

PORT OF PORT ANGELES BOATHAVEN MARINA SHORE POWER ADDITIONS PORT ANGELES, WA

PORT OF PORT ANGELES REPRESENTATIVES

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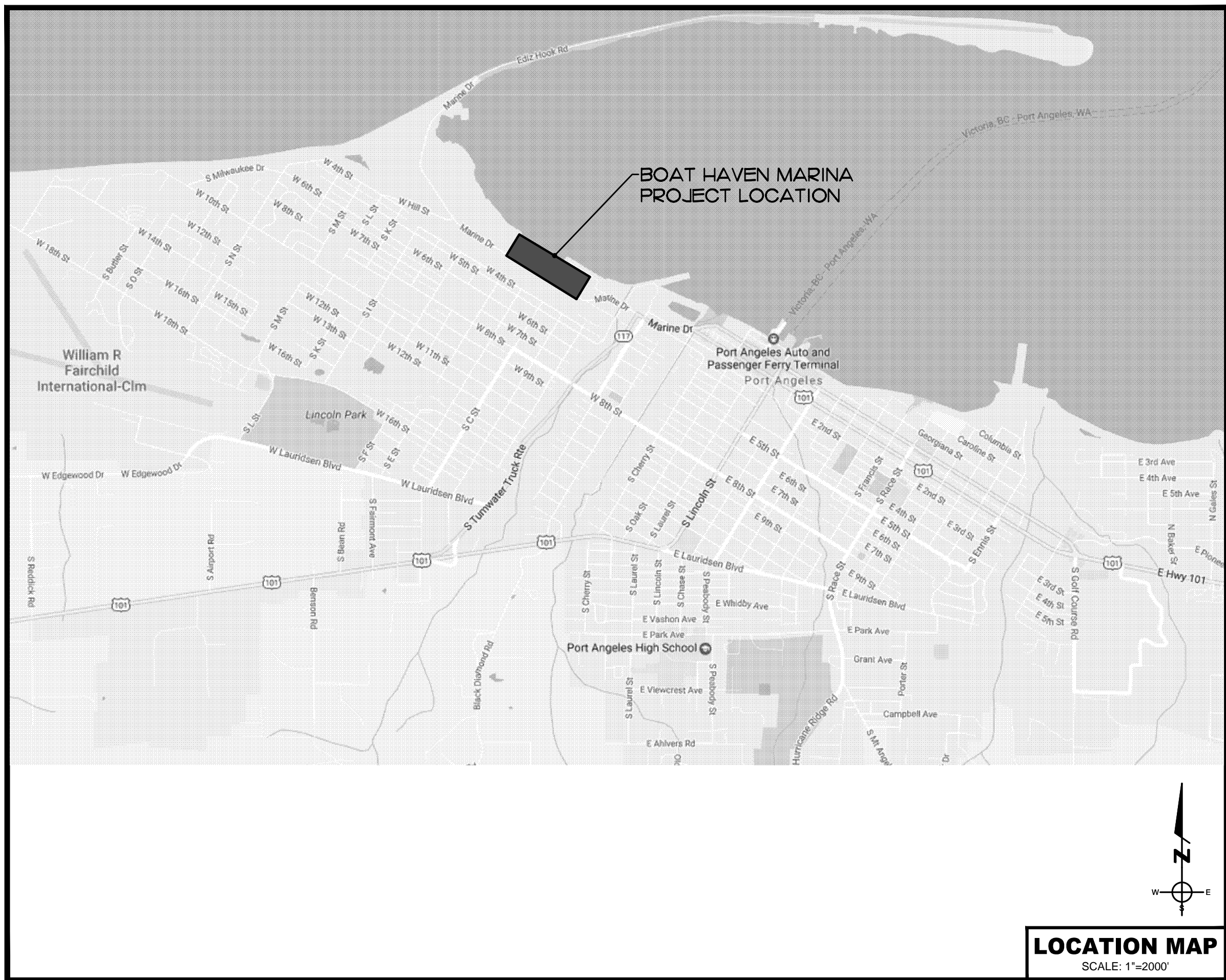
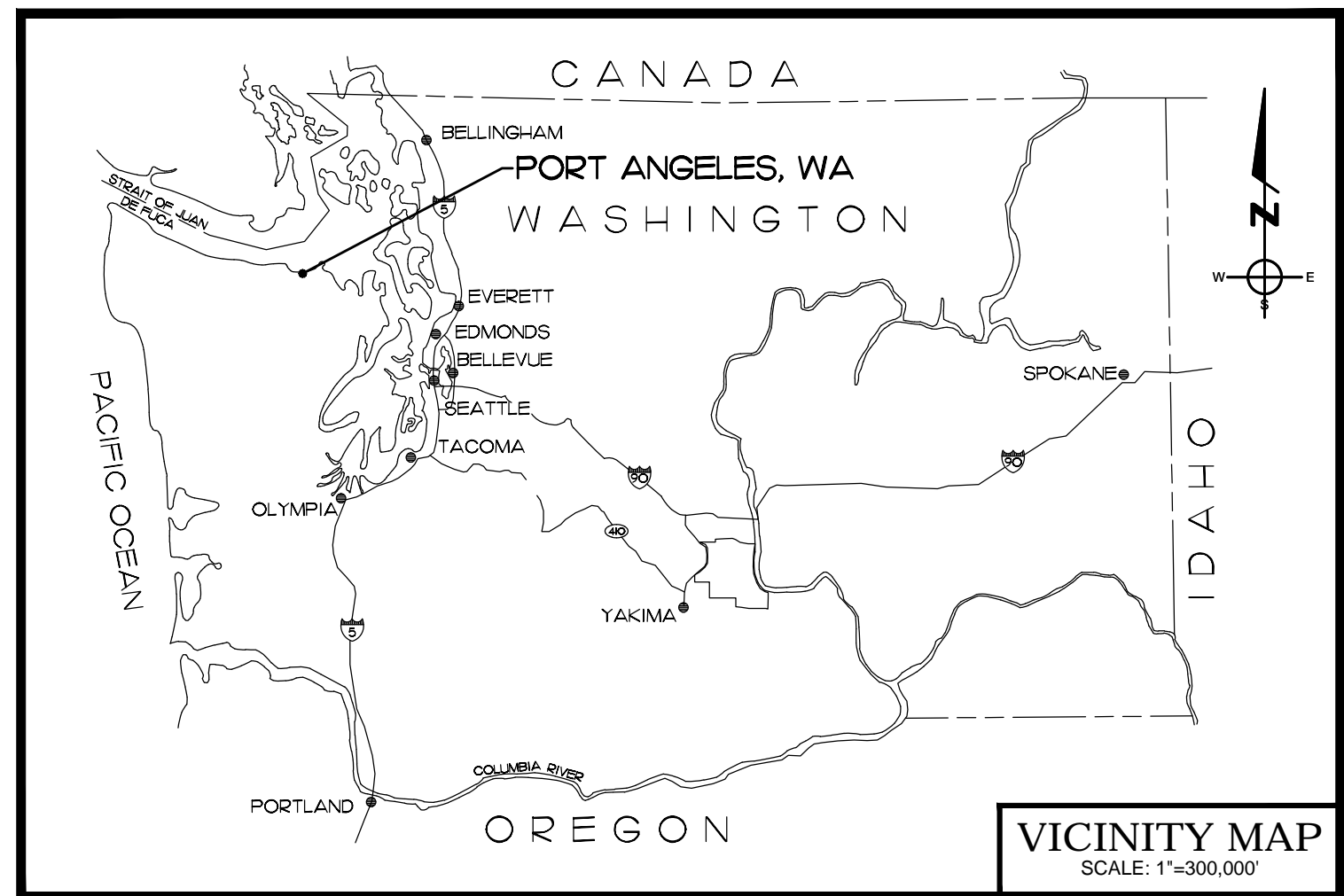
PROJECT TEAM

ELECTRICAL ENGINEER

BCE ENGINEERS, INC.
6021 12TH STREET EAST, SUITE 200
FIFE, WA 98424
PHONE : (253) 922-0446
FAX : (253) 922-0896
CONTACT : DAREN BITTERLING, P.E.

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REVISIONS		
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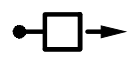
































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DRAWING No. 1 of 7

G-001

DATE: 08/14/2017
SUBMITTAL: FOR CONSTRUCTION
CONTRACT #: 41-3-02-00

ABBREVIATION			
A	AMMETER, AMPERE		
AC	ABOVE COUNTER	KCM	THOUSAND CIRCULAR MILS
AFF	ABOVE FINISHED FLOOR	kV	KILOVOLT
AFG	ABOVE FINISHED GRADE		
AHJ	AUTHORITY HAVING JURISDICTION	LA	LIGHTNING ARRESTOR
AIC	AMPERE INTERRUPTING CAPACITY	LC	LIGHTING CONTACTOR
AM	AMMETER		
ANN	ANNUNCIATOR	M	MAGNETIC COIL
ASYM	ASYMMETRICAL	MAINT	MAINTENANCE
ATS	AUTOMATIC TRANSFER SWITCH	MCC	MOTOR CONTROL CENTER
AUX	AUXILIARY	MDP	MAIN DISTRIBUTION PANEL
		MH	MANHOLE, METAL HALIDE
		MIN	MINIMUM
		MOV	METAL OXIDE VARISTOR
		MTG	MOUNTING
BF	BALLAST FACTOR		
BLDG	BUILDING	N	NEUTRAL, NEW
BRKR	BREAKER	NC	NORMALLY CLOSED
		NEMA	NATIONAL ELECTRICAL
			MANUFACTURERS ASSOCIATION
C	CONDUIT	NEUT	NEUTRAL
CATV	CABLE TELEVISION	NO	NORMALLY OPEN, NUMBER
CB	CIRCUIT BREAKER	NIC	NOT IN CONTRACT
CCTV	CLOSED CIRCUIT TELEVISION	NP	NAMEPLATE
CKT	CIRCUIT	NREC	NON-RESIDENTIAL ENERGY CODE
CL	CENTER LINE		
CLF	CURRENT LIMITING FUSE	ø	PHASE, DIAMETER
CLR	CLEAR	P	PANEL, POLE
CM	CIRCULAR MILS	PB	PUSH-BUTTON
COMM	COMMUNICATIONS	PF	POWER FACTOR
CONC	CONCRETE	PH	PHASE
CONT	CONTINUED	PIV	POST INDICATOR VALVE
CPT	CONTROL POWER TRANSFORMER	PNL	PANEL
CR	CONTROL RELAY	POMB	POSITION ORIENTED MOGUL BASE (SOCKET)
CT	CURRENT TRANSFORMER	PS	SCHEDULE
CTRL	CONTROL	SD	SMOKE DETECTOR
CU	COPPER	SHT	SHEET
		SUPV	SUPERVISOR
DDC	DEDICATED DIALER CIRCUIT	SW	SWITCH
DEM	DEMAND	SYM	SYMMETRICAL
DEMO	DEMOLITION		
DIM	DIMENSION	T	THERMOSTAT
DISC	DISCONNECT	TB	TERMINAL BLOCK, TRANSFORMER BANK
DN	DOWN	TEL,TELE	TELEPHONE
DS	DISCONNECT SWITCH	ITB	TELEPHONE TERMINAL BOARD
DWG	DRAWING	TYP	TYPICAL
		UG	UNDERGROUND
E	EMPTY, EXISTING	UH	UNIT HEATER
EF	EXHAUST FAN	UNO	UNLESS NOTED OTHERWISE
ELEC	ELECTRICAL	UPS	UNINTERRUPTIBLE POWER SUPPLY
ELEV	ELEVATION, ELEVATOR		
EMT	ELECTRICAL METALLIC TUBING	V	VOLTMETER, VOLT
EXIST	EXISTING		
		W	WIRE, WATT
F,FU	FUSE	W/	WITH
FACP	FIRE ALARM CONTROL PANEL	WHD	WATTHOUR DEMAND METER
FBOIC	FURNISHED BY OTHERS INSTALLED BY CONTRACTOR	W/O	WITHOUT
		WP	WEATHERPROOF
FLUOR	FLUORESCENT	XFMR	TRANSFORMER
FSA	FIRE SYSTEM ANNUNCIATOR		
FT	FOOT		
FVNR	FULL VOLTAGE NON-REVERSING		
G,GND,			
GRD	GROUND		
GA	GAUGE		
GALV	GALVANIZED		
GFI	GROUND FAULT INTERRUPTER		
GRC,GRS	GALVANIZED RIGID STEEL		
HH	HANDHOLE		
HP	HORSEPOWER		
HPS	HIGH PRESSURE SODIUM		
HWH	HOT WATER HEATER		
IC	INTERRUPTING CAPACITY		
JB,			
J-BOX	JUNCTION BOX		

ELECTRICAL LEGEND	
SYMBOL	DISCRIPTION
LIGHTING	
	RECESSED LIGHT FIXTURE IN BULL RAIL.
	POLE LIGHT FIXTURE (ARROW INDICATES DIRECTION OF AIMING FOR OPTICS)
RECEPTACLES	
	DUPLEX RECEPTACLE
	DUPLEX RECEPTACLE (G INDICATES GROUND FAULT CIRCUIT INTERRUPTER)
	SPECIAL PURPOSE OUTLET – 3ø, VOLTAGE AND AMPERES AS INDICATED
EQUIPMENT, WIRING AND RACEWAYS	
	CONDUIT STUB OUT (PROVIDE CONCRETE MARKER ON EXTERIOR)
	DEDICATED CONDUIT HOMERUN TO PANEL & CIRCUIT NUMBERS AS INDICATED ON PLANS
	RACEWAY CONCEALED IN WALL OR CEILING
	RACEWAY CONCEALED UNDERGROUND OR UNDER FLOOR SLAB
	MARKS INDICATE NUMBER OF #12 AWG UNLESS NOTED OTHERWISE
	GROUNDING CONDUCTOR
	FLEXIBLE CONDUIT
	GROUNDING SYSTEM PER CODE
	JUNCTION BOX – SIZE PER CODE
	MOTOR CONNECTION
	DISCONNECT SWITCH
	FUSED DISCONNECT SWITCH
	COMBINATION DISCONNECT / MAGNETIC MOTOR STARTER
	277/480 VOLT PANELBOARD
	120/208 VOLT PANELBOARD (OR AT RATED VOLTAGE AS NOTED)
	EXISTING PANELBOARD TO BE RETAINED
	MAIN DISTRIBUTION BOARD
	TRANSFORMER
	ENCLOSED CIRCUIT BREAKER, AMPERES AS INDICATED
	HANDHOLE
	MANHOLE – PRE-CAST CONCRETE W/COVER
	SURGE PROTECTOR DEVICE
	UTILITY POLE
	GROUND ROD 5/8"x10' COPPER CLAD STEEL. (T INDICATES PROVIDE WITH TEST WELL)
MISCELLANEOUS	
	CONSTRUCTION NOTES
	DEMOLITION NOTES
	W INDICATES WEATHERPROOF FOR ALL DEVICES, PROVIDE LOCKING COVER ON RECEPTACLES.
	ALL DEVICES WITH LIGHT LINE WEIGHT INDICATES EXISTING TO BE RETAINED
	ALL DEVICES WITH DASH LINE INDICATES EXISTING TO BE REMOVED

GENERAL NOTES (APPLIES TO ALL SHEETS)

- ALL EXTERIOR HARDWARE SHALL BE TYPE 316 STAINLESS STEEL UNLESS NOTED OTHERWISE.
- ALL EXTERIOR ENCLOSURES SHALL BE NEMA 4X.
- SEE SHEET E6.0 FOR FEEDER SCHEDULE.
- ALL CONDUITS INSTALLED ON THE WATER SIDE OF THE BULKHEAD SHALL BE FIBERGLASS REINFORCED THERMOSETTING RESIN CONDUIT INSTALLED PER THE MANUFACTURE'S RECOMMENDATIONS.
- ALL CONDUITS AND BOXES INSTALLED BELOW THE FLOAT DECK SHALL BE IP 68 AND SUBMERSIBLE.

PORT OF PORT ANGELES
BOAT HAVEN MARINA
SHORE POWER ADDITIONS
832 BOAT HAVEN DRIVE
PORT ANGELES, WA 98363

LEGEND & ABBREVIATIONS

REVISIONS		
NO.	DESCRIPTION	DATE

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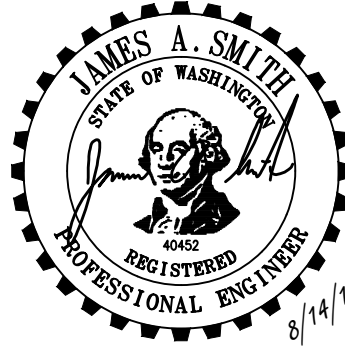
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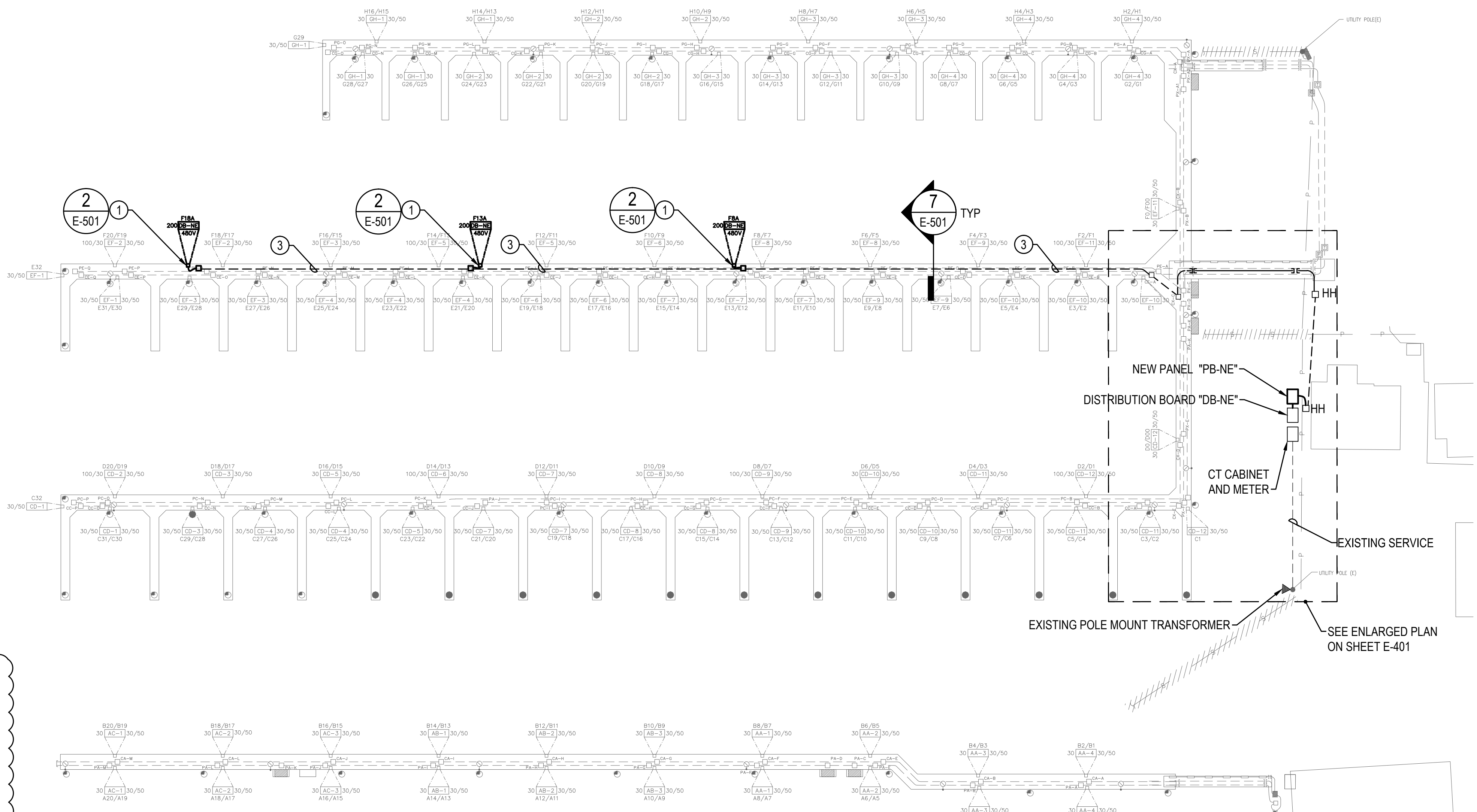
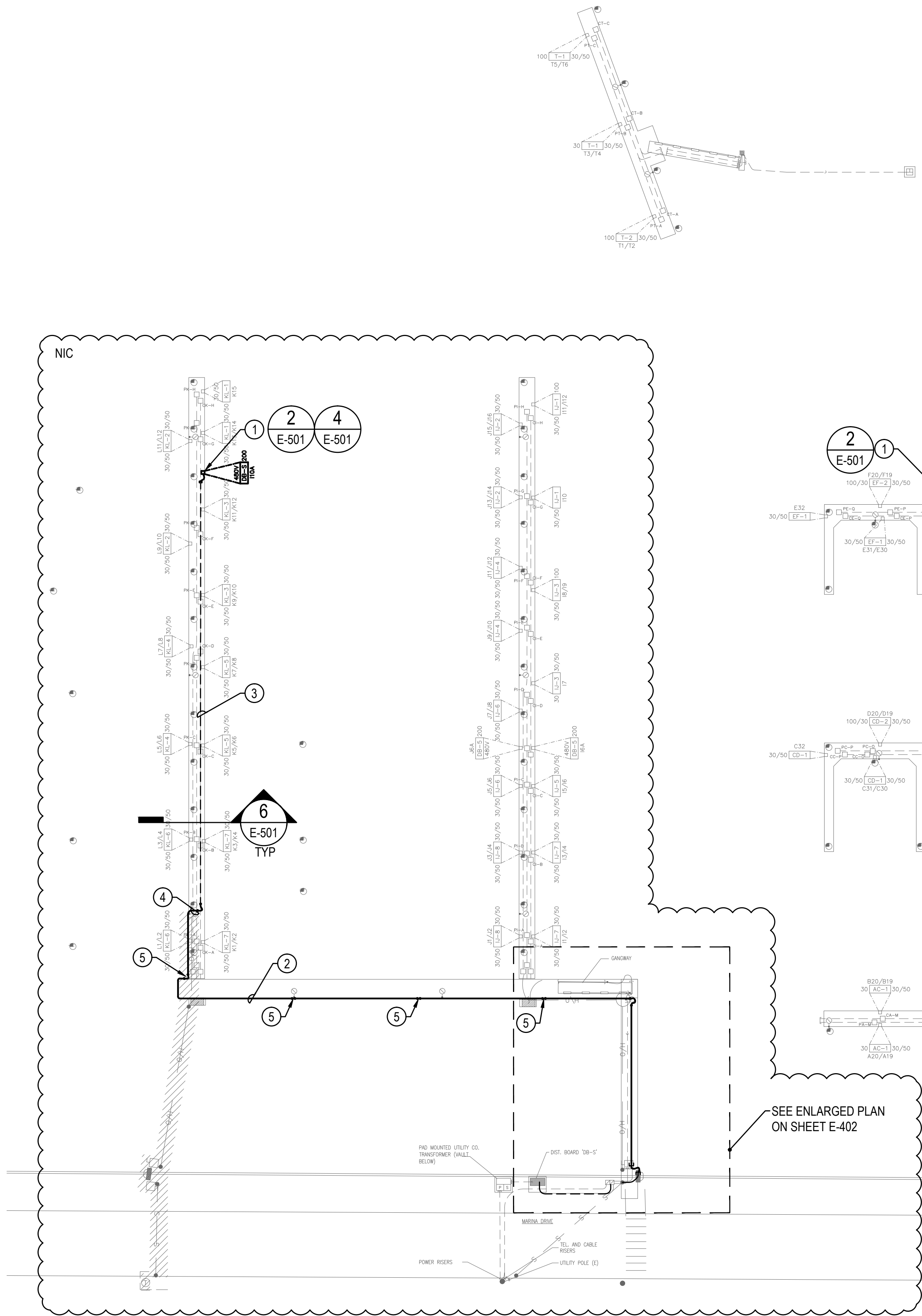
DRAWING No. 2 of 7

E-001

DATE: 08/14/2017
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CONTRACT #: 41-3-02-00



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GENERAL NOTES

- CONDUIT ROUTING SHOWN IS DIAGRAMMATIC. THE CONTRACTOR SHALL PROVIDE PULL BOXES OR SUITABLE TRANSITIONS FOR THE INSTALLED LOCATION AS REQUIRED PER THE NATIONAL ELECTRICAL CODE.

CONSTRUCTION NOTES

- NEW POWER PEDESTAL.
- NEW 4" CONDUIT(RFRC) WITH NEW CABLE.
- NEW CABLE IN EXISTING 4" CONDUIT.
- FEEDER SHALL TRANSITION FROM SURFACE MOUNT CONDUIT ON THE SIDE OF THE FLOAT TO EXISTING SPARE CONDUIT IN THE FLOAT. TRANSITION LOCATION SHALL BE ADJUSTED AS REQUIRED TO SPAN THE GAP BETWEEN FLOATS AT THE ANCHOR PILES.
- THE CONTRACTOR SHALL PROVIDE CONDUIT BREAKS AT ALL EXPANSION JOINTS BETWEEN FLOAT SECTIONS WITH 12" OF CABLE SLACK TO ACCOMMODATE FLOAT MOVEMENT.

PORT OF PORT ANGELES
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SHORE POWER ADDITIONS
832 BOAT HAVEN DRIVE
PORT ANGELES, WA 98363

OVERALL SITE PLAN

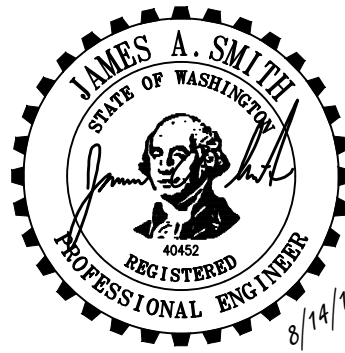
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DRAWING No. 3 of 7

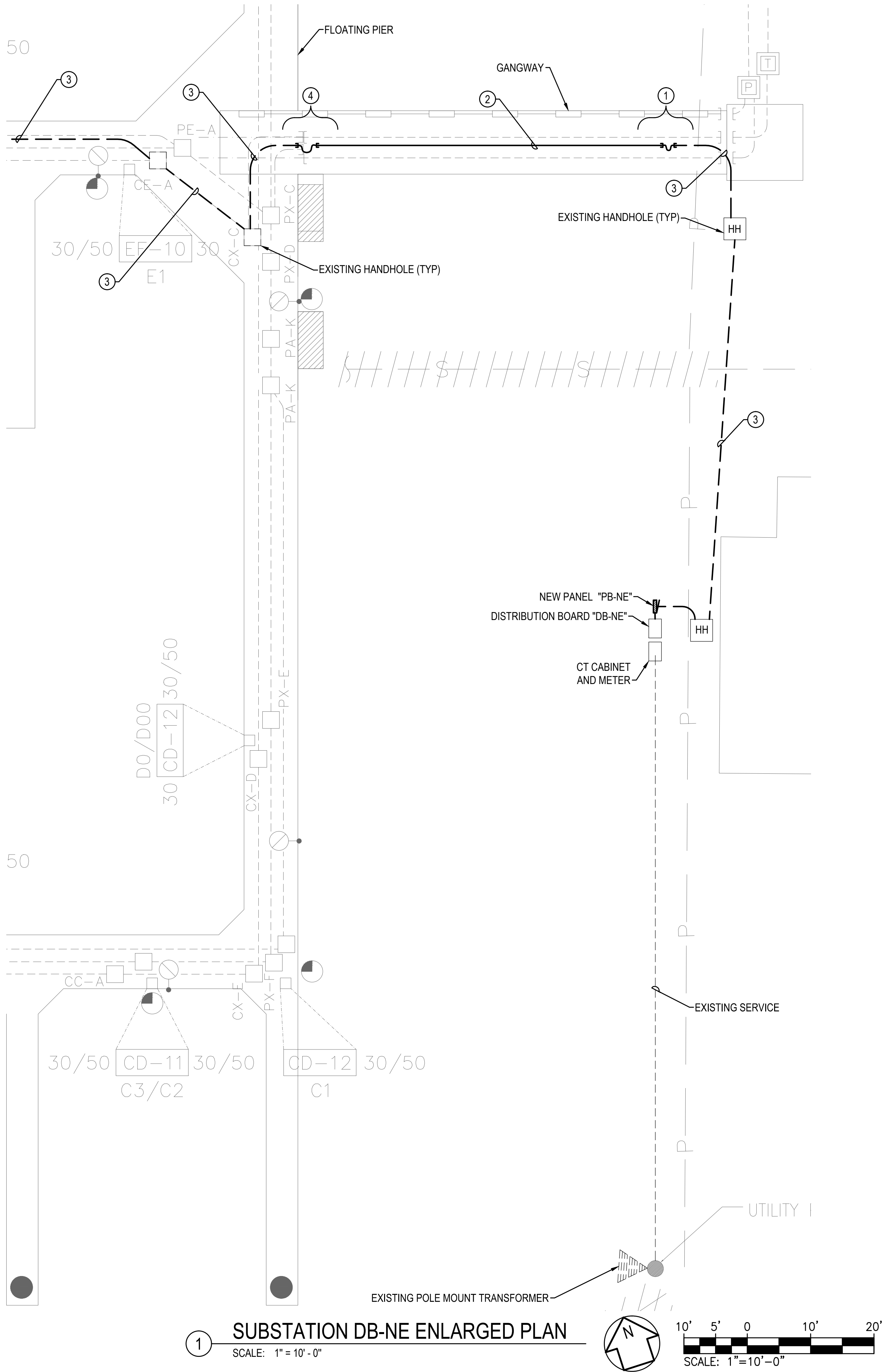
E-101

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CONTRACT #: 41-3-02-00



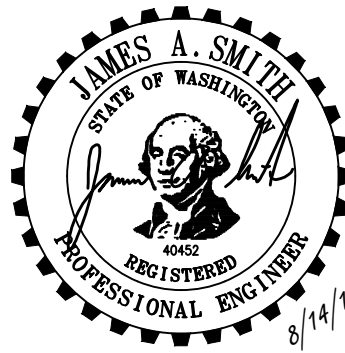
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bce engineers, inc.
p:(253) 922-0446
f: (253) 922-0896
6021 12th street east, suite 200, fife, wa 98424



CONSTRUCTION NOTES

- 1 OPEN TRANSITION FROM BELOW GRADE TO SURFACE MOUNTED RACEWAY. STUB BELOW GROUND RACEWAY OUT ABOVE GRADE WITH OPEN CABLE LOOP TO CONDUIT SUPPORTED UNDER WALKWAY. PROVIDE BELL END ON BOTH CONDUIT ENDS. SUPPORT CABLE AND PROVIDE STRAIN RELIEF WHEN CABLE IS NOT IN CONDUIT.
- 2 NEW 4" RESIN REINFORCED FIBER GLASS CONDUIT WITH NEW CABLE. ANCHOR TO UNDERSIDE OF WALKWAY WITH STAINLESS STEEL HARDWARE.
- 3 NEW CABLE IN EXISTING 4" CONDUIT.
- 4 OPEN TRANSITION FROM WALKWAY SUPPORTED CONDUIT TO CONDUIT IN FLOAT. PROVIDE 5' LOOP IN CABLE AT TRANSITION TO ALLOW FOR WALKWAY MOVEMENT. SUPPORT CABLE AND PROVIDE STRAIN RELIEF WHEN NOT IN CONDUIT.



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PORT OF PORT ANGELES
BOAT HAVEN MARINA
SHORE POWER ADDITIONS
832 BOAT HAVEN DRIVE
PORT ANGELES, WA 98363

SUBSTATION "DB-NE" ENLARGED PLAN

REVISIONS		
NO.	DESCRIPTION	DATE

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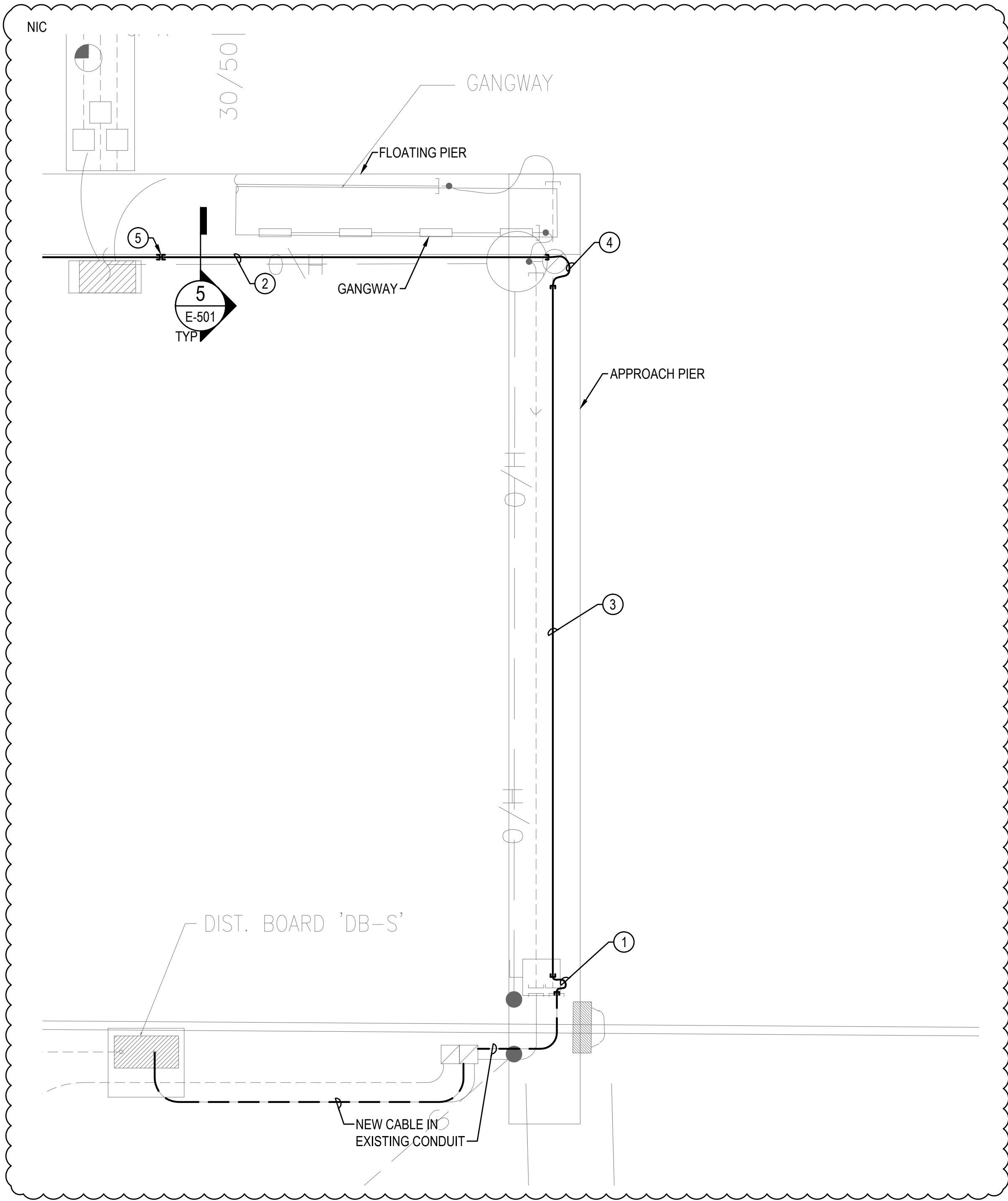
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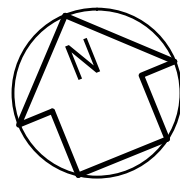
DRAWING No. 4 of 7

E-401

DATE: 08/14/2017
SUBMITTAL: FOR CONSTRUCTION
CONTRACT #: 41-3-02-CO



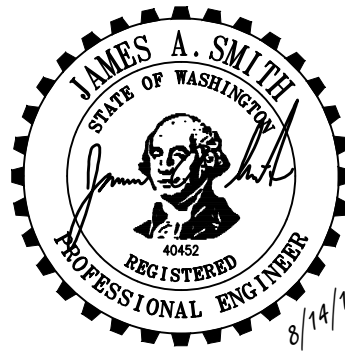
1 SUBSTATION DB-S ENLARGED PLAN
SCALE: 1" = 10' - 0"



10' 5' 0 10' 20'
SCALE: 1"=10'-0"

CONSTRUCTION NOTES

- 1 OPEN TRANSITION FROM BELOW GRADE TO SURFACE MOUNTED RACEWAY. STUB BELOW GROUND RACEWAY OUT ABOVE GRADE WITH OPEN CABLE LOOP TO CONDUIT SUPPORTED UNDER WALKWAY. PROVIDE BELL END ON BOTH CONDUIT ENDS. SUPPORT CABLE AND PROVIDE STRAIN RELIEF WHEN EXPOSED.
- 2 NEW 4" RTRC WITH NEW CABLE. ROUTE UNDER THE WALERS AND MOUNT WITH STAINLESS STEEL HARDWARE.
- 3 NEW CABLE IN EXISTING 4" CONDUIT ROUTED UNDER APPROACH PIER.
- 4 OPEN TRANSITION FROM WALKWAY SUPPORTED CONDUIT TO CONDUIT IN FLOAT. PROVIDE 5' LOOP IN CABLE AT TRANSITION TO ALLOW FOR WALKWAY MOVEMENT. SUPPORT CABLE AND PROVIDE STRAIN RELIEF WHEN NOT IN CONDUIT.
- 5 CABLE TRANSITION FROM ONE FLOATING DOCK TO ANOTHER. PROVIDE GAP IN CONDUITS TO PROVIDE CAPACITY FOR FLOAT MOVEMENT.



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BOAT HAVEN MARINA
SHORE POWER ADDITIONS
832 BOAT HAVEN DRIVE
PORT ANGELES, WA 98363

SUBSTATION "DB-S"
ENLARGED PLAN

REVISIONS		
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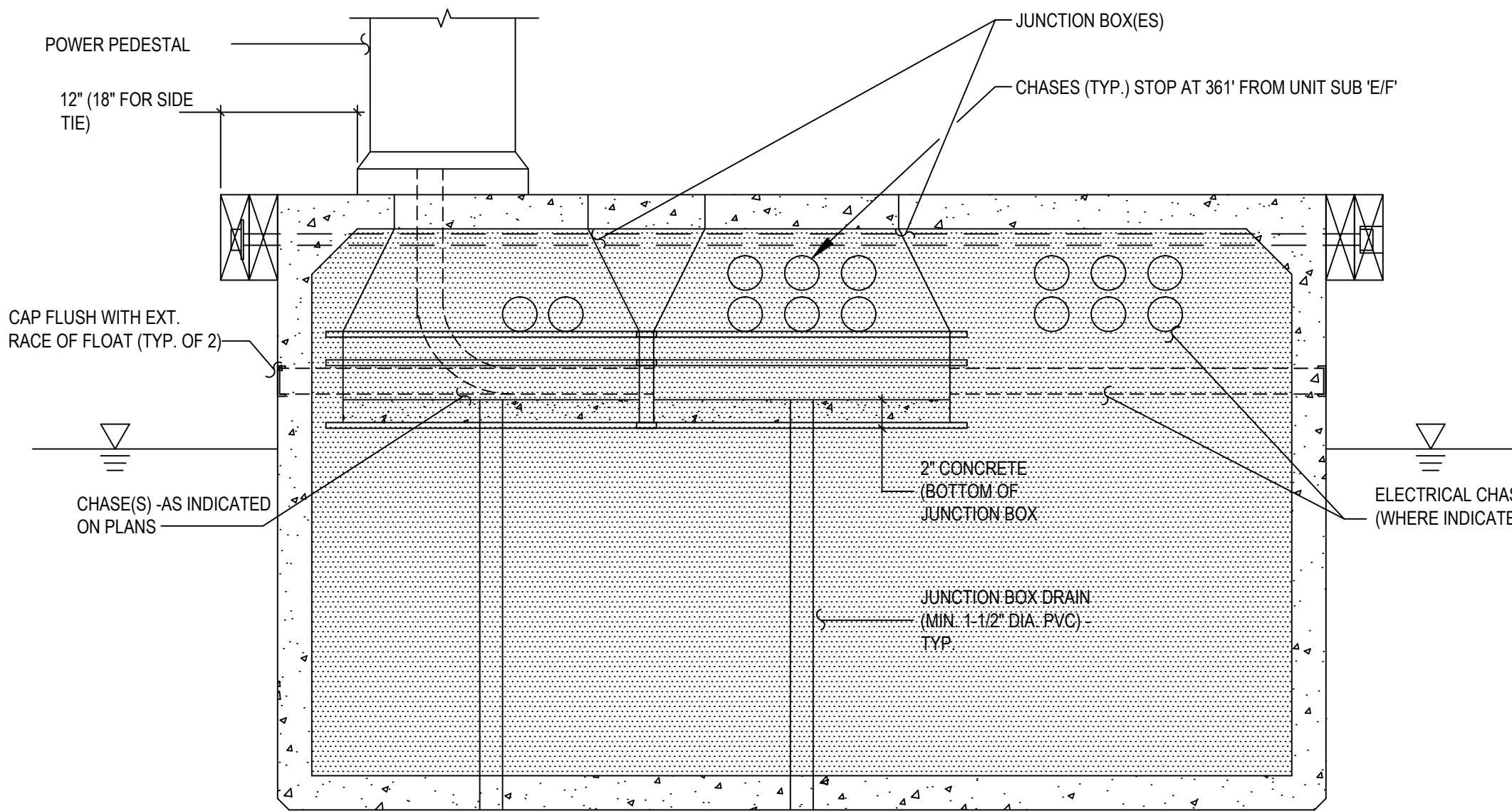
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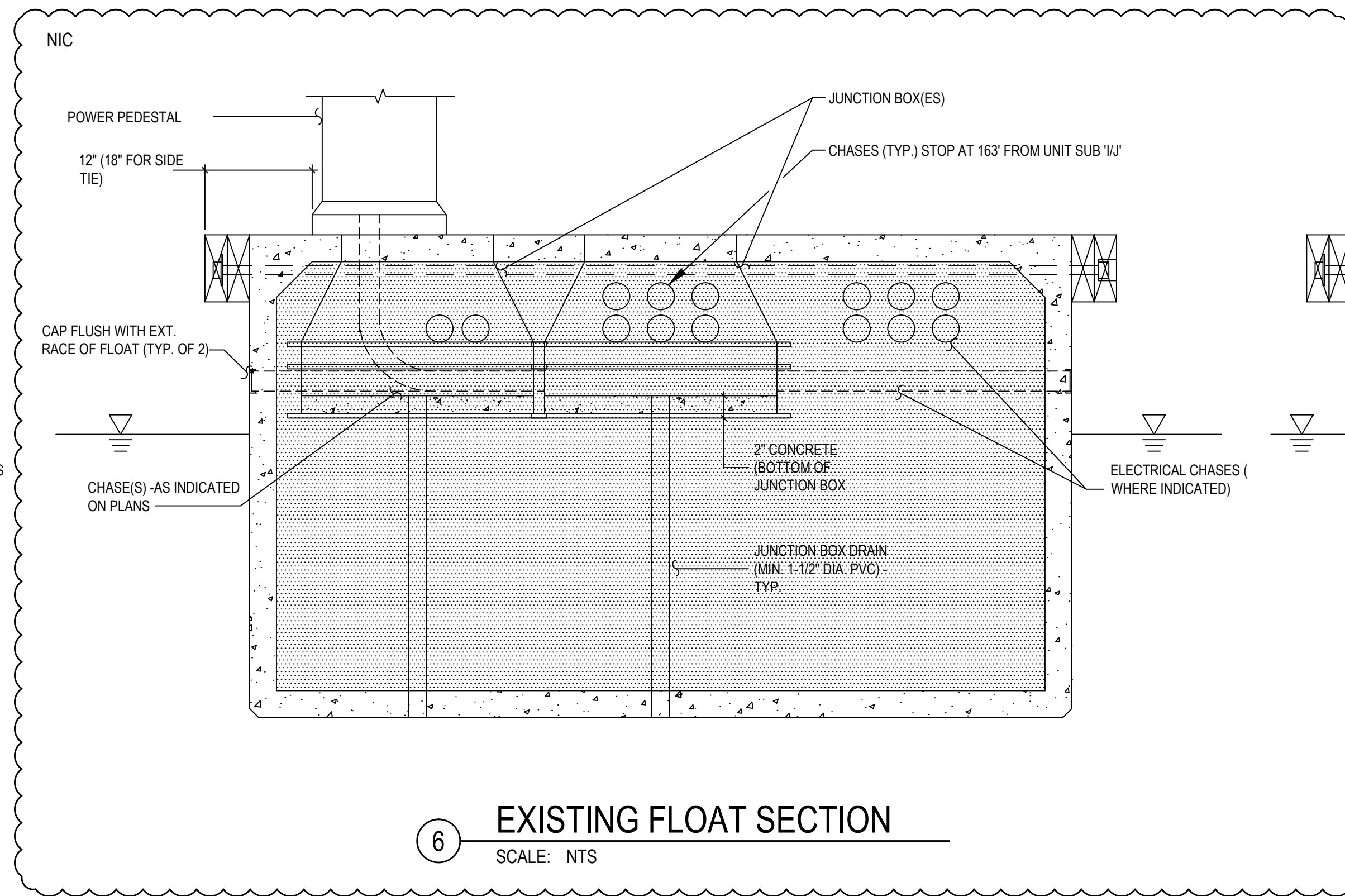
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E-402

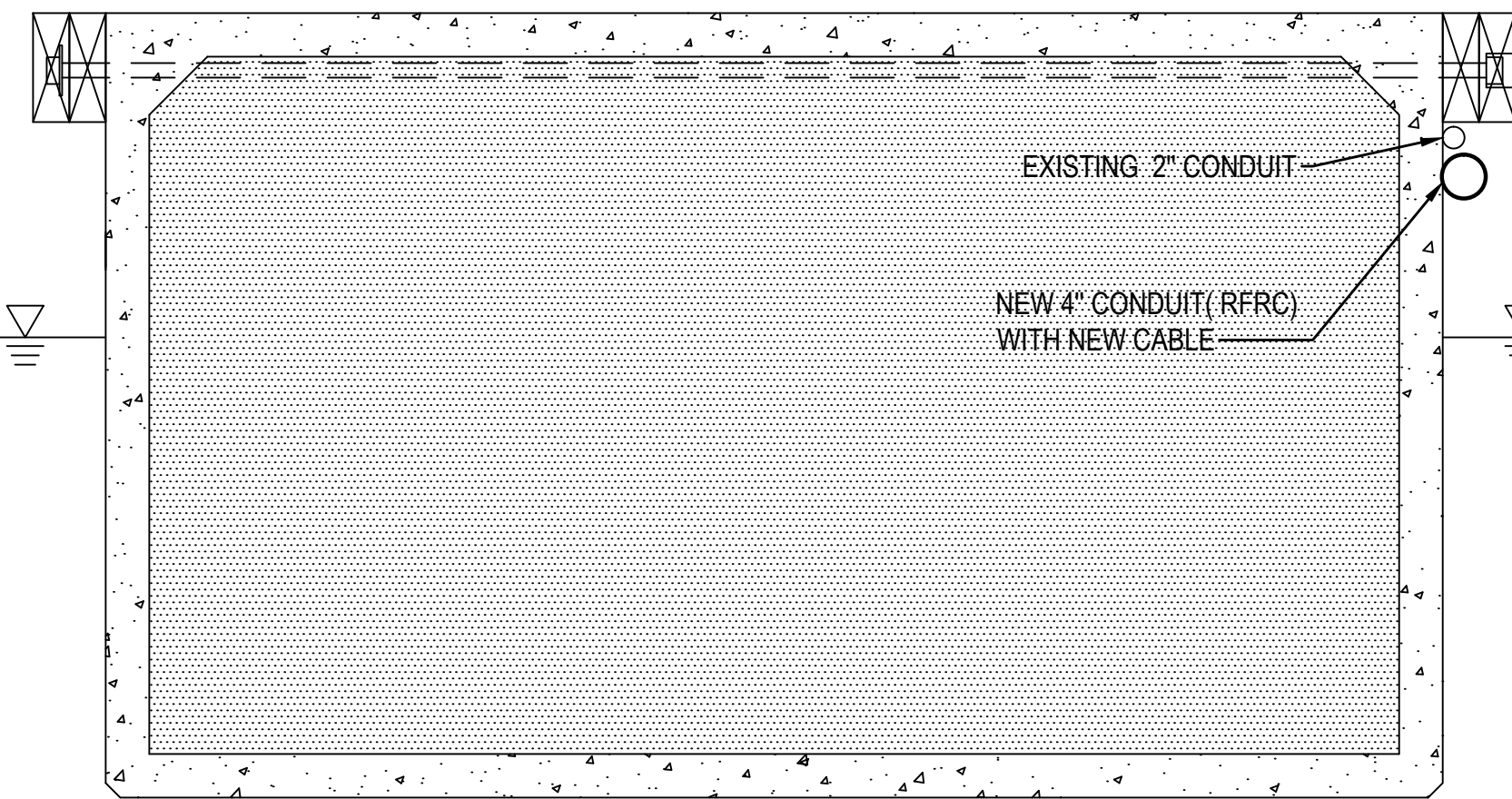
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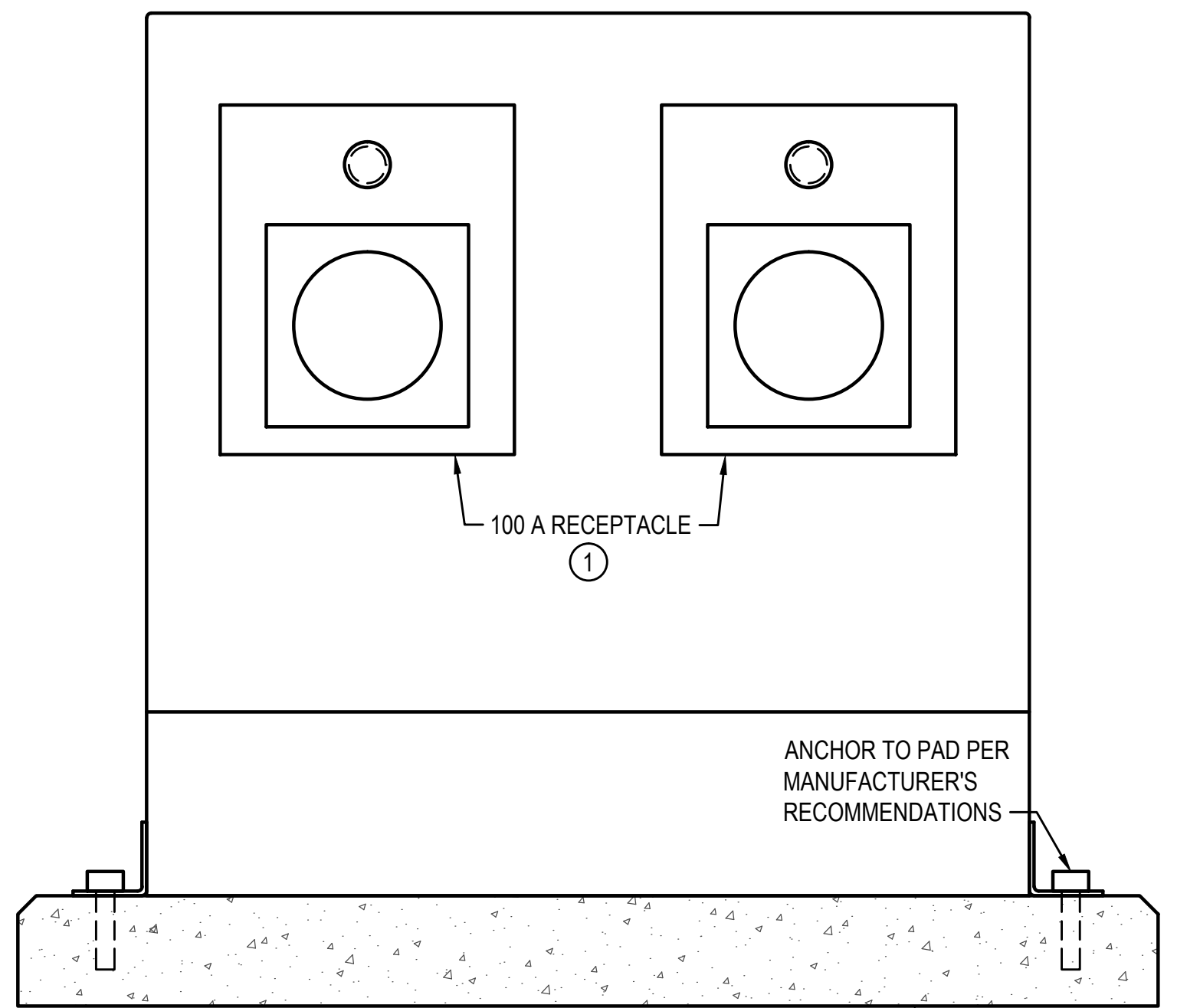
7 EXISTING FLOAT SECTION
SCALE: NTS



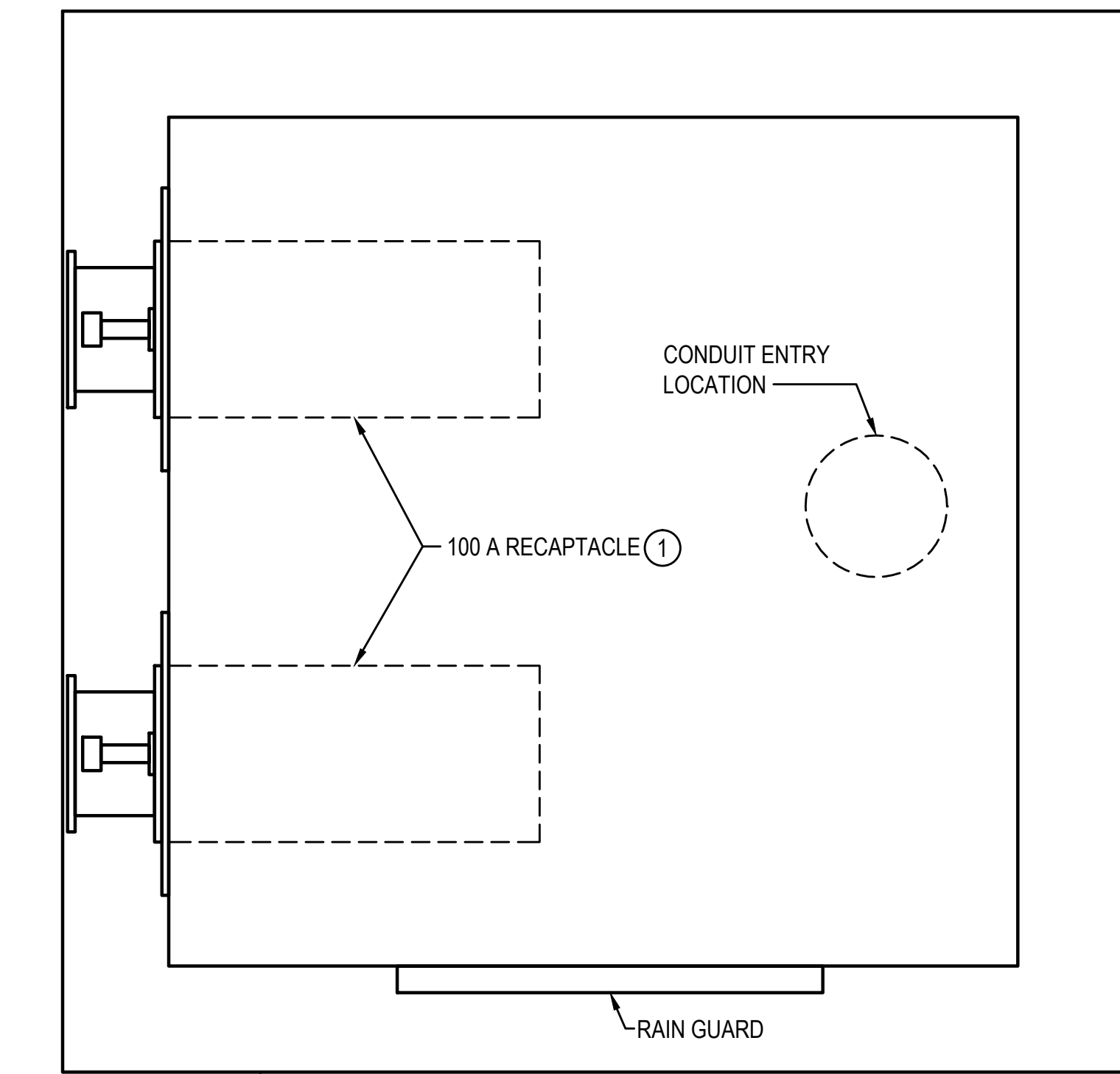
6 EXISTING FLOAT SECTION
SCALE: NTS



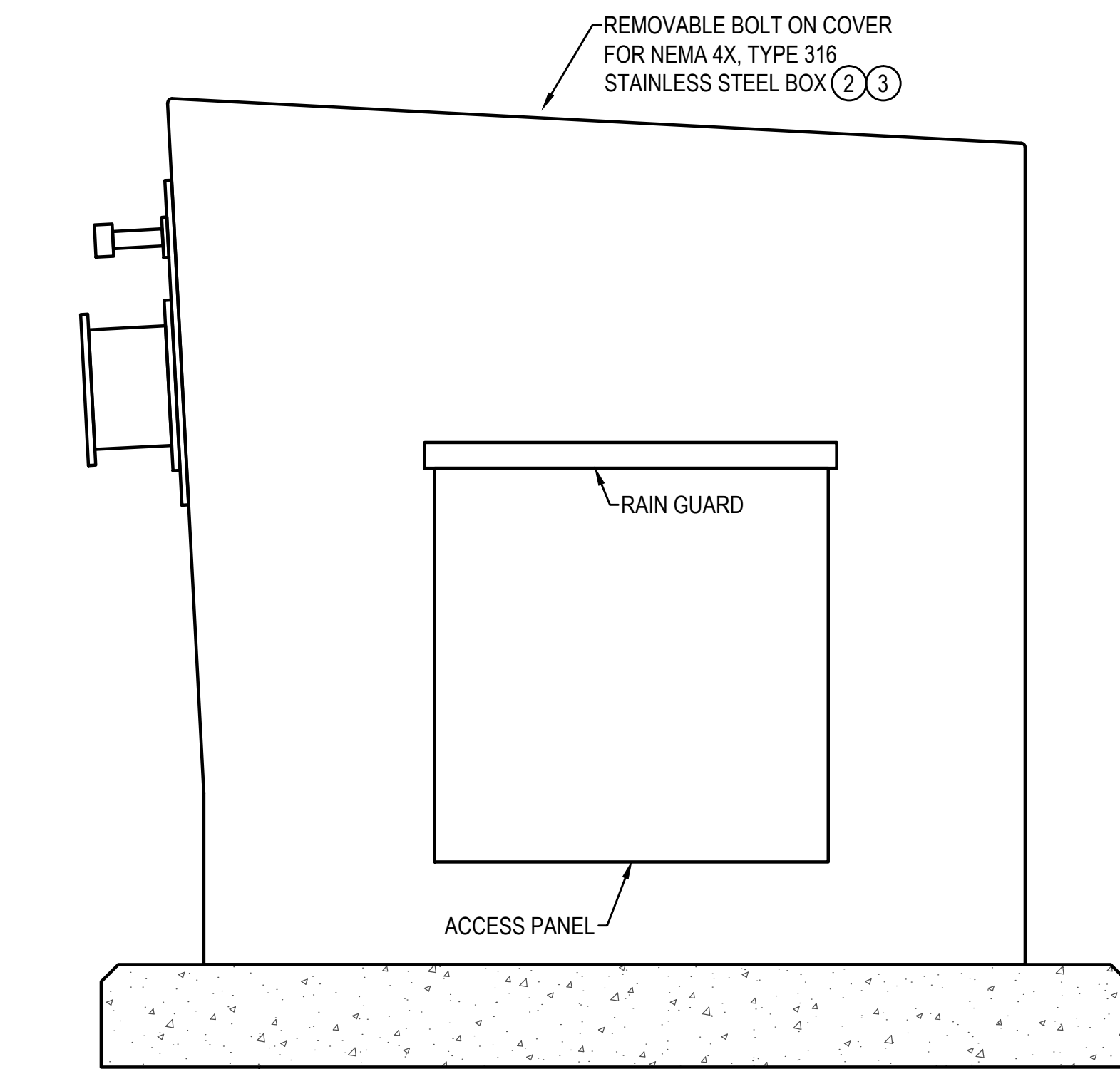
5 EXISTING FLOAT SECTION
SCALE: NTS



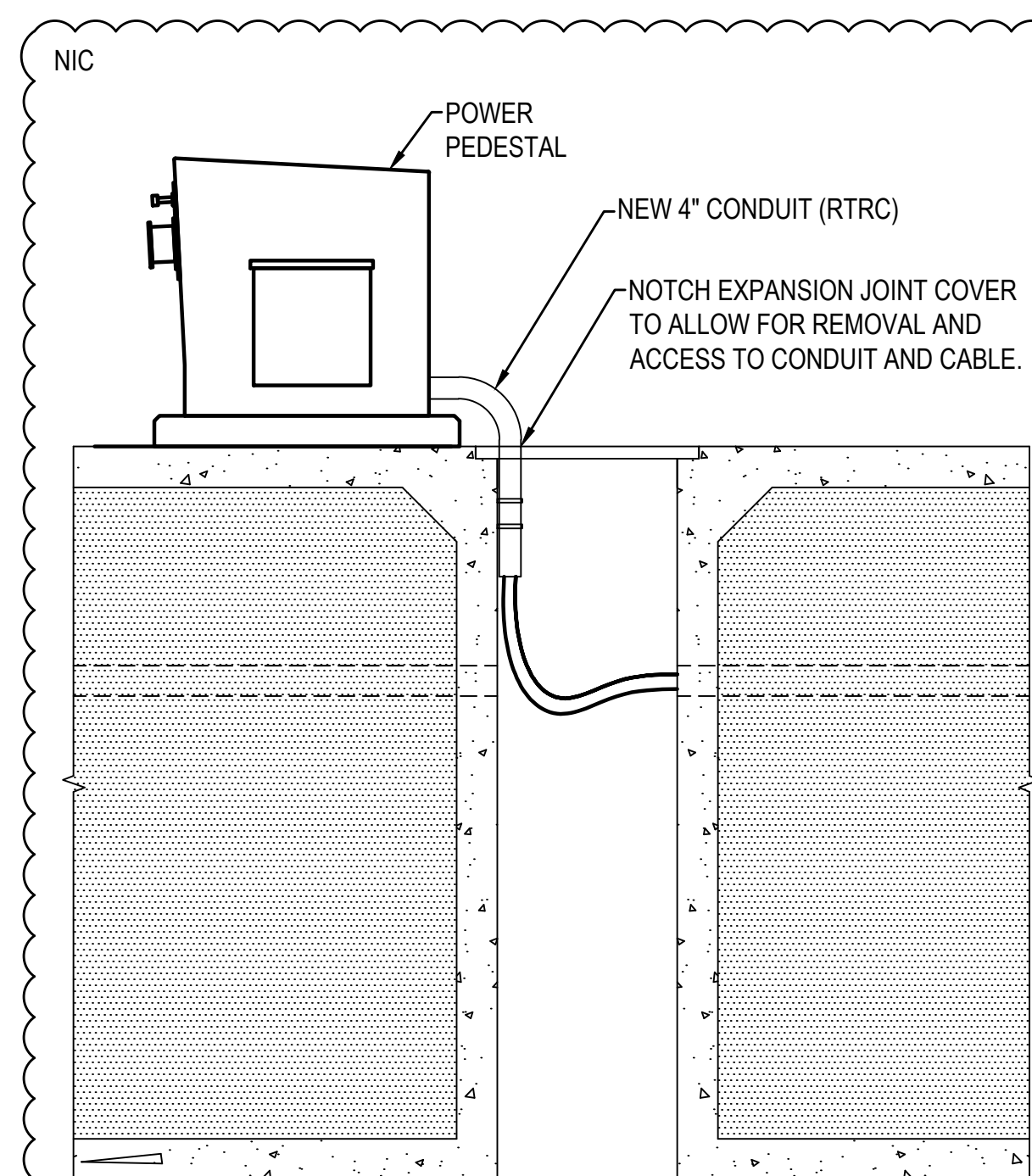
1 TYPICAL POWER MOUND
SCALE: 3"=1'-0"
FRONT VIEW



2 TYPICAL POWER MOUND
SCALE: 3"=1'-0"
TOP VIEW



3 TYPICAL POWER MOUND
SCALE: 3"=1'-0"
SIDE VIEW



4 PEDESTAL SECTION
SCALE: NTS
SIDE VIEW

- CONSTRUCTION NOTES
- 1 THE CONTRACTOR SHALL PROVIDE 100A, 480V, 3-PHASE, 4-WIRE SAFETY INTERLOCKED RECEPTACLES INCLUDING INTEGRAL OVERCURRENT PROTECTION AND MECHANICAL INTERLOCK.
 - 2 THE CONTRACTOR SHALL SEAL ALL CONDUITS ENTERING THE BOX, REMOVE ANY MOISTURE AND PROVIDE A DESSICANT BAG IN EACH POWER MOUND PRIOR TO SEALING THE BOX FOR ENERGIZATION. THE CONTRACTOR SHALL PROVIDE POWER DISTRIBUTION BLOCKS FOR POWER MOUNDS WITH A SINGLE FEEDER SPLITTING INTO TWO OUTLETS. EACH POWER MOUND SHALL BE BONDED TO THE EQUIPMENT GROUNDING CONDUCTOR AS REQUIRED BY CODE INCLUDING A FLEXIBLE CONNECTION TO THE LID WITH SUFFICIENT LENGTH TO ALLOW REMOVAL.
 - 3 THE CONTRACTOR SHALL PROVIDE A UL LISTED OUTLET ASSEMBLY. BASED ON THE EQUIPMENT PROVIDED, THE CONTRACTOR SHALL ADJUST THE SIZE OF THE ENCLOSURE AND PAD REQUIRED. POWER MOUND WITH ASSOCIATED ELECTRICAL COMPONENTS SHALL BE SUBMITTED TO THE PORT FOR REVIEW AND APPROVAL PRIOR TO ORDERING. ESL POWER SYSTEMS, BARBARA PINEDA-(800) 922-4188, IS THE PREFERRED ASSEMBLY MANUFACTURER OR APPROVED EQUAL.

PORT OF PORT ANGELES
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832 BOAT HAVEN DRIVE
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FLOAT AND
PEDESTAL DETAILS

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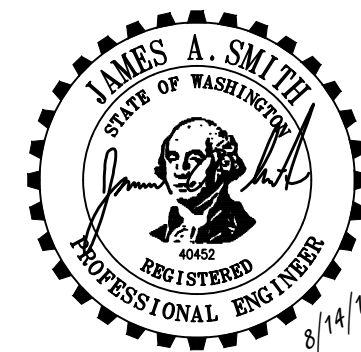
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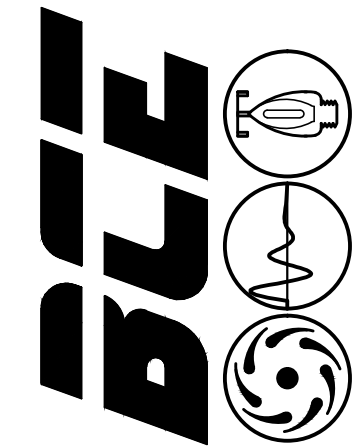
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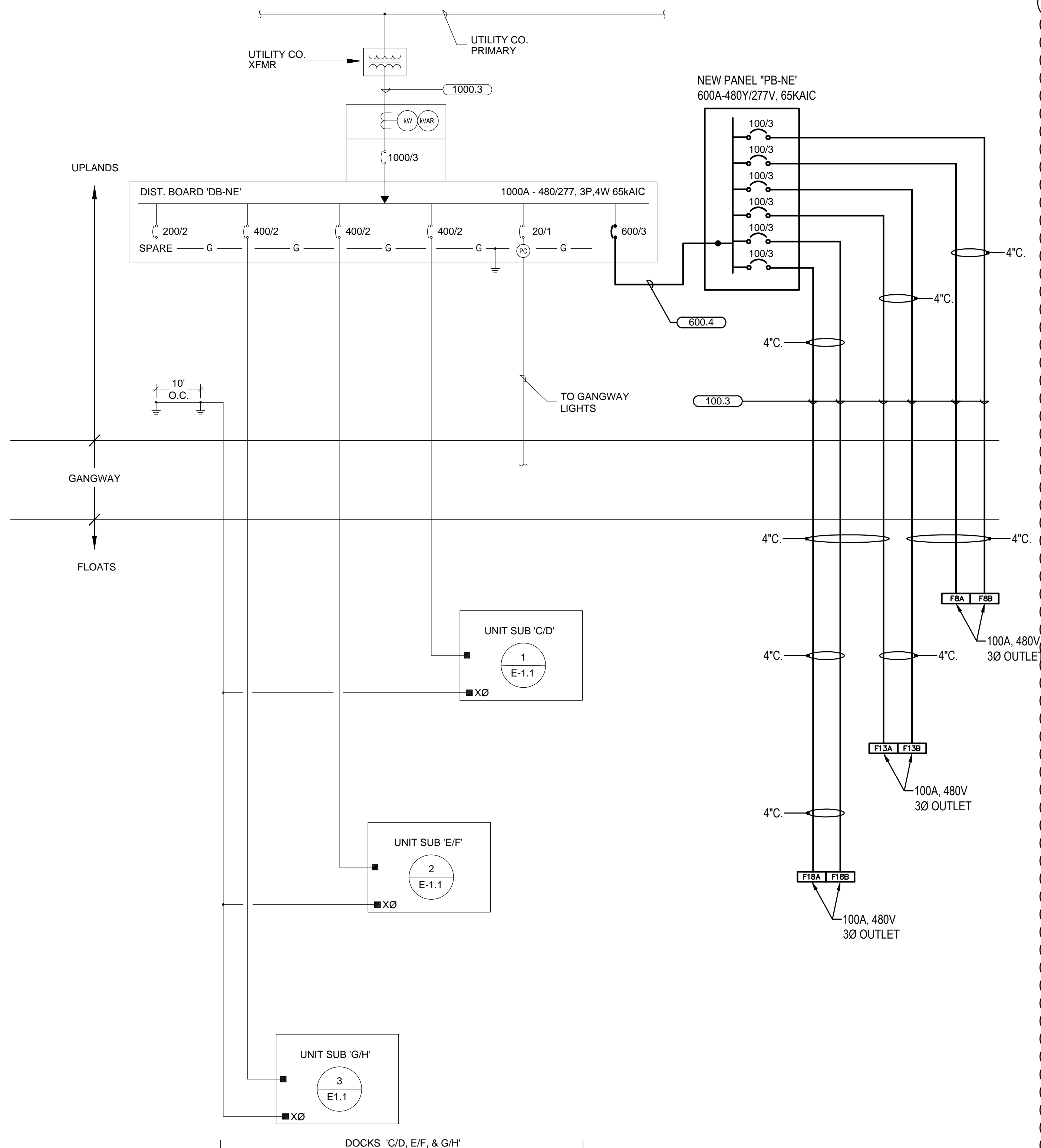
E-501

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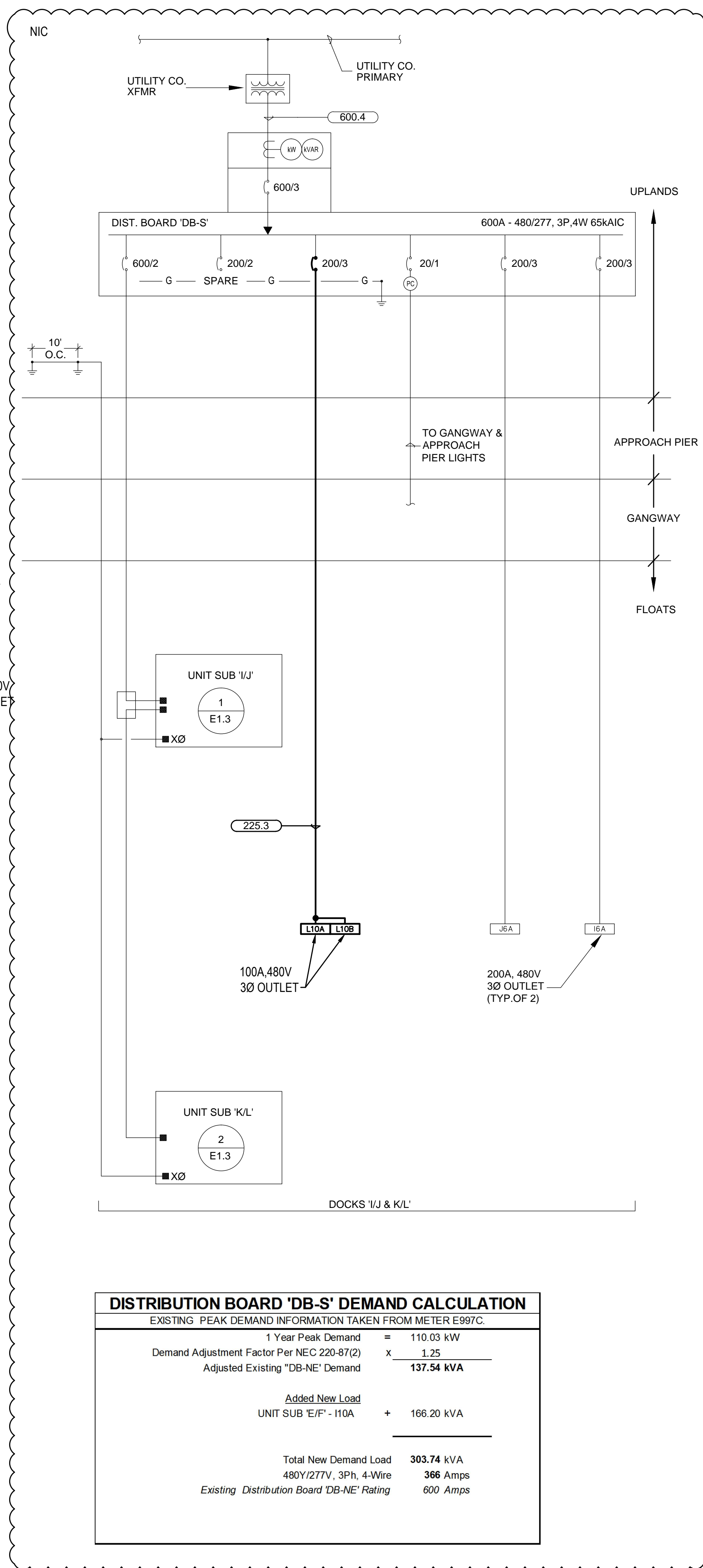


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DISTRIBUTION BOARD 'DB-NE' DEMAND CALCULATION			
EXISTING PEAK DEMAND INFORMATION TAKEN FROM METER E1066C.			
1 Year Peak Demand	=	134.29 kW	
Demand Adjustment Factor Per NEC 220-87(2)	x	1.25	
Adjusted Existing "DB-NE" Demand		167.86 kVA	
<u>Added New Load</u>			
UNIT SUB 'E/F' - New Panel 'PB-NE'	+	498.60 kVA	
			<hr/>
Total New Demand Load		666.46 kVA	
480Y/277V, 3Ph, 4-Wire		802 Amps	
Existing Distribution Board 'DB-NE' Rating		1000 Amps	



DISTRIBUTION BOARD 'DB-S' DEMAND CALCULATION			
EXISTING PEAK DEMAND INFORMATION TAKEN FROM METER E997C.			
1 Year Peak Demand	=	110.03 kW	
Demand Adjustment Factor Per NEC 220-87(2)	x	1.25	
Adjusted Existing "DB-NE" Demand			137.54 kVA
<u>Added New Load</u>			
UNIT SUB 'E/F' - 110A	+	166.20 kVA	
Total New Demand Load		303.74 kVA	
480Y/277V, 3Ph, 4-Wire		366 Amps	
Existing Distribution Board "DB-NE" Rating		600 Amps	

COPPER FEEDER SCHEDULE						
FEEDER TAG	CONDUITS ②			CONDUCTORS PER SET		REMARKS
	MET	SETS	RNC	PHASE/NEUTRAL	GROUND ③	
1000.4	3.00"	3	4.00"	4 #400 KCMIL	#2/0	-
500.4	3.00"	2	4.00"	4 #350 KCM	#1	-
225.3	4.00"	1	4.00"	3 #3/0	2 #3	TYPE 'G'
100.3	1.00"	1	1.00"	3 #2	2 #3	TYPE 'G'

GENERAL NOTES (SCHEDULE):

A. CONDUCTORS AND CONDUITS SHOWN IN THIS SCHEDULE ARE BASED ON COPPER CONDUCTORS WITH THIN/THWN INSULATION. THIS NOTE INDICATES THAT CONDUIT (LISTED IN SCHEDULE) IS SIZED BASED ON TYPE THIN/THWN WIRE. USE WIRE TYPES AS SPECIFIED IN TABLE 161-120 OF THE NATIONAL ELECTRICAL CODE DOCUMENTS.

B. PROVIDE NOTED SIZE GROUND CONDUCTOR IN EACH CONDUIT OF FEEDERS CONSISTING OF MULTIPLE SETS OF CONDUCTORS.

C. NOT ALL FEEDERS ARE NECESSARILY USED ON THIS PROJECT.

D. NOMINAL AMPACITIES GREATER THAN 100 AMPS ARE FOR 75°C TERMINATIONS.

E. ON FEEDERS SHOWN WITH A "6" SUFFIX, PROVIDE SIX PHASE CONDUCTORS AND ONE GROUND WIRE IN CODE SIZED CONDUIT. INCLUDE 80% DERATING FACTOR ON PHASE CONDUCTOR SIZE.

F. CONDUIT SIZES AND QUANTITIES ON PLANS TAKE PRECEDENCE OVER THOSE SHOWN IN SCHEDULE. PROVIDE CONDUITS INDICATED IN SCHEDULE FOR FEEDERS NOT SHOWN ON PLANS.

G. TBD - SEE PLANS AND ONE-LINE FOR CONDUIT SIZE.

SCHEDULE REMARKS:

- ① CABLES NOTED MAY BE USED ONLY WHEN ALLOWED BY CODE AND PROJECT SPECIFICATIONS.
- ② "MET"=EMT, GRC (RIGID), RAC, OR PVC COATED GRC TYPE CONDUITS, "RNC"=PVC 40, PVC 80 OR FIBERGLASS TYPE CONDUITS ROUTED UNDERGROUND. REFER TO SIZING ON DRAWINGS IF "RNC" CONDUITS ARE ROUTED ABOVEGROUND. CONDUIT SIZES NOTED ON SINGLE-LINE DIAGRAM OR ON PLANS SUPERSEDES SIZES NOTED ABOVE IF LARGER.
- ③ PROVIDE GROUND WIRE NOTED ABOVE OR EQUIVALENT IN ALL FEEDERS AND BRANCH CIRCUITS.

PORT OF PORT ANGELES
BOAT HAVEN MARINA
SHORE POWER ADDITIONS

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PORT ANGELES, WA 98363

ONE-LINE DIAGRAMS

REVISIONS		
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"	"	"

DRAWN BY: KN

CHECKED BY: JS

PROJECT MANAGER: JS

DRAWING No. 7 of 7

E-601

DATE: 08/14/2017
SUBMITTAL: FOR CONSTRUCTION
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