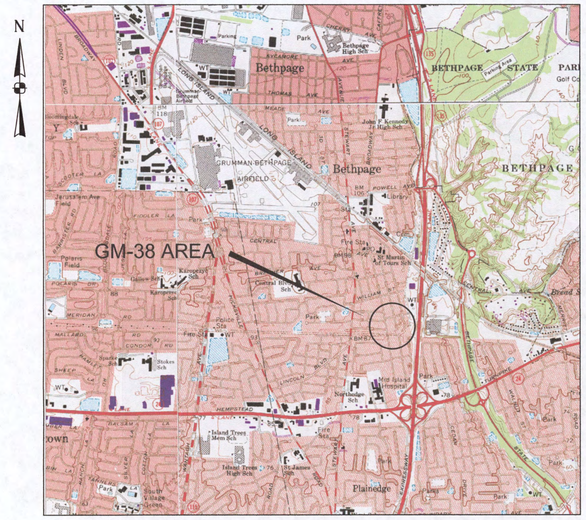
APPENDIX G

GROUNDWATER TREATMENT PLANT ADVANCED OXIDATION PROCESS ADDITION

JUNE 2019

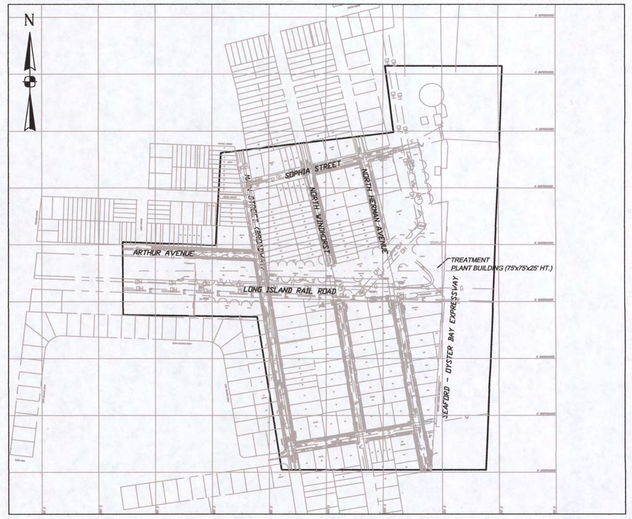
GM-38 AREA - GROUNDWATER TREATMENT FACILITY
NAVAL WEAPONS INDUSTRIAL RESERVE PLANT
BETHPAGE, NEW YORK

COMPREHENSIVE LONG TERM
ENVIRONMENTAL ACTION NAVY (CLEAN) CONTRACT
CONTRACT NUMBER N6247216D9008
CONTRACT TASK ORDER WE24



NWIRP BETHPAGE VICINITY MAP
NAVAL WEAPONS INDUSTRIAL RESERVE PLANT
BETHPAGE, NEW YORK

0 2000 4000
SCALE IN FEET



WORK AREA
0 300 600
SCALE IN FEET

DRAWING INDEX

Submitted to:
Department of the Navy
Naval Facilities Engineering Command Mid-Atlantic
9324 Maryland Avenue
Norfolk, VA 23511-3085

Submitted by:
Tetra Tech
5700 Lake Wright Drive, Suite 102
Norfolk, VA, 23502

ISSUED FOR BID - 06/21/2019
CAUTION: IF SHEET IS LESS THAN 34"x22" USE GRAPHIC SCALE

DES	HKM	DR	SNL
REVIEWED BY	HKM		
PM/DM	HKM		
CHIEF ENG/ARCH	HKM		

STATE OF NEW YORK · CHRISTOPHER DANIEL BAKER · 080336 · LICENSED PROFESSIONAL ENGINEER · 6-24-2019
SEAL AREA

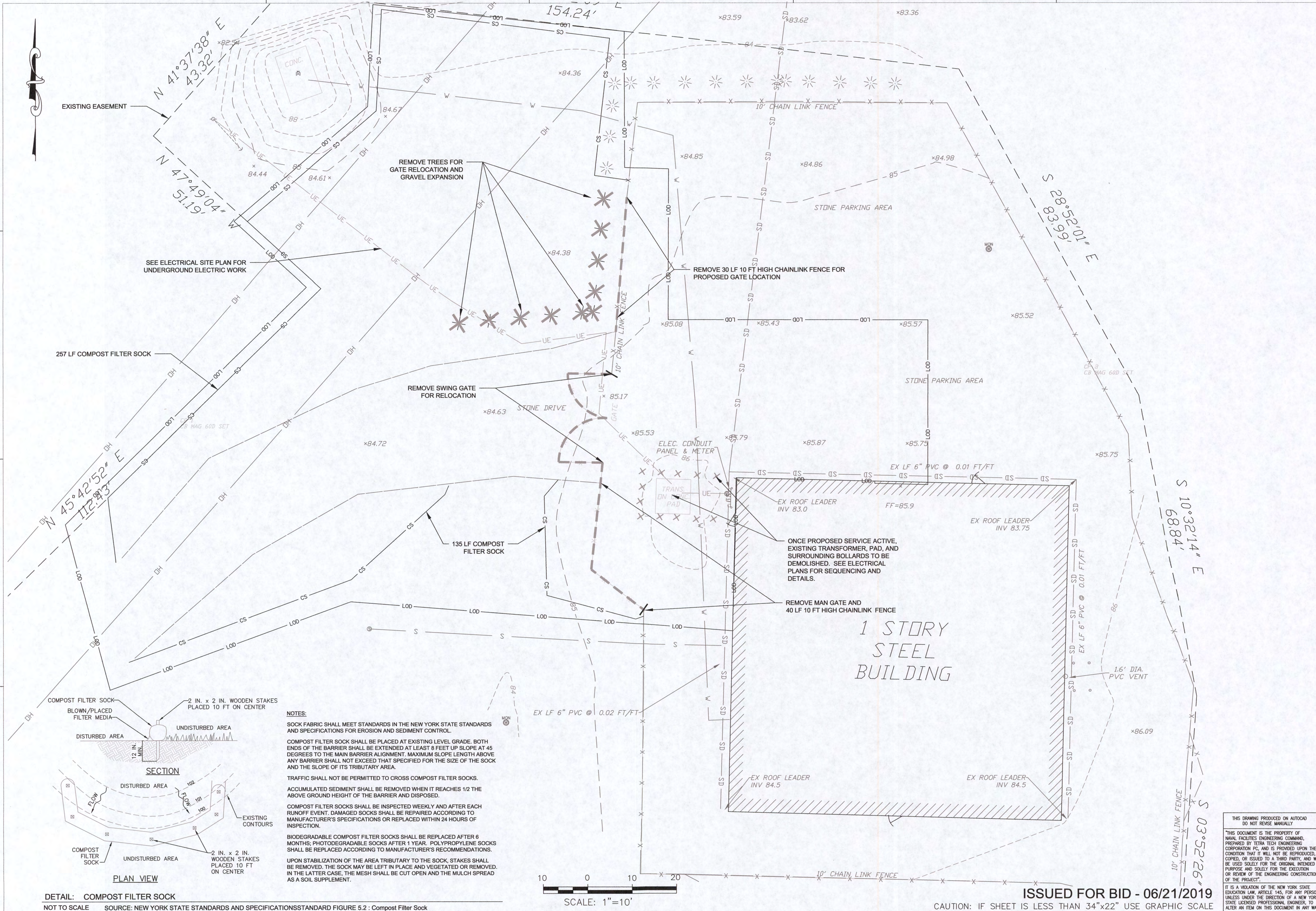
DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND ~ MID-ATLANTIC
NAVAL WEAPONS INDUSTRIAL RESERVE PLANT BETHPAGE, NEW YORK
GM-38 AREA
GROUNDWATER TREATMENT PLANT
AOP SYSTEM ADDITION
GM 38

TITLE - INDEX

CODE ID. NO. 80091	SIZE D
SCALE:	NTS
MAXIMO NO. N62470-08-D-1001	
JOB ORDER NO. WE-24	
SPEC. NO.	
CONSTR. CONTR. NO. N62472-89-D-0032	
112G08005	
NAVFAC DRAWING NO.	
....	
SHEET	OF
G-100	

Rev	Description	Date	Appr

S:\03-Projects\Federal\NAVFAC\112G08005 WP24 GM38 HKM\3 Working Files\Drawings\Mechanical\GM38 TitlePage.dwg 06/21/2019 17:34



NOTES:

SOCK FABRIC SHALL MEET STANDARDS IN THE NEW YORK STATE STANDARDS AND SPECIFICATIONS FOR EROSION AND SEDIMENT CONTROL.

COMPOST FILTER SOCK SHALL BE PLACED AT EXISTING LEVEL GRADE. BOTH ENDS OF THE BARRIER SHALL BE EXTENDED AT LEAST 8 FEET UP SLOPE AT 45 DEGREES TO THE MAIN BARRIER ALIGNMENT. MAXIMUM SLOPE LENGTH ABOVE ANY BARRIER SHALL NOT EXCEED THAT SPECIFIED FOR THE SIZE OF THE SOCK AND THE SLOPE OF ITS TRIBUTARY AREA.

TRAFFIC SHALL NOT BE PERMITTED TO CROSS COMPOST FILTER SOCKS.

ACCUMULATED SEDIMENT SHALL BE REMOVED WHEN IT REACHES 1/2 THE ABOVE GROUND HEIGHT OF THE BARRIER AND DISPOSED.

COMPOST FILTER SOCKS SHALL BE INSPECTED WEEKLY AND AFTER EACH RUNOFF EVENT. DAMAGED SOCKS SHALL BE REPAIRED ACCORDING TO MANUFACTURER'S SPECIFICATIONS OR REPLACED WITHIN 24 HOURS OF INSPECTION.

BIODEGRADABLE COMPOST FILTER SOCKS SHALL BE REPLACED AFTER 6 MONTHS; PHOTODEGRADABLE SOCKS AFTER 1 YEAR. POLYPROPYLENE SOCKS SHALL BE REPLACED ACCORDING TO MANUFACTURER'S RECOMMENDATIONS.

UPON STABILIZATION OF THE AREA TRIBUTARY TO THE SOCK, STAKES SHALL BE REMOVED. THE SOCK MAY BE LEFT IN PLACE AND VEGETATED OR REMOVED. IN THE LATTER CASE, THE MESH SHALL BE CUT OPEN AND THE MULCH SPREAD AS A SOIL SUPPLEMENT.

ISSUED FOR BID - 06/21/2019

CAUTION: IF SHEET IS LESS THAN 34"x22" USE GRAPHIC SCALE

THIS DRAWING PRODUCED ON AUTOCAD
DO NOT REVISE MANUALLY

SYM | DESCRIPTION | DATE | APPR

NAVFAC

SEAL AREA

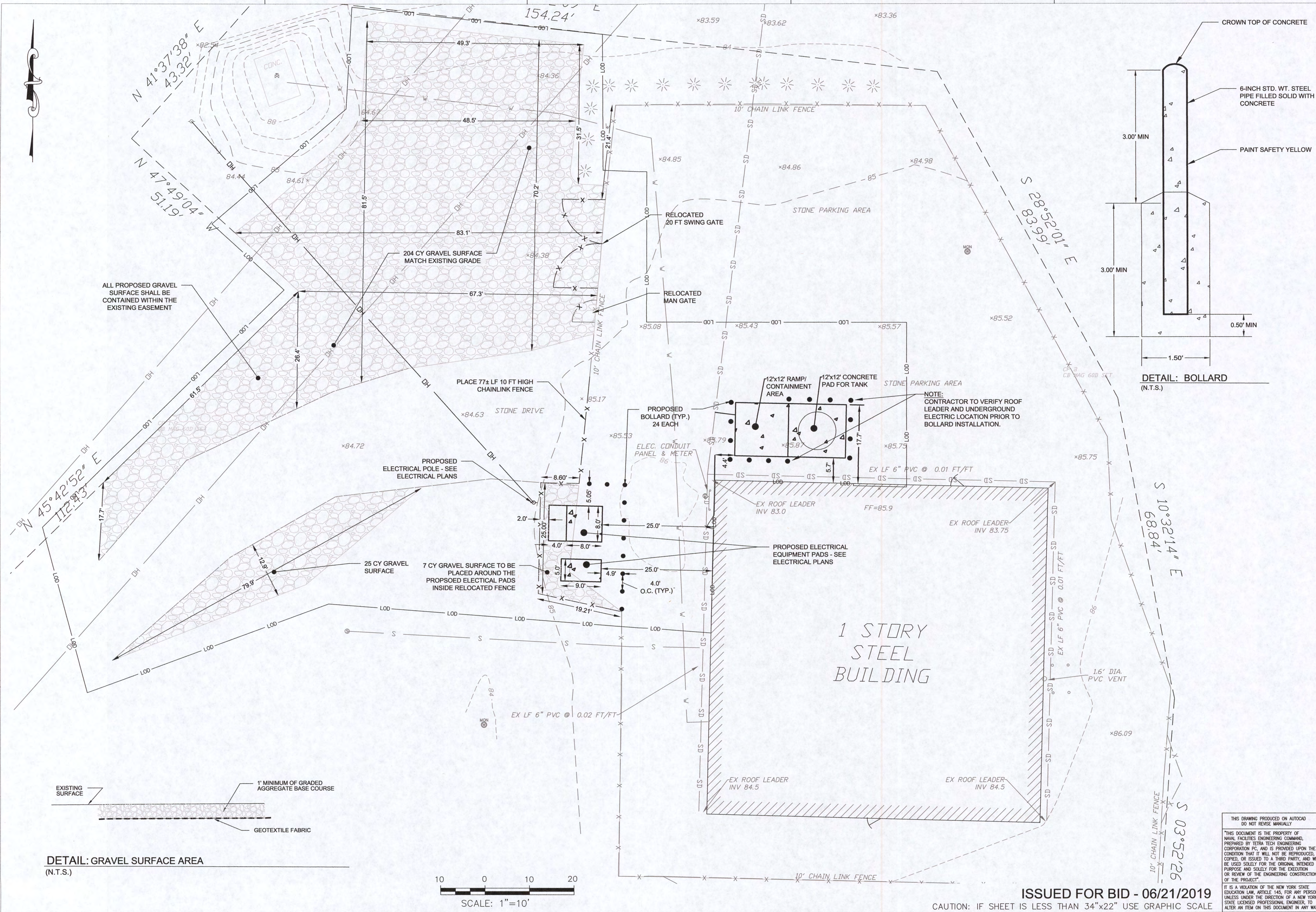
DES	DR
REVIEWED BY	
PM/DM	
CHIEF ENG/ARCH	

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
NAVAL FACILITIES ENGINEERING COMMAND ~ MID-ATLANTIC
GM 38 NAVAL WEAPONS INDUSTRIAL RESERVE PLANT
NAVAL INDUSTRIAL RESERVE ORDNANCE PLANT
BETHPAGE, NEW YORK

GM-38 AREA GROUNDWATER TREATMENT PLANT AOP SYSTEM ADDITION

EXISTING CONDITIONS & DEMOLITION PLAN

CODE ID. NO. 80091	SIZE D
SCALE:	
MAXIMO NO. N62470-08-D-1001	
JOB ORDER NO. WE-24	
SPEC. NO.	
CONSTR. CONTR. NO. N62472-99-D-0032	
112G08005	
NAVFAC DRAWING NO.	
SHEET	OF
C-100	



CROWN TOP OF CONCRETE
6-INCH STD. WT. STEEL PIPE FILLED SOLID WITH CONCRETE
PAINT SAFETY YELLOW
3.00' MIN
3.00' MIN
0.50' MIN
1.50'
DETAIL: BOLLARD
(N.T.S.)
10' CHAIN LINK FENCE
STONE PARKING AREA
RELOCATED 20 FT SWING GATE
RELOCATED MAN GATE
204 CY GRAVEL SURFACE MATCH EXISTING GRADE
ALL PROPOSED GRAVEL SURFACE SHALL BE CONTAINED WITHIN THE EXISTING EASEMENT
PLACE 77± LF 10 FT HIGH CHAINLINK FENCE
STONE DRIVE
PROPOSED BOLLARD (TYP.) 24 EACH
12'x12' RAMP/ CONTAINMENT AREA
12'x12' CONCRETE PAD FOR TANK
NOTE: CONTRACTOR TO VERIFY ROOF LEADER AND UNDERGROUND ELECTRIC LOCATION PRIOR TO BOLLARD INSTALLATION.
ELEC. CONDUIT PANEL & METER
PROPOSED ELECTRICAL POLE - SEE ELECTRICAL PLANS
PROPOSED ELECTRICAL EQUIPMENT PADS - SEE ELECTRICAL PLANS
25 CY GRAVEL SURFACE
7 CY GRAVEL SURFACE TO BE PLACED AROUND THE PROPSOED ELECTIONAL PADS INSIDE RELOCATED FENCE
4.0' O.C. (TYP.)
EX ROOF LEADER INV 83.0
EX ROOF LEADER INV 83.75
EX ROOF LEADER INV 84.5
EX ROOF LEADER INV 84.5
EX LF 6" PVC @ 0.01 FT/FT
EX LF 6" PVC @ 0.02 FT/FT
FF=85.9
1 STORY STEEL BUILDING
1.6' DIA. PVC VENT
N 41°37'38" E 43.32'
N 47°49'04" W 51.19'
N 45°42'52" E 112.43'
S 28°52'01" E 83.99'
S 10°32'14" E 68.84'
S 03°52'26
154.24'
EXISTING SURFACE
1' MINIMUM OF GRADED AGGREGATE BASE COURSE
GEOTEXTILE FABRIC
DETAIL: GRAVEL SURFACE AREA
(N.T.S.)
SCALE: 1"=10'

ISSUED FOR BID - 06/21/2019

CAUTION: IF SHEET IS LESS THAN 34"x22" USE GRAPHIC SCALE

THIS DRAWING PRODUCED ON AUTOCAD DO NOT REVISE MANUALLY

SEAL AREA

DES | DR

REVIEWED BY

PM/DM

CHIEF ENG/ARCH

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
NAVAL FACILITIES ENGINEERING COMMAND ~ MID-ATLANTIC
GM 38
NAVAL WEAPONS INDUSTRIAL RESERVE PLANT
NAVAL INDUSTRIAL RESERVE ORDNANCE PLANT
BETHPAGE, NEW YORK

GM-38 AREA
GROUNDWATER TREATMENT PLANT
AOP SYSTEM ADDITION

LAYOUT PLAN

CODE ID. NO. 80091 | SIZE D

SCALE:

MAXIMO NO. N62470-08-D-1001

JOB ORDER NO. WE-24

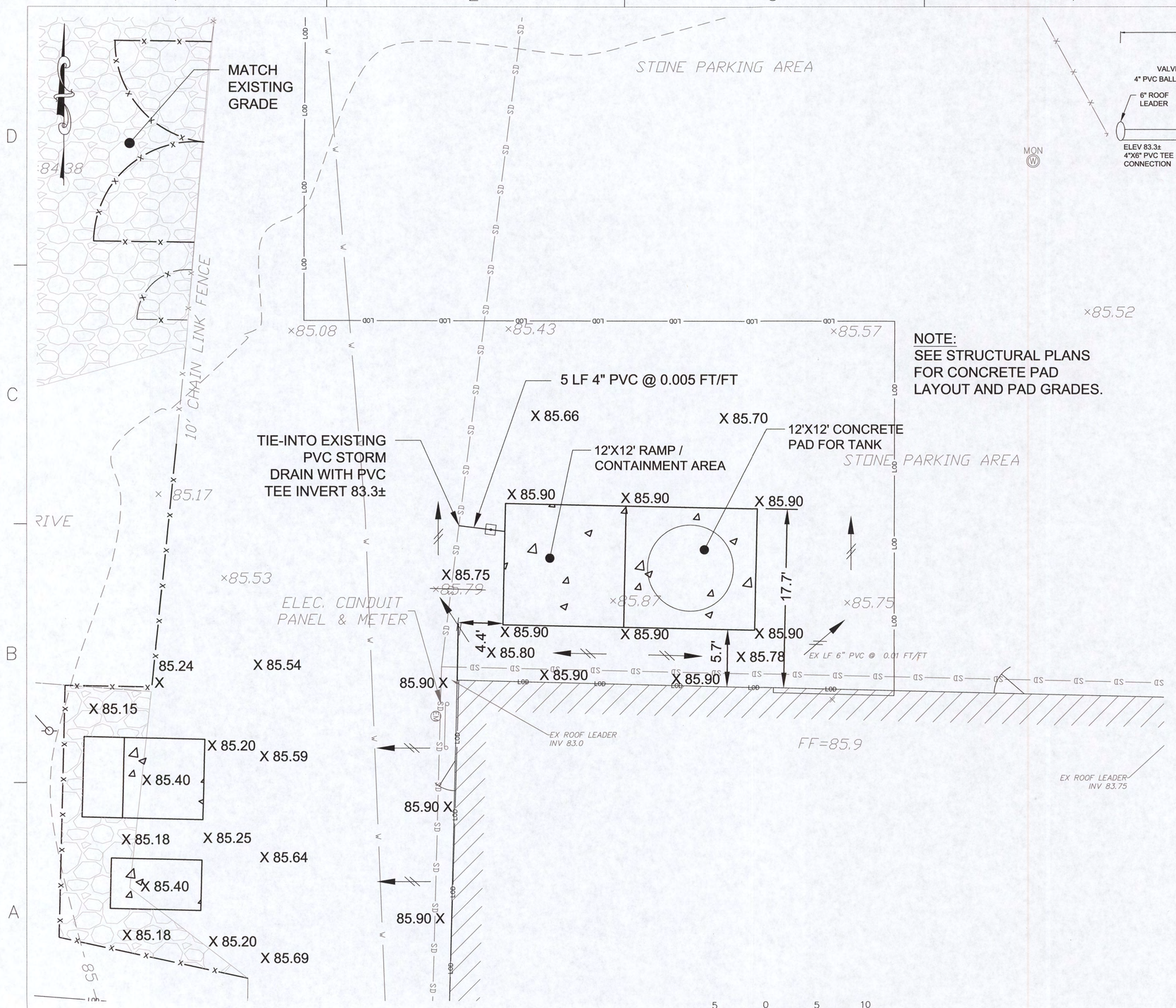
SPEC. NO.

CONSTR. CONTR. NO. N62472-99-D-0032
112G08005

NAVFAC DRAWING NO.

SHEET OF

C-200



ISSUED FOR BID - 06/21/2019

CAUTION: IF SHEET IS LESS THAN 34"x22" USE GRAPHIC SCALE

SYM	DESCRIPTION	DATE	APPR

NAVFAC

STATE OF NEW YORK — LICENSED PROFESSIONAL ENGINEER — 050336 — 6-21-19

SEAL AREA

DES	DR
REVIEWED BY	
PM/DM	
CHIEF ENG/ARCH	

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
GM 38
NAVAL WEAPONS INDUSTRIAL RESERVE PLANT

NAVAL FACILITIES ENGINEERING COMMAND ~ MID-ATLANTIC
NAVAL INDUSTRIAL RESERVE ORDNANCE PLANT
BETHPAGE, NEW YORK

GM-38 AREA
GROUNDWATER TREATMENT PLANT
AOP SYSTEM ADDITION

GRADING PLAN

CODE ID. NO. 80091	SIZE D
SCALE:	
MAXIMO NO. N62470-08-D-1001	
JOB ORDER NO. WE-24	
SPEC. NO.	
CONSTR. CONTR. NO. N62472-89-D-0032	
112G08005	
NAVFAC DRAWING NO.	
SHEET	OF
C-300	

STRUCTURAL GENERAL NOTES

A. THESE GENERAL NOTES PRESENT AND/OR SUMMARIZE KEY PROJECT INFORMATION FOR THE DRAWING READER'S CONVENIENCE. SEE ALSO INDIVIDUAL DRAWING NOTES AND PROJECT SPECIFICATIONS FOR FURTHER DETAILS AND REQUIREMENTS.

B. ALL REFERENCES TO REFERENCE STANDARDS HEREIN ARE TO MOST RECENT ISSUE IN EFFECT AS OF THE DATE OF THESE DOCUMENTS, UNLESS NOTED OTHERWISE IN PROJECT SPECIFICATIONS OR ON THE DRAWING

C. ALL ELEVATIONS ARE REFERENCED TO FINISH FLOOR EL. 0'-0" = 85.9' (VIF) ELEVATIONS SHOWN ON DRAWINGS ARE REFERENCED TO THIS DATUM UNLESS NOTED.

D. SUBMIT SHOP DRAWINGS, PROJECT DATA AND SAMPLES AS SPECIFIED IN PROJECT SPECIFICATIONS.

E. ABBREVIATIONS

A.B.	ANCHOR BOLT	F.V.	FIELD VERIFY	ORIG	ORIGINAL
ADD'L	ADDITIONAL	FD	FLOOR DRAIN	PEMB	PRE-ENGINEERED METAL BUILDING
AISC	AMERICAN INSTITUTE OF STEEL CONSTRUCTION	FF	FINISH FLOOR	PERF	PERFORATED
		FFE	FINISH FLOOR ELEVATION	PERP	PERPENDICULAR
ALT.	ALTERNATE	FIN	FINISH (ED)	PL	PLATE
ALUM.	ALUMINUM	FLG.	FLANGE	PLF	POUNDS PER LINEAR FOOT
APPROX.	APPROXIMATE	FLR	FLOOR	PRCST	PRECAST
ARCH.	ARCHITECT(URAL)	FND.	FOUNDATION	PREFAB	PREFABRICATED
B.M.	BEAM	FRMG	FRAMING	PSF	POUNDS PER SQUARE FOOT
B.O.	BOTTOM OF	FT	FOOT	PSI	POUNDS PER SQUARE INCH
B.O.F	BOTTOM OF FOOTING	FTG	FOOTING	PT	PRESSURE TREATED
B.O.S.	BOTTOM OF STEEL	GA	GAGE, GAUGE	QTY	QUANTITY
BLDG.	BUILDING	GALV	GALVANIZED	R	RISER
BOT.	BOTTOM	GR.	GRADE	RAD.	RADIUS
BRG.	BEARING	GRTG	GRATING	RD	ROOF DRAIN
BTWN	BETWEEN	H.P.	HIGH POINT	REF	REFERENCE
C/C	CENTER TO CENTER	H.R.	HAND RAIL	REINF.	REINFORCEMENT
CCJ	CRACK CONTROL JOINT	HK	HOOK	REQ	REQUIRE
CFS	COLD FORMED STEEL	HORIZ	HORIZONTAL	REQ'D	REQUIRED
CJ	CONSTRUCTION JOINT	HT	HEIGHT	REV	REVISION
CL	CENTER LINE	HVAC	HEATING VENTILATION AND AIR CONDITIONING	RO	ROUGH OPENING
CLG	CEILING			SCHED	SCHEDULE
CLR	CLEAR	I.D.	INSIDE DIAMETER	SF	SQUARE FOOT
CMU	CONCRETE MASONRY UNIT	I.F.	INSIDE FACE	SHT.	SHEET
COL	COLUMN	I.J.	ISOLATION JOINT	SIM.	SIMILAR
CONC	CONCRETE	IN.	INCH	SLF	SIDE LAP FASTENER
CONST	CONSTRUCTION	INSUL	INSULATION	SPA.	SPACE
CONT	CONTINUOUS	L	ANGLE	SPEC	SPECIFICATIONS
COORD	COORDINATE	L.P.	LOW POINT	SQ	SQUARE
CTR	CENTER	LBS	POUNDS	SS	STAINLESS STEEL
DBA	DEFORMED BAR ANCHOR	LF	LINEAR FOOT (FEET)	STAG.	STAGGER
DEMO	DEMOLISH	LLH	LONG LEG HORIZONTAL	STD	STANDARD
DIA	DIAMETER	LLV	LONG LEG VERTICAL	STL	STEEL
DIM	DIMENSION	LOC	LOCATION	STL JST	STEEL JOIST
DIST	DISTANCE	MATL	MATERIAL	STRUCT	STRUCTURE(AL)
DN	DOWN	MAX	MAXIMUM	SYM	SYMMETRICAL
DTL.	DETAIL	MECH	MECHANICAL	T	TREAD
DWG(S)	DRAWING(S)	MFR	MANUFACTURER	T.O.C.	TOP OF CONCRETE
DWL	DOWEL	MID	MIDDLE / MIDPOINT	T/	TOP OF
E	EXISTING	MIN	MINIMUM, MINUTE	TEMP	TEMPORARY
EA	EACH	MISC.	MISCELLANEOUS	THK	THICKNESS
EF	EACH FACE	MTL	METAL	TOF	TOP OF FOOTING
EJ	EXPANSION JOINT	N	NEW	TOS	TOP OF SLAB
EL / ELEV.	ELEVATION	N.S.	NEAR SIDE	TRANSV.	TRANSVERE
ELEC	ELECTRIC(AL)	N.T.S.	NOT TO SCALE	TYP	TYPICAL
ENGR	ENGINEER	NA	NOT APPLICABLE	UNO	UNLESS NOTED OTHERWISE
EQ	EQUAL	NO	NUMBER	V.I.F.	VERIFY IN FIELD
EQUIP	EQUIPMENT	NOM	NOMINAL	VERT	VERTICAL
EW	EACH WAY	O.C.	ON CENTER	W.P.	WORK POINT
EXIST	EXISTING	O.D.	OUTSIDE DIAMETER	W/	WITH
EXP	EXPANSION	OPH	OPPOSITE HAND	W/O	WITHOUT
EXTG	EXISTING	OPNG	OPENING	WS	WATER STOP.
F.S.	FAR SIDE	OPP	OPPOSITE	WWF	WELDED WIRE FABRIC

FOUNDATIONS

A. SEE GEOTECHNICAL/SUBSURFACE INVESTIGATION REPORT BY TETRA TECH, DATED 4/23/2019. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE WHETHER OR NOT ADDITIONAL GEOTECHNICAL INFORMATION IS REQUIRED AND TO PROVIDE SUCH INFORMATION AS THE CONTRACTOR DEEMS NECESSARY.

B. ALLOWABLE BEARING PRESSURES AS FOLLOWS:

SLAB ON GRADE = 3000 PSF

C. GEOTECHNICAL ENGINEER SHALL BE RETAINED BY OWNER TO PROVIDE OBSERVATION AND TESTING SERVICES DURING THE GRADING AND FOUNDATION PHASE OF CONSTRUCTION. INSPECTION AND TESTING REPORTS SHALL BE SUBMITTED TO THE STRUCTURAL ENGINEER.

D. PRIOR TO PLACING ENGINEERED FILL, THE SITE SHALL BE STRIPPED AND PROOF ROLLED. ANY SOFT SPOTS ENCOUNTERED SHALL BE REMOVED AND REPLACED WITH ENGINEERED FILL. REFER TO GEOTECHNICAL REPORT FOR ADDITIONAL INFORMATION.

E. SITE PREPARATION ACTIVITIES WILL BE REQUIRED PRIOR TO CONSTRUCTION OF THE TANK MAT FOUNDATION AND CONTAINMENT SLAB DUE TO THE PRESENCE OF THE STRATUM "A" HISTORICALLY FILL SOILS. THE STRATUM "A" FILL SOILS (INCLUDING THE ORGANIC SOILS) ARE CONSIDERED UNSUITABLE FOR DIRECT SUPPORT OF THE MAT FOUNDATION BECAUSE EXCESSIVE AND DETRIMENTAL DIFFERENTIAL SETTLEMENT OF THE MAT FOUNDATION COULD RESULT. THEREFORE, CONTRACTOR TO REMOVE ALL STRATUM "A" FILL SOILS FROM THE SLAB FOUNDATIONS AREAS TO A MINIMUM DEPTH OF FIVE (5) FEET BELOW GRADE SURFACE. REMOVAL OF THESE MATERIALS IS TO EXTEND A MINIMUM OF FIVE (5) FEET BEYOND THE FOOTPRINT OF THE SLABS. FOLLOWING REMOVAL OF THE STRATUM "A" FILL MATERIAL AND PROPER SUBGRADE PREPARATION, APPROVED ENGINEERED FILL MAY BE USED TO BRING THESE AREAS TO DESIGN SUBGRADE ELEVATIONS. SEE GEOTECHNICAL REPORT FOR ADDITIONAL INFORMATION.

DESIGN CRITERIA

A. REFERENCES:

1. ICC INTERNATIONAL BUILDING CODE, 2015 EDITION
   RISK CATEGORY III IN ACCORDANCE WITH TABLE 1604.5
2. STATE BUILDING CODE: NYC CONSTRUCTION CODE 2014
3. ASCE/SEI 7-10 - MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES

B. DEAD LOADS:

ROOF DEAD LOAD	= (SELF WEIGHT) OR 5 PSF
ROOF COLLATERAL* LOAD	= 10 PSF
AVAILABLE TO RESIST UPLIFT	= SELF WEIGHT OF STRUCTURAL FRAMING ONLY

* COLLATERAL LOAD INCLUDES PROVISION FOR HANGING LOADS INCLUDING PROCESS, PLUMBING AND OTHER COMPONENTS. REFER TO DRAWINGS FOR CONCENTRATED LOADING.

C. LIVE LOADS (U.N.O.):

TYPICAL GROUND FLOORS	= WEIGHT OF TANK	30,000 LBS (FULL) 2,300 LBS (EMPTY) TO BE CONFIRMED BY CONTRACTOR UPON FINAL EQUIPMENT SELECTION
TRUCK LOADING SLAB	= H-20 LOADING	
CANOPY ROOF	= 20 PSF	
PROCESS FLOOR	= 200 PSF	

D. FROST DEPTH = 48 INCHES

E. ROOF SNOW LOAD:

GROUND SNOW LOAD, Pg	= 30.0 PSF
FLAT ROOF SNOW LOAD, Pf	= 27.7 PSF
SNOW EXPOSURE FACTOR, Ce	= 1.0
SNOW LOAD IMPORTANCE FACTOR, I	= 1.10
THERMAL FACTOR, Ct	= 1.20

F. WIND LOAD:

ULTIMATE DESIGN WIND SPEED, Vult	= 136 MPH
NOMINAL DESIGN WIND SPEED, Vasd	= 106 (Vult*\0.6) MPH
RISK CATEGORY	= III
WIND EXPOSURE CATEGORY	= B
DIRECTIONALITY FACTOR, Kd	= 0.85
TOPOGRAPHY	= 1.0
INTERNAL PRESSURE COEFFICIENT, GCpi	= 0.00
BUILDING ENCLOSURE CLASSIFICATION	= OPEN BUILDING
FOR COMPONENTS & CLADDING PRESSURES,	REFER TO CHART ON SHEET S-002

G. SEISMIC DESIGN DATA:

RISK CATEGORY	= III
SEISMIC IMPORTANCE FACTOR, Ie	= 1.25
SDS	= 0.250
SD1	= 0.106
SS	= 0.234
S1	= 0.066
SITE CLASS	= 'D'
SEISMIC DESIGN CATEGORY	= 'B'
RESPONSE MODIFICATION FACTOR, R	= 3
BASIC SEISMIC FORCE RESISTING SYSTEM	= (STRUCTURAL STEEL SYSTEM NOT SPECIFICALLY DETAILED FOR SEISMIC RESISTANCE)
SEISMIC RESPONSE COEFFICIENT, Cs	= 0.104
DESIGN BASE SHEAR:	= 0.5 KIPS
ANALYSIS PROCEDURE:	= EQUIVALENT LATERAL FORCE

STRUCTURAL CONCRETE

A. REFERENCES:

1. ACI 318-14 BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE
2. ACI 350-06 CODE REQUIREMENTS FOR ENVIRONMENTAL ENGINEERING CONCRETE STRUCTURES
3. ACI SP-66 ACI DETAILING MANUAL
4. ACI 301-16 SPECIFICATION FOR STRUCTURAL CONCRETE
5. ACI 117-10 SPECIFICATION FOR TOLERANCES FOR CONCRETE CONSTRUCTION AND MATERIALS
6. CRSI MSP-2-01 MANUAL OF STANDARD PRACTICE
7. CRSI REINFORCING BAR DETAILING
8. CRSI PLACING REINFORCING BARS

B. MATERIALS

1. STRUCTURAL CONCRETE
   a) MINIMUM COMPRESSIVE STRENGTH AT 28 DAYS (f'c).....4500 PSI
   b) ALL CONCRETE EXPOSED TO THE ELEMENTS SHALL BE AIR-ENTRAINED IN ACCORDANCE WITH ASTM C260. SEE SPECIFICATIONS.
   c) ALL CONCRETE AGGREGATE SHALL COMPLY WITH ASTM C33 (NORMAL WEIGHT).

2. REINFORCEMENT
   a) REINFORCING BARS: ASTM A615, GRADE 60

3. ANCHOR RODS
   a) SHALL BE GALVANIZED, FURNISHED WITH CHAMFERED ENDS, AND SHALL MEET STRENGTH AND DUCTILITY REQUIREMENTS EQUIVALENT ASTM F1554, GR 55 WELDABLE MATERIAL.

4. MECHANICAL (TORQUE-CONTROLLED) ANCHORS
   a) APPROVED SYSTEMS INCLUDE HILTI KWIK BOLT TZ (ICC ESR 1917) OR HILTI KWIK HUS-EZ (ICC ESR 3027) OR EQUAL CONSIDERING LOAD RESISTANCE. MECHANICAL ANCHORS SHALL BE APPROVED FOR USE WITH CRACKED CONCRETE PER AC 193. CURRENT ICC-ESR SHALL BE SUBMITTED. ALL PERSONNEL INSTALLING ANCHORS SHALL BE TRAINED BY THE MANUFACTURER ON PROPER INSTALLATION TECHNIQUE. TRAINING DOCUMENTATION FROM THE MANUFACTURER SHALL BE AVAILABLE ON REQUEST

5. ADHESIVE ANCHORS
   a) APPROVED SYSTEMS INCLUDE HILTI HIT-RE 500 V3 (ICC ESR 3814) OR HILTI HIT-HY 200 HAS WITH SAFESET TECHNOLOGY (ICC ESR 3187) OR EQUAL CONSIDERING LOAD RESISTANCE, IN-SERVICE AND INSTALLATION TEMPERATURE, AVAILABILITY OR COMPREHENSIVE INSTALLATION INSTRUCTIONS, AND CREEP. ADHESIVE ANCHORS SHALL BE APPROVED FOR USE WITH CRACKED CONCRETE PER AC 308. CURRENT ICC-ESR SHALL BE SUBMITTED.
   b) ALL PERSONNEL INSTALLING ANCHORS SHALL BE TRAINED BY THE MANUFACTURER ON PROPER INSTALLATION TECHNIQUE. TRAINING DOCUMENTATION FROM THE MANUFACTURER SHALL BE AVAILABLE ON REQUEST.
   c) HOLE SIZES AND INSTALLATION SHALL BE IN ACCORDANCE WITH MANUFACTURER'S PRINTED INSTALLATION INSTRUCTIONS (MPII)

STRUCTURAL CONCRETE(CONTINUED)

   d) ADHESIVE FOR REBAR AND ANCHORS SHALL HAVE BEEN TESTED IN ACCORDANCE WITH ACI 355.4 AND ICC-ES AC308 FOR CRACKED CONCRETE AND SEISMIC APPLICATIONS. DESIGN ADHESIVE BOND STRENGTH HAS BEEN BASED ON ACI 355.4 TEMPERATURE CATEGORY A WITH INSTALLATIONS INTO DRY OR WATER SATURATED HOLES DRILLED USING A CARBIDE DRILL BIT INTO CONCRETE THAT HAS BEEN CURED FOR AT LEAST 21 DAYS.
   e) ANY ADHESIVE ANCHOR INSTALLED HORIZONTALLY OR IN A VERTICALLY INCLINED PLANE SHALL BE INSTALLED BY CERITIFIED ADHESIVE ANCHOR INSTALLER, PER ACI 318-14 17.8.2.2, AND SHALL BE INSPECTED PER ACI 318-14 17.8.2.4.
   f) FILL IN ALL ABANDONED HOLES WITHIN 2" OF NEW ANCHOR LOCATIONS.

6. GROUT: HIGH STRENGTH, NON-SHRINK STRUCTURAL GROUT. SEE SPECIFICATIONS.

C. REINFORCEMENT DETAILING

1. ALL REINFORCING STEEL DETAILS SHALL BE IN ACCORDANCE WITH THE ACI CODE REQUIREMENTS (ACI 350 - CURRENT EDITION).
2. REINFORCING STEEL PLACING DRAWINGS AND BAR LISTS SHALL CONFORM TO THE ACI OR CRSI DETAILING MANUALS. ALL BAR AND MESH SUPPORTS MUST BE CLEARLY DETAILED
3. CONCRETE COVER FOR REINFORCING SHALL BE INDICATED ON THE APPLICABLE REINFORCING STEEL SHOP DRAWINGS. HOWEVER, NO REINFORCING IN AREAS EXPOSED TO EARTH, WEATHER OR WATER SHALL HAVE COVER LESS THAN TWO INCHES.
4. SPECIFIED COVER FOR REINFORCING PER ACI 350 (BUILDING STRUCTURES):
   CURB (EXTERIOR).....2.0"
   SLAB-ON-GRADE .....3.0" BOTTOM (U.N.O)
5. PROVIDE CORNER BARS AT ALL TURNDOWN FOUNDATION CORNERS LAPPED WITH THE HORIZONTAL BARS. CORNER BARS ARE TO MATCH THE HORIZONTAL BARS IN SIZE, GRADE AND SPACING UNLESS OTHERWISE SHOWN.
6. HOOKS AND BENDS SHALL MEET ACI STANDARD UNLESS OTHERWISE INDICATED.
7. SPLICES: CONTINUOUS REINFORCING BARS SHALL BE FURNISHED WITH CLASS 'B' TENSION LAPS SPLICES INCLUDING CORNER BARS, UNLESS NOTED OTHERWISE.
8. MECHANICAL SPLICES SHALL NOT BE PERMITTED UNLESS SHOWN ON THE DRAWINGS OR APPROVED BY THE ENGINEER
9. REINFORCING STEEL FABRICATION AND PLACEMENT SHALL BE IN ACCORDANCE WITH CRSI MANUAL OF STANDARD PRACTICE AND CRSI PLACING REINFORCING BARS (LATEST EDITIONS).
10. SPREAD BARS AROUND SMALL OPENINGS AND SLEEVES IN SLABS AND WALLS WHERE POSSIBLE AND WHERE BAR SPACING WILL NOT EXCEED 1.5 TIMES THE NORMAL SPACING. DISCONTINUE BARS AT LARGE OPENINGS WHERE NECESSARY AND PROVIDE AN AREA OF REINFORCEMENT EQUAL TO THE INTERRUPTED REINFORCEMENT DISTRIBUTING ONE-HALF OF THIS REINFORCEMENT EACH SIDE OF THE OPENING (TENSION LAP SPLICED). HOLES LARGER THAN 12 INCHES IN ANY DIRECTION SHALL HAVE (2) #6 X 4'-0" DIAGONAL BARS IN BOTH FACES AT EACH CORNER
11. ALL REINFORCING SHALL BE HELD SECURELY IN POSITION WITH STANDARD ACCESSORIES IN CONCRETE
12. NO REINFORCING STEEL SHALL BE FIELD BENT WITHOUT THE APPROVAL OF THE STRUCTURAL ENGINEER. FIELD BENDING OF PLAIN REINFORCEMENT, IF PERMITTED, SHALL BE PERFORMED USING AN APPROVED AND APPROPRIATE SIZED PORTABLE HYDRAULIC DEVICE THAT MAKES ACI STANDARD RADIUS BENDS. NO OTHER FIELD BENDING METHOD SHALL BE PERMITTED.
13. WELDING, INCLUDING TACK WELDING, FOR REINFORCING STEEL IS PROHIBITED. WELDING OF REINFORCING STEEL AND HIGH STRENGTH BOLTS, IE. A36, F1554, WILL BE PERMITTED ONLY BY WRITTEN APPROVAL OF THE ENGINEER.
14. ALL OPENINGS THROUGH WALLS, SLABS OR OTHER STRUCTURAL ELEMENTS NOT DETAILED ON THE STRUCTURAL DRAWINGS MUST BE LOCATED BY THE CONTRACTOR AND SHOWN ON THE APPLICABLE REINFORCING STEEL SHOP DRAWINGS. THE FINAL LOCATION OF ALL OPENINGS MUST BE REVIEWED BY THE ENGINEER BEFORE THE CONCRETE IS POURED.

D. FORMWORK

1. SEE SPECIFICATIONS
2. CAMBER: PROVIDE CAMBER TO COMPENSATE FOR DISPLACEMENT OF FORMS (SEE SPECS.) AND TO PROVIDE AS-CAST MEMBER CAMBER AS NOTED ON DRAWINGS.
3. RUSTICATION STRIPS, CHAMFERS, DRIPS, MISC. EMBEDS, ETC. SEE DRAWINGS AND/OR ARCHITECTURAL DRAWINGS.
4. PROVIDE 3/4" CHAMFER AT ALL EXPOSED CORNERS OF SLAB ON GRADE AND CONCRETE CURBS ETC. UNLESS OTHERWISE NOTED.
5. OPENINGS FOR MEP TRADES ARE TO BE INCLUDED IN THE BID. ALL HOLES FOR OTHER TRADES WHICH MUST BE CUT OR FORMED AND WHICH ARE NOT SHOWN ON THE STRUCTURAL DESIGN(S) DRAWINGS SHALL BE SUBMITTED TO THE STRUCTURAL ENGINEER DESIGNER FOR REVIEW AND APPROVAL. ANY STRENGTHENING OR ADDITIONAL REINFORCEMENT REQUIRED SHALL BE FURNISHED BY THE CONTRACTOR WITHOUT ADDITIONAL COST TO THE OWNER.

F. CONCRETE FINISHES: SEE SPECIFICATIONS

1. FORMED SURFACES:
   a) EXPOSED TO VIEW: SMOOTH FINISH
   b) COVERED OR AS NOTED ON PLANS: AS-CAST

2. FLATWORK:
   a) EXPOSED TO VIEW: LIGHT BROOM FINISH PARALLEL WITH DIRECTION OF SLAB SLOPE

G. CURING AND PROTECTION: SEE SPECIFICATIONS.

H. EMBEDDED PIPES OR CONDUIT. MAXIMUM DIAMETER ONE THIRD x SLAB OR WALL THICKNESS, SPACED MINIMUM OF 3 TIMES DIAMETER ON CENTER. ALL EMBEDDED PIPES OR CONDUIT SHALL BE APPROVED BY ENGINEER OF RECORD PRIOR TO INSTALLING.

J. ANY CONSTRUCTION JOINTS IN STRUCTURES WHERE WATERSTOPS ARE USED SHALL BE PROTECTED BY WATERSTOP UNLESS OTHERWISE NOTED. CONTRACTOR SHALL SUBMIT A CONSTRUCTION JOINT LAYOUT PLAN FOR APPROVAL BY THE ENGINEER OF RECORD PRIOR TO CONSTRUCTION.

K. SUBMITTALS

1. CONTRACTOR SHALL BE RESPONSIBLE FOR SUBMITTING THE FOLLOWING DOCUMENTS TO THE ENGINEER OF RECORD:
   a) CONCRETE MIX DESIGN
   b) CONCRETE REINFORCING DRAWINGS

ISSUED FOR BID – 06/21/2019

CAUTION: IF SHEET IS LESS THAN 34"x22" USE GRAPHIC SCALE

DATE APPR DESCRIPTION BY

NAVFAC

STATE OF NEW YORK KIRREN TODD CLARK 084869-1 LICENSED PROFESSIONAL ENGINEER

6-20-19

SEAL AREA			
DES	SPS	DR	SPS
REVIEWED BY		ATC	
PM/DM		HKM	
CHIEF ENG/ARCH		ATC	

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
NAVAL FACILITIES ENGINEERING COMMAND ~ MID-ATLANTIC
NAVAL INDUSTRIAL RESERVE ORDNANCE PLANT
BETHPAGE, NEW YORK
NAVAL WEAPONS INDUSTRIAL RESERVE PLANT
GM-38 AREA
GROUNDWATER TREATMENT PLANT
AOP SYSTEM ADDITION
GM 38
STRUCTURAL GENERAL NOTES I

THIS DRAWING PRODUCED ON AUTOCAD
DO NOT REVISE MANUALLY

CODE ID. NO. 80091	SIZE D
SCALE	AS NOTED
MAXIMO NO. N62470-08-D-1001	
JOB ORDER NO. WE-24	
SPEC. NO.	--
CONSTR. CONTR. NO. N62472-99-D-0032	112G08005
NAVFAC DRAWING NO.	....
SHEET	OF --

AS-001

STRUCTURAL STEEL

A. REFERENCES:
1. AISC STEEL CONSTRUCTION MANUAL, 14TH EDITION
2. AWS D1.1 STRUCTURAL WELDING CODE - STEEL

B. MATERIALS:

1. GRADE STEEL
   WIDE FLANGES...ASTM A992, GRADE 50
   CHANNELS, ANGLES, AND PLATES............ASTM A36
   SHEAR CONNECTOR PLATES......................ASTM A572, GRADE 50
   SQUARE HSS..ASTM A500, GRADE C, Fy=46 KSI
2. ANCHOR BOLTS: ASTM F1554, GRADE 55, WELDABLE.
3. STRUCTURAL BOLTS: ASTM A325-N
4. WELDS: E70XX ELECTRODES

C. CONNECTIONS
1. AISC MANUAL STANDARD CONNECTIONS UNLESS NOTED. HIGH-STRENGTH BOLTS: ASTM A325-N 5/8" UNLESS NOTED OTHERWISE. BEARING TYPE INSTALLED IN CONFORMANCE WITH "SPECIFICATIONS FOR STRUCTURAL JOINTS USING ASTM A325 OR A490 BOLTS", RESEARCH COUNCIL ON RIVETED AND BOLTED STRUCTURAL JOINTS. UNLESS NOTED OTHERWISE, STANDARD AISC "USUAL GAGE" DIMENSIONS SHALL BE USED FOR LOCATING HOLES FOR BOLTS, EXPANSION ANCHORS, ETC. IN ALL ANGLES, BEAM FLANGES, ETC.
2. THE ASSEMBLY SURFACE, INCLUDING THOSE ADJACENT TO THE WASHER, SHALL BE FREE OF MILL SCALE, OIL, PAINT OR OTHER COATINGS.
3. ALL HIGH STRENGTH BOLTS SHALL BE TIGHTENED TO A BOLT TENSION NOT LESS THAN THAT SPECIFICATION IN THE AISC MANUAL. FULL TENSIONING SHALL BE BY THE TURN OF NUT METHOD, BY A DIRECT TENSION INDICATOR, OR BY PROPERLY CALIBRATED WRENCHES. PROVIDE HARDENED WASHERS UNDER THE NUT OR BOLT HEAD, WHICHEVER IS THE ELEMENT TURNED IN TIGHTENING.
4. WELDING - PERFORM ALL WELDING IN ACCORDANCE WITH AWS D1.1 CODE, LATEST EDITION, WELDS SHALL BE MADE ONLY BY OPERATORS CERTIFIED BY AWS IN PERFORMING THE TYPE OF WORK INDICATED.

D. TOLERANCES: AISC CODE OF STANDARD PRACTICE (LATEST EDITION)

E. CAMBER: PROVIDE POSITIVE CAMBER AS NOTED ON DRAWINGS. WHERE NO CAMBER IS NOTED, RESIDUAL MILL CAMBER IS TO BE UPWARDS.

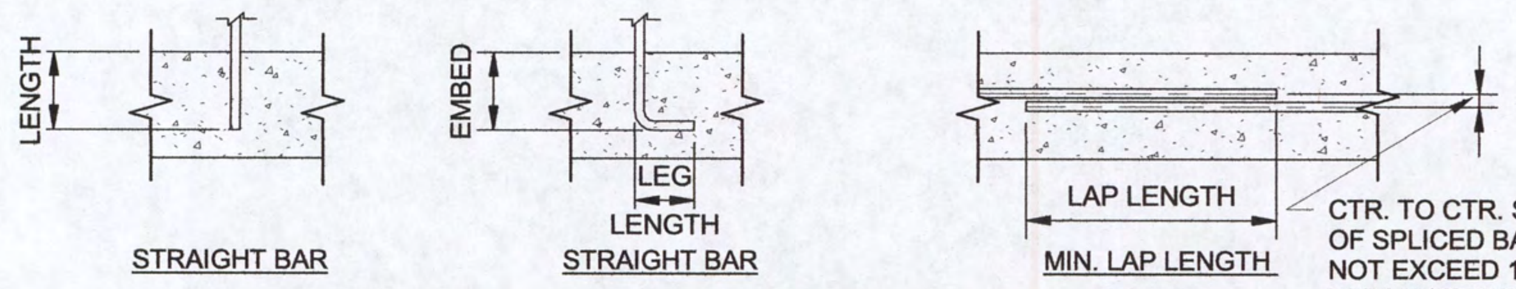
F. SHOP DRAWINGS
1. SUBMIT ERECTION AND FABRICATION SHOP DRAWINGS. SEE SPECS.

G. ALL STEEL MEMBERS AND CONNECTIONS ITEMS SHALL BE HOT DIPPED (G90) GALVANIZED

TENSION DEVELOPMENT / LAP SPLICE SCHEDULE (UNCOATED BARS)

DEVELOPMENT / LAP SPLICE LENGTH IN CONCRETE (f'c = 4500 PSI)

BAR SIZE	DEVELOPMENT LENGTH (IN)		CLASS 'B' LAP SPLICE LENGTH (IN)		STD 90 DEG. HOOK (IN)		
	BAR TYPE 1	BAR TYPE 2	BAR TYPE 1	BAR TYPE 2	EMBED	LEG LENGTH	BEND DIA.
4	18	27	24	35	7	8	3
5	23	34	30	44	9	10	3 3/4
6	27	41	35	53	10	12	4 1/2
7	40	59	51	77	12	14	5 1/4
8	45	67	59	88	14	16	6
9	51	76	66	99	15	19	9 1/2
10	57	86	74	111	17	22	10 3/4



BAR TYPE 1 - CLEAR SPACING OF BARS BEING DEVELOPED OR SPLICED NOT LESS THAN Db, CLEAR COVER NOT LESS THAN Db, AND STIRRUPS OR TIES THROUGHOUT Ld NOT LESS THAN CODE MINIMUM
OR
CLEAR SPACING OF BARS BEING DEVELOPED OR SPLICED NOT LESS THAN 2*Db AND CLEAR COVER NOT LESS THAN Db.

BAR TYPE 2 - TOP BARS WITH MORE THAN 12" OF FRESH CONCRETE CAST BELOW **AND** OTHER CASES

STEEL DECK

A. REFERENCES:
1. SDI DESIGN MANUAL FOR COMPOSITE DECKS, FORM DECKS, AND ROOF DECKS
2. SDI DIAPHRAGM DESIGN MANUAL

B. MATERIAL: A653 GRADE A (33,000 PSI MIN.), GALVANIZED (G90).

C. INSTALLATION:
1. DECK ATTACHMENTS SHALL BE IN ACCORDANCE WITH SDI SPECS AND PLAN NOTES UNLESS NOTED OTHERWISE AND SHALL BE ADEQUATELY SHOWN ON SHOP DRAWING SUBMITTAL.

COMPONENTS & CLADDING WIND PRESSURES FOR CANOPY

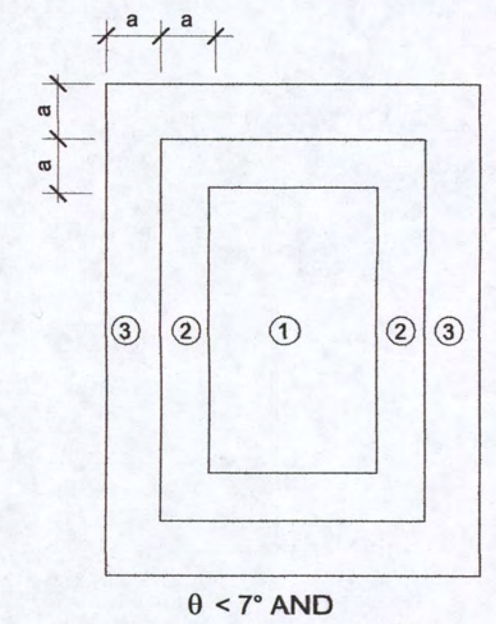
FACTORED (ULTIMATE) COMPONENTS & CLADDING WIND PRESSURES (PSF)

OPEN BUILDING

ROOF ZONES	EFFECTIVE TRIBUTARY AREA*		
	≤ 9SF	9SF, ≤ 36 SF	> 36 SF
NEGATIVE ZONE 1	-27	-27	-27
NEGATIVE ZONE 2	-42	-42	-27
NEGATIVE ZONE 3	-81	-42	-27
POSITIVE ZONE 1	29	29	29
POSITIVE ZONE 2	43	43	29
POSITIVE ZONE 3	57	43	29

NOTES:
1. EDGE DISTANCE 'a' = 3'-0"
2. * EFFECTIVE TRIBUTARY AREA: SPAN LENGTH MULTIPLIED BY AN EFFECTIVE WIDTH THAT NEED NOT BE LESS THAN 1/3 THE SPAN LENGTH
3. NEGATIVE VALUE DENOTES PRESSURE ACTING AWAY FROM THE SURFACE
4. UNFACTORED (NOMINAL) COMPONENTS AND CLADDING PRESSURES MAY BE OBTAINED BY MULTIPLYING THE VALUES IN THE TABLE BY 0.60

LOCATION OF WIND PRESSURE ZONES



θ < 7° AND MONOSLOPES < 3°

NAVFAC

SEAL AREA 084869-1 6-20-19

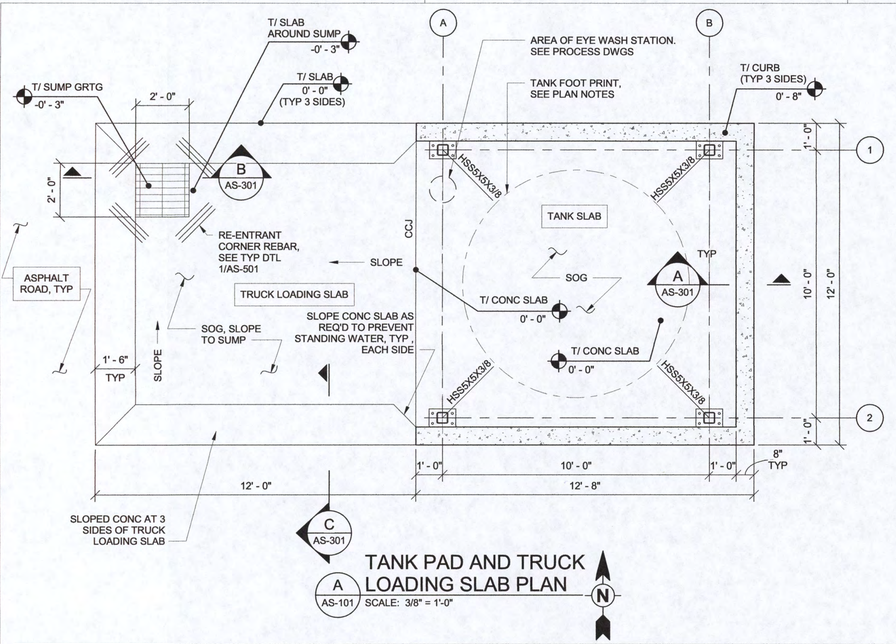
DES	SPS	DR	SPS
REVIEWED BY			ATC
PM/DM			HKM
CHIEF ENG/ARCH			ATC

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
NAVAL FACILITIES ENGINEERING COMMAND ~ MID-ATLANTIC
GM 38 NAVAL INDUSTRIAL RESERVE ORDNACE PLANT
NAVAL WEAPONS INDUSTRIAL RESERVE PLANT BETHPAGE, NEW YORK
GM-38 AREA
GROUNDWATER TREATMENT PLANT
AOP SYSTEM ADDITION
STRUCTURAL GENERAL NOTES II

THIS DRAWING PRODUCED ON AUTOCAD
DO NOT REVISE MANUALLY

CODE ID. NO. 80091 | SIZE D
SCALE: AS NOTED
MAXIMO NO. N62470-D8-D-1001
JOB ORDER NO. WE-24
SPEC. NO. ...
CONSTR. CONTR. NO. N62472-99-D-0032
112G08005
NAVFAC DRAWING NO. ....
SHEET ..... OF --
AS-002

ISSUED FOR BID - 06/21/2019
CAUTION: IF SHEET IS LESS THAN 34"x22" USE GRAPHIC SCALE



A AS-101 TANK PAD AND TRUCK LOADING SLAB PLAN

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

PLAN NOTES:

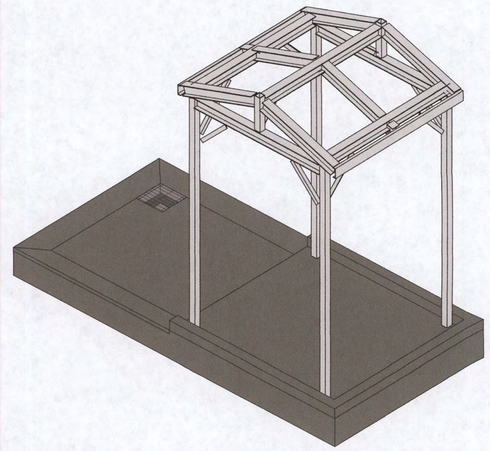
1. SEE AS-001 AND AS-002 FOR DESIGN CRITERIA AND GENERAL NOTES.
2. SEE AS-501 FOR TYPICAL DETAILS NOT CUT IN PLAN.
3. CONTRACTOR TO COORDINATE SIZE OF PAD AND CANOPY WITH FINAL TANK SELECTION SIZE BEFORE CONSTRUCTION AND FABRICATION OF TANK SLAB AND CANOPY.
4. APPLY CHEMICAL-RESISTANT EPOXY COATING TO ALL EXTERIOR EXPOSED CONCRETE SURFACES. PRODUCT TO BE SPECIFICALLY DESIGNED FOR EXPOSURE TO A 30% HYDROGEN PEROXIDE SOLUTION. CLEAN, PREPARE SURFACE AND INSTALL COATING PER WRITTEN MANUFACTURER'S INSTRUCTIONS.
5. ALL STEEL TO BE (G90) HOT DIPPED GALVANIZED.
6. FRP GRATING TO BE DESIGNED FOR H-20 LOADING.
7. 8.5' DIA BY 9' HIGH TANK , SEE PROCESS DWGS FOR TANK INFO. CONTRACTOR TO INFORM EOR IF FINAL TANK DIAMETER/ HEIGHT VARIES FROM ASSUMED VALUES.

LEGEND:

SOG - DENOTES 8" SLAB ON GRADE REINF W/ #5 @ 12" O.C., E.W., MID-DEPTH.

- DENOTES 2" FRP GRATING.

CCJ - DENOTES CRACK CONTROL JOINT, SEE TYPICAL DETAILS



B AS-101 OVERALL 3-D VIEW

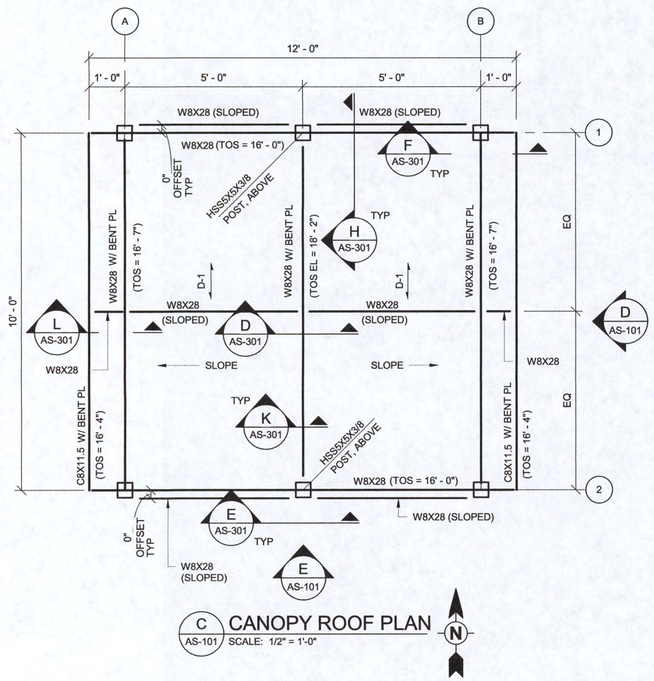
SCALE: N/A

PLAN NOTES:

1. SEE AS-001 AND AS-002 FOR DESIGN CRITERIA AND GENERAL NOTES.
2. SEE AS-501 FOR TYPICAL DETAILS NOT CUT IN PLAN.
3. CONTRACTOR TO COORDINATE SIZE OF CANOPY WITH FINAL TANK SELECTION SIZE BEFORE CONSTRUCTION AND FABRICATION.
4. ALL STEEL TO BE (G90) HOT DIPPED GALVANIZED.

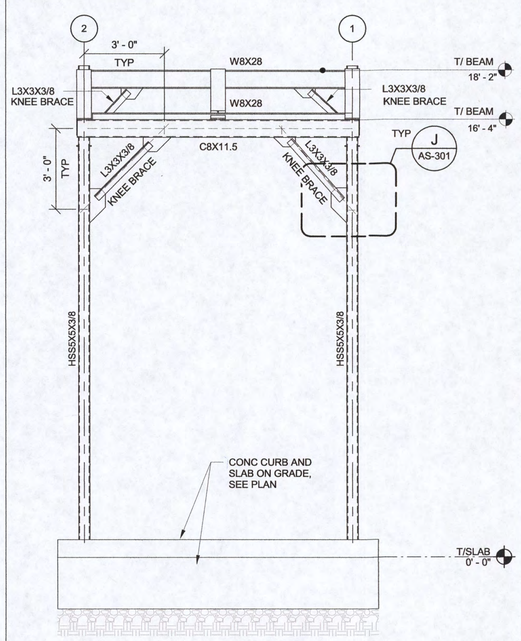
LEGEND:

D-1 - DENOTES SPAN OF 1 ½" TYPE B 20 GAUGE GALV ROOF DECK SECURED HILTI X-HSN24 POWDER ACTUATED FASTNER AT 36/7 PATTERN AND 6" O.C AROUND THE PERIMETER. S-SLC 01 M HWH SIDELAP CONNECTORS AT 9" O.C.



C AS-101 CANOPY ROOF PLAN

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

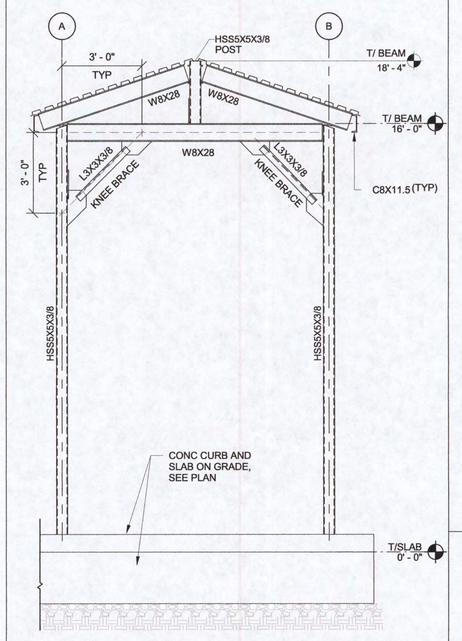


D AS-101 ELEVATION

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

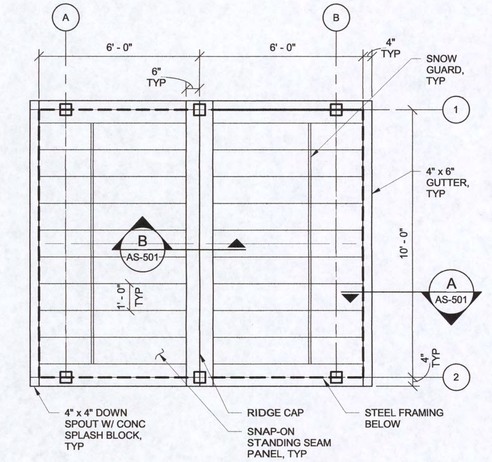
NOTES:

1. ROOF DECK NOT SHOWN FOR CLARITY



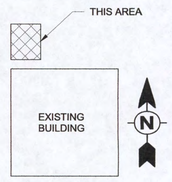
E AS-101 ELEVATION

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



F AS-101 ARCH ROOF PLAN

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



KEY PLAN

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

0 1'-4" 2'-8" 5'-4"
SCALE: 3/8" = 1'-0"

THIS DRAWING PRODUCED ON AUTOCAD DO NOT REVISE MANUALLY

ISSUED FOR BID – 06/21/2019

CAUTION: IF SHEET IS LESS THAN 34"x22" USE GRAPHIC SCALE

DATE	APPR	DESCRIPTION

NAVFAC

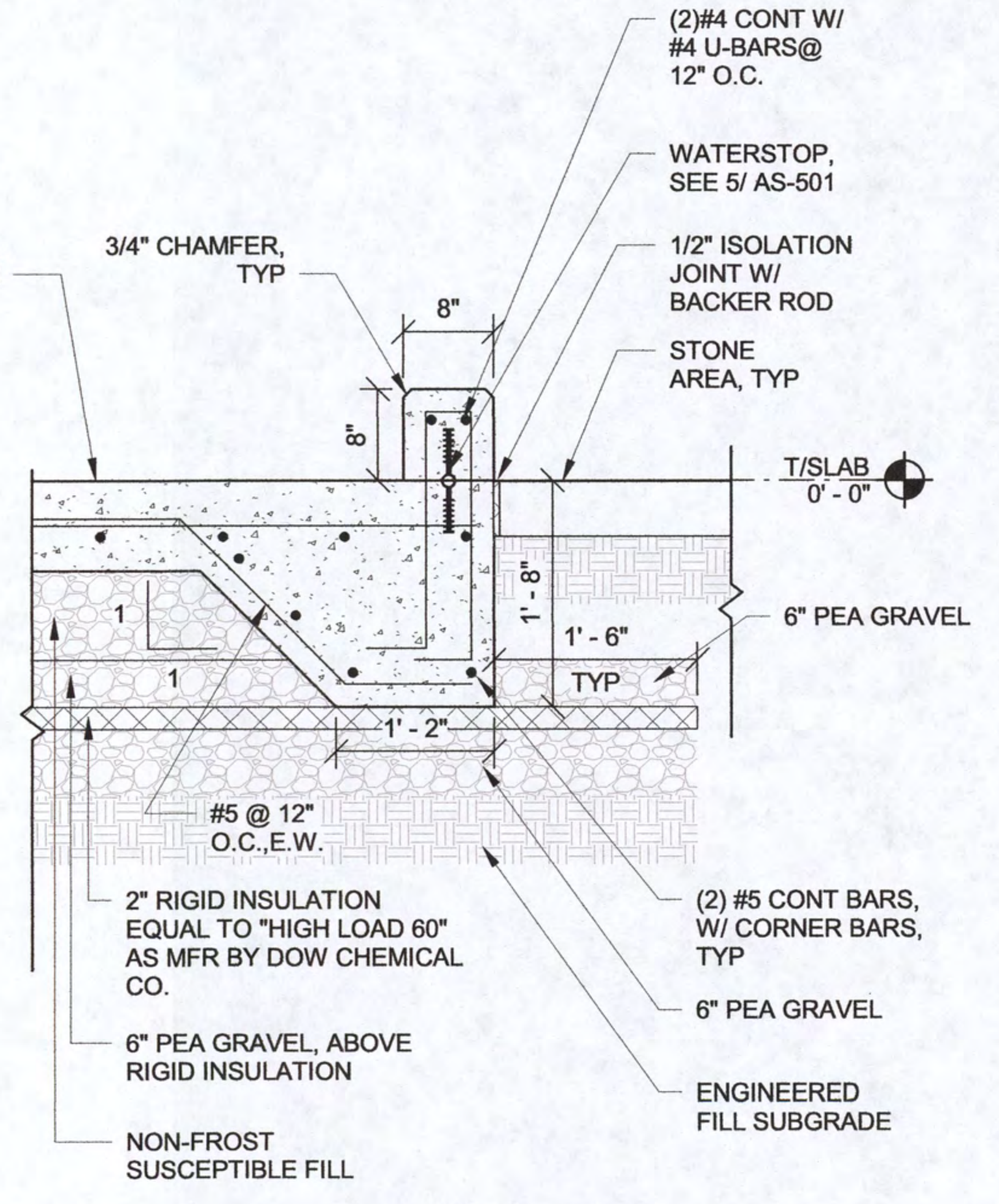
Tt

SEAL AREA			
DES	SPS	DR	SPS
REVIEWED BY		ATC	
PM/DM		HKM	
CHIEF ENG/ARCH		ATC	

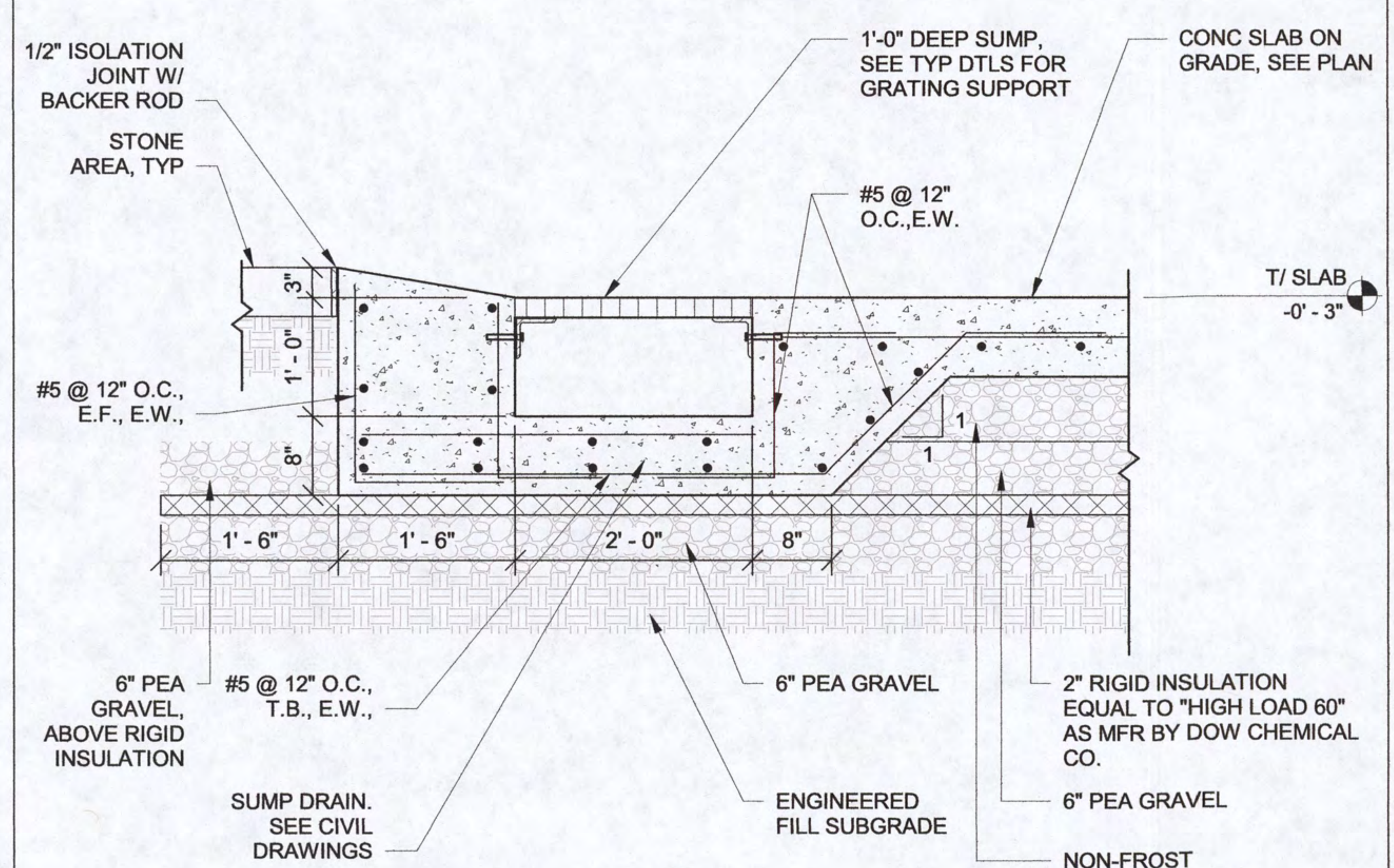
DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
NAVAL FACILITIES ENGINEERING COMMAND ~ MID-ATLANTIC
NAVAL INDUSTRIAL RESERVE ORDNANCE PLANT
NAVAL WEAPONS INDUSTRIAL RESERVE PLANT, BETHPAGE, NEW YORK
GM-38
GM 38 AREA
GROUNDWATER TREATMENT PLANT
AOP SYSTEM ADDITION
STRUCTURAL FDN AND ROOF PLAN

CODE ID. NO. 80091	SIZE D
SCALE:	AS NOTED
MAXIMO NO. N62470-08-D-1001	
JOB ORDER NO. WE-24	
SPEC. NO.	
CONSTR. CONTR NO.	N62472-99-D-0032
	112G08005
NAVFAC DRAWING NO.	
SHEET	OF .....

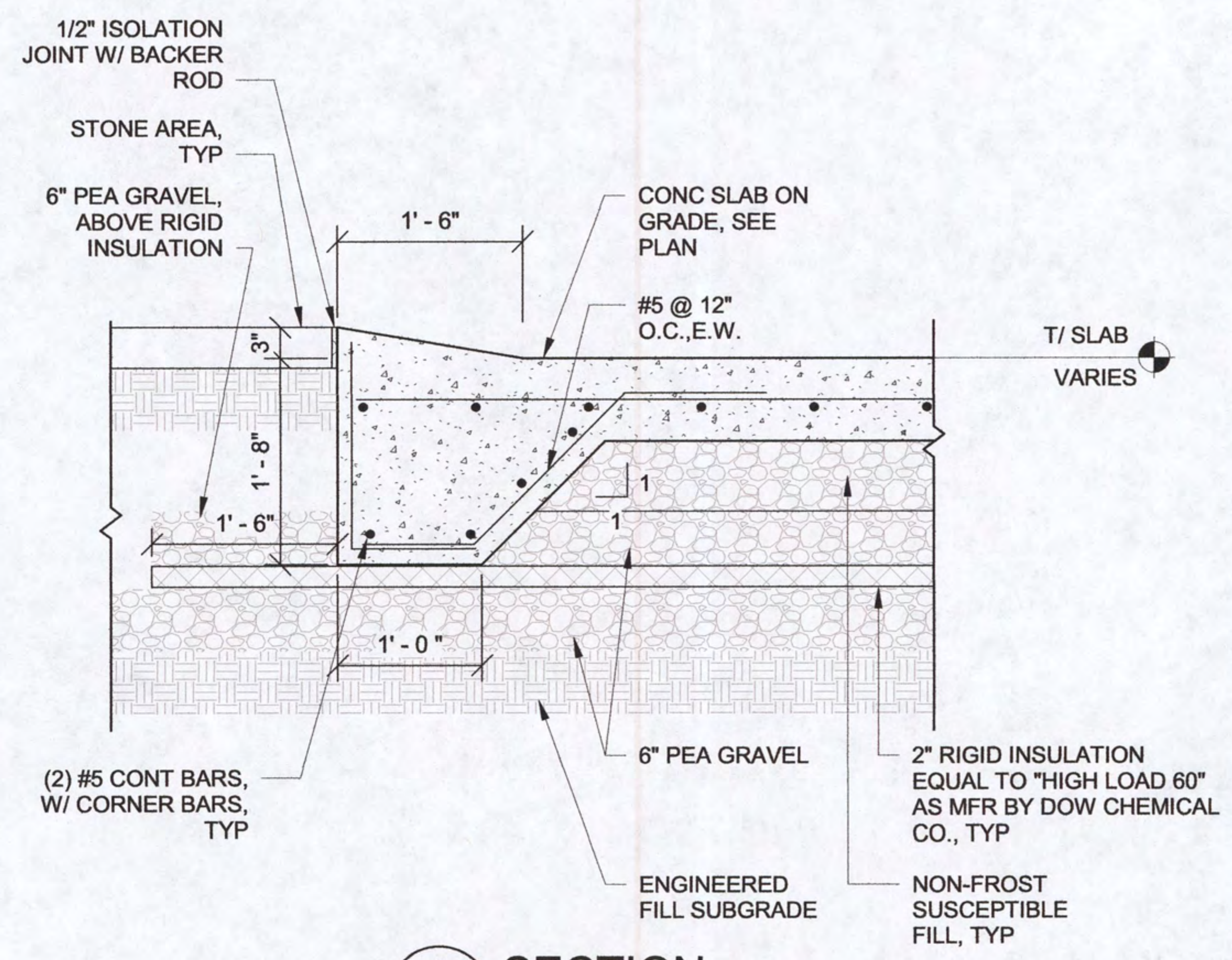
AS-101



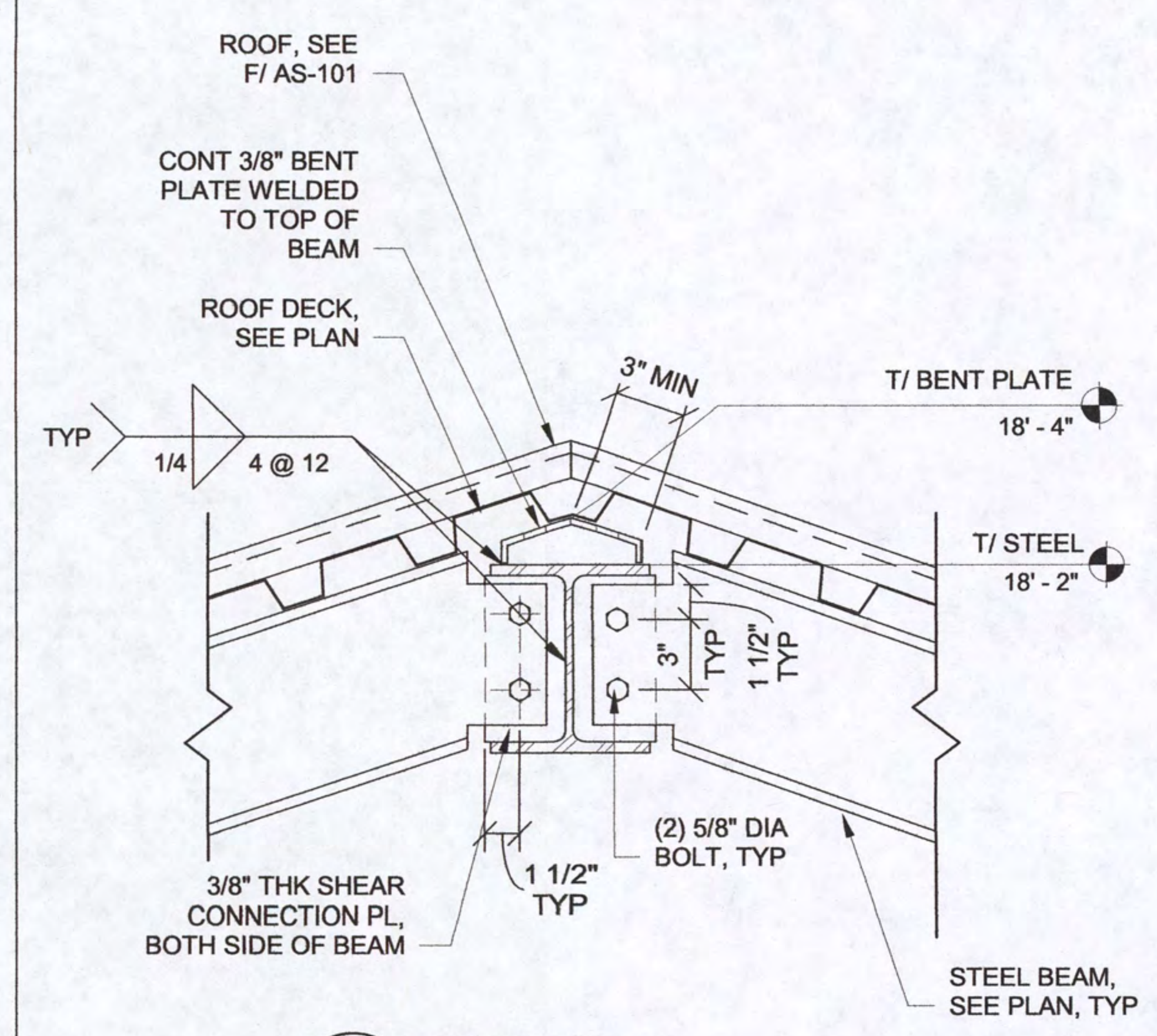
A SECTION
AS-101 SCALE: 3/4" = 1'-0"



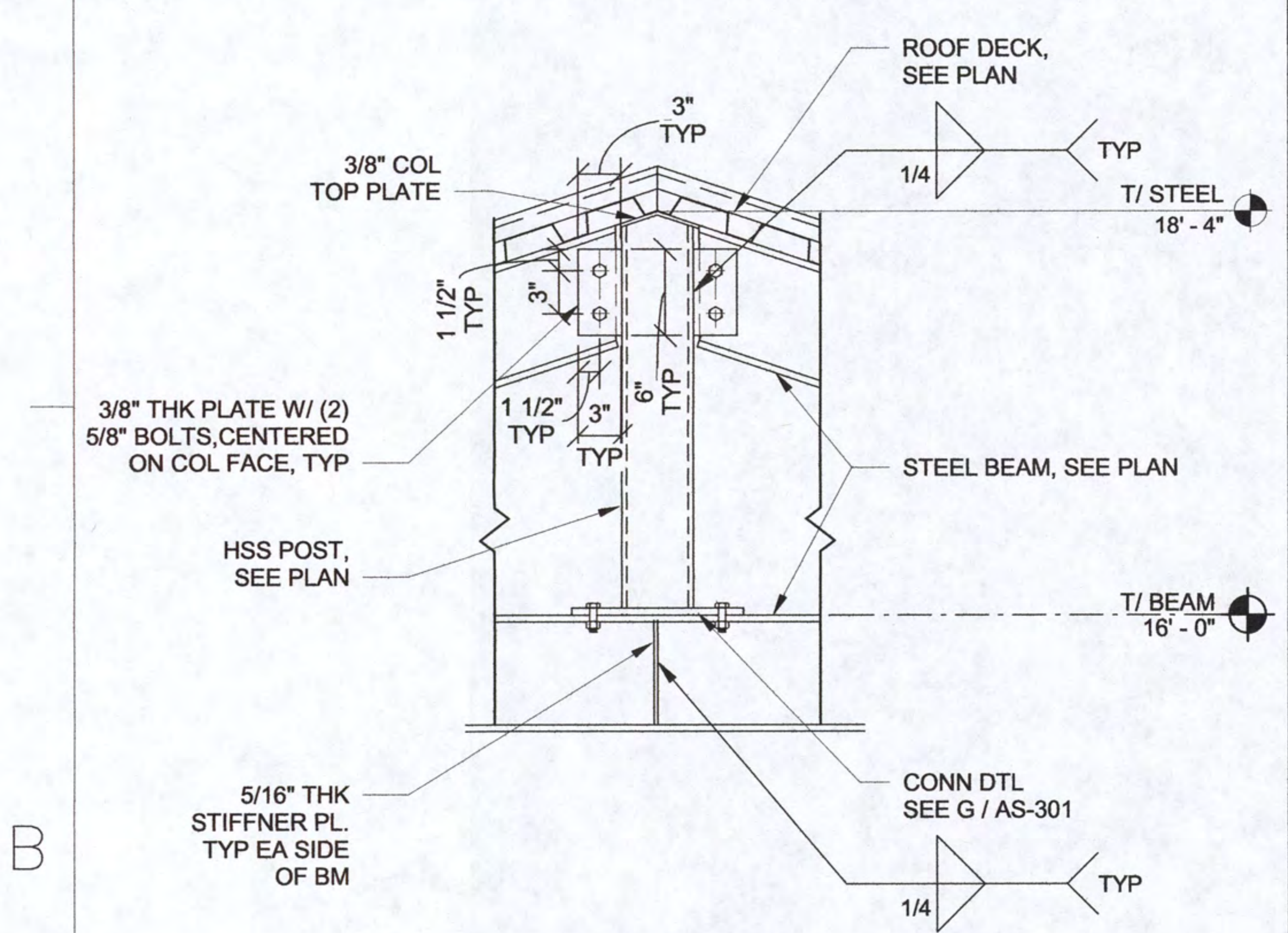
B SECTION
AS-101 SCALE: 3/4" = 1'-0"



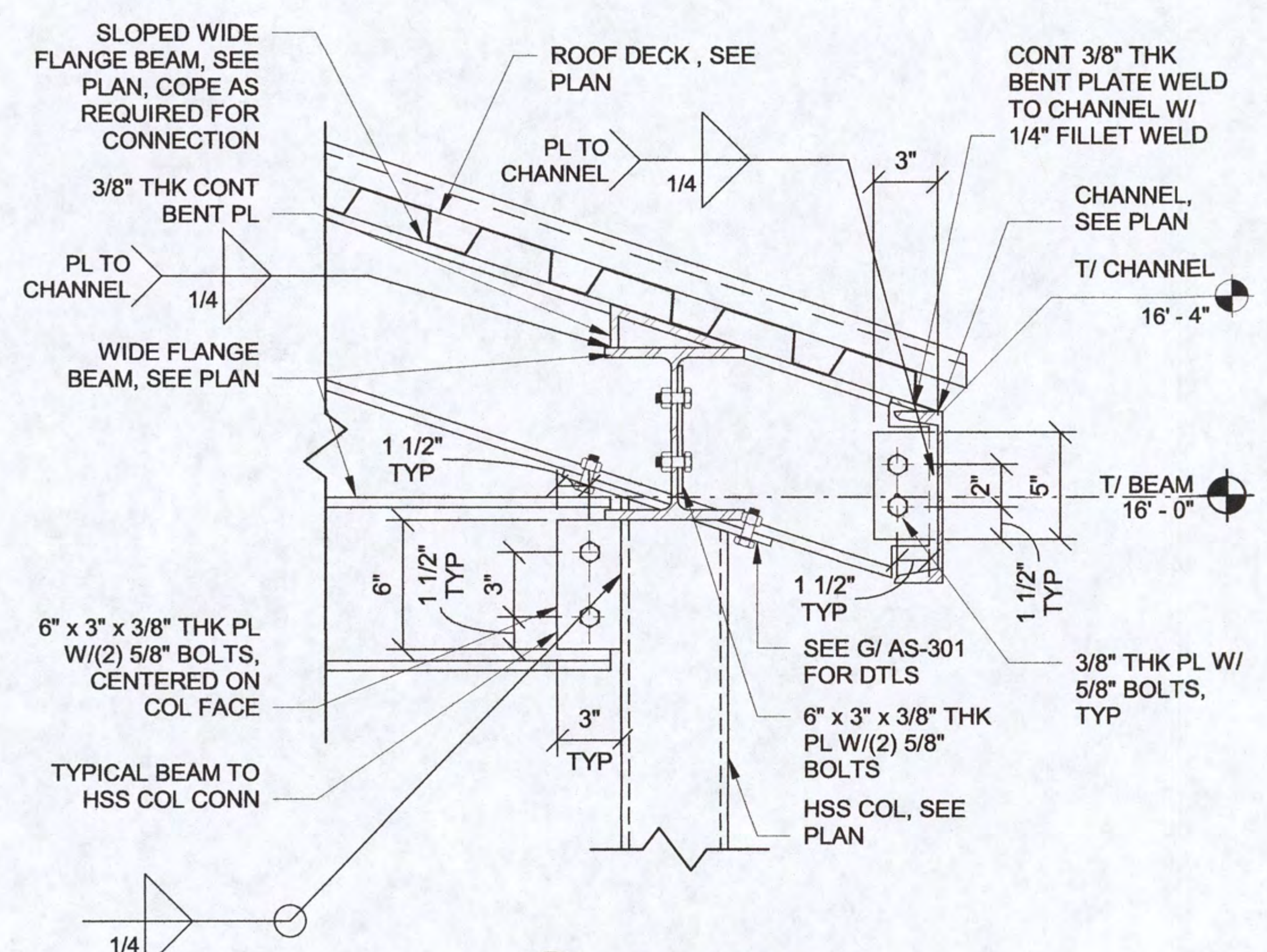
C SECTION
AS-101 SCALE: 3/4" = 1'-0"



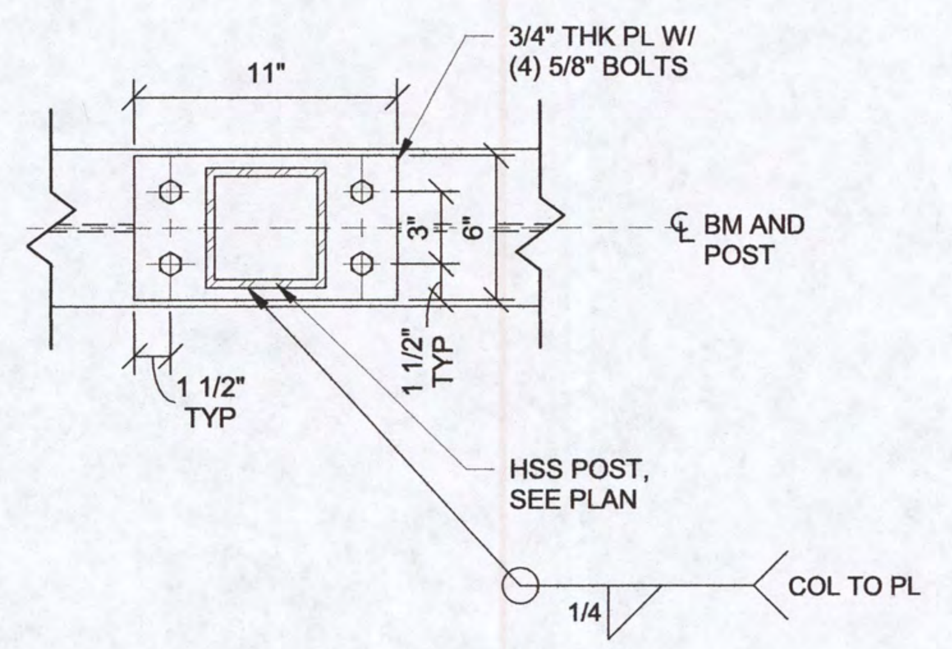
D SECTION
AS-101 SCALE: 1 1/2" = 1'-0"



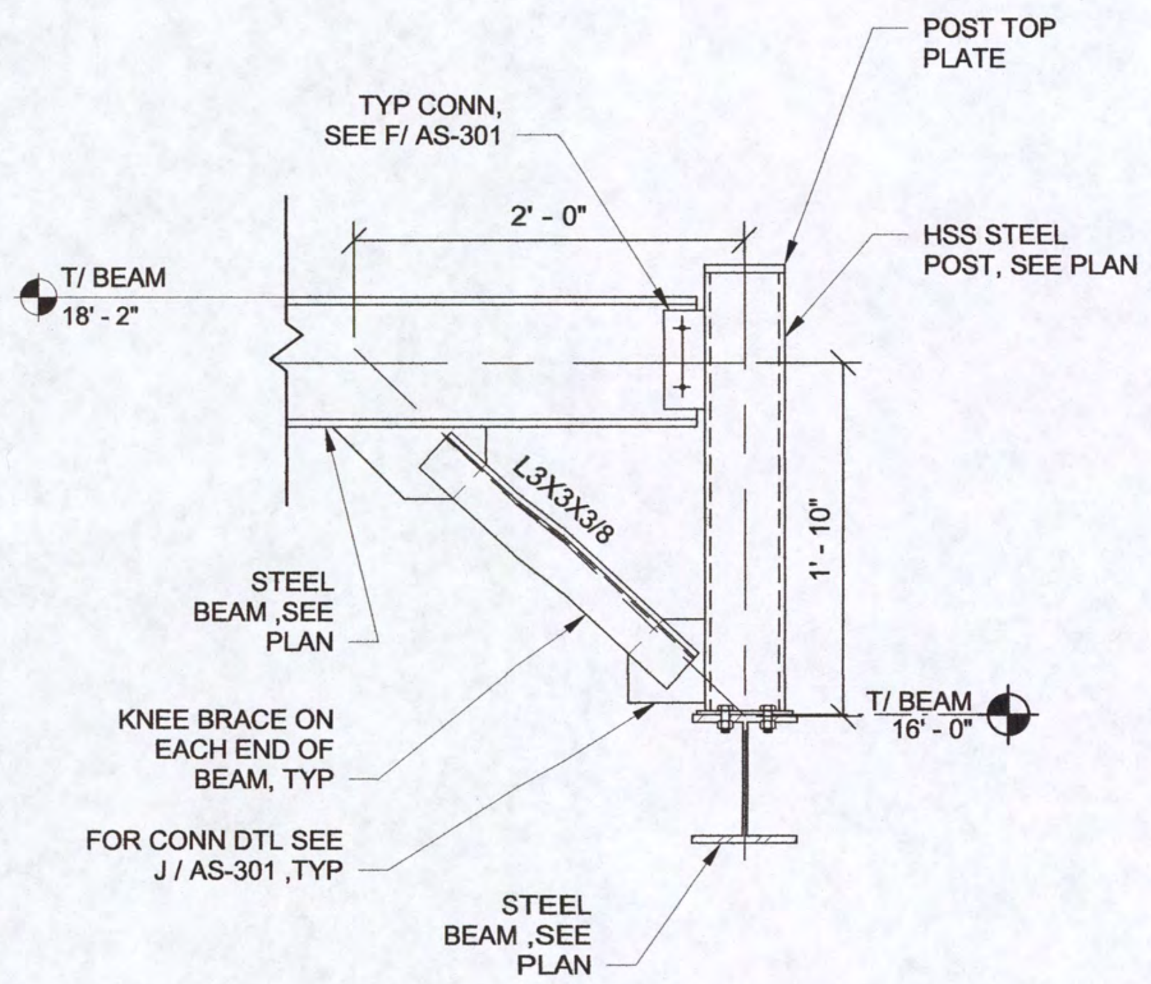
E SECTION
AS-101 SCALE: 1" = 1'-0"



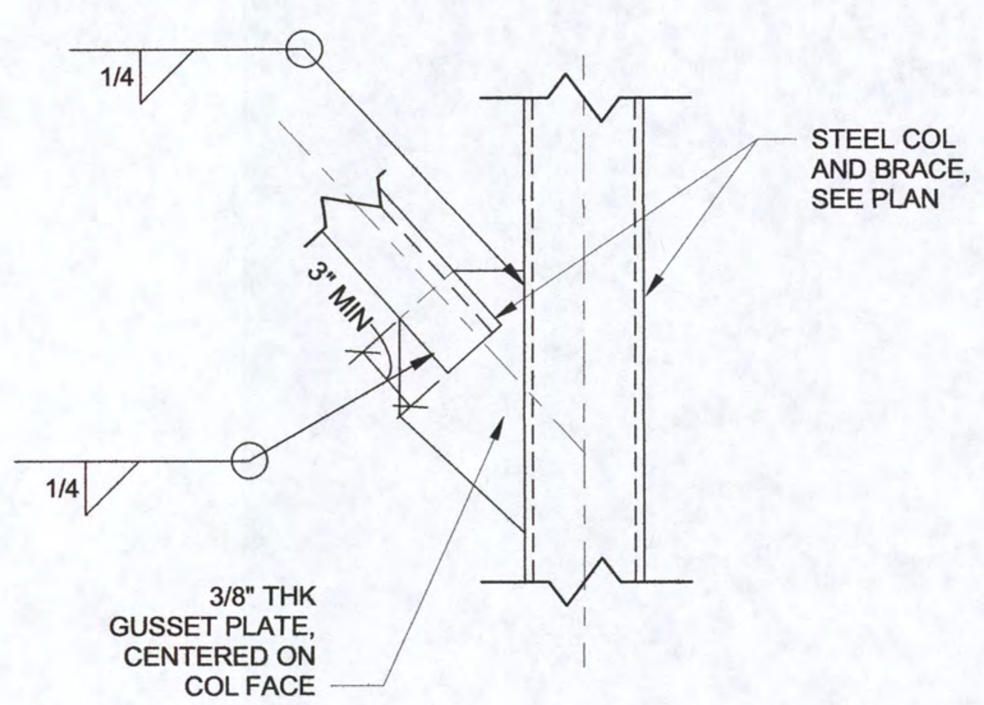
F SECTION
AS-101 SCALE: 1 1/2" = 1'-0"



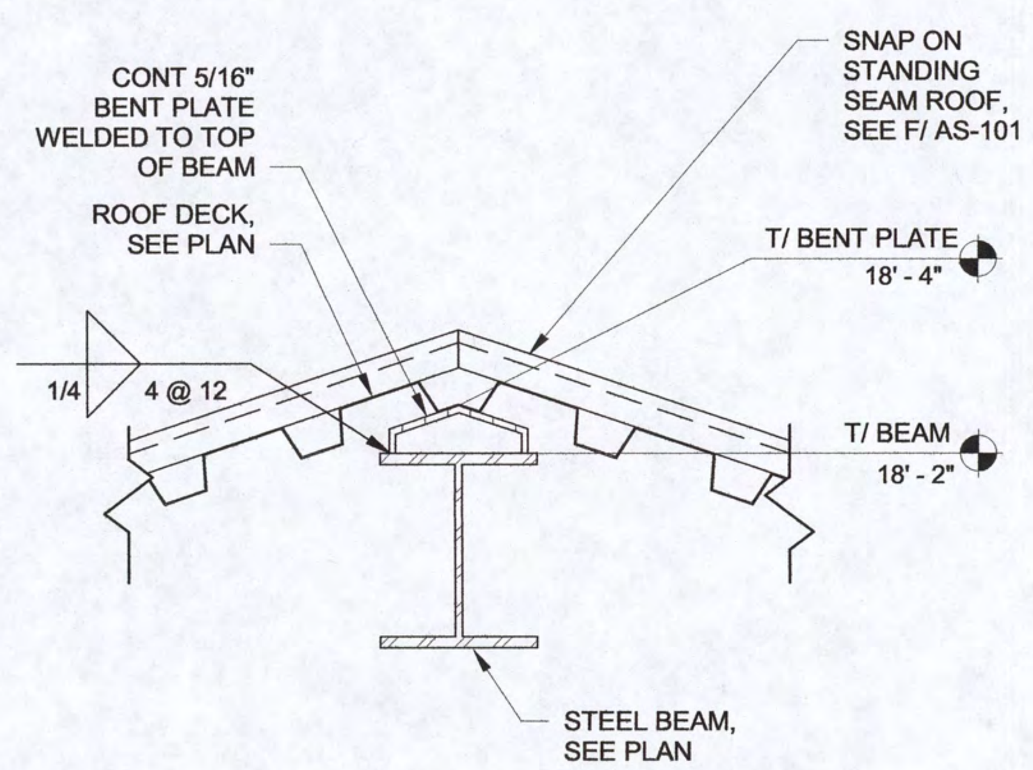
TYP POST TO WIDE FLANGE CONN
AS-301 SCALE: 1 1/2" = 1'-0"



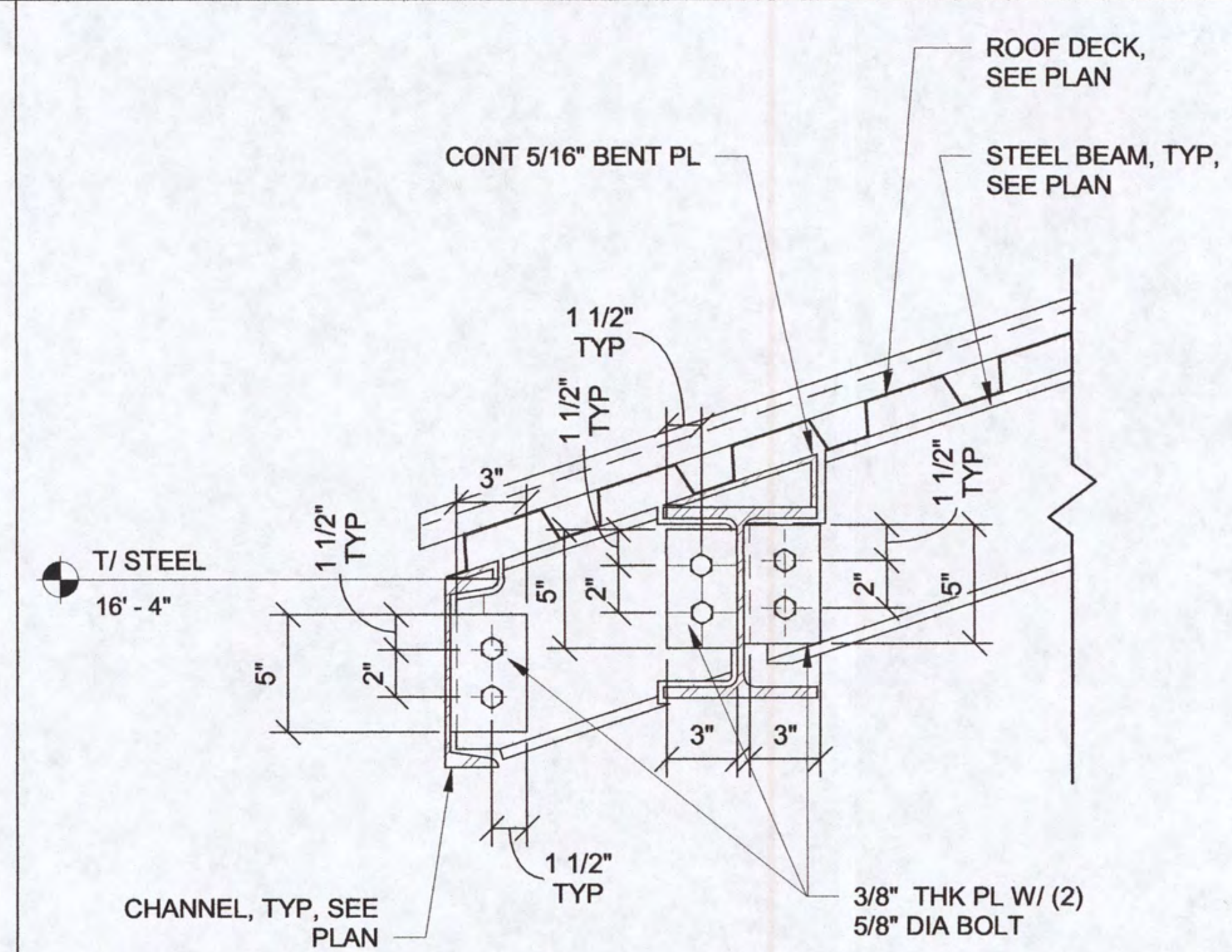
H SECTION
AS-101 SCALE: 1" = 1'-0"



J TYP BRACE GUSSET CONN
AS-101 SCALE: 1 1/2" = 1'-0"



K SECTION
AS-101 SCALE: 1 1/2" = 1'-0"



L SECTION
AS-101 SCALE: 1 1/2" = 1'-0"

0 8" 1'-4" 2'-8"
SCALE: 3/4" = 1'-0"

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

0 4" 8" 1'-4"
SCALE: 1 1/2" = 1'-0"

THIS DRAWING PRODUCED ON AUTOCAD
DO NOT REVISE MANUALLY

ISSUED FOR BID – 06/21/2019

CAUTION: IF SHEET IS LESS THAN 34"x22" USE GRAPHIC SCALE

SYM	DESCRIPTION	DATE	APPR

NAVFAC

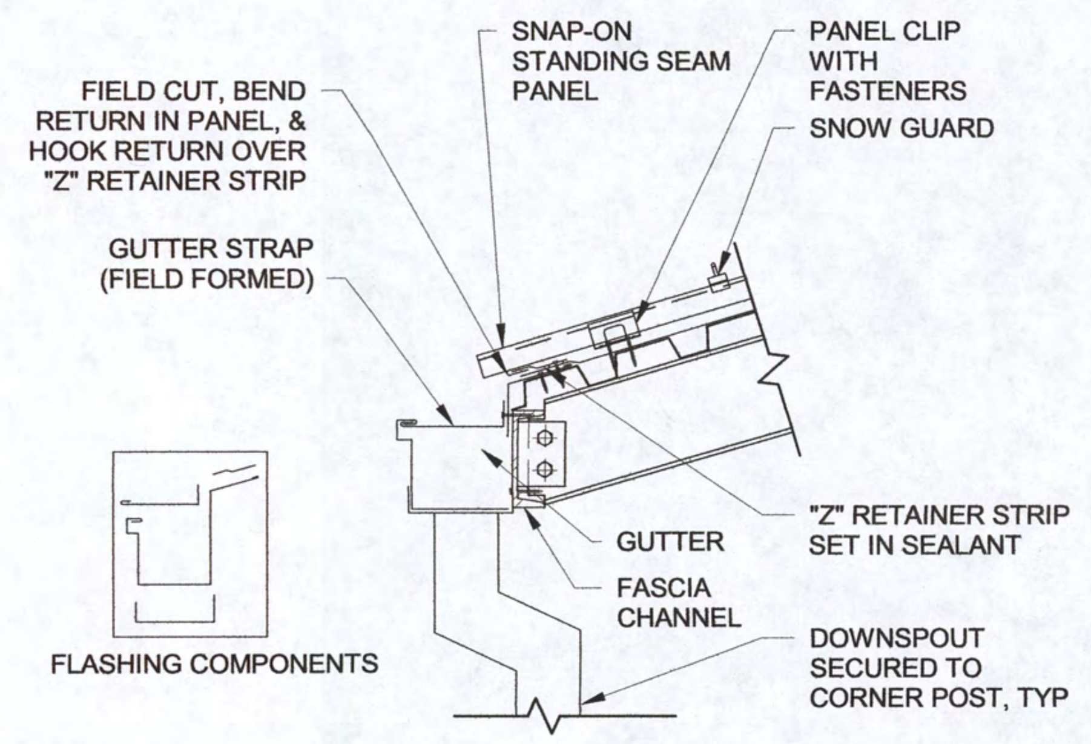
SEAL AREA

6-20-19

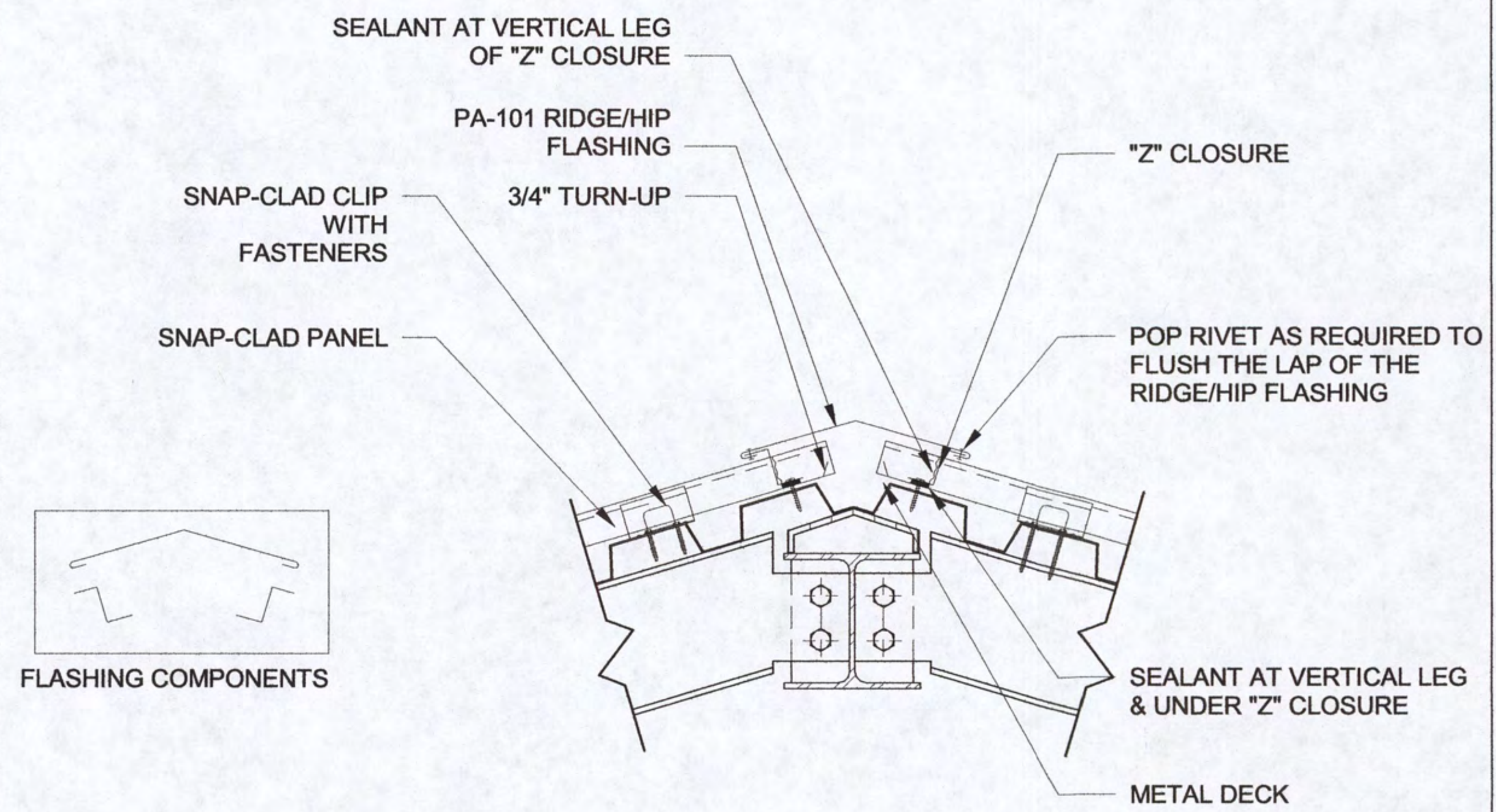
DES	SPS	DR	SPS
REVIEWED BY			ATC
PM/DM			HKM
CHIEF ENG/ARCH			ATC

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
NAVAL FACILITIES ENGINEERING COMMAND – MID-ATLANTIC
NAVAL INDUSTRIAL RESERVE ORDNANCE PLANT BETHPAGE, NEW YORK
NAVAL WEAPONS INDUSTRIAL RESERVE PLANT
GM-38 AREA
GROUNDWATER TREATMENT PLANT
AOP SYSTEM ADDITION
STRUCTURAL FDN & ROOF SECTIONS

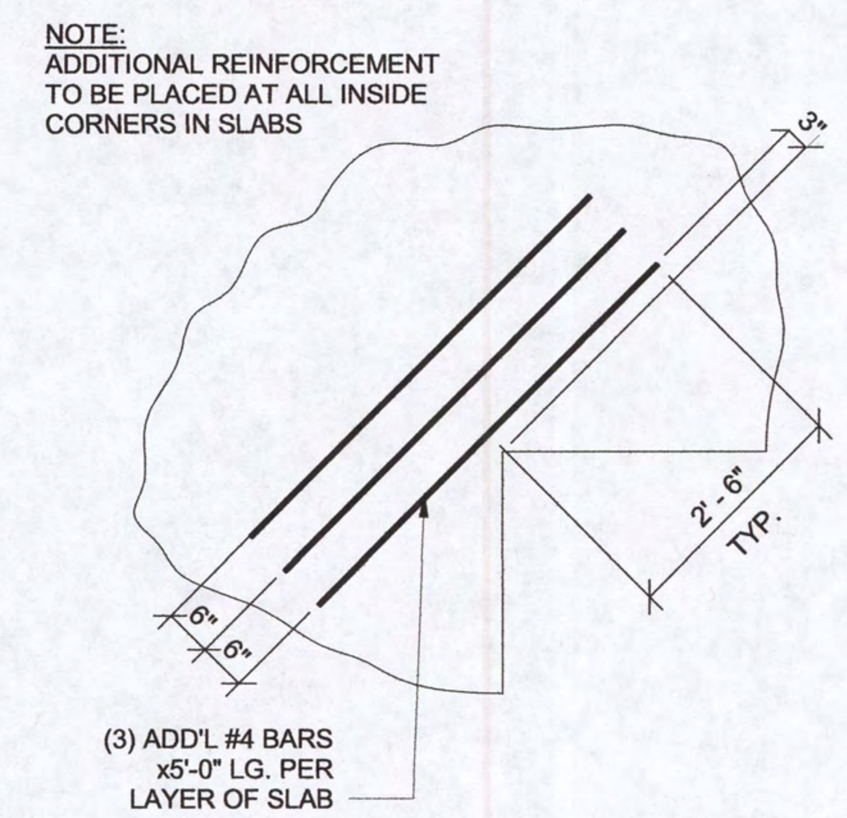
CODE ID. NO. 80091 SIZE D
SCALE: AS NOTED
MAXIMO NO. N62470-08-D-1001
JOB ORDER NO. WE-24
SPEC. NO.
CONSTR. CONTR. NO. N62472-99-D-0032
112G08005
NAVFAC DRAWING NO.
SHEET OF
AS-301



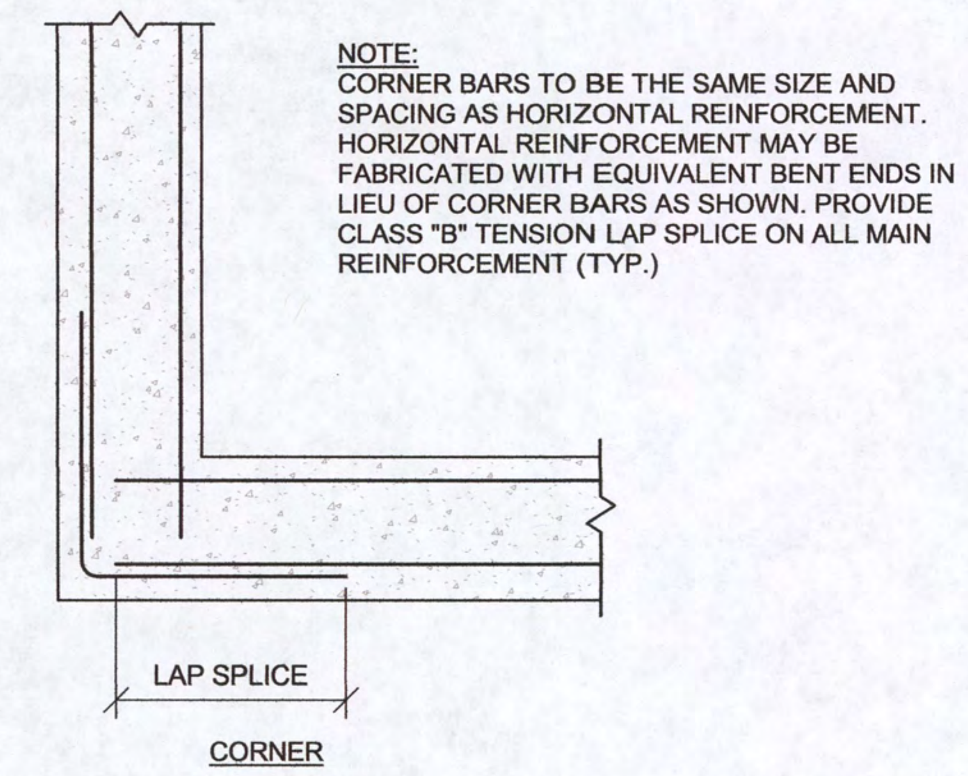
A AS-101 ARCH GUTTER DETAIL
SCALE: 1" = 1'-0"



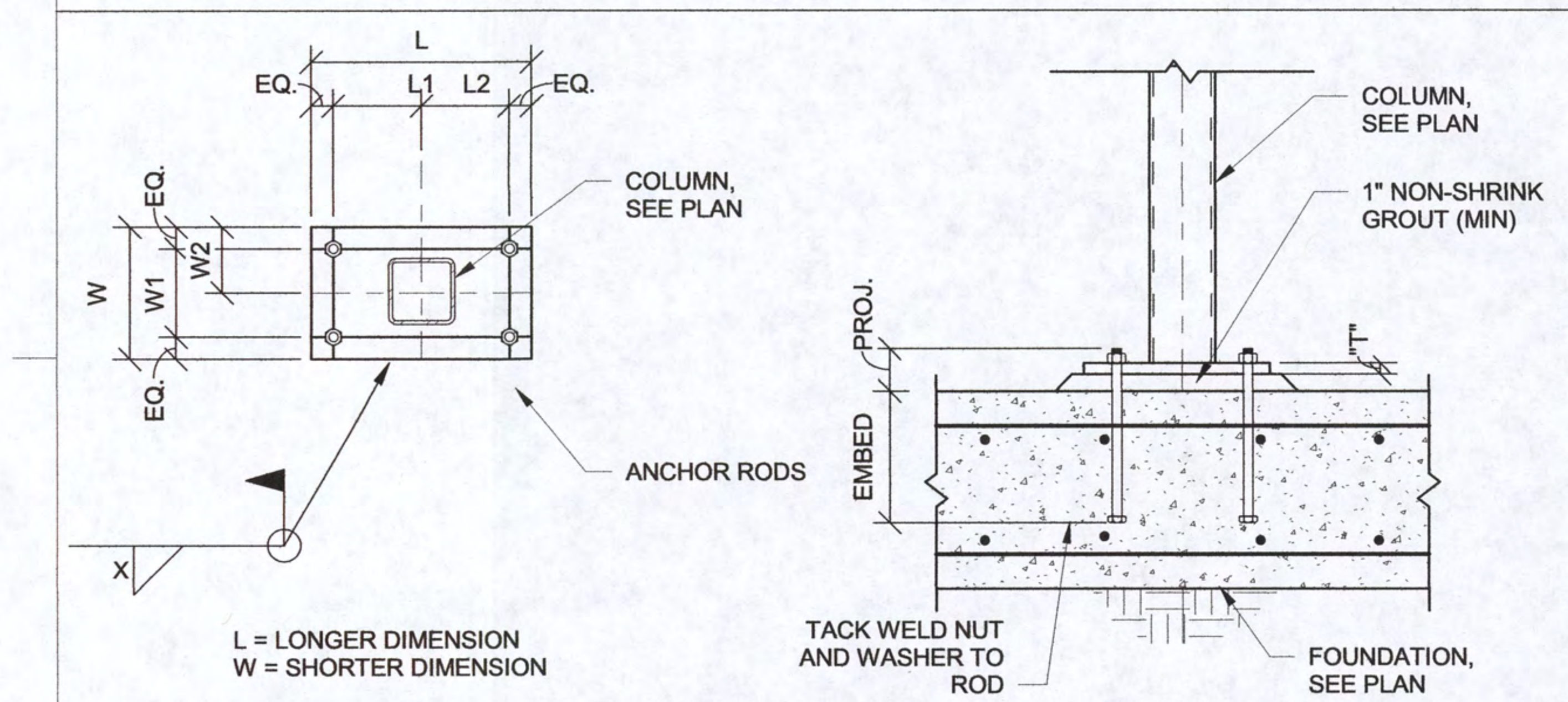
B AS-101 ARCH RIDGE DETAIL
SCALE: 1 1/2" = 1'-0"



1 AS-501 REINF. SLAB RE-ENTRANT CORNER
SCALE: 1/2" = 1'-0"



2 AS-501 WALL CORNERS AT BLDG WALLS
SCALE: 3/4" = 1'-0"

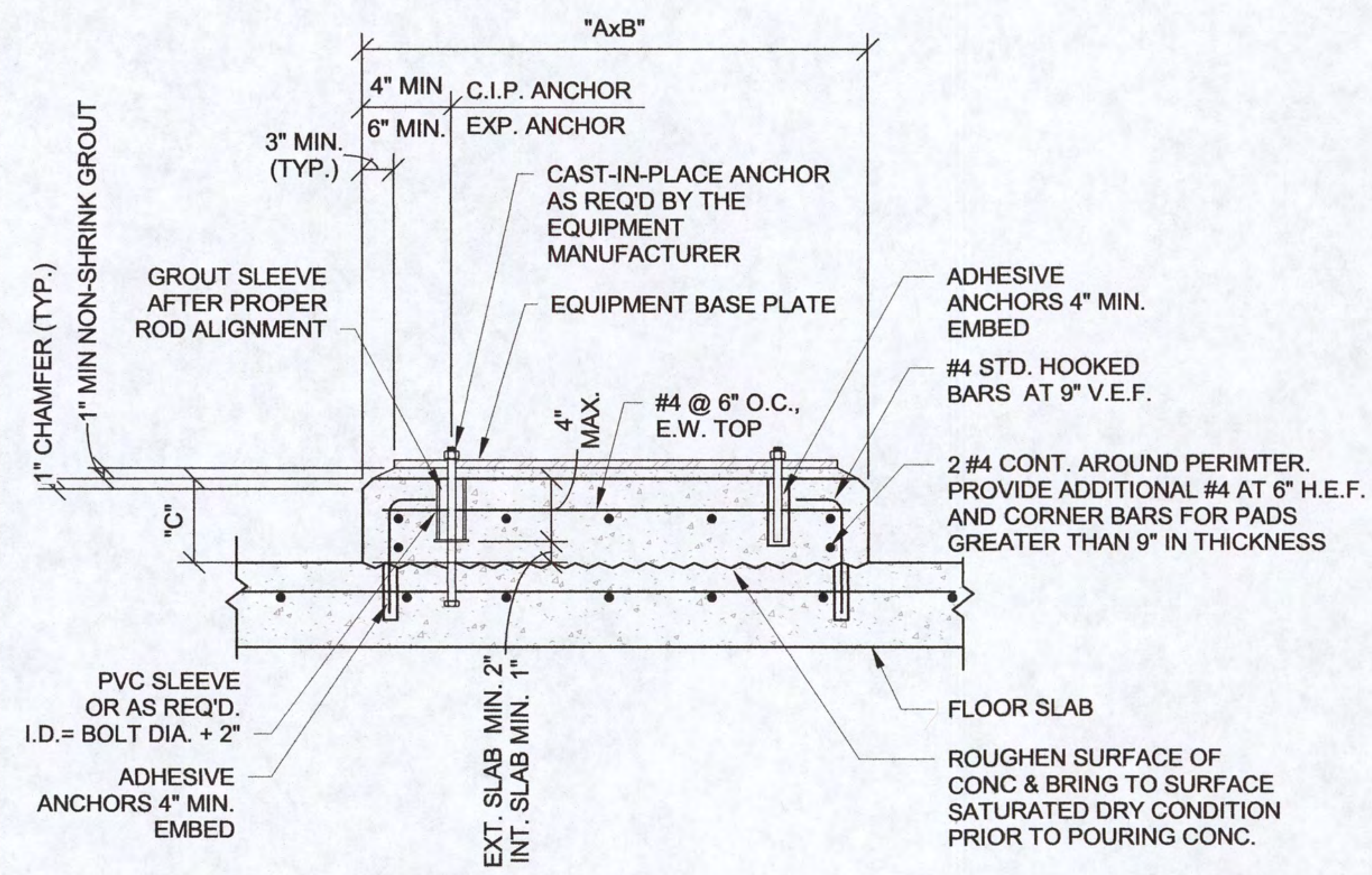


BASEPLATE								ANCHOR ROD		
L	L1	L2	W	W1	W2	"T"	X	SIZE	EMBED.	PROJ.
1'-0"	0'-9"	0'-6"	0'-8"	0'-5"	0'-4"	3/4 "	1/4	3/4"	6"	6"

NOTES:

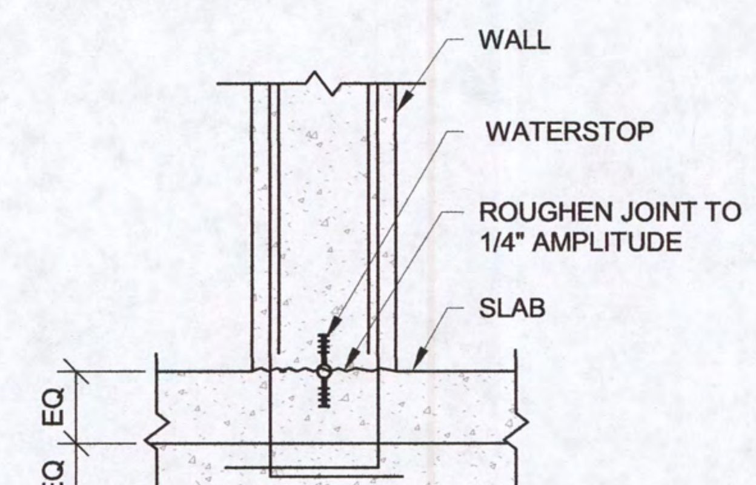
1. ANCHOR RODS SHALL CONFORM TOASTM F1554, GRADE 55, WELDABLE
2. ALL ANCHOR RODS SHALL BE STRAIGHTBOLTS W/NUTS & STANDARD WASHER TACK WELD
3. HOLE SIZES FOR ANCHOR RODS ARE NORMALLY MADE OVERSIZE TO FACILITATE ERECTION. BOLTS 3/4" TO 1" DIA. = 5/16" OVERSIZE

3 AS-501 BASEPLATE DETAIL W/ SCHEDULE
SCALE: 3/4" = 1'-0"

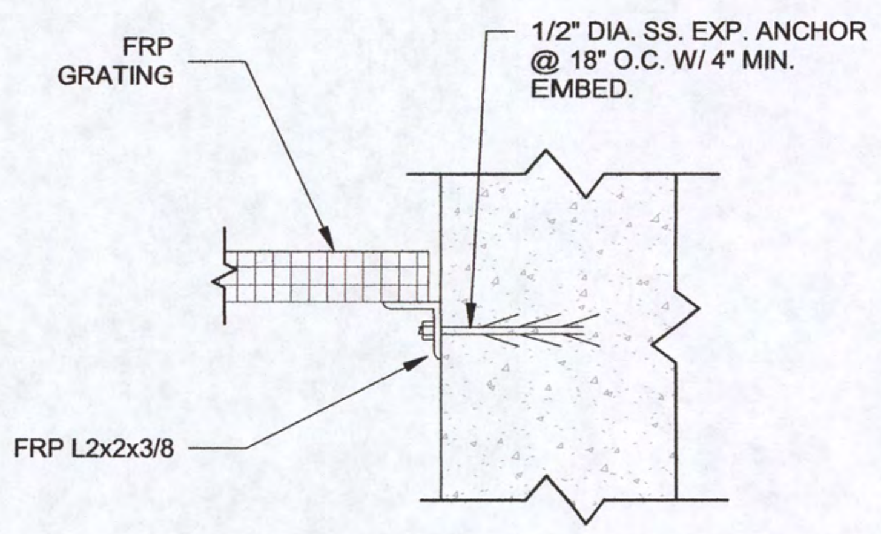


NOTE:
"A","B" & "C" DIMS. AS REQ'D TO SUIT EQUIPMENT. ("C" = 8" TYP. U.N.O.)

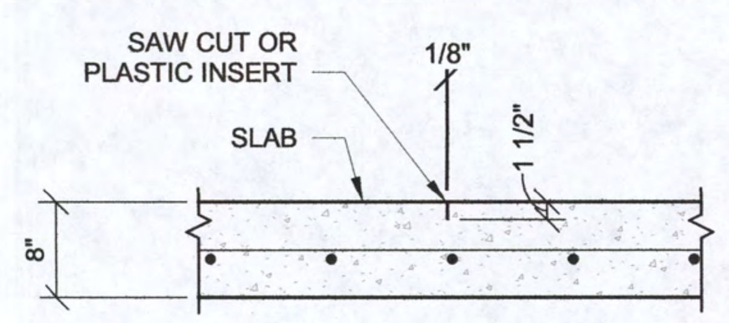
4 AS-501 TYP. EQUIPMENT PAD
SCALE: 3/4" = 1'-0"



5 AS-501 WATERSTOP CONSTRUCTION JOINTS
SCALE: 3/4" = 1'-0"



6 AS-501 GRATING DETAIL
SCALE: 1 1/2" = 1'-0"



7 AS-501 CRACK CONTROL JOINT DETAIL
SCALE: 3/4" = 1'-0"

0 4" 8" 1'-4"
SCALE: 1 1/2" = 1'-0"
0 8" 1'-4" 2'-8"
SCALE: 3/4" = 1'-0"
0 1' 2' 4'
SCALE: 1/2" = 1'-0"

ISSUED FOR BID – 06/21/2019

CAUTION: IF SHEET IS LESS THAN 34"x22" USE GRAPHIC SCALE

SYM | DESCRIPTION | DATE | APPR

NAVFAC

Tt

STATE OF NEW YORK
ANDREW TODD COX
084869-1
LICENSED PROFESSIONAL ENGINEER
6-20-19

SEAL AREA

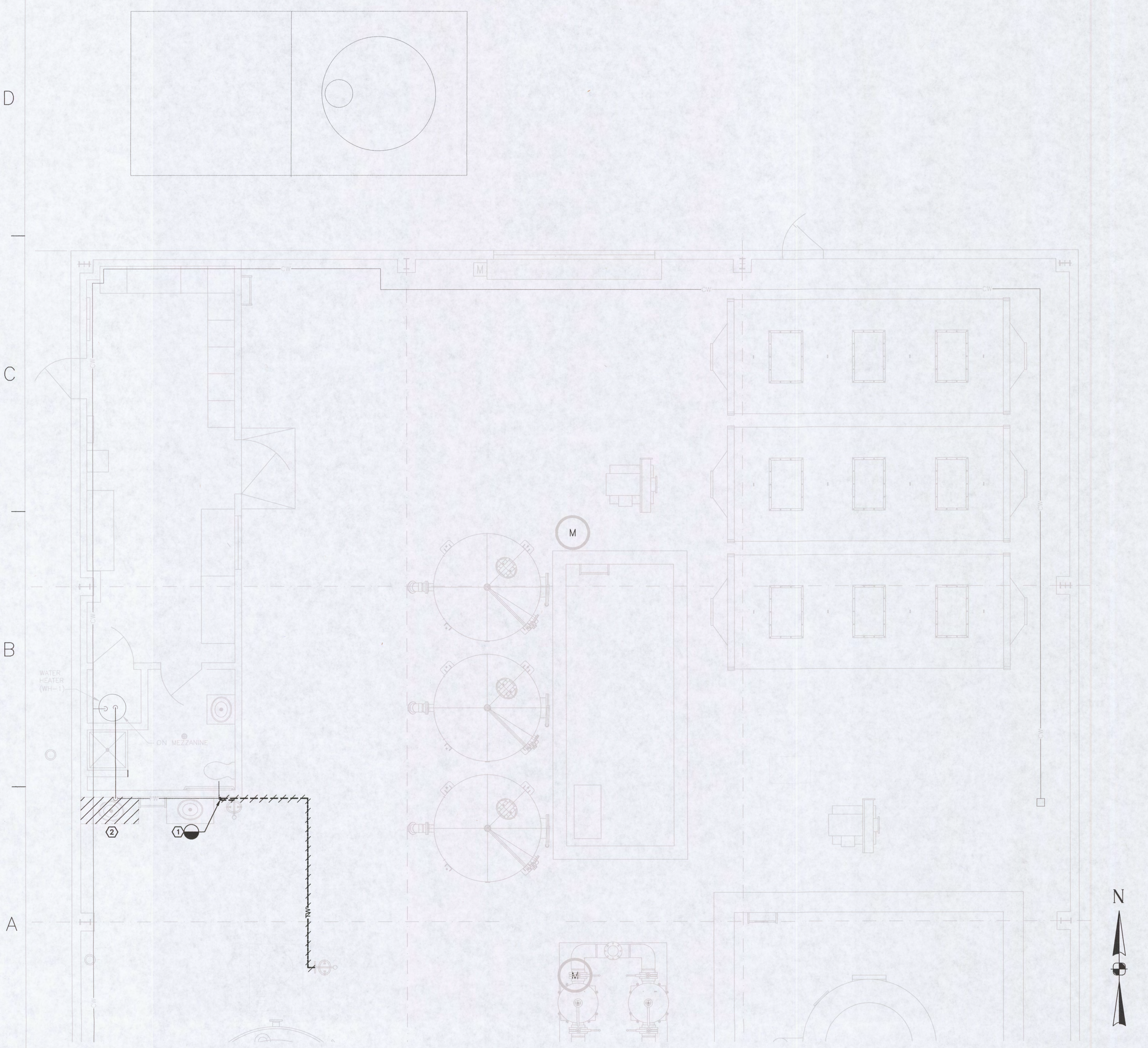
DES	SPS	DR	SPS
REVIEWED BY	ATC		
PM/DM	HKM		
CHIEF ENG/ARCH	ATC		

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
NAVAL FACILITIES ENGINEERING COMMAND ~ MID-ATLANTIC
GM 38
NAVAL INDUSTRIAL RESERVE ORDNACE PLANT
NAVAL WEAPONS INDUSTRIAL RESERVE PLANT
BETHPAGE, NEW YORK
GM-38 AREA
GROUNDWATER TREATMENT PLANT
AOP SYSTEM ADDITION

STRUCTURAL TYPICAL DETAILS

CODE ID. NO. 80091	SIZE D
SCALE: AS NOTED	
MAXIMO NO. N62470-D8-D-1001	
JOB ORDER NO. WE-24	
SPEC. NO. ...	
CONSTR. CONTR. NO. N62472-99-D-0032 112G08005	
NAVFAC DRAWING NO.	
SHEET ..... OF --	

AS-501



PLUMBING REMOVAL WORK NOTES:

1. DISCONNECT AND REMOVE EXISTING HOT WATER PIPING, INSULATION, HANGERS AND ACCESSORIES FROM EMERGENCY SHOWER EYE WASH STATION TO POINT INDICATED.
2. DISCONNECT AND REMOVE EXISTING SINK, INCLUDING DOMESTIC WATER PIPING AND SANITARY PIPING TO WALL. CAP PIPING AT WALL.

ISSUED FOR BID - 06/21/2019

CAUTION: IF SHEET IS LESS THAN 34"x22" USE GRAPHIC SCALE

THIS DRAWING PRODUCED ON AUTOCAD
DO NOT REVISE MANUALLY

NAVFAC

STATE OF NEW YORK
LICENSED PROFESSIONAL ENGINEER
080336
6-21-19

SEAL AREA

DES APS	DR APS
REVIEWED BY	BM
PM/DM	HKM
CHIEF ENG/ARCH	HKM

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
NAVAL FACILITIES ENGINEERING COMMAND ~ MID-ATLANTIC
GM 38 NAVAL WEAPONS INDUSTRIAL RESERVE PLANT
NAVAL INDUSTRIAL RESERVE ORDNANCE PLANT
BETHPAGE, NEW YORK

GM-38 AREA
GROUNDWATER TREATMENT PLANT
AOP SYSTEM ADDITION

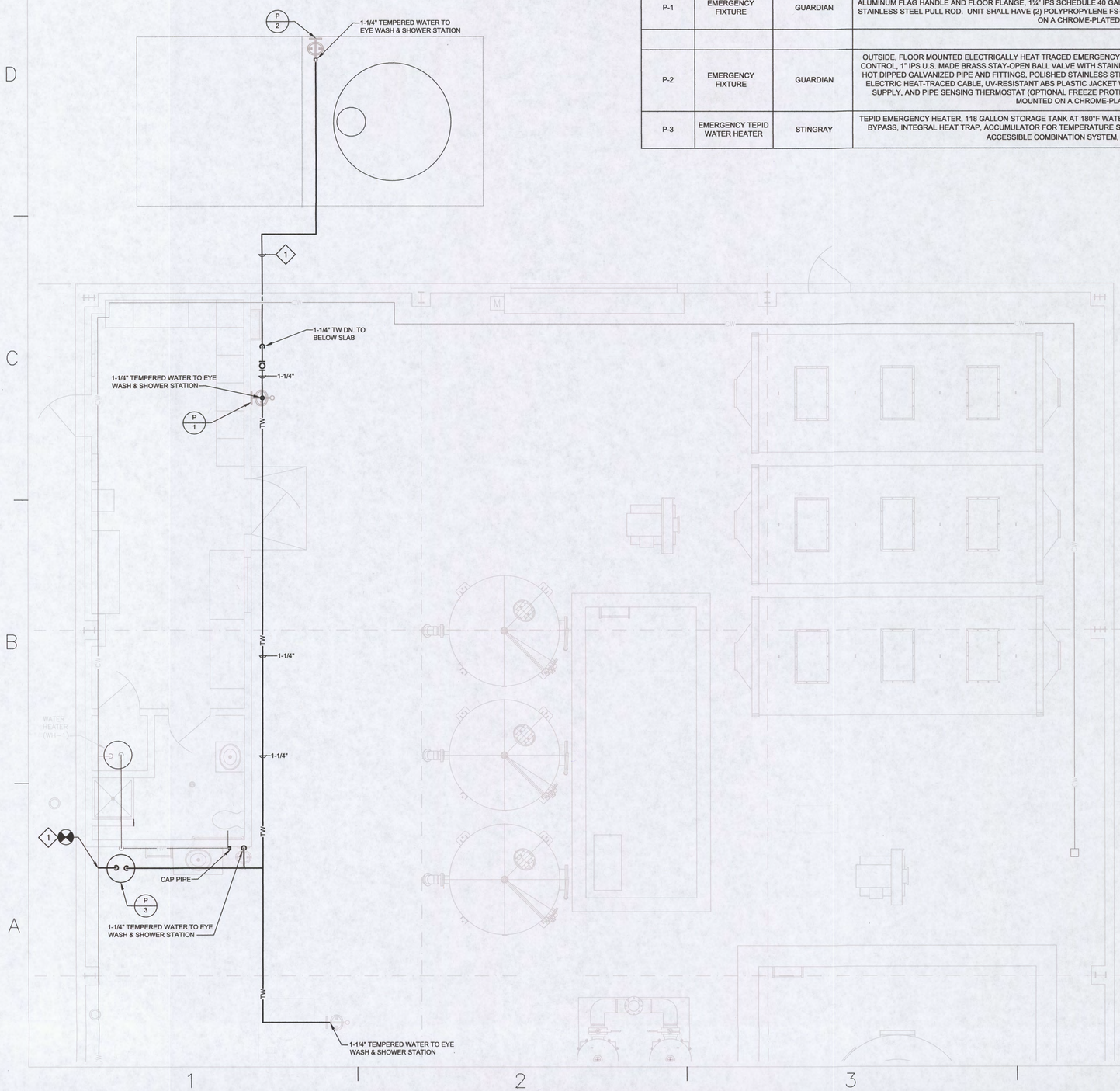
PLUMBING FLOOR PLAN - REMOVAL WORK

CODE ID. NO. 80091	SIZE D
SCALE:	1/4" = 1'-0"
MAXIMO NO. N62470-08-D-1001	
JOB ORDER NO. WE-24	
SPEC. NO.	
CONSTR. CONTR. NO.	N62472-99-D-0032
112G08005	
NAVFAC DRAWING NO.	
SHEET	OF

MD101

PLUMBING FIXTURE SCHEDULE

ID NO.	ITEM	MANUFACTURER	MODEL	NUMBER	FLOW RATE
P-1	EMERGENCY FIXTURE	GUARDIAN	COMBINATION EYE/FACE WASH AND SHOWER SAFETY STATION WITH ABS PLASTIC SHOWER HEAD. INTERNAL 20 GPM FLOW CONTROL, ABS PLASTIC EYE/FACE WASH BOWL, POWDER-COATED CAST ALUMINUM FLAG HANDLE AND FLOOR FLANGE, 1¼" IPS SCHEDULE 40 GALVANIZED PIPE AND FITTINGS, 1" IPS AND ½" IPS U.S. MADE CHROME-PLATED BRASS STAY-OPEN BALL VALVES, AND POLISHED STAINLESS STEEL PULL ROD. UNIT SHALL HAVE (2) POLYPROPYLENE FS-PLUS™ SPRAY HEADS WITH INTEGRAL "FLIP-TOP" DUST COVERS, FILTERS, AND 3.2 GPM FLOW CONTROL ORIFICES MOUNTED ON A CHROME-PLATED BRASS EYEWASH ASSEMBLY. UNIT SHALL INCLUDE ANSI COMPLIANT SIGN.	G1950P	20 GPM
P-2	EMERGENCY FIXTURE	GUARDIAN	OUTSIDE, FLOOR MOUNTED ELECTRICALLY HEAT TRACED EMERGENCY EYEWASH AND SHOWER SAFETY STATION WITH BOTTOM INLET, ABS PLASTIC SHOWER HEAD WITH INTERNAL 20 GPM FLOW CONTROL, 1" IPS U.S. MADE BRASS STAY-OPEN BALL VALVE WITH STAINLESS STEEL ACTUATING ARM, ½" IPS U.S. MADE BRASS 3-WAY SELF DRAINING STAY-OPEN BALL VALVE, 1¼" IPS SCHEDULE 40 HOT DIPPED GALVANIZED PIPE AND FITTINGS, POLISHED STAINLESS STEEL PULL ROD, STAINLESS STEEL FLAG HANDLE AND POWDER-COATED CAST ALUMINUM FLOOR FLANGE, SELF REGULATING ELECTRIC HEAT-TRACED CABLE, UV-RESISTANT ABS PLASTIC JACKET WITH FOAM INSULATED CORE AND WEATHER SEALED WITH ELASTOMERIC MATERIAL, 120VAC, 60 HZ SINGLE PHASE POWER SUPPLY, AND PIPE SENSING THERMOSTAT (OPTIONAL FREEZE PROTECTION VALVE, "FP"). UNIT SHALL HAVE FREEZE-RESISTANT SPRAY HEADS WITH DUST COVERS. SPRAY HEADS SHALL BE MOUNTED ON A CHROME-PLATED BRASS EYEWASH ASSEMBLY. UNIT SHALL INCLUDE ANSI COMPLIANT SIGNS.	GFR3110	20 GPM
P-3	EMERGENCY TEPID WATER HEATER	STINGRAY	TEPID EMERGENCY HEATER, 118 GALLON STORAGE TANK AT 180°F WATER, 1" COLD SUPPLY, DUAL THERMOSTAT MIXING VALVES WITH POSITIVE HOT WATER SHUT-OFF AND INTEGRAL COLD WATER BYPASS, INTEGRAL HEAT TRAP, ACCUMULATOR FOR TEMPERATURE SPIKES, NEMA 4 HEATING ELEMENT LISTED UL TANK. 120VAC/20A ELECTRICAL POWER, COLD WATER FILTER, BARRIER FREE ACCESSIBLE COMBINATION SYSTEM, ELEMENT FILTER. ABS BOWL/ABS SHOWERHEAD MATERIALS ¾" THK X 8" DIA. BASE PLATE.	S9300	2-22 GPM



PLUMBING LEGEND AND ABBREVIATIONS

- EXISTING WORK
- NEW WORK
- EXTENT OF REMOVAL
- CONNECT NEW TO EXISTING
- NEW WORK NOTES
- P / X — FIXTURE REFERENCE ITEM
- CW — COLD WATER SUPPLY
- HW — HOT WATER SUPPLY
- TW — TEPID WATER SUPPLY
- S — SANITARY
- BALL VALVE

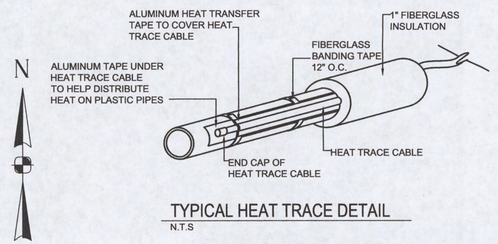
DN	DOWN
CO	FLOOR CLEANOUT
FD	FLOOR DRAIN
S/SAN	SANITARY SEWER

PLUMBING GENERAL WORK NOTES:

1. INSTALLER SHALL VERIFY ALL DIMENSIONS IN THE FIELD PRIOR TO THE START OF CONSTRUCTION OR FABRICATION OF PIPING.
2. FINAL LOCATIONS OF PIPING AND FIXTURE CONNECTIONS SHALL BE COORDINATED WITH THE SHOP DRAWINGS AND GENERAL INSTALLER. THE PLUMBING INSTALLER SHALL BE RESPONSIBLE FOR CONDUCTING THIS COORDINATION OF THEIR PLUMBING ROUGH-IN AND FINAL CONNECTION WORK.
3. PROVIDE SLEEVES AND SEALS FOR ALL PIPING THROUGH FLOOR SLAB.
4. UPON COMPLETION OF ALL NEW PIPING, FIXTURE INSTALLATION AND ACTIVATION, PATCH ALL WALL AND FLOOR OPENINGS MADE BY NEW WORK. CLEAN UP AND RESTORE ALL WORK AREAS.
5. INSTALLER TO LOCATE CONNECTION POINTS IN FIELD, AS NOTED ON THE DRAWINGS, BEFORE STARTING WORK.

PLUMBING NEW WORK NOTES:

1. RUN 1-1/4" TEPID WATER LINE UNDERGROUND BELOW FROST LINE (MIN. 48"). PROVIDE PIPE HEAT TRACE CABLE WITH NICKEL-COPPER MIN. 6 WATTS/FT., 120V, SINGLE PHASE, 60 HZ. (PROVIDE POWER CIRCUIT AS REQUIRED) SELF REGULATING AND CONDUCTIVE CORE, INSULATING BRAID FOR FREEZE PROTECTION OF WATER PIPE SHOWN/INDICATED. PROVIDE SHOP DRAWING WITH ALL NECESSARY DEVICES, HARDWIRE ELECTRICAL CONDUIT (AS DETERMINED FROM PANEL SCHEDULE IN COORDINATION WITH ELECTRICAL CONTRACTOR) FOR COMPLETE OPERATION/FUNCTIONAL SYSTEM FOR APPROVAL FROM ENGINEER. PROVIDE 2" INSULATION.
2. CONNECT NEW TEPID WATER LINE SERVING THE TEPID EMERGENCY HEATER TO EXISTING COLD WATER MAIN.



TYPICAL HEAT TRACE DETAIL
N.T.S

ISSUED FOR BID - 06/21/2019

CAUTION: IF SHEET IS LESS THAN 34"x22" USE GRAPHIC SCALE

THIS DRAWING PRODUCED ON AUTOCAD DO NOT REVISE MANUALLY

DATE APPR
DESCRIPTION
STM

NAVFAC

Tt

STATE OF NEW YORK — 060336 — LICENSED PROFESSIONAL ENGINEER — 6-21-19

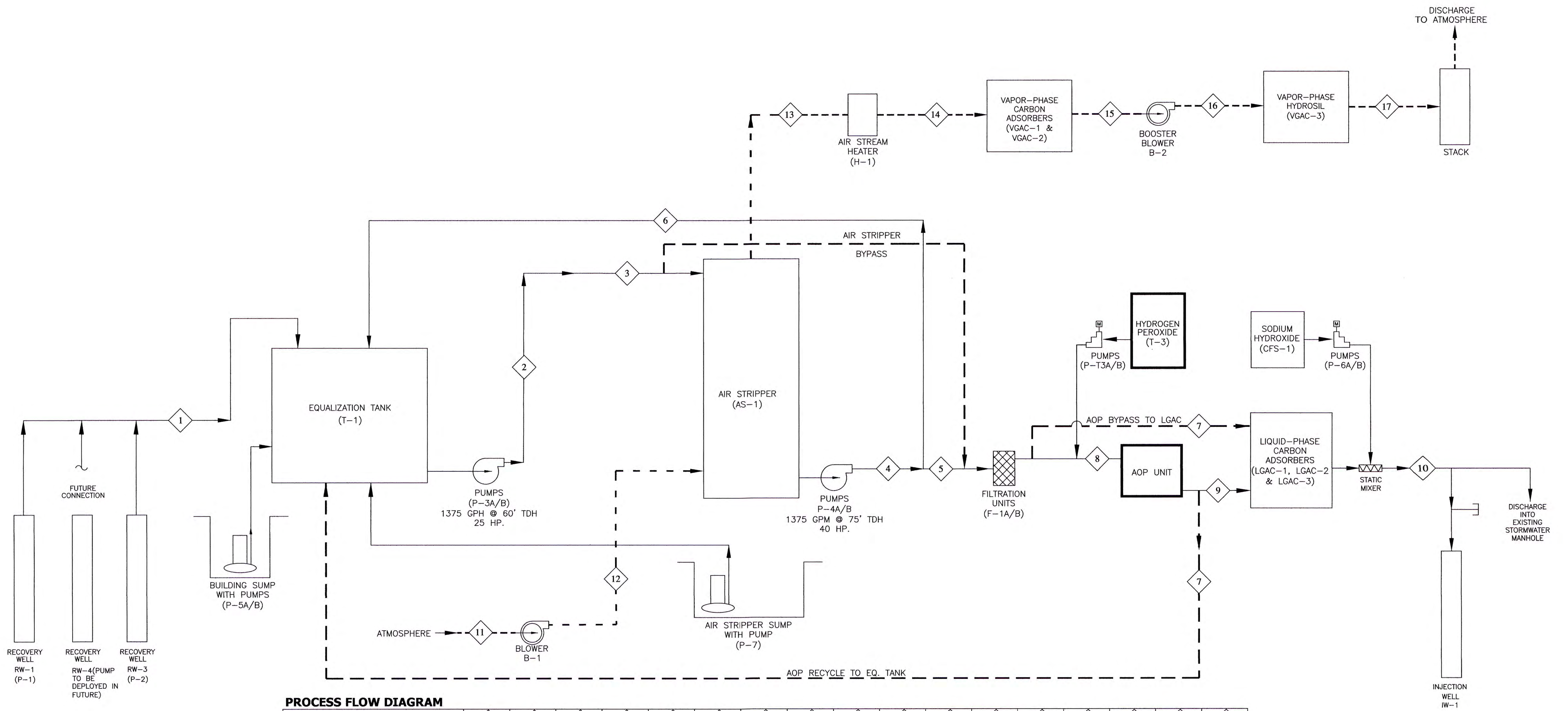
SEAL AREA	
DES: APS	DR: APS
REVIEWED BY	SM
PM/CM	HKH
CHIEF ENG/ARCH	HKH

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
NAVAL FACILITIES ENGINEERING COMMAND ~ MID-ATLANTIC
NAVAL INDUSTRIAL RESERVE ORDNANCE PLANT
BETHPAGE, NEW YORK
NAVAL WEAPONS INDUSTRIAL RESERVE PLANT GM-38 AREA
GM 38
GROUNDWATER TREATMENT PLANT
AOP SYSTEM ADDITION

PLUMBING FLOOR PLAN - NEW WORK

CODE ID. NO. 80091	SIZE D
SCALE:	1/4" = 1'-0"
MAXIMO NO. N62470-08-D-1001	.
JOB ORDER NO. WE-24	-
SPEC NO.	
CONSTR. CONTR. NO.	N62472-99-D-0032
	112G08005
NAVFAC DRAWING NO.	
	****
SHEET	OF .

M-101



PROCESS FLOW DIAGRAM

STREAM NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
COMPOSITION (UG/L, UNLESS OTHERWISE NOTED)																	
TETRACHLOROETHENE	15.7	15.7	15.7	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5							
TRICHLOROETHENE	1,293	1,293	1,293	19.4	19.4	19.4	19.4	19.4	< 0.5	< 0.5							
CIS-1,2-DICHLOROETHENE	7.2	7.2	7.2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5							
TRANS-1,2-DICHLOROETHENE	1	1	1	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5							
1,1-DICHLOROETHENE	3.5	3.5	3.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5							
VINYL CHLORIDE	0.9	0.9	0.9	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5							
1,1,1-TRICHLOROETHANE	1.1	1.1	1.1	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5							
FREON 113	6.6	6.6	6.6	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5							
1,4-DIOXANE	5	5	5	5	5	5	5	5	< 0.5	< 0.5							
1,1-DICHLOROETHANE	2.2	2.2	2.2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5							
1,1,2-TRICHLOROETHANE	1.7	1.7	1.7	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5							
WATER FLOW RATE (GPM)	1,000	1,000	1,000	1,000	1,000	0	0	1,000	1,000	1,000							
HYDROGEN PEROXIDE (mg/L)	-	-	-	-	-	-	-	12	10	<1							
TEMPERATURE (°F)	55	55	55	55	55	55	55	55	55	55							
PRESSURE (PSIG)											-0.27	1.5	1.36	1.18	0.53	0.53	0.53
DENSITY (lb/ft^3)											0.077	0.085	0.084	0.082	0.079	0.079	0.079
MASS FLOW RATE (lb/hr)	550,500	600,545	600,545	600,545	550,500	0	0	550,500	550,500	550,500	36,960	40,800	40,320	39,360	37,920	37,920	37,920
RELATIVE HUMIDITY (%)											50	50	100	50	50	50	50
STATIC PRESSURE (PSIA)											0.214	0.214	0.214	0.275	0.275	0.275	0.275
pH (S.U.)	5.5	5.5	5.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5							
VAPOR FLOW RATE (CFM)											8,000	8,000	8,000	8,000	8,000	8,000	8,000
TOTAL VAPOR VOC (PPMV)													25.5	25.5	1.2	1.2	1.2
TOTAL VAPOR VOC (LBS/HR)													3.18	3.18	0.15	0.15	0.15

ISSUED FOR BID - 06/21/2019

CAUTION: IF SHEET IS LESS THAN 34"x22" USE GRAPHIC SCALE

THIS DRAWING PRODUCED ON AUTOCAD DO NOT REVISE MANUALLY

DES HKM | DR SNL
REVIEWED BY HKM
PM/DM HKM
CHIEF ENG/ARCH HKM

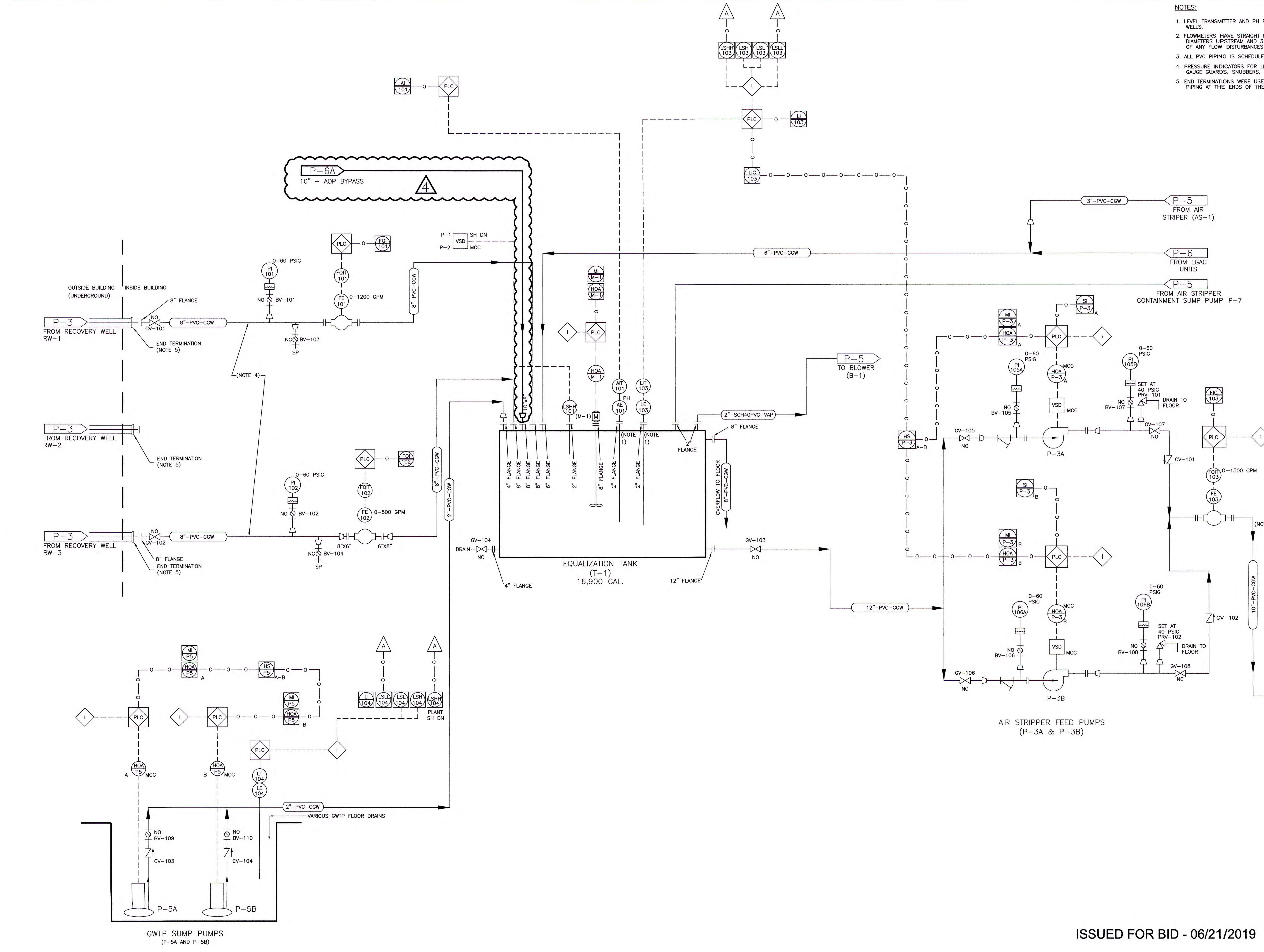
DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
NAVAL FACILITIES ENGINEERING COMMAND ~ MID-ATLANTIC
NAVAL INDUSTRIAL RESERVE ORDNANCE PLANT
GM 38

GM-38 AREA
GROUNDWATER TREATMENT PLANT
AOP SYSTEM ADDITION

PROCESS FLOW DIAGRAM

CODE ID. NO. 80091 | SIZE D
SCALE: NTS
MAXIMO NO. N62470-08-D-1001
JOB ORDER NO. WE-24
SPEC. NO.
CONSTR. CONTR. NO. 112G08005
NAVFAC DRAWING NO.
SHEET OF

PFD-100



NOTES:

1. LEVEL TRANSMITTER AND PH PROBE ARE LOCATED IN STILLING WELLS.
2. FLOWMETERS HAVE STRAIGHT PIPE RUN OF 5 PIPE DIAMETERS UPSTREAM AND 3 PIPE DIAMETERS DOWNSTREAM OF ANY FLOW DISTURBANCES
3. ALL PVC PIPING IS SCHEDULE 80 UNLESS OTHERWISE NOTED.
4. PRESSURE INDICATORS FOR LIQUID SERVICE INCLUDE GAUGE GUARDS, SNUBBERS, GLYCERIN FILL AND READ IN PSI.
5. END TERMINATIONS WERE USED TO SEAL SECONDARY CONTAINMENT PIPING AT THE ENDS OF THE PIPING RUNS.

ISSUED FOR BID - 06/21/2019

THIS DRAWING PRODUCED ON AUTOCAD DO NOT REVISE MANUALLY

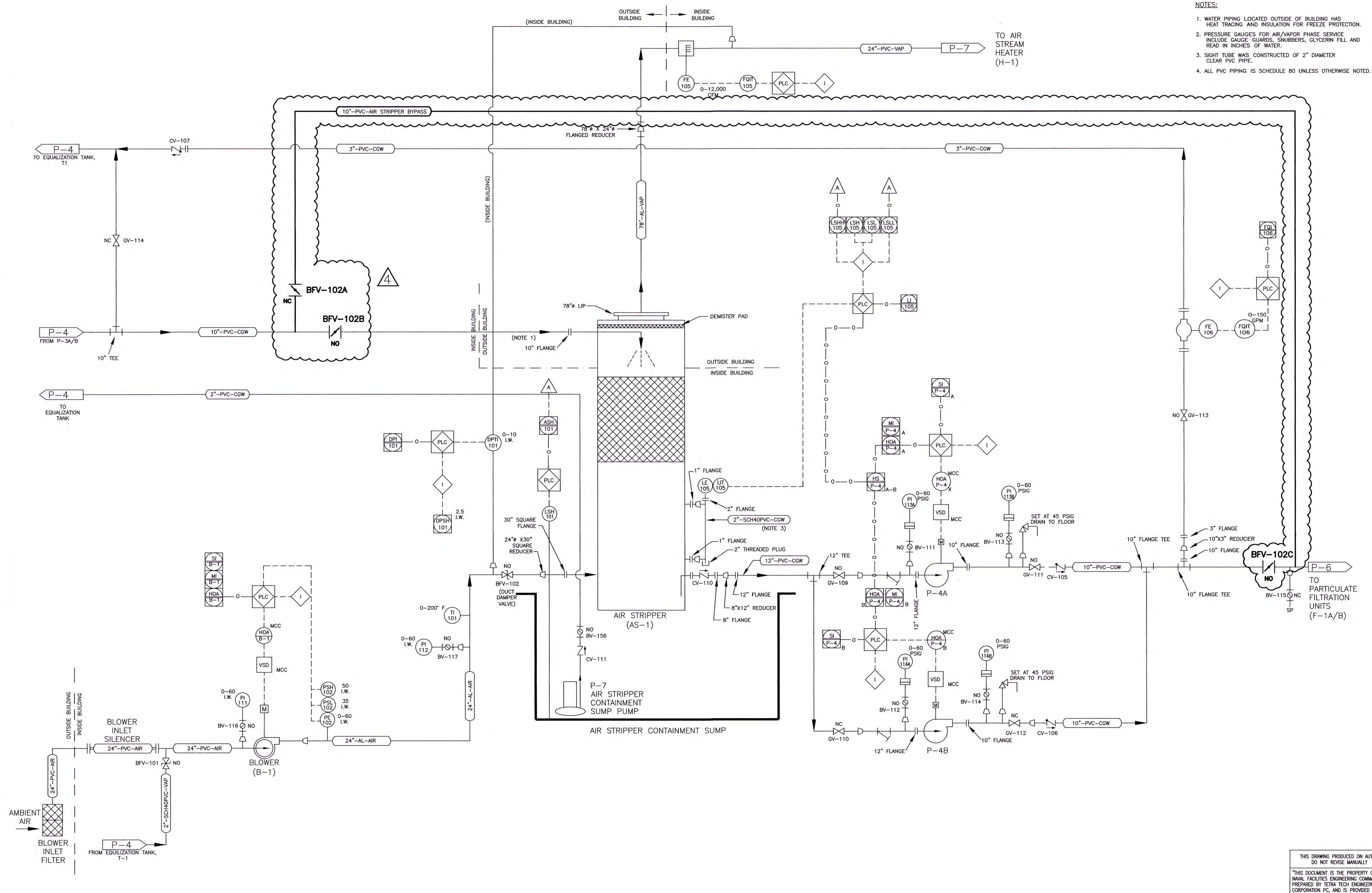
TETRA TECH ENGINEERING CORPORATION PC

REV	DESCRIPTION	PREP BY	DATE	APPRVD
0	FINAL DESIGN	DL	05/05/06	BKB
1	ADDED RECOVERY WELL RW-3 AND PIPING; DELETED TERMINATION VAULT	DLB	03/31/08	BKB
2	REVISED BASED ON VENDOR SUBMITTALS, DRAWING UPDATES FOR CONSTRUCTION	TAD	02/24/09	BKB
3	FINAL RECORD DRAWING	DLB	04/16/10	SGP
4	AOP SYSTEM ADDITION	SNL	06/21/19	HKM

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND, MID-ATLANTIC
NAVAL WEAPONS INDUSTRIAL RESERVE PLANT — BETHPAGE, NEW YORK
GM-38 AREA
GROUNDWATER TREATMENT PLANT
PIPING AND INSTRUMENTATION DIAGRAM (SHEET 2 OF 5)

6-21-19

SAT TO — DATE 05/05/06
CODE I.D. NO. 80091
SCALE : AS SHOWN
SPEC. NO.
CONSTR. CONTR. NO. N62472-99-D-0032
NAVFAC DRAWING NO.
SHEET OF
SIZE: D — DRS. SH. NO. P-4


OUTSIDE BUILDING
INSIDE BUILDING
(INSIDE BUILDING)
TO AIR STREAM HEATER (H-1)
P-7
24"-PVC-VAP
FE 105
FQIT 105
0-12,000 CFM
PLC
10"-PVC-AIR STRIPPER BYPASS
78"φ X 24"φ FLANGED REDUCER
3"-PVC-CGW
P-4
TO EQUALIZATION TANK, T1
CV-107
NC GV-114
BFV-102A
NC
BFV-102B
NO
P-4
FROM P-3A/B
10" TEE
10"-PVC-CGW
78"-AL-VAP
78"φ LIP
DEMISTER PAD
(NOTE 1)
10" FLANGE
P-4
TO EQUALIZATION TANK
2"-PVC-CGW
LSHH 105
LSH 105
LSL 105
LSLL 105
LI 105
FQI 106
FE 106
FQIT 106
0-150 GPM
NO GV-113
DPI 101
DPTI 101
0-10 I.W.
ASH 101
LSH 101
DPSH 101
2.5 I.W.
30" SQUARE FLANGE
24"φ X30" SQUARE REDUCER
1" FLANGE
LE 105
LIT 105
2" FLANGE
2"-SCH40PVC-CGW
(NOTE 3)
1" FLANGE
2" THREADED PLUG
12"-PVC-CGW
12" TEE
CV-110
12" FLANGE
8"X12" REDUCER
8" FLANGE
AIR STRIPPER (AS-1)
SI P-4
MI P-4
HOA P-4
HS P-4
VSD
MCC
PI 113A
PI 113B
0-60 PSIG
SET AT 45 PSIG DRAIN TO FLOOR
NO BV-111
NO BV-113
GV-111
CV-105
10" FLANGE
10"-PVC-CGW
P-4A
P-4B
10" FLANGE TEE
3" FLANGE
10"X3" REDUCER
10" FLANGE
BFV-102C
NO
P-6
TO PARTICULATE FILTRATION UNITS (F-1A/B)
BV-115 NC
SP
NO GV-109
NC GV-110
12" FLANGE
PI 114A
PI 114B
NO BV-112
NO BV-114
NC GV-112
CV-106
SI B-1
MI B-1
HOA B-1
0-200° F
TI 101
NO BFV-102
(DUCT DAMPER VALVE)
0-60 I.W.
PI 112
NO BV-117
PSH 102
PSL 102
PE 102
50 I.W.
35 I.W.
0-60 I.W.
PI 111
BV-116 NO
24"-AL-AIR
NO BV-156
CV-111
P-7 AIR STRIPPER CONTAINMENT SUMP PUMP
AIR STRIPPER CONTAINMENT SUMP
BLOWER INLET SILENCER
24"-PVC-AIR
BFV-101 NO
2"-SCH40PVC-VAP
BLOWER (B-1)
AMBIENT AIR
BLOWER INLET FILTER
P-4
FROM EQUILIZATION TANK, T-1

NOTES:

1. WATER PIPING LOCATED OUTSIDE OF BUILDING HAS HEAT TRACING AND INSULATION FOR FREEZE PROTECTION.
2. PRESSURE GAUGES FOR AIR/VAPOR PHASE SERVICE INCLUDE GAUGE GUARDS, SNUBBERS, GLYCERIN FILL AND READ IN INCHES OF WATER.
3. SIGHT TUBE WAS CONSTRUCTED OF 2" DIAMETER CLEAR PVC PIPE.
4. ALL PVC PIPING IS SCHEDULE 80 UNLESS OTHERWISE NOTED.

ISSUED FOR BID - 06/21/2019

REV	DESCRIPTION	PREP BY	DATE	APPRVD
0	FINAL DESIGN	DL	05/05/06	BKB
1	REVISED BASED ON VENDOR SUBMITTALS, DRAWING UPDATES FOR CONSTRUCTION	DLB	02/25/09	BKB
2	FINAL RECORD DRAWING	DLB	04/16/10	SGP
4	AOP SYSTEM ADDITION	SNL	06/21/19	HKM

TETRA TECH ENGINEERING CORPORATION PC

DSGN: DR: CHK:
SUPV: CH ENG:
SUBMITTED BY: (FIRM MEMBER) (TITLE) (DATE)
NORTHDIV DM: HD:
FPE: HD: DIR:
OFFICER IN CHARGE
APPROVED DATE

DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING COMMAND

NAVAL FACILITIES ENGINEERING COMMAND, MID-ATLANTIC

NAVAL WEAPONS INDUSTRIAL RESERVE PLANT BETHPAGE, NEW YORK

GM-38 AREA

GROUNDWATER TREATMENT PLANT

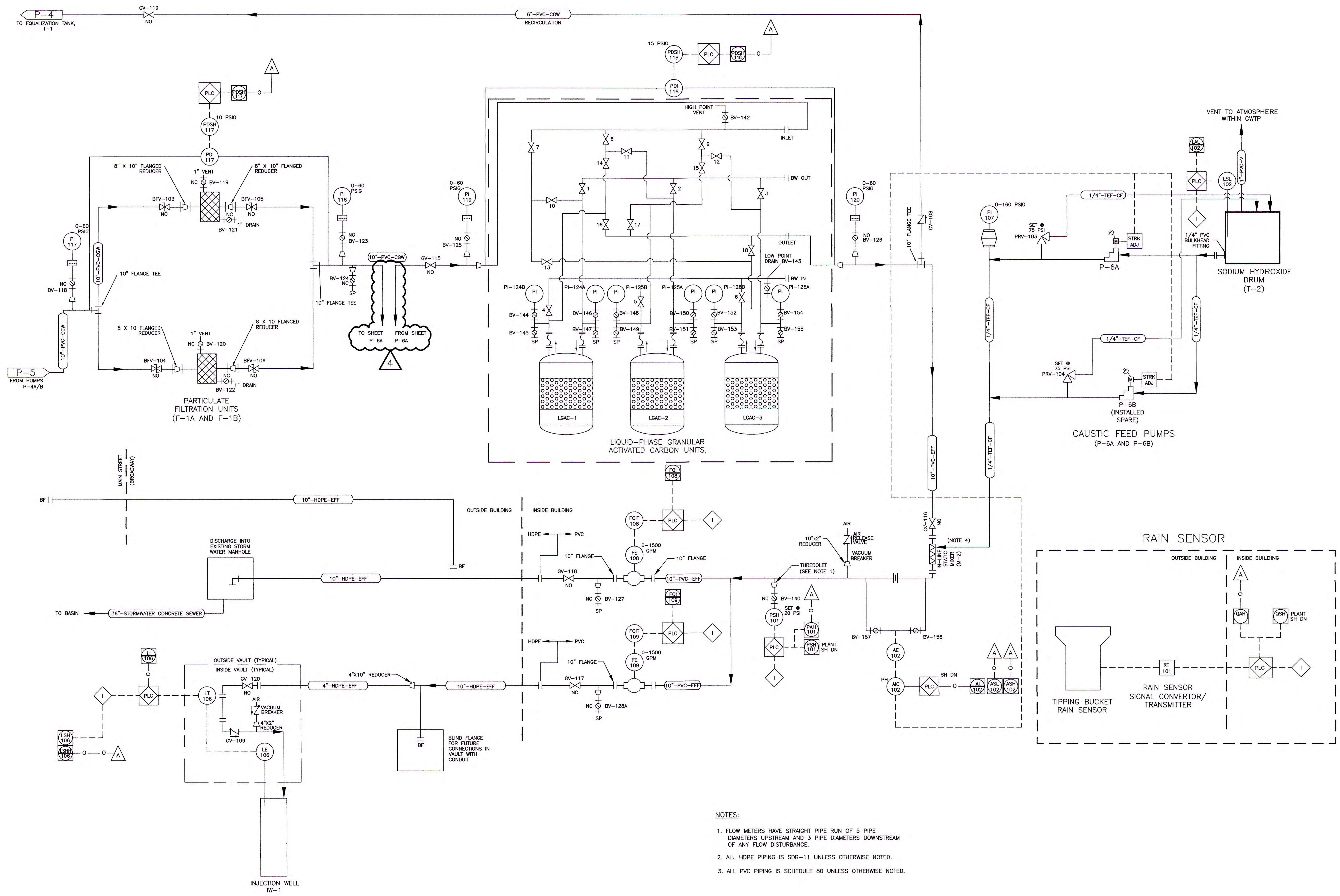
PIPING AND INSTRUMENTATION DIAGRAM (SHEET 3 OF 5)

APPROVED DATE FOR COMMANDER, NAVFAC MID-ATLANTIC

STATE OF NEW YORK DAVID DANIEL B... 080336 LICENSED PROFESSIONAL ENGINEER 6-21-19

SAT TO DATE 05/05/06
CODE I.D. NO. 80091
SCALE : AS SHOWN
SPEC. NO.
CONSTRN. CONTR. NO. N62472-99-D-0032
NAVFAC DRAWING NO.
SHEET OF
SIZE: D DIS. SH. NO. P-5

THIS DRAWING PRODUCED ON AUTOCAD DO NOT REVISE MANUALLY



NOTES:

1. FLOW METERS HAVE STRAIGHT PIPE RUN OF 5 PIPE DIAMETERS UPSTREAM AND 3 PIPE DIAMETERS DOWNSTREAM OF ANY FLOW DISTURBANCE.
2. ALL HDPE PIPING IS SDR-11 UNLESS OTHERWISE NOTED.
3. ALL PVC PIPING IS SCHEDULE 80 UNLESS OTHERWISE NOTED.

ISSUED FOR BID - 06/21/2019

REV	DESCRIPTION	PREP BY	DATE	APPRVD
0	FINAL DESIGN	DL	05/05/06	BKB
1	DELETED TERMINATION VAULT AND ASSOCIATED PIPING AND FITTINGS. NOTE 6 CHANGES.	DLB	03/31/08	BKB
2	REVISED BASED ON VENDOR SUBMITTALS, DRAWING UPDATES FOR CONSTRUCTION	DLB	02/12/09	BKB
3	FINAL RECORD DRAWING	DLB	04/16/10	SGP
4	AOP SYSTEM ADDITION	SNL	06/21/19	HKM

TETRA TECH ENGINEERING CORPORATION PC

DSGN: SUPV: DR: CH ENG: CHK:
SUBMITTED BY: (FIRM MEMBER) (TITLE) (DATE)
NORTHDIV DM: HD: FPE: HD: DIR:
OFFICER IN CHARGE
APPROVED DATE

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
NAVAL FACILITIES ENGINEERING COMMAND, MID-ATLANTIC
NAVAL WEAPONS INDUSTRIAL RESERVE PLANT
BETHPAGE, NEW YORK

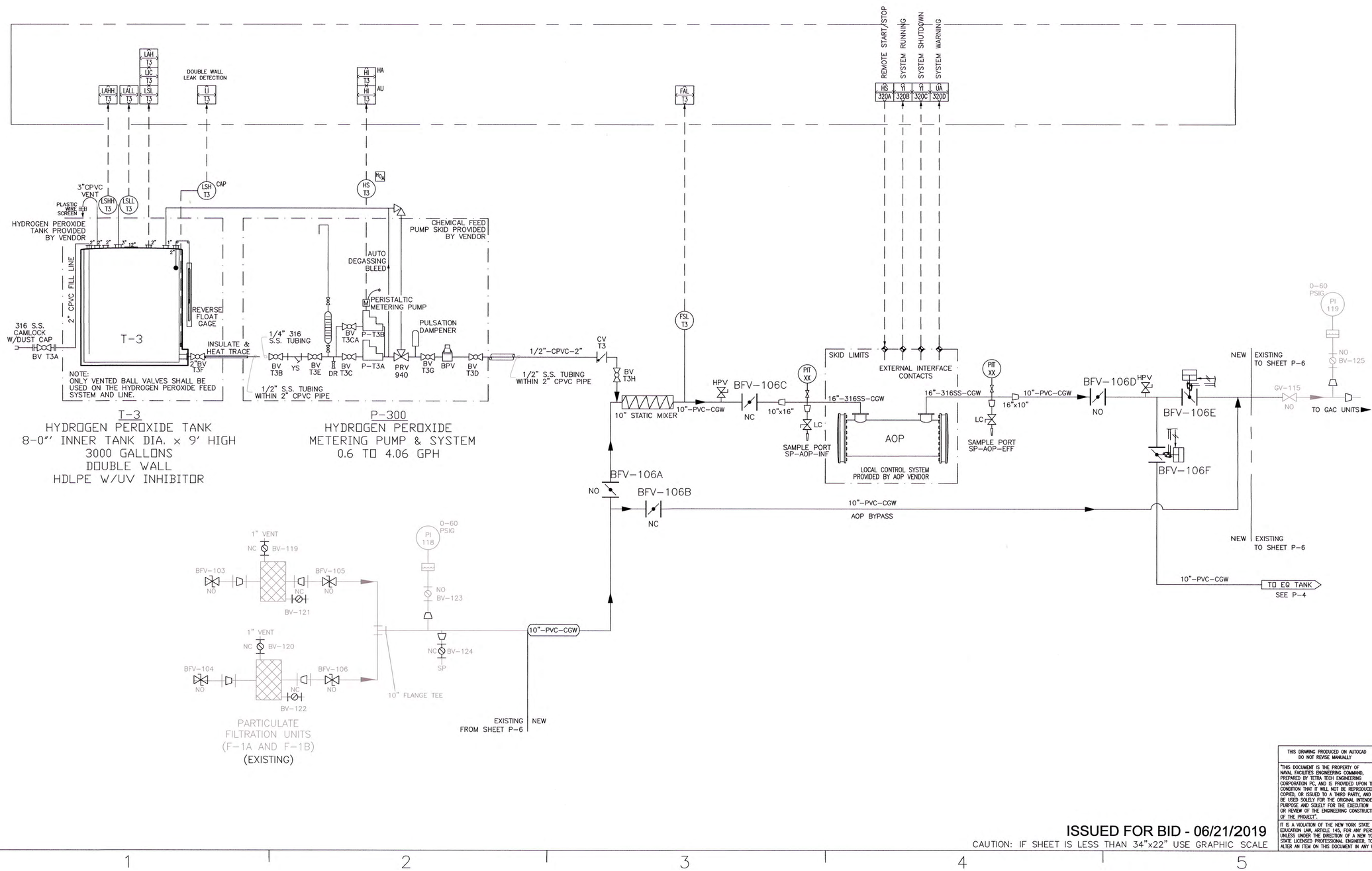
GM-38 AREA
GROUNDWATER TREATMENT PLANT
PIPING AND INSTRUMENTATION DIAGRAM (SHEET 4 OF 5)

APPROVED DATE FOR COMMANDER, NAVFAC MID-ATLANTIC

STATE OF NEW YORK — DAVID DANIEL BRA...CK — 6-21-19

THIS DRAWING PRODUCED ON AUTOCAD DO NOT REVISE MANUALLY

SAT TO | DATE 05/05/06
CODE I.D. NO. 80091
SCALE : AS SHOWN
SPEC. NO.
CONSTRN. CONTR. NO. N62472-99-D-0032
NAVFAC DRAWING NO.
SHEET OF
SIZE: D
DIS. SH. NO. P-6



ISSUED FOR BID - 06/21/2019

CAUTION: IF SHEET IS LESS THAN 34"x22" USE GRAPHIC SCALE

NO.	DESCRIPTION	DATE	APPR

NAVFAC

6-21-19

SEAL AREA

DES	HKM	DR	SNL
REVIEWED BY		HKM	
PM/DM		HKM	
CHIEF ENG/ARCH		HKM	

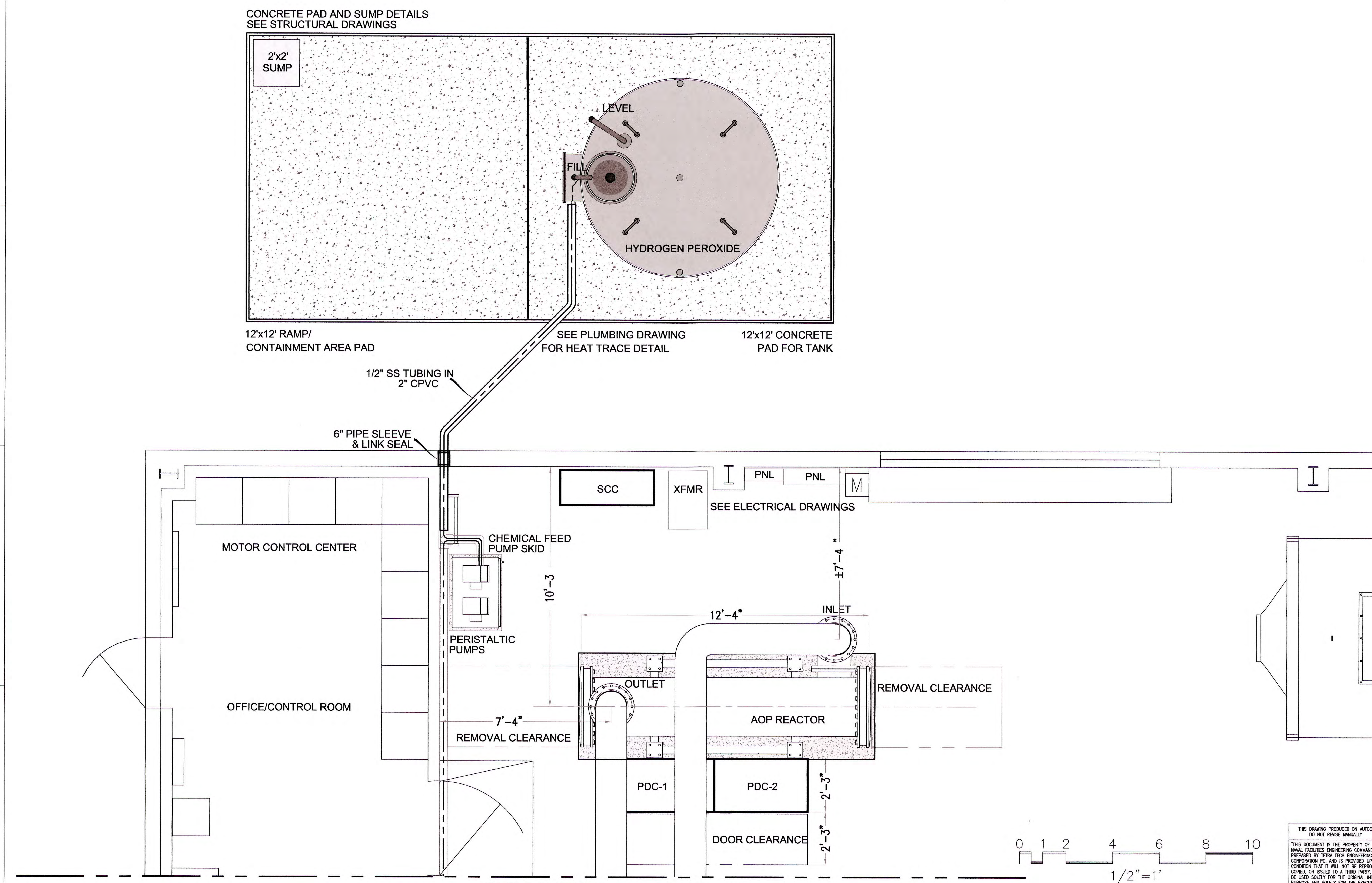
DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND ~ MID-ATLANTIC
NAVAL WEAPONS INDUSTRIAL RESERVE PLANT GM-38
NAVAL INDUSTRIAL RESERVE ORDNANCE PLANT BETHPAGE, NEW YORK

GM-38 AREA
GROUNDWATER TREATMENT PLANT
AOP SYSTEM ADDITION

AOP PIPING AND INSTRUMENTATION DIAGRAM

CODE ID. NO. 80091	SIZE D
SCALE:	NTS
MAXIMO NO. N62470-08-D-1001	-
JOB ORDER NO. WE-24	-
SPEC. NO.	-
CONSTR. CONTR. NO.	N62472-99-D-0032
	112G08005
NAVFAC DRAWING NO.	
	....
SHEET	OF .

P-6A



FOR CONTINUATION SEE DRAWING P-13

ISSUED FOR BID - 06/21/2019

CAUTION: IF SHEET IS LESS THAN 34"x22" USE GRAPHIC SCALE

THIS DRAWING PRODUCED ON AUTOCAD
DO NOT REVISE MANUALLY

SEAL AREA

6-21-19

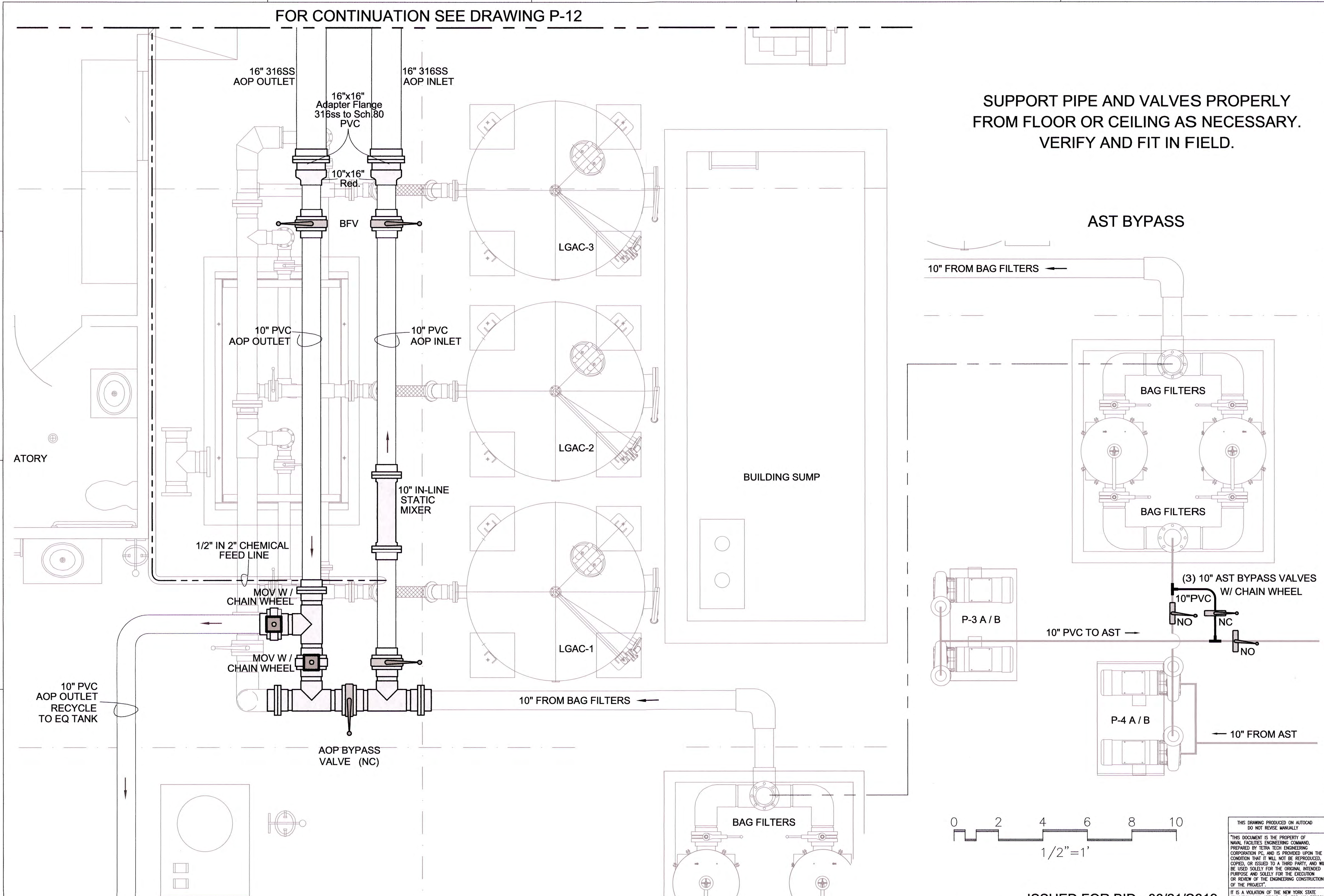
DES HKM	DR SNL
REVIEWED BY	HKM
PM/DM	HKM
CHIEF ENG/ARCH	HKM

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
NAVAL FACILITIES ENGINEERING COMMAND ~ MID-ATLANTIC
GM 38 NAVAL INDUSTRIAL RESERVE ORDNANCE PLANT
NAVAL WEAPONS INDUSTRIAL RESERVE PLANT BETHPAGE, NEW YORK

GM-38 AREA
GROUNDWATER TREATMENT PLANT
AOP SYSTEM ADDITION

AOP PROPOSED OVERALL PIPING LAYOUT (1 OF 2)

CODE ID. NO. 80091	SIZE D
SCALE:	NTS
MAXIMO NO. N62470-08-D-1001	
JOB ORDER NO. WE-24	
SPEC. NO.	
CONSTR. CONTR. NO. N62472-99-D-0032 112G08005	
NAVFAC DRAWING NO.	
SHEET	OF
P-12	



ISSUED FOR BID - 06/21/2019

CAUTION: IF SHEET IS LESS THAN 34"x22" USE GRAPHIC SCALE

THIS DRAWING PRODUCED ON AUTOCAD
DO NOT REVISE MANUALLY

SEAL AREA

DES HKM	DR SNL
REVIEWED BY	HKM
PM/DM	HKM
CHIEF ENG/ARCH	HKM

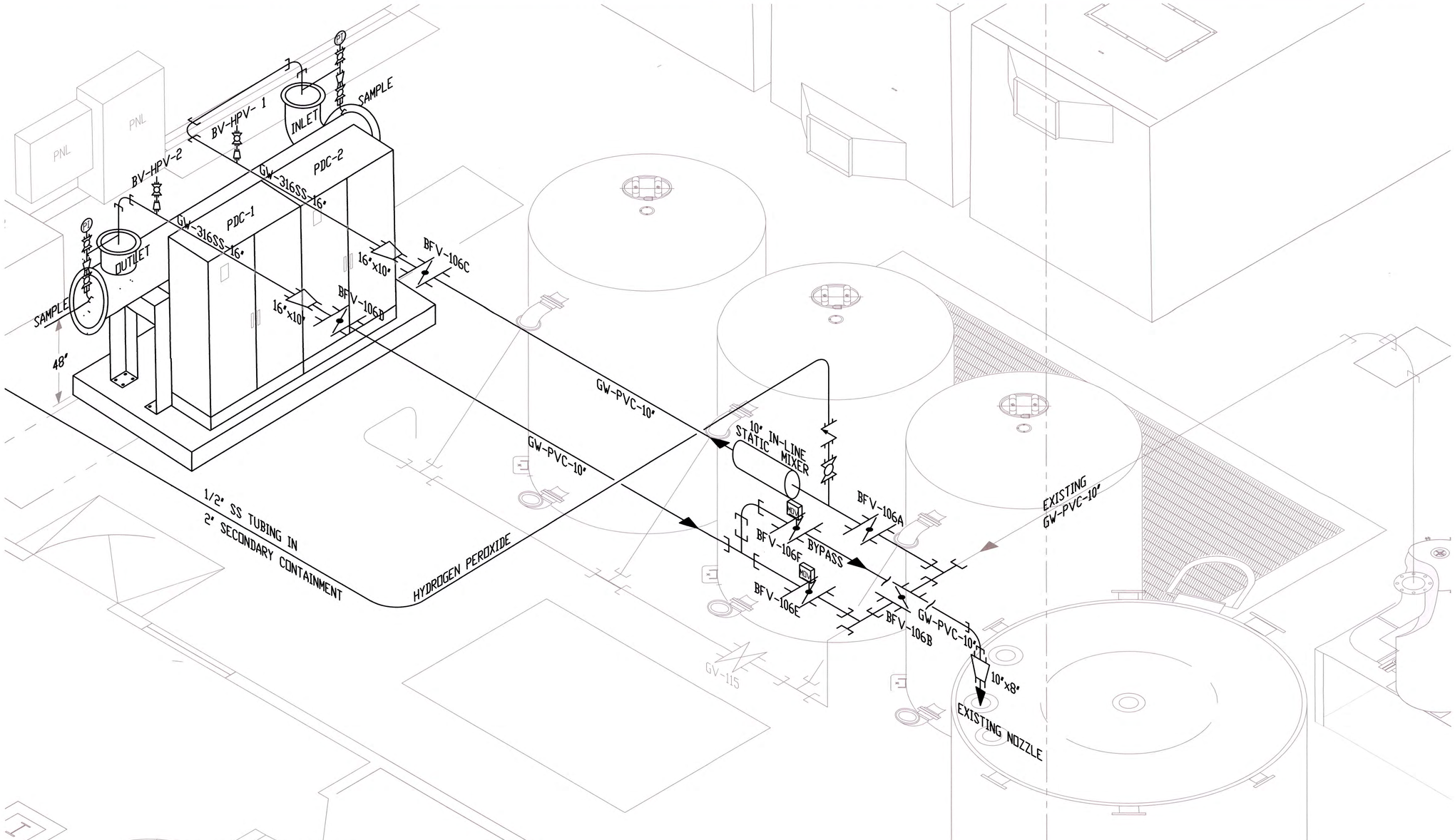
DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
NAVAL FACILITIES ENGINEERING COMMAND ~ MID-ATLANTIC
GM 38
NAVAL WEAPONS INDUSTRIAL RESERVE PLANT
NAVAL INDUSTRIAL RESERVE ORDNANCE PLANT
BETHPAGE, NEW YORK

GM-38 AREA
GROUNDWATER TREATMENT PLANT
AOP SYSTEM ADDITION

AOP PROPOSED OVERALL PIPING LAYOUT (2 OF 2)

CODE ID. NO. 80091	SIZE D
SCALE:	NTS
MAXIMO NO. N62470-08-D-1001	
JOB ORDER NO. WE-24	
SPEC. NO.	
CONSTR. CONTR. NO. N62472-99-D-0032 112G08005	
NAVFAC DRAWING NO.	
SHEET	OF

P-13



ISSUED FOR BID - 06/21/2019

CAUTION: IF SHEET IS LESS THAN 34"x22" USE GRAPHIC SCALE

NO.	DESCRIPTION	DATE	APPR

NAVFAC

Tt

STATE OF NEW YORK
6-21-19

SEAL AREA

DES	HKM	DR	SNL
REVIEWED BY		HKM	
PM/DM		HKM	
CHIEF ENG/ARCH		HKM	

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND ~ MID-ATLANTIC
GM 38 NAVAL WEAPONS INDUSTRIAL RESERVE PLANT NAVAL INDUSTRIAL RESERVE ORDNANCE PLANT BETHPAGE, NEW YORK

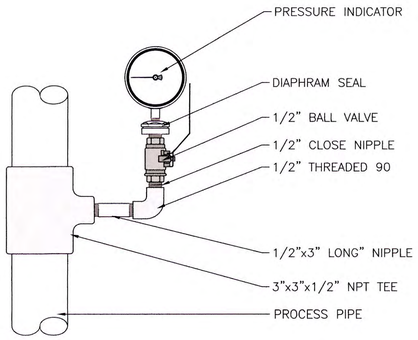
GM-38 AREA
GROUNDWATER TREATMENT PLANT
AOP SYSTEM ADDITION

TIE-IN ISOMETRIC

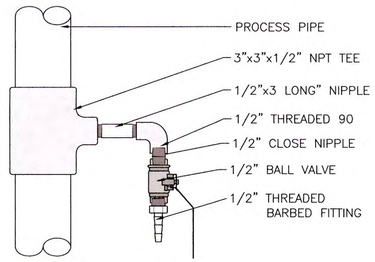
THIS DRAWING PRODUCED ON AUTOCAD
DO NOT REVISE MANUALLY

CODE ID. NO. 80091	SIZE D
SCALE:	NTS
MAXIMO NO. N62470-08-D-1001	-
JOB ORDER NO. WE-24	-
SPEC. NO.	-
CONSTR. CONTR. NO.	N62472-99-D-0032
112G08005	
NAVFAC DRAWING NO.	
....	
SHEET	OF -

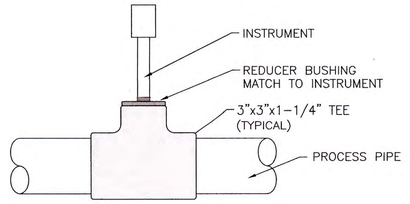
P-14

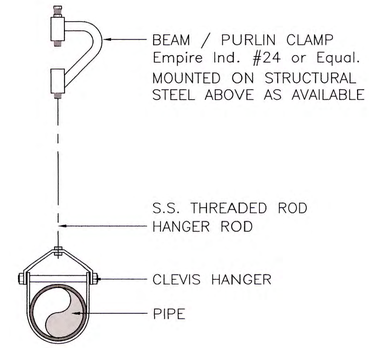


TYPICAL FOR ALL PUMP DISCHARGE INSTALLATIONS
3" SHOWN – OTHERS TYPICAL

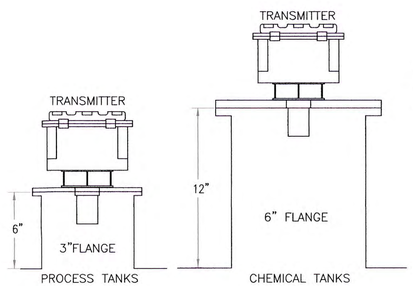


TYPICAL FOR ALL SAMPLE PORT INSTALLATIONS
3" SHOWN – OTHERS TYPICAL
MAX. HEIGHT 5'–0" AFF

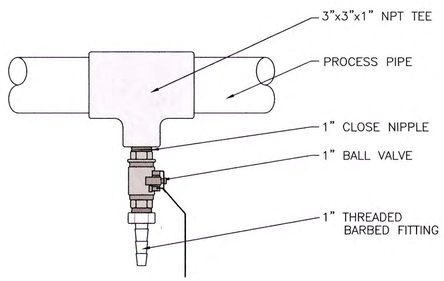




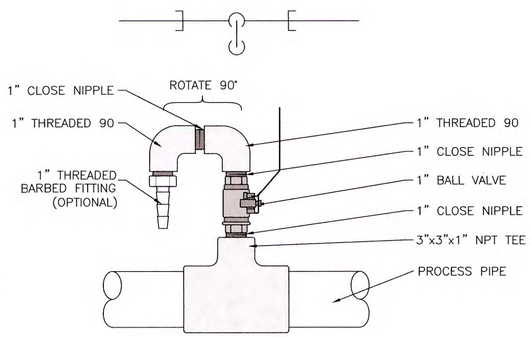
TYPICAL HANGER INSTALLATION
Empire Ind. #11 or Equal.



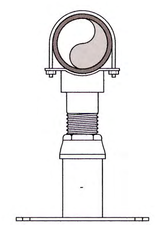
TYPICAL MOUNTING DETAIL
FOR TRANSMITTERS



TYPICAL FOR ALL LOW POINT DRAIN INSTALLATIONS
3" SHOWN – OTHERS TYPICAL



TYPICAL FOR ALL HIGH POINT VENT INSTALLATIONS
3" SHOWN – OTHERS TYPICAL



Adjustable Pipe Saddle Support
Empire Ind. #427 or Equal.

DATE	APPR	DESCRIPTION
		STN

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
NAVAL FACILITIES ENGINEERING COMMAND ~ MID-ATLANTIC
NAVAL INDUSTRIAL RESERVE ORDNANCE PLANT
GM 38

GM-38 AREA
GROUNDWATER TREATMENT PLANT
AOP SYSTEM ADDITION

DETAILS

6-21-2019

DES	HKM	DR	SNL
REVIEWED BY		HKM	
PM/DM		HKM	
CHIEF ENG/ARCH		HKM	

THIS DRAWING PRODUCED ON AUTOCAD
DO NOT REVISE MANUALLY

CODE ID. NO. 80091	SIZE D
SCALE:	NTS
MAXIMO NO. N62470-08-D-1001	-
JOB ORDER NO. WE-24	-
SPEC. NO.	-
CONSTR. CONTR. NO.	112G08005
NAVFAC DRAWING NO.	....
SHEET	OF -

P-15

ISSUED FOR BID - 06/21/2019

CAUTION: IF SHEET IS LESS THAN 34"x22" USE GRAPHIC SCALE

ELECTRICAL LEGEND

- EXISTING TO REMAIN
- EXISTING TO BE REMOVED
- NEW WORK
- EXTENT OF REMOVAL
- CONNECT NEW TO EXISTING
- DETAIL/EQUIPMENT BUBBLE (X / X-####)
- REMOVAL NOTES
- NEW WORK NOTES FOR THE SHEET SHOWN
- 2'x2' LAY-IN GRID FIXTURE # DENOTES TYPE
- 4' LINEAR SURFACE MTD FIXTURE LETTER DENOTE TYPE
- HIGH BAY LIGHT FIXTURE
- WALL MOUNTED FIXTURE LETTER DENOTES TYPE
- EXIT FIXTURE: WALL MOUNTED
- ELU: EMERGENCY LIGHTING UNIT
- LIGHTING SWITCH: '3' DENOTES 3-WAY
- TRANSFORMER
- DUPLEX RECEPTACLE: 20A, 125V, 2P GROUNDING
- DUPLEX RECEPTACLE: 20A, 125V, 2P GROUNDING, GROUND FAULT CIRCUIT INTERRUPTER
- NON-FUSED, HP-RATED DISCONNECT SWITCH VOLTAGE RATING AS REQUIRED, "30" INDICATES AVERAGE RATING, "3" INDICATES NUMBER OF POLES (TYP.)
- FUSED DISCONNECT SWITCH, HP-RATED
- COMBINATION FUSED DISCONNECT SWITCH WITH INTEGRAL MAGNETIC MOTOR STARTER . DISCONNECT SIZE AND FUSE RATING AS INDICATED.
- HP-RATED MOTOR STARTER
- JUNCTION BOX
- NEMA 6P SUBMERSIBLE, STAINLESS STEEL JUNCTION BOX UNLESS NOTED OTHERWISE (U.N.O.)
- EMERGENCY STOP- PUSH BUTTON STATION
- CONTROL STATION (SEL OR PB) SEE STARTER CIRCUITS FOR SPECIFIC TYPE
- THERMOSTAT
- MOTOR OR EQUIPMENT LOAD
- GROUNDING SYSTEM (3/4" DIA. ROD x 10'-0"L)

ELECTRICAL ABBREVIATIONS

CB/C.B.	CIRCUIT BREAKER
CIRC.	CIRCUIT
C.T.	CURRENT TRANSFORMER
DISC.	DISCONNECT SWITCH
DN	DOWN
DP	DISTRIBUTION PANEL
EDP	EMERGENCY DISTRIBUTION PANEL
ERP	EMERGENCY RECEPTACLE PANEL
EQUIP	EQUIPMENT
ER	EXISTING TO REMAIN
EUH	ELECTRIC UNIT HEATER
EX	EXISTING
EXR	EXISTING TO REMAIN
FACP	FIRE ALARM CONTROL PANEL
GFCI	GROUND FAULT CIRCUIT INTERRUPTER (PERSONNEL)
IC/ I.C.	INTERRUPTING CURRENT
MCC	MOTOR CONTROL CENTER
MP	MECHANICAL (POWER) PANEL
MV	MEDIUM VOLTAGE
O/H, OH	OVERHEAD
PSEG	PUBLIC SERVICE ENTERPRISES GROUP OF NEW YORK
T	TRANSFORMER
TELCO	TELEPHONE COMPANY
U.O.N.	UNLESS OTHERWISE NOTED
U.N.O.	UNLESS NOTED OTHERWISE
UPS	UNINTERRUPTIBLE POWER SUPPLY
UPSLxx	UNINTERRUPTIBLE POWER SUPPLY LIGHTING (277/480 PANEL). 'XX' INDICATES BUILDING
UPSRxx	UNINTERRUPTIBLE POWER SUPPLY RECEPTACLE (120/208 PANEL). 'XX' INDICATES BUILDING
WP	WEATHERPROOF

ELECTRICAL GENERAL NOTES:

1. WIRING AND CONDUIT SHALL BE RUN CONCEALED, WHERE POSSIBLE.
2. CONTRACTOR SHALL IMMEDIATELY REPAIR AT NO COST TO THE OWNER ANY DAMAGE CAUSED BY THIS WORK.
3. CONTRACTOR SHALL COORDINATE AND VERIFY ALL FIELD CONDITIONS, CLEARANCES AND WORKING SPACES WITH OTHER TRADES PRIOR TO THE START OF CONSTRUCTION.
4. CONTRACTOR SHALL PROVIDE REVISED PANEL SCHEDULES FOR PANELBOARDS AFTER BALANCING LOAD AMONG PHASES IN THE PANELBOARD.
5. CONTRACTOR SHALL LABEL RECEPTACLES WITH CIRCUIT NUMBER TO CORRESPONDING PANELBOARDS.
6. WIRING SHALL MEET CURRENT NEW YORK & NEC CODES.
7. RECEPTACLES SHALL BE GROUND FAULT INTERRUPTING (GFI/GFCI) - TYPE UNLESS NOTED OTHERWISE.
8. CONTRACTOR SHALL PROVIDE SLEEVES AND SEALS WHERE REQUIRED.
9. PENETRATIONS THROUGH FIRE RATED STRUCTURES (WALL/CEILING) SHALL HAVE AN APPROVED FIRE RATED STOPPING MATERIAL.
10. DISCONNECT SWITCHES FOR MECHANICAL EQUIPMENT SHALL BE MOUNTED TO THE STRUCTURE, NOT TO THE EQUIPMENT UNLESS OTHERWISE NOTED. PROVIDE NECESSARY MOUNTING SUPPORT AS REQUIRED.
11. MOTOR STARTERS FOR THE HVAC EQUIPMENT SHALL BE PROVIDED AND INSTALLED BY THE ELECTRICAL CONTRACTOR PER MANUFACTURERS INSTRUCTIONS OF HVAC EQUIPMENT. THE STARTER SHALL BE PROVIDED WITH HAND-OFF-AUTO SWITCH, PUSH TO TEST TYPE PILOT LIGHTS (RED=ON & GREEN=OFF), RESET BUTTON, CONTROL COIL, CONTACTOR WITH MINIMUM OF TWO SETS OF 'N.O.' & 'N.C.' CONTACTS. THE STARTER SHALL BE PROVIDED WITH CONTROL (FOR AUTOMATIC START/STOP PER SEQUENCE OF OPERATION) AND POWER WIRING IN CONDUIT.
12. DISCONNECT SWITCHES SHALL BE HORSEPOWER RATED WITH VOLTAGE RATINGS & NUMBER OF POLES AS REQUIRED FOR EQUIPMENT ENCLOSURE TYPE SHALL BE NEMA 4X STAINLESS STEEL UNLESS NOTED OTHERWISE.
13. CONDUIT AND WIRING FOR PRIMARY AND SECONDARY SIDE OF UTILITY TRANSFORMER SHALL BE COORDINATED WITH PSIG LONG ISLAND INCLUDING BUT NOT LIMITED TO ADVANCE NOTICE PRIOR TO ANY DEMOLITION AND/OR INSTALLATION WORK AND TAKING OUT THE NECESSARY WORK PERMITS.

ELECTRICAL DEMOLITION WORK NOTES:

1. DISCONNECT AND REMOVE EXISTING 15 KV PRIMARY POWER CABLES FROM SIDE OF EXISTING 500 KVA OIL FILLED PAD MOUNTED TRANSFORMER.
2. DISCONNECT EXISTING SECONDARY CABLES & CONDUITS (2) FROM THE SECONDARY SIDE OF THE TRANSFORMER AND REMOVE EXISTING TRANSFORMER, CONCRETE PAD AND BOLLARDS WITH ALL ACCESSORIES. PATCH AND REPAIR AREA TO MATCH EXISTING.
3. DISCONNECT & REMOVE EXISTING WIRES & EXISTING (2) 4" CONDUITS. EXISTING CONDUITS CAN BE RE-USED IF POSSIBLE.
4. PRIOR TO CONSTRUCTION, CONTRACTOR MUST COORDINATE WITH POWER COMPANY. (PSEG) TO GET SHUT DOWN.
5. REMOVE EXISTING BONDING & WIRING FROM GROUNDING SYSTEM TO NEUTRAL TERMINAL.

ELECTRICAL NEW WORK NOTES:

1. PROVIDE 800A, 600V, 3P,4W SERVICE RATED TYPE FUSED DISCONNECT SWITCH IN NEMA 4x STAINLESS STEEL ENCL. PROVIDE (6) 800A FUSES TIME DELAY FUSE W/ 3 SPARES. PROVIDE COPPER NEUTRAL & GROUNDING KITS.
2. PROVIDE 400A, 600V, 3P,4W SERVICE RATED TYPE FUSED DISCONNECT SWITCH IN NEMA 4x STAINLESS STEEL ENCL. PROVIDE (6) 300A FUSES TIME DELAY FUSE W/ 3 SPARES PROVIDE COPPER NEUTRAL & GROUNDING KITS.
3. PROVIDE 3-4C, EA WITH (4) #350KCMIL, (1)# 2/0 G)
4. PROVIDE 2-4"C, EA WITH (4) #4/0, (1) #2 G)
5. PROVIDE 1" C WITH #3/0 G. PER NEC 250. PROVIDE BONDING BETWEEN NEUTRAL AND GROUNDING BUSSES.
6. REPLACE EX. 13.2KV, 40A LINE FUSES (3) WITH MATCHING 100A FUSES (3).
7. MIN. 16"D x 14"H NEMA 4x, FULL LENGTH HINGED DOOR STEEL WIRE TROUGH WITH LENGTH TO BE DETERMINED AT THE SITE CONDITION.
8. FINAL REPLACEMENT PROCEDURE AND SIZE & TYPE OF 15KV UNDERGROUND CABLE/OVERHEAD CABLE LINE FUSES SHALL BE DETERMINED BY THE UTILITY COMPANY. COORDINATE ALL ASSOCIATED MATERIALS & WORK. PROVIDE UNDERGROUND CONCRETE ENCASED SCH. 40 PVC CONDUIT AS REQUIRED WITH (1) 4" CONDUIT SPARE.
9. PROVIDE (4) 4"C EACH WITH (4) #350 KCMIL, XHHW CABLES.
10. PROVIDE (1) 2"C WITH PULL STRING FROM EACH PDC AND SCC TO WALL MOUNTED NEMA 4x JUNCTION BOX (SIZE PER NEC). PROVIDE (2) 2"C TO BE ROUTED TO TERMINATE ALL CONTROL & DATA WIRING OF PDC/SSC ABOVE VIA JUNCTION BOX TO EXISTING MAIN CONTROL CENTER I/O CABINET IN CONTROL ROOM.
11. PROVIDE MV CABLE IN CONCRETE ENCASED SCHEDULE 40 PVC CONDUIT EXTENDING MINIMUM OF 30" OF THE DRIVEWAY. TOP OF CONCRETE ENCASED DUCTBANK SHALL BE A MINIMUM OF 30" BELOW FINISHED GRADE. CONDUITS SHALL BE MINIMUM OF 2" COVERED WITH CONCRETE. PROVIDE "WARNING TAPE" PER SPECIFICATIONS.
12. PROVIDE 45KVA, 3 PH, DRY TYPE TRANSFORMER IN NEMA 4x ENCLOSURE. PROVIDE MOUNTING BRACKET TO BE WELDED/BOLTED FROM STRUCTURAL STEEL OF BUILDING.
13. PROVIDE CONDUIT & WIRING FOR POWER AND CONTROL FOR HEAT TRACE CABLE IN COORDINATION WITH MECHANICAL AND PLUMBING CONTRACTOR. PROVIDE LOCAL SWITCH.
14. PROVIDE (4) #2/0 & (1) #4G, 2"C.
15. PROVIDE (1) #4G, 1"C.
16. PROVIDE LOCAL DISCONNECTING MEANS WITH WIRING IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
17. EXISTING MAIN CIRCUIT BREAKER IS SERVICE ENTRANCE TYPE, SQ D. MODEL #PLP34080CU444ASA WITH 42KAIC RATING AT 480V AND IT HAS TRIPPING UNIT WITH CT IN NEUTRAL. REMOVE BONDING WIRE BETWEEN NEUTRAL AND GROUNDING SYSTEM. REPLACE EXISTING TRIPPING UNIT WITH A NEW SQ.D. 'LSIG' TRIPPING UNIT.
18. PROVIDE UTILITY COMPLIANT METER AND MINIMUM 1-1/2" RGS CONDUIT TO C.T. CABINET.
19. PROVIDE 36"x36"x12" OR SIZED PER NEC PULL BOX IN 4x STAINLESS STEEL ENCLOSURE WITH FULL SIZE HINGED LOCKABLE DOOR.
20. PROVIDE ENGRAVED SIGNAGE LABELS FOR SERVICE DISCONNECT SWITCHES AND LABEL DISCONNECTS "SERVICE DISCONNECT 1 OF 2" FOR 800A AND "SERVICE DISCONNECT 2 OF 2" FOR 400A.
21. PROVIDE OVER 15KV WIRING TO EXTEND WIRING FROM EXISTING O/H POLE 'LIPA #18' PER PSEG.
22. FAULT CURRENT VALUES SHOWN ARE BASED ON AVAILABLE FAULT CURRENT OF 31KA, WHICH HAS BEEN PROVIDED BY PSEG VIA EMAIL ON 06-14-2019. CALCULATED FAULT CURRENT SHOWN AT OTHER DOWNSTREAM OF EQUIPMENT ARE ONLY FOR INFORMATION PURPOSES ONLY. ACTUAL FAULT CURRENT VALUES SHALL BE CALCULATED BY THE CONTRACTOR TO DETERMINE SHORT CIRCUIT CURRENT WITHSTANDING RATINGS IN SHOP DRAWING. SHORT CIRCUIT CALCULATION SHALL BE BASED ON ACTUAL LENGTHS OF FEEDERS, BRANCHES, SIZES, TYPES OF CABLES AND TYPES OF CONDUITS(MAGNETIC OR NON-MAGNETIC).

14. PROVIDE MATCHING CONDUIT-WIRING (UNDERGROUND AND OVERHEAD POWER SERVICE) THROUGH THE ELECTRICAL CONTRACTOR. ALL MATERIALS & SERVICE RELATED WORK SHALL BE PROVIDED IN COORDINATION WITH PSEG. THE ABOVE SHALL INCLUDE BUT IS NOT LIMITED TO THE FOLLOWING ITEMS:
    - 14.1. PROVIDE UNDERGROUND 4" SCHEDULE 40 PVC CONDUITS FROM PRIMARY SIDE OF THE NEW UTILITY TRANSFORMER FOR MV CABLES AND EXTEND CONDUIT WITH CABLE UP TO NEW POLE MINIMUM OF 20'-0" ABOVE FINISHED GRADE OR AS DIRECTED BY PSEG. CONCRETE ENCASED CONDUIT DUCTBANK SHALL BE MIN 24" BELOW FINISHED GRADE.
    - 14.2. PROVIDE MV CABLE IN CONDUIT AS STATED IN 15.1 ABOVE, PROVIDING ENOUGH SLACK OF CABLE SO THAT PSEG CAN BE ABLE TO CONNECT TO THE OVERHEAD MV WIRING ON POLE. COORDINATE WITH PSEG AND OWNER IN ADVANCE. PRIMARY CABLE SHALL BE MIN. (2) #2 OR 1/0 AL OR COPPER.
    - 14.3. PROVIDE PROPER SIZE WIRE TROUGH WITH STEEL SUPPORT TO SPLIT MAIN POWER SERVICE INTO TWO NEW FUSED DISCONNECT SWITCHES AS INDICATED.
    - 14.4. PROVIDE FEES AND ANY COSTS ASSOCIATED WITH BILL OF MATERIALS REQUIRED TO HAVE SERVICE/S.
    - 14.5. PROVIDE OVERHEAD SERVICE DROP MV CABLES & CONDUITS WITH MV CABLES. CONDUITS SHALL BE PROPERLY CLAMPED ALONG POLE. CABLE LENGTH SHALL BE LEFT ENOUGH FOR PSEG TO MAKE FINAL CONNECTIONS AT THE POLE . THE ADDITIONAL CABLE SHALL BE COILED WITH A KELLUMS GRIP BASKET WITHOUT BEING DAMAGED BY BENDING AND IT SHALL BE ATTACHED TO THE POLE TO PREVENT DAMAGE OR VANDALISM. BOTH ENDS OF CABLES SHALL BE CAPPED WITH APPROVED TIGHT FITTING WATER TIGHT SEALING CAPS.
    - 14.6. PROVIDE GROUND ROD & GROUNDING WIRE.
    - 14.7. PROVIDE ANCHORS ON POLE, CLAMPS (GALVANIZED) AND ON WITH ALL NECESSARY HARDWARE, MAST, CLEVIS, INSULATOR, WEATHER PROOF METAL CONDUIT THREADED LB/LL EXPANSION JOINTS WHEREVER THEY ARE REQUIRED.
    - 14.8. REPAIR ANY DAMAGES TO MATCH EXISTING AT NO ADDITIONAL COST TO THE OWNER.
    - 14.9. PROVIDE TRANSFORMER PAD WITH CONCRETE VAULT IN COORDINATION WITH PSEG.
    - 14.10. ALL ELECTRICAL WORK AND MATERIALS SHALL BE PROVIDED BY THE CONTRACTOR PER ELECTRICAL INSTALLATION SPECIFICATIONS FOR CUSTOMER AND CONTRACT PROVIDED IN ATTACHMENT 'A' TO SPECIFICATION 26 05 00.
15. CONTRACTOR MUST CONTACT 'MISS UTILITY" PRIOR TO CONSTRUCTION. ALL EXISTING UTILITIES (SANITARY, STORM WATER LINE, TELEPHONE AND COMMUNICATION LINES SHALL BE IDENTIFIED FOR PHYSICAL PROTECTION. IF ANY UTILITY LINE COMES IN THE SAME HORIZONTAL AND/OR VERTICAL LINE OR IN NEARBY LINE OF PROPOSED POWER LINE, BOTH SHALL BE CONCRETE ENCASED AND MUST MAINTAIN SLOPES AND INVERTS OF EXISTING UTILITY. EXTEND CONCRETE ENCASEMENTS MINIMUM OF 24" ON ALL SIDES OF THAT INTERSECTION.
16. PROVIDE GROUNDING CONNECTIONS WITH #4/0 COPPER WIRE AT MINIMUM OF TWO PLACES OF METAL FRAME/ STRUCTURE OF NEW EQUIPMENT WITH ALL NECESSARY ACCESSORIES AND HARDWARE.

ELECTRICAL SHEET NOTES:

1. FOR SITE PLAN REMOVAL AND NEW WORK, REFER TO SHEET E-100.
2. FOR FLOOR PLAN NEW WORK, REFER TO SHEET E-101.
3. FOR SINGLE LINE DIAGRAM REMOVAL WORK, REFER TO SHEET TO SHEET E-601.
4. FOR SINGLE LINE DIAGRAM NEW WORK, REFER TO SHEET TO SHEET E-602.
5. FOR SCHEDULES REFER TO SHEET E-603.

APPR	DATE	DESCRIPTION	INIT.
.	.	.	.

NAVFAC

STATE OF NEW YORK — DAVID A. BURGER — 098252 — LICENSED PROFESSIONAL ENGINEER

DES	KKG	DR	JS
REVIEWED BY		KKG	
PM/DM		HKM	
CHIEF ENG/ARCH		HKM	

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND ~ MID-ATLANTIC
NAVAL WEAPONS INDUSTRIAL RESERVE PLANT
NAVAL INDUSTRIAL RESERVE ORDNANCE PLANT
BETHPAGE, NEW YORK
GM 38

GM-38 AREA
GROUNDWATER TREATMENT PLANT
AOP SYSTEM ADDITION

ELECTRICAL GENERAL NOTES, LEGEND & ABBREVIATIONS

THIS DRAWING PRODUCED ON AUTOCAD DO NOT REVISE MANUALLY

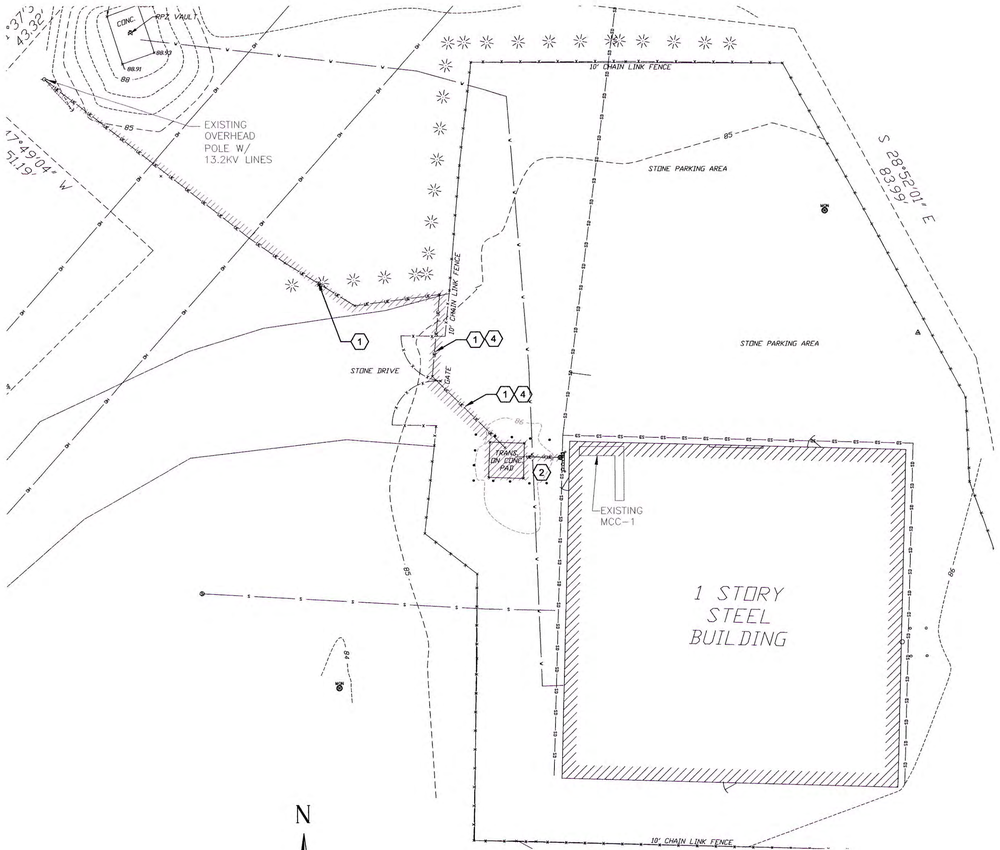
CODE ID. NO. 80091	SIZE D
SCALE:	NTS
MAXIMO NO. N62470--08--D--1001	-
JOB ORDER NO. WE--24	-
SPEC. NO.	-
CONSTR. CONTR. NO.	N62472--99--D--0032
	112G08005
NAVFAC DRAWING NO.	
	....
SHEET	OF .
	E-001

ISSUED FOR BID - 06/21/2019

CAUTION: IF SHEET IS LESS THAN 34"x22" USE GRAPHIC SCALE

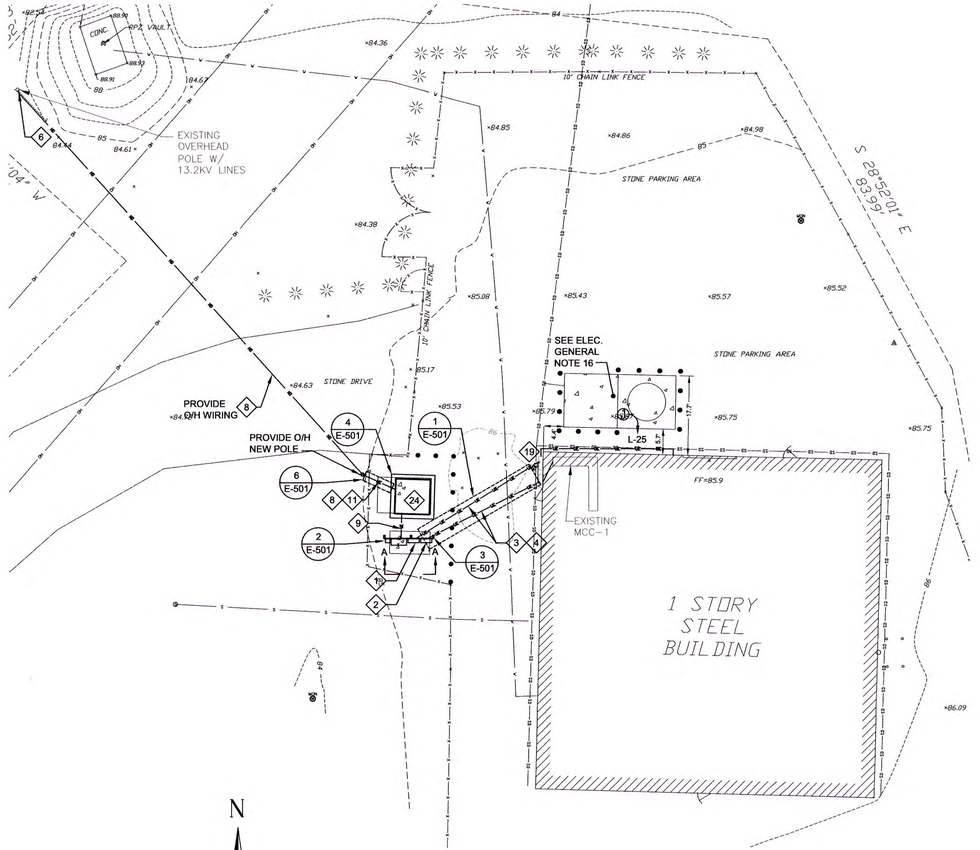
ELECTRICAL SHEET NOTES:

1. FOR LEGEND, ABBREVIATIONS, GENERAL AND WORK NOTES, REFER TO SHEET E-001.
2. FOR FLOOR PLAN NEW WORK, REFER TO SHEET E-101.
3. FOR SINGLE LINE DIAGRAM REMOVAL WORK, REFER TO SHEET TO SHEET E-601.
4. FOR SINGLE LINE DIAGRAM NEW WORK, REFER TO SHEET TO SHEET E-602.
5. FOR SCHEDULES REFER TO SHEET E-603.



N

1 E-100 SITE PLAN - REMOVAL WORK
SCALE: 1/16"=1'-0"



N

2 E-100 SITE PLAN - NEW WORK
SCALE: 1/16"=1'-0"

ISSUED FOR BID - 06/21/2019

CAUTION: IF SHEET IS LESS THAN 34"x22" USE GRAPHIC SCALE

NO.	DESCRIPTION	DATE	APPR

NAVFAC

STATE OF NEW YORK — David A. Burger — 096252 — REGISTERED PROFESSIONAL ENGINEER

DES	KKG	DR	JS
REVIEWED BY		KKG	
PM/DM		HKM	
CHIEF ENG/ARCH		HKM	

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND ~ MID-ATLANTIC
NAVAL WEAPONS INDUSTRIAL RESERVE PLANT GM 38 — NAVAL INDUSTRIAL RESERVE ORDNANCE PLANT BETHPAGE, NEW YORK
NAVAL FACILITIES ENGINEERING COMMAND

GM-38 AREA
GROUNDWATER TREATMENT PLANT
AOP SYSTEM ADDITION

ELECTRICAL SITE PLAN REMOVAL & NEW WORK

THIS DRAWING PRODUCED ON AUTOCAD DO NOT REVISE MANUALLY

CODE ID. NO. 80091	SIZE D
SCALE:	NTS
MAXIMO NO. N62470-08-D-1001	.
JOB ORDER NO. WE-24	.
SPEC. NO.	.
CONSTR. CONTR. NO.	N62472-99-D-0032
	112G08005
NAVFAC DRAWING NO.	
	....
SHEET	OF .
	E-100

PROVIDE 8" CONCRETE PAD

4 E-501

21

1000KVA PAD MOUNTED XFMR (96"W x 96"D x 8"H)

PROVIDE NEW METER WITH SOCKET

9

M

A A

PROVIDE C.T. W/CAB (42"Wx67"Hx18"D)

NEW 800A FUSED DISCONNECT SWITCH (28"Wx70"Hx18"D)

NEW 400A, 600V, 3P 4W DISCONNECT SWITCH (28"Wx50"Hx10"D)

1

2

2 E-501

SECTION A-A

1/2" SS TUBING IN 2" CPVC

12 45KVA XFRM

4

6" PIPE SLEEVE & LINK SEAL

PANEL "P"

PANEL "L"

SCC

XFMR T2

PNL PNL

M

SEE ELECTRICAL DRAWINGS

10

PROVIDE ELECTRONIC KWH METER BY CONTRACTOR WITH WIRING AND CONDUIT

L-20

CHEMICAL FEED PUMP SKID

L-22

PERISTALTIC PUMPS

MOTOR CONTROL CENTER

3

OFFICE/CONTROL ROOM

P-1,3,5

P-7,9,11

INLET

OUTLET

AOP REACTOR

REMOVAL CLEARANCE

REMOVAL CLEARANCE

PDC-1

PDC-2

DOOR CLEARANCE

EXISTING MAIN CONTROL I/O CABINET

16" 316SS AOP OUTLET

16" 316SS AOP INLET

16"x16" Adapter Flange 316ss to Sch.80 PVC

10"x16" RED

BFV

LGAC-3

LGAC-2

LGAC-1

10" PVC AOP OUTLET

10" PVC AOP INLET

10" IN-LINE STATIC MIXER

1/2" IN 2" CHEMICAL FEED LINE

MOV W / CHAIN WHEEL

MOV W / CHAIN WHEEL

10" PVC AOP OUTLET RECYCLE TO EQ TANK

AOP BYPASS VALVE (NC)

10" FROM BAG FILTERS

BUILDING SUMP

LAVATORY

L-23 16

S

BAG FILTERS

BAG FILTERS

(3) 10" AST BYPASS VALVES W/ CHAIN WHEEL

10"PVC

NO NC NO

10" PVC TO AST

P-3 A / B

ELECTRICAL SHEET NOTES:

1. FOR LEGEND, ABBREVIATIONS, GENERAL AND WORK NOTES, REFER TO SHEET E-001.
2. FOR SITE PLAN REMOVAL AND NEW WORK, REFER TO SHEET E-100.
3. FOR SINGLE LINE DIAGRAM REMOVAL WORK, REFER TO SHEET TO SHEET E-601.
4. FOR SINGLE LINE DIAGRAM NEW WORK, REFER TO SHEET TO SHEET E-602.
5. FOR SCHEDULES REFER TO SHEET E-603.

N

1 E-101 ELECTRICAL FLOOR PLAN - NEW WORK

NO SCALE

ISSUED FOR BID - 06/21/2019

CAUTION: IF SHEET IS LESS THAN 34"x22" USE GRAPHIC SCALE

DATE	APPR	DESCRIPTION

NAVFAC

STATE OF NEW YORK David A. Burger 086252 LICENSED PROFESSIONAL ENGINEER

DES	KKG	DR	JS
REVIEWED BY		KKG	
PM/DM		HKM	
CHIEF ENG/ARCH		HKM	

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
NAVAL WEAPONS INDUSTRIAL RESERVE PLANT GM 38

NAVAL FACILITIES ENGINEERING COMMAND ~ MID-ATLANTIC
NAVAL INDUSTRIAL RESERVE ORDNANCE PLANT
BETHPAGE, NEW YORK

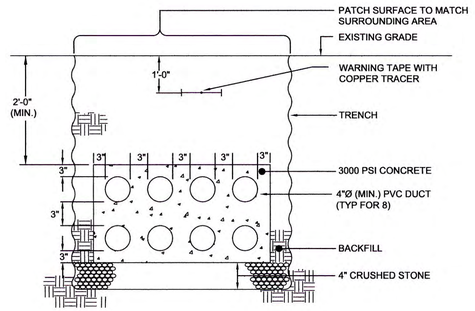
GM-38 AREA
GROUNDWATER TREATMENT PLANT
AOP SYSTEM ADDITION

ELECTRICAL FLOOR PLAN NEW WORK

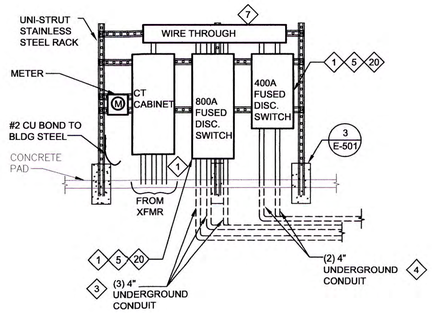
THIS DRAWING PRODUCED ON AUTOCAD DO NOT REVISE MANUALLY

CODE ID. NO. 80091	SIZE D
SCALE:	NTS
MAXIMO NO. N62470-08-D-1001	.
JOB ORDER NO. WE-24	..
SPEC. NO.	
CONSTR. CONTR. NO.	N62472-99-D-0032
	112G08005
NAVFAC DRAWING NO.	
	...
SHEET	OF .

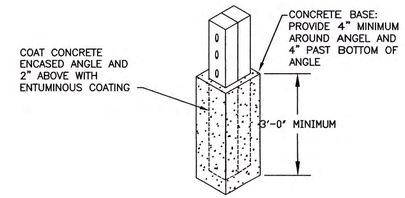
E-101



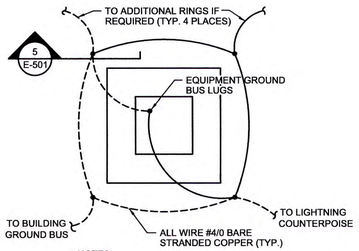
1 E-501 **8-WAY DUCTBANK DETAIL**
NO SCALE



2 E-501 **ELECTRICAL POWER ELEVVATION DETAIL (SECT. A-A)**
NO SCALE



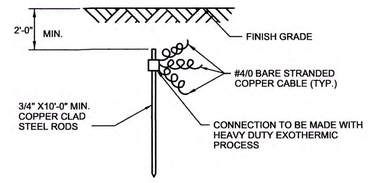
3 E-501 **FREE STANDING RACK FOOTING DETAIL**
NO SCALE



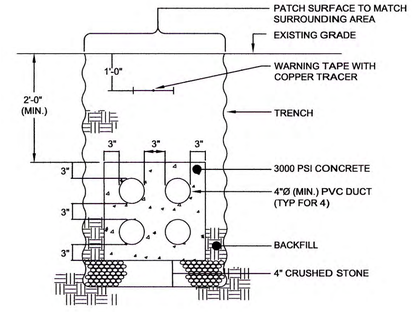
NOTES:

1. ADDITIONAL CONCENTRIC RINGS SHALL BE ADDED AS REQUIRED TO MEET THE (10) OHM SPECIFIED RESISTANCE. EACH RING TO HAVE 4 GROUND RODS AND SPACED 10 FEET FROM THE INNER RING.
2. BELOW 1000 KVA TRANSFORMER VAULT.

4 E-501 **GROUND MAT DETAIL**
NO SCALE



5 E-501 **GROUND ROD SECTION DETAIL**
NO SCALE



6 E-501 **4-WAY DUCTBANK DETAIL**
NO SCALE

NO.	DESCRIPTION	DATE	APPR

NAVFAC

DES KKG | DR JS
REVIEWED BY KKG
PM/DM HKM
CHIEF ENG/ARCH HKM

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
NAVAL FACILITIES ENGINEERING COMMAND ~ MID-ATLANTIC
NAVAL INDUSTRIAL RESERVE ORDNANCE PLANT
BETHPAGE, NEW YORK
NAVAL WEAPONS INDUSTRIAL RESERVE PLANT GM-38 AREA
GROUNDWATER TREATMENT PLANT
AOP SYSTEM ADDITION
GM 38

ELECTRICAL DETAILS

STATE OF NEW YORK
David A. Burger
LICENSED PROFESSIONAL ENGINEER
096252

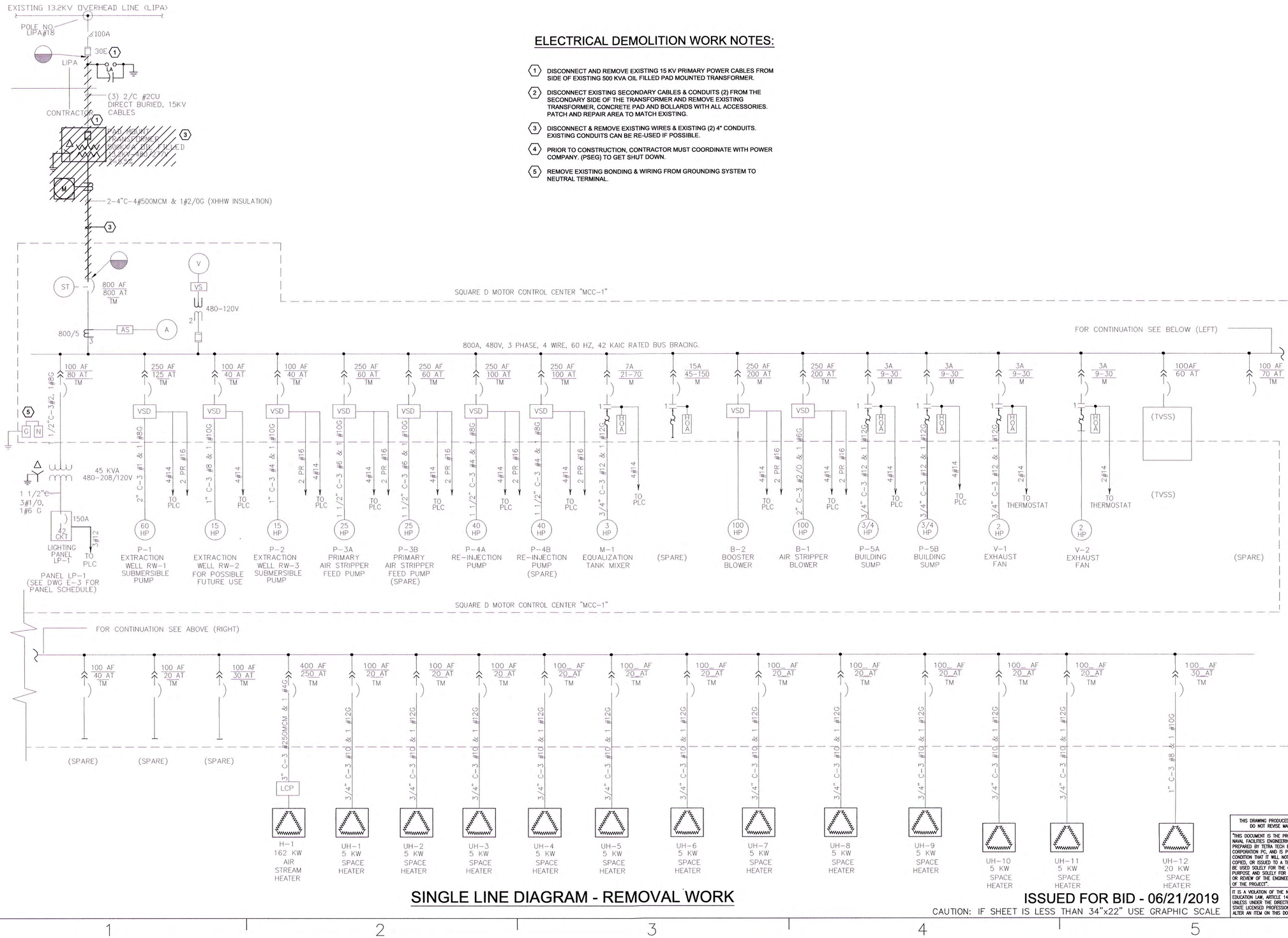
CODE ID. NO. 80091 | SIZE D
SCALE: NTS
MAXIMO NO. N62470-08-D-1001
JOB ORDER NO. WE-24
SPEC. NO.
CONSTR. CONTR. NO. N62472-99-D-0032
112G08005
NAVFAC DRAWING NO. ...
SHEET ... OF ...

E-501

ISSUED FOR BID - 06/21/2019
CAUTION: IF SHEET IS LESS THAN 34"x22" USE GRAPHIC SCALE

ELECTRICAL DEMOLITION WORK NOTES:

1. DISCONNECT AND REMOVE EXISTING 15 KV PRIMARY POWER CABLES FROM SIDE OF EXISTING 500 KVA OIL FILLED PAD MOUNTED TRANSFORMER.
2. DISCONNECT EXISTING SECONDARY CABLES & CONDUITS (2) FROM THE SECONDARY SIDE OF THE TRANSFORMER AND REMOVE EXISTING TRANSFORMER, CONCRETE PAD AND BOLLARDS WITH ALL ACCESSORIES. PATCH AND REPAIR AREA TO MATCH EXISTING.
3. DISCONNECT & REMOVE EXISTING WIRES & EXISTING (2) 4" CONDUITS. EXISTING CONDUITS CAN BE RE-USED IF POSSIBLE.
4. PRIOR TO CONSTRUCTION, CONTRACTOR MUST COORDINATE WITH POWER COMPANY. (PSEG) TO GET SHUT DOWN.
5. REMOVE EXISTING BONDING & WIRING FROM GROUNDING SYSTEM TO NEUTRAL TERMINAL.



SINGLE LINE DIAGRAM - REMOVAL WORK

ISSUED FOR BID - 06/21/2019

CAUTION: IF SHEET IS LESS THAN 34"x22" USE GRAPHIC SCALE

APPR	DATE	DESCRIPTION	SYM
.	.	.	.

NAVFAC

STATE OF NEW YORK — David A. Burger — 098252 — LICENSED PROFESSIONAL ENGINEER

DES	KKG	DR	JS
REVIEWED BY		KKG	
PM/DM		HKM	
CHIEF ENG/ARCH		HKM	

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND ~ MID-ATLANTIC
NAVAL FACILITIES ENGINEERING COMMAND
NAVAL INDUSTRIAL RESERVE ORDNANCE PLANT
BETHPAGE, NEW YORK
NAVAL WEAPONS INDUSTRIAL RESERVE PLANT
GM 38

GM-38 AREA
GROUNDWATER TREATMENT PLANT
AOP SYSTEM ADDITION

ELECTRICAL SINGLE LINE DIAGRAM REMOVAL WORK

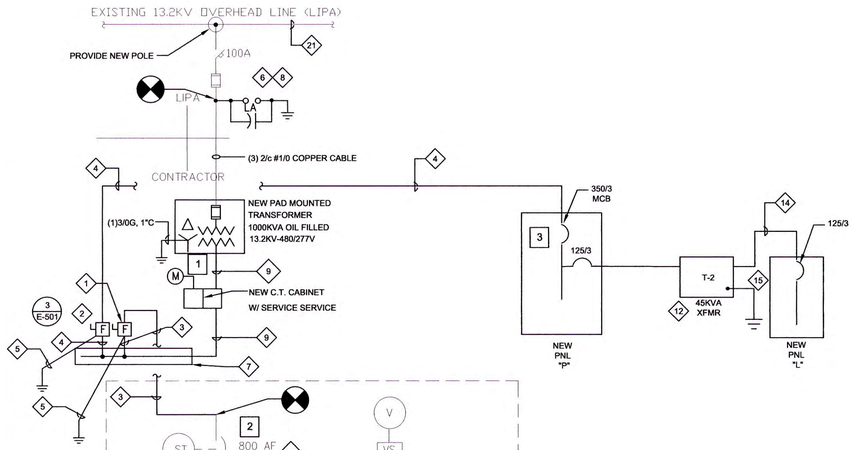
THIS DRAWING PRODUCED ON AUTOCAD DO NOT REVISE MANUALLY

"THIS DOCUMENT IS THE PROPERTY OF NAVAL FACILITIES ENGINEERING COMMAND, PREPARED BY TETRA TECH ENGINEERING CORPORATION PC, AND IS PROVIDED UPON THE CONDITION THAT IT WILL NOT BE REPRODUCED, COPIED, OR ISSUED TO A THIRD PARTY, AND WILL BE USED SOLELY FOR THE ORIGINAL INTENDED PURPOSE AND SOLELY FOR THE EXECUTION OR REVIEW OF THE ENGINEERING CONSTRUCTION OF THE PROJECT."

IT IS A VIOLATION OF THE NEW YORK STATE EDUCATION LAW, ARTICLE 145, FOR ANY PERSON, UNLESS UNDER THE DIRECTION OF A NEW YORK STATE LICENSED PROFESSIONAL ENGINEER, TO ALTER AN ITEM ON THIS DOCUMENT IN ANY WAY.

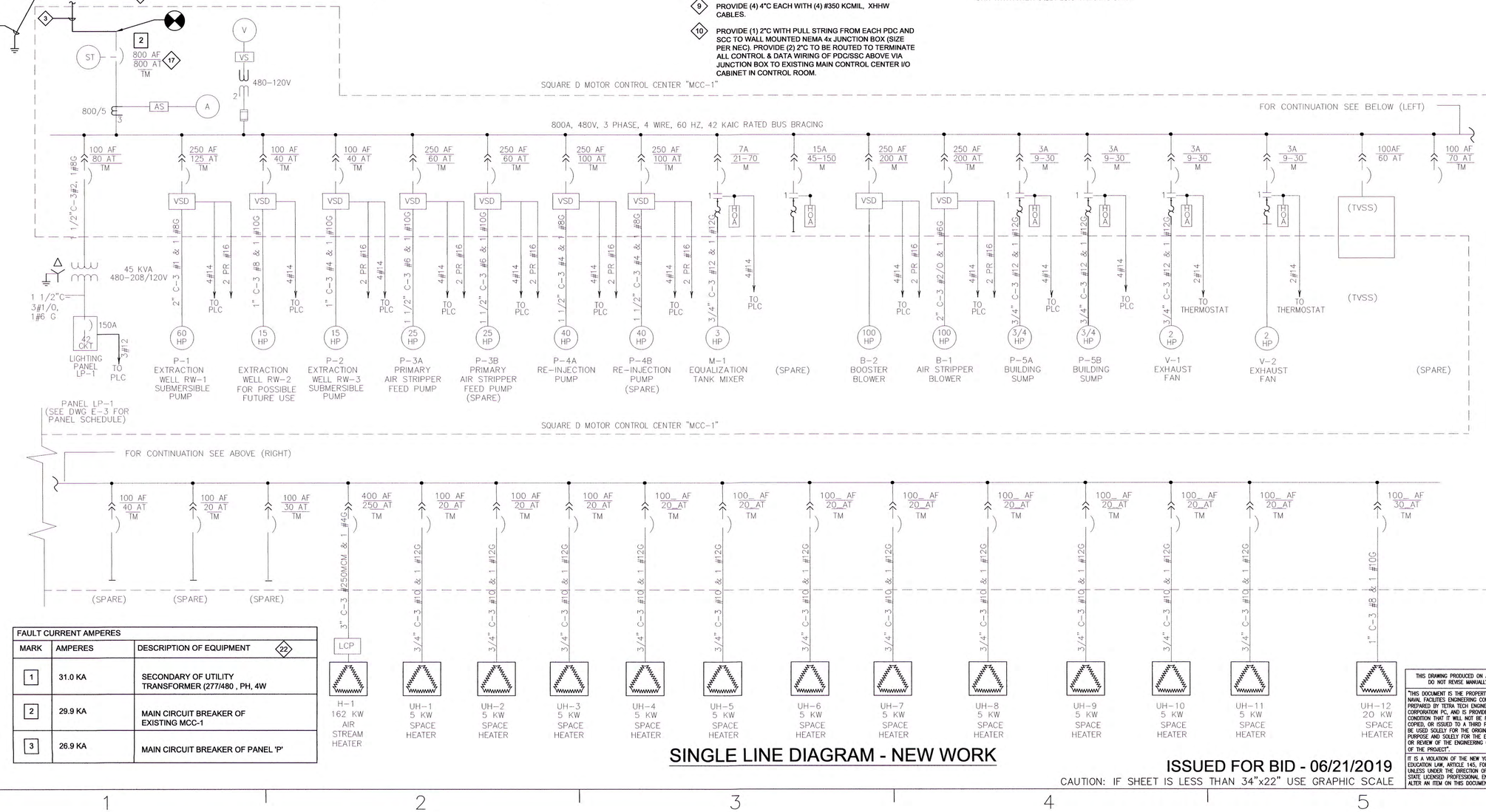
CODE ID. NO. 80091	SIZE D
SCALE:	NTS
MAXIMO NO. N62470-08-D-1001	.
JOB ORDER NO. WE-24	.
SPEC. NO.	.
CONSTR. CONTR. NO.	N62472-99-D-0032
	112G08005
NAVFAC DRAWING NO.	
	....
SHEET	OF .

E-601



ELECTRICAL NEW WORK NOTES:

1. PROVIDE 800A, 600V, 3P,4W SERVICE RATED TYPE FUSED DISCONNECT SWITCH IN NEMA 4x STAINLESS STEEL ENCL. PROVIDE (6) 800A FUSES TIME DELAY FUSE W/ 3 SPARES. PROVIDE COPPER NEUTRAL & GROUNDING KITS.
2. PROVIDE 400A, 600V, 3P,4W SERVICE RATED TYPE FUSED DISCONNECT SWITCH IN NEMA 4x STAINLESS STEEL ENCL. PROVIDE (6) 300A FUSES TIME DELAY FUSE W/ 3 SPARES PROVIDE COPPER NEUTRAL & GROUNDING KITS.
3. PROVIDE 3-4C, EA WITH (4) #350KCMIL, (1)# 2/0 G)
4. PROVIDE 2-4"C, EA WITH (4) #4/0, (1) #2 G)
5. PROVIDE 1" C WITH #3/0 G. PER NEC 250. PROVIDE BONDING BETWEEN NEUTRAL AND GROUNDING BUSSES.
6. REPLACE EX. 13.2KV, 40A LINE FUSES (3) WITH MATCHING 100A FUSES (3).
7. MIN. 16"D x 14"H NEMA 4x, FULL LENGTH HINGED DOOR STEEL WIRE TROUGH WITH LENGTH TO BE DETERMINED AT THE SITE CONDITION.
8. FINAL REPLACEMENT PROCEDURE AND SIZE & TYPE OF 15KV UNDERGROUND CABLE/OVERHEAD CABLE LINE FUSES SHALL BE DETERMINED BY THE UTILITY COMPANY. COORDINATE ALL ASSOCIATED MATERIALS & WORK. PROVIDE UNDERGROUND CONCRETE ENCASED SCH. 40 PVC CONDUIT AS REQUIRED WITH (1) 4" CONDUIT SPARE.
9. PROVIDE (4) 4"C EACH WITH (4) #350 KCMIL, XHHW CABLES.
10. PROVIDE (1) 2"C WITH PULL STRING FROM EACH PDC AND SCC TO WALL MOUNTED NEMA 4x JUNCTION BOX (SIZE PER NEC). PROVIDE (2) 2"C TO BE ROUTED TO TERMINATE ALL CONTROL & DATA WIRING OF PDC/SSC ABOVE VIA JUNCTION BOX TO EXISTING MAIN CONTROL CENTER I/O CABINET IN CONTROL ROOM.
11. PROVIDE MV CABLE IN CONCRETE ENCASED SCHEDULE 40 PVC CONDUIT EXTENDING MINIMUM OF 30" OF THE DRIVEWAY. TOP OF CONCRETE ENCASED DUCTBANK SHALL BE A MINIMUM OF 30" BELOW FINISHED GRADE. CONDUITS SHALL BE MINIMUM OF 2" COVERED WITH CONCRETE. PROVIDE "WARNING TAPE" PER SPECIFICATIONS.
12. PROVIDE 45KVA, 3 PH, DRY TYPE TRANSFORMER IN NEMA 4x ENCLOSURE. PROVIDE MOUNTING BRACKET TO BE WELDED/BOLTED FROM STRUCTURAL STEEL OF BUILDING.
13. PROVIDE CONDUIT & WIRING FOR POWER AND CONTROL FOR HEAT TRACE CABLE IN COORDINATION WITH MECHANICAL AND PLUMBING CONTRACTOR. PROVIDE LOCAL SWITCH.
14. PROVIDE (4) #2/0 & (1) #4G, 2"C.
15. PROVIDE (1) #4G, 1"C.
16. PROVIDE LOCAL DISCONNECTING MEANS WITH WIRING IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
17. EXISTING MAIN CIRCUIT BREAKER IS SERVICE ENTRANCE TYPE, SQ D. MODEL #PLP34080CU444ASA WITH 42KAIC RATING AT 480V AND IT HAS TRIPPING UNIT WITH CT IN NEUTRAL. REMOVE BONDING WIRE BETWEEN NEUTRAL AND GROUNDING SYSTEM. REPLACE EXISTING TRIPPING UNIT WITH A NEW SQ.D. 'LSIG' TRIPPING UNIT.
18. PROVIDE UTILITY COMPLIANT METER AND MINIMUM 1-1/2" RGS CONDUIT TO C.T. CABINET.
19. PROVIDE 36"x36"x12" OR SIZED PER NEC PULL BOX IN 4x STAINLESS STEEL ENCLOSURE WITH FULL SIZE HINGED LOCKABLE DOOR.
20. PROVIDE ENGRAVED SIGNAGE LABELS FOR SERVICE DISCONNECT SWITCHES AND LABEL DISCONNECTS "SERVICE DISCONNECT 1 OF 2" FOR 800A AND "SERVICE DISCONNECT 2 OF 2" FOR 400A.
21. PROVIDE OVER 15KV WIRING TO EXTEND WIRING FROM EXISTING O/H POLE 'LIPA #18' PER PSEG.
22. FAULT CURRENT VALUES SHOWN ARE BASED ON AVAILABLE FAULT CURRENT OF 31KA, WHICH HAS BEEN PROVIDED BY PSEG VIA EMAIL ON 06-14-2019. CALCULATED FAULT CURRENT SHOWN AT OTHER DOWNSTREAM OF EQUIPMENT ARE ONLY FOR INFORMATION PURPOSES ONLY. ACTUAL FAULT CURRENT VALUES SHALL BE CALCULATED BY THE CONTRACTOR TO DETERMINE SHORT CIRCUIT CURRENT WITHSTANDING RATINGS IN SHOP DRAWING. SHORT CIRCUIT CALCULATION SHALL BE BASED ON ACTUAL LENGTHS OF FEEDERS, BRANCHES, SIZES, TYPES OF CABLES AND TYPES OF CONDUITS(MAGNETIC OR NON-MAGNETIC).



FAULT CURRENT AMPERES		
MARK	AMPERES	DESCRIPTION OF EQUIPMENT ◇22
1	31.0 KA	SECONDARY OF UTILITY TRANSFORMER (277/480 , PH, 4W
2	29.9 KA	MAIN CIRCUIT BREAKER OF EXISTING MCC-1
3	26.9 KA	MAIN CIRCUIT BREAKER OF PANEL 'P'

SINGLE LINE DIAGRAM - NEW WORK

ISSUED FOR BID - 06/21/2019

CAUTION: IF SHEET IS LESS THAN 34"x22" USE GRAPHIC SCALE

DES	KKG	DR	JS
REVIEWED BY		KKG	
PM/DM		HKH	
CHIEF ENG/ARCH		HKH	

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND ~ MID-ATLANTIC
NAVAL FACILITIES ENGINEERING COMMAND
NAVAL INDUSTRIAL RESERVE ORDNANCE PLANT
BETHPAGE, NEW YORK
NAVAL WEAPONS INDUSTRIAL RESERVE PLANT
GM 38
GM-38 AREA
GROUNDWATER TREATMENT PLANT
AOP SYSTEM ADDITION

ELECTRICAL SINGLE LINE DIAGRAM NEW WORK

THIS DRAWING PRODUCED ON AUTOCAD DO NOT REVISE MANUALLY

"THIS DOCUMENT IS THE PROPERTY OF NAVAL FACILITIES ENGINEERING COMMAND, PREPARED BY TETRA TECH ENGINEERING CORPORATION PC, AND IS PROVIDED UPON THE CONDITION THAT IT WILL NOT BE REPRODUCED, COPIED, OR ISSUED TO A THIRD PARTY, AND WILL BE USED SOLELY FOR THE ORIGINAL INTENDED PURPOSE AND SOLELY FOR THE EXECUTION OR REVIEW OF THE ENGINEERING CONSTRUCTION OF THE PROJECT."

IT IS A VIOLATION OF THE NEW YORK STATE EDUCATION LAW, ARTICLE 145, FOR ANY PERSON, UNLESS UNDER THE DIRECTION OF A NEW YORK STATE LICENSED PROFESSIONAL ENGINEER, TO ALTER AN ITEM ON THIS DOCUMENT IN ANY WAY.

CODE ID. NO. 80091	SIZE D
SCALE:	NTS
MAXIMO NO. N62470-08-D-1001	-
JOB ORDER NO. WE-24	-
SPEC. NO.	-
CONSTR. CONTR. NO.	N62472-99-D-0032
	112G08005
NAVFAC DRAWING NO.	
	....
SHEET	OF .
	E-602

APPR	DATE	DESCRIPTION	NAS

SCHEDULE OF EX. MOTOR CONTROL CENTER			MCC-1		800A	277/480V, 3 PHASE, 4 W				FLOOR MOUNT		LOCATION: MCC ROOM-	MOUNTING SPACE (INCHES)
			MAIN:	800A	MCB	SQUARE D MODEL 6, ENCLOSURE TYPE 1A. BUSES: 800A-HORIZONTAL, 600A VERTICAL & 300A NEUTRAL; FO: 25293308-002					42KA	INTERRUPTING CURRENT RATING	
SECTION	CKT#	DESCRIPTION	H.P./ KW	STARTER SIZE (NEMA)	PROTECTION DEVICE				WIRING	KVA	DEVICES	NOTES	
					TYPE: CB OR FUSED SWITCH	FRAME AMP.	TRIP AMP.	POLES	C-QTY#AWG,G#AWG			a: PILOT LIGHT FOR RED (ON), b: GREEN (OFF); c: HAND-ON-AUTO; d: RESET BUTTON; e: START-STOP BUTTONS; f: AMPERE METER; g: VOLT-METER; h: SPEED STAT	
1	A	MONITORING UNIT FOR MAIN						3	EX. TO REMAIN	XX		ELECTRONIC POWER METER	6
	B	BLANK											15
	C	SERVICE ENTRANCE MCB			CB	800A	800A	3	TWO 4"C, EA W/ (4#500KCMIL, 1#2/0G)		f, g	MICROLOGIC POWERPACT, PL-800, SQ. D. #PLP34080CU44ASA. SEE DEMO. NOTE 5	51
2	A	EX. 45KVA TRANSFORMER FOR PANEL "LP-1"			CB	100A	80A	3	EX. TO REMAIN6	45.0			6
	B	H-1 162KW AIR STREAM HEATER			CB	400A	250A	3	EX. TO REMAIN	162.0			18
	C	P-2 EXTRACTION WELL RW-3	15	VFD	CB	100A	40A	3	EX. TO REMAIN	11.6	a, c, d, h		24
	D	FUTURE EXTRACTION WELL RW-2	15	VFD	CB	100A	40A	3	EX. TO REMAIN	0.0	a, c, d, h	SPARE	24
3	A	P-3A PRIMARY AIR STRIPPER FEED PUMP	25	VFD	CB	250A	60A	3	EX. TO REMAIN	0.0	a, c, d, h	SPARE	27
	B	P-4A RE-INJECTION PUMP	40	VFD	CB	400A	100A	3	EX. TO REMAIN	0.0	a, c, d, h	SPARE	45
4	C	P-3B PRIMARY AIR STRIPPER FEED PUMP	25	VFD	CB	250A	60A	3	EX. 1 1/2"- (3#6, 1#10G)	28.3	a, c, d, h		27
	D	P-4B RE-INJECTION PUMP	40	VFD	CB	250A	100A	3	EX. 1 1/2"- (3#4, 1#8G)	43.2	a, c, d, h		45
5	CORNER BLANK SECTION EXTENDED WITH HORIZONTAL BUSES												72
6	A	AIR STRIP BLOWER B-1	100	VFD	CB	250A	200A	3	EX. 2"C-(3#2/0, 1#6G)	103.1	a, c, d, h		72
7	A	AIR STRIP BLOWER B-2	100	VFD	CB	250A	200A	3	EX. 2"C-(3#2/0, 1#6G)	103.1	a, c, d, h		72
8	A	P-1 EXTRACTION WELL RW-1 (SUBMERSIBLE PUMP)	60	VFD	CB	250A	125A	3	EX. 2"C-(3#1, 1#8G)	64.0	a, c, d, h		72
9	A	10HP SPARE FVNR	10	1 FVNR	CB	100A	80A	3	XX	0.0	a, b, c, d	SPARE	12
	B	SPARE			CB	100A	70A	3	XX	0.0		SPARE	6
	C	SPD			CB	100A	60A	3	EX. TO REMAIN	6.0		SQ. D. 3PH. SURGE LOGIC DISPLAY	6
	D	SPARE			CB	100A	70A	3	XX	0.0		SPARE	6
	E	UH-2	5KW		CB	100A	20A	3	EX. 3/4"C- (3#10, 1#12G)	5.0			6
	F	UH-4	5KW		CB	100A	20A	3	EX. 3/4"C- (3#10, 1#12G)	5.0			6
	G	UH-3	5KW		CB	100A	20A	3	EX. 3/4"C- (3#10, 1#12G)	5.0			6
	H	UH-1	5KW		CB	100A	20A	3	EX. 3/4"C- (3#10, 1#12G)	5.0			6
	I	UH-9	5KW		CB	100A	20A	3	EX. 3/4"C- (3#10, 1#12G)	5.0			6
	L	ASD OUTPUT FILTER FOR P-1 EXTRACTION PUMP RW-1											12
10	A	SPARE			CB	100A	70A	3	XX	0.0		SPARE	6
	B	UH-8	5KW		CB	100A	20A	3	EX. 3/4"C- (3#10, 1#12G)	5.0			6
	C	UH-12	5KW		CB	100A	20A	3	EX. 3/4"C- (3#10, 1#12G)	5.0			6
	D	FEED TO AOP			CB	100A	40A	3	TEMP. 3/4"C-(3#8, 1#10G)	23.3		** TEMPORARY SERVICE WITH APPROXIMATE LOAD OF 23.3KW	6
	E	3HP FVNR- M-1 EQUALIZATION TANK MIXER	4KW	0	CB	100A	20A	3	EX. 3/4"C- (3#10, 1#12G)	0.0	a, b, c, d	** IT'S INFORMED THAT THE MIXER IS NOT BEING USED	6
	F	V-1 EXHAUST FAN	2	0	CB	100A	20A	3	EX. 3/4"C- (3#10, 1#12G)	2.8	a, b, c, d		6
	G	P-5A BUILDING SUMP	3/4	0	CB	100A	20A	3	EX. 3/4"C- (3#10, 1#12G)	1.3	a, b, c, d		6
	H	P-5B BUILDING SUMP SPARE	0	0	CB	100A	20A	3	EX. 3/4"C- (3#10, 1#12G)	0.0	a, b, c, d		6
	I	V-2 EXHAUST FAN	2	0	CB	100A	20A	3	EX. 3/4"C- (3#10, 1#12G)	2.8	a, b, c, d		6
	J	UH-5	5KW		CB	100A	20A	3	EX. 3/4"C- (3#10, 1#12G)	5.0			6
	K	UH-7	5KW		CB	100A	20A	3	EX. 3/4"C- (3#10, 1#12G)	5.0			6
	L	UH-6	5KW		CB	100A	20A	3	EX. 3/4"C- (3#10, 1#12G)	5.0			6
11	A	UH-11	5KW		CB	100A	20A	3	EX. 3/4"C- (3#10, 1#12G)	5.0			6
	B	UH-10	5KW		CB	100A	20A	3	EX. 3/4"C- (3#10, 1#12G)	5.0			6
	C	SPACE			XX	XX	XX	3	XX	0.0		SPACE	12
	D	SPACE			XX	XX	XX	3	XX	0.0		SPACE	12
	E	SPACE			XX	XX	XX	3	XX	0.0		SPACE	12
	F	SPACE			XX	XX	XX	3	XX	0.0		SPACE	12
	G	SPACE			XX	XX	XX	3	XX	0.0		SPACE	6
	H	SPACE	5KW		XX	XX	XX	3	XX	0.0		SPACE	6
	SUB-TOTAL=									656.6			
		WITH SPARE OF	0%	TOTAL=	657	KVA	CURRENT IN AMPERES			790			

REVISED SCHEDULE OF EX. MOTOR CONTROL CENTER			MCC-1		800A	277/480V, 3 PHASE, 4 W				FLOOR MOUNT		LOCATION: MCC ROOM-	MOUNTING SPACE (INCHES)
			MAIN:	800A	MCB	SQUARE D MODEL 6, ENCLOSURE TYPE 1A. BUSES: 800A-HORIZONTAL, 600A VERTICAL & 300A NEUTRAL; FO: 25293308-002					42KA	INTERRUPTING CURRENT RATING	
SECTION	CKT#	DESCRIPTION	H.P./ KW	STARTER SIZE (NEMA)	PROTECTION DEVICE				WIRING	KVA	DEVICES	NOTES	
					TYPE: CB OR FUSED SWITCH	FRAME AMP.	TRIP AMP.	POLES	C-QTY#AWG,G#AWG			a: PILOT LIGHT FOR RED (ON), b: GREEN (OFF); c: HAND-ON-AUTO; d: RESET BUTTON; e: START-STOP BUTTONS; f: AMPERE METER; g: VOLT-METER; h: SPEED STAT	
1	A	MONITORING UNIT FOR MAIN						3	EX. TO REMAIN	XX		ELECTRONIC POWER METER	6
	B	BLANK											15
	C	SERVICE ENTRANCE MCB			CB	800A	800A	3	TWO 4"C, EA W/ (4#500KCMIL, 1#2/0G)		f, g	MICROLOGIC POWERPACT, ◇17 PL-800, SQ. D. #PLP34080CU44ASA. SEE NEW WORK NOTE 17	51
2	A	EX. 45KVA TRANSFORMER FOR PANEL "LP-1"			CB	100A	80A	3	EX. TO REMAIN6	45.0			6
	B	H-1 162KW AIR STREAM HEATER			CB	400A	250A	3	EX. TO REMAIN	162.0			18
	C	P-2 EXTRACTION WELL RW-3	15	VFD	CB	100A	40A	3	EX. TO REMAIN	11.6	a, c, d, h		24
	D	FUTURE EXTRACTION WELL RW-2	15	VFD	CB	100A	40A	3	EX. TO REMAIN	0.0	a, c, d, h	SPARE	24
3	A	P-3A PRIMARY AIR STRIPPER FEED PUMP	25	VFD	CB	250A	60A	3	EX. TO REMAIN	0.0	a, c, d, h	SPARE	27
	B	P-4A RE-INJECTION PUMP	40	VFD	CB	400A	100A	3	EX. TO REMAIN	0.0	a, c, d, h	SPARE	45
4	C	P-3B PRIMARY AIR STRIPPER FEED PUMP	25	VFD	CB	250A	60A	3	EX. 1 1/2"- (3#6, 1#10G)	28.3	a, c, d, h		27
	D	P-4B RE-INJECTION PUMP	40	VFD	CB	250A	100A	3	EX. 1 1/2"- (3#4, 1#8G)	43.2	a, c, d, h		45
5	CORNER BLANK SECTION EXTENDED WITH HORIZONTAL BUSES												72
6	A	AIR STRIP BLOWER B-1	100	VFD	CB	250A	200A	3	EX. 2"C-(3#2/0, 1#6G)	103.1	a, c, d, h		72
7	A	AIR STRIP BLOWER B-2	100	VFD	CB	250A	200A	3	EX. 2"C-(3#2/0, 1#6G)	103.1	a, c, d, h		72
8	A	P-1 EXTRACTION WELL RW-1 (SUBMERSIBLE PUMP)	60	VFD	CB	250A	125A	3	EX. 2"C-(3#1, 1#8G)	64.0	a, c, d, h		72
9	A	10HP SPARE FVNR	10	1 FVNR	CB	100A	80A	3	XX	0.0	a, b, c, d	SPARE	12
	B	SPARE			CB	100A	70A	3	XX	0.0		SPARE	6
	C	SPD			CB	100A	60A	3	EX. TO REMAIN	6.0		SQ. D. 3PH. SURGE LOGIC DISPLAY	6
	D	SPARE			CB	100A	70A	3	XX	0.0		SPARE	6
	E	UH-2	5KW		CB	100A	20A	3	EX. 3/4"C- (3#10, 1#12G)	5.0			6
	F	UH-4	5KW		CB	100A	20A	3	EX. 3/4"C- (3#10, 1#12G)	5.0			6
	G	UH-3	5KW		CB	100A	20A	3	EX. 3/4"C- (3#10, 1#12G)	5.0			6
	H	UH-1	5KW		CB	100A	20A	3	EX. 3/4"C- (3#10, 1#12G)	5.0			6
	I	UH-9	5KW		CB	100A	20A	3	EX. 3/4"C- (3#10, 1#12G)	5.0			6
	L	ASD OUTPUT FILTER FOR P-1 EXTRACTION PUMP RW-1											12
10	A	SPARE			CB	100A	70A	3	XX	0.0		SPARE	6
	B	UH-8	5KW		CB	100A	20A	3	EX. 3/4"C- (3#10, 1#12G)	5.0			6
	C	UH-12	5KW		CB	100A	20A	3	EX. 3/4"C- (3#10, 1#12G)	5.0			6
	D	SPARE			CB	100A	40A	3	TEMP. 3/4"C-(3#8, 1#10G)	0.0			6
	E	3HP FVNR- M-1 EQUALIZATION TANK MIXER	4KW	0	CB	100A	20A	3	EX. 3/4"C- (3#10, 1#12G)	0.0	a, b, c, d	** IT'S REPORTED THAT THE MIXER IS NOT BEING USED	6
	F	V-1 EXHAUST FAN	2	0	CB	100A	20A	3	EX. 3/4"C- (3#10, 1#12G)	2.8	a, b, c, d		6
	G	P-5A BUILDING SUMP	3/4	0	CB	100A	20A	3	EX. 3/4"C- (3#10, 1#12G)	1.3	a, b, c, d		6
	H	P-5B BUILDING SUMP SPARE	0	0	CB	100A	20A	3	EX. 3/4"C- (3#10, 1#12G)	0.0	a, b, c, d		6
	I	V-2 EXHAUST FAN	2	0	CB	100A	20A	3	EX. 3/4"C- (3#10, 1#12G)	2.8	a, b, c, d		6
	J	UH-5	5KW		CB	100A	20A	3	EX. 3/4"C- (3#10, 1#12G)	5.0			6
	K	UH-7	5KW		CB	100A	20A	3	EX. 3/4"C- (3#10, 1#12G)	5.0			6
	L	UH-6	5KW		CB	100A	20A	3	EX. 3/4"C- (3#10, 1#12G)	5.0			6
11	A	UH-11	5KW		CB	100A	20A	3	EX. 3/4"C- (3#10, 1#12G)	5.0			6
	B	UH-10	5KW		CB	100A	20A	3	EX. 3/4"C- (3#10, 1#12G)	5.0			6
	C	SPACE			XX	XX	XX	3	XX	0.0			12
	D	SPACE			XX	XX	XX	3	XX	0.0			12
	E	SPACE			XX	XX	XX	3	XX	0.0		SPACE	12
	F	SPACE			XX	XX	XX	3	XX	0.0		SPACE	12
	G	SPACE			XX	XX	XX	3	XX	0.0		SPACE	6
	H	SPACE	5KW		XX	XX	XX	3	XX	0.0		SPACE	6
	SUB-TOTAL=									633.3			
		WITH SPARE OF	0%	TOTAL=	633	KVA	CURRENT IN AMPERES			762			

SCHEDULE OF NEW PANEL		P	400A, 277/480V, 3HASE, 4WIRES									SURFACE	MOUNTED;		LOCATION: PUMP ROOM	
		MAIN:	350A		MCB										KAIC:	42
CKT#	DESCRIPTION	BREAKER			WIRING		PHASES				CKT#	DESCRIPTION	BREAKER			WIRING
		FRAME	P	TRIP	C-QTY#AWG,G#AWG	KVA	A	B	C	KVA			FRAME	P	TRIP	C-QTY#AWG,G#AWG
1	PDC-1	100A	3P	70A	1 1/4"C-(4#4, 1#8G)	13.4	28.4			15.0	2	45KVA, 3PHASE TRANSFORMER T2. PROVIDE WALL BRACKET	250A	3P	125A	1 1/2"C-(3#1, 1#6G)
3						13.4		28.4		15.0	4					
5						13.4			28.4	15.0	6					
7	PDC-2		3P	70A	1 1/4"C-(4#4, 1#8G)	13.4	19.4			6.0	8	120 GAL., 480V, 3 PHA., 18KW WATER HEATER. PROVIDE 30A,3P,600V LOCAL DISCONN. SW.	100A	3P	30A	3/4"C-(3#10, 1#10G)
9						13.4		19.4		6.0	10					
11						13.4			19.4	6.0	12					
13	SPARE		3P	50A	XX	0.0	0.0			0.0	14	SPARE		3P	70A	XX
15						0.0		0.0		0.0	16					
17						0.0			0.0	0.0	18					
19	SPARE		3P	50A	XX	0.0	15.0			0.0	20	SPARE		3P	20A	XX
21						0.0		0.0		0.0	22					
23						0.0			0.0	0.0	24					
25	SPARE		1P	20A	XX	0.0	0.0			0.0	26	SPARE		1P	20A	XX
27	SPARE		1P	20A	XX	0.0		0.0		0.0	28	SPARE		1P	20A	XX
29	SPARE		1P	20A	XX	0.0			0.0	0.0	30	SPARE		1P	20A	XX
31	SPARE		1P	30A	XX	0.0	0.0			0.0	32	SPARE		1P	20A	XX
33	SPARE					0.0		0.0		0.0	34	SPARE		1P	20A	XX
35	SPARE					0.0			0.0	0.0	36	SPARE		1P	20A	XX
37	SPACE		3P	XX	XX	0.0	0.0			0.0	38	SPACE		3P	XX	XX
39						0.0		0.0		0.0	40					
41						0.0			0.0	0.0	42					
SUB-TOTAL=						80.6	62.9	47.9	47.9	63.0		TOTAL=	143.6			
TOTAL WITH SPARE OF		25%	179.6		KVA	CURRENT AT 277/480V, 3PHASE, 4 WIRES=							216.0		A	

DEMAND LOAD CALCULATION		
LOAD TYPE	HP	KVA
LIGHTING		11
TOTAL MOTORS	320	239
ELEC. HEATING - HTRS.		72.5
AIR CONDITIONING		7.4
MISCELLANEOUS EQUIP. I/C NEW 18KW WH		447.4
TOTAL LOAD		777
25% FUTURE GROWTH OF LOAD	25%	194
GRAND TOTAL LOAD		971
CURRENT IN AMPERES AT 277/480V, 3PHASE, 4W		1,168

SCHEDULE OF NEW PANEL		L	225A, 120/208V, 3HASE, 4WIRES									SURFACE	MOUNTED;		LOCATION: PUMP ROOM	
		MAIN:	150A		MCB										KAIC:	25K
CKT#	DESCRIPTION	BREAKER			WIRING		PHASES				CKT#	DESCRIPTION	BREAKER			WIRING
		FRAME	P	TRIP	C-QTY#AWG,G#AWG	KVA	A	B	C	KVA			FRAME	P	TRIP	C-QTY#AWG,G#AWG
1	SCC	100A	1P	20A	3/4"C-(2#12, 1#12G)	1.9	2.0			0.1	2	UVT-1	100A	1P	15A	3/4"C-(2#12, 1#12G)
3	SERVICE RECEPT., LIGHTS & HEATER- PDC-1		1P	20A	3/4"C-(2#12, 1#12G)	1.2		2.4		1.2	4	SERVICE RECEPT., LIGHTS & HEATER- PDC-2		1P	20A	3/4"C-(2#12, 1#12G)
5	PLC1- PDC-1		1P	20A	3/4"C-(2#12, 1#12G)	1.2			2.4	1.2	6	PLC2- PDC-2		1P	20A	3/4"C-(2#12, 1#12G)
7	SPARE		3P	50A	XX	0.0	0.0			0.0	8	SPARE		3P	50A	XX
9						0.0		0.0		0.0	10					
11						0.0			0.0	0.0	12					
13	SPARE		3P	30A	XX	0.0	0.0			0.0	14	SPARE		3P	30A	XX
15						0.0		0.0		0.0	16					
17						0.0			0.0	0.0	18					
◇13 19	HEAT TRACE CABLE FOR EXTERIOR WATER PIPING TO EYE WASH		1P	20A	3/4"C-(2#12, 1#12G)	1.0	2.2			1.5	20	METER PUMP- PUMP ROOM: PROVIDE LOCAL DISCONN. SWITCH		1P	20A	3/4"C-(2#10, 1#10G)
◇13 21	HEAT TRACE CABLE FOR EXTERIOR WATER PIPING TO EYE WASH		1P	20A	3/4"C-(2#12, 1#12G)	1.0		1.0		1.5	12	METER PUMP (FUTURE) - PUMP ROOM: PROVIDE LOCAL DISCONN. SWITCH		1P	20A	3/4"C-(2#10, 1#10G)
23	EM. TEPID WATER HEATER- PROVIDE 30A,2P,125V LOCAL DISCONN. SWITCH		1P	XX	3/4"C-(2#12, 1#12G)	1.8			3.3	0.0	14	SPACE		1P	XX	XX
25	PLUMBING FIXTURE MOUNTED HEATER		1P	20A	3/4"C-(2#10, 1#10G)	1.5	1.5			0.0	16	SPACE		1P	XX	XX
27	SPACE		1P	XX	XX	0.0		0.0		0.0	18	SPACE		1P	XX	XX
29	SPACE		1P	XX	XX	0.0			0.0	0.0	20	SPACE		1P	XX	XX
31						1.0	1.0			0.0	22	SPARE		1P	20A	XX
33	SPACE		1P	XX	XX	0.0		1.5		1.5	24	SPACE		1P	XX	XX
35	SPACE		1P	XX	XX	0.0			0.0	0.0	26	SPACE		1P	XX	XX
							0.0									
37	SPACE		1P	XX	XX	0.0		0.0		0.0	28	SPACE		1P	XX	XX
39	SPACE		1P	XX	XX	0.0			0.0	0.0	30	SPACE		1P	XX	XX
SUB-TOTAL=						10.6	6.7	4.9	5.7	7.0		TOTAL=	17.6			
TOTAL WITH SPARE OF		25%	22.0		KVA	CURRENT AT 120/208V, 3PHASE, 4 WIRES=							69.6		A	

SYM	DESCRIPTION	DATE	APPR

NAVFAC

David A. Burger
096252

DES KKG	DR JS
REVIEWED BY	KKG
PM/DM	HKM
CHIEF ENG/ARCH	HKM

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
NAVAL FACILITIES ENGINEERING COMMAND ~ MID-ATLANTIC
GM 38
NAVAL INDUSTRIAL RESERVE ORDNANCE PLANT
NAVAL WEAPONS INDUSTRIAL RESERVE PLANT
BETHPAGE, NEW YORK

GM-38 AREA
GROUNDWATER TREATMENT PLANT
AOP SYSTEM ADDITION

ELECTRICAL SCHEDULES

THIS DRAWING PRODUCED ON AUTOCAD
DO NOT REVISE MANUALLY

"THIS DOCUMENT IS THE PROPERTY OF NAVAL FACILITIES ENGINEERING COMMAND, PREPARED BY TETRA TECH ENGINEERING CORPORATION PC, AND IS PROVIDED UPON THE CONDITION THAT IT WILL NOT BE REPRODUCED, COPIED, OR ISSUED TO A THIRD PARTY, AND WILL BE USED SOLELY FOR THE ORIGINAL INTENDED PURPOSE AND SOLELY FOR THE EXECUTION OR REVIEW OF THE ENGINEERING CONSTRUCTION OF THE PROJECT".

IT IS A VIOLATION OF THE NEW YORK STATE EDUCATION LAW, ARTICLE 145, FOR ANY PERSON, UNLESS UNDER THE DIRECTION OF A NEW YORK STATE LICENSED PROFESSIONAL ENGINEER, TO ALTER AN ITEM ON THIS DOCUMENT IN ANY WAY.

CODE ID. NO. 80091	SIZE D
SCALE:	NTS
MAXIMO NO. N62470-08-D-1001	.
JOB ORDER NO. WE-24	..
SPEC. NO.	...
CONSTR. CONTR. NO. N62472-99-D-0032 112G08005	
NAVFAC DRAWING NO.	....
SHEET OF	.
E-603	

ISSUED FOR BID - 06/21/2019

CAUTION: IF SHEET IS LESS THAN 34"x22" USE GRAPHIC SCALE