SYMBOLS  
AND LEGEND

FULTON ELEVATED WATER TANK

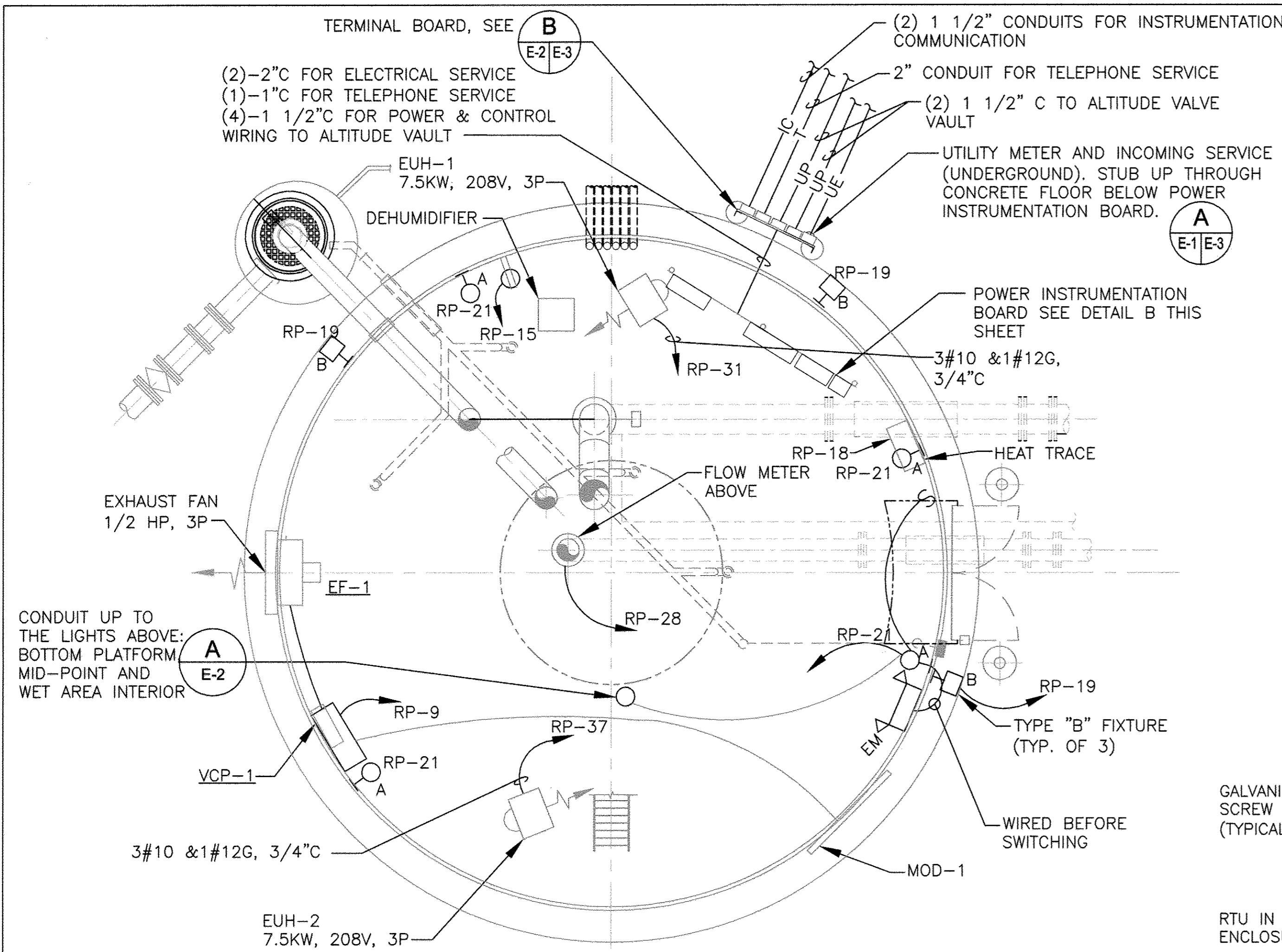
CAPITAL PROJECT No. W8280  
CONTRACT No. 44-4517

ELECTION DISTRICT NO.5 HOWARD COUNTY, MARYLAND

E-1

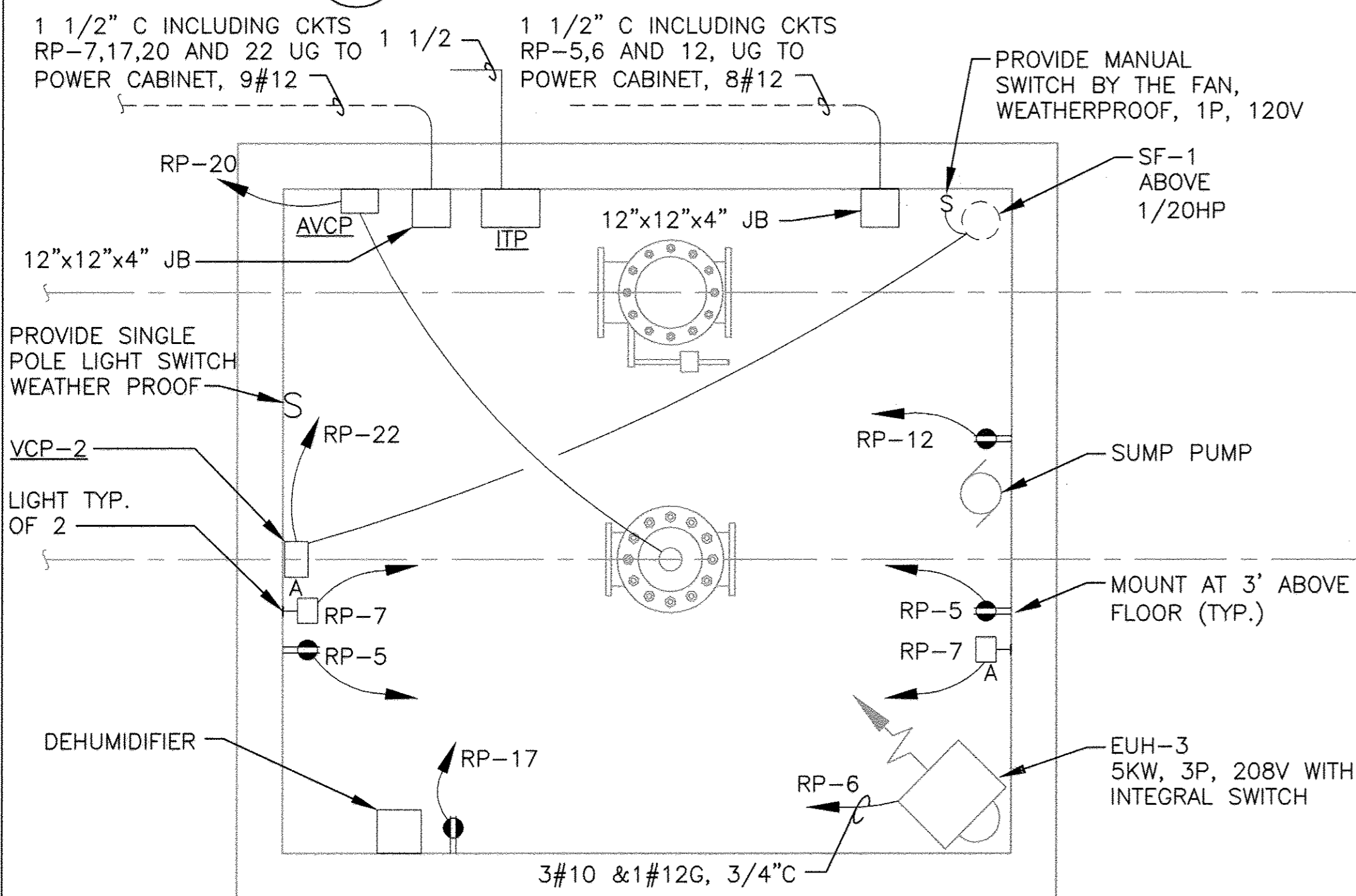
SCALE AS SHOWN  
CONTRACT SHEET  
16 OF 22





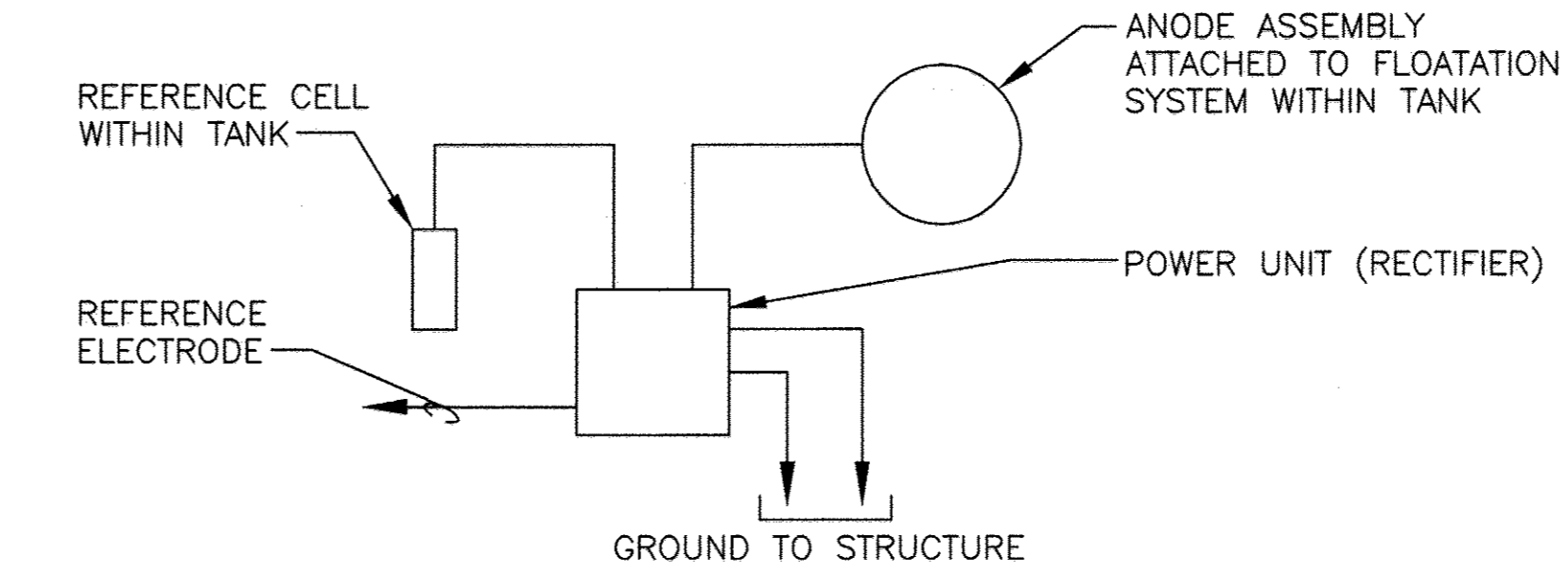
**1 TANK LIGHTING AND POWER PLAN**  
E-2

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



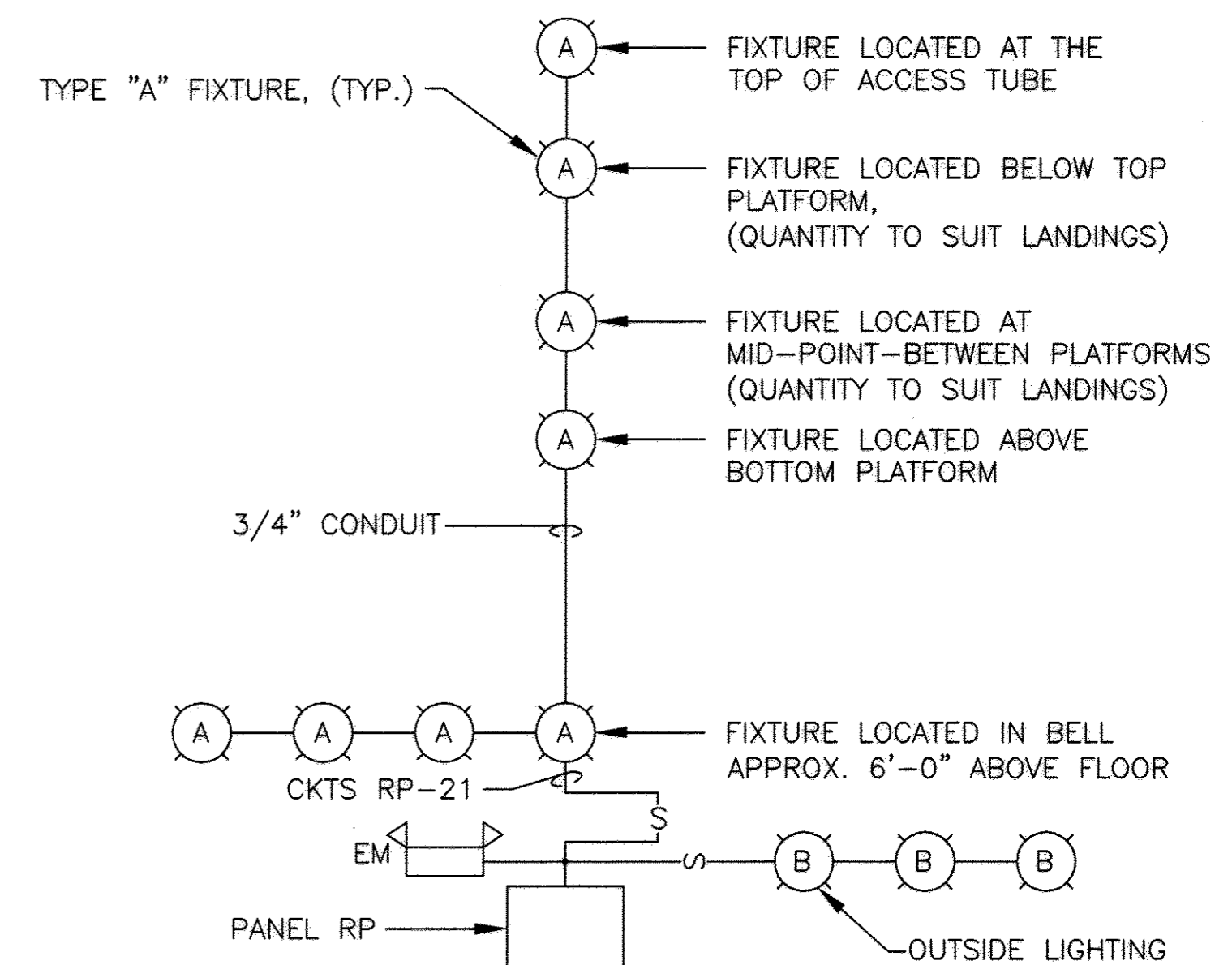
**PLAN - ALTITUDE VALVE VAULT**

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



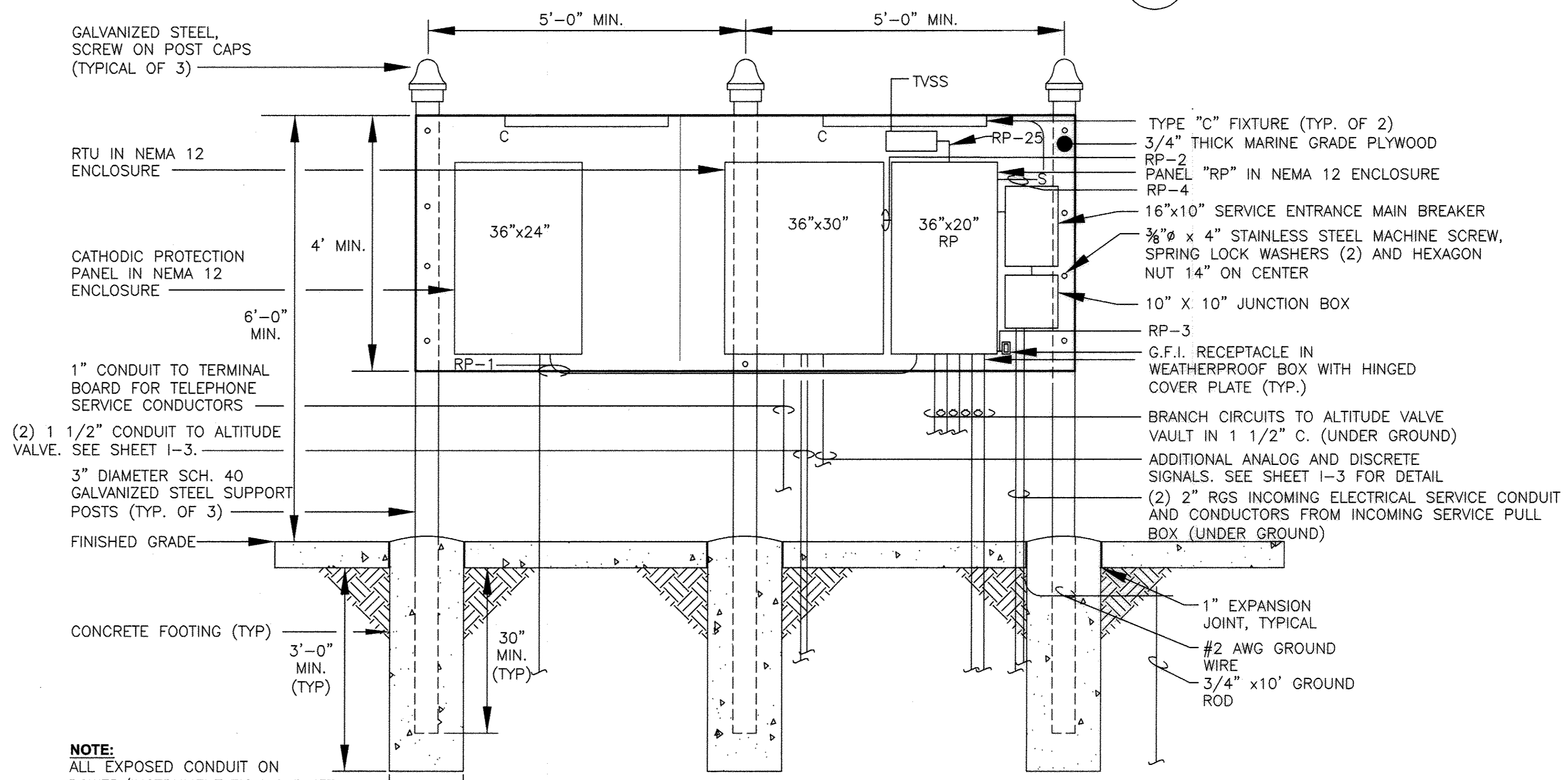
**ELECTRICAL SCHEMATIC - CATHODIC PROTECTION SYSTEM**

NO SCALE



**A ELECTRICAL SCHEMATIC - LIGHTS**

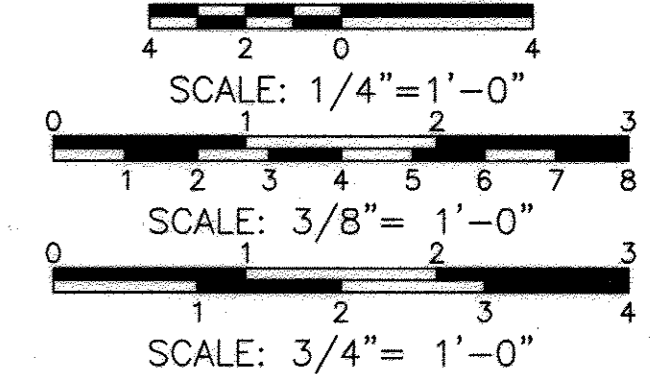
NO SCALE



**FRONT ELEVATION - POWER/INSTRUMENTATION BOARD**

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

**GRAPHIC SCALES**



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Apr 20, 2009 9:46am User: kevin.jacobson File: M:\2009\07070409\Drawings\ELEVATED TANK-2\09-16-09-E-2 POWER AND LIGHTING PLANS AND DETAILS.dwg

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CHIEF, BUREAU OF UTILITIES DATE

*By...* 4-21-09  
CHIEF, UTILITY DESIGN DIVISION DATE

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No. 33925  
4/2/09

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CHK: JRK			
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**POWER AND LIGHTING PLANS AND DETAILS**

DATE: 600' SCALE MAP NO. 46 BLOCK NO. 4

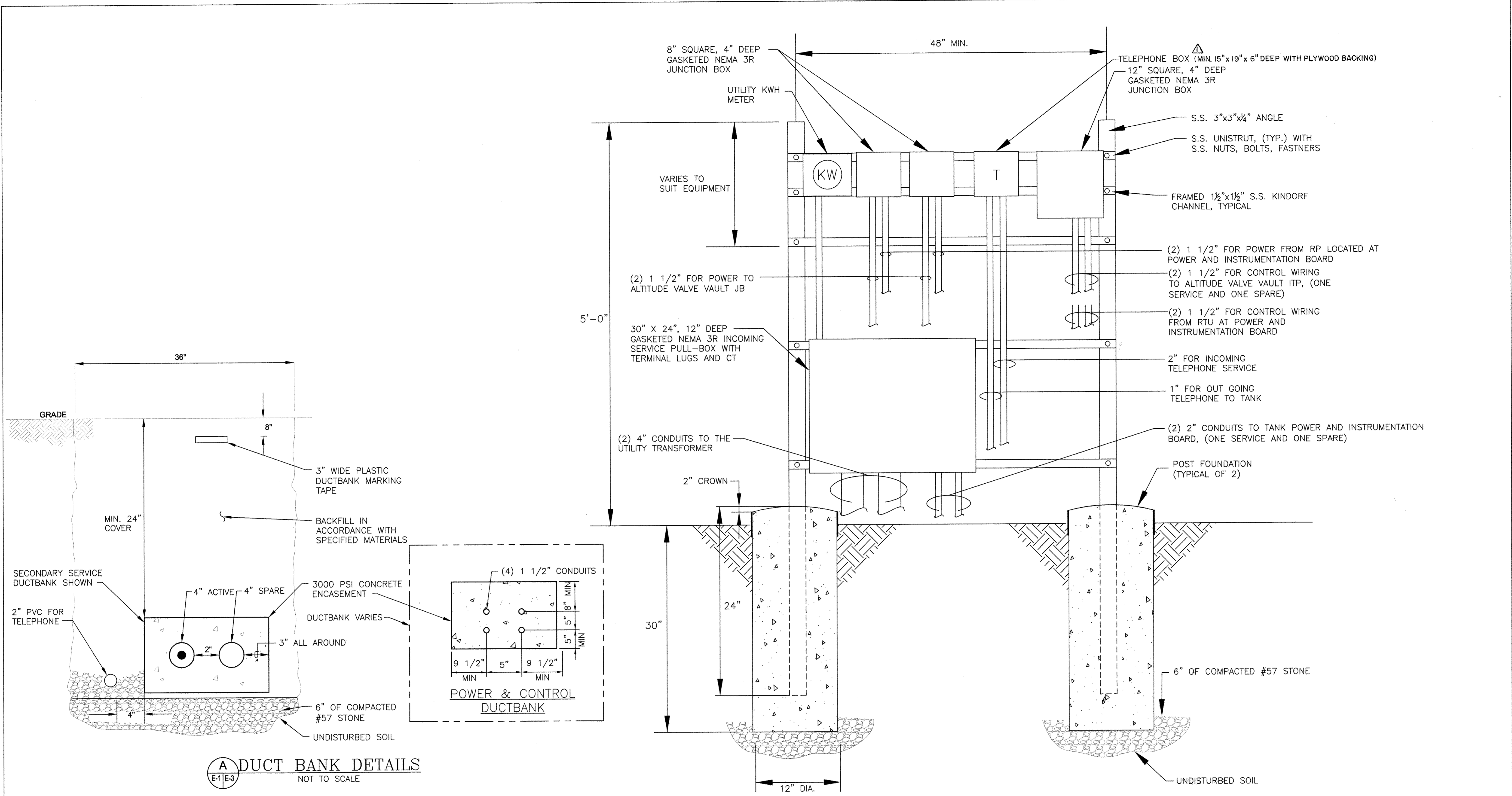
**FULTON ELEVATED WATER TANK**

CAPITAL PROJECT No. W8280  
CONTRACT No. 44-4517

ELECTION DISTRICT NO.5 HOWARD COUNTY, MARYLAND

E-2  
SCALE AS SHOWN  
CONTRACT SHEET  
17 OF 22

Apr 20, 2008 - 9:46am User: kaci.jackson  
 M:\2007\01070460\Drawings\ELEVATED TANK-2\09-16-08\E-3 ELECTRICAL DETAILS.dwg



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DATE 1/4/2012

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CHIEF, BUREAU OF UTILITIES DATE

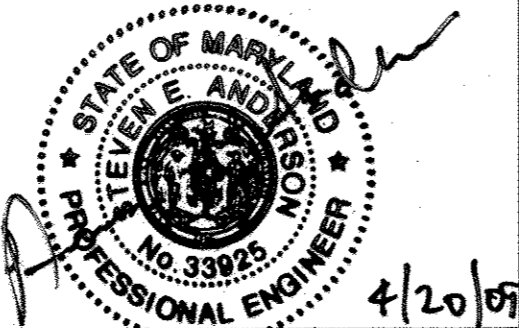
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**ELECTRICAL DETAILS**

600' SCALE MAP NO. 46 BLOCK NO. 4

**FULTON ELEVATED WATER TANK**

CAPITAL PROJECT No. W8280  
CONTRACT No. 44-4517

ELECTION DISTRICT NO.5 HOWARD COUNTY, MARYLAND

SCALE AS SHOWN  
CONTRACT SHEET 18 OF 22

**PROCESS & INSTRUMENTATION SYMBOLS**

- FIELD-MOUNTED DEVICE
- PANEL-MOUNTED DEVICE
- INDICATING LAMP - X INDICATES LENS COLOR:  
R = RED G = GREEN  
W = WHITE A = AMBER
- RTU INPUT/OUTPUT
- CONTROLLER DISPLAY
- SCADA INPUT/OUTPUT
- ANALOG INPUT
- ANALOG OUTPUT
- DIGITAL INPUT
- DIGITAL OUTPUT
- ABC - LETTERS INDICATE FUNCTION ACCORDING TO IDENTIFICATION ASSOCIATED WITH ISA SCHEDULE.  
123 - DIGITS INDICATE SEQUENTIAL EQUIPMENT
- ELECTRICAL SERVICE
- PROCESS FLOW
- ELECTRICAL SIGNAL
- JUNCTION BOX
- SIGNAL BOOSTER/ISOLATOR
- PANEL JUNCTION

**HAND SWITCHES**

- XXX SELECTOR SWITCH OR PUSH BUTTON (MAINTAINED CONTACTS)
  - XXX SPRING RETURN SWITCH OR PUSH BUTTON (MOMENTARY CONTACTS)
  - XXX HAND CONTROL STATION (SPEED OR POSITION)
- MODIFIER (XXX) DESCRIPTIONS**
- ACK = ACKNOWLEDGE PUSHBUTTON
  - CL = CLOSE (PUSH BUTTON)
  - ES = EMERGENCY STOP (PUSHBUTTON)
  - HOA = HAND-OFF-AUTOMATIC (SELECTOR SWITCH)
  - LR = LOCAL/REMOTE (SELECTOR SWITCH)
  - LOR = LOCAL-OFF-REMOTE (SELECTOR SWITCH)
  - MA = MANUAL/AUTOMATIC (SELECTOR SWITCH)
  - RST = RESET
  - VOB = VFD - OFF - BYPASS (SELECTOR SWITCH)

**ECD SYMBOLS**

- CIRCUIT BREAKER
- DISCONNECT SWITCH
- LIMIT SWITCH - NORMALLY OPEN
- CONTACTS - NORMALLY OPEN
- CONTACTS - NORMALLY CLOSED
- PUSH BUTTON - MOMENTARY CONTACT
- PUSHBUTTON - MOMENTARY CONTACT START/STOP
- PUSH-PULL BUTTON - MAINTAINED CONTACT
- START-STOP PUSHBUTTON - MAINTAINED CONTACT
- FLOAT SWITCH - NORMALLY OPEN, CLOSE ON LEVEL RISE
- FLOAT SWITCH - NORMALLY OPEN, CLOSE ON LEVEL DROP
- THERMOSTAT, NORMALLY CLOSED
- OVERCURRENT ELEMENT THERMOSTAT
- LIMIT SWITCH
- PRESSURE SWITCH - N.O. - CLOSING ON PRESSURE RISE
- PRESSURE SWITCH - N.O. - CLOSING ON PRESSURE DROP
- INCOMING LINE  
OUTGOING LINE
- HAND-OFF AUTOMATIC SWITCH
- PLC OUTPUT
- FUSE
- PUSH TO TEST (TRANSFORMER TYPE) INDICATING LAMP - X INDICATES LENS COLOR:  
R = RED (RUN) B = BLUE (POSITION)  
G = GREEN (STOP) Y = YELLOW (POSITION)  
W = WHITE (POWER) A = AMBER (ALARM)
- CONTROL RELAY (SEQUENTIAL)
- TIMER  
NOTC NCTO
- STARTER OR CONTACT COIL - DESIGNATION AS INDICATED
- RUN TIME METER (ETM)

**EQUIPMENT SYMBOLS**

- GROUND
- CONTROL TRANSFORMER
- MOTOR
- CENTRIFUGAL PUMP
- CONTROL FLOAT
- TERMINAL ENCLOSURE OR J - JUNCTION
- GATE VALVE
- ALTITUDE VALVE
- SWING CHECK VALVE
- HEAT TRACE

**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
C	COMMUNICATIONS			CONTROL	
D	DENSITY	DIFFERENTIAL		OPEN OR START	
E	VOLTAGE (EMF)		PRIMARY ELEMENT	SENSOR	
F	FLOW RATE	RATIO	FAIL	FAIL	FAIL
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
S	SPEED OR FREQUENCY	SUM	SWITCH	SWITCH	STOP
T	TEMPERATURE			TRANSMIT	MULTIFUNCTION
U	MULTIVARIABLE		MULTIFUNCTION	MULTIFUNCTION	VFD/VALVE
V	VARIABLE OR VISCOSITY			VALVE OR DAMPER	
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	

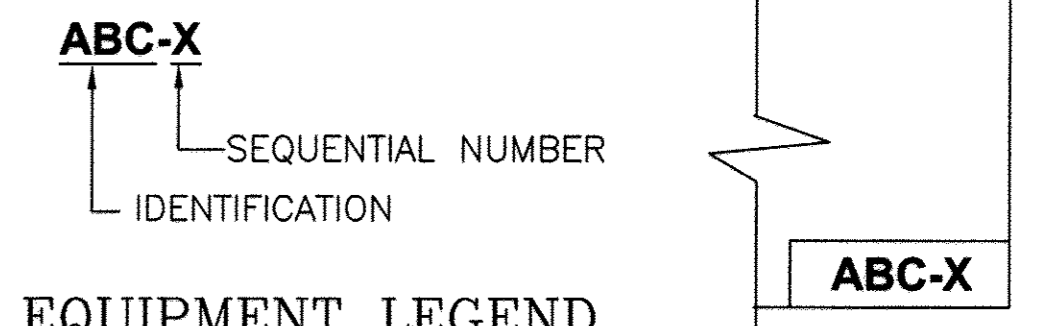
**INSTRUMENT, EXAMPLES**

- FIT = FLOW INDICATING TRANSMITTER
- PIT = PRESSURE INDICATING TRANSMITTER
- ZS = POSITION SWITCH

**GENERAL ABBREVIATIONS**

- AUTO= AUTOMATIC
- CB = CIRCUIT BREAKER
- DPDT= DOUBLE POLE-DOUBLE THROW
- ECD = ELECTRICAL CONTROL DIAGRAM
- ETM = ELAPSED TIME METER
- GND = GROUND
- HOA = HAND-OFF-AUTOMATIC
- HT = HEAT TRACE
- I/O = INPUT/OUTPUT
- MB = MAIN BREAKER
- PM = PHASE MONITOR
- SF = SUPPLY FAN
- TEMP= TEMPERATURE
- TPS = TWISTED PAIR SHIELDED
- TVSS= TRANSIENT VOLTAGE SURGE SUPPRESSION
- TYP = TYPICAL
- VAC = VOLTS/ALTERNATING CURRENT
- XFMR= TRANSFORMER

**P & I LEGEND**



**EQUIPMENT LEGEND**

- ABC-X  
↑ SEQUENTIAL NUMBER  
└ IDENTIFICATION
- ATS - AUTOMATIC TRANSFER SWITCH
- AVCP - ALTITUDE VALVE CONTROL PANEL
- CCU - CENTRAL CONTROL UNIT
- ITP - INSTRUMENTATION TERMINATION PANEL
- PCP - PUMP CONTROL PANEL
- RTU - REMOTE TELEMETRY UNIT
- SF - SUPPLY FAN
- VCP - VENTILATION CONTROL PANEL
- VFD - VARIABLE FREQUENCY DRIVE
- LSH - LEVEL SWITCH HIGH

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*John R. ...* 4/22/09  
DIRECTOR OF PUBLIC WORKS DATE

*Paul H. ...* 4/21/09  
CHIEF, BUREAU OF ENGINEERING DATE

*...* 4/21/09  
CHIEF, UTILITY DESIGN DIVISION DATE

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STATE OF MARYLAND  
PROFESSIONAL ENGINEER  
No. 33925  
4/20/09

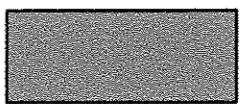





DES: SEA					
DRN: LFN					
CHK: JRK					
DATE: 3/20/09	LFN	AS BUILT	1/4/12		
BY NO.					
		REVISION	DATE		

**INSTRUMENTATION AND CONTROLS LEGEND AND SYMBOLS**

**AS-BUILT**  
DATE 1/4/2012

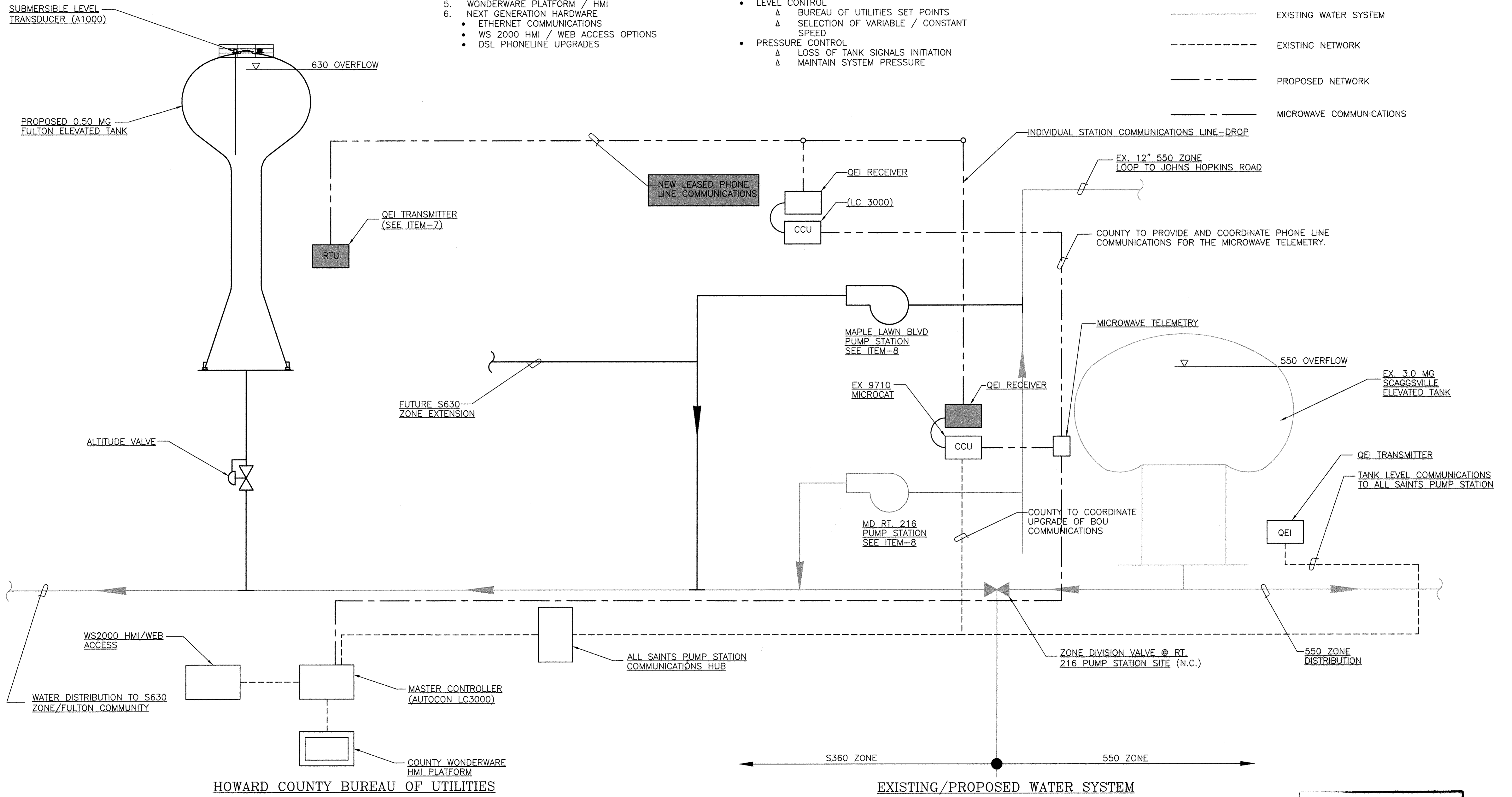
**FULTON ELEVATED WATER TANK**  
CAPITAL PROJECT No. W8280  
CONTRACT No. 44-4517  
ELECTION DISTRICT NO.5 HOWARD COUNTY, MARYLAND

**LEGEND:**

-  CONTRACT SCOPE
-  PROPOSED WATER SYSTEM IMPROVEMENTS
-  EXISTING WATER SYSTEM
-  EXISTING NETWORK
-  PROPOSED NETWORK
-  MICROWAVE COMMUNICATIONS

**SCADA SYSTEM CRITERIA**

1. DEDICATE LEASED PHONE LINES
2. SIEMENS / AUTOCON / US FILTER HARDWARE
3. MICRONET COMMUNICATIONS
4. BUREAU OF UTILITIES AUTOCON LC3000 MASTER
5. WONDERWARE PLATFORM / HMI
6. NEXT GENERATION HARDWARE
  - ETHERNET COMMUNICATIONS
  - WS 2000 HMI / WEB ACCESS OPTIONS
  - DSL PHONELINE UPGRADES
7. FULTON ELEVATED TANK SCADA (QEI)
  - Δ DIRECT COMMUNICATION TO MD ROUTE 216 AND MAPLE LAWN BLVD WATER PUMPING STATIONS
8. STATION CONTROL PROGRAMMING
  - LEVEL CONTROL
    - Δ BUREAU OF UTILITIES SET POINTS
    - Δ SELECTION OF VARIABLE / CONSTANT SPEED
  - PRESSURE CONTROL
    - Δ LOSS OF TANK SIGNALS INITIATION
    - Δ MAINTAIN SYSTEM PRESSURE



**AS-BUILT**  
DATE 1/4/2012

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 01/15/11

Apr 20, 2009 - 9:46am User: kevin.jackson M:\2007\01\07\080\Drawings\ELEVATED TANK-2\1-2 SCADA SYSTEM COM.dwg

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

*[Signature]* 4/22/05  
DIRECTOR OF PUBLIC WORKS DATE

*[Signature]* 4/22/05  
CHIEF, BUREAU OF UTILITIES DATE

*[Signature]* 4/21/09  
CHIEF, BUREAU OF ENGINEERING DATE

*[Signature]* 4-21-09  
CHIEF/UTILITY DESIGN DIVISION DATE

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DATE: 3/20/09	LFN	AS BUILT	1/4/12	
BY NO.				
		REVISION	DATE	

**SCADA COMMUNICATIONS DIAGRAM**

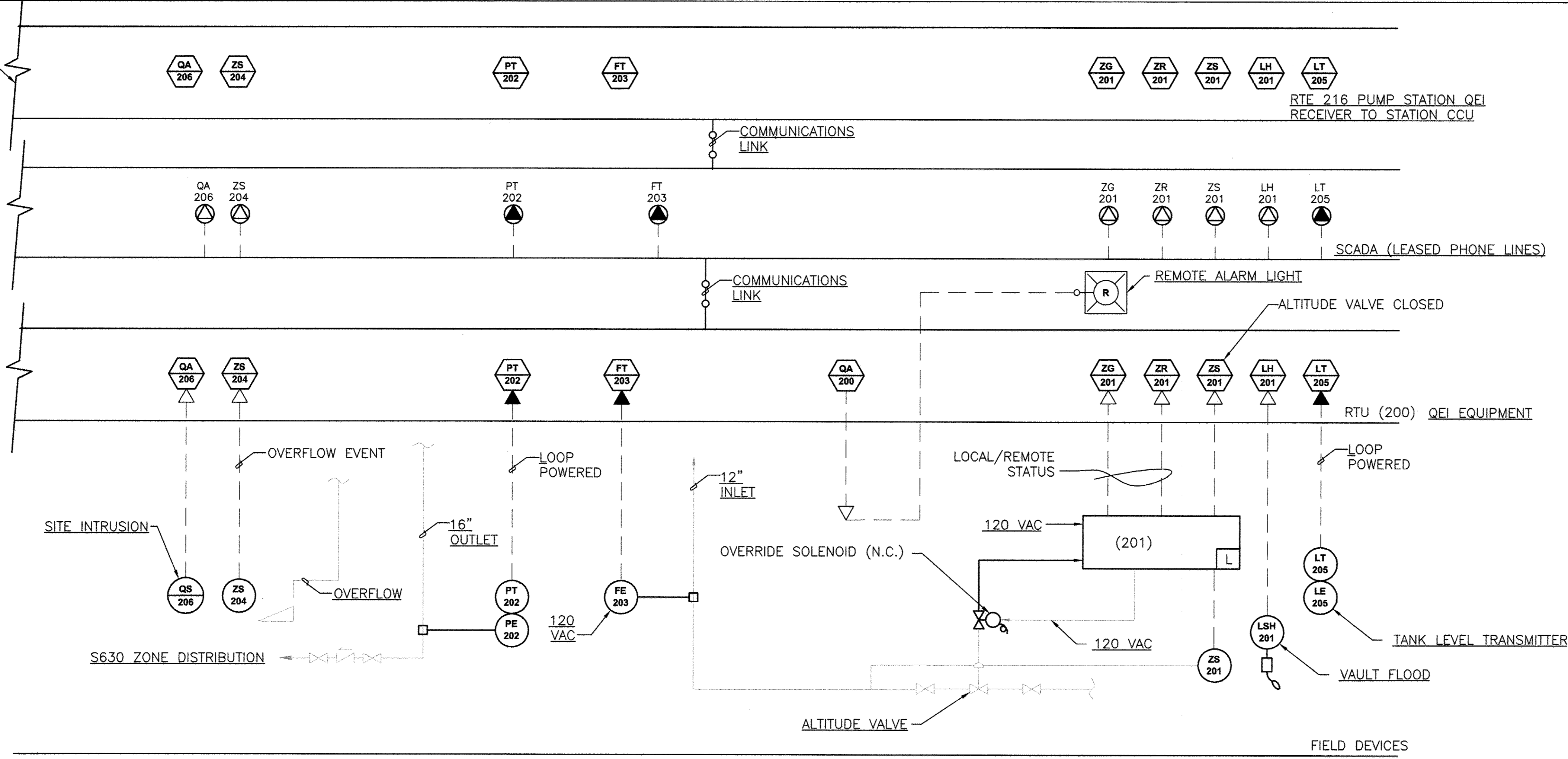
600' SCALE MAP NO. 46 BLOCK NO. 4

**FULTON ELEVATED WATER TANK**

CAPITAL PROJECT No. W8280  
CONTRACT No. 44-4517

ELECTION DISTRICT NO.5 HOWARD COUNTY, MARYLAND

SEE SHEET I-4



**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 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.
4. ALL CONDUIT SHALL BE 3/4-INCH IN SIZE UNLESS OTHERWISE NOTED ON INSTRUMENT RISER DIAGRAMS.
5. SYSTEMS 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. CONTRACTOR COORDINATE SWITCH TYPE AND KEYED-ENTRANCE DEVICE WITH HOWARD COUNTY DPW.

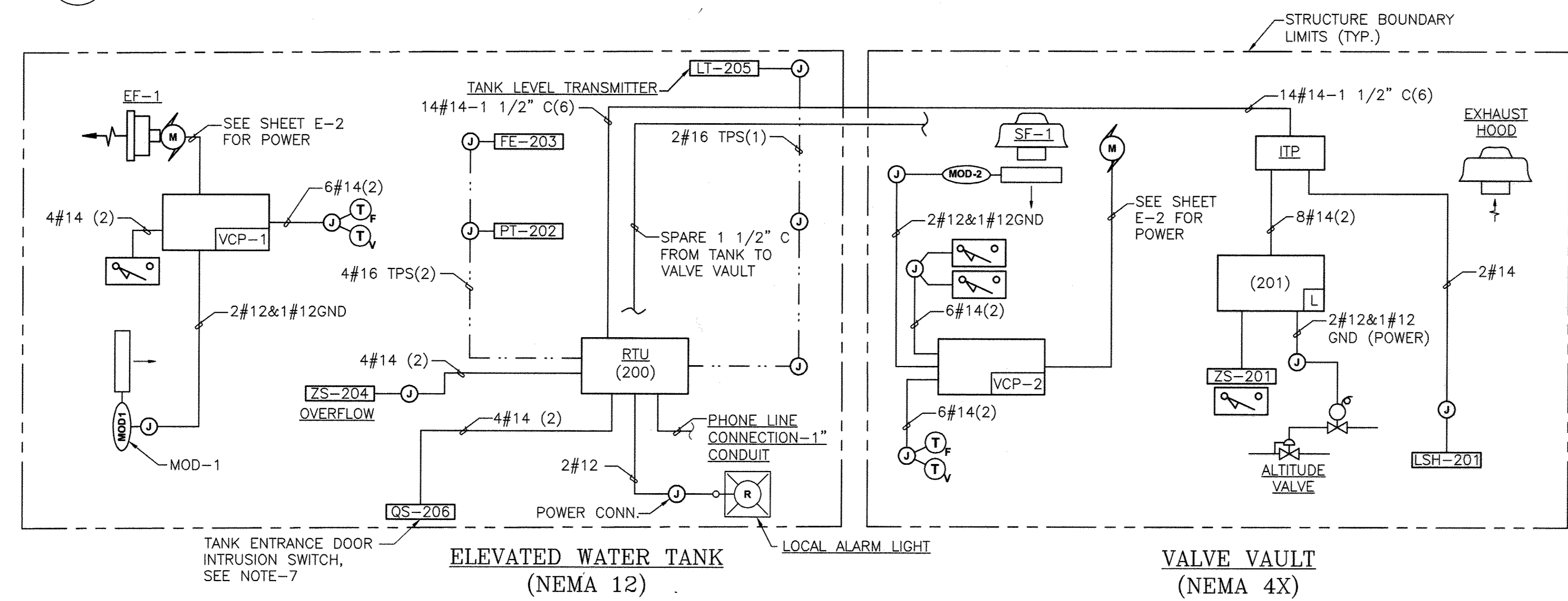
**CONDUIT LEGEND**

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:**

- EXISTING FEATURES
- PROPOSED FEATURES
- ELECTRICAL SIGNAL
- ANALOG SIGNAL CONDUIT

**1 PROCESS AND INSTRUMENTATION DIAGRAM**  
I-3



**P & I LEGEND**

- 201 - ALTITUDE VALVE
- 202 - TANK LEVEL PRESSURE TRANSMITTER
- 203 - FLOW METER
- 204 - OVERFLOW EVENT SWITCH
- 205 - TANK LEVEL CAPACITANCE TRANSMITTER
- 206 - INTRUSION EVENT SWITCH

**RTU I/O**

- 6 - DI
- 1 - DO
- 3 - AI

**2 INSTRUMENTATION RISER DIAGRAM**  
I-3 (SEE NOTE-4)

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. 33929. Expiration Date 01/15/11

**AS-BUILT**  
DATE 1/4/2012

User: karen.jackson Date: 4/22/09 File: I:\2009\01\09\04\05\06\07\08\09\10\11\12\13\14\15\16\17\18\19\20\21\22\23\24\25\26\27\28\29\30\31\32\33\34\35\36\37\38\39\40\41\42\43\44\45\46\47\48\49\50\51\52\53\54\55\56\57\58\59\60\61\62\63\64\65\66\67\68\69\70\71\72\73\74\75\76\77\78\79\80\81\82\83\84\85\86\87\88\89\90\91\92\93\94\95\96\97\98\99\100\101\102\103\104\105\106\107\108\109\110\111\112\113\114\115\116\117\118\119\120\121\122\123\124\125\126\127\128\129\130\131\132\133\134\135\136\137\138\139\140\141\142\143\144\145\146\147\148\149\150\151\152\153\154\155\156\157\158\159\160\161\162\163\164\165\166\167\168\169\170\171\172\173\174\175\176\177\178\179\180\181\182\183\184\185\186\187\188\189\190\191\192\193\194\195\196\197\198\199\200\201\202\203\204\205\206\207\208\209\210\211\212\213\214\215\216\217\218\219\220\221\222\223\224\225\226\227\228\229\230\231\232\233\234\235\236\237\238\239\240\241\242\243\244\245\246\247\248\249\250\251\252\253\254\255\256\257\258\259\260\261\262\263\264\265\266\267\268\269\270\271\272\273\274\275\276\277\278\279\280\281\282\283\284\285\286\287\288\289\290\291\292\293\294\295\296\297\298\299\300\301\302\303\304\305\306\307\308\309\310\311\312\313\314\315\316\317\318\319\320\321\322\323\324\325\326\327\328\329\330\331\332\333\334\335\336\337\338\339\340\341\342\343\344\345\346\347\348\349\350\351\352\353\354\355\356\357\358\359\360\361\362\363\364\365\366\367\368\369\370\371\372\373\374\375\376\377\378\379\380\381\382\383\384\385\386\387\388\389\390\391\392\393\394\395\396\397\398\399\400\401\402\403\404\405\406\407\408\409\410\411\412\413\414\415\416\417\418\419\420\421\422\423\424\425\426\427\428\429\430\431\432\433\434\435\436\437\438\439\440\441\442\443\444\445\446\447\448\449\450\451\452\453\454\455\456\457\458\459\460\461\462\463\464\465\466\467\468\469\470\471\472\473\474\475\476\477\478\479\480\481\482\483\484\485\486\487\488\489\490\491\492\493\494\495\496\497\498\499\500\501\502\503\504\505\506\507\508\509\510\511\512\513\514\515\516\517\518\519\520\521\522\523\524\525\526\527\528\529\530\531\532\533\534\535\536\537\538\539\540\541\542\543\544\545\546\547\548\549\550\551\552\553\554\555\556\557\558\559\560\561\562\563\564\565\566\567\568\569\570\571\572\573\574\575\576\577\578\579\580\581\582\583\584\585\586\587\588\589\590\591\592\593\594\595\596\597\598\599\600\601\602\603\604\605\606\607\608\609\610\611\612\613\614\615\616\617\618\619\620\621\622\623\624\625\626\627\628\629\630\631\632\633\634\635\636\637\638\639\640\641\642\643\644\645\646\647\648\649\650\651\652\653\654\655\656\657\658\659\660\661\662\663\664\665\666\667\668\669\670\671\672\673\674\675\676\677\678\679\680\681\682\683\684\685\686\687\688\689\690\691\692\693\694\695\696\697\698\699\700\701\702\703\704\705\706\707\708\709\710\711\712\713\714\715\716\717\718\719\720\721\722\723\724\725\726\727\728\729\730\731\732\733\734\735\736\737\738\739\740\741\742\743\744\745\746\747\748\749\750\751\752\753\754\755\756\757\758\759\760\761\762\763\764\765\766\767\768\769\770\771\772\773\774\775\776\777\778\779\780\781\782\783\784\785\786\787\788\789\790\791\792\793\794\795\796\797\798\799\800\801\802\803\804\805\806\807\808\809\810\811\812\813\814\815\816\817\818\819\820\821\822\823\824\825\826\827\828\829\830\831\832\833\834\835\836\837\838\839\840\841\842\843\844\845\846\847\848\849\850\851\852\853\854\855\856\857\858\859\860\861\862\863\864\865\866\867\868\869\870\871\872\873\874\875\876\877\878\879\880\881\882\883\884\885\886\887\888\889\890\891\892\893\894\895\896\897\898\899\900\901\902\903\904\905\906\907\908\909\910\911\912\913\914\915\916\917\918\919\920\921\922\923\924\925\926\927\928\929\930\931\932\933\934\935\936\937\938\939\940\941\942\943\944\945\946\947\948\949\950\951\952\953\954\955\956\957\958\959\960\961\962\963\964\965\966\967\968\969\970\971\972\973\974\975\976\977\978\979\980\981\982\983\984\985\986\987\988\989\990\991\992\993\994\995\996\997\998\999\1000

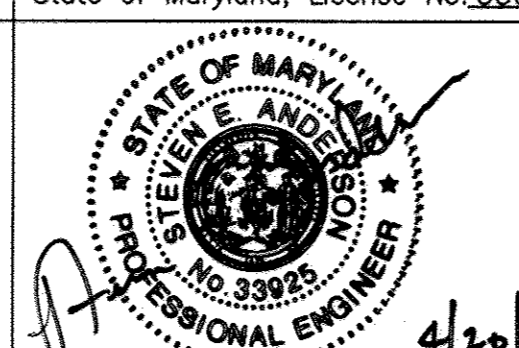
DEPARTMENT OF PUBLIC WORKS  
 HOWARD COUNTY, MARYLAND

4/22/09  
 DATE  
 CHIEF, BUREAU OF UTILITIES

4/21/09  
 DATE  
 CHIEF, UTILITY DESIGN DIVISION

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DRN: LFN			
CHK: JRK			
DATE: 3/20/09	LFN	AS BUILT	1/4/12
BY NO.		REVISION	DATE

**PROCESS AND INSTRUMENTATION  
 DIAGRAM, RISER DIAGRAM AND  
 DETAILS**

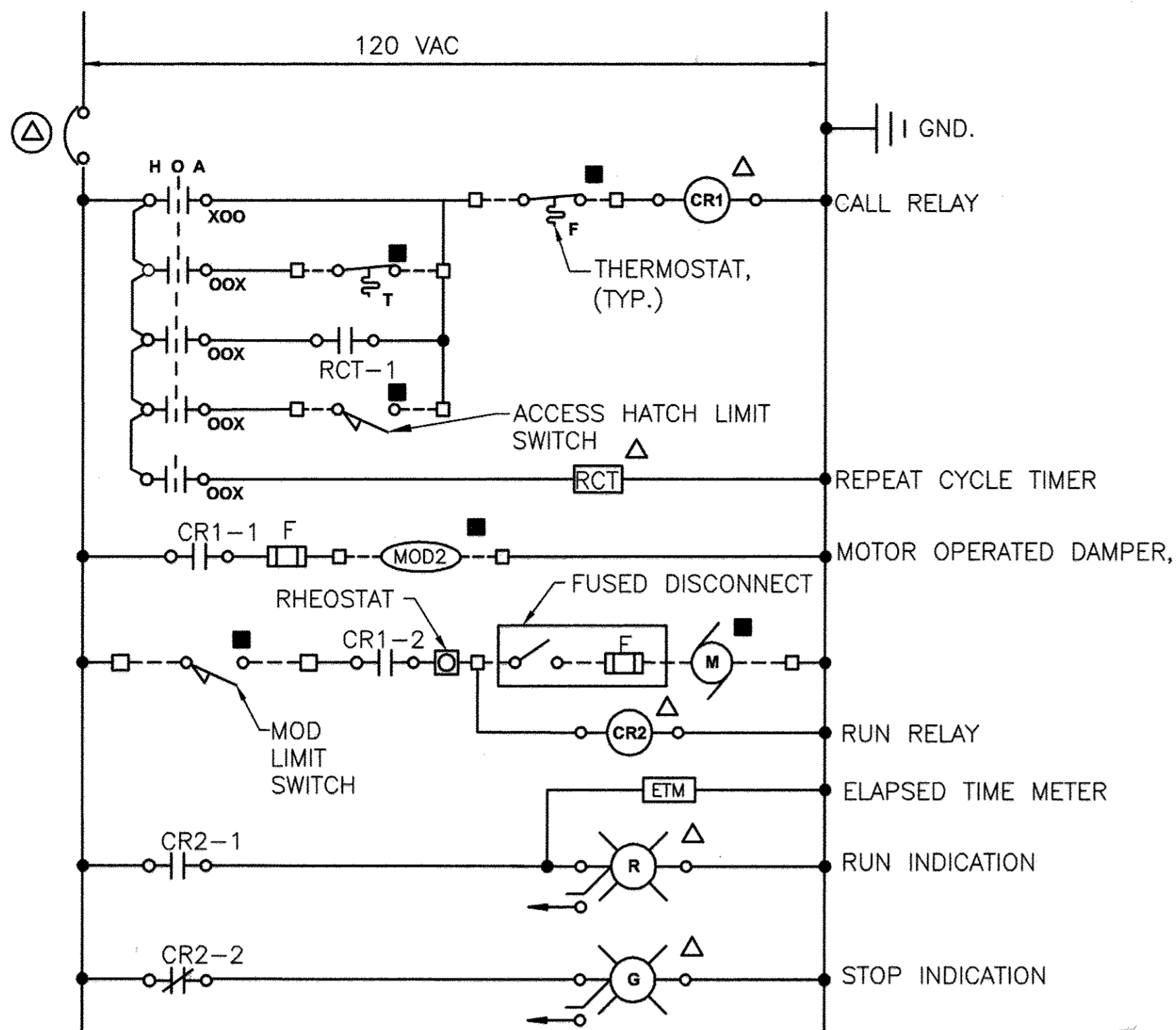
600' SCALE MAP NO. 46 BLOCK NO. 4

**FULTON ELEVATED WATER TANK**

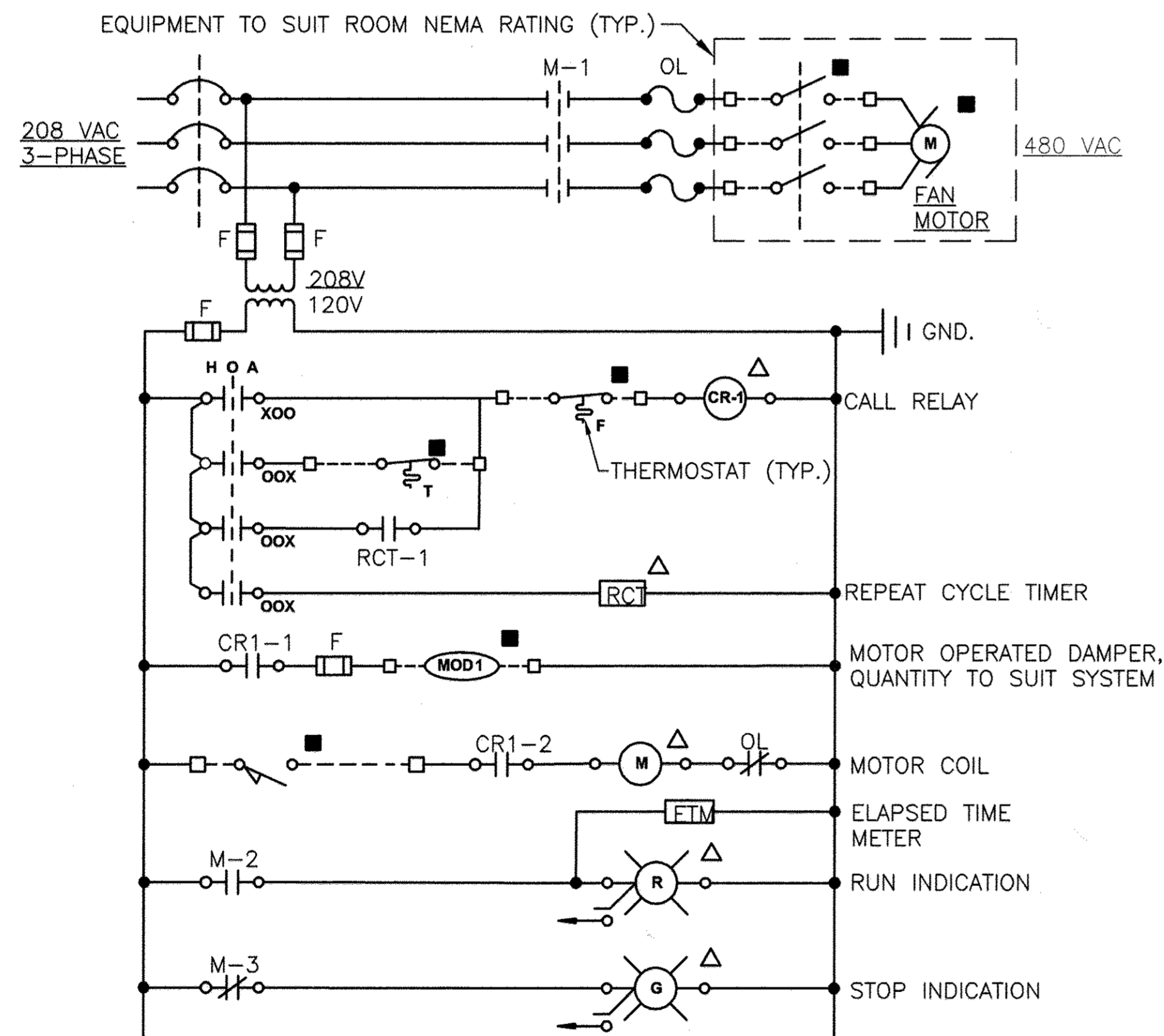
CAPITAL PROJECT No. W8280  
 CONTRACT No. 44-4517

ELECTION DISTRICT NO.5 HOWARD COUNTY, MARYLAND

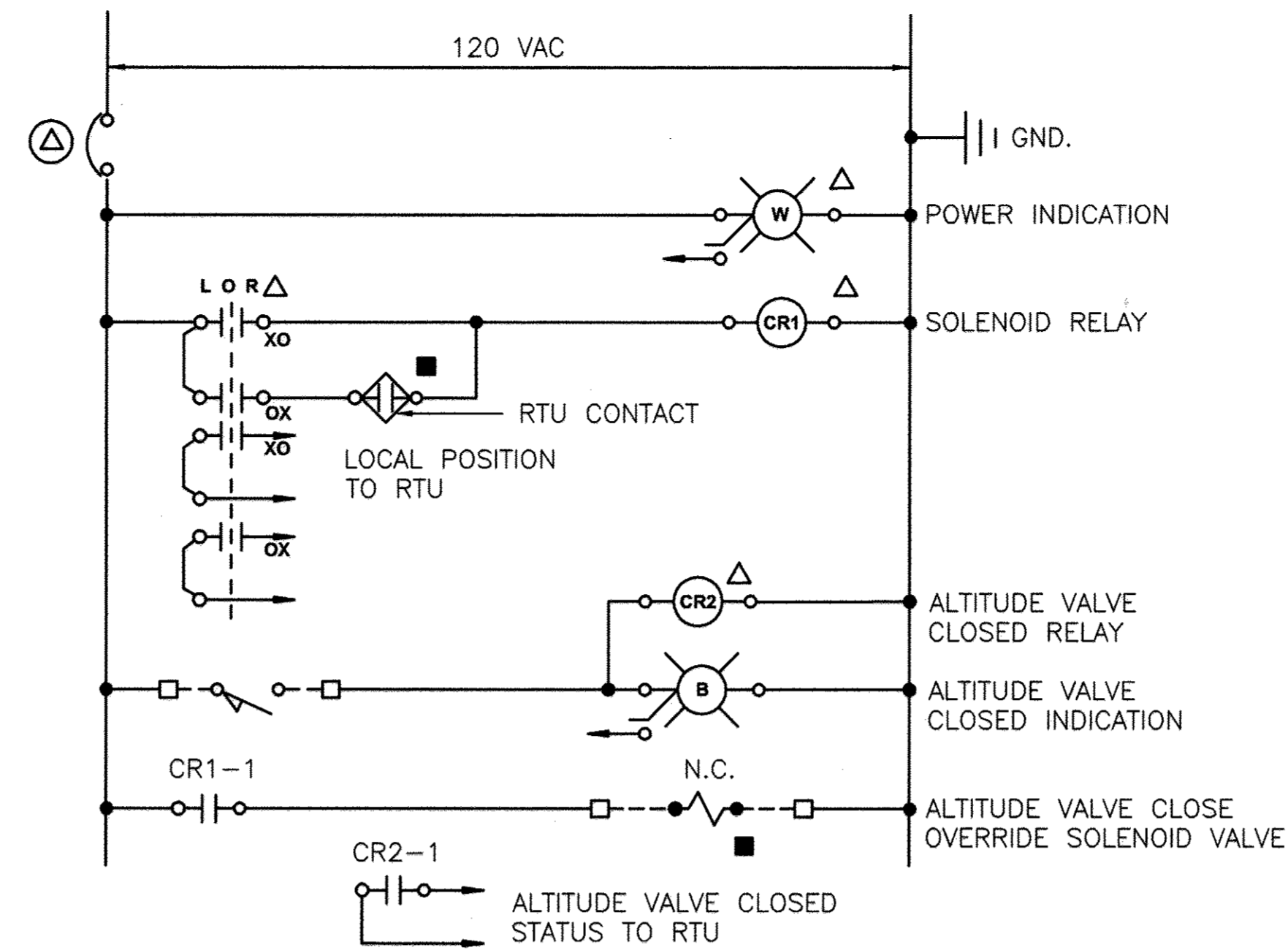
I-3  
 SCALE AS SHOWN  
 CONTRACT SHEET  
 21 OF 22



**1 SUPPLY FAN (SF-1) ECD**  
(VALVE VAULT VCP-2)



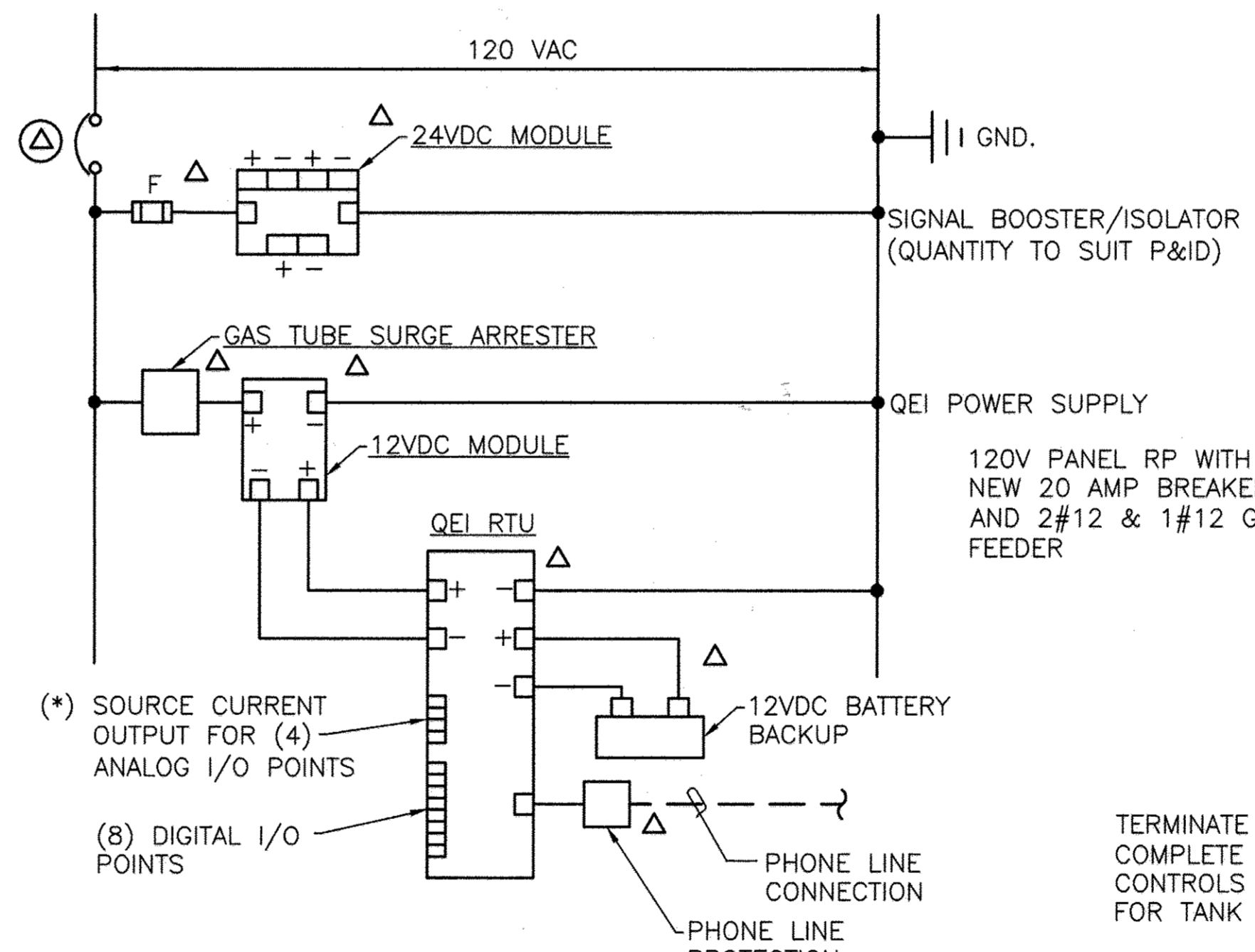
**2 EXHAUST FAN (EF-1) ECD**  
(TANK BASE VCP-1)



**3 ALTITUDE VALVE CONTROL PANEL**

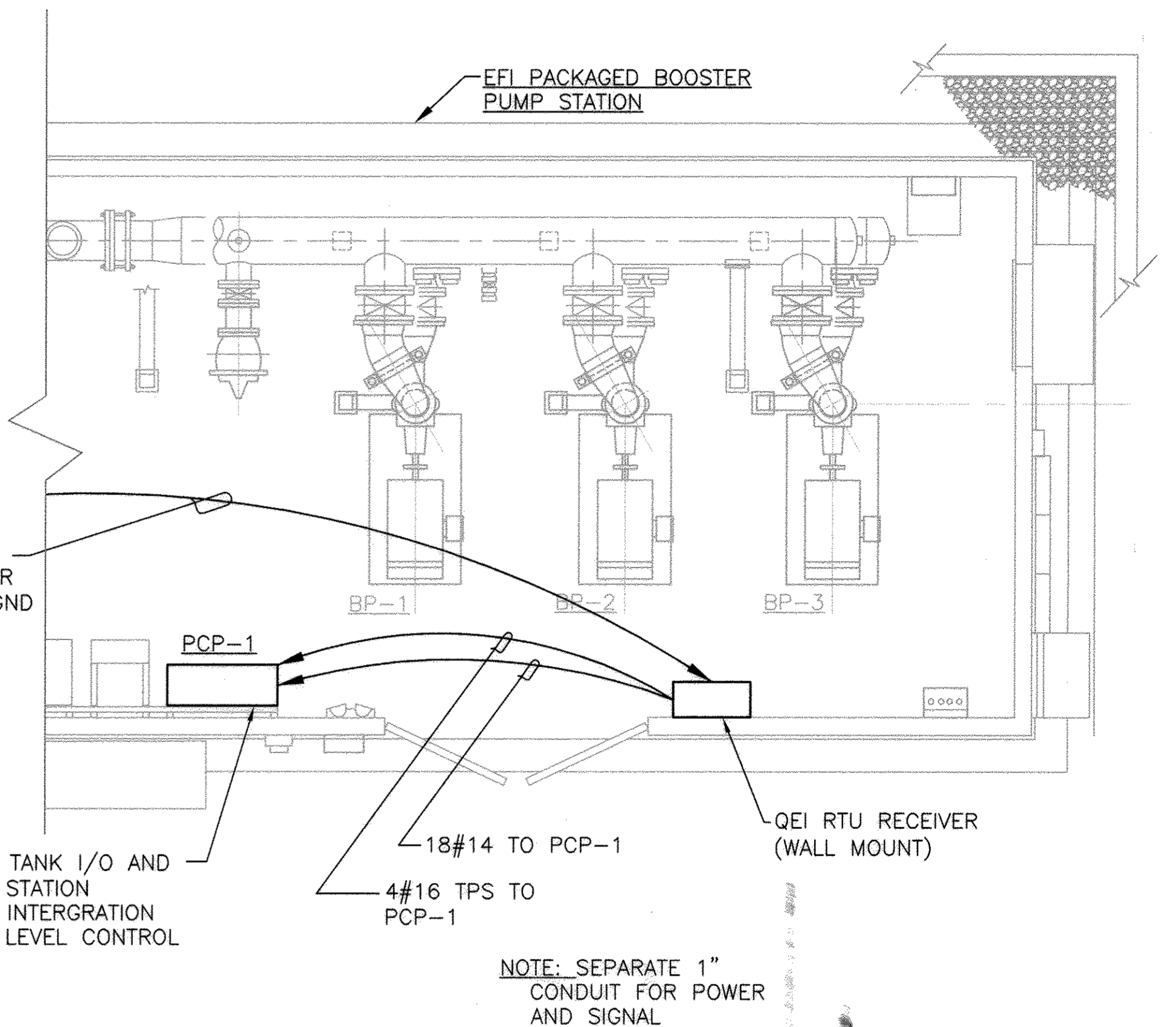
- DEVICE LEGEND**
- LOCATED REMOTE OR AT MOTOR
  - ⊙ LOCATED AT PANELBOARD
  - △ LOCATED IN CONTROL PANEL

- TERMINALS**
- REMOTE / MOTOR TERMINATION
  - PANEL WIREWAY TERMINATION
  - PANEL CONNECTIONS
  - REMOTE CONNECTIONS



**4 RTU DIAGRAM**

QEI EQUIPMENT:  
1-TANK TRANSMITTER RTU  
1-RTE 216 PUMP STATION RECEIVER RTU



**5 RTE 216 PUMP STATION**  
**RTU RECEIVER**  
NOT TO SCALE

**AS-BUILT**  
DATE 1/4/2012

Apr. 20, 2009 - 9:46am User: kevin.jackson M:\2007\01070490\Drawings\ELEVATED TANK-2\1-4 CONTROL DIAGRAMS AND DETAILS.dwg

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

4/21/09  
4/21/09

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BY NO.			
		REVISION	DATE

CONTROL DIAGRAMS AND DETAILS

600' SCALE MAP NO. 46 BLOCK NO. 4

FULTON ELEVATED WATER TANK

CAPITAL PROJECT No. W8280  
CONTRACT No. 44-4517

ELECTION DISTRICT NO.5 HOWARD COUNTY, MARYLAND

I-4

SCALE AS SHOWN

CONTRACT SHEET

22 OF 22