CHESAPEAKE BAY BRIDGE TUNNEL
NORTH SUBSTATION POWER UPGRADES
CAPE CHARLES, VIRGINIA

PROJECT NUMBER ____

BID NO. ____-__-___

PACE COLLABORATIVE
MECHANICAL / ELECTRICAL ENGINEERS

DRAWING INDEX		
SHEET No.	DRAWING	DRAWING TITLE
1	T001	TITLE SHEET
2	G001	LOCATION MAP
3	E001	GENERAL NOTES, LEGEND, AND ABBREVIATIONS
4	E002	ONE-LINE DIAGRAM - DEMOLITION
5	E003	ONE-LINE DIAGRAM - NEW WORK
6	E101	PARTIAL SITE PLAN
7	E201	FLOOR PLANS
8	E301	PHOTOS
9	E501	DETAILS
10	E502	DETAILS
11	E801	PANEL SCHEDULES

GENERAL CONTRACT NOTES:

1. CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING, PAYING, AND POSTING ALL APPLICABLE PERMITS.
2. COORDINATE CONTRACTOR PARKING AND THE LOCATION FOR ANY CONSTRUCTION OFFICES OR STORAGE TRAILERS WITH THE OWNER. CONTRACTOR SHALL NOT BLOCK ANY PARKING AREAS OR DRIVE AISLES, OR INTERFERE WITH THE TRAFFIC FLOW AROUND THE BUILDINGS WITHOUT PRIOR APPROVAL AND COORDINATION WITH THE OWNER.
3. CONTRACTOR MUST PROVIDE SAFETY TAPE AND BARRIERS AROUND AREAS OF WORK. ALL EQUIPMENT AND MATERIALS MUST BE SECURED FROM THEFT AND VANDALISM.
4. CONTRACTOR SHALL CONTROL WORKERS ON SITE AT ALL TIMES. WORKERS SHALL BE RESTRICTED TO THE WORKING AREAS ONLY.
5. WORK AREAS SHALL BE CLEANED WHEN WORK HAS BEEN COMPLETED OR ON A DAILY BASIS, WHICHEVER MAINTAINS THE CLEANEST AND MOST PROFESSIONAL WORK ENVIRONMENT. CONTRACTOR SHALL NOT USE ANY BUILDING DUMPSTER FOR DISPOSAL OF DEBRIS/TRASH. CONTRACTOR SHALL FURNISH MEANS FOR DISPOSAL OF DEBRIS OR TRASH TO A SUITABLE LOCATION OFF-SITE AND ANY ASSOCIATED FEES INCURRED.

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Designed By:	RTW
Drawn By:	MLC
Checked By:	JSB
Scale:	AS NOTED
Date:	10-17-2022

SEAL

REVISIONS		
No.	DATE	DESCRIPTION

VIRGINIA

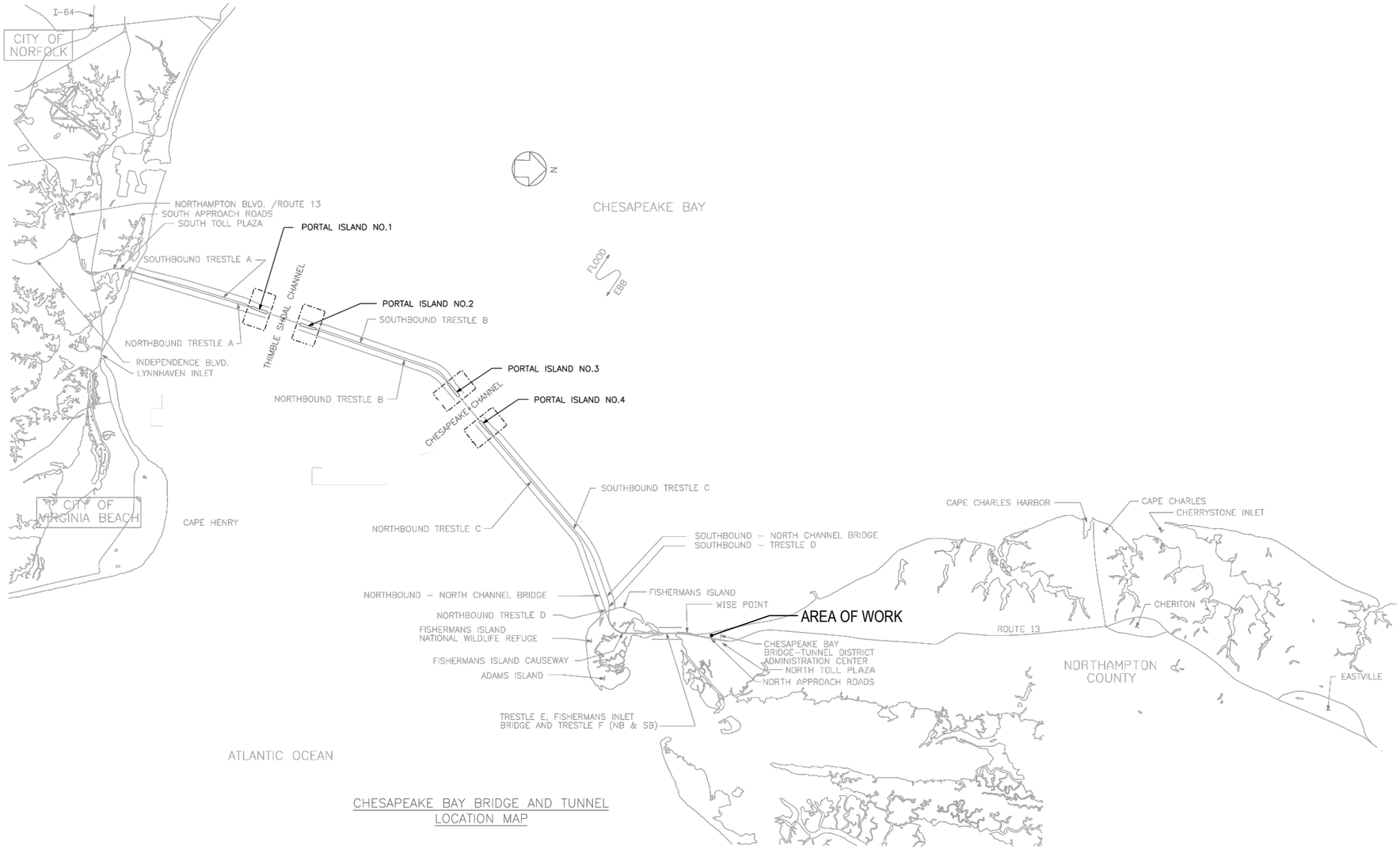
CHESAPEAKE BAY BRIDGE TUNNEL
NORTH SUBSTATION POWER UPGRADES
CAPE CHARLES

TITLE SHEET

PROJECT No: 22130

T001

SHEET 1 OF 11



CHESAPEAKE BAY BRIDGE AND TUNNEL
LOCATION MAP

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CAPE CHARLES

LOCATION MAP

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G001

SHEET 2 OF 11

SEQUENCE OF CONSTRUCTION NOTES

GENERAL NOTES:

1. THE CONTRACTOR SHALL SALVAGE EXISTING EQUIPMENT REMOVED AS PART OF DEMOLITION AND TURN OVER TO THE DISTRICT AS DIRECTED.

2. CONTRACTOR SHALL COORDINATE THE DEMOLITION OF EXISTING EQUIPMENT AND ASSOCIATED CONDUIT, WIRE, ETC. TO ALLOW FOR MINIMAL PLANNED POWER OUTAGES. CONTRACTOR SHALL PROVIDE TEMPORARY EMERGENCY POWER AS DETAILED BELOW TO ENSURE BACKUP POWER FOR EXISTING EMERGENCY LOADS IS AVAILABLE AT ALL TIMES.

3. THE CONTRACTOR SHALL CAREFULLY COORDINATE THE PROPOSED SEQUENCE OF CONSTRUCTION AND SUBMIT A DETAILED PHASING PLAN WITH PROPOSED SEQUENCE OF CONSTRUCTION, INCLUDING CONTINGENCY PLANS IN THE EVENT OF UNEXPECTED SEVERE WEATHER, TO THE DISTRICT AND THE ENGINEER FOR APPROVAL PRIOR TO CONSTRUCTION.

PROPOSED SEQUENCE OF CONSTRUCTION:

NOTE: THE INTENT OF THIS SEQUENCE IS TO DISPLAY AN OVERVIEW OF THE PROJECT WITH SUGGESTED PHASING TO MINIMIZE DOWN TIME DURING REQUIRED POWER OUTAGES. FINAL SEQUENCING AND SCHEDULING IS THE RESPONSIBILITY OF THE CONTRACTOR WITH CAREFUL COORDINATION WITH THE OWNER.

1: MOVE LOADS FROM "L-2" TO "H-6".
- a. CONTRACTOR SHALL TEMPORARILY RE-FEED EXISTING LOADS FED FROM UNIT SUBSTATION #2 (PANEL "L-2") FROM EXISTING UNIT SUBSTATION #1 (PANEL "H-6") DURING INSTALLATION OF MAIN SWITCHBOARD "MSBN", PAD-MOUNTED TRANSFORMER, AND STANDBY GENERATOR.
- b. ONCE LOADS ARE TRANSFERRED, REMOVE UNIT SUBSTATION #2, 112.5KVA TRANSFORMER, AND PANEL "L-2" COMPLETE.
- c. STUB 13.8KV PRIMARY FEEDER CONDUITS OUT OF SWITCHGEAR DURING REQUIRED OUTAGE TO REMOVE UNIT SUBSTATION #2.

2: MAIN SERVICE EXTERIOR SITE WORK
- a. LOCATE AND DOCUMENT THE LOCATION AND ELEVATION OF ALL UNDERGROUND UTILITIES.
- b. REMOVE VEGETATION AND GRADE AS REQUIRED.
- c. ROUGH-IN CONDUITS AT TRANSFORMER AND GENERATOR PAD, ROUTE TO EXTERIOR WALL OF ELECTRICAL ROOM.
- d. EXTEND PRIMARY FEEDER CONDUITS OVERHEAD AND CONNECT TO CONDUITS STUBBED OUT OF 13.8KV SWITCHGEAR PREVIOUSLY.
- e. POUR CONCRETE PADS, SIDEWALKS, AND DUCTBANKS.

3: REMOVE EXISTING 175KW GENERATOR
- a. UTILIZE EXISTING KIRK KEY INTERLOCK SYSTEM TO PROVIDE STANDBY POWER TO WISE POINT FACILITIES VIA EXISTING 125KW GENERATOR. AS DIRECTED BY THE OWNER, PROVIDE 175KW PORTABLE GENERATOR AND CONNECT TO EXISTING SAFETY SWITCH.
- b. REMOVE EXISTING 175KW GENERATOR, FUEL STORAGE TANK, CONCRETE PAD, LOUVER, AND ASSOCIATED APPURTENANCES AS INDICATED ON PLANS.

4: INSTALL SWITCHBOARD, TRANSFORMER, AND GENERATOR INFRASTRUCTURE
- a. POUR CONCRETE HOUSEKEEPING PADS FOR SWITCHBOARD "MSBN" AND TRANSFORMER "T-EG".
- b. INSTALL SWITCHBOARD "MSBN", TRANSFORMER "T-EG", AND ECB SERVING PANEL "EG".
- c. EXTEND SECONDARY CONDUITS AND GENERATOR CONDUITS TO ASSOCIATED EQUIPMENT IN ELECTRICAL ROOM.
- d. PULL SECONDARY FEEDERS AND TERMINATE.
- e. PULL GENERATOR FEEDERS, CONTROL WIRING, GAP WIRING AND TERMINATE.
- f. PULL TRANSFORMER "T-EG" PRIMARY FEEDER AND TERMINATE.
- g. PULL PAD-MOUNTED TRANSFORMER PRIMARY FEEDERS. COORDINATE OUTAGE IN 13.8KV SWITCHGEAR AND TERMINATE.
- h. MAIN SWITCHBOARD "MSBN" AND GENERATOR ARE NOW ENERGIZED.

5: POWER DISTRIBUTION SITE WORK
- a. LOCATE AND DOCUMENT THE LOCATION AND ELEVATION OF ALL UNDERGROUND UTILITIES.
- b. EXCAVATE AND INSTALL PRECAST CONCRETE VAULTS AND HANDHOLES.
- c. DIRECTIONALLY DRILL AND INSTALL CONDUITS AS INDICATED.
- d. ROUGH-IN CONDUITS FROM "MSBN" THROUGH VAULTS AND HANDHOLES AND TERMINATE AT EQUIPMENT AT EACH FACILITY.
- e. PULL FEEDERS TO EQUIPMENT AT EACH FACILITY.

6: TRANSFER EXISTING LOADS TO "MSBN"
- a. EXTEND AND TERMINATE EXISTING FEEDERS AT "MSBN":
  - a.a. ROADWAY AND PARKING LOT LIGHTING
  - a.b. OUTSIDE LIGHTS
  - a.c. ELECTRICAL STORAGE BUILDINGS
  - a.d. EXISTING PANEL "H6" AT ADMIN BUILDING
  - a.e. PUMP HOUSE

7: ENERGIZE 480V PANELS AT EXISTING FACILITIES AND TRANSFER LOADS
- b. PULL FEEDERS TO 480V EQUIPMENT AT EACH FACILITY.
- c. COORDINATE OUTAGES AND REMOVE CONNECTIONS TO EXISTING DRY-TYPE TRANFORMERS AT EACH FACILITY AS INDICATED ON ONE-LINE DIAGRAMS.
- d. BACKFEED EXISTING DRY-TYPE TRANSFORMERS AT EACH FACILITY AS INDICATED ON ONE-LINE DIAGRAMS.
- e. AT THIS POINT, ALL EXISTING FACILITIES ARE FED FROM "MSBN".
- f. COMPLETE DEMOLITION OF ALL EXISTING EQUIPMENT TO BE REMOVED AS INDICATED ON ONE-LINE DIAGRAMS.

GENERAL ELECTRICAL NOTES

GENERAL: UNLESS SPECIFICALLY INDICATED OTHERWISE, ALL WORK SHOWN ON ELECTRICAL DRAWINGS IS NEW WORK TO BE PROVIDED UNDER THIS CONTRACT.

COORDINATION: CONTRACTOR SHALL COORDINATE AND COOPERATE WITH ALL TRADES ON THE PROJECT. THE CONTRACTOR SHALL REVIEW ALL CONTRACT DOCUMENTS INCLUDING DRAWINGS AND SPECIFICATIONS. CONTRACTOR SHALL COORDINATE AND ADJUST ACCORDINGLY AS DIRECTED BY THE ENGINEER/OWNER.

AS-BUILT DRAWINGS: CONTRACTOR SHALL SECURE AN EXTRA SET OF ELECTRICAL DRAWINGS TO BE KEPT ON SITE AND MARK, DAILY, THE DRAWINGS IN RED AS THE PROJECT PROGRESSES IN ORDER TO KEEP AN ACCURATE RECORD OF ALL DEVIATIONS BETWEEN THE WORK SHOWN ON THE DRAWINGS AND THE WORK WHICH IS ACTUALLY INSTALLED. THESE MARKED DRAWINGS SHALL REFLECT ANY AND ALL CHANGES AND REVISIONS TO THE ORIGINAL DESIGN WHICH EXISTS IN THE COMPLETED WORK. CONTRACTOR SHALL DELIVER THE MARKED DRAWINGS TO THE ENGINEER AT PROJECT CLOSE-OUT.

TESTS: CONTRACTOR SHALL TEST ALL WIRING FOR CONTINUITY AND GROUNDS BEFORE CONNECTING ANY FIXTURES OR DEVICES. CONTRACTOR SHALL PERFORM INSULATION RESISTANCE TESTS ON ALL WIRING #6 OR LARGER TO ENSURE THAT ALL PORTIONS ARE FREE FROM SHORT-CIRCUITS AND GROUNDS.

GROUNDING: CONTRACTOR SHALL PROVIDE GROUNDING IN ACCORDANCE WITH THE NEC FOR THE ENTIRE ELECTRICAL SYSTEM INCLUDING EQUIPMENT FRAMES CONDUITS, SWITCHES, CONTROLLERS, WIRE-WAYS, NEUTRAL CONDUCTORS, AND OTHER EQUIPMENT. CONTRACTOR SHALL PROVIDE A GROUNDING CONDUCTOR IN ALL POWER CONDUITS.

SHORT CIRCUIT AND COORDINATION STUDY: CONTRACTOR SHALL BE RESPONSIBLE FOR HAVING A SHORT CIRCUIT AND COORDINATION STUDY COMPLETED FOR THE AS-BUILT ELECTRICAL DISTRIBUTION SYSTEM (480V AND DOWNSTREAM EQUIPMENT) BASED UPON ACTUAL EQUIPMENT AND FEEDER LENGTHS INSTALLED. THE STUDY SHALL BE COMPLETED WITH STANDARD COMMERCIAL SOFTWARE, AND INCLUDE RECOMMENDED SETTINGS FOR ALL ADJUSTABLE DEVICES. THE STUDY SHALL BE PERFORMED BY A LICENSED PROFESSIONAL ENGINEER.

CONTRACTOR SHALL ADJUST ALL BREAKER SETTINGS IN FIELD. NO ELECTRICAL EQUIPMENT SHALL BE ORDERED UNTIL SUBMITTED STUDY IS APPROVED.

LABELS: CONTRACTOR SHALL PROVIDE LABELS FOR ALL ENCLOSED CIRCUIT BREAKERS, PANELBOARDS, SAFETY SWITCHES AND MOTOR CONTROL CENTERS. LABELS SHALL BE MACHINE ENGRAVED, LAMINATED PLASTIC, PERMANENTLY ATTACHED WITH SELF-TAPPING SCREWS OR RIVETS. DO NOT USE SELF-ADHESIVE LABELS. LABEL SHALL INDICATE EQUIPMENT DESIGNATION AND ASSOCIATED PANEL AND CIRCUIT THAT SERVES IT.

J-BOX LABELING: CONTRACTOR SHALL LABEL ALL JUNCTION BOXES WITH PERMANENT MARKER IDENTIFYING CIRCUIT NUMBER AND PANELBOARD OF CIRCUITS WITHIN.

WIRING DEVICES: CONTRACTOR SHALL LABEL ALL WIRING DEVICES WITH PANELBOARD AND CIRCUIT DESIGNATION PERMANENTLY ATTACHED WITH BLACK TYPED DESIGNATION ON CLEAR TAPE.

FLOOR MOUNTED EQUIPMENT: ALL FLOOR OR GRADE MOUNTED ELECTRICAL EQUIPMENT SHALL BE PROVIDED WITH CONCRETE HOUSEKEEPING PADS. PADS SHALL BE 4" THICK 4000 PSI CONCRETE WITH 1" CHAMFERED EDGE AND EXTEND 4" ON ALL SIDES BEYOND EQUIPMENT.

PANEL DIRECTORY: CONTRACTOR SHALL PROVIDE TYPEWRITTEN PANELBOARD DIRECTORY CARD IN EACH PANELBOARD ADDED OR MODIFIED WITH CIRCUIT LOAD INFORMATION AND ROOM NUMBER CLEARLY IDENTIFIED. CONTRACTOR SHALL USE ACTUAL ROOM NUMBERS IN THE BUILDING, NOT THE ROOM NUMBERS SHOWN ON THE CONTRACT DRAWINGS, AS THEY ARE OFTEN DIFFERENT.

CONDUCTORS AND MATCHING LUGS: IN SITUATIONS WHERE CONDUCTOR SIZES AND/OR QUANTITIES OF PARALLEL SETS HAVE BEEN INCREASED DUE TO VOLTAGE DROP OR FOR OTHER REASONS, CONTRACTOR SHALL PROVIDE THE APPROPRIATE LUG SIZES/QUANTITIES WITHIN THE EQUIPMENT CONNECTED (SWITCHBOARD, PANELBOARD, DISCONNECT SWITCH, TRANSFER SWITCH ETC.) TO PERMIT SATISFACTORY CONNECTION OF THE INDICATED CONDUCTORS. WHERE SUFFICIENT LUG SIZES AND/OR QUANTITIES CANNOT BE PROVIDED TO ACCOMMODATE THE CONDUCTORS INDICATED, THEN PROVIDE REDUCING ADAPTERS, PIN TERMINALS, OR A JUNCTION BOX TO SPLICE LARGER CONDUCTORS TO APPROPRIATELY SIZED SMALLER CONDUCTORS TO FIT INTO THE LUGS PROVIDED. ALL CONDUCTORS SHALL BE SIZED IN ACCORDANCE WITH THE NEC.

WORKING CLEARANCE: CONTRACTOR SHALL COORDINATE FINAL LOCATIONS OF ELECTRICAL EQUIPMENT WITH MECHANICAL DUCTWORK, PIPING ETC. AND ASSURE WORKING CLEARANCE REQUIRED BY NEC WILL BE MET. SUFFICIENT ACCESS AND WORKING SPACE SHALL BE PROVIDED AND MAINTAINED AROUND ELECTRICAL EQUIPMENT AS REQUIRED BY THE NATIONAL ELECTRICAL CODE. CONTRACTOR SHALL COORDINATE FINAL LOCATION OF EQUIPMENT PROVIDED AND INSTALLED BY OTHER TRADES.

MATERIAL COORDINATION: CONTRACTOR SHALL VERIFY CEILING AND WALL CONSTRUCTION AND MATERIAL PRIOR TO ORDERING EQUIPMENT OR OTHER DEVICES TO INSURE PROPER EQUIPMENT OR DEVICE IS FURNISHED TO MATCH CONSTRUCTION.

MOUNTING HEIGHTS: MOUNTING HEIGHTS INDICATED ARE FROM THE FINISHED FLOOR TO THE CENTERLINE OF THE WIRING DEVICE UNLESS OTHERWISE NOTED. MOUNTING HEIGHTS OF LIGHTING FIXTURES ARE TO THE BOTTOM OF THE FIXTURE UNLESS OTHERWISE NOTED.

BARRIERS: WHERE A MULTIPLE-GANG BOX HAS CIRCUITS OF DIFFERENT VOLTAGES OR SYSTEMS WHICH ARE REQUIRED TO BE SEPARATED, CONTRACTOR SHALL PROVIDE THE CODE-REQUIRED SEPARATION USING A FULL HEIGHT AND DEPTH BARRIER PLATE.

CLEAN UP: ON PROJECT CLOSE-OUT, CONTRACTOR SHALL CLEAN ALL ELECTRICAL DEVICES, AND EQUIPMENT AND REMOVE ALL PAINT SPATTERS.

PHASE ROTATION: CONTRACTOR SHALL ENSURE PROPER PHASE ROTATION PRIOR TO ENERGIZING LOADS.

EXCAVATION AND CONDUIT INSTALLATION NOTES

THE FOLLOWING NOTES ARE INTENDED TO ESTABLISH GENERAL GUIDELINES FOR EXCAVATION AND CONDUIT INSTALLATION AND SHALL BE USED SOLELY FOR THAT PURPOSE. TRENCHLESS EXCAVATION SHALL BE PERFORMED IN ACCORDANCE WITH ALL APPLICABLE STATE LAWS AND COMMISSION REGULATIONS. REFER TO THE CODE OF VIRGINIA FOR APPLICABLE LEGAL REFERENCES.

GENERAL:

1. MISS UTILITY OF VIRGINIA MUST BE CONTACTED BY THE CONTRACTOR THREE (3) DAYS MINIMUM PRIOR TO ANY AND ALL EXCAVATION. THE PROJECT AREAS CONTAIN HIGH CONCENTRATIONS OF UNDERGROUND UTILITIES. EXCAVATE WITH CAUTION.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL COORDINATION EFFORTS WITH FRANCHISE UTILITIES, INCLUDING BUT NOT LIMITED TO THE COX COMMUNICATIONS, VERIZON, DOMINION ENERGY (DE), VIRGINIA NATURAL GAS (VNG), CHESAPEAKE BAY BRIDGE AND TUNNEL DISTRICT (CBBT), EASTERN SHORE OF VIRGINIA BROADBAND AUTHORITY (ESVBA), AND A&N ELECTRIC COOPERATIVE (ANEC).
3. THE CONTRACTOR MAY ADJUST THE EXACT ROUTING OF THE CONDUITS AND JUNCTION BOX LOCATIONS AS REQUIRED TO ACCOMMODATE ACTUAL PHYSICAL CONDITIONS ENCOUNTERED.
   - 3.1. THE CONTRACTOR SHALL RECORD THE DIMENSIONED ROUTING AND DEPTHS OF ALL CONDUITS ON THE AS-BUILT DRAWINGS TO BE FURNISHED TO THE OWNER.
4. CONDUITS INSTALLED UNDER EXISTING ROADWAYS SHALL BE INSTALLED UTILIZING DIRECTION DRILLING METHODS ONLY. TRENCHING AND EXCAVATION SHALL NOT BE PERMITTED.
5. HORIZONTAL DIRECTIONAL DRILLING (HDD) METHODS SHALL BE UTILIZED TO INSTALL UNDERGROUND CONDUITS AS INDICATED. WHERE EXISTING CONDITIONS DO NOT PERMIT DIRECTIONAL DRILLING, HAND TRENCH AND EXCAVATE TO MINIMIZE LAND DISTURBANCE IN ACCORDANCE WITH VDOT ROAD AND BRIDGE STANDARDS, DETAILS "ECI-1" AND "ECI-2".
6. UNLESS SPECIFICALLY NOTED OTHERWISE, ALL CONDUITS SHALL BE INSTALLED 24" BFG MINIMUM.
7. CONTRACTOR SHALL EXERCISE CAUTION IN ORDER TO AVOID DAMAGE OR DISTURBANCE TO EXISTING VEGETATION.
8. NO HDD EQUIPMENT SHALL BE PERMITTED ON PRIVATE PROPERTY WITHOUT PRIOR AUTHORIZATION.
9. INSTALL CONDUITS BENEATH EXISTING DOMESTIC WATER, GRAVITY SANITARY SEWER, AND FORCE MAIN PIPING TO THE FULLEST EXTENT POSSIBLE.
10. UNDERGROUND CONDUIT INSTALLED BY HORIZONTAL DIRECTIONAL DRILLING (HDD) METHODS SHALL BE SCHEDULE-80 HDPE.

TRENCHLESS EXCAVATION:

1. ENSURE GROUNDING RODS AND BORE STABILIZING AUGERS ARE INSTALLED AT A SAFE DISTANCE FROM THE MARKED UTILITY LINES (MIN 24" PLUS THE WIDTH OF THE UTILITY).
2. PRIOR TO EXCAVATION, THE CONTRACTOR SHALL PERFORM A SITE INSPECTION TO LOOK FOR SIGNS OF CLEAR EVIDENCE OF UNMARKED UTILITY LINES IN THE BORE PATH. IF UNMARKED UTILITY LINES ARE IDENTIFIED, THE EXCAVATOR SHALL SUBMIT A 3-HOUR NOTICE TO HAVE THE UTILITY PROPERLY MARKED. EXCAVATION SHALL NOT PROCEED UNTIL THE UNMARKED UTILITY LINES ARE CORRECTED.
3. GIVE SPECIAL CONSIDERATION TO WATER AND SEWER SYSTEMS WITHIN THE AREA THAT CANNOT BE LOCATED ACCURATELY.
4. ALL MARKED UTILITIES IN THE BORE PATH MUST BE EXPOSED. UTILITIES THAT WILL BE CROSSED MUST BE EXPOSED BY TEST PITS (POTHOLING) OR HAND DIGGING.
   - 4.1. THE CROSSING OF THE EXPOSED UTILITIES MUST BE OBSERVED WHEN DRILLING AND BACKREAMING (PULLBACK).
   - 4.2. THE DRILL HEAD SHALL BE OBSERVED WHEN PASSING THROUGH POTHOLES, ENTRANCE, AND EXIT PITS.
5. WHEN EXCAVATING WITHIN 24" OF THE MARKED LOCATION OF UNDERGROUND UTILITY LINES, ALL REASONABLE STEPS MUST BE TAKEN TO PROTECT, SUPPORT AND BACKFILL.
   - 5.1. EXPOSE THE UNDERGROUND UTILITY LINE TO ITS EXTREMITIES BY HAND DIGGING.
   - 5.2. WHEN DRILLING PARALLEL TO EXISTING FACILITIES, HAND EXPOSE THE EXISTING LINES AT REASONABLE DISTANCES.
6. MAINTAIN A MINIMUM OF 24" SEPARATION FROM EXISTING UTILITIES.
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVAL AND DISPOSAL OF ALL WASTE PRODUCT AS A RESULT OF THE HDD PROCESS. THIS INCLUDES ANY REQUIRED TEMPORARY RELIEF PITS FOR SLURRY ACCUMULATION AND PORTABLE VACUUM SYSTEMS FOR MUD/SLURRY DISPOSAL.

ELECTRICAL DEMOLITION NOTES

GENERAL: DEMOLITION DRAWINGS ARE BASED ON EXISTING PLANS AND FIELD INVESTIGATION PRIOR TO DEMOLITION. PROPOSED BIDDERS SHALL VISIT THE EXISTING BUILDING PRIOR TO BID IN ORDER TO BECOME FAMILIAR WITH THE EXISTING CONDITIONS AND IN ORDER TO AVOID CONFLICTS.

DASHED ITEMS: ALL ITEMS SHOWN DASHED ON DEMOLITION PLANS ARE EXISTING AND SHALL BE REMOVED BY THE CONTRACTOR.

SOLID ITEMS: ALL ITEMS SHOWN SOLID ON DEMOLITION PLANS ARE EXISTING TO REMAIN.

CIRCUITING TO REMAIN: EXISTING CIRCUITING TO REMAIN SHALL BE REROUTED OR RECONNECTED BY THE CONTRACTOR, AS REQUIRED, WHERE AFFECTED BY NEW WORK IN ORDER TO MAINTAIN CONTINUITY OF THE CIRCUIT.

EXISTING CONDUIT: ALL EXISTING CONDUITS AND WIRING THAT WILL NOT BE REUSED SHALL BE REMOVED BY THE CONTRACTOR WHERE THEY WILL BE EXPOSED UPON COMPLETION OF NEW WORK. EXISTING CONDUIT TO REMAIN CONCEALED IN WALLS SHALL BE ABANDONED. EXISTING CONDUITS TO REMAIN BELOW FLOOR SLAB SHALL BE CUT OFF ONE INCH BELOW ROUGH FLOOR AND GROUTED FLUSH BY THE CONTRACTOR. ALL EXISTING WIRING IN CONDUITS TO BE ABANDONED SHALL BE DISCONNECTED FROM POWER SOURCE AND REMOVED BY THE CONTRACTOR.

REPAIR DAMAGE: CONTRACTOR SHALL EXERCISE CARE IN REMOVAL OF DEMOLITION ITEMS. CONTRACTOR SHALL REPAIR, AT NO ADDITIONAL COST TO THE OWNER, ANY DAMAGE CAUSED TO EXISTING CONSTRUCTION AND/OR EQUIPMENT TO REMAIN.

ASSOCIATED APPURTENANCES: CONTRACTOR SHALL REMOVE ALL ELECTRICAL APPURTENANCES (DISCONNECTS, STARTERS, WIRING, CONDUIT, ETC.) ASSOCIATED WITH ITEMS TO BE REMOVED.

KNOCKOUT PLUGS AND COVERS: ALL CONDUIT REMOVED SHALL BE REMOVED IN ITS ENTIRETY BY THE CONTRACTOR, INCLUDING FITTINGS, MOUNTING DEVICES, MOUNTING HARDWARE, ETC. CONTRACTOR SHALL PROVIDE CONDUIT PLUGS AND BLANKS FOR ALL OPENINGS CREATED BY THE REMOVAL OF CONDUIT. CONTRACTOR SHALL PROVIDE BLANK COVER PLATES FOR ALL OPENED OUTLET BOXES CREATED BY THE REMOVAL OF EQUIPMENT AND/OR DEVICES

DEMOLISHED MATERIALS: ALL MATERIALS REMOVED UNDER DEMOLITION, NOT TO BE RELOCATED OR DESIGNATED TO BE TURNED OVER TO THE OWNER, SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE REMOVED COMPLETELY FROM THE SITE BY THE CONTRACTOR.

SCHEDULE OUTAGES: CONTRACTOR SHALL SCHEDULE ALL WORK AND ALL POWER OUTAGES IN THE EXISTING BUILDINGS AT TIMES CONVENIENT TO THE OWNER WITH A MINIMUM OF 48 HOURS NOTICE.

NOTIFICATION: CONTRACTOR SHALL NOTIFY THE OWNER PRIOR TO TURNING OFF ANY CIRCUITS.

ELECTRICAL LEGEND

LIGHTING

- EXISTING WALL MOUNTED LIGHTING FIXTURE
- S — SINGLE POLE SWITCH, 20A, 120/277V, 46" AFF UON
- P — EXISTING PHOTOCELL

POWER

THE FOLLOWING SUBSCRIPTS SHALL APPLY TO RECEPTACLES WHERE USED:
- WP: WEATHER RESISTANT GFI RECEPTACLE WITH METALLIC "EXTRA-DUTY" WEATHERPROOF WHILE-IN-USE COVER.

- SINGLE RECEPTACLE 20A, 120V, 18" AFF, UON
- DUPLEX CONVENIENCE RECEPTACLE 20A, 120V, 18" AFF, UON
- E — EQUIPMENT CONNECTION
- J — JUNCTION BOX
- MOTOR CONNECTION
- CIRCUIT BREAKER
- CONTACTOR
- MD — MOTORIZED DAMPER, 120V
- MPDM — MULTI-FUNCTION DIGITAL METER
- ARMS — ARC FLASH REDUCTION MAINTENANCE SYSTEM
- GFPM — GROUND FAULT PROTECTION MODULE
- SAFETY SWITCH, 60A-3P, FU @ 30A, 3R
  - SWITCH RATING
  - NUMBER OF POLES
  - FUSE RATING (NF INDICATES NON-FUSED)
  - NEMA ENCLOSURE IF OTHER THAN NEMA 1
- ENCLOSED CIRCUIT BREAKER, 60A-3P, 3R
  - BREAKER TRIP RATING
  - NUMBER OF POLES
  - NEMA ENCLOSURE IF OTHER THAN NEMA 1
- SPD — SURGE PROTECTIVE DEVICE
- ATS — AUTOMATIC TRANSFER SWITCH
- ELECTRICAL PANELBOARD
- T — DRY-TYPE TRANSFORMER
- T — PAD MOUNTED TRANSFORMER
  - INDICATES FRONT
- AND — ELECTRICAL CIRCUIT RUN IN CONDUIT AND CIRCUIT HOMERUN TO PANELBOARD (PANEL AND CIRCUIT DESIGNATION AS INDICATED). AS A MINIMUM CONDITION; EACH SINGLE PHASE CIRCUIT SHALL HAVE 1 #12 PHASE CONDUCTOR, 1 #12 NEUTRAL CONDUCTOR AND 1 #12 GROUNDING CONDUCTOR IN 3/4" CONDUIT. PROVIDE ADDITIONAL PHASE CONDUCTORS AS REQUIRED FOR "MULTIPLE PHASED" ELECTRICAL LOADS. PROVIDE NEUTRAL CONDUCTOR TO ALL WALL SWITCH OUTLET BOXES WHETHER REQUIRED OR NOT. PROVIDE ADDITIONAL "SWITCH LEG" CONDUCTORS TO PROVIDE THE LIGHT FIXTURE CONTROL INDICATED. MULTIPLE SINGLE PHASE CONDUCTORS MAY BE GROUPED TOGETHER IN A COMMON CONDUIT IN ACCORDANCE WITH THE NEC AND AT THE CONTRACTOR'S DISCRETION. GROUNDING CONDUCTORS MAY BE SHARED AS ALLOWED BY THE NEC. NEUTRAL CONDUCTORS SHALL NOT BE SHARED. MULTI-POLE BREAKERS SHALL BE PROVIDED IN ACCORDANCE WITH THE NEC WHERE MULTI-WIRE BRANCH CIRCUITS ARE REQUIRED. CONDUIT LARGER THAN 3/4" AND CONDUCTORS LARGER THAN #12 SHALL BE AS INDICATED.
- HH — ELECTRICAL HANDHOLE JB-S3, SEE DETAIL
- X — DUCTBANK SECTION LOOKING IN DIRECTION OF ARROWS, "X" INDICATES DUCTBANK TYPE, REFER TO DUCTBANK DETAILS
- EXISTING ELECTRICAL INTERLOCK
- EXISTING KIRK KEY INTERLOCK

FUEL OIL

- FOR — FUEL OIL RETURN PIPING
- FOS — FUEL OIL SUPPLY PIPING

GENERAL

- 1 — NEW WORK NOTE SYMBOL
- 1 — DEMOLITION NOTE SYMBOL
- 1 — NOTE SYMBOL
- 1 — PHOTO SYMBOL

CONDUIT AND WIRING APPLICATION NOTES:

1. ALL INTERIOR WIRING SHALL BE RUN IN RIGID STEEL CONDUIT. ALL EXPOSED OR SURFACE OUTLET BOXES SHALL BE 'FS' SERIES WITH CAST HUBS, UON. CONDUIT RUN UNDERGROUND SHALL BE SCHEDULE-40 PVC. TRANSITION TO PVC-COATED RIGID STEEL BEFORE TURNING CONDUIT UP.
2. WHERE EXPOSED, ALL EXTERIOR WIRING SHALL BE RUN IN PVC-COATED RIGID STEEL CONDUIT. ALL EXTERIOR EXPOSED OR SURFACE OUTLET BOXES SHALL BE NEMA 4X METALLIC TYPE, UON.
3. UTILIZE 316 STAINLESS STEEL HARDWARE, STRAPS, UNISTRUT, FITTINGS, AND SUPPORTS FOR ALL EXPOSED EXTERIOR WORK AS REQUIRED.
4. UTILIZE RHW-2 OR USE-2 CONDUCTORS FOR ALL EXTERIOR AND UNDERGROUND WIRING. THHN IS PERMISSIBLE WITHIN BUILDINGS.

EXCAVATION NOTE:

MISS UTILITY OF VIRGINIA MUST BE CONTACTED BY THE CONTRACTOR THREE (3) DAYS MINIMUM PRIOR TO ANY AND ALL EXCAVATION. THE PROJECT AREA CONTAINS A HIGH CONCENTRATION OF UNDERGROUND UTILITIES. EXCAVATE WITH CAUTION.

EXISTING CONDITIONS NOTE:

THE CONTRACTOR SHALL VISIT THE EXISTING SITE PRIOR TO BID IN ORDER TO BECOME FAMILIAR WITH THE EXISTING CONDITIONS AND IN ORDER TO AVOID CONFLICTS. LACK OF KNOWLEDGE OF EXISTING CONDITIONS SHALL NOT BE A BASIS FOR CHANGE ORDERS.

ABBREVIATIONS

A	AMPERE
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
ATS	AUTOMATIC TRANSFER SWITCH
BC	BARE COPPER
BFG	BELOW FINISHED GRADE
C	CONDUIT
CFCI	CONTRACTOR FURNISHED, CONTRACTOR INSTALLED
CKT	CIRCUIT
CB	CIRCUIT BREAKER
DE	DOMINION ENERGY
EBU	EMERGENCY BATTERY UNIT
EC	EMPTY CONDUIT
ECB	ENCLOSED CIRCUIT BREAKER
EF	EXHAUST FAN
ETR	EXISTING TO REMAIN
EWC	ELECTRIC WATER COOLER
EWH	ELECTRIC WATER HEATER
EXIST	EXISTING
FLA	FULL LOAD AMPS
GFI	GROUND FAULT INTERRUPTER
GND	GROUND
HP	HORSE POWER/HEAT PUMP
KAIC	THOUSAND AMPERE INTERRUPTING CAPACITY
KVA	KILO-VOLT-AMPERES
KW	KILO-WATTS
LSI	LONG TIME, SHORT TIME, INSTANTANEOUS
LSIG	LONG TIME, SHORT TIME, INSTANTANEOUS, GROUND
LTG	LIGHTING
MCA	MINIMUM CIRCUIT AMPS
MCB	MAIN CIRCUIT BREAKER
MFR	MANUFACTURER
MLO	MAIN LUGS ONLY
MTD	MOUNTED
NEC	NATIONAL ELECTRICAL CODE
NF	NON-FUSED
NIC	NOT IN CONTRACT
NLEPR	NO LEAD ETHYLENE PROPYLENE RUBBER
NTS	NOT TO SCALE
OC	ON CENTER
OFCI	OWNER FURNISHED, CONTRACTOR INSTALLED
OFOI	OWNER FURNISHED, OWNER INSTALLED
P	POLE
PF	POWER FACTOR
PL	PROPERTY LINE
PNL	PANEL
Ø	PHASE
PRI	PRIMARY
RECEPT	RECEPTACLE
RTU	ROOF TOP UNIT
SE	SERVICE ENTRANCE
SEC	SECONDARY
SPD	SURGE PROTECTION DEVICE
TBB	TELEPHONE BACKBOARD
TYP	TYPICAL
UON	UNLESS OTHERWISE NOTED
V	VOLT
VFD	VARIABLE FREQUENCY DRIVE
W	WATTS/WIRE
WG	WIRE GUARD
WP	WEATHERPROOF

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Drawn By:	MLC
Checked By:	JSB
Scale:	AS NOTED
Date:	10-17-2022

SEAL

No.	DATE	DESCRIPTION

REVISIONS

VIRGINIA

CHESAPEAKE BAY BRIDGE TUNNEL
NORTH SUBSTATION POWER UPGRADES
CAPE CHARLES

GENERAL NOTES, LEGEND, AND ABBREVIATIONS

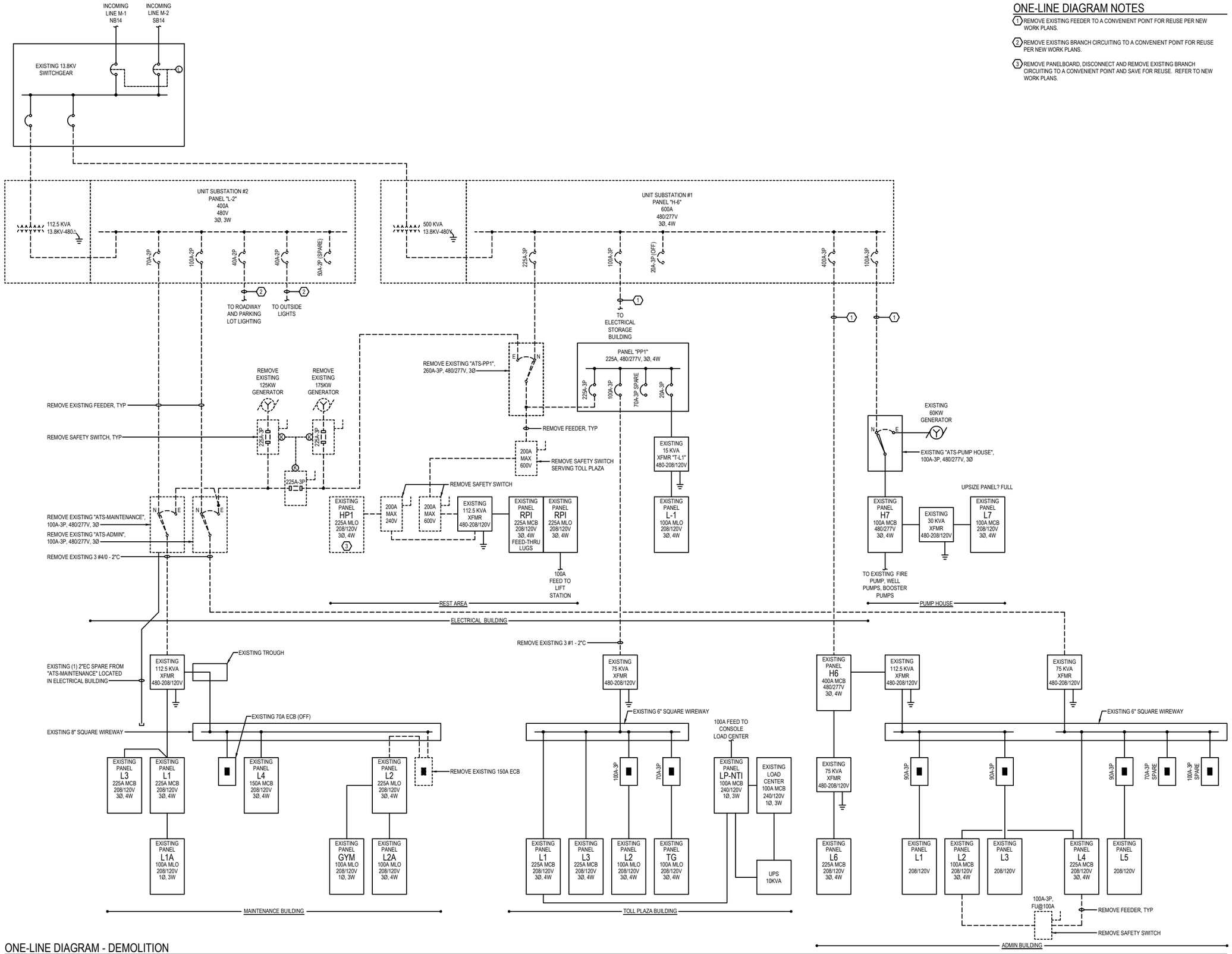
PROJECT No: 22130

E001

SHEET 3 OF 11

ONE-LINE DIAGRAM NOTES

1. REMOVE EXISTING FEEDER TO A CONVENIENT POINT FOR REUSE PER NEW WORK PLANS.
2. REMOVE EXISTING BRANCH CIRCUITING TO A CONVENIENT POINT FOR REUSE PER NEW WORK PLANS.
3. REMOVE PANELBOARD, DISCONNECT AND REMOVE EXISTING BRANCH CIRCUITING TO A CONVENIENT POINT AND SAVE FOR REUSE. REFER TO NEW WORK PLANS.



ONE-LINE DIAGRAM - DEMOLITION

NO SCALE

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NORTH SUBSTATION POWER UPGRADES

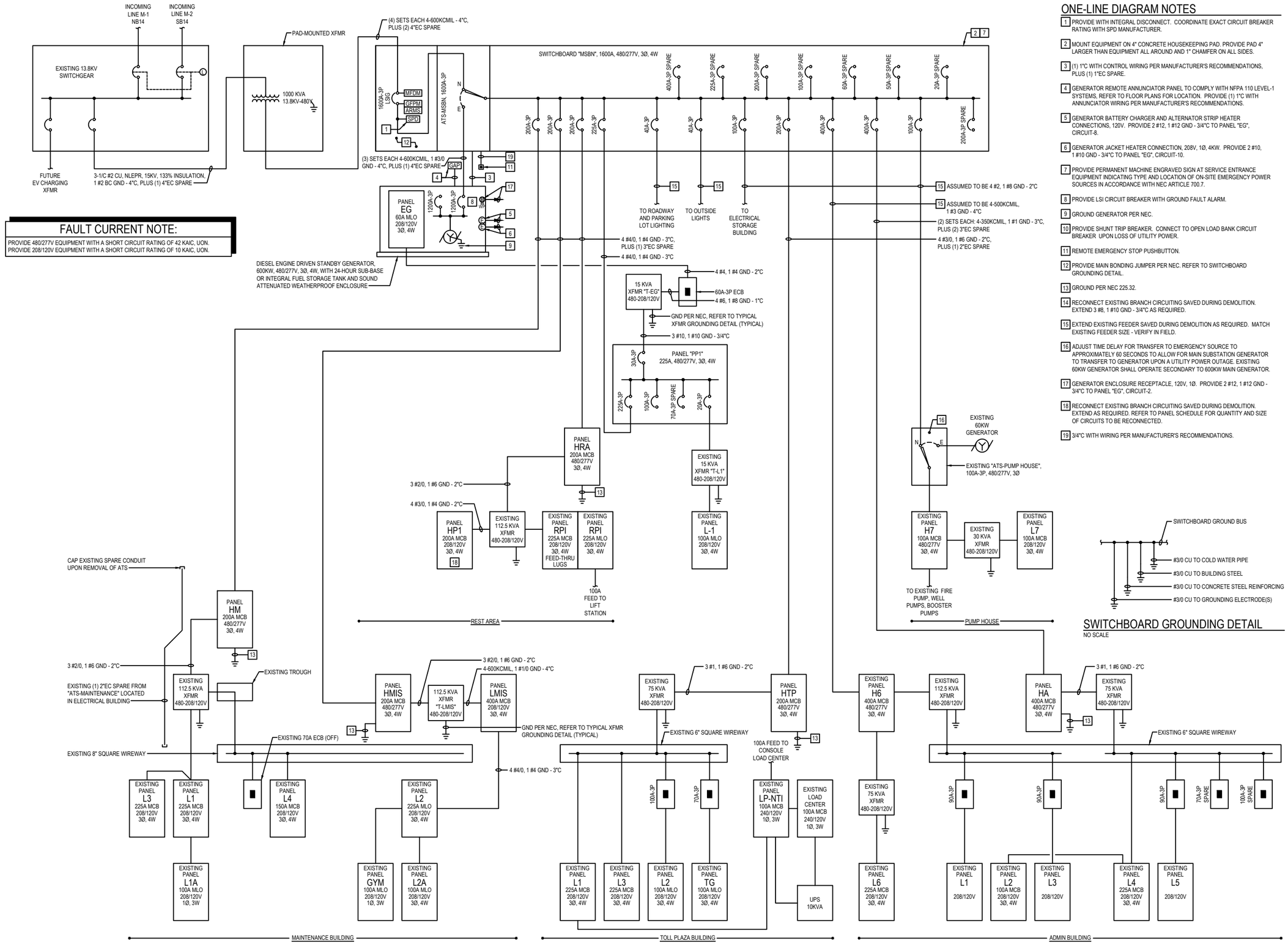
CAPE CHARLES

ONE-LINE DIAGRAM - DEMOLITION

PROJECT No: 22130

E002

SHEET 4 OF 11



FAULT CURRENT NOTE:

PROVIDE 480/277V EQUIPMENT WITH A SHORT CIRCUIT RATING OF 42 KAIC, UON.
PROVIDE 208/120V EQUIPMENT WITH A SHORT CIRCUIT RATING OF 10 KAIC, UON.

ONE-LINE DIAGRAM NOTES

1. PROVIDE WITH INTEGRAL DISCONNECT. COORDINATE EXACT CIRCUIT BREAKER RATING WITH SPD MANUFACTURER.
2. MOUNT EQUIPMENT ON 4" CONCRETE HOUSEKEEPING PAD. PROVIDE PAD 4" LARGER THAN EQUIPMENT ALL AROUND AND 1" CHAMFER ON ALL SIDES.
3. (1) 1"C WITH CONTROL WIRING PER MANUFACTURER'S RECOMMENDATIONS, PLUS (1) 1"EC SPARE.
4. GENERATOR REMOTE ANNUNCIATOR PANEL TO COMPLY WITH NFPA 110 LEVEL-1 SYSTEMS, REFER TO FLOOR PLANS FOR LOCATION. PROVIDE (1) 1"C WITH ANNUNCIATOR WIRING PER MANUFACTURER'S RECOMMENDATIONS.
5. GENERATOR BATTERY CHARGER AND ALTERNATOR STRIP HEATER CONNECTIONS, 120V. PROVIDE 2 #12, 1 #12 GND - 3/4"C TO PANEL "EG", CIRCUIT-8.
6. GENERATOR JACKET HEATER CONNECTION, 208V, 1Ø, 4KW. PROVIDE 2 #10, 1 #10 GND - 3/4"C TO PANEL "EG", CIRCUIT-10.
7. PROVIDE PERMANENT MACHINE ENGRAVED SIGN AT SERVICE ENTRANCE EQUIPMENT INDICATING TYPE AND LOCATION OF ON-SITE EMERGENCY POWER SOURCES IN ACCORDANCE WITH NEC ARTICLE 700.7.
8. PROVIDE LSI CIRCUIT BREAKER WITH GROUND FAULT ALARM.
9. GROUND GENERATOR PER NEC.
10. PROVIDE SHUNT TRIP BREAKER. CONNECT TO OPEN LOAD BANK CIRCUIT BREAKER UPON LOSS OF UTILITY POWER.
11. REMOTE EMERGENCY STOP PUSHBUTTON.
12. PROVIDE MAIN BONDING JUMPER PER NEC. REFER TO SWITCHBOARD GROUNDING DETAIL.
13. GROUND PER NEC 225.32.
14. RECONNECT EXISTING BRANCH CIRCUITING SAVED DURING DEMOLITION. EXTEND 3 #8, 1 #10 GND - 3/4"C AS REQUIRED.
15. EXTEND EXISTING FEEDER SAVED DURING DEMOLITION AS REQUIRED. MATCH EXISTING FEEDER SIZE - VERIFY IN FIELD.
16. ADJUST TIME DELAY FOR TRANSFER TO EMERGENCY SOURCE TO APPROXIMATELY 60 SECONDS TO ALLOW FOR MAIN SUBSTATION GENERATOR TO TRANSFER TO GENERATOR UPON A UTILITY POWER OUTAGE. EXISTING 60KW GENERATOR SHALL OPERATE SECONDARY TO 600KW MAIN GENERATOR.
17. GENERATOR ENCLOSURE RECEPTACLE, 120V, 1Ø. PROVIDE 2 #12, 1 #12 GND - 3/4"C TO PANEL "EG", CIRCUIT-2.
18. RECONNECT EXISTING BRANCH CIRCUITING SAVED DURING DEMOLITION. EXTEND AS REQUIRED. REFER TO PANEL SCHEDULE FOR QUANTITY AND SIZE OF CIRCUITS TO BE RECONNECTED.
19. 3/4"C WITH WIRING PER MANUFACTURER'S RECOMMENDATIONS.

SWITCHBOARD GROUNDING DETAIL

NO SCALE

ONE-LINE DIAGRAM - NEW WORK

NO SCALE

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NORTH SUBSTATION POWER UPGRADES
CAPE CHARLES

ONE-LINE DIAGRAM - NEW WORK

PROJECT No: 22130

E003

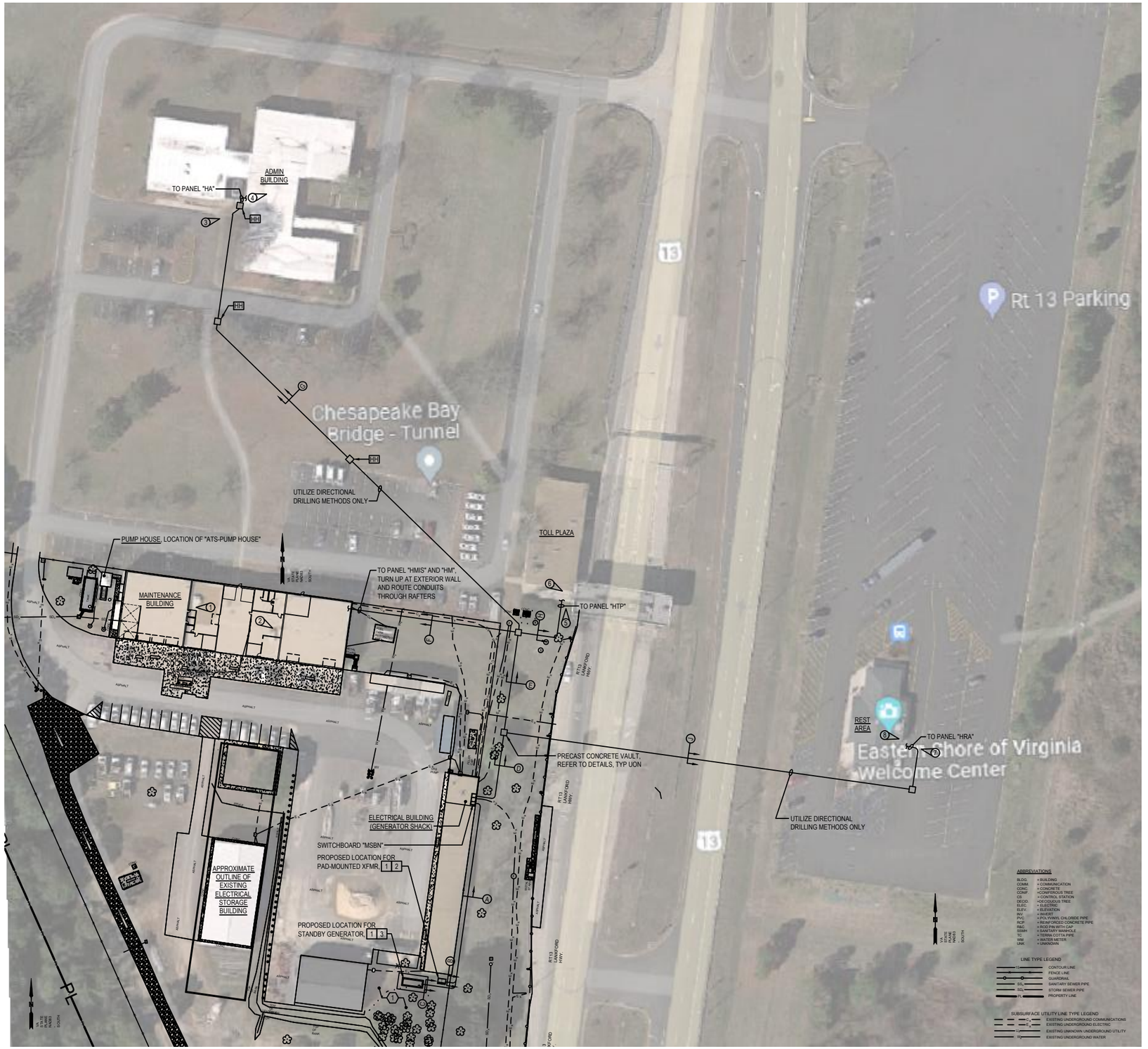
SHEET 5 OF 11

DEMOLITION NOTES THIS SHEET

1. REMOVE EXISTING VEGETATION AND GRADE AS REQUIRED TO ACCOMMODATE NEW WORK THIS AREA.

NEW WORK NOTES THIS SHEET

1. REFER TO ONE-LINE DIAGRAM AND DETAILS.
2. MAINTAIN 5'-0" CLEAR ON ALL SIDES AND 10'-0" CLEAR IN FRONT OF XFMR.
3. MAINTAIN 4'-0" CLEAR ON ALL SIDES OF GENERATOR.



N

PARTIAL SITE PLAN
SCALE: 1"=40'-0"

EXCAVATION NOTE:

MISS UTILITY OF VIRGINIA MUST BE CONTACTED BY THE CONTRACTOR THREE (3) DAYS MINIMUM PRIOR TO ANY AND ALL EXCAVATION. THE PROJECT AREA CONTAINS A HIGH CONCENTRATION OF UNDERGROUND UTILITIES. EXCAVATE WITH CAUTION.

GRAPHIC SCALES

1" = 40'-0" 40' 20' 0' 40' 80' 120'

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NORTH SUBSTATION POWER UPGRADES

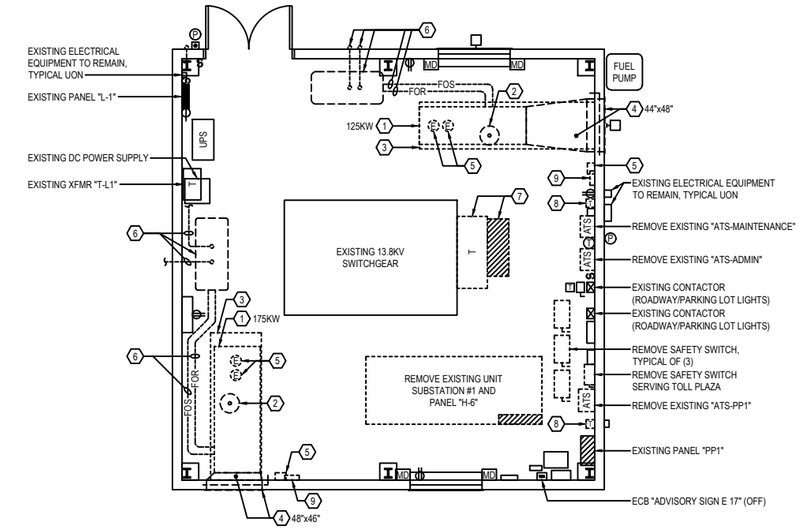
CAPE CHARLES

PARTIAL SITE PLAN

PROJECT No: 22130

E101

SHEET 6 OF 11

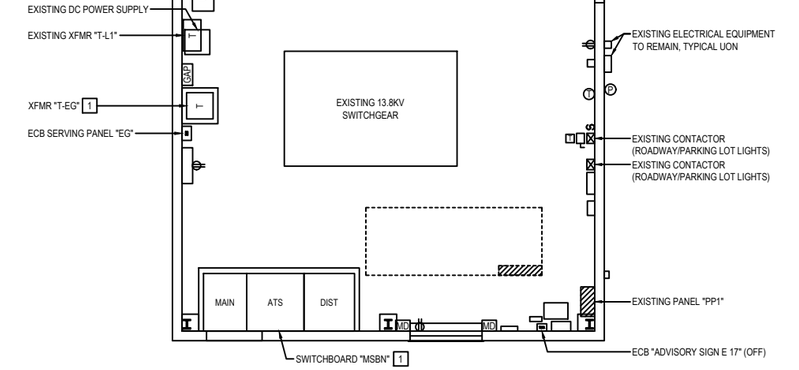


PARTIAL ELECTRICAL BUILDING FLOOR PLAN - DEMOLITION

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

DEMOLITION NOTES THIS SHEET

1. REMOVE DIESEL ENGINE GENERATOR AND ASSOCIATED SUPPORTS
2. REMOVE VERTICAL MUFFLER AND ASSOCIATED EXHAUST PIPING AND THIMBLE THROUGH ROOF. CAP EXISTING ROOF PENETRATION WITH INSULATED ALUMINUM ROOF CAP, CAULK AND SEAL WEATHERTIGHT.
3. REMOVE CONCRETE PAD TO FINISH FLOOR. GRIND FLUSH AND SMOOTH.
4. REMOVE RADIATOR EXHAUST DUCT, DAMPERS, AND LOUVER (SIZE IS AS INDICATED). REPAIR TO MATCH ADJACENT CONSTRUCTION.
5. DISCONNECT GENERATOR COOLANT HEATER AND BATTERY CHARGER AND REMOVE ASSOCIATED CIRCUITS BACK TO SOURCE.
6. REMOVE +/- 300 GALLON DOUBLE WALL DIESEL FUEL STORAGE TANK COMPLETE. REMOVE FILL AND VENT PIPING, SUPPORTS, AND ALL ASSOCIATED FOS/FOR PIPING. DRAIN, DESLUGE, PURGE, AND CERTIFY GAS FREE PRIOR TO REMOVAL. CLEAN AND DISPOSE OF FUEL OIL TANK PER GOVERNING REGULATIONS.
7. REMOVE UNIT SUBSTATION #2 TRANSFORMER AND PANEL "L-2".
8. REMOVE CONTROL POWER TRANSFORMER ASSOCIATED WITH ATS.
9. REMOVE JUNCTION BOX SERVING GENERATOR SYSTEMS.



PARTIAL ELECTRICAL BUILDING FLOOR PLAN - NEW WORK

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

NEW WORK NOTES THIS SHEET

1. MOUNT EQUIPMENT ON 4" CONCRETE HOUSEKEEP PAD.

GRAPHIC SCALES

1/4" = 1'-0" 5' 0' 5' 10'

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NORTH SUBSTATION POWER UPGRADES

CAPE CHARLES

FLOOR PLANS

PROJECT No: 22130

E201

SHEET 7 OF 11

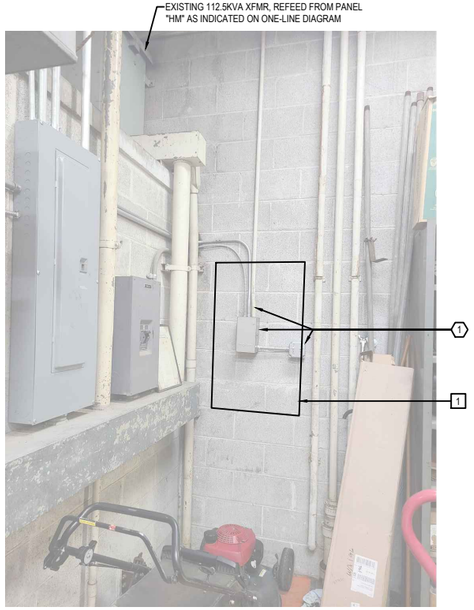

PHOTO-1 ①
NO SCALE

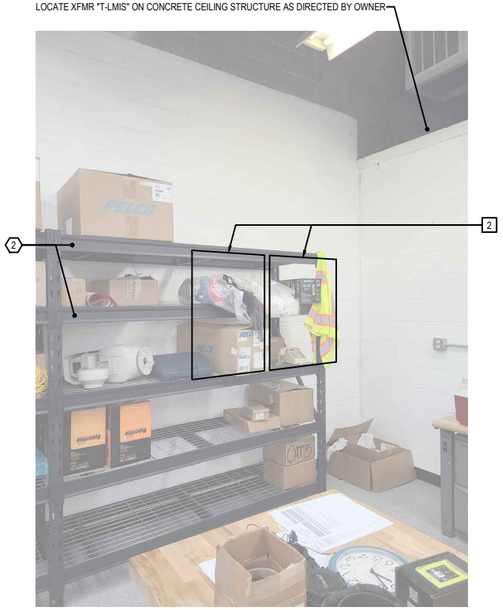

PHOTO-2 ②
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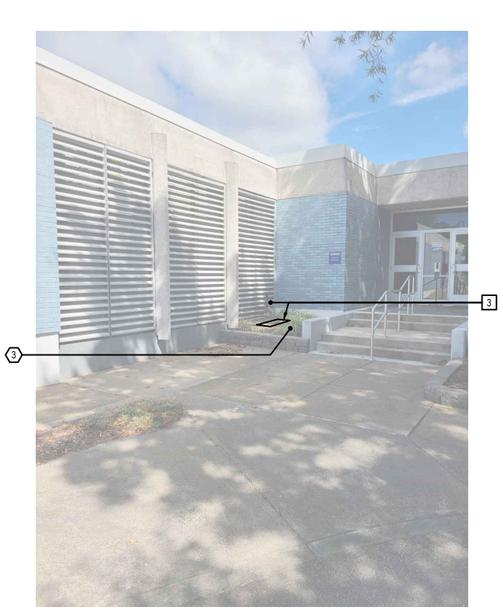

PHOTO-3 ③
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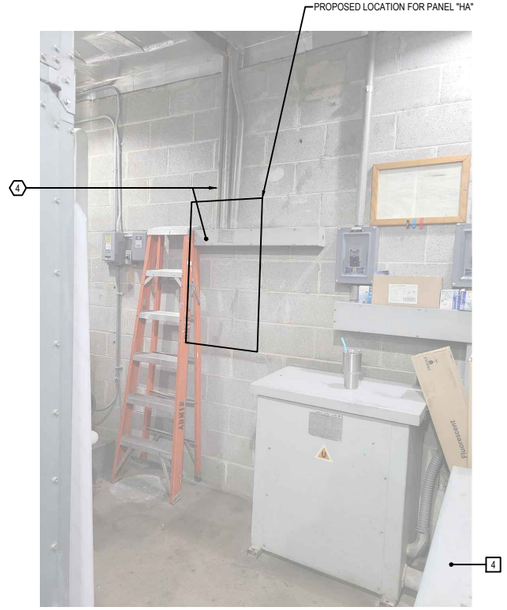

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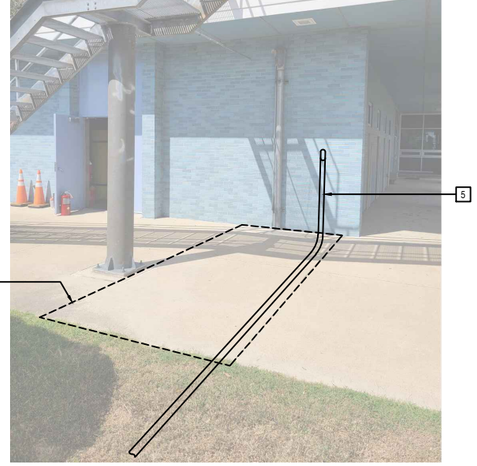

PHOTO-5 ⑤
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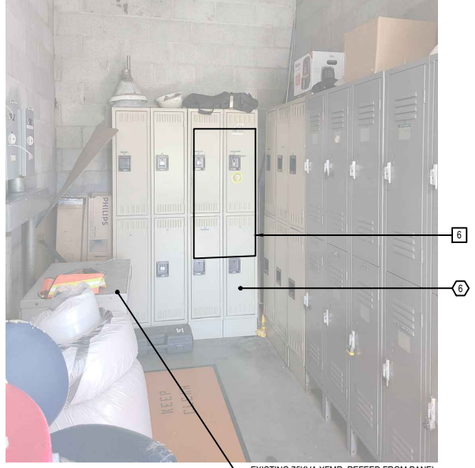

PHOTO-6 ⑥
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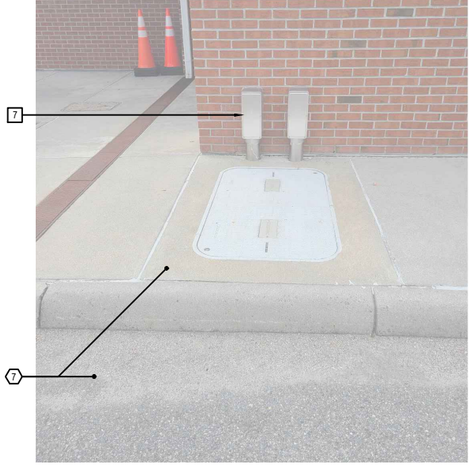

PHOTO-7 ⑦
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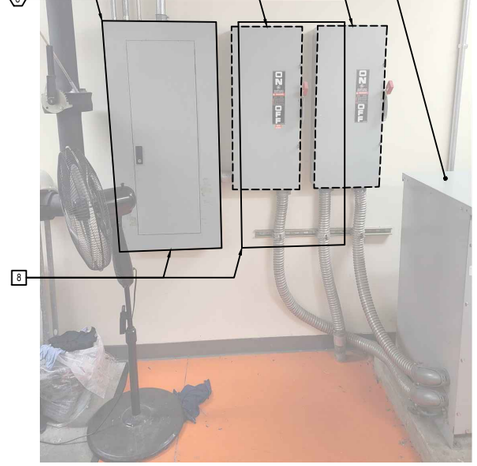

PHOTO-8 ⑧
NO SCALE

DEMOLITION NOTES THIS SHEET

1. RELOCATE EXISTING LIGHTING CONTROLS AS REQUIRED TO ACCOMMODATE INSTALLATION OF PANEL "HM".
2. RELOCATE EXISTING SHELVING AS DIRECTED BY OWNER AND REQUIRED TO ACCOMMODATE INSTALLATION OF PANEL "HMIS" AND "LMIS".
3. REMOVE EXISTING VEGETATION AS REQUIRED TO ACCOMMODATE HANDHOLE INSTALLATION.
4. RELOCATE EXISTING TROUGH AND BRANCH CIRCUITING AS REQUIRED TO ACCOMMODATE INSTALLATION OF PANEL "HA".
5. SAWCUT AND REMOVE EXISTING SIDEWALK AS REQUIRED TO ACCOMMODATE PANEL "HTP" FEEDER INSTALLATION. REPAIR TO MATCH EXISTING UPON COMPLETION OF NEW WORK.
6. REMOVE/RELOCATE EXISTING LOCKERS AS DIRECTED BY OWNER TO ACCOMMODATE INSTALLATION OF PANEL "HTP".
7. SAWCUT AND REMOVE EXISTING SIDEWALK/ASPHALT PAVEMENT AS REQUIRED TO INSTALL PANEL "HRA" FEEDER. REPAIR TO MATCH EXISTING UPON COMPLETION OF NEW WORK.
8. REMOVE EXISTING SAFETY SWITCHES AND PANEL "HP1", REFER TO ONE-LINE DIAGRAMS.

NEW WORK NOTES THIS SHEET

1. PROPOSED LOCATION FOR PANEL "HM".
2. PROPOSED LOCATIONS FOR PANEL "HMIS" AND "LMIS".
3. PROPOSED LOCATION FOR HANDHOLE. TURN FEEDER UP AND ROUTE THROUGH EXISTING LOUVERED OPENING TO PANEL "HA".
4. EXISTING 75KVA XFMR, RE-FEED FROM PANEL "HA" AS INDICATED ON ONE-LINE DIAGRAM.
5. PROPOSED ROUTING FOR PANEL "HTP" FEEDER, REFER TO ONE-LINE DIAGRAM.
6. PROPOSED LOCATION FOR PANEL "HTP".
7. UTILIZE EXISTING SPARE CONDUIT PATHWAY FROM PULLBOX INTO REST AREA BUILDING.
8. PROPOSED LOCATIONS FOR PANELS "HRA" AND "HP1".

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CHESAPEAKE BAY BRIDGE TUNNEL
NORTH SUBSTATION POWER UPGRADES

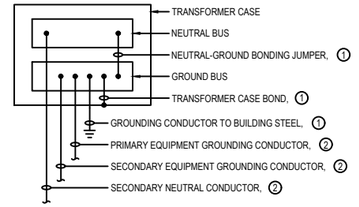
CAPE CHARLES

PHOTOS

PROJECT No: 22130

E301

SHEET 8 OF 11



TYPICAL XFMR GROUNDING DETAIL NOTES:

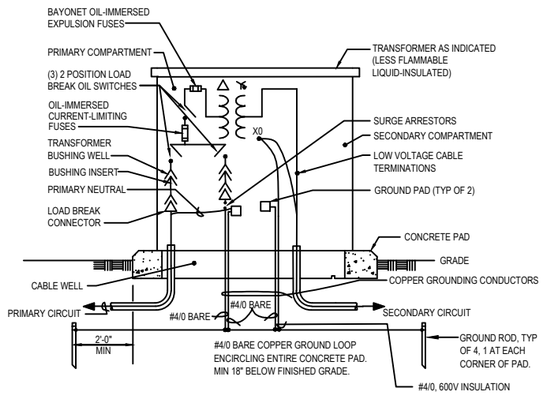
1. GROUNDING ELECTRODE CONDUCTOR SIZES:
   15KVA: #8 CU GND - 1/2"C
   75KVA: #2 CU GND - 1/2"C
   112.5KVA: #1/0 CU GND - 1/2"C

2. REFER TO ONE-LINE DIAGRAM FOR CONDUCTOR SIZES.

TYPICAL XFMR GROUNDING DETAIL

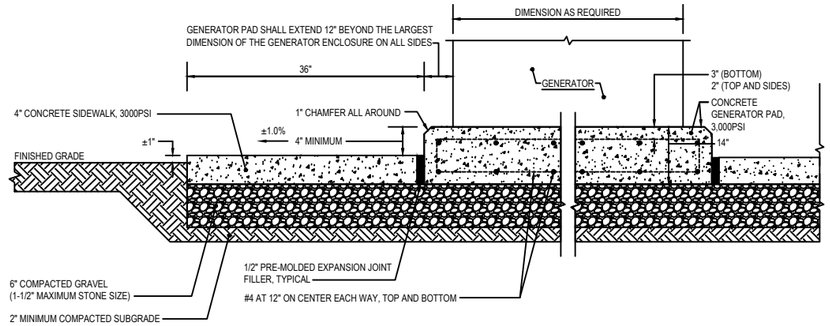
NO SCALE

NOTE: DESIGN BASED ON EATON "COOPER POWER SERIES" THREE-PHASE TRANSFORMER.



PAD-MOUNTED TRANSFORMER DETAIL

NO SCALE



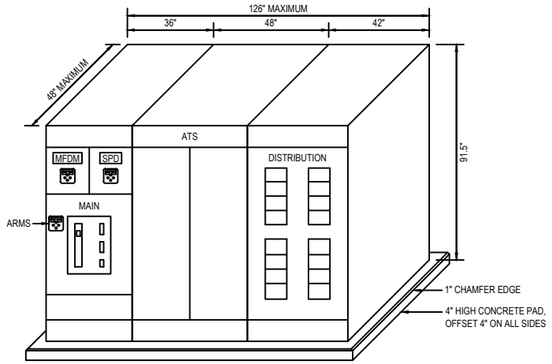
NOTES:

1. PROVIDE TOOLED CONTROL JOINTS IN SIDEWALK AT 6'-0" ON CENTER.
2. PROVIDE BROOM FINISH IN DIRECTION PERPENDICULAR TO SIDEWALK DIRECTION.
3. SLOPE CONCRETE SIDEWALK TO DIRECT STORMWATER RUNOFF AWAY FROM THE GENERATOR PAD.

GENERATOR PAD AND CONCRETE SIDEWALK DETAIL

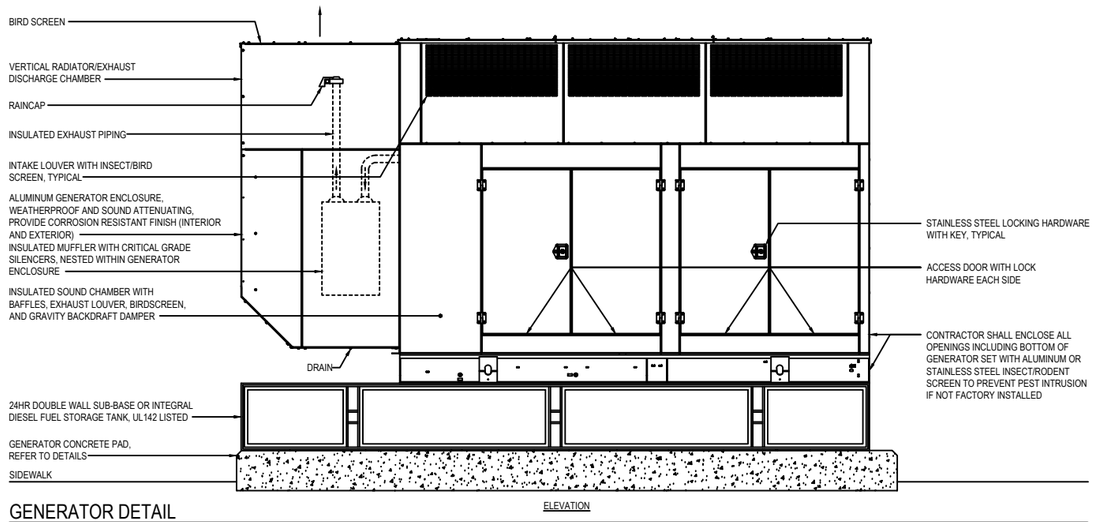
NO SCALE

NOTE: DESIGN BASED ON SQUARE-D. SWITCHBOARD SHALL BE CONFIGURED FOR INCOMING UTILITY AND EMERGENCY FEEDERS OVERHEAD



SWITCHBOARD "MSBN" ELEVATION

NO SCALE



GENERATOR DETAIL

NO SCALE

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NORTH SUBSTATION POWER UPGRADES

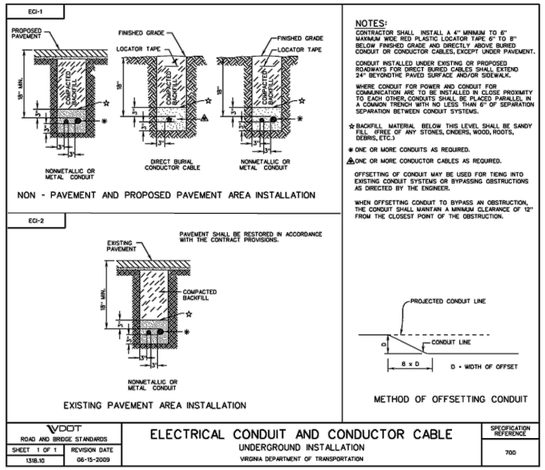
CAPE CHARLES

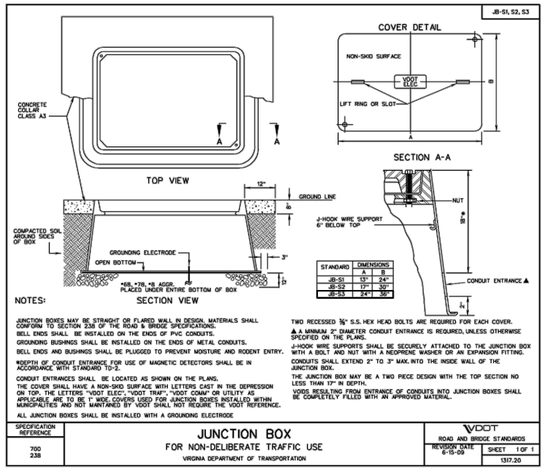
DETAILS

PROJECT No: 22130

E501

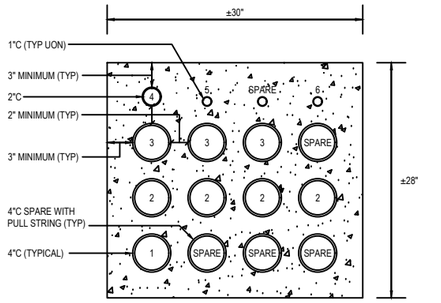
SHEET 9 OF 11





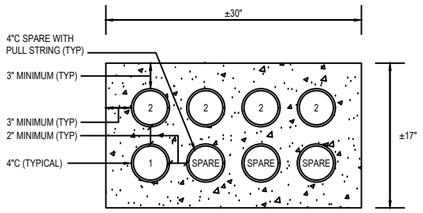
HANDHOLE DETAIL HH

NO SCALE



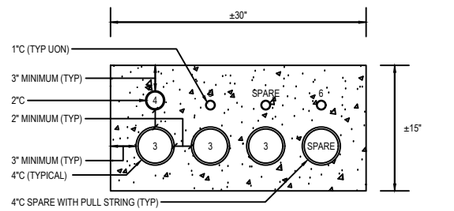
DUCTBANK TYPE-A (CONCRETE ENCASED)

NO SCALE



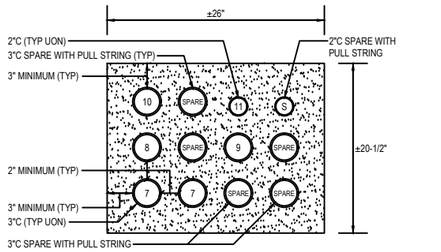
DUCTBANK TYPE-B (CONCRETE ENCASED)

NO SCALE



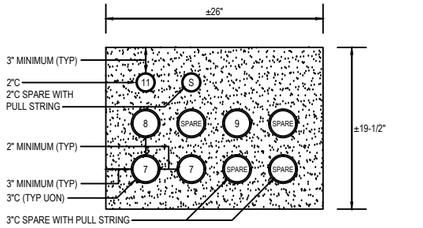
DUCTBANK TYPE-C (CONCRETE ENCASED)

NO SCALE



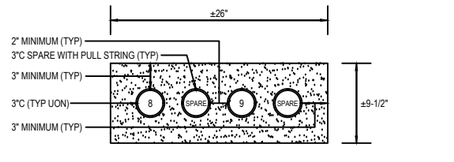
DUCTBANK TYPE-D (NON CONCRETE ENCASED)

NO SCALE



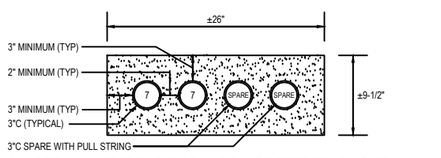
DUCTBANK TYPE-E (NON CONCRETE ENCASED)

NO SCALE



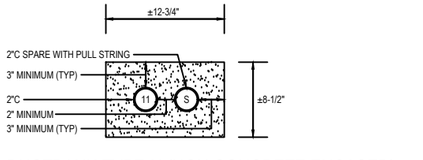
DUCTBANK TYPE-F (NON CONCRETE ENCASED)

NO SCALE



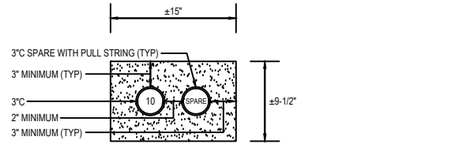
DUCTBANK TYPE-G (NON CONCRETE ENCASED)

NO SCALE



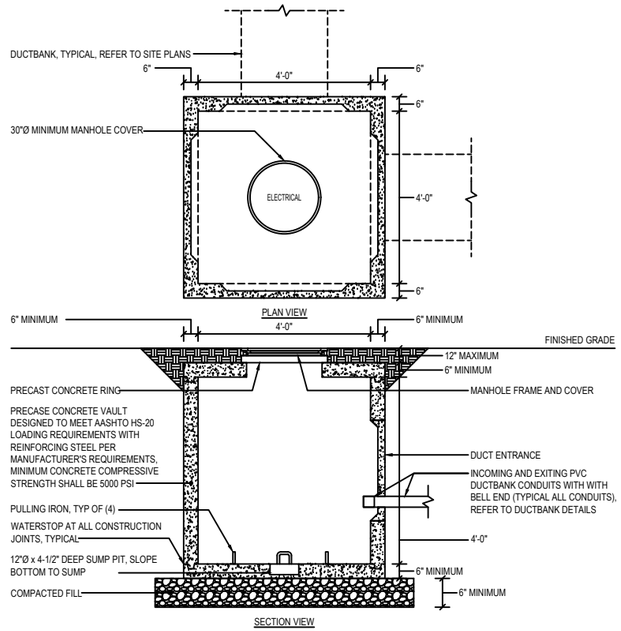
DUCTBANK TYPE-H (NON CONCRETE ENCASED)

NO SCALE



DUCTBANK TYPE-J (NON CONCRETE ENCASED)

NO SCALE



PRECAST CONCRETE VAULT DETAIL

NO SCALE

GENERAL TRENCH AND DUCTBANK NOTES:

1. THE CONTRACTOR MAY ALTER CONFIGURATIONS AS REQUIRED TO ACCOMMODATE ACTUAL PHYSICAL CONDITIONS ENCOUNTERED.
2. TOP OF DUCTBANK ENCASEMENT SHALL BE 24" BELOW FINISHED GRADE UNLESS APPROVED OTHERWISE BY THE ENGINEER OF RECORD.
3. PROVIDE DETECTABLE WARNING TAPE ABOVE DUCTBANKS AT 12" BELOW FINISHED GRADE.
4. MINIMUM CONCRETE COMPRESSIVE STRENGTH SHALL BE 4000 PSI.

UNDERGROUND DUCTBANK FEEDER SCHEDULE

CONDUIT DESIGNATION	DESCRIPTION
①	UNDERGROUND PRIMARY FEEDER
②	UNDERGROUND SECONDARY FEEDER
③	GENERATOR FEEDER
④	PANEL "EG" FEEDER
⑤	GENERATOR CONTROL WIRING
⑥	GENERATOR GAP WIRING
⑦	PANEL "HA" FEEDER
⑧	PANEL "HM" FEEDER
⑨	PANEL "HMIS" FEEDER
⑩	PANEL "HRA" FEEDER
⑪	PANEL "HTP" FEEDER

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RICHMOND, VIRGINIA 23294
(804) 270-7222

Designed By:	RTW
Drawn By:	MLC
Checked By:	JSB
Scale:	AS NOTED
Date:	10-17-2022

SEAL

No.	DESCRIPTION	DATE

REVISIONS

VIRGINIA

CHESAPEAKE BAY BRIDGE TUNNEL
NORTH SUBSTATION POWER UPGRADES

CAPE CHARLES

DETAILS

PROJECT No: 22130

E502

SHEET 10 OF 11

PANELBOARD HM SCHEDULE

SEE ONE-LINE DIAGRAM FOR RATINGS

LOAD SERVED	LOAD (AMPS) A	B	C	BKR TRIP	CKT NO.	PHASE A B C	CKT NO.	BKR TRIP	LOAD (AMPS) A	B	C	LOAD SERVED
SPARE				20/3P	1		2	20/1P				SPARE
							4	20/1P				SPARE
							6	20/1P				SPARE
SPARE				20/3P	7		8	20/1P				SPARE
							10	20/1P				SPARE
							12	20/1P				SPARE
SPARE				20/3P	13		14	20/1P				SPARE
							16	20/1P				SPARE
							18	20/1P				SPARE
SPARE				20/3P	19		20	50/3P				SPARE
SPARE				30/3P	25		26	70/3P				SPARE
SPARE				60/3P	31		32	100/3P				SPARE
SPARE				125/3P	37		38	175/3P	*			112.5 KVA XFMR
										*		
											*	
TOTAL	0.0	0.0	0.0						0.0	0.0	0.0	TOTAL

TOTAL CONNECTED AMPS A: 0.0 B: 0.0 C: 0.0

*DENOTES EXISTING LOAD

PANELBOARD HMIS SCHEDULE

SEE ONE-LINE DIAGRAM FOR RATINGS

LOAD SERVED	LOAD (AMPS) A	B	C	BKR TRIP	CKT NO.	PHASE A B C	CKT NO.	BKR TRIP	LOAD (AMPS) A	B	C	LOAD SERVED
SPARE				20/3P	1		2	20/1P				SPARE
							4	20/1P				SPARE
							6	20/1P				SPARE
SPARE				20/3P	7		8	20/1P				SPARE
							10	20/1P				SPARE
							12	20/1P				SPARE
SPARE				20/3P	13		14	20/1P				SPARE
							16	20/1P				SPARE
							18	20/1P				SPARE
SPARE				20/3P	19		20	50/3P				SPARE
SPARE				30/3P	25		26	70/3P				SPARE
SPARE				60/3P	31		32	100/3P				SPARE
SPARE				125/3P	37		38	175/3P	*			PANEL LMIS
										*		
											*	
TOTAL	0.0	0.0	0.0						0.0	0.0	0.0	TOTAL

TOTAL CONNECTED AMPS A: 0.0 B: 0.0 C: 0.0

*DENOTES EXISTING LOAD

PANELBOARD HRA SCHEDULE

SEE ONE-LINE DIAGRAM FOR RATINGS

LOAD SERVED	LOAD (AMPS) A	B	C	BKR TRIP	CKT NO.	PHASE A B C	CKT NO.	BKR TRIP	LOAD (AMPS) A	B	C	LOAD SERVED
SPARE				20/3P	1		2	20/1P				SPARE
							4	20/1P				SPARE
							6	20/1P				SPARE
SPARE				20/3P	7		8	20/1P				SPARE
							10	20/1P				SPARE
							12	20/1P				SPARE
SPARE				20/3P	13		14	20/1P				SPARE
							16	20/1P				SPARE
							18	20/1P				SPARE
SPARE				20/3P	19		20	50/3P				SPARE
SPARE				30/3P	25		26	70/3P				SPARE
SPARE				60/3P	31		32	100/3P				SPARE
SPARE				125/3P	37		38	175/3P	*			112.5 KVA XFMR
										*		
											*	
TOTAL	0.0	0.0	0.0						0.0	0.0	0.0	TOTAL

TOTAL CONNECTED AMPS A: 0.0 B: 0.0 C: 0.0

*DENOTES EXISTING LOAD

PANELBOARD HTP SCHEDULE

SEE ONE-LINE DIAGRAM FOR RATINGS

LOAD SERVED	LOAD (AMPS) A	B	C	BKR TRIP	CKT NO.	PHASE A B C	CKT NO.	BKR TRIP	LOAD (AMPS) A	B	C	LOAD SERVED
SPARE				20/3P	1		2	20/1P				SPARE
							4	20/1P				SPARE
							6	20/1P				SPARE
SPARE				20/3P	7		8	20/1P				SPARE
							10	20/1P				SPARE
							12	20/1P				SPARE
SPARE				20/3P	13		14	20/1P				SPARE
							16	20/1P				SPARE
							18	20/1P				SPARE
SPARE				20/3P	19		20	50/3P				SPARE
SPARE				30/3P	25		26	70/3P				SPARE
SPARE				60/3P	31		32	100/3P				SPARE
SPARE				125/3P	37		38	125/3P	*			75 KVA XFMR
										*		
											*	
TOTAL	0.0	0.0	0.0						0.0	0.0	0.0	TOTAL

TOTAL CONNECTED AMPS A: 0.0 B: 0.0 C: 0.0

*DENOTES EXISTING LOAD

PANELBOARD HA SCHEDULE

SEE ONE-LINE DIAGRAM FOR RATINGS

LOAD SERVED	LOAD (AMPS) A	B	C	BKR TRIP	CKT NO.	PHASE A B C	CKT NO.	BKR TRIP	LOAD (AMPS) A	B	C	LOAD SERVED
SPARE				20/3P	1		2	20/1P				SPARE
							4	20/1P				SPARE
							6	20/1P				SPARE
SPARE				20/3P	7		8	20/1P				SPARE
							10	20/1P				SPARE
							12	20/1P				SPARE
SPARE				20/3P	13		14	20/1P				SPARE
							16	20/1P				SPARE
							18	20/1P				SPARE
SPARE				20/3P	19		20	50/3P				SPARE
SPARE				30/3P	25		26	70/3P				SPARE
SPARE				60/3P	31		32	100/3P				SPARE
75 KVA XFMR	*			125/3P	37		38	175/3P				SPARE
		*										
			*									
TOTAL	0.0	0.0	0.0						0.0	0.0	0.0	TOTAL

TOTAL CONNECTED AMPS A: 0.0 B: 0.0 C: 0.0

*DENOTES EXISTING LOAD

PANELBOARD EG SCHEDULE

SEE ONE-LINE DIAGRAM FOR RATINGS

LOAD SERVED	LOAD (AMPS) A	B	C	BKR TRIP	CKT NO.	PHASE A B C	CKT NO.	BKR TRIP	LOAD (AMPS) A	B	C	LOAD SERVED
SPARE				20/1P	1		2	20/1P	3.0			GENSET RECEPTACLE
SPARE				20/1P	3		4	20/1P				SPARE
SPARE				20/1P	5		6	20/1P				SPARE
SPARE				20/1P	7		8	20/1P	8.0			BATTERY CHARGER
SPARE				20/1P	9		10	30/2P		19.2		JACKET HEATER
SPARE				20/1P	11						19.2	
TOTAL	0.0	0.0	0.0						11.0	19.2	19.2	TOTAL

TOTAL CONNECTED AMPS A: 11.0 B: 19.2 C: 19.2

PANELBOARD LMIS SCHEDULE

SEE ONE-LINE DIAGRAM FOR RATINGS

LOAD SERVED	LOAD (AMPS) A	B	C	BKR TRIP	CKT NO.	PHASE A B C	CKT NO.	BKR TRIP	LOAD (AMPS) A	B	C	LOAD SERVED
SPARE				20/1P	1		2	20/1P				SPARE
SPARE				20/1P	3		4	20/1P				SPARE
SPARE				20/1P	5		6	20/1P				SPARE
SPARE				20/1P	7		8	20/1P				SPARE
SPARE				20/1P	9		10	20/1P				SPARE
SPARE				20/1P	11		12	20/1P				SPARE
SPARE				20/1P	13		14	20/1P				SPARE
SPARE				20/1P	15		16	20/1P				SPARE
SPARE				20/1P	17		18	20/1P				SPARE
SPARE				20/1P	19		20	20/1P				SPARE
SPARE				20/1P	21		22	20/1P				SPARE
SPARE				20/1P	23		24	20/2P				SPARE
SPARE				20/1P	25							
SPARE				20/1P	27		28	20/2P				SPARE
SPARE				20/1P	29							
SPARE				100/3P	31		32	60/3P				SPARE
SPARE				100/3P	37		38	225/3P	*			PANEL L2
										*		
											*	
TOTAL	0.0	0.0	0.0						0.0	0.0	0.0	TOTAL

TOTAL CONNECTED AMPS A: 0.0 B: 0.0 C: 0.0

*DENOTES EXISTING LOAD

PANELBOARD HP1 SCHEDULE

SEE POWER RISER DIAGRAM FOR RATINGS

LOAD SERVED	LOAD (AMPS) A	B	C	BKR TRIP	WIRE SIZE	GND SIZE	COND SIZE	CKT NO.	PHASE A B C	CKT NO.	COND SIZE	GND SIZE	WIRE SIZE	BKR TRIP	LOAD (AMPS) A	B	C	LOAD SERVED
ROOF TOP UNIT	*			80/3P	4	8	1-1/4"	1		2	3/4"	10	8	35/3P	*			WATER HEATER
RTU-1		*														*		HWP-01
			*														*	
EXHAUST	*			20/3P	12	12	3/4"	7		8				20/3P				SPARE
ERU-1		*																
			*															
SPARE				20/1P				13		14				20/1P				SPARE
SPARE				20/1P				15		16				20/1P				SPARE
SPARE				20/1P				17		18				20/1P				SPARE
SPARE				20/1P				19		20				20/1P				SPARE
SPARE				20/1P				21		22				20/1P				SPARE
SPARE				20/1P				23		24				20/1P				SPARE
SPARE				20/1P				25		26				20/1P				SPARE
SPARE				20/1P				27		28				20/1P				SPARE
SPARE				20/1P				29		30				20/2P				SPARE
SPARE				20/1P				31										
SPARE				20/1P				33		34				20/2P				SPARE
SPARE				20/1P				35										
SPARE				20/1P				37		38				60/3P				SPARE
SPARE				20/1P				39										
SPARE				20/1P				41										
TOTAL	0.0	0.0	0.0												0.0	0.0	0.0	TOTAL

TOTAL CONNECTED AMPS A: 0.0 B: 0.0 C: 0.0

*DENOTES EXISTING LOAD

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CHESAPEAKE BAY BRIDGE TUNNEL
NORTH SUBSTATION POWER UPGRADES

PANEL SCHEDULES

PROJECT No: 22130

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SHEET 11 OF 11