DRAWING NO CS-100
CONT ON SHEET
SH NO 1

WATERFORD RESTRUCTURE

SILOXANE UNLOADING FACILITY

EARLY WORKS PACKAGE

WATERFORD, NY NOVEMBER 2020

DRAWING LIST

DOCUMENT NO.	DRAWING TITLE	REV NO.	REV DATE
APPENDIX A - CIVIL / STRUCTURAL			
CS-100 SHEET 1	COVER	P0	19 NOV 2020
CS-101 SHEET 1	EXISTING CONDITIONS PLAN	P0	19 NOV 2020
CS-102 SHEET 1	SITE PLAN	P0	19 NOV 2020
CS-103 SHEET 1	STRUCTURAL NOTES	P0	19 NOV 2020
CS-103 SHEET 2	FOUNDATION PLAN	P0	19 NOV 2020
CS-103 SHEET 4	FOUNDATION DETAILS 1	P0	19 NOV 2020
CS-103 SHEET 5	FOUNDATION DETAILS 2	P0	19 NOV 2020
CS-103 SHEET 6	PIPE RACK DETAILS	P0	19 NOV 2020
APPENDIX B - ELECTRICAL			
EE-107 SHEET 1	ELECTRICAL GROUNDING SPECIFICATION	P0	19 NOV 2020
EE-107 SHEET 2	ELECTRICAL GROUNDING PLAN B87	P0	19 NOV 2020
EE-107 SHEET 3	ELECTRICAL GROUNDING DETAILS B87	P0	19 NOV 2020
EE-107 SHEET 4	ELECTRICAL GROUNDING DETAILS B87	P0	19 NOV 2020
APPENDIX C - MECHANICAL PLUMBING			
P-100 SHEET 1	SANITARY WASTE AND VENT PIPING SPECIFICATION	P0	19 NOV 2020
P-100 SHEET 2	SL01 UNDERGROUND PLUMBING PLAN	P0	19 NOV 2020

REV NO	DESCRIPTION	REVISED BY & DATE	APPROVED BY & DATE	MICRO FILM DATE
P0	ISSUED FOR PERMIT	NGK 11/19/20	CRK 11/19/20	

REVISIONS

ISSUED, MGR. FACILITIES DATE

APPROVALS

CENTRAL SAFETY		PROJECT ENG	
PROCESS ENG		DESIGN SUPERVISOR	

DWG. BY NGK CHK. BY CRK SCALE 1"=20'

MOMENTIVE

Waterford, New York 12188

CAD FILE: CS-100A

PLANT: 87 UNLOADING STATION

PROCESS: CHEM OPS EAST

TITLE

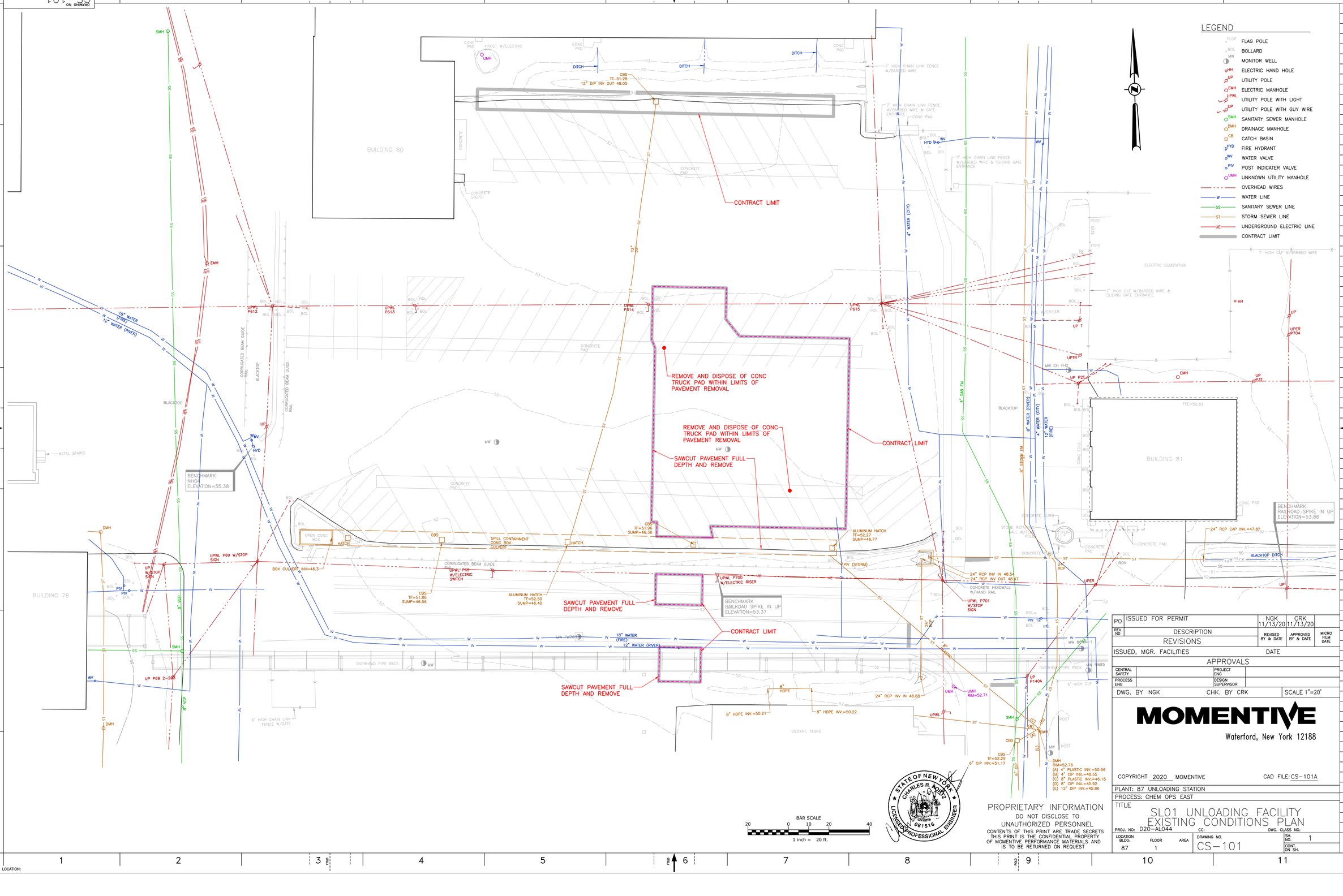
SL01 UNLOADING FACILITY COVER

PROJ. NO: D20-AL044 CC: DWG. CLASS NO.

LOCATION BLDG.	FLOOR	AREA	DRAWING NO.	SH. NO.	CONT. ON SH.
87	1		CS-100	1	

DWG. LOCATION:

DRAWING NO CS-101
SH NO 1
CONT ON SHEET



STATE OF NEW YORK
CHARLES R. ROBITZ
081516
LICENSED PROFESSIONAL ENGINEER

PROPRIETARY INFORMATION
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PO	ISSUED FOR PERMIT	NGK 11/13/20	CRK 11/13/20	
REV NO	DESCRIPTION	REVISED BY & DATE	APPROVED BY & DATE	MICRO FILM DATE
	REVISIONS			

ISSUED, MGR. FACILITIES DATE

APPROVALS

CENTRAL SAFETY		PROJECT ENG	
PROCESS ENG		DESIGN SUPERVISOR	

DWG. BY NGK CHK. BY CRK SCALE 1"=20'

MOMENTIVE
Waterford, New York 12188

CAD FILE: CS-101A

PLANT: 87 UNLOADING STATION
PROCESS: CHEM OPS EAST

TITLE
SL01 UNLOADING FACILITY EXISTING CONDITIONS PLAN

PROJ. NO: D20-AL044 CC: DWG. CLASS NO.

LOCATION BLDG.	FLOOR	AREA	DRAWING NO.	SH. NO.	CONT. ON SH.
87	1		CS-101	1	

DWG. LOCATION:

DRAWING NO CS-102
SH NO 1
CONT ON SHEET

SL01 UNLOADING FACILITY
FFE 53.50

UTILITY BUILDING
FFE 54.00

CONTRACT LIMIT

PIPE SUPPORT (TYP.) 8" ø X 7' LONG CONC FILLED SONOTUBE. EMBED 4' INTO GROUND, PROJECT 3' ABOVE GROUND. SPACE AT 10' ON-CENTER MAX.

4" PVC SANITARY

LIMIT OF PAVEMENT REPLACEMENT
5' OUTSIDE OF BUILDING FOOTINGS

2" HDPE WATER (CITY)
8" DIP WATER (FIRE)

18" DIP AT 0.50% (TYPICAL)

CB 4
FG 53.25
INV IN 49.04
INV OUT 48.96

CB 3
FG 53.25
INV IN 48.88
INV OUT 48.78

34"x48" (8" WALLS) PRECAST CONC CATCH BASIN WITH NYSDOT RETICULINE FRAME AND GRATE #22 (TYPICAL 4 PLACES)

CB 2
FG 53.25
INV IN 48.70
INV OUT 48.60

8" HIGH MONOLITHIC CAST CONC ISLAND (TYPICAL 3 PLACES)

CB 1
FG 53.25
INV IN 48.52
INV OUT 48.42

12'x68'-4" CONTAINMENT AREA CAST IN FLOOR (TYPICAL 4 PLACES)

PIPE RACK FOUNDATION

18" INV OUT 48.30

8" CONC FILLED STEEL BOLLARD (TYP)

ALUMINUM HATCH TF=52.27 SUMP=46.77

PIV (STORM)

24" RCP INV IN 48.54
24" RCP INV OUT 48.47

CONCRETE HEADWALL W/HAND RAIL

UPWL P701 W/STOP SIGN

BENCHMARK RAILROAD SPIKE IN UP ELEVATION=53.37

BENCHMARK RAILROAD SPIKE IN UP ELEVATION=53.86

BENCHMARK NHOA ELEVATION=55.38

BOX CULVERT INV=46.3

UPWL P69 W/STOP SIGN

UP W/STOP SIGN

UP P69 2-23S

UPWL P69 W/ELECTRIC SWITCH

UPWL P700 W/ELECTRIC RISER

SPILL CONTAINMENT CONC BOX CULVERT

OPEN CONC BOX

HATCH

CBS
TF=51.96
SUMP=45.36

CBS
TF=51.86
SUMP=46.56

ALUMINUM HATCH
TF=52.50
SUMP=46.40

CBS
TF=52.29
6" CIP INV.=51.17

DMH
RIM=52.76
(A) 4" PLASTIC INV.=50.96
(B) 4" CIP INV.=48.55
(C) 8" PLASTIC INV.=46.18
(D) 8" CIP INV.=45.92
(E) 12" DIP INV.=45.86

UMH
RIM=52.71

24" RCP INV IN 48.88

8" HDPE INV.=50.21

8" HDPE INV.=50.22

8" HDPE

18" WATER (FIRE)
12" WATER (RIVER)

8" WATER (RIVER)
4" WATER (CITY)
12" WATER (FIRE)

4" SAN FM

8" SANITARY

24" RCP CAP INV.=47.87

BLACKTOP DITCH

BUILDING 78
BUILDING 80
BUILDING 81

ELECTRIC SUBSTATION

7' HIGH CHAIN LINK FENCE W/BARBED WIRE

7' HIGH CHAIN LINK FENCE W/BARBED WIRE & GATE ENTRANCE

7' HIGH CHAIN LINK FENCE W/BARBED WIRE & SLIDING GATE ENTRANCE

7' HIGH CLF W/BARBED WIRE

7' HIGH CLF W/BARBED WIRE & SLIDING GATE ENTRANCE

6' HIGH CHAIN LINK FENCE W/GATE

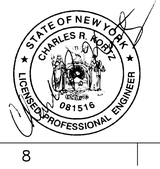
6' HIGH CLF

METAL STAIRS

OVERHEAD PIPE RACK

SILOXNE TANKS

BAR SCALE
20 0 10 20 40
1 inch = 20 ft.



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REV NO	DESCRIPTION	REVISED BY & DATE	APPROVED BY & DATE	MICRO FILM DATE
PO	ISSUED FOR PERMIT	NGK 11/13/20	CRK 11/13/20	
	REVISIONS			

ISSUED, MGR. FACILITIES DATE

APPROVALS

CENTRAL SAFETY		PROJECT ENG	
PROCESS ENG		DESIGN SUPERVISOR	

DWG. BY NGK CHK. BY CRK SCALE 1"=20'

MOMENTIVE
Waterford, New York 12188

CAD FILE: CS-102A

PLANT: 87 UNLOADING STATION
PROCESS: CHEM OPS EAST

TITLE
SL01 UNLOADING FACILITY SITE PLAN

PROJ. NO: D20-AL044 CC: DWG. CLASS NO.

LOCATION BLDG.	FLOOR	AREA	DRAWING NO.	SH. NO.	CONT. ON SH.
87	1		CS-102	1	

DWG. LOCATION:

DRAWING NO CS-103 SH NO 1
CONT ON SHEET 2

GENERAL

G1. CONTRACTOR TO VERIFY/CONFIRM BY SITE VISIT/FIELD MEASUREMENT ALL EXISTING CONDITIONS PRIOR TO COMMENCEMENT OF CONSTRUCTION. NOTIFY THIS ENGINEER OF ANY EXISTING CONDITION NOT MATCHING THOSE SHOWN ON THESE DRAWINGS.

G2. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY/CONFIRM THE LOCATION OF ALL EQUIPMENT, ANCHORAGES, OPENINGS (INCLUDING SIZE AND CLEARANCES), DRAINS, ETC., AND REPORT ANY DISCREPANCY TO THIS ENGINEER PRIOR TO COMMENCEMENT OF CONSTRUCTION.

G3. CONTRACTOR TO PATCH, MATCH, AND RESTORE TO EXISTING CONDITION ALL PERIPHERAL AREAS AFFECTED BY MODIFICATION CONSTRUCTION.

G4. CONTRACTOR TO PROVIDE ADEQUATE MEANS TO PROTECT ADJACENT AREAS FROM DUST AND FOREIGN MATERIAL CONTAMINATION.

G5. CONTRACTOR TO MAKE THE NECESSARY PROVISIONS THAT ANY EXISTING BUILDINGS AFFECTED BY CONSTRUCTION REMAIN WEATHER TIGHT DURING CONSTRUCTION.

G6. CONTRACTOR IS TO PROVIDE AND COORDINATE TEMPORARY SHORING AT EXISTING BUILDING STRUCTURES AS NECESSARY.

G7. SUBSTITUTIONS WILL BE MADE ON AN "OR EQUIVALENT" BASIS AND ARE TO BE APPROVED BY THIS ENGINEER. THE CONTRACTOR SHALL NOTIFY THIS ENGINEER OF THE PROPOSED SUBSTITUTION IN WRITING PRIOR TO PROCEEDING WITH THE PROPOSED SUBSTITUTION, AND IS RESPONSIBLE FOR DEMONSTRATING THE EQUIVALENCE OF THE PROPOSED SUBSTITUTION TO THE SATISFACTION OF THIS ENGINEER.

EARTHWORK

E1. THE EXPOSED SUBGRADE MUST BE THOROUGHLY PROOF-ROLLED AND COMPACTED. THE COMPACTION OF THE SUBGRADE SHALL BE ACCOMPLISHED BY USING A SMOOTH DRUM VIBRATORY ROLLER WITH A STATIC WEIGHT OF AT LEAST 10 TONS AND OPERATING IN THE VIBRATORY MODE. ANY AREAS THAT PUMP OR WEAVE BENEATH THE PASSING ROLLER SHALL BE CONSIDERED UNSTABLE, AND SHALL BE UNDERCUT AND BACKFILLED WITH WELL COMPACTED SELECT GRANULAR FILL TO 95 PERCENT OF MAXIMUM DRY DENSITY ACCORDING TO ASTM D1557.

E2. ALLOWABLE SOIL BEARING PRESSURE 2,000 PSF.

E3. FOOTINGS AND FOUNDATIONS TO BEAR ON UNDISTURBED NATIVE SOIL UNLESS INDICATED OTHERWISE. FILL ANY OVEREXCAVATION WITH FILL CONCRETE OR ELECT GRANULAR FILL COMPACTED TO 95 PERCENT OF MAXIMUM DRY DENSITY ACCORDING TO ASTM D1557 AS APPROVED BY THE ENGINEER. FOOTING STEPS ARE NOT TO EXCEED A 1 (VERTICAL) TO 2 (HORIZONTAL) SLOPE.

E4. STRUCTURAL FILL: NATURALLY OR ARTIFICIALLY GRADED MIXTURE OF NATURAL OR CRUSHED GRAVEL, CRUSHED STONE, OR NATURAL OR CRUSHED SAND WITH THE FOLLOWING GRADATION:

SIEVE SIZE	PERCENT PASSING
4"	100%
1/4"	75-100%
#40	50-95%
#200	0-15%

E5. SELECT GRANULAR FILL: NATURALLY OR ARTIFICIALLY GRADED MIXTURE OF NATURAL OR CRUSHED GRAVEL, CRUSHED STONE, OR NATURAL OR CRUSHED SAND WITH THE FOLLOWING GRADATION:

SIEVE SIZE	PERCENT PASSING
2"	100%
1/4"	30-65%
#40	5-40%
#200	0-10%

E6. SUBBASE MATERIAL: CRUSHER-RUN STONE THAT CONFORMS TO THE GRADATION REQUIREMENTS OF TYPE 2 SUBBASE, SECTION 304-2.02 OF THE NYSDOT STANDARD SPECIFICATIONS MEETING THE FOLLOWING GRADATION:

SIEVE SIZE	PERCENT PASSING
2"	100%
1/4"	25-60%
#40	5-40%
#200	0-10%

E7. PLACE BACKFILL AND FILL MATERIALS IN LAYERS NOT MORE THAN 8 INCHES IN LOOSE DEPTH FOR MATERIAL COMPACTED BY HEAVY COMPACTION EQUIPMENT, AND NOT MORE THAN 4 INCHES IN LOOSE DEPTH FOR MATERIAL COMPACTED BY HAND-OPERATED TAMPERS.

E8. PLACE BACKFILL AND FILL MATERIALS EVENLY ON ALL SIDES OF STRUCTURES TO REQUIRED ELEVATIONS. PLACE BACKFILL AND FILL UNIFORMLY ALONG THE FULL LENGTH OF EACH STRUCTURE.

MASONRY

M1. COMPLY WITH APPLICABLE PROVISIONS OF THE FOLLOWING SPECIFICATIONS AND DOCUMENTS: ACI 530 "BUILDING CODE REQUIREMENTS FOR MASONRY STRUCTURES", ACI 530.1 "SPECIFICATIONS FOR MASONRY STRUCTURES", AND THE 2020 BUILDING CODE OF NEW YORK STATE

M2. MATERIALS:

CONCRETE MASONRY UNITS	ASTM C90, 1900 PSI, NORMAL WEIGHT
MORTAR	C270, TYPE S ABOVE GRADE, TYPE M BELOW GRADE
REINFORCING BARS	A615, GRADE 60
GROUT	C476 WITH 2000 PSI COMP STRENGTH

M3. MIX GROUT TO A CONSISTENCY WHICH HAS A SLUMP BETWEEN 8 AND 11 INCHES. DO NOT USE ANY ADMIXTURES WITHOUT PRIOR APPROVAL FROM THIS ENGINEER.

M4. ALL LINTELS AND BEAMS ARE TO BEAR ON A MINIMUM OF 6" OF SOLID MASONRY BEARING. LINTELS IN EXTERIOR WALLS TO BE HOT DIP GALVANIZED.

M5. FILL MASONRY CORES/CELLS WITH GROUT AT ALL REINFORCING BAR LOCATIONS FOR HEIGHT AND/OR LENGTH OF BAR. CONSOLIDATE AT TIME OF PLACEMENT.

M6. WHERE EXPANSION BOLTS ANCHOR TO MASONRY, BREAK OUT CELL WALL AND FILL CELL VOID FLUSH WITH GROUT TO INSURE ADEQUATE ANCHORAGE.

M7. LAP REINFORCING BARS 48 DIAMETERS MINIMUM OR AS INDICATED ON THE DRAWINGS, CORNER BARS TO MATCH ALL BOND BEAM REINFORCING WITH A MINIMUM LAP OF 48 DIAMETERS, HOOKS ARE "STANDARD" UNLESS OTHERWISE INDICATED.

CONCRETE

C1. CONCRETE CONSTRUCTION TO COMPLY WITH THE FOLLOWING: ACI 301, "SPECIFICATIONS FOR STRUCTURAL CONCRETE FOR BUILDINGS" ACI 318, "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE." CRSI "MANUAL OF STANDARD PRACTICE." ACI 305R, "HOT WEATHER CONCRETING." ACI 306R, "COLD WEATHER CONCRETING."

C2. SUBMIT SHOP DRAWINGS FOR ALL CONCRETE REINFORCEMENT.

C3. MATERIALS:

CEMENT	ASTM C150 TYPE 1
FLYASH	ASTM C618 TYPE F, MAXIMUM 25% BY WEIGHT OF CEMENTITIOUS MATERIALS
AIR ENTRAINING ADMIXTURES	ASTM C260
WATER-REDUCING ADMIXTURES	ASTM C494
NORMAL WEIGHT AGGREGATES	ASTM C33 CLASS 4S
VAPOR BARRIER	15 MIL ASTM E1745 CLASS A
CURING COMPOUND	ASTM C309 TYPE I CLASS B DISSIPATING EVAPORATION CONTROL MATERIAL MONO-MOLECULAR FILM-FORMING COMPOUND
SURFACE TREATMENT	SILOXANE PENETRATING SEALER WEATHER
REINFORCEMENT	ASTM A615 GRADE 60
WELDED WIRE FABRIC	ASTM A1064 SUPPLIED IN SHEETS
ISOLATION JOINT FILLER	ASTM D1751 ASPHALT SATURATED FIBERBOARD

C4. CALCIUM CHLORIDE SHALL NOT BE USED. WATER SHALL NOT BE ADDED AT THE JOB SITE.

C5. INSTALL VAPOR BARRIER PER MANUFACTURER'S INSTRUCTIONS AND TAPE JOINTS AS REQUIRED.

C6. CONCRETE MIX FOR FOOTINGS:

	STRENGTH AT 28 DAYS: 4000 PSI
SLUMP	2-4"
W/CM RATIO:	0.5
MAX. NOM. COARSE AGGREGATE:	1"
ENTRAINED AIR:	5.5%

C7. CONCRETE MIX FOR FOUNDATION WALLS:

STRENGTH AT 28 DAYS:	4500 PSI
SLUMP	2-4"
W/CM RATIO:	0.45
MAX. NOM. COARSE AGGREGATE:	1"
ENTRAINED AIR:	5.5%

C7. CONCRETE MIX FOR UTILITY BUILDING INTERIOR SLABS-ON-GRADE:

	STRENGTH AT 28 DAYS: 4000 PSI
SLUMP	2-4"
W/CM RATIO:	0.45
MAX. NOM. COARSE AGGREGATE:	1 1/2"
ENTRAINED AIR:	NOT PERMITTED

C8. CONCRETE MIX FOR EXTERIOR SLABS-ON-GRADE, UNLOADING FACILITY FLOOR, CURBS:

STRENGTH AT 28 DAYS:	5000 PSI
SLUMP	2-4"
W/CM RATIO:	0.4
MAX. NOM. COARSE AGGREGATE:	1"
ENTRAINED AIR:	6%
ADMIXTURE:	XYPEX C-1000 AT 1% OF CEMENTITIOUS CONTENT BY WEIGHT OR ENGINEER APPROVED EQUIVALENT

C9. WHERE 1" MAX. NOM. COARSE AGGREGATE IS REQUIRED IN INTERIOR OR EXTERIOR SLABS-ON-GRADE A MINIMUM OF 1 PERCENT MUST BE RETAINED ON THE 3/4" SEIVE.

C10. USE HIGH-RANGE WATER-REDUCING OR PLASTICIZING ADMIXTURE IN CONCRETE, AS REQUIRED, FOR PLACEMENT AND WORKABILITY. USE WATER-REDUCING AND RETARDING ADMIXTURE WHEN REQUIRED BY HIGH TEMPERATURES, LOW HUMIDITY, OR OTHER ADVERSE PLACEMENT CONDITIONS. USE WATER-REDUCING ADMIXTURE IN PUMPED CONCRETE, CONCRETE FOR HEAVY-USE INDUSTRIAL SLABS AND PARKING STRUCTURE SLABS, CONCRETE REQUIRED TO BE WATERTIGHT, AND CONCRETE WITH A WATER-CEMENTITIOUS MATERIALS RATIO BELOW 0.50.

C11. LAP REINFORCING BARS 48 DIAMETERS MINIMUM OR AS INDICATED ON THE DRAWINGS, CORNER BARS TO MATCH ALL HORIZONTAL FOOTING AND WALL, REINFORCING HOOKS ARE "STANDARD" UNLESS OTHERWISE INDICATED.

C12. PROVIDE (2) #5 X 36" LONG REINFORCING BARS PLACED DIAGONALLY ACROSS EACH RE-ENTRANT CORNER OF SLABS AND WALLS.

C13. FINISH SLABS AS FOLLOWS:
CONTROL BUILDING INTERIOR SLABS: TROWEL FINISH
GARAGE INTERIOR SLABS: FLOAT FINISH
GARAGE CURBS: BROOM FINISH
EXTERIOR SLABS: BROOM FINISH

C14. START INITIAL CURING OF ALL CONCRETE AS SOON AS FREE WATER HAS DISAPPEARED FROM CONCRETE SURFACE AFTER PLACING AND FINISHING. CURE FORMED CONCRETE SURFACES WITH FORMS IN PLACE FOR A MINIMUM OF 4 DAYS WHEN FORMS ARE REMOVED, CONTINUE CURING BY MOIST CURING OR THE APPLICATION OF CURING COMPOUND. CURE UNFORMED SURFACES, INCLUDING SLABS, FLOOR TOPPING, AND OTHER FLAT SURFACES, PREFERABLY BY MOIST CURING FOR A MINIMUM OF 7 DAYS OR THE APPLICATION OF CURING COMPOUND.

C15. CONTRACTION JOINTS (CJ) IN SLABS ON GRADE ARE TO BE 1/8" X 1" DEEP SAW CUT BY A "DRY CUT" SAW SUCH AS THE "SOFF-CUT" AT CRACK CONTROL LOCATIONS WITHIN TWO (2) HOURS AFTER FINISHING. IF NOT SPECIFIED DO NOT EXCEED A 15' X 15' JOINT SPACING WITH PANELS NOT EXCEEDING A 1 TO 1.5 RATIO. AFTER A MINIMUM OF 60 DAYS (UNLESS OTHERWISE DIRECTED BY THE OWNER) FILL JOINTS WITH MM-80 EPOXY BY "METZGER-MCGUIRE" OR APPROVED EQUIVALENT.

C16. WHERE NEW CONCRETE ABUTS EXISTING, ROUGHEN THE EXISTING SURFACE AND BRUSH CLEAN OF ALL FOREIGN MATERIAL PRIOR TO COATING WITH BONDING AGENT "SIKADUR 32".

STEEL

S1. COMPLY WITH APPLICABLE PROVISIONS OF THE FOLLOWING SPECIFICATIONS AND DOCUMENTS: AISC "SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS-ALLOWABLE STRESS DESIGN AND PLASTIC DESIGN." AWS D1.1 "STRUCTURAL WELDING CODE-STEEL."

S2. SUBMIT SHOP DRAWINGS DETAILING FABRICATION OF STRUCTURAL STEEL

S3. MATERIALS:

WIDE FLANGE SHAPES	ASTM A992 (Fy=50ksi)
ANGLES, PLATE, AND CHANNELS	ASTM A36
ANCHOR BOLTS	ASTM F1554 GRADE 55 HOT DIP GALVANIZE
WELD FILLER METAL	70 KSI TENSILE STRENGTH

DESIGN DATA - UTILITY BUILDING 87

CODE: 2020 BUILDING CODE OF NEW YORK STATE AND ASCE 7-16
BUILDING OCCUPANCY/RISK CATEGORY: II
LIGHT STORAGE LIVE LOAD = 125 psf
MINIMUM ROOF LIVE LOAD = 20 psf

SNOW LOAD:
GROUND SNOW LOAD: Pg= 40 psf
FLAT ROOF SNOW LOAD: Pf = 28 psf
Ce = 1.0
Is = 1.0
Ct = 1.0
SEE X/X FOR DRIFTED SNOW LOADS

WIND LOAD
Vult = 115 mph
Vasd = 89 mph
Iw = 1.0
EXPOSURE B
INTERNAL PRESSURE COEFFICIENT: +/-0.18

RAIN LOAD
RAIN INTENSITY = i = 2.5 INCHES PER HOUR

EARTHQUAKE LOADS:
SITE CLASS B
SDS= 0.201
SD1 = 0.115
Ss = 0.189
S1 = 0.072
Ie = 1.0
SEISMIC RESPONSE COEFFICIENT = CS = 0.057
RESPONSE MODIFICATION COEFFICIENT = R = 3.5
SEISMIC DESIGN CATEGORY: B

BASIC SEISMIC FORCE RESISTING SYSTEMS:
INTERMEDIATE REINFORCES MASONRY SHEAR WALLS

DESIGN BASE SHEAR:
2.6 KIPS (STRENGTH LEVEL)

ANALYSIS PROCEDURE:
~~EQUIVALENT LATERAL FORCE~~

NET ALLOWABLE SOIL BEARING PRESSURE = 2000 PSF

DESIGN DATA - UNLOADING FACILITY

CODE: 2020 BUILDING CODE OF NEW YORK STATE AND ASCE 7-16
BUILDING OCCUPANCY/RISK CATEGORY: II
FLOOR LIVE LOAD: HEAVY VEHICLE GARAGE; H20 LOADING
MINIMUM ROOF LIVE LOAD = 20 psf

SNOW LOAD:
GROUND SNOW LOAD: Pg= 40 psf
FLAT ROOF SNOW LOAD: Pf = 33.6 psf
Ce = 1.0
Is = 1.0
Ct = 1.2

WIND LOAD
Vult = 115 mph
Vasd = 89 mph
Iw = 1.0
EXPOSURE B
INTERNAL PRESSURE COEFFICIENT: +/-0.18

RAIN LOAD
RAIN INTENSITY = i = 2.5 INCHES PER HOUR

EARTHQUAKE LOADS:
SITE CLASS B
SDS= 0.201
SD1 = 0.115
Ss = 0.189
S1 = 0.072
Ie = 1.0
SEISMIC RESPONSE COEFFICIENT = CS = 0.067
RESPONSE MODIFICATION COEFFICIENT = R = 3
SEISMIC DESIGN CATEGORY: B

BASIC SEISMIC FORCE RESISTING SYSTEMS:
STEEL SYSTEMS NOT SPECIFICALLY DETAILED FOR SEISMIC RESISTANCE, EXCLUDING CANTILEVER COLUMN SYSTEMS

DESIGN BASE SHEAR:
BY PEMB MANUFACTURER

ANALYSIS PROCEDURE:
EQUIVALENT LATERAL FORCE

NET ALLOWABLE SOIL BEARING PRESSURE = 2000 PSF

STATE OF NEW YORK · MATTHEW W. CLARK · LICENSED PROFESSIONAL ENGINEER · 086560

REV NO	DESCRIPTION	REVISED BY & DATE	APPROVED BY & DATE	MICRO FILM DATE
P0	ISSUED FOR PERMIT	MWC 11/19/20	CMS 11/19/20	

REVISIONS

ISSUED, MGR. FACILITIES DATE

APPROVALS

CENTRAL SAFETY		PROJECT ENG	
PROCESS ENG		DESIGN SUPERVISOR	

DWG. BY MWC CHK. BY CMS SCALE AS NOTED

MOMENTIVE
Waterford, New York 12188

CAD FILE: CS-103-A

PLANT: 87 UNLOADING STATION
PROCESS: CHEM OPS EAST

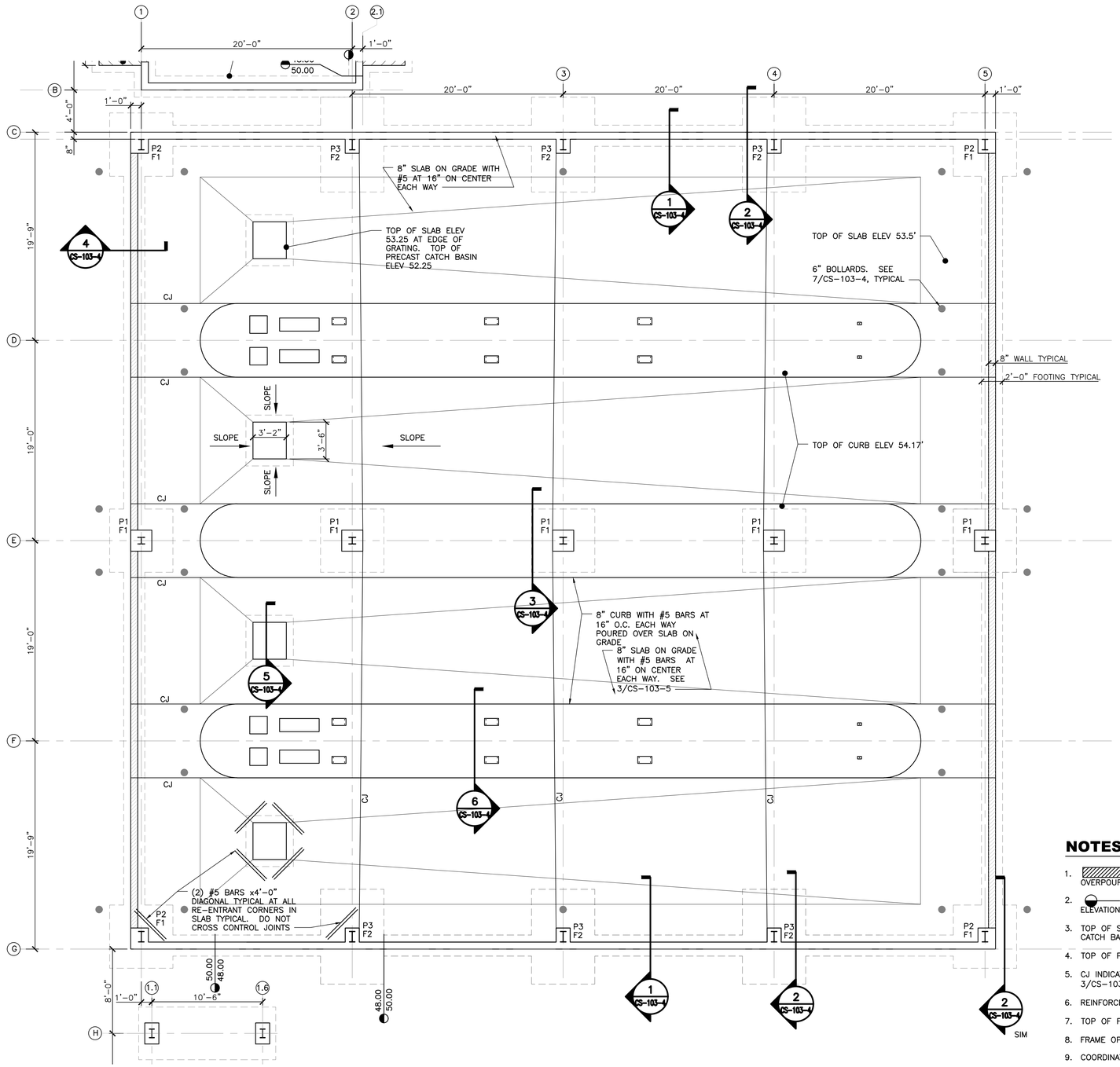
TITLE
SLO1 UNLOADING UTILITY BUILDING STRUCTURAL NOTES

PROJ. NO: D20-AL044 CC: DWG. CLASS NO.

LOCATION BLDG.	FLOOR	AREA	DRAWING NO.	SH. NO.	CONT. ON SH.
87	1		CS-103	1	2

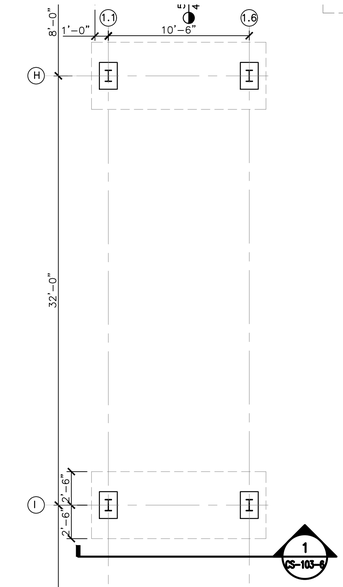
DWG. LOCATION:

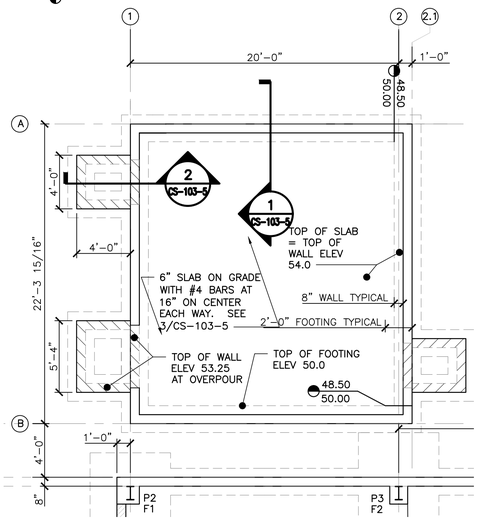
DRAWING NO CS-103
SH NO 2
CONT ON SHEET 3



FOUNDATION PLAN UNLOADING FACILITY

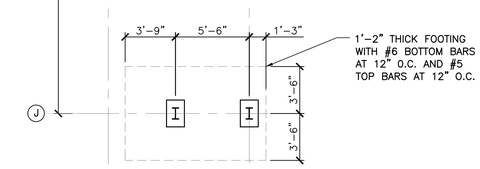
1 / CS-103-2 SCALE: 3/16"= 1'-0"
CROSS REFERENCE: **CS-102**





FOUNDATION PLAN UTILITY BUILDING

1 / CS-103-2 SCALE: 3/16"= 1'-0"
CROSS REFERENCE: **CS-102**



FOUNDATION PLAN PIPE BRIDGE

3 / CS-103-2 SCALE: 3/16"= 1'-0"
CROSS REFERENCE: **CS-102**

NOTES:

1. ▨ DENOTES AREAS WHERE TOP OF WALL IS DEPRESSED AND SLAB OVERPOURS WALL. TOP OF WALL ELEV 52.58 UNLESS NOTED OTHERWISE.
2. ⟷ DENOTES FOOTING STEPS. ELEVATIONS GIVEN ARE TOP OF FOOTING ELEVATIONS. STEP FOOTINGS PER 6/CS-103-5.
3. TOP OF SLAB ELEV 53.5' TYPICAL UNLESS NOTED OTHERWISE. SLOPE UNIFORMLY TO CATCH BASINS.
4. TOP OF PIER AND TOP OF WALL ELEV 57.5' TYPICAL UNLESS NOTED OTHERWISE.
5. CJ INDICATES SLAB CONSTRUCTION OR CONTROL JOINT LAYOUT. SEE 2/CS-103-5 AND 3/CS-103-5.
6. REINFORCE WALLS AT CORNERS AND T INTERSECTIONS PER DETAIL 5/CS-103-5.
7. TOP OF FOOTING ELEV 50.0' UNLESS NOTED OTHERWISE.
8. FRAME OPENINGS IN FOUNDATION WALLS PER 4/CS-103-5.
9. COORDINATE INTERIOR BOLLARD LOCATIONS WITH CIVIL DRAWINGS.

REV NO	DESCRIPTION	REVISED BY & DATE	APPROVED BY & DATE	MICRO FILM DATE
P0	ISSUED FOR PERMIT	MWC 11/19/20	CMS 11/19/20	

REVISIONS

ISSUED, MGR. FACILITIES DATE

APPROVALS

CENTRAL SAFETY		PROJECT ENG	
PROCESS ENG		DESIGN SUPERVISOR	

DWG. BY MWC CHK. BY CMS SCALE AS NOTED

MOMENTIVE
Waterford, New York 12188

CAD FILE: CS-103-B

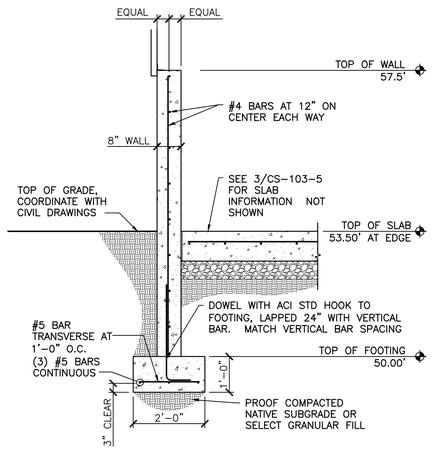
PLANT: 87 UNLOADING STATION
PROCESS: CHEM OPS EAST

TITLE
SLO1 UNLOADING UTILITY BUILDING FOUNDATION PLAN

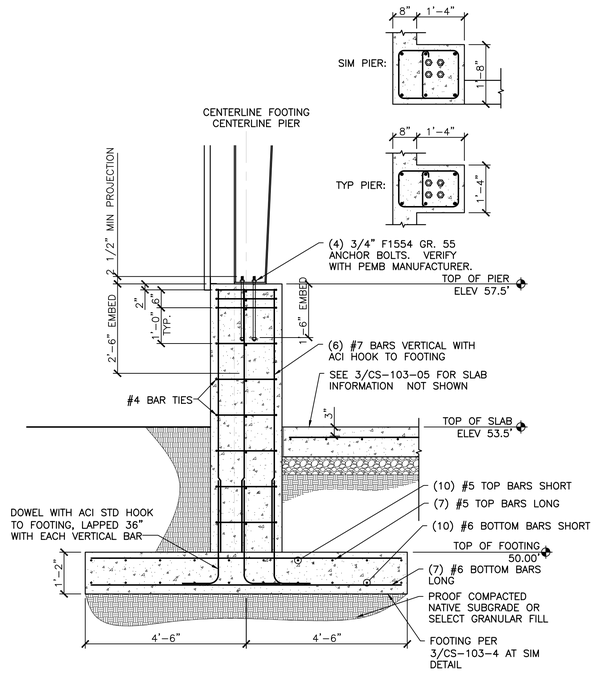
PROJ. NO: D20-AL044 CC: DWG. CLASS NO.

LOCATION BLDG.	FLOOR	AREA	DRAWING NO.	SH. NO.	CONT. ON SH.
87	1		CS-103	2	3

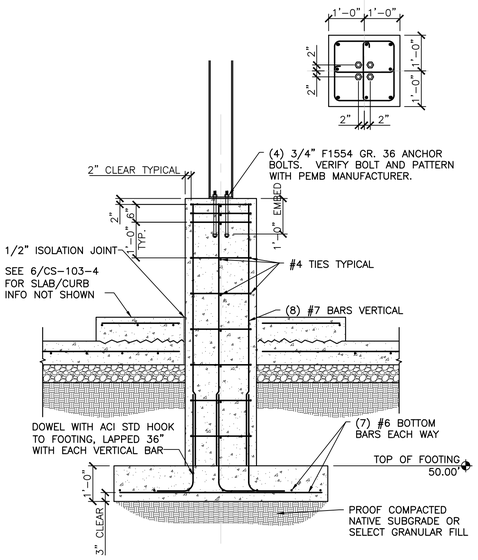
DWG. LOCATION:



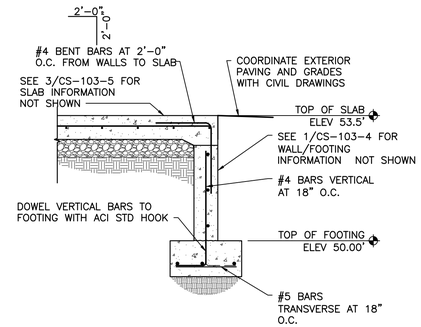
1 WALL DETAIL
CS-103-4 **SCALE:** 1/2" = 1'-0"
CROSS REFERENCE: **1/CS-103-2**



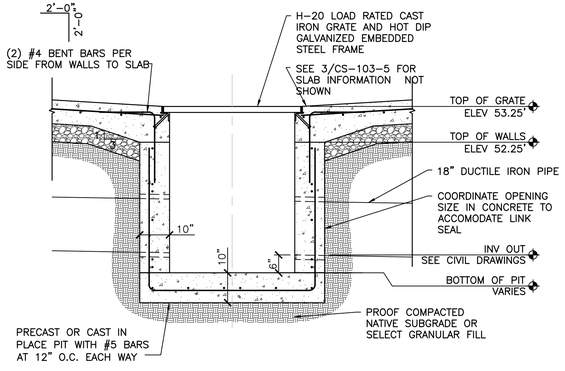
2 EXTERIOR PIER DETAIL
CS-103-4 **SCALE:** 1/2" = 1'-0"
CROSS REFERENCE: **1/CS-103-2**



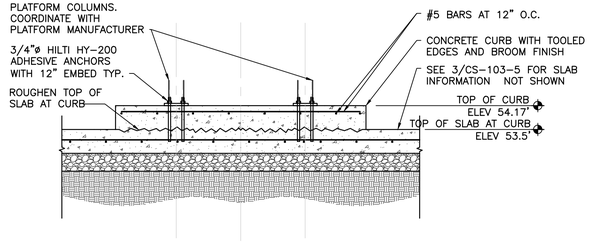
3 INTERIOR PIER DETAIL
CS-103-4 **SCALE:** 1" = 1'-0"
CROSS REFERENCE: **1/CS-103-2**



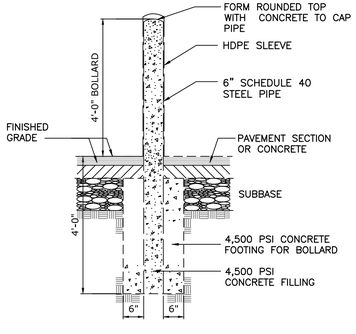
4 EDGE DETAIL
CS-103-4 **SCALE:** 1/2" = 1'-0"
CROSS REFERENCE: **1/CS-103-2**



5 CATCH BASIN SECTION
CS-103-4 **SCALE:** 1/2" = 1'-0"
CROSS REFERENCE: **1/CS-103-2**



6 SECTION AT CURB
CS-103-4 **SCALE:** 1/2" = 1'-0"
CROSS REFERENCE: **1/CS-103-2**



7 BOLLARD DETAIL
CS-103-4 **SCALE:** 1/2" = 1'-0"
CROSS REFERENCE: **1/CS-103-2**

REV NO	DESCRIPTION	REVISED BY & DATE	APPROVED BY & DATE	MICRO FILM DATE
P0	ISSUED FOR PERMIT	MWC 11/19/20	CMS 11/19/20	

REVISIONS

ISSUED, MGR. FACILITIES DATE

APPROVALS

CENTRAL SAFETY		PROJECT ENG	
PROCESS ENG		DESIGN SUPERVISOR	

DWG. BY MWC | CHK. BY CMS | SCALE AS NOTED

MOMENTIVE
Waterford, New York 12188

CAD FILE: CS-103-D

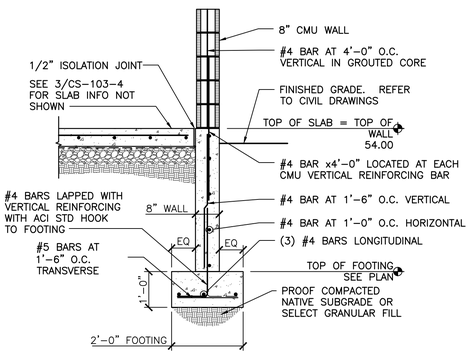
PLANT: 87 UNLOADING STATION
PROCESS: CHEM OPS EAST

TITLE
SL01 UNLOADING UTILITY BUILDING FOUNDATION DETAILS 1

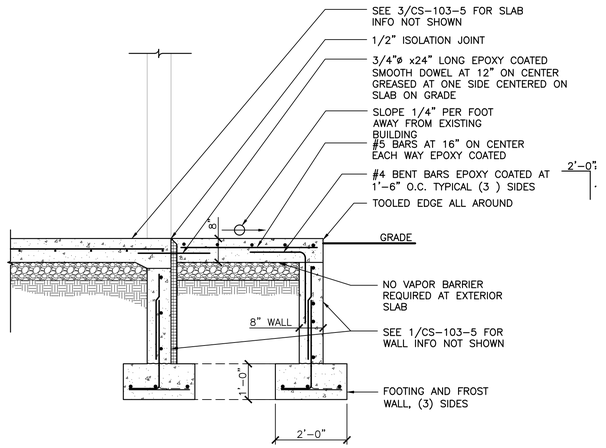
PROJ. NO: D20-AL044 | CC: | DWG. CLASS NO.

LOCATION BLDG.	FLOOR	AREA	DRAWING NO.	SH. NO.	4
87	1		CS-103	CONT. ON SH.	5

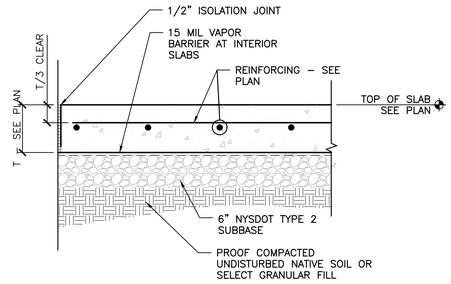
DWG. LOCATION:



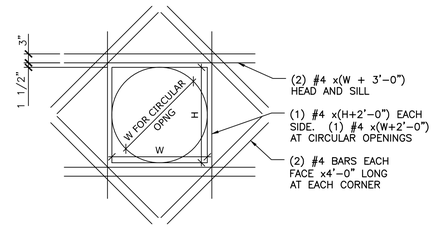
1 CS-103-5 **UTILITY BUILDING WALL DETAIL**
SCALE: 1/2" = 1'-0"
CROSS REFERENCE: **2/CS-103-02**



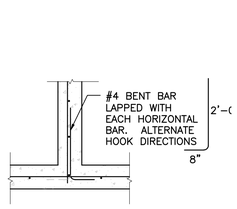
2 CS-103-5 **ENTRYWAY DETAIL**
SCALE: 1/2" = 1'-0"
CROSS REFERENCE: **2/CS-103-2**



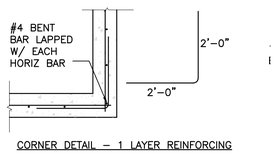
3 CS-103-5 **SLAB DETAIL**
SCALE: 1" = 1'-0"
CROSS REFERENCE: **CS-103-2**



4 CS-103-5 **CONCRETE WALL PENETRATION DETAIL**
SCALE: NOT TO SCALE
CROSS REFERENCE: **CS-103-2**

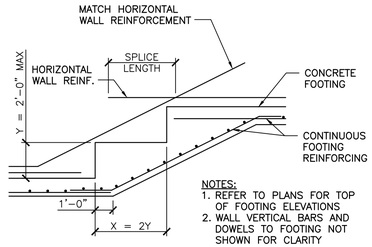


T DETAIL – 1 LAYER REINFORCING



CORNER DETAIL – 1 LAYER REINFORCING

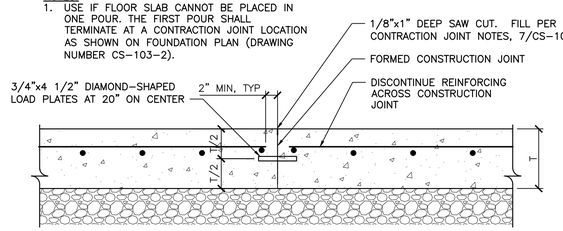
5 CS-103-5 **CORNER AND T REINFORCING**
SCALE: 1/2" = 1'-0"
CROSS REFERENCE: **CS-103-2**



NOTES:
1. REFER TO PLANS FOR TOP OF FOOTING ELEVATIONS
2. WALL VERTICAL BARS AND DOWELS TO FOOTING NOT SHOWN FOR CLARITY

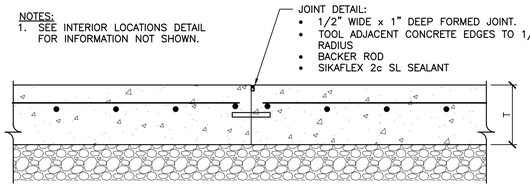
6 CS-103-5 **FOOTING STEP DETAIL**
SCALE: 1/4" = 1'-0"
CROSS REFERENCE: **CS-103-2**

NOTES:
1. USE IF FLOOR SLAB CANNOT BE PLACED IN ONE POUR. THE FIRST POUR SHALL TERMINATE AT A CONTRACTION JOINT LOCATION AS SHOWN ON FOUNDATION PLAN (DRAWING NUMBER CS-103-2).



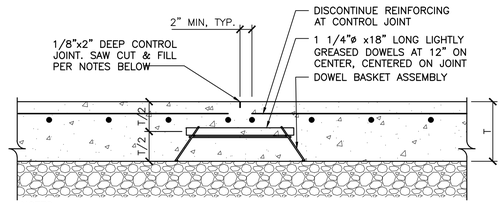
INTERIOR LOCATIONS

NOTES:
1. SEE INTERIOR LOCATIONS DETAIL FOR INFORMATION NOT SHOWN.



EXTERIOR LOCATIONS

7 CS-103-5 **SLAB CONSTRUCTION JOINTS**
SCALE: 1" = 1'-0"
CROSS REFERENCE: **CS-103-2**



NOTES:
1. FORM WEAKENED-PLANE CONTRACTION JOINTS WITH POWER SAWS EQUIPPED WITH SHATTERPROOF ABRASIVE OR DIAMOND RIMMED BLADES. CUT JOINTS WHEN CUTTING ACTION DOES NOT TEAR, ABRADE OR OTHERWISE DAMAGE SURFACE AND BEFORE CONCRETE DEVELOPS RANDOM CONTRACTION CRACKS.
2. JOINT FILLER SHALL BE A SEMI-RIGID, TWO-COMPONENT, 100% SOLIDS EPOXY RESIN WITH A TYPE A SHORE DUROMETER HARDNESS OF 80 ACCORDING TO ASTM D2240.
3. INSTALL JOINT FILLER IN ACCORDANCE WITH MANUFACTURERS INSTRUCTIONS.
4. DEFER JOINT FILLING UNTIL CONCRETE HAS AGED AT LEAST 1 MONTH AND CONSTRUCTION TRAFFIC HAS PERMANENTLY CEASED.
5. INSTALL JOINT FILLER FULL DEPTH IN SAW CUT JOINTS AND AT LEAST 2 INCHES DEEP IN FORMED JOINTS. OVERFILL JOINT AND TRIM JOINT FILLER FLUSH WITH TOP OF JOINT AFTER HARDENING.
6. AFTER INSTALLING JOINT FILLER, IF FURTHER SLAB SHRINKAGE CAUSES JOINT FILLER TO SEPARATE FROM CONCRETE, FILL IN ANY NEW GAPS THAT APPEAR. USE A PRODUCT AND APPLICATION METHOD ACCEPTABLE TO THE ORIGINAL JOINT FILLER MANUFACTURER.

8 CS-103-5 **SLAB CONTRACTION JOINTS**
SCALE: 1" = 1'-0"
CROSS REFERENCE: **CS-103-2**

PQ	ISSUED FOR PERMIT	MWC 11/13/20	CMS 11/13/20	
REV NO	DESCRIPTION	REVISED BY & DATE	APPROVED BY & DATE	MICRO FILM DATE
	REVISIONS			
ISSUED, MGR. FACILITIES		DATE		

APPROVALS

CENTRAL SAFETY		PROJECT ENG	
PROCESS ENG		DESIGN SUPERVISOR	

DWG. BY MWC | CHK. BY CMS | SCALE AS NOTED

MOMENTIVE
Waterford, New York 12188

CAD FILE: CS-103-E.DWG

PLANT: 87 UNLOADING STATION
PROCESS: CHEM OPS EAST

TITLE
SLO1 UNLOADING UTILITY BUILDING FOUNDATION DETAILS 2

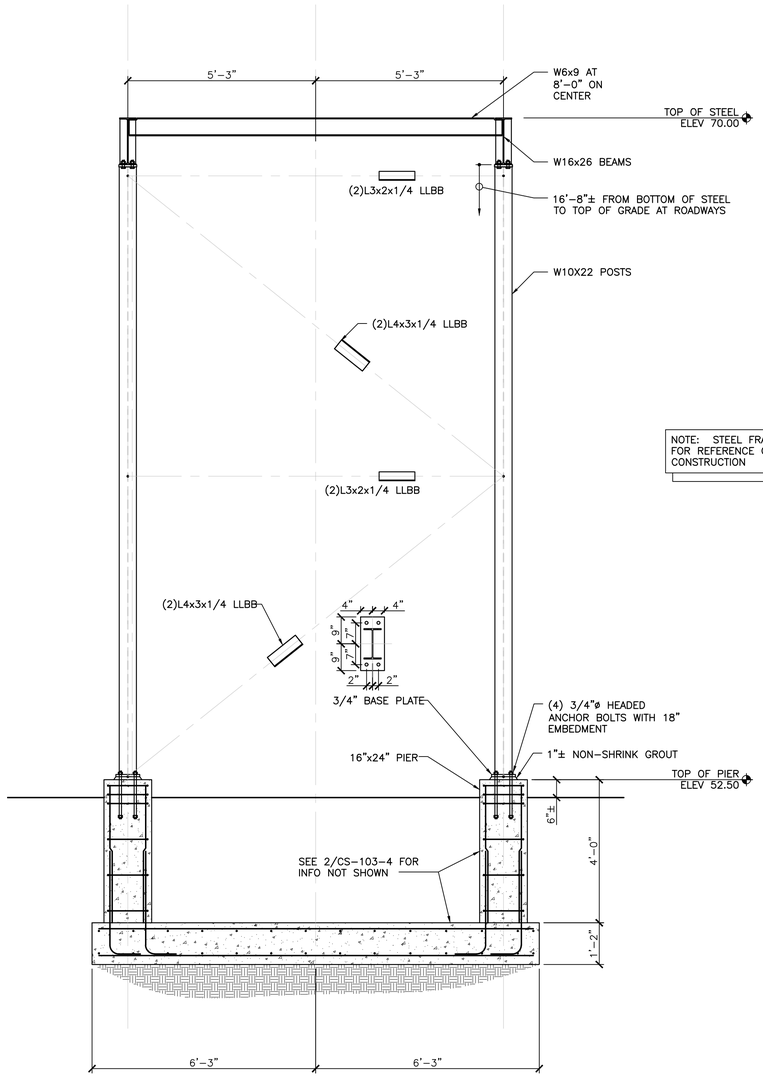
PROJ. NO: D20-AL044 | CC: | DWG. CLASS NO.

LOCATION BLDG.	FLOOR	AREA	DRAWING NO.	SH. NO.	5
87	1		CS-103	CONT. ON SH.	6

STATE OF NEW YORK * MATTHEW W. CLARK * LICENSED PROFESSIONAL ENGINEER 086560

DRAWING NO
CONT ON SHEET SH NO

DWG. LOCATION:



NOTE: STEEL FRAMING SHOWN FOR REFERENCE ONLY; NOT FOR CONSTRUCTION

1 CS-103-6 **TYPICAL PIPE BRIDGE**
SCALE: 1/2" = 1'-0"
CROSS REFERENCE: **3/CS-103-2**

REV NO	DESCRIPTION	REVISED BY & DATE	APPROVED BY & DATE	MICRO FILM DATE
P0	ISSUED FOR PERMIT	MWC 11/19/20	CMS 11/19/20	

REVISIONS

ISSUED, MGR. FACILITIES DATE

APPROVALS

CENTRAL SAFETY		PROJECT ENG	
PROCESS ENG		DESIGN SUPERVISOR	

DWG. BY MWC CHK. BY CMS SCALE AS NOTED

MOMENTIVE
Waterford, New York 12188

CAD FILE: CS-103-F

PLANT: 87 UNLOADING STATION

PROCESS: CHEM OPS EAST

TITLE
SLO1 UNLOADING UTILITY BUILDING PIPE RACK DETAILS

PROJ. NO: D20-AL044 CC: DWG. CLASS NO.

LOCATION BLDG.	FLOOR	AREA	DRAWING NO.	SH. NO.	CONT. ON SH.
87	1		CS-103	6	-

STATE OF NEW YORK · MATTHEW W. CLARK · LICENSED PROFESSIONAL ENGINEER · 086560

DWG. LOCATION:

1.0 SCOPE

THIS STANDARD COVERS MANDATORY REQUIREMENTS GOVERNING THE BONDING, GROUNDING, AND LIGHTNING PROTECTION FACILITIES FOR ELECTRICAL POWER SYSTEMS AND EQUIPMENT, STRUCTURES AND BUILDINGS.

THIS STANDARD DOES NOT COVER PROCESS INSTRUMENTATION SYSTEMS.

THE CONTENTS OF THIS STANDARD ARE ARRANGED AS FOLLOWS:

2.0 SYSTEM NEUTRAL GROUND

THREE PHASE A/C SYSTEMS FOR PLANT DISTRIBUTION ARE WYE CONNECTED WITH THE NEUTRAL GROUNDING AT THE TRANSFORMER.

A. THE SYSTEM NEUTRAL GROUND ORIGINATES AT EACH TRANSFORMER OR GENERATOR UNIT OF EQUIPMENT. TRANSFORMERS ARE GENERALLY SUPPLIED WITH A DELTA CONNECTION ON THE PRIMARY AND WITH A WYE CONNECTION ON THE SECONDARY. GENERATORS ARE USUALLY WYE CONNECTED.

B. THE SYSTEM NEUTRAL GROUND CONDUCTOR BECOMES THE WHITE INSULATED CURRENT CARRYING NEUTRAL OVER WHICH UNBALANCED LOAD CURRENTS MAY FLOW. AN EXCEPTION TO THIS IS THE CASE OF THE 5 KV FEEDERS ORIGINATING AT THE MAIN POWER TRANSFORMER AND SERVING ONLY DELTA CONNECTED PRIMARIES OF LOAD CENTER UNIT SUBSTATIONS. UNBALANCED LOAD CURRENTS CANNOT FLOW IN THE NEUTRAL AND THE NEUTRAL ACTUALLY FUNCTIONS AS AN EQUIPMENT GROUND (PATH FOR LINE-TO-GROUND FAULT CURRENTS).

3.0 EQUIPMENT GROUND

A. THE EQUIPMENT GROUND IS ESTABLISHED AT EACH SECONDARY TRANSFORMER WINDING OR GENERATOR WINDING AT THE SAME POINT THAT THE SYSTEM NEUTRAL ORIGINATES (AS DESCRIBED UNDER "SYSTEM NEUTRAL GROUND").

B. THE EQUIPMENT GROUND CONDUCTOR IS DISTINCT AND SEPARATE FROM THE SYSTEM NEUTRAL GROUND CONDUCTOR AND SHALL NOT BE USED AS A LOAD CURRENT-CARRYING CONDUCTOR. THE FUNCTION OF THE EQUIPMENT GROUND CONDUCTOR IS TO (1) PROVIDE A LOW IMPEDANCE PATH FOR LINE-TO-GROUND FAULT CURRENTS AND (2) TO BOND ALL NON-CURRENT CARRYING ENCLOSURES TOGETHER INCLUDING RACEWAYS, FIXTURES, PANELS, CONTROLS, MOTORS, DISCONNECT SWITCHES, SWITCHGEAR, AND EXTERIOR LIGHTING STANDARDS, ETC.

C. THE EQUIPMENT CONDUCTOR SHALL BE ELECTRICALLY AND MECHANICALLY CONTINUOUS FROM THE SOURCE OF SUPPLY TO THE EQUIPMENT TO BE GROUNDED.

D. WHERE BUILDING TYPE CONDUCTORS ARE INSTALLED IN A RACEWAY, THE EQUIPMENT GROUND CONDUCTOR SHALL BE A MINIMUM OF ONE SIZE SMALLER THAN THE PHASE CONDUCTORS EXCEPT THAT THE MAXIMUM SIZE CONDUCTOR SHALL BE #4/0 AWG COPPER AND THE MINIMUM SIZE SHALL BE #12 AWG COPPER. THE CONDUCTOR SHALL BE IDENTIFIED WITH GREEN THW INSULATION. WHERE GREEN INSULATION IS NOT AVAILABLE, ON LARGER SIZES, BLACK INSULATION SHALL BE USED AND SUITABLY IDENTIFIED WITH GREEN PVC TAPE AT EACH JUNCTION BOX OR DEVICE ENCLOSURE. THE EQUIPMENT GROUND CONDUCTOR SHALL BE PROVIDED INSIDE EACH RACEWAY SYSTEM.

E. MULTI-CONDUCTOR POWER CABLES SHALL BE SPECIFIED WITH EQUIPMENT GROUND CONDUCTORS CONSTRUCTED INSIDE THE CABLE SHEATH IN THE INTERSTICES OF THE CABLE.

F. MULTI-CONDUCTOR CABLE USED FOR BUSWAY DROPS, LIGHTING EQUIPMENT, PORTABLE EQUIPMENT AND CONTROL CIRCUITS ABOVE 30 VOLTS SHALL BE SPECIFIED TO INCLUDE A GREEN EQUIPMENT GROUND CONDUCTOR TO BE USED FOR THIS PURPOSE.

G. PLUG-IN BUSWAY TYPES DE AND ARMOR-CLAD SHALL UTILIZE THE BUSWAY HOUSING FOR THE EQUIPMENT GROUND CONDUCTOR. THE EQUIPMENT GROUND CONDUCTOR IN THE FEEDER SERVING THE BUSWAY SHALL BE SECURELY CONNECTED TO THE BUSWAY IN THE CABLE TAP BOX. THE EQUIPMENT GROUND CONDUCTOR IN THE CIRCUITS LEAVING THE BUSWAY SHALL BE SECURELY CONNECTED TO THE BUSWAY VIA THE GROUND CONNECTOR IN THE PLUG-IN DEVICE.

H. THE ARMOR OF INTERLOCKED ARMOR CABLE, WIRING CHANNELS, CABLE TRAYS AND ALL METALLIC CONDUIT INCLUDING RIGID, ELECTRICAL METALLIC TUBING AND FLEXIBLE CONDUITS SHALL BE CONNECTED AT EACH END TO THE EQUIPMENT GROUND CONDUCTOR UTILIZING A CONDUIT GROUND BUSHING O-Z TYPE BL OR APPROVED EQUAL. SWITCHGEAR PANELBOARDS AND MOTOR CONTROL PANELS SHALL BE PROVIDED WITH AN EQUIPMENT GROUND BUS (INCLUDING LUG OR SCREW TERMINALS) SECURELY BONDED TO THE ENCLOSURE. JUNCTION BOXES AND OTHER ENCLOSURES (SIZES ABOVE 5" X 5") SHALL UTILIZE AN EQUIPMENT GROUND BUS OR LUG AS REQUIRED TO SECURELY BOND THE EQUIPMENT GROUND CONDUCTOR TO THE ENCLOSURE.

I. LIGHTING FIXTURES SHALL BE SECURELY CONNECTED TO THE EQUIPMENT GROUND CONDUCTOR. A CONTINUOUS ROW OF FLUORESCENT FIXTURES MECHANICALLY JOINED TO PROVIDE GOOD ELECTRICAL CONTACT MAY BE CONSIDERED AS ONE FIXTURE WITH THE EQUIPMENT GROUND CONDUCTOR CONNECTED AT ONLY ONE POINT.

J. ARC WELDING TRANSFORMERS AND GENERATORS SHALL BE PROVIDED WITH A RETURN CONDUCTOR OF SUFFICIENT CAPACITY TO CARRY THE WELDING CURRENT. THE RETURN CONDUCTOR IS IN ADDITION TO AND WILL PROTECT THE EQUIPMENT GROUND CONDUCTOR.

K. MOTORS SHALL BE CONNECTED TO THE EQUIPMENT GROUND CONDUCTOR WITH A CONDUIT GROUNDING BUSHING OR A BOLTED SOLDERLESS LUG CONNECTION ON THE METAL FRAME. BOLTS, NUTS AND WASHERS SHALL BE BRONZE, CADMIUM PLATED STEEL, OR OTHER NON-CORROSIVE MATERIAL.

L. FLEXIBLE DUCT CONNECTIONS AT AIR HANDLERS, EXHAUST AND SUPPLY FANS SHALL BE PARALLELED WITH A FLEXIBLE COPPER GROUND STRAP EQUIVALENT TO NO. 6 AWG COPPER.

M. THE EQUIPMENT GROUND CONDUCTOR SHALL BE CONTINUOUS THROUGHOUT THE SYSTEM CONNECTING ALL TRANSFORMER NEUTRALS, ALL NON-CURRENT CARRYING ENCLOSURES, BUILDING STRUCTURAL GROUNDS AND EQUIPMENT AND MACHINERY GROUNDS.

4.0 BUILDING STRUCTURAL GROUND

A. PROVIDE A #4/0 AWG COPPER GROUND BUS LOOP BURIED A MINIMUM OF 30" BELOW FINISHED GRADE AND 24" OUTSIDE THE STRUCTURAL FOOTING AROUND THE ENTIRE PERIMETER OF THE BUILDING.

B. 1. PROVIDE A MINIMUM OF TWO GROUND ELECTRODES WITH MAXIMUM 200 FEET SPACING BETWEEN ELECTRODES MEASURED ALONG THE PERIMETER OF THE BUILDING. CONNECT EACH ELECTRODE TO THE GROUND BUS LOOP WITH 500 KCMIL BARE COPPER CONDUCTOR. GROUND ELECTRODES SHALL BE 3/4" X 10' COPPERWELD GROUND RODS WITH THREADED BRONZE COUPLINGS DRIVEN 20 FEET DEEP. THE TOP OF THE GROUND ELECTRODE SHALL BE 30" BELOW GRADE AND LOCATED OUTSIDE OF THE BUILDING STRUCTURE.

2. WHERE SOIL CONDITIONS MAKE IT IMPOSSIBLE TO DRIVE THE GROUND ELECTRODE 30 FEET DEEP, PROVIDE THREE 10 FOOT GROUND RODS SPACED 10 FEET APART IN AN EQUILATERAL TRIANGLE AND INTERCONNECTED WITH #4/0 AWG COPPER CONDUCTOR.

3. BELOW GRADE CONNECTIONS SHALL BE MADE BY EXOTHERMIC WELDING.

4. AFTER INSTALLATION OF THE GROUND LOOP BUS AND GROUND ELECTRODES, PROVIDE GROUND RESISTANCE TESTING PRIOR TO INTERCONNECTION OF OTHER GROUNDING SYSTEMS. GROUND RESISTANCE TESTING SHALL BE ACCOMPLISHED WITH A GROUND RESISTANCE DIRECT-READING SINGLE TEST METER UTILIZING THE AC FALL-OF-POTENTIAL METHOD AND TWO REFERENCE ELECTRODES. ORIENT THE GROUND ELECTRODE TO BE TESTED AND THE TWO REFERENCE ELECTRODES IN A STRAIGHT LINE (5) FEET DEEP. PRESENT THE OWNER WITH TEST RESULTS IN WRITING, INCLUDING TEMPERATURE, HUMIDITY AND CONDITION OF THE SOIL AT THE TIME OF THE TESTS. IN THE CASE WHERE THE GROUND RESISTANCE EXCEEDS 2 OHMS, THE OWNER WILL ISSUE ADDITIONAL INSTRUCTIONS.

C. 1. STEEL COLUMNS IN EXTERIOR WALLS SHALL BE CONNECTED TO THE GROUND BUS LOOP AT INTERVALS NOT TO EXCEED SIXTY FEET. THE #4/0 AWG BARE COPPER CONNECTIONS SHALL UTILIZE CAD WELDS BELOW GRADE AND MAY BE BOLTED ABOVE GRADE. CONNECTIONS AT THE STEEL COLUMNS SHALL BE MADE 18" ABOVE THE FINISHED FLOOR IN THE WEB OF THE COLUMN. REFER TO FIGURE ON PAGE 13.

2. STEEL COLUMNS INSIDE THE BUILDING SHALL BE CONNECTED TO THE GROUND BUS LOOP ON EACH SIDE OF THE BUILDING, WITH A CONTINUOUS #4/0 AWG BARE COPPER CONDUCTOR AT INTERVALS NOT TO EXCEED 200 FEET.

3. BUILDING USING MATERIALS OTHER THAN STEEL FOR COLUMNS AND WHERE THE ROOF STRUCTURE IS STEEL, THE STEEL BEAMS SHALL BE GROUNDED TO THE GROUND BUS LOOP SIMILAR TO THE METHODS DESCRIBED IN 1 AND 2.

D. DOMESTIC AND FIRE PROTECTION METALLIC WATER PIPES SHALL BE CONNECTED TO THE GROUND BUS LOOP WITH #4/0 AWG BARE COPPER CONDUCTOR AT A MINIMUM OF TWO POINTS.

E. MEDIUM VOLTAGE SWITCHGEAR AND LOAD CENTER UNIT SUBSTATION EQUIPMENT GROUND BUS SHALL BE CONNECTED TO THE GROUND BUS LOOP WITH #4/0 AWG COPPER CONDUCTOR AT A MINIMUM O F TWO POINTS.

F. MISCELLANEOUS METAL OBJECTS INCLUDING PIPING, VESSELS AND STRUCTURAL SHAPES WITHIN SIX FEET OF METALLIC OBJECTS CONNECTED TO THE GROUND SYSTEM AND WHICH ARE NOT INTERCONNECTED MECHANICALLY WITH THE GROUNDING SYSTEM, SHALL BE INTERCONNECTED WITH A MINIMUM #2 AWG BARE COPPER CONDUCTOR.

G. THE FRAMES OF ALL 460 VOLT MOTORS SHALL BE SOLIDLY GROUNDED WITH A GROUNDING CONDUCTOR LOCATED IN THE SAME CONDUIT AS THE PHASE CONDUCTORS.

H. WHERE A LIGHTNING PROTECTING SYSTEM IS PROVIDED IN THE FORM OF AIR TERMINALS ON NON-CONDUCTIVE MATERIALS OR IN THE FORM OF METAL PROTUBERANCES, THESE SYSTEMS SHALL BE DIRECTLY CONNECTED TO THE GROUND BUS LOOP WITH COPPER DOWN CONDUCTORS EQUIVALENT TO #2/0 AWG COPPER. THE DESIGN OF THESE SYSTEMS SHALL BE BASED UPON THE LATEST EDITION OF THE NATIONAL FIRE PROTECTION ASSOCIATION PAMPHLET NO. 78, ENTITLED "LIGHTNING PROTECTION CODE."

I. 1. OUTDOOR SUBSTATION GROUND MATS SHALL BE CONNECTED TO THE GROUND BUS LOOP WITH #4/0 AWG COPPER CONDUCTOR IN ADDITION TO ANY EQUIPMENT GROUNDS IN THE CONNECTING RACEWAY SYSTEM. PROVIDE EACH MANHOLE WITH ONE 3/4" X 10' COPPERWELD GROUND ROD AND CONNECT TO #4/0 AWG COPPER CONDUCTOR. ALL CONNECTIONS SHALL BE CAD-WELDED.

2. GROUND MATS FOR STANDARD OUTDOOR POWER TRANSFORMER SIZES THROUGH 25,000 KVA SHALL UTILIZE #4/0 AWG BARE COPPER CONDUCTOR LOOP LOCATED 24 INCHES INSIDE THE PERIMETER OF THE FENCE AND BURIED A MINIMUM OF 18" DEEP. CONNECT LOOP TO THE FENCE WITH #4 AWG BARE COPPER CONDUCTOR MAKING A CONNECTION AT THE BOTTOM, TOP AND AT EACH BARBED WIRE STRAND. FENCE CONNECTIONS SHALL BE MADE AT INTERVALS NOT TO EXCEED 50 FEET. FENCE CONNECTIONS SHALL BE MADE AT EACH CORNER, EACH SIDE OF EACH GATE, AT EACH FENCE DEAD END AND AT EACH POST OF ANY REMOVABLE SECTIONS. PROVIDE A FLEXIBLE COPPER JUMPER EQUIVALENT TO #6 AWG COPPER BETWEEN EACH GATE POST AND GATE LEAF.

3. PROVIDE ON 3/4" X 10' COPPERWELD GROUND ROD AT INTERVALS NOT TO EXCEED 15 FEET ALONG THE 4/0 PERIMETER LOOP.

4. PROVIDE THREE 3/4" X 10' COPPERWELD GROUND RODS DRIVE 30 FEET DEEP AT GROUND TERMINATIONS FOR LIGHTNING ARRESTERS. CONNECTIONS SHALL BE MADE WITH #4/0 AWG BARE COPPER CONDUCTORS.

5. GROUND CONDUCTORS CROSSING THE SUBSTATION YARD SHALL BE #4/0 AWG BARE COPPER CONDUCTOR WITH EACH END CONNECTED TO THE 4/0 PERIMETER LOOP. BREAKERS, TRANSFORMERS, LIGHTNING ARRESTERS, STRUCTURAL STEEL AND OTHER METAL DEVICES SHALL BE CONNECTED TO THE 4/0 CROSSING CONDUCTOR WITH SHORT RUNS OF #4/0 AWG BARE COPPER CONDUCTORS.

6. GANG OPERATED SWITCHES SHALL BE PROVIDED WITH A #4/0 COPPER EQUIVALENT FLEXIBLE COPPER BRAID CONNECTION FROM THE OPERATING HANDLE TO AN ABOVE-GROUND EXTENSION OF THE 4/0 GROUND MAT. PROVIDE A POTENTIAL MAT COMPOSED OF ERICO PRE-MANUFACTURED COPPER GRID WITH #4 COPPER WIRE.

5.0 OVERVOLTAGE PROTECTION FOR TRANSMISSION LINES

A. POWER SYSTEMS WITH SUPPLY CIRCUITS OR DISTRIBUTION CIRCUITS SUBJECT TO OVERVOLTAGES FROM LIGHTNING OR SWITCHING SURGES SHALL BE PROTECTED AGAINST OVERVOLTAGE.

B. OVERVOLTAGE PROTECTION SHALL MEET THE FOLLOWING:

1. OVERVOLTAGE PROTECTION FORM LIGHTNING SHALL CONSIST OF LIGHTNING ARRESTERS AND, IF NEEDED, CAPACITORS APPLIED IN THE MINIMUM NUMBER OF LOCATIONS TO PROTECT ALL EQUIPMENT.

2. OVERVOLTAGE PROTECTION FROM SWITCHING SURGES PREFERABLE SHALL BE PROVIDED BY USING SWITCHING DEVICES OF TYPES WHICH DO NOT GENERATE DANGEROUS OVERVOLTAGES UNDER THE CONDITIONS IN WHICH THEY ARE APPLIED. PROTECTION PER SUBPARAGRAPH A, ABOVE, IS ACCEPTABLE.

C. WHERE EXPOSED LINES TERMINATE IN OUTDOOR OPEN-BUS SWITCHGEAR, ARRESTER LOCATIONS SHALL BE SELECTED TO PROTECT BREAKERS AND METERING TRANSFORMERS WITH THE BREAKERS OPEN.

D. IF PROTECTION OF MOTORS IS REQUIRED AGAINST SURGES TRANSMITTED THROUGH TRANSFORMERS, IT IS PREFERRED THAT COMMON PROTECTION BE PROVIDED AT THE US BUT ONLY IF THIS PROTECTION IS ADEQUATE. THE BASIS FOR THE SYSTEM CAPACITANCE (NUMBER OF CABLES ENERGIZED) USED TO CALCULATE THE NEED FOR THIS PROTECTION SHALL BE APPROVED BY THE OWNER'S ENGINEER.

E. GROUNDS FOR LIGHTNING ARRESTERS SHALL HAVE A RESISTANCE TO EARTH NOT EXCEEDING 5 OHMS. ELECTRODES FOR LIGHTNING ARRESTER GROUNDS SHALL BE DRIVEN RODS.

F. THE GROUND TERMINALS OF LIGHTNING ARRESTORS USED TO PROTECT TRANSFORMERS, WHICH ARE MOUNTED ON OR WITHIN A FEW FEET OF THE TRANSFORMER, SHALL BE CONNECTED BY A GROUNDING CONDUCTOR (OR AN EQUIVALENT BUS OR STRAP) TO THE SOLDERLESS CONNECTOR FURNISHED ON THE TRANSFORMER TANK FOR THAT PURPOSE. THE CONNECTION FROM ARRESTER TO TANK SHALL BE AS SHORT AND STRAIGHT AS POSSIBLE.

G. GROUND CONDUCTORS SHALL NOT BE CONNECTED TO SUCH TRANSFORMER PARTS AS RADIATORS OR HANDHOLE COVERS.

H. ARRESTER GROUND CONNECTIONS ON DRY TYPE TRANSFORMERS HAVING SHEET METAL ENCLOSURES SHALL BE MADE BY GROUNDING CONDUCTORS RUN IN AS DIRECT A PATH AS POSSIBLE TO THE TRANSFORMER GROUNDING PAD.

I. TRANSFORMER ARRESTOR GROUNDS CONNECTED AS DESCRIBED ABOVE REQUIRE THAT SYSTEM NEUTRAL AND TRANSFORMER TANK GROUNDS BE 5 OHMS OR LESS.

J. THE GROUND TERMINALS OF LIGHTNING ARRESTERS WHICH ARE INSTALLED AT THE JUNCTION OF INSULATED CABLES AND OVERHEAD SPACER CABLES OR OPEN WIRE LINES, SHALL BE GROUNDED PER THE FOLLOWING:

1. METALLIC SHEATHS OF MULTIPLE CONDUCTOR CABLES SHALL BE CONNECTED TO THE LIGHTNING ARRESTER GROUNDING CONDUCTOR.

2. METALLIC SHEATHS OF SINGLE CONDUCTOR CABLES SHALL BE CONNECTED TO THE LIGHTNING ARRESTER GROUND TERMINALS AND THE ARRESTER SHALL BE GROUNDED THROUGH AN ISOLATING GAP.

3. METALLIC CONDUITS SHALL BE CONNECTED TO THE LIGHTNING ARRESTER GROUNDING CONDUCTOR.

4. FOR SITUATIONS NOT COVERED BY SUBPARAGRAPH A, B, OR C ABOVE, A GROUND RETURN CONDUCTOR WITHIN NONMETALLIC SHEATHED MULTIPLE CONDUCTOR CABLES SHALL BE CONNECTED TO THE LIGHTNING ARRESTER GROUNDING CONDUCTOR.

5. ALTERNATIVELY, A GROUND RETURN CONDUCTOR WITHIN THE NONMETALLIC DUCT CARRYING NONMETALLIC SHEATHED CABLES SHALL BE CONNECTED TO THE LIGHTNING ARRESTER GROUNDING CONDUCTOR.

6. GROUNDING CONDUCTORS SHALL RUN IN AS STRAIGHT AND SHORT A PATH AS POSSIBLE FROM ARRESTER GROUNDING TERMINALS TO THE GROUNDING ELECTRODE.

7. CONDUCTORS ON WOOD POLES SHALL BE COVERED FROM ARRESTER TERMINALS TO BELOW GROUND BY INSULATION EQUAL TO NEC, TYPE THW (600 VOLTS MINIMUM).

6.0 INSTRUMENTATION SYSTEM GROUNDING

FOR PROPER SYSTEM PERFORMANCE, SEPARATE EARTH GROUND SYSTEMS ARE NECESSARY FOR THE DC POWER AND SIGNAL WIRING AND AC POWER AND CABINET GROUND SYSTEM.

A. AC GROUNDING

A SINGLE-POINT GROUND, CONFORMING TO ALL LOCAL, STATE, AND NATIONAL ELECTRICAL CODE REQUIREMENTS, MUST BE PROVIDED FOR THE INSTRUMENTATION SYSTEM AC POWER SUPPLY. THIS MAY BE A SEPARATE EARTH GROUND, PLANT GROUND, OR GROUND-GRID SYSTEM. WHEN USING PLANT GROUNDS OR GROUND-GRID SYSTEMS, THE INSTRUMENTATION SYSTEM MUST BE GROUNDED AT A POINT ON THE GRID OR GROUND SYSTEM THAT IS SEPARATED FROM THE GROUND POINTS FOR ALL OTHER ELECTRICAL DEVICES (WELDERS, MOTORS, ETC.). ANY GROUND POINTS FOR LIGHTNING PROTECTION DEVICES MUST BE AT LEAST 6 FEET (1.8 METERS) FROM ALL OTHER GROUND POINTS.

B. DC GROUNDING

AN ISOLATED, SINGLE-POINT GROUND MUST BE PROVIDED FOR THE INSTRUMENTATION SYSTEM POWER SUPPLY COMMON (PSC) AND SIGNAL COMMON (SC). THIS GROUNDING SYSTEM SHOULD PROVIDE A MAXIMUM OF 3 OHMS IMPEDANCE BETWEEN ANY POINT IN THE DC GROUNDING SYSTEM AND TRUE EARTH. THE INSTRUMENTATION SYSTEM SHOULD NOT BE ENERGIZED FOR TEST OF OPERATION UNTIL THIS GROUNDING REQUIREMENT IS SATISFIED.

C. CABINET GROUNDING

THE CABINET FRAMES IN EACH MULTIBAY GROUPING ARE CONNECTED TOGETHER BY THE CABINET GROUNDING SYSTEM. AT THE INSTALLATION SITE, A CABINET GROUND CONNECTION MUST BE PROVIDED FOR EACH CABINET GROUPING. ALL CABINET GROUND POINTS MUST BE SEPARATED FROM THE DC GROUND. HOWEVER, A CABINET GROUND POINT CAN BE LOCATED AT THE SAME POINT AS THE AC GROUND, PLANT GROUND, OR EVEN BUILDING STEEL. USE 1/2 INCH (12.7MM) DIAMETER OR LARGER BRAIDED WIRE, AND CONNECT THE WIRE TO ONE OF THE FOUR MOUNTING STUDS ON THE BOTTOM CORNERS OF A CABINET. THE CABINET GROUNDING SYSTEM PROVIDES PROTECTION TO BOTH PERSONNEL AND PROPERTY FROM ACCIDENTAL SHOCK HAZARDS. IT ALSO PROVIDES A DIRECT DRAIN LINE FOR ANY ELECTROMAGNETIC INTERFERENCE. THIS GROUND MUST MEET ALL CODE REQUIREMENTS.

STATE OF NEW YORK
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APPROVALS

CENTRAL SAFETY		PROJECT ENG	
PROCESS ENG		DESIGN SUPERVISOR	

DWG. BY IJA CHK. BY MJS SCALE NONE

MOMENTIVE
Waterford, New York 12188

 CAD FILE: EE-107A

PLANT: CHEM OPS EAST
PROCESS: 87 UNLOADING STATION

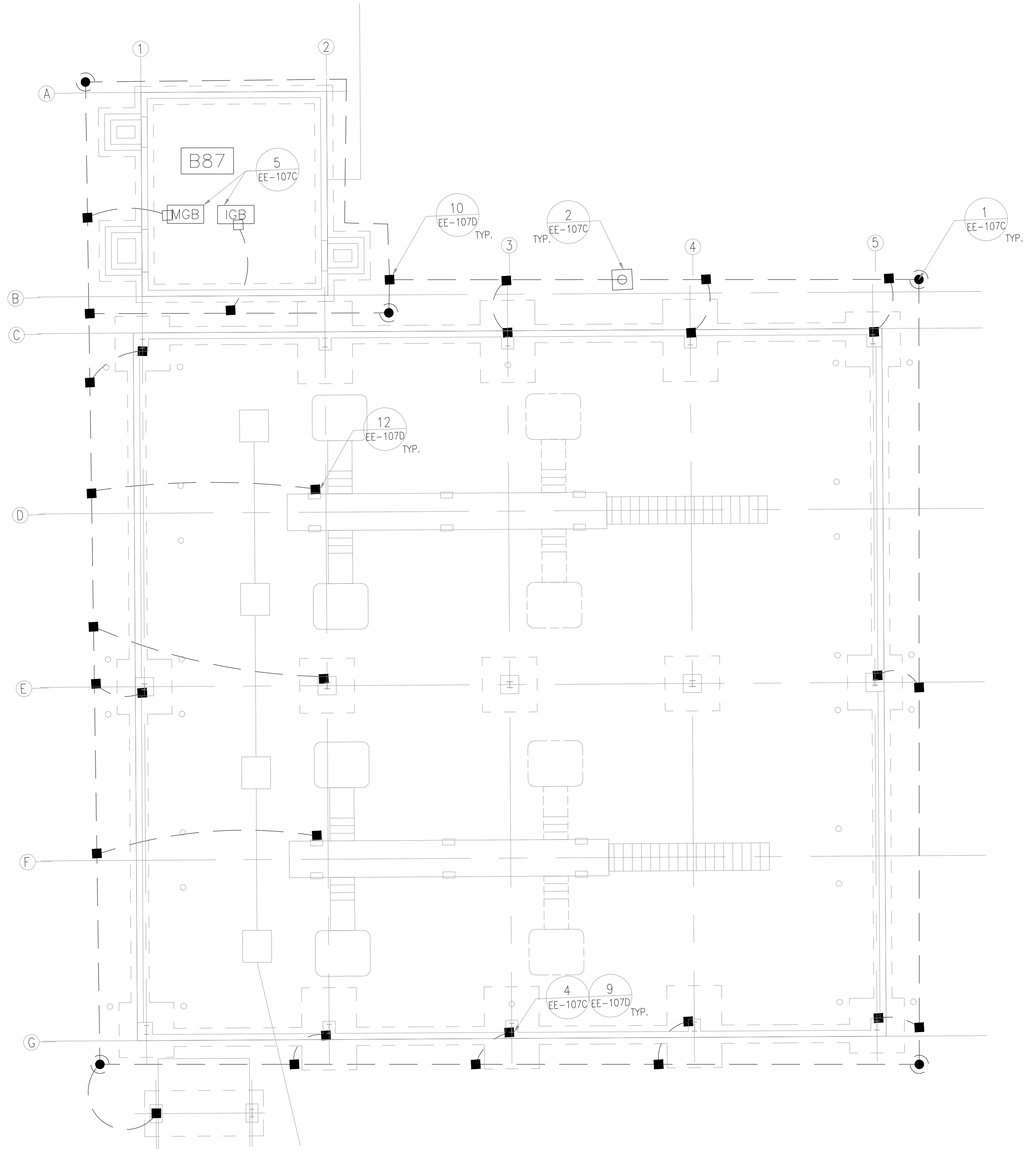
TITLE
ELECTRICAL GROUNDING DETAILS B87 TANK WAGON UNLOADING FACILITY

PROJ. NO: CC: DWG. CLASS NO.

LOCATION BLDG.	FLOOR	AREA	DRAWING NO.	SH. NO.	1
87	1	--	EE-107	CONT. ON SH.	2

DWG. LOCATION:

DRAWING NO EE-107A
CONT ON SHEET SH NO



01 ELECTRICAL GROUNDING PLAN UNLOADING FACILITY
Scale: 1" = 100'

NOTES:

1. REFER TO DRAWING EE-107C AND EE-107D FOR GROUNDING DETAILS.
2. ALL CONNECTIONS TO THE STRUCTURES ARE FUTURE. PROVIDE PIG TAILS FOR FUTURE CONNECTIONS SHOWN ON THIS DRAWING.
3. PROVIDE BARE #4/0 AWG STRANDED GROUND WIRING BURIED AROUND BUILDING STRUCTURE AS SHOWN.

LEGEND:

- GROUND ROD
- GROUND ROD TEST WELL
- MGB MAIN GROUND BAR
- IGB ISOLATED GROUND BAR
- EXOTHERMICALLY WELDED CONNECTION
- BOLTED CONNECTION

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APPROVALS

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PROCESS ENG		DESIGN SUPERVISOR	

DWG. BY IJA CHK. BY MJS SCALE 1" = 100'

MOMENTIVE
Waterford, New York 12188

CAD FILE: EE-107B

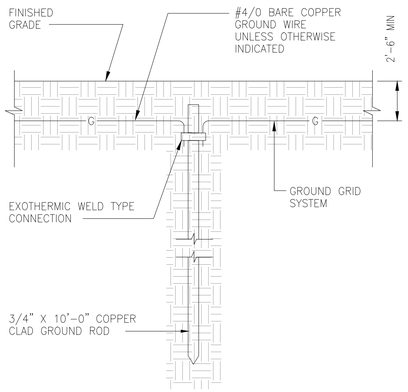
PLANT: CHEM OPS EAST
PROCESS: 87 UNLOADING STATION

TITLE
ELECTRICAL GROUNDING PLAN B87
TANK WAGON UNLOADING FACILITY

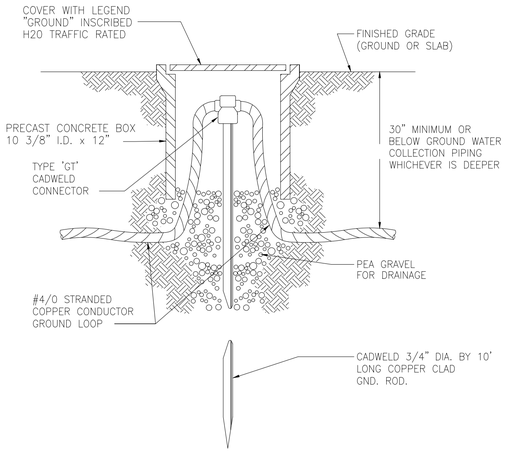
PROJ. NO.	CC:	DWG. CLASS NO.

LOCATION BLDG.	FLOOR	AREA	DRAWING NO.	SH. NO.	CONT. ON SH.
87	1	--	EE-107	2	3

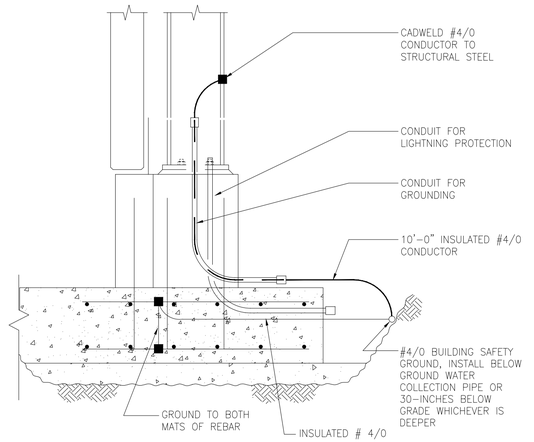
DWG. LOCATION:



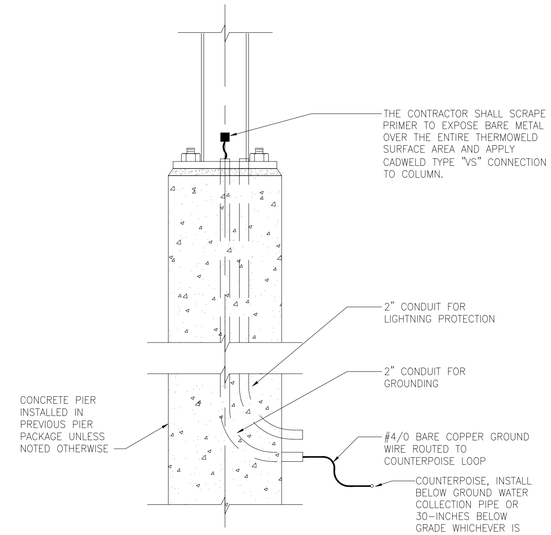
01 TYPICAL GROUND ROD DETAIL
Scale:NTS



02 GROUND ROD TEST WELL DETAIL
Scale:NTS



03 TYPICAL FOUNDATION/COLUMN GROUNDING DETAIL
Scale:NTS



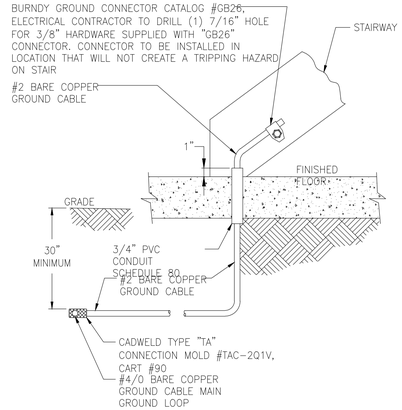
04 TYPICAL COLUMN GROUNDING DETAIL
Scale:NTS

05 TYPICAL GROUND BUS BAR DETAIL
Scale:NTS

NOTES :

1. AREA OF EXOTHERMIC WELD TO BE PREPARED BY GRINDING OR WIRE BRUSH CLEANING (TYPICAL).
2. ALL EXOTHERMIC WELD CONNECTIONS UNDERGROUND SHALL BE COMPLETELY COVERED WITH BITUMASTIC 50 FROM THE CARBOLINE CO. (OR APPROVED SUBSTITUTE).
3. THIS DETAIL IS INTENDED TO ILLUSTRATE THE CONCEPT WHICH MUST BE IMPLEMENTED BY THE CONTRACTOR. SEE STRUCTURAL DOCUMENTS FOR SPECIFIC FOUNDATION DETAILS.

06 TYPICAL FOUNDATION/SLAB REBAR GROUND
Scale:NTS



NOTES :

1. AREA OF EXOTHERMIC WELD TO BE PREPARED BY GRINDING OR WIRE BRUSH CLEANING (TYPICAL).
2. ALL EXOTHERMIC WELD CONNECTIONS UNDERGROUND SHALL BE COMPLETELY COVERED WITH BITUMASTIC 50 FROM THE CARBOLINE CO. (OR APPROVED SUBSTITUTE).
3. SCHEDULE 80 PVC CONDUIT SLEEVE SHALL BE LOCATED AS CLOSE AS POSSIBLE TO WALL, COLUMN OR STRUCTURE TO BE GROUNDED.

07 TYPICAL STAIRWAY GROUND
Scale:NTS

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APPROVALS

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PROCESS ENG		DESIGN SUPERVISOR	

DWG. BY IJA CHK. BY MJS SCALE NONE

MOMENTIVE
Waterford, New York 12188

 CAD FILE: EE-107C

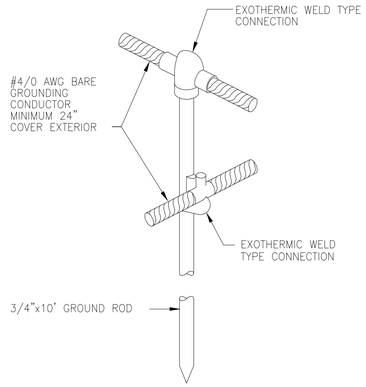
PLANT: CHEM OPS EAST
PROCESS: 87 UNLOADING STATION

TITLE
ELECTRICAL GROUNDING DETAILS B87 TANK WAGON UNLOADING FACILITY

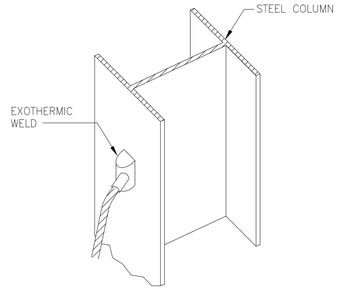
PROJ. NO:	CC:	DWG. CLASS NO.

LOCATION BLDG.	FLOOR	AREA	DRAWING NO.	SH. NO.	3
87	1	--	EE-107	CONT. ON SH.	4

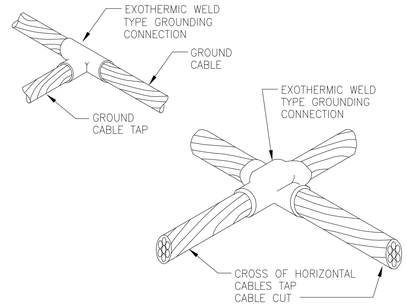
DWG. LOCATION:



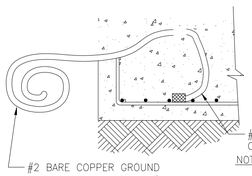
08 CONDUCTOR TO GROUND ROD CONNECTION
Scale:NTS



09 GROUND CABLE CONNECTION TO STEEL
Scale:NTS



10 TYPICAL GROUND CABLE CONNECTION DETAIL
Scale:NTS

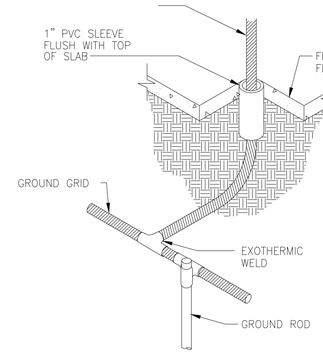


PLAN DRAWING SYMBOL

NOTES :

1. AREA OF EXOTHERMIC WELD TO BE PREPARED BY GRINDING OR WIRE BRUSH CLEANING (TYPICAL).
2. ALL EXOTHERMIC WELD CONNECTIONS UNDERGROUND SHALL BE COMPLETELY COVERED WITH BITUMASTIC 50 FROM THE CARBOLINE CO. (OR APPROVED SUBSTITUTE).
3. THIS DETAIL IS INTENDED TO ILLUSTRATE THE CONCEPT WHICH MUST BE IMPLEMENTED BY THE CONTRACTOR. SEE STRUCTURAL DOCUMENTS FOR SPECIFIC FOUNDATION DETAILS.

11 CONCRETE MAT GROUNDING DETAIL
Scale:NTS



12 TYPICAL GROUND CONDUCTOR STUB-UP
Scale:NTS

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 CAD FILE: EE-107D

PLANT: CHEM OPS EAST
PROCESS: 87 UNLOADING STATION

TITLE
ELECTRICAL GROUNDING DETAILS B87 TANK WAGON UNLOADING FACILITY

PROJ. NO:	CC:	DWG. CLASS NO.

LOCATION BLDG.	FLOOR	AREA	DRAWING NO.	SH. NO.
87	1	--	P-107	4
				CONT. ON SH. --

DWG. LOCATION:

PART 1 – GENERAL

1.1 RELATED DOCUMENTS
A. DRAWINGS AND GENERAL PROVISIONS OF THE CONTRACT, INCLUDING GENERAL AND SUPPLEMENTARY CONDITIONS AND DIVISION 01 SPECIFICATION SECTIONS, APPLY TO THIS SECTION.

1.2 SUMMARY
A. THIS SECTION INCLUDES THE FOLLOWING FOR SOIL, WASTE, AND VENT PIPING INSIDE OR UNDER THE BUILDING AND :
1. PIPE, AND FITTINGS. THE FOLLOWING PIPE CLASS SPECIFICATIONS ARE INCLUDED IN PART 2 OF THIS SECTION:
a. M–01–01 – EXTRA HEAVY CAST IRON SOIL PIPE, HUB AND SPIGOY, FURNISHED IN 5 OR 10 FOOT LAYING LENGTHS, COATED WITH A COAL TAR PITCH, ALL PER ASTM A47 (a)(b)(c).
b. A–38–01–W – HDPE CODE PE3408, CELL CLASSIFICATION PE345464C, ASTM D3350 (a)(b)(c)(d).
c. A–41–01–S&C – POLYVINYL CHLORIDE PIPE AND HASTELLOY, POLYVINYL CHLORIDE OR CAST IRON VALVES.

2. SPECIAL PIPE FITTINGS.

B. COMPONENTS AND INSTALLATION SHALL BE CAPABLE OF WITHSTANDING THE FOLLOWING MINIMUM WORKING PRESSURE, UNLESS OTHERWISE INDICATED:
1. SOIL, WASTE, AND VENT PIPING: 10–FOOT HEAD OF WATER.

1.3 SUBMITTALS
A. PRODUCT DATA: FOR PIPE, FITTINGS, AND COUPLINGS.

B. LEED SUBMITTAL:
1. PRODUCT DATA FOR CREDIT EQ 4.1: FOR SOLVENT CEMENTS AND ADHESIVE PRIMERS, INCLUDING PRINTED STATEMENT OF VOC CONTENT.

C. SHOP DRAWINGS:

D. FIELD QUALITY–CONTROL INSPECTION AND TEST REPORTS.

1.4 QUALITY ASSURANCE
A. PIPING MATERIALS SHALL BEAR LABEL, STAMP, OR OTHER MARKINGS OF SPECIFIED TESTING AGENCY.

B. COMPLY WITH NSF 14, "PLASTICS PIPING SYSTEMS COMPONENTS AND RELATED MATERIALS," FOR PLASTIC PIPING COMPONENTS. INCLUDE MARKING WITH "NSF–DWV" FOR PLASTIC DRAIN, WASTE, AND VENT PIPING; "NSF–DRAIN" FOR PLASTIC DRAIN PIPING; "NSF–TUBULAR" FOR PLASTIC CONTINUOUS WASTE PIPING; AND "NSF–SEWER" FOR PLASTIC SEWER PIPING.

PART 2 – PRODUCTS

2.1 MANUFACTURERS
A. IN OTHER PART 2 ARTICLES WHERE TITLES BELOW INTRODUCE LISTS, THE FOLLOWING REQUIREMENTS APPLY TO PRODUCT SELECTION:
1. AVAILABLE MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, MANUFACTURERS OFFERING PRODUCTS THAT MAY BE INCORPORATED INTO THE WORK INCLUDE, BUT ARE NOT LIMITED TO, MANUFACTURERS SPECIFIED.

2.2 PIPING MATERIALS
A. REFER TO PART 3 "PIPING APPLICATIONS" ARTICLE FOR APPLICATIONS OF PIPE, FITTING, AND JOINING MATERIALS.

2.3 HUBLESS CAST–IRON SOIL PIPE AND FITTINGS (PIPE CLASS CI01)
A. HUBLESS CAST IRON PIPE AND FITTINGS: ASTM A 888 OR CISPI 301. FOR USE IN ALL SIZES OF ABOVEGROUND SANITARY WASTE AND VENT PIPING.

B. SHIELDED COUPLINGS: ASTM C 1277 ASSEMBLY OF METAL SHIELD OR HOUSING, CORROSION–RESISTANT FASTENERS, AND RUBBER SLEEVE WITH INTEGRAL, CENTER PIPE STOP.
1. STANDARD, SHIELDED, HUBLESS COUPLINGS, CISPI 310 WITH STAINLESS–STEEL CORRUGATED SHIELD; STAINLESS–STEEL BANDS AND TIGHTENING DEVICES; AND ASTM C 564, RUBBER SLEEVE.
a. AVAILABLE MANUFACTURERS:
1) ANACO.
2) FERNCO, INC.
3) IDEAL DIV.; STANT CORP.
4) MISSION RUBBER CO.
5) TYLER COUPLINGS

2. HEAVY–DUTY, SHIELDED, COUPLINGS: ASTM C1540 WITH STAINLESS–STEEL SHIELD, STAINLESS–STEEL BANDS AND TIGHTENING DEVICES, AND ASTM C 564, RUBBER SLEEVE.
a. AVAILABLE MANUFACTURERS:
1) ANACO.
2) IDEAL DIV.; STANT CORP.
3) MISSION RUBBER CO.
4) TYLER COUPLINGS

2.4 HUB–AND–SPIGOT, CAST–IRON SOIL PIPE AND FITTINGS (PIPE CLASS CI02)
A. HUB AND SPIGOT CAST IRON PIPE AND FITTINGS: ASTM A 74, SERVICE CLASS WITH GASKETED JOINTS. FOR USE IN ALL SIZES OF UNDERGROUND SANITARY WASTE AND VENT PIPING.
1. GASKETS: ASTM C56, NEOPRENE COMPRESSION GASKETS, RATED FOR 212 F SERVICE. GASKETS TO BE "CHARSEAL" BY CHARLOTTE PIPE AND FOUNDRY CO, TY–SEAL BY TYLER COUPLING OR APPROVED EQUAL.

2.5 PVC PIPE AND FITTINGS (PIPE CLASS PVC03)
A. SOLID–WALL PVC PIPE: SCHEDULE 40, ASTM D 2665, DRAIN, WASTE, AND VENT (PIPE CLASS PVC03). FOR USE IN UNDERGROUND SANITARY WASTE AND VENT PIPING.
1. PVC SOCKET FITTINGS: SCHEDULE 40, ASTM D 2665, SOCKET TYPE, MADE TO ASTM D 3311, DRAIN, WASTE, AND VENT (DWV) PATTERNS.
2. PROVIDE ELECTRICALLY CONTINUOUS TRACE WIRE ON ALL UNDERGROUND PVC PIPES. TRACE WIRE SHALL BE #12 AWG SOLID COPPER WIRE WITH THERMOPLASTIC INSULATION RECOMMENDED FOR DIRECT BURIAL. TRACE WIRE CONNECTIONS SHALL BE SECURELY MADE USING AN APPROVED DIRECT BURIAL TYPE WATERTIGHT CONNECTOR AS APPROPRIATE FOR THE APPLICATION AT EACH WIRE JOINT TO PROVIDE ELECTRICAL CONTINUITY.

B. SOLVENT CEMENT AND ADHESIVE PRIMER:
1. USE PVC SOLVENT CEMENT THAT HAS A VOC CONTENT OF 510 G/L OR LESS WHEN CALCULATED ACCORDING TO 40 CFR 59, SUBPART D (EPA METHOD 24).
2. USE ADHESIVE PRIMER THAT HAS A VOC CONTENT OF 550 G/L OR LESS WHEN CALCULATED ACCORDING TO 40 CFR 59, SUBPART D (EPA METHOD 24).

2.6 HDPE PIPE AND FITTINGS (PIPE CLASS PE01)
A. HDPE MATERIAL DESIGNATION 3608, RESIN PER ASTM D 3350, MANUFACTURED PER ASTM F 714.
1. SDR NO. 17 FOR PIPING UP TO 12 INCHES; SDR 32.5 FOR PIPING 14 INCHES AND LARGER. SAME MATERIAL FOR CARRIER PIPE AND OUTER CONTAINMENT PIPE.
2. MOLDED HDPE FITTINGS: ASTM D 3261 OR F 1055, PE RESIN, BUTT–FUSION TYPE, MADE TO MATCH PIPE DIMENSIONS AND CLASS.

2.7 SPECIAL PIPE FITTINGS
A. FLEXIBLE, NONPRESSURE PIPE COUPLINGS: COMPLY WITH ASTM C 1173, ELASTOMERIC, SLEEVE–TYPE, REDUCING OR TRANSITION PATTERN. INCLUDE SHEAR RING, ENDS OF SAME SIZES AS PIPING TO BE JOINED, AND CORROSION–RESISTANT–METAL TENSION BAND AND TIGHTENING MECHANISM ON EACH END.
1. AVAILABLE MANUFACTURERS:
a. DALLAS SPECIALTY & MFG. CO.
b. FERNCO, INC.
c. LOGAN CLAY PRODUCTS COMPANY (THE).
d. MISSION RUBBER CO.
e. NDS, INC.
f. PLASTIC ODDITIES, INC.
2. SLEEVE MATERIALS:
a. FOR CAST–IRON SOIL PIPES: ASTM C 564, RUBBER.

B. SHIELDED NONPRESSURE PIPE COUPLINGS: ASTM C 1460, ELASTOMERIC OR RUBBER SLEEVE WITH FULL–LENGTH, CORROSION–RESISTANT OUTER SHIELD AND CORROSION–RESISTANT–METAL TENSION BAND AND TIGHTENING MECHANISM ON EACH END.
1. AVAILABLE MANUFACTURERS:
a. CASCADE WATERWORKS MFG. CO.
b. MISSION RUBBER CO.

C. RIGID, UNSHIELDED, NON–PRESSURE PIPE COUPLINGS: ASTM C 1461, SLEEVE–TYPE REDUCING– OR TRANSITION–TYPE MECHANICAL COUPLING MOLDED FROM ASTM C 1440, TPE MATERIAL WITH CORROSION–RESISTANT–METAL TENSION BAND AND TIGHTENING MECHANISM ON EACH END.
1. AVAILABLE MANUFACTURERS:
a. ANACO.

D. FLEXIBLE BALL JOINTS: DUCTILE–IRON FITTING WITH COMBINATION OF FLANGED AND MECHANICAL–JOINT ENDS COMPLYING WITH AWWA C110 OR AWWA C153. INCLUDE GASKETED BALL–JOINT SECTION AND DUCTILE–IRON GLAND, RUBBER GASKET, AND STEEL BOLTS.
1. AVAILABLE MANUFACTURERS:
a. EBAA IRON SALES, INC.

E. EXPANSION JOINTS: TWO OR THREE–PIECE, DUCTILE–IRON ASSEMBLY CONSISTING OF TELESCOPING SLEEVE(S) WITH GASKETS AND RESTRAINED–TYPE, DUCTILE–IRON, BELL–AND–SPIGOT END SECTIONS COMPLYING WITH AWWA C110 OR AWWA C153. SELECT AND ASSEMBLE COMPONENTS FOR EXPANSION INDICATED. INCLUDE AWWA C111, DUCTILE–IRON GLANDS, RUBBER GASKETS, AND STEEL BOLTS.
1. AVAILABLE MANUFACTURERS:
a. EBAA IRON SALES, INC.
b. ROMAC INDUSTRIES, INC.
c. STAR PIPE PRODUCTS; STAR FITTINGS DIV.

F. WALL–PENETRATION FITTINGS: COMPOUND, DUCTILE–IRON COUPLING FITTING WITH SLEEVE AND FLEXING SECTIONS FOR UP TO 20–DEGREE DEFLECTION, GASKETS, AND RESTRAINED–JOINT ENDS COMPLYING WITH AWWA C110 OR AWWA C153. INCLUDE AWWA C111, DUCTILE–IRON GLANDS, RUBBER GASKETS, AND STEEL BOLTS. FOR UNDERGROUND PENETRATIONS USE CORROSIVE RESISTANT BOLTS.
1. AVAILABLE MANUFACTURERS:
a. SIGMA CORP.

PART 3 – EXECUTION

3.1 EXCAVATION
A. REFER TO DIVISION 31 SECTION "EARTH MOVING" FOR EXCAVATING, TRENCHING, AND BACKFILLING.

3.2 PIPING APPLICATIONS
A. PROVIDE PIPING PER PIPE CLASS INDICATED ON PLANS. APPLICATIONS LISTED BELOW OFFER A GENERAL OVERVIEW FOR THE MOST COMMON CASES ONLY AND EXCEPTIONS TO THESE APPLY.

B. ABOVEGROUND, WASTE AND VENT PIPING NPS 4 AND SMALLER SHALL BE THE FOLLOWING:
1. HUBLESS CAST–IRON SOIL PIPE AND FITTINGS STANDARD, SHIELDED, STAINLESS–STEEL COUPLINGS; AND HUBLESS–COUPLING JOINTS.
2. DISSIMILAR PIPE–MATERIAL COUPLINGS: FLEXIBLE, SHIELDED, OR RIGID, UNSHIELDED, AS NEEDED, NON–PRESSURE PIPE COUPLINGS FOR JOINING DISSIMILAR PIPE MATERIALS WITH SMALL DIFFERENCE IN OD.

C. ABOVEGROUND, WASTE AND VENT PIPING NPS 5 AND LARGER SHALL BE THE FOLLOWING:
1. HUBLESS CAST–IRON SOIL PIPE AND FITTINGS STANDARD, SHIELDED, STAINLESS–STEEL COUPLINGS; AND HUBLESS–COUPLING JOINTS.
2. DISSIMILAR PIPE–MATERIAL COUPLINGS: FLEXIBLE, SHIELDED, NON–PRESSURE PIPE COUPLINGS FOR JOINING DISSIMILAR PIPE MATERIALS WITH SMALL DIFFERENCE IN OD.

D. UNDERGROUND, SOIL, WASTE, AND VENT PIPING NPS 4 AND SMALLER SHALL BE THE FOLLOWING:
1. SOLID WALL SCHEDULE 40 PVC PIPE, DWV PVC SOCKET FITTINGS, AND SOLVENT–CEMENTED JOINTS.
a. INSTALL ELECTRICALLY CONTINUOUS TRACE WIRE ON ALL UNDERGROUND PVC PIPES. TRACE WIRE SHALL BE #12 AWG SOLID COPPER WIRE WITH THERMOPLASTIC INSULATION RECOMMENDED FOR DIRECT BURIAL. TRACE WIRE CONNECTIONS SHALL BE SECURELY MADE USING AN APPROVED DIRECT BURIAL TYPE WATERTIGHT CONNECTOR AS APPROPRIATE FOR THE APPLICATION AT EACH WIRE JOINT TO PROVIDE ELECTRICAL CONTINUITY. TRACE WIRE SHALL BE ACCESSIBLE AT CLEANOUTS. SECURE THE TRACE WIRE TO THE UNDERGROUND PIPE AT LEAST EVERY 5 FEET WITH TAPE. AN ELECTRICAL CONTINUITY TEST SHALL BE PERFORMED ON THE INSTALLED TRACE WIRE SYSTEM. IF THE TRACE WIRE IS FOUND TO BE NOT CONTINUOUS, THE FAILED SECTION SHALL BE REPAIRED OR REPLACED.
2. DISSIMILAR PIPE–MATERIAL COUPLINGS: FLEXIBLE, SHIELDED, OR RIGID, UNSHIELDED, AS NEEDED, NON–PRESSURE PIPE COUPLINGS FOR JOINING DISSIMILAR PIPE MATERIALS WITH SMALL DIFFERENCE IN OD.

E. UNDERGROUND, SOIL AND WASTE PIPING NPS 5 AND LARGER SHALL BE THE FOLLOWING:
1. SOLID–WALL, SCHEDULE 40, PVC PIPE; DWV PVC SOCKET FITTINGS; AND SOLVENT–CEMENTED JOINTS.
a. INSTALL ELECTRICALLY CONTINUOUS TRACE WIRE ON ALL UNDERGROUND PVC PIPES. TRACE WIRE SHALL BE #12 AWG SOLID COPPER WIRE WITH THERMOPLASTIC INSULATION RECOMMENDED FOR DIRECT BURIAL. TRACE WIRE CONNECTIONS SHALL BE SECURELY MADE USING AN APPROVED DIRECT BURIAL TYPE WATERTIGHT CONNECTOR AS APPROPRIATE FOR THE APPLICATION AT EACH WIRE JOINT TO PROVIDE ELECTRICAL CONTINUITY. TRACE WIRE SHALL BE ACCESSIBLE AT CLEANOUTS. SECURE THE TRACE WIRE TO THE UNDERGROUND PIPE AT LEAST EVERY 5 FEET WITH TAPE. AN ELECTRICAL CONTINUITY TEST SHALL BE PERFORMED ON THE INSTALLED TRACE WIRE SYSTEM. IF THE TRACE WIRE IS FOUND TO BE NOT CONTINUOUS, THE FAILED SECTION SHALL BE REPAIRED OR REPLACED.
2. DISSIMILAR PIPE–MATERIAL COUPLINGS: FLEXIBLE, SHIELDED, NONPRESSURE PIPE COUPLINGS FOR JOINING DISSIMILAR PIPE MATERIALS WITH SMALL DIFFERENCE IN OD.

3.3 PIPING INSTALLATION
A. BASIC PIPING INSTALLATION REQUIREMENTS ARE SPECIFIED IN DIVISION 22 SECTION "COMMON WORK RESULTS FOR PLUMBING."

B. INSTALL CLEANOUTS AT GRADE AND EXTEND TO WHERE BUILDING SANITARY DRAINS CONNECT TO BUILDING SANITARY SEWERS.

C. INSTALL CLEANOUT FITTING WITH CLOSURE PLUG INSIDE THE BUILDING IN SANITARY FORCE–MAIN PIPING.

D. INSTALL CAST–IRON SLEEVE WITH WATER STOP AND MECHANICAL SLEEVE SEAL AT EACH SERVICE PIPE PENETRATION THROUGH FOUNDATION WALL. SELECT NUMBER OF INTERLOCKING RUBBER LINKS REQUIRED TO MAKE INSTALLATION WATERTIGHT. SLEEVES AND MECHANICAL SLEEVE SEALS ARE SPECIFIED IN DIVISION 22 SECTION "COMMON WORK RESULTS FOR PLUMBING."

E. INSTALL WALL–PENETRATION FITTING AT EACH SERVICE PIPE PENETRATION THROUGH FOUNDATION WALL. MAKE INSTALLATION WATERTIGHT.

F. INSTALL CAST–IRON SOIL PIPING ACCORDING TO CISPI'S "CAST IRON SOIL PIPE AND FITTINGS HANDBOOK," CHAPTER IV, "INSTALLATION OF CAST IRON SOIL PIPE AND FITTINGS."

G. MAKE CHANGES IN DIRECTION FOR SOIL AND WASTE DRAINAGE AND VENT PIPING USING APPROPRIATE BRANCHES, BENDS, AND LONG–SWEEP BENDS. SANITARY TEES AND SHORT–SWEEP 1/4 BENDS MAY BE USED ON VERTICAL STACKS IF CHANGE IN DIRECTION OF FLOW IS FROM HORIZONTAL TO VERTICAL. USE LONG–TURN, DOUBLE Y–BRANCH AND 1/8–BEND FITTINGS IF 2 FIXTURES ARE INSTALLED BACK TO BACK OR SIDE BY SIDE WITH COMMON DRAIN PIPE. STRAIGHT TEES, ELBOWS, AND CROSSES MAY BE USED ON VENT LINES. DO NOT CHANGE DIRECTION OF FLOW MORE THAN 90 DEGREES. USE PROPER SIZE OF STANDARD INCREASERS AND REDUCERS IF PIPES OF DIFFERENT SIZES ARE CONNECTED. REDUCING SIZE OF DRAINAGE PIPING IN DIRECTION OF FLOW IS PROHIBITED.

H. LAY BURIED BUILDING DRAINAGE PIPING BEGINNING AT LOW POINT OF EACH SYSTEM. INSTALL TRUE TO GRADES AND ALIGNMENT INDICATED, WITH UNBROKEN CONTINUITY OF INVERT. PLACE HUB ENDS OF PIPING UPSTREAM. INSTALL REQUIRED GASKETS ACCORDING TO MANUFACTURER'S WRITTEN INSTRUCTIONS FOR USE OF LUBRICANTS, CEMENTS, AND OTHER INSTALLATION REQUIREMENTS. MAINTAIN SWAB IN PIPING AND PULL PAST EACH JOINT AS COMPLETED.

I. INSTALL SOIL AND WASTE DRAINAGE AND VENT PIPING AT THE FOLLOWING MINIMUM SLOPES, UNLESS OTHERWISE INDICATED:
1. BUILDING SANITARY DRAIN: 2 PERCENT DOWNWARD IN DIRECTION OF FLOW FOR PIPING NPS 3 AND SMALLER; 1 PERCENT DOWNWARD IN DIRECTION OF FLOW FOR PIPING NPS 4 AND LARGER.
2. HORIZONTAL SANITARY DRAINAGE PIPING: 2 PERCENT DOWNWARD IN DIRECTION OF FLOW FOR PIPING NPS 2–1/2 AND SMALLER, 1 PERCENT DOWNWARD IN DIRECTION OF FLOW FOR PIPING NPS 3 AND LARGER.
3. VENT PIPING: 1 PERCENT DOWN TOWARD VERTICAL FIXTURE VENT OR TOWARD VENT STACK.

J. INSTALL ENGINEERED SOIL AND WASTE DRAINAGE AND VENT PIPING SYSTEMS AS FOLLOWS:
1. COMBINATION WASTE AND VENT: COMPLY WITH STANDARDS OF AUTHORITIES HAVING JURISDICTION.
2. REDUCED–SIZE VENTING: COMPLY WITH STANDARDS OF AUTHORITIES HAVING JURISDICTION.

K. SLEEVES ARE NOT REQUIRED FOR CAST–IRON SOIL PIPING PASSING THROUGH CONCRETE SLABS–ON–GRADE IF SLAB IS WITHOUT MEMBRANE WATERPROOFING.

L. INSTALL PVC SOIL AND WASTE DRAINAGE AND VENT PIPING ACCORDING TO ASTM D 2665.

M. INSTALL UNDERGROUND PVC SOIL AND WASTE DRAINAGE PIPING ACCORDING TO ASTM D 2321.

N. DO NOT ENCLOSE, COVER, OR PUT PIPING INTO OPERATION UNTIL IT IS INSPECTED AND APPROVED BY AUTHORITIES HAVING JURISDICTION.

O. JOIN HDPE PIPING ACCORDING TO ASTM F1290 OR F 2620 USING BUTT–FUSION OR ELECTRO–FUSION PROCESS.

P. INSTALL HDPE PIPE ACCORDING TO ASTM D 2321 OR D 2774 AND MANUFACTURER'S WRITTEN INSTRUCTIONS.

3.4 JOINT CONSTRUCTION
A. BASIC PIPING JOINT CONSTRUCTION REQUIREMENTS ARE SPECIFIED IN DIVISION 22 SECTION "COMMON WORK RESULTS FOR PLUMBING."

B. JOIN HUBLESS CAST–IRON SOIL PIPING ACCORDING TO CISPI 310 AND CISPI'S "CAST IRON SOIL PIPE AND FITTINGS HANDBOOK" FOR HUBLESS–COUPLING JOINTS.

C. PVC NON–PRESSURE PIPING JOINTS: JOIN PIPING ACCORDING TO ASTM D 2665.

3.5 CONNECTIONS
A. DRAWINGS INDICATE GENERAL ARRANGEMENT OF PIPING, FITTINGS, AND SPECIALTIES.

B. CONNECT SOIL AND WASTE PIPING TO EXTERIOR SANITARY SEWER PIPING. USE TRANSITION FITTING TO JOIN DISSIMILAR PIPING MATERIALS.

C. CONNECT DRAINAGE AND VENT PIPING TO THE FOLLOWING:
1. PLUMBING FIXTURES: CONNECT DRAINAGE PIPING IN SIZES INDICATED, BUT NOT SMALLER THAN REQUIRED BY PLUMBING CODE.
2. PLUMBING FIXTURES AND EQUIPMENT: CONNECT ATMOSPHERIC VENT PIPING IN SIZES INDICATED, BUT NOT SMALLER THAN REQUIRED BY AUTHORITIES HAVING JURISDICTION.
3. PLUMBING SPECIALTIES: CONNECT DRAINAGE AND VENT PIPING IN SIZES INDICATED, BUT NOT SMALLER THAN REQUIRED BY PLUMBING CODE.
4. EQUIPMENT: CONNECT DRAINAGE PIPING AS INDICATED. PROVIDE SHUTOFF VALVE, IF INDICATED, AND UNION FOR EACH CONNECTION. USE FLANGES INSTEAD OF UNIONS FOR CONNECTIONS NPS 2–1/2 AND LARGER.

3.6 FIELD QUALITY CONTROL
A. DURING INSTALLATION, NOTIFY AUTHORITIES HAVING JURISDICTION AT LEAST 24 HOURS BEFORE INSPECTION MUST BE MADE. PERFORM TESTS SPECIFIED BELOW IN PRESENCE OF AUTHORITIES HAVING JURISDICTION.
1. ROUGHING–IN INSPECTION: ARRANGE FOR INSPECTION OF PIPING BEFORE CONCEALING OR CLOSING–IN AFTER ROUGHING–IN AND BEFORE SETTING FIXTURES.
2. FINAL INSPECTION: ARRANGE FOR FINAL INSPECTION BY AUTHORITIES HAVING JURISDICTION TO OBSERVE TESTS SPECIFIED BELOW AND TO ENSURE COMPLIANCE WITH REQUIREMENTS.

B. RE–INSPECTION: IF AUTHORITIES HAVING JURISDICTION FIND THAT PIPING WILL NOT PASS TEST OR INSPECTION, MAKE REQUIRED CORRECTIONS AND ARRANGE FOR RE–INSPECTION.

C. REPORTS: PREPARE INSPECTION REPORTS AND HAVE THEM SIGNED BY AUTHORITIES HAVING JURISDICTION.

D. TEST SANITARY DRAINAGE AND VENT PIPING ACCORDING TO PROCEDURES OF AUTHORITIES HAVING JURISDICTION OR, IN ABSENCE OF PUBLISHED PROCEDURES, AS FOLLOWS:
1. TEST FOR LEAKS AND DEFECTS IN NEW PIPING AND PARTS OF EXISTING PIPING THAT HAVE BEEN ALTERED, EXTENDED, OR REPAIRED. IF TESTING IS PERFORMED IN SEGMENTS, SUBMIT SEPARATE REPORT FOR EACH TEST, COMPLETE WITH DIAGRAM OF PORTION OF PIPING TESTED.
2. LEAVE UNCOVERED AND UNCONCEALED NEW, ALTERED, EXTENDED, OR REPLACED DRAINAGE AND VENT PIPING UNTIL IT HAS BEEN TESTED AND APPROVED. EXPOSE WORK THAT WAS COVERED OR CONCEALED BEFORE IT WAS TESTED.
3. ROUGHING–IN PLUMBING TEST PROCEDURE: TEST DRAINAGE AND VENT PIPING, EXCEPT OUTSIDE LEADERS, ON COMPLETION OF ROUGHING–IN. CLOSE OPENINGS IN PIPING SYSTEM AND FILL WITH WATER TO POINT OF OVERFLOW, BUT NOT LESS THAN 10–FOOT HEAD OF WATER. FROM 15 MINUTES BEFORE INSPECTION STARTS TO COMPLETION OF INSPECTION, WATER LEVEL MUST NOT DROP. INSPECT JOINTS FOR LEAKS.
4. FINISHED PLUMBING TEST PROCEDURE: AFTER PLUMBING FIXTURES HAVE BEEN SET AND TRAPS FILLED WITH WATER, TEST CONNECTIONS AND PROVE THEY ARE GASTIGHT AND WATERTIGHT. PLUG VENT–STACK OPENINGS ON ROOF AND BUILDING DRAINS WHERE THEY LEAVE BUILDING. INTRODUCE AIR INTO PIPING SYSTEM EQUAL TO PRESSURE OF 1–INCH WG. USE U–TUBE OR MANOMETER INSERTED IN TRAP OF WATER CLOSET TO MEASURE THIS PRESSURE. AIR PRESSURE MUST REMAIN CONSTANT WITHOUT INTRODUCING ADDITIONAL AIR THROUGHOUT PERIOD OF INSPECTION. INSPECT PLUMBING FIXTURE CONNECTIONS FOR GAS AND WATER LEAKS.
5. REPAIR LEAKS AND DEFECTS WITH NEW MATERIALS AND RETEST PIPING, OR PORTION THEREOF, UNTIL SATISFACTORY RESULTS ARE OBTAINED.
6. PREPARE REPORTS FOR TESTS AND REQUIRED CORRECTIVE ACTION.

3.7 CLEANING
A. CLEAN INTERIOR OF PIPING. REMOVE DIRT AND DEBRIS AS WORK PROGRESSES.

B. PROTECT DRAINS DURING REMAINDER OF CONSTRUCTION PERIOD TO AVOID CLOGGING WITH DIRT AND DEBRIS AND TO PREVENT DAMAGE FROM TRAFFIC AND CONSTRUCTION WORK.

C. PLACE PLUGS IN ENDS OF UNCOMPLETED PIPING AT END OF DAY AND WHEN WORK STOPS.

STATE OF NEW YORK
MICHEL BOURNONS
LICENSED PROFESSIONAL ENGINEER
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Michel Bournons
2020.11.19 16:50:53-05'00'

REV NO	DESCRIPTION			
P0	ISSUED FOR PERMIT	DN 11/19/20	ES 11/19/20	
	REVISIONS	REVISED BY & DATE	APPROVED BY & DATE	MICRO FILM DATE

ISSUED, MGR. FACILITIES DATE

APPROVALS

CENTRAL SAFETY		PROJECT ENG	
PROCESS ENG		DESIGN SUPERVISOR	

DWG. BY DN CHK. BY SCALE NONE

MOMENTIVE
Waterford, New York 12188

 CAD FILE: P–100A

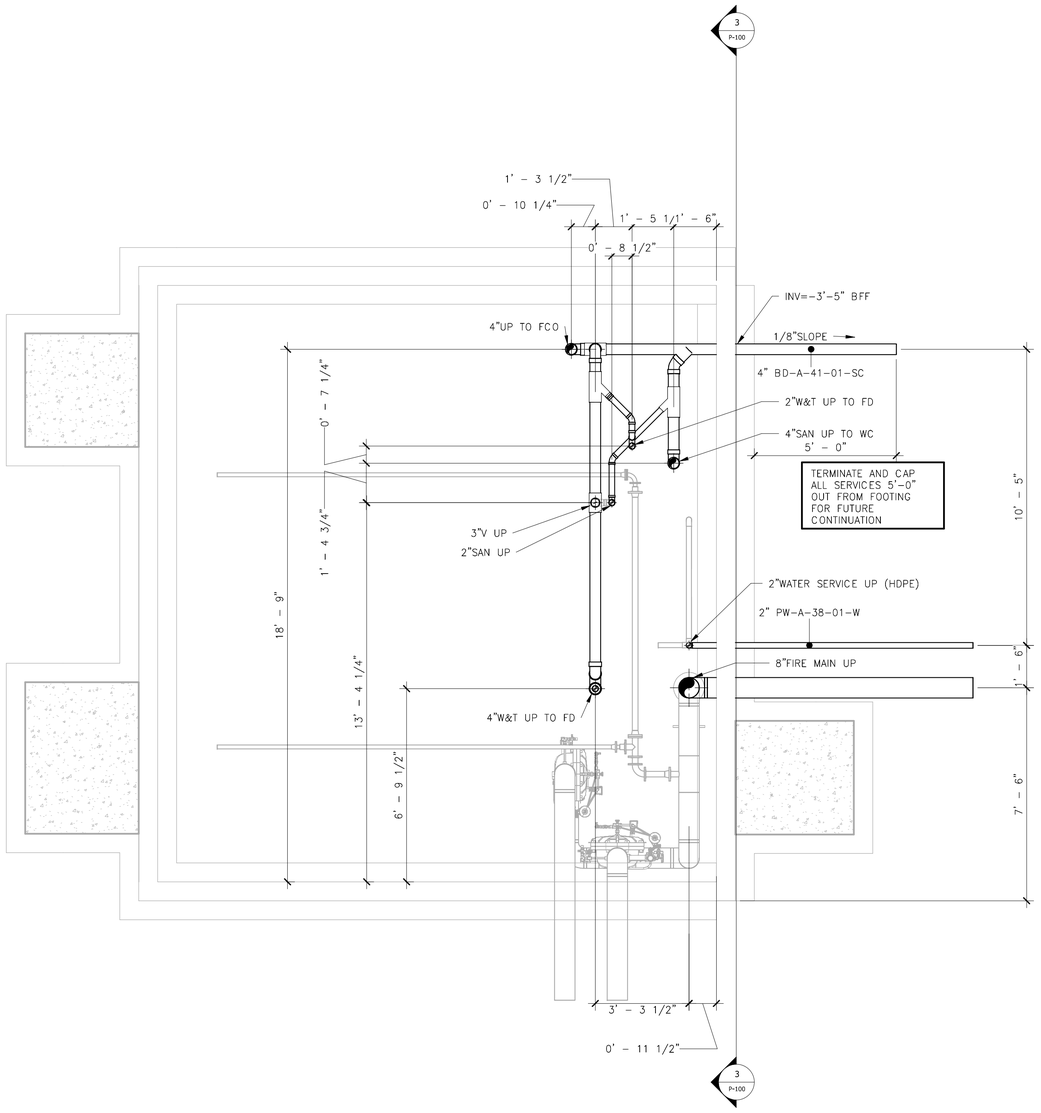
PLANT: CHEM OPS EAST
PROCESS: 87 UNLOADING STATION–

TITLE
SANITARY WASTE AND VENT PIPING SPECIFICATION

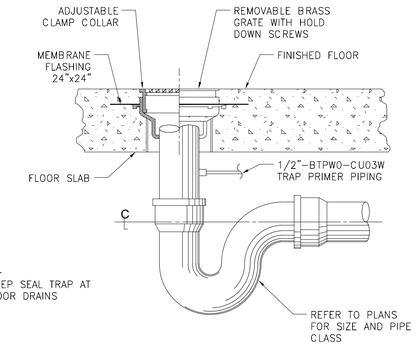
PROJ. NO: CC: DWG. CLASS NO.

LOCATION BLDG.	FLOOR	AREA	DRAWING NO.	SH. NO.	CONT. ON SH.
87	1	x	P–100	1	2

DWG. LOCATION:



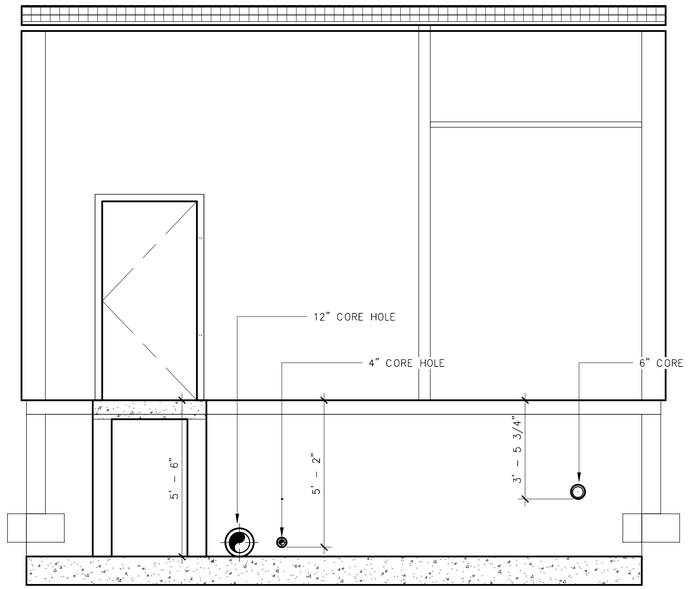
1 SPM-LEVEL 0 - UTILITY BUILDING UNDERGROUND LEVEL
SCALE: 3/8" = 1'-0"



NOTE:
USE DEEP SEAL TRAP AT ALL FLOOR DRAINS

COORDINATE ALL PENETRATIONS OF ARCHITECTURAL AND STRUCTURAL ELEMENTS WITH ARCHITECT AND STRUCTURAL ENGINEER.

2 FLOOR DRAIN DETAIL TYPICAL
SCALE: 1/2" = 1'-0"



3 EAST FOUNDATION WALL ELEVATION
SCALE: 3/8" = 1'-0"

GENERAL NOTES:

1. ALL INV ELEVATIONS ARE REFERENCED TO THE FINISHED FLOOR ELEVATION.
2. ALL PIPE PENETRATIONS THROUGH SLAB TO BE CAPPED OR OTHERWISE PROTECTED FROM WEATHER AND PEST INVASION.

N

STATE OF NEW YORK
MICHEL BOURNONS
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Michel Bournons
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REV NO	DESCRIPTION	REVISED BY & DATE	APPROVED BY & DATE	MICRO FILM DATE
P0	ISSUED FOR PERMIT	JAB 11/19/20	ES 11/19/20	

REVISIONS

ISSUED, MGR. FACILITIES: DATE:

APPROVALS

CENTRAL SAFETY		PROJECT ENG	
PROCESS ENG		DESIGN SUPERVISOR	

DWG. BY: JAB CHK. BY: ES SCALE: AS NOTED

MOMENTIVE
Waterford, New York 12188

CAD FILE: P-100B

PLANT: CHEM OPS EAST
PROCESS: 87 UNLOADING STATION

TITLE SL01 B87 UNDERGROUND PLUMBING PLAN

PROJ.NO: D20AL044.10 CC: DWG. CLASS NO.

LOCATION BLDG.	FLOOR	AREA	DRAWING NO.	SH. NO.	2
87	1		P-100	CONT. ON SH.	-

DWG. LOCATION: