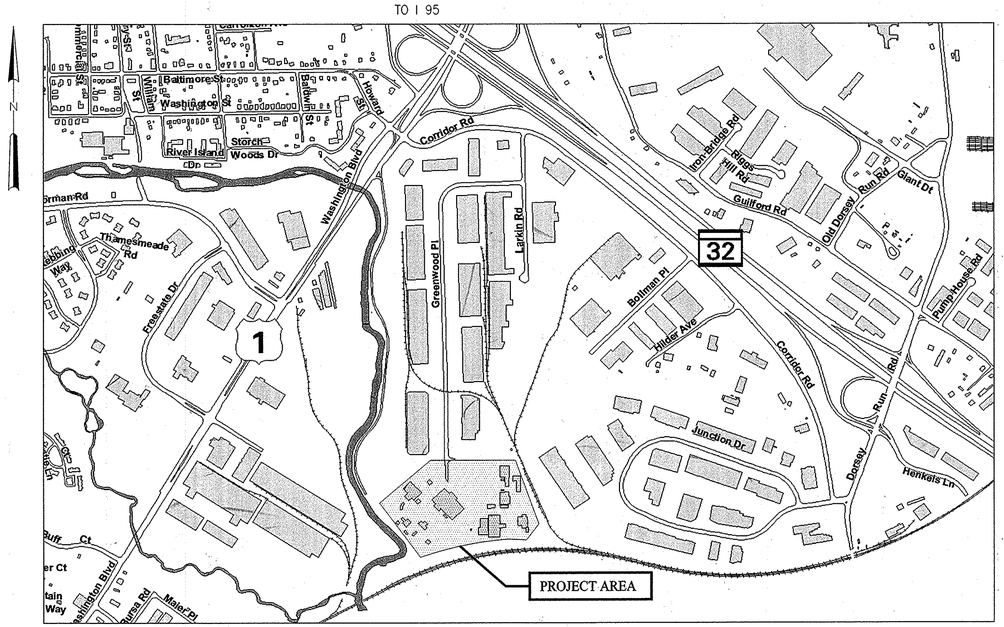
HOWARD COUNTY, MARYLAND
LITTLE PATUXENT WATER RECLAMATION PLANT
GENERATOR/SWITCHGEAR INSTALLATION CONTRACT



CAPITAL PROJECT NO. S-6264

CONTRACT NO. 20-4832

HAZEN AND SAWYER
Environmental Engineers & Scientists
ONE SOUTH STREET, BALTIMORE, MD 21202

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS	1/30/14 DATE	CHIEF BUREAU OF ENGINEERING	1/29/14 DATE
CHIEF BUREAU OF UTILITIES	1.28.14 DATE	CHIEF UTILITY DESIGN DIVISON	1/29/14 DATE

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. 22307 EXPIRATION DATE 4/9/15
SIGNED:

STATE OF MARYLAND — 22307 — REGISTERED PROFESSIONAL ENGINEER — 1/29/14

STATE OF MARYLAND — DAVID A. ARKIN — 25571 — REGISTERED PROFESSIONAL ENGINEER — 1/24/14

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. 25571 EXPIRATION DATE 6/4/14
SIGNED:

AS-BUILT 4/2016

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ABBREVIATIONS

AB	ANCHOR BOLT
AC	ALTERNATING CURRENT/ ASBESTOS CEMENT
ACT	ACOUSTIC TILE
AD	AREA DRAIN
ADJ	ADJUSTABLE
AFF	ABOVE FINISHED FLOOR
AGGR	AGGREGATE
AL	ALUMINUM
ALLOW	ALLOWANCE/ALLOWABLE
ALT	ALTERNATE
APPROX	APPROXIMATE
ARCH	ARCHITECTURAL
ASB	ASBESTOS
ASPH	ASPHALT
AT	ASPHALT TILE
B	BORING
BD	BOARD
BFE	BOTTOM OF FITTING ELEV
BFV	BUTTERFLY VALVE
BITUM	BITUMINOUS
B	BASELINE
BL	BUILDING LINE
BLDG	BUILDING
BLK	BLOCK
BM	BENCH MARK
BOC	BACK OF CURB
BOT	BOTTOM
BRG	BEARING
BRK	BRICK
BRZ	BRONZE
BSMT	BASEMENT
BT	BOLT
BUR	BUILT-UP ROOFING
BV	BALL VALVE
C	CLOSET/CARPET/CHANNEL
CAB	CABINET
CB	CATCH BASIN
C/C	CENTER TO CENTER
CE	CONSTRUCTION EASEMENT
CEM	CEMENT
CER	CERAMIC
CF	CUBIC FEET
CFM	CUBIC FEET PER MINUTE
CI	CAST IRON/CUBIC INCHES
CIP	CAST IRON PIPE
℄	CENTER LINE
CL~~2	CHLORINE
CLG	CEILING
CLKG	CAULKING
CLR	CLEAR
CMP	CORRUGATED METAL PIPE
CMU	CONCRETE MASONRY UNIT
CO	CLEANOUT
COL	COLUMN
CONC	CONCRETE
CONST	CONSTRUCTION
CONT	CONTINUOUS
CONTR	CONTRACTOR
CORP	CORPORATION
CORR	CORRIDOR
CP	CONCRETE PLANK
CRS	COURSE
CT	CERAMIC TILE
CTJ	CONTROL JOINT
CU	COPPER
CV	CHECK VALVE
CW	COLD WATER
CY	CUBIC YARD
DC	DIRECT CURRENT
DET	DETAIL
DF	DRINKING FOUNTAIN
DIA (ø)	DIAMETER
DIAG	DIAGONAL
DIM	DIMENSION
DIP	DUCTILE IRON PIPE
DISCH	DISCHARGE
DIST	DISTRIBUTION
DJ	DOUBLE JOIST
DL	DEAD LOAD
DN	DOWN
DOZ	DOZEN
DR	DOOR
DWG	DRAWING
DWL	DOWEL
E	EAST/EASEMENT
E&SC	EROSION AND SEDIMENT CONTROL
EA	EACH
ECC	ECCENTRIC
EF	EACH FACE
EFF	EFFLUENT
EIP	EXIST IRON PIPE
EL	ELEVATION
ELEC	ELECTRIC/ELECTRICAL
ELL	ELBOW
ENGR	ENGINEER
ENT	ENTRANCE
EOG	EDGE OF GRAVEL
EOP	EDGE OF PAVEMENT
EQ	EQUAL
EQPT	EQUIPMENT
EW	EACH WAY
EX	EXISTING
EXC	EXCAVATE
EXH	EXHAUST
EXP	EXPANSION
EXT	EXTERIOR
FAB	FABRICATE
F&C	FRAME AND COVER
F&G	FRAME AND GRATE
FC	FLUSHING CONNECTION
FD	FLOOR DRAIN
FDN	FOUNDATION
FE	FIRE EXTINGUISHER
FF	FINISH FLOOR
FH	FIRE HYDRANT
FIN	FINISH
FIX	FIXTURE
FL	FLASHING/FLOOR
FLEX	FLEXIBLE
FLG	FLANGE
FLUOR	FLUORESCENT
FLXC	FLEXIBLE CONNECTION
FM	FORCE MAIN
FPRF	FIREPROOF
FRP	FIBERGLASS REINFORCED POLYESTER LAMINATE
FT	FEET
FTG	FOOTING/FITTING
FURR	FURRING/FURRED
G	GAS/GAS LINE
GA	GAUGE
GAL	GALLON
GALV	GALVANIZED
GC	GENERAL CONTRACTOR
GEN	GENERATOR
GI	GALVANIZED IRON
GL	GLASS
GPM	GALLONS PER MINUTE
GR	GRADE
GV	GATE VALVE
GW	GUY WIRE
GWB	GYPSUM WALL BOARD
GWF	GLAZED WALL FINISH
GYP	GYPSUM
H	HEIGHT
HDW	HARDWARE
HEX	HEXAGONAL
HM	HOLLOW METAL
HORZ	HORIZONTAL
HP	HORSEPOWER
HPT	HIGH POINT
HTR	HEATER
HVAC	HEATING,VENTILATION AND AIR CONDITIONING
HW	HOT WATER
HWL	HIGH WATER LEVEL
HWY	HIGHWAY
HYD	HYDRAULIC
I	IRON
ID	INSIDE DIAMETER
IF	INSIDE FACE
IN	INCH
INCL	INCLUDED
INF	INFLUENT
INS	INSULATION
INT	INTERIOR
INV	INVERT
J	JOIST
JB	JUNCTION BOX
JCT	JUNCTION
JT	JOINT
L	LENGTH/ANGLE
LA	LINE AHEAD
LAB	LABORATORY
LAM	LAMINATED
LAT	LATERAL
LAV	LAVATORY
LB	POUND/LINE BACK
LF	LINEAR FEET
LG	LONG
LL	LIVE LOAD
LLH	LONG LEG HORIZONTAL
LLV	LONG LEG VERTICAL
LP	LIGHT POLE
LPT	LOW POINT
LT	LIGHT
LTG	LIGHTING
LVR	LOUVER
LWL	LOW WATER LEVEL
MAINT	MAINTENANCE
MATL	MATERIAL
MAX	MAXIMUM
MECH	MECHANICAL
MEMB	MEMBRANE
MET	METAL
MFR	MANUFACTURER
MG	MILLION GALLONS
MGD	MILLION GALLONS PER DAY
MH	MANHOLE
MIN	MINIMUM
MISC	MISCELLANEOUS
MJ	MECHANICAL JOINT
MLDG	MOLDING
MO	MASONRY OPENING
MOD	MODIFY/MODIFIED
MON	MONUMENT
MOT	MOTOR
MTD	MOUNTED
MTG	MOUNTING
MULT	MULTIPLE
N	NORTH
NA	NOT APPLICABLE
NF	NEAR FACE
NIC	NOT IN CONTRACT
NO	NUMBER
NOM	NOMINAL
NPW	NON POTABLE WATER
NTS	NOT TO SCALE
OC	ON CENTER
OD	OUTSIDE DIAMETER
OF	OUTSIDE FACE
OFF	OFFICE
OPER	OPERATOR
OPNG	OPENING
OPP	OPPOSITE
ORIG	ORIGINAL
OT	OPEN TRUSS
OVHD	OVERHEAD
PAR	PARALLEL
PC	POINT OF CURVE/PIECE
PCC	POINT OF COMPOUND CURVE
PCF	POUNDS PER CUBIC FOOT
PE LINING	POLYETHYLENE LINING
PERF	PERFORATED
PERP	PERPENDICULAR
PI	POINT OF INTERSECTION
ℚ	PROPERTY LINE/PLATE
PNL	PANEL
PP	POWER POLE
PREFAB	PREFABRICATED
PRV	PRESSURE RELIEF VALVE
PS	PUMPING STATION
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PT	POINT OF TANGENT/POINT
PTN	PARTITION
PV	PLUG VALVE
PVC	POLYVINYL CHLORIDE
PVMT	PAVEMENT
PW	POTABLE WATER
QTY	QUANTITY
R	RADIUS/RISER
RCP	REINFORCED CONCRETE PIPE
RD	ROAD/ROOF DRAIN
RECIR	RECIRCULATION
RECP	RECEPTACLE
RECT	RECTANGULAR
RED	REDUCER
REF	REFERENCE
REG	REGISTER
REINF	REINFORCING
REM	REMOVE
REQD	REQUIRED
REST	RESTRAINED
REV	REVISE
RF	ROOF
RFG	ROOFING
RJ	RESTRAINED JOINT
RM	ROOM
RND	ROUND
RO	ROUGH OPENING
RPM	REVOLUTIONS PER MINUTE
RR	RAILROAD
RT	RIGHT
RTU	REMOTE TERMINAL UNIT
RW	RAW WATER
R/W	RIGHT OF WAY
S	SOUTH/SLOPE
SAN	SANITARY
SBL	SURVEY BASELINE
SCH	SCHEDULE
SD	STORM/SITE DRAIN
SECT	SECTION
SERV	SERVICE
SEW	SEWER
SF	SQUARE FEET
SHT	SHEET
SI	SQUARE INCH
SIM	SIMILAR
SJ	STEEL JOIST
SPEC	SPECIFICATION
SQ	SQUARE
SS	SANITARY SEWER
SST	STAINLESS STEEL
ST	STREET
STA	STATION
STD	STANDARD
STG	STORAGE
STIR	STIRRUP
STL	STEEL
STR	STRUCTURAL
SUB	SUBSTITUTE
SUP	SUPPLY
SUPT	SUPERINTENDENT
SUR	SURFACE
SUSP	SUSPENDED
SW	SWITCH
SWBD	SWITCHBOARD
SWD	SIDE WATER DEPTH
SYM	SYMMETRICAL
T	TREAD
T&B	TOP AND BOTTOM
T&G	TONGUE AND GROOVE
TAN	TANGENT
TBM	TEMPORARY BENCH MARK
TC	TOP OF CURB
TDH	TOTAL DYNAMIC HEAD
TECH	TECHNICAL
TEL	TELEPHONE
TEMP	TEMPERATURE
TER	TERRAZZO
THERMO	THERMOSTAT
THK	THICK
THRU	THROUGH
TOD	TOP OF DECK
TOF	TOP OF FOOTING
TOM	TOP OF MASONRY/MANHOLE
TOS	TOP OF SLAB
TOW	TOP OF WALL
TOL	TOLERANCE
TPS	TWISTED PAIR SHIELDED
TRANS	TRANSFORMER
TYP	TYPICAL
UG	UNDERGROUND
UH	UNIT HEATER
UNFIN	UNFINISHED
UNO	UNLESS NOTED OTHERWISE
UR	URINAL
UTIL	UTILITY
VAC	VACUUM
VAT	VINYL ASBESTOS TILE
VCP	VITRIFIED CLAY PIPE
VEL	VELOCITY
VENT	VENTILATING/VENTILATION
VERT	VERTICAL
VOL	VOLUME
VP	VENT PIPE
VWC	VINYL WALL COVERING
W	WEST/WIDTH
W/	WITH
WC	WATER CLOSET
WF	WIDE FLANGE
WH	WALL HYDRANT
WI	WROUGHT IRON
WL	WATER LEVEL
W/L	WATER LINE
WO	WINDOW OPENING
W/O	WITHOUT
WP	WATERPROOF
WPFG	WATER PROOFING
WPT	WALL PENETRATING TYPE
WSE	WATER SURFACE ELEVATION
WSP	WEATHERSTRIP
WT	WEIGHT
WV	WATER VALVE
WWF	WELDED WIRE FABRIC
YD	YARD
YR	YEAR

PIPE DESIGNATIONS

A	AIR
ATO	AERATION TANK OVERFLOW
BW	FILTER BACKWASH WATER
BWD	BACKWASH DRAIN
C	CENTRATE
CG	CHLORINE GAS
CLS	CHLORINE SOLUTION
D	DRAIN
DS	DIGESTED SLUDGE
FBP	FILTER BYPASS
FD	FLOOR DRAIN
FE	FILTER EFFLUENT
GR	GRIT
HOCL	HYPOCHLORITE
HS	HEAVY SLUDGE
LD	LAND DISPOSAL
ME	METHANOL
ML	MIXED LIQUOR
NPW	NON-POTABLE WATER
NRCY	NITRIFIED RECYCLE
P	POLYMER
PE	PRIMARY EFFLUENT
PS	PRIMARY SLUDGE
PW	POTABLE WATER
RAS	RETURN ACTIVATED SLUDGE
RBR	RECLAIM BASIN RETURN
RD	ROOF DRAIN
RS	RAW SEWAGE
S	SAMPLE
SA	SERVICE AIR
SBS	SODIUM BISULFATE SOLUTION
SC	SCUM
SD	STORM DRAIN
SDO	SLUDGE DRAWOFF
SE	SECONDARY EFFLUENT
SL	SLUDGE
SLF	SLUDGE FEED
SPD	SUMP PUMP DISCHARGE
SR	SCRUBBER RECIRCULATION
SU	SUPERNATANT
TDS	THICKENED DIGESTED SLUDGE
TE	TERTIARY EFFLUENT
TS	THICKENED SLUDGE
TWAS	THICKENED WASTE ACTIVATED SLUDGE
V	VENT
WAS	WASTE ACTIVATED SLUDGE

INDEX OF DRAWINGS

DRAWING NUMBER	DESCRIPTION
GENERAL	
COVER	COVER
X1	ABBREVIATIONS, LEGEND, CODE DATA AND INDEX
CIVIL	
C1	OVERALL SITE PLAN
C2	EXISTING CONDITION AND DEMOLITION – PARTIAL SITE PLAN
C3	EROSION AND SEDIMENT CONTROL PLANS
C4	EROSION AND SEDIMENT CONTROL NOTES AND DETAILS
C5	STAKING PAVEMENT. GRADING AND DRAINAGE – PARTIAL SITE PLAN
C6	DETAILS
STRUCTURAL	
S1	GENERAL STRUCTURAL NOTES
S2	DEMOLITION PLAN
S3	DEMOLITION PHOTOGRAPHS
S4	MICROPILE PLAN
S5	FOUNDATION PLAN
S6	TOP PLAN
S7	MAIN ELECTRICAL FACILITY VAULTS
S8	SECTIONS AND DETAILS
S9	FRAMING ELEVATIONS
S10	FRAMING ELEVATIONS
S11	FRAMING DETAILS
ELECTRICAL	
E1	LEGEND AND GENERAL NOTES
E2	OVERALL DEMOLITION PLAN
E3	PARTIAL DEMOLITION PLANS
E4	OVERALL SINGLE LINE DIAGRAM – DEMOLITION
E5	BOTTOM PLAN
E6	SWGR-MEF SINGLE LINE DIAGRAM AND ELEVATION
E7	SWGR-MEF SINGLE LINE DIAGRAM AND ELEVATION
E8	PRIMARY SUBSTATION SINGLE LINE DIAGRAM
E9	SWGR-GEN SINGLE LINE DIAGRAM AND ELEVATION
E10	PS-1 SINGLE LINE DIAGRAM AND ELEVATION – PROPOSED (5)
E11	PANEL AND DUCTBANK SCHEDULES
E12	RISER DIAGRAMS
E13	CONDUIT AND WIRE SCHEDULES
E14	CONDUIT AND WIRE SCHEDULES
E15	TOP PLAN
STANDARD DETAILS	
SD1	SHEET 1
SD2	SHEET 2
SD3	SHEET 3
E16	OVERALL ELECTRICAL SITE PLAN (5)

LEGEND

MATERIALS

GRADE OR EARTH
ASPHALT PAVING
SAND
GRAVEL
CONCRETE
CONC. FILL OR GROUT
CONC. MASONRY UNIT
BRICK
ROCK
STEEL
INSULATION
WATER SURFACE
GRATING
CHECKERED PLATE
GLASS
WOOD BLOCKING

SYMBOLS

GATE VALVE
BUTTERFLY VALVE
PLUG VALVE
SWING CHECK VALVE
GLOBE VALVE
PINCH VALVE
DIAPHRAGM VALVE
BALL VALVE
BALL CHECK VALVE
HARNESSED FLANGED ADAPTER
HARNESSED SLEEVE TYPE COUPLING
SLEEVE TYPE COUPLING
HARNESSED
WALL PENETRATION
MECHANICAL COUPLING
WELDED JOINT
FLANGED JOINT
MECHANICAL, PUSH ON OR RESTRAINED JOINT
SLUICE GATE
SLIDE GATE/STOP GATE
FLUSHING CONNECTION
HOSE BIBB
QUICK DISCONNECT FITTING
YARD HYDRANT
FIRE HYDRANT
SOIL BORING

SECTION AND DETAIL KEYING

DRAWINGS ARE CROSS REFERENCED IN THE FOLLOWING METHOD:

(A) A SECTION CUT ON DRAWING A3 IS IDENTIFIED AS FOLLOWS:

A — SECTION LETTER
A6 — DRAWING WHERE SECTION IS SHOWN

(B) THE SECTION SHOWN ON DRAWING A6 IS IDENTIFIED AS FOLLOWS:

A — SECTION LETTER
A3 — DRAWING FROM WHERE SECTION WAS TAKEN

DETAILS ARE CROSS REFERENCED IN A SIMILAR MANNER, EXCEPT DETAILS ARE IDENTIFIED BY A SQUARE WITH A NUMBER IN THE UPPER HALF.

STANDARD DETAILS ARE REFERENCED BY A UNIQUE SEVEN DIGIT NUMBER AND ARE SHOWN ON THE CONTRACT DRAWINGS BY ONE OF TWO METHODS:

1509203 → REFERENCED ITEM

OR:

SEE 1509203 → REFERENCED ITEM

STANDARD DETAILS ARE COMPILED IN APPROXIMATE NUMERICAL ORDER IN THE BACK OF THE CONTRACT DRAWINGS ON THE D» DRAWINGS.

LINETYPES

PROPOSED ITEMS
EXISTING ITEMS
HIDDEN ITEMS
DEMOLITION ITEMS
CENTER LINE
MATCH LINE

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

SOIL CONSERVATION DISTRICT DATE

REVIEWED FOR HOWARD COUNTY SOIL CONSERVATION DISTRICT AND MEETS TECHNICAL REQUIREMENTS.

US SOIL CONSERVATION DISTRICT DATE

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. 22307 EXPIRATION DATE: 4/9/16

SIGNED:

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. 35671 EXPIRATION DATE: 6/11/16

SIGNED:

AS-BUILT REPLACEMENT 4/2016

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 5/16/16
CHIEF BUREAU OF ENGINEERING — DATE 5/16/16
CHIEF BUREAU OF UTILITIES — DATE 5/13/16
CHIEF UTILITY DESIGN DIVISON — DATE 5/10/16

HAZEN AND SAWYER
Environmental Engineers & Scientists
ONE SOUTH STREET, BALTIMORE, MD 21202

STATE OF MARYLAND — 22307 — REGISTERED PROFESSIONAL ENGINEER — 4/9/14
STATE OF MARYLAND — 35671 — REGISTERED PROFESSIONAL ENGINEER — 11/23/14

DESIGNED CAS
DRAWN CAS
CHECKED
PROJ. ENGR.
APPROVED

NO.	ISSUED FOR	DATE	BY
5	AS-BUILT REPLACEMENT	9/2015	DAV
4	ADDENDUM 1	7/2014	DAA
3	BIDDING	1/2014	DAA
2	90% REVIEW	9/2013	DAA
1	60% REVIEW	6/2013	DAA

GENERAL

ABBREVIATIONS; LEGEND, CODE DATA AND INDEX

GENERATOR/SWITCHGEAR INSTALLATION CONTRACT
LITTLE PATUXENT WATER RECLAMATION PLANT
CAPITAL PROJECT NUMBER S-6264
CONTRACT NUMBER 20-4832
6TH ELECTION DISTRICT HOWARD COUNTY, MARYLAND

DATE FEB 2016
DRAWING NUMBER X1
SCALE AS SHOWN
SHEET 2 OF 37

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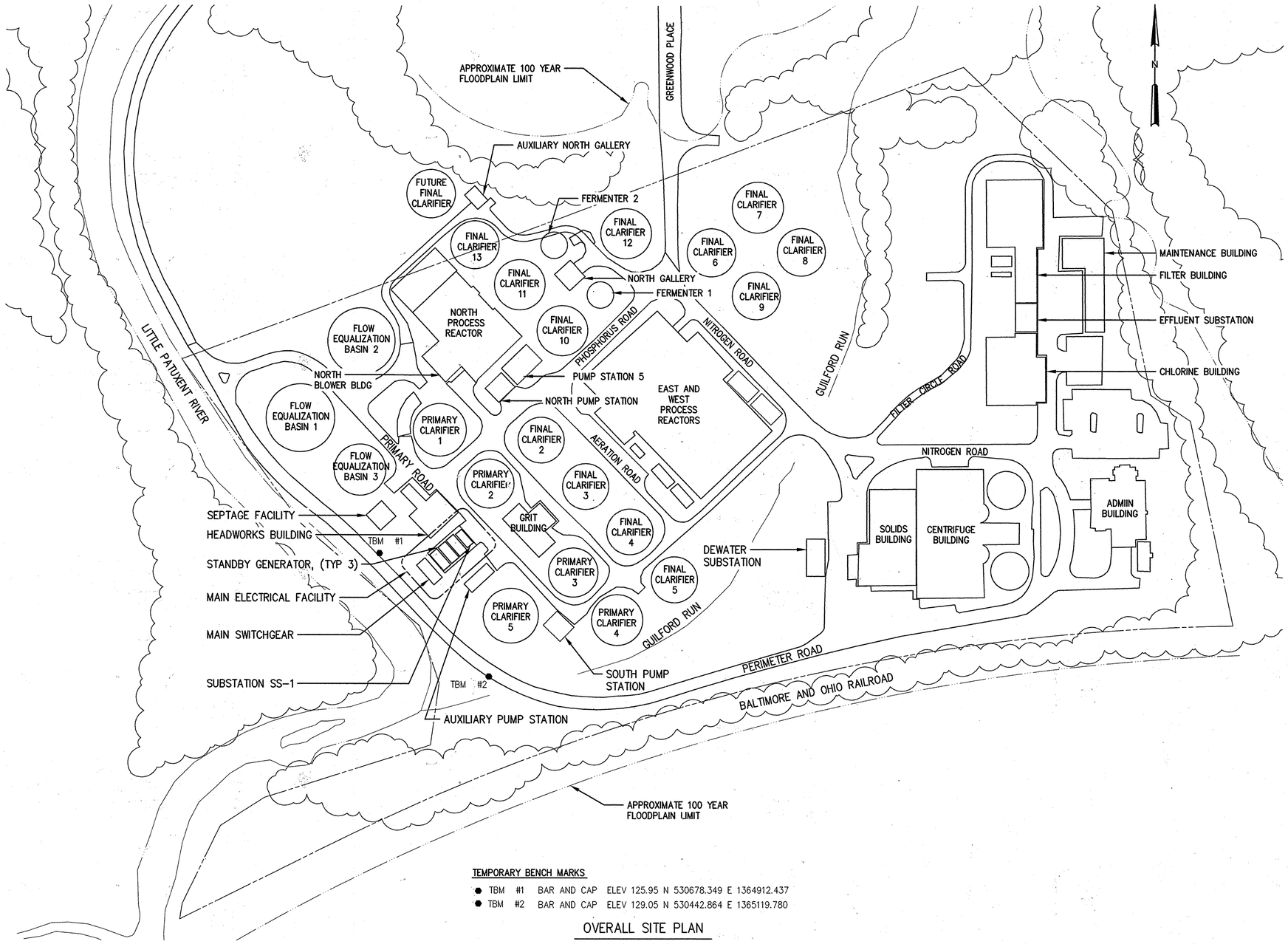

TEMPORARY BENCH MARKS

- TBM #1 BAR AND CAP ELEV 125.95 N 530678.349 E 1364912.437
- TBM #2 BAR AND CAP ELEV 129.05 N 530442.864 E 1365119.780

OVERALL SITE PLAN

1" = 50'-0"

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

NOTES:

1. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE LATEST STANDARDS AND SPECIFICATIONS OF HOWARD COUNTY PLUS MSHA STANDARDS AND SPECIFICATIONS IF APPLICABLE.
2. 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 START OF WORK.
3. THE CONTRACTOR SHALL NOTIFY "MISS UTILITY" AT 1-800-257-7777 AT LEAST 48 HOURS PRIOR TO ANY EXCAVATION WORKING BEING DONE.
4. ALL PLAN DIMENSIONS ARE TO FACE OF CURB UNLESS OTHERWISE NOTED.
5. THE SURVEY INFORMATION PROVIDED NEAR THE HEADWORKS SUBSTATION BY:

   BAY ENGINEERING
   190 ADMIRAL COCHRANE DRIVE, SUITE 175
   ANNAPOLIS, MD 21401

   THE COORDINATES AND ELEVATIONS SHOWN HEREON ARE BASED ON THE HOWARD COUNTY GEODETIC CONTROL. THE HORIZONTAL DATUM IS REFERENCED TO MARYLAND STATE PLANE (NAD 83/91) AND THE VERTICAL DATUM IS REFERENCED TO NAVD 88.
6. WATER AND SEWER ARE PUBLIC (HOWARD COUNTY LITTLE PATUXENT WATER RECLAMATION PLANT).
7. EXISTING UTILITIES SHOWN MUST BE FIELD VERIFIED BY THE CONTRACTOR PRIOR TO START OF ANY DEMOLITION AND CONSTRUCTION.
8. THE ENTIRE LITTLE PATUXENT WATER RECLAMATION PLANT IS LOCATED IN THE 100 YEAR FLOOD PLAIN. 100 YEAR FLOOD PLAIN ELEVATION AT THE PLANT IS AT ELEVATION 146.00.
9. OFF SITE DISPOSAL OF EXCESS MATERIAL WILL BE TO AN APPROVED SITE.
10. THE CONTRACTOR SHALL LOCATE AND PROTECT ALL EXISTING FACILITIES, STRUCTURES AND UTILITIES FROM DAMAGE UNLESS OTHERWISE NOTED TO BE REMOVED/DEMOLISHED.
11. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO REMOVE AND LEGALLY DISPOSE OF ANY AND ALL DEMOLISHED/DELETERIOUS MATERIALS.
12. POSITIVE DRAINAGE SHALL BE MAINTAINED AT ALL TIMES. PONDING OF WATER SHALL NOT BE PERMITTED. ALL PONDING WATER SHALL BE FILTERED THROUGH A PORTABLE SEDIMENT TANK PRIOR TO DISCHARGE INTO THE PUBLIC STORM SEWER SYSTEM.
13. SURFACED STREET AND PARKING AREAS SHALL BE MAINTAINED IN A CLEAN CONDITION - FREE OF MUD AND DUST AT ALL TIMES. ADEQUATE MEANS SHALL BE PROVIDED TO CLEAN TRUCKS AND EQUIPMENT.
14. THE SITE PLAN AND EROSION CONTROL PLAN ARE BASED ON THE SITE DEVELOPMENT PLAN (SDP-00-94 LITTLE PATUXENT WATER RECELAMATION FACILITY) AMENDMENT DATED 10/31/2013 AND SUBMITTED TO HOWARD COUNTY. THE SDP IS INCLUDED IN THE CONTRACT BY REFERENCE. THE CONTRACTOR SHALL COMPLY WITH ALL REQUIREMENTS OF THE SDP AMENDMENT.

ZONING SITE DATE TABLE

SITE ADDRESS:
8900 GREENWOOD PLACE
SAVAGE, MD

APPLICANT/OWNER:
HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS

AREA OF PARCEL/LOT:
AREA OF PLAT NO. 10148 = 38.01± ACRES
AREA OF PLAT NO. 4872 = 18.19± ACRES
TOTAL SITE AREA = 56.20± ACRES
PRESENT ZONING: M-2 PER 02/02/04 COMPREHENSIVE REZONING PLAN
OVERLAY ZONING DISTRICT: FLOODPLAIN OVERLAY DISTRICT
EXISTING/PROPOSED USE: WATER RECLAMATION PLANT
EXISTING FLOOR SPACE USE: BLOWER, PUMP, AND CONTROL ROOMS
NUMBER OF EMPLOYEES: 55

BUILDING/STRUCTURES/ PROCESS TANK COVERAGE:	PLAT #10148 ACRES	%	PLAT #4872 ACRES	%	TOTAL SITE ACRES	%
EXISTING	10.20	26.84	0.32	1.76	10.52	18.17
PROPOSED	0.08	0.21	---	---	0.08	0.21
TOTAL	10.28	27.05	0.32	1.76	10.60	18.86
DISTURBED AREA	0.39	1.03	---	---	0.39	0.01
ONSITE PARKING						
EXISTING	110 SPACES		---		110 SPACES	
PROPOSED	---		---		---	
TOTAL	110 SPACES		---		110 SPACES	

AS-BUILT 4/2016

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

SOIL CONSERVATION DISTRICT DATE

REVIEWED FOR HOWARD COUNTY SOIL CONSERVATION DISTRICT AND MEETS TECHNICAL REQUIREMENTS.

US SOIL CONSERVATION DISTRICT DATE

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. 22307 EXPIRATION DATE 4/9/15
SIGNED: 4/9/14

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SIGNED: 1/29/14

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 1/30/14
CHIEF BUREAU OF ENGINEERING — DATE 1/29/14
CHIEF BUREAU OF UTILITIES — DATE 1/28/14
CHIEF UTILITY DESIGN DIVISON — DATE 1/29/14

HAZEN AND SAWYER
Environmental Engineers & Scientists
ONE SOUTH STREET, BALTIMORE, MD 21202

STATE OF MARYLAND — CHRISTOPHER A. SCHWARTZ — 22307 — REGISTERED PROFESSIONAL ENGINEER — 1/29/14

STATE OF MARYLAND — DANIEL A. ATKINSON — 36369 — REGISTERED PROFESSIONAL ENGINEER — 1/29/14

DESIGNED CAS
DRAWN CAS
CHECKED MS
PROJ. ENGR.
APPROVED MS

NO.	ISSUED FOR	DATE	BY
5	AS-BUILT	9/2015	DAV
4	ADDENDUM 1	7/2014	DAA
3	BIDDING	1/2014	DAA
2	90% REVIEW	9/2013	DAA
1	60% REVIEW	6/2013	DAA

CIVIL

OVERALL SITE PLAN

GENERATOR/SWITCHGEAR INSTALLATION CONTRACT
LITTLE PATUXENT WATER RECLAMATION PLANT
CAPITAL PROJECT NUMBER S-6264
CONTRACT NUMBER 20-4832
6TH ELECTION DISTRICT HOWARD COUNTY, MARYLAND

DATE JAN 2014
DRAWING NUMBER C1
SCALE AS SHOWN
SHEET 3 OF 37

IMAGES= 20121126144415, 20121127094611, 20121128154628, aerial, FLOOD, XREFs= 32232-TB, SP-CV-GR, SP-CV, buildings_mojor, buildings_minor, EdgeOfPavement, streams_mojorandreservoir, tree_line, streams_minor, address_points

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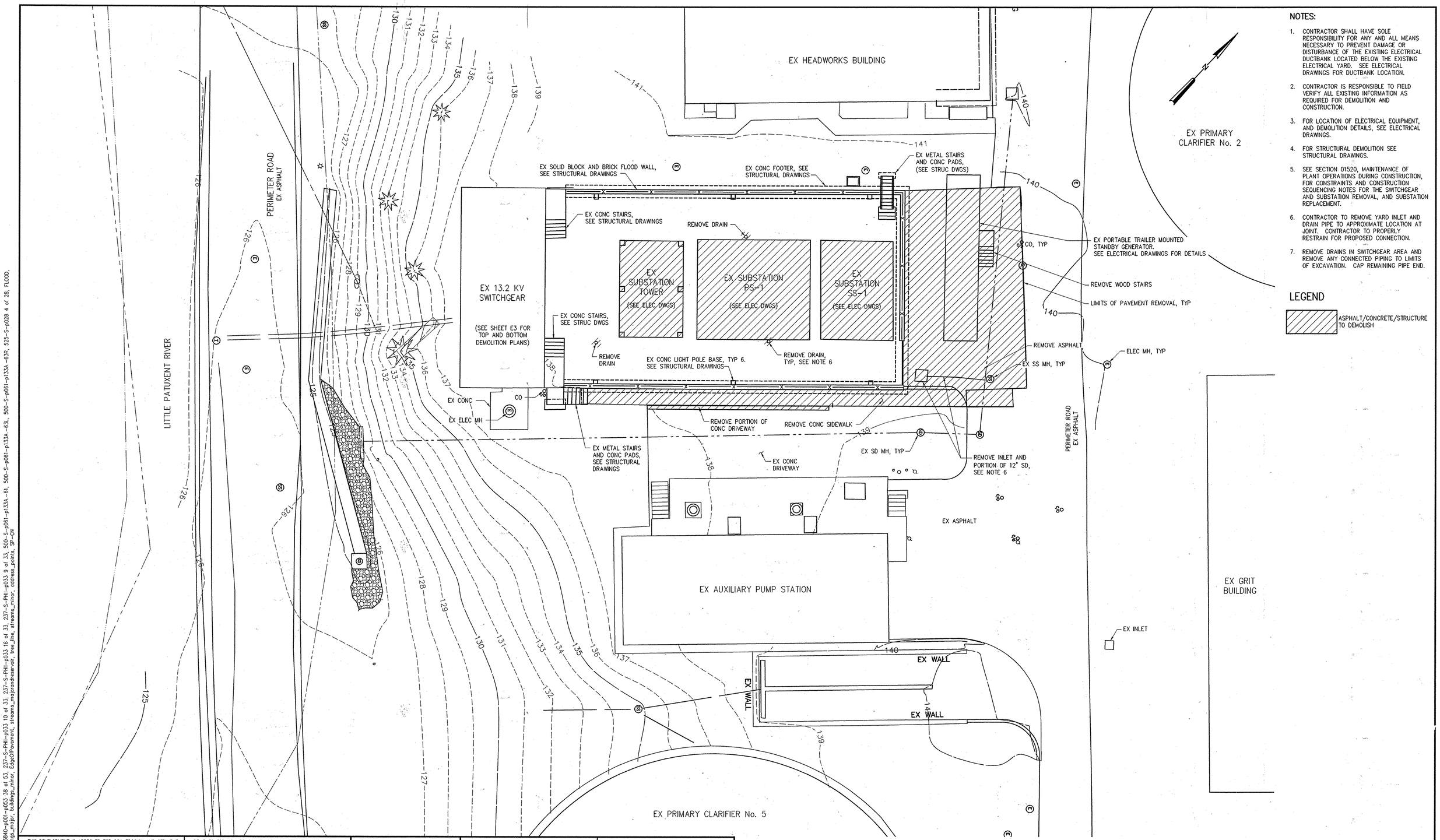

NOTES:

1. CONTRACTOR SHALL HAVE SOLE RESPONSIBILITY FOR ANY AND ALL MEANS NECESSARY TO PREVENT DAMAGE OR DISTURBANCE OF THE EXISTING ELECTRICAL DUCTBANK LOCATED BELOW THE EXISTING ELECTRICAL YARD. SEE ELECTRICAL DRAWINGS FOR DUCTBANK LOCATION.
2. CONTRACTOR IS RESPONSIBLE TO FIELD VERIFY ALL EXISTING INFORMATION AS REQUIRED FOR DEMOLITION AND CONSTRUCTION.
3. FOR LOCATION OF ELECTRICAL EQUIPMENT, AND DEMOLITION DETAILS, SEE ELECTRICAL DRAWINGS.
4. FOR STRUCTURAL DEMOLITION SEE STRUCTURAL DRAWINGS.
5. SEE SECTION 01520, MAINTENANCE OF PLANT OPERATIONS DURING CONSTRUCTION, FOR CONSTRAINTS AND CONSTRUCTION SEQUENCING NOTES FOR THE SWITCHGEAR AND SUBSTATION REMOVAL, AND SUBSTATION REPLACEMENT.
6. CONTRACTOR TO REMOVE YARD INLET AND DRAIN PIPE TO APPROXIMATE LOCATION AT JOINT. CONTRACTOR TO PROPERLY RESTRAIN FOR PROPOSED CONNECTION.
7. REMOVE DRAINS IN SWITCHGEAR AREA AND REMOVE ANY CONNECTED PIPING TO LIMITS OF EXCAVATION. CAP REMAINING PIPE END.

LEGEND

ASPHALT/CONCRETE/STRUCTURE TO DEMOLISH

1"=10'-0"

10 5 0 10'

AS-BUILT 4/2016

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

SOIL CONSERVATION DISTRICT DATE

REVIEWED FOR HOWARD COUNTY SOIL CONSERVATION DISTRICT AND MEETS TECHNICAL REQUIREMENTS.

US SOIL CONSERVATION DISTRICT DATE

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. 12307 EXPIRATION DATE 4/6/16
SIGNED:

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. 19369 EXPIRATION DATE 7/21/14
SIGNED:

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 1/30/14
CHIEF BUREAU OF ENGINEERING — DATE 1/29/14
CHIEF BUREAU OF UTILITIES — DATE 1/28/14
CHIEF UTILITY DESIGN DIVISON — DATE 1/29/14

HAZEN AND SAWYER
Environmental Engineers & Scientists
ONE SOUTH STREET, BALTIMORE, MD 21202

STATE OF MARYLAND — CHRISTOPHER A. SCHERSON — 12307 — REGISTERED PROFESSIONAL ENGINEER — 1/29/14

STATE OF MARYLAND — CHRISTOPHER A. SCHERSON — 19369 — REGISTERED PROFESSIONAL ENGINEER — 1/29/14

DESIGNED CAS
DRAWN CAS
CHECKED [illegible]
PROJ. ENGR.
APPROVED

NO.	ISSUED FOR	DATE	BY
5	AS-BUILT	8/2015	DAV
4	ADDENDUM 1	7/2014	DAA
3	BIDDING	1/2014	DAA
2	90% REVIEW	9/2013	DAA
1	60% REVIEW	6/2013	DAA

CIVIL
MAIN ELECTRICAL FACILITY
EXISTING CONDITION AND DEMOLITION - PARTIAL SITE PLAN

GENERATOR/SWITCHGEAR INSTALLATION CONTRACT
LITTLE PATUXENT WATER RECLAMATION PLANT
CAPITAL PROJECT NUMBER S-6264
CONTRACT NUMBER 20-4832
6TH ELECTION DISTRICT HOWARD COUNTY, MARYLAND

DATE JAN 2014
DRAWING NUMBER C2
SCALE AS SHOWN
SHEET 4 OF 37

IMAGES= 20-3840-p001-p053 16 of 53, 20-3840-p001-p053 38 of 53, 237-S-PHII-p033 10 of 33, 237-S-PHII-p033 16 of 33, 237-S-PHII-p033 9 of 33, 500-S-p061-p133A-61, 500-S-p061-p133A-63L, 500-S-p061-p133A-63R, 525-S-p028 4 of 28, FLOOD, XREFs= 32232-1B, SP-CX, SP-CX-GIS, buildings_majr, buildings_minor, EdgeOfPavement, streams_majorandreservoir, tree_line, streams_minor, address_points, SP-CN

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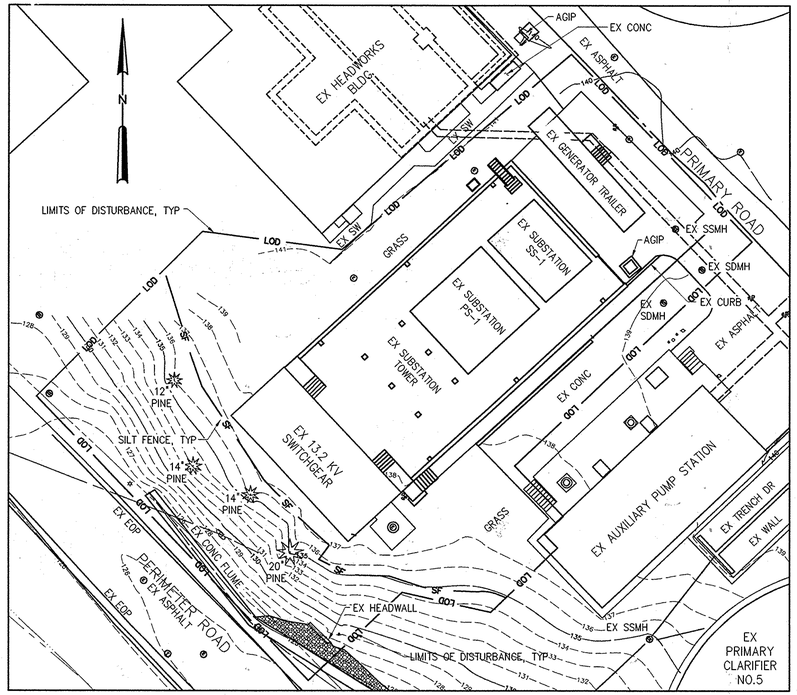
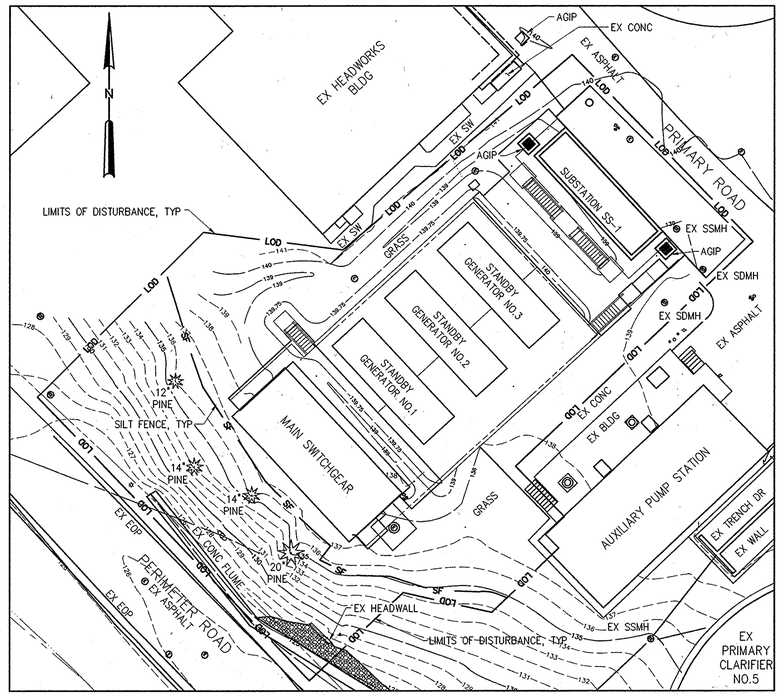


PLAN – PHASE I EXISTING CONDITIONS

1"=20'

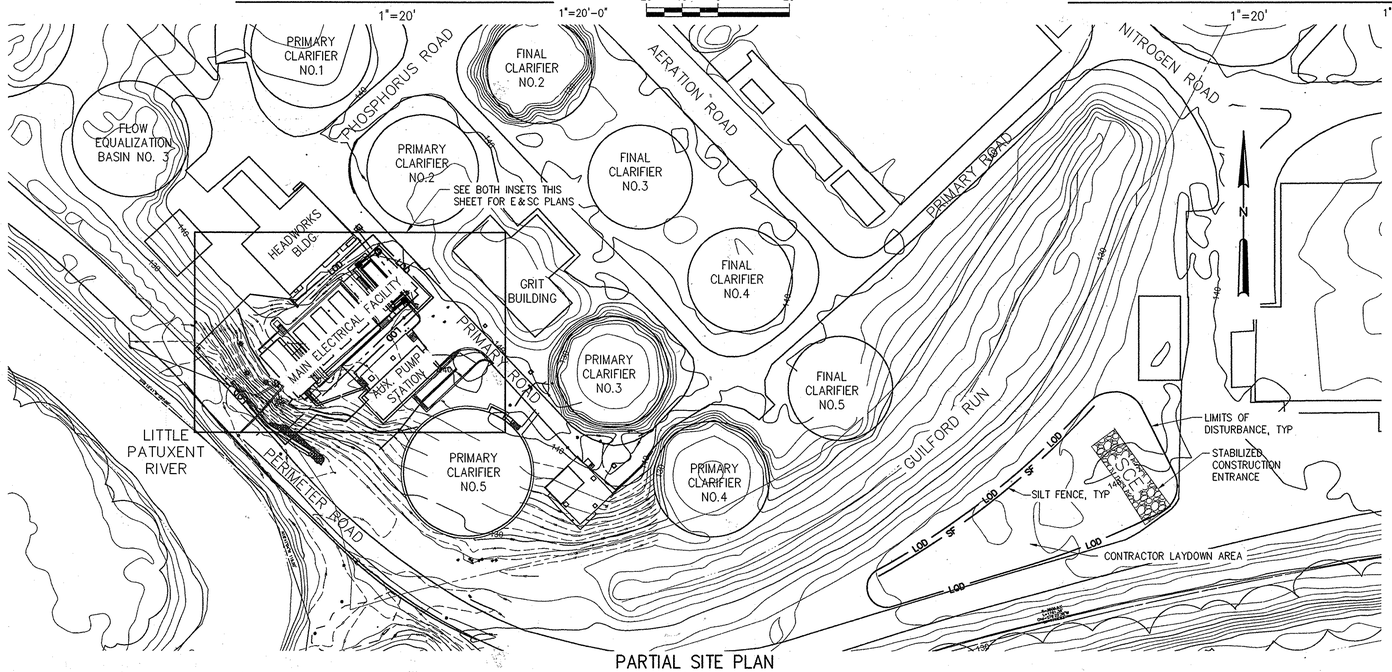


PLAN – PHASE II CONSTRUCTION CONDITIONS

1"=20'

20 10 0 20'

1"=20'-0"



PARTIAL SITE PLAN

1"=50'

1"=50'-0"

50 25 0 50'

ENGINEER'S CERTIFICATE

"I CERTIFY THAT THIS PLAN FOR EROSION AND SEDIMENT CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS AND THAT IT WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF HOWARD SOIL CONSERVATION DISTRICT."

SIGNATURE OF ENGINEER (PRINT WHOLE NAME BELOW SIGNATURE) — DATE

DEVELOPER'S CERTIFICATE

"I/WE CERTIFY THAT ALL DEVELOPMENT AND CONSTRUCTION WILL BE DONE ACCORDING TO THIS PLAN, AND THAT ANY RESPONSIBLE INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A DEPARTMENT OF ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT. I ALSO AUTHORIZE PERIODIC ON-SITE INSPECTION BY THE HOWARD SOIL CONSERVATION DISTRICT."

SIGNATURE OF DEVELOPER (PRINT WHOLE NAME BELOW SIGNATURE) — DATE

DEPARTMENT OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE

CHIEF, DEP — DATE

EROSION AND SEDIMENT CONTROL NOTES:

1. A MINIMUM OF 24 HOURS NOTICE MUST BE GIVEN TO THE HOWARD COUNTY OFFICE OF INSPECTION AND PERMITS PRIOR TO THE START OF ANY CONSTRUCTION (410) 992-2437.
2. ALL VEGETATIVE AND STRUCTURAL PRACTICES ARE TO BE INSTALLED ACCORDING TO THE PROVISIONS OF THIS PLAN AND ARE IN CONFORMANCE WITH THE 2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL.
3. FOLLOWING INITIAL DISTURBANCE OR REDISTURBANCE, PERMANENT OR TEMPORARY STABILIZATION SHALL BE COMPLETED WITHIN: A) 7 CALENDAR DAYS FOR ALL PERIMETER SEDIMENT CONTROL STRUCTURES; B) 14 DAYS AS TO ALL OTHER DISTURBED OR GRADED AREAS ON THE PROJECT SITE
4. ALL DISTURBED AREAS MUST BE STABILIZED WITHIN THE TIME SPECIFIED ABOVE IN ACCORDANCE WITH THE 2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL FOR MULCHING, PERMANENT AND TEMPORARY SEEDING.
5. ANY SEDIMENT CONTROL PRACTICE WHICH IS DISTURBED BY PLACEMENT OF UTILITIES MUST BE REPAIRED ON THE SAME DAY OF DISTURBANCE.
6. IF DEEMED NECESSARY BY THE HOWARD COUNTY DPW SEDIMENT CONTROL INSPECTOR, ADDITIONAL SEDIMENT CONTROLS MUST BE PROVIDED.

LEGEND:

LOD — LIMITS OF DISTURBANCE

SF — SILT FENCE

AGIP — AT GRADE INLET PROTECTION

SCE — STABALIZED CONSTRUCTION ENTRANCE

EROSION CONTROL CONSTRUCTION SEQUENCE NOTES:

1. OBTAIN APPROVED PLAN AND APPROVAL PLACARD. A COPY OF THE APPROVED PLAN MUST BE ON-FILE AT THE JOB SITE. NOTIFY EROSION CONTROL AUTHORITIES OF PROPOSED STARTING DATE OF LAND DISTURBING ACTIVITIES.
2. PRE-CONSTRUCTION MEETING WILL BE HELD.
3. INSTALL ALL PERIMETER MEASURES, INCLUDING GRAVEL CONSTRUCTION ENTRANCE AND SILT FENCE WITHIN 7 DAYS OF THE START OF ANY LAND DISTURBING (INCLUDING DEMO).
4. CALL FOR INSPECTION OF INSTALLED DEVICES.
5. BEGIN DEMOLITION AND CONSTRUCTION ACTIVITIES.
6. VEGETATE ALL DISTURBED AREAS WHERE GRADING ACTIVITIES HAVE STOPPED AND WILL NOT CONTINUE FOR MORE THAN 21 CALENDAR DAYS.
7. MAINTAIN ALL EROSION & SEDIMENT CONTROL MEASURES THROUGHOUT CONSTRUCTION.
8. PRIOR TO COMPLETION OF PROJECT, CALL FOR SITE INSPECTION BY ENGINEER. ALL TEMPORARY DEVICES SHALL BE FOUND IN GOOD AND STABLE CONDITION.
9. WHEN CONSTRUCTION IS COMPLETE AND ALL AREAS ARE STABILIZED, CALL FOR INSPECTION BY THE OWNER.
10. ONCE REMAINING VEGETATION IS ESTABLISHED, CALL FOR A FINAL INSPECTION BY THE OWNER INSPECTOR TO OBTAIN A CERTIFICATE OF COMPLETION AND REMOVE REMAINING PERIMETER MEASURES. ALL AREAS DISTURBED BY REMOVAL SHALL BE GRADED AS CLOSELY AS POSSIBLE TO ORIGINAL CONDITIONS, AND SEEDED, MULCHED AND FERTILIZED AS SPECIFIED.

AS-BUILT 4/2016

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

SOIL CONSERVATION DISTRICT — DATE

REVIEWED FOR HOWARD COUNTY SOIL CONSERVATION DISTRICT AND MEETS TECHNICAL REQUIREMENTS.

US SOIL CONSERVATION DISTRICT — DATE

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. 22307, EXPIRATION DATE 4/9/15

SIGNED:

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. 22307, EXPIRATION DATE 7/21/14

SIGNED:

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 1/30/14

CHIEF BUREAU OF ENGINEERING — DATE 1/28/14

CHIEF UTILITIES — DATE 1/28/14

CHIEF UTILITY DESIGN DIVISON — DATE 1/29/14

HAZEN AND SAWYER
Environmental Engineers & Scientists
ONE SOUTH STREET, BALTIMORE, MD 21202

STATE OF MARYLAND — CHRISTOPHER A. SIMPSON — 22307 — REGISTERED PROFESSIONAL ENGINEER — 1/29/14

STATE OF MARYLAND — DAVID A. ANDERSON — 22307 — REGISTERED PROFESSIONAL ENGINEER — 1/21/14

DESIGNED CAS
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PROJ. ENGR.
APPROVED

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5	AS-BUILT	9/2016	DAV
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2	90% REVIEW	9/2013	DAA
1	60% REVIEW	6/2013	DAA

GENERAL
MAIN ELECTRICAL FACILITY
EROSION AND SEDIMENT CONTROL PLANS

GENERATOR/SWITCHGEAR INSTALLATION CONTRACT
LITTLE PATUXENT WATER RECLAMATION PLANT
CAPITAL PROJECT NUMBER S-6264
CONTRACT NUMBER 20-4832
6TH ELECTION DISTRICT HOWARD COUNTY, MARYLAND

DATE JAN 2014
DRAWING NUMBER C3
SCALE AS SHOWN
SHEET 5 OF 37

IMAGES= 2013-11-01 LOD markup from LaTosha, 20121126144415, 20121127094611, 20121128154628, aerial, FLOOD, 20-3840-p001-p053 16 of 53, 20-3840-p001-p053 38 of 53, 237-S-PHII-p033 10 of 33, 237-S-PHII-p033 16 of 33, 237-S-PHII-p033 9 of 33, 500-S-p061-p133A-61, 500-S-p061-p133A-63L, 500-S-p061-p133A-63R, 525-S-p028 4 of 28, FLOOD, XREFs= 32232-TB, SP-CN, SP-CV, SP-CY, buildings_major, buildings_minor, EdgeOfPavement, streams_majorandreservoir, tree_line, streams_minor, address_points

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NOTES:
1. LENGTH – MINIMUM OF 50' (30' FOR SINGLE RESIDENCE LOT).
2. WIDTH – 10' MINIMUM SHOULD BE FLARED AT THE EXISTING ROAD TO PROVIDE A TURNING RADIUS.
3. GEOTEXTILE FABRIC (FILTER CLOTH) SHALL BE PLACED OVER THE EXISTING GROUND PRIOR TO PLACING STONE. ** THE PLAN APPROVAL AUTHORITY MAY NOT REQUIRE SINGLE FAMILY RESIDENCES TO USE GEOTEXTILE.
4. STONE-CRUSHED AGGREGATE (2" TO 3") OR RECLAIMED OR RECYCLED CONCRETE EQUIVALENT SHALL BE PLACED AT LEAST 6" DEEP OVER THE LENGTH AND WIDTH OF THE ENTRANCE.
5. SURFACE WATER–ALL SURFACE WATER FLOWING TO OR DIVERTED TOWARD CONSTRUCTION ENTRANCES SHALL BE PIPED THROUGH THE ENTRANCE, MAINTAINING POSITIVE DRAINAGE. PIPE INSTALLED THROUGH THE STABILIZED CONSTRUCTION ENTRANCE SHALL BE PROTECTED WITH A MOUNTABLE BERM WITH 5:1 SLOPES AND A MINIMUM OF 6" OF STONE OVER THE PIPE. PIPE HAS TO BE SIZED ACCORDING TO THE DRAINAGE. WHEN THE SCE IS LOCATED AT A HIGH SPOT AND HAS NO DRAINAGE TO CONVEY A PIPE WILL NOT BE NECESSARY. PIPE SHOULD BE SIZED ACCORDING TO THE AMOUNT OF RUNOFF TO BE CONVEYED. A 8" MINIMUM DIAMETER IS REQUIRED.
6. LOCATION– A STABILIZED CONSTRUCTION ENTRANCE SHALL BE LOCATED AT EVERY POINT WHERE CONSTRUCTION TRAFFIC ENTERS OR LEAVES A CONSTRUCTION SITE. VEHICLES LEAVING THE SITE MUST TRAVEL OVER THE ENTIRE LENGTH OF STABILIZED CONSTRUCTION ENTRANCE.
7. STABILIZED CONSTRUCTION ENTRANCE SHALL BE PLACED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS. ADDITIONAL ENTRANCES ARE PROHIBITED.

Revised / Revised 1/2/2007 / Approved	Howard County, Maryland Department of Public Works Approved: ______ Chief, Bureau of Engineering	Stabilized Construction Entrance	Detail G-6.01

DETAIL E-1 SILT FENCE

STANDARD SYMBOL: |——SF——|

1 OF 2

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

E.2

DETAIL E-1 SILT FENCE

STANDARD SYMBOL: |——SF——|

CONSTRUCTION SPECIFICATIONS

1. USE WOOD POSTS 1¾ X 1¾ ± ⅟₁₆ INCH (MINIMUM) SQUARE CUT OF SOUND QUALITY HARDWOOD. AS AN ALTERNATIVE TO WOODEN POST USE STANDARD "T" OR "U" SECTION STEEL POSTS WEIGHING NOT LESS THAN 1 POUND PER LINEAR FOOT.
2. USE 36 INCH MINIMUM POSTS DRIVEN 16 INCH MINIMUM INTO GROUND NO MORE THAN 6 FEET APART.
3. USE WOVEN SLIT FILM GEOTEXTILE AS SPECIFIED IN SECTION H-1 MATERIALS AND FASTEN GEOTEXTILE SECURELY TO UPSLOPE SIDE OF FENCE POSTS WITH WIRE TIES OR STAPLES AT TOP AND MID-SECTION.
4. PROVIDE MANUFACTURER CERTIFICATION TO THE AUTHORIZED REPRESENTATIVE OF THE INSPECTION/ENFORCEMENT AUTHORITY SHOWING THAT THE GEOTEXTILE USED MEETS THE REQUIREMENTS IN SECTION H-1 MATERIALS.
5. EMBED GEOTEXTILE A MINIMUM OF 8 INCHES VERTICALLY INTO THE GROUND. BACKFILL AND COMPACT THE SOIL ON BOTH SIDES OF FABRIC.
6. WHERE TWO SECTIONS OF GEOTEXTILE ADJOIN: OVERLAP, TWIST, AND STAPLE TO POST IN ACCORDANCE WITH THIS DETAIL.
7. EXTEND BOTH ENDS OF THE SILT FENCE A MINIMUM OF FIVE HORIZONTAL FEET UPSLOPE AT 45 DEGREES TO THE MAIN FENCE ALIGNMENT TO PREVENT RUNOFF FROM GOING AROUND THE ENDS OF THE SILT FENCE.
8. REMOVE ACCUMULATED SEDIMENT AND DEBRIS WHEN BULGES DEVELOP IN SILT FENCE OR WHEN SEDIMENT REACHES 25% OF FENCE HEIGHT. REPLACE GEOTEXTILE IF TORN. IF UNDERMINING OCCURS, REINSTALL FENCE.

2 OF 2

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

E.3

DETAIL E-9-2 AT-GRADE INLET PROTECTION

STANDARD SYMBOL: AGIP

MAXIMUM DRAINAGE AREA = 1 ACRE

CONSTRUCTION SPECIFICATIONS

1. USE NONWOVEN GEOTEXTILE AS SPECIFIED IN SECTION H-1 MATERIALS.
2. LIFT GRATE AND WRAP WITH NONWOVEN GEOTEXTILE TO COMPLETELY COVER ALL OPENINGS. SECURE WITH WIRE TIES AND SET GRATE BACK IN PLACE.
3. PLACE CLEAN ¾ TO 1½ INCH STONE OR EQUIVALENT RECYCLED CONCRETE 6 INCHES THICK ON THE GRATE.
4. STORM DRAIN INLET PROTECTION REQUIRES FREQUENT MAINTENANCE. REMOVE ACCUMULATED SEDIMENT AFTER EACH RAIN EVENT TO MAINTAIN FUNCTION AND AVOID PREMATURE CLOGGING. IF INLET PROTECTION DOES NOT COMPLETELY DRAIN WITHIN 24 HOURS AFTER A STORM EVENT, IT IS CLOGGED. WHEN THIS OCCURS, REMOVE ACCUMULATED SEDIMENT AND CLEAN, OR REPLACE GEOTEXTILE AND STONE.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

E.26

SEDIMENT AND EROSION CONTROL:

1. THE CONTRACTOR SHALL INSPECT ALL EROSION AND SEDIMENTATION CONTROLS A MINIMUM OF ONCE EVERY SEVEN CALENDAR DAYS AND WITHIN 24 HOURS AFTER ANY STORM EVENT WHERE RAIN FALL AMOUNTS ARE 1/2 INCH OR GREATER.
2. ALL TEMPORARY AND PERMANENT EROSION AND SEDIMENTATION CONTROLS SHALL BE MAINTAINED AND REPAIRED AS NEEDED TO ASSURE CONTINUED PERFORMANCE OF THEIR INTENDED FUNCTION. CLOSE ATTENTION SHALL BE PAID TO THE DAMAGE, UNDERMINING OR LOSS OF SUPPORT AND SHALL BE REPAIRED OR REPLACED PROMPTLY. SEDIMENT DEPOSITS SHOULD BE REMOVED AFTER EACH RAINFALL. THEY MUST BE REMOVED WHEN THE LEVEL OF DEPOSITION REACHES APPROXIMATELY 25% THE HEIGHT OF THE BARRIER.
3. WHENEVER POSSIBLE, PRESERVE EXISTING TREES, SHRUBS, AND OTHER VEGETATION TO PREVENT ROOT DAMAGE, DO NOT GRADE, PLACE SOIL PILES, OR PARK VEHICLES NEAR TREES MARKED FOR PRESERVATION.
4. SILT FENCE SHALL BE INSTALLED PRIOR TO ANY MAJOR SOIL DISTURBANCE AT THE CONSTRUCTION SITE. INSTALL ON THE DOWN SLOPE SIDE(S) OF THE SITE WITH ENDS EXTENDED UP SIDE SLOPES A SHORT DISTANCE. PLACE PARALLEL TO THE CONTOUR OF THE LAND TO ALLOW WATER TO POND BEHIND THE FENCE. THE ENTRENCH SHALL BE 6 INCHES DEEP. INSPECT AND REPAIR ONCE A WEEK AND AFTER EVERY 1/2 INCH RAIN. REMOVE SEDIMENT IF DEPOSITS REACH 25% THE FENCE HEIGHT.
5. LOCATE SOIL PILES A MINIMUM OF 50 FT AWAY FROM ANY DOWN SLOPE STREET, DRIVEWAY, STREAM, LAKE, WETLAND, DITCH OR DRAINAGE WAY. TEMPORARY SEED SUCH AS ANNUAL RYE IS RECOMMENDED FOR TOPSOIL PILES. SURROUND WITH SILT FENCE.
6. SPOIL PILES SHALL BE COVERED OR OTHERWISE MANAGED TO REDUCE SEDIMENTATION. ALL MATERIAL WHICH IS TO BE PLACED AT AN UPLAND SITE SHALL BE DISPOSED OF IN SUCH A WAY THAT SEDIMENT RUNOFF IS CONTROLLED AND MINIMIZED.
7. INSTALL GRAVEL DRIVE AS A SINGLE ACCESS DRIVE. GRAVEL DRIVE IS USED TO PREVENT TRACKING DIRT ONTO THE ROAD BY ALL VEHICLES. MAINTAIN GRAVEL DRIVE THROUGHOUT CONSTRUCTION. PARK ALL CONSTRUCTION VEHICLES IN AN APPROVED LOCATION.
8. BY THE END OF EACH WORK DAY, SWEEP OR SCRAPE UP SOIL TRACKED ONTO THE ROAD AND IN THE GUTTERS. BY THE END OF THE NEXT WORK DAY AFTER A STORM, CLEAN UP SOIL WASHED OFFSET. AND CHECK SILT FENCE FOR DAMAGE OR SEDIMENT BUILDUP.
9. DISTURBED SOILS SHALL BE STABILIZED AS QUICKLY AS PRACTICABLE WITH TEMPORARY VEGETATION AND/OR MULCHING TO PROTECT EXPOSED CRITICAL AREAS DURING DEVELOPMENT.
10. CONTRACTOR SHALL BE WHOLLY RESPONSIBLE FOR THE DESIGN, IMPLEMENTATION, AND MAINTENANCE OF SEDIMENT AND EROSION CONTROLS IN CONFORMANCE WITH THE REQUIREMENTS OF REGULATORY AGENCIES THROUGHOUT THE CONSTRUCTION PERIOD. STORMWATER MEASURES MAY BE REQUIRED TO BE INSTALLED AT ANY TIME DURING CONSTRUCTION AT THE DIRECTION OF THE ENGINEER OR OWNER.
11. TEMPORARY SEDIMENT AND EROSION CONTROLS (E.G., TEMPORARY SEEDING, MULCHING, SILT FENCE) SHALL BE IMPLEMENTED ON ALL DISTURBED AREAS WITHIN 2 DAYS IF THEY ARE TO REMAIN DORMANT FOR MORE THAN 21 DAYS. PERMANENT SOIL STABILIZATION (E.G., PERMANENT SEEDING, EROSION CONTROL FABRIC) SHALL BE IMPLEMENTED ON DISTURBED AREAS WITHIN 7 DAYS AFTER FINAL GRADE IS REACHED ON ANY PORTION OF THE PROJECT AREA.
12. TEMPORARY SEDIMENT AND EROSION CONTROLS SHALL BE MAINTAINED TO BE FUNCTIONAL UNTIL THE SITE HAS REACHED FINAL STABILIZATION. THE PROJECT AREA SHALL BE CONSIDERED TO HAVE REACHED FINAL STABILIZATION WHEN:
    - A. PERENNIAL, VEGETATIVE COVER HAS GROWN TO A 70-PERCENT DENSITY THROUGHOUT THE ENTIRE DISTURBED AREA.
    - B. ALL TRAPPED SEDIMENT HAS BEEN REMOVED AND PERMANENTLY STABILIZED WITHIN THIRTY (30) DAYS AFTER FINAL STABILIZATION.
    - C. ALL CONSTRUCTION ACTIVITIES HAVE CEASED.
    - D. CONTRACTOR HAS OBTAINED NECESSARY OWNER APPROVAL OF ALL SITE STABILIZATION MEASURES.
16. STEPS SHALL BE EMPLOYED THROUGHOUT THE COURSE OF THE PROJECT TO AVOID THE CREATION OF EXCESSIVE TURBIDITY WHICH MAY DEGRADE WATER QUALITY OR ADVERSELY AFFECT AQUATIC LIFE.
17. MATERIALS USED IN THIS PROJECT FOR FILL OR BANK PROTECTION SHALL CONSIST OF SUITABLE MATERIAL FREE FROM TOXIC CONTAMINANTS. FILL PLACED IN THE ROCKY RIVER OR TRIBUTARY SHALL CONSIST OF CLEAN, NON-ERODIBLE MATERIAL.
18. CONTRACTOR SHALL TAKE ANY NECESSARY STEPS TO STORE EQUIPMENT WITHIN CONSTRUCTION AREAS THAT WILL NOT BECOME SUBMERGED BY THE LITTLE PATUXENT RIVER OR TRIBUTARY.
19. ALL FUELING OPERATIONS, LUBRICATING, HYDRAULIC TOPPING OFF, FUEL TANK PURGING, AND EQUIPMENT MAINTENANCE/REPAIRS SHALL BE PERFORMED AT AN UPLAND SITE THAT IS PROTECTED FROM FLOODING CONDITIONS. THESE ACTIVITIES SHALL TAKE PLACE ON AN APPROVED PAD WITH SPILL CONTROL/COLLECTION DEVICES IN PLACE. THE USE OF CANOLA OIL OR OTHER BIODEGRADABLE FUELS AND FLUIDS IS RECOMMENDED WHEN WORKING IN SENSITIVE RIVERINE ENVIRONMENTS.
20. ALL CONSTRUCTION EQUIPMENT SHALL BE INSPECTED DAILY FOR HYDRAULIC AND FUEL LEAKS; LEAKS MUST BE REPAIRED PRIOR TO OPERATION WITHIN 1,000 FEET OF THE RIVER. WHEN NOT IN USE, FUEL AND HYDRAULIC FLUIDS SHALL BE STORED AT AN UPLAND SITE THAT IS PROTECTED FROM FLOODING CONDITIONS. EMERGENCY SPILL RESPONSE DEVICES SHALL BE ON-SITE AT ALL TIMES DURING CONSTRUCTION IN WATERWAYS AND FLOODPLAINS AND SHALL BE READY TO DEPLOY IN THE EVENT OF A SPILL.
21. LITTER AND CONSTRUCTION DEBRIS SHALL BE CONTAINED DAILY. ALL CONSTRUCTION DEBRIS AND LITTER SHALL BE COMPLETELY REMOVED OFFSITE AND DISPOSED OF PROPERLY UPON PROJECT COMPLETION.
22. NO WASTEWATER FROM CONSTRUCTION ACTIVITIES, OR OTHER NON-PERMITTED SOURCE, SHALL BE DISCHARGED INTO THE RIVER.
23. ANY RE-VEGETATION OR PLANTING SHALL OCCURRING WITHIN THE APPROPRIATE PLANTING WINDOWS AND IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS.
24. NO PERSON SHALL CAUSE OR ALLOW EARTH-DISTURBING ACTIVITIES, LAND CLEARING, GRADING, EXCAVATING OR FILLING EXCEPT IN COMPLIANCE WITH THE PERFORMANCE CRITERIA SET OUT IN THE HOWARD COUNTY STANDARDS.
25. EROSION AND SEDIMENT CONTROL PRACTICES USED TO SATISFY THE PERFORMANCE CRITERIA SHALL MEET THE STANDARDS AND SPECIFICATIONS IN THE CURRENT EDITION OF 2011 STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL.
26. THE PERFORMANCE CRITERIA ARE GENERAL GUIDELINES AND SHALL NOT LIMIT THE RIGHT OF THE OWNER TO IMPOSE ADDITIONAL, MORE STRINGENT REQUIREMENTS, NOR SHALL THE CRITERIA LIMIT THE RIGHT OF THE OWNER TO WAIVE INDIVIDUAL REQUIREMENTS.
27. CONTRACTOR SHALL NOT DISPOSE OF EXCESS OR UNSUITABLE EXCAVATED MATERIAL IN WETLANDS OR FLOODPLAINS, EVEN WITH THE PERMISSION OF THE PROPERTY OWNER.
28. CONTRACTOR SHALL NOT LOCATE STOCKPILE STORAGE AREAS IN ENVIRONMENTALLY SENSITIVE AREAS.
29. CONTRACTOR SHALL NOT PUMP SEDIMENT-LADEN WATER FROM TRENCHES OR OTHER EXCAVATIONS DIRECTLY INTO ANY SURFACE WATERS, ANY STREAM CORRIDORS, ANY WETLANDS, OR STORM SEWERS; ALL SUCH WATER WILL BE PROPERLY FILTERED OR SETTLED TO REMOVE SILT PRIOR TO RELEASE.
30. CONTRACTOR SHALL NOT CAUSE PERMANENT OR UNSPECIFIED ALTERATION OF THE FLOW LINE OF ANY STREAM.
31. CONTRACTOR SHALL NOT DAMAGE VEGETATION OUTSIDE OF THE CONSTRUCTION AREA.
32. CONTRACTOR SHALL NOT DISPOSE OF TREES, BRUSH, OR OTHER DEBRIS IN ANY STREAM CORRIDORS, ANY WETLANDS, ANY SURFACE WATERS, OR AT UNSPECIFIED LOCATIONS.
33. CONTRACTOR SHALL NOT DISCHARGE INJURIOUS SILICA DUST CONCENTRATIONS INTO THE ATMOSPHERE RESULTING FROM BREAKING, CUTTING, CHIPPING, RILLING, BUFFING, GRINDING, POLISHING, SHAPING OR SURFACING CLOSER THAN 200 FEET TO PLACES OF RESIDENCES OR COMMERCIAL, PROFESSIONAL, QUASI-PUBLIC OR PUBLIC PLACES OF HUMAN OCCUPATION.
34. CONTRACTOR SHALL NOT STORE CONSTRUCTION EQUIPMENT AND VEHICLES AND/OR STOCKPILE CONSTRUCTION MATERIALS ON PROPERTY, PUBLIC OR PRIVATE, NOT PREVIOUSLY SPECIFIED ON THE PLANS BY THE ENGINEER FOR SUCH PURPOSES.
35. CONTRACTOR SHALL NOT ROUTE WELL POINT OR PUMP DISCHARGE LINES THROUGH PRIVATE PROPERTY OR PUBLIC PROPERTY AND RIGHTS-OF-WAY WITHOUT THE WRITTEN PERMISSION OF THE PROPERTY OWNER AND THE CONSENT OF THE ENGINEER.
36. CONTRACTOR SHALL NOT CLOSE OFF CLEAR ACCESS TO ANY PUBLIC ALLEY, STREET, ROAD, AVENUE OR BOULEVARD WITHOUT THE PRIOR CONSENT OF MUNICIPAL OFFICIALS AND THE ENGINEER, OR CLOSE CLEAR ACCESS:
    - BY FIRE PROTECTION EQUIPMENT AND EMERGENCY VEHICLES;
    - BY THE PUBLIC TO ANY COMMERCIAL OR PROFESSIONAL PLACE OF BUSINESS, QUASI-PUBLIC OR PUBLIC ESTABLISHMENT, OR PLACE OF RESIDENCE; OR
    - BY VEHICLES TO DRIVEWAYS WITHOUT THE PROVISION OF ALTERNATIVE MEANS OF BUILDING INGRESS AND EGRESS

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

SOIL CONSERVATION DISTRICT ______ DATE ______

REVIEWED FOR HOWARD COUNTY SOIL CONSERVATION DISTRICT AND MEETS TECHNICAL REQUIREMENTS.

US SOIL CONSERVATION DISTRICT ______ DATE ______

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. 22307, EXPIRATION DATE 4/9/15
SIGNED: [signature]

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. 39369, EXPIRATION DATE 7/21/14
SIGNED: [signature]

AS-BUILT 4/2016

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

[signature] 1/30/14	[signature] 1/29/14
DIRECTOR OF PUBLIC WORKS — DATE	CHIEF BUREAU OF ENGINEERING — DATE
[signature] 1/29/14 — CHIEF BUREAU OF UTILITIES — DATE	[signature] 1/29/14 — CHIEF UTILITY DESIGN DIVISON — DATE

HAZEN AND SAWYER
Environmental Engineers & Scientists
ONE SOUTH STREET, BALTIMORE, MD 21202

STATE OF MARYLAND — 22307 — REGISTERED PROFESSIONAL ENGINEER — 1/23/14
STATE OF MARYLAND — 39369 — REGISTERED PROFESSIONAL ENGINEER — 1/23/14

DESIGNED CAS
DRAWN CAS
CHECKED LCS
PROJ. ENGR.
ACS
APPROVED

NO.	ISSUED FOR	DATE	BY
5	AS-BUILT	9/2015	DAV
4	ADDENDUM 1	7/2014	DAA
3	BIDDING	1/2014	DAA
2	90% REVIEW	9/2013	DAA
1	60% REVIEW	6/2013	DAA

GENERAL
MAIN ELECTRICAL FACILITY
EROSION AND SEDIMENT CONTROL NOTES AND DETAILS

GENERATOR/SWITCHGEAR INSTALLATION CONTRACT
LITTLE PATUXENT WATER RECLAMATION PLANT
CAPITAL PROJECT NUMBER S-6264
CONTRACT NUMBER 20-4832
6TH ELECTION DISTRICT HOWARD COUNTY, MARYLAND

DATE JAN 2014
DRAWING NUMBER C4
SCALE AS SHOWN
SHEET 6 OF 37

IMAGEs= E-1_1, E-1_2, E-9-2_1,
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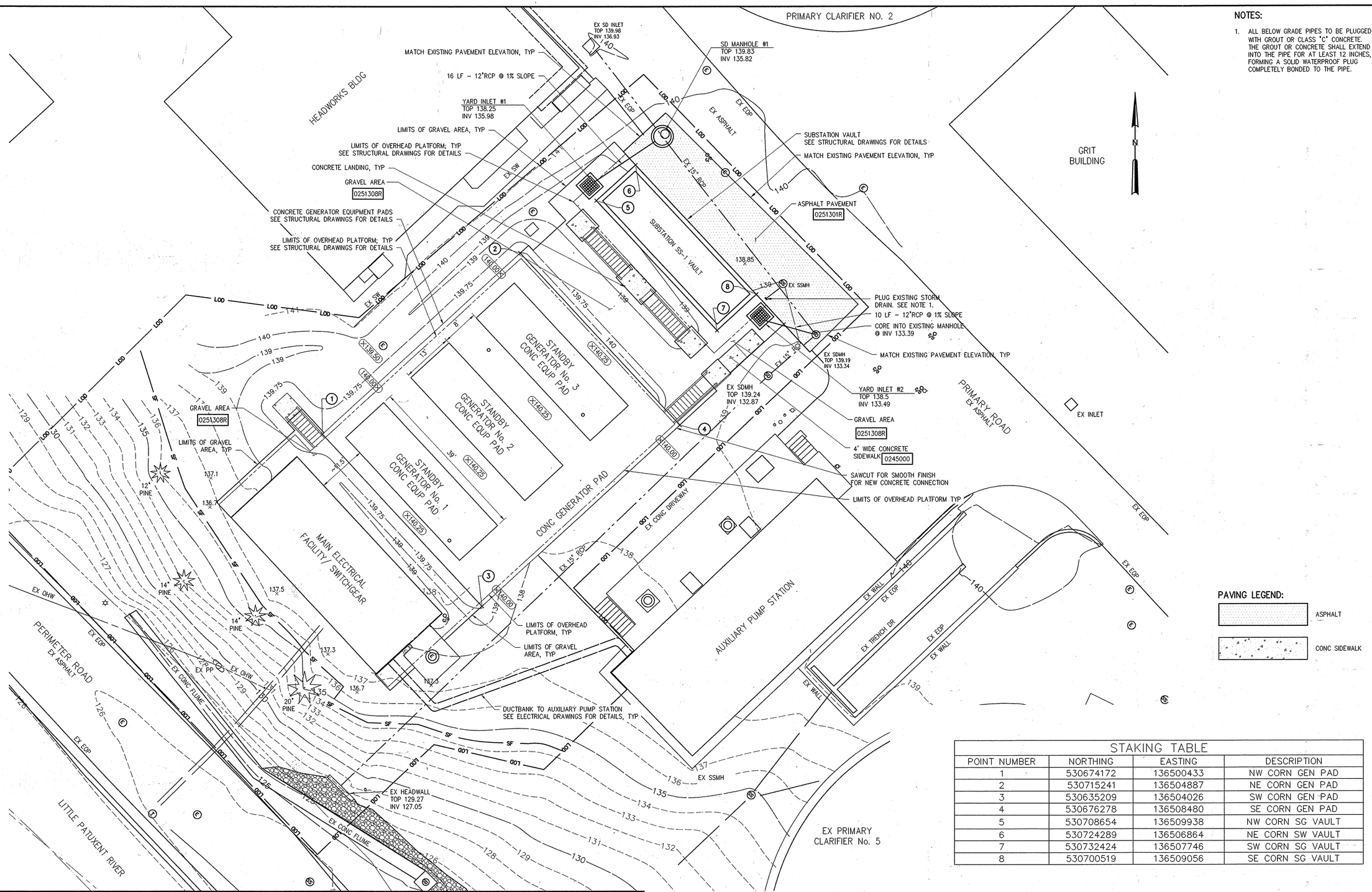

NOTES:

1. ALL BELOW GRADE PIPES TO BE PLUGGED WITH GROUT OR CLASS "C" CONCRETE. THE GROUT OR CONCRETE SHALL EXTEND INTO THE PIPE FOR AT LEAST 12 INCHES, FORMING A SOLID WATERPROOF PLUG COMPLETELY BONDED TO THE PIPE.

PAVING LEGEND:

ASPHALT

CONC SIDEWALK

STAKING TABLE			
POINT NUMBER	NORTHING	EASTING	DESCRIPTION
1	530674172	136500433	NW CORN GEN PAD
2	530715241	136504887	NE CORN GEN PAD
3	530635209	136504026	SW CORN GEN PAD
4	530676278	136508480	SE CORN GEN PAD
5	530708654	136509938	NW CORN SG VAULT
6	530724289	136506864	NE CORN SW VAULT
7	530732424	136507746	SW CORN SG VAULT
8	530700519	136509056	SE CORN SG VAULT

PARTIAL SITE PLAN

1" = 10'-0"

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

AS-BUILT 4/2016

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

SOIL CONSERVATION DISTRICT DATE

REVIEWED FOR HOWARD COUNTY SOIL CONSERVATION DISTRICT AND MEETS TECHNICAL REQUIREMENTS.

US SOIL CONSERVATION DISTRICT DATE

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. 22307, EXPIRATION DATE 4/4/15

SIGNED:

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. 22307, EXPIRATION DATE 7/21/2016

SIGNED:

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 1/30/14

CHIEF BUREAU OF ENGINEERING — DATE 1/29/14

CHIEF BUREAU OF UTILITIES — DATE 1/28/14

CHIEF-UTILITY DESIGN DIVISON — DATE 1/29/14

HAZEN AND SAWYER
Environmental Engineers & Scientists
ONE SOUTH STREET, BALTIMORE, MD 21202

STATE OF MARYLAND — 22307 — REGISTERED PROFESSIONAL ENGINEER — 1/29/14

STATE OF MARYLAND — REGISTERED PROFESSIONAL ENGINEER — 1/29/14

DESIGNED CAS
DRAWN CAS
CHECKED ULS
PROJ. ENGR.
APPROVED ASZ

NO.	ISSUED FOR	DATE	BY
5	AS-BUILT	9/2015	DAV
4	ADDENDUM 1	7/2014	DAA
3	BIDDING	1/2014	DAA
2	90% REVIEW	9/2013	DAA
1	60% REVIEW	6/2013	DAA

GENERAL
MAIN ELECTRICAL FACILITY
STAKING PAVEMENT. GRADING AND DRAINAGE - PARTIAL SITE PLAN

GENERATOR/SWITCHGEAR INSTALLATION CONTRACT
LITTLE PATUXENT WATER RECLAMATION PLANT
CAPITAL PROJECT NUMBER S-6264
CONTRACT NUMBER 20-4832
6TH ELECTION DISTRICT HOWARD COUNTY, MARYLAND

DATE JAN 2014
DRAWING NUMBER C5
SCALE AS SHOWN
SHEET 7 OF 37

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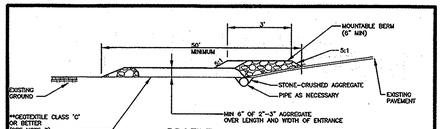
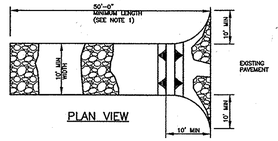


PROFILE

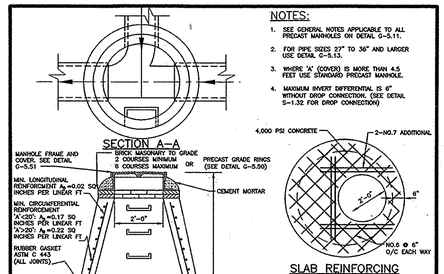


PLAN VIEW

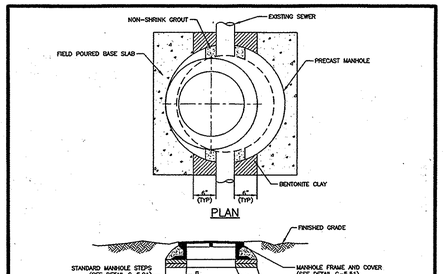
NOTES:

1. LENGTH – MINIMUM OF 50' (20' FOR SINGLE RESIDENCE LOT).
2. WIDTH – 10' MINIMUM SHOULD BE FLARED AT THE EXISTING ROAD TO PROVIDE A TURNING RADIUS.
3. GEOTEXTILE FABRIC (FILTER CLOTH) SHALL BE PLACED OVER THE EXISTING GROUND PRIOR TO PLACING STONE. ** THE PLAN APPROVAL AUTHORITY MAY NOT REQUIRE SINGLE FAMILY RESIDENCES TO USE GEOTEXTILE.
4. STONE-CRUSHED AGGREGATE (2" TO 3") OR RECLAIMED OR RECYCLED CONCRETE EQUIVALENT SHALL BE PLACED TO A LEAST 6" DEPTH OVER THE LENGTH AND WIDTH OF THE ENTRANCE. ADDITIONAL STONE MAY BE REQUIRED BY THE SEDIMENT CONTROL INSPECTOR. ALL SURFACE WATER FLOWING TOWARD CONSTRUCTION ENTRANCES SHALL BE PIPED THROUGH THE ENTRANCE, MAINTAINING A POSITIVE DRAINAGE. PIPE INSTALLED THROUGH THE STABILIZED CONSTRUCTION ENTRANCE SHALL BE PROTECTED WITH A MOUNTABLE BERM WITH 5:1 SLOPES AND A MINIMUM OF 6" OF STONE OVER THE PIPE. PIPE HAS TO BE SIZED ACCORDING TO THE DRAINAGE. WHEN THE SCE IS LOCATED AT A HIGH SPOT AND HAS NO DRAINAGE TO CONVEY A PIPE WILL NOT BE NECESSARY. PIPE SHOULD BE SIZED ACCORDING TO THE AMOUNT OF RUNOFF TO BE CONVEYED. A 6" MINIMUM DIAMETER IS REQUIRED.
5. LOCATION– A STABILIZED CONSTRUCTION ENTRANCE SHALL BE LOCATED AT EVERY POINT WHERE CONSTRUCTION TRAFFIC ENTERS OR LEAVES A CONSTRUCTION SITE. VEHICLES LEAVING THE SITE MUST TRAVEL OVER THE ENTIRE LENGTH OF STABILIZED CONSTRUCTION ENTRANCE.
6. STABILIZED CONSTRUCTION ENTRANCE SHALL BE PLACED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS. ADDITIONAL ENTRANCES ARE PROHIBITED.

Revised	Howard County, Maryland Department of Public Works	Stabilized Construction Entrance	Detail G-6.01
Revised 1/1/2007	Approved: Chief, Bureau of Engineering		
Approved			



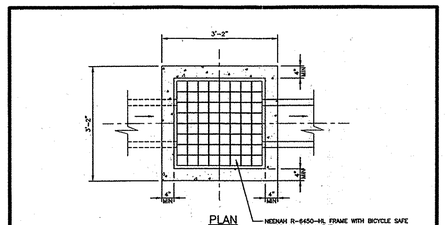
Revised	Howard County, Maryland Department of Public Works	PRECAST MANHOLE Standard and Shallow 4'-0" for 24" Pipe and smaller	Detail G-5.12
Revised 5/1/2007	Approved: Chief, Bureau of Engineering		
Approved			



NOTES:

1. SEE DETAIL G-5.11 FOR GENERAL NOTES APPLICABLE TO ALL PRECAST MANHOLES.
2. SEE DETAIL G-5.13 FOR MANHOLE DETAILS FOR PIPES 27 INCHES TO 36 INCHES.

Revised	Howard County, Maryland Department of Public Works	PRECAST MANHOLE Doghouse Over Existing Sewer 24" Pipe and smaller	Detail G-5.14
Revised 5/1/2007	Approved: Chief, Bureau of Engineering		
Approved			



NOTE:

1. INLET TO BE USED IN A SWALE OR SUMP. MAX. CAPACITY UNDER .25"=3 C.F.S. TO BE USED WITH 15" CMP, OR SMALLER, NOT TO BE USED IN ROADWAY OR PARKING AREA.
2. TO BE USED ONLY WHEN APPROVED BY COUNTY.

Revised	Howard County, Maryland Department of Public Works	Yard Inlet	Detail D-4.14
Revised 5/1/2007	Approved: Chief, Bureau of Engineering		
Approved			

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

SOIL CONSERVATION DISTRICT DATE

REVIEWED FOR HOWARD COUNTY SOIL CONSERVATION DISTRICT AND MEETS TECHNICAL REQUIREMENTS.

US SOIL CONSERVATION DISTRICT DATE

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. 22307 EXPIRATION DATE 4/9/15
SIGNED:

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. 29363 EXPIRATION DATE 7/2/14
SIGNED:

AS-BUILT 4/2016

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 1/30/14
CHIEF BUREAU OF ENGINEERING — DATE 1/29/14
CHIEF BUREAU OF UTILITIES — DATE 1/29/14
CHIEF UTILITY DESIGN DIVISON — DATE 1/29/14

HAZEN AND SAWYER
Environmental Engineers & Scientists
ONE SOUTH STREET, BALTIMORE, MD 21202

STATE OF MARYLAND — CHRISTOPHER A. SCHMIDT — 22307 — REGISTERED PROFESSIONAL ENGINEER — 1/29/14

STATE OF MARYLAND — DAVID A. ATKINSON — 29363 — REGISTERED PROFESSIONAL ENGINEER — 1/29/14

DESIGNED CAS
DRAWN CAS
CHECKED CLS
PROJ. ENGR.
APPROVED

NO.	ISSUED FOR	DATE	BY
5	AS-BUILT	9/2015	DAV
4	ADDENDUM 1	7/2014	DAA
3	BIDDING	1/2014	DAA
2	90% REVIEW	9/2013	DAA
1	60% REVIEW	6/2013	DAA

CIVIL
MAIN ELECTRICAL FACILITY
DETAILS

GENERATOR/SWITCHGEAR
INSTALLATION CONTRACT
LITTLE PATUXENT WATER RECLAMATION PLANT
CAPITAL PROJECT NUMBER S-6264
CONTRACT NUMBER 20-4832
6TH ELECTION DISTRICT HOWARD COUNTY, MARYLAND

DATE JAN 2014
DRAWING NUMBER C6
SCALE AS SHOWN
SHEET 8 OF 37

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GENERAL STRUCTURAL NOTES

G-1 THESE NOTES ARE GENERAL AND SUPPLEMENT THE SPECIFICATIONS. THESE NOTES APPLY TO THE ENTIRE PROJECT UNLESS MODIFIED OR NOTED OTHERWISE IN THE CONTRACT DOCUMENTS.

G-2 STANDARD DETAILS SHALL BE USED WHEN REFERRED TO OR WHEN NO MORE RESTRICTIVE OR DIFFERENT DETAILS ARE SHOWN ON THE DRAWINGS.

G-3 DESIGN IS IN ACCORDANCE WITH AND CONSTRUCTION SHALL COMPLY WITH THE PROVISIONS OF THE MARYLAND BUILDING PERFORMANCE STANDARDS. THE DESIGN LOADS AND OTHER DESIGN VALUES GIVEN IN NOTES G-4 THROUGH G-7 WERE USED FOR DESIGN OF STRUCTURES UNLESS NOTED OTHERWISE ON THE DRAWINGS.

G-4 LIVE LOADS:

STRUCTURE / LEVEL	LOAD
ACCESS PLATFORM	100 PSF
GENERATOR PAD	100 PSF + EQUIPMENT WEIGHT
SUBSTATION SS-1 VAULT	100 PSF + EQUIPMENT WEIGHT

-ALL STAIRWAYS, LANDINGS AND PLATFORMS ARE DESIGNED FOR A LIVE LOAD = 100 PSF UNLESS NOTED OTHERWISE.

G-5 SNOW LOAD: N/A

G-6 WIND DESIGN CRITERIA: N/A

G-7 SEISMIC LOAD:

OCCUPANCY CATEGORY = I(GENERATOR PLATFORM)/ III(NEW SWITCHYARD VAULT)
SEISMIC IMPORTANCE FACTOR (Ie) = 1.0 (GENERATOR PLATFORM)/ (1.25 SWITCHYARD VAULT)
SITE CLASS = D
MAPPED SPECTRAL RESPONSE ACCELERATIONS (Ss/S1) = 0.159/ 0.050
SPECTRAL RESPONSE ACCELERATIONS (SMS/SM1) = 0.254/ 0.120
SPECTRAL RESPONSE COEFFICIENTS (SDS/SD1) = 0.170/ 0.080
SEISMIC DESIGN CATEGORY = B

G-8 ALL DIMENSIONS INDICATED (*) SHALL BE VERIFIED EITHER BY FIELD MEASUREMENTS FOR EXISTING STRUCTURES OR BY SHOP DRAWINGS FOR EQUIPMENT FURNISHED. STRUCTURAL DIMENSIONS NOT SHOWN BUT CONTROLLED BY OR RELATED TO EQUIPMENT SHALL BE VERIFIED BY THE CONTRACTOR WITH THE MANUFACTURER PRIOR TO CONSTRUCTION.

G-9 THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING ALL EXISTING INFORMATION IN THE FIELD AS REQUIRED FOR NEW WORK.

G-10 IF A CONFLICT IS FOUND BETWEEN DIFFERENT PORTIONS OF THE CONTRACT DOCUMENTS, THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY. CONTINUED CONSTRUCTION OF THE AREA IN CONFLICT SHALL BE AT THE CONTRACTOR'S OWN RISK UNTIL THE CONFLICT IS RESOLVED.

G-11 EQUIPMENT ANCHOR BOLT SIZES, TYPES, EMBEDMENT AND PATTERNS SHALL BE VERIFIED WITH THE MANUFACTURER. ALL BOLT PATTERNS SHALL BE TEMPLATED TO INSURE ACCURACY OF PLACEMENT.

G-12 STRUCTURAL DRAWINGS SHALL BE USED IN COORDINATION WITH THE DRAWINGS OF ALL OTHER DISCIPLINES AND MANUFACTURER'S SHOP DRAWINGS.

G-13 STRUCTURES HAVE BEEN DESIGNED FOR OPERATIONAL LOADS ON THE COMPLETED STRUCTURE. DURING CONSTRUCTION, THE STRUCTURES SHALL BE PROTECTED BY BRACING AND TEMPORARY SUPPORTS WHEREVER EXCESSIVE CONSTRUCTION LOADS MAY OCCUR. OVERSTRESSING OF ANY STRUCTURAL ELEMENT IS PROHIBITED.

STRUCTURAL METALS

M-1 ALUMINUM SHALL BE ALLOY 6061-T6 UNLESS NOTED OTHERWISE.

M-2 ALL BOLTS, ANCHOR BOLTS, AND CONCRETE ANCHORS CONNECTING ALUMINUM SHALL BE STAINLESS STEEL TYPE 316 FOR UNDERWATER APPLICATIONS AND TYPE 304 FOR ALL OTHER APPLICATIONS.

M-3 DETAIL, FABRICATE, AND ERECT ALUMINUM IN ACCORDANCE WITH THE LATEST EDITION OF THE ALUMINUM ASSOCIATION ALUMINUM DESIGN MANUAL.

M-4 ALUMINUM SHALL BE ISOLATED FROM CONTACT WITH CONCRETE AND DISSIMILAR METALS.

M-5 ALL GROOVE AND BUTT WELDS SHALL BE FULL PENETRATION.

M-6 FILLET WELD SIZES SHALL NOT BE LESS THAN THE MINIMUM SIZE REQUIRED BY AISC CODE FOR PLATE SIZES TO BE CONNECTED AND SHALL BE APPLIED TO THE ENTIRE JOINT CONTACT LENGTH, AND NOT LESS THAN 3/16".

M-7 BOTTOM SURFACES OF BASE PLATES SHALL BE GROUTED TO ENSURE FULL BEARING CONTACT WITH CONCRETE SLAB.

M-8 WHENEVER ONE MEMBER IS FASTENED TO ANOTHER WITH FASTENINGS (BOLTS, WELDS, ETC.) SET AT A UNIFORM SPACING, THERE SHALL BE A MINIMUM OF TWO FASTENINGS PER PIECE CONNECTED AND THE FIRST AND LAST FASTENINGS SHALL BE LOCATED NOT TO EXCEED 0.25 OF FASTENER SPACING FROM EACH END.

M-9 STRUCTURAL WELDED JOINTS SHALL CONFORM TO THE PROVISIONS OF AWS D1.21, STRUCTURAL WELDING CODE ALUMINUM BY AMERICAN WELDING SOCIETY. PROOF OF WELDER CERTIFICATION SHALL BE AVAILABLE AT THE JOB SITE DURING TIMES OF INSPECTION.

NONSTRUCTURAL COMPONENT ANCHORAGE

A-1 ALL ARCHITECTURAL, MECHANICAL, AND ELECTRICAL COMPONENTS SHALL BE DESIGNED AND INSTALLED TO RESIST THE CONTROLLING CONDITION OF OPERATIONAL FORCES OR SEISMIC FORCES IN ACCORDANCE WITH THE GOVERNING BUILDING CODE. SEISMIC FORCES SHALL ALSO BE AS PER ASCE 7. COMPONENT SEISMIC ATTACHMENTS SHALL BE BOLTED, WELDED, OR OTHERWISE POSITIVELY FASTENED WITHOUT CONSIDERATION OF FRICTIONAL RESISTANCE PRODUCED BY THE EFFECTS OF GRAVITY. A CONTINUOUS LOAD PATH OF SUFFICIENT STRENGTH AND STIFFNESS BETWEEN THE COMPONENT AND THE SUPPORTING STRUCTURE SHALL BE PROVIDED. CONNECTIONS FOR BOTH ORTHOGONAL DIRECTIONS (TRANSVERSE AND LONGITUDINAL) SHALL BE DESIGNED BY THE CONTRACTOR'S ENGINEER CURRENTLY REGISTERED IN THE STATE OF MARYLAND.

A-2 COMPONENT REACTION FORCES AT THE POINT OF ATTACHMENT TO THE STRUCTURE SHALL BE SUBMITTED TO AND COORDINATED WITH THE ENGINEER FOR CONFIRMATION SUPPORTING STRUCTURE CAN WITHSTAND REACTION FORCES.

A-3 CONTRACTOR SHALL PROVIDE SPECIAL SEISMIC CERTIFICATION (SSC) FROM MANUFACTURER OF EQUIPMENT FOR ALL SYSTEMS DEEMED NECESSARY BY SPECIFICATIONS. SPECIAL SEISMIC CERTIFICATION SHALL BE IN COMPLIANCE WITH ASCE 7.

FOUNDATIONS

F-1 CONCRETE (CAST-IN-PLACE) NOTES APPLY TO FOUNDATIONS.

F-2 ALLOWABLE SOIL BEARING PRESSURE = NOT APPLICABLE

F-3 MICROPILE CAPACITY = SEE SHEET S4

F-4 MINIMUM DEPTH FROM ADJACENT FINISHED GRADE TO BOTTOM OF FOUNDATION = 30 INCHES.

F-5 SOFT OR LOOSE SOILS MAY BE ENCOUNTERED DURING EARTHWORK OPERATIONS, REQUIRING ADDITIONAL UNDERCUTTING AND FILL. REFER TO GEOTECHNICAL REPORT FOR DETAILED SOIL STRATIFICATION.

F-6 STRUCTURES ARE DESIGNED TO RESIST FORCES INDUCED DURING EVENT WHERE WATER EXISTS AT THE 100-YEAR FLOOD ELEVATION OF 146.00.

F-7 GROUNDWATER CONTROL MAY BE REQUIRED DURING CONSTRUCTION.

PRECAST CONCRETE

PC-1 PRECAST VAULTS AND MANHOLES SHALL BE DESIGNED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF MARYLAND. STRUCTURAL DRAWINGS SHALL INDICATE DESIGN IS IN COMPLIANCE WITH THE MARYLAND BUILDING PERFORMANCE STANDARDS.

CONCRETE (CAST-IN-PLACE)

C-1 DESIGN OF CONCRETE ELEMENTS INCLUDING WALLS, FORMED SLABS, BEAMS, AND COLUMNS IS IN ACCORDANCE WITH ACI 318 (CODE REQUIREMENTS FOR STRUCTURAL CONCRETE).

C-2 FOR CONCRETE MIX DESIGN SEE SPECIFICATION SECTION 03300.

C-3 CONCRETE STRENGTH CLASSES (28-DAY COMPRESSIVE STRENGTH):

A) CLASS A1 CONCRETE (4,500 PSI): NORMAL WEIGHT CONCRETE SHALL BE USED IN ALL STRUCTURES, SIDEWALKS, PAVEMENTS, EXCEPT WHERE NOTED OTHERWISE IN CONTRACT DOCUMENTS. ALL CONCRETE SHALL BE CLASS A1 CONCRETE UNLESS ANOTHER CLASS IS SPECIFICALLY CALLED FOR ON CONTRACT DOCUMENTS OR SPECIFIED HEREIN.

B) CLASS A2 CONCRETE (4,500 PSI): N/A

C) CLASS A3 CONCRETE (4,500 PSI): NORMAL WEIGHT STRUCTURAL CONCRETE TO BE USED WHERE SPECIFICALLY CALLED FOR ON CONTRACT DRAWINGS OR WHERE SPECIFICALLY REQUESTED BY CONTRACTOR AND APPROVED BY ENGINEER. CLASS A3 CONCRETE SHALL BE SIMILAR TO CLASS A1 EXCEPT CLASS A3 CONCRETE SHALL CONTAIN A MANDATORY ADDITION OF HIGH RANGE WATER REDUCER TO AID IN PLACEMENT OF CONCRETE.

D) CLASS A4 CONCRETE (4,500 PSI): N/A

E) CLASS A5 CONCRETE (4,500 PSI): N/A

F) CLASS A6 CONCRETE (4,500 PSI): NORMAL WEIGHT STRUCTURAL CONCRETE USED WHERE CONCRETE IS PLACED UNDER PRESSURE (PUMPED). CLASS A6 CONCRETE SHALL BE USED ONLY WHERE SPECIFICALLY APPROVED BY ENGINEER.

G) CLASS B CONCRETE (3,000 PSI): NORMAL WEIGHT STRUCTURAL CONCRETE USED FOR DUCT BANK ENCASEMENTS, CATCH BASINS, FENCE AND GUARD POST EMBEDMENT, CONCRETE FILL AND OTHER AREAS WHERE SPECIFICALLY NOTED ON CONTRACT DRAWINGS.

C-4 ALL BAR REINFORCING SHALL CONFORM TO ASTM A615, GRADE 60. WHERE REINFORCEMENT IS TO BE WELDED IN ACCORDANCE WITH AWS D1.4, ASTM A706 GRADE 60 SHALL BE USED. WELDED WIRE FABRIC SHALL CONFORM TO ASTM A185.

C-5 CONCRETE COVER FOR REINFORCING (UNLESS NOTED OTHERWISE ON THE DRAWINGS):

A) CONCRETE DEPOSITED DIRECTLY AGAINST SOIL:	3"
B) CONCRETE EXPOSED TO WEATHER (#5 OR SMALLER):	1 1/2"
CONCRETE EXPOSED TO WEATHER (#6 OR LARGER):	2"
C) SLABS:	1 1/2"
AT SURFACES CONTACTING FLUID:	2"
D) BEAMS AND COLUMNS (TO MAIN REINFORCEMENT):	2"
BEAMS AND COLUMNS (TO COLUMN TIES OR STIRRUPS):	1 1/2"
E) WALLS 12" OR MORE:	2"
WALLS LESS THAN 12" (#5 OR SMALLER):	1 1/2"
WALLS LESS THAN 12" (#6 OR LARGER):	2"
F) FOR SURFACES EXPOSED TO FLUID IN BEAMS, COLUMNS AND WALLS:	ADD 1/2" TO ABOVE VALUES

C-6 SPLICES SHALL BE CLASS 'B' TENSION SPLICE CONFORMING TO THE PROVISIONS OF ACI 318 UNLESS NOTED OTHERWISE.

C-7 CONSTRUCTION JOINTS SHALL BE LOCATED AS SHOWN ON THE DRAWINGS. CONSTRUCTION JOINTS NOT SHOWN SHALL BE SUBMITTED BY THE CONTRACTOR FOR THE APPROVAL OF THE ENGINEER PRIOR TO SUBMITTING REBAR SHOP DRAWINGS. VERTICAL CONSTRUCTION JOINTS IN WALLS AND HORIZONTAL JOINTS IN SLABS SHALL BE PROVIDED AT A SPACING NOT GREATER THAN 45 FEET ON CENTER. FOR EXPOSED WALLS WITH FLUID OR EARTH ON THE OPPOSITE SIDE, THE SPACING BETWEEN VERTICAL AND HORIZONTAL JOINTS SHALL BE A MAXIMUM OF 25 FEET.

C-8 WHERE HORIZONTAL CONSTRUCTION JOINTS, LOCATED ABOVE THE FOUNDATION SLAB, EXTEND BEYOND WHERE NEEDED, THEY SHALL BE TERMINATED AT A VERTICAL CONSTRUCTION JOINT APPROVED BY THE ENGINEER.

C-9 ALL JOINTS WHICH ARE IN MEMBERS IN CONTACT WITH LIQUID OR BELOW GRADE SHALL HAVE A WATERSTOP. CONSTRUCTION JOINTS SHALL HAVE A 6" PVC RIBBED WATERSTOP. EXPANSION JOINTS SHALL HAVE A 9" PVC CENTER BULB RIBBED WATERSTOP. IN VERTICAL JOINTS, WATERSTOPS SHALL TERMINATE NO LESS THAN 18" ABOVE THE MAXIMUM WATER SURFACE OR 18" ABOVE GRADE, WHICHEVER IS HIGHER.

CONCRETE (CAST-IN-PLACE)

C-10 SLABS WITH SLOPING SURFACES SHALL HAVE THE INDICATED SLAB THICKNESS MAINTAINED AS THE MINIMUM. SLAB BOTTOMS CAN EITHER SLOPE WITH THE TOP SURFACE OR BE LEVEL. REINFORCEMENT IN SLABS WITH SLOPING SURFACES SHALL BE PLACED AT THE REQUIRED CLEARANCE FROM THE SLAB SURFACE.

C-11 ALL EXPOSED CORNERS SHALL HAVE A 3/4" CHAMFER OR A 1/2" RADIUS TOOLED CORNER.

C-12 EQUIPMENT SUPPORTS, ANCHORAGES, OPENINGS, RECESSES AND REVEALS NOT SHOWN ON THE STRUCTURAL DRAWINGS BUT REQUIRED BY OTHER CONTRACT DOCUMENTS, SHALL BE PROVIDED FOR PRIOR TO PLACING CONCRETE.

C-13 REINFORCING BARS AND ACCESSORIES SHALL NOT BE IN CONTACT WITH ANY METAL PIPE, PIPE FLANGE, METAL CONDUIT, OR OTHER METAL PARTS EMBEDDED IN CONCRETE. A MINIMUM CLEARANCE OF 2" SHALL BE PROVIDED.

C-14 DOWELS, ANCHOR BOLTS, PIPES, WATERSTOPS AND OTHER EMBEDDED ITEMS SHALL BE HELD SECURELY IN POSITION WHILE CONCRETE IS BEING PLACED.

C-15 CONDUITS AND OTHER SIMILAR ITEMS EMBEDDED IN OR PENETRATING THROUGH CONCRETE SHALL BE SPACED ON CENTER NOT LESS THAN 3 TIMES THEIR OUTSIDE DIMENSION, BUT NOT LESS THAN 2 1/2" CLEAR. WHEN SUCH ITEMS ARE EMBEDDED IN WALLS OR SLABS, THEY SHALL NOT OCCUPY MORE THAN 1/3 OF THE MEMBER THICKNESS.

C-16 AT ALL TYPICAL CURBS, EQUIPMENT PADS, AND PIPE SUPPORT PIERS, REINFORCING DOWELS SHOWN MAY BE REPLACED WITH MATCHING DOWELS SET IN EPOXY IN DRILLED HOLES AS SPECIFIED. DOWELS LOCATED CLOSER THAN 3" FROM ANY EDGE OF CONCRETE SHALL NOT BE REPLACED WITH DRILLED DOWELS.

C-17 DRILLED ADHESIVE DOWELS (WHERE DOWELS ARE SHOWN TO BE PLACED INTO HARDENED CONCRETE):

A) THE HOLE DIAMETER SHALL BE NO LARGER THAN 1/8" GREATER THAN THE DIAMETER OF THE REINFORCING BAR AT THE DEFORMATIONS.
B) THE DEPTH OF EMBEDMENT SHALL BE 12 BAR DIAMETERS, UNLESS NOTED OTHERWISE.
C) ADJUST THE DOWEL LOCATIONS AS NEEDED TO AVOID DRILLING THROUGH ANY REINFORCING BARS. IF THE LOCATION NEEDS TO BE MODIFIED, CONTACT THE ENGINEER.

C-18 CLEAR DISTANCE FROM ANCHOR BOLTS TO ANY CONCRETE EDGE SHALL BE 4" MINIMUM UNLESS NOTED OTHERWISE.

C-19 CONCRETE COMPRESSIVE STRENGTH TESTS SHALL BE AVAILABLE ON THE JOB SITE FOR REVIEW BY THE ENGINEER.

DEMOLITION

D-1 FOR DEMOLITION REQUIREMENTS, REFER TO SPECIFICATION 01540 – DEMOLITION AND REMOVAL OF EXISTING STRUCTURES AND EQUIPMENT.

D-2 CONCRETE DEMOLITION WITHIN STRUCTURES BEING MODIFIED SHALL BE SELECTIVE DEMOLITION BY CORE DRILLING OR SAWCUTTING AND CAREFUL REMOVAL OF CONCRETE SHOWN TO BE REMOVED. NO OVER CUTTING OF AREAS TO BE DEMOLISHED SHALL BE PERMITTED. CONTRACTOR SHALL CORE DRILL CORNERS OF OPENING PRIOR TO SAWCUTTING IF NECESSARY. VIBRATORY HAMMERS SHALL NOT BE USED FOR SELECT DEMOLITION WORK. JACK HAMMERS, HOE RAMS AND OTHER HIGH ENERGY DEMOLITION EQUIPMENT MAY BE USED FOR COMPLETE REMOVAL OF A STRUCTURE. EXPLOSIVES SHALL NOT BE USED FOR ANY DEMOLITION.

D-3 UNLESS ANCHORING DEVICES AND/OR REINFORCEMENT ARE NOTED TO REMAIN FOLLOWING DEMOLITION, REMOVE AND/OR BURN BACK ANCHORS AND REINFORCEMENT STEEL 1/2" MIN BELOW SURFACE. VOIDS CREATED SHALL BE FILLED WITH EPOXY RESIN BINDER.

D-4 WHERE DRAWINGS INDICATE A CONCRETE EQUIPMENT PAD TO BE DEMOLISHED, THE FLOOR SLAB SURFACE SHALL BE REPAIRED AS APPROVED BY ENGINEER. FOLLOWING SELECT DEMOLITION AND REMOVAL OF THE EQUIPMENT PAD, THE FLOOR SLAB SURFACE SHALL BE INSPECTED. IF THE FLOOR SLAB IS DAMAGED FROM THE EQUIPMENT PAD REMOVAL THE REPAIR SHALL BE:

A) SAW CUT THE FLOOR SLAB AROUND THE EQUIPMENT PAD PERIMETER TO A DEPTH OF 1/4 INCH.
B) SCARIFY AND REMOVE SLAB CONCRETE WITHIN THE PERIMETER TO A NOMINAL 1/4 INCH DEPTH. CLEAN AND REMOVE ALL CONCRETE LAITANCE.
C) RESURFACE THE AREA BY APPLYING A POLYMER MODIFIED OR SILICA FUME ENHANCED CEMENTITIOUS REPAIR MORTAR, APPROVED BY THE ENGINEER, FOLLOWING THE MANUFACTURERS SURFACE PREPARATION AND APPLICATION RECOMMENDATIONS. LEVEL AND FINISH THE SURFACE TO MATCH THE FLOOR SLAB SURROUNDING AREA.

D-5 CONCRETE SURFACES LEFT EXPOSED FOLLOWING DEMOLITION SHALL BE SEALED WITH A HIGH-BUILD, MOISTURE TOLERANT, EPOXY RESIN COATING. THE COATING SHALL BE SIKAGUARD 62 BY SIKA CORPORATION OR APPROVED EQUAL. FOR POTABLE WATER APPLICATIONS, REQUIREMENTS OF ANSI/NSF STANDARD 61 SHALL BE SATISFIED.

D-6 A DETAILED CONSTRUCTION AND DEMOLITION PLAN SHALL BE SUBMITTED TO THE ENGINEER AND APPROVED BY THE ENGINEER AND OWNER PRIOR TO BEGINNING CONSTRUCTION. ANY SHUTDOWNS SHALL BE SUBMITTED TO, COORDINATED WITH, AND APPROVED BY THE OWNER. ONCE APPROVED, CONTRACTOR SHALL PROVIDE A MINIMUM OF THREE (3) WEEKS NOTICE TO OWNER PRIOR TO SHUTDOWN, SEE SPECIFICATION SECTION 01520.

EXISTING INFORMATION

X-1 THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING ALL EXISTING INFORMATION IN THE FIELD AS REQUIRED FOR DEMOLITION AND MODIFICATIONS.

AS-BUILT 4/2016

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

SOIL CONSERVATION DISTRICT DATE

REVIEWED FOR HOWARD COUNTY SOIL CONSERVATION DISTRICT AND MEETS TECHNICAL REQUIREMENTS.

US SOIL CONSERVATION DISTRICT DATE

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. 22307, EXPIRATION DATE 4/9/15
SIGNED:

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. 43434, EXPIRATION DATE 03/27/2015
SIGNED:

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 1/30/14
CHIEF BUREAU OF ENGINEERING — DATE 1/29/14
CHIEF BUREAU OF UTILITIES — DATE 1/28/14
CHIEF UTILITY DESIGN DIVISON — DATE 1/29/14

HAZEN AND SAWYER
Environmental Engineers & Scientists
ONE SOUTH STREET, BALTIMORE, MD 21202

STATE OF MARYLAND — 22307 REGISTERED PROFESSIONAL ENGINEER — 1/23/14

STATE OF MARYLAND — 43434 REGISTERED PROFESSIONAL ENGINEER

DESIGNED AGM
DRAWN JDM
CHECKED CDP
PROJ. ENGR.
APPROVED

NO.	ISSUED FOR	DATE	BY
5	AS-BUILT	9/2016	DAV
4	ADDENDUM 1	7/2014	DAA
3	BIDDING	1/2014	DAA
2	90% REVIEW	9/2013	DAA
1	60% REVIEW	6/2013	DAA

STRUCTURAL
GENERAL
GENERAL STRUCTURAL NOTES

GENERATOR/SWITCHGEAR
INSTALLATION CONTRACT
LITTLE PATUXENT WATER RECLAMATION PLANT
CAPITAL PROJECT NUMBER S-6264
CONTRACT NUMBER 20-4832
6TH ELECTION DISTRICT HOWARD COUNTY, MARYLAND

DATE JAN 2014
DRAWING NUMBER
S1
SCALE AS SHOWN
SHEET 9 OF 37

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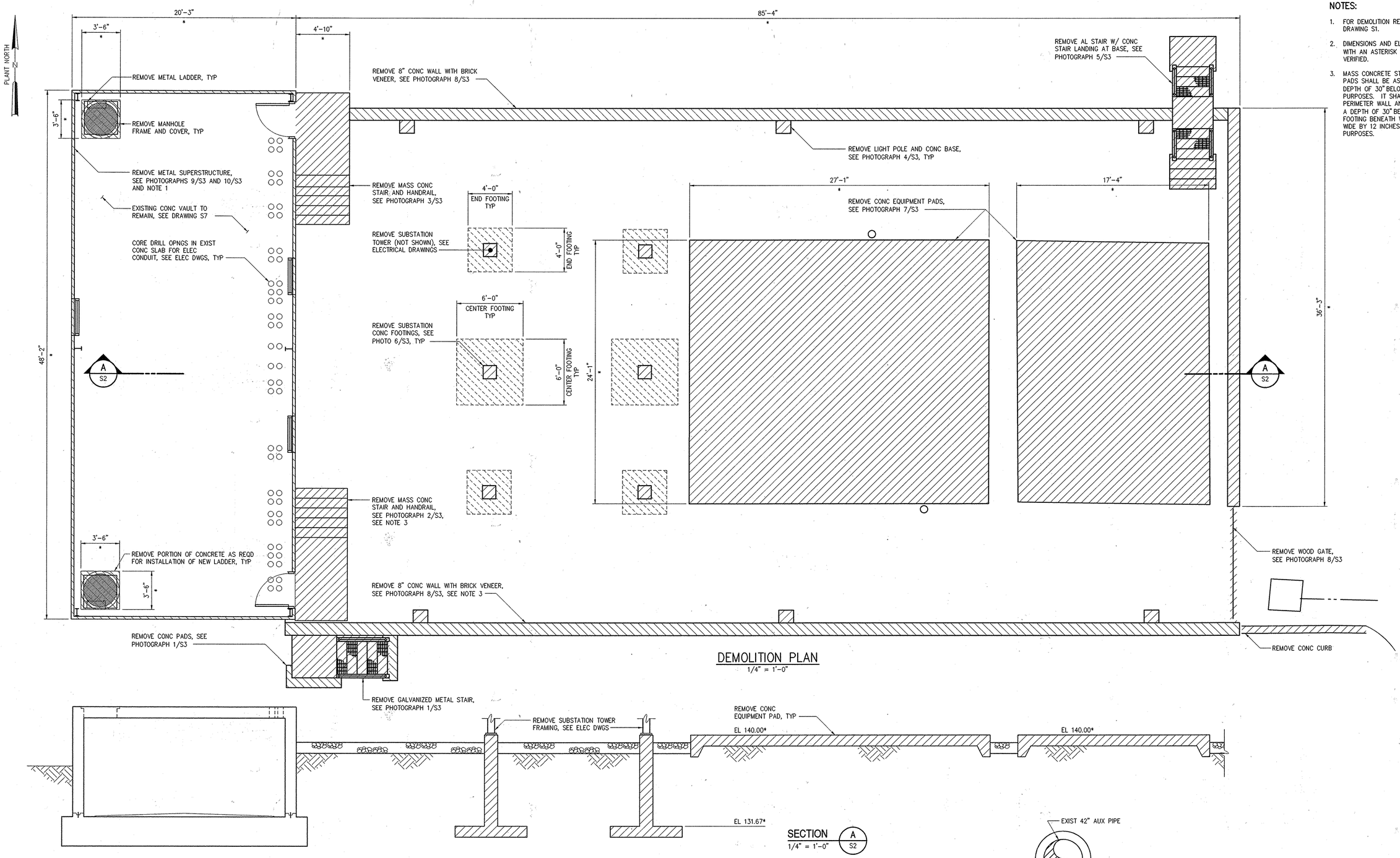

DEMOLITION PLAN
1/4" = 1'-0"

SECTION A / S2
1/4" = 1'-0"

NOTES:

1. FOR DEMOLITION REQUIREMENTS, SEE DRAWING S1.
2. DIMENSIONS AND ELEVATIONS INDICATED WITH AN ASTERISK (*) SHALL BE FIELD VERIFIED.
3. MASS CONCRETE STAIRS AND CONCRETE PADS SHALL BE ASSUMED TO EXTEND TO A DEPTH OF 30" BELOW GRADE FOR BIDDING PURPOSES. IT SHALL BE ASSUMED THAT PERIMETER WALL AND FOOTING EXTEND TO A DEPTH OF 30" BELOW GRADE AND THAT FOOTING BENEATH WALL SHALL BE 2 FOOT WIDE BY 12 INCHES DEEP FOR BIDDING PURPOSES.

AS-BUILT 4/2016

1/4"=1'-0" 1 0 1 2 3 7'

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

SOIL CONSERVATION DISTRICT DATE

REVIEWED FOR HOWARD COUNTY SOIL CONSERVATION DISTRICT AND MEETS TECHNICAL REQUIREMENTS.

US SOIL CONSERVATION DISTRICT DATE

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. 22307 EXPIRATION DATE 4/9/15
SIGNED:

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. [illegible] EXPIRATION DATE 10/21/2015
SIGNED:

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 1/30/14
CHIEF BUREAU OF ENGINEERING — DATE 1/29/14
CHIEF BUREAU OF UTILITIES — DATE 1/28/14
CHIEF UTILITY DESIGN DIVISON — DATE 1/29/14

HAZEN AND SAWYER
Environmental Engineers & Scientists
ONE SOUTH STREET, BALTIMORE, MD 21202

STATE OF MARYLAND — 22307 — REGISTERED PROFESSIONAL ENGINEER — 1/29/14

STATE OF MARYLAND — CHRISTOPHER M. PHILLIPS — REGISTERED PROFESSIONAL ENGINEER

DESIGNED AGM
DRAWN JDM
CHECKED CMP
PROJ. ENGR.
APPROVED

NO.	ISSUED FOR	DATE	BY
5	AS-BUILT	9/2015	DAV
4	ADDENDUM 1	7/2014	DAA
3	BIDDING	1/2014	DAA
2	90% REVIEW	9/2013	DAA
1	60% REVIEW	6/2013	DAA

STRUCTURAL
MAIN ELECTRICAL FACILITY
DEMOLITION PLAN

GENERATOR/SWITCHGEAR
INSTALLATION CONTRACT
LITTLE PATUXENT WATER RECLAMATION PLANT
CAPITAL PROJECT NUMBER S-6264
CONTRACT NUMBER 20-4832
6TH ELECTION DISTRICT HOWARD COUNTY, MARYLAND

DATE JAN 2014
DRAWING NUMBER S2
SCALE AS SHOWN
SHEET 10 OF 37

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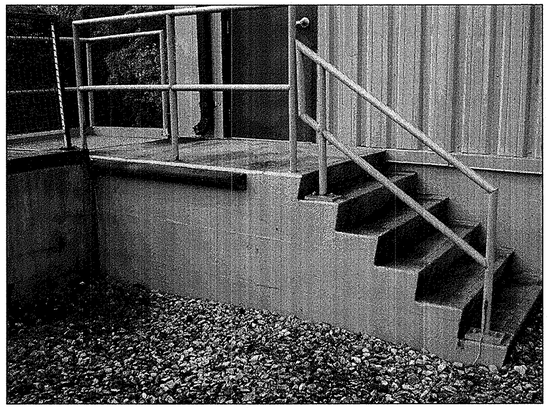
PHOTOGRAPH 1
NTS



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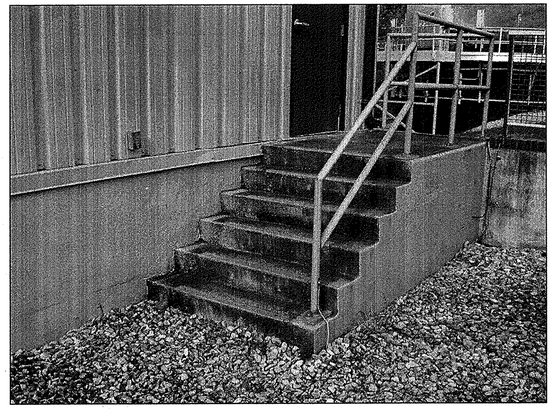
NTS

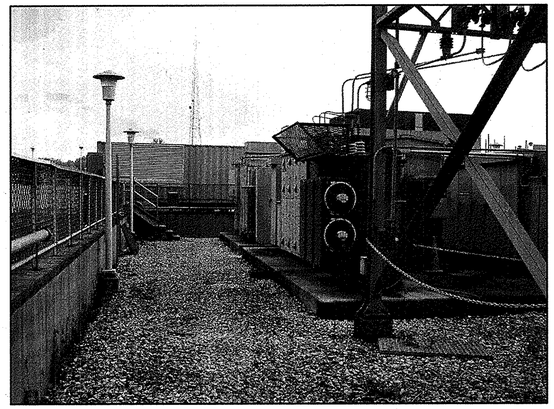


PHOTOGRAPH 3
NTS

PHOTOGRAPH 4
NTS

PHOTOGRAPH 5
NTS

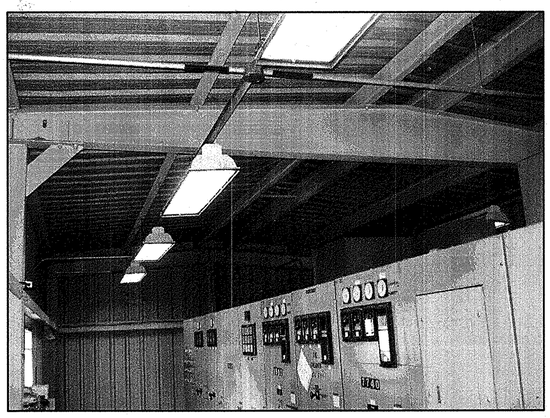
PHOTOGRAPH 6
NTS



PHOTOGRAPH 7
NTS

PHOTOGRAPH 8
NTS

PHOTOGRAPH 9
NTS



PHOTOGRAPH 10
NTS

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

SOIL CONSERVATION DISTRICT DATE

REVIEWED FOR HOWARD COUNTY SOIL CONSERVATION DISTRICT AND MEETS TECHNICAL REQUIREMENTS.

US SOIL CONSERVATION DISTRICT DATE

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. 22307 EXPIRATION DATE 4/9/15
SIGNED:

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. 43434 EXPIRATION DATE 03/27/2015
SIGNED:

AS-BUILT 4/2016

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS 1/30/14 DATE
CHIEF BUREAU OF ENGINEERING 1/29/14 DATE
CHIEF BUREAU OF UTILITIES 1/28/14 DATE
CHIEF UTILITY DESIGN DIVISON 1/29/14 DATE

HAZEN AND SAWYER
Environmental Engineers & Scientists
ONE SOUTH STREET, BALTIMORE, MD 21202

STATE OF MARYLAND · ROBERT J. GREGSON · 22307 · REGISTERED PROFESSIONAL ENGINEER · 1/29/14

STATE OF MARYLAND · JEROPHERT BIRMINGHAM · 43434 · REGISTERED PROFESSIONAL ENGINEER

DESIGNED AGM
DRAWN JDM
CHECKED CTP
PROJ. ENGR.
APPROVED

NO.	ISSUED FOR	DATE	BY
5	AS-BUILT	9/2015	DAV
4	ADDENDUM 1	7/2014	DAA
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2	90% REVIEW	9/2013	DAA
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STRUCTURAL
MAIN ELECTRICAL FACILITY
DEMOLITION PHOTOGRAPHS

GENERATOR/SWITCHGEAR
INSTALLATION CONTRACT
LITTLE PATUXENT WATER RECLAMATION PLANT
CAPITAL PROJECT NUMBER S-6264
CONTRACT NUMBER 20-4832
6TH ELECTION DISTRICT HOWARD COUNTY, MARYLAND

DATE JAN 2014
DRAWING NUMBER S3
SCALE AS SHOWN
SHEET 11 OF 37

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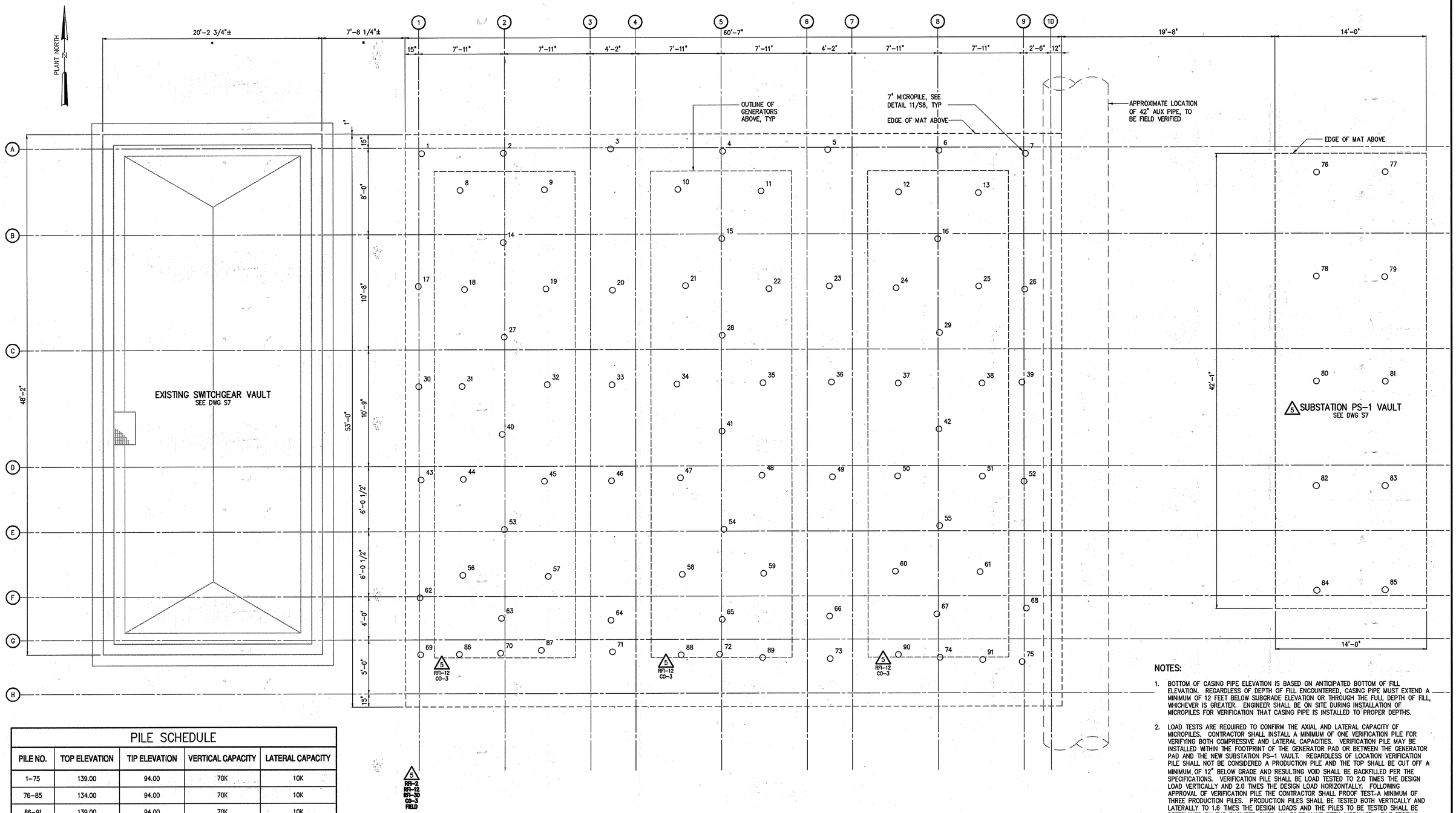

PILE SCHEDULE

PILE NO.	TOP ELEVATION	TIP ELEVATION	VERTICAL CAPACITY	LATERAL CAPACITY
1–75	139.00	94.00	70K	10K
76–85	134.00	94.00	70K	10K
86–91	139.00	94.00	70K	10K

NOTE:
SEE NOTES 1 AND 2 FOR PILE INSTALLATION PARAMETERS.

MICROPILE PLAN
1/4" = 1'-0"

1/4"=1'-0"

NOTES:

1. BOTTOM OF CASING PIPE ELEVATION IS BASED ON ANTICIPATED BOTTOM OF FILL ELEVATION. REGARDLESS OF DEPTH OF FILL ENCOUNTERED, CASING PIPE MUST EXTEND A MINIMUM OF 12 FEET BELOW SUBGRADE ELEVATION OR THROUGH THE FULL DEPTH OF FILL, WHICHEVER IS GREATER. ENGINEER SHALL BE ON SITE DURING INSTALLATION OF MICROPILES FOR VERIFICATION THAT CASING PIPE IS INSTALLED TO PROPER DEPTHS.
2. LOAD TESTS ARE REQUIRED TO CONFIRM THE AXIAL AND LATERAL CAPACITY OF MICROPILES. CONTRACTOR SHALL INSTALL A MINIMUM OF ONE VERIFICATION PILE FOR VERIFYING BOTH COMPRESSIVE AND LATERAL CAPACITIES. VERIFICATION PILE MAY BE INSTALLED WITHIN THE FOOTPRINT OF THE GENERATOR PAD OR BETWEEN THE GENERATOR PAD AND THE NEW SUBSTATION PS-1 VAULT. REGARDLESS OF LOCATION VERIFICATION PILE SHALL NOT BE CONSIDERED A PRODUCTION PILE AND THE TOP SHALL BE CUT OFF A MINIMUM OF 12" BELOW GRADE AND RESULTING VOID SHALL BE BACKFILLED PER THE SPECIFICATIONS. VERIFICATION PILE SHALL BE LOAD TESTED TO 2.0 TIMES THE DESIGN LOAD VERTICALLY AND 2.0 TIMES THE DESIGN LOAD HORIZONTALLY. FOLLOWING APPROVAL OF VERIFICATION PILE THE CONTRACTOR SHALL PROOF TEST A MINIMUM OF THREE PRODUCTION PILES. PRODUCTION PILES SHALL BE TESTED BOTH VERTICALLY AND LATERALLY TO 1.5 TIMES THE DESIGN LOADS AND THE PILES TO BE TESTED SHALL BE DETERMINED BY THE ENGINEER ONCE ALL PILES HAVE BEEN INSTALLED. PILE TESTING PROCEDURES AND SUBMITTAL REQUIREMENTS SHALL BE AS REQUIRED BY SPECIFICATION 02467.
3. DIMENSIONS AND ELEVATIONS INDICATED WITH AN ASTERISK (*) SHALL BE FIELD VERIFIED.

AS-BUILT REPLACEMENT 4/2016

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

REVIEWED FOR HOWARD COUNTY SOIL CONSERVATION DISTRICT AND MEETS TECHNICAL REQUIREMENTS.
US SOIL CONSERVATION DISTRICT — DATE

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. 22387, EXPIRATION DATE 4/9/17
SIGNED:

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. 43434, EXPIRATION DATE 03/27/17
SIGNED:

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 5/16/16
CHIEF BUREAU OF ENGINEERING — DATE 5/16/16
CHIEF BUREAU OF UTILITIES — DATE 5/16/16
CHIEF UTILITY DESIGN DIVISON — DATE 5/16/16

HAZEN AND SAWYER
Environmental Engineers & Scientists
ONE SOUTH STREET, BALTIMORE, MD 21202

STATE OF MARYLAND — 22387 — REGISTERED PROFESSIONAL ENGINEER — 4/9/17
STATE OF MARYLAND — CHRISTOPHER T. PHILLIPS — 43434 — PROFESSIONAL ENGINEER — 03/27/17

DESIGNED AGM
DRAWN JDM
CHECKED CTP
PROJ. ENGR. 1SG
APPROVED

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STRUCTURAL
MAIN ELECTRICAL FACILITY
MICROPILE PLAN

GENERATOR/SWITCHGEAR
INSTALLATION CONTRACT
LITTLE PATUXENT WATER RECLAMATION PLANT
CAPITAL PROJECT NUMBER S-6264
CONTRACT NUMBER 20-4832
6TH ELECTION DISTRICT HOWARD COUNTY, MARYLAND

DATE FEB 2016
DRAWING NUMBER S4
SCALE AS SHOWN
SHEET 12 OF 37

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NOTES:

1. DIMENSION AND TOP OF PAD ELEVATION INDICATED FOR GENERATOR PAD ARE APPROXIMATE AND SHALL BE VERIFIED BY THE CONTRACTOR WITH ACTUAL EQUIPMENT PROVIDED. FOOTPRINT OF PAD SHALL BE SUCH THAT A MINIMUM OF 4" EXISTS BETWEEN EDGE OF PAD AND THE CENTERLINE OF THE CLOSEST ANCHOR. TOP OF PAD ELEVATION SHALL BE SET SUCH THAT FLOOR OF GENERATOR ENCLOSURE IS AT ELEVATION 148.00 TO MATCH GRATED PLATFORM. PROVIDE VERIFICATION OF REQUIRED PAD SIZE PRIOR TO SUBMITTAL OF CONCRETE REINFORCEMENT SHOP DRAWINGS.
2. TURN DOWN SHOWN IS TO PROVIDE SLAB THAT EXTENDS BELOW FROST LINE DUE TO LOW GRADE AT SOUTHWEST CORNER OF PROPOSED MAT. LENGTH SHOWN IS APPROXIMATE AND IS BASED ON DISTANCE FROM CORNER OF PROPOSED MAT TO WESTERN EDGE OF EXISTING CONCRETE PAD BETWEEN EXISTING PUMP STATION AND PROPOSED MAT. CONTRACTOR SHALL VERIFY DISTANCE WITH ACTUAL FILED CONDITIONS.
3. CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING SIZE AND QUANTITY OF ANCHORS TO RESIST UPLIFT FORCES FROM FLOOD WATERS. ANCHORS SHALL BE DESIGNED FOR THE NET UPLIFT FORCE DUE TO FLOOD WATERS AT ELEVATION 148.00 (FUEL TANK COMPLETELY SUBMERGED) AND A COMPLETELY EMPTY FUEL TANK WITH A FACTOR OR SAFETY OF 1.10. SUBMIT TO ENGINEER SHOP DRAWINGS AND CALCULATIONS, SEALED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF MARYLAND, INDICATING SIZE AND LOCATIONS OF ANCHORS AND WORST CASE REACTIONS FOR VERIFICATION OF STRUCTURAL INTEGRITY OF CONCRETE SUPPORTS. ANCHORS SHALL BE INSTALLED BY THE INSTALL CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.

FOUNDATION PLAN

1/4" = 1'-0"

EXISTING SWITCHGEAR VAULT
SEE DWG S7

SUBSTATION PS-1 VAULT
SEE DWG S7

TOP OF GENERATOR PAD
EL 143.33 SEE NOTE 1 & 3

CONSTRUCTION JOINT
LPT EL 140.00, TYP
16 ANCHOR BOLTS, SEE NOTE 1, TYP
AL I8 POST AND BASEPLATE, TYP
OUTLINE OF GENERATOR, TYP
GENERATOR BASE MAT, TYP
HPT EL 140.29, TYP
16" THK CONC EQPT PAD 0331600 TYP
OPP HAND
TURN DOWN, SEE NOTE 2
SLOPE
SIM, TYP

LEGEND

S-1 UP — STAIR DIRECTION
STAIR MARK

1/4"=1'-0"

1 0 1 2 3 7'

AS-BUILT REPLACEMENT 4/2016

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

SOIL CONSERVATION DISTRICT DATE

REVIEWED FOR HOWARD COUNTY SOIL CONSERVATION DISTRICT AND MEETS TECHNICAL REQUIREMENTS.

US SOIL CONSERVATION DISTRICT DATE

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. 22307 EXPIRATION DATE 4/9/17
SIGNED:

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. 22307 EXPIRATION DATE 4/9/17
SIGNED:

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 5/18/16
CHIEF BUREAU OF ENGINEERING — DATE 5/18/16
CHIEF BUREAU OF UTILITIES — DATE 5/18/16
CHIEF UTILITY DESIGN DIVISON — DATE 5/16/16

HAZEN AND SAWYER
Environmental Engineers & Scientists
ONE SOUTH STREET, BALTIMORE, MD 21202

STATE OF MARYLAND — ANDREW G. MCROCAT — 22307 — REGISTERED PROFESSIONAL ENGINEER — 4/9/17

STATE OF MARYLAND — CHRISTOPHER PHILLIPS — 24141 — PROFESSIONAL ENGINEER

DESIGNED AGM
DRAWN JDM
CHECKED CTP
PROJ. ENGR. AGM
APPROVED

NO.	ISSUED FOR	DATE	BY
5	AS-BUILT REPLACEMENT	9/2015	DAV
4	ADDENDUM 1	7/2014	DAA
3	BIDDING	1/2014	DAA
2	90% REVIEW	9/2013	DAA
1	60% REVIEW	6/2013	DAA

STRUCTURAL
MAIN ELECTRICAL FACILITY
FOUNDATION PLAN

GENERATOR/SWITCHGEAR
INSTALLATION CONTRACT
LITTLE PATUXENT WATER RECLAMATION PLANT
CAPITAL PROJECT NUMBER S-6264
CONTRACT NUMBER 20-4832
6TH ELECTION DISTRICT HOWARD COUNTY, MARYLAND

DATE FEB 2016
DRAWING NUMBER
S5
SCALE AS SHOWN
SHEET 13 OF 37

IMAGES= XREFs= 32232-TB, 5g-pb, sy-pb-sb, 08-PF-S, 08-CL, 08-PT-S, 08-SECTIONCUTS

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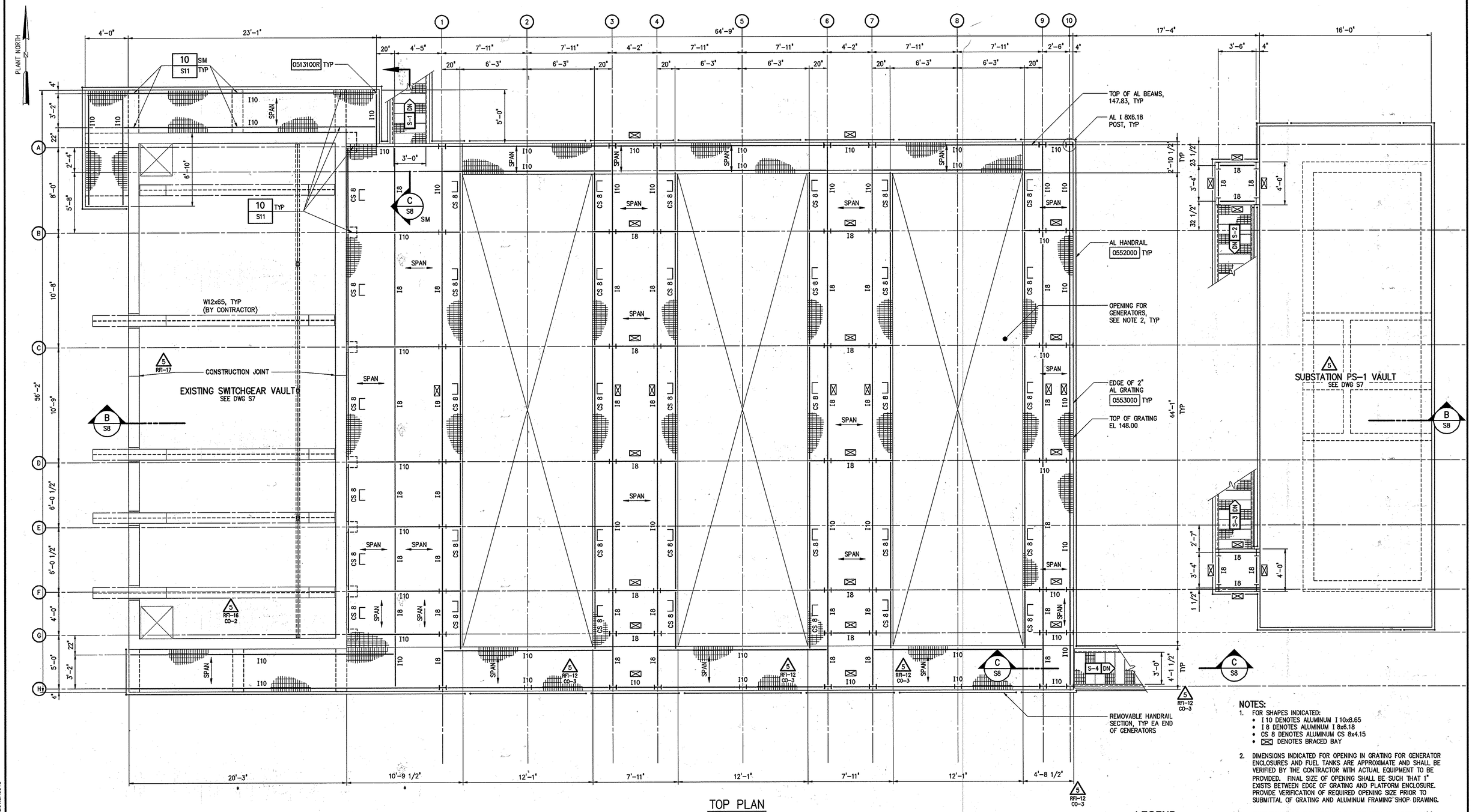

TOP PLAN
1/4" = 1'-0"

NOTES:
1. FOR SHAPES INDICATED:
   - I 10 DENOTES ALUMINUM I 10x8.65
   - I 8 DENOTES ALUMINUM I 8x6.18
   - CS 8 DENOTES ALUMINUM CS 8x4.15
   - ⊠ DENOTES BRACED BAY
2. DIMENSIONS INDICATED FOR OPENING IN GRATING FOR GENERATOR ENCLOSURES AND FUEL TANKS ARE APPROXIMATE AND SHALL BE VERIFIED BY THE CONTRACTOR WITH ACTUAL EQUIPMENT TO BE PROVIDED. FINAL SIZE OF OPENING SHALL BE SUCH THAT 1" EXISTS BETWEEN EDGE OF GRATING AND PLATFORM ENCLOSURE. PROVIDE VERIFICATION OF REQUIRED OPENING SIZE PRIOR TO SUBMITTAL OF GRATING AND ALUMINUM FRAMING SHOP DRAWING.
3. DIMENSIONS AND ELEVATIONS INDICATED WITH AN ASTERISK (*) SHALL BE FIELD VERIFIED.

LEGEND

S-1 UP — STAIR DIRECTION; STAIR MARK

1/4"=1'-0"

AS-BUILT REPLACEMENT 4/2016

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

SOIL CONSERVATION DISTRICT — DATE

REVIEWED FOR HOWARD COUNTY SOIL CONSERVATION DISTRICT AND MEETS TECHNICAL REQUIREMENTS.

US SOIL CONSERVATION DISTRICT — DATE

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. 22307, EXPIRATION DATE 4/9/17
SIGNED:

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. 8424, EXPIRATION DATE 03/27/17
SIGNED:

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 5/16/16
CHIEF BUREAU OF ENGINEERING — DATE 5/10/16
CHIEF BUREAU OF UTILITIES — DATE 5/3/16
CHIEF UTILITY DESIGN DIVISON — DATE 5/10/16

HAZEN AND SAWYER
Environmental Engineers & Scientists
ONE SOUTH STREET, BALTIMORE, MD 21202

STATE OF MARYLAND — ALEXANDER S. GREGSON — 22307 — REGISTERED PROFESSIONAL ENGINEER — 1/29/17

STATE OF MARYLAND — CHRISTOPHER S. PLUMB — 8424 — REGISTERED PROFESSIONAL ENGINEER — 04/22/14

DESIGNED AGM
DRAWN JDM
CHECKED CTP
PROJ. ENGR. ASH
APPROVED

NO.	ISSUED FOR	DATE	BY
5	AS-BUILT REPLACEMENT	9/2015	DAV
4	ADDENDUM 1	7/2014	DAA
3	BIDDING	1/2014	DAA
2	90% REVIEW	9/2013	DAA
1	60% REVIEW	6/2013	DAA

STRUCTURAL
MAIN ELECTRICAL FACILITY
TOP PLAN

GENERATOR/SWITCHGEAR INSTALLATION CONTRACT
LITTLE PATUXENT WATER RECLAMATION PLANT
CAPITAL PROJECT NUMBER S-6264
CONTRACT NUMBER 20-4832
6TH ELECTION DISTRICT HOWARD COUNTY, MARYLAND

DATE FEB 2016
DRAWING NUMBER S6
SCALE AS SHOWN
SHEET 14 OF 37

IMAGES= XREFS= 32232-TB, Sg-pt, sy-pt-sb, GB-PT-S, GB-CL, GB-SECTIONCUTS

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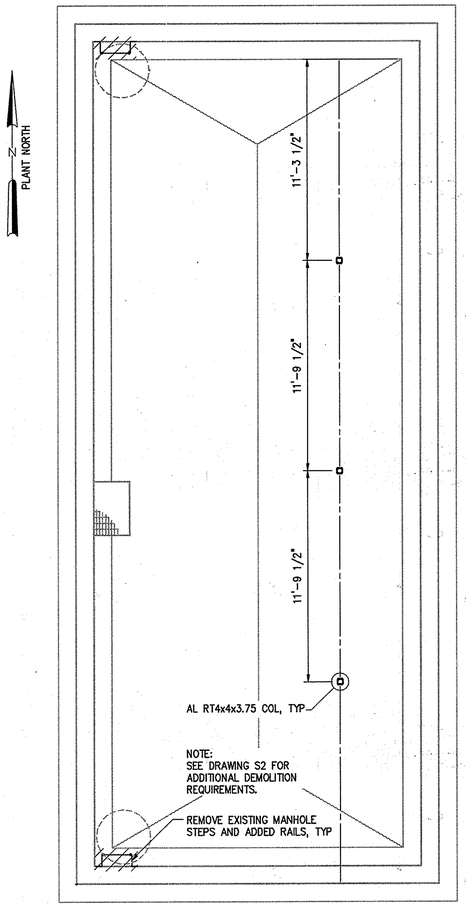
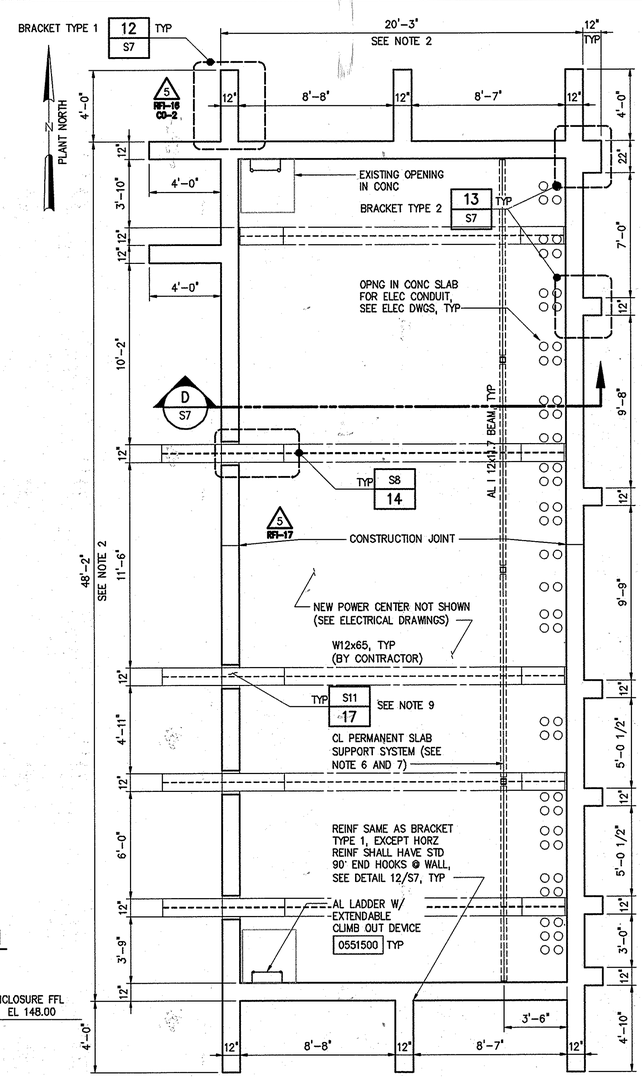
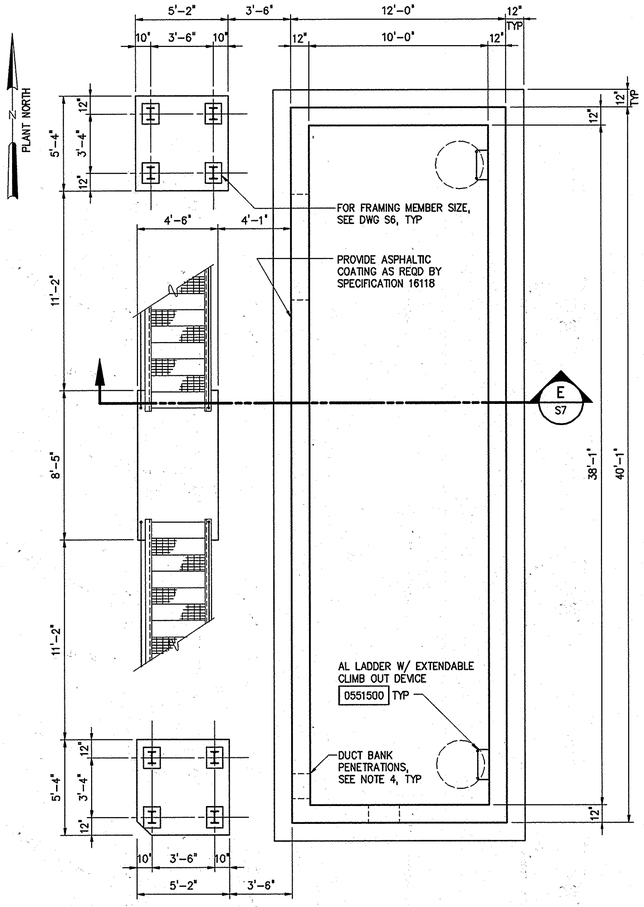


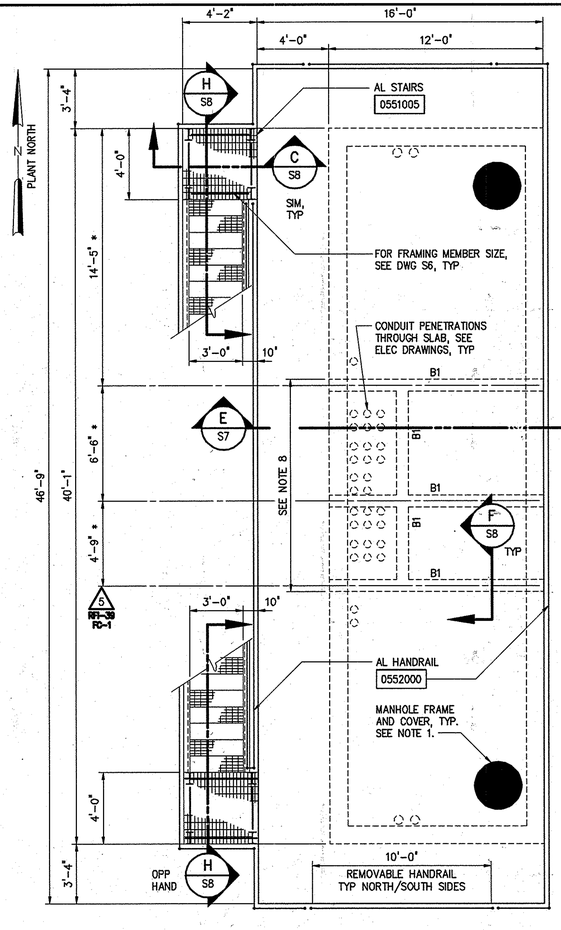
EXISTING SWITCHGEAR VAULT DEMOLITION PLAN
1/4" = 1'-0"



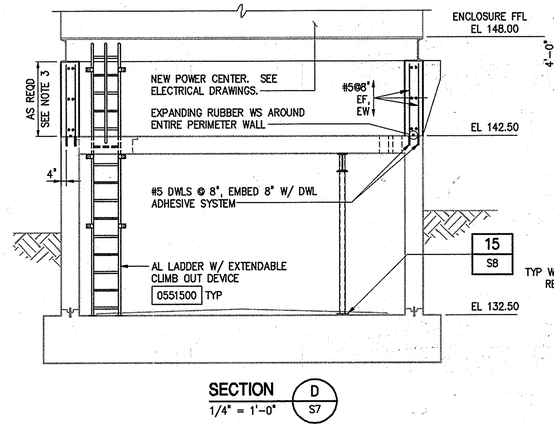
EXISTING SWITCHGEAR VAULT TOP PLAN
1/4" = 1'-0"



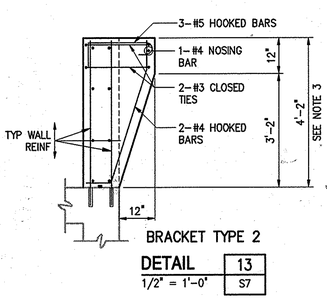
SUBSTATION PS-1 VAULT BOTTOM PLAN
1/4" = 1'-0"



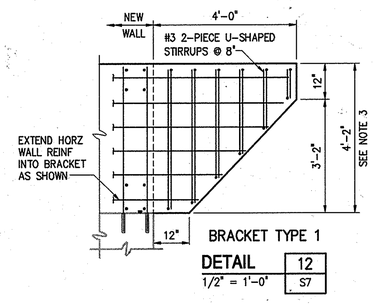
SUBSTATION PS-1 VAULT TOP PLAN
1/4" = 1'-0" 5



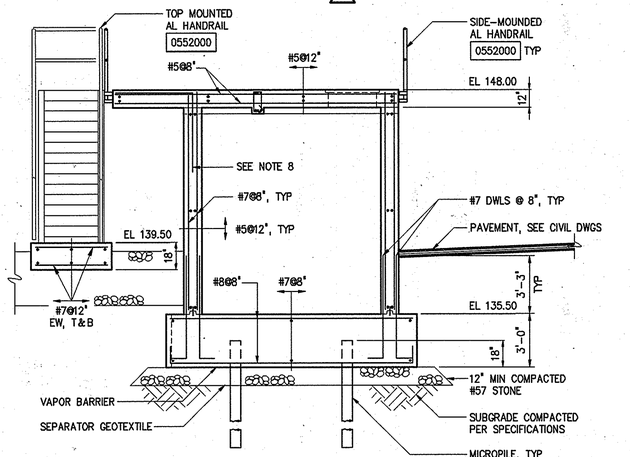
SECTION D S7
1/4" = 1'-0"



BRACKET TYPE 2
DETAIL 13 S7
1/2" = 1'-0"



BRACKET TYPE 1
DETAIL 12 S7
1/2" = 1'-0"



SECTION E S7
1/4" = 1'-0"

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

1/4"=1'-0" 1 0 1 2 3 7'

NOTES:

1. PROVIDE 32" DIAMETER COVER WITH "ELECTRICAL" CAST INTO TOP. COVER SHALL BE NEENAH R-1640CI WITH TYPE 'A' ANCHOR RING OR EQUAL. EMBED FRAME INTO SLAB SO MANHOLE COVER IS FLUSH WITH TOP OF VAULT. (5 RF1-36)
2. DIMENSIONS AND ELEVATIONS OF THE EXISTING VAULT ARE BASED ON A RECENT SITE SURVEY. CONTRACTOR SHALL FIELD VERIFY EXISTING VAULT DIMENSIONS AND ELEVATIONS PRIOR TO MODIFICATIONS.
3. HEIGHT OF WALL EXTENSION IS APPROXIMATE AND SHALL BE DETERMINED BY THE CONTRACTOR BASED ON EQUIPMENT INSTALLED. IF HEIGHT OF WALL REQUIRED IS GREATER THAN THAT SHOWN CONTRACTOR SHALL COORDINATE ACTUAL HEIGHT WITH ENGINEER PRIOR TO CONSTRUCTION OF WALL EXTENSION.
4. CONTINUE HORIZONTAL AND VERTICAL WALL REINFORCING THROUGH DUCT BANK PENETRATIONS OF THE SUBSTATION PS-1 VAULT. (5)
5. * COORDINATE BEAM LOCATIONS WITH ELECTRICAL EQUIPMENT CONDUIT LOCATION REQUIREMENTS.
6. SLAB SUPPORT BEAMS AND COLUMNS ARE DESIGNED TO SUPPORT THE EXISTING SLAB IN SERVICE CONDITION (EXIST SWITCHGEAR REMOVED AND NEW POWER CENTER INSTALLED). CONTRACTOR SHALL BE RESPONSIBLE FOR SUPPORTING THE SLAB DURING THE CONSTRUCTION SEQUENCE.
7. AL I 12 x 11.7 SHALL BE BOLTED TO THE UNDERSIDE OF THE EXISITNG VAULT SLAB WITH 1/2" DIA SST EXPANSION ANCHORS AT 3 FEET OC. MIN. EMBEDMENT = 3". FOR ATTACHMENT OF BEAMS TO COLUMNS, SEE STANDARD DETAIL 0513100R. (5 RF1-24)
8. PROVIDE TOP SLAB BARS IN CANTILEVER WITH END HOOKS @ CONDUIT PENETRATIONS. HOOKS SHALL EXTEND INTO WALL A MINIMUM OF 19".
9. CUT OFF W12s 3" MIN FROM OUTSIDE FACE OF CONCRETE WALL. FILL WALL CUT OUT AROUND BEAM ENDS WITH NON-SHRINK GROUT. (5 RF1-16 CO-2)

AS-BUILT REPLACEMENT 4/2016

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

SOIL CONSERVATION DISTRICT DATE

REVIEWED FOR HOWARD COUNTY SOIL CONSERVATION DISTRICT AND MEETS TECHNICAL REQUIREMENTS.

US SOIL CONSERVATION DISTRICT DATE

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. 22307, EXPIRATION DATE 7/9/17
SIGNED:

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. 43434, EXPIRATION DATE 7/9/17
SIGNED:

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 5/16/16
CHIEF BUREAU OF ENGINEERING — DATE 5/16/16
CHIEF BUREAU OF UTILITIES — DATE 5/16/16
CHIEF UTILITY DESIGN DIVISON — DATE 5/16/16

HAZEN AND SAWYER
Environmental Engineers & Scientists
ONE SOUTH STREET, BALTIMORE, MD 21202

STATE OF MARYLAND — JAMES M. SAWYER — 22307 — REGISTERED PROFESSIONAL ENGINEER — 7/9/17

STATE OF MARYLAND — JAMES M. SAWYER — 43434 — REGISTERED PROFESSIONAL ENGINEER — 7/9/17

DESIGNED AGM
DRAWN JDM
CHECKED CTP
PROJ. ENGR.
APPROVED

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4	ADDENDUM 1	7/2014	DAA
3	BIDDING	1/2014	DAA
2	90% REVIEW	9/2013	DAA
1	60% REVIEW	6/2013	DAA

STRUCTURAL
MAIN ELECTRICAL FACILITY
MAIN ELECTRICAL FACILITY VAULTS

GENERATOR/SWITCHGEAR INSTALLATION CONTRACT
LITTLE PATUXENT WATER RECLAMATION PLANT
CAPITAL PROJECT NUMBER S-6264
CONTRACT NUMBER 20-4832
6TH ELECTION DISTRICT HOWARD COUNTY, MARYLAND

DATE FEB 2016
DRAWING NUMBER S7
SCALE AS SHOWN
SHEET 15 OF 37

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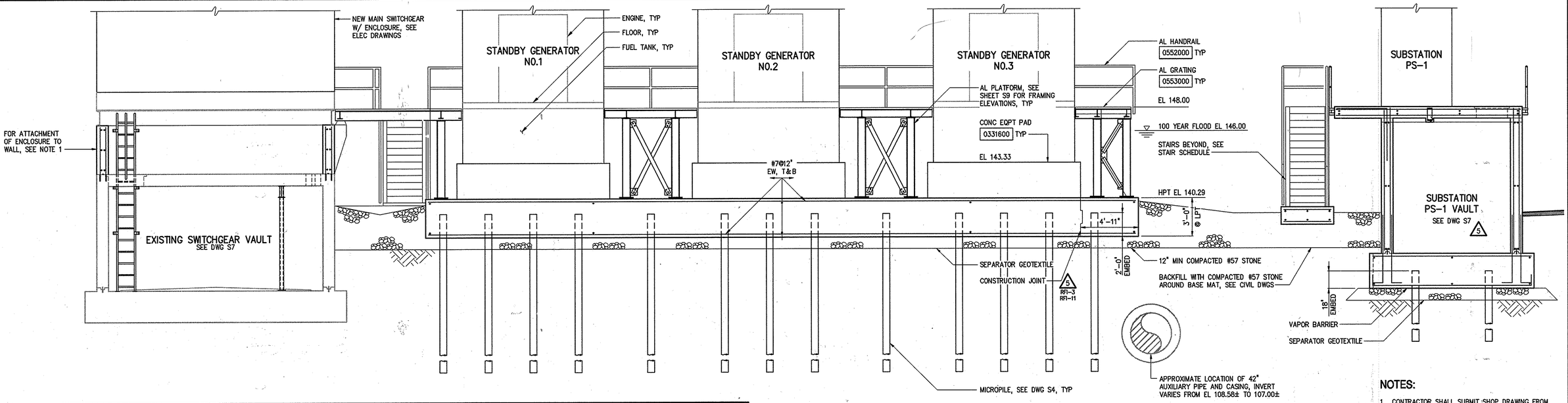
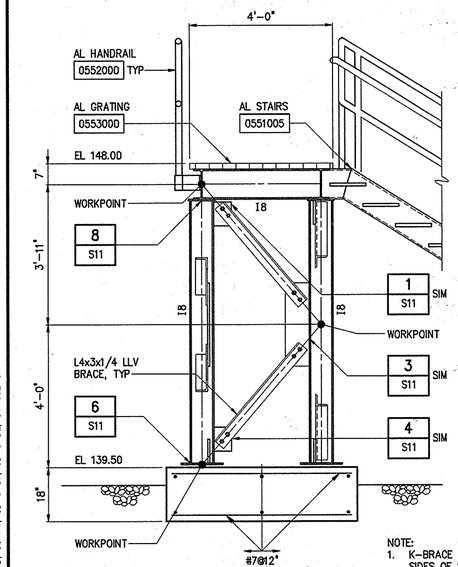


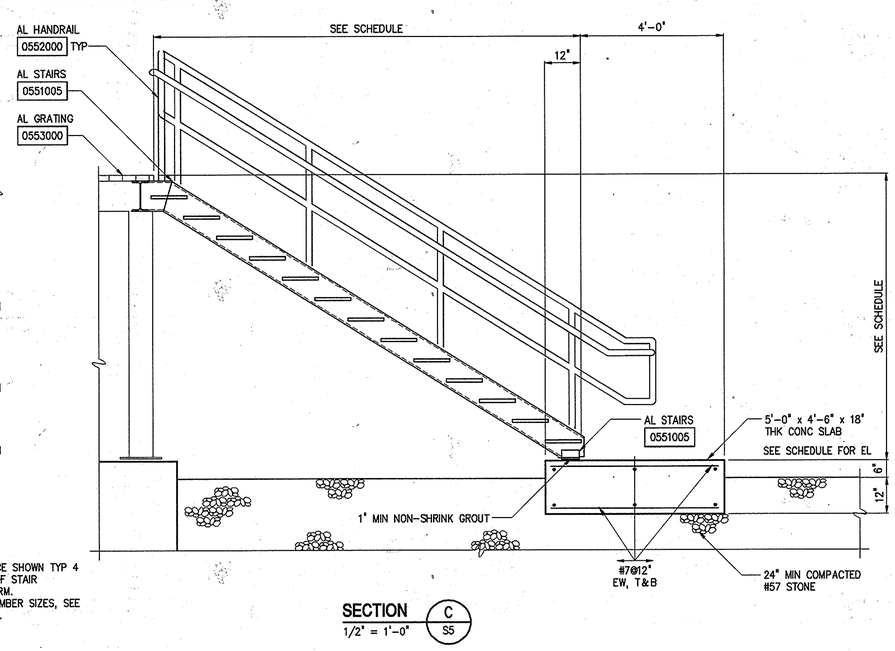
STAIR SCHEDULE

MARK	TYPE	ELEVATION		RISER		TREAD			STRINGER SIZE	DETAILS	
		BOT	TOP	NUMBER	SPACING	NUMBER	SPACING	WIDTH		TOP CONN	BOT CONN
S-1	ALUMINUM GRATING	140.00	148.00	14	EQ	13	11"	36"	AA CS 12x8.27	0551005	0551005 AND SECTION C/S8
S-2	ALUMINUM GRATING	139.50	148.00	15	EQ	14	11"	36"	AA CS 12x8.27	0551005 AND SECTION H/S8	0551005 AND SECTION C/S8
S-3	ALUMINUM GRATING	139.50	148.00	15	EQ	14	11"	36"	AA CS 12x8.27	0551005 AND SECTION H/S8	0551005 AND SECTION C/S8
S-4	ALUMINUM GRATING	139.25	148.00	15	7	14	11"	36"	AA CS 12x8.27	0551005	0551005 AND SECTION C/S8



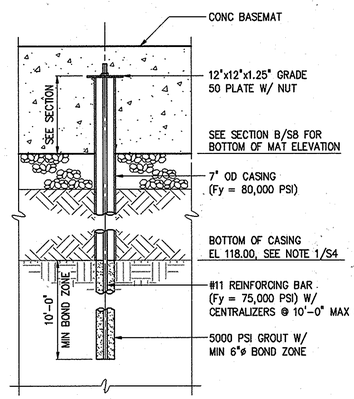
SECTION H — 1/2" = 1'-0" — S5

NOTE:
1. K-BRACE SHOWN TYP 4 SIDES OF STAIR PLATFORM.
2. FOR MEMBER SIZES, SEE DWG S6.



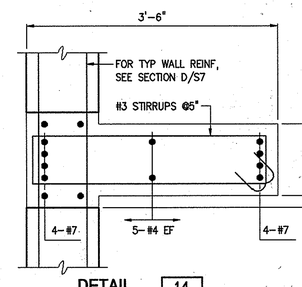
SECTION C — 1/2" = 1'-0" — S5

SECTION B — 1/4" = 1'-0" — S5



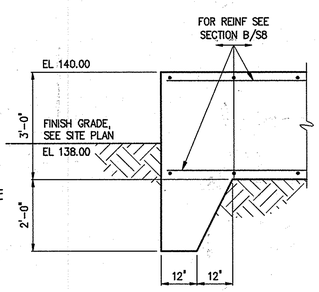
NOTE:
MICROPILE DESIGN AS SHOWN IS FOR BIDDING PURPOSES ONLY. FINAL DESIGN SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AS REQUIRED BY SPECIFICATION 02467.

MICROPILE
DETAIL 11 — 1/2" = 1'-0" — S4

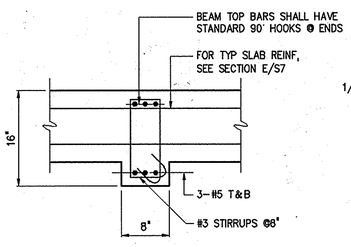


DETAIL 14 — 1" = 1'-0" — S7

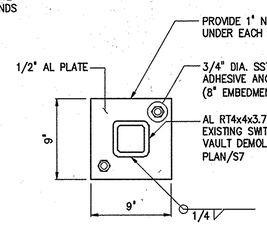
5 RFI-16 CO-2



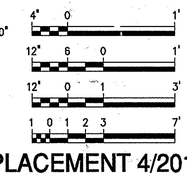
SECTION G — 1/2" = 1'-0" — S5



BEAM B1
SECTION F — 1" = 1'-0" — S7



BASE PLATE
DETAIL 15 — 1 1/2" = 1'-0" — S7



NOTES:

1. CONTRACTOR SHALL SUBMIT SHOP DRAWING FROM NEW MAIN SWITCHGEAR MANUFACTURER SHOWING METHOD OF ANCHORAGE OF EQUIPMENT TO THE NEW CONCRETE WALL EXTENSION PRIOR TO CONSTRUCTION. ENGINEER SHALL REVIEW MANUFACTURER'S ATTACHMENT RECOMMENDATIONS TO VERIFY STRUCTURAL INTEGRITY OF WALL IS NOT COMPROMISED AND SHALL PROVIDE DIRECTION ON WALL MODIFICATIONS (IF REQUIRED) TO ACCOMMODATE ATTACHMENT.

AS-BUILT REPLACEMENT 4/2016

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

SOIL CONSERVATION DISTRICT — DATE

REVIEWED FOR HOWARD COUNTY SOIL CONSERVATION DISTRICT AND MEETS TECHNICAL REQUIREMENTS.

US SOIL CONSERVATION DISTRICT — DATE

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. 22307, EXPIRATION DATE 4/9/17
SIGNED:

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. 43434, EXPIRATION DATE 07/31/17
SIGNED:

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 5/16/16
CHIEF BUREAU OF ENGINEERING — DATE 5/10/16
CHIEF BUREAU OF UTILITIES — DATE 5/12/16
CHIEF UTILITY DESIGN DIVISON — DATE 5/6/16

HAZEN AND SAWYER
Environmental Engineers & Scientists
ONE SOUTH STREET, BALTIMORE, MD 21202

STATE OF MARYLAND — JAMES P. MARKWELL — 22307 — REGISTERED PROFESSIONAL ENGINEER — 1/9/17

STATE OF MARYLAND — CHRISTOPHER T. PHILLIPS — 43434 — REGISTERED PROFESSIONAL ENGINEER — 07/31/17

DESIGNED AGM
DRAWN JDM
CHECKED CTP
PROJ. ENGR. JSK
APPROVED

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STRUCTURAL
MAIN ELECTRICAL FACILITY
SECTIONS AND DETAILS

GENERATOR/SWITCHGEAR INSTALLATION CONTRACT
LITTLE PATUXENT WATER RECLAMATION PLANT
CAPITAL PROJECT NUMBER S-6264
CONTRACT NUMBER 20-4832
6TH ELECTION DISTRICT HOWARD COUNTY, MARYLAND

DATE FEB 2016
DRAWING NUMBER S8
SCALE AS SHOWN
SHEET 16 OF 37

IMAGES= XREFs= 32232-TB, GB-S01, sy-s01-s, SG-S01, GB-S02, GB-S-GB, SG-PT, GB-S-DF, GB-S-DE, SY-S02-S

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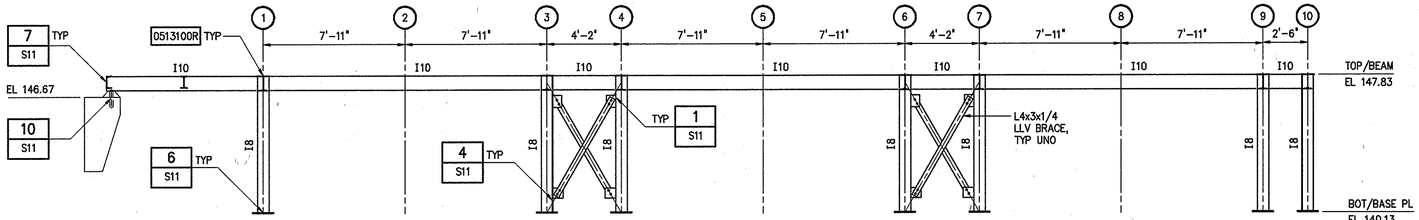
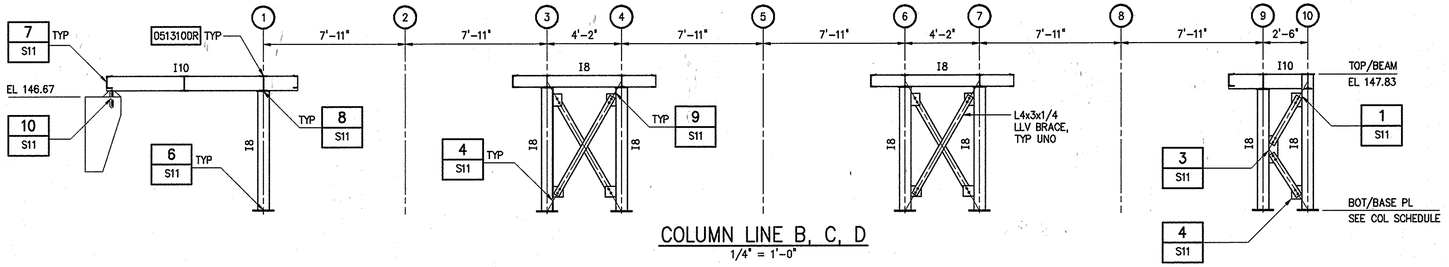
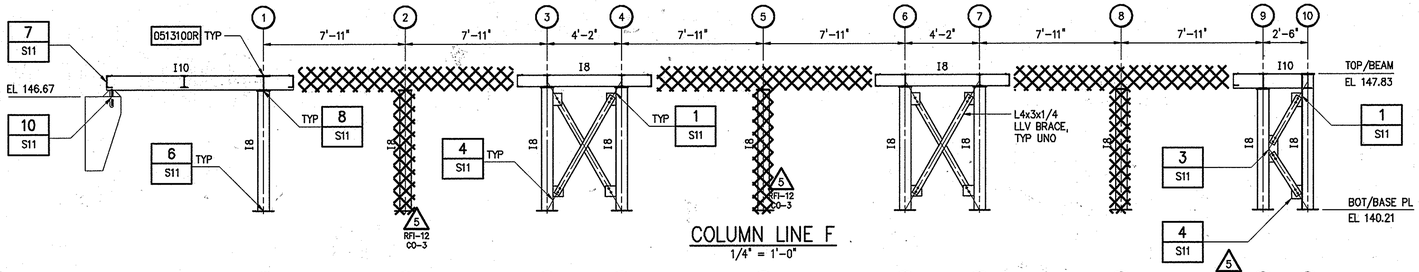


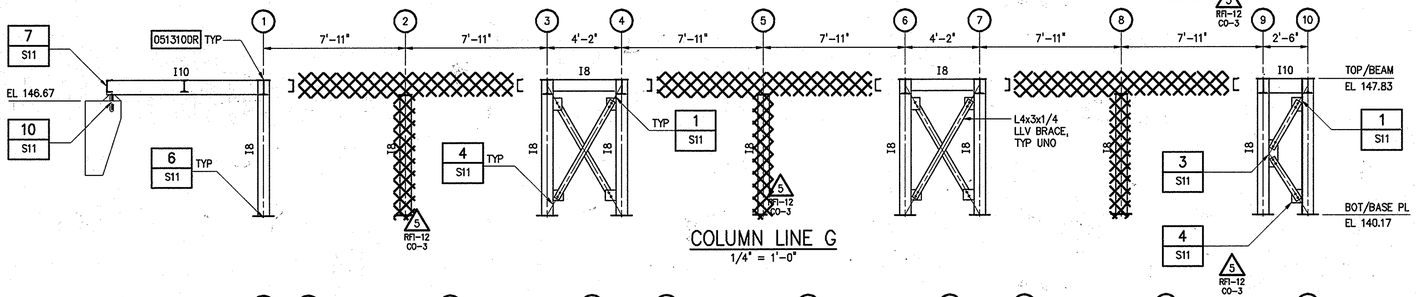
COLUMN LINE A
1/4" = 1'-0"



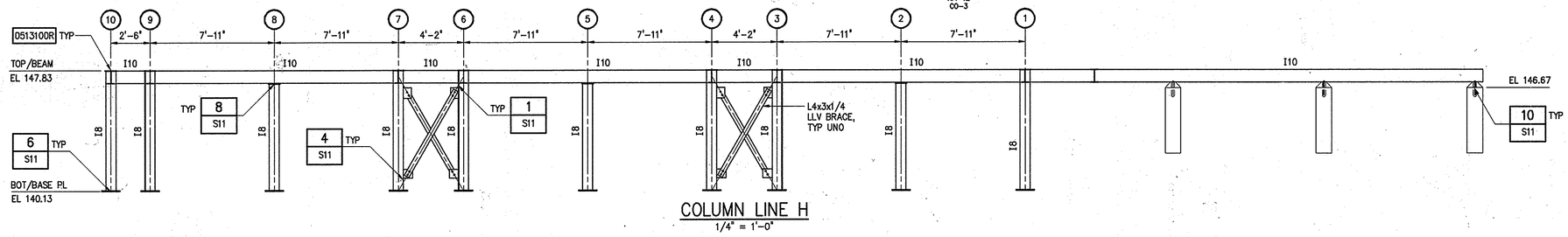
COLUMN LINE B, C, D
1/4" = 1'-0"



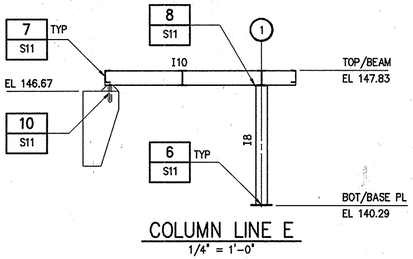
COLUMN LINE F
1/4" = 1'-0"



COLUMN LINE G
1/4" = 1'-0"



COLUMN LINE H
1/4" = 1'-0"



COLUMN LINE E
1/4" = 1'-0"

COLUMN SCHEDULE

COLUMN ID	BOTTOM OF BASE PLATE ELEVATION
A1 – A10	140.13
B1 – B10	140.21
C1 – C10	140.33
D1 – D10	140.33
E1	140.29
F1 – F10	140.21
G1 – G10	140.17
H1 – H10	140.13

NOTE:
PROVIDE MINIMUM 1" NON-SHRINK GROUT BELOW BASE PLATES.

1/4"=1'-0" 1 0 1 2 3 7'

AS-BUILT REPLACEMENT 4/2016

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

REVIEWED FOR HOWARD COUNTY SOIL CONSERVATION DISTRICT AND MEETS TECHNICAL REQUIREMENTS.
US SOIL CONSERVATION DISTRICT DATE

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. 22307, EXPIRATION DATE 7/9/17
SIGNED:

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. 43434, EXPIRATION DATE 9/9/17
SIGNED:

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND
DIRECTOR OF PUBLIC WORKS — DATE 5/16/16
CHIEF BUREAU OF ENGINEERING — DATE 5/16/16
CHIEF BUREAU OF UTILITIES — DATE 5/13/16
CHIEF UTILITY DESIGN DIVISON — DATE 5/16/16

HAZEN AND SAWYER
Environmental Engineers & Scientists
ONE SOUTH STREET, BALTIMORE, MD 21202

STATE OF MARYLAND — 22307 — REGISTERED PROFESSIONAL ENGINEER — 7/9/17

STATE OF MARYLAND — 43434 — REGISTERED PROFESSIONAL ENGINEER — 9/9/17

DESIGNED AGM
DRAWN JDM
CHECKED CTP
PROJ. ENGR.
APPROVED ASG

NO.	ISSUED FOR	DATE	BY
5	AS-BUILT REPLACEMENT	9/2015	DAV
4	ADDENDUM 1	7/2014	DAA
3	BIDDING	1/2014	DAA
2	90% REVIEW	9/2013	DAA
1	60% REVIEW	6/2013	DAA

STRUCTURAL
MAIN ELECTRICAL FACILITY
FRAMING ELEVATIONS

GENERATOR/SWITCHGEAR
INSTALLATION CONTRACT
LITTLE PATUXENT WATER RECLAMATION PLANT
CAPITAL PROJECT NUMBER S-6264
CONTRACT NUMBER 20-4832
6TH ELECTION DISTRICT HOWARD COUNTY, MARYLAND

DATE FEB 2016
DRAWING NUMBER S9
SCALE AS SHOWN
SHEET 17 OF 37

IMAGES= XREFs= 32232-TB, 08-S-ELEV, 08-CL

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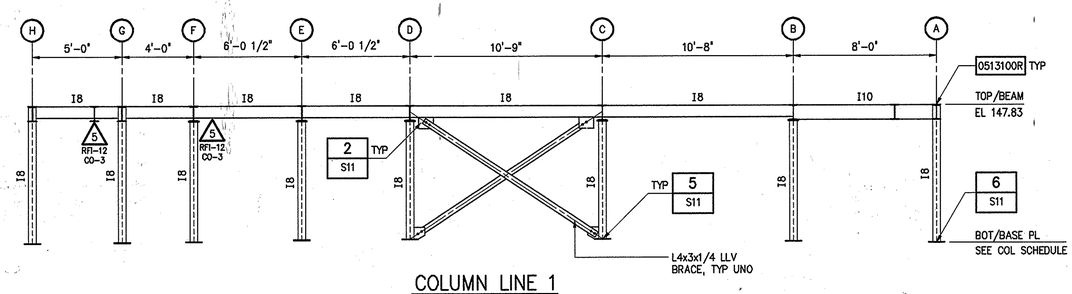
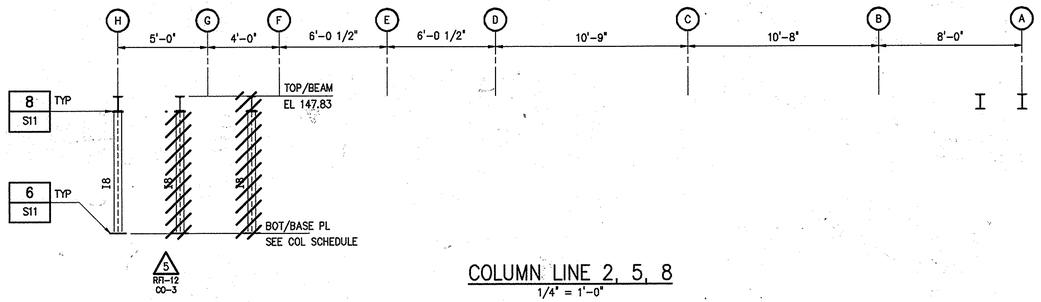
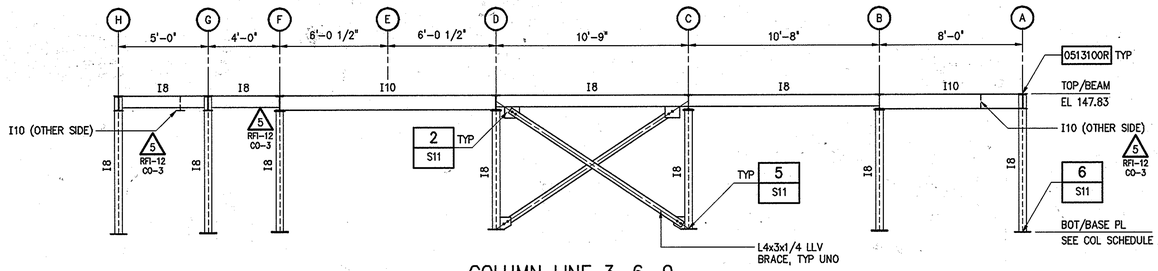


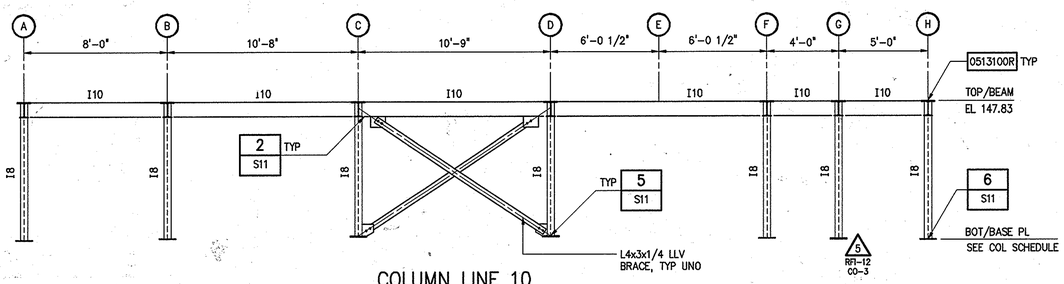
COLUMN LINE 1
1/4" = 1'-0"



COLUMN LINE 2, 5, 8
1/4" = 1'-0"



COLUMN LINE 3, 6, 9
COLUMN LINE 4, 7 OPP HAND
1/4" = 1'-0"



COLUMN LINE 10
1/4" = 1'-0"

1/4"=1'-0" 1 0 1 2 3 7'

AS-BUILT REPLACEMENT 4/2016

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

SOIL CONSERVATION DISTRICT DATE

REVIEWED FOR HOWARD COUNTY SOIL CONSERVATION DISTRICT AND MEETS TECHNICAL REQUIREMENTS.

US SOIL CONSERVATION DISTRICT DATE

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. 22307 EXPIRATION DATE 4/9/17
SIGNED:

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. 43434 EXPIRATION DATE 03/27/17
SIGNED:

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS 5/16/16 DATE
CHIEF BUREAU OF ENGINEERING 5/10/16 DATE
CHIEF BUREAU OF UTILITIES 5/3/16 DATE
CHIEF UTILITY DESIGN DIVISON 5/10/16 DATE

HAZEN AND SAWYER
Environmental Engineers & Scientists
ONE SOUTH STREET, BALTIMORE, MD 21202

STATE OF MARYLAND ALBERT J. SHEREGSON 22307 REGISTERED PROFESSIONAL ENGINEER 1/23/14

STATE OF MARYLAND CHRISTOPHER J. SAWYER 43434 REGISTERED PROFESSIONAL ENGINEER 03/27/14

DESIGNED AGM
DRAWN JDM
CHECKED CPP
PROJ. ENGR.
APPROVED

NO.	ISSUED FOR	DATE	BY
5	AS-BUILT REPLACEMENT	9/2015	DAV
4	ADDENDUM 1	7/2014	DAA
3	BIDDING	1/2014	DAA
2	90% REVIEW	9/2013	DAA
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STRUCTURAL
MAIN ELECTRICAL FACILITY
FRAMING ELEVATIONS

GENERATOR/SWITCHGEAR
INSTALLATION CONTRACT
LITTLE PATUXENT WATER RECLAMATION PLANT
CAPITAL PROJECT NUMBER S-6264
CONTRACT NUMBER 20-4832
6TH ELECTION DISTRICT HOWARD COUNTY, MARYLAND

DATE FEB 2016
DRAWING NUMBER S10
SCALE AS SHOWN
SHEET 18 OF 37

IMAGES= XREFS= 32232-TB, GB-S-ELEV, GB-CL

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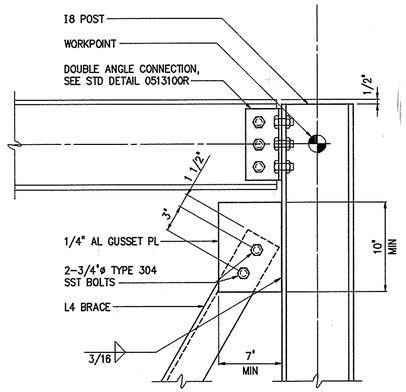
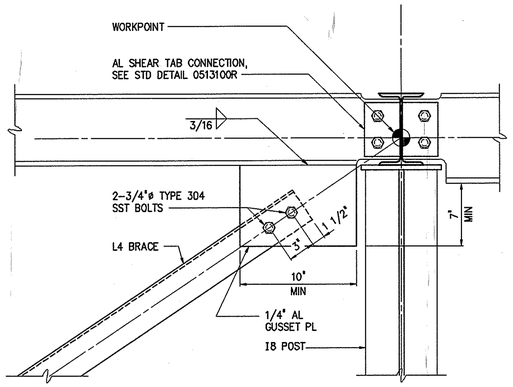


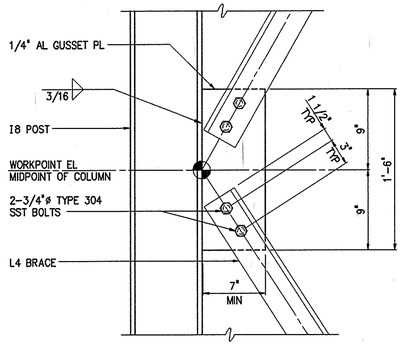
TOP CONNECTION TO POST FLANGE

DETAIL 1 — 1 1/2" = 1'-0" — S9



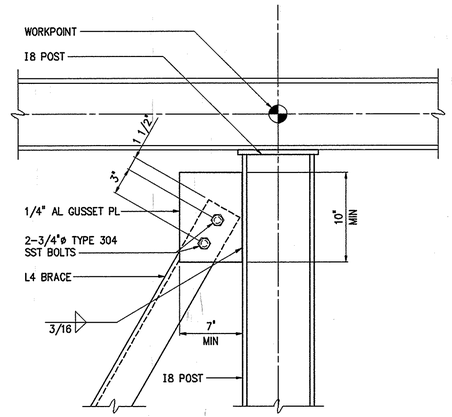
TOP CONNECTION TO POST WEB

DETAIL 2 — 1 1/2" = 1'-0" — S10



K-BRACE CONNECTION

DETAIL 3 — 1 1/2" = 1'-0" — S9



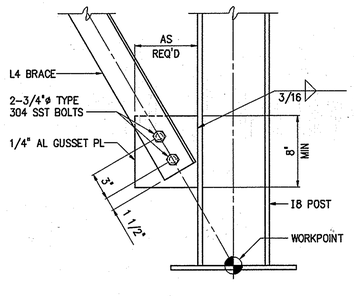
TOP GUSSET WELDED TO POST

DETAIL 9 — 1 1/2" = 1'-0" — S9

NOTES:

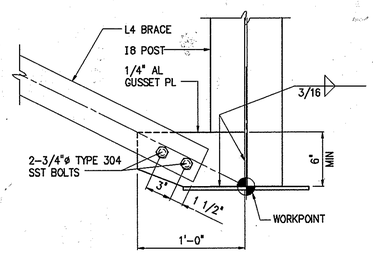
1. CONTRACTOR SHALL VERIFY SIZE OF BEAM POCKET WITH MANUFACTURER'S RECOMMENDATIONS.
2. DROP IN ANCHOR SHALL BE AN INTERNALLY THREADED EXPANSION ANCHOR SUCH AS "STEEL DROPIN" BY POWERS FASTENERS OR APPROVED EQUAL. ANCHOR SHALL BE A FLANGED LIP STYLE AND SHALL BE CONSTRUCTED OF EITHER TYPE 303 OR TYPE 316 STAINLESS STEEL. HEX HEAD BOLTS FOR FASTENING PLATE SHALL BE 1/4"ø STAINLESS STEEL WITH BOTH FLAT AND LOCK WASHERS.
3. SEALANT SHALL MEET THE REQUIREMENTS OF SPECIFICATION 07900 FOR A TYPE 2 OR TYPE 3 SEALANT.

5 CO-2



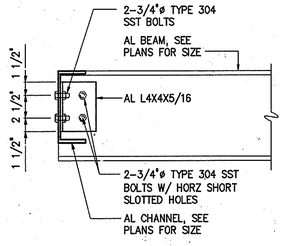
BOTTOM CONNECTION TO FLANGE

DETAIL 4 — 1 1/2" = 1'-0" — S9



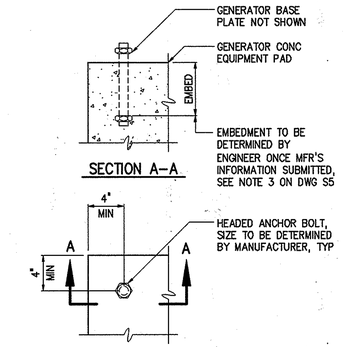
BOTTOM CONNECTION TO WEB

DETAIL 5 — 1 1/2" = 1'-0" — S10



CHANNEL CONNECTION

DETAIL 7 — 1 1/2" = 1'-0" — S6



GENERATOR ANCHOR BOLT DETAIL

DETAIL 16 — 1 1/2" = 1'-0" — S5

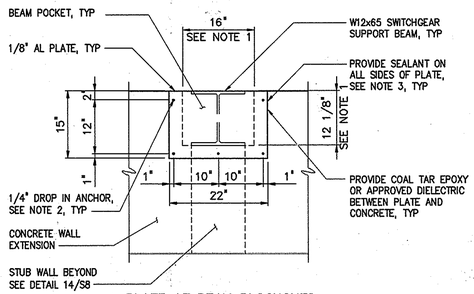
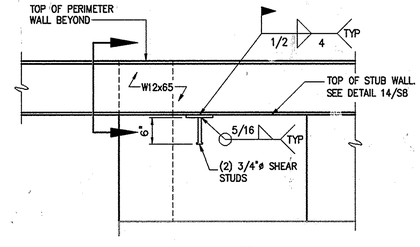


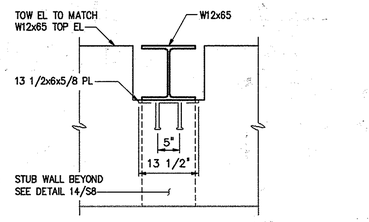
PLATE AT BEAM BLOCKOUTS

DETAIL 17 — 3/4"=1'-0" — S7 — 5 CO-2



SECTION

3/4"=1'-0"



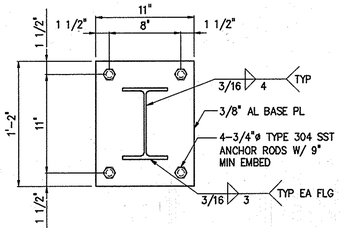
END ELEVATION

3/4"=1'-0"

NOTE: PAINT STRUCTURAL STEEL PER SPECIFICATION 09900 AFTER COMPLETION OF WELDING.

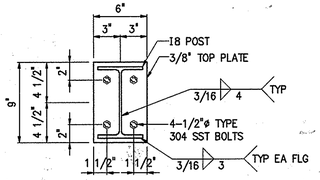
EMBEDDED PLATE ANCHORING

DETAIL 18 — 3/4"=1 '- 0" — S7 — 5 CO-2



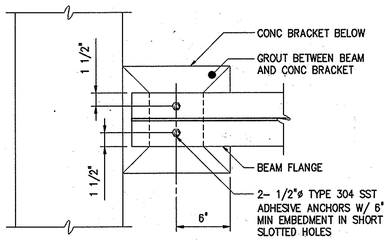
BASE PLATE

DETAIL 6 — 1 1/2" = 1'-0" — S9



TOP PLATE

DETAIL 8 — 1 1/2" = 1'-0" — S9



BEAM TO BRACKET CONNECTION

DETAIL 10 — 1 1/2" = 1'-0" — S6

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

AS-BUILT REPLACEMENT 4/2016

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

SOIL CONSERVATION DISTRICT DATE

REVIEWED FOR HOWARD COUNTY SOIL CONSERVATION DISTRICT AND MEETS TECHNICAL REQUIREMENTS.

US SOIL CONSERVATION DISTRICT DATE

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. 22307 EXPIRATION DATE 4/9/17
SIGNED:

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. 43434 EXPIRATION DATE 04/21/2017
SIGNED:

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 5/16/16
CHIEF BUREAU OF ENGINEERING — DATE 5/16/16
CHIEF BUREAU OF UTILITIES — DATE 5/16/16
CHIEF UTILITY DESIGN DIVISON — DATE 5/16/16

HAZEN AND SAWYER
Environmental Engineers & Scientists
ONE SOUTH STREET, BALTIMORE, MD 21202

STATE OF MARYLAND — CHRISTOPHER A. JOHNSON — 22307 — REGISTERED PROFESSIONAL ENGINEER — 4/9/16

STATE OF MARYLAND — CHRISTOPHER A. JOHNSON — 43434 — PROFESSIONAL ENGINEER — 4/21/16

DESIGNED AGM
DRAWN JDM
CHECKED CTP
PROJ. ENGR.
APPROVED AGG

NO.	ISSUED FOR	DATE	BY
5	AS-BUILT REPLACEMENT	9/2015	DAV
4	ADDENDUM 1	7/2014	DAA
3	BIDDING	1/2014	DAA
2	90% REVIEW	9/2013	DAA
1	60% REVIEW	8/2013	DAA

STRUCTURAL
MAIN ELECTRICAL FACILITY
FRAMING DETAILS

GENERATOR/SWITCHGEAR INSTALLATION CONTRACT
LITTLE PATUXENT WATER RECLAMATION PLANT
CAPITAL PROJECT NUMBER S-6264
CONTRACT NUMBER 20-4832
6TH ELECTION DISTRICT HOWARD COUNTY, MARYLAND

DATE FEB 2016
DRAWING NUMBER S11
SCALE AS SHOWN
SHEET 19 OF 37

IMAGES= XREFs= 32232-TB, GB-S-DA, GB-S-DC, GB-S-DA, GB-S-DG, Embedded_Plate_detail

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LIGHTING:

X DENOTES FIXTURE TYPE (TYP.)
# DENOTES CIRCUIT NUMBER (TYP.)

- 2' X 4' FLUORESCENT FIXTURE
- 1' X 4' FLUORESCENT FIXTURE
- CEILING-MOUNTED FIXTURE
- WALL-MOUNTED FIXTURE
- EMERGENCY WALL-MOUNTED FIXTURE: LEFT: STANDARD/RIGHT: REMOTE-HEAD
- CEILING-MOUNTED EXIT SIGN: SHADED PORTION DENOTES SIGN FACE
- WALL-MOUNTED EXIT SIGN: SHADED PORTION DENOTES SIGN FACE
- POLE-MOUNTED FIXTURE
- (PC) PHOTOCELL
- (OS) CEILING MOUNTED OCCUPANCY SENSOR: NUMBER DENOTES TYPE
- (OS) WALL MOUNTED OCCUPANCY SENSOR: NUMBER DENOTES TYPE

RECEPTACLES:

X DENOTES RECEPTACLE TYPE (TYP.):
GFCI DENOTES GROUND FAULT CIRCUIT INTERRUPT
UPS DENOTES UNINTERRUPTABLE POWER SUPPLY
WPCR DENOTES WEATHERPROOF CORROSION RESISTANT
# DENOTES CIRCUIT NUMBER (TYP.)

- DUPLEX RECEPTACLE
- SIMPLEX RECEPTACLE
- QUADRAPLEX RECEPTACLE
- MULTI-OUTLET RECEPTACLE SIMPLEX
- MULTI-OUTLET RECEPTACLE DUPLEX
- 240 VOLT RECEPTACLE
- SPECIAL PURPOSE OUTLET

PANELS AND BOXES

- JB — JUNCTION BOX
- PB — PULL BOX
- CP — CONTROL PANEL

HVAC AND FIRE ALARM

- FIRE ALARM CONTROL PANEL
- FIRE ALARM ANNUNCIATOR PANEL
- F — FIRE ALARM PULL STATION
- FIRE ALARM INDICATOR: X DENOTES ALERT TYPE (TYP.): A DENOTES AUDIBLE; V DENOTES VISIBLE (# DENOTES STROBE INTENSITY)
- FIRE ALARM INDICATOR MOUNTED ABOVE A FIRE ALARM PULL STATION
- DD — DUCT DETECTOR
- SMOKE DETECTOR: X DENOTES TYPE: Z DENOTES IONIZATION; P DENOTES PHOTOELECTRIC; T DENOTES THERMAL
- (H) HEAT DETECTOR
- (T) THERMOSTAT
- (R) AMBIENT TEMPERATURE TRANSMITTER

SWITCHES

- WALL SWITCH: X DENOTES TYPE: NO SUBSCRIPT DENOTES SINGLE-POLE SWITCH; 3 DENOTES 3-WAY SWITCH; 4 DENOTES 4-WAY SWITCH; # DENOTES CIRCUIT NUMBER; WPCR DENOTES WEATHERPROOF AND CORROSION RESISTANT
- COMBINATION MOTOR STARTER
- DISCONNECT SWITCH
- LOCAL CONTROL STATION

WIRING

- CONDUIT HOME RUN
- CONDUIT EXPOSED
- CONCRETE ENCASED CONDUIT
- CONDUIT CONCEALED
- FLEXIBLE CONDUIT
- CONCRETE ENCASED DUCTBANK
- LEFT: CONDUIT RISE (TURN UP) / RIGHT: CONDUIT DROP (TURN DOWN)

ELEMENTARY CONTROL SCHEMATICS

- (H, O, A, XOO, OOX) 3-POSITION SELECTOR SWITCH: HOA DENOTES HAND/OFF/AUTO; LOR DENOTES LOCAL/OFF/REMOTE; FOR DENOTES FORWARD/OFF/REVERSE
- (START, STOP) PUSHBUTTON SWITCHES: LEFT: N.O./RIGHT: N.C. TEXT DENOTES LEGEND PLATE
- (E-STOP) MUSHROOM HEAD EMERGENCY STOP PUSHBUTTON SWITCH N.C. MAINTAINED: TEXT DENOTES LEGEND PLATE
- (STOP, L.O.) PUSHBUTTON SWITCH N.C. WITH LOCK-OUT: TEXT DENOTES LEGEND PLATE
- (RUN, STOP) SELECTOR SWITCH: TEXT DENOTES LEGEND PLATE
- DISCONNECT SWITCHES: LEFT: N.O./RIGHT: N.C.
- (TS) TEMPERATURE SWITCHES/THERMOSTATS: LEFT: N.O./RIGHT: N.C. TEXT DENOTES TAG NUMBER
- (PS) PRESSURE SWITCHES N.O.: LEFT: RISE TO CLOSE/RIGHT: FALL TO CLOSE TEXT DENOTES TAG NUMBER
- (PS) PRESSURE SWITCHES N.C.: LEFT: RISE TO OPEN/RIGHT: FALL TO OPEN TEXT DENOTES TAG NUMBER
- (LS) LEVEL SWITCHES N.O.: LEFT: RISE TO CLOSE/RIGHT: FALL TO CLOSE TEXT DENOTES TAG NUMBER
- (LS) LEVEL SWITCHES N.C.: LEFT: RISE TO OPEN/RIGHT: FALL TO OPEN TEXT DENOTES TAG NUMBER
- (TR, N.O.T.C., N.O.T.O.) ON DELAY TIMED SWITCHES N.O.: TEXT DENOTES TAG NUMBER
- (TR, N.C.T.C., N.C.T.O.) ON DELAY TIMED SWITCHES N.C.: TEXT DENOTES TAG NUMBER
- (TR, N.O.T.O., N.C.T.C.) OFF DELAY TIMED SWITCHES: TEXT DENOTES TAG NUMBER
- (TS) TORQUE SWITCH: TEXT DENOTES TAG NUMBER
- (LS) LIMIT SWITCHES: LEFT: N.O./RIGHT: N.C. TEXT DENOTES TAG NUMBER
- (FS) FLOW SWITCHES N.O.: LEFT: RISE TO CLOSE/RIGHT: FALL TO CLOSE TEXT DENOTES TAG NUMBER
- (FS) FLOW SWITCHES N.C.: LEFT: RISE TO OPEN/RIGHT: FALL TO OPEN TEXT DENOTES TAG NUMBER
- CONTACTS: LEFT: N.O./RIGHT: N.C. # DENOTES COIL NUMBER
- (PTT) INDICATOR LIGHT: LEFT: STANDARD/RIGHT: PUSH-TO-TEST X DENOTES COLOR
- RTM — RUN TIME METER
- SV — SOLENOID VALVE
- (480-120V CPT) CONTROL POWER TRANSFORMER
- MECHANICAL INTERLOCK CONNECTION
- (MSH) MOTOR SPACE HEATER
- COIL: X DENOTES TYPE: M DENOTES MOTOR STARTER; CR DENOTES CONTROL RELAY; TR DENOTES TIME DELAY RELAY; LC DENOTES LIGHTING CONTACTOR; PR DENOTES INTERPOSING PILOT RELAY; # DENOTES REFERENCE LINE NUMBER

SINGLE-LINE DIAGRAMS

- (TRANSFORMER ID 45kVA 480-120/208V 3P/4W DRY TRANS) TRANSFORMER
- (#) PROTECTIVE RELAY: NUMBER DENOTES IEEE DEVICE FUNCTION
- (PS) PRESSURE SWITCH
- (TS) TEMPERATURE SWITCH
- (100A) FUSE
- (E.O. 800AF 800A PLUG 800AT LSIG N.C.) LOW-VOLTAGE DRAWOUT POWER CIRCUIT BREAKER: E.O. DENOTES ELECTRICALLY OPERATED; LSIG DENOTES INSTALLED TRIP FUNCTIONS: L DENOTES LONG-TIME; S DENOTES SHORT-TIME; I DENOTES INSTANTANEOUS; G DENOTES GROUND FAULT
- (1200A 52 E.O. BATT. N.C.) MEDIUM-VOLTAGE DRAWOUT POWER CIRCUIT BREAKER: E.O. DENOTES ELECTRICALLY OPERATED; BATT. DENOTES BATTERY BACKUP POWER
- (800AF/800AT) LOW-VOLTAGE MOLDED CASE CIRCUIT BREAKER
- (30A/MCP) MOTOR CIRCUIT PROTECTOR
- (O.L.) THERMAL OVERLOAD RELAY
- GROUND
- (600:5 (3)) CT: NUMBERS DENOTE CT WINDING RATIO AND CT QUANTITY
- (50:5 (1)) GFCT: NUMBERS DENOTE GFCT WINDING RATIO AND GFCT QUANTITY
- (480:120 (2)) PT: NUMBERS DENOTE PT WINDING VOLTAGES AND PT QUANTITY
- (<<) DRAW-OUT ELEMENT
- (800A 3Ø 3W ATS N S L) ATS OR MTS
- (#) MOTOR: # DENOTES HORSEPOWER
- (500kW 480V,3Ø,4W) GENERATOR
- (SA) SURGE ARRESTOR

SINGLE-LINE DIAGRAMS, CONT'D.

- (#%) LEFT: RESISTOR; RIGHT: LINE REACTOR: #% DENOTES IMPEDENCE
- CAPACITOR
- (V)-(VS) VOLTMETER AND SWITCH
- (A)-(AS) AMMETER AND SWITCH
- ST — SHUNT TRIP
- SPD — SURGE PROTECTIVE DEVICE
- (K) KIRK-KEY INTERLOCK
- (30A/MCP, X, M, F, R) LEFT: FVNR STARTER: X DENOTES NEMA SIZE; DP DENOTES DEFINITE PURPOSE CONTACTOR; RIGHT: FVR STARTER
- MFR — MULTI FUNCTION RELAY
- PMU — POWER MONITORING UNIT
- TB — TEST BLOCK
- TS — TEST SWITCH

ABBREVIATIONS

ANSI	AMERICAN NATIONAL STANDARDS INSTITUTE
ASCE	AMERICAN SOCIETY OF CIVIL ENGINEERS
ASME	AMERICAN SOCIETY OF MECHANICAL ENGINEERS
ATS	AUTOMATIC TRANSFER SWITCH
BC	BYPASS CONTACTOR
BGE	BALTIMORE GAS AND ELECTRIC
CT	CURRENT TRANSFORMER
DB	DUCTBANK
DSW	DISCONNECT SWITCH
EHH	ELECTRIC HAND HOLE
EMH	ELECTRIC MANHOLE
EO	ELECTRICALLY OPERATED
FAAP	FIRE ALARM ANNUNCIATOR PANEL
FACP	FIRE ALARM CONTROL PANEL
FVNR	FULL VOLTAGE NON-REVERSING
FVR	FULL VOLTAGE REVERSING
GFCI	GROUND FAULT CIRCUIT INTERRUPT
GFCT	GROUND FAULT CURRENT TRANSFORMER
IC	INPUT CONTACTOR
IEEE	INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS
ISO	INTL ORGANIZATION FOR STANDARDIZATION
LCS	LOCAL CONTROL STATION
LP	LIGHTING PANEL
MFR	MULTI-FUNCTION RELAY
MOD	MOTOR OPERATED DAMPER
MOG	MOTOR OPERATED GATE
MOL	MOTOR OPERATED LOUVER
MOV	MOTOR OPERATED VALVE
MTS	MANUAL TRANSFER SWITCH
NC/NO	NORMALLY CLOSED/NORMALLY OPEN
NEC	NATIONAL ELECTRICAL CODE
NEMA	NATIONAL ELECTRICAL MANUFACTURERS ASSN
NGR	NEUTRAL GROUNDING RESISTOR
NTS	NOT TO SCALE
OC	OUTPUT CONTACTOR
OL	OVERLOAD
PC	PHOTOCELL
PCC	POINT OF COMMON COUPLING
PLC	PROGRAMMABLE LOGIC CONTROLLER
PNL	PANEL
PP	POWER PANEL
PT	POTENTIAL TRANSFORMER
RCS	REMOTE CONTROL STATION
RIO	REMOTE I/O
RVAT	REDUCED VOLTAGE AUTO TRANSFORMER
RVSS	REDUCED VOLTAGE SOLID STATE
SP. C.	SPARE CONDUIT
SST	STAINLESS STEEL
TB	TEST BLOCK
TC/TO	TIMED CLOSE//TIMED OPEN
TSH	TWISTED SHIELDED
TX	TRANSFORMER
UPS	UNINTERRUPTABLE POWER SUPPLY
VFD	VARIABLE FREQUENCY DRIVE
WPCR	WEATHER PROOF CORROSION RESISTANT
WT	WALK THROUGH

MISC PLAN VIEW SYMBOLS

- (E) EQUIPMENT CONNECTION
- GROUND RODS: LEFT: BURIED/RIGHT: IN TESTWELL
- (X) DUCTBANK TAG: X DENOTES DUCTBANK ID
- (X #) INSTRUMENT TAG: X DENOTES INSTRUMENT TYPE; # DENOTES INSTRUMENT NUMBER
- INSTRUMENT TRANSMITTER
- (P-XXXX) CONDUIT TAGS: P DENOTES POWER; C DENOTES CONTROL; XXXX DENOTES CONDUIT ID

NOTES:

1. UNLESS SPECIFICALLY NOTED OTHERWISE, ALL UNDERGROUND CONCRETE ENCASED ELECTRICAL CONDUITS SHALL BE PER STANDARD DETAIL 1611801.
2. THE INSTALLATION OF ALL CONCRETE ENCASED ELECTRICAL CONDUITS SHALL COMPLY WITH ACI 318, SECTION 6.3. CONTRACTOR SHALL SUPPLY EXPANSION JOINT FITTINGS AS REQUIRED FOR THERMAL EXPANSION AND DEFLECTION.
3. BOND ALL NEW CONCRETE ENCASED GROUND CONDUCTORS TO EXISTING GROUND CONDUCTORS IN ALL MANHOLES, PULL BOXES, CABLE TRAYS, AND SIMILAR LOCATIONS WHERE APPLICABLE.
4. UNLESS OTHERWISE SPECIFIED OR NOTED, ALL WALL MOUNTED ELECTRICAL PANELS, ENCLOSURES, AND SIMILAR EQUIPMENT SHALL BE MOUNTED 6'-6" (MAX) FROM THE TOP OF THE PANEL TO FINISHED FLOOR OR GRADE.
5. UNLESS OTHERWISE NOTED, ALL LIGHTING SWITCHES, CONTROL SWITCHES, AND SIMILAR EQUIPMENT SHALL BE MOUNTED WITH THEIR CENTERLINE APPROXIMATELY 4'-0" ABOVE FINISHED FLOOR, SLAB, OR GRADE. THERMOSTATS SHALL BE MOUNTED 4'-4" ABOVE FINISHED FLOOR.
6. A SEPARATE EQUIPMENT GROUNDING CONDUCTOR SHALL BE PROVIDED FOR EACH CIRCUIT (SEPARATE CONDUCTOR IN THE CONDUIT). THE CONDUCTOR SHALL BE TERMINATED AT THE PROPER DEVICE, TERMINAL, OR LUG AT THE POWER SOURCE (MCC GROUND BUS, PANELBOARD GROUND BUS, ETC.). GROUND CONDUCTOR SIZE SHALL BE PER THE LATEST EDITION OF THE NEC.
7. UNLESS SPECIFICALLY NOTED OTHERWISE, EXISTING PAVEMENT SHALL BE SAW CUT AND REMOVED TO ALLOW FOR THE INSTALLATION OF NEW ELECTRICAL DUCTBANKS. AFTER INSTALLATION, REPLACE PAVEMENT WITH NEW TO MATCH ORIGINAL CONDITIONS.
8. LIGHTNING PROTECTION SHALL BE PROVIDED FOR THE STRUCTURES INDICATED ON THE DRAWINGS AND IN ACCORDANCE WITH SECTION 16670.

COMMUNICATIONS

- TELEPHONE OR NETWORK DROP
- PAGER RECEPTACLE
- HORN/LIGHT DEVICE
- (PA) PA UNIT

EQUIPMENT/DEVICE LOCATION SYMBOLS

- * LOCATED AT MCC, COMBINATION STARTER, OR BYPASS STARTER
- △ LOCATED IN FIELD
- LOCATED AT PANEL: X DENOTES PANEL ID: L DENOTES LOCAL CONTROL STATION
- □ LOCATED AT VFD

AS-BUILT 4/2016

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

REVIEWED FOR HOWARD COUNTY SOIL CONSERVATION DISTRICT AND MEETS TECHNICAL REQUIREMENTS.
US SOIL CONSERVATION DISTRICT — DATE

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. 22307 EXPIRATION DATE 4/9/15 SIGNED:

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. 35671 EXPIRATION DATE 6/11/14 SIGNED:

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 1/30/14
CHIEF BUREAU OF ENGINEERING — DATE 1/29/14
CHIEF BUREAU OF UTILITIES — DATE 1/29/14
CHIEF UTILITY DESIGN DIVISON — DATE 1/29/14

HAZEN AND SAWYER
Environmental Engineers & Scientists
ONE SOUTH STREET, BALTIMORE, MD 21202

STATE OF MARYLAND — ANDREW GREGSON — 22307 — REGISTERED PROFESSIONAL ENGINEER — 1/23/14
STATE OF MARYLAND — DAVID A. ATKINSON JR — 35671 — REGISTERED PROFESSIONAL ENGINEER — 1/22/14

DESIGNED DAA
DRAWN H&S
CHECKED DAA
PROJ. ENGR.
APPROVED AGR

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5	AS-BUILT	9/2015	DAV
4	ADDENDUM 1	7/2014	DAA
3	BIDDING	1/2014	DAA
2	90% REVIEW	9/2013	DAA
1	60% REVIEW	6/2013	DAA

ELECTRICAL

LEGEND AND GENERAL NOTES

GENERATOR/SWITCHGEAR INSTALLATION CONTRACT
LITTLE PATUXENT WATER RECLAMATION PLANT
CAPITAL PROJECT NUMBER S-6264
CONTRACT NUMBER 20-4832
6TH ELECTION DISTRICT HOWARD COUNTY, MARYLAND

DATE JAN 2014
DRAWING NUMBER E1
SCALE AS SHOWN
SHEET 20 OF 37

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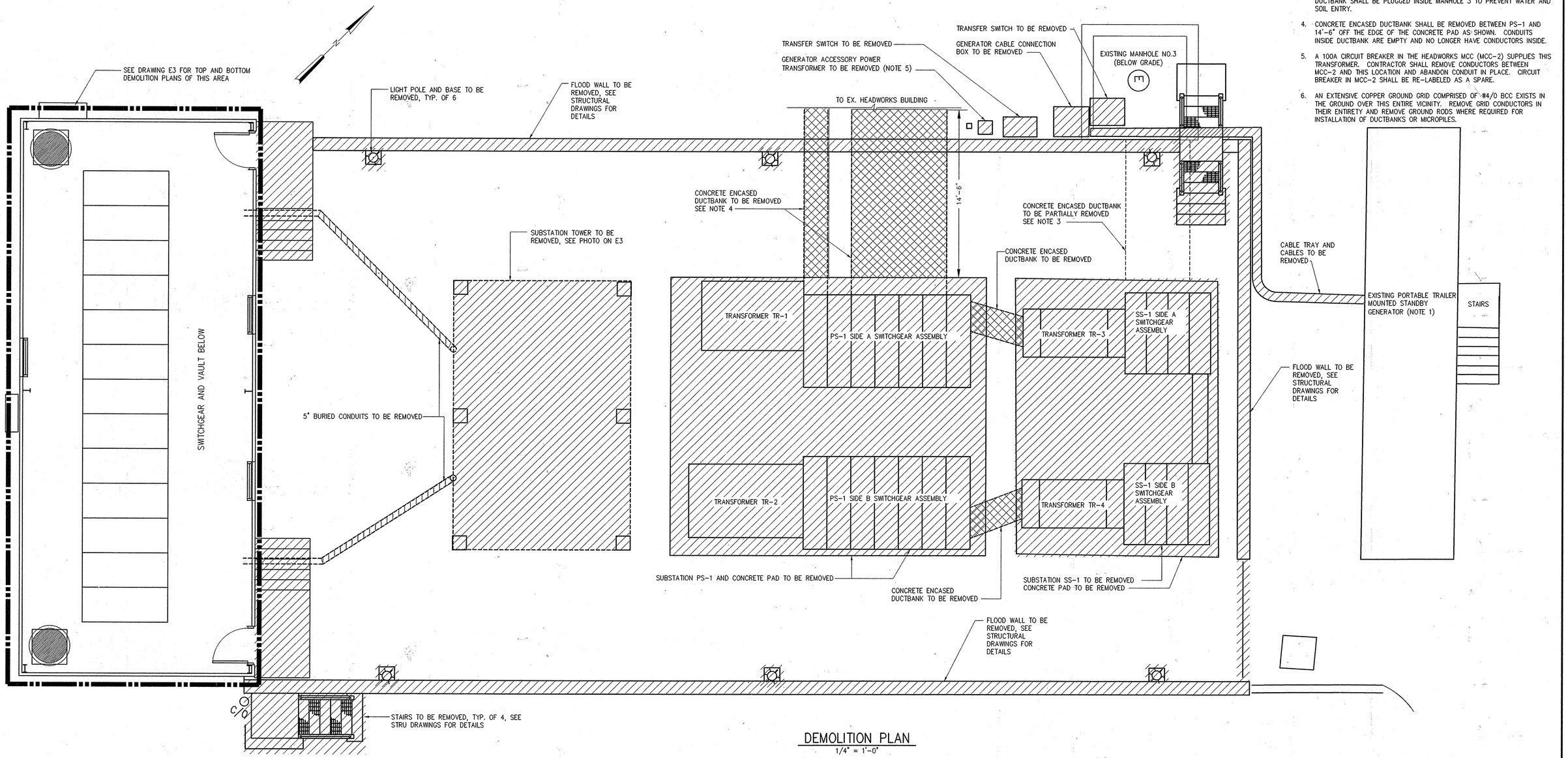
NOTES:

1. PORTABLE STANDBY GENERATOR AND STAIRS SHALL EVENTUALLY BE REMOVED BY THE COUNTY, BUT SHALL REMAIN IN PLACE DURING MOST OF THE CONSTRUCTION PERIOD. SEE SECTION 01520 FOR SPECIFIC CONSTRAINTS RELATED TO THIS GENERATOR.
2. SEE SECTION 01520, MAINTENANCE OF PLANT OPERATIONS DURING CONSTRUCTION, FOR CONSTRAINTS AND CONSTRUCTION SEQUENCING NOTES FOR THE SWITCHGEAR AND SUBSTATION REMOVAL, AND SUBSTATION REPLACEMENT.
3. THE PORTION OF THE CONCRETE ENCASED DUCTBANK BELOW THE EXISTING SS-1 EQUIPMENT PAD SHALL BE REMOVED. DUCTBANK FROM EDGE OF PAD TO MANHOLE 3 SHALL REMAIN IN PLACE AS SHOWN. CABLE SHALL BE REMOVED BETWEEN EXISTING SS-1 AND EACH OF THE RESPECTIVE MOTOR CONTROL CENTERS VIA MANHOLE 3. CONDUITS ASSOCIATED WITH EXISTING DUCTBANK SHALL BE PLUGGED INSIDE MANHOLE 3 TO PREVENT WATER AND SOIL ENTRY.
4. CONCRETE ENCASED DUCTBANK SHALL BE REMOVED BETWEEN PS-1 AND 14'-6" OFF THE EDGE OF THE CONCRETE PAD AS SHOWN. CONDUITS INSIDE DUCTBANK ARE EMPTY AND NO LONGER HAVE CONDUCTORS INSIDE.
5. A 100A CIRCUIT BREAKER IN THE HEADWORKS MCC (MCC-2) SUPPLIES THIS TRANSFORMER. CONTRACTOR SHALL REMOVE CONDUCTORS BETWEEN MCC-2 AND THIS LOCATION AND ABANDON CONDUIT IN PLACE. CIRCUIT BREAKER IN MCC-2 SHALL BE RE-LABELED AS A SPARE.
6. AN EXTENSIVE COPPER GROUND GRID COMPRISED OF #4/0 BCC EXISTS IN THE GROUND OVER THIS ENTIRE VICINITY. REMOVE GRID CONDUCTORS IN THEIR ENTIRETY AND REMOVE GROUND RODS WHERE REQUIRED FOR INSTALLATION OF DUCTBANKS OR MICROPILES.



DEMOLITION PLAN
1/4" = 1'-0"

AS-BUILT 4/2016

1/4"=1'-0"

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

SOIL CONSERVATION DISTRICT DATE

REVIEWED FOR HOWARD COUNTY SOIL CONSERVATION DISTRICT AND MEETS TECHNICAL REQUIREMENTS.

US SOIL CONSERVATION DISTRICT DATE

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. 22307 EXPIRATION DATE 4/9/15
SIGNED:

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. 25671 EXPIRATION DATE 4/11/14
SIGNED:

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 1/30/14
CHIEF BUREAU OF ENGINEERING — DATE 1/29/14
CHIEF BUREAU OF UTILITIES — DATE 1/28/14
CHIEF UTILITY DESIGN DIVISON — DATE 1/29/14

HAZEN AND SAWYER
Environmental Engineers & Scientists
ONE SOUTH STREET, BALTIMORE, MD 21202

CITY OF BALTIMORE, MARYLAND — DAVID A. GREGORSON — 22307 — REGISTERED PROFESSIONAL ENGINEER — 1/29/14

STATE OF MARYLAND — DAVID A. ATKINSON — 25671 — REGISTERED PROFESSIONAL ENGINEER — 4/22/14

DESIGNED DAA
DRAWN H&S
CHECKED DAA
PROJ. ENGR.
APPROVED

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ELECTRICAL
MAIN ELECTRICAL FACILITY
OVERALL DEMOLITION PLAN

GENERATOR/SWITCHGEAR INSTALLATION CONTRACT
LITTLE PATUXENT WATER RECLAMATION PLANT
CAPITAL PROJECT NUMBER S-6264
CONTRACT NUMBER 20-4832
6TH ELECTION DISTRICT HOWARD COUNTY, MARYLAND

DATE JAN 2014
DRAWING NUMBER
E2
SCALE AS SHOWN
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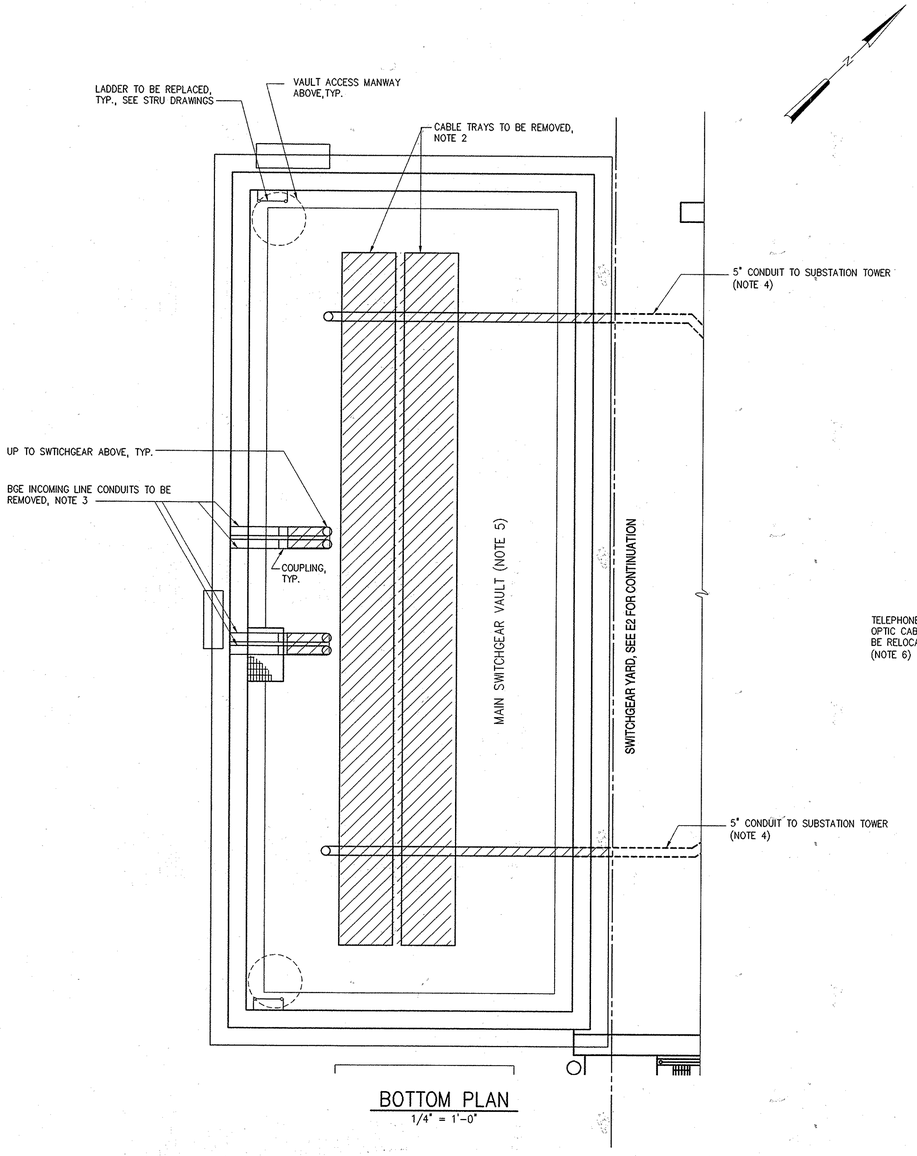
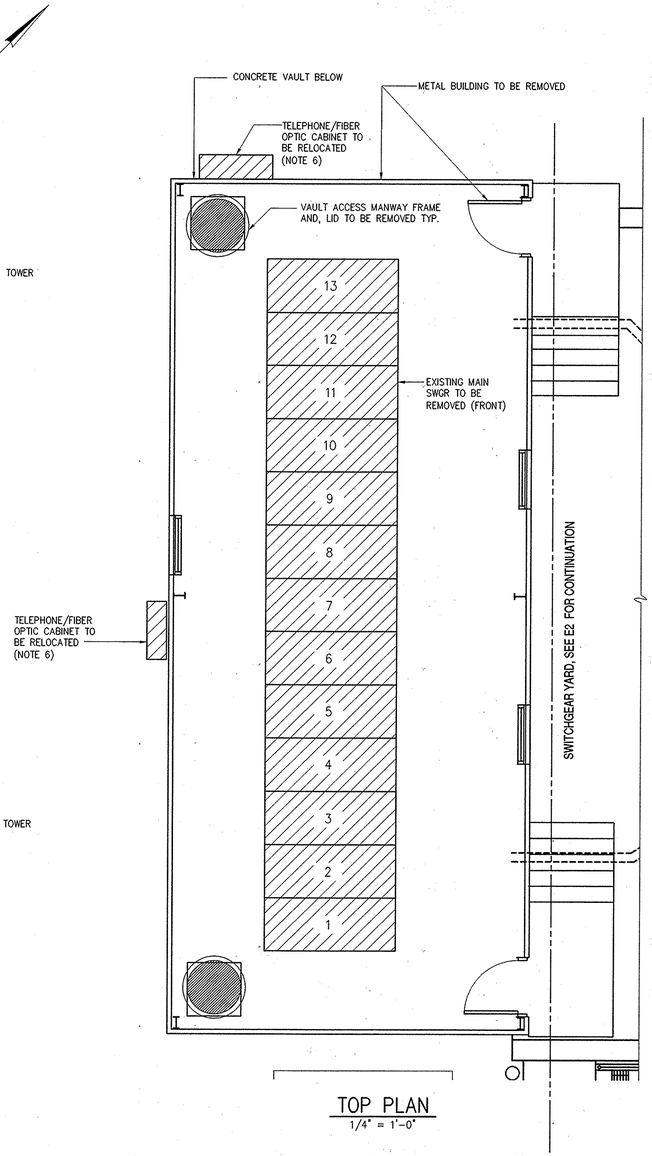
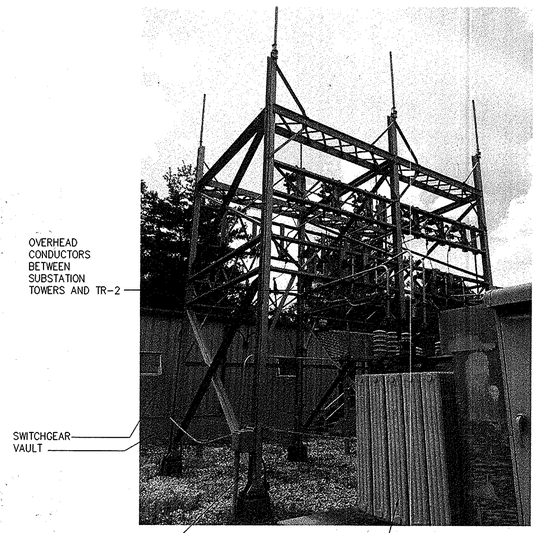


BOTTOM PLAN
1/4" = 1'-0"



TOP PLAN
1/4" = 1'-0"

BGE CONDUITS IN VAULT



SUBSTATION TOWER

AS-BUILT 4/2016

1/4"=1'-0"

1 0 1 2 3 7'

NOTES:

1. SEE SECTION 01520, MAINTENANCE OF PLANT OPERATIONS DURING CONSTRUCTION, FOR CONSTRAINTS AND CONSTRUCTION SEQUENCING NOTES FOR THE SWITCHGEAR REPLACEMENT.
2. CABLE TRAYS ARE SUSPENDED FROM VAULT CEILING BY THREADED ROD. THE CONTRACTOR SHALL REMOVE FOUR (4) CABLE TRAYS TOTAL. THE TWO (2) CABLE TRAYS SHOWN EACH HAVE TWO (2) LEVELS. AS SHOWN ON THE DEMOLITION SINGLE LINE DIAGRAMS, ALL CONDUCTORS IN THE CABLE TRAYS SHALL BE REMOVED.
3. BGE CONDUITS (RIGID GALVANIZED STEEL) SHALL BE REMOVED BETWEEN THE COUNDUIT COUPLING NEAR THE VAULT WEST WALL AND THE SWITCHGEAR. THE CONTRACTOR SHALL DEMOLISH THE CONDUITS CAREFULLY SO THAT THE REMAINDER OF THE CONDUIT BETWEEN THE COUPLING AND THE BGE MANHOLE OUTSIDE CAN BE RE-USED. BGE SHALL BE RESPONSIBLE FOR REMOVAL OF CABLES FROM CONDUITS PRIOR TO DEMOLITION. SEE PICTURE THIS SHEET.
4. CONDUIT AND CABLE BETWEEN THE SWITCHGEAR AND THE SUBSTATION TOWER OUTSIDE SHALL BE REMOVED. CONDUIT IS RIGID GALVANIZED STEEL. FILL HOLE IN VAULT EAST WALL WITH APPROVED PATCHING COMPOUND.
5. THE MAIN SWITCHGEAR VAULT IS A CONFINED SPACE. THE SPACE AVAILABLE IN THIS VAULT FROM FLOOR TO CEILING IS 8'-10".
6. TELEPHONE/FIBER OPTIC ENCLOSURES CONTAIN THE TELEPHONE CABLES FOR THE ENTIRE PLANT AS WELL AS FIBER OPTIC CABLES FOR THE TWO NEARBY PUMP STATIONS. CONDUITS AND CABLE ENTER THE BOTTOM OF BOTH ENCLOSURES. ENCLOSURES ARE SUPPORTED FROM VAULT WALL, BUT THEIR LOCATION WILL BE IN CONFLICT WITH VAULT WALL EXTENSION FORMWORK TO BE PROVIED. LOWER EACH BOX AS REQUIRED ON THE VAULT WALL TO CLEAR FORM WORK AND RE-ANCHOR. COORDINATE RELOCATION WITH PLANT PERSONNEL SO THAT FIBER OPTICS AND TELEPHONE SERVICE IS NOT INTERRUPTED.
7. REMOVE GROUNDING CONDUCTOR CONNECTIONS TO EXISTING SWITCHGEAR AND FILL HOLES IN VAULT WALLS WITH APPROVED PATCHING COMPOUND.

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

SOIL CONSERVATION DISTRICT DATE

REVIEWED FOR HOWARD COUNTY SOIL CONSERVATION DISTRICT AND MEETS TECHNICAL REQUIREMENTS.

US SOIL CONSERVATION DISTRICT DATE

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. 22307 EXPIRATION DATE 4/9/15
SIGNED:

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. 35671 EXPIRATION DATE 6/1/14
SIGNED:

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 1/30/14
CHIEF BUREAU OF ENGINEERING — DATE 1/29/14
CHIEF BUREAU OF UTILITIES — DATE 1/28/14
CHIEF UTILITY DESIGN DIVISON — DATE 1/29/14

HAZEN AND SAWYER
Environmental Engineers & Scientists
ONE SOUTH STREET, BALTIMORE, MD 21202

STATE OF MARYLAND — ANDREW A. KATSOUROS — 22307 — REGISTERED PROFESSIONAL ENGINEER — 1/29/14

STATE OF MARYLAND — DAVID A. ATKINSON — 35671 — REGISTERED PROFESSIONAL ENGINEER — 1/28/14

DESIGNED DAA
DRAWN H&S
CHECKED DAA
PROJ. ENGR.
APPROVED

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ELECTRICAL
MAIN ELECTRICAL FACILITY
PARTIAL DEMOLITION PLANS

GENERATOR/SWITCHGEAR INSTALLATION CONTRACT
LITTLE PATUXENT WATER RECLAMATION PLANT
CAPITAL PROJECT NUMBER S-6264
CONTRACT NUMBER 20-4832
6TH ELECTION DISTRICT HOWARD COUNTY, MARYLAND

DATE JAN 2014
DRAWING NUMBER
E3
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SHEET 22 OF 37

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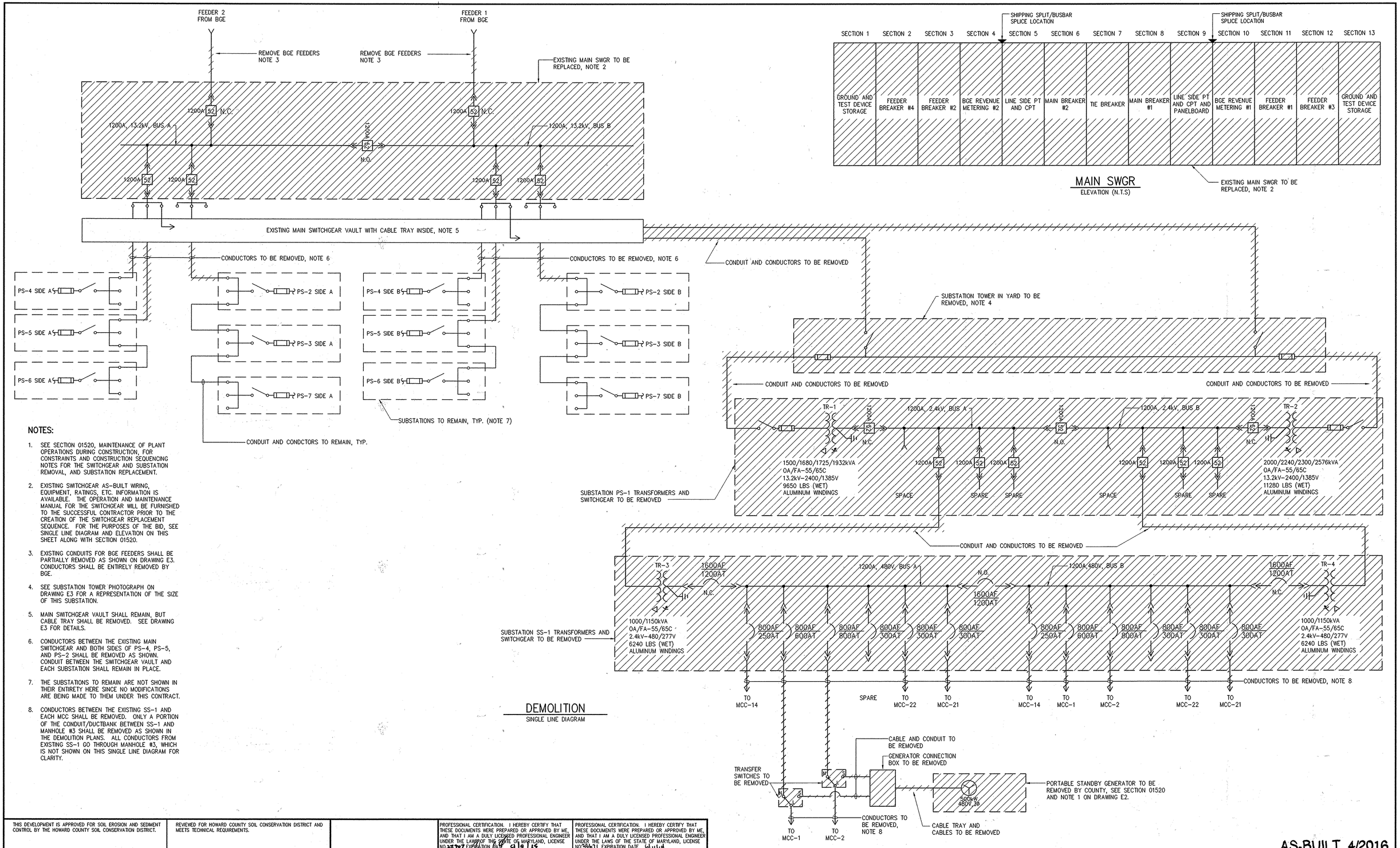

DEMOLITION
SINGLE LINE DIAGRAM

MAIN SWGR
ELEVATION (N.T.S)

NOTES:

1. SEE SECTION 01520, MAINTENANCE OF PLANT OPERATIONS DURING CONSTRUCTION, FOR CONSTRAINTS AND CONSTRUCTION SEQUENCING NOTES FOR THE SWITCHGEAR AND SUBSTATION REMOVAL, AND SUBSTATION REPLACEMENT.
2. EXISTING SWITCHGEAR AS-BUILT WIRING, EQUIPMENT, RATINGS, ETC. INFORMATION IS AVAILABLE. THE OPERATION AND MAINTENANCE MANUAL FOR THE SWITCHGEAR WILL BE FURNISHED TO THE SUCCESSFUL CONTRACTOR PRIOR TO THE CREATION OF THE SWITCHGEAR REPLACEMENT SEQUENCE. FOR THE PURPOSES OF THE BID, SEE SINGLE LINE DIAGRAM AND ELEVATION ON THIS SHEET ALONG WITH SECTION 01520.
3. EXISTING CONDUITS FOR BGE FEEDERS SHALL BE PARTIALLY REMOVED AS SHOWN ON DRAWING E3. CONDUCTORS SHALL BE ENTIRELY REMOVED BY BGE.
4. SEE SUBSTATION TOWER PHOTOGRAPH ON DRAWING E3 FOR A REPRESENTATION OF THE SIZE OF THIS SUBSTATION.
5. MAIN SWITCHGEAR VAULT SHALL REMAIN, BUT CABLE TRAY SHALL BE REMOVED. SEE DRAWING E3 FOR DETAILS.
6. CONDUCTORS BETWEEN THE EXISTING MAIN SWITCHGEAR AND BOTH SIDES OF PS-4, PS-5, AND PS-2 SHALL BE REMOVED AS SHOWN. CONDUIT BETWEEN THE SWITCHGEAR VAULT AND EACH SUBSTATION SHALL REMAIN IN PLACE.
7. THE SUBSTATIONS TO REMAIN ARE NOT SHOWN IN THEIR ENTIRETY HERE SINCE NO MODIFICATIONS ARE BEING MADE TO THEM UNDER THIS CONTRACT.
8. CONDUCTORS BETWEEN THE EXISTING SS-1 AND EACH MCC SHALL BE REMOVED. ONLY A PORTION OF THE CONDUIT/DUCTBANK BETWEEN SS-1 AND MANHOLE #3 SHALL BE REMOVED AS SHOWN IN THE DEMOLITION PLANS. ALL CONDUCTORS FROM EXISTING SS-1 GO THROUGH MANHOLE #3, WHICH IS NOT SHOWN ON THIS SINGLE LINE DIAGRAM FOR CLARITY.

AS-BUILT 4/2016

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

SOIL CONSERVATION DISTRICT DATE

REVIEWED FOR HOWARD COUNTY SOIL CONSERVATION DISTRICT AND MEETS TECHNICAL REQUIREMENTS.

US SOIL CONSERVATION DISTRICT DATE

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. 22307 EXPIRATION DATE 9/19/15
SIGNED:

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. 25671 EXPIRATION DATE 6/11/14
SIGNED:

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 1/30/14
CHIEF BUREAU OF ENGINEERING — DATE 1/29/14
CHIEF BUREAU OF UTILITIES — DATE 1/28/14
CHIEF UTILITY DESIGN DIVISON — DATE 1/29/14

HAZEN AND SAWYER
Environmental Engineers & Scientists
ONE SOUTH STREET, BALTIMORE, MD 21202

DESIGNED DAA
DRAWN H&S
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PROJ. ENGR
APPROVED

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ELECTRICAL
MAIN ELECTRICAL FACILITY
OVERALL SINGLE LINE DIAGRAM - DEMOLITION

GENERATOR/SWITCHGEAR INSTALLATION CONTRACT
LITTLE PATUXENT WATER RECLAMATION PLANT
CAPITAL PROJECT NUMBER S-6264
CONTRACT NUMBER 20-4832
6TH ELECTION DISTRICT HOWARD COUNTY, MARYLAND

DATE JAN 2014
DRAWING NUMBER E4
SCALE AS SHOWN
SHEET 23 OF 37

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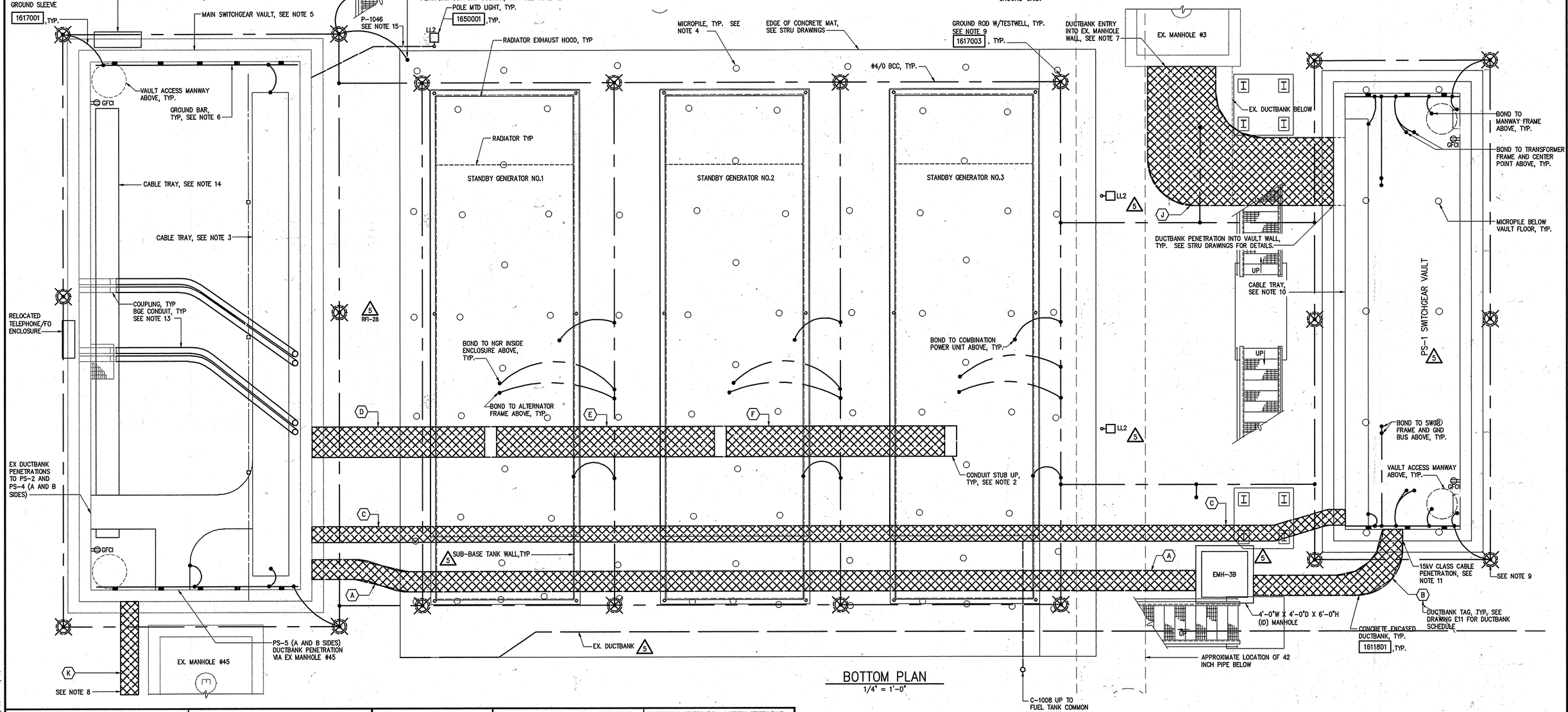
NOTES:

1. THE CONTRACTOR SHALL PROVIDE A LIGHTNING PROTECTION SYSTEM FOR THE GENERATORS, PS-1 ASSEMBLY, AND WALKWAY IN ACCORDANCE WITH SECTION 16670.
2. EXACT LOCATION OF CONDUIT STUB UPS SHALL BE COORDINATED WITH THE APPROVED SHOP DRAWINGS FROM THE GENERATOR MANUFACTURER.
3. TWO (2) CABLE TRAYS EACH 36 INCHES WIDE BY 4 INCHES DEEP SHALL BE STACKED IN THIS LOCATION IN THE VAULT BENEATH THE CONDUIT SLEEVE PENETRATIONS ABOVE. THIS CABLE TRAY SHALL ONLY BE USED FOR 15kV CLASS CABLES. UPPER TRAY SHALL BE USED FOR THE SWGR-MEF AND SWGR-GEN SIDE B CONDUCTORS, LOWER TRAY SHALL BE USED FOR SIDE B CONDUCTORS AND CONDUCTORS FROM EACH STANDBY GENERATOR.
4. EXACT LOCATION OF DUCTBANKS SHALL BE COORDINATED WITH THE LOCATIONS OF THE MICROPILES. SEE STRUCTURAL DRAWINGS FOR DETAILS.
5. THE MAIN SWITCHGEAR VAULT IS A CONFINED SPACE. THE SPACE AVAILABLE IN THIS VAULT FROM FLOOR TO CEILING IS 8'-10".
6. THE CONTRACTOR SHALL FURNISH AND INSTALL A TIN-PLATED COPPER GROUND BAR AT EACH END OF EACH VAULT AS SHOWN. GROUND BAR SHALL COVER THE ENTIRE LENGTH OF EACH VAULT END, SHALL BE TWO-HOLE DESIGN, AND SHALL CONSIST OF 1/4 INCH THICK BY 2 INCH HIGH MATERIAL. GROUND BAR SHALL BE MOUNTED TO WALL AT 36 INCHES AFF WITH INSULATING STANDOFFS UTILIZING STAINLESS STEEL FASTENING HARDWARE.
7. THE BOTTOM OF THE DUCTBANK SHALL SIT DIRECTLY ON TOP OF THE PORTION OF EXISTING DUCTBANK THAT REMAINS AND ENTERS THIS SAME WALL. SEE STRUCTURAL DRAWINGS FOR DETAILS OF DUCTBANK PENETRATION AND REINFORCEMENT REQUIRED.
8. DUCTBANK TO AUXILIARY PUMP STATION. SEE CIVIL DRAWINGS FOR CONTINUATION.
9. FOR THE SIX (6) GROUND RODS SURROUNDING THE PS-1 SWITCHGEAR VAULT, THE CONTRACTOR SHALL FURNISH AND INSTALL A SEGMENTED GROUND ROD THAT IS 20 FEET IN LENGTH. ALL OTHER GROUND RODS SHALL BE 10 FEET LONG IN ACCORDANCE WITH THE STANDARD DETAIL.
10. TWO (2) CABLE TRAYS EACH 24 INCHES WIDE BY 4 INCHES DEEP SHALL BE STACKED IN THIS LOCATION IN THE VAULT BENEATH THE CONDUIT SLEEVE PENETRATIONS ABOVE. CABLE TRAY SHALL ONLY BE USED FOR CABLES RATED 600V AND BELOW. UPPER TRAY SHALL BE USED FOR PS-1 SIDE B CONDUCTORS, LOWER TRAY SHALL BE USED FOR PS-1 SIDE A CONDUCTORS.
11. ALL 15kV CLASS CABLE IN THIS VAULT SHALL BE INSTALLED IN RIGID GALVANIZED STEEL CONDUIT. ROUTE CONDUITS TO PREVENT TRIPPING HAZARDS AND MAXIMIZE HEAD ROOM IN THE VAULT.
12. THE MANY SUPPORT COLUMNS FOR THE PLATFORM ABOVE ARE NOT SHOWN HERE FOR CLARITY. HOWEVER, THE CONTRACTOR SHALL BOND A SUPPORT COLUMN AT EACH OF THE FOUR (4) CORNERS OF THE PLATFORM TO THE GROUND GRID.
13. RIGID GALVANIZED STEEL CONDUIT SHALL BE CONNECTED TO EXISTING CONDUIT COUPLINGS AND ROUTED TO THE LOCATION OF THE INCOMING BGE SECTIONS OF THE SWITCHGEAR ABOVE. SEE CONDUIT AND WIRE SCHEDULE FOR SIZE, QUANTITY AND FILL FOR THESE CONDUITS.
14. ONE (1) CABLE TRAY THAT IS 24 INCHES WIDE AND 4 INCHES DEEP SHALL BE INSTALLED IN THIS LOCATION BENEATH THE PANELBOARDS AND SWITCHGEAR CONTROLS ABOVE. THIS CABLE TRAY SHALL ONLY BE USED FOR CABLES RATED 600V AND BELOW. FOR CLARITY PURPOSES, THE CONNECTION BETWEEN THIS CABLE TRAY AND DUCTBANKS C, G, AND K ARE NOT SHOWN, BUT SHALL BE PROVIDED.
15. CONDUIT AND WIRE BETWEEN LIGHT POLES SHALL BE 2#10, #10GND IN 1" DIRECT BURIED CONDUIT. CONDUIT AND WIRE BETWEEN LIGHT POLES IS NOT SHOWN ON THIS PLAN.
16. BOND BOTH SWITCHGEAR ASSEMBLIES, THE POWER CENTER ENCLOSURE, AND TX-LP-MEF ABOVE TO THE GROUND BAR IN THE MAIN SWITCHGEAR VAULT.
17. ALL ANALOG SIGNAL WIRING THAT IS ROUTED THROUGH EITHER SWITCHGEAR VAULT SHALL BE INSTALLED IN RIGID GALVANIZED STEEL TO PROVIDE ELECTRICAL NOISE SHIELDING. ANALOG SIGNAL WIRING SHALL NOT BE ROUTED IN CABLE TRAYS WITH 600V POWER CONDUCTORS OR 5kV POWER CONDUCTORS.



BOTTOM PLAN
1/4" = 1'-0"

1/4"=1'-0"

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

SOIL CONSERVATION DISTRICT DATE

REVIEWED FOR HOWARD COUNTY SOIL CONSERVATION DISTRICT AND MEETS TECHNICAL REQUIREMENTS.

US SOIL CONSERVATION DISTRICT DATE

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. 22307, EXPIRATION DATE 4/9/17
SIGNED:

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. 35671, EXPIRATION DATE 6/11/16
SIGNED:

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 5/6/16
CHIEF BUREAU OF ENGINEERING — DATE 5/10/16
CHIEF BUREAU OF UTILITIES — DATE 5/3/16
CHIEF UTILITY DESIGN DIVISON — DATE 5/6/16

HAZEN AND SAWYER
Environmental Engineers & Scientists
ONE SOUTH STREET, BALTIMORE, MD 21202

STATE OF MARYLAND — DAVID A. ATKINSON — No. 22307 — REGISTERED PROFESSIONAL ENGINEER — 1/08/14
STATE OF MARYLAND — DAVID A. ATKINSON — No. 35671 — REGISTERED PROFESSIONAL ENGINEER — 11/23/14

DESIGNED DAA
DRAWN H&S
CHECKED DAA
PROJ. ENGR.
APPROVED

NO.	ISSUED FOR	DATE	BY
5	AS-BUILT REPLACEMENT	9/2015	DAV
4	ADDENDUM 1	7/2014	DAA
3	BIDDING	1/2014	DAA
2	90% REVIEW	9/2013	DAA
1	60% REVIEW	6/2013	DAA

AS-BUILT REPLACEMENT 4/2016

ELECTRICAL
MAIN ELECTRICAL FACILITY
BOTTOM PLAN

GENERATOR/SWITCHGEAR INSTALLATION CONTRACT
LITTLE PATUXENT WATER RECLAMATION PLANT
CAPITAL PROJECT NUMBER S-6264
CONTRACT NUMBER 20-4832
6TH ELECTION DISTRICT HOWARD COUNTY, MARYLAND

DATE FEB 2016
DRAWING NUMBER
E5
SCALE AS SHOWN
SHEET 24 OF 37

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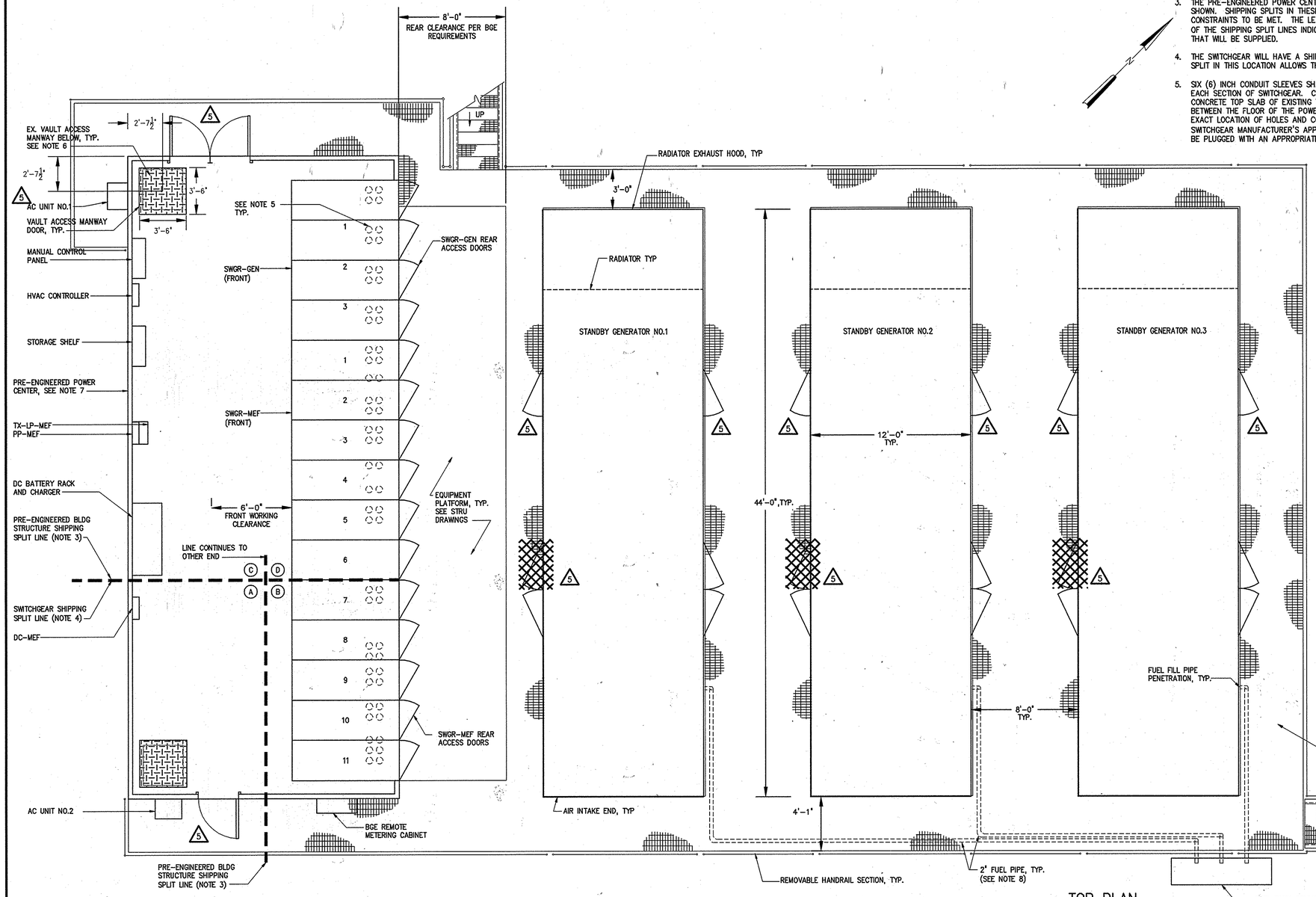
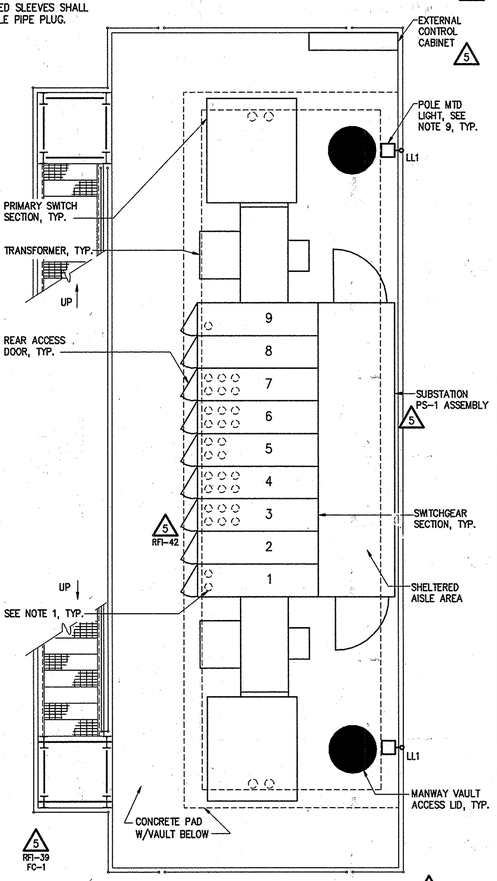
NOTES:

1. SIX (6) INCH CONDUIT SLEEVES SHALL BE INSTALLED IN THE QUANTITY SHOWN UNDER EACH SECTION OF SWITCHGEAR/INCOMING LINE SECTION. CONTRACTOR SHALL PLACE SLEEVES INTO FORMWORK SO THAT SLEEVES ARE ENCASED DURING THE TOP SLAB POUR. EXACT LOCATION OF CONDUIT SLEEVES SHALL BE COORDINATED WITH SWITCHGEAR MANUFACTURER'S APPROVED SHOP DRAWINGS. ALL UNUSED SLEEVES SHALL BE PLUGGED WITH AN APPROPRIATELY SIZED RUBBER COMPRESSION STYLE PIPE PLUG.
2. THE CONTRACTOR SHALL PROVIDE A LIGHTNING PROTECTION SYSTEM FOR THE PRE-ENGINEERED POWER DISTRIBUTION CENTER, STANDBY GENERATORS, PS-1 ASSEMBLY, AND THE EQUIPMENT PLATFORM IN ACCORDANCE WITH SECTION 16670.
3. THE PRE-ENGINEERED POWER CENTER WILL HAVE SHIPPING SPLITS IN THE LOCATIONS SHOWN. SHIPPING SPLITS IN THESE SPECIFIC LOCATIONS ALLOW THE PLANT OPERATIONAL CONSTRAINTS TO BE MET. THE LETTERS SHOWN INSIDE OF A CIRCLE AT THE INTERSECTION OF THE SHIPPING SPLIT LINES INDICATE THE FOUR (4) PARTS OF THE POWER CENTER THAT WILL BE SUPPLIED.
4. THE SWITCHGEAR WILL HAVE A SHIPPING SPLIT IN THE LOCATION SHOWN. A SHIPPING SPLIT IN THIS LOCATION ALLOWS THE PLANT OPERATION CONSTRAINTS TO BE MET.
5. SIX (6) INCH CONDUIT SLEEVES SHALL BE INSTALLED IN THE QUANTITY SHOWN UNDER EACH SECTION OF SWITCHGEAR. CONTRACTOR SHALL CORE DRILL THE 12 INCH THICK CONCRETE TOP SLAB OF EXISTING VAULT. CONDUIT SLEEVES SHALL BE INSTALLED BETWEEN THE FLOOR OF THE POWER CENTER AND THE MAIN SWITCHGEAR VAULT BELOW. EXACT LOCATION OF HOLES AND CONDUIT SLEEVES SHALL BE COORDINATED WITH SWITCHGEAR MANUFACTURER'S APPROVED SHOP DRAWINGS. ALL UNUSED SLEEVES SHALL BE PLUGGED WITH AN APPROPRIATELY SIZED RUBBER COMPRESSION STYLE PIPE PLUG.
6. ACCESS DOOR SHALL BE LOCATED AS SHOWN CENTERED OVER THE EXISTING OPENING BELOW. CENTER OF THE EXISTING MANWAY BELOW IS SHOWN MEASURED FROM THE OUTSIDE WALL OF THE SWITCHGEAR VAULT.
7. REFERENCE SPECIFICATION SECTION 16346 FOR PRE-ENGINEERED POWER CENTER DETAILS. POWER CENTER WILL HAVE THE EXACT OVERALL DIMENSIONS OF THE SWITCHGEAR VAULT BELOW.
8. FUEL PIPE SHALL BE ROUTED BELOW THE EQUIPMENT PLATFORM AND SHALL BE SUPPORTED FROM THE PLATFORM COLUMNS AND BEAMS. PIPE SHALL TURN UP THROUGH THE PLATFORM GRATING AND TURN INTO THE FUEL PIPE PENETRATION AT EACH GENERATOR ENCLOSURE AS SHOWN. COORDINATE EXACT LOCATION OF FUEL PIPE PENETRATION WITH SHOP DRAWINGS OF APPROVED EQUIPMENT.
9. POLE BASES SHALL BE EPOXY ANCHORED INTO THE VERTICAL WALL OF THE STRUCTURE PER SECTION 05050. COORDINATE REQUIRED EMBED LENGTH AND DIAMETER WITH LIGHT POLE MANUFACTURER.
10. ONLY LARGE CONDUIT PENETRATIONS BELOW EACH RESPECTIVE SWITCHGEAR ASSEMBLY ARE SHOWN THROUGH THE CONCRETE SLABS ON THIS SHEET, THE SMALLER ONES ARE OMITTED FOR CLARITY. ALL REQUIRED CONDUIT PENETRATIONS SHALL BE PROVIDED AT THE APPROPRIATE LOCATIONS BASED ON THE MANUFACTURER'S RESPECTIVE APPROVED SHOP DRAWINGS.



TOP PLAN
1/4" = 1'-0"



1/4"=1'-0" (1 0 1 2 3 7')

AS-BUILT REPLACEMENT 4/2016

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

SOIL CONSERVATION DISTRICT DATE

REVIEWED FOR HOWARD COUNTY SOIL CONSERVATION DISTRICT AND MEETS TECHNICAL REQUIREMENTS.

US SOIL CONSERVATION DISTRICT DATE

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. 22307 EXPIRATION DATE: 4/9/16
SIGNED:

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. 35671, EXPIRATION DATE 6/30/16
SIGNED:

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 5/16/16
CHIEF BUREAU OF ENGINEERING — DATE 5/10/16
CHIEF BUREAU OF UTILITIES — DATE 5/12/16
CHIEF UTILITY DESIGN DIVISON — DATE 5/16/16

HAZEN AND SAWYER
Environmental Engineers & Scientists
ONE SOUTH STREET, BALTIMORE, MD 21202

STATE OF MARYLAND — DAVID A. ATKINS JR — 22307 — REGISTERED PROFESSIONAL ENGINEER — 4/9/16
STATE OF MARYLAND — DAVID A. ATKINS JR — 35671 — REGISTERED PROFESSIONAL ENGINEER — 6/22/14

DESIGNED DAA
DRAWN H&S
CHECKED DAA
PROJ. ENGR.
APPROVED

NO.	ISSUED FOR	DATE	BY
5	AS-BUILT REPLACEMENT	9/2015	DAV
4	ADDENDUM 1	7/2014	DAA
3	BIDDING	1/2014	DAA
2	90% REVIEW	9/2013	DAA
1	60% REVIEW	6/2013	DAA

ELECTRICAL
MAIN ELECTRICAL FACILITY
TOP PLAN

GENERATOR/SWITCHGEAR INSTALLATION CONTRACT
LITTLE PATUXENT WATER RECLAMATION PLANT
CAPITAL PROJECT NUMBER S-6264
CONTRACT NUMBER 20-4832
6TH ELECTION DISTRICT HOWARD COUNTY, MARYLAND

DATE FEB 2016
DRAWING NUMBER E6
SCALE AS SHOWN
SHEET 25 OF 37

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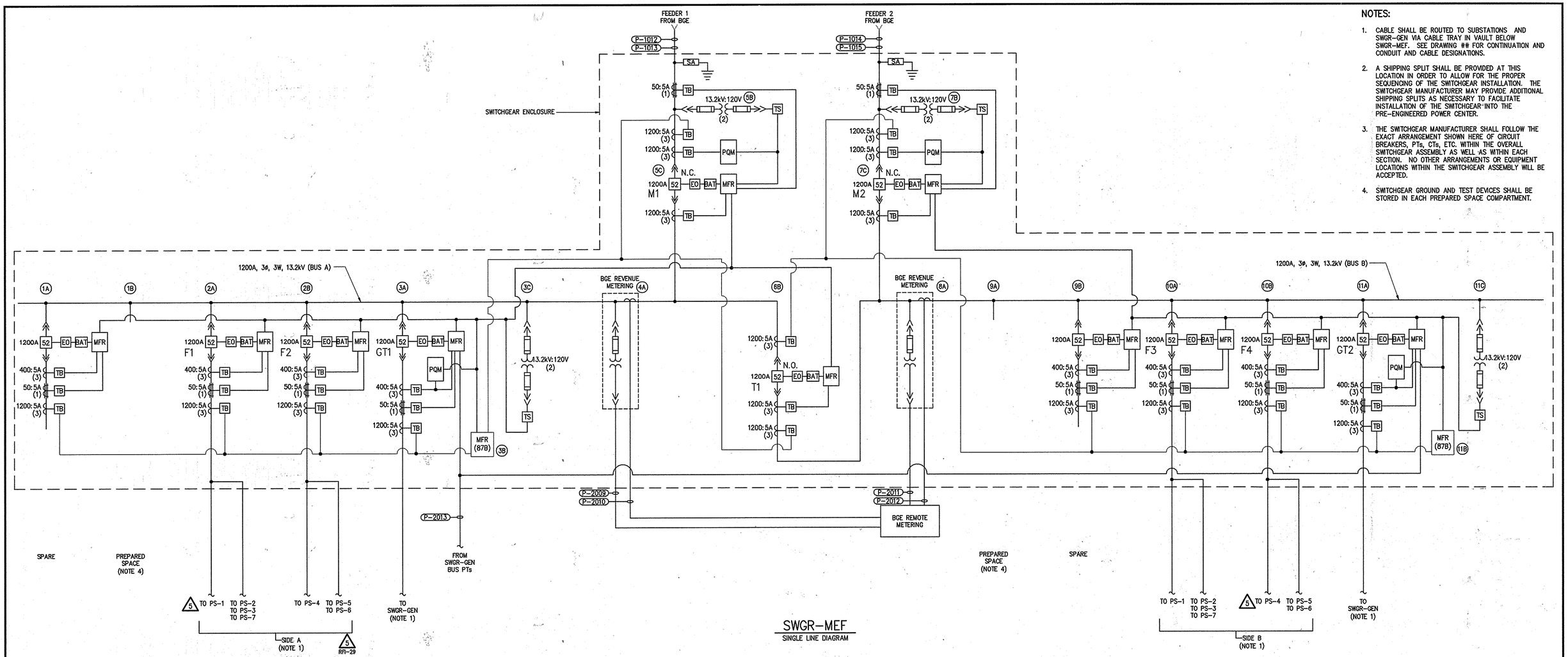
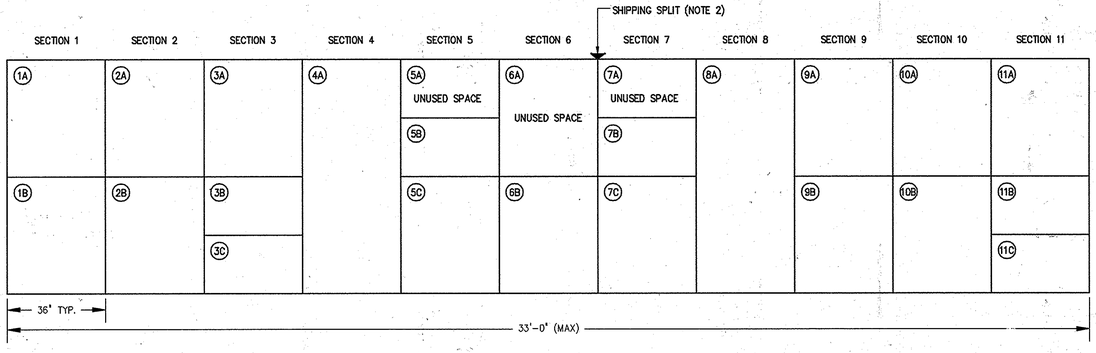
NOTES:

1. CABLE SHALL BE ROUTED TO SUBSTATIONS AND SWGR-GEN VIA CABLE TRAY IN VAULT BELOW SWGR-MEF. SEE DRAWING ## FOR CONTINUATION AND CONDUIT AND CABLE DESIGNATIONS.
2. A SHIPPING SPLIT SHALL BE PROVIDED AT THIS LOCATION IN ORDER TO ALLOW FOR THE PROPER SEQUENCING OF THE SWITCHGEAR INSTALLATION. THE SWITCHGEAR MANUFACTURER MAY PROVIDE ADDITIONAL SHIPPING SPLITS AS NECESSARY TO FACILITATE INSTALLATION OF THE SWITCHGEAR INTO THE PRE-ENGINEERED POWER CENTER.
3. THE SWITCHGEAR MANUFACTURER SHALL FOLLOW THE EXACT ARRANGEMENT SHOWN HERE OF CIRCUIT BREAKERS, PTs, CTs, ETC. WITHIN THE OVERALL SWITCHGEAR ASSEMBLY AS WELL AS WITHIN EACH SECTION. NO OTHER ARRANGEMENTS OR EQUIPMENT LOCATIONS WITHIN THE SWITCHGEAR ASSEMBLY WILL BE ACCEPTED.
4. SWITCHGEAR GROUND AND TEST DEVICES SHALL BE STORED IN EACH PREPARED SPACE COMPARTMENT.



SWGR-MEF
SINGLE LINE DIAGRAM



SWGR-MEF
ELEVATION (NOTE 3)

AS-BUILT REPLACEMENT 4/2016

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

SOIL CONSERVATION DISTRICT DATE

REVIEWED FOR HOWARD COUNTY SOIL CONSERVATION DISTRICT AND MEETS TECHNICAL REQUIREMENTS.

US SOIL CONSERVATION DISTRICT DATE

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. 22307 EXPIRATION DATE 9/9/17
SIGNED:

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. 35671 EXPIRATION DATE 6/11/16
SIGNED:

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 5/16/16
CHIEF BUREAU OF ENGINEERING — DATE 5/16/16
CHIEF BUREAU OF UTILITIES — DATE 5/13/16
CHIEF UTILITY DESIGN DIVISON — DATE 5/16/16

HAZEN AND SAWYER
Environmental Engineers & Scientists
ONE SOUTH STREET, BALTIMORE, MD 21202

STATE OF MARYLAND — DAVID A. STEGER — 22307 — REGISTERED PROFESSIONAL ENGINEER — 9/9/14
STATE OF MARYLAND — DANIEL A. ATKINSON — 35671 — REGISTERED PROFESSIONAL ENGINEER — 6/11/14

DESIGNED DAA
DRAWN H&S
CHECKED DAA
PROJ. ENGR.
APPROVED

NO.	ISSUED FOR	DATE	BY
5	AS-BUILT REPLACEMENT	9/2015	DAV
4	ADDENDUM 1	7/2014	DAA
3	BIDDING	1/2014	DAA
2	90% REVIEW	9/2013	DAA
1	60% REVIEW	6/2013	DAA

ELECTRICAL
MAIN ELECTRICAL FACILITY
SWGR-MEF SINGLE LINE DIAGRAM AND ELEVATION

GENERATOR/SWITCHGEAR INSTALLATION CONTRACT
LITTLE PATUXENT WATER RECLAMATION PLANT
CAPITAL PROJECT NUMBER S-6264
CONTRACT NUMBER 20-4832
6TH ELECTION DISTRICT HOWARD COUNTY, MARYLAND

DATE FEB 2016
DRAWING NUMBER
E7
SCALE AS SHOWN
SHEET 26 OF 37

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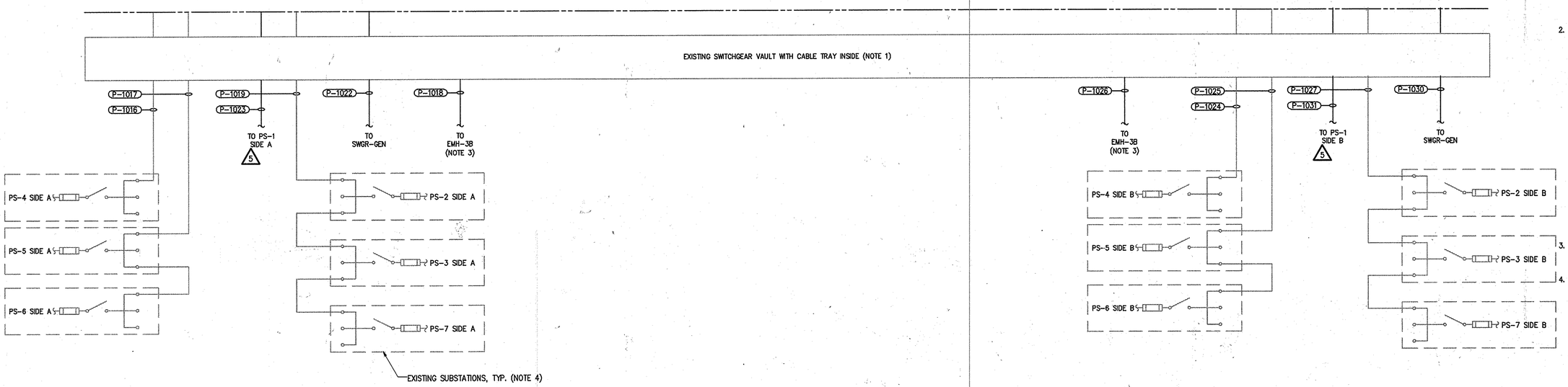

PRIMARY SUBSTATION
SINGLE LINE DIAGRAM

CONDUCTOR LENGTH TABLE (NOTE 2)			
CONDUIT NO.	FROM	TO	APPROXIMATE LENGTH (FEET)
P-1016	SWGR-MEF A SIDE	PS-4 A SIDE	2000
P-1017	SWGR-MEF A SIDE	PS-5 A SIDE	600
P-1019	SWGR-MEF A SIDE	PS-2 A SIDE	1050
P-1024	SWGR-MEF B SIDE	PS-4 B SIDE	2000
P-1025	SWGR-MEF B SIDE	PS-5 B SIDE	600
P-1027	SWGR-MEF B SIDE	PS-2 B SIDE	1100

5 CO-6

NOTES:

1. CABLES SHALL BE INSTALLED FROM THE BOTTOM OF THE SWITCHGEAR INTO NEW CABLE TRAY INSIDE THE VAULT, AND THEN OUT TO THE RESPECTIVE EQUIPMENT THROUGH CONDUITS AND DUCTBANKS. SEE DRAWING E5 FOR CABLE TRAY AND CONDUCTOR ROUTING DETAILS.
2. THE APPROXIMATE LENGTHS SHOWN IN THIS TABLE BETWEEN THE SWGR-MEF AND THE RESPECTIVE PRIMARY SUBSTATIONS ARE FOR THE CONTRACTOR'S USE IN PREPARING THE BID. THE LENGTHS SHALL NOT BE USED FOR CONSTRUCTION OR FOR ORDERING CABLES. VALUES SHOWN REFLECT ESTIMATED LENGTH OF EACH CABLE REQUIRED INCLUDING VAULTS AND MANHOLES THAT ARE NOT SHOWN IN THE SINGLE LINE DIAGRAM. THE SUCCESSFUL CONTRACTOR SHALL DETERMINE THE ACTUAL CABLE LENGTHS REQUIRED VIA FIELD INVESTIGATION AFTER THE BID IS AWARDED. ANY DISCREPANCIES IN CABLE LENGTH BETWEEN THIS TABLE AND LENGTHS MEASURED VIA FIELD INVESTIGATION SHALL BE SUBMITTED TO THE COUNTY AS A PROPOSED CHANGE ORDER. THE LENGTHS SHOWN HERE ARE FOR A SINGLE CABLE, THEREFORE THE CONTRACTOR SHALL MULTIPLY EACH LENGTH SHOWN BY THE NUMBER OF CABLES REQUIRED AS SHOWN IN THE CONDUIT AND WIRE SCHEDULES.
3. THIS SPARE CONDUIT SHALL TERMINATE AT THE WALL OF THE EXISTING SWITCHGEAR VAULT.
4. THE EXISTING SUBSTATIONS ARE NOT SHOWN HERE IN THEIR ENTIRETY SINCE NO MODIFICATIONS ARE BEING MADE TO THEM UNDER THIS CONTRACT.

AS-BUILT REPLACEMENT 4/2016

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

SOIL CONSERVATION DISTRICT DATE

REVIEWED FOR HOWARD COUNTY SOIL CONSERVATION DISTRICT AND MEETS TECHNICAL REQUIREMENTS.

US SOIL CONSERVATION DISTRICT DATE

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. 22307 EXPIRATION DATE 07/01/17
SIGNED:

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. 35671 EXPIRATION DATE 6/8/16
SIGNED:

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 5/16/16
CHIEF BUREAU OF ENGINEERING — DATE 5/16/16
CHIEF BUREAU OF UTILITIES — DATE 5/3/16
CHIEF UTILITY DESIGN DIVISON — DATE 5/16/16

HAZEN AND SAWYER
Environmental Engineers & Scientists
ONE SOUTH STREET, BALTIMORE, MD 21202

STATE OF MARYLAND — 22307 — REGISTERED PROFESSIONAL ENGINEER — 7/01/17
STATE OF MARYLAND — 35671 — REGISTERED PROFESSIONAL ENGINEER — 6/8/16

DESIGNED DAA
DRAWN CAS
CHECKED DAA
PROJ. ENGR. DAS
APPROVED

NO.	ISSUED FOR	DATE	BY
5	AS-BUILT REPLACEMENT	9/2015	DAV
4	ADDENDUM 1	7/2014	DAA
3	BIDDING	1/2014	DAA
2	90% REVIEW	9/2013	DAA
1	60% REVIEW	6/2013	DAA

ELECTRICAL
MAIN ELECTRICAL FACILITY
PRIMARY SUBSTATION SINGLE LINE DIAGRAM

GENERATOR/SWITCHGEAR
INSTALLATION CONTRACT
LITTLE PATUXENT WATER RECLAMATION PLANT
CAPITAL PROJECT NUMBER S-6264
CONTRACT NUMBER 20-4832
6TH ELECTION DISTRICT HOWARD COUNTY, MARYLAND

DATE FEB 2016
DRAWING NUMBER
E8
SCALE AS SHOWN
SHEET 27 OF 37

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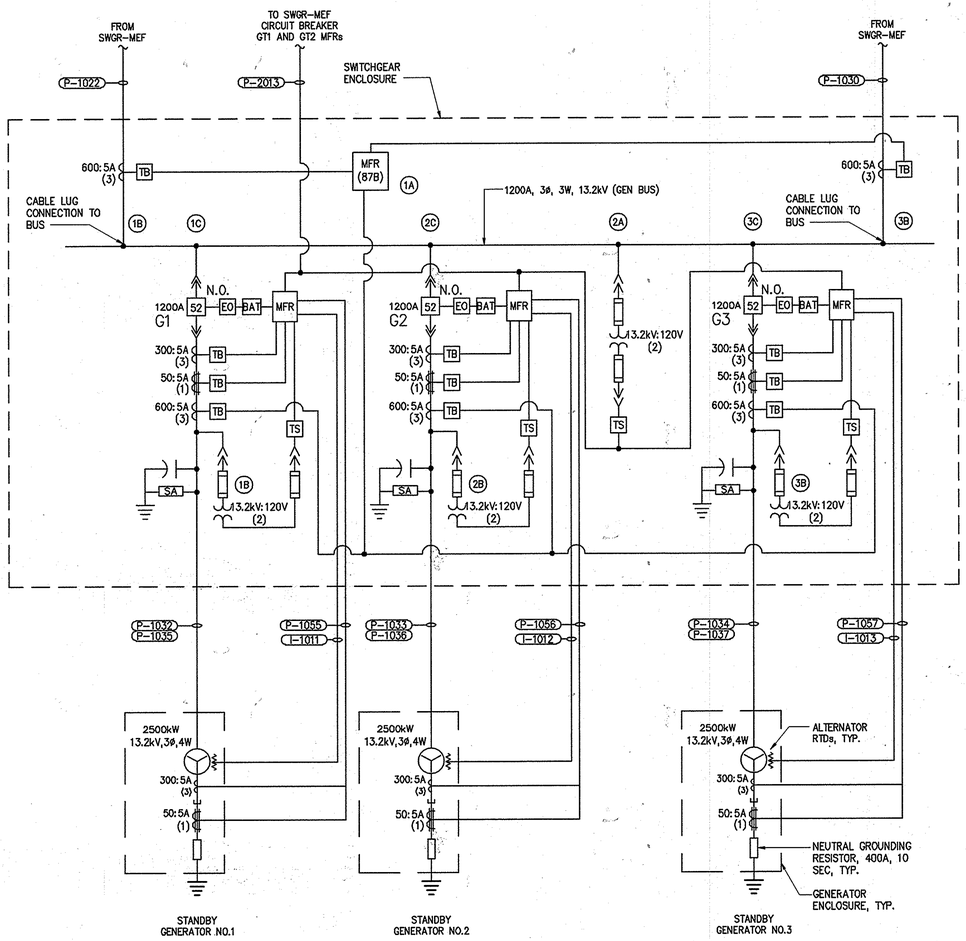
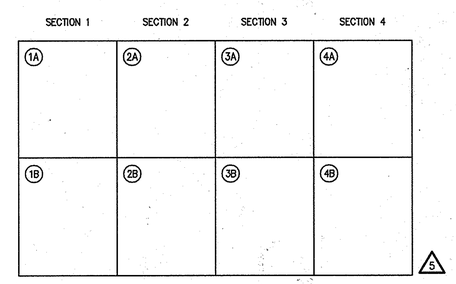


SWGR-GEN
SINGLE LINE DIAGRAM



SWGR-GEN
ELEVATION

AS-BUILT REPLACEMENT 4/2016

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

SOIL CONSERVATION DISTRICT DATE

REVIEWED FOR HOWARD COUNTY SOIL CONSERVATION DISTRICT AND MEETS TECHNICAL REQUIREMENTS.

US SOIL CONSERVATION DISTRICT DATE

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. 22307, EXPIRATION DATE 4/9/17
SIGNED:

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. 35671, EXPIRATION DATE 6/11/16
SIGNED:

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS 5/16/16 DATE
CHIEF BUREAU OF ENGINEERING 5/10/16 DATE
CHIEF BUREAU OF UTILITIES 5/3/16 DATE
CHIEF UTILITY DESIGN DIVISON 5/16/16 DATE

HAZEN AND SAWYER
Environmental Engineers & Scientists
ONE SOUTH STREET, BALTIMORE, MD 21202

STATE OF MARYLAND — ANDREW J. ARTHUR — REGISTERED PROFESSIONAL ENGINEER — 22307 — 1/23/14

STATE OF MARYLAND — ANDREW A. ATKINSON JR. — REGISTERED PROFESSIONAL ENGINEER — 35671 — 1/22/14

DESIGNED DAA
DRAWN H&S
CHECKED DAA
PROJ. ENGR.
APPROVED

NO.	ISSUED FOR	DATE	BY
5	AS-BUILT REPLACEMENT	9/2015	DAV
4	ADDENDUM 1	7/2014	DAA
3	BIDDING	1/2014	DAA
2	90% REVIEW	9/2013	DAA
1	60% REVIEW	6/2013	DAA

ELECTRICAL
MAIN ELECTRICAL FACILITY
SWGR-GEN SINGLE LINE DIAGRAM AND ELEVATION

GENERATOR/SWITCHGEAR
INSTALLATION CONTRACT
LITTLE PATUXENT WATER RECLAMATION PLANT
CAPITAL PROJECT NUMBER S-6264
CONTRACT NUMBER 20-4832
6TH ELECTION DISTRICT HOWARD COUNTY, MARYLAND

DATE FEB 2016
DRAWING NUMBER E9
SCALE AS SHOWN
SHEET 28 OF 37

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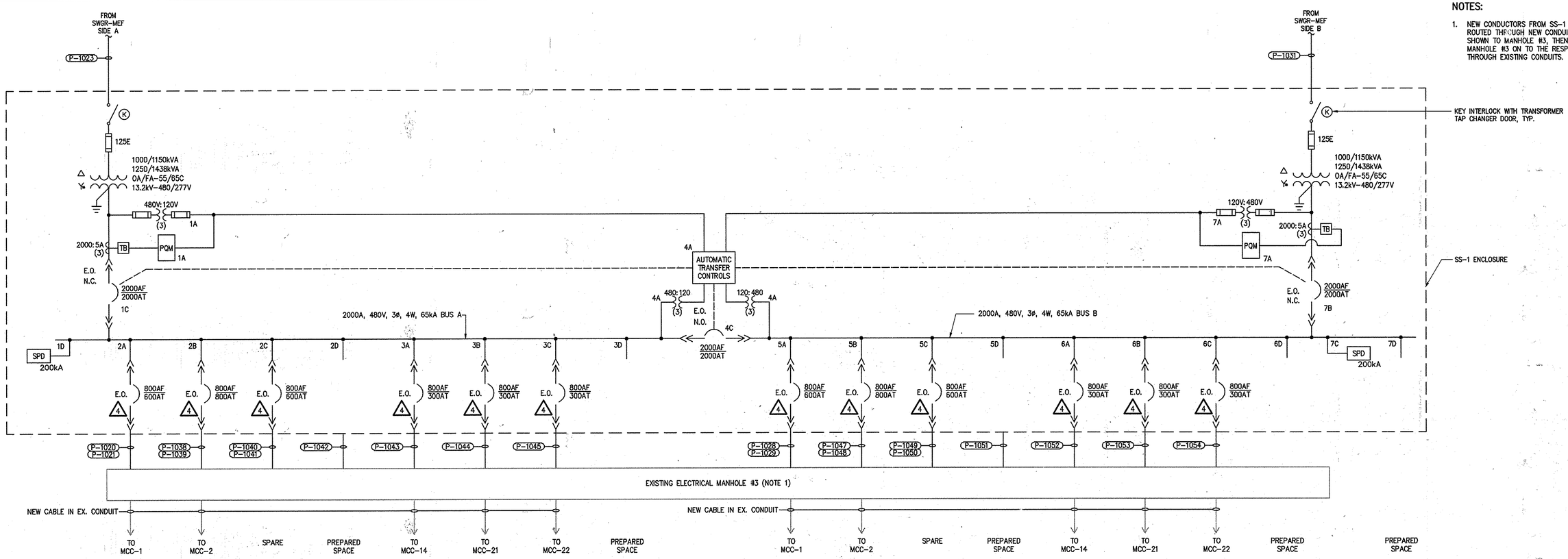
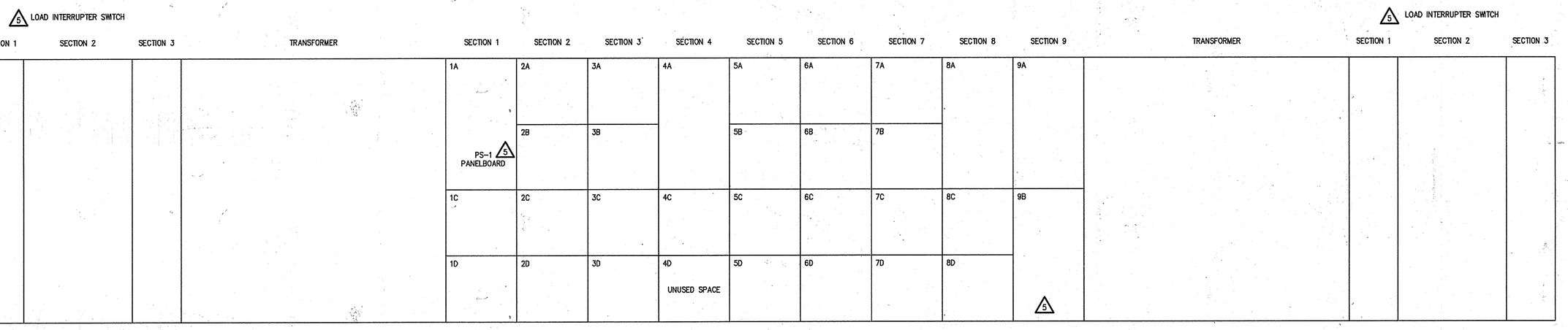


5 PS-1
SINGLE LINE DIAGRAM

NOTES:

1. NEW CONDUCTORS FROM SS-1 SHALL BE ROUTED THROUGH NEW CONDUITS AS SHOWN TO MANHOLE #3, THEN FROM MANHOLE #3 ON TO THE RESPECTIVE MCC THROUGH EXISTING CONDUITS.



5 PS-1
ELEVATION (N.T.S)

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

SOIL CONSERVATION DISTRICT DATE

REVIEWED FOR HOWARD COUNTY SOIL CONSERVATION DISTRICT AND MEETS TECHNICAL REQUIREMENTS.

US SOIL CONSERVATION DISTRICT DATE

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. 22307 EXPIRATION DATE 7/9/16
SIGNED:

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. 35671 EXPIRATION DATE 6/11/16
SIGNED:

AS-BUILT REPLACEMENT 4/2016

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 5/16/16
CHIEF BUREAU OF ENGINEERING — DATE 5/10/16
CHIEF BUREAU OF UTILITIES — DATE 5/3/16
CHIEF UTILITY DESIGN DIVISON — DATE 5/16/16

HAZEN AND SAWYER
Environmental Engineers & Scientists
ONE SOUTH STREET, BALTIMORE, MD 21202

STATE OF MARYLAND — MARK A. SCHULTZ — 22307 — REGISTERED PROFESSIONAL ENGINEER — 1/9/14
STATE OF MARYLAND — MICHAEL A. ATKINS JR. — 35671 — REGISTERED PROFESSIONAL ENGINEER — 1/22/14

DESIGNED DAA
DRAWN CAS
CHECKED DAA
PROJ. ENGR.
APPROVED

NO.	ISSUED FOR	DATE	BY
5	AS-BUILT REPLACEMENT	9/2015	DAV
4	ADDENDUM 1	7/2014	DAA
3	BIDDING	1/2014	DAA
2	90% REVIEW	9/2013	DAA
1	60% REVIEW	6/2013	DAA

ELECTRICAL
MAIN ELECTRICAL FACILITY
PS-1 SINGLE LINE DIAGRAM AND
5 ELEVATION - PROPOSED

GENERATOR/SWITCHGEAR
INSTALLATION CONTRACT
LITTLE PATUXENT WATER RECLAMATION PLANT
CAPITAL PROJECT NUMBER S-6264
CONTRACT NUMBER 20-4832
6TH ELECTION DISTRICT HOWARD COUNTY, MARYLAND

DATE FEB 2016
DRAWING NUMBER
E10
SCALE AS SHOWN
SHEET 29 OF 37

IMAGES= XREFs= 32232-TB

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DUCTBANK SCHEDULES

A	P-1023	H	P-1001
	P-1031		P-1002
	P-1018		P-1010
	P-1026		P-1011
			C-1003
B	P-1023		C-1004
	P-1031		I-1002
			I-1003
C	P-1004		I-1004
	C-1005		I-1005
	C-1008		P-1056
	I-1006		P-1057
	I-1007		I-1012
	I-1008		I-1013
D	P-1032	I	P-1002
	P-1033		P-1011
	P-1034		C-1004
	P-1035		I-1004
	P-1036		I-1005
	P-1037		P-1057
			I-1013
E	P-1033		
	P-1034	J	P-1020
	P-1036		P-1021
	P-1037		P-1038
			P-1039
F	P-1034		P-1040
	P-1037		P-1041
			P-1042
G	P-1000		P-1043
	P-1001		P-1044
	P-1002		P-1045
	P-1009		P-1028
	P-1010		P-1029
	P-1011		P-1047
	C-1002		P-1048
	C-1003		P-1049
	C-1004		P-1050
	I-1000		P-1051
	I-1001		P-1052
	I-1002		P-1053
	I-1003		P-1054
	I-1004		
	I-1005	K	I-1006
	P-1055		I-1007
	P-1056		I-1008
	P-1057		I-1010
	I-1011		C-1000
	I-1012		C-1001
	I-1013		C-1005

208/120 VOLTS
3 PHASE, 4 WIRE

LP-MEF
MAIN BREAKER
100A 3P

TYPE: NEMA 1
MOUNT: SURFACE

DESCRIPTION	WIRE	TRIP	POLE	No.	VOLT-AMPERES A	B	C	VOLT-AMPERES A	B	C	No.	POLE	TRIP	WIRE	DESCRIPTION
RECP POWER CENTER OUTDOOR	SEE NOTE 1	20	1	1	540			500			2	1	20	P-2007	SWGR BATTERY CHARGER
RECP POWER CENTER INDOOR	SEE NOTE 1	20	1	3		540			3,000		4				
LTG POWER CENTER INDOOR	SEE NOTE 1	20	1	5			300			3,000	6	3	50	P-1004	PS-1 PANELBOARD (5)
LTG POWER CENTER OUTDOOR	SEE NOTE 1	20	1	7	300			3,000			8				
SWGR-MEF SIDE A SPACE HTRS	P-2004	20	1	9		600					10	1	20		SPARE
SWGR-MEF SIDE B SPACE HTRS	P-2005	20	1	11			600				12	1	20		SPARE
SWGR-GEN SPACE HTRS	P-2006	20	1	13	300						14	1	20		SPARE
RECP MAIN SWGR VAULT	SEE NOTE 1	20	1	15		360					16	1	20		SPARE
POLE MTD LIGHTS	P-1046	20	1	17			275				18	1	30		SPARE
SPARE		20	1	19	–			–			20	1	30		SPARE
SPARE		20	1	21		–			–		22	1	20		SPARE
SPARE		20	1	23			–			–	24	1	20		SPARE
SPARE		20	1	25	–			–			26	1	20		SPARE
SPARE		20	1	27		–			–		28	1	20		SPARE
SPARE		20	1	29			–			–	30	1	20		SPARE

NOTES:
10K AIC
SPD – 80kA

TOTAL	1,140	1,500	1,175
PHASE TOTAL			
	4,640	4,500	4,175

3,500	3,000	3,000	TOTAL
TOTAL LOAD			
13,315			

TOTAL LOAD (AMPS)
37.0

480 VOLTS
3 PHASE, 3 WIRE

PP-MEF
MAIN BREAKER
200A 3P

TYPE: NEMA 1
MOUNT: SURFACE

DESCRIPTION	WIRE	TRIP	POLE	No.	VOLT-AMPERES A	B	C	VOLT-AMPERES A	B	C	No.	POLE	TRIP	WIRE	DESCRIPTION
TX-LP-MEF	P-2000	50	3	1	4,640			5,000			2				
				3		4,500			5,000		4	3	30	P-2002	AIR CONDITIONING UNIT NO.1 (NOTE 3)
				5			4,175			5,000	6				
STANDBY GENERATOR NO.1 COMBINATION POWER UNIT (NOTE 2)	P-1000	50	3	7	5,000			5,000			8				
				9		5,000			5,000		10	3	30	P-2003	AIR CONDITIONING UNIT NO.2 (NOTE 3)
				11			5,000			5,000	12				
STANDBY GENERATOR NO.2 COMBINATION POWER UNIT (NOTE 2)	P-1001	50	3	13	5,000			0			14				
				15		5,000			0		16	3	50		SPARE
				17			5,000			0	18				
STANDBY GENERATOR NO.3 COMBINATION POWER UNIT (NOTE 2)	P-1002	50	3	19	5,000			–			20				
				21		5,000			–		22	3	20		SPARE
				23			5,000			–	24				
SPARE		30	3	25	–			–			26				
				27		–			–		28	3	20		SPARE
				29			–			–	30				
SPARE		20	3	31	–			–			32				
				33		–			–		34	3	20		SPARE
				35			–			–	36				
SPARE		20	3	37	–			–			38				
				39		–			–		40	3	20		SPARE
				41			–			–	42				

NOTES:
65 kAIC
SPD – 100kA

TOTAL	19,640	19,500	19,175
PHASE TOTAL			
	29,640	29,500	29,175

10,000	10,000	10,000	TOTAL
TOTAL LOAD			
88,315			

TOTAL LOAD (AMPS)
106.2

NOTES:

1. CONDUIT AND WIRE FOR LIGHTING AND RECEPTACLE CIRCUITS SHALL BE 2#12, #12GND IN 3/4" CONDUIT UNLESS OTHERWISE NOTED.
2. CIRCUIT BREAKER FOR EACH COMBINATION POWER UNIT IS SIZED FOR A 30KVA LOAD. POWER CENTER MANUFACTURER SHALL INCREASE THE AMPACITY OF THE CIRCUIT BREAKER IF A UNIT LARGER THAN 30KVA IS FURNISHED BY THE GENERATOR MANUFACTURER.
3. POWER CENTER MANUFACTURER SHALL INCREASE THE AMPACITY OF THE CIRCUIT BREAKER FOR AIR CONDITIONING UNITS IF REQUIRED TO ACCOMMODATE THE PROPOSED AC UNITS.

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

SOIL CONSERVATION DISTRICT DATE

REVIEWED FOR HOWARD COUNTY SOIL CONSERVATION DISTRICT AND MEETS TECHNICAL REQUIREMENTS.

US SOIL CONSERVATION DISTRICT DATE

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. 22307, EXPIRATION DATE 4/9/17
SIGNED:

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. 35671, EXPIRATION DATE 5/11/16
SIGNED:

AS-BUILT REPLACEMENT 4/2016

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 5/16/16
CHIEF BUREAU OF ENGINEERING — DATE 5/10/16
CHIEF BUREAU OF UTILITIES — DATE 5/3/16
CHIEF UTILITY DESIGN DIVISON — DATE 5/10/16

HAZEN AND SAWYER
Environmental Engineers & Scientists
ONE SOUTH STREET, BALTIMORE, MD 21202

STATE OF MARYLAND — CRAIG A. PEUMLER — 22307 — REGISTERED PROFESSIONAL ENGINEER — 1/23/14

STATE OF MARYLAND — DAVID A. ATKINSON — 35671 — REGISTERED PROFESSIONAL ENGINEER — 1/22/14

DESIGNED DAA
DRAWN CAS
CHECKED DAA
PROJ. ENGR. ASK
APPROVED

NO.	ISSUED FOR	DATE	BY
5	AS-BUILT REPLACEMENT	9/2015	DAV
4	ADDENDUM 1	7/2014	DAA
3	BIDDING	1/2014	DAA
2	90% REVIEW	9/2013	DAA
1	60% REVIEW	6/2013	DAA

ELECTRICAL
MAIN ELECTRICAL FACILITY
PANEL AND DUCTBANK SCHEDULES

GENERATOR/SWITCHGEAR
INSTALLATION CONTRACT
LITTLE PATUXENT WATER RECLAMATION PLANT
CAPITAL PROJECT NUMBER S-6264
CONTRACT NUMBER 20-4832
6TH ELECTION DISTRICT HOWARD COUNTY, MARYLAND

DATE FEB 2016
DRAWING NUMBER
E11
SCALE AS SHOWN
SHEET 30 OF 37

IMAGES= XREFs= 32232-TB

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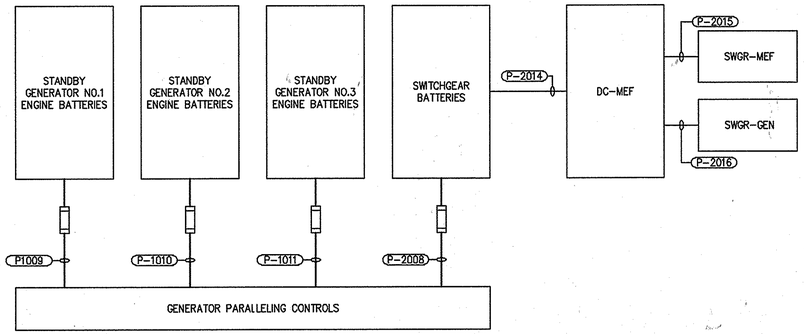
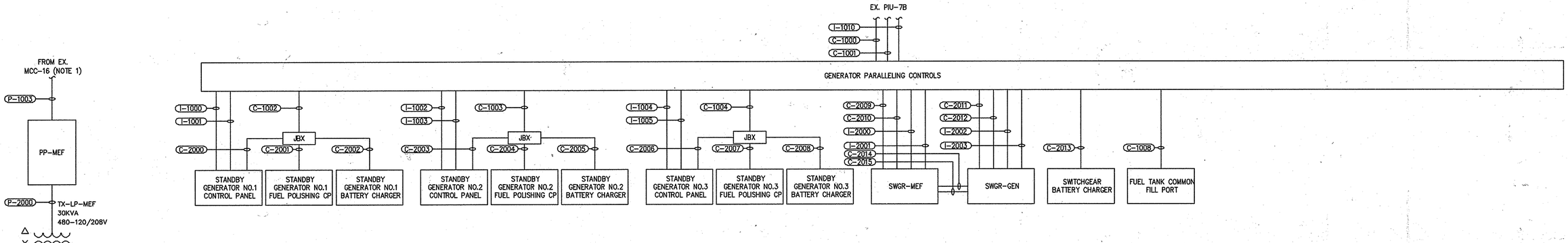
NOTES:

1. CONTRACTOR SHALL USE THE SPARE 250AF/200AT CIRCUIT BREAKER IN UNIT 8D AT EX MCC-16 TO SUPPLY THE POWER PANEL. SEE DRAWING E15.
2. PER THE SHERWOOD-LOGAN PROPOSAL FOR INTEGRATION OF THE PLANT CONTROL SYSTEM WITH THE GENERATORS/SWITCHGEAR INCLUDED IN APPENDIX E VIA ADDENDUM NO. 1, THE CONTRACTOR SHALL INSTALL A FIBER OPTIC PATCH CABLE BETWEEN PIU-7B AND A PATCH PANEL IN THE BASEMENT OF THE AUXILIARY PUMP STATION. THE PATCH CABLE ITSELF WILL BE FURNISHED BY SHERWOOD-LOGAN. (4)

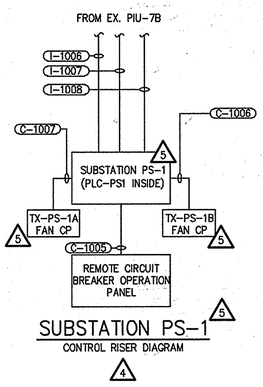


DIRECT CURRENT
RISER DIAGRAM

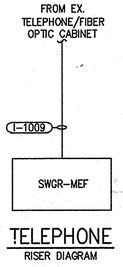


PARALLELING CONTROLS
CONTROL RISER DIAGRAM

PANELBOARDS
RISER DIAGRAM



SUBSTATION PS-1
CONTROL RISER DIAGRAM



TELEPHONE
RISER DIAGRAM

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

SOIL CONSERVATION DISTRICT DATE

REVIEWED FOR HOWARD COUNTY SOIL CONSERVATION DISTRICT AND MEETS TECHNICAL REQUIREMENTS.

US SOIL CONSERVATION DISTRICT DATE

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. 22307 EXPIRATION DATE 4/9/17
SIGNED:

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. 35571 EXPIRATION DATE 6/14/16
SIGNED:

AS-BUILT REPLACEMENT 4/2016

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 5/16/16
CHIEF BUREAU OF ENGINEERING — DATE 5/16/16
CHIEF BUREAU OF UTILITIES — DATE 5/31/16
CHIEF UTILITY DESIGN DIVISON — DATE 5/16/16

HAZEN AND SAWYER
Environmental Engineers & Scientists
ONE SOUTH STREET, BALTIMORE, MD 21202

STATE OF MARYLAND — JAMES C. SIMPSON — 22307 — REGISTERED PROFESSIONAL ENGINEER — 4/20/17

STATE OF MARYLAND — DAVID A. KRAMER — 35571 — REGISTERED PROFESSIONAL ENGINEER — 6/22/16

DESIGNED DAA
DRAWN CAS
CHECKED DAA
PROJ. ENGR. ASG
APPROVED

NO.	ISSUED FOR	DATE	BY
5	AS-BUILT REPLACEMENT	9/2015	DAV
4	ADDENDUM 1	7/2014	DAA
3	BIDDING	1/2014	DAA
2	90% REVIEW	9/2013	DAA
1	60% REVIEW	6/2013	DAA

ELECTRICAL
MAIN ELECTRICAL FACILITY
RISER DIAGRAMS

GENERATOR/SWITCHGEAR INSTALLATION CONTRACT
LITTLE PATUXENT WATER RECLAMATION PLANT
CAPITAL PROJECT NUMBER S-6264
CONTRACT NUMBER 20-4832
6TH ELECTION DISTRICT HOWARD COUNTY, MARYLAND

DATE FEB 2016
DRAWING NUMBER E12
SCALE AS SHOWN
SHEET 31 OF 37

IMAGES= XREFs= 32232-TB

CONDUIT AND WIRE FURNISHED AND INSTALLED BY CONTRACTOR					
CONDUIT NO.	SIZE	FROM	TO	CONDUCTORS	REMARKS
P-1000	1"	PP-MEF	STANDBY GENERATOR NO.1 COMBINATION POWER UNIT	3#8, #10GND	
P-1001	1"	PP-MEF	STANDBY GENERATOR NO.2 COMBINATION POWER UNIT	3#8, #10GND	
P-1002	1"	PP-MEF	STANDBY GENERATOR NO.3 COMBINATION POWER UNIT	3#8, #10GND	
P-1003	3"	EX. MCC-16	PP-MEF	3#250KCMIL, #4GND	
P-1004	1"	LP-MEF	PS-1 PANELBOARD	4#8, #10GND	
P-1005	3/4"	PS-1 PANELBOARD	POLE MOUNTED LIGHTS AT PS-1	2#12, #12GND	
P-1006	3/4"	PS-1 PANELBOARD	PS-1 VAULT RECP	2#12, #12GND	
P-1007				NOT USED	
P-1008				NOT USED	
P-1009	1"	STANDBY GENERATOR NO.1 ENGINE BATTERIES	GENERATOR PARALLELING CONTROLS	2#10, #10GND	
P-1010	1"	STANDBY GENERATOR NO.2 ENGINE BATTERIES	GENERATOR PARALLELING CONTROLS	2#10, #10GND	
P-1011	1"	STANDBY GENERATOR NO.3 ENGINE BATTERIES	GENERATOR PARALLELING CONTROLS	2#10, #10GND	
P-1012	5"	FEEDER 1 FROM BGE	SWGR-MEF A SIDE	CONDUCTORS BY BGE	SEE NOTE 4
P-1013	5"	FEEDER 1 FROM BGE	SWGR-MEF A SIDE	EMPTY W/PULL STRING	SPARE, SEE NOTE 4
P-1014	5"	FEEDER 2 FROM BGE	SWGR-MEF B SIDE	CONDUCTORS BY BGE	SEE NOTE 4
P-1015	5"	FEEDER 2 FROM BGE	SWGR-MEF B SIDE	EMPTY W/PULL STRING	SPARE, SEE NOTE 4
P-1016	N/A	SWGR-MEF A SIDE	PS-4 A SIDE	3#500KCMIL (15KV), #1/0 GND (600V)	SEE NOTE 1
P-1017	N/A	SWGR-MEF A SIDE	PS-5 A SIDE	3#500KCMIL (15KV), #1/0 GND (600V)	SEE NOTE 1
P-1018	5"	SWGR-MEF A SIDE	EMH-3B	EMPTY W/PULL STRING	SPARE
P-1019	N/A	SWGR-MEF A SIDE	PS-2 A SIDE	3#500KCMIL (15KV), #1/0 GND (600V)	SEE NOTE 1
P-1020	4"	PS-1 A SIDE	MCC-1 A SIDE	4#500kcmil, #1/0 GND	VIA MANHOLE #3, SEE NOTE 3
P-1021	4"	PS-1 A SIDE	MCC-1 A SIDE	4#500kcmil, #1/0 GND	VIA MANHOLE #3, SEE NOTE 3
P-1022	N/A	SWGR-MEF A SIDE	SWGR-GEN	3#500KCMIL (15KV), #1/0 GND (600V)	INSTALL IN CABLE TRAY
P-1023	5"	SWGR-MEF A SIDE	PS-1 A SIDE	3#500KCMIL (15KV), #1/0 GND (600V)	SEE NOTE 2
P-1024	N/A	SWGR-MEF B SIDE	PS-4 B SIDE	3#500KCMIL (15KV), #1/0 GND (600V)	SEE NOTE 1
P-1025	N/A	SWGR-MEF B SIDE	PS-5 B SIDE	3#500KCMIL (15KV), #1/0 GND (600V)	SEE NOTE 1
P-1026	5"	SWGR-MEF B SIDE	EMH-3B	EMPTY W/PULL STRING	SPARE
P-1027	N/A	SWGR-MEF B SIDE	PS-2 B SIDE	3#500KCMIL (15KV), #1/0 GND (600V)	SEE NOTE 1
P-1028	4"	PS-1 B SIDE	MCC-1 B SIDE	4#500kcmil, #1/0 GND	VIA MANHOLE #3, SEE NOTE 3
P-1029	4"	PS-1 B SIDE	MCC-1 B SIDE	4#500kcmil, #1/0 GND	VIA MANHOLE #3, SEE NOTE 3
P-1030	N/A	SWGR-MEF B SIDE	SWGR-GEN	3#500KCMIL (15KV), #1/0 GND (600V)	INSTALL IN CABLE TRAY
P-1031	5"	SWGR-MEF B SIDE	PS-1 B SIDE	3#500KCMIL (15KV), #1/0 GND (600V)	SEE NOTE 2
P-1032	4"	SWGR-GEN	STANDBY GENERATOR NO.1	3#2/0 (15KV), #2GND (600V)	SEE NOTE 2
P-1033	4"	SWGR-GEN	STANDBY GENERATOR NO.2	3#2/0 (15KV), #2GND (600V)	SEE NOTE 2
P-1034	4"	SWGR-GEN	STANDBY GENERATOR NO.3	3#2/0 (15KV), #2GND (600V)	SEE NOTE 2
P-1035	4"	SWGR-GEN	STANDBY GENERATOR NO.1	EMPTY W/PULL STRING	SPARE
P-1036	4"	SWGR-GEN	STANDBY GENERATOR NO.2	EMPTY W/PULL STRING	SPARE
P-1037	4"	SWGR-GEN	STANDBY GENERATOR NO.3	EMPTY W/PULL STRING	SPARE
P-1038	4"	PS-1 A SIDE	MCC-2 A SIDE	3#600KCMIL, #1/0GND	VIA MANHOLE #3, SEE NOTE 3
P-1039	4"	PS-1 A SIDE	MCC-2 A SIDE	3#600KCMIL, #1/0GND	VIA MANHOLE #3, SEE NOTE 3
P-1040	4"	PS-1 A SIDE	EX. MANHOLE #3	EMPTY W/PULL STRING	SPARE
P-1041	4"	PS-1 A SIDE	EX. MANHOLE #3	EMPTY W/PULL STRING	SPARE
P-1042	4"	PS-1 A SIDE	EX. MANHOLE #3	EMPTY W/PULL STRING	SPARE
P-1043	4"	PS-1 A SIDE	MCC-14 A SIDE	3#350KCMIL, #4GND	VIA MANHOLE #3, SEE NOTE 3
P-1044	4"	PS-1 A SIDE	MCC-21 A SIDE	3#350KCMIL, #4GND	VIA MANHOLE #3, SEE NOTE 3
P-1045	4"	PS-1 A SIDE	MCC-22 A SIDE	3#350KCMIL, #4GND	VIA MANHOLE #3, SEE NOTE 3
P-1046	1"	LP-MEF	POLE MOUNTED LIGHTS	2#10, #10GND	
P-1047	4"	PS-1 B SIDE	MCC-2 B SIDE	3#600KCMIL, #1/0GND	VIA MANHOLE #3, SEE NOTE 3
P-1048	4"	PS-1 B SIDE	MCC-2 B SIDE	3#600KCMIL, #1/0GND	VIA MANHOLE #3, SEE NOTE 3
P-1049	4"	PS-1 B SIDE	EX. MANHOLE #3	EMPTY W/PULL STRING	SPARE
P-1050	4"	PS-1 B SIDE	EX. MANHOLE #3	EMPTY W/PULL STRING	SPARE
P-1051	4"	PS-1 B SIDE	EX. MANHOLE #3	EMPTY W/PULL STRING	SPARE
P-1052	4"	PS-1 B SIDE	MCC-14 B SIDE	3#350KCMIL, #4GND	VIA MANHOLE #3, SEE NOTE 3
P-1053	4"	PS-1 B SIDE	MCC-21 B SIDE	3#350KCMIL, #4GND	VIA MANHOLE #3, SEE NOTE 3
P-1054	4"	PS-1 B SIDE	MCC-22 B SIDE	3#350KCMIL, #4GND	VIA MANHOLE #3, SEE NOTE 3
P-1055	1"	SWGR-GEN	STANDBY GENERATOR NO.1	4#12, #12GND	CT WIRING
P-1056	1"	SWGR-GEN	STANDBY GENERATOR NO.2	4#12, #12GND	CT WIRING
P-1057	1"	SWGR-GEN	STANDBY GENERATOR NO.3	4#12, #12GND	CT WIRING
P-1058				NOT USED	
P-1059				NOT USED	
P-1060				NOT USED	

CONDUCTOR LENGTH TABLE (NOTE 6)			
CONDUIT NO.	FROM	TO	APPROXIMATE LENGTH (FEET)
P-1020	PS-1 A SIDE	MCC-1 A SIDE	150
P-1021	PS-1 A SIDE	MCC-1 A SIDE	150
P-1028	PS-1 B SIDE	MCC-1 B SIDE	170
P-1029	PS-1 B SIDE	MCC-1 B SIDE	170
P-1038	PS-1 A SIDE	MCC-2 A SIDE	250
P-1039	PS-1 A SIDE	MCC-2 A SIDE	250
P-1043	PS-1 A SIDE	MCC-14 A SIDE	300
P-1044	PS-1 A SIDE	MCC-21 A SIDE	450
P-1045	PS-1 A SIDE	MCC-22 A SIDE	380
P-1047	PS-1 B SIDE	MCC-2 B SIDE	260
P-1048	PS-1 B SIDE	MCC-2 B SIDE	260
P-1052	PS-1 B SIDE	MCC-14 B SIDE	310
P-1053	PS-1 B SIDE	MCC-21 B SIDE	455
P-1054	PS-1 B SIDE	MCC-22 B SIDE	385

NOTES:

1. CABLES SHALL BE INSTALLED IN CABLE TRAY IN VAULT BELOW SWITCHGEAR AS SHOWN ON THE DRAWINGS. WHEN THE CONDUCTORS LEAVE THE VAULT, THEY SHALL BE INSTALLED THROUGH EXISTING DUCTBANKS TO THEIR RESPECTIVE EQUIPMENT.
2. CABLE SHALL BE INSTALLED IN CABLE TRY IN THE VAULT BELOW THE SWITCHGEAR AS SHOWN ON THE DRAWINGS. WHEN THE CONDUCTORS LEAVE THE VAULT, THEY SHALL BE INSTALLED THROUGH NEW CONDUIT/DUCTBANK AS INDICATED.
3. NEW CABLES SHALL BE INSTALLED IN NEW CONDUITS TO EX MANHOLE #3, THEN INTO EXISTING CONDUITS BETWEEN MANHOLE #3 AND EACH RESPECTIVE MCC.
4. NEW PORTION OF CONDUIT SHALL BE CONNECTED TO EXISTING CONDUIT AT COUPLING. SEE DRAWING ##.
5. IT IS THE INTENT THAT THE CONDUIT AND WIRE SHOWN ON THIS SHEET IS TO BE FURNISHED AND INSTALLED BY THE INSTALLING CONTRACTOR.
6. THE APPROXIMATE LENGTHS SHOWN IN THIS TABLE BETWEEN SWITCHGEAR PS-1 AND THE RESPECTIVE MOTOR CONTROL CENTERS ARE FOR THE CONTRACTOR'S USE IN PREPARING THE BID. THE LENGTHS SHALL NOT BE USED FOR CONSTRUCTION OR FOR ORDERING CABLES. VALUES SHOWN REFLECT ESTIMATED LENGTH OF EACH CABLE REQUIRED INCLUDING VAULTS AND MANHOLES THAT ARE NOT SHOWN IN THE SINGLE LINE DIAGRAM. THE SUCCESSFUL CONTRACTOR SHALL DETERMINE THE ACTUAL CABLE LENGTHS REQUIRED VIA FIELD INVESTIGATION AFTER THE BID IS AWARDED. ANY DISCREPANCIES IN CABLE LENGTH BETWEEN THIS TABLE AND LENGTHS MEASURED VIA FIELD INVESTIGATION SHALL BE SUBMITTED TO THE COUNTY AS A PROPOSED CHANGE ORDER. THE LENGTHS SHOWN HERE ARE FOR A SINGLE CABLE, THEREFORE THE CONTRACTOR SHALL MULTIPLY EACH LENGTH SHOWN BY THE NUMBER OF CABLES REQUIRED AS SHOWN IN THE CONDUIT AND WIRE SCHEDULES (5)

CONDUIT AND WIRE FURNISHED AND INSTALLED BY CONTRACTOR					
CONDUIT NO.	SIZE	FROM	TO	CONDUCTORS	REMARKS
C-1000	1 1/2"	EX. PIU-7B	GENERATOR PARALELLING CONTROLS	40#14, #14GND	
C-1001	1"	EX. PIU-7B	GENERATOR PARALELLING CONTROLS	EMPTY W/PULL STRING	SPARE
C-1002	1"	GENERATOR PARALELLING CONTROLS	STANDBY GENERATOR NO.1 JBX	20#14, #14GND	
C-1003	1"	GENERATOR PARALELLING CONTROLS	STANDBY GENERATOR NO.2JBX	20#14, #14GND	
C-1004	1"	GENERATOR PARALELLING CONTROLS	STANDBY GENERATOR NO.3 JBX	20#14, #14GND	
C-1005	1"	EX. PIU-7B	PS-1 JBX	8#14, #14GND	
C-1006	3/4"	PS-1 JBX	TX-PS-1A FAN CP	4#14, #14GND	FAN PACKAGE ALARM
C-1007	3/4"	PS-1 JBX	TX-PS-1B FAN CP	4#14, #14GND	FAN PACKAGE ALARM
C-1008	1"	GENERATOR PARALELLING CONTROLS	FUEL TANK COMMON FILL PORT	8#14, #14GND	
C-1009				NOT USED	
C-1010				NOT USED	
C-1011				NOT USED	
C-1012				NOT USED	
C-1013				NOT USED	
C-1014				NOT USED	

CONDUIT AND WIRE FURNISHED AND INSTALLED BY CONTRACTOR					
CONDUIT NO.	SIZE	FROM	TO	CONDUCTORS	REMARKS
I-1000	1"	GENERATOR PARALELLING CONTROLS	STANDBY GENERATOR NO.1 CONTROL PANEL	2(2/C#16TSH), #14GND	
I-1001	1"	GENERATOR PARALELLING CONTROLS	STANDBY GENERATOR NO.1 CONTROL PANEL	1-CAT 6 STP CABLE	
I-1002	1"	GENERATOR PARALELLING CONTROLS	STANDBY GENERATOR NO.2 CONTROL PANEL	2(2/C#16TSH), #14GND	
I-1003	1"	GENERATOR PARALELLING CONTROLS	STANDBY GENERATOR NO.2 CONTROL PANEL	1-CAT 6 STP CABLE	
I-1004	1"	GENERATOR PARALELLING CONTROLS	STANDBY GENERATOR NO.3 CONTROL PANEL	2(2/C#16TSH), #14GND	
I-1005	1"	GENERATOR PARALELLING CONTROLS	STANDBY GENERATOR NO.3 CONTROL PANEL	1-CAT 6 STP CABLE	
I-1006	1"	EX. PIU-7B	SUBSTATION PS-1	EMPTY W/PULL STRING	SPARE
I-1007	1"	EX. PIU-7B	SUBSTATION PS-1	2(2/C#16TSH), #14GND	TRIP UNIT METERING
I-1008	1"	EX. PIU-7B	SUBSTATION PS-1	1-CAT 6 STP CABLE	POWER QUALITY METERING
I-1009	1"	EX. TELEPHONE/FIBER OPTIC ENCLOSURE	SWGR-MEF	1-CAT 6 UTP CABLE	FOR BGE METERING
I-1010	2"	EX. PIU-7B	GENERATOR PARALELLING CONTROLS	1-CAT6 STP CABLE, 1-FIBER OPTIC CABLE	
I-1011	1 1/2"	SWGR-GEN	STANDBY GENERATOR NO.1	6(3/C#16TSH), #14GND	ALTERNATOR RTD WIRING
I-1012	1 1/2"	SWGR-GEN	STANDBY GENERATOR NO.2	6(3/C#16TSH), #14GND	ALTERNATOR RTD WIRING
I-1013	1 1/2"	SWGR-GEN	STANDBY GENERATOR NO.3	6(3/C#16TSH), #14GND	ALTERNATOR RTD WIRING
I-1014				NOT USED	

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

SOIL CONSERVATION DISTRICT DATE

REVIEWED FOR HOWARD COUNTY SOIL CONSERVATION DISTRICT AND MEETS TECHNICAL REQUIREMENTS.

US SOIL CONSERVATION DISTRICT DATE

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. 22307 EXPIRATION DATE 4/9/17
SIGNED:

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. 35671, EXPIRATION DATE 6/11/16
SIGNED:

AS-BUILT REPLACEMENT 4/2016

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 5/4/16
CHIEF BUREAU OF ENGINEERING — DATE 5/10/16
CHIEF BUREAU OF UTILITIES — DATE 5/3/16
CHIEF UTILITY DESIGN DIVISON — DATE 5/10/16

HAZEN AND SAWYER
Environmental Engineers & Scientists
ONE SOUTH STREET, BALTIMORE, MD 21202

STATE OF MARYLAND — 22307 — REGISTERED PROFESSIONAL ENGINEER — 1/23/14
STATE OF MARYLAND — DAVID A. ATKINSON, JR — 35671 — REGISTERED PROFESSIONAL ENGINEER — 1/22/14

DESIGNED DAA
DRAWN CAS
CHECKED DAA
PROJ. ENGR.
APPROVED

NO.	ISSUED FOR	DATE	BY
5	AS-BUILT REPLACEMENT	9/2015	DAV
4	ADDENDUM 1	7/2014	DAA
3	BIDDING	1/2014	DAA
2	90% REVIEW	9/2013	DAA
1	60% REVIEW	6/2013	DAA

ELECTRICAL
MAIN ELECTRICAL FACILITY
CONDUIT AND WIRE SCHEDULES

GENERATOR/SWITCHGEAR
INSTALLATION CONTRACT
LITTLE PATUXENT WATER RECLAMATION PLANT
CAPITAL PROJECT NUMBER S-6264
CONTRACT NUMBER 20-4832
6TH ELECTION DISTRICT HOWARD COUNTY, MARYLAND

DATE FEB 2016
DRAWING NUMBER
E13
SCALE AS SHOWN
SHEET 32 OF 37

IMAGEs= XREFs= 32232-TB

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CONDUIT AND WIRE FURNISHED AND INSTALLED BY GENERATOR OR SWITCHGEAR ENCLOSURE MANUFACTURER					
CONDUIT NO.	SIZE	FROM	TO	CONDUCTORS	REMARKS
P-2000	3/4"	PP-MEF	TX-LP-MEF	3 #8, #10GND	
P-2001	1 1/2"	TX-LP-MEF	LP-MEF	4 #3, #8GND	
P-2002	3/4"	PP-MEF	AIR CONDITIONING UNIT NO.1	3 #10, #10GND	SEE NOTE 1
P-2003	3/4"	PP-MEF	AIR CONDITIONING UNIT NO.2	3 #10, #10GND	SEE NOTE 1
P-2004	3/4"	LP-MEF	SWGR-MEF SIDE A SPACE HTRS	3 #12, #12GND	
P-2005	3/4"	LP-MEF	SWGR-MEF SIDE B SPACE HTRS	3 #12, #12GND	
P-2006	3/4"	LP-MEF	SWGR-GEN SPACE HTRS	3 #12, #12GND	
P-2007	3/4"	LP-MEF	SWGR BATTERY CHARGER	3 #12, #12GND	
P-2008	3/4"	SWGR BATTERIES	GENERATOR PARALLELING CONTROLS	2 #10, #10GND	
P-2009	2"	BGE REMOTE METERING	SWGR-MEF REVENUE METERING SIDE A	CONDUCTORS BY BGE	PT WIRING
P-2010	2"	BGE REMOTE METERING	SWGR-MEF REVENUE METERING SIDE A	CONDUCTORS BY BGE	CT WIRING
P-2011	2"	BGE REMOTE METERING	SWGR-MEF REVENUE METERING SIDE B	CONDUCTORS BY BGE	PT WIRING
P-2012	2"	BGE REMOTE METERING	SWGR-MEF REVENUE METERING SIDE B	CONDUCTORS BY BGE	CT WIRING
P-2013	3/4"	SWGR-MEF	SWGR-GEN	2 #12, #12GND	PT WIRING
P-2014	1"	SWGR BATTERIES	DC-MEF	2 #4, #6GND	
P-2015	1 1/2"	DC-MEF	SWGR-MEF	16 #12, #12GND	
P-2016	1"	DC-MEF	SWGR-GEN	8 #12, #12GND	
P-2017				NOT USED	
P-2018				NOT USED	

CONDUIT AND WIRE FURNISHED AND INSTALLED BY GENERATOR OR SWITCHGEAR ENCLOSURE MANUFACTURER					
CONDUIT NO.	SIZE	FROM	TO	CONDUCTORS	REMARKS
C-2000	3/4"	STANDBY GENERATOR NO.1 JBX	STANDBY GENERATOR NO.1 CONTROL PANEL	12 #14, #14GND	
C-2001	3/4"	STANDBY GENERATOR NO.1 JBX	STANDBY GENERATOR NO.1 FUEL POLISHING CP	4 #14, #14GND	
C-2002	3/4"	STANDBY GENERATOR NO.1 JBX	STANDBY GENERATOR NO.1 BATTERY CHARGER	4 #14, #14GND	
C-2003	3/4"	STANDBY GENERATOR NO.2JBX	STANDBY GENERATOR NO.2 CONTROL PANEL	12 #14, #14GND	
C-2004	3/4"	STANDBY GENERATOR NO.2JBX	STANDBY GENERATOR NO.2 FUEL POLISHING CP	4 #14, #14GND	
C-2005	3/4"	STANDBY GENERATOR NO.2JBX	STANDBY GENERATOR NO.2 BATTERY CHARGER	4 #14, #14GND	
C-2006	3/4"	STANDBY GENERATOR NO.3JBX	STANDBY GENERATOR NO.3 CONTROL PANEL	12 #14, #14GND	
C-2007	3/4"	STANDBY GENERATOR NO.3JBX	STANDBY GENERATOR NO.3 FUEL POLISHING CP	4 #14, #14GND	
C-2008	3/4"	STANDBY GENERATOR NO.3JBX	STANDBY GENERATOR NO.3 BATTERY CHARGER	4 #14, #14GND	
C-2009	2"	GENERATOR PARALELLING CONTROLS	SWGR-MEF	SEE NOTE 2	
C-2010	2"	GENERATOR PARALELLING CONTROLS	SWGR-MEF	EMPTY W/PULL STRING	SPARE
C-2011	2"	GENERATOR PARALELLING CONTROLS	SWGR-GEN	SEE NOTE 2	
C-2012	2"	GENERATOR PARALELLING CONTROLS	SWGR-GEN	EMPTY W/PULL STRING	SPARE
C-2013	3/4"	GENERATOR PARALELLING CONTROLS	SWITCHGEAR BATTERY CHARGER	4 #14, #14GND	
C-2014	2"	SWGR-GEN	SWGR-MEF	SEE NOTE 3	
C-2015	2"	SWGR-GEN	SWGR-MEF	EMPTY W/PULL STRING	SPARE
C-2016				NOT USED	
C-2017				NOT USED	
C-2018				NOT USED	

CONDUIT AND WIRE FURNISHED AND INSTALLED BY GENERATOR OR SWITCHGEAR ENCLOSURE MANUFACTURER					
CONDUIT NO.	SIZE	FROM	TO	CONDUCTORS	REMARKS
I-2000	1"	GENERATOR PARALELLING CONTROLS	SWGR-MEF	EMPTY W/PULL STRING	SPARE
I-2001	2"	GENERATOR PARALELLING CONTROLS	SWGR-MEF	15 (CAT 6 UTP CABLES)	PROTECTIVE RELAYING
I-2002	1"	GENERATOR PARALELLING CONTROLS	SWGR-GEN	EMPTY W/PULL STRING	SPARE
I-2003	1"	GENERATOR PARALELLING CONTROLS	SWGR-GEN	3 (CAT 6 UTP CABLES)	PROTECTIVE RELAYING
I-2004				NOT USED	
I-2005				NOT USED	
I-2006				NOT USED	
I-2007				NOT USED	
I-2008				NOT USED	

NOTES:

1. POWER CENTER MANUFACTURER SHALL INCREASE THE AMPACITY OF THE WIRE FOR AIR CONDITIONING UNITS IF REQUIRED TO ACCOMMODATE THE PROPOSED AC UNITS.
2. POWER CENTER MANUFACTURER SHALL INSTALL THE APPROPRIATE NUMBER OF #14AWG CONDUCTORS FOR DISCRETE SIGNALS IN THIS CONDUIT TO MEET THE REQUIREMENTS GIVEN BY THE SWITCHGEAR MANUFACTURER.
3. POWER CENTER MANUFACTURER SHALL INSTALL THE APPROPRIATE NUMBER OF CONDUCTORS IN THIS CONDUIT FOR PROPER INTERLOCKING BETWEEN THE SWITCHGEAR ASSEMBLIES.
4. IT IS THE INTENT THAT THE CONDUIT AND WIRE SHOWN HERE IS TO BE FURNISHED AND INSTALLED BY THE GENERATOR AND SWITCHGEAR ENCLOSURE MANUFACTURER. IT IS PROVIDED HERE AS A REFERENCE ONLY TO THE INSTALLING CONTRACTOR.

AS-BUILT 4/2016

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

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

SOIL CONSERVATION DISTRICT DATE

REVIEWED FOR HOWARD COUNTY SOIL CONSERVATION DISTRICT AND MEETS TECHNICAL REQUIREMENTS.

US SOIL CONSERVATION DISTRICT DATE

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. 22307 EXPIRATION DATE 4/9/15

SIGNED:

STATE OF MARYLAND — ANDREW C. GREASON — 22307 — REGISTERED PROFESSIONAL ENGINEER — 1/23/14

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. 35671 EXPIRATION DATE 4/11/14

SIGNED:

STATE OF MARYLAND — DAVID A. ATKINSON — 35671 — REGISTERED PROFESSIONAL ENGINEER — 1/22/14

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 1/30/14
CHIEF BUREAU OF ENGINEERING — DATE 1/09/14
CHIEF BUREAU OF UTILITIES — DATE 1/28/14
CHIEF UTILITY DESIGN DIVISON — DATE 1/29/14

HAZEN AND SAWYER
Environmental Engineers & Scientists
ONE SOUTH STREET, BALTIMORE, MD 21202

DESIGNED DAA
DRAWN CAS
CHECKED DAA
PROJ. ENGR.
APPROVED

NO.	ISSUED FOR	DATE	BY
5	AS-BUILT	9/2015	DAV
4	ADDENDUM 1	7/2014	DAA
3	BIDDING	1/2014	DAA
2	90% REVIEW	9/2013	DAA
1	60% REVIEW	6/2013	DAA

ELECTRICAL
MAIN ELECTRICAL FACILITY
CONDUIT AND WIRE SCHEDULES

GENERATOR/SWITCHGEAR
INSTALLATION CONTRACT
LITTLE PATUXENT WATER RECLAMATION PLANT
CAPITAL PROJECT NUMBER S-6264
CONTRACT NUMBER 20-4832
6TH ELECTION DISTRICT HOWARD COUNTY, MARYLAND

DATE JAN 2014
DRAWING NUMBER
E14
SCALE AS SHOWN
SHEET 33 OF 37

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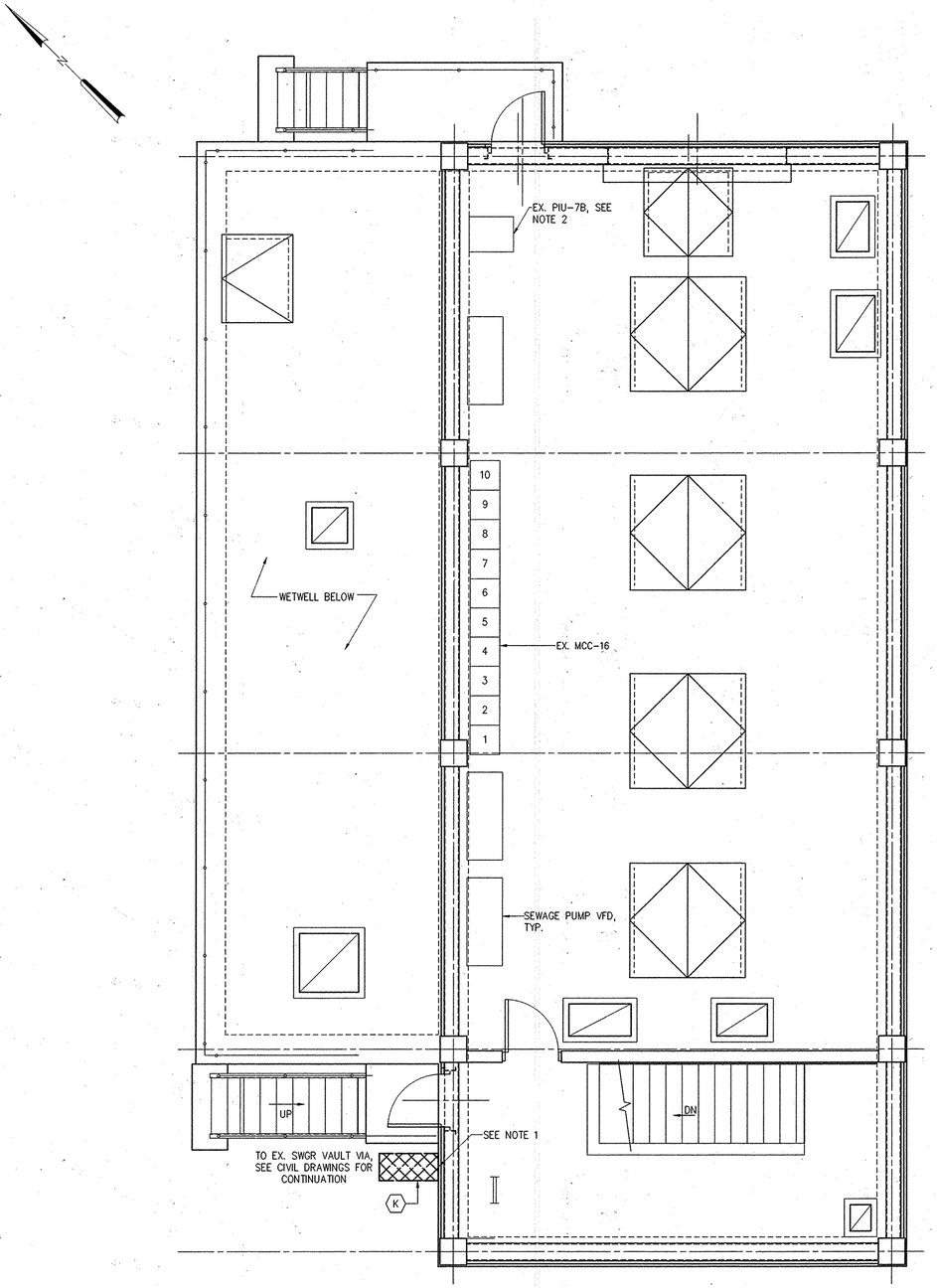
NOTES:

1. CONDUITS FROM THIS DUCTBANK SHALL BE INSTALLED UP THE EXTERIOR WALL OF THE PUMP STATION, PENETRATE INTO THE PUMP STATION, THEN HEAD STRAIGHT ALONG THE INSIDE OF THE WALL TOWARDS MCC-16 AND PIU-7B. CONDUITS SHALL BE ROUTED IN SUCH A MANNER AS TO NOT INTERFERE WITH THE BRIDGE CRANE OPERATION.
2. THE CONTRACTOR SHALL TERMINATE CABLES AT PIU-7B TO NEW EQUIPMENT IN THIS ENCLOSURE THAT IS FURNISHED AND INSTALLED BY THE COUNTY. THE COUNTY SHALL SUPPLY ALL HARDWARE IN PIU-7B, AS WELL AS ALL PROGRAMMING.



TOP PLAN
1/4" = 1'-0"

AS-BUILT 4/2016

1/4"=1'-0" 1 0 1 2 3 7'

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

SOIL CONSERVATION DISTRICT DATE

REVIEWED FOR HOWARD COUNTY SOIL CONSERVATION DISTRICT AND MEETS TECHNICAL REQUIREMENTS.

US SOIL CONSERVATION DISTRICT DATE

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. 22307 EXPIRATION DATE 4/9/15
SIGNED:

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. 35671 EXPIRATION DATE 6/11/14
SIGNED:

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS	1/30/14 DATE	CHIEF BUREAU OF ENGINEERING	1/29/14 DATE
CHIEF BUREAU OF UTILITIES	1/29/14 DATE	CHIEF UTILITY DESIGN DIVISON	1/29/14 DATE

HAZEN AND SAWYER
Environmental Engineers & Scientists
ONE SOUTH STREET, BALTIMORE, MD 21202

STATE OF MARYLAND GREGSON 22307 REGISTERED PROFESSIONAL ENGINEER 1/29/14

STATE OF MARYLAND DAVID A. ATKINSON JR. 35671 REGISTERED PROFESSIONAL ENGINEER 1/22/14

DESIGNED DAA
DRAWN CAS
CHECKED DAA
PROJ. ENGR.
APPROVED

NO.	ISSUED FOR	DATE	BY
5	AS-BUILT	9/2015	DAV
4	ADDENDUM 1	7/2014	DAA
3	BIDDING	1/2014	DAA
2	90% REVIEW	9/2013	DAA
1	60% REVIEW	6/2013	DAA

ELECTRICAL
AUXILLIARY PUMP STATION
TOP PLAN

GENERATOR/SWITCHGEAR
INSTALLATION CONTRACT
LITTLE PATUXENT WATER RECLAMATION PLANT
CAPITAL PROJECT NUMBER S-6264
CONTRACT NUMBER 20-4832
6TH ELECTION DISTRICT HOWARD COUNTY, MARYLAND

DATE JAN 2014
DRAWING NUMBER E15
SCALE AS SHOWN
SHEET 34 OF 37

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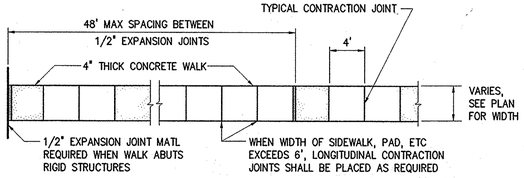

TYPICAL CONCRETE WALKWAY

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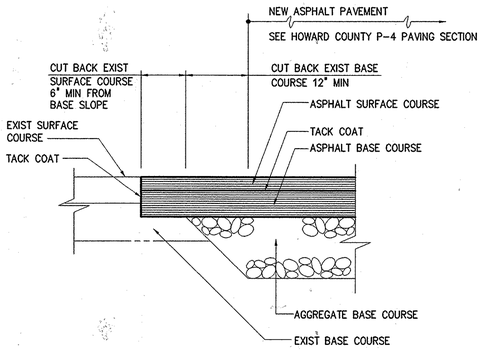
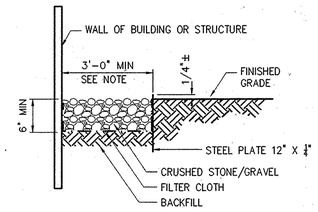


TYPICAL PAVEMENT JUNCTION

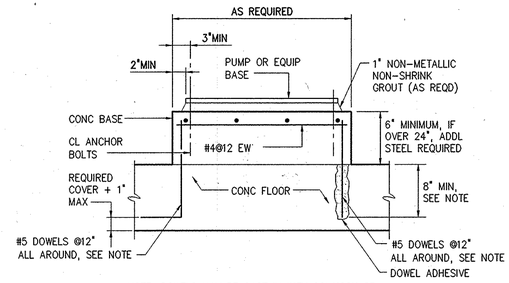
0251301R



NOTE:
SEE CONTRACT DRAWINGS FOR LIMITS OF GRAVEL AROUND STRUCTURES

GRAVEL STRIP

0251308R



NOTE: DOWELS MAY BE CAST IN WITH 90° HOOK OR ANCHORED WITH DOWEL ADHESIVE AT CONTRACTORS OPTION. WHERE FLOOR IS 8" THICK OR LESS, USE #4 DOWELS EMBEDDED TO WITHIN 2" OF BOTTOM OF FLOOR SLAB.

TYP PUMP OR EQUIP BASE

0331600

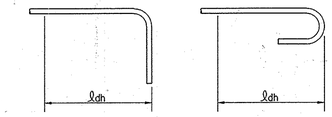
DEVELOPMENT LENGTH OF STANDARD HOOKS

FOR BARS IN TENSION

fy = 60,000 psi fc' = 4000 psi OR GREATER

BAR SIZE	DEVELOPMENT LENGTH, ℓdh	
	BASIC	W/ CONC COVER *
#3	8"	6"
#4	10"	7"
#5	1'-0"	9"
#6	1'-3"	11"
#7	1'-5"	1'-0"
#8	1'-7"	1'-2"
#9	1'-10"	1'-4"
#10	2'-1"	1'-6"
#11	2'-3"	1'-7"

* SIDE COVER NORMAL TO PLANE OF HOOK AT LEAST 2 1/2", AND FOR 90° HOOK, END COVER BEYOND OUTSIDE END OF HOOK AT LEAST 2".



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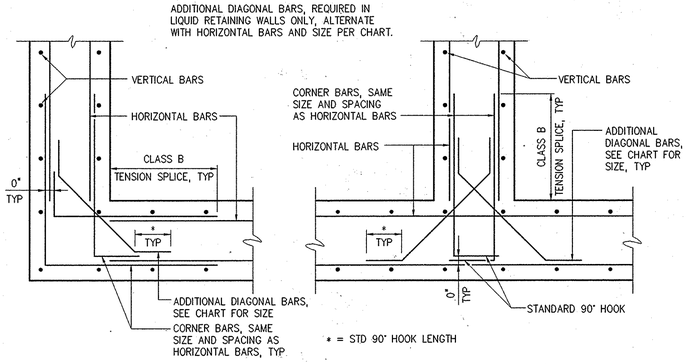


TYPICAL WALL REINFORCING

0331700

DIAGONAL BAR SIZE CHART	
BAR SIZE – HORIZONTAL REINFORCEMENT	BAR SIZE – DIAGONAL REINFORCEMENT
# 3	# 3
# 4	# 3
# 5	# 4
# 6	# 5
# 7	# 5
# 8	# 6
# 9	# 7
# 10	# 8
# 11	# 9
AT LOCATIONS WHERE DIFFERENT SIZE HORIZONTAL BARS CONVERGE, THE LARGER BAR SIZE SHALL CONTROL	

BASIC DEVELOPMENT LENGTH AND SPLICE LENGTH

FOR BARS IN TENSION

** BASED ON MATERIALS AND CONDITIONS AS FOLLOWS:
fy = 60,000 psi fc' = 4000 psi OR GREATER
UNCOATED BARS NORMAL WEIGHT CONCRETE
CLEAR COVER ≥ 1.5 INCHES

BASIC DEVELOPMENT LENGTH ℓd				BAR SIZE	CLASS B SPLICE LENGTH 1.3 x ℓd			
CLEAR SPACING ≥ 3"		CLEAR SPACING < 3"			CLEAR SPACING ≥ 3"		CLEAR SPACING < 3"	
BASIC	TOP *	BASIC	TOP *		BASIC	TOP *	BASIC	TOP *
1'-0"	1'-0"	1'-0"	1'-4"	# 3	1'-0"	1'-3"	1'-4"	1'-8"
1'-0"	1'-3"	1'-7"	2'-1"	# 4	1'-3"	1'-8"	2'-1"	2'-9"
1'-3"	1'-7"	2'-4"	3'-0"	# 5	1'-7"	2'-0"	3'-0"	3'-11"
1'-6"	1'-11"	3'-1"	4'-0"	# 6	1'-11"	2'-5"	4'-0"	5'-2"
2'-5"	3'-1"	4'-11"	6'-4"	# 7	3'-1"	4'-0"	6'-4"	8'-3"
3'-0"	3'-11"	6'-0"	7'-9"	# 8	3'-11"	5'-1"	7'-9"	10'-1"
3'-8"	4'-9"	6'-9"	8'-9"	# 9	4'-9"	6'-3"	8'-9"	11'-4"
4'-6"	5'-10"	7'-7"	9'-10"	# 10	5'-10"	7'-7"	9'-10"	12'-9"
5'-5"	7'-0"	8'-5"	10'-11"	# 11	7'-0"	9'-1"	10'-11"	14'-2"

* TOP REINFORCEMENT IS HORIZONTAL REINFORCEMENT SO PLACED THAT MORE THAN 12 INCHES OF FRESH CONCRETE IS CAST IN THE MEMBER BELOW THE REINFORCEMENT.

** FOR MATERIALS OR CONDITIONS DIFFERENT FROM THOSE STATED, LENGTHS SHOWN IN CHART SHALL BE MODIFIED TO CONFORM TO THE PROVISIONS OF ACI 318, SECTION 12.2.

0321004

NOTES:

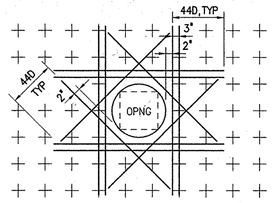
1 THIS DETAIL APPLIES FOR OPENINGS 8"ø AND LARGER. FOR SMALLER OPENINGS, BEND BARS OR ADJUST SPACING OF REINFORCEMENT TO AVOID OPENING.

2 PLACE EXTRA BARS OF THE SAME SIZE AS THE INTERRUPTED BARS AT EACH SIDE OF OPENING. QUANTITY OF EXTRA BARS AT EACH SIDE SHALL EQUAL HALF THE QUANTITY OF INTERRUPTED BARS EXCEPT WHERE NOTED OTHERWISE.

3 PROVIDE ONE DIAGONAL BAR EACH SIDE OF OPENING WITH SIZE EQUAL TO MAIN REINFORCEMENT, TYPICAL EACH FACE.

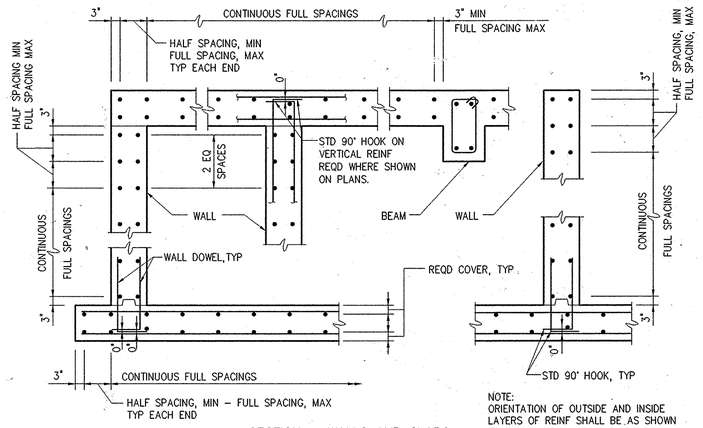
4 WHERE INVERT OF OPENING IN WALL IS LESS THAN 44 BAR DIAMETERS FROM TOP OF SLAB, EXTRA REINFORCEMENT ON EACH SIDE SHALL INCLUDE DOWELS EMBEDDED INTO SLAB WITH STANDARD 90 DEGREE HOOKS TO SPLICE WITH EXTRA VERTICAL REINFORCEMENT. DOWELS SHALL ALSO STILL BE PROVIDED BELOW OPENING.

5 WHERE INVERT OF OPENING IN WALL OR SLAB IS CLOSER THAN 44 BAR DIAMETERS TO EDGE OF SLAB OR BOTTOM OF WALL, EXTRA DIAGONAL BARS MAY BE TERMINATED TWO INCHES FROM EDGE OF SLAB OR BOTTOM OF WALL. DOWELS DO NOT HAVE TO BE PROVIDED TO SPLICE WITH DIAGONAL BARS.



TYPICAL REINF AT OPENINGS

0331703

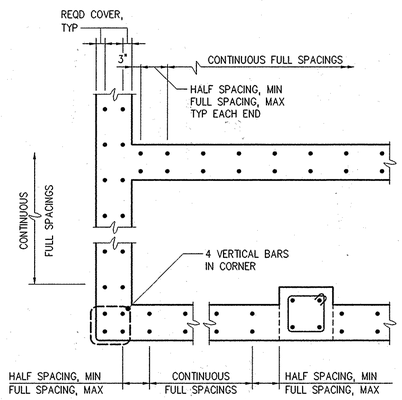


SECTION – WALLS AND SLABS

NOTE:
ORIENTATION OF OUTSIDE AND INSIDE LAYERS OF REINF SHALL BE AS SHOWN ON PLANS. "FULL SPACING" IS BAR SPACING CALLED OUT ON PLANS.

TYPICAL BAR PLACEMENT

0331704



PLAN – WALLS

AS-BUILT 4/2016

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

SOIL CONSERVATION DISTRICT DATE

REVIEWED FOR HOWARD COUNTY SOIL CONSERVATION DISTRICT AND MEETS TECHNICAL REQUIREMENTS.

US SOIL CONSERVATION DISTRICT DATE

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. 22307, EXPIRATION DATE 4/4/15
SIGNED:

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. 44434, EXPIRATION DATE 3/31/2015
SIGNED:

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS DATE 1/30/14
CHIEF BUREAU OF ENGINEERING DATE 1/29/14
CHIEF BUREAU OF UTILITIES DATE 1/29/14
CHIEF UTILITY DESIGN DIVISON DATE 1/29/14

HAZEN AND SAWYER
Environmental Engineers & Scientists
ONE SOUTH STREET, BALTIMORE, MD 21202

CERTIFICATE OF MARYLAND – 22307 – REGISTERED PROFESSIONAL ENGINEER – 1/29/14

STATE OF MARYLAND – 44434 – REGISTERED PROFESSIONAL ENGINEER

DESIGNED CAS
DRAWN CAS
CHECKED CMP
PROJ. ENGR.
APPROVED

NO.	ISSUED FOR	DATE	BY
5	AS-BUILT	9/2015	DAV
4	ADDENDUM 1	7/2014	DAA
3	BIDDING	1/2014	DAA
2	90% REVIEW	9/2013	DAA
1	60% REVIEW	6/2013	DAA

STANDARD DETAILS
SHEET 1

GENERATOR/SWITCHGEAR INSTALLATION CONTRACT
LITTLE PATUXENT WATER RECLAMATION PLANT
CAPITAL PROJECT NUMBER S-6264
CONTRACT NUMBER 20-4832
6TH ELECTION DISTRICT HOWARD COUNTY, MARYLAND

DATE JAN 2014
DRAWING NUMBER
SD1
SCALE AS SHOWN
SHEET 35 OF 37

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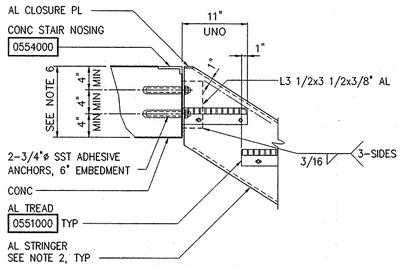
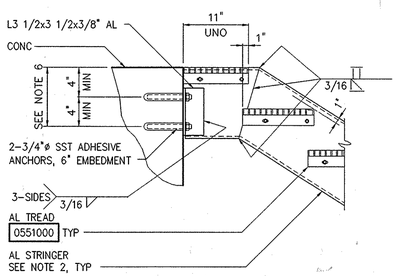
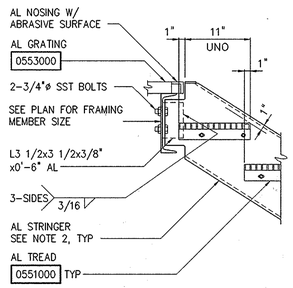


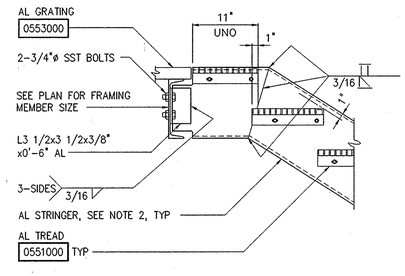
UPPER STRINGER CONNECTION TO CONCRETE



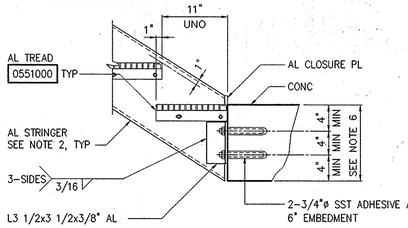
UPPER STRINGER CONNECTION TO CONCRETE WITH TREAD



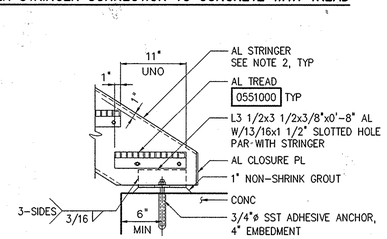
UPPER STRINGER CONNECTION TO FRAMING MEMBER



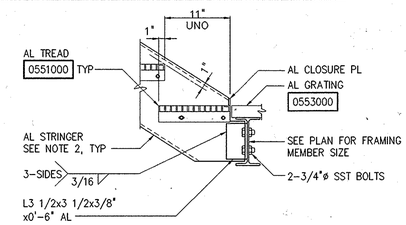
UPPER STRINGER CONNECTION TO FRAMING MEMBER WITH TREAD



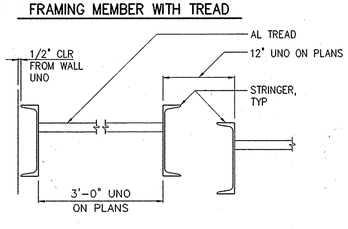
LOWER STRINGER CONNECTION TO CONCRETE



LOWER STRINGER CONNECTION TO CONCRETE SLAB



LOWER STRINGER CONNECTION TO FRAMING MEMBER

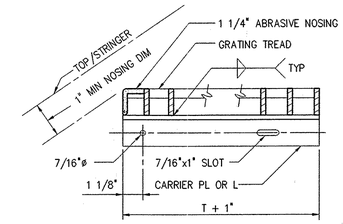


TYPICAL TREAD CROSS SECTION

NOTES:

1. PROVIDE PROTECTION FOR DISSIMILAR METALS AND CONCRETE PER SPECIFICATIONS.
2. C12x10.4 AL STRINGERS ARE TYPICAL UNLESS NOTED OTHERWISE ON PLANS.
3. STAIR HANDRAIL AND TOEBOARD NOT SHOWN FOR CLARITY.
4. ALL FASTENERS SHALL BE STAINLESS STEEL, UNLESS NOTED OTHERWISE.
5. FIELD VERIFY ALL DIMENSIONS AND ELEVATIONS PRIOR TO FABRICATION.
6. NO CONCRETE REINFORCING SHALL BE CUT FOR INSTALLATION OF ADHESIVE ANCHORS UNLESS APPROVED BY THE ENGINEER. PRIOR TO FABRICATION CONTRACTOR SHALL COORDINATE LOCATION OF ADHESIVE ANCHORS WITH REINFORCING AND LENGTHEN DIMENSIONS AS NEEDED TO CLEAR REINFORCING.

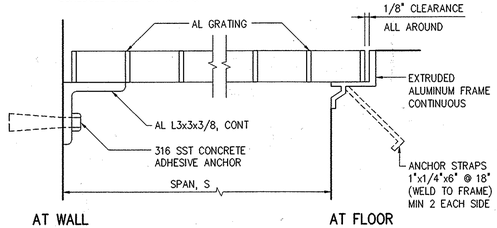
ALUMINUM STAIR DETAILS
0551005



TYP TREAD DETAIL
0551000

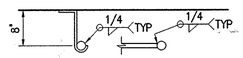
SPAN, S	DEPTH (MIN)	CONCRETE ANCHOR (SIZE AND SPACING)
0'-0" < S ≤ 4'-0"	1 1/2"	1/2"ø x 5 1/2" @ 18"
4'-0" < S ≤ 5'-0"	1 3/4"	
5'-0" < S ≤ 5'-6"	2"	
5'-6" < S ≤ 6'-0"	2 1/4"	5/8"ø x 6" @ 18"
6'-0" < S ≤ 6'-6"	2 1/2"	

SCHEDULE BASED ON 150 PSF

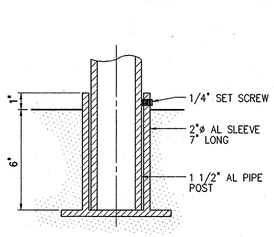


AT WALL AT FLOOR

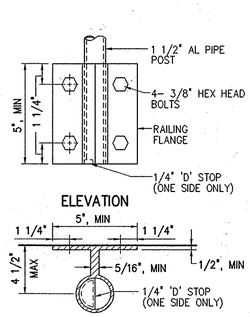
ALUMINUM GRATING
0553000



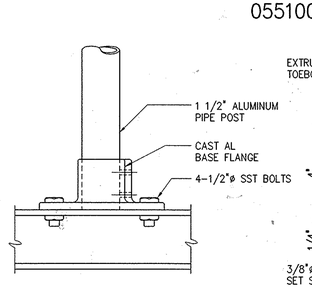
SECTION



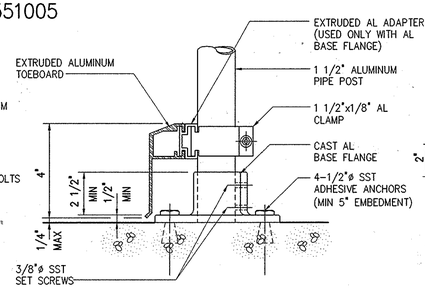
REMOVABLE POST IN CONCRETE



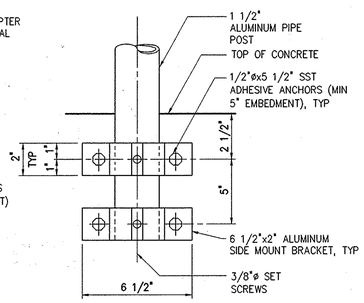
SIDE MOUNT TO METAL



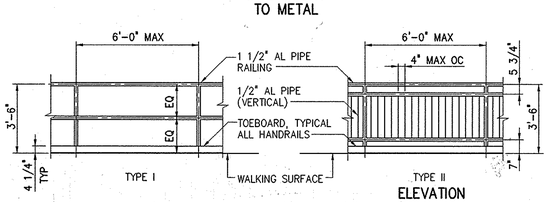
SURFACE MOUNTED TO METAL



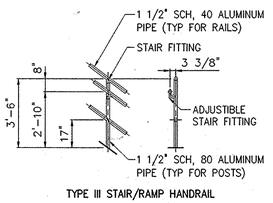
SURFACE MOUNTED TO CONCRETE



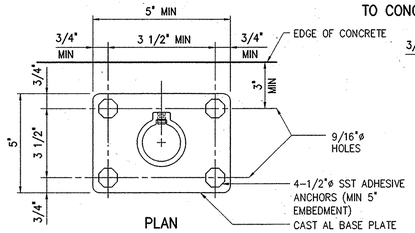
SIDE MOUNT TO CONCRETE



NOTE:
UNLESS SHOWN OTHERWISE ON THE CONTRACT DRAWING, HANDRAILS SHALL BE TYPE I.

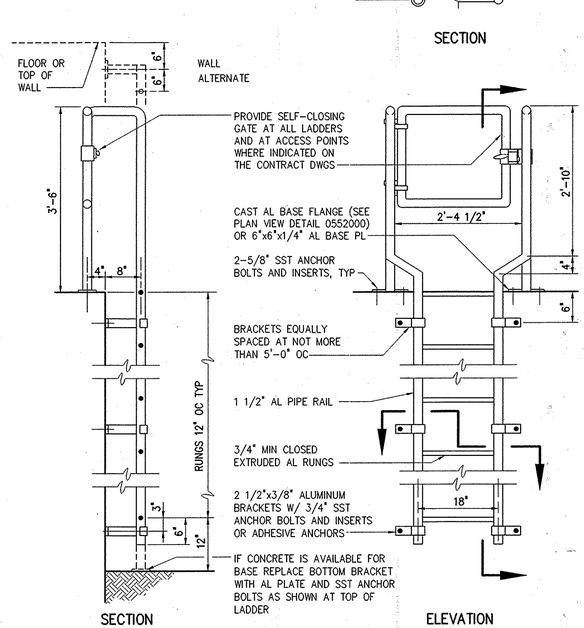


TYPE III STAIR/RAMP HANDRAIL



PLAN PLAN

ALUMINUM HANDRAILS
0552000



SECTION ELEVATION

ALUMINUM LADDER
0551500

AS-BUILT 4/2016

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

SOIL CONSERVATION DISTRICT DATE

REVIEWED FOR HOWARD COUNTY SOIL CONSERVATION DISTRICT AND MEETS TECHNICAL REQUIREMENTS.

US SOIL CONSERVATION DISTRICT DATE

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. 22307 EXPIRATION DATE 4/9/15
SIGNED:

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. 43997 EXPIRATION DATE 03/27/2015
SIGNED:

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 1/30/14
CHIEF BUREAU OF ENGINEERING — DATE 1/29/14
CHIEF BUREAU OF UTILITIES — DATE 1/28/14
CHIEF UTILITY DESIGN DIVISON — DATE 1/29/14

HAZEN AND SAWYER
Environmental Engineers & Scientists
ONE SOUTH STREET, BALTIMORE, MD 21202

STATE OF MARYLAND — CHRISTOPHER GORSON — 22307 — REGISTERED PROFESSIONAL ENGINEER — 1/29/14

STATE OF MARYLAND — CHRISTOPHER PAULUS — 43997 — PROFESSIONAL ENGINEER

DESIGNED CAS
DRAWN CAS
CHECKED CP
PROJ. ENGR.
APPROVED

NO.	ISSUED FOR	DATE	BY
5	AS-BUILT	9/2015	DAV
4	ADDENDUM 1	7/2014	DAA
3	BIDDING	1/2014	DAA
2	90% REVIEW	9/2013	DAA
1	60% REVIEW	6/2013	DAA

STANDARD DETAILS
STANDARD DETAILS
SHEET 2

GENERATOR/SWITCHGEAR INSTALLATION CONTRACT
LITTLE PATUXENT WATER RECLAMATION PLANT
CAPITAL PROJECT NUMBER S-6264
CONTRACT NUMBER 20-4832
6TH ELECTION DISTRICT HOWARD COUNTY, MARYLAND

DATE JAN 2014
DRAWING NUMBER
SD2
SCALE AS SHOWN
SHEET 36 OF 37

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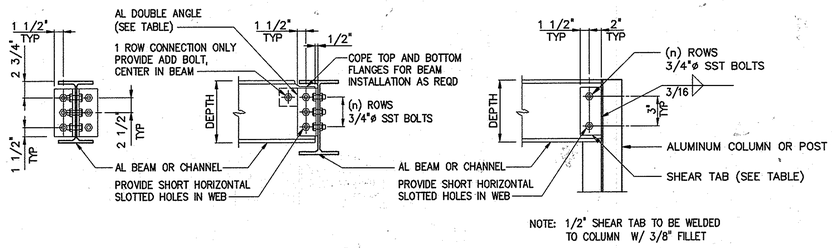
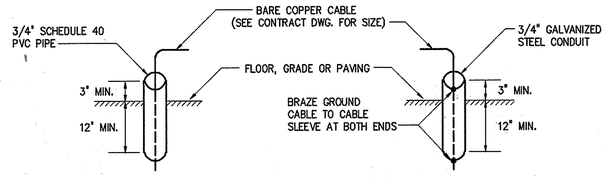
AL MEMBER DEPTH	AL DOUBLE ANGLES	SHEAR TABS	(N) ROWS
4", 5", 6"	2-L6x4x3/8x0'-3" LONG	N/A	1
8"	2-L4x4x5/16x0'-5 1/2"	3 1/2" X 1/4" X 6"	2
10", 12", 15"	2-L4x4x5/16x0'-8"	3 1/2" X 1/4" X 9"	3
I 12x11.7 IN VAULT	2-L4x4x5/16x0'-9"	4" X 1/2" X 9"	(3) 7/8"



ALUMINUM FRAMING CONNECTION

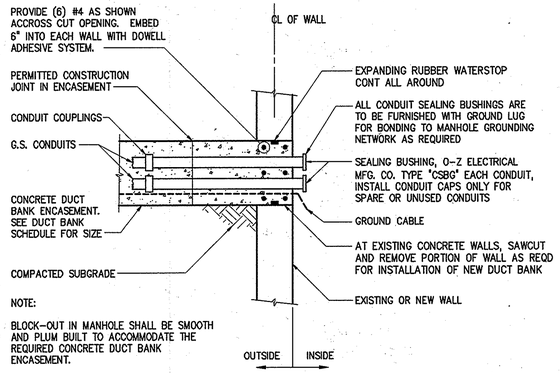
0513100R



PREFERRED SLEEVE INSTALLATION ALTERNATIVE SLEEVE INSTALLATION

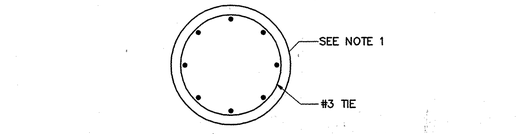
GROUND CABLE SLEEVE INSTALLATION

1617001

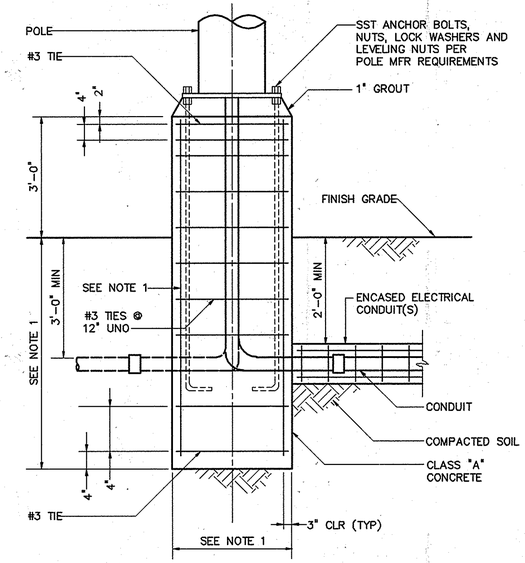


DUCT BANK TERMINATION AT CONCRETE WALL

1611804R



PLAN



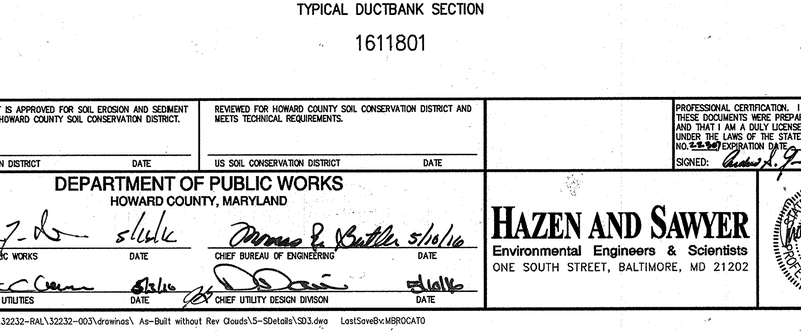
ELEVATION

NOTES:

1 SEE SECTION 16500. DEPTH AND WIDTH OF POLE BASE SHALL BE PER CALCULATIONS BY STRUCTURAL ENGINEER

AREA LIGHTING FIXTURE MOUNTING

1650001 ⚠4



NOTES:

1 CONCRETE SHALL BE FURNISHED AND INSTALLED IN ACCORDANCE WITH SPECIFICATION SECTION 03300.

2 REINFORCING STEEL AND TIES SHALL BE FURNISHED AND INSTALLED IN ACCORDANCE WITH SPECIFICATION SECTION 03200. OVERLAP FOR REINFORCING STEEL SPLICES ALONG THE DUCTBANK LENGTH SHALL BE 15", MINIMUM.

3 CONDUIT SPACERS ARE REQUIRED IN ACCORDANCE WITH SPECIFICATION SECTION 16118. HORIZONTAL SPACING OF CONDUIT SPACER ASSEMBLIES ALONG LENGTH OF DUCTBANK SHALL AS SHOWN IN THE TABLE.

4 FOR DUCTBANKS LESS THAN 15" IN HEIGHT, THE LAP SHALL BE THE HEIGHT OF THE DUCTBANK.

MAX SPACING BETWEEN CONDUIT SPACER ASSEMBLIES	
CONDUIT SIZE	SPACING
1"	3 FT
1 1/4-2"	5 FT
2 1/2-3"	6 FT
3 1/2-5"	7 FT
6"	8 FT

TYPICAL DUCTBANK SECTION

1611801

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

SOIL CONSERVATION DISTRICT DATE

REVIEWED FOR HOWARD COUNTY SOIL CONSERVATION DISTRICT AND MEETS TECHNICAL REQUIREMENTS.

US SOIL CONSERVATION DISTRICT DATE

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. 22307 EXPIRATION DATE 7/9/17
SIGNED:

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. 35571 EXPIRATION DATE 6/11/16
SIGNED:

AS-BUILT REPLACEMENT 4/2016

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 5/16/16
CHIEF BUREAU OF ENGINEERING — DATE 5/16/16
CHIEF BUREAU OF UTILITIES — DATE 5/16/16
CHIEF UTILITY DESIGN DIVISON — DATE 5/16/16

HAZEN AND SAWYER
Environmental Engineers & Scientists
ONE SOUTH STREET, BALTIMORE, MD 21202

STATE OF MARYLAND — 22307 — REGISTERED PROFESSIONAL ENGINEER — 1/22/14
STATE OF MARYLAND — 35571 — REGISTERED PROFESSIONAL ENGINEER — 1/22/14

DESIGNED CAS
DRAWN CAS
CHECKED DAA
PROJ. ENGR.
APPROVED

NO.	ISSUED FOR	DATE	BY
5	AS-BUILT REPLACEMENT	9/2015	DAV
4	ADDENDUM 1	7/2014	DAA
3	BIDDING	1/2014	DAA
2	90% REVIEW	9/2013	DAA
1	60% REVIEW	6/2013	DAA

STANDARD DETAILS
STANDARD DETAILS
SHEET 3

GENERATOR/SWITCHGEAR INSTALLATION CONTRACT
LITTLE PATUXENT WATER RECLAMATION PLANT
CAPITAL PROJECT NUMBER S-6264
CONTRACT NUMBER 20-4832
6TH ELECTION DISTRICT HOWARD COUNTY, MARYLAND

DATE FEB 2016
DRAWING NUMBER
SD3
SCALE AS SHOWN
SHEET 37 OF 37

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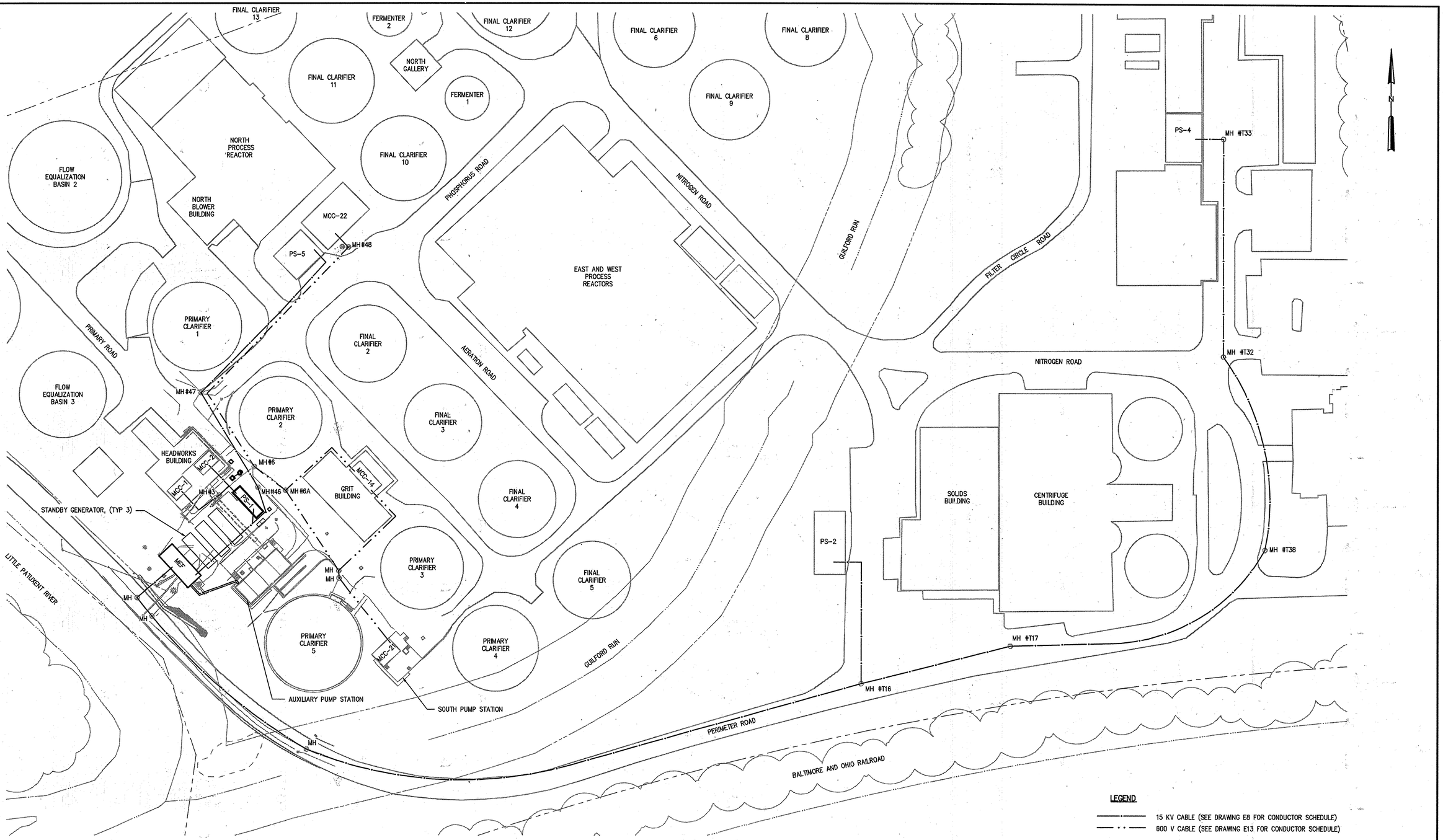

OVERALL SITE PLAN

1" = 50'-0"

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

SOIL CONSERVATION DISTRICT DATE

REVIEWED FOR HOWARD COUNTY SOIL CONSERVATION DISTRICT AND MEETS TECHNICAL REQUIREMENTS.

US SOIL CONSERVATION DISTRICT DATE

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. 22307 EXPIRATION DATE 4/9/16
SIGNED:

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. 35671 EXPIRATION DATE 6/11/16
SIGNED:

AS-BUILT REPLACEMENT 4/2016

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS DATE 5/6/16
CHIEF BUREAU OF ENGINEERING DATE 5/10/16
CHIEF BUREAU OF UTILITIES DATE 5/2/16
CHIEF UTILITY DESIGN DIVISON DATE 5/16/16

HAZEN AND SAWYER
Environmental Engineers & Scientists
ONE SOUTH STREET, BALTIMORE, MD 21202

STATE OF MARYLAND — JOHN A. ATKINS JR. — 22307 — REGISTERED PROFESSIONAL ENGINEER — 1/23/14

STATE OF MARYLAND — JOHN A. ATKINS JR. — 35671 — REGISTERED PROFESSIONAL ENGINEER — 1/22/14

DESIGNED DAA
DRAWN CAS
CHECKED DAA
PROJ. ENGR. ASG
APPROVED

NO.	ISSUED FOR	DATE	BY
5	AS-BUILT REPLACEMENT	9/2015	DAV
4	ADDENDUM 1	7/2014	DAA
3	BIDDING	1/2014	DAA
2	90% REVIEW	9/2013	DAA
1	60% REVIEW	6/2013	DAA

ELECTRICAL

OVERALL ELECTRICAL SITE PLAN 5

GENERATOR/SWITCHGEAR
INSTALLATION CONTRACT
LITTLE PATUXENT WATER RECLAMATION PLANT
CAPITAL PROJECT NUMBER S-6264
CONTRACT NUMBER 20-4832
6TH ELECTION DISTRICT HOWARD COUNTY, MARYLAND

DATE FEB 2016
DRAWING NUMBER E-16
SCALE AS SHOWN
SHEET 37A OF 37

IMAGES= 20-3840-p001-p053 16 of 53, 20-3840-p001-p053 38 of 53, 237-S-PHII-p033 10 of 33, 237-S-PHII-p033 16 of 33, 237-S-PHII-p033 9 of 33, 500-S-p061-p133A-61, 500-S-p061-p133A-63L, 500-S-p061-p133A-63R, 525-S-p028 4 of 28, FLOOD,
XREFs= 32232-TB, SP-CX-GIS, SP-CX, buildings_major, buildings_minor, EdgeOfPavement, streams_majorandreservoir, tree_line, streams_minor, address_points, SP-CN

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