

APPENDIX C.7
CASE 10-T-0139
STRUCTURAL DRAWINGS – SERVICE AND CONVERTER
BUILDING PILES AND FOUNDATIONS
ASTORIA HVDC CONVERTER STATION - SEGMENT 22

ASTORIA HVDC CONVERTER STATION

CONVERTER AND SERVICE BUILDING STRUCTURAL PILES AND FOUNDATIONS

SCOPE OF WORK

THE STRUCTURAL SCOPE OF WORK INCLUDES THE PROPOSED PILE/FOUNDATION WORK FOR THE SERVICE AND CONVERTER BUILDING AND (WHERE REQUIRED) FOR THE FOLLOWING AREAS AS SUBJECT TO THE REQUIREMENTS AND PERFORMANCE CRITERIA PROVIDED IN THE STRUCTURAL BASIS OF DESIGN:

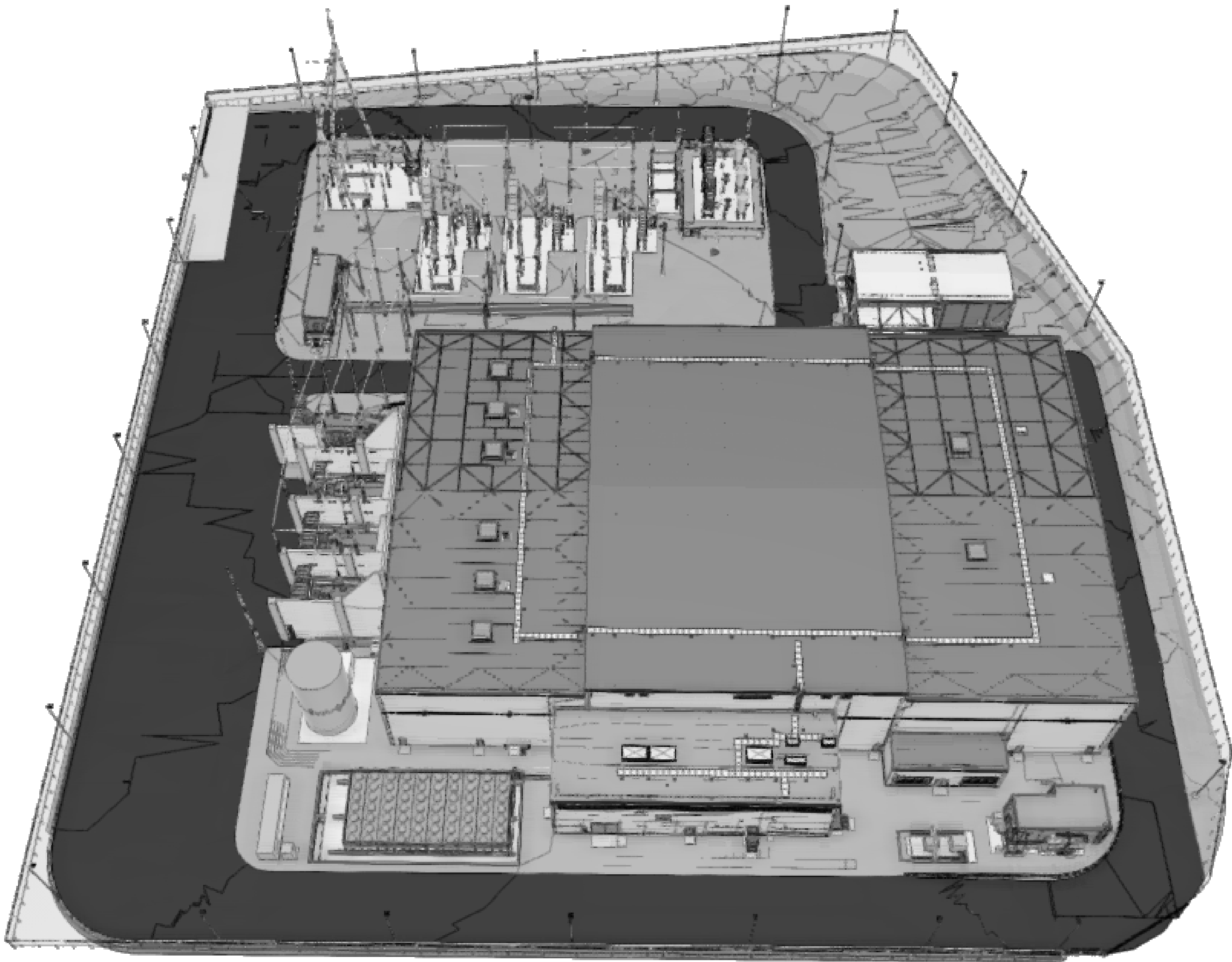
- 1. CONVERTER BUILDING
- 2. SERVICE BUILDING
- 3. ACCESS PLATFORMS

FLOOD ZONE DESIGN CERTIFICATION:

THE EXISTING PROPERTY IS IN THE SPECIAL FLOOD HAZARD AREA (SFHA), ZONE AE PER EFFECTIVE 2015 FLOOD INSURANCE RATE MAP(FIRM). THIS IS TO CONFIRM THAT THE PROPOSED INSTALLATION IS IN COMPLIANCE WITH THE REQUIREMENTS SET FORTH IN APPENDIX Q OF THE NYC BUILDING CODE.

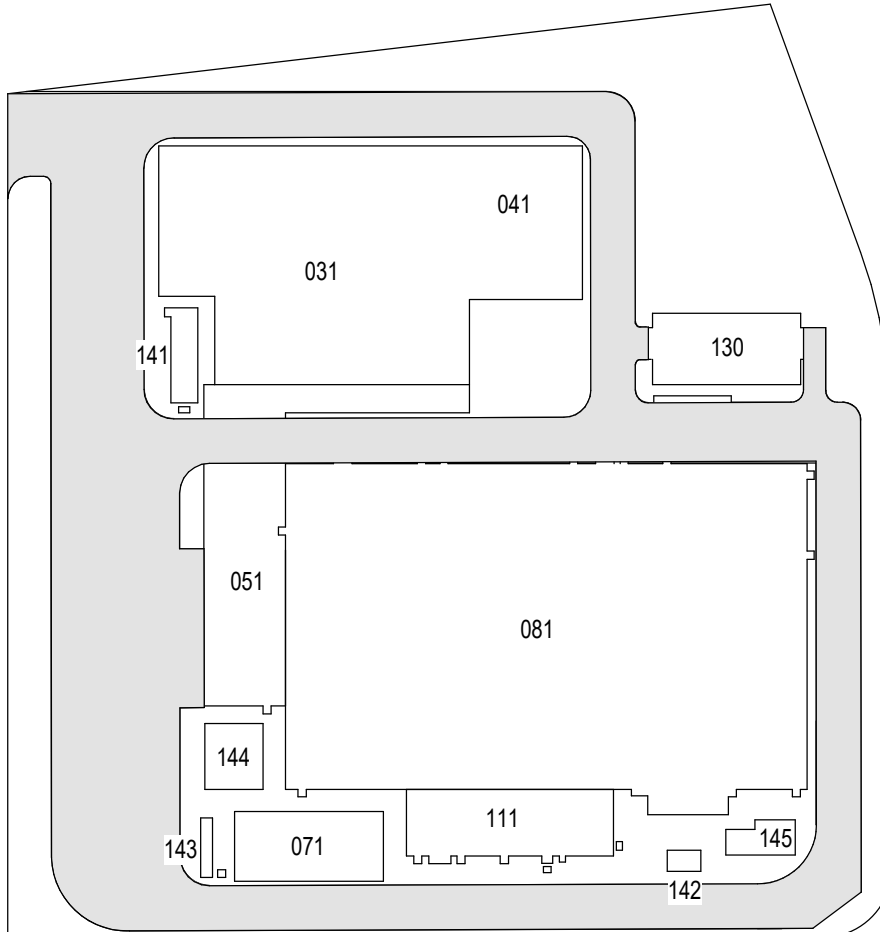
NYC ENERGY CODE COMPLIANCE:

STATEMENT: TO THE BEST OF MY KNOWLEDGE, BELIEF AND PROFESSIONAL JUDGEMENT, THESE PLANS AND SPECIFICATIONS ARE IN COMPLIANCE WITH THE NEW YORK CITY ENERGY CONSERVATION CODE. PROPOSED WORK MEETS THE GUIDELINES AND INSTRUCTIONS OUTLINED IN THE 2020 NYC ECC CHAPTER 4.



1 OVERALL SITE VIEW
T-001.00 N.T.S.

ISSUED FOR PERMIT



KEY PLAN
N.T.S. PLAN NORTH

**Engineering and
Land Surveying, P.C.** 370 7th Avenue
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CONFIDENTIAL
THESE DRAWINGS ARE CONFIDENTIAL IN NATURE. ANY MISUSE OR UNAUTHORIZED DISTRIBUTION OF THE DRAWINGS CONTAINED HEREIN WILL BE A VIOLATION OF THIS CONFIDENTIALITY REQUIREMENT AND SUBJECT THE VIOLATOR TO LIABILITY. REVIEW OF THESE MATERIALS BY RECEPTOR SHALL CONSTITUTE ACCEPTANCE OF THESE TERMS AND THE TERMS OF ANY UNDERLYING CONFIDENTIALITY AGREEMENT WE MAY HAVE. EXCLUDED IN OBTAINING THIS INFORMATION FROM A THIRD PARTY. IF THE RECIPIENT IS NOT IN AGREEMENT WITH THE OBLIGATION OF CONFIDENTIALITY THEN THE DRAWINGS SHALL BE RETURNED TO THE ORIGINATOR.

B	FINAL SUBMISSION	VSP	EK	11/08/2022
A	INTERIM SUBMISSION	VSP	EK	09/13/2022
REV	DESCRIPTION	DRW BY	CHK BY	DATE

Kiewit 470 Chestnut Ridge Rd # 2,
Woodcliff Lake, NJ 07677

Hitachi Energy 901 Main Campus Drive
Raleigh, North Carolina 27606

PROJECT **CHPE**
Champlain Hudson
Power Express

**Astoria HVDC
Converter Station**

31-45 20th Avenue, Astoria, Queens NY 11105
Block #850 - Lot #310 - BIN #4624437

COVER SHEET



DATE 11/08/2022
PROJECT NO 105121
DRAWING BY V. PATEL
CHECKED BY E. KIDANE
DRAWING NO
T-001.00
CADD FILE NO
AstoriaHVDC-CoverSheet.rvt 1 of 25

GN GENERAL REQUIREMENTS

- GN-1. THE DESIGN DRAWINGS ARE NOT TO BE CONSIDERED ALL INCLUSIVE, AND IT IS THE FIELD PERSONNEL'S RESPONSIBILITY TO VERIFY ALL EXISTING CONDITIONS AND VERIFY ALL DIMENSIONS BEFORE PROCEEDING WITH FOUNDATION INSTALLATION OR ANY OTHER CONSTRUCTION. ANY DISCREPANCIES FOUND BETWEEN THE DESIGN DRAWINGS AND THE ACTUAL FIELD CONDITIONS SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER OF RECORD FOR REEVALUATION BEFORE PROCEEDING WITH WORK.
- GN-2. IN CASE OF CONFLICT BETWEEN DESIGN DRAWINGS AND SPECIFICATIONS, THE ENGINEER OF RECORD SHALL BE NOTIFIED TO OBTAIN CLARIFICATION PRIOR TO PROCEEDING WITH WORK.
- GN-3. ONLY USE DIMENSIONS INDICATED ON THE DESIGN DRAWINGS. DO NOT SCALE DESIGN DRAWINGS.
- GN-4. STRUCTURES HAVE BEEN DESIGNED TO BE STABLE IN THEIR FINAL STATE. CONTRACTOR TO ENGAGE A QUALIFIED ENGINEER FOR ALL TEMPORARY CONDITIONS. ERECTION AIDS, LIFTING DEVICES, ETC. ARE NOT SHOWN AND ARE THE RESPONSIBILITY OF THE ERECTOR'S ENGINEER OR AS APPROVED BY THE ENGINEER OF RECORD.

CS CODES AND SPECIFICATIONS

- CS-1. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE FOLLOWING CODES AND MANUALS.
- a. NFPA 850: RECOMMENDED PRACTICE FOR FIRE PROTECTION FOR ELECTRIC GENERATING PLANTS AND HIGH VOLTAGE DIRECT CURRENT CONVERTER STATIONS (2020).
- b. NEW YORK CITY BUILDING CODE, 2022
- c. INTERNATIONAL BUILDING CODE, IBC 2012 AND 2015
- d. MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES, ASCE/SEI 7-2016
- e. ASCE 113-2008 SUBSTATION STRUCTURE DESIGN GUIDE.
- f. ASCE 48-19 DESIGN OF STEEL TRANSMISSION POLE STRUCTURES.
- g. BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE, ACI 318-2014 AS MODIFIED BY NYC1908.
- h. SPECIFICATIONS FOR STRUCTURAL CONCRETE, ACI 301-2010
- i. MANUAL OF STANDARD PRACTICE, CRSI MSP-1 2009
- j. BUILDING CODE REQUIREMENTS AND SPECIFICATION FOR MASONRY STRUCTURES, ASCE 5-13 OR TMS 402/602-16
- k. STEEL CONSTRUCTION MANUAL – 15TH EDITION, AISC 325-2015
- l. SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS, AISC 360-2016
- m. STRUCTURAL WELDING CODE – STEEL, AWS D1.1/D1.1M:2015
- n. STRUCTURAL WELDING CODE – REINFORCING STEEL, STEEL REINFORCING BARS, AWS D1.4/D1.4M:2018
- o. STANDARD FOR NON-COMPOSITE STEEL FLOOR DECK, ANSI/SDI NC1.0- 2017
- p. STANDARD FOR STEEL ROOF DECK, ANSI/SDI RD1.0- 2017
- q. STANDARD FOR COMPOSITE STEEL FLOOR DECK - SLABS, SDI C- 2017
- r. STANDARD FOR QUALITY CONTROL AND QUALITY ASSURANCE FOR INSTALLATION OF STEEL DECK, SDI QA/QC- 2017
- s. OCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) STANDARDS, DEPARTMENT OF LABOR, PART 1910 AND PART 1926
- CS-2. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE FOLLOWING SPECIFICATIONS:
- a. SECTION 023200, GEOTECHNICAL INVESTIGATION
- b. SECTION 312000, EARTHWORK
- c. SECTION 031100, CONCRETE FORMING
- d. SECTION 033000, CAST-IN-PLACE CONCRETE
- e. SECTION 032000, CONCRETE REINFORCEMENT
- f. SECTION 036000, GROUTING
- g. SECTION 031500, CONCRETE ACCESSORIES, ANCHORS, AND EMBEDMENTS
- h. SECTION 034100, PRECAST STRUCTURAL CONCRETE
- i. SECTION 051200, STRUCTURAL STEEL FABRICATION AND SUPPLY
- j. SECTION 053100, STEEL DECK
- k. SECTION 055300, GRATING FABRICATION AND SUPPLY
- l. SECTION 316216, STEEL DRIVEN HP OR PIPE PILES
- m. SECTION 051210, STRUCTURAL STEEL ERECTION
- n. SECTION 133419, METAL BUILDING SYSTEMS
- o. 95.87, SECTION 099713, FIELD APPLIED PROTECTIVE COATINGS
- p. SECTION 099723, COATINGS FOR CONCRETE AND MASONRY
- q. SECTION 099600, SPECIALTY PAINTING

DL DESIGN LOADS

- DL-1. REFER TO LOAD DIAGRAMS FOR SPECIFIC CONDITIONS.
- DL-2. RISK CATEGORY.....IV
- DL-3. MINIMUM LIVE LOADS:
- a. CATWALKS.....40 PSF
- b. CONTROL ROOMS.....250 PSF
- c. ELECTRICAL EQUIPMENT ROOMS.....75 PSF + ACTUAL EQUIPMENT WEIGHT
- d. FIRE PROTECTION SPRINKLER PIPING SUPPORT......5x WATER WT + 250 LB
- e. ISOLATED PLATFORM FOR SERVICING EQUIPMENT.....150 PSF
- f. PLATFORMS & WALKWAYS.....100 PSF
- g. ROOF LIVE LOAD.....20 PSF
- h. SLABS-ON-GRADE.....250 PSF
- i. STAIRS AND RAMPS.....100 PSF
- j. STORAGE AREA.....250 PSF
- CS-3. SURCHARGE ADJACENT TO STRUCTURES:
- a. AASHTO DESIGN TRUCK LOADING.....HL-93

- b. SIDEWALK, VEHICULAR DRIVEWAYS SUBJECTED AND YARD SUBJECTED TO TRUCKING.....300 PSF
- DL-4. WIND LOADS:
- a. IMPORTANCE FACTOR (I_w).....1.0
- b. BASIC WIND SPEED (V_{ult}).....132 MPH
- c. NOMINAL WIND SPEED (V_{as0}).....102 MPH
- d. EXPOSURE CATEGORY.....C
- DL-5. SEISMIC LOADS:
- a. IMPORTANCE FACTOR (I_e).....1.5
- b. SITE CLASS.....D
- c. MAPPED SPECTRAL RESPONSE ACCELERATIONS:
- i. 0.2 SECOND SHORT PERIOD (S_s).....0.296
- ii. 1.0 SECOND PERIOD (S_1).....0.061
- d. DESIGN SPECTRAL RESPONSE ACCELERATIONS:
- i. 0.2 SECOND SHORT PERIOD (S_{ds})0.310
- ii. 1.0 SECOND PERIOD (S_{d1}).....0.098
- e. SEISMIC DESIGN CATEGORY.....C
- f. SEISMIC RESPONSE COEFFICIENT.....CS=0.10
- g. RESPONSE MODIFICATION FACTOR.....R=3
- h. OVERSTRENGTH FACTOR.....3
- i. ANALYSIS PROCEDURE USED.....EQUIVALENT LATERAL FORCE PROCEDURE
- j. BASIC SEISMIC FORCE RESISTING SYSTEM.....STEEL SYSTEM NOT SPECIFICALLY DETAILED FOR SEISMIC RESISTANCE
- DL-6. SNOW LOADS:
- a. IMPORTANCE FACTOR (I_s).....1.15
- b. GROUND SNOW LOAD (p_g).....25 PSF
- c. EXPOSURE FACTOR (C_e).....1.0
- d. THERMAL FACTOR (C_t).....1.2
- e. FLAT ROOF SNOW LOAD (p_f).....24.15 PSF
- DL-7. SERVICEABILITY
- a. ROOF MEMBERS - VERTICAL DEFLECTION:
- i. LIVE.....L/180
- ii. DEAD + LIVE.....L/120
- b. FLOOR MEMBERS - VERTICAL DEFLECTION:
- i. LIVE.....L/360
- ii. DEAD.....L/240
- c. GIRTS:
- i. VERTICAL DEFLECTION.....L/360
- ii. LATERAL DEFLECTION.....L/180
- d. LATERAL DRIFT DUE TO 10-YR MRI WIND LOADS:
- i. BUILDINGS.....H/400
- ii. PIPE RACK AND SIMILAR OPEN STRUCTURES.....H/200
- DL-8. REFER TO VENDOR DOCUMENTATION FOR SPECIFIC EQUIPMENT FOUNDATION LOAD AND SERVICEABILITY INFORMATION.

FO FOUNDATIONS

- FO-1. FOUNDATION DESIGN IS BASED UPON THE INFORMATION AND RECOMMENDATIONS INCLUDED IN THE LATEST GEOTECHNICAL REPORT PREPARED BY GZA GEOENVIRONMENTAL OF NEW YORK.
- FO-2. ALLOWABLE FOUNDATION SOIL PRESSURE IS 2000 PSF.
- FO-3. FOUNDATION SURFACES SHALL BE PREPARED, AND UNSUITABLE BEARING SOILS REMOVED, IN ACCORDANCE WITH THE RECOMMENDATIONS INCLUDED IN THE GEOTECHNICAL REPORT. FOUNDATIONS MUST BEAR ON A MINIMUM OF ONE FOOT OF COMPACTED STRUCTURAL FILL, ON TOP OF PROPERLY PREPARED NATIVE SOILS OR FILL. MUD MAT MAY BE USED IN LIEU OF OR ON TOP OF COMPACTED STRUCTURAL FILL.
- FO-4. INSPECTORS SHALL SUBMIT REPORTS TO FIELD PERSONNEL AND THE ENGINEER OF RECORD INDICATING APPROVAL OF MATERIALS, METHODS OF CONSTRUCTION, AND COMPLIANCE WITH THE SPECIFICATIONS AFTER SATISFACTORY COMPLETION OF THE REQUIRED TESTS.
- FO-5. PROVIDE BRACING FOR ALL FOUNDATION WALLS PRIOR TO BACKFILLING UNLESS SPECIFICALLY INDICATED OTHERWISE WITHIN THE CONTRACT DOCUMENTS. THIS BRACING SHALL REMAIN IN PLACE UNTIL ALL SLABS AND BEAMS FRAMING INTO THE WALL HAVE BEEN PLACED AND HAVE ATTAINED 100% OF THEIR DESIGN STRENGTH.
- FO-6. DO NOT BACKFILL AGAINST CANTILEVER RETAINING WALLS UNTIL THE CONCRETE HAS ATTAINED 100% OF ITS DESIGN STRENGTH.
- FO-7. FOUNDATION CONSTRUCTION ON OR IN FROZEN SOIL IS NOT PERMITTED.
- FO-8. EMBEDDED PIPING, CONDUIT, AND UNISTRUT SHALL NOT COME IN CONTACT WITH REINFORCING STEEL.
- FO-9. ALL PILES AND CONCRETE REINFORCEMENT SHALL BE ELECTRICALLY GROUNDED. GROUNDING DETAILS IN ELECTRICAL DRAWINGS SHALL BE REFERENCED IN CONJUNCTION WITH THIS STRUCTURAL PACKAGE.

DF DEEP FOUNDATIONS


- DF-1. FOUNDATION DESIGN IS BASED UPON THE INFORMATION AND RECOMMENDATIONS INCLUDED IN THE GEOTECHNICAL REPORT PREPARED BY GZA GEOENVIRONMENTAL OF NEW YORK IN THEIR REPORT FILE #41.0163020.00 DATED 07-22-22.
- DF-2. DEEP FOUNDATIONS ARE DESIGNED FOR THE FOLLOWING ALLOWABLE LOADS:
- a. TYPE 1 FIXED HEAD:
- i. STRONG-AXIS SHEAR
- ia. SHEAR FOR 3 FT. PILE SPACING.....16.3 KIPS
- ib. SHEAR FOR 5 FT. PILE SPACING.....18.2 KIPS
- ic. SHEAR FOR 8 FT. PILE SPACING.....19.3 KIPS
- ii. WEAK-AXIS SHEAR
- ii.a. SHEAR FOR 3 FT. PILE SPACING.....10 KIPS
- ii.b. SHEAR FOR 5 FT. PILE SPACING.....11.2 KIPS
- ii.c. SHEAR FOR 8 FT. PILE SPACING.....12 KIPS

- iii. COMPRESSION.....220 KIPS
- iv. TENSION FOR 50 FOOT LONG PILES.....60 KIPS
- v. TENSION FOR 30 FOOT LONG PILES.....22 KIPS
- b. TYPE 2: FREE HEAD:
- i. STRONG-AXIS SHEAR
- ia. SHEAR FOR 3 FT. PILE SPACING.....3.1 KIPS
- ib. SHEAR FOR 5 FT. PILE SPACING.....3.5 KIPS
- ii.c. SHEAR FOR 8 FT. PILE SPACING.....3.7 KIPS
- ii. WEAK-AXIS SHEAR
- ii.a. SHEAR FOR 3 FT. PILE SPACING.....1.9 KIPS
- ii.b. SHEAR FOR 5 FT. PILE SPACING.....2.1 KIPS
- ii.c. SHEAR FOR 8 FT. PILE SPACING.....2.3 KIPS
- iii. COMPRESSION.....220 KIPS
- DF-3. PILE CAPACITIES WILL BE VERIFIED BY MEANS OF AN INDICATOR TEST PILE PROGRAM IN ACCORDANCE WITH ASTM D3966, THE NEW YORK CITY BUILDING CODE, AND THE GEOTECHNICAL REPORT.
- DF-4. THE PILING CONTRACTOR SHALL KEEP AN ACCURATE RECORD OF EACH PILE INSTALLATION, WHICH SHALL BE AVAILABLE FOR INSPECTION BY THE ENGINEER OF RECORD OR ENGINEER OF RECORD'S REPRESENTATIVE. THE RECORD SHALL INCLUDE PILE NUMBER, AS-BUILT LOCATION, GROUND ELEVATION, AND TOP OF PILE ELEVATION.
- DF-5. PILES SHALL BE LOCATED AS SHOWN ON THE DESIGN DRAWINGS OR AS OTHERWISE DIRECTED BY THE ENGINEER OF RECORD. PILE CENTER SHALL BE LOCATED TO A HORIZONTAL ACCURACY OF +/- THREE INCHES. PILES SHALL BE PLUMB WITHIN TWO PERCENT UNLESS NOTED OTHERWISE. TOP OF PILE ELEVATION SHALL BE LOCATED TO AN ACCURACY OF +/- ONE INCH.
- DF-6. INSPECTORS SHALL SUBMIT REPORTS TO THE CONTRACTOR AND THE ENGINEER OF RECORD INDICATING APPROVAL OF MATERIALS, METHODS OF CONSTRUCTION, AND COMPLIANCE WITH ASTM D3966, THE NEW YORK CITY BUILDING CODE, AND THE GEOTECHNICAL REPORT AFTER SATISFACTORY COMPLETION OF THE REQUIRED TESTS.

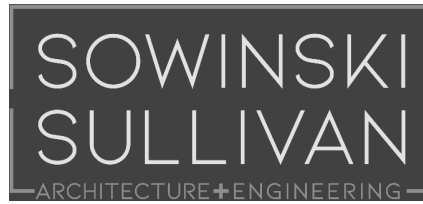
CM CONCRETE MATERIALS

- CM-1. CONCRETE MIX DESIGN, PLACEMENT, AND CURING SHALL BE IN ACCORDANCE WITH ACI 301.
- CM-2. USE A MINIMUM 28-DAY CONCRETE COMPRESSIVE STRENGTH OF 5,000 PSI UNLESS NOTED OTHERWISE.
- CM-3. ALL EXTERIOR FOUNDATIONS SHALL BE BROOM FINISHED, UNLESS NOTED OTHERWISE. ALL INTERIOR SLABS SHALL BE SMOOTH TROWEL FINISHED UNLESS NOTED OTHERWISE.
- CM-4. ALL MASS CONCRETE WILL BE INDICATED ON THE INDIVIDUAL FOUNDATION AND CONCRETE DESIGN DRAWINGS. PLACEMENTS OF MASS CONCRETE SHALL BE INSTALLED IN ACCORDANCE WITH THERMAL CONTROL PLANS AND BE APPROVED BY THE ENGINEER OF RECORD.
- CM-5. CONCRETE SHALL BE CURED ACCORDING TO ACI 308.1. CONCRETE SHALL BE PROTECTED FROM LOSS OF MOISTURE FOR NOT LESS THAN SEVEN DAYS AFTER PLACEMENT AND WITH NECESSARY PROTECTION FOR COLD OR HOT WEATHER PLACEMENT.
- CM-6. THE USE OF CALCIUM CHLORIDE AND OTHER CHLORIDE-CONTAINING AGENTS IS PROHIBITED. THE USE OF RECYCLED CONCRETE IS PROHIBITED. PLACEMENT WITHIN/CONTACT BETWEEN ALUMINUM ITEMS (INCLUDING ALUMINUM CONDUIT) AND CONCRETE IS PROHIBITED.
- CM-7. ALL PERMANENTLY EXPOSED CONCRETE EDGES SHALL HAVE A 3/4" CHAMFER UNLESS NOTED OTHERWISE.
- CM-8. CONSULT MECHANICAL AND ELECTRICAL DRAWINGS (FILED UNDER A SEPARATE APPLICATION) FOR OPENINGS AND EMBEDDED ITEMS SUCH AS FLOOR DRAIN SYSTEMS, CONDUIT, ETC.
- CM-9. OBSERVABLE CRACKS SHALL BE REPORTED TO THE ENGINEER OF RECORD TO DETERMINE CAUSE AND APPROPRIATE REPAIR PROCEDURE.
- CM-10. PERFORM CONCRETE TESTING IN ACCORDANCE WITH SPECIFICATIONS.

ISSUED FOR PERMIT

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A	INTERIM SUBMISSION	DJF	WA	08/29/2022
REV	DESCRIPTION	DRW BY	CHK BY	DATE



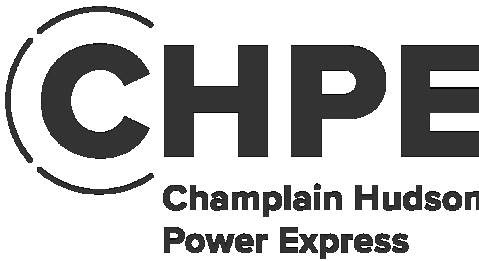
Kiewit

470 Chestnut Ridge Rd # 2,
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901 Main Campus Drive
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PROJECT

 CHPE
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**Astoria HVDC
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31-45 20th Avenue, Astoria, Queens NY 11105
Block #850 - Lot #310 - BIN #4624437

STRUCTURAL GENERAL
NOTES



DATE	11/08/2022
PROJECT NO	105121
DRAWING BY	D. FLYNN
CHECKED BY	W. ABBASSI
DRAWING NO	FO-001.00
CADD FILE NO	2 of 25
Astoria HVDC CHPE Astoria CHA-KIE-000-XX-M2-S-001.rvt	

RE. CONCRETE REINFORCEMENT

- RE-1. REINFORCING BAR STEEL SHALL CONFORM TO THE REQUIREMENTS OF ASTM A615 GRADE 60 AND GRADE 80 DEFORMED BARS UNLESS NOTED OTHERWISE. WELDED WIRE REINFORCEMENT SHALL CONFORM TO THE REQUIREMENTS OF ASTM A1064. MILL TEST CERTIFICATES SHALL BE PROVIDED IN ACCORDANCE WITH SPECIFICATIONS.
- RE-2. FABRICATION AND PLACEMENT OF REINFORCING STEEL SHALL BE IN ACCORDANCE WITH CRSI MSP-1 AND ACI 301.
- RE-3. CHAIRS, SPACERS, STANDEES, AND CARRIER BARS SHALL BE SIZED, SPACED, AND PLACED TO PROVIDE THE REQUIRED SPACING, ALIGNMENT, AND CLEARANCES OF REINFORCING. CARRIER BARS SHALL NOT BE USED AS PRIMARY REINFORCING BARS.
- RE-4. REINFORCING BAR LAP SPLICES NOT OTHERWISE INDICATED SHALL BE ACI CLASS B. WELDED WIRE REINFORCEMENT SHALL BE LAPPED ONE PANEL PLUS TWO INCHES MINIMUM.
- RE-5. WHERE A 90-DEGREE, 135-DEGREE, OR 180-DEGREE HOOK IS GRAPHICALLY INDICATED, PROVIDE CORRESPONDING ACI 318-14 STANDARD HOOKS UNLESS NOTED OTHERWISE.
- RE-6. DOWELS SHALL MATCH SIZE AND SPACING OF MAIN REINFORCEMENT UNLESS NOTED OTHERWISE.
- RE-7. REINFORCING STEEL SHALL BE SECURELY TIED IN PLACE.
- RE-8. ALL BENDING OF REINFORCEMENT SHALL BE DONE COLD.
- RE-9. PROVIDE MECHANICAL SPLICES FOR BARS LARGER THAN #11 OR WHERE INDICATED. ALL MECHANICAL SPLICES SHALL BE APPROVED BY THE ENGINEER OF RECORD.
- RE-10. PROVIDE MIN CONCRETE COVER OVER REINFORCING STEEL AS FOLLOWS UNLESS NOTED OTHERWISE:

CONCRETE EXPOSURE	MEMBER	REINFORCEMENT	SPECIFIED COVER, IN.
CAST AGAINST AND PERMANENTLY IN CONTACT WITH GROUND	ALL	ALL	3
EXPOSED TO WEATHER OR IN CONTACT WITH GROUND	ALL	#6 THROUGH #18 BARS	2
		#5 BAR, W31 OR D31 WIRE AND SMALLER	1-1/2
NOT EXPOSED TO WEATHER OR IN CONTACT WITH GROUND	SLABS, JOISTS, AND WALLS	#14 AND #18 BARS	1-1/2
	BEAMS, COLUMNS, PEDESTALS, AND TENSION TIES	#11 BAR AND SMALLER	1 1/2 UNO
		PRIMARY REINFORCEMENT, STIRRUPS, TIES, AND HOOPS	1-1/2

- RE-12. PROVIDE SPLICES, DEVELOPMENT, AND STANDARD HOOKS AS FOLLOWS UNLESS NOTED OTHERWISE:

REINFORCING STEEL SPLICE CHART FOR F'c = [5000 PSI]						
BAR SIZE	SPLICE LENGTH (CLASS B)		DEVELOPMENT LENGTH		DEVELOPMENT LENGTH FOR STANDARD HOOKS	LENGTH OF STANDARD HOOKS
	TOP BARS	OTHER BARS	TOP BARS	OTHER BARS		
#3	22"	17"	17"	13"	6"	7"
#4	29"	22"	22"	17"	9"	9"
#5	36"	27"	28"	21"	11"	11"
#6	43"	33"	33"	25"	13"	14"
#7	62"	48"	48"	37"	15"	16"
#8	72"	55"	55"	42"	17"	18"
#9	81"	62"	62"	48"	19"	23"
#10	91"	70"	70"	54"	22"	25"
#11	101"	78"	78"	60"	24"	28"

CJ. CONCRETE CONSTRUCTION JOINTS

- CJ-1. SEE DESIGN DRAWINGS FOR ALL CONSTRUCTION JOINT, CRACK CONTROL JOINT, EXPANSION JOINT, AND ISOLATION JOINT LOCATIONS.
- CJ-2. NO HORIZONTAL CONSTRUCTION JOINTS SHALL BE PERMITTED IN BEAMS, WALLS, OR SLABS UNLESS SPECIFICALLY SHOWN ON THE DESIGN DRAWINGS OR APPROVED BY THE ENGINEER OF RECORD.
- CJ-3. PROVIDE CONTINUOUS WATERSTOPS AT ALL CONSTRUCTION JOINTS EXPOSED TO SOIL OR WATER ON THE DESIGN DRAWINGS UNLESS NOTED OTHERWISE. INSTALL PER SPECIFICATIONS AND MANUFACTURER'S RECOMMENDATIONS.
- CJ-4. WATERSTOPS SHALL BE FOUR-INCH RIBBED CENTERBULB-TYPE POLYVINYL CHLORIDE PER SPECIFICATIONS UNLESS NOTED OTHERWISE.
- CJ-5. FOR ALL CONSTRUCTION JOINTS ROUGHEN EXPOSED CONCRETE SURFACE TO AN AMPLITUDE OF APPROXIMATELY 1/4" UNLESS NOTED OTHERWISE. CLEAN THE EXPOSED CONCRETE SURFACE OF ALL LOOSE MATERIAL AND LAITANCE.
- CJ-6. SAWCUT JOINTS SHALL BE CUT AS SOON AS THE CONCRETE HAS HARDENED SUFFICIENTLY TO PREVENT AGGREGATE BEING DISLODGED BY SAW; GENERALLY, WITHIN FOUR HOURS AFTER PLACING IN HOT WEATHER AND NOT MORE THAN 12 HOURS IN COLD WEATHER.

SP. STRUCTURAL PRECAST CONCRETE

- SP-1. DO NOT USE POWER-DRIVEN ANCHORS OR ANCHORS WHICH REQUIRE DRILLING AT PRESTRESSED UNITS. SUBMIT PROPOSED ANCHOR PROCEDURES FOR PRECAST UNITS TO THE ENGINEER OF RECORD AND PRECAST SUPPLIER FOR REVIEW.
- SP-2. ALL PRECAST DESIGN, DETAILING, AND CONNECTIONS SHALL BE IN ACCORDANCE WITH RECOMMENDATIONS OF PCI AND SPECIFICATIONS.

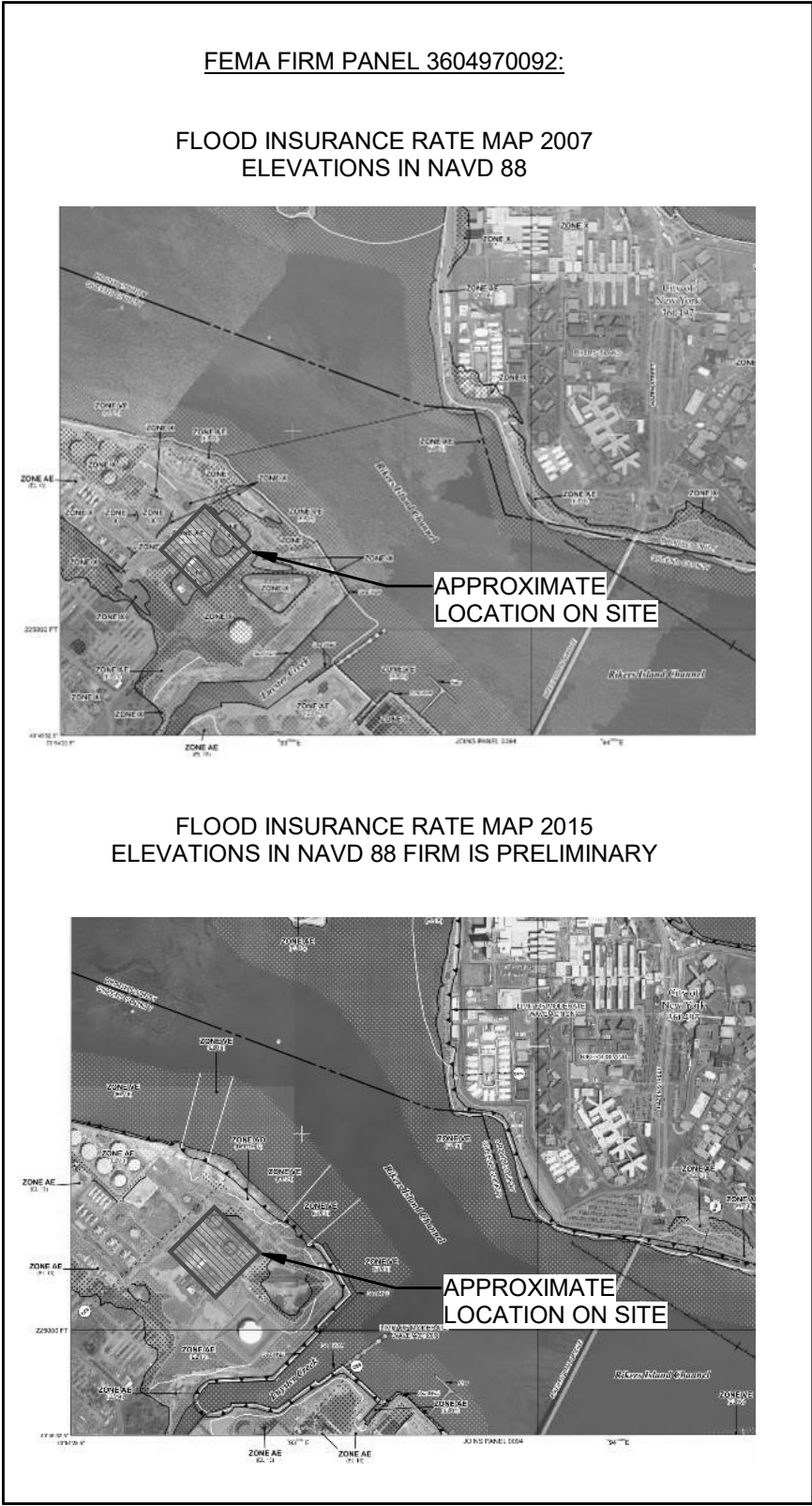
GT. GROUT

- GT-1. GROUT SHALL BE NON-SHRINK, NON-METALLIC, NON-GASEOUS, PREMIX TYPE UNLESS NOTED OTHERWISE. COMPRESSIVE STRENGTH OF CEMENTITIOUS GROUT SHALL BE MINIMUM 5000 PSI AT 28 DAYS. COMPRESSIVE STRENGTH OF EPOXY GROUT SHALL BE MINIMUM 12,000 PSI AT SEVEN DAYS. CURING SHALL FOLLOW MANUFACTURER'S RECOMMENDATIONS.
- GT-2. THE ORDER OF PRECEDENCE FOR GROUTING OF MACHINERY AND EQUIPMENT SHALL BE AS FOLLOWS: EQUIPMENT MANUFACTURER'S INSTALLATION INSTRUCTIONS, DESIGN DRAWINGS, AND THEN SPECIFICATIONS. IN THE EVENT OF CONFLICT BETWEEN THESE DOCUMENTS, NOTIFY THE ENGINEER OF RECORD PRIOR TO PROCEEDING WITH WORK.

FL FLOOD

- FL-1. THE SITE IS DEFINED AS A ZONE (NON-COASTAL).
- FL-2. BASE FLOOD ELEVATION, BFE, = 13 FEET NAVD 88.
- FL-3. RECOMMENDED FREE BOARD BY THE 2022 NYCBC-APPENDIX G IS 2.0 FEET.
- FL-4. RECOMMENDED DESIGN FLOOD ELEVATION, DFE = 15 FEET NAVD 88.
- FL-5. THE STRUCTURE IS NOT SUBJECTED TO HYDRODYNAMIC LOADS.

DESIGN ELEVATION / DEPTH	FEET IN NAVD 88
DESIGN BASE FLOOD ELEVATION	13.0
FINISH FLOOR ELEVATION	15.0
SEA LEVEL RISE	NOT CONSIDERED



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K Engineering and
Land Surveying, P.C.

370 7th Avenue
SUITE 1604
New York, NY 10001

**SOWINSKI
SULLIVAN**
—ARCHITECTURE+ENGINEERING—

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A	INTERIM SUBMISSION	DJF	WA	08/29/2022
REV	DESCRIPTION	DRW BY	CHK BY	DATE



Kiewit

470 Chestnut Ridge Rd # 2,
Woodcliff Lake, NJ 07677

Hitachi Energy

901 Main Campus Drive
Raleigh, North Carolina 27606

PROJECT

CHPE
Champlain Hudson
Power Express

**Astoria HVDC
Converter Station**

31-45 20th Avenue, Astoria, Queens NY 11105
Block #850 - Lot #310 - BIN #4624437

STRUCTURAL GENERAL
NOTES



DATE 11/08/2022
PROJECT NO 105121
DRAWING BY D. FLYNN
CHECKED BY W. ABBASSI

DRAWING NO
FO-002.00

CADD FILE NO
Astoria-HVDC-CHPE
Astoria-CHA-KIE-000-XX-M2-S-001.rvt

SI-1. REQUIRED VERIFICATION AND INSPECTION OF CONCRETE CONSTRUCTION.

VERIFICATION AND INSPECTION	CONTINUOUS	PERIODIC	REFERENCED STANDARD	BC REFERENCE	CONCRETE SPECIAL INSPECTOR (CAST IN PLACE, PRECAST, & PRESTRESSED)	LICENSED CONCRETE TESTING LABORATORY
1. INSPECTION OF REINFORCING STEEL, INCLUDING PRESTRESSING TENDONS, AND PLACEMENT	-	X	ACI 318: 3.5, 7.1-7.7	1903.6 1907.1 1907.4 1911.4	X	
2. INSPECTION OF REINFORCING STEEL WELDING IN ACCORDANCE WITH TABLE 1705.2.2, ITEM 2B	-	-	AWS D1.4 ACI 318: 3.5.2	1903.6.2		
3. INSPECTION OF ANCHORS CAST IN CONCRETE WHERE ALLOWABLE LOADS HAVE BEEN INCREASED OR WHERE STRENGTH DESIGN IS USED	-	X	ACI 318: 8.1.3, 21.2.8	1901.3	X	
4. INSPECTION OF ANCHORS POST-INSTALLED IN HARDENED CONCRETE MEMBERS	-	X	ACI 318: 3.8.6, 8.1.3, 21.2.8	-	X	
5. VERIFYING USE OF REQUIRED DESIGN MIX	-	X	ACI 318: CH. 4, 5.2-5.4	1904, 1905.2-1905.4, 1911.3		X
6. AT THE TIME FRESH CONCRETE IS SAMPLED TO FABRICATE SPECIMENS FOR STRENGTH TESTS, PERFORM SLUMP AND AIR CONTENT TESTS, AND DETERMINE THE TEMPERATURE OF THE CONCRETE	X	-	ASTM C 172, ASTM C 31, ACI 318: 5.8, 5.8	1905.6, 1911.10		X
7. INSPECTION OF CONCRETE AND SHOTCRETE PLACEMENT FOR PROPER APPLICATION TECHNIQUES	X	-	ACI 318: 5.9, 5.10	1905.9, 1905.10, 1911.6, 1911.7, 1911.8	X	
8. INSPECTION FOR MAINTENANCE OF SPECIFIED CURING TEMPERATURE AND TECHNIQUES	-	X	ACI 318: 5.11-5.13	1905.11, 1905.13, 1911.9	X	
9. INSPECTION OF PRESTRESSED CONCRETE: A. APPLICATION OF PRESTRESSING FORCES	X		ACI 318: 18.20		X	
B. GROUTING OF BONDED PRESTRESSING TENDONS IN THE SEISMIC FORCE-RESISTING SYSTEM	X	-	ACI 318: 18.18.4	-		
10. ERECTION OF PRECAST CONCRETE MEMBERS	-	X	ACI 318: CH. 16	-	X	
11. VERIFICATION OF IN-SITU CONCRETE STRENGTH, PRIOR TO STRESSING OF TENDONS IN POST TENSIONED CONCRETE AND PRIOR TO REMOVAL OF SHORES AND FORMS FROM BEAMS AND STRUCTURAL SLABS	-	X	ACI 318: 6.2	1906.2	---	X
12. INSPECT FORMWORK FOR SHAPE, LOCATION AND DIMENSIONS OF THE CONCRETE MEMBER BEING FORMED	-	X	ACI 318: 6.1.1	1906.2	X	

SI-2. REQUIRED SPECIAL INSPECTIONS OF SUBSURFACE CONDITIONS:

VERIFICATION AND INSPECTION TASK	CONTINUOUS DURING TASK LISTED	PERIODICALLY DURING TASK LISTED
1. DURING FILL PLACEMENT: DURING PLACEMENT AND COMPACTION OF THE FILL MATERIAL, THE SPECIAL INSPECTOR SHALL DETERMINE THAT THE MATERIAL BEING USED AND THE MAXIMUM LIFT THICKENSS COMPLY WITH THE APPROVED GEOTECHNICAL REPORT, AS SPECIFIED IN SECTION 1804.5.	X	-
2. EVALUATION OF IN-PLACE DENSITY: THE SPECIAL INSPECTOR SHALL DETERMINE THAT THE IN-PLACE DRY DENSITY OF THE SOMPACTED FILL COMPLIES WITH THE APPROVED CONSTRUCTION DOCUMENTS	X	-
3. SUBGRADE INSPECTION: IMMEDIATELY PRIOR TO PLACEMENT OF EACH AND EVERY FOOTING, FOUNDATION, FILL OR OTHER SUPPORTING MATERIALS, THE SPECIAL INSPECTOR SHALL ETERMINE THAT THE SITE HAS BEEN PREPARED AND IS IN ACCORDANCE WITH THE APPROVED GEOTECHNICAL REPORT.	-	X

SI-3. REQUIRED VERIFICATION AND INSPECTION OF DRIVEN DEEP FOUNDATION ELEMENTS:

VERIFICATION AND INSPECTION TASK	CONTINUOUS DURING TASK LISTED	PERIODICALLY DURING TASK LISTED
1. VERIFY ELEMENT MATERIALS, SIZES AND LENGTHS COMPLY WITH THE REQUIREMENTS	X	-
2. DETERMINE CAPACITIES OF TEST ELEMENTS AND CONDUCT ADDITIONAL LOAD TESTS, AS REQUIRED	X	-
3. OBSERVE DRIVING OPERATIONS AND MAINTAIN COMPLETE AND ACCURATE RECORDS FOR EACH ELEMENT	X	-
4. VERIFY PLACEMENT LOCATIONS AND PLUMBNESS, CONFIRM TYPE AND SIZE OF HAMMER, RECORD NUMBER OF BLOWS PER FOOT OF PENETRATION, DETERMINE REQUIRED BLOWS PER FOOT OF PENETRATION TO ACHIEVE DESIGN CAPACITY, RECORD TIP AND BUTT ELEVATIONS AND DOCUMENT ANY DAMAGE TO FOUNDATION ELEMENT	X	-
5. FOR STEEL ELEMENTS, PERFORM ADDITIONAL INSPECTIONS IN ACCORDANCE WITH SECTION 1705.2	-	-
6. FOR CONCRETE ELEMENTS AND CONCRETE-FILLED ELEMENTS, PERFORM ADDITIONAL INSPECTIONS IN ACCORDANCE WITH SECTION 1705.	-	-
7. FOR SPECIALTY ELEMENTS, PERFORM ADDITIONAL INSPECTIONS AS DETERMINED BY THE REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE	-	-

SI-4. REQUIRED SPECIAL INSPECTIONS AND TESTS OF DEEP FOUNDATION ELEMENTS

INSTALLATION	CONTINUOUS SPECIAL INSPECTION	PERIODIC SPECIAL INSPECTION
1. VERIFY THE IDENTIFYING DESIGNATION OF THE DEEP FOUNDATION ELEMENT AND RECORD THE DATE OF THE INSTALLATION, INCLUDING THE START AND END TIMES.	X	-
2. VERIFY THE SIZE, MATERIAL, AND ALLOWABLE CAPACITY AS SPECIFIED IN THE CONSTRUCTION DOCUMENTS.	X	-
3. RECORD THE ELEVATION OF THE MINIMUM REQUIRED DEPTH OF PENETRATION AND RECORD THE FINAL TIP ELEVATION AND BUTT ELEVATION.	X	-
4. RECORD THE ELEVATION OF SPLICES AND NOTE WHETHER OR NOT THE SPLICES WERE INSTALLED AND LOCATED IN COMPLIANCE WITH THE CONSTRUCTION DOCUMENTS.	X	-
LOAD TEST		
5. FOR LOAD TEST REQUIRING A LOAD OR REACTION FRAME, INSPECT THE CONSTRUCTION OF THE LOAD OR REACTION FRAME. RECORD THE RESULTS OF THE INSPECTION AND NOTE WHETHER OR NOT THE FRAME COMPLIES WITH THE CONSTRUCTION DOCUMENTS PREPARED BY THE REGISTERED DESIGN PROFESSIONAL.	-	X
6. RECORD THE IDENTIFYING DESIGNATION FOR THE ELEMENT BEING TESTED, AND THE DATE OF THE TESTING, INCLUDING THE START AND END TIME.	X	-
7. RECORD THE METHOD OF PERFORMING THE TEST, INCLUDING THE EQUIPMENT BEING USED, AS WELL AS THE TEST RESULTS, NOTING WHETHER OR NOT THE METHOD OF TESTING AND THE TEST RESULTS COMPLY WITH THE REQUIREMENTS OF SECTIONS 1810, 1811, AND 1812 AND THE CONSTRUCTION DOCUMENTS.	X	-


SI-5. PROGRESS INSPECTORS OF FOOTINGS AND FOUNDATIONS SHALL COMPLY WITH SECTION 110.3.1 OF THE BUILDING CODE.

SI-6. INSPECTION OF WELDING:

INSPECTION OF WELDING:				
A. STRUCTURAL STEEL:	-	-	-	-
1) COMPLETE AND PARTIAL PENETRATION GROOVE WELDS.	X	-	AWS D1.1	1705.2.1
2) MULTI-PASS FILLET WELDS.	X	-		
3) SINGLE-PASS FILLET WELDS > 5/16" -	X	-		
4) PLUG AND SLOT WELDS.	X	-		
5) SINGLE-PASS FILLET WELDS < 5/16" -	-	X	AWS D1.3	-
6) FLOOR AND ROOF DECK WELDS.	-	X		
7) COLD-FORMED STEEL WELDS.	-	X	AWS D1.3	-
B. REINFORCING STEEL:	-	-	AWS D1.4	1903.6.2
1) PRE-WELDING VERIFICATION OF BASE METAL.	-	X		
2) REINFORCING STEEL-RESISTING FLEXURAL AND AXIAL FORCES INTERMEDIATE AND SPECIAL MOMENT FRAMES, AND BOUNDARY ELEMENTS OF SPECIAL REINFORCED CONCRETE SHEAR WALLS AND SHEAR REINFORCEMENT.	X	-		
3) SHEAR REINFORCEMENT.	X NOTE A	-		
4) OTHER REINFORCING STEEL.	-	X NOTE B		

SI-7. INSPECTORS SHALL SUBMIT REPORTS TO FIELD PERSONNEL AND ENGINEER OF RECORD INDICATING APPROVAL OF MATERIALS, METHODS OF CONSTRUCTION, AND COMPLIANCE WITH SPECIFICATIONS AFTER SATISFACTORY COMPLETION OF REQUIRED TESTS AND SUBMISSION OF REQUIRED TEST REPORTS.


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 **Kiewit** 470 Chestnut Ridge Rd # 2, Woodcliff Lake, NJ 07677

 **Hitachi Energy** 901 Main Campus Drive Raleigh, North Carolina 27606


PROJECT

 **CHPE**
Champlain Hudson Power Express

Astoria HVDC Converter Station

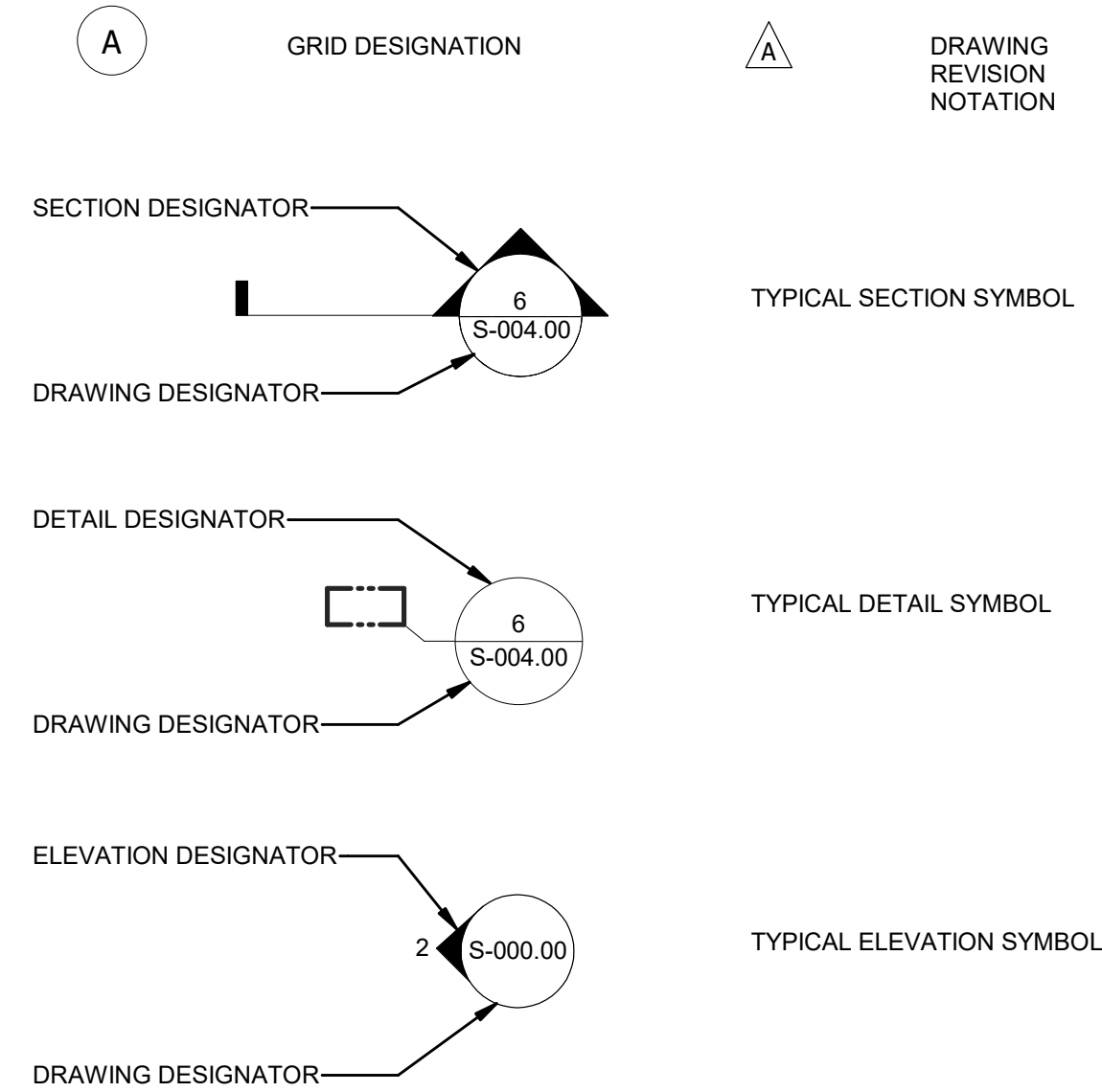
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Block #850 - Lot #310 - BIN #4624437

STRUCTURAL GENERAL NOTES

 DATE 11/08/2022
PROJECT NO 105121
DRAWING BY D. FLYNN
CHECKED BY W. ABBASSI
DRAWING NO
FO-003.00
CADD FILE NO Astoria-CHA-KIE-000-XX-M2-S-001.rvt 4 of 25

ABBREVIATIONS			
AB	ANCHOR BOLT	Ld	STRAIGHT BAR DEVELOPMENT LENGTH
ACI	AMERICAN CONCRETE INSTITUTE	LG	LONG
ADHV	ADHESIVE	Lh	DEVELOPMENT LENGTH FOR STANDARD HOOKS
AFF	ABOVE FINISHED FLOOR	LL	LIVE LOAD
AISC	AMERICAN INSTITUTE OF STEEL CONSTRUCTION	LLBB	LONG LEGS BACK TO BACK
ALT	ALTERNATE	LLH	LONG LEG HORIZONTAL
ALUM	ALUMINUM	LLV	LONG LEG VERTICAL
ANC	ANCHOR	LOC	LOCATION
ANSI	AMERICAN NATIONAL STANDARDS INSTITUTE	LP	LOW POINT
APPROX	APPROXIMATE	LRFD	LOAD AND RESISTANCE FACTOR DESIGN
AR	ANCHOR ROD	LSH	LONG SLOTTED HOLE
ASCE	AMERICAN SOCIETY OF CIVIL ENGINEERS	LSL	LONG SLOTTED LIGHT
ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIALS	MACH	MACHINE
AVG	AVERAGE	MAS	MASONRY
AWS	AMERICAN WELDING SOCIETY	MATL	MATERIAL
BB	BACK TO BACK	MAX	MAXIMUM
BC	BOLT CIRCLE	MECH	MECHANICAL
BF	BRACED FRAME	MEP	MECHANICAL/ELECTRICAL/PLUMBING
BLDG	BUILDING	MFR	MANUFACTURER
BM	BEAM	MIN	MINIMUM
BO	BOTTOM OF	MISC	MISCELLANEOUS
BOC	BOTTOM OF CONCRETE	MO	MASONRY OPENING
BOF	BOTTOM OF FOOTING	MTL	METAL
BOS	BOTTOM OF STEEL	MWFRS	MAIN WIND FORCE RESISTING SYSTEM
BOT	BOTTOM	N	NORTH
BP	BASE PLATE	NER	NEUTRAL EARTHING RESISTOR
BRG	BEARING	NIC	NOT IN CONTRACT
BT	BRACING TRUSS	NO	NUMBER
CA	COLUMN ABOVE	NS	NEAR SIDE
CB	COLUMN BELOW	NTS	NOT TO SCALE
CC	CENTER TO CENTER	OC	ON CENTER
C&C	COMPONENTS AND CLADDING	OD	OUTSIDE DIAMETER
CHKD	CHECKED	OLP	OPERATING LOAD PRESSURE
CFMF	COLD-FORMED METAL FRAMING	OLT	OPERATING LOAD TRANSIENT PRESSURE
CJ	CONSTRUCTION/CONTROL JOINT	OPNG	OPENING
CJP	COMPLETE JOINT PENETRATION	OPP	OPPOSITE
CL	CENTERLINE	OSHA	OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION
CLR	CLEAR	OVS	OVERSIZED
CMU	CONCRETE MASONRY UNIT	PA	POST ABOVE
COL	COLUMN	PB	POST BELOW
CONC	CONCRETE	PCF	POUNDS PER CUBIC FOOT
CONN	CONNECTION	PENE	PENETRATION
CONT	CONTINUOUS	PERP	PERPENDICULAR
CRSI	CONCRETE REINFORCING STEEL INSTITUTE	PG	PLATE GIRDER
CTR	CENTER	PJFF	PULSE JET FABRIC FILTER
CTRD	CENTERED	PJP	PARTIAL JOINT PENETRATION
CY	CUBIC YARD	PL	PLATE
DEG	DEGREE	PLCS	PLACES
DEMO	DEMOLITION/DEMOLISH	PLTF	PLATFORM
DET	DETAIL	PROJ	PROJECTION
DIA	DIAMETER	PSF	POUNDS PER SQUARE FOOT
DIAG	DIAGONAL	PSI	POUNDS PER SQUARE INCH
DM	DIMENSION	R	RADIUS
DN	DOWN	RCSC	RESEARCH COUNCIL ON STRUCTURAL CONNECTIONS
DWG	DRAWING	RD	ROOF DRAIN
DWL	DOWEL	REBAR	REINFORCING BAR
EA	EACH	REF	REFERENCE
EJ	EACH FACE	REINF	REINFORCING
EJ	EXPANSION JOINT	REQD	REQUIRED
EL	ELEVATION	REV	REVISION
ELEC	ELECTRICAL	SC	SLIP CRITICAL
EMB	EMBEDMENT	SCH	SCHEDULE
EOD	EDGE OF DECK	SECT	SECTION
EOG	EDGE OF GRATING	SEI	STRUCTURAL ENGINEERING INSTITUTE
EOR	ENGINEER OF RECORD	SF	SQUARE FOOT
EOS	EDGE OF SLAB	SHT	SHEET
EQ	EQUAL	SIM	SIMILAR
EQUIP	EQUIPMENT	SLBB	SHORT LEGS BACK TO BACK
EW	EACH WAY	SPA	SPACES
EXIST	EXISTING	SPEC	SPECIFICATIONS
EXP	EXPANSION	SQ	SQUARE
FD	FLOOR DRAIN	SS	STAINLESS STEEL
FDN	FOUNDATION	SSH	SHORT SLOTTED HOLE
FIN	FINISH	SSL	SHORT SLOTTED
FLG	FLANGE	STD	STANDARD
FLR	FLOOR	STIFF	STIFFENER
FS	FAR SIDE	STL	STEEL
FT	FOOT	STRUCT	STRUCTURAL
FTG	FOOTING	SUPT	SUPPORT
FV	FIELD VERIFY	SYM	SYMMETRICAL
GA	GAUGE	SYS	SYSTEM
GALV	GALVANIZED	T & B	TOP AND BOTTOM
GRTG	GRATING	TEMP	TEMPORARY
HA	HANGER ABOVE	THD	THREAD
HB	HANGER BELOW	THK	THICK
HGR	HANGER	THRU	THROUGH
HORIZ	HORIZONTAL	TO	TOP OF
HP	HIGH POINT	TOC	TOP OF CONCRETE
HR	HANDRAIL	TOF	TOP OF FOOTING
HS	HEADED STUDS	TOS	TOP OF STEEL
HT	HEIGHT	TYP	TYPICAL
ID	INSIDE DIAMETER	UG	UNDERGROUND
IJ	ISOLATION JOINT	UNO	UNLESS NOTED OTHERWISE
IN	INCHES	VERT	VERTICAL
INT	INTERIOR	w/	WITH
JST	JOIST	w/o	WITHOUT
JT	JOINT	WF	WIDE FLANGE
K	KIP	WP	WORK POINT
KB	KNEE BRACE	WS	WATER STOP
KPL	KICK PLATE	WT	WEIGHT
KSI	KIPS PER SQUARE INCH	WWR	WELDED WIRE REINFORCEMENT
L	LENGTH		
LB	POUND		
LF	LINEAR FEET		
LFRS	LATERAL FORCE RESISTING SYSTEM		

LEGEND			
	COMPACTED CRUSH ROCK		LEAN CONCRETE MAT
	CONCRETE		GRATING
	COMPACTED BACKFILL		CHECKERED PLATE
	UNDISTURBED EARTH		OPENING



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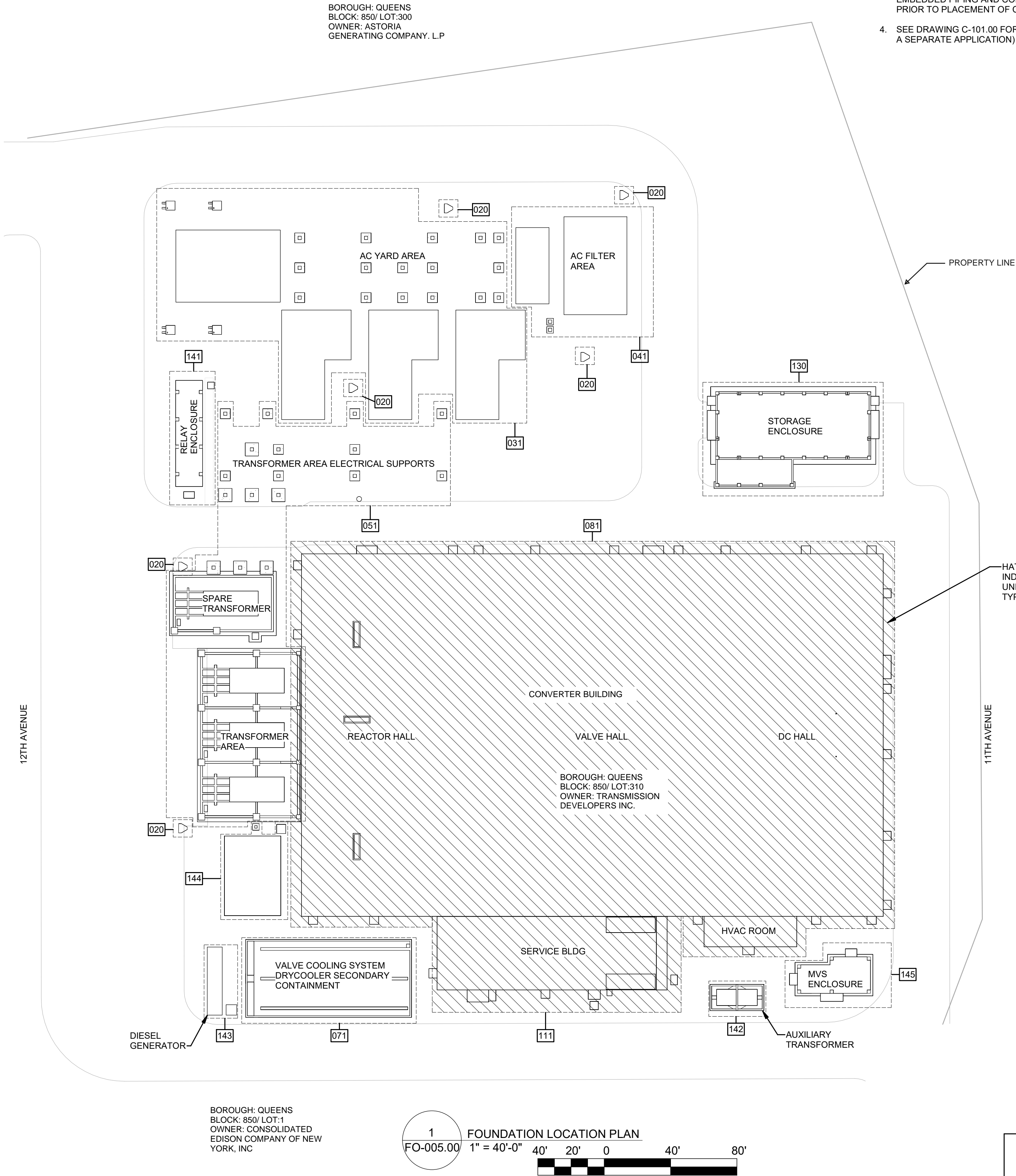
DRAWING NO

FO-004.00

CADD FILE NO
Astoria CHA-KIE-000-XX-M2-S-001.rvt
5 of 25

FOUNDATION SHEET INDEX		
PPID	SHEET NAME	SHEET NUMBER
000	STRUCTURAL GENERAL NOTES	FO-001.00
000	STRUCTURAL GENERAL NOTES	FO-002.00
000	STRUCTURAL GENERAL NOTES	FO-003.00
000	STRUCTURAL GENERAL NOTES	FO-004.00
000	FOUNDATION LOCATION PLAN	FO-005.00
081	CONVERTER BUILDING FOUNDATION 3D VIEW	FO-010.00
111	SERVICE BUILDING FOUNDATION 3D VIEW	FO-015.00
081	CONVERTER BUILDING PILE LOCATION TABLE/SCHEDULE	FO-101.00
081	CONVERTER BUILDING PILE LOCATION PLAN	FO-102.00
081	CONVERTER BUILDING PILE CAP PLAN	FO-103.00
081	CONVERTER BUILDING STRUCTURAL SLAB PLAN	FO-104.00
111	SERVICE BUILDING PILE LOCATION PLAN	FO-115.00
111	SERVICE BUILDING PILE CAP PLAN	FO-116.00
111	SERVICE BUILDING STRUCTURAL SLAB PLAN	FO-117.00
081	CONVERTER BUILDING FOUNDATION SECTIONS AND DETAILS	FO-301.00
081	CONVERTER BUILDING CONTAINMENT CURBS DETAIL AND SECTION	FO-302.00
111	SERVICE BUILDING FOUNDATION SECTIONS AND DETAILS	FO-305.00
081	CONVERTER BUILDING GROUNDING PLAN AND SECTION	FO-401.00
000	ANCHOR BOLT TYPICAL DETAILS	FO-601.00
000	CONCRETE TYPICAL DETAILS	FO-602.00
000	CONCRETE PENETRATION TYPICAL DETAILS	FO-603.00
000	CONCRETE REINFORCING TYPICAL DETAILS	FO-604.00
000	CONCRETE JOINT TYPICAL DETAILS	FO-605.00
000	GROUNDING TYPICAL DETAILS	FO-606.00

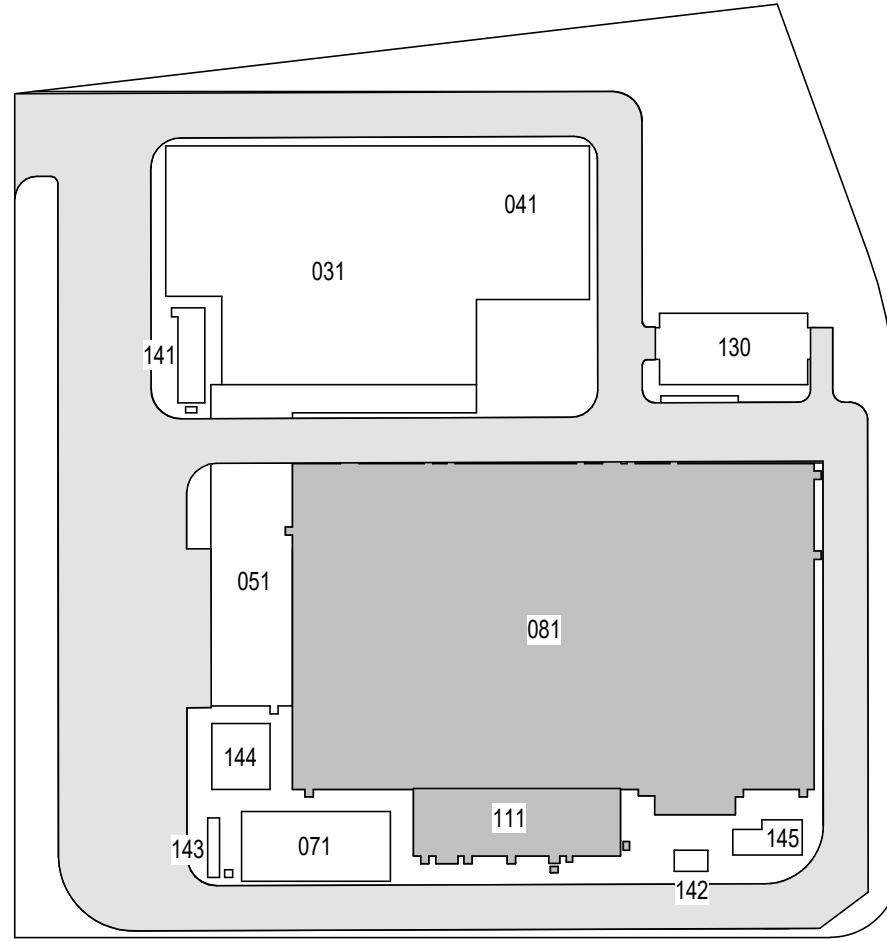
Grand total: 24



STRUCTURE NOTES:

1. SEE DRAWINGS FO-001.00 THRU FO-004.00 FOR GENERAL NOTES, LEGEND, AND ABBREVIATIONS.
2. SEE DRAWINGS FO-601.00 THRU FO-605.00 FOR TYPICAL CONCRETE AND TYPICAL ANCHOR BOLT DETAILS.
3. SEE MECHANICAL YARD PIPING DRAWINGS AND ELECTRICAL UNDERGROUND DRAWINGS (FILED UNDER A SEPARATE APPLICATION) FOR THE LOCATION OF UNDER FOUNDATION PIPING, CONDUITS, AND DUCTBANKS TO BE PLACED BEFORE THE FOUNDATION IS CONSTRUCTED. EMBEDDED PIPING AND CONDUITS SHALL BE SET IN THE FOUNDATION PRIOR TO PLACEMENT OF CONCRETE.
4. SEE DRAWING C-101.00 FOR CIVIL SITE GRADING DRAWINGS (FILED UNDER A SEPARATE APPLICATION) FOR FINISHED GRADE ELEVATIONS.

ISSUED FOR PERMIT



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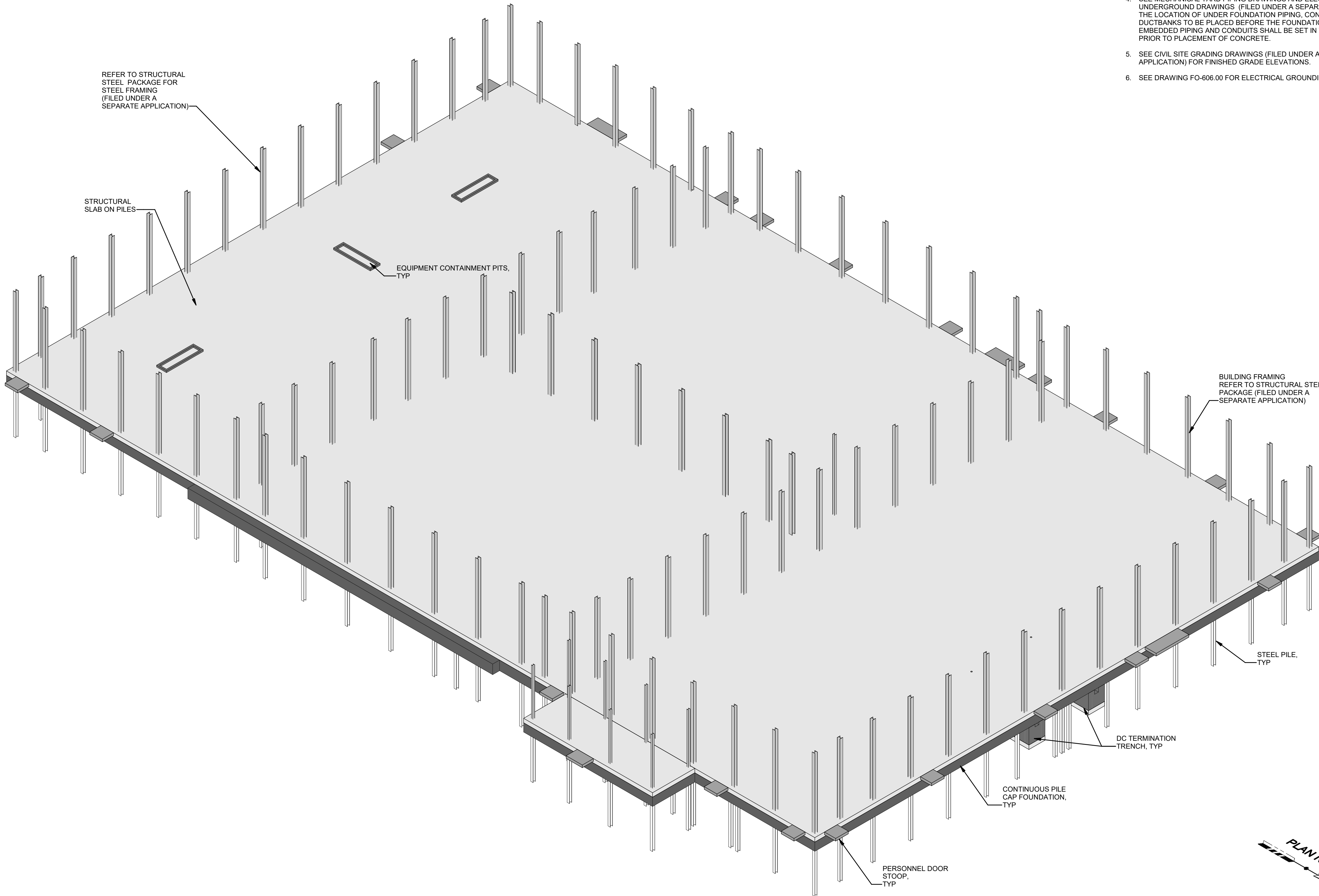
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FOUNDATION LOCATION
PLAN



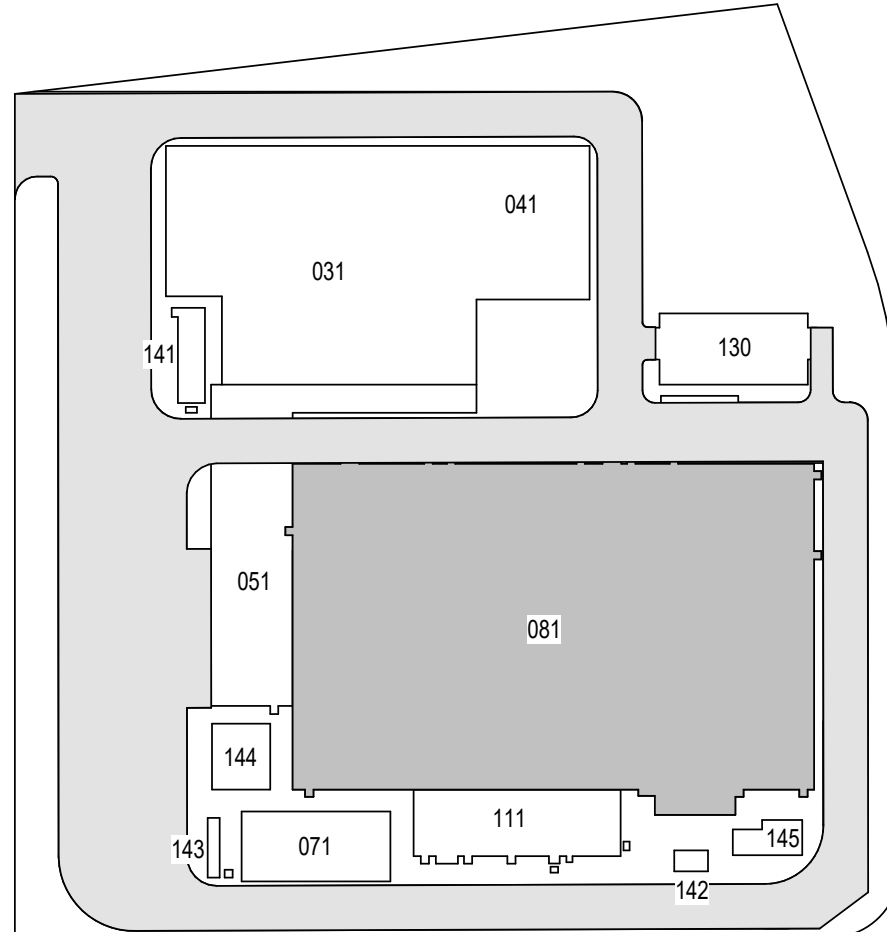
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Astoria-HVDC-CHPE
Astoria-CHPE-005-FO-005-001.rvt
6 of 25

11/10/2022 8:38:05 AM



- STRUCTURE NOTES:
1. SEE DRAWINGS FO-001.00 THRU FO-004.00 GENERAL NOTES, LEGEND, AND ABBREVIATIONS.
 2. SEE DRAWING FO-005.00 FOUNDATION LOCATION PLANS.
 3. SEE DRAWINGS FO-601.00 THRU FO-605.00 FOR TYPICAL CONCRETE DETAILS, AND TYPICAL ANCHOR BOLT DETAILS.
 4. SEE MECHANICAL YARD PIPING DRAWINGS AND ELECTRICAL UNDERGROUND DRAWINGS (FILED UNDER A SEPARATE APPLICATION) FOR THE LOCATION OF UNDER FOUNDATION PIPING, CONDUITS, AND DUCTBANKS TO BE PLACED BEFORE THE FOUNDATION IS CONSTRUCTED. EMBEDDED PIPING AND CONDUITS SHALL BE SET IN THE FOUNDATION PRIOR TO PLACEMENT OF CONCRETE.
 5. SEE CIVIL SITE GRADING DRAWINGS (FILED UNDER A SEPARATE APPLICATION) FOR FINISHED GRADE ELEVATIONS.
 6. SEE DRAWING FO-606.00 FOR ELECTRICAL GROUNDING DETAILS.

ISSUED FOR PERMIT



KEY PLAN
N.T.S.

Engineering and
Land Surveying, P.C.

370 7th Avenue
SUITE 1604
New York, NY 10001

SOWINSKI
SULLIVAN
ARCHITECTURE+ENGINEERING

25 Mohawk Avenue
Sparta, NJ 07871

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B	FINAL SUBMISSION	CMS	WA	11/08/2022
A	INTERIM SUBMISSION	DC	SD	08/29/2022
REV	DESCRIPTION	DRW BY	CHK BY	DATE

Kiewit
470 Chestnut Ridge Rd # 2,
Woodcliff Lake, NJ 07677

Hitachi Energy
901 Main Campus Drive
Raleigh, North Carolina 27606

PROJECT

CHPE
Champlain Hudson
Power Express

**Astoria HVDC
Converter Station**

31-45 20th Avenue, Astoria, Queens NY 11105
Block #850 - Lot #310 - BIN #4624437

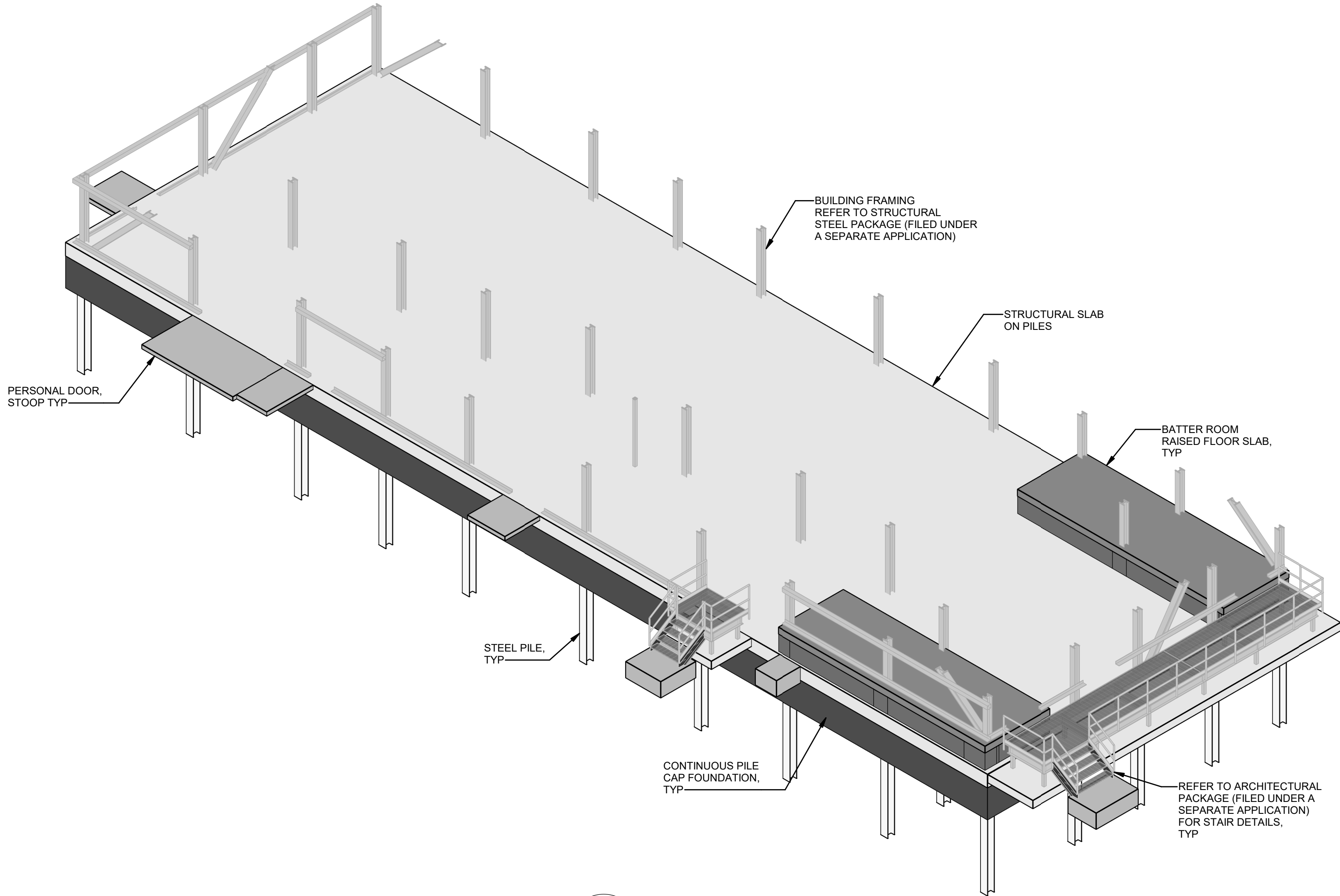
**CONVERTER BUILDING
FOUNDATION 3D VIEW**



DATE 11/08/22
PROJECT NO 105121
DRAWING BY C.SPAULDING
CHECKED BY M.SCHWABAUER
DRAWING NO
FO-010.00
CADD FILE NO
Astoria/CHA-KIE-081-F-1-M3-S-001.rvt 7 of 25

11/10/2022 8:33:52 AM

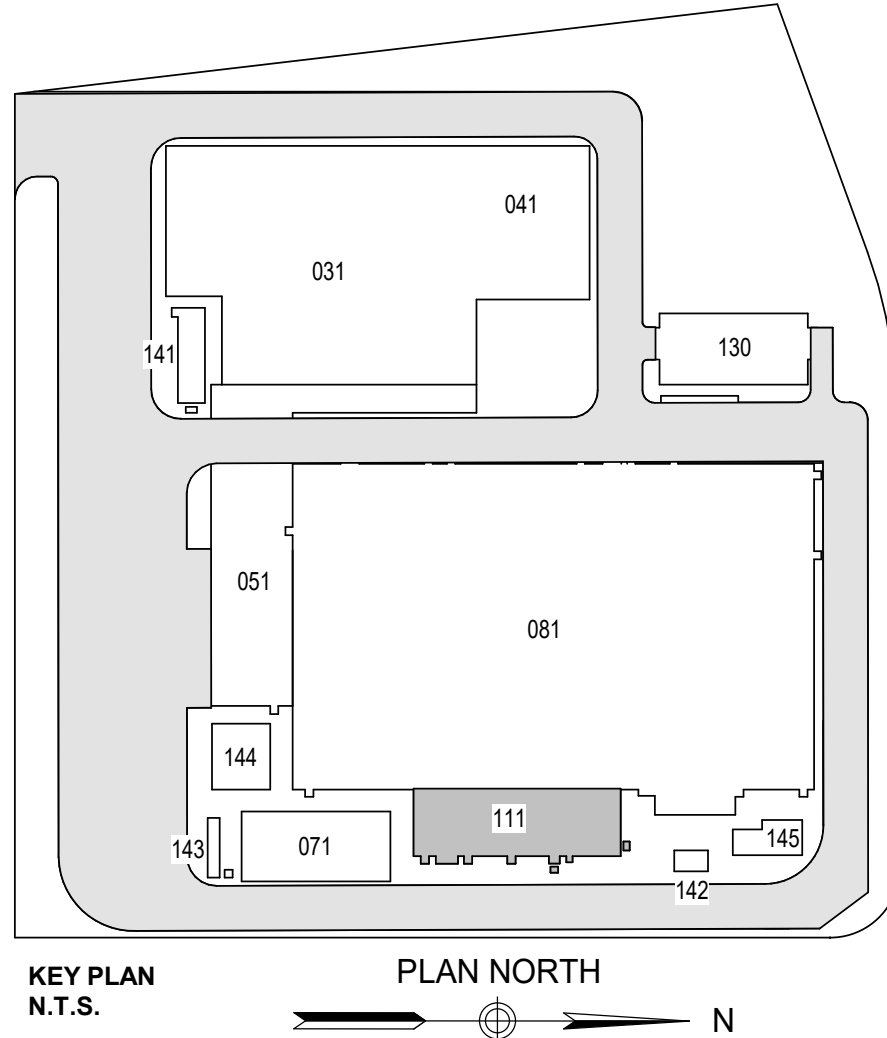
SERVICE BUILDING FOUNDATION SHEET INDEX	
SHEET NAME	SHEET NUMBER
SERVICE BUILDING FOUNDATION 3D VIEW	FO-015.00
SERVICE BUILDING PILE LOCATION PLAN	FO-115.00
SERVICE BUILDING PILE CAP PLAN	FO-116.00
SERVICE BUILDING STRUCTURAL SLAB PLAN	FO-117.00
SERVICE BUILDING FOUNDATION SECTIONS AND DETAILS	FO-305.00



1 SERVICE BUILDING FOUNDATION 3D VIEW
FO-015.00 N.T.S.

- STRUCTURE NOTES:**
- SEE DRAWINGS FO-001.00 THRU FO-004.00 GENERAL NOTES, LEGEND, AND ABBREVIATIONS.
 - SEE DRAWING FO-005.00 FOUNDATION LOCATION PLAN.
 - SEE DRAWINGS FO-601.00 THRU FO-605.00 FOR TYPICAL CONCRETE DETAILS, AND TYPICAL ANCHOR BOLT DETAILS.
 - SEE MECHANICAL YARD PIPING DRAWINGS AND ELECTRICAL UNDERGROUND DRAWINGS (FILED UNDER A SEPARATE APPLICATION) FOR THE LOCATION OF UNDER FOUNDATION PIPING, CONDUITS, AND DUCTBANKS TO BE PLACED BEFORE THE FOUNDATION IS CONSTRUCTED. EMBEDDED PIPING AND CONDUITS SHALL BE SET IN THE FOUNDATION PRIOR TO PLACEMENT OF CONCRETE.
 - SEE CIVIL SITE GRADING DRAWINGS (FILED UNDER A SEPARATE APPLICATION) FOR FINISHED GRADE ELEVATIONS.
 - SEE DRAWING FO-606.00 FOR ELECTRICAL GROUNDING DETAILS.

ISSUED FOR PERMIT



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B	FINAL SUBMISSION	WA	CMS	11/08/2022
A	INTERIM SUBMISSION	WA	CMS	08/29/2022
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Kiewit
470 Chestnut Ridge Rd # 2,
Woodcliff Lake, NJ 07677

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901 Main Campus Drive
Raleigh, North Carolina 27606

PROJECT

CHPE
Champlain Hudson
Power Express

Astoria HVDC Converter Station
31-45 20th Avenue, Astoria, Queens NY 11105
Block #850 - Lot #310 - BIN #4624437

SERVICE BUILDING FOUNDATION 3D VIEW

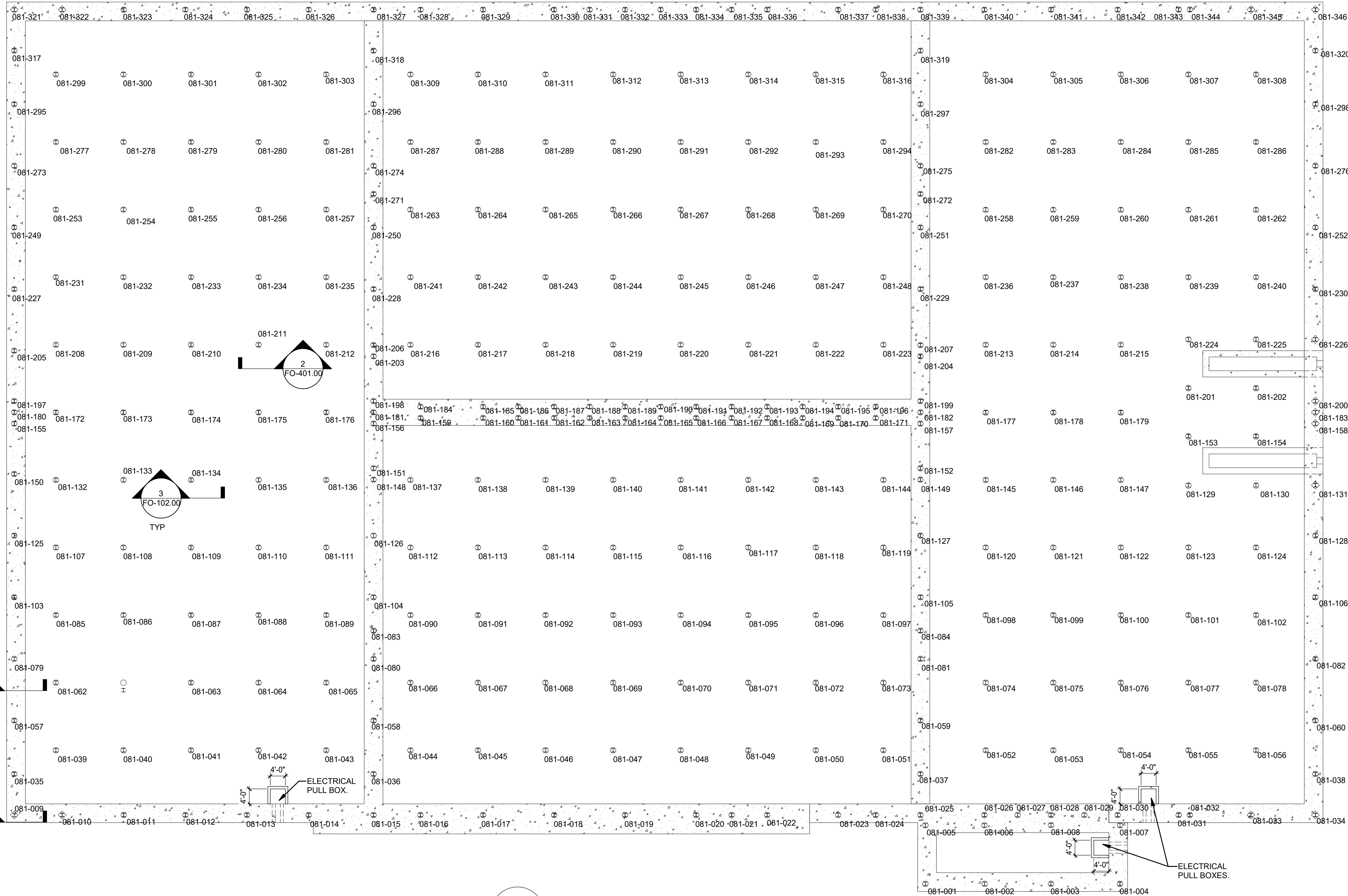


DATE 11/08/2022
PROJECT NO 105121
DRAWING BY C.SPAULDING
CHECKED BY M.SCHWABAUER
DRAWING NO
FO-015.00
CADD FILE NO
Astoria/CHA-KIE-11-F-1-M3-S-001.rvt
8 of 25

CONVERTER BUILDING PILE LOCATION TABLE				
PILE NUMBER	TYPE	NORTHING	EASTING	ESTIMATED TIP ELEVATION *
081-001	HP	225924.076	1012075.798	-36'-3 1/2"
081-002	HP	225935.632	1012086.538	-36'-3 1/2"
081-003	HP	225948.611	1012096.800	-36'-3 1/2"
081-004	HP	225962.044	1012111.085	-36'-3 1/2"
081-005	HP	225984.669	1012084.424	-36'-3 1/2"
081-006	HP	225946.179	1012075.122	-36'-3 1/2"
081-007	HP	225972.654	1012099.683	-36'-3 1/2"
081-008	HP	225959.237	1012087.144	-36'-3 1/2"
081-009	HP	225758.792	1011897.151	-36'-3 1/2"
081-010	HP	225768.132	1011905.832	-36'-3 1/2"
081-011	HP	225780.157	1011917.008	-36'-3 1/2"
081-012	HP	225792.182	1011928.184	-36'-3 1/2"
081-013	HP	225804.207	1011939.360	-36'-3 1/2"
081-014	HP	225816.232	1011950.536	-36'-3 1/2"
081-015	HP	225828.897	1011962.308	-36'-3 1/2"
081-016	HP	225838.053	1011970.818	-36'-3 1/2"
081-017	HP	225850.261	1011982.164	-36'-3 1/2"
081-018	HP	225864.118	1011995.042	-36'-3 1/2"
081-019	HP	225877.974	1012007.920	-36'-3 1/2"
081-020	HP	225891.830	1012020.798	-36'-3 1/2"
081-021	HP	225898.758	1012027.237	-36'-3 1/2"
081-022	HP	225905.686	1012033.676	-36'-3 1/2"
081-023	HP	225919.542	1012046.554	-36'-3 1/2"
081-024	HP	225926.867	1012053.362	-36'-3 1/2"
081-025	HP	225935.596	1012061.475	-36'-3 1/2"
081-026	HP	225948.079	1012073.077	-36'-3 1/2"
081-027	HP	225954.580	1012079.119	-36'-3 1/2"
081-028	HP	225961.081	1012085.161	-36'-3 1/2"
081-029	HP	225967.582	1012091.203	-36'-3 1/2"
081-030	HP	225974.082	1012097.244	-36'-3 1/2"
081-031	HP	225985.985	1012108.307	-36'-3 1/2"
081-032	HP	225988.183	1012110.349	-36'-3 1/2"
081-033	HP	226000.086	1012121.412	-36'-3 1/2"
081-034	HP	226012.660	1012133.099	-36'-3 1/2"
081-035	HP	225766.224	1011889.155	-36'-3 1/2"
081-036	HP	225836.329	1011954.311	-36'-3 1/2"
081-037	HP	225943.028	1012053.478	-36'-3 1/2"
081-038	HP	226020.091	1012125.102	-36'-3 1/2"
081-039	HP	225778.654	1011892.061	-36'-3 1/2"
081-040	HP	225791.839	1011904.315	-36'-3 1/2"
081-041	HP	225805.015	1011916.562	-36'-3 1/2"
081-042	HP	225818.200	1011928.816	-36'-3 1/2"
081-043	HP	225831.385	1011941.070	-36'-3 1/2"
081-044	HP	225847.843	1011956.367	-36'-3 1/2"
081-045	HP	225861.028	1011968.621	-36'-3 1/2"
081-046	HP	225874.205	1011980.867	-36'-3 1/2"
081-047	HP	225887.390	1011993.121	-36'-3 1/2"
081-048	HP	225900.574	1012005.375	-36'-3 1/2"
081-049	HP	225913.759	1012017.630	-36'-3 1/2"
081-050	HP	225926.944	1012029.884	-36'-3 1/2"
081-051	HP	225940.129	1012042.138	-36'-3 1/2"
081-052	HP	225960.074	1012060.875	-36'-3 1/2"
081-053	HP	225973.259	1012072.929	-36'-3 1/2"
081-054	HP	225986.436	1012085.176	-36'-3 1/2"
081-055	HP	225999.621	1012097.430	-36'-3 1/2"
081-056	HP	226012.805	1012109.684	-36'-3 1/2"
081-057	HP	225775.925	1011878.717	-36'-3 1/2"
081-058	HP	225846.030	1011943.873	-36'-3 1/2"
081-059	HP	225952.729	1012043.041	-36'-3 1/2"
081-060	HP	226029.800	1012114.657	-36'-3 1/2"
081-061	HP	225802.730	1011892.597	-36'-3 1/2"
081-062	HP	225790.908	1011878.876	-36'-3 1/2"
081-063	HP	225817.270	1011903.377	-36'-3 1/2"
081-064	HP	225830.454	1011915.631	-36'-3 1/2"
081-065	HP	225843.639	1011927.885	-36'-3 1/2"
081-066	HP	225860.098	1011943.182	-36'-3 1/2"
081-067	HP	225873.282	1011955.436	-36'-3 1/2"
081-068	HP	225886.459	1011967.683	-36'-3 1/2"
081-069	HP	225899.644	1011979.937	-36'-3 1/2"
081-070	HP	225912.829	1011992.191	-36'-3 1/2"
081-071	HP	225926.013	1012004.445	-36'-3 1/2"
081-072	HP	225939.198	1012016.699	-36'-3 1/2"
081-073	HP	225952.383	1012028.953	-36'-3 1/2"
081-074	HP	225972.328	1012047.491	-36'-3 1/2"
081-075	HP	225985.513	1012059.745	-36'-3 1/2"
081-076	HP	225998.690	1012071.981	-36'-3 1/2"
081-077	HP	226011.875	1012084.245	-36'-3 1/2"
081-078	HP	226025.059	1012096.499	-36'-3 1/2"
081-079	HP	225787.101	1011866.692	-36'-3 1/2"
081-080	HP	225857.206	1011931.848	-36'-3 1/2"
081-081	HP	225963.905	1012031.016	-36'-3 1/2"
081-082	HP	226040.969	1012102.639	-36'-3 1/2"
081-083	HP	225862.312	1011926.355	-36'-3 1/2"
081-084	HP	225969.011	1012025.522	-36'-3 1/2"
081-085	HP	225803.162	1011865.692	-36'-3 1/2"
081-086	HP	225816.347	1011877.946	-36'-3 1/2"
081-087	HP	225829.524	1011890.192	-36'-3 1/2"
081-088	HP	225842.708	1011902.446	-36'-3 1/2"
081-089	HP	225855.893	1011914.700	-36'-3 1/2"
081-090	HP	225872.352	1011929.997	-36'-3 1/2"
081-091	HP	225885.536	1011942.251	-36'-3 1/2"
081-092	HP	225898.713	1011954.498	-36'-3 1/2"
081-093	HP	225911.898	1011966.752	-36'-3 1/2"
081-094	HP	225925.083	1011979.006	-36'-3 1/2"
081-095	HP	225938.267	1011991.260	-36'-3 1/2"
081-096	HP	225951.452	1012003.514	-36'-3 1/2"
081-097	HP	225964.637	1012015.768	-36'-3 1/2"
081-098	HP	225984.582	1012034.306	-36'-3 1/2"
081-099	HP	225997.767	1012046.560	-36'-3 1/2"
081-100	HP	226010.944	1012058.806	-36'-3 1/2"
081-101	HP	226024.129	1012071.061	-36'-3 1/2"
081-102	HP	226037.313	1012083.315	-36'-3 1/2"
081-103	HP	225798.277	1011854.667	-36'-3 1/2"
081-104	HP	225868.383	1011919.824	-36'-3 1/2"
081-105	HP	225975.081	1012018.991	-36'-3 1/2"
081-106	HP	226052.145	1012090.614	-36'-3 1/2"
081-107	HP	225815.416	1011852.507	-36'-3 1/2"
081-108	HP	225828.601	1011864.761	-36'-3 1/2"
081-109	HP	225841.778	1011877.008	-36'-3 1/2"
081-110	HP	225854.962	1011889.262	-36'-3 1/2"
081-111	HP	225868.147	1011901.516	-36'-3 1/2"
081-112	HP	225884.606	1011916.812	-36'-3 1/2"
081-113	HP	225897.790	1011929.066	-36'-3 1/2"
081-114	HP	225910.967	1011941.313	-36'-3 1/2"
081-115	HP	225924.152	1011953.567	-36'-3 1/2"
081-116	HP	225937.337	1011965.821	-36'-3 1/2"
081-117	HP	225950.521	1011978.075	-36'-3 1/2"
081-118	HP	225963.706	1011990.329	-36'-3 1/2"
081-119	HP	225976.891	1012002.583	-36'-3 1/2"
081-120	HP	225996.837	1012021.121	-36'-3 1/2"
081-121	HP	226010.021	1012033.375	-36'-3 1/2"
081-122	HP	226023.198	1012045.622	-36'-3 1/2"
081-123	HP	226036.383	1012057.876	-36'-3 1/2"

CONVERTER BUILDING PILE LOCATION TABLE				
PILE NUMBER	TYPE	NORTHING	EASTING	ESTIMATED TIP ELEVATION *
081-124	HP	226049.568	1012070.130	-36'-3 1/2"
081-125	HP	225809.454	1011842.642	-36'-3 1/2"
081-126	HP	225879.559	1011907.799	-36'-3 1/2"
081-127	HP	225986.257	1012006.966	-36'-3 1/2"
081-128	HP	226063.321	1012078.599	-36'-3 1/2"
081-129	HP	226047.672	1012045.729	-36'-3 1/2"
081-130	HP	226060.857	1012057.983	-36'-3 1/2"
081-131	HP	226072.455	1012068.762	-36'-3 1/2"
081-132	HP	225827.670	1011839.322	-36'-3 1/2"
081-133	HP	225840.855	1011851.576	-36'-3 1/2"
081-134	HP	225854.032	1011863.823	-36'-3 1/2"
081-135	HP	225867.216	1011876.077	-36'-3 1/2"
081-136	HP	225880.401	1011888.331	-36'-3 1/2"
081-137	HP	225896.860	1011903.628	-36'-3 1/2"
081-138	HP	225910.044	1011915.882	-36'-3 1/2"
081-139	HP	225923.221	1011928.128	-36'-3 1/2"
081-140	HP	225936.406	1011940.382	-36'-3 1/2"
081-141	HP	225949.591	1011952.636	-36'-3 1/2"
081-142	HP	225962.775	1011964.890	-36'-3 1/2"
081-143	HP	225975.960	1011977.145	-36'-3 1/2"
081-144	HP	225989.145	1011989.399	-36'-3 1/2"
081-145	HP	226009.091	1012007.936	-36'-3 1/2"
081-146	HP	226022.275	1012020.190	-36'-3 1/2"
081-147	HP	226035.452	1012032.437	-36'-3 1/2"
081-148	HP	225889.714	1011896.872	-36'-3 1/2"
081-149	HP	225996.412	1011996.039	-36'-3 1/2"
081-150	HP	225820.630	1011830.617	-36'-3 1/2"
081-151	HP	225891.756	1011894.675	-36'-3 1/2"
081-152	HP	225908.455	1011993.842	-36'-3 1/2"
081-153	HP	226056.579	1012036.145	-36'-3 1/2"
081-154	HP	226069.764	1012048.399	-36'-3 1/2"
081-155	HP	225829.764	1011820.790	-36'-3 1/2"
081-156	HP	225899.869	1011885.946	-36'-3 1/2"
081-157	HP	226006.567	1011985.113	-36'-3 1/2"
081-158	HP	226083.631	1012056.737	-36'-3 1/2"
081-159	HP	225910.046	1011893.357	-36'-3 1/2"
081-160	HP	225922.254	1011904.703	-36'-3 1/2"
081-161	HP	225929.121	1011911.086	-36'-3 1/2"
081-162	HP	225936.110	1011917.581	-36'-3 1/2"
081-163	HP	225943.038	1011924.021	-36'-3 1/2"
081-164	HP	225949.966	1011930.460	-36'-3 1/2"
081-165	HP	225956.895	1011936.899	-36'-3 1/2"
081-166	HP	225963.823	1011943.338	-36'-3 1/2"
081-167	HP	225970.751	1011949.777	-36'-3 1/2"
081-168	HP	225977.679	1011956.216	-36'-3 1/2"
081-169	HP	225984.607	1011962.655	-36'-3 1/2"
081-170	HP	225991.535	1011969.094	-36'-3 1/2"
081-171	HP	225998.860	1011975.502	-36'-3 1/2"
081-172	HP	225839.924	1011826.138	-36'-3 1/2"
081-173	HP	225853.108	1011836.392	-36'-3 1/2"
081-174	HP	225866.285	1011850.639	-36'-3 1/2"
081-175	HP	225879.470	1011862.893	-36'-3 1/2"
081-176	HP	225892.655	1011875.147	-36'-3 1/2"
081-177	HP	226021.344	1011994.752	-36'-3 1/2"
081-178	HP	226034.529	1012007.006	-36'-3 1/2"
081-179	HP	226047.706	1012019.253	-36'-3 1/2"
081-180	HP	225831.806	1011818.592	-36'-3 1/2"
081-181	HP	225901.911	1011883.749	-36'-3 1/2"
081-182	HP	226008.610	1011982.916	-36'-3 1/2"
081-183	HP	226085.673	1012054.539	-36'-3 1/2"
081-184	HP	225912.088	1011891.160	-36'-3 1/2"
081-185	HP	225924.296	1011902.506	-36'-3 1/2"
081-186	HP	225931.163	1011908.888	-36'-3 1/2"
081-187	HP	225938.153	1011915.834	-36'-3 1/2"
081-188	HP	225945.081	1011921.823	-36'-3 1/2"
081-189	HP	225952.009	1011928.262	-36'-3 1/2"
081-190	HP	225958.937	1011934.701	-36'-3 1/2"
081-191	HP	225965.865	1011941.140	-36'-3 1/2"
081-192	HP	225972.793	1011947.579	-36'-3 1/2"
081-193	HP	225979.721	1011954.018	-36'-3 1/2"
081-194	HP	225986.649	1011960.457	-36'-3 1/2"
081-195	HP	225993.577	1011966.896	-36'-3 1/2"
081-196	HP	226000.902	1011973.704	-36'-3 1/2"
081-197	HP	225833.848	1011816.395	-36'-3 1/2"
081-198	HP	225903.953	1011881.551	-36'-3 1/2"
081-199	HP	226010.652	1011980.718	-36'-3 1/2"
081-200	HP	226087.716	1012052.342	-36'-3 1/2"
081-201	HP	226065.316	1012026.745	-36'-3 1/2"
081-202	HP	226078.501	1012038.999	-36'-3 1/2"
081-203	HP	225912.066	1011872.822	-36'-3 1/2"
081-204	HP	226018.765	1011971.989	-36'-3 1/2"
081-205	HP	225842.982	1011806.567	-36'-3 1/2"
081-206	HP	225914.108	1011870.625	-36'-3 1/2"
081-207	HP	226020.807	1011969.792	-36'-3 1/2"
081-208	HP	225852.178	1011812.953	-36'-3 1/2"
081-209	HP	225865.357	1011825.202	-36'-3 1/2"
081-210	HP	225878.539	1011831.654	-36'-3 1/2"
081-211	HP	225891.724	1011849.708	-36'-3 1/2"
081-212	HP	225904.909	1011861.962	-36'-3 1/2"
081-213	HP	226033.598	1011881.567	-36'-3 1/2"
081-214	HP	226046.783	1011993.821	-36'-3 1/2"
081-215	HP	226059.990	1012006.068	-36'-3 1/2"
081-216	HP	225921.368	1011877.257	-36'-3 1/2"
081-217	HP	225934.553	1011889.511	-36'-3 1/2"
081-218	HP	225947.730	1011901.758	-36'-3 1/2"
081-219	HP	225960.915	1011914.012	-36'-3 1/2"
081-220	HP	225974.100	1011926.266	-36'-3 1/2"
081-221	HP	225987.284	1011938.520	-36'-3 1/2"
081-222	HP	226000.469	1011950.774	-36'-3 1/2"
081-223	HP	226013.654	1011963.028	-36'-3 1/2"
081-224	HP	226074.109	1012017.284	-36'-3 1/2"
081-225	HP	226087.294	1012029.538	-36'-3 1/2"
081-226	HP	226098.892	1012040.317	-36'-3 1/2"
081-227	HP	225854.158	1011794.542	-36'-3 1/2"
081-228	HP	225924.263	1011859.699	-36'-3 1/2"
081-229	HP	226030.962	1011958.866	-36'-3 1/2"
081-230	HP	226108.026	1012030.489	-36'-3 1/2"
081-231	HP	225864.432	1011799.769	-36'-3 1/2"
081-232	HP	225877.617	1011812.023	-36'-3 1/2"
081-233	HP	225890.793	1011842.269	-36'-3 1/2"
081-234	HP	225903.978	1011836.523	-36'-3 1/2"
081-235	HP	225917.163	1011846.777	-36'-3 1/2"
081-236	HP	226045.852	1011968.383	-36'-3 1/2"
081-237	HP	226059.037	1011980.637	-36'-3 1/2"
081-238	HP	226072.214	1011992.883	-36'-3 1/2"
081-239	HP	226085.398	1012005.137	-36'-3 1/2"
081-240	HP	226098.583	1012017.391	-36'-3 1/2"
081-241	HP	225933.623	1011864.073	-36'-3 1/2"
081-242	HP	225946.807	1011876.327	-36'-3 1/2"
081-243	HP	225959.984	1011888.573	-36'-3 1/2"
081-244	HP	225973.169	1011900.827	-36'-3 1/2"
081-245	HP	225986.354	1011913.081	-36'-3 1/2"
081-246	HP	225999.538	1011925.335	-36'-3 1/2"

11/10/2022 8:38:14 AM



1 CONVERTER BUILDING PILE LOCATION PLAN
1/16" = 1'-0"
2' 0' 8' 16' 32'

2 TYPICAL PILE HEAD DETAIL AT PILE CAPS
FO-102.00 3/4" = 1'-0"
1' 0' 1' 2'

3 TYPICAL PILE HEAD DETAIL AT INTERIOR SLAB
FO-102.00 3/4" = 1'-0"
1' 0' 1' 2'

4 TYPICAL PILE HEAD TIED DETAIL AT PILE CAP
FO-102.00 3/4" = 1'-0"
1' 0' 1' 2'

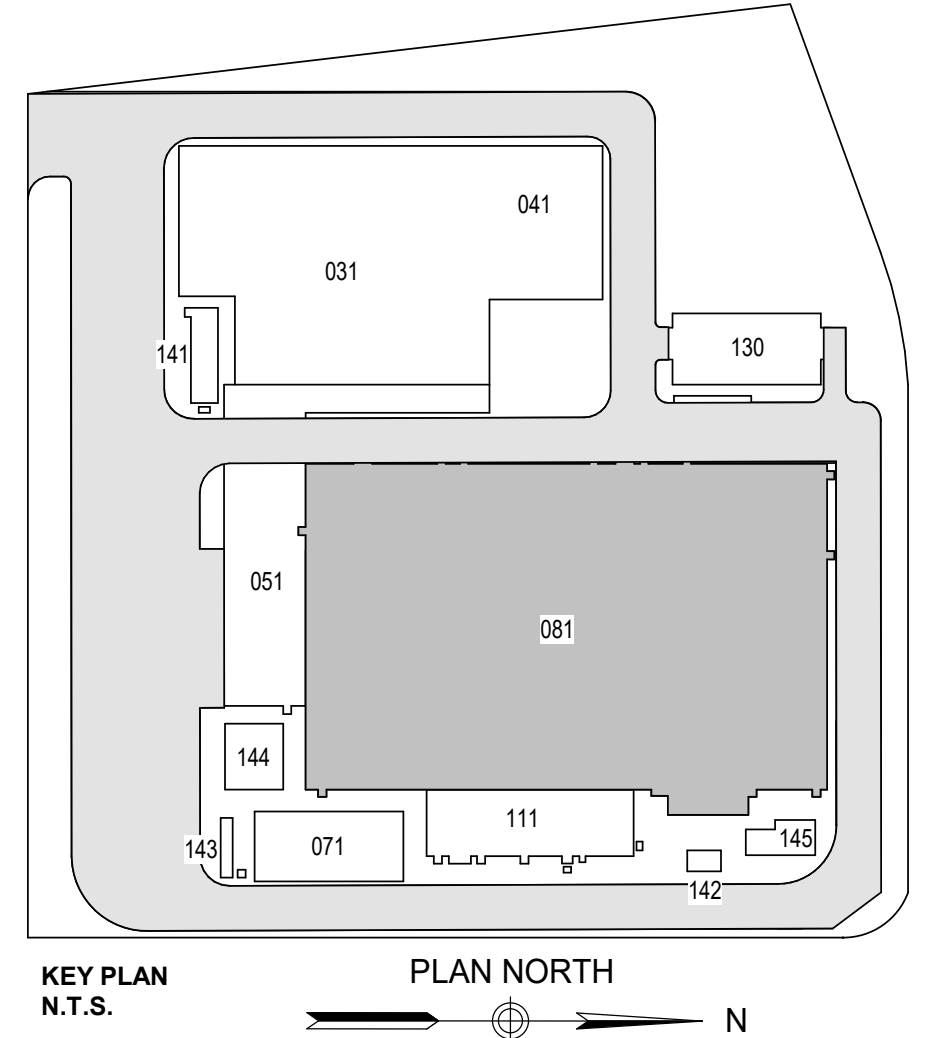
SHEET NOTES:

- SEE DRAWING FO-010.00 FOR STRUCTURE NOTES.
- EACH PERIMETER PILE SHALL BE CONNECTED TO THE PERIMETER GROUNDING ELECTRODE WITH A 4/0 AWG COPPER CONDUCTOR WELDED TO THE PILE. ALL INTERIOR PILES SHALL BE INTERCONNECTED WITH A WELDED CONNECTION TO MAINTAIN ELECTRICAL CONTINUITY TO THE EXTERIOR PILES.

SHEET LEGEND:

- HP 12X53 PILE WITH 6" EMBEDMENT
- HP 12X53 PILE WITH 6" EMBEDMENT AND TIED REBAR

ISSUED FOR PERMIT



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Land Surveying, P.C.

370 7th Avenue
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New York, NY 10001

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SULLIVAN
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REV	DESCRIPTION	DRW BY	CHK BY	DATE
B	FINAL SUBMISSION	CMS	WA	11/08/2022
A	INTERIM SUBMISSION	DC	SD	08/29/2022

Kiewit
470 Chestnut Ridge Rd # 2,
Woodcliff Lake, NJ 07677

Hitachi Energy
901 Main Campus Drive
Raleigh, North Carolina 27606

PROJECT

CHPE
Champlain Hudson
Power Express

Astoria HVDC
Converter Station

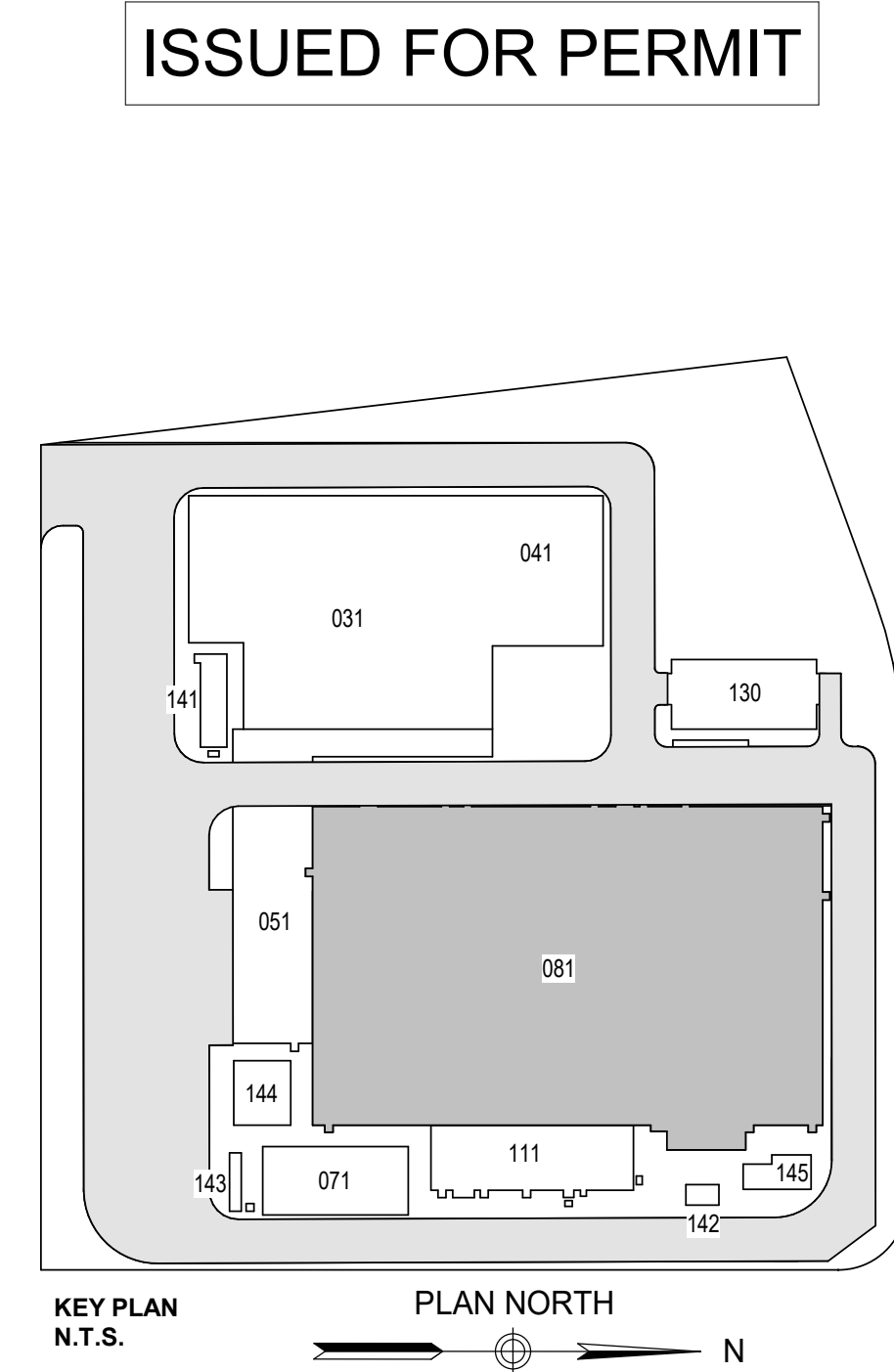
31-45 20th Avenue, Astoria, Queens NY 11105
Block #850 - Lot #310 - BIN #4624437

CONVERTER BUILDING
PILE LOCATION PLAN



DATE 11/08/22
PROJECT NO 105121
DRAWING BY C.SPAULDING
CHECKED BY M.SCHWABAUER
DRAWING NO
FO-102.00
CADD FILE NO
Astoria/CHA-KIE-081-F-1-M3-S-001.rvt
10 of 25

1. SEE DRAWING FO-010.00 FOR STRUCTURE NOTES.
2. C-J-SXX ON PLAN DENOTES CONCRETE TYPICAL DETAILS, SEE SHEET FO-605.



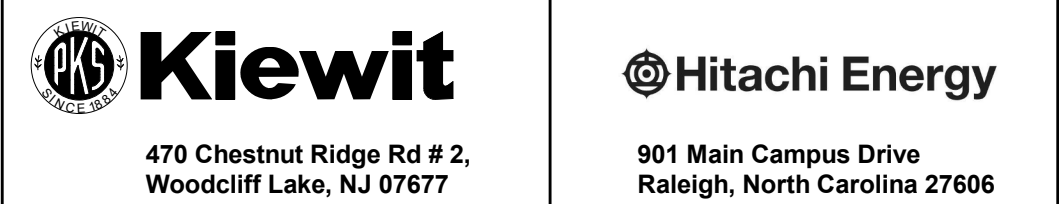
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B	FINAL SUBMISSION	CMS	WA	11/08/2022
A	INTERIM SUBMISSION	DC	SD	08/29/2022
REV	DESCRIPTION	DRW BY	CHK BY	DATE



PROJECT


**Champlain Hudson
Power Express**

**Astoria HVDC
Converter Station**

31-45 20th Avenue, Astoria, Queens NY 11105
Block #850 - Lot #310 - BIN #4624437

CONVERTER BUILDING PILE CAP PLAN

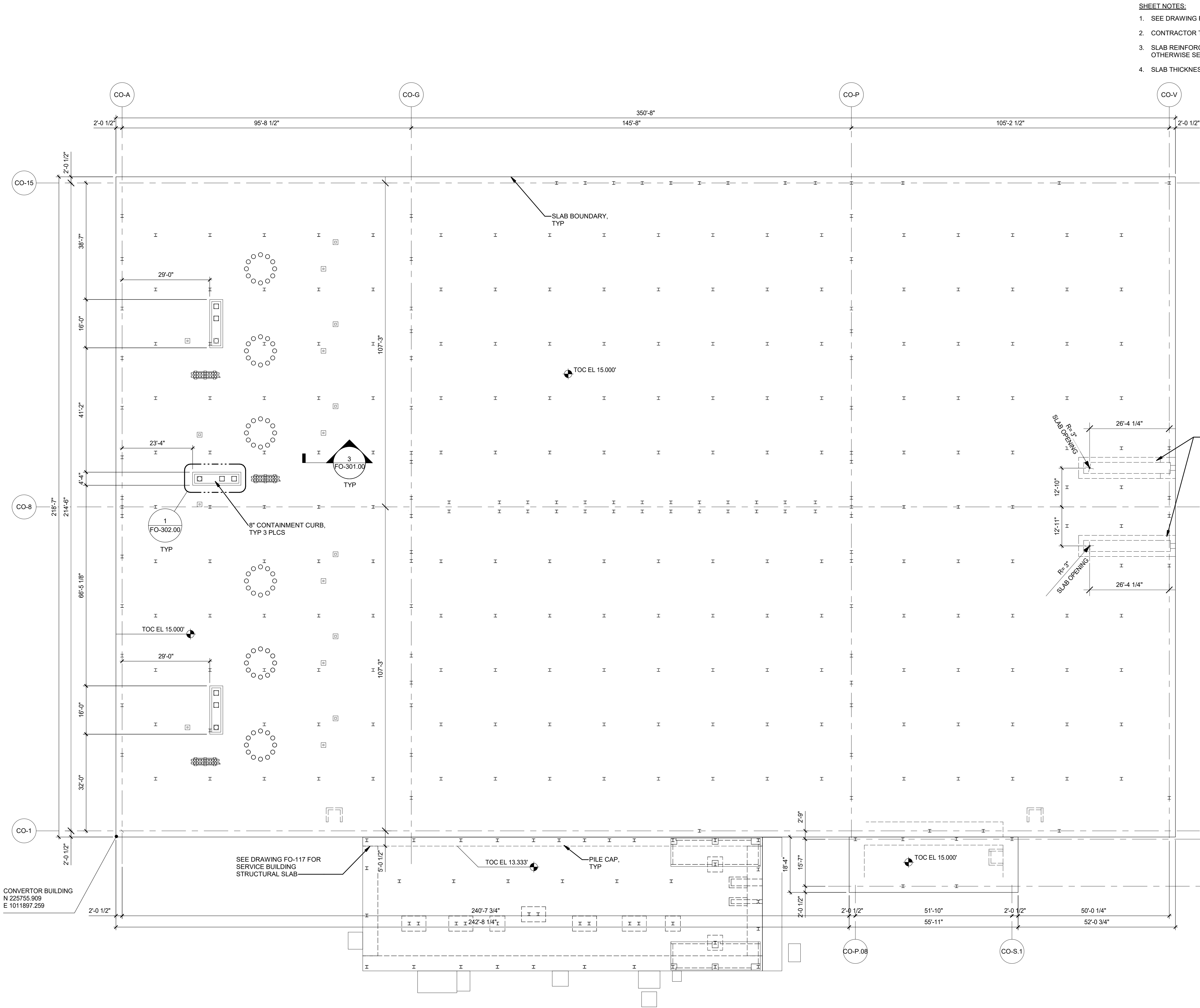


DATE	11/08/22
PROJECT NO	105121
DRAWING BY	C.SPAULDING
CHECKED BY	M.SCHWABAUER
DRAWING NO	
FO-103.00	
CADD FILE NO	11 of 25
Autodesk Docs/CADPE Austria/CH4-KIE-081-F-1-M3-S-001.nt	

11/10/2022 8:38:17 AM

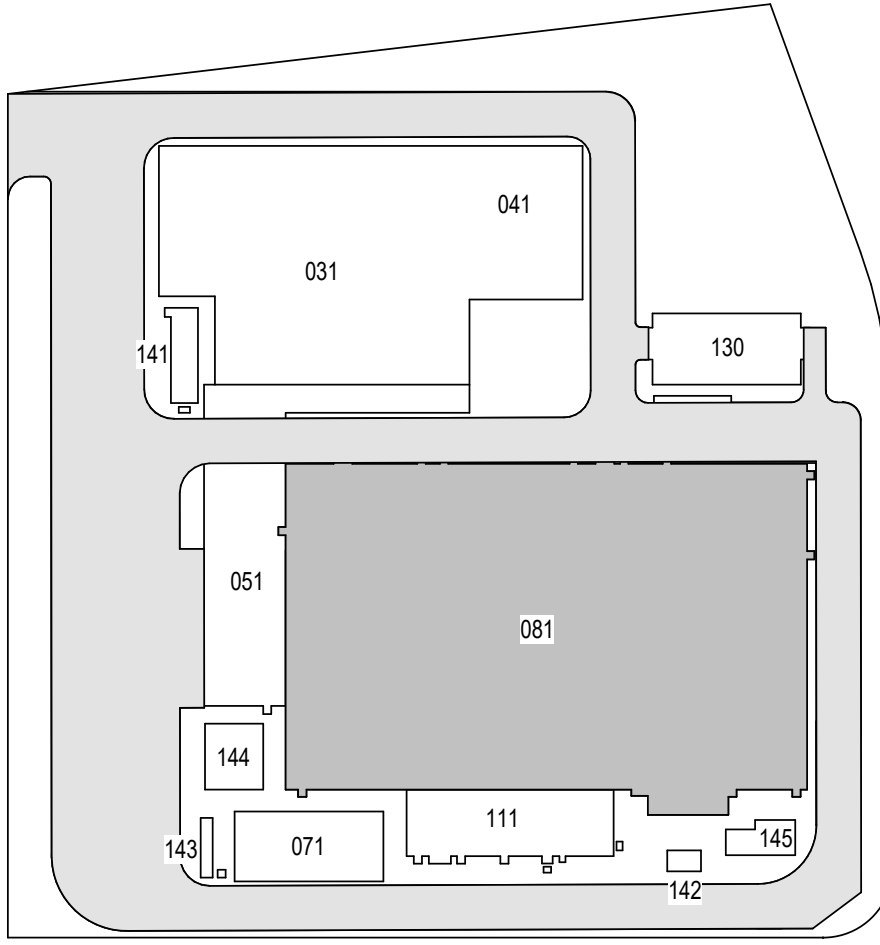
BUILDING COLUMN ANCHOR BOLT TABLE (SEE FO-601.00 FOR ANCHOR BOLT SCHEDULE LEGEND)														
EQUIPMENT/BUILDING	MARK	QTY	TYPE	ANCHOR TYPE	D	L	E	T	GROUT THK.	GRADE	COATING			
CONVERTER BUILDING	FO-081	408	AB-01	Cast-In-Place	1 1/2"	2'-3"	1'-6"	11 1/2"	1 1/2"					

11/10/2022 8:38:20 AM



- SHEET NOTES:**
1. SEE DRAWING FO-010.00 FOR STRUCTURE NOTES.
 2. CONTRACTOR TO COORDINATE CONSTRUCTION JOINTS WITH THE EOR.
 3. SLAB REINFORCEMENT TO BE #6 @ 12" OC TOP & BOTTOM, UNLESS NOTED OTHERWISE SEE SECTION 3/FO-301
 4. SLAB THICKNESS = 20" UNLESS NOTED OTHERWISE.

ISSUED FOR PERMIT



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N.T.S.

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B	FINAL SUBMISSION	CMS	WA	11/08/2022
A	INTERIM SUBMISSION	DC	SD	08/29/2022
REV	DESCRIPTION	DRW BY	CHK BY	DATE

Kiewit
470 Chestnut Ridge Rd # 2,
Woodcliff Lake, NJ 07677

Hitachi Energy
901 Main Campus Drive
Raleigh, North Carolina 27606

PROJECT

CHPE
Champlain Hudson
Power Express

**Astoria HVDC
Converter Station**

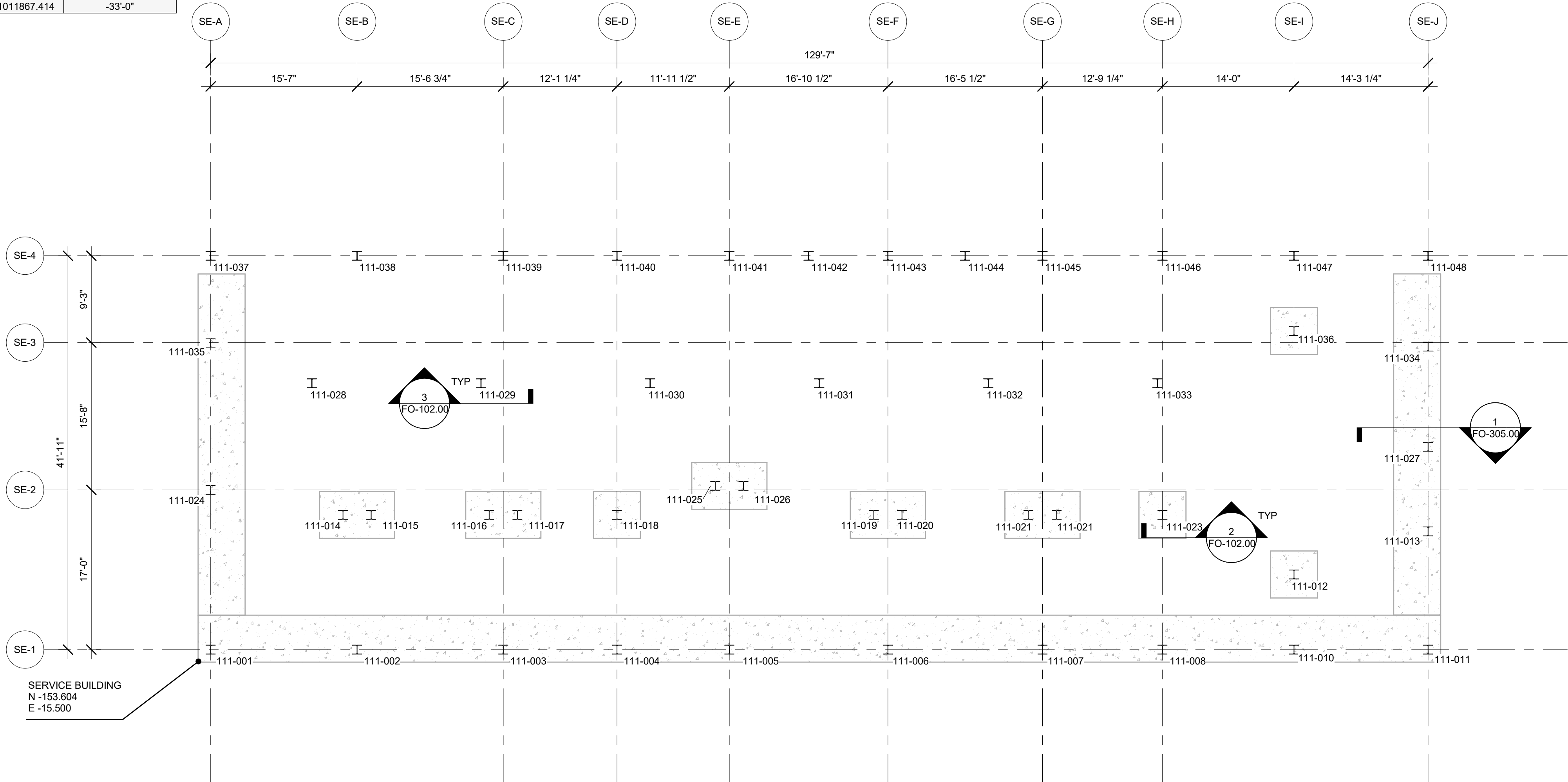
31-45 20th Avenue, Astoria, Queens NY 11105
Block #850 - Lot #310 - BIN #4624437

**CONVERTER BUILDING
STRUCTURAL SLAB PLAN**

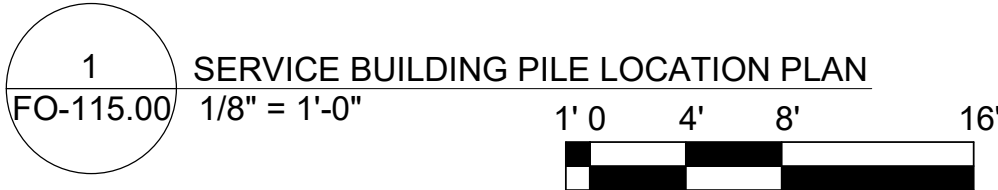


DATE 11/08/22
PROJECT NO 105121
DRAWING BY C.SPAULDING
CHECKED BY M.SCHWABAUER
DRAWING NO
FO-104.00
CADD FILE NO
Astoria/CHA-KIE-081-F-1-M3-S-001.rvt 12 of 25

SERVICE BUILDING PILE LOCATION TABLE					SERVICE BUILDING PILE LOCATION TABLE				
PILE NUMBER	TYPE	NORTHING	EASTING	ESTIMATED TIP ELEVATION *	PILE NUMBER	TYPE	NORTHING	EASTING	ESTIMATED TIP ELEVATION *
111-001	HP	225808.749	1011763.387	-33'-0"	111-028	HP	225820.150	1011791.482	-33'-0"
111-002	HP	225797.335	1011773.995	-33'-0"	111-029	HP	225806.965	1011803.736	-33'-0"
111-003	HP	225785.935	1011784.590	-33'-0"	111-030	HP	225793.781	1011815.990	-33'-0"
111-004	HP	225777.069	1011792.830	-33'-0"	111-031	HP	225780.596	1011828.245	-33'-0"
111-005	HP	225768.310	1011800.971	-33'-0"	111-032	HP	225767.411	1011840.499	-33'-0"
111-006	HP	225755.949	1011812.459	-33'-0"	111-033	HP	225754.226	1011852.753	-33'-0"
111-007	HP	225743.894	1011823.664	-33'-0"	111-034	HP	225735.786	1011875.227	-33'-0"
111-008	HP	225734.539	1011832.358	-33'-0"	111-035	HP	225830.988	1011787.314	-33'-0"
111-009	HP	225724.284	1011841.889	-33'-0"	111-036	HP	225747.374	1011866.732	-33'-0"
111-010	HP	225724.284	1011841.889	-33'-0"	111-037	HP	225837.285	1011794.090	-33'-0"
111-011	HP	225713.831	1011851.604	-33'-0"	111-038	HP	225825.871	1011804.699	-33'-0"
111-012	HP	225729.730	1011847.749	-33'-0"	111-039	HP	225814.471	1011815.293	-33'-0"
111-013	HP	225722.397	1011860.821	-33'-0"	111-040	HP	225805.605	1011823.534	-33'-0"
111-014	HP	225808.191	1011783.473	-33'-0"	111-041	HP	225796.846	1011831.675	-33'-0"
111-015	HP	225805.994	1011785.515	-33'-0"	111-042	HP	225790.666	1011837.419	-33'-0"
111-016	HP	225796.792	1011794.068	-33'-0"	111-043	HP	225784.485	1011843.163	-33'-0"
111-017	HP	225794.594	1011796.110	-33'-0"	111-044	HP	225778.457	1011848.765	-33'-0"
111-018	HP	225786.827	1011803.329	-33'-0"	111-045	HP	225772.430	1011854.367	-33'-0"
111-019	HP	225766.806	1011821.937	-33'-0"	111-046	HP	225763.075	1011863.061	-33'-0"
111-020	HP	225764.608	1011823.980	-33'-0"	111-047	HP	225752.820	1011872.592	-33'-0"
111-021	HP	225754.750	1011833.142	-33'-0"	111-048	HP	225742.367	1011882.308	-33'-0"
111-022	HP	225752.553	1011835.184	-33'-0"	Grand total: 48				
111-023	HP	225744.297	1011842.857	-33'-0"					
111-024	HP	225820.322	1011775.839	-33'-0"					
111-025	HP	225781.265	1011812.707	-33'-0"					
111-026	HP	225779.068	1011814.750	-33'-0"					
111-027	HP	225728.524	1011867.414	-33'-0"					



SERVICE BUILDING
N -153.604
E -15.500



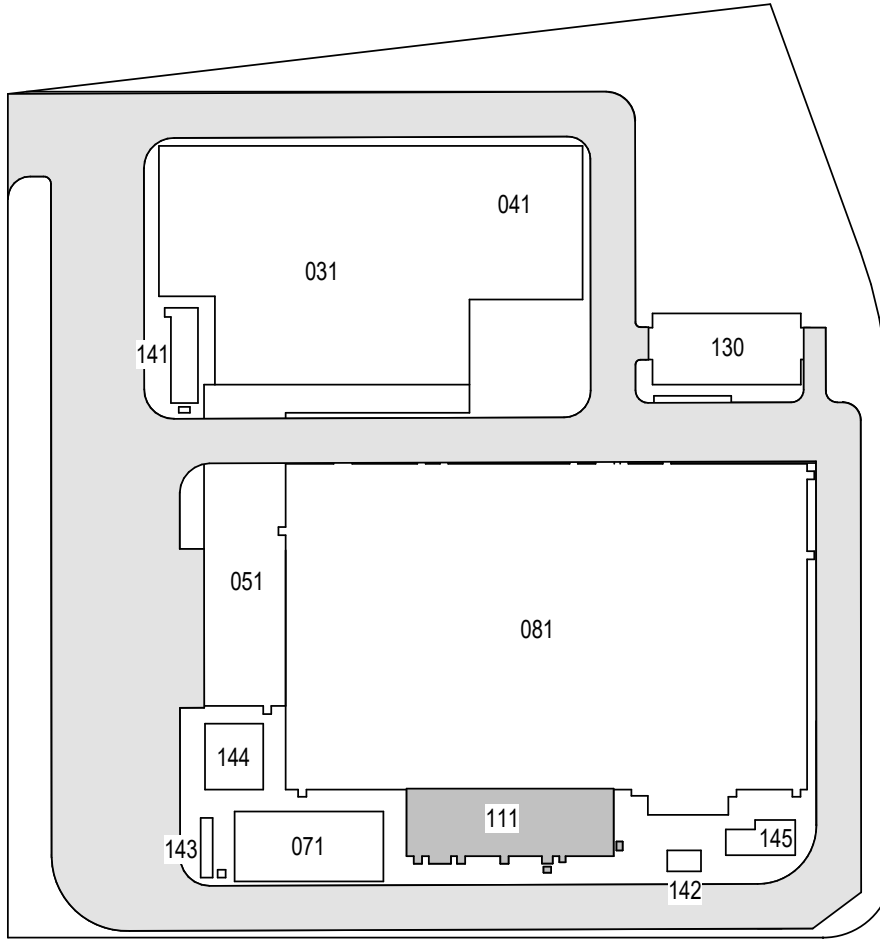
SHEET NOTES:

- SEE DRAWING FO-015.00 FOR STRUCTURE NOTES.
- ALL PILES SHALL BE DRIVEN 5'-0" INTO THE DECOMPOSED ROCK. THE ESTIMATED TIP ELEVATION SHOULD BE USED FOR PLANNING PURPOSE ONLY. SEE GEOTECHNICAL REPORT FOR MORE INFORMATION.

SHEET LEGEND:

- HP 12X53 PILE (HP) WITH 6" EMBEDMENT

ISSUED FOR PERMIT



KEY PLAN
N.T.S.

PLAN NORTH
N

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Land Surveying, P.C.

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New York, NY 10001

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A	INTERIM SUBMISSION	WA	CMS	08/29/2022
REV	DESCRIPTION	DRW BY	CHK BY	DATE

Kiewit
470 Chestnut Ridge Rd # 2,
Woodcliff Lake, NJ 07677

Hitachi Energy
901 Main Campus Drive
Raleigh, North Carolina 27606

PROJECT

CHPE
Champlain Hudson
Power Express

Astoria HVDC
Converter Station

31-45 20th Avenue, Astoria, Queens NY 11105
Block #850 - Lot #310 - BIN #4624437

SERVICE BUILDING PILE
LOCATION PLAN



DATE 11/08/2022
PROJECT NO 105121
DRAWING BY C.SPAULDING
CHECKED BY M.SCHWABAUER

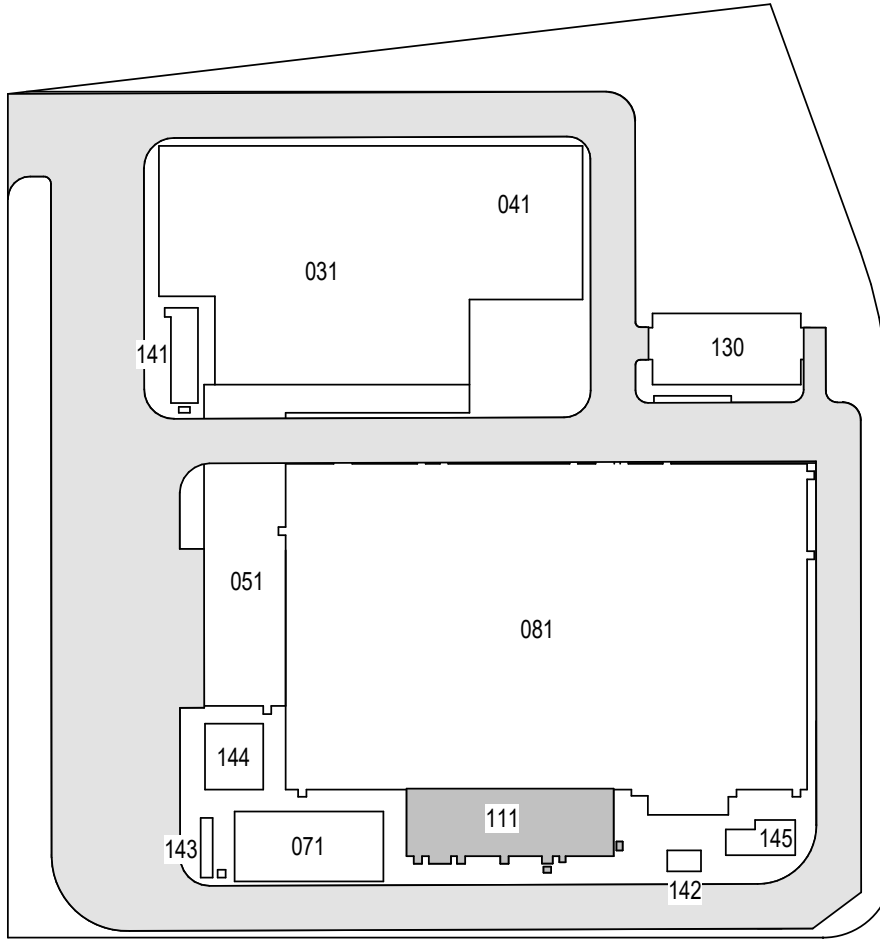
DRAWING NO

FO-115.00

CADD FILE NO
Astoria/CHA-KIE-115-F-M3-S-001.rvt
13 of 25

SHEET NOTES:
1. SEE DRAWING FO-015.00 FOR STRUCTURE NOTES.

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A	INTERIM SUBMISSION	WA	CMS	08/29/2022
REV	DESCRIPTION	DRW BY	CHK BY	DATE

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470 Chestnut Ridge Rd # 2,
Woodcliff Lake, NJ 07677

Hitachi Energy
901 Main Campus Drive
Raleigh, North Carolina 27606

PROJECT

CHPE
Champlain Hudson
Power Express

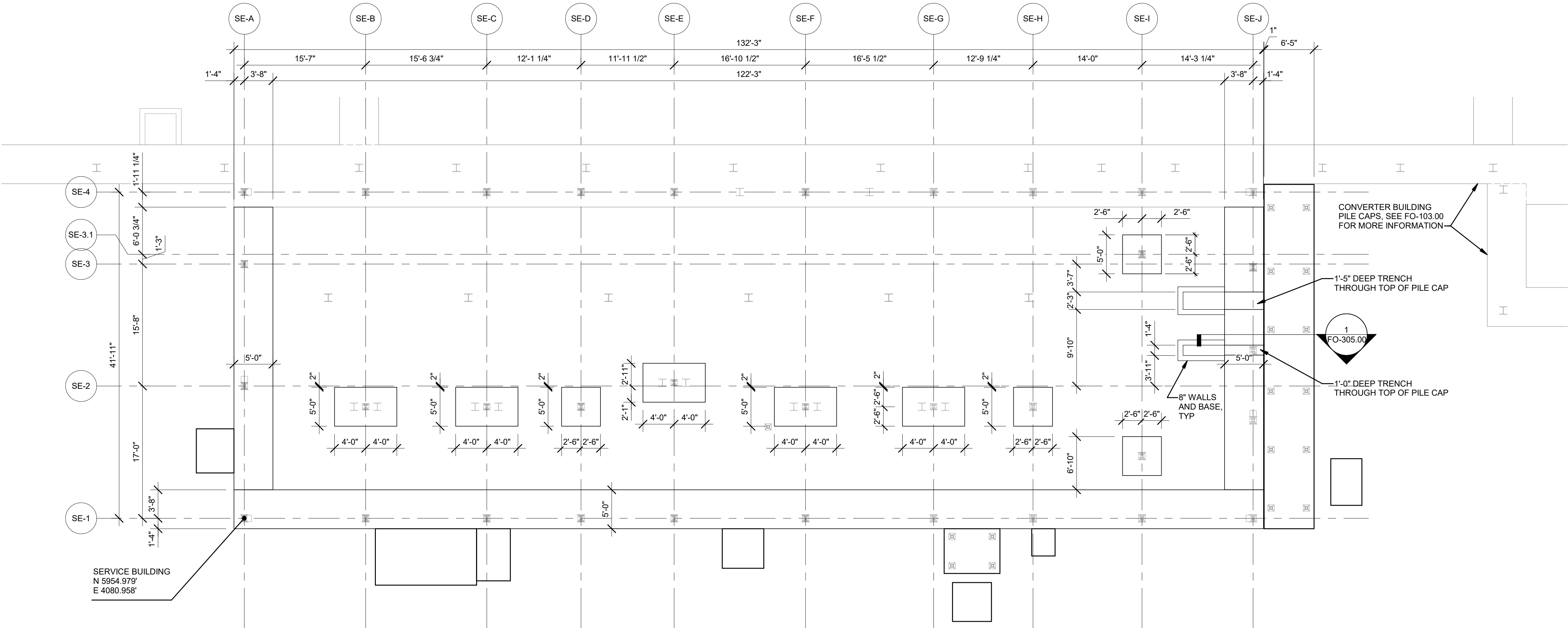
**Astoria HVDC
Converter Station**

31-45 20th Avenue, Astoria, Queens NY 11105
Block #850 - Lot #310 - BIN #4624437

**SERVICE BUILDING PILE
CAP PLAN**



DATE 11/08/2022
PROJECT NO 105121
DRAWING BY C.SPAULDING
CHECKED BY M.SCHWABAUER
DRAWING NO
FO-116.00
CADD FILE NO
Astoria-HVDC-CHPE
Astoria-CHA-KIE-11-F-1-M3-S-001.rvt
14 of 25



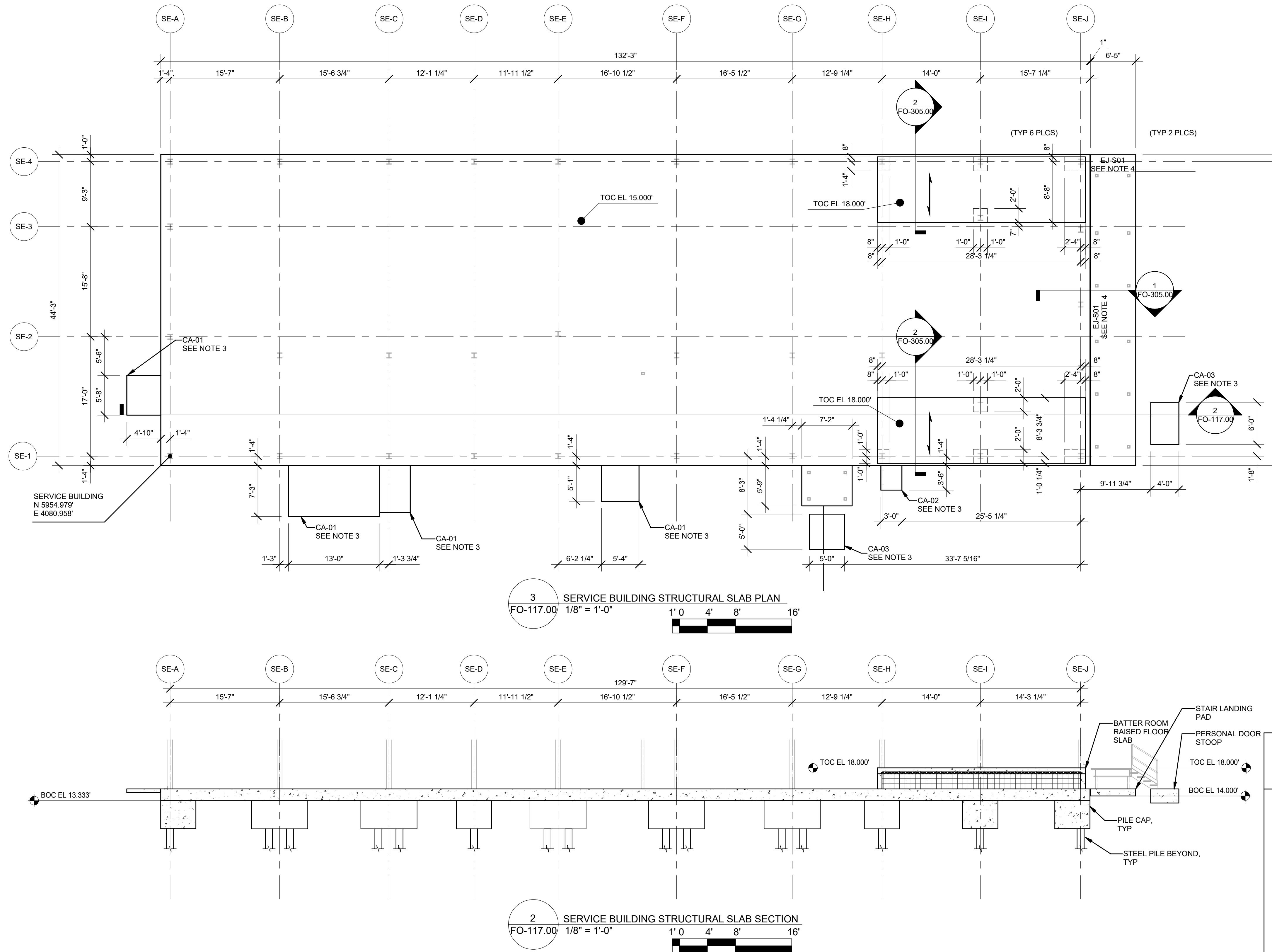
SERVICE BUILDING
N 5954.979
E 4080.958

1
FO-116.00
SERVICE BUILDING PILE CAP PLAN
1/8" = 1'-0"



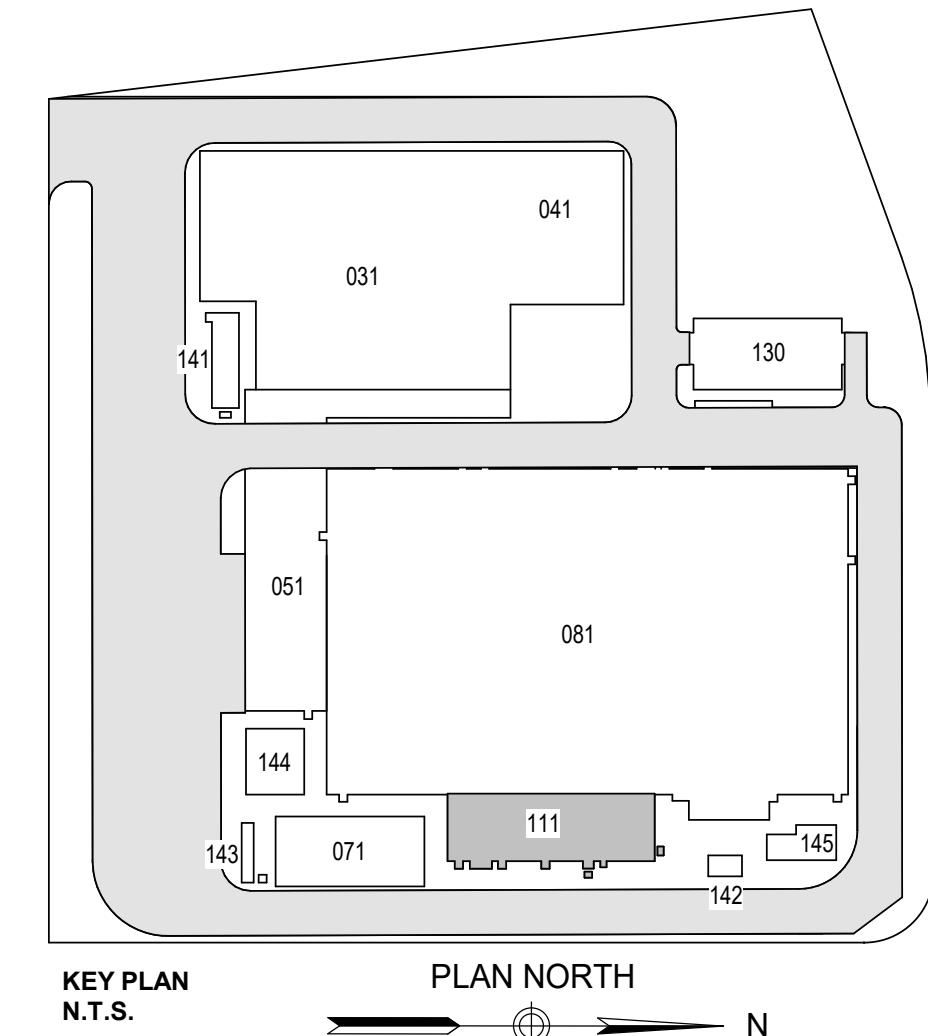
PLAN NORTH





- SHEET NOTES:**
1. SEE GENERAL NOTES, LEGEND, AND ABBREVIATIONS.
 2. SEE FOUNDATION LOCATION PLANS, CONCRETE TYPICAL DETAILS, AND ANCHOR BOLT TYPICAL DETAILS.
 3. CA-XX ON PLAN DENOTES CONCRETE TYPICAL DETAILS, SEE DRAWING FO-602.00.
 4. CCJ-XXX AND/OR EJ-XXX ON PLAN DENOTES CONCRETE JOINT TYPICAL DETAILS, SEE DRAWING FO-605.00.
 5. SEE CIVIL SITE GRADING DRAWINGS FOR FINISHED GRADE ELEVATIONS.
 6. SLAB REINFORCEMENT TO BE #6 @ 12" OC TOP & BOTTOM, UNLESS NOTED OTHERWISE SEE SECTION 1/FO-301.00
 7. SLAB THICKNESS T = 18" NORMAL UNLESS NOTED OTHERWISE.

ISSUED FOR PERMIT



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370 7th Avenue
SUITE 1604
New York, NY 10001

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REV	DESCRIPTION	DRW BY	CHK BY	DATE

Kiewit
470 Chestnut Ridge Rd # 2,
Woodcliff Lake, NJ 07677

Hitachi Energy
901 Main Campus Drive
Raleigh, North Carolina 27606

PROJECT

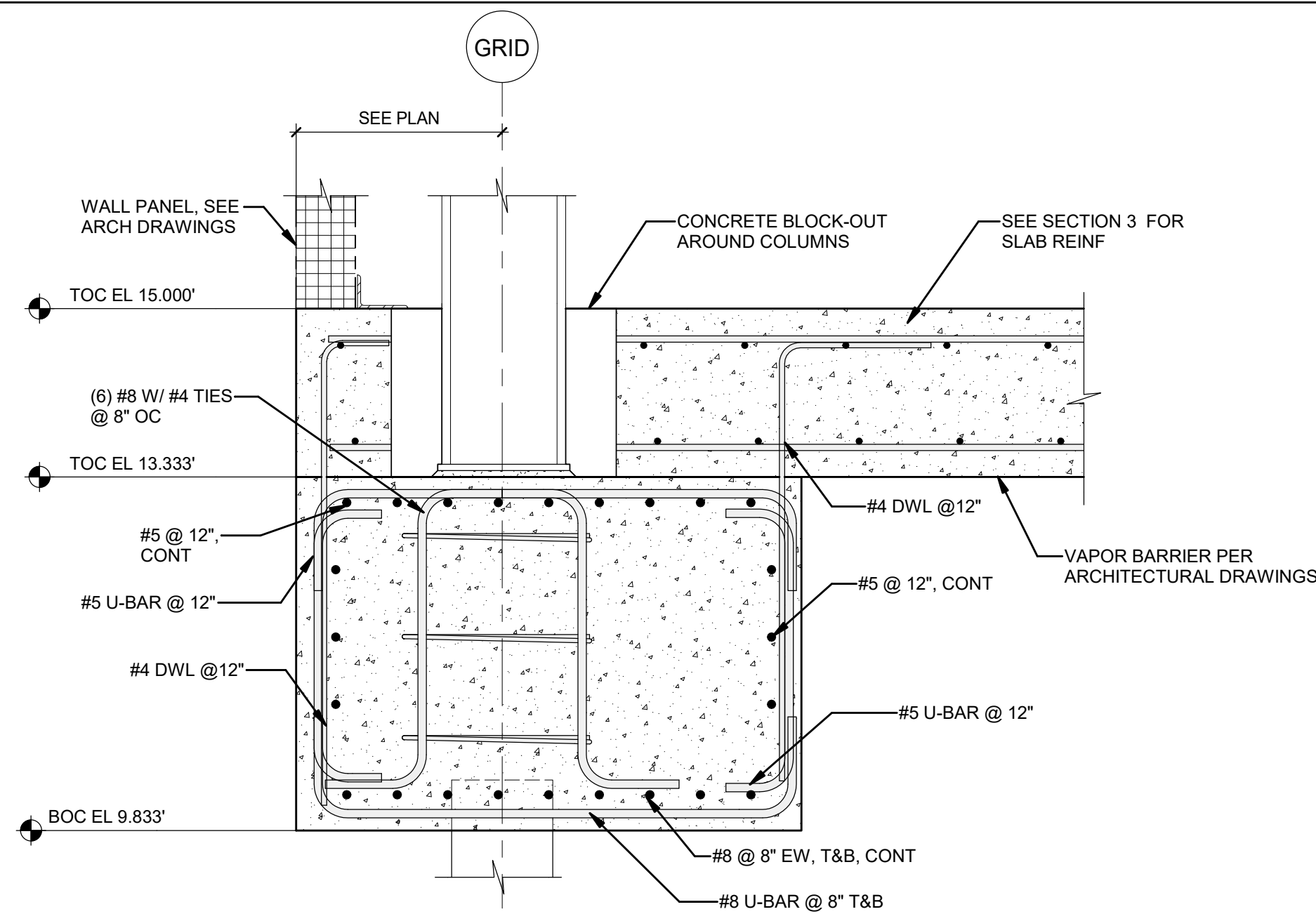
CHPE
Champlain Hudson
Power Express

Astoria HVDC Converter Station
31-45 20th Avenue, Astoria, Queens NY 11105
Block #850 - Lot #310 - BIN #4624437

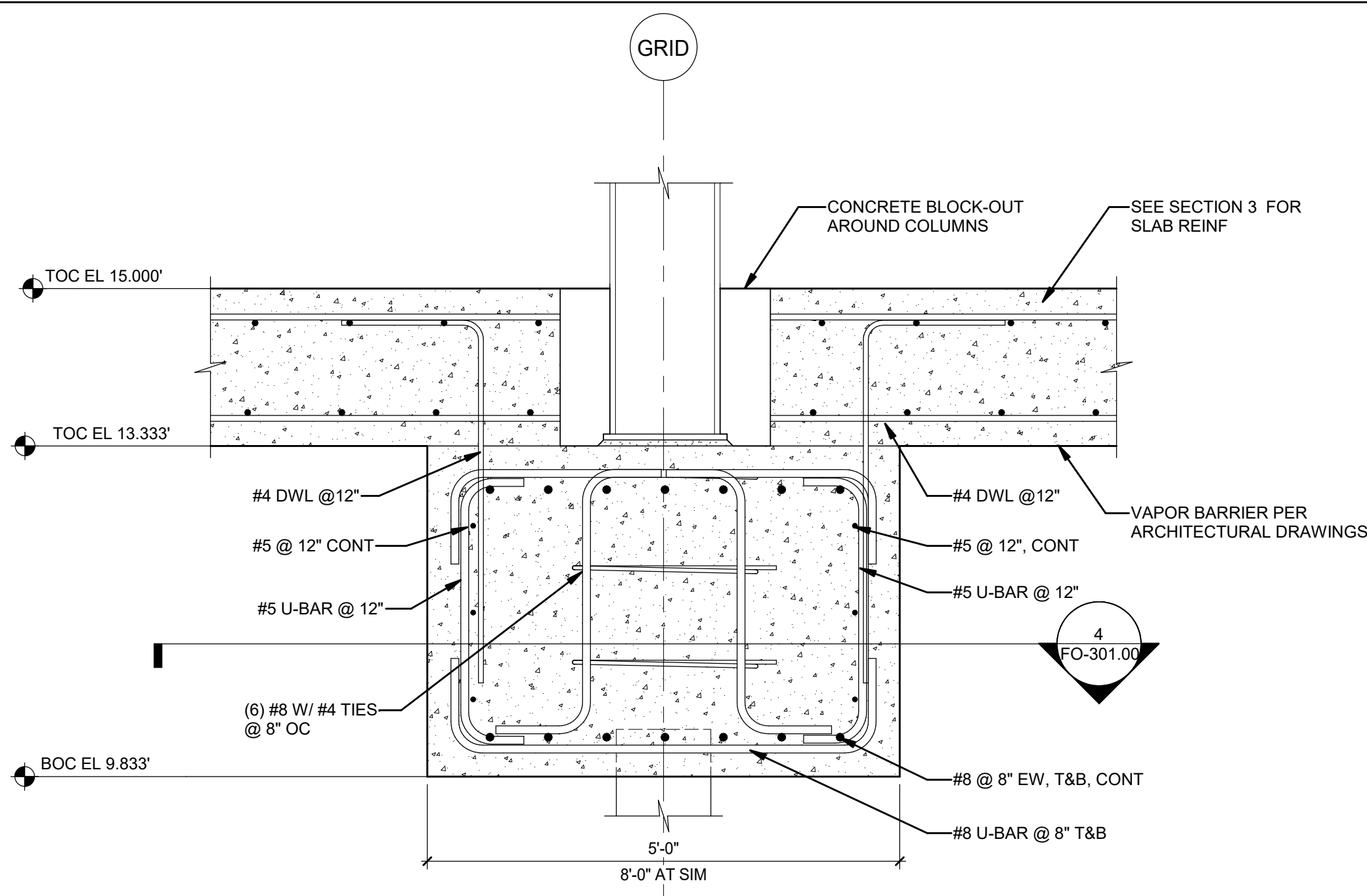
**SERVICE BUILDING
STRUCTURAL SLAB PLAN**

STATE OF NEW YORK
JAMES M. HOGAN, JR.
JULY 1, 2013
REGISTERED PROFESSIONAL ENGINEER

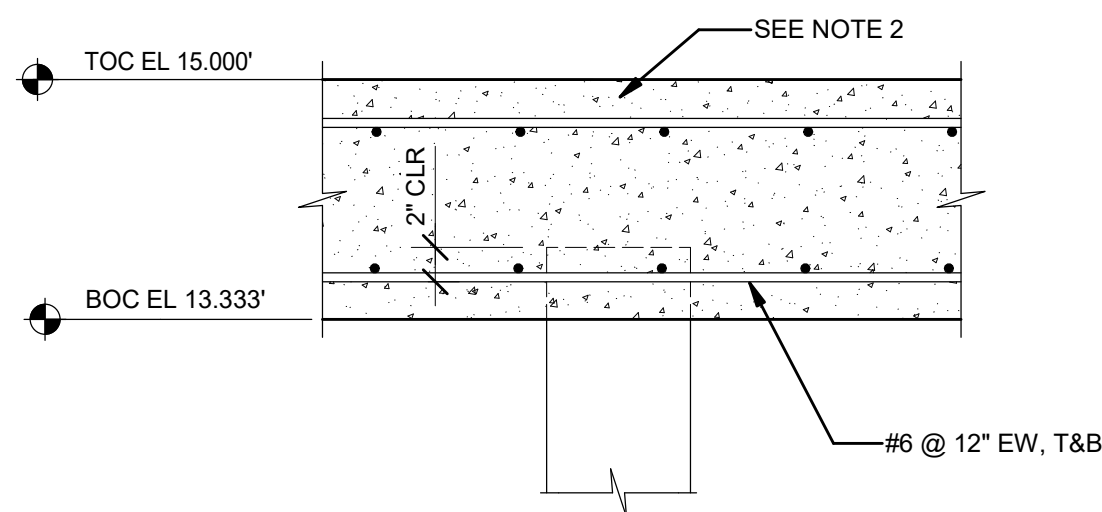
DATE: 11/08/2022
PROJECT NO: 105121
DRAWING BY: C.SPAULDING
CHECKED BY: M.SCHWABAUER
DRAWING NO: **FO-117.00**
CADD FILE NO: Astoria/CHA-KIE-11-F-1-M3-S-001.rvt
15 of 25



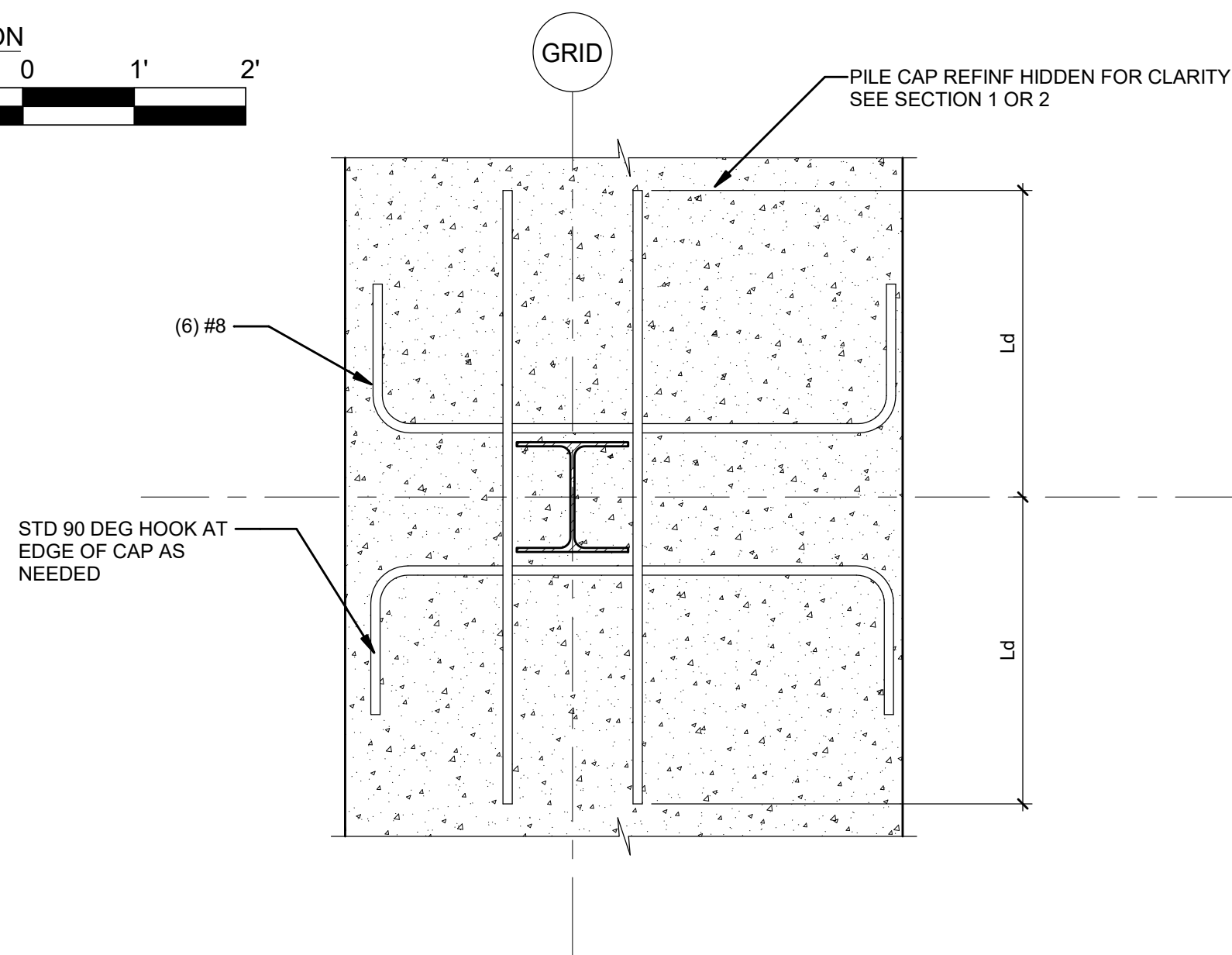
1 EXTERIOR PILE CAP SECTION
FO-103.00 3/4" = 1'-0"



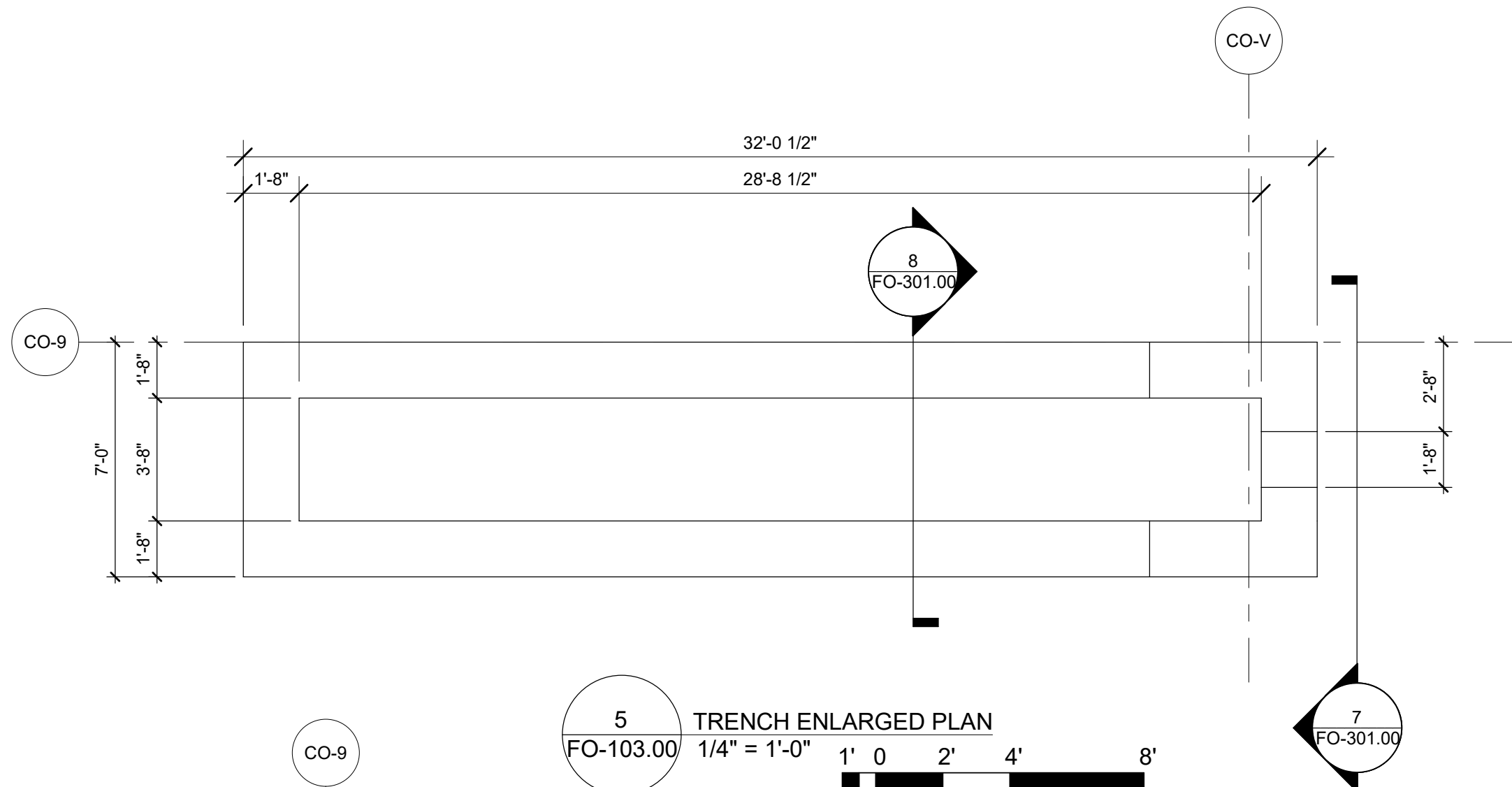
2 INTERIOR PILE CAP SECTION
FO-103.00 3/4" = 1'-0"



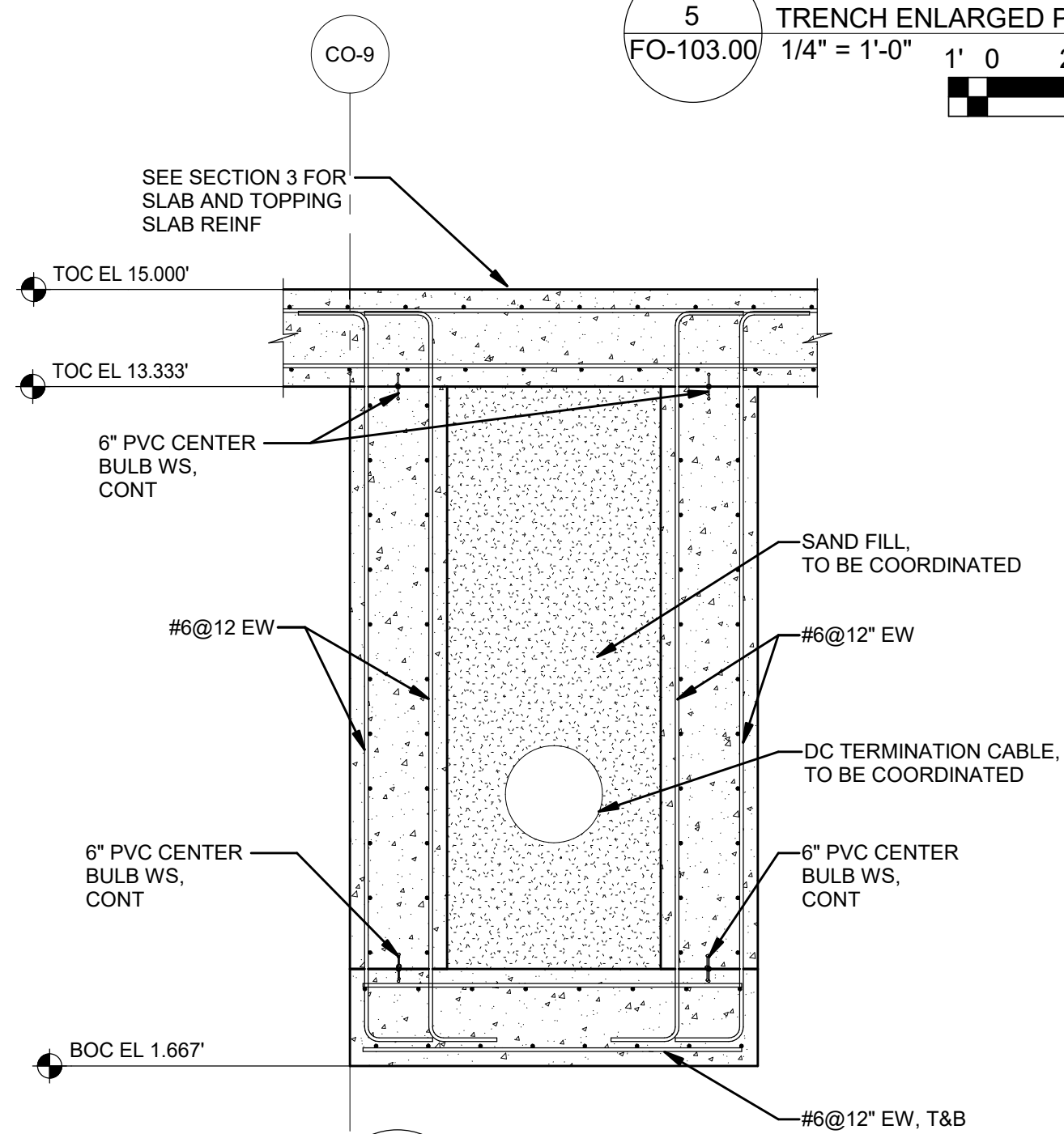
3 TYPICAL STRUCTURAL SLAB SECTION
FO-104.00 3/4" = 1'-0"



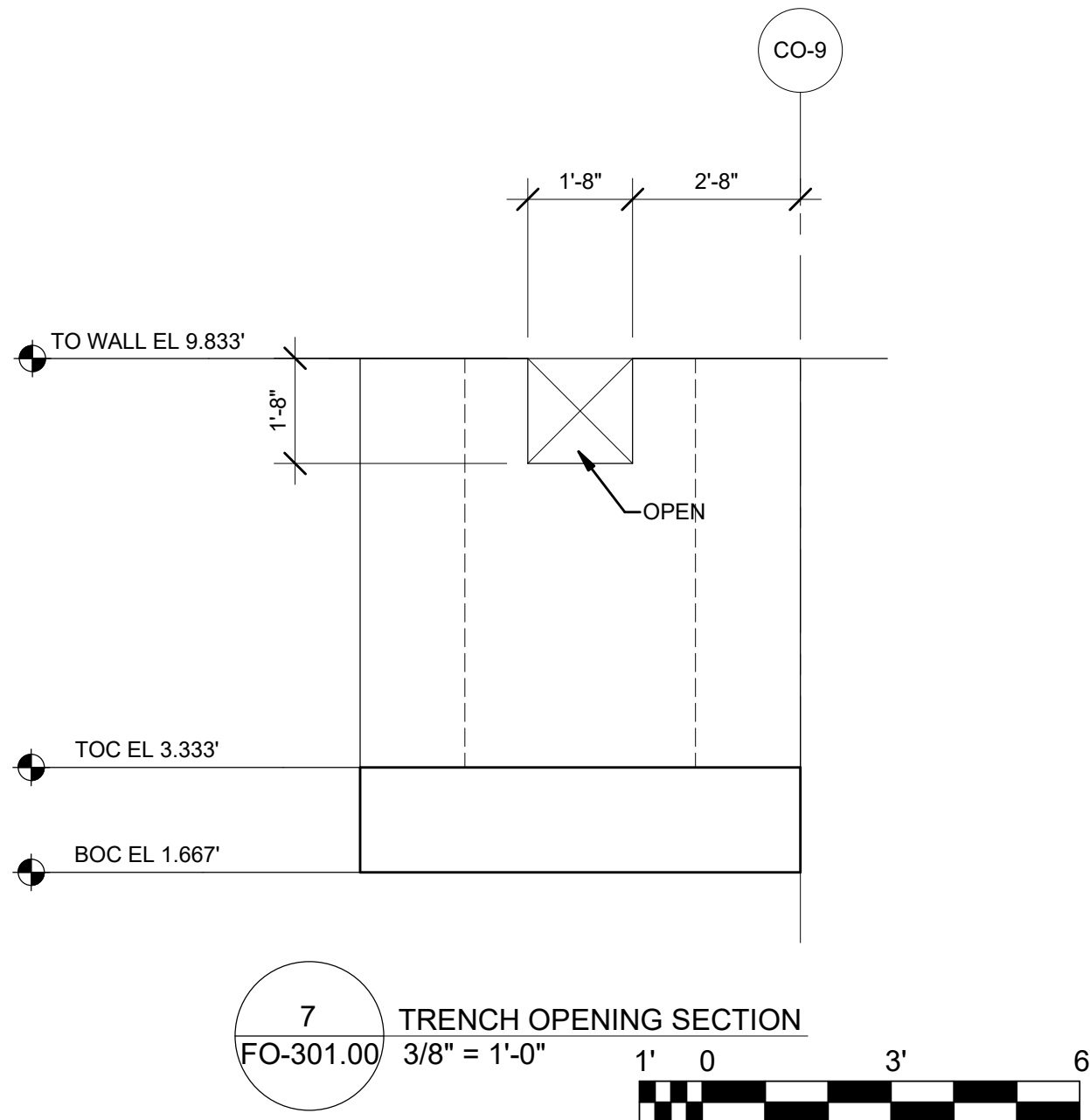
4 PILE ADDITIONAL REBAR SECTION
FO-301.00 3/4" = 1'-0"



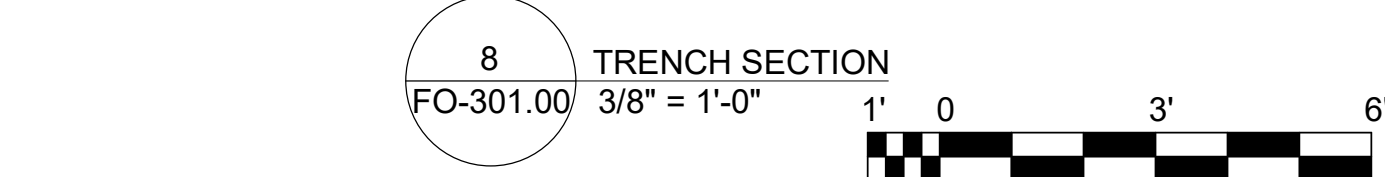
5 TRENCH ENLARGED PLAN
FO-103.00 1/4" = 1'-0"



6 ANCHOR BOLT DETAIL
FO-103.00 1 1/2" = 1'-0"



7 TRENCH OPENING SECTION
FO-301.00 3/8" = 1'-0"



8 TRENCH SECTION
FO-301.00 3/8" = 1'-0"

- SHEET NOTES:
1. SEE DRAWING FO-010.00 FOR STRUCTURE NOTES.
 2. EACH MESH OF THE TOP LAYER OF THE REINFORCEMENT SHALL BE WELDED TOGETHER IN JOINTS WITH A MAXIMUM 3'-11" AND INSTALLED TO PRODUCE A CONTINUOUS AND SMOOTH GROUND PLANE, WHICH IN TURN SHALL BE PART OF THE EQUIPOTENTIAL BONDING SYSTEM AND BE CONNECTED TO THE BUILDING RING CONDUCTOR BY NORMALLY 185 MM2 (OR AS SPECIFIED BY HITACHI ENERGY) COPPER WIRE AT MAXIMUM 32'-9" SPACING AND TO THE INSIDE STEEL SHEET CLADDING OF THE WALLS EVERY 3'-11" FT, THUS FORMING PART OF THE REACTOR HALL'S SHIELDING PERFORMANCE (95 MM2 FOR DC HALL).
 3. WATER PROOFING AND VAPOR BARRIER PER ARCHITECTURAL DRAWINGS.

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Woodcliff Lake, NJ 07677

Hitachi Energy
901 Main Campus Drive
Raleigh, North Carolina 27606

PROJECT

CHPE
Champlain Hudson
Power Express

Astoria HVDC
Converter Station

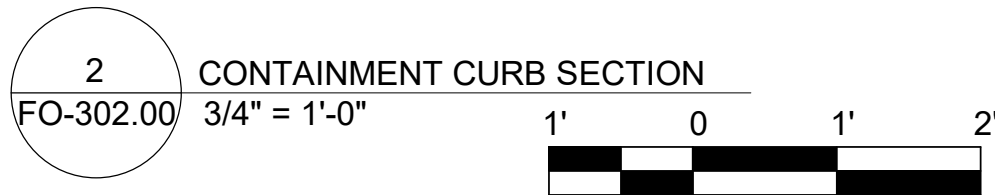
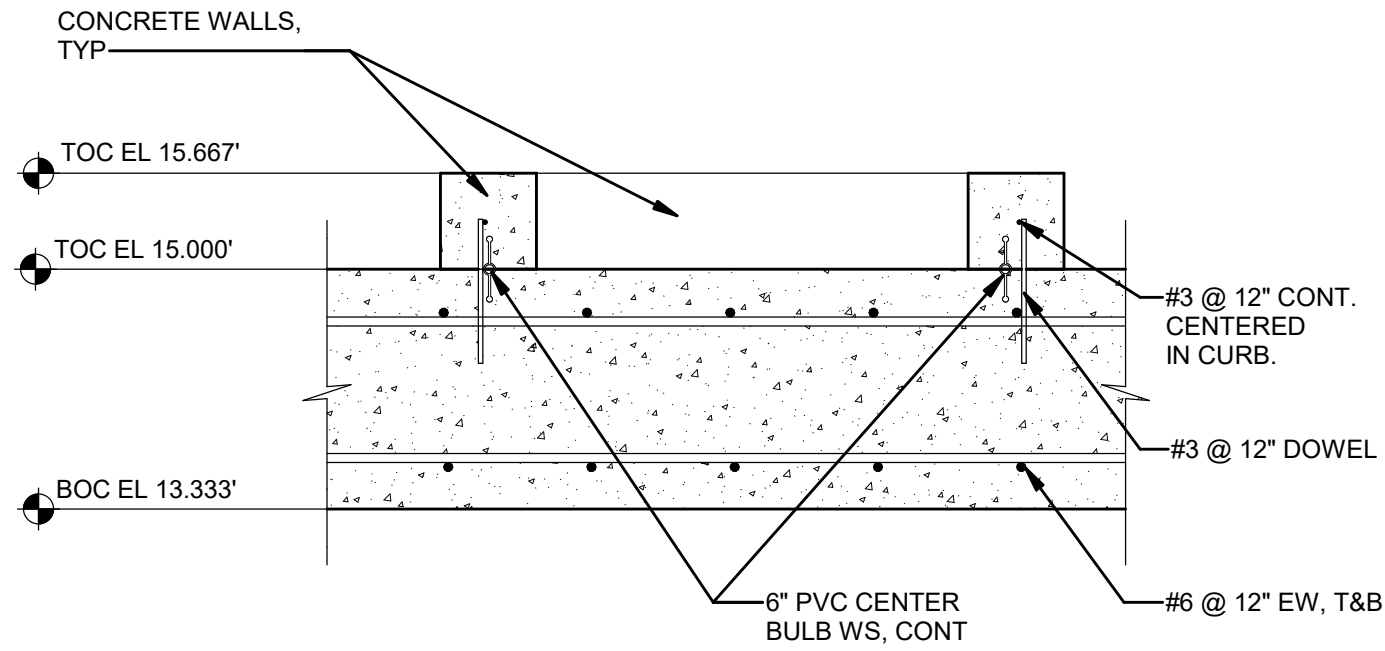
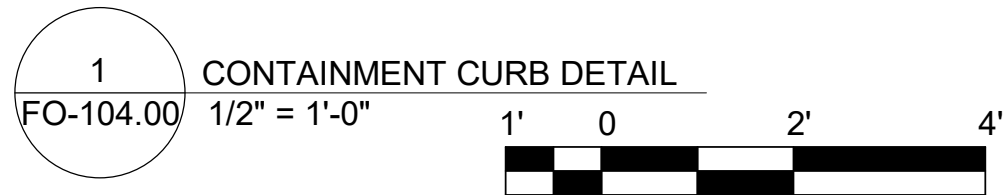
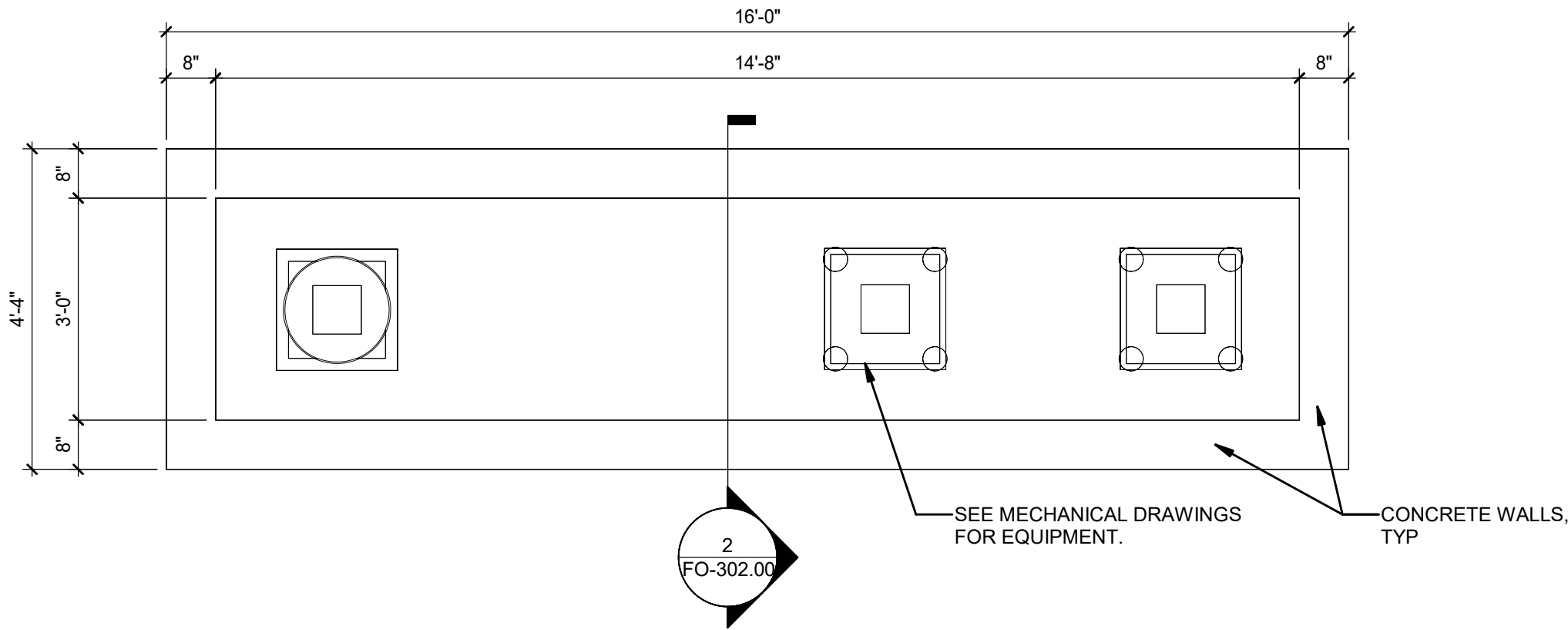
31-45 20th Avenue, Astoria, Queens NY 11105
Block #850 - Lot #310 - BIN #4624437

CONVERTER BUILDING
FOUNDATION SECTIONS
AND DETAILS

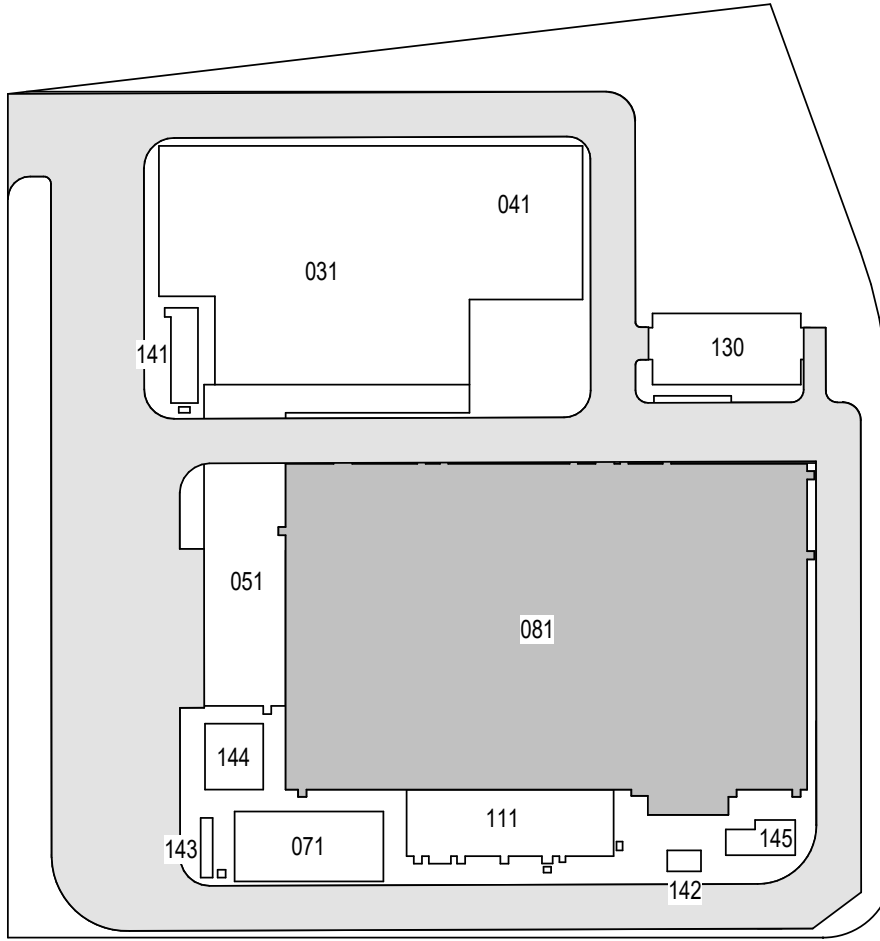


DATE 11/08/22
PROJECT NO 105121
DRAWING BY C.SPAULDING
CHECKED BY M.SCHWABAUER
DRAWING NO
FO-301.00
CADD FILE NO
Astoria/CHA-KIE-081-F-MS-S-001.rvt
16 of 25

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**CONVERTER BUILDING
CONTAINMENT CURBS
DETAIL AND SECTION**



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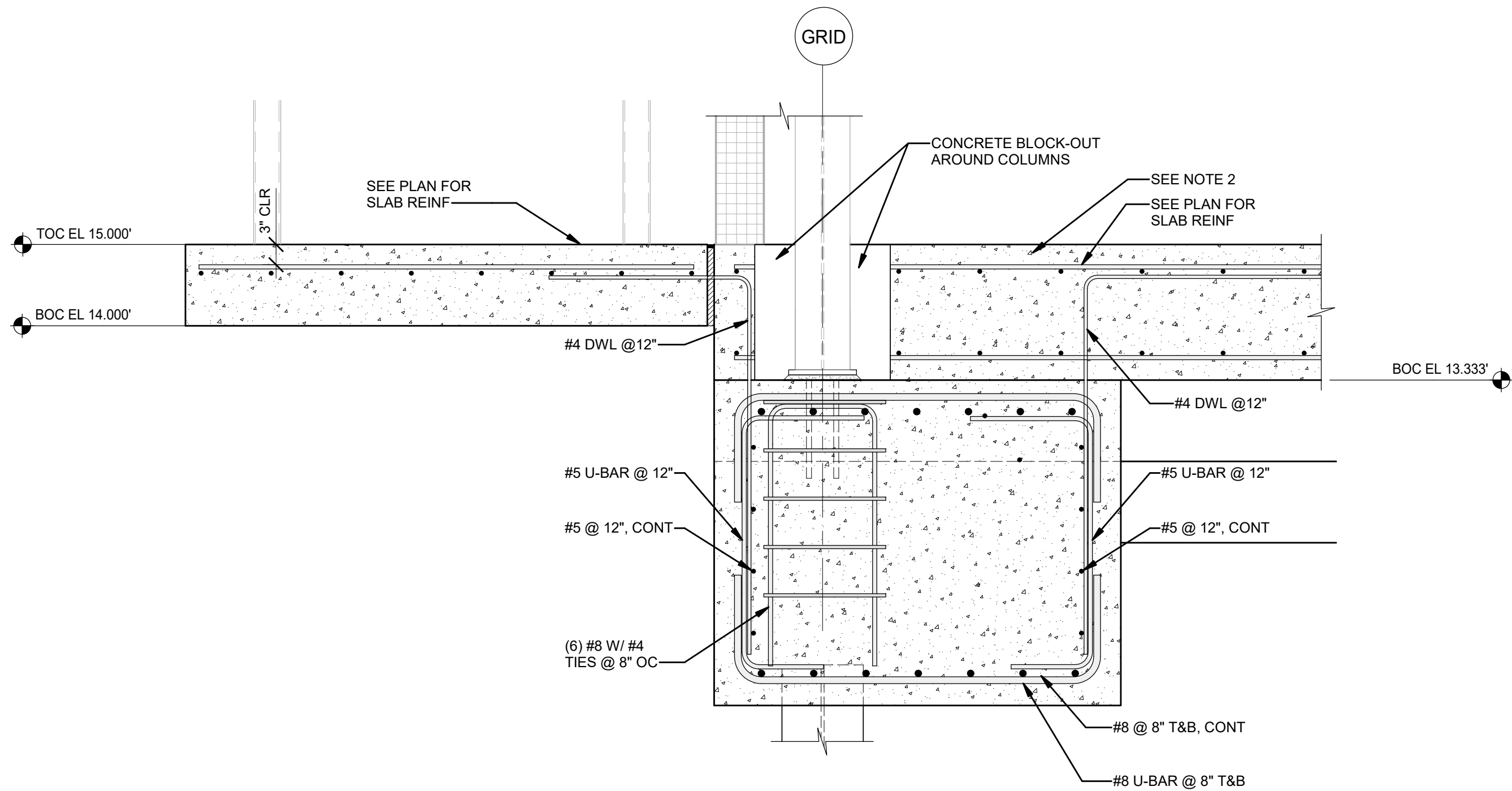
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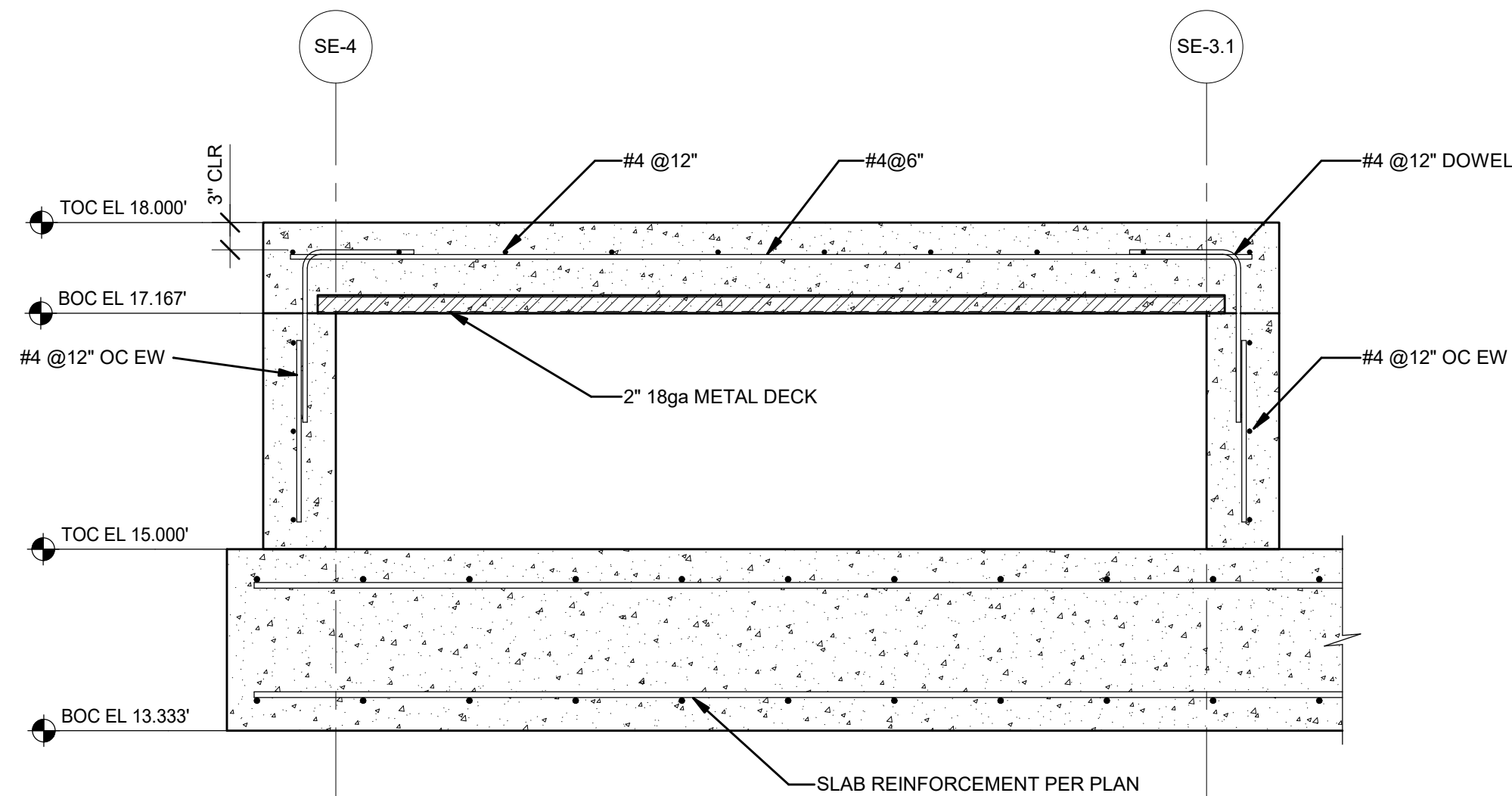
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17 of 25

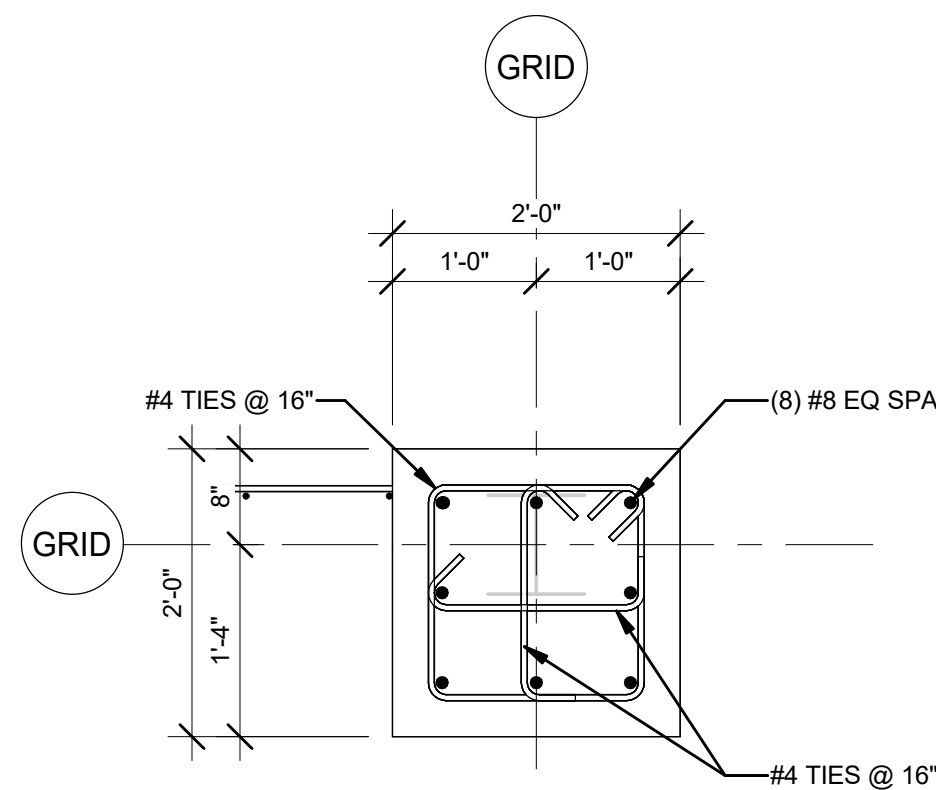
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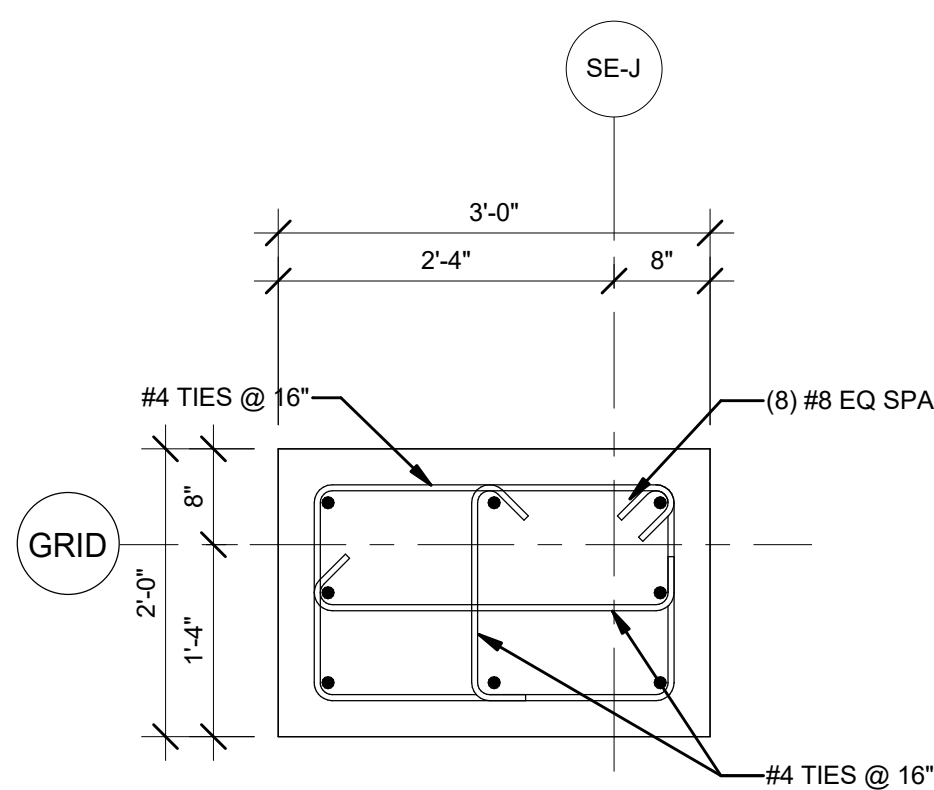
1
FO-305.00
3/4" = 1'-0"



2
FO-305.00
3/4" = 1'-0"



3
FO-305.00
3/4" = 1'-0"



4
FO-305.00
3/4" = 1'-0"

- SHEET NOTES:**
- SEE DRAWING FO-015.00 FOR STRUCTURE NOTES.
 - WELDED WIRE FABRIC CONNECTED TO STRUCTURAL SLAB REINFORCING, PILE CAP REINFORCING, AND PILES.
 - WATER PROOFING AND VAPOR BARRIER PER ARCHITECTURAL DRAWINGS.

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PROJECT
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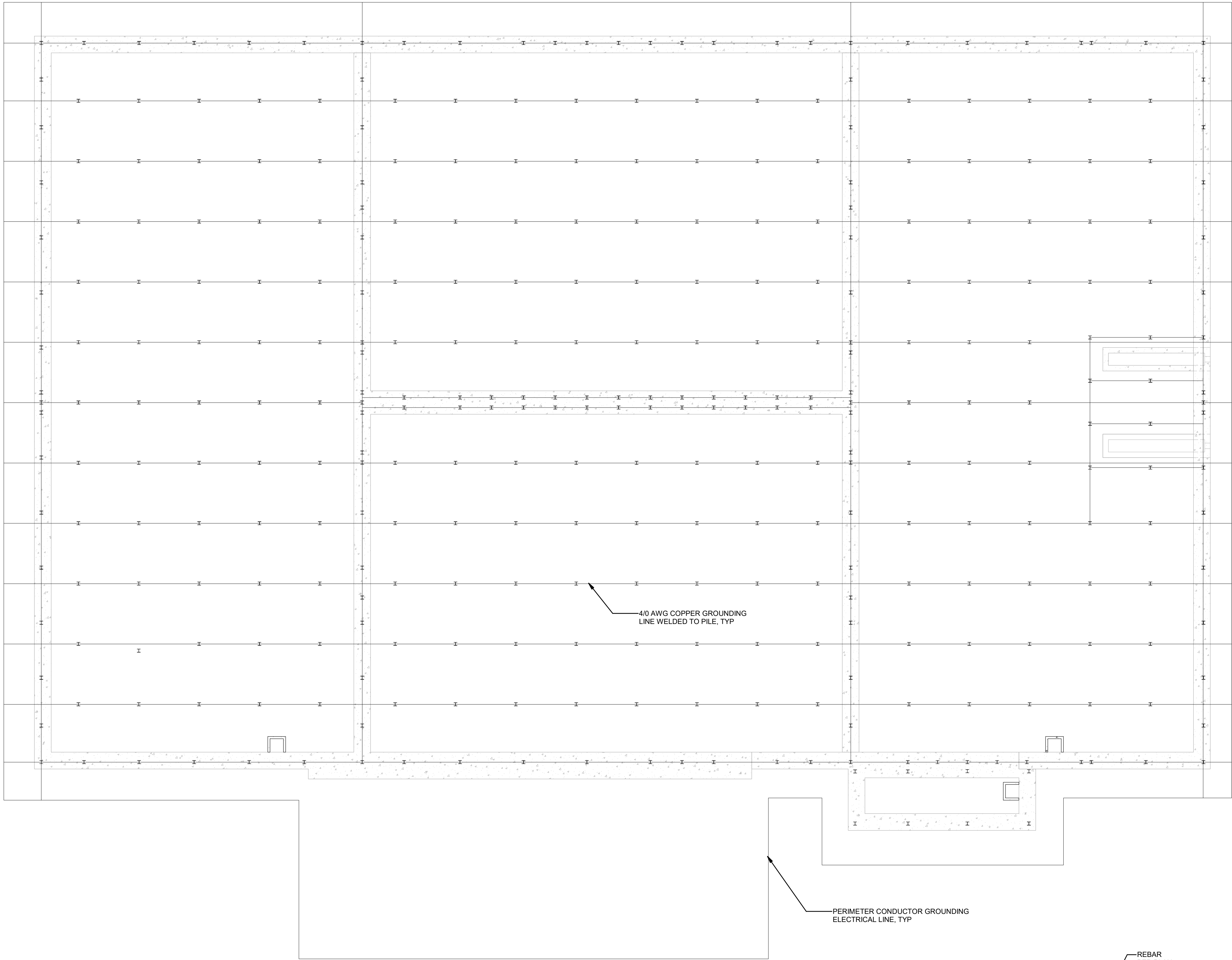
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**SERVICE BUILDING
FOUNDATION SECTIONS
AND DETAILS**

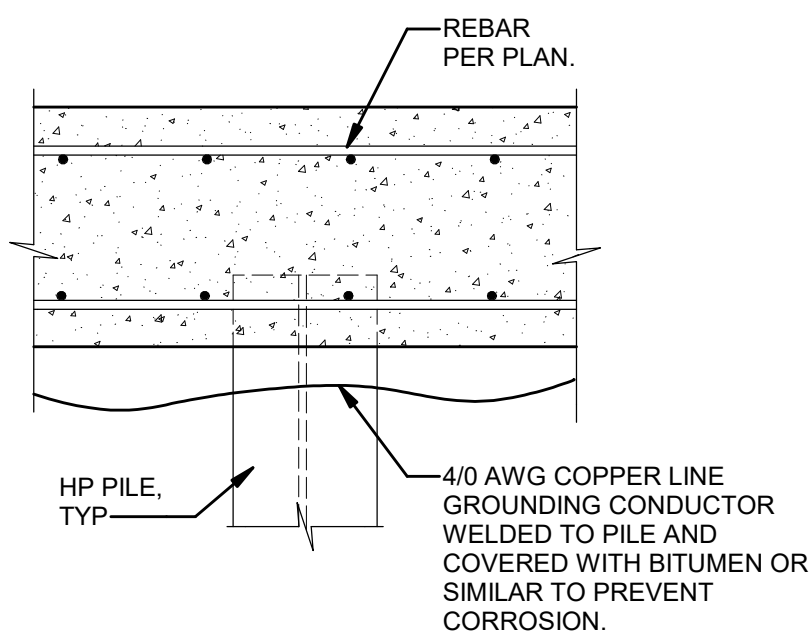


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DRAWING NO
FO-305.00
CADD FILE NO
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Astoria-CHA-KIE-11-F-1-M3-S-001.rvt
18 of 25

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1
FO-401.00
CONVERTER BUILDING GROUNDING PLAN
1/16" = 1'-0"
2' 0' 8' 16' 32'

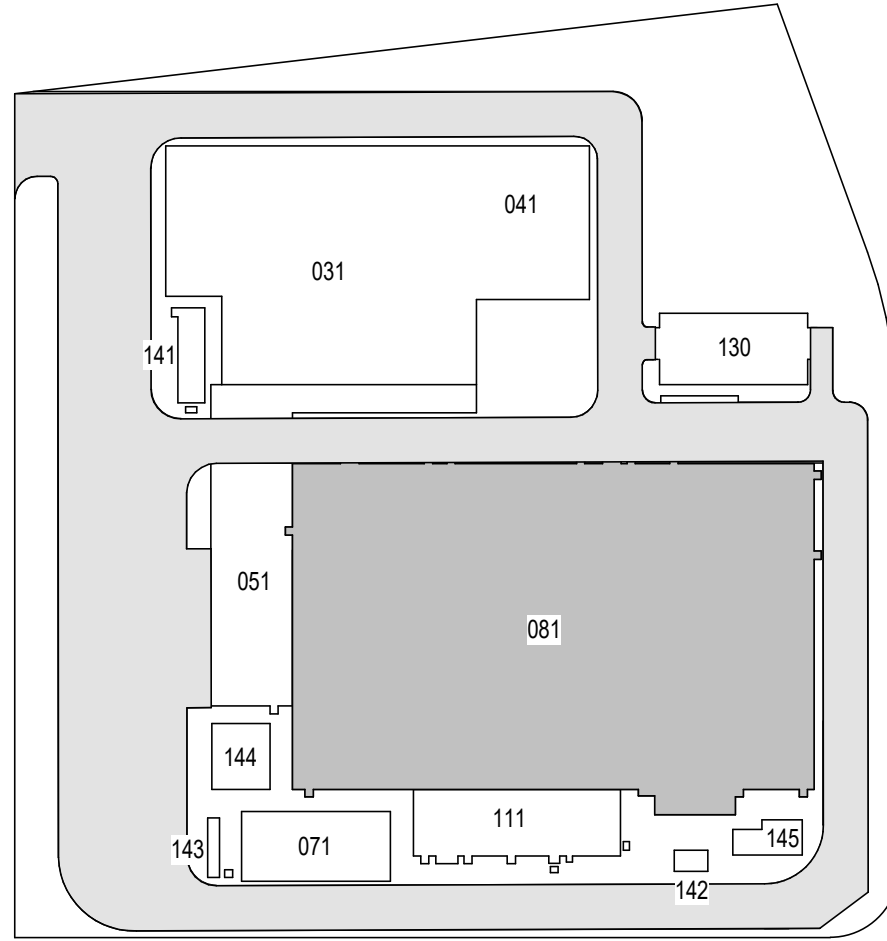


2
FO-102.00
TYPICAL GROUNDING SECTION @ CONVERTOR BUILDING
3/4" = 1'-0"
1' 0' 1' 2'

- SHEET NOTES:**
- SEE DRAWING FO-010.00 FOR STRUCTURE NOTES.
 - *** ALL PILES SHALL BE DRIVEN 5'-0" INTO THE DECOMPOSED ROCK. THE ESTIMATED TIP ELEVATION SHOULD BE USED FOR PLANNING PURPOSE ONLY. SEE GEOTECHNICAL REPORT FOR MORE INFORMATION.
 - EACH PERIMETER PILE SHALL BE CONNECTED TO THE PERIMETER GROUNDING ELECTRODE WITH A 4/0 AWG COPPER CONDUCTOR WELDED TO THE PILE. ALL INTERIOR PILES SHALL BE INTERCONNECTED WITH A WELDED CONNECTION TO MAINTAIN ELECTRICAL CONTINUITY TO THE EXTERIOR PILES.



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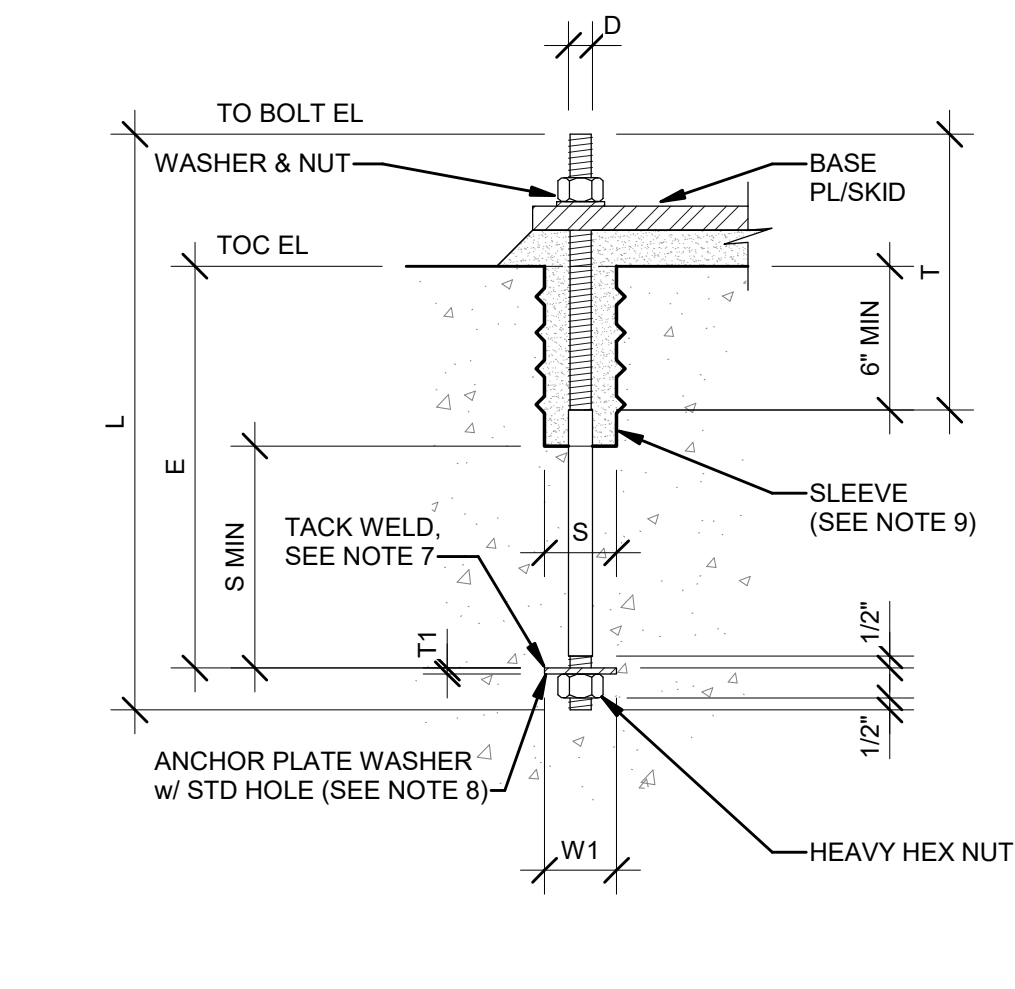
**Astoria HVDC
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Block #850 - Lot #310 - BIN #4624437

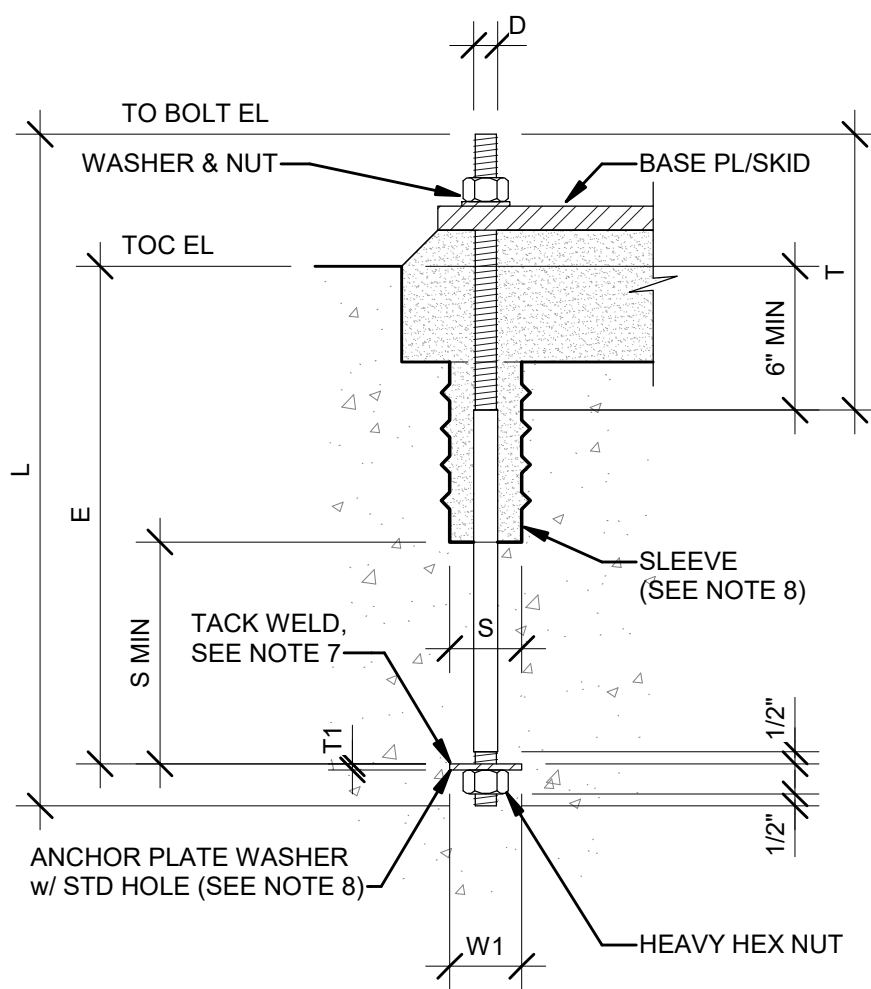
**CONVERTER BUILDING
GROUNDING PLAN AND
SECTION**



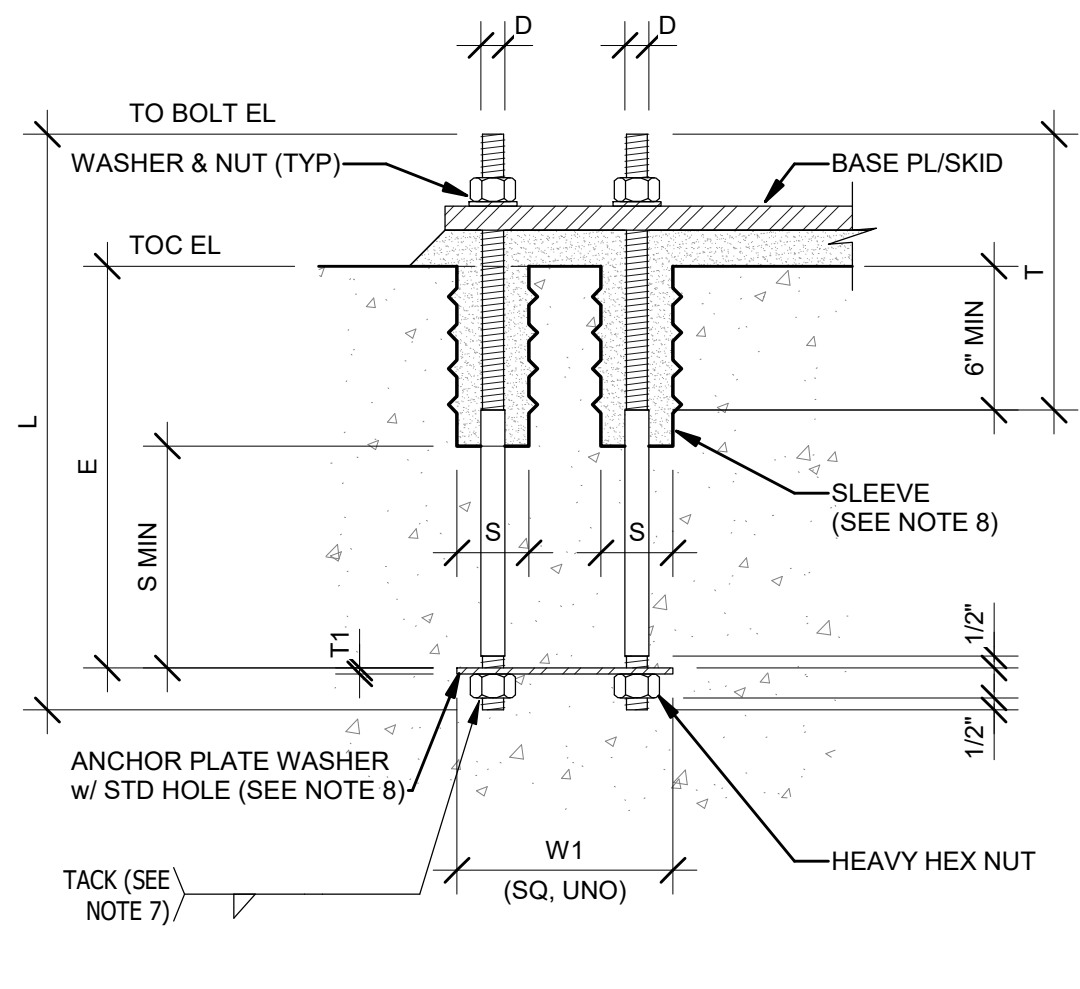
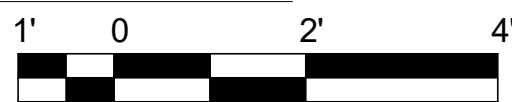
DATE 11/08/22
PROJECT NO 105121
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DRAWING NO
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CADD FILE NO
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19 of 25



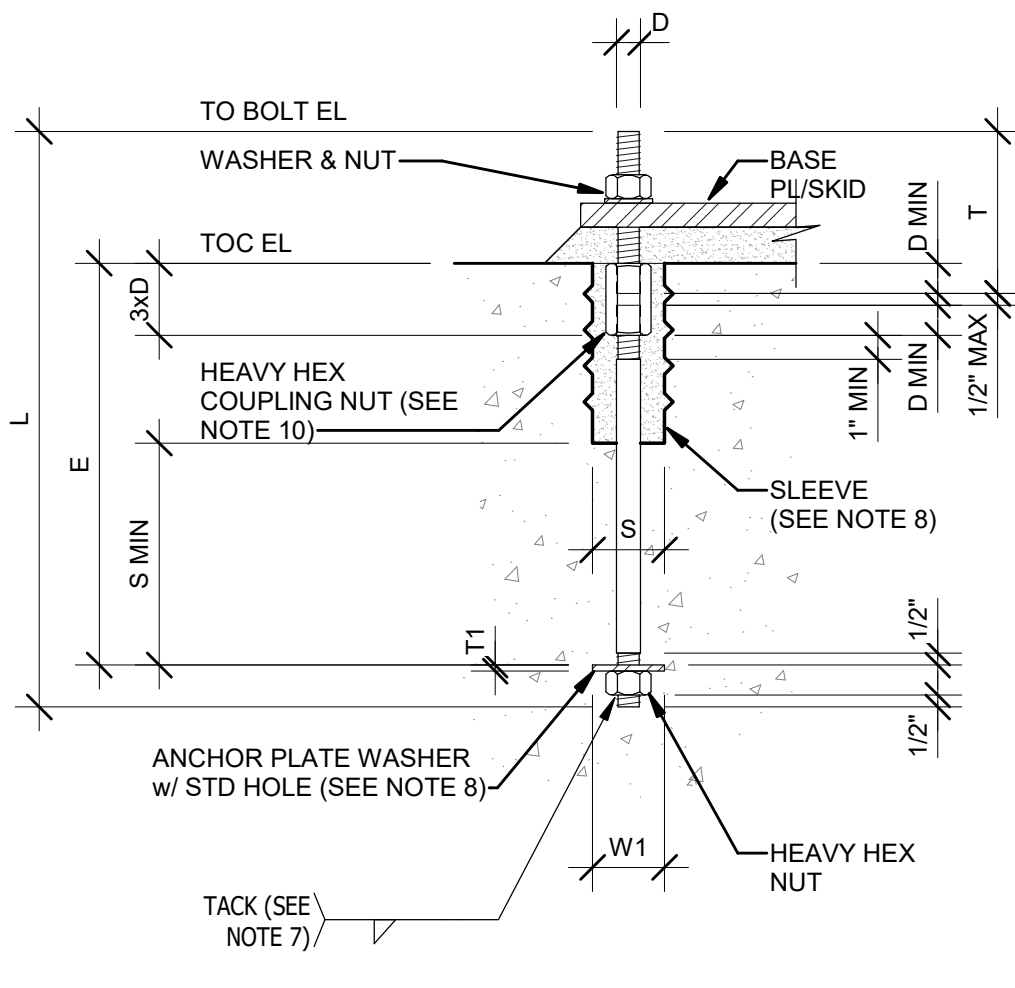
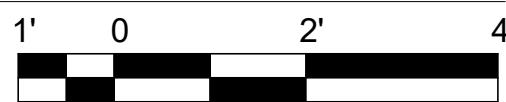
1 AB-01
FO-601.00 ANCHOR BOLT
1 1/2" = 1'-0"



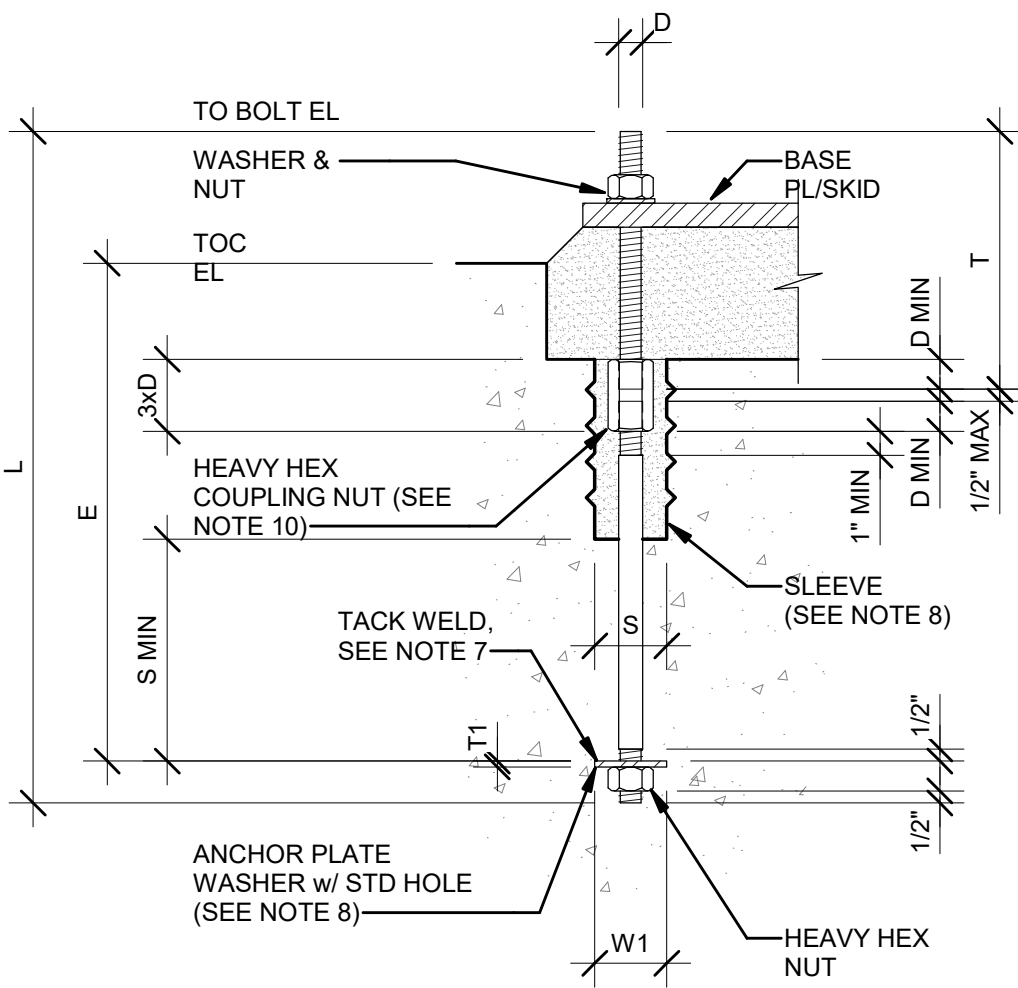
2 AB-02
FO-601.00 ANCHOR BOLT IN GROUT POCKET
1 1/2" = 1'-0"



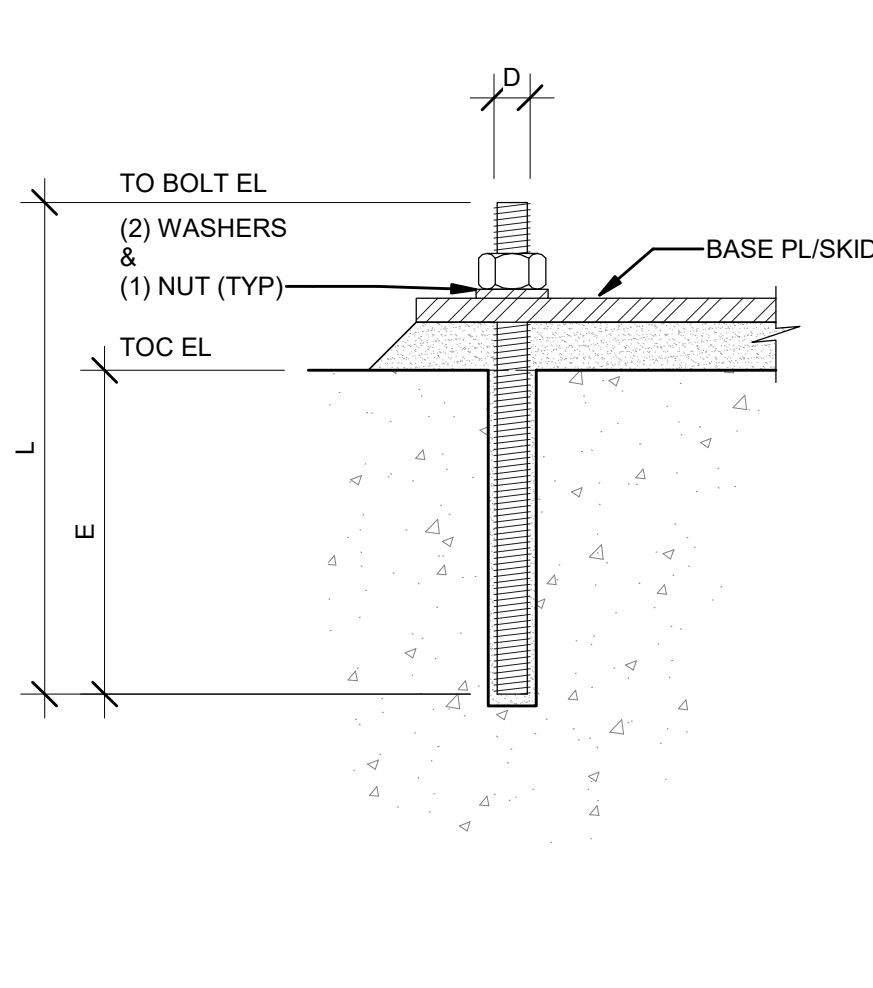
3 AB-03
FO-601.00 ANCHOR BOLT GROUP W/ SHARED ANCHOR PL
1 1/2" = 1'-0"



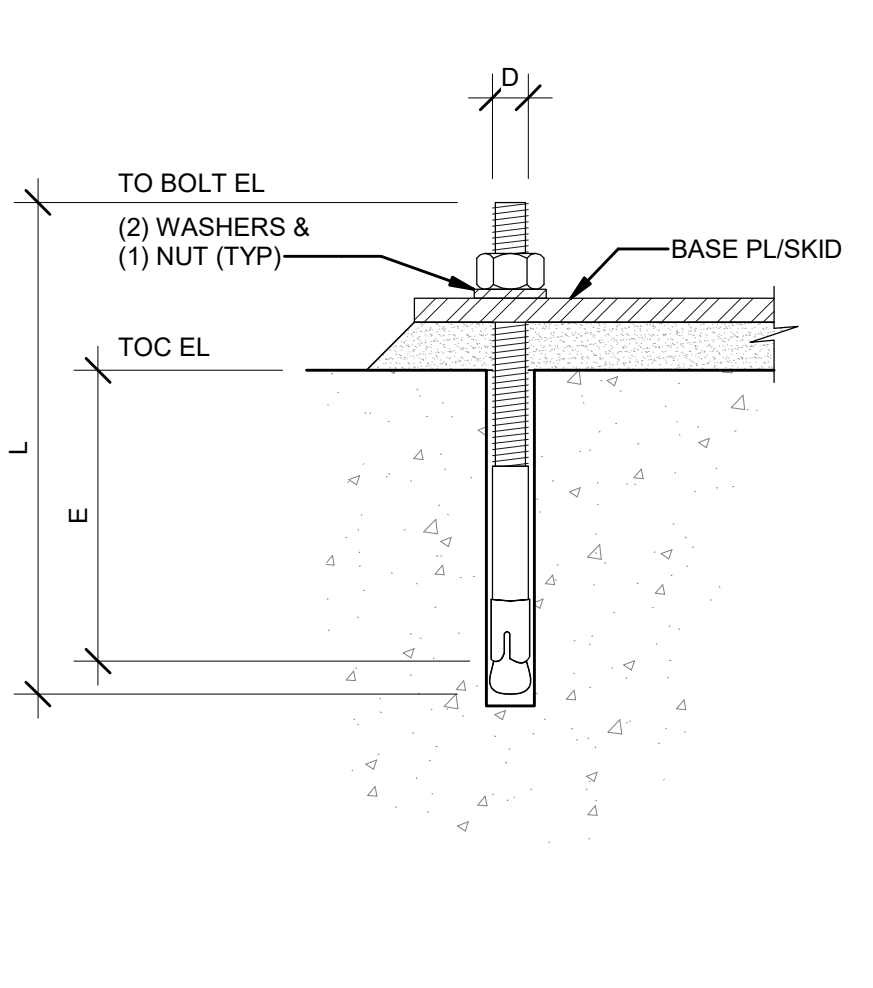
4 AB-04
FO-601.00 ANCHOR BOLT W/ COUPLER
1 1/2" = 1'-0"



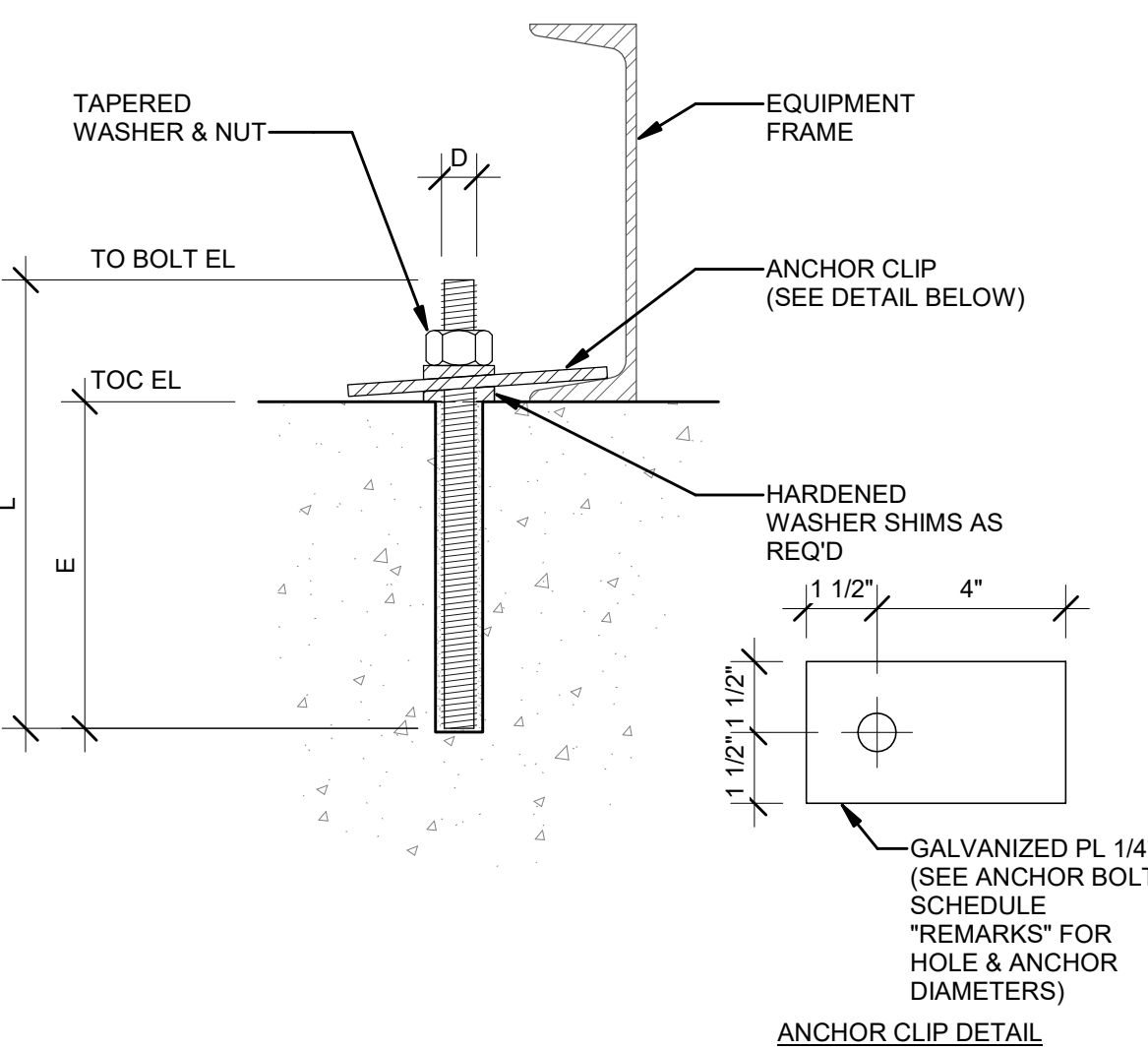
5 AB-05
FO-601.00 ANCHOR BOLT W/ COUPLER IN GROUT POCKET
1 1/2" = 1'-0"



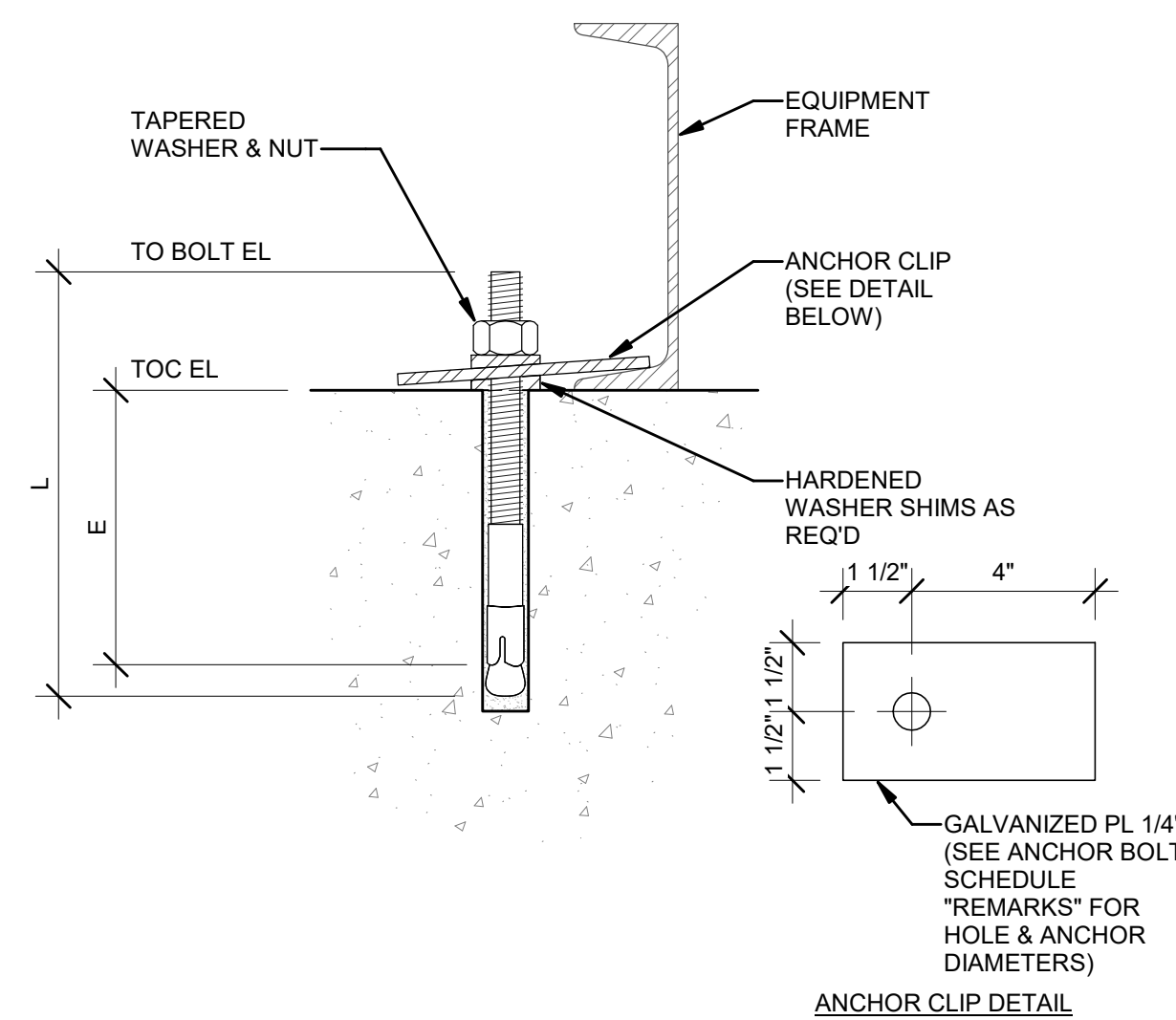
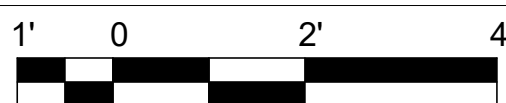
6 AB-06
FO-601.00 POST-INSTALLED ADHESIVE ANCHOR BOLT
3" = 1'-0"



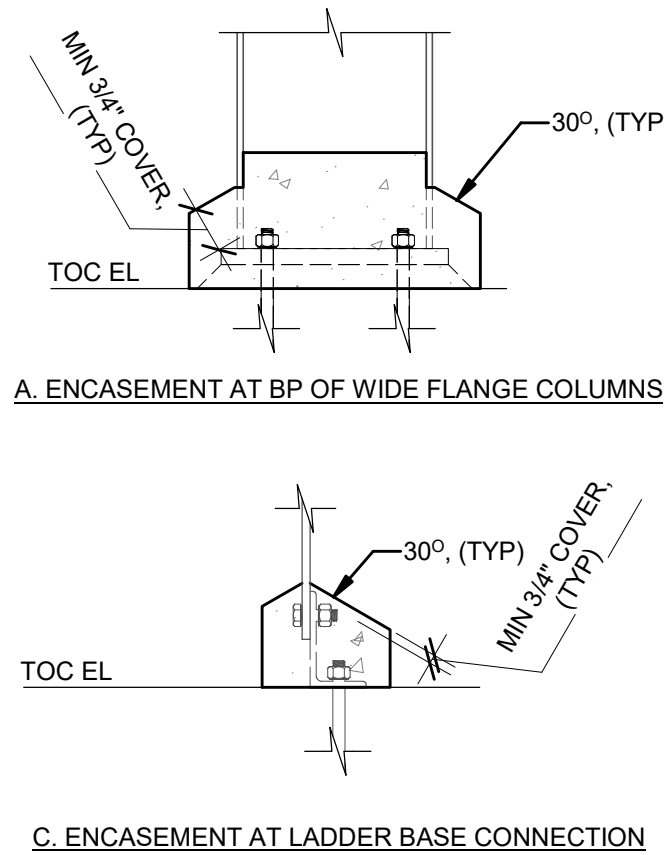
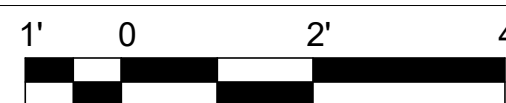
7 AB-07
FO-601.00 POST-INSTALLED MECH. ANCHOR BOLT
3" = 1'-0"



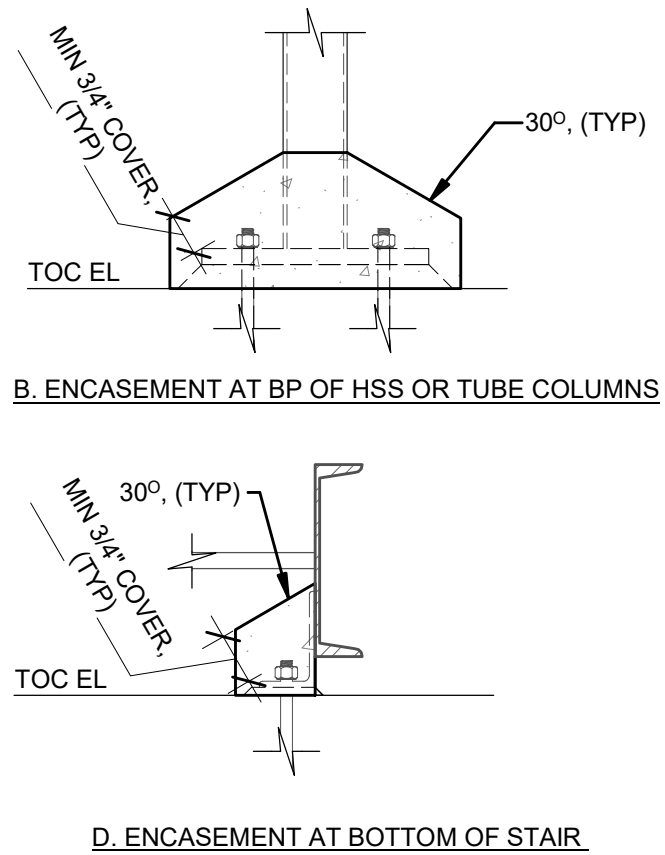
8 AB-08
FO-601.00 POST-INSTALLED ADHESIVE ANCHOR BOLT W/ CLIP
3" = 1'-0"



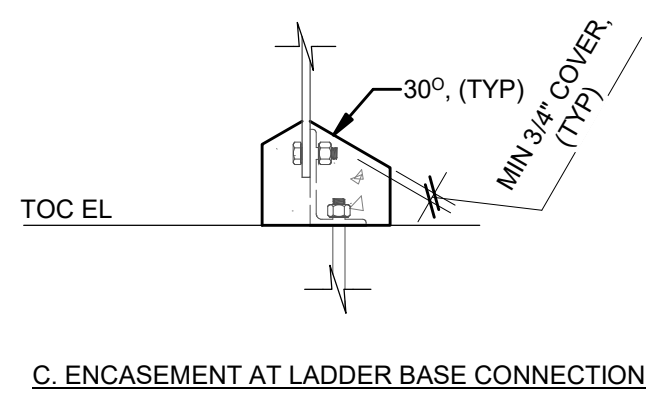
9 AB-09
FO-601.00 POST-INSTALLED MECH. ANCHOR BOLT W/ CLIP
3" = 1'-0"



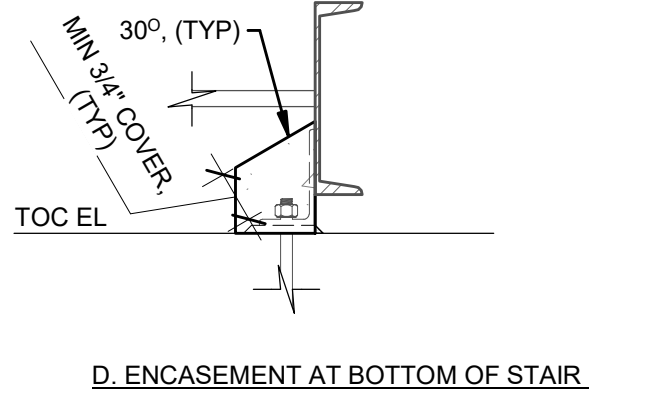
A. ENCASMENT AT BP OF WIDE FLANGE COLUMNS



B. ENCASMENT AT BP OF HSS OR TUBE COLUMNS



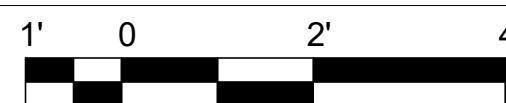
C. ENCASMENT AT LADDER BASE CONNECTION



D. ENCASMENT AT BOTTOM OF STAIR STRINGER CONNECTION

- NOTES:
- FULLY ENCASE ANCHORS IN CONCRETE. USE CONCRETE CLASS I-F1 WITH 3/8" MAX AGGREGATE SIZE.
 - SEE ARCHITECTURAL DRAWINGS (FILED UNDER A SEPARATE APPLICATION) FOR CAULKING AND CONCRETE COATING SYSTEM AROUND ENCASEMENTS.
 - PROVIDE POSITIVE SLOPE FOR DRAINAGE AWAY FROM COLUMN/POST.

AB-10
FO-601.00 ANCHOR BOLT ENCASMENT DETAIL FOR ANCHORS EXPOSED ABOVE THE SLAB.
1" = 1'-0"



SHEET NOTES:

- SEE DRAWINGS FO-001.00 THRU FO-004.00 FOR GENERAL NOTES, LEGEND, AND ABBREVIATIONS.
- SEE DRAWING FO-005.00 FOR FOUNDATION LOCATION PLAN.
- SEE DRAWING FO-601.00 THRU FO-605.00 FOR TYPICAL CONCRETE AND TYPICAL ANCHOR BOLT DETAILS.
- SUPPLEMENTAL REINFORCEMENT AROUND ANCHOR BOLTS, WHEN REQUIRED BY ANALYSIS, IS SPECIFIED ON THE FOUNDATION DRAWINGS.
- PROVIDE GROUT UNDER COLUMN BASEPLATES ACCORDING TO ANCHOR BOLT SCHEDULES. FOR EQUIPMENT BASES, THE GROUT THICKNESS SHALL BE DETERMINED AS THE DIFFERENCE BETWEEN THE BOTTOM OF BASE ELEVATION AND THE TOP OF CONCRETE ELEVATION OR A MINIMUM OF ONE INCH, UNLESS NOTED OTHERWISE. GROUT SHALL NOT EXTEND ABOVE THE BOTTOM OF THE COLUMN BASEPLATE OR EQUIPMENT BASE ELEVATION AND SHALL BE CHAMFERED AT A 45 DEGREE ANGLE STARTING FROM THE BOTTOM EDGE OF THE COLUMN BASEPLATE OR EQUIPMENT BASE.
- FULLY THREADED ROD MAY BE USED AT CONTRACTOR'S OPTION FOR CAST-IN-PLACE.
- TACK WELD NUT TO ANCHOR BOLT OR DAMAGE THREADS TO LOCK NUT IN PLACE. TACK WELD MAY ONLY BE USED WHEN MATERIAL SATISFIES ASTM F1554 SUPPLEMENTAL REQUIREMENT S1 (WELDABILITY).
- OMIT SLEEVE AND ANCHOR PLATE WASHER UNLESS SPECIFIED IN ANCHOR BOLT SCHEDULE. EFFECTIVE EMBEDMENT "E" SHALL BE MEASURED TO TOP OF BOTTOM NUT WHERE ANCHOR PLATE WASHER IS NOT SPECIFIED.
- REFER TO DRAWING SERIES FO-0000 AND INDIVIDUAL FOUNDATION ANCHOR BOLT SCHEDULES FOR ANCHOR BOLT MATERIAL, COATING INFORMATION, AND ADDITIONAL INSTALLATION REQUIREMENTS.
- COUPLER
 - COUPLER THREAD LENGTH SHALL BE EQUAL TO THREE TIMES THE ANCHOR BOLT DIAMETER.
 - COUPLER SHALL BE OF COMPATIBLE ASTM MATERIAL AS THE SPECIFIED ANCHOR BOLT.
 - COUPLER SHALL BE FULLY EMBEDDED IN THE CONCRETE OR GROUT.
 - USE PLUG BOLT TO SEAL COUPLER UNTIL THE UPPER SECTION OF THE SPECIFIED ANCHOR BOLT IS INSTALLED.
 - TACK WELD PERMANENT BOLTS IN PLACE (SEE NOTE 7).
 - ALL DIMENSIONS OF THE SPECIFIED ANCHOR BOLTS SHALL REMAIN UNCHANGED, UNLESS APPROVED BY ENGINEER OF RECORD.
 - CONTRACTORS QA / QC FIELD PERSONNEL SHALL MEASURE ANCHOR BOLT THREADS BEFORE AND AFTER THE INSTALLATION OF THE ANCHOR BOLT SECTIONS, TO ENSURE COMPLIANCE WITH THE INSTALLATION STANDARDS.
- SHIMS SHALL BE PLACED IN CLOSE PROXIMITY TO THE ANCHOR BOLTS.

ANCHOR BOLT SCHEDULE LEGEND:

D - ANCHOR BOLT DIAMETER
L - ANCHOR BOLT LENGTH
E - ANCHOR BOLT EFFECTIVE EMBEDMENT
T - ANCHOR BOLT THREAD LENGTH
S - ANCHOR BOLT SLEEVE NOMINAL DIAMETER
T1 - BOTTOM PLATE / PLATE WASHER THICKNESS
W1 - BOTTOM PLATE / PLATE WASHER WIDTH (SQUARE)

SLEEVE SCHEDULE		
AB DIA	SLEEVE SIZE	REMARKS
1/2"	2" X 5"	ALTERNATE VENDOR PRODUCTS MAY BE SLIGHTLY DIFFERENT. TABLE PROVIDED FOR REFERENCE ONLY.
5/8"	2" X 7"	
3/4"	2" X 5"	
7/8"	2" X 7"	
1"	3" X 10"	
1 1/4"	3" X 10"	
1 1/2"	4" X 15"	
1 3/4"	4" X 15"	
2"	4" X 18"	
2 1/4"	4" X 18"	
2 1/2"	6" X 24"	

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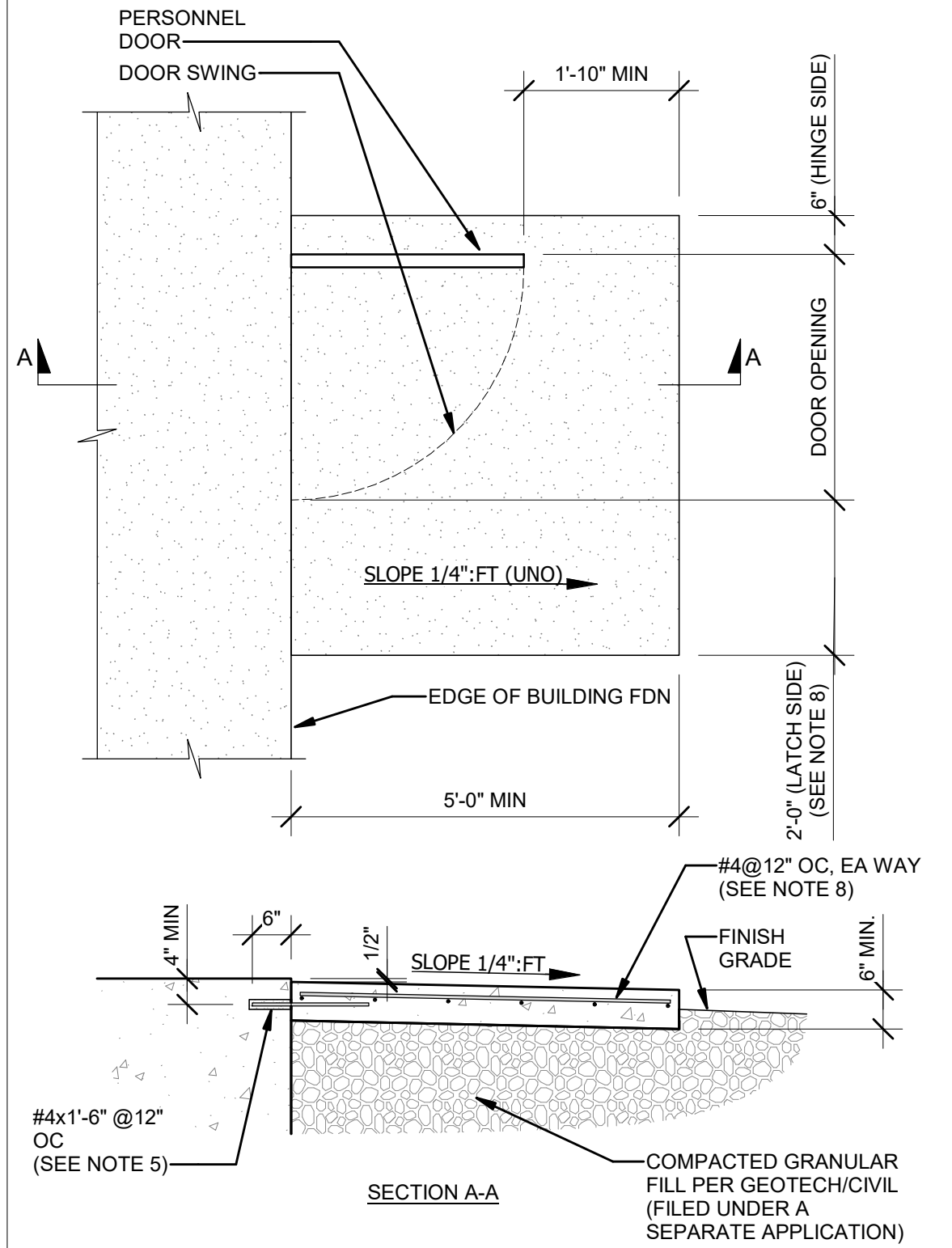
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Block #850 - Lot #310 - BIN #4624437

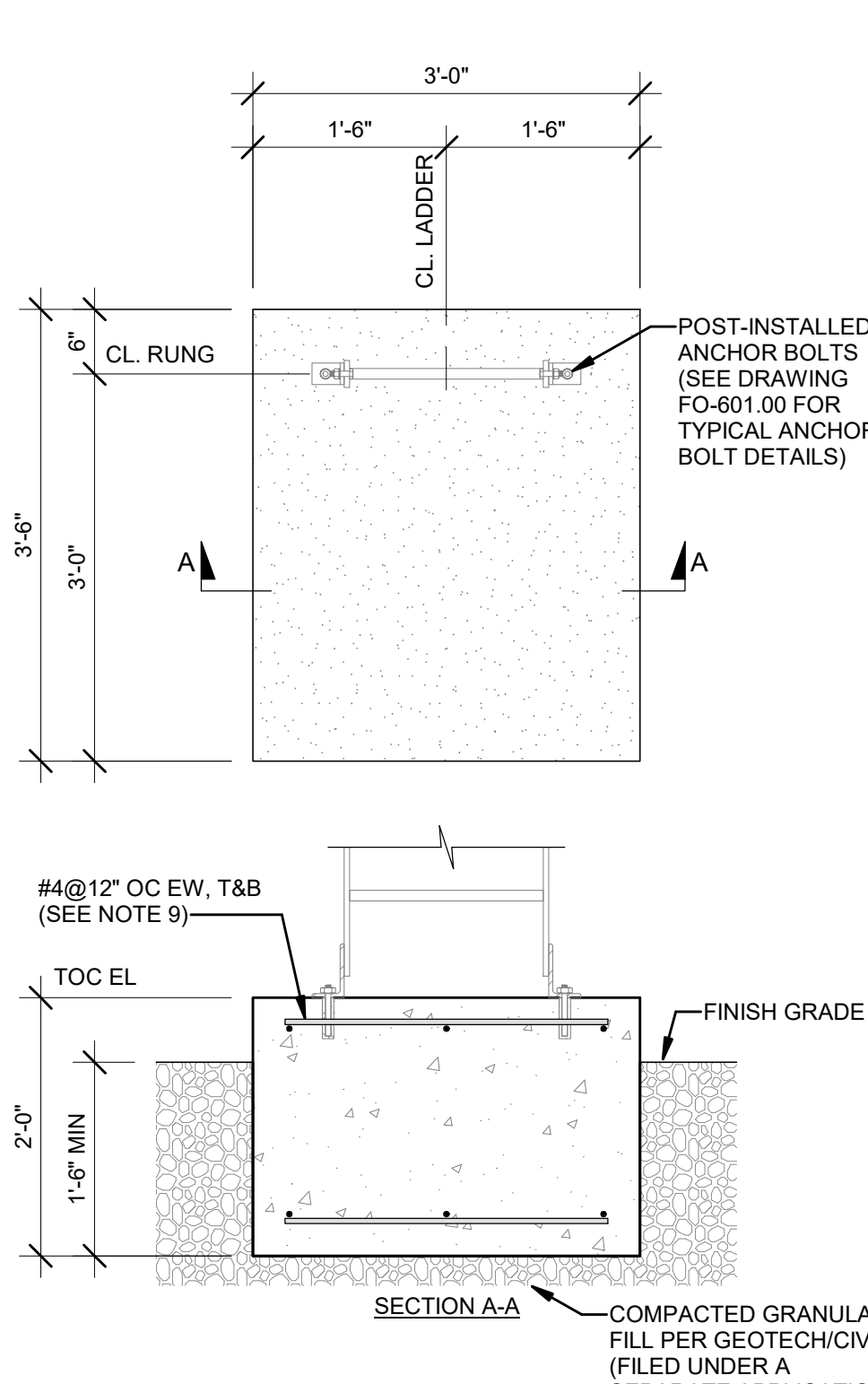
ANCHOR BOLT TYPICAL DETAILS



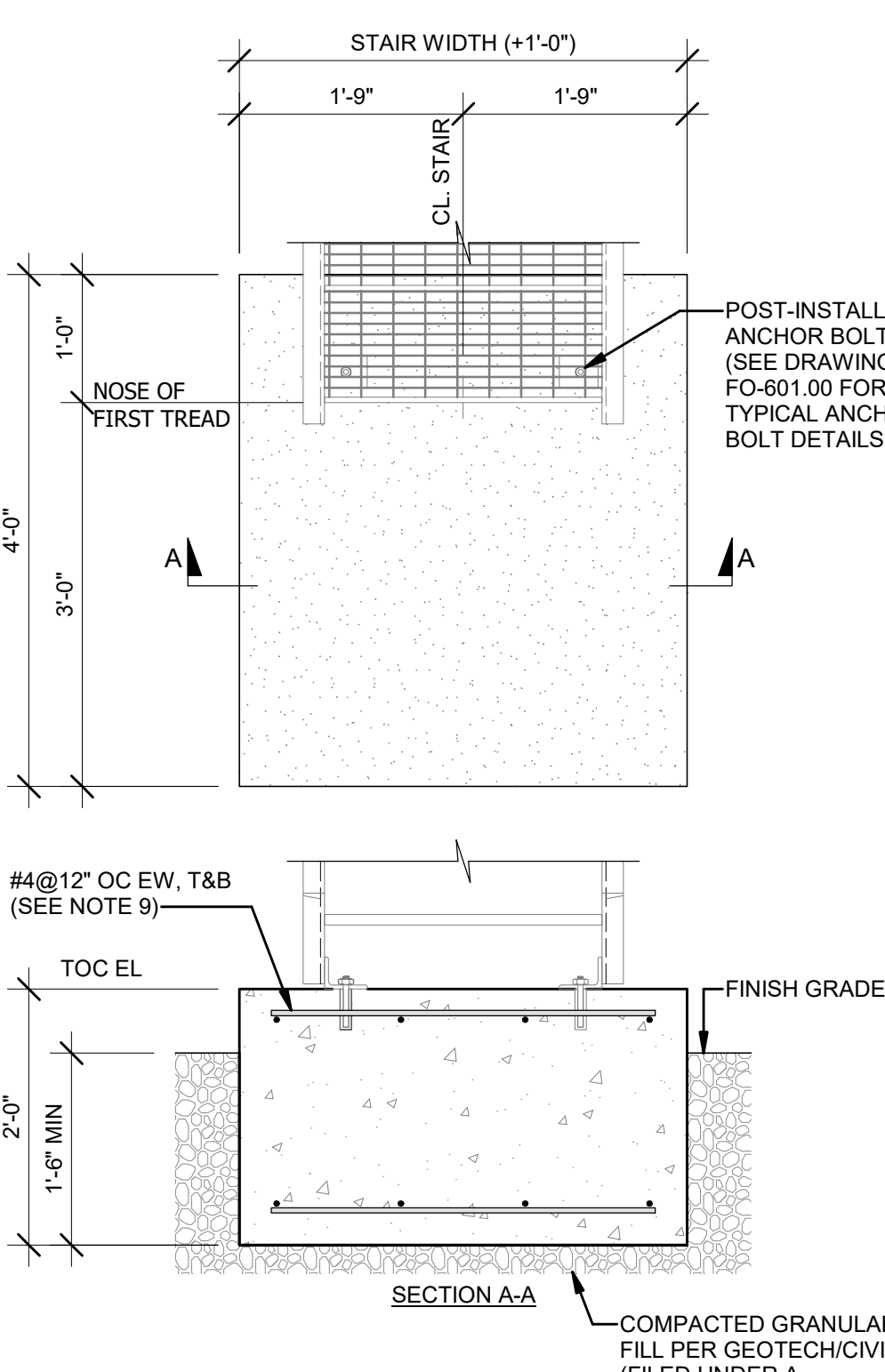
DATE 11/08/2022
PROJECT NO 105121
DRAWING BY D. FLYNN
CHECKED BY W. ABBASSI
DRAWING NO
FO-601.00
CADD FILE NO
Astoria-HVDC-CHPE
Astoria-CHPE-000-XX-M2-S-001.rvt
20 of 25



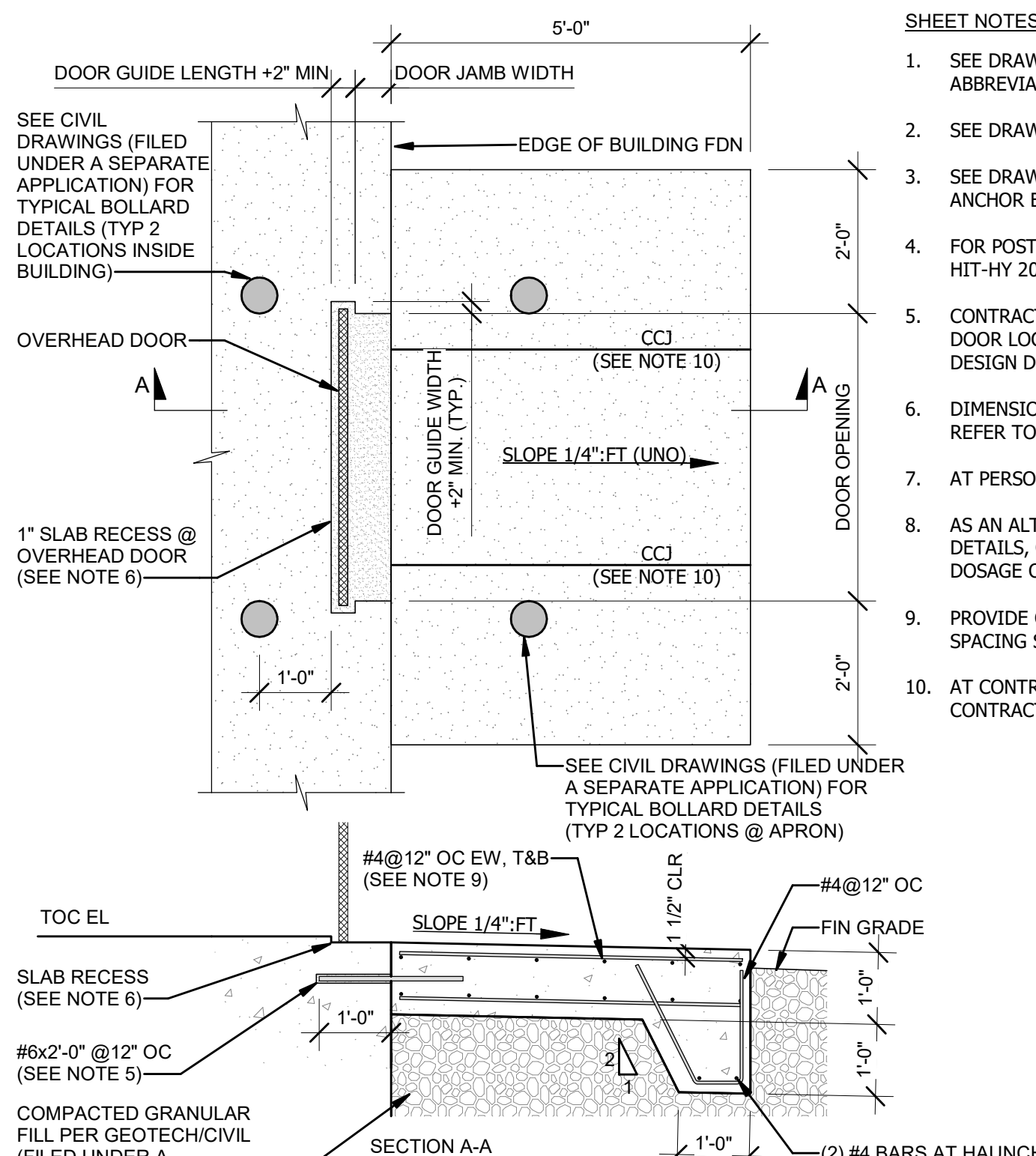
1 CA-01 PERSONNEL DOOR STOOP
FO-602.00 1/2" = 1'-0"



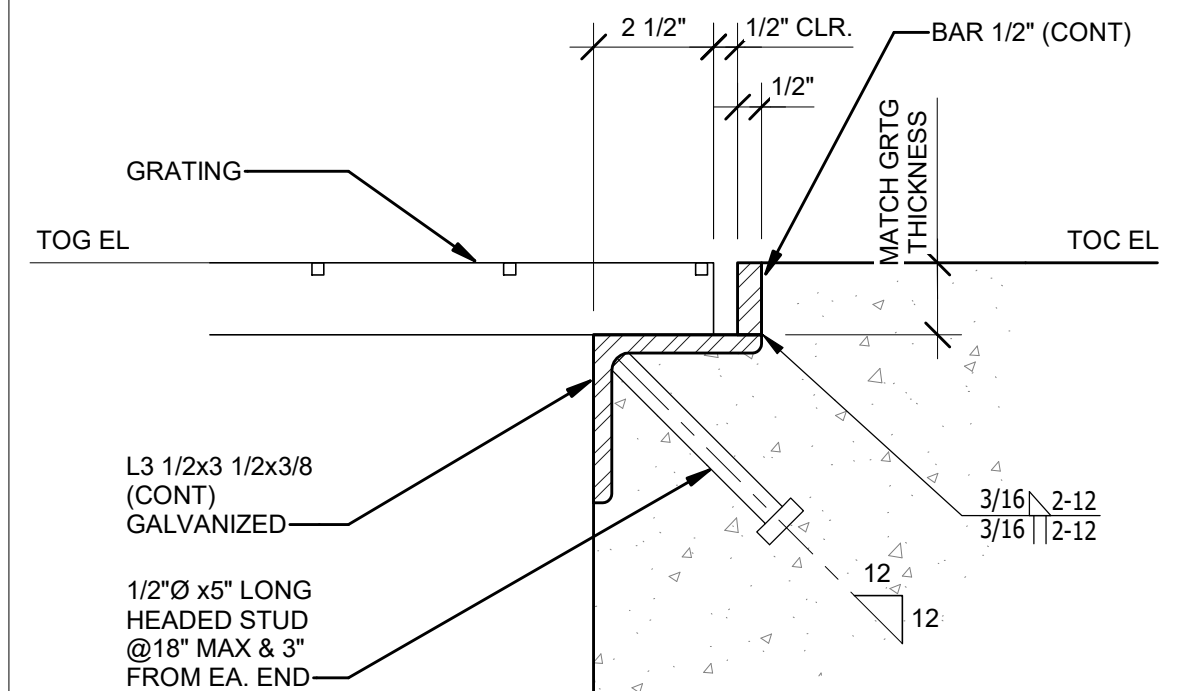
2 CA-02 LADDER PAD
FO-602.00 3/4" = 1'-0"



3 CA-03 STAIR LANDING PAD
FO-602.00 3/4" = 1'-0"

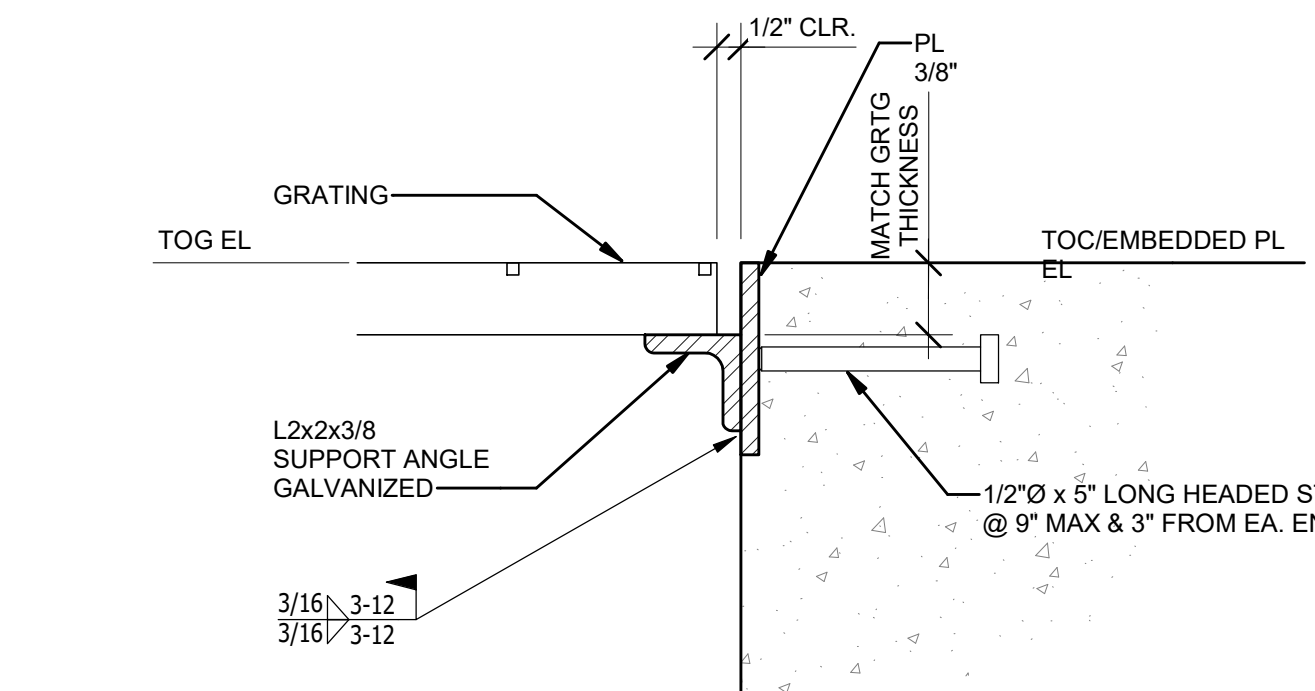


4 CA-04 OVERHEAD DOOR STOOP
FO-602.00 1/2" = 1'-0"



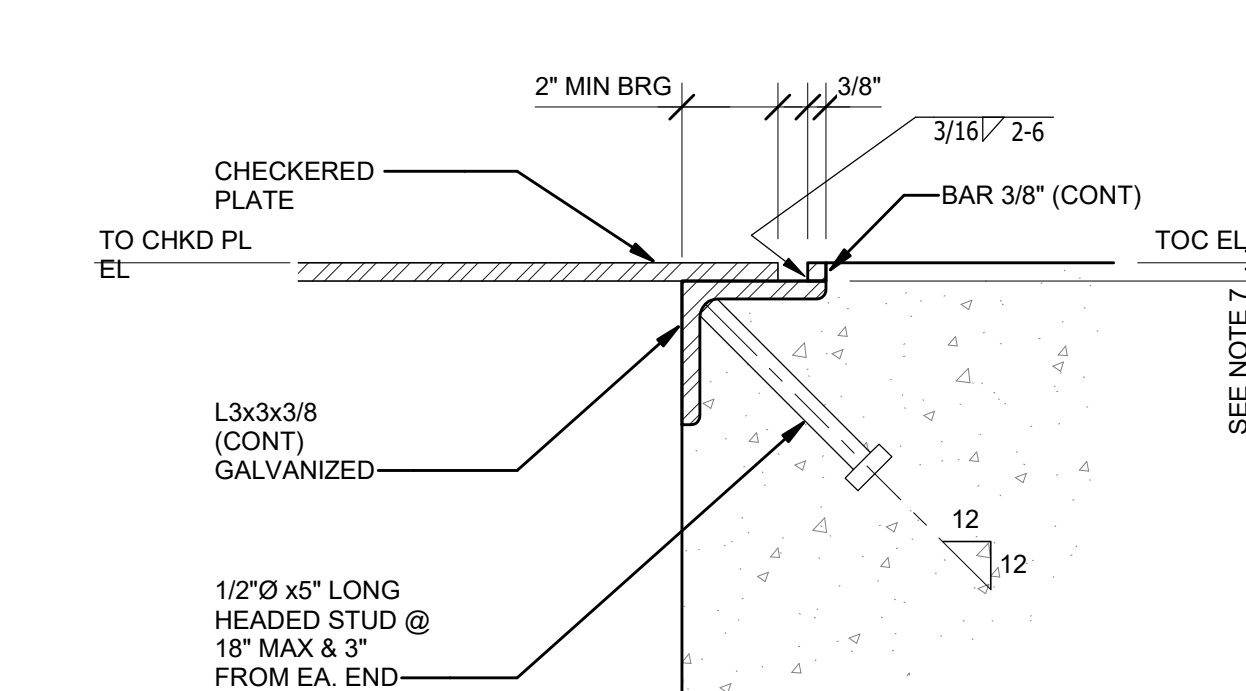
NOTES:
A. REINFORCING NOT SHOWN FOR CLARITY.
B. MITER AND WELD (GRIND FLUSH) AT CORNERS.

5 CE-01 GRATING SUPPORT AT CONCRETE EDGE
FO-602.00 3" = 1'-0"



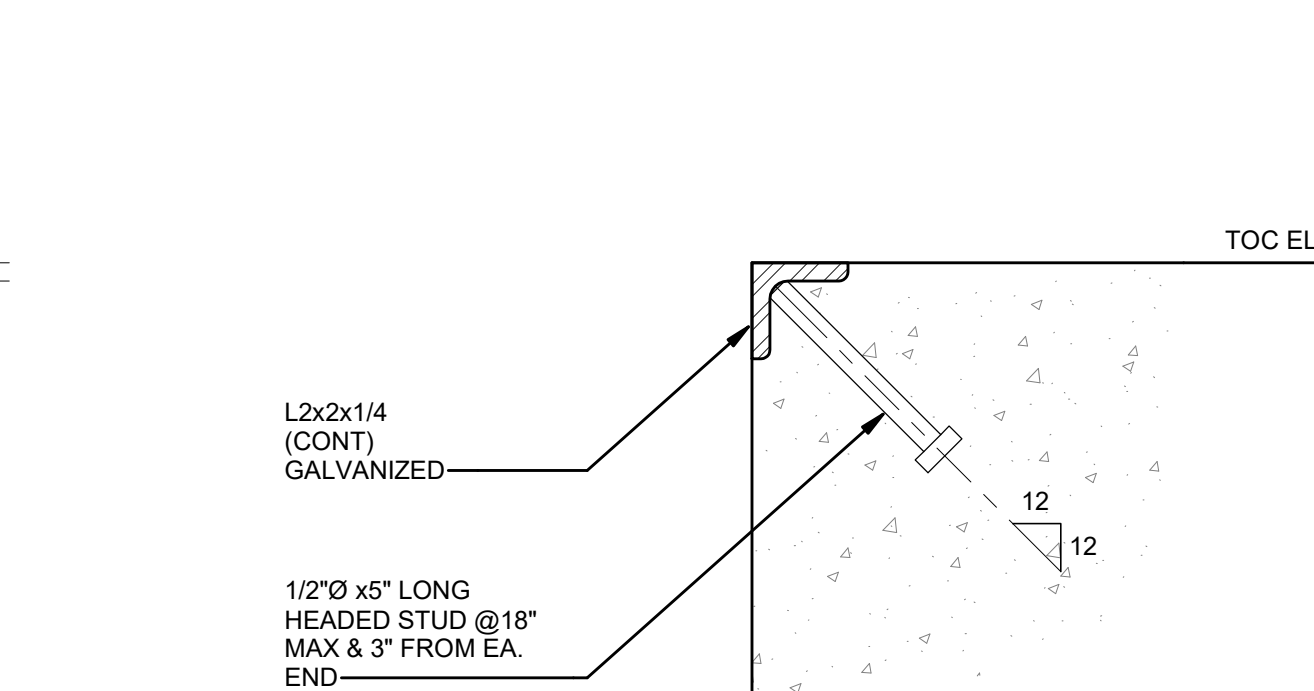
NOTE:
A. REINFORCING NOT SHOWN FOR CLARITY.

6 CE-02 GRATING SUPPORT AT CONCRETE EDGE (ALT DETAIL)
FO-602.00 3" = 1'-0"



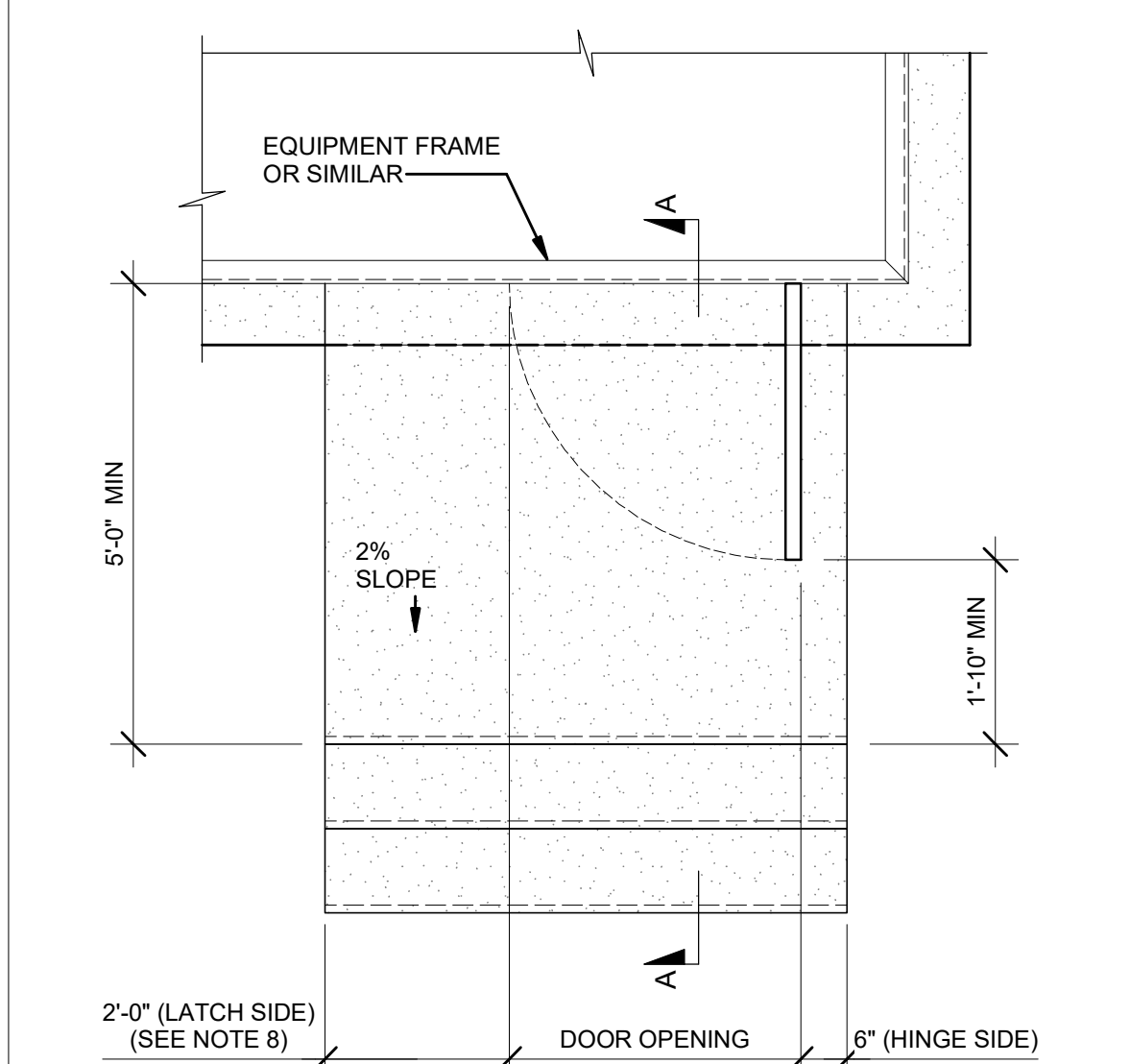
NOTES:
A. REINFORCING NOT SHOWN FOR CLARITY.
B. MITER AND WELD (GRIND FLUSH) AT CORNERS.

7 CE-03 CHECKERED PLATE SUPPORT AT CONCRETE EDGE
FO-602.00 3" = 1'-0"

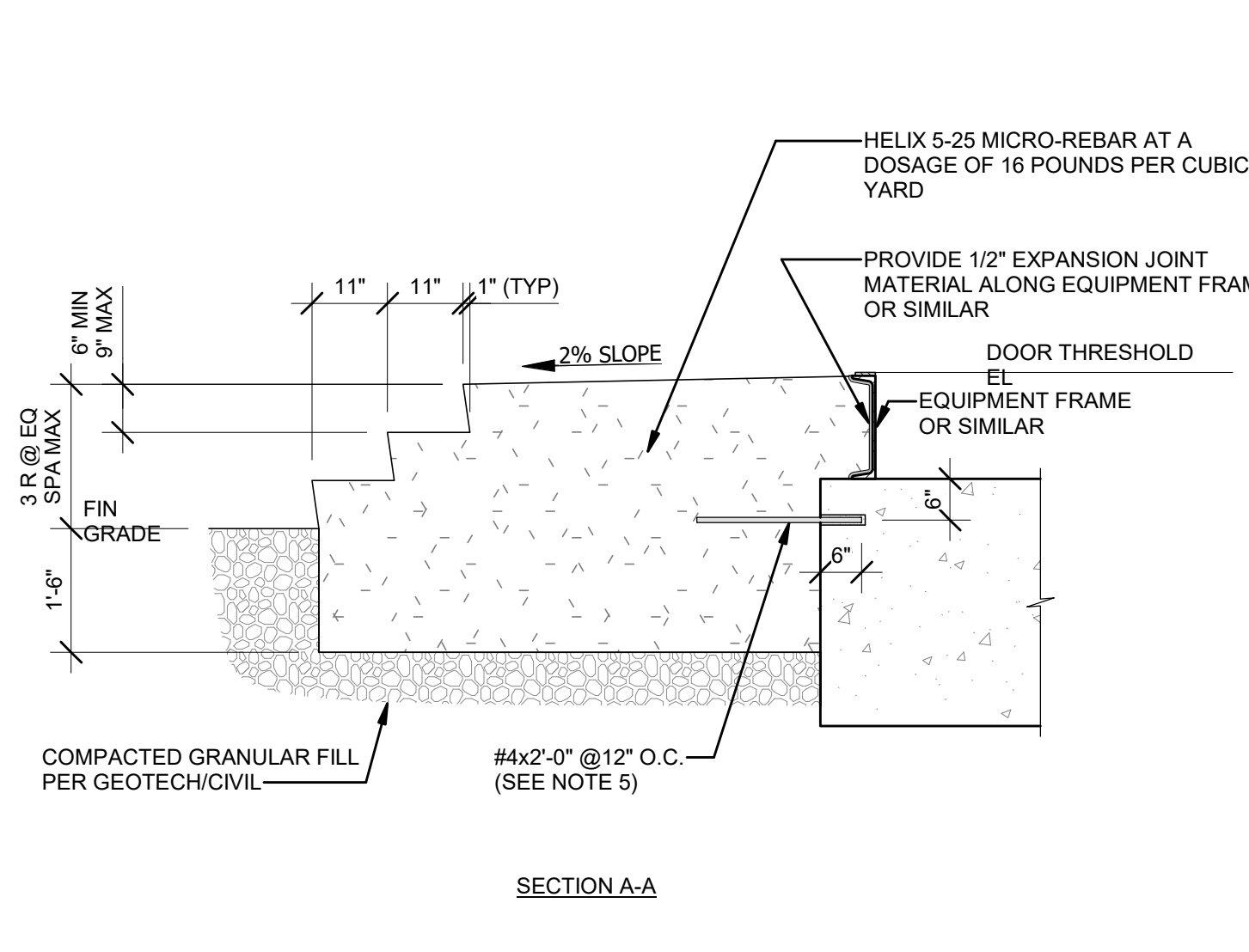


NOTES:
A. REINFORCING NOT SHOWN FOR CLARITY.
B. MITER AND WELD (GRIND FLUSH) AT CORNERS.

8 CE-04 PROTECTED CONCRETE EDGE ANGLE W/O GRATING
FO-602.00 3" = 1'-0"



9 CS-01 CONCRETE STAIR ON GRADE
FO-602.00 1/2" = 1'-0"



10 CS-02 CONCRETE STAIR ON FOUNDATION OR AREA MAT
FO-602.00 1/2" = 1'-0"

- SHEET NOTES:
- SEE DRAWINGS FO-001.00 THRU FO-004.00 FOR GENERAL NOTES, LEGEND, AND ABBREVIATIONS.
 - SEE DRAWING FO-005.00 FOR FOUNDATION LOCATION PLAN.
 - SEE DRAWING FO-601.00 THRU FO-605.00 FOR TYPICAL CONCRETE AND TYPICAL ANCHOR BOLT DETAILS.
 - FOR POST-INSTALLED APPLICATIONS, DRILL AND INSTALL DOWELS USING HILTI HIT-HY 200 ADHESIVE ANCHORING SYSTEM.
 - CONTRACTOR SHALL PROVIDE 1" RECESS WITH TOOLED EDGE AT OVERHEAD DOOR LOCATIONS. RECESS DETAIL AND LOCATIONS SHALL BE PER SHOWN ON DESIGN DRAWINGS.
 - DIMENSION ON DETAIL CE-03 TO MATCH CHECKERED PLATE THICKNESS. REFER TO DESIGN DRAWINGS FOR CHECKERED PLATE SPECIFICATION.
 - AT PERSONNEL DOUBLE DOOR ENTRY, EXTEND STOOPS 6" ON BOTH SIDES.
 - AS AN ALTERNATIVE TO REINFORCEMENT SPECIFIED WHERE NOTED IN "CA" DETAILS, CONTRACTOR MAY SUBSTITUTE WITH HELIX 5-25 MICRO-REBAR AT DOSAGE OF 11 POUNDS PER CUBIC YARD.
 - PROVIDE CRACK CONTROL JOINT WHEN USING HELIX MICRO-REBAR. JOINT SPACING SHALL BE LESS THAN 1.5X THE LATEST APRON PLAN DIMENSION.
 - AT CONTRACTOR'S OPTION, CONSTRUCTION JOINTS MAY BE USED IN LIEU OF CONTRACTION JOINTS.

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B	FINAL SUBMISSION	DJF	WA	11/08/2022
A	INTERIM SUBMISSION	DJF	WA	08/29/2022
REV	DESCRIPTION	DRW BY	CHK BY	DATE

Kiewit
470 Chestnut Ridge Rd # 2,
Woodcliff Lake, NJ 07677

Hitachi Energy
901 Main Campus Drive
Raleigh, North Carolina 27606

PROJECT

CHPE
Champlain Hudson
Power Express

Astoria HVDC
Converter Station

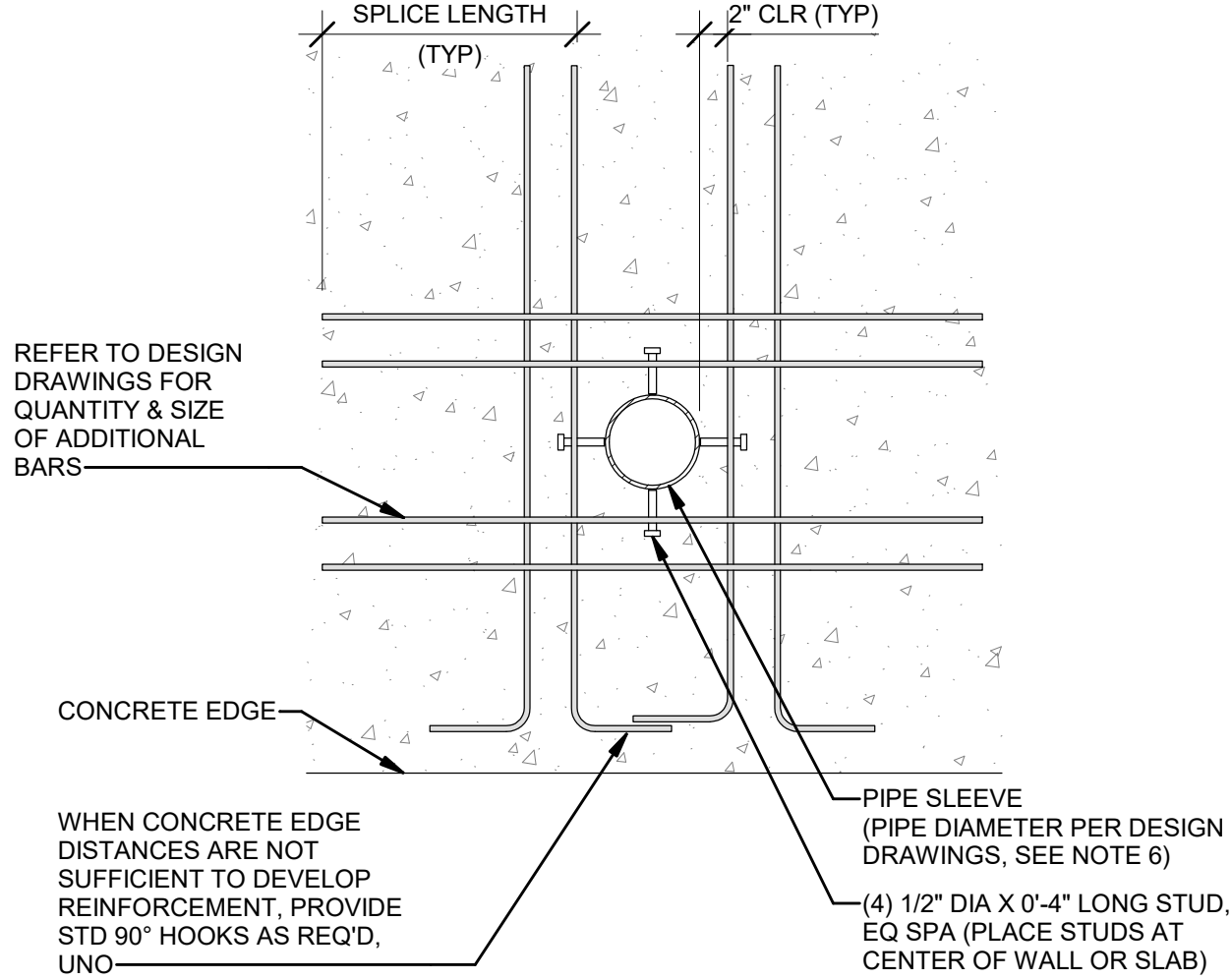
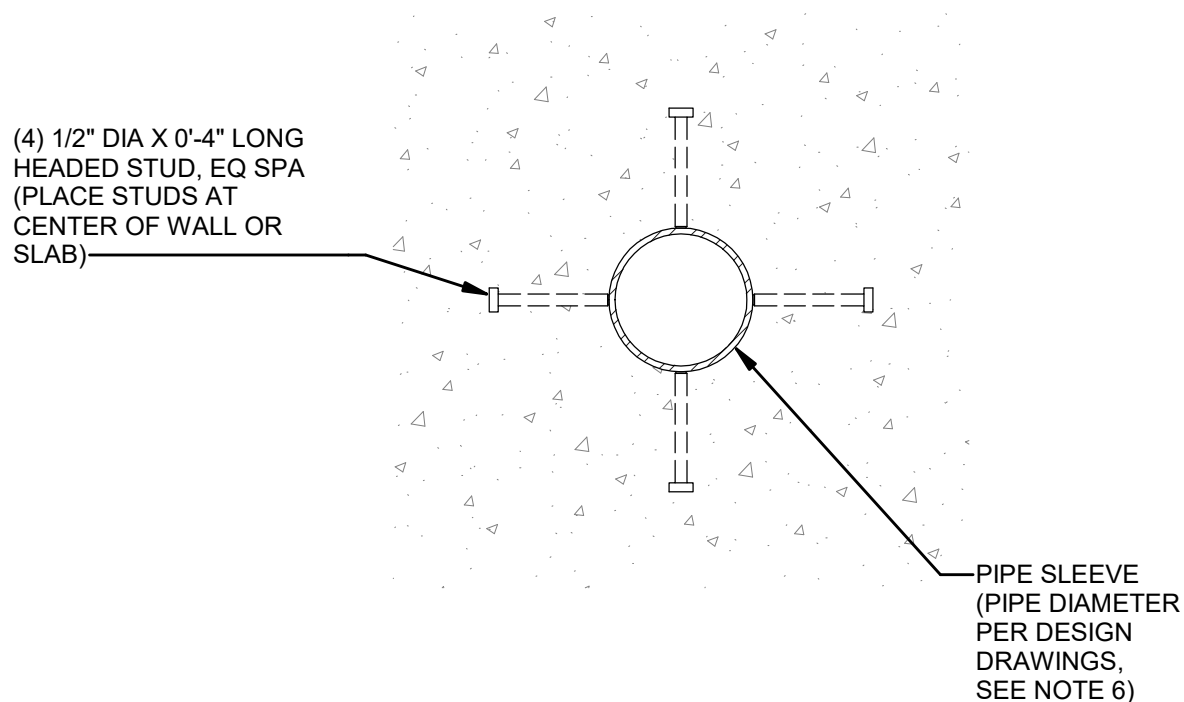
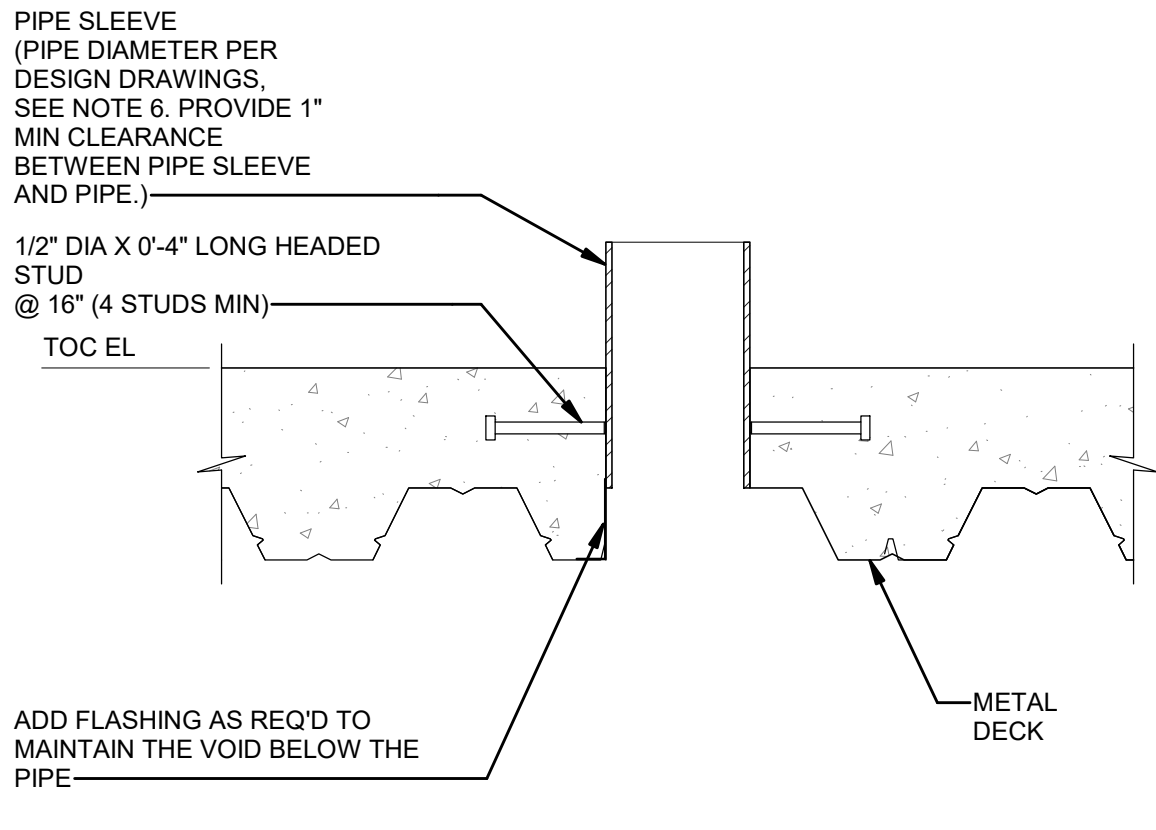
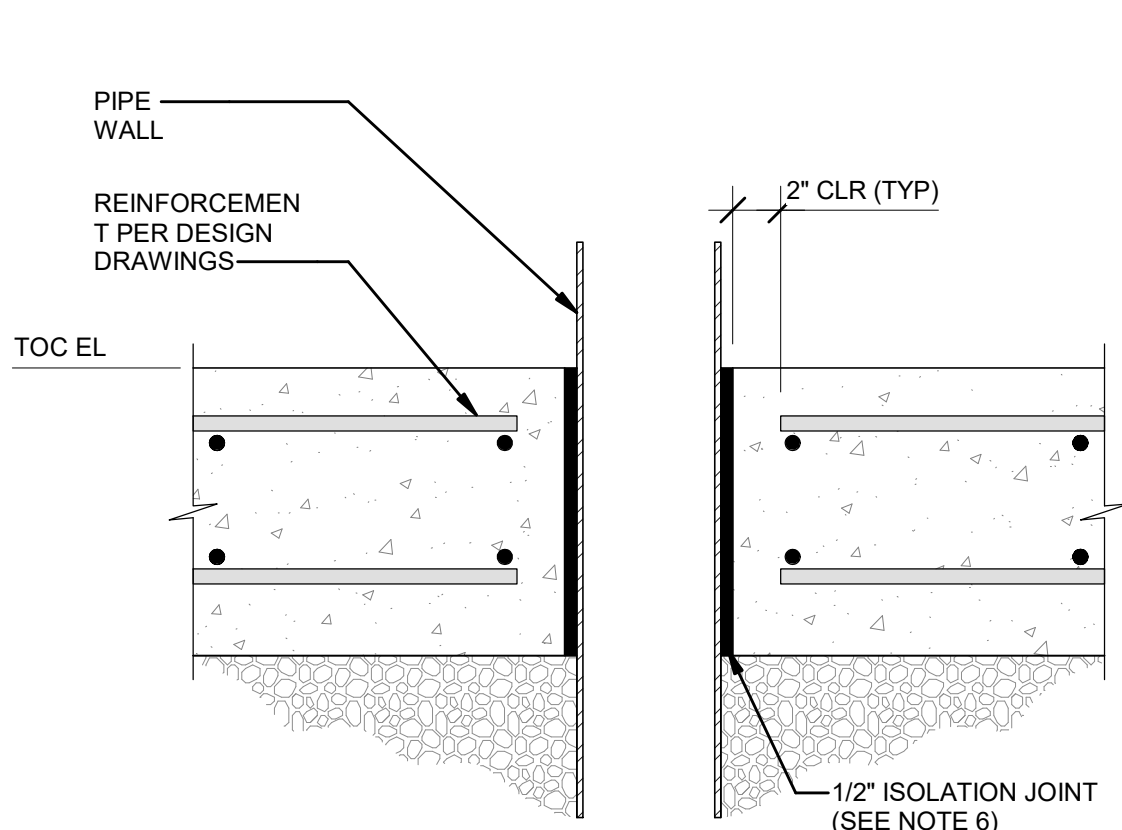
31-45 20th Avenue, Astoria, Queens NY 11105
Block #850 - Lot #310 - BIN #4624437

CONCRETE TYPICAL
DETAILS



DATE 11/08/2022
PROJECT NO 105121
DRAWING BY D. FLYNN
CHECKED BY W. ABBASSI
DRAWING NO
FO-602.00
CADD FILE NO
Astoria CHA-KIE-000-XX-M2-S-001.rvt
21 of 25

11/10/2022 9:12:40 AM



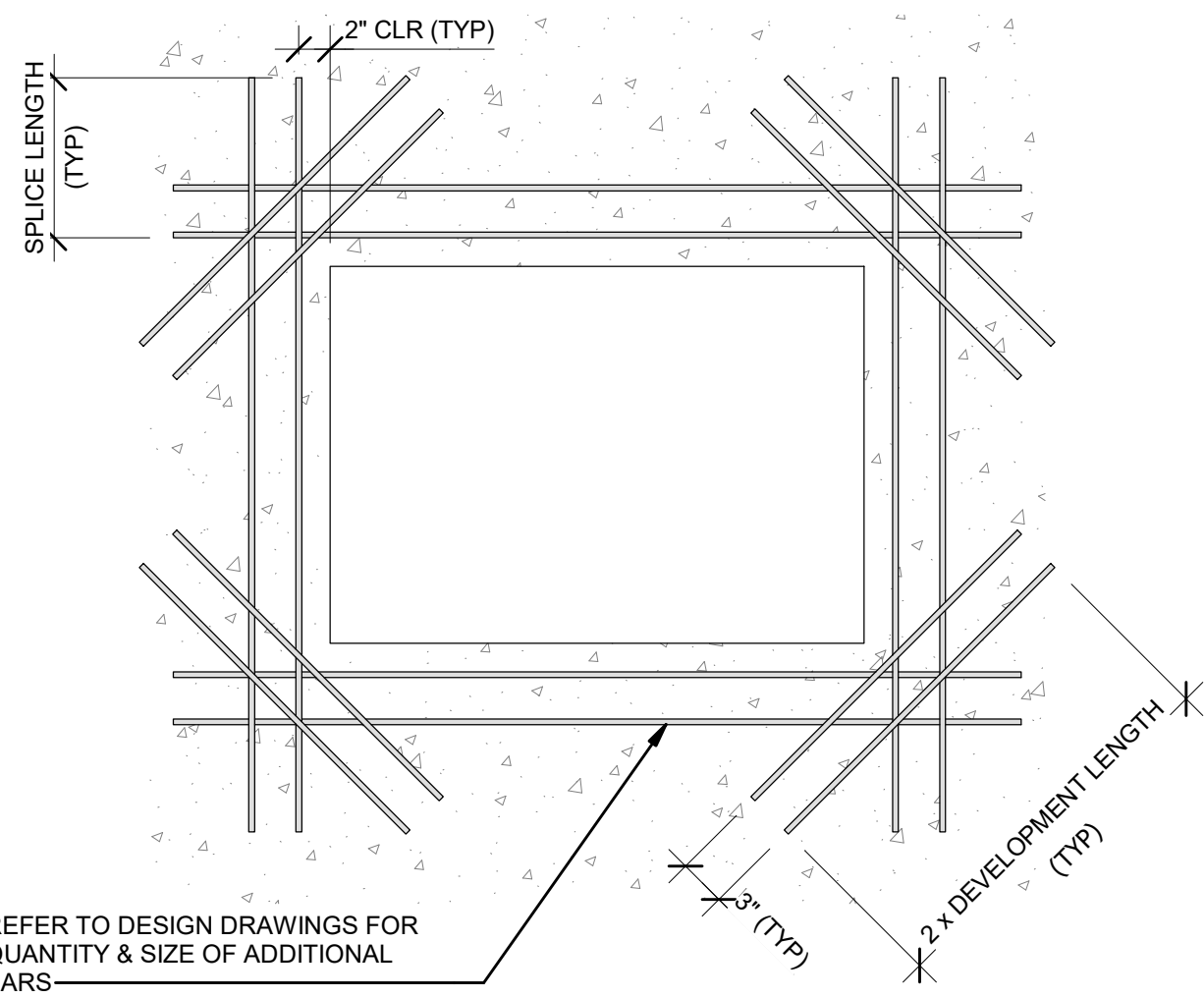
NOTES:
A. PIPE SLEEVE SMALLER THAN 30" OUTSIDE DIA SHALL BE STANDARD WEIGHT PIPE. SLEEVES WITH OUTSIDE DIA 30" AND LARGER SHALL BE 3/8" THICK PLATE.
B. PIPE SLEEVE TO BE INSTALLED SUCH THAT STEEL DECK WILL BE CUT AT LEAST 7 DAYS AFTER PLACING OF CONCRETE.

1 CP-01
FO-603.00 PIPE PENETRATION DETAIL AT SLAB ON GRADE
1 1/2" = 1'-0" 0 6" 12" 24"

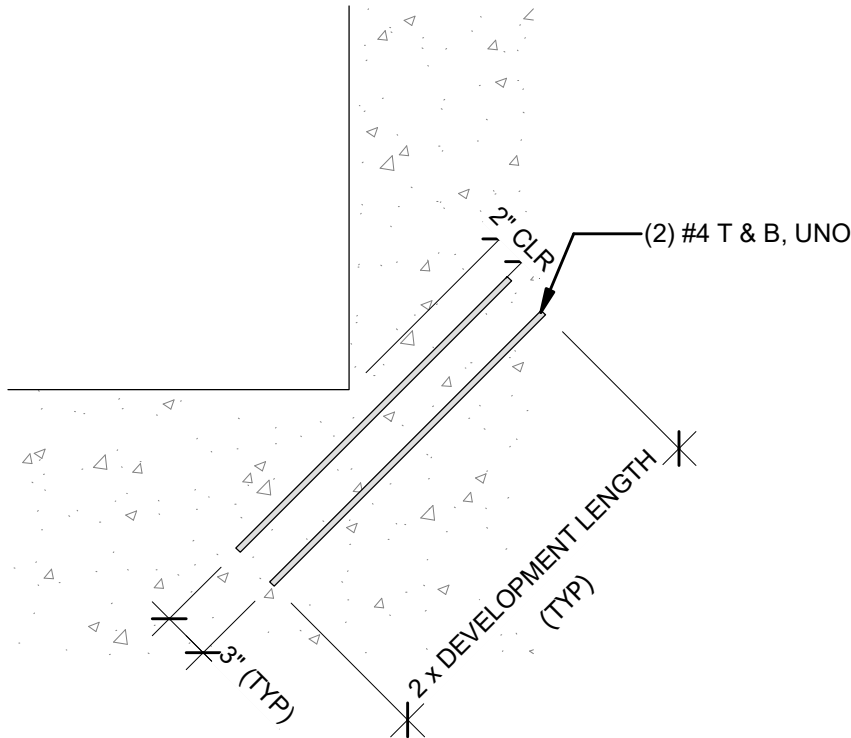
2 CP-02
FO-603.00 SLEEVE DETAIL AT ELEVATED SLAB
1 1/2" = 1'-0" 0 6" 12" 24"

3 CP-03
FO-603.00 WALL OR ELEVATED SLAB PENETRATION FOR CIRCULAR SLEEVES W/ DIAMETER LESS THAN MINIMUM REINFORCEMENT SPACING
1 1/2" = 1'-0" 0 6" 12" 24"

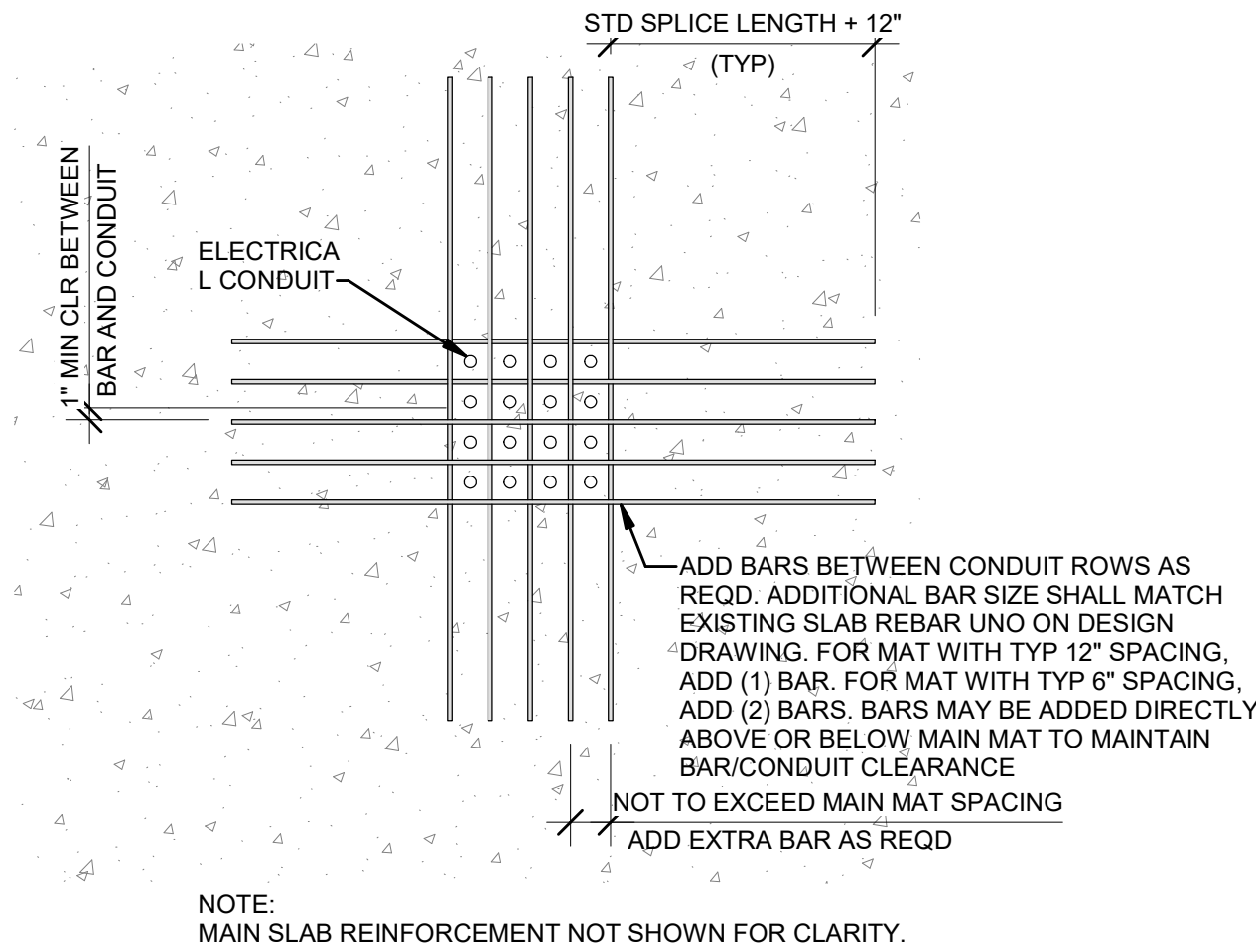
4 CP-04
FO-603.00 WALL OR ELEVATED SLAB PENETRATION FOR CIRCULAR SLEEVES W/ DIAMETER GREATER THAN MINIMUM REINFORCEMENT SPACING
1" = 1'-0" 1' 6" 0 1' 2'



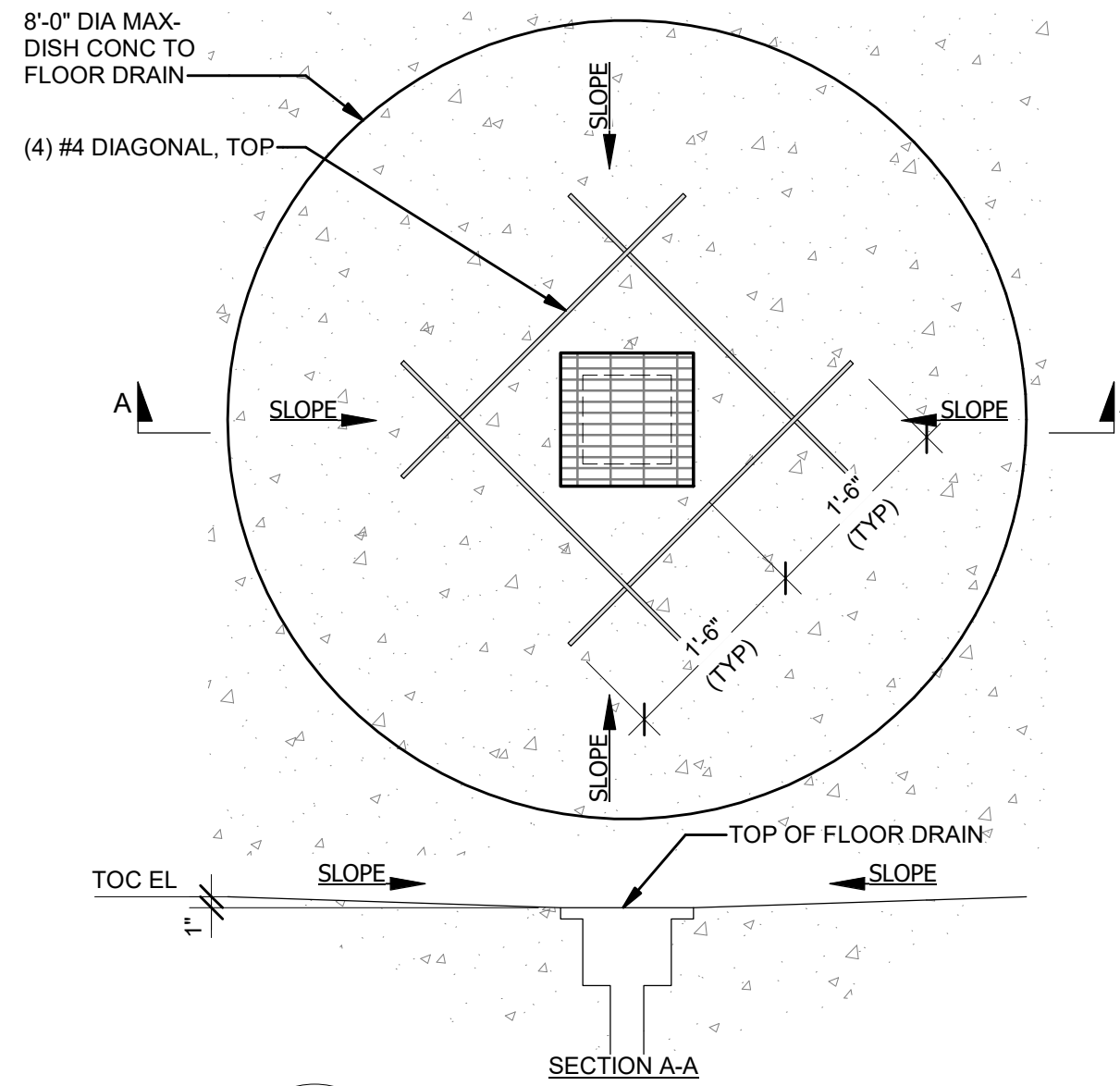
5 CP-05
FO-603.00 WALL OR SLAB PENETRATION FOR RECTANGULAR SLEEVES GREATER THAN MINIMUM REINFORCEMENT SPACING
1" = 1'-0" 1' 6" 0 1' 2'



6 CP-06
FO-603.00 WALL OR SLAB RE-ENTRANT CORNER REINFORCEMENT
1" = 1'-0" 1' 6" 0 1' 2'



7 CP-07
FO-603.00 SLAB PENETRATION REINFORCEMENT FOR GROUPS OF CONDUIT
3/4" = 1'-0" 1' 0 1' 2'



8 FD-01
FO-603.00 FLOOR DRAIN IN LEVEL SLAB OR MAT
3/4" = 1'-0" 1' 0 1' 2'

- SHEET NOTES:
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 - SEE DRAWING FO-005.00 FOR FOUNDATION LOCATION PLAN.
 - SEE DRAWING FO-601.00 THRU FO-606.00 FOR TYPICAL CONCRETE AND TYPICAL ANCHOR BOLT DETAILS.
 - FOR POST-INSTALLED APPLICATIONS, DRILL AND INSTALL DOWELS USING HILTI HIT-HY 200 ADHESIVE ANCHORING SYSTEM OR APPROVED EQUAL.
 - WHERE PIPE SLEEVE PENETRATIONS ARE REQUIRED TO BE WATERTIGHT, PIPE SLEEVES SHALL BE SEALED USING LINK-SEAL MODULAR SEAL (OR APPROVED EQUAL), UNLESS NOTED OTHERWISE ON DESIGN DRAWINGS.
 - WHERE SLAB ON GRADE PENETRATIONS ARE REQUIRED TO BE WATERTIGHT, REPLACE ISOLATION JOINT MATERIAL WITH HYDROPHILIC WATERSTOP, INSTALLED AT CENTER OF SLAB.

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REV	DESCRIPTION	DRW BY	CHK BY	DATE

Kiewit
470 Chestnut Ridge Rd # 2,
Woodcliff Lake, NJ 07677

Hitachi Energy
901 Main Campus Drive
Raleigh, North Carolina 27606

PROJECT

CHPE
Champlain Hudson
Power Express

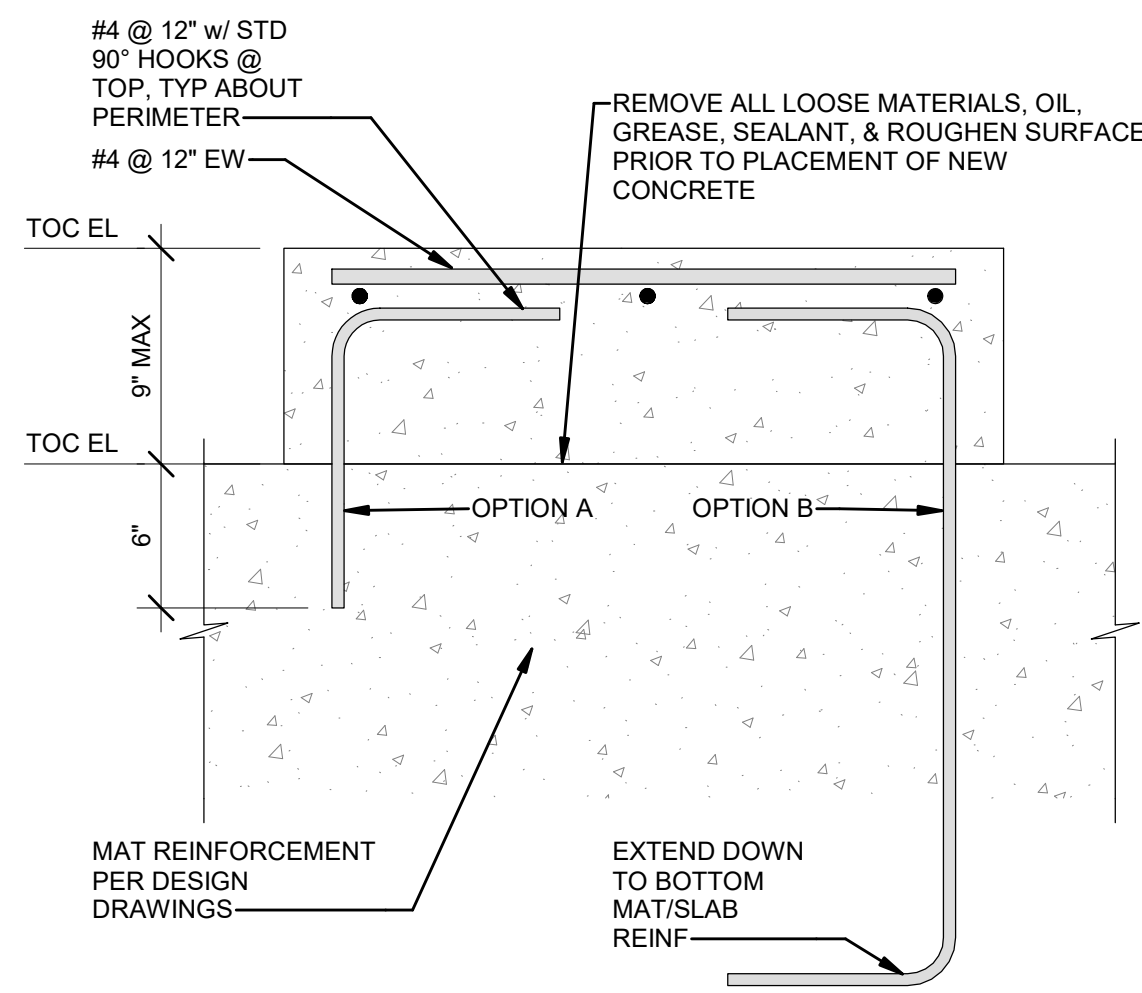
Astoria HVDC
Converter Station

31-45 20th Avenue, Astoria, Queens NY 11105
Block #850 - Lot #310 - BIN #4624437

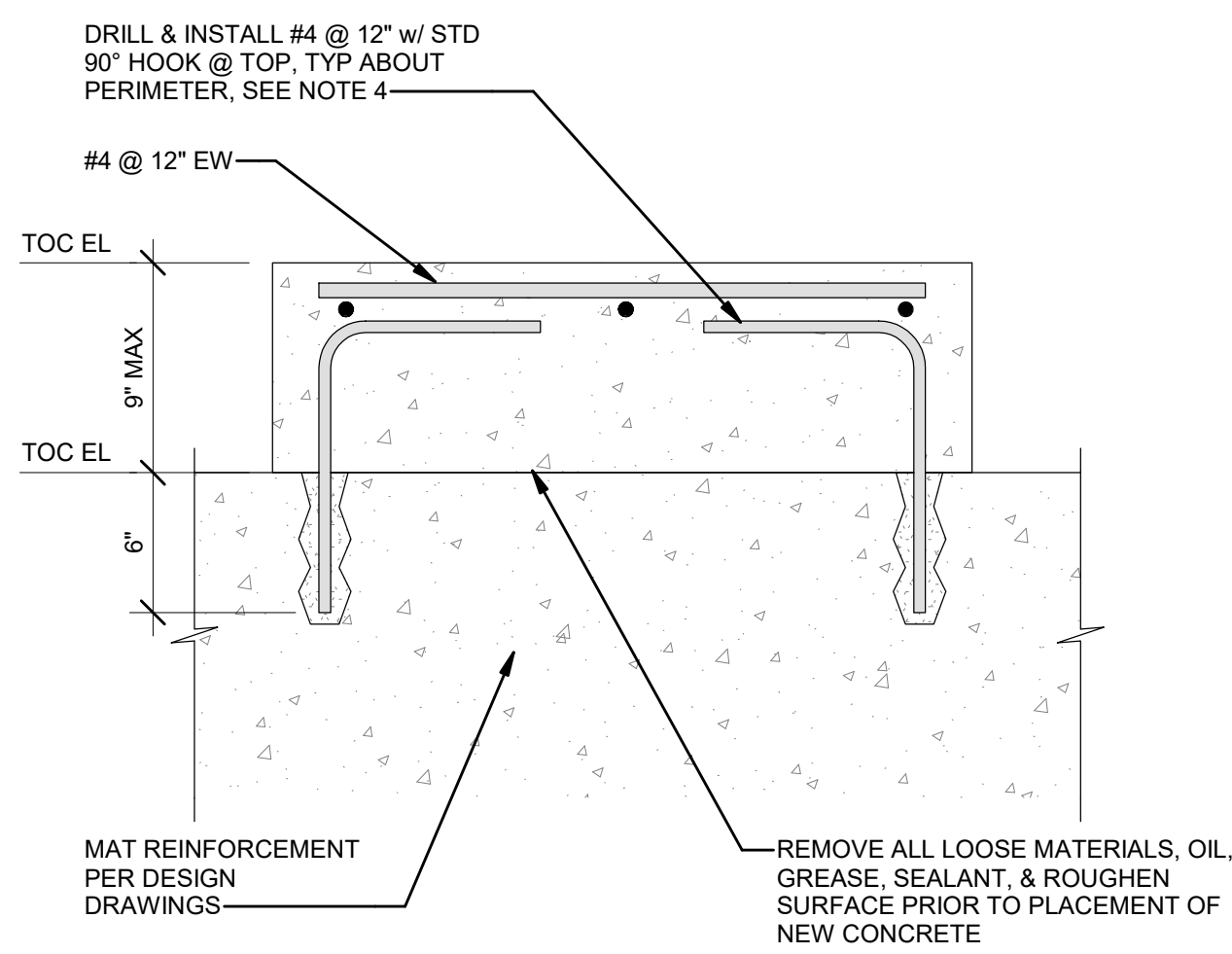
CONCRETE PENETRATION
TYPICAL DETAILS



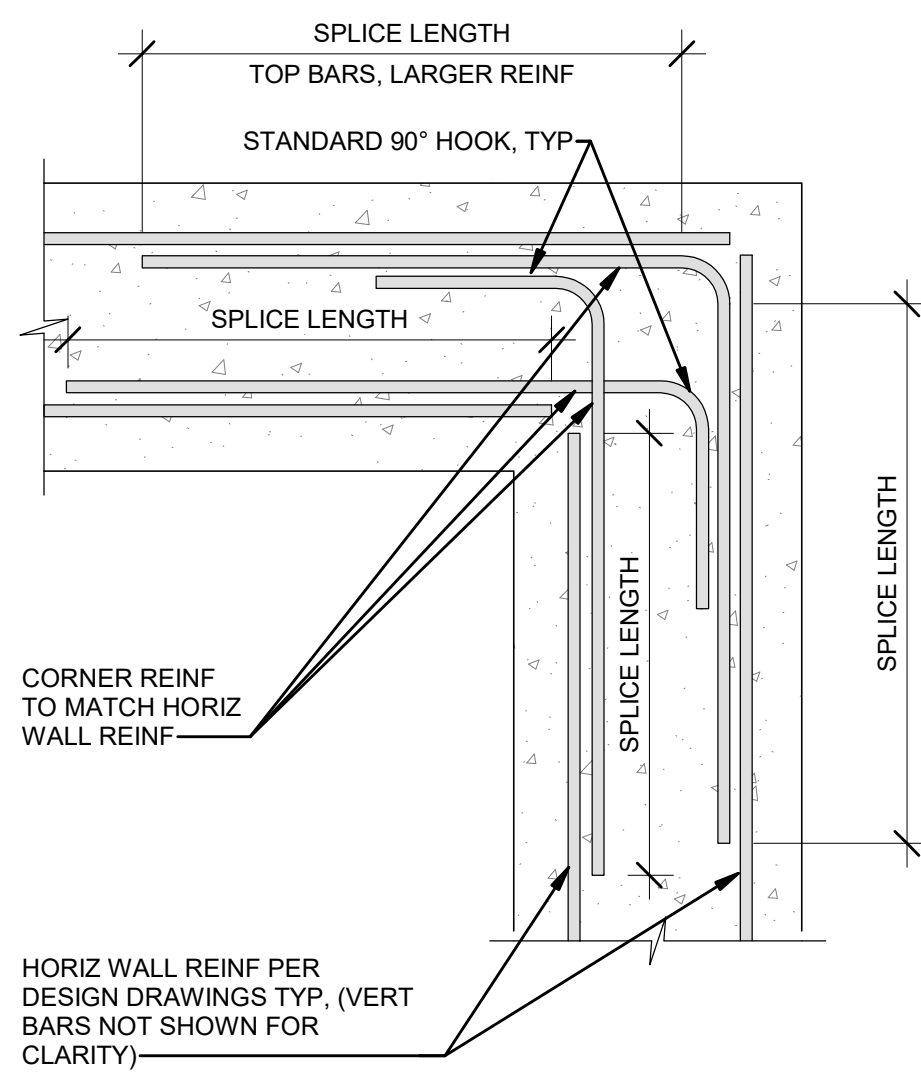
DATE 11/08/2022
PROJECT NO 105121
DRAWING BY D. FLYNN
CHECKED BY W. ABBASSI
DRAWING NO
FO-603.00
CADD FILE NO
Astoria/CHA-KIE-000-XX-M2-S-001.rvt
22 of 25



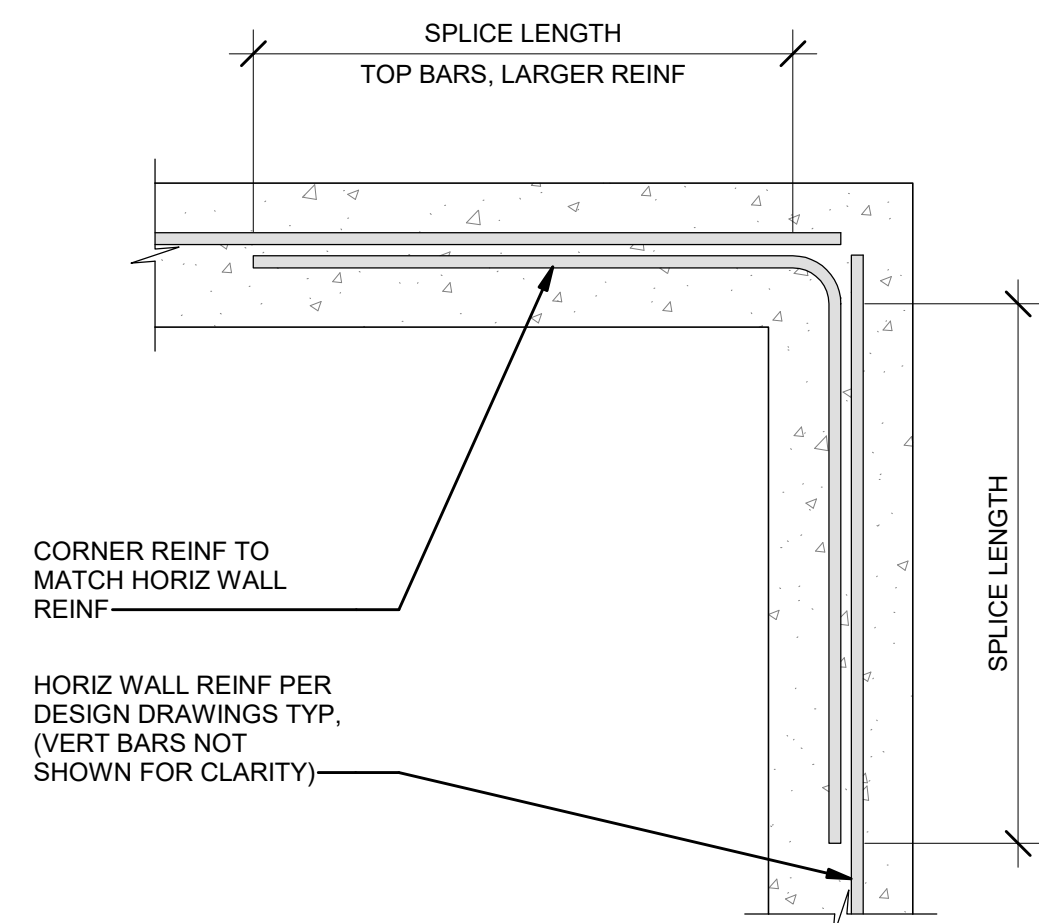
1 CR-01
EQUIPMENT PAD
w/ CAST-IN-PLACE DOWELS
FO-604.00 1 1/2" = 1'-0" 0 6" 12" 24"



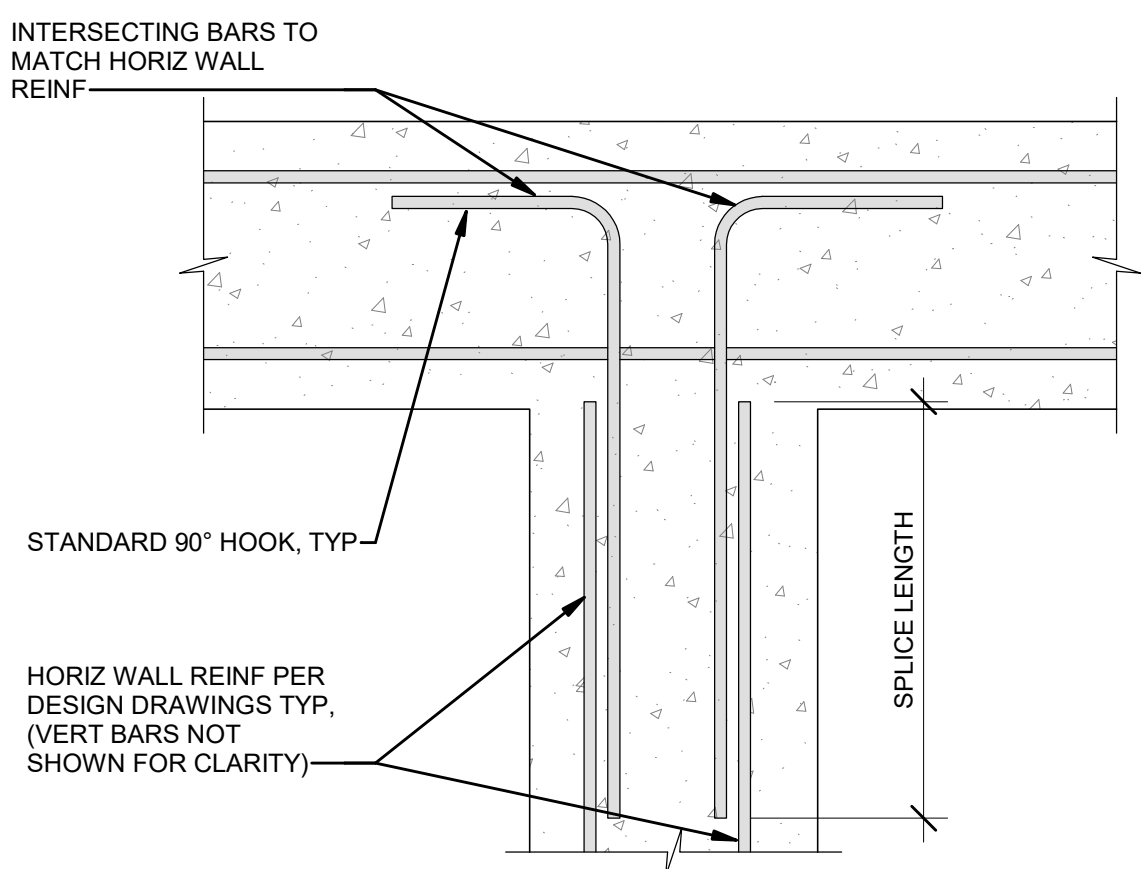
2 CR-02
EQUIPMENT PAD
w/ POST-INSTALLED DOWELS
FO-604.00 1 1/2" = 1'-0" 0 6" 12" 24"



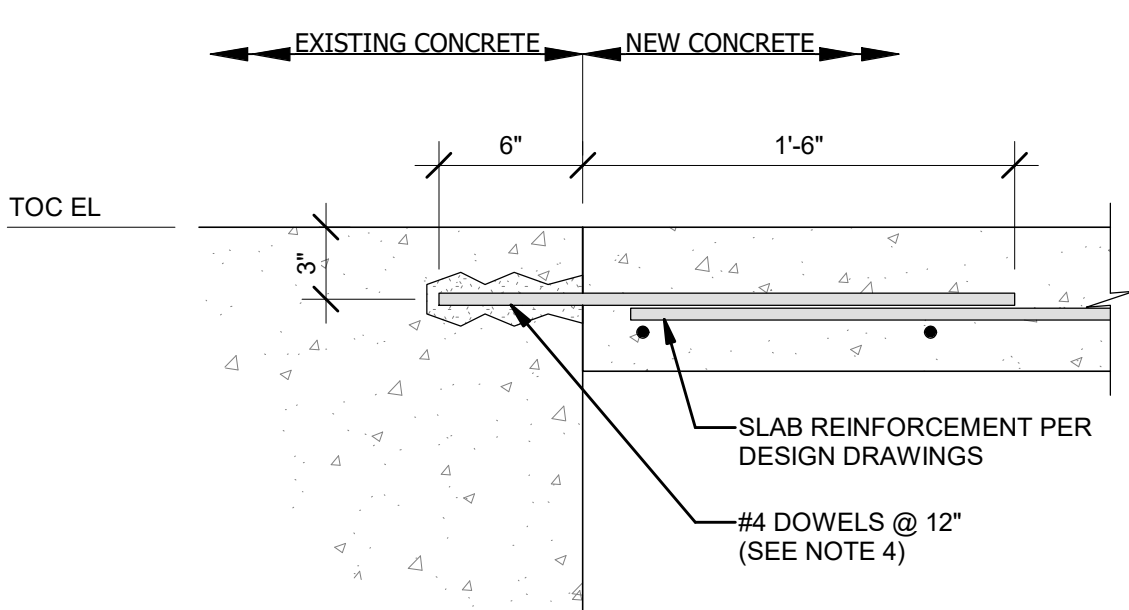
3 CR-03
WALL CORNER REINFORCEMENT
FO-604.00 1 1/2" = 1'-0" 0 6" 12" 24"



4 CR-04
WALL CORNER REINFORCEMENT
FO-604.00 1 1/2" = 1'-0" 0 6" 12" 24"



5 CR-05
WALL INTERSECTION REINFORCEMENT
FO-604.00 1 1/2" = 1'-0" 0 6" 12" 24"



6 CR-06
SLAB ON GRADE ATTACHMENT
TO CONCRETE
FO-604.00 1 1/2" = 1'-0" 0 6" 12" 24"

SHEET NOTES:

1. SEE DRAWINGS FO-001.00 THRU FO-004.00 FOR GENERAL NOTES, LEGEND, AND ABBREVIATIONS.
2. SEE DRAWING FO-005.00 FOR FOUNDATION LOCATION PLAN.
3. SEE DRAWING FO-601.00 THRU FO-605.00 FOR TYPICAL CONCRETE AND TYPICAL ANCHOR BOLT DETAILS.
4. FOR POST-INSTALLED APPLICATIONS, DRILL AND INSTALL DOWELS USING HILTI HIT-HY 200 ADHESIVE ANCHORING SYSTEM OR APPROVED EQUAL.

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A	INTERIM SUBMISSION	DJF	WA	08/29/2022
REV	DESCRIPTION	DRW BY	CHK BY	DATE

Kiewit
470 Chestnut Ridge Rd # 2,
Woodcliff Lake, NJ 07677

Hitachi Energy
901 Main Campus Drive
Raleigh, North Carolina 27606

PROJECT
CHPE
Champlain Hudson
Power Express

**Astoria HVDC
Converter Station**

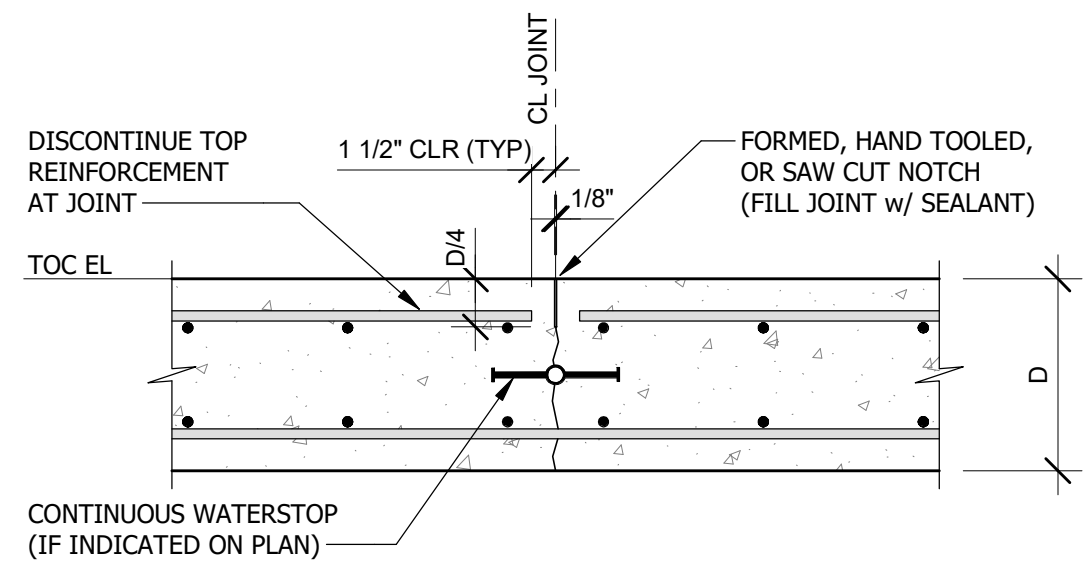
31-45 20th Avenue, Astoria, Queens NY 11105
Block #850 - Lot #310 - BIN #4624437

**CONCRETE REINFORCING
TYPICAL DETAILS**

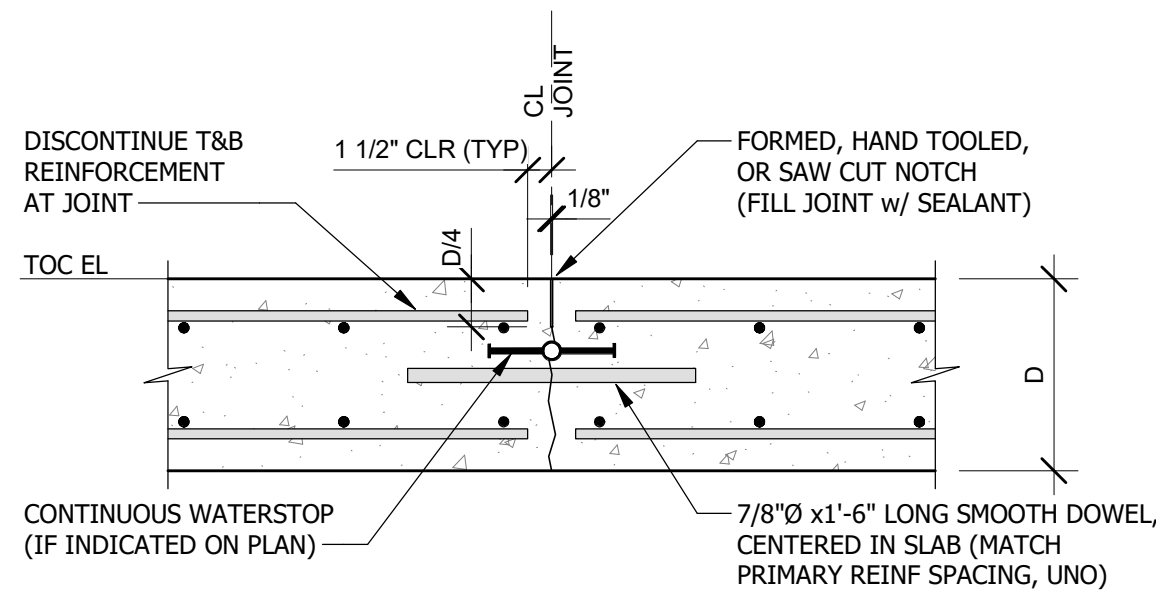


DATE 11/08/2022
PROJECT NO 105121
DRAWING BY D. FLYNN
CHECKED BY W. ABBASSI
DRAWING NO
FO-604.00
CADD FILE NO
Astoria/CHA-KIE-000-XX-M2-S-001.rvt
23 of 25

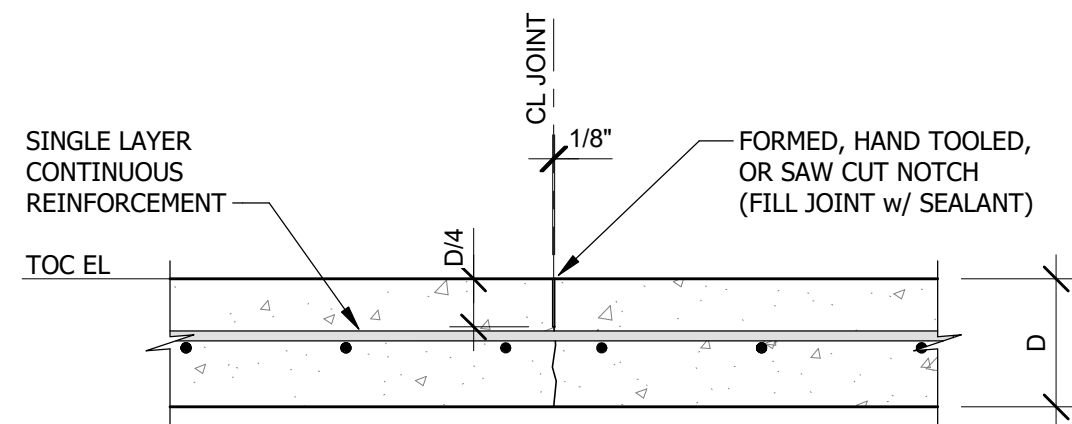
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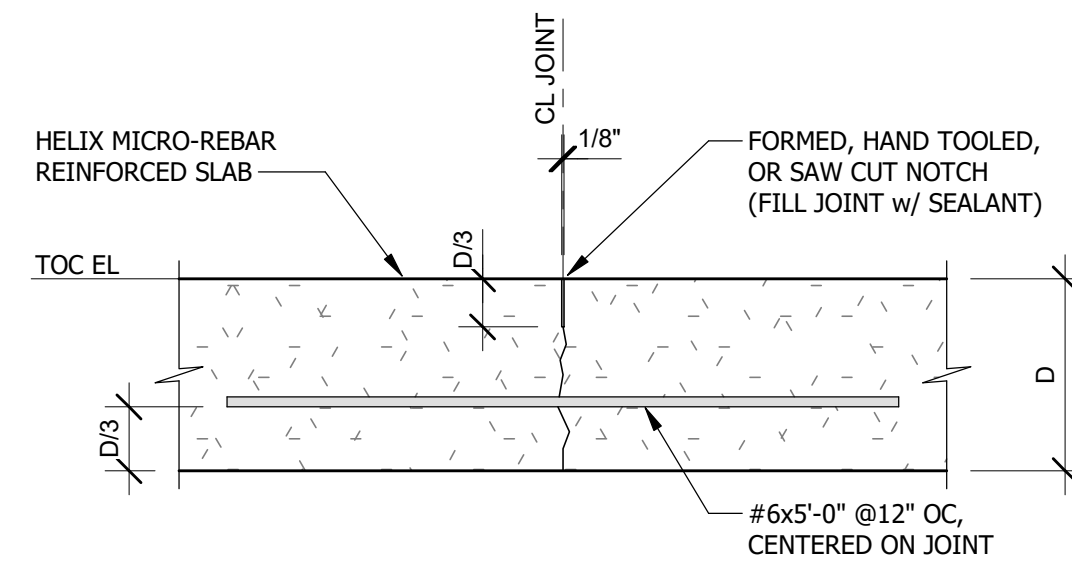
1
FO-605.00
CCJ-S01
SLAB JOINT
1" = 1'-0"



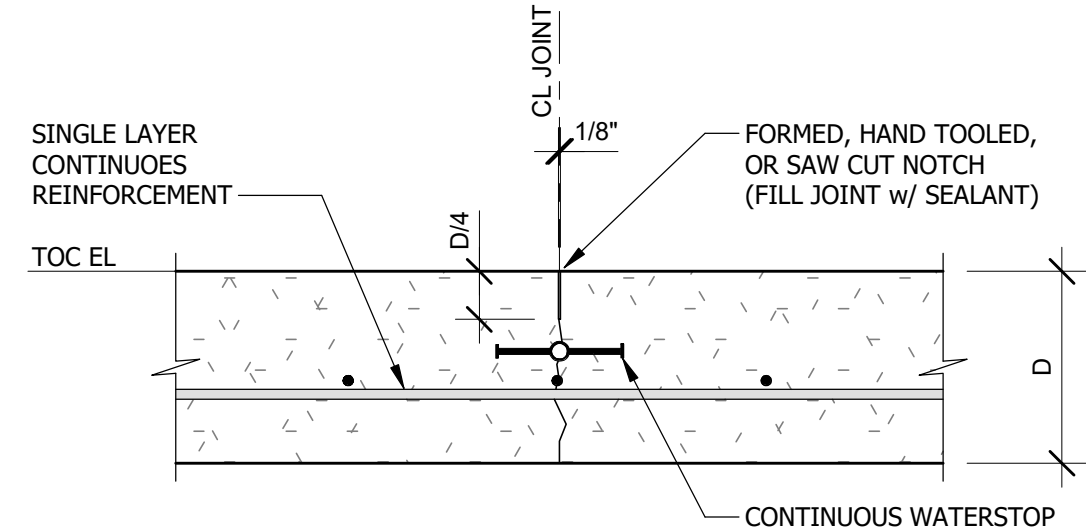
2
FO-605.00
CCJ-S02
SLAB JOINT
1" = 1'-0"



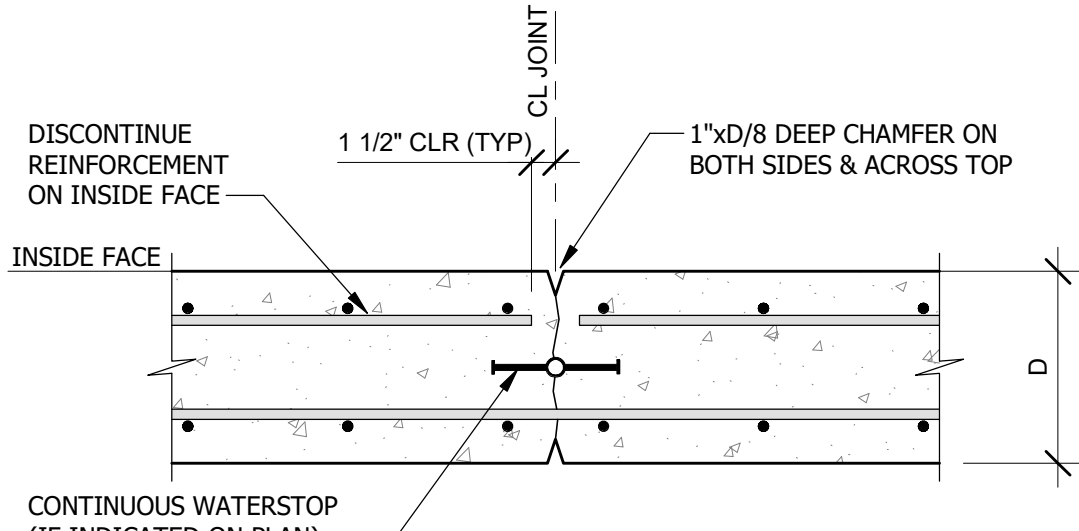
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CCJ-S03
SLAB JOINT
1" = 1'-0"



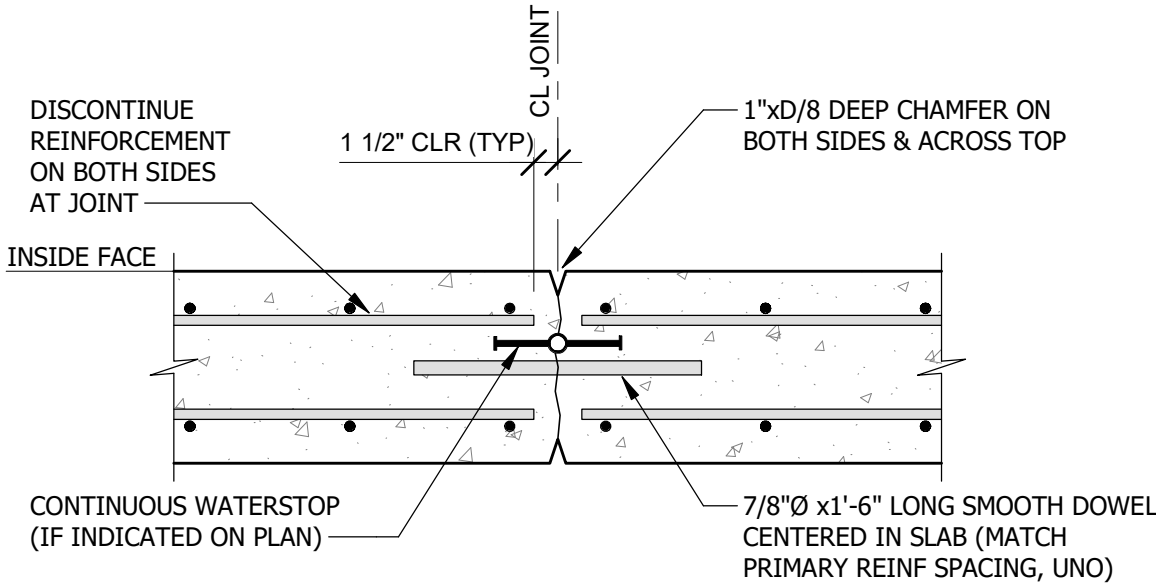
4
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CCJ-S04
SLAB JOINT
1" = 1'-0"



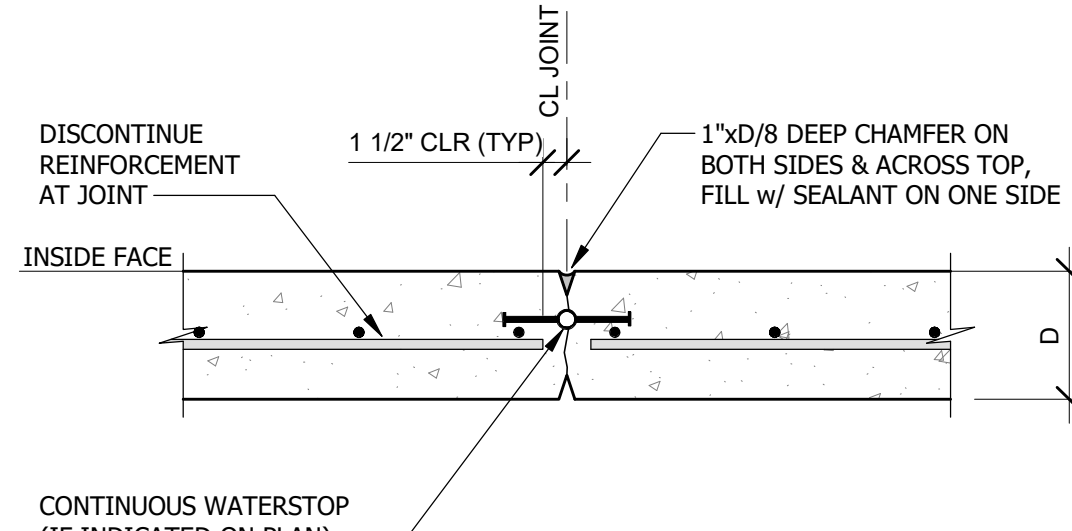
5
FO-605.00
CCJ-S05
SLAB JOINT
1" = 1'-0"



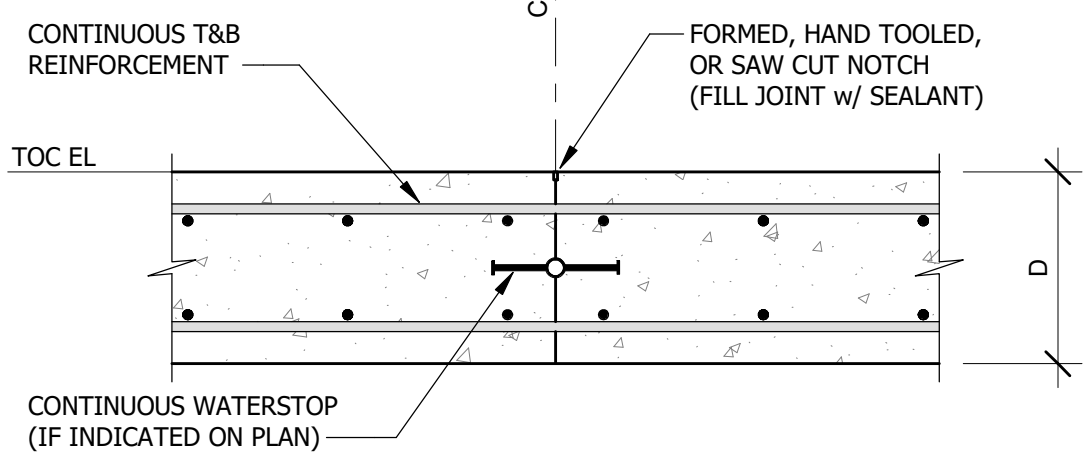
6
FO-605.00
CCJ-W01
WALL JOINT
1" = 1'-0"



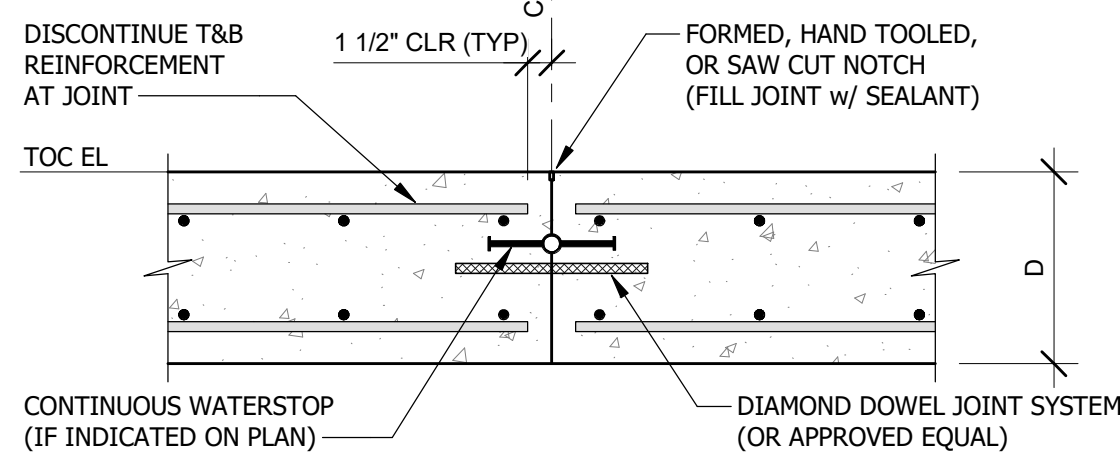
7
FO-605.00
CCJ-W02
WALL JOINT
1" = 1'-0"



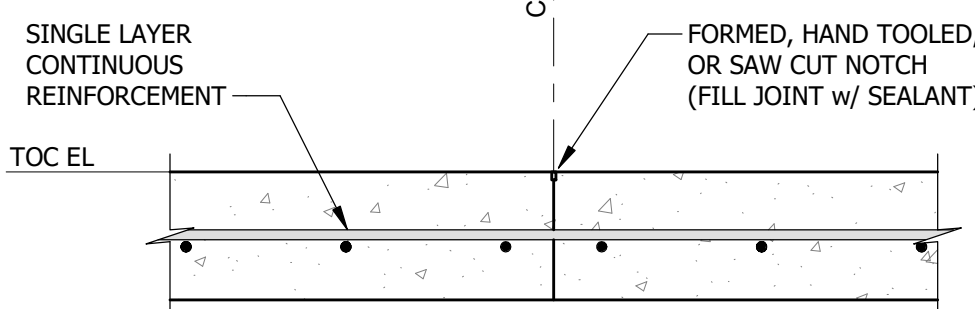
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CCJ-W03
WALL JOINT
1" = 1'-0"



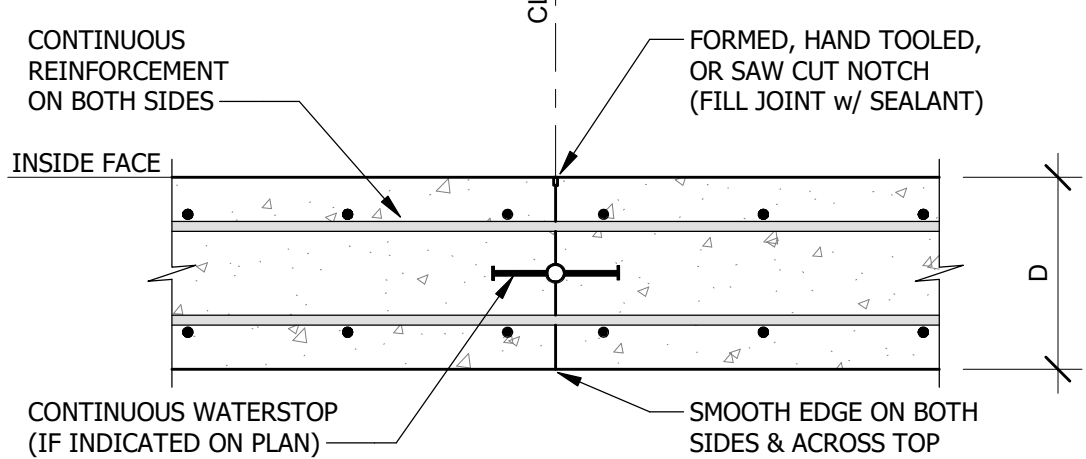
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CJ-S01
SLAB JOINT
1" = 1'-0"



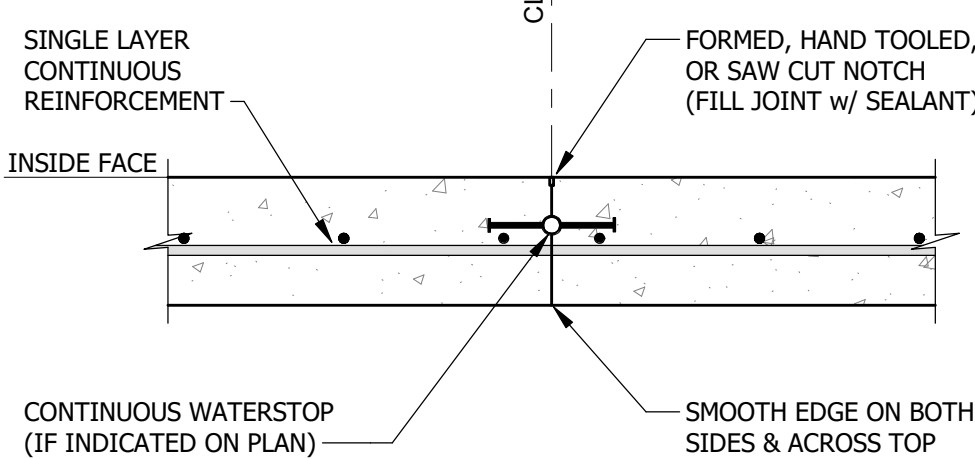
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CJ-S02
SLAB JOINT
1" = 1'-0"



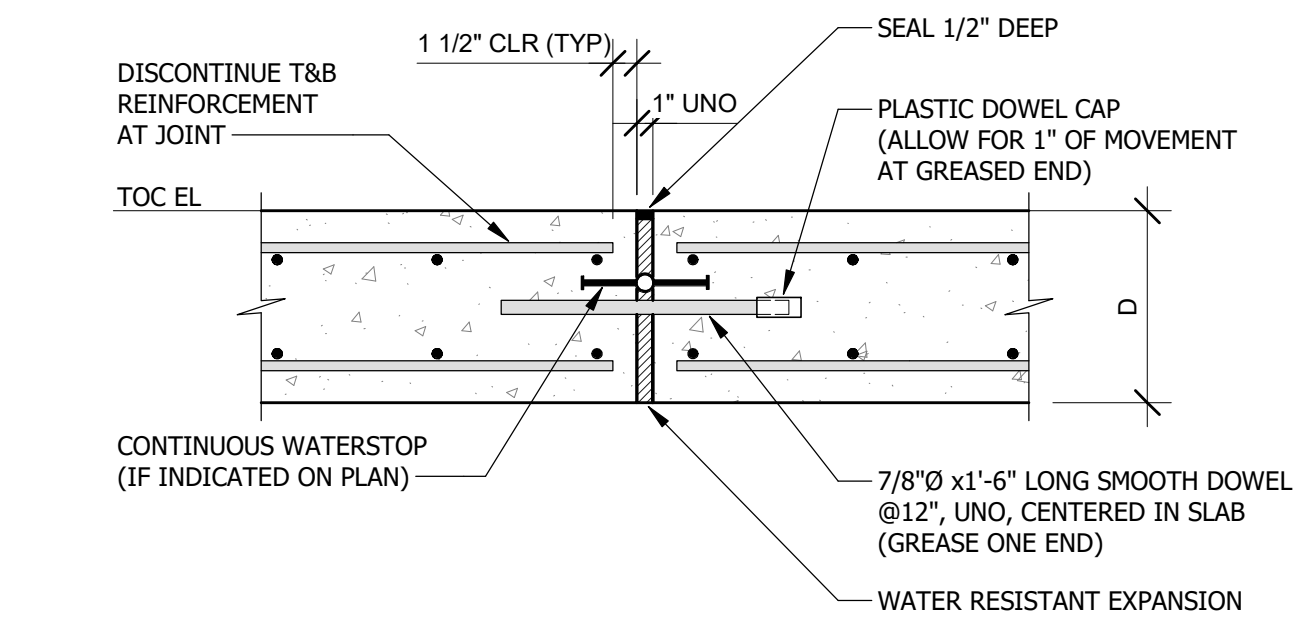
11
FO-605.00
CJ-S03
SLAB JOINT
1" = 1'-0"



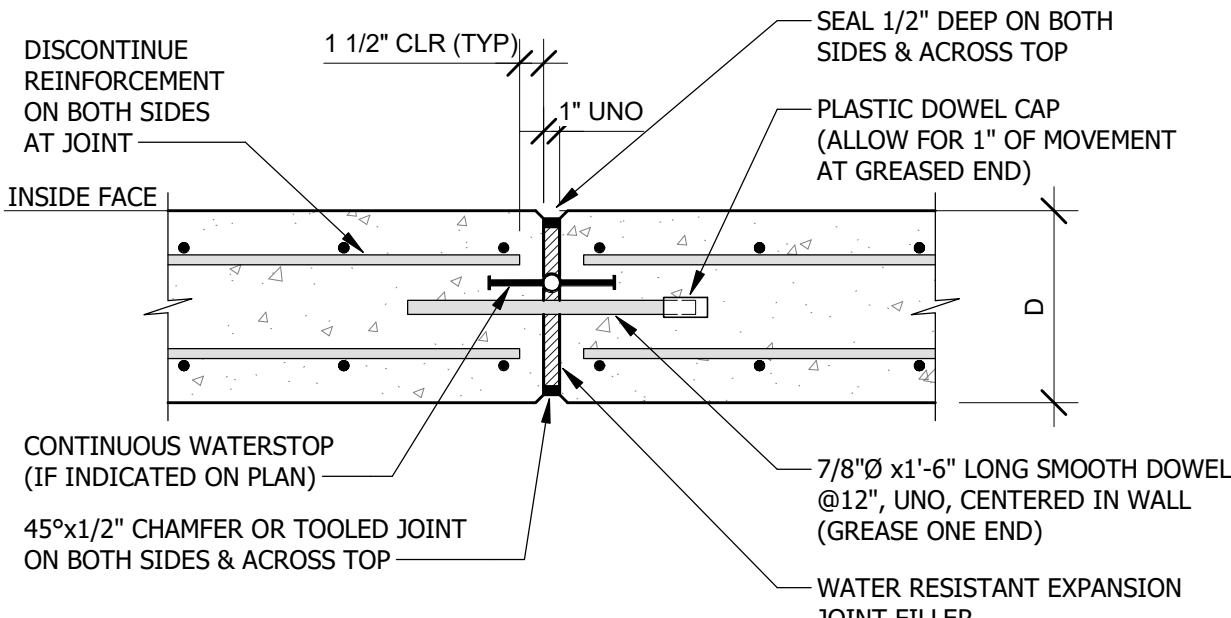
12
FO-605.00
CJ-W01
WALL JOINT
1" = 1'-0"



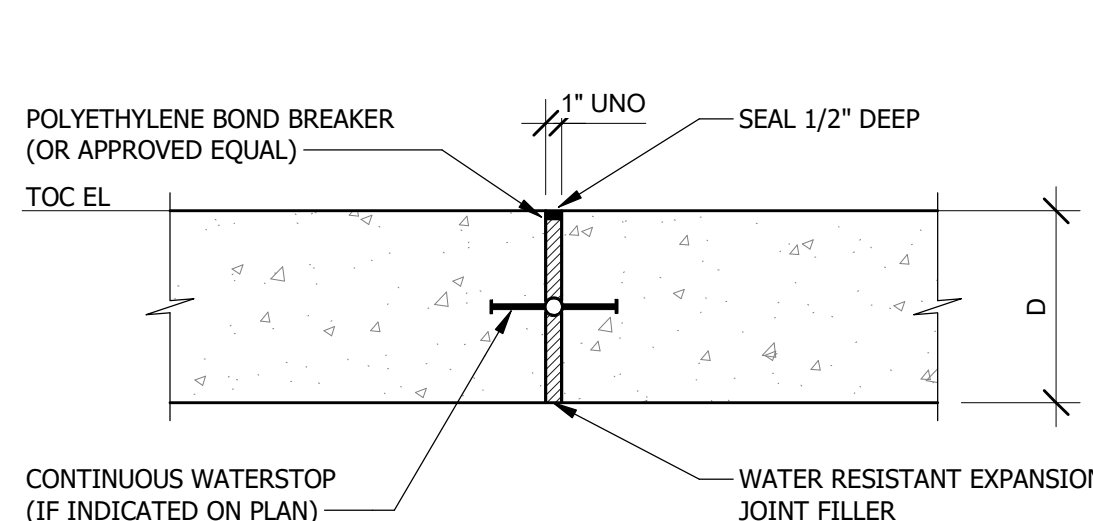
13
FO-605.00
CJ-W02
WALL JOINT
1" = 1'-0"



14
FO-605.00
EJ-S01
SLAB EXPANSION JOINT
1" = 1'-0"



15
FO-605.00
EJ-W01
WALL EXPANSION JOINT
1" = 1'-0"



16
FO-605.00
IJ-S01
ISOLATION JOINT
1" = 1'-0"

SHEET NOTES:

- SEE DRAWINGS FO-001.00 THRU FO-004.00 FOR GENERAL NOTES, LEGEND, AND ABBREVIATIONS. SEE FO-001.00, SECTION "CJ CONCRETE JOINTS" FOR ADDITIONAL DETAIL INFORMATION.
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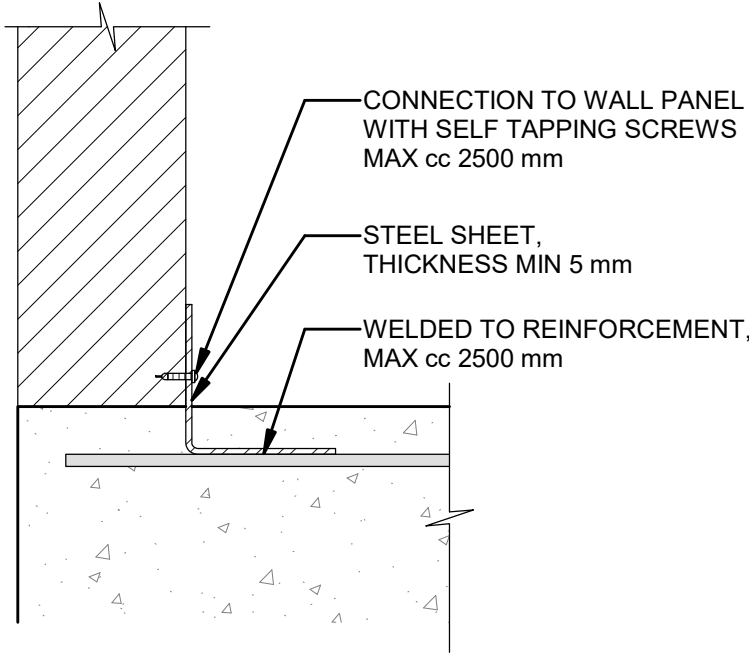
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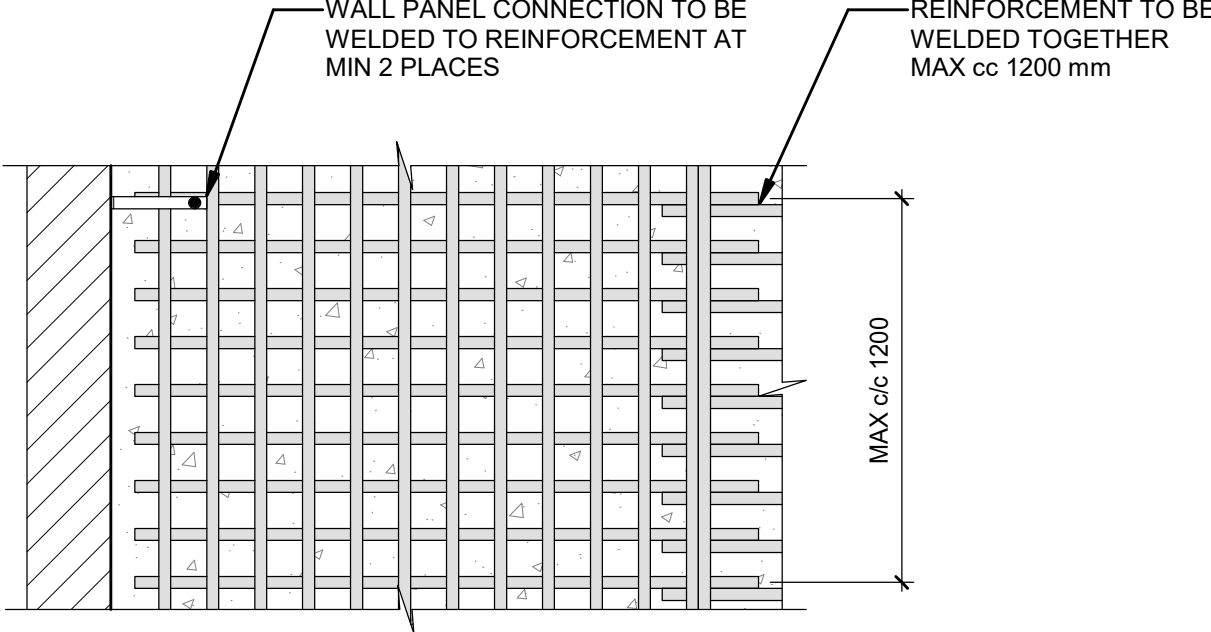
CONCRETE JOINT TYPICAL
DETAILS



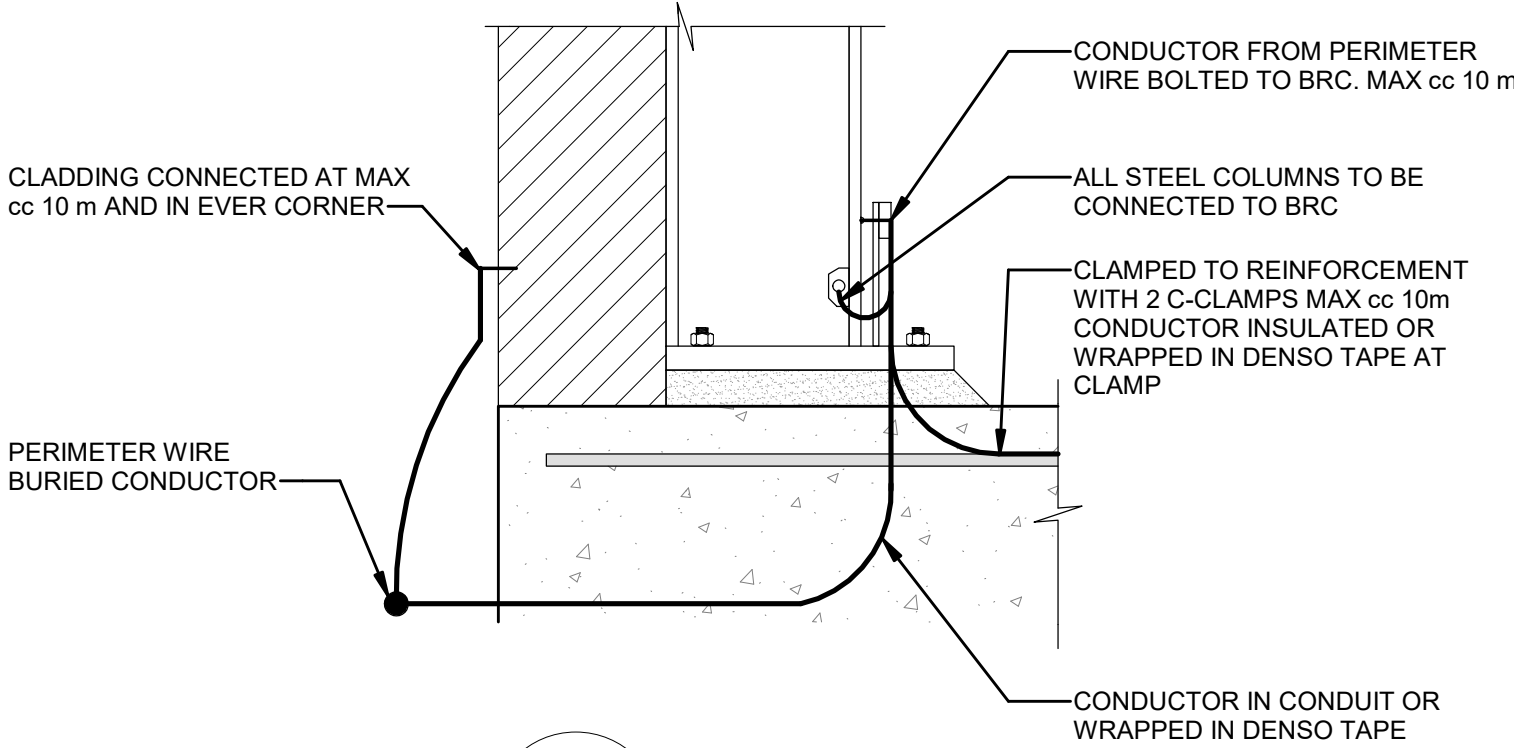
DATE 11/08/2022
PROJECT NO 105121
DRAWING BY D. FLYNN
CHECKED BY W. ABBASSI
DRAWING NO
FO-605.00
CADD FILE NO
Astoria HVDC CHPE
Astoria CHA-KIE-000-XX-M2-S-001.rvt



1 SLAB WALL DETAIL
FO-606.00 1 1/2" = 1'-0" 0 6" 12" 24"



2 PLAN DETAIL OF REINFORCEMENT
FO-606.00 1 1/2" = 1'-0" 0 6" 12" 24"



3 GROUTING DETAIL
FO-606.00 1 1/2" = 1'-0" 0 6" 12" 24"

- SHEET NOTES:
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 - SEE DRAWING FO-005.00 FOR FOUNDATION LOCATION PLAN.
 - SEE DRAWING FO-601.00 THRU FO-606.00 FOR TYPICAL CONCRETE AND TYPICAL ANCHOR BOLT DETAILS.

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**SOWINSKI
SULLIVAN**
—ARCHITECTURE+ENGINEERING—

25 Mohawk Avenue
Sparta, NJ 07871

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REV	DESCRIPTION	DRW BY	CHK BY	DATE
B	FINAL SUBMISSION	DJF	WA	11/08/2022
A	INTERIM SUBMISSION	DJF	WA	08/29/2022



Kiewit

470 Chestnut Ridge Rd # 2,
Woodcliff Lake, NJ 07677



Hitachi Energy

901 Main Campus Drive
Raleigh, North Carolina 27606

PROJECT

CHPE
Champlain Hudson
Power Express

**Astoria HVDC
Converter Station**

31-45 20th Avenue, Astoria, Queens NY 11105
Block #850 - Lot #310 - BIN #4624437

**GROUNDING TYPICAL
DETAILS**



DATE 11/08/2022
PROJECT NO 105121
DRAWING BY D. FLYNN
CHECKED BY W. ABBASSI

DRAWING NO
FO-606.00

CADD FILE NO
Astoria-HVDC-CHPE
Astoria-CHA-KIE-000-XX-M2-S-001.rvt

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