CHRISTOPHER WILLIAMS ARCHITECTS LLC

ADDENDUM NO. 2

Date: November 2, 2022

Project: **SSF-2018-01 GNHWPCA COLLECTIONS MAINTENANCE FACILITY**

Re: ADDENDUM NO. 2

Issued by: Christopher Williams Architects LLC
85 Willow Street, Building 54
New Haven, CT 06511
(203) 776-0184

To: All Bidders

No. of pages: 3, including the cover sheet.

Notice to all Bidders:

This Addendum forms a part of and modifies the original documents issued for bidding, dated **May 23, 2022,** to the extent noted herein.

This Addendum supersedes all previous Drawings, General Documents, Specifications, Instructions and Addenda pertaining to these items.
Acknowledge receipt of this Addendum on the submitted Bid.

REVISION COMMENTS:

Sheet A000: COVER SHEET
SHEET INDEX: ADDENDUM 1 ISSUED SHEET

Sheet C101: ESWPAF PROPERTY PLAN
A5: EXCESS & CONTAMINATED SOIL LOCATIONS AND SILT FENCE
B2: ADDED TYP APRON & PAVING DETAIL

Sheet C102: SITE PLAN
A5-D4: ADDED ELEC. CONN. & PLANT WATER PIPING

Sheet S600: TYPICAL DETAILS
P1: UPDATED TYPICAL PIER DETAIL

Sheet S601: TYPICAL DETAILS
2: UPDATED CONTROL JOINT NOTE

Sheet S700: GENERAL NOTES
UPDATED FOOTINGS NOTE

Sheet A111: FLOOR PLANS
C5: SMALLER LOUVER OPENING SIZE & UPDATED DIMENSIONS
A5: ADDED CONCRETE PAD & BOLLARD FOR ELECTRICAL PANELS AND TRANSFORMER

Sheet A112: REFLECTED CEILING AND ROOF PLANS
C5: ADDED TAPERED CRICKETS AT SKYLIGHTS
A5: ADDED CONDUIT NOTE

Sheet A201: EXTERIOR ELEVATIONS
D4: UPDATED LOUVER & OPENING SIZE
D5: NEW LOUVER SIZES & ADDED EXPANSION JOINTS
B4: ADDED NOTE OH COILING DR
A4-B2-B4: ADDED EXPANSION JOINTS

Sheet A202: INTERIOR ELEVATIONS
C3-C4: ADDED NOTE OH COILING DR
C5-C2: ADDED CONCRETE PAD & BOLLARD FOR ELECTRICAL PANELS & TRANSFORMER

Sheet A301: BUILDING SECTIONS
D5-B3: ADDED LEVELS & NOTES
D5-B5-A5: ADDED CRUSHED STONE UNDER FOUNDATION

Sheet A311: WALL SECTIONS
A3: ADDED NEW DETAIL
A2: ADDED FLOOR GRATE
A5-A4-A3-A2: UPDATED NOTES
A2: ADDED ACCESS LADDER
A5-A4-A3-A2: ADDED CRUSHED STONE UNDER FOUNDATION

Sheet A312: WALL SECTIONS
A4-A3-A1: UPDATED NOTES
A4-A3: ADDED 2" RIGID INSULATION
A4-A3-A1: ADDED CRUSHED STONE UNDER FOUNDATION

Sheet A501: OPENING DETAILS
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A4: ADDED FLASHING COMPONENT
B4: UPDATED SILL NOTE
D5: ADDED MORTAR COLLECTION
D5: UPDATED FLASHING DETAIL
B5: UPDATED MASONRY TIES
C3-B3-A3: MOVED DETAILS TO SHEET A601

Sheet A502: ROOF DETAILS

D1: UPDATED ROOF STEP DETAIL
C4: ADDED BLOCKING & SHIM
C4-B3: ADDED INSULATION
A4: REMOVED DUPLICATE DETAIL

Sheet A503: DETAILS
A5: UPDATED BOLLARD FOOTING DEPTH
A4: BOTTOM OF MASONRY CAVITY DETAIL
A2: UPDATED DETAIL
C3: ADDED NEW DETAIL OF RETAINING WALL
B2: UPDATED STEEL ANGLE

Sheet A601: SCHEDULES
A5: UPDATED INSULATION, MORTAR COLLECTION & WEEPS
B3: UPDATED MASONRY ANCHORS
B2: UPDATED DOOR JAMB DETAIL
DOOR SCHEDULE: UPDATED DETAIL LOCATION

Sheet P101: FLOOR PLAN PLUMBING
UPDATED SPECIFICATIONS & LEGEND

Sheet M101: FLOOR PLAN MECHANICAL
UPDATED SPECIFICATIONS & NOTES

Sheet E101: FLOOR PLAN ELECTRICAL
UPDATED FICTURE SPECIFICATIONS & LEGEND

Sheet SE101: SITE PLAN ELECTRICAL
UPDATED NOTES & LEGEND

Item #2: Attached are responses to RFI's received during the RFI period.
See attached bid RFI log with all current responses

Item #3: Updated specs
04 2000 UNIT MASONRY
05 5000 METAL FABRICATIONS
05 5313 BAR GRATING
07 2100 THERMAL INSULATION
07 5200 SBS ROOFING
31 6613 RIGID INCLUSION GROUND IMPROVEMENT

Item #4: Meeting Minutes
20221006 Pre-Bid Collection Maintenance Facility Minutes

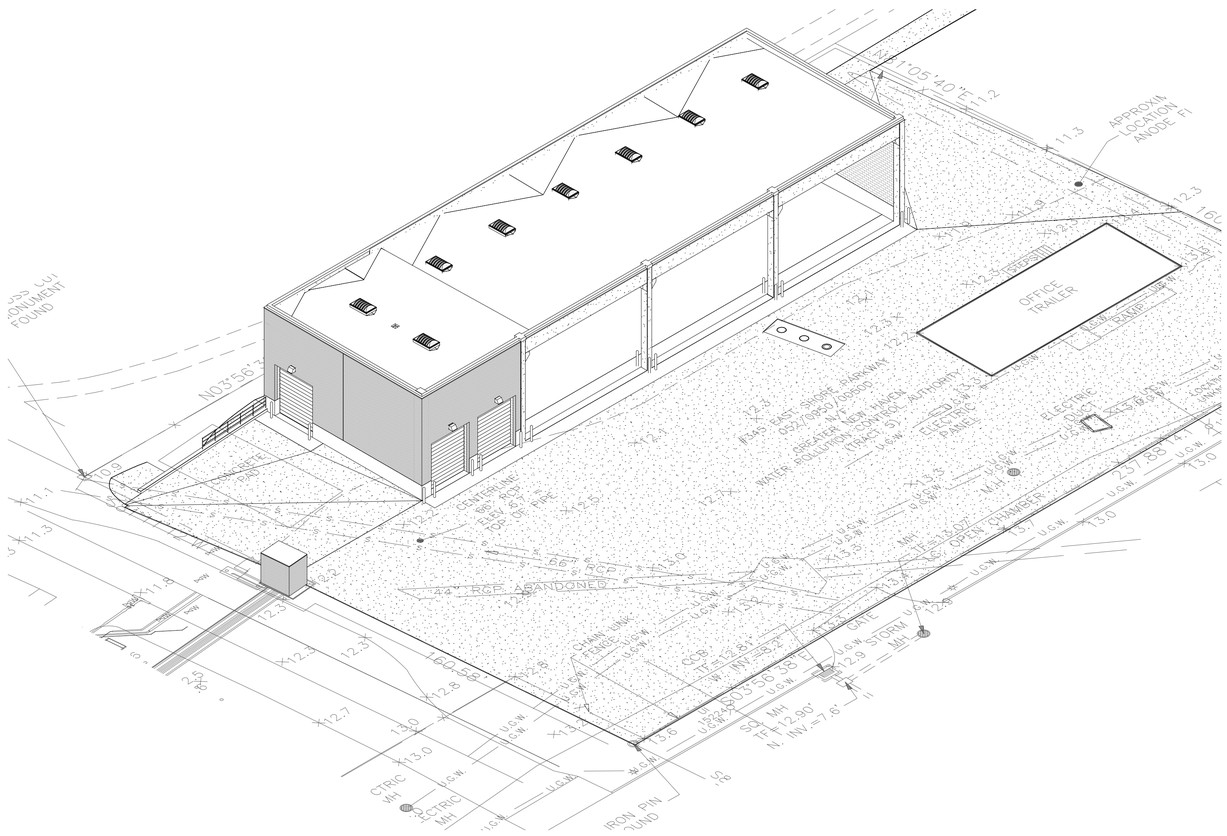
END OF ADDENDUM #2

EAST SHORE WATER POLLUTION ABATEMENT FACILITY (ESWPAF) COLLECTIONS MAINTENANCE FACILITY

345 East Shore Parkway, New Haven, Connecticut

GNHWPCA PROJECT NO: SSF 2018-01

CWA PROJECT NO: 1801



SHEET INDEX

NO.	SHEET NAME	ISSUE 1 DATE	ISSUE 2 DATE
A000	COVER SHEET	5/23/2022	11/01/2022
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C104	SITE PHOTOMETRICS	5/23/2022	
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A503	DETAILS	5/23/2022	11/01/2022
A601	SCHEDULES	5/23/2022	11/01/2022
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M101	FLOOR PLAN MECHANICAL	5/23/2022	11/01/2022
SE101	SITE PLAN ELECTRICAL	5/23/2022	11/01/2022
E101	FLOOR PLANS ELECTRICAL	5/23/2022	11/01/2022

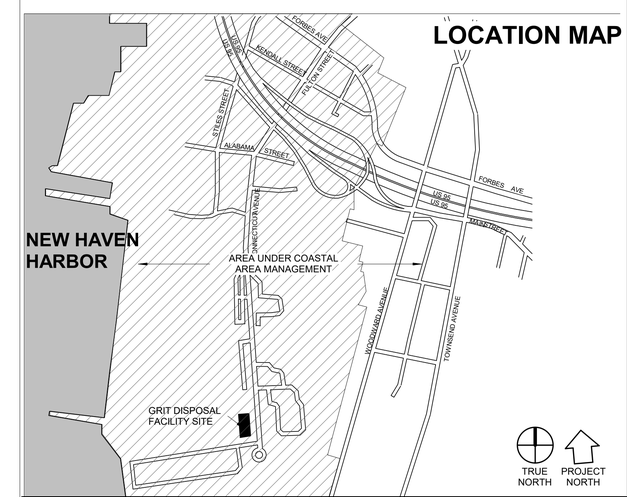
BOARD OF DIRECTORS

Joyce Alton	New Haven
Russell Cyr	Hamden
Salvatore Decola	New Haven
Robert Falcigno	East Haven
Michael Fimiani	New Haven
Jeffrey D. Ginzberg	Woodbridge
Stephen A. Mongillo, Chairman	Hamden
Raymond Pompano	East Haven
Clayton Williams, Vice-Chairman	New Haven

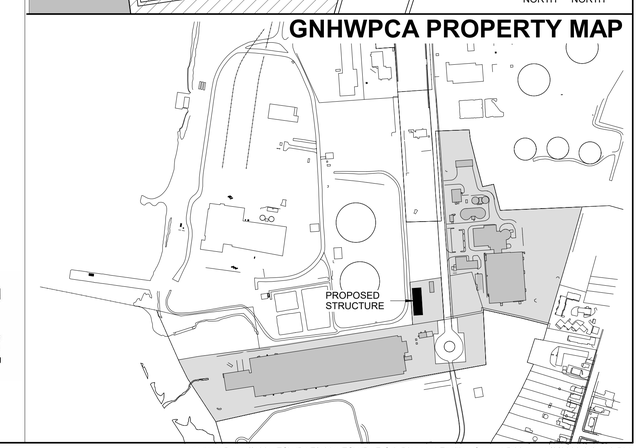
MANAGEMENT AND STAFF

Sidney J. Holbrook	Executive Director
Gabriel Varca	Director of Finance & Administration (Treasurer)
Thomas Sgroi, P.E.	Director of Engineering
Gary Zrelak	Director of Operations
Charlie Biggs	Maintenance Administrator

LOCATION MAP



GNHWPCA PROPERTY MAP



ADDENDUM 2

11/02/22

FOR CONSTRUCTION

5/23/2022

OWNER

GNHWPCA Protecting the Environment

Greater New Haven Water Pollution Control Authority
260 East Street New Haven, CT 06511
203.466.5280 p 203.772.1564 f www.gnhwpca.com

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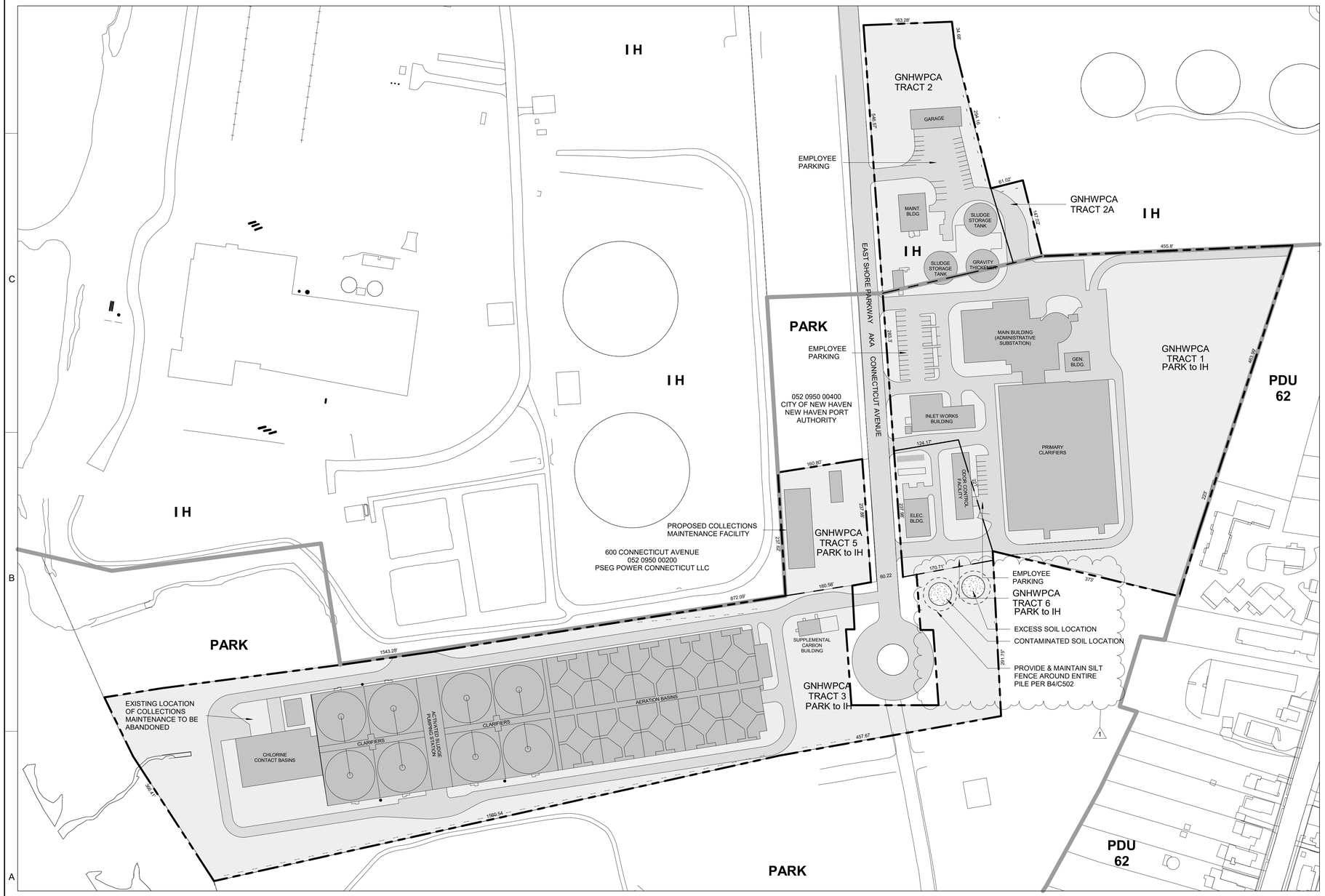
ROGER K. DUSENBERY JOSEPH S. ZELSKO



A5 GNHWPCA EAST SHORE WATER POLLUTION ABATEMENT FACILITY
1" = 100'-0"

0' 50' 100' 200' 300'

TRUE NORTH PROJECT NORTH

GREATER NEW HAVEN WATER POLLUTION CONTROL AUTHORITY EAST SHORE WATER POLLUTION ABATEMENT FACILITY

ADDRESS: 345 East Shore Parkway
New Haven, Connecticut

TRACT	MAP	BLOCK	LOT	AREA
Tract 1	052	0950	00400	340,929 SF
Tract 1A				
Tract 2				
Tract 2A				
Tract 5				38,040 SF
Tract 3 p/o	052	0950	00800	439,710 +/- SF
Tract 6	052	0950	00600	35,450 SF

Park to IH: 854,129 SF +/-

OWNER

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203.466.5280 p 203.772.1564 f www.gnhwpca.com

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FOR CONSTRUCTION

5/23/2022

ESWPAF COLLECTIONS MAINTENANCE FACILITY
GNHWPCA PROJECT NO: SSF 2018-01

EAST SHORE WATER POLLUTION ABATEMENT FACILITY
345 EAST SHORE PARKWAY, NEW HAVEN, CONNECTICUT 06512

MARK	DATE	DESCRIPTION
1	11/02/22	ADDENDUM 1

PROJECT NO: SSF 2018-01
CWA PROJECT NO.: 1801
DRAWN BY: Author
CHK'D BY: Checker
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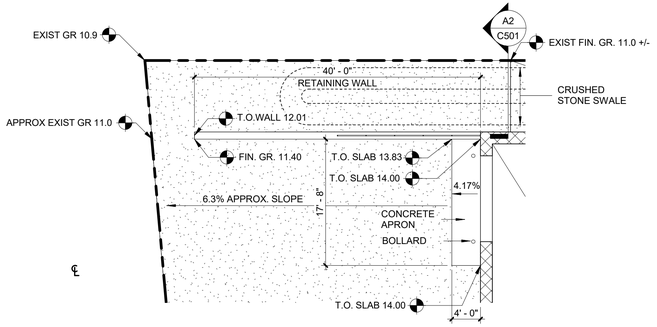
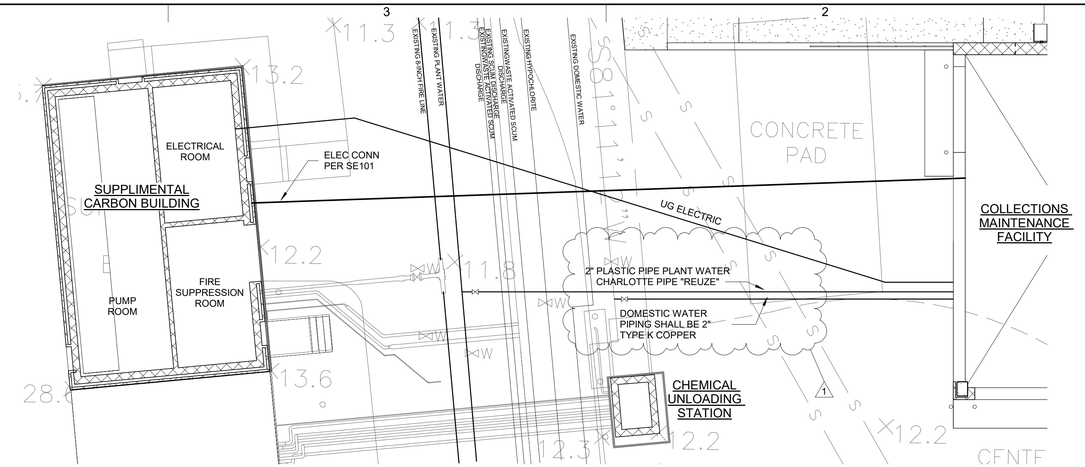
SHEET TITLE
ESWPAF PROPERTY PLAN

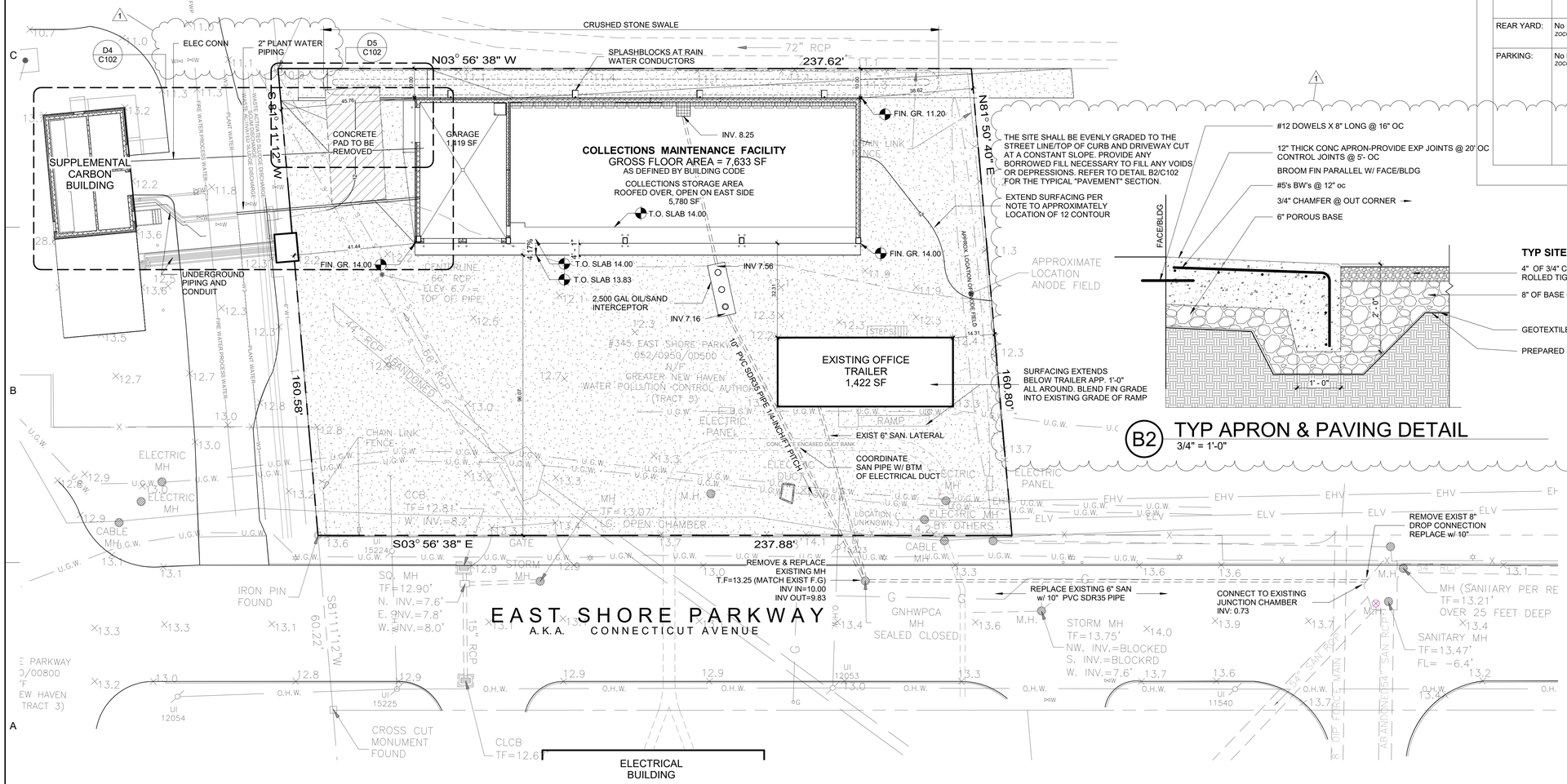
C101



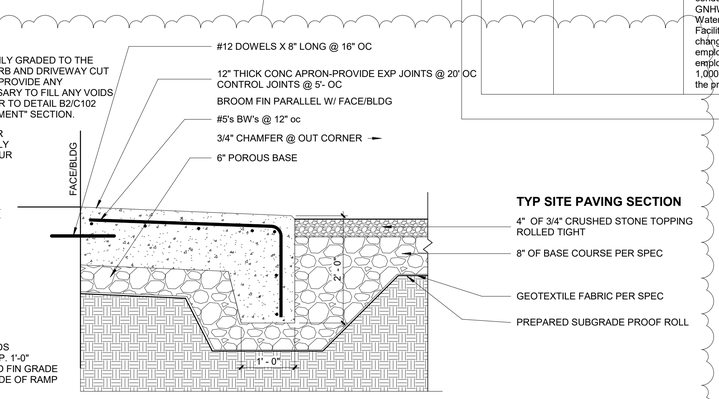
D5 PARTIAL ENLARGED SITE PLAN
1" = 10'-0"



D4 SITE UTILITY PLAN
1" = 10'-0"



A5 SITE PLAN
1" = 20'-0"



B2 TYP APRON & PAVING DETAIL
3/4" = 1'-0"

TRUE NORTH PROJECT NORTH

SURVEY INFORMATION FROM SURVEY PREPARED BY CRISCUOLO ENGINEERING LLC DATED 11/15/18

ADDITIONAL UNDERGROUND UTILITIES FROM WET WEATHER CAPACITY IMPROVEMENTS AND NITROGEN REDUCTION - PHASE 1 RECORD DOCUMENTS DATED MARCH 2017 AND UTILITY MAPPING PLAN OF FACILITY AT 345 EAST SHORE PARKWAY BY UNITED ENGINEERS AND SURVEYORS DATED SEPTEMBER 2009

ZONING SUMMARY

LOT: 052 0950 00400
Greater New Haven water pollution Control authority Tract 5

PARCEL: GNHWPCA East Shore Water Pollution Abatement Facility
345 East Shore Parkway, New Haven, CT 06512

ZONE: PARK
City of New Haven Zoning Map

EXISTING USE: Waste processing and transfer

PROPOSED USE: Waste processing and transfer
(No Change)

LOT AREA: 38,037 Square Feet

GROSS BUILDING AREA
Proposed Building: 7,633 Square Feet
Existing Building to Remain: 1,422 Square Feet
Proposed Total Building Area: 9,055 Square Feet

	PERMITTED / REQUIRED	EXISTING	PROPOSED
FAR:	No Requirement *ZOCONH Section 51*	0.05 *(Existing Building to Remain)*	0.24 *(New and Existing Buildings)*
BUILDING HEIGHT:	No Requirement *ZOCONH Section 51*	11.0 Ft *(Existing Building to Remain)*	27.5 Ft *(New Principal Building)*
BUILDING COVERAGE:	No Requirement *ZOCONH Section 51*	0.05 *(Existing Building to Remain)*	0.24 *(New Principal Building)*
FRONT YARD:	No Requirement *ZOCONH Section 51*	44.5 Ft *(Existing Building to Remain)*	44.5 Ft *(Existing Building to Remain)* 100.1 Ft *(New Principal Building)*
SIDE YARD:	No Requirement *ZOCONH Section 51*	14.31 Ft & 160.83 Ft *(Existing Building to Remain)*	14.31 Ft & 160.83 Ft *(Existing Building to Remain)* 38.62 Ft & 41.44 Ft *(New Principal Building)*
REAR YARD:	No Requirement *ZOCONH Section 51*	92.2 Ft *(Existing Building to Remain)*	10 Ft *(New Principal Building)*
PARKING:	No Requirement *ZOCONH Section 51*	0 on site	0 on site

Operations at the proposed structure are currently conducted elsewhere at the GNHWPCA East Shore Water Pollution Abatement Facility. There will be no net change of the number of employees at the facility, all employee parking is within 1,000 Ft. walking distance of the proposed structure

OWNER
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FOR CONSTRUCTION

5/23/2022

ESWPAF COLLECTIONS MAINTENANCE FACILITY

GNHWPCA PROJECT NO: SSF 2018-01

EAST SHORE WATER POLLUTION ABATEMENT FACILITY
345 EAST SHORE PARKWAY, NEW HAVEN, CONNECTICUT 06512

MARK	DATE	DESCRIPTION
1	11/02/22	ADDENDUM 2

PROJECT NO: SSF 2018-01
CWA PROJECT NO.: 1801
DRAWN BY: Author
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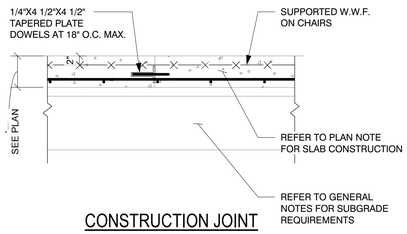
SHEET TITLE
SITE PLAN

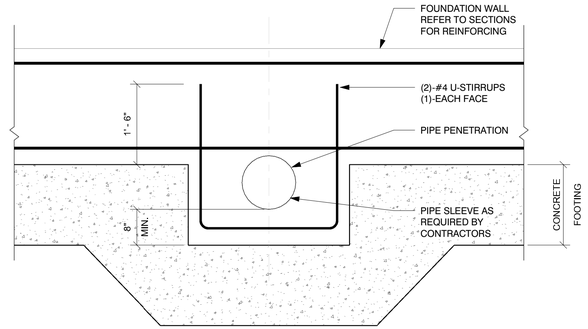
C102



CONSTRUCTION JOINT

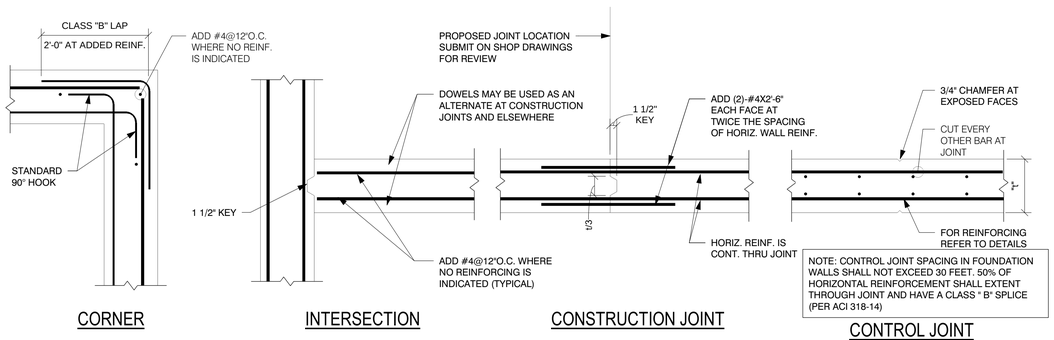
NOTE:
CONTRACTOR SHALL SUBMIT A PLAN INDICATING THE PROPOSED LOCATION OF
CONSTRUCTION JOINTS PRIOR TO PLACING CONCRETE FOR SLAB.
REFER TO GENERAL NOTES FOR SUBGRADE PREPERATION. REMOVE ALL FILL MATERIALS BELOW SLAB ON GRADE

1 TYPICAL SLAB ON GRADE DETAIL
3/4" = 1'-0"

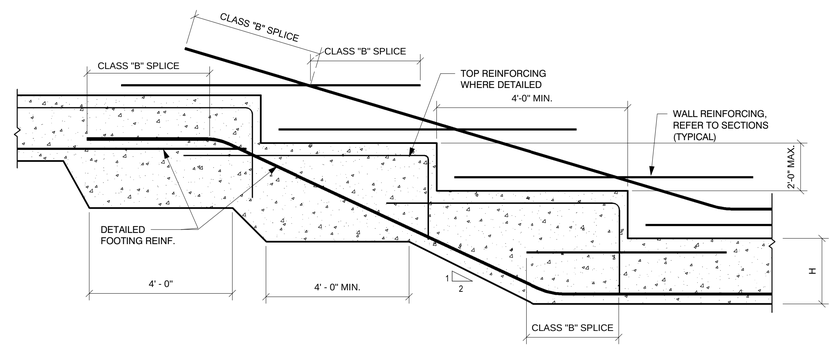


NOTE: DO NOT PLACE PENETRATIONS THROUGH COLUMNS PIERS OR FOOTINGS.
REFER TO PLAN FOR LOCATIONS AND COORDINATE WITH SITE, MECHANICAL, PLUMBING, ELECTRICAL, AND FIRE PROTECTION DRAWINGS.

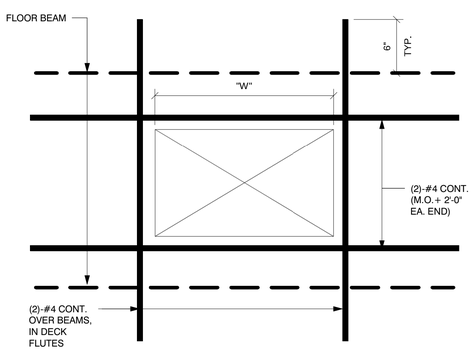
2 TYPICAL DETAIL OF PIPE PENETRATIONS THRU FOUNDATION WALLS
3/4" = 1'-0"



3 TYPICAL WALL REINFORCING DETAIL
3/4" = 1'-0"

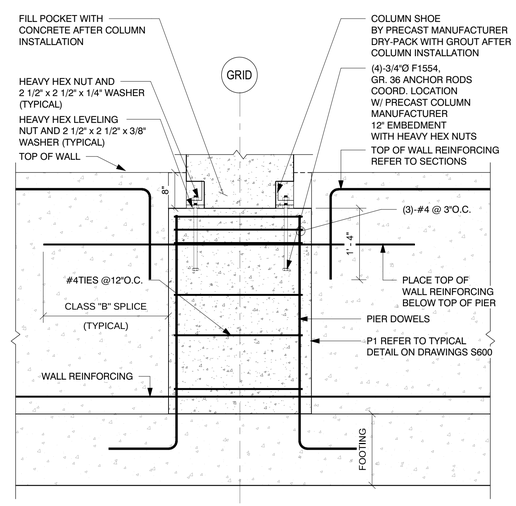


4 TYPICAL STEPPED FOOTING DETAIL
1/2" = 1'-0"



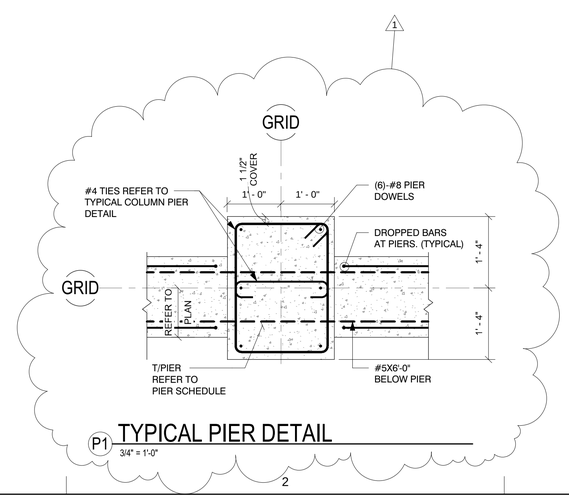
NOTES:
1. FOR OPENINGS WITH "W" GREATER THAN 4'-0" SUBMIT LOCATION FOR REVIEW.
2. FOR STEEL FRAME, REFER TO TYPICAL FLOOR OPENING DETAIL
3. COORDINATE QUANTITY AND LOCATIONS WITH MECHANICAL, ELECTRICAL AND PLUMBING DRAWINGS.

5 TYPICAL SLAB OPENING DETAIL
1 1/2" = 1'-0"



NOTE: REFER TO SECTIONS FOR REINFORCING.

6 TYPICAL WALL REINFORCING DETAIL
3/4" = 1'-0"



P1 TYPICAL PIER DETAIL
3/4" = 1'-0"

OWNER

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FOR CONSTRUCTION

5/31/2019

ESWPAF COLLECTIONS MAINTENANCE FACILITY

EAST SHORE WATER POLLUTION ABATEMENT FACILITY
345 EAST SHORE PARKWAY, NEW HAVEN, CONNECTICUT 06512

MARK	DATE	DESCRIPTION
1	11/1/22	REVISION 1

PROJECT NO:
CWA PROJECT NO.: 1801
DRAWN BY: AC
CHK'D BY: PJS
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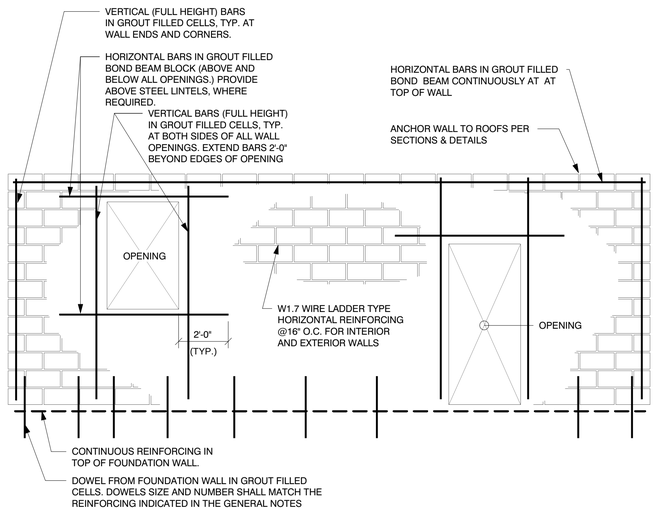
SHEET TITLE
TYPICAL DETAILS

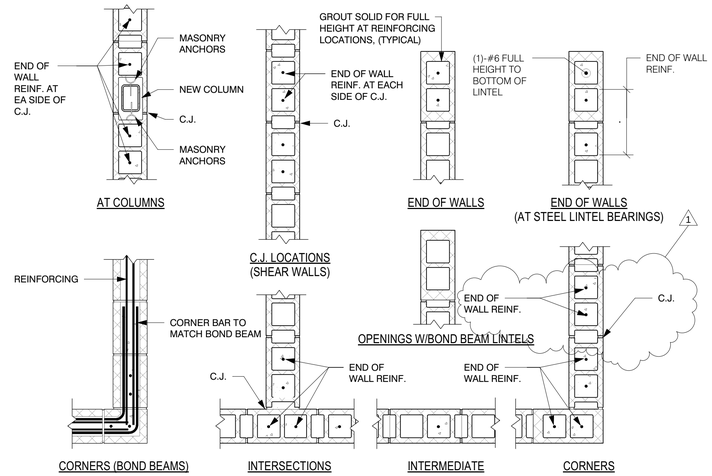
S600



NOTE: REFER TO CONCRETE MASONRY GENERAL NOTES FOR WALL REINFORCING REQUIREMENTS.

1 TYPICAL CMU WALL REINFORCEMENT DETAIL

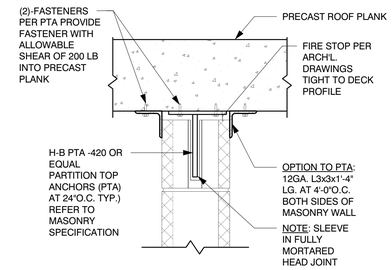
3/4" = 1'-0"



NOTES:
1. REINFORCING DETAILS APPLY TO ALL CMU WALLS. FOR ACTUAL REINFORCING REQUIREMENTS, REFER TO GENERAL NOTES ON DRAWINGS
2. PROVIDE DOWELS FROM CONCRETE FOUNDATIONS TO CMU WALL ABOVE. SIZE AND NUMBER TO MATCH WALL REINFORCING.

2 TYPICAL CMU REINFORCING PLAN DETAILS

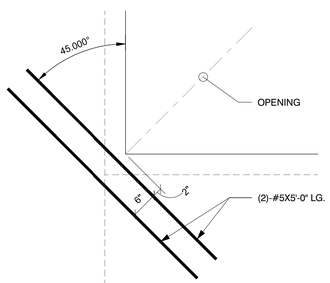
3/4" = 1'-0"



NOTE: APPLIES TO INTERIOR WALLS ONLY. ALL EXPOSED STEEL TO BE GALVANIZED.

3 TYPICAL TOP OF WALL MASONRY ANCHORAGE TO PRECAST PLANK

1 1/2" = 1'-0"



4 TYPICAL AT REENTRANT SLAB CORNERS

3/4" = 1'-0"

LINTEL SCHEDULE

MARK	CMU	OPENING WIDTH	LINTEL
	12" BLOCK	INTERIOR MECHANICAL OPENINGS UP TO 3'-0"	(2)-#5 CONT.
	12" BLOCK	OPENINGS NOT COVERED ABOVE UP TO 5'-0"	PRECAST LINTEL SIMILAR TO SECTION 3/S400

NOTE:
1. PROVIDE LINTELS WHERE NEEDED. NOT SHOWN ON THE DRAWINGS
2. ALL EXTERIOR STEEL SHALL BE HOT DIPPED GALVANIZED
3. COORDINATE ALL OPENINGS WITH ARCHT & MECH DRAWINGS.
4. GROUT ALL JAMBS SOLID PER TYPICAL CMU WALL REINF. DETAILS.

OWNER

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FOR CONSTRUCTION

5/31/2019

ESWPAF COLLECTIONS MAINTENANCE FACILITY

EAST SHORE WATER POLLUTION ABATEMENT FACILITY
345 EAST SHORE PARKWAY, NEW HAVEN, CONNECTICUT 06512

MARK	DATE	DESCRIPTION
1	11/1/22	REVISION 1

PROJECT NO:
CWA PROJECT NO.: 1801
DRAWN BY: AC
CHK'D BY: PJS
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SHEET TITLE

TYPICAL DETAILS

S601

GENERAL NOTES

GENERAL

GOVERNING CODE: 2018 CONNECTICUT STATE BUILDING CODE, (2015 INTERNATIONAL BUILDING CODE).

DESIGN LOADS: CITY OF NEW HAVEN

MINIMUM LIVE LOADS:

SLAB ON GRADE: 40 PSF + 45,500 LB AXLE LOAD

ROOF LOAD:

ROOF SNOW LOAD CRITERIA: Pg = 30 PSF, Ce = 0.9 AND Is = 1.0, Ct= 1.2 WITH INCREASES FOR SNOW DRIFTING, UNBALANCES AND SLIDING PER SECTION 1608 (2015 IBC).

MINIMUM ROOF LIVE LOAD = 30 PSF

ROOF DEAD LOAD = 130 PSF

WIND LOAD CRITERIA: SECTION 1609 (2015 IBC)
ULTIMATE WIND SPEED V_{ult} = 125 MPH
NOMINAL DESIGN WIND V_{ASD} = 105 MPH
RISK CATEGORY II, Iw = 1.0
EXPOSURE CLASSIFICATION "D".

MINIMUM WIND LOAD ON PRIMARY STRUCTURE = 15 PSF

WIND LOADS ON SECONDARY ELEMENTS SHALL CONFORM WITH ASCE 7-10.

COMPONENT AND CLADDING DESIGN WIND PRESSURES:

ROOF ZONE 1: POSITIVE: 18.55 PSF
NEGATIVE: -45.60 PSF

ROOF ZONE 2: POSITIVE: 18.55 PSF
NEGATIVE: -76.55 PSF

ROOF ZONE 3: POSITIVE: 15.55 PSF
NEGATIVE: -115.18 PSF

WALL ZONE 4: POSITIVE: 45.61 PSF
NEGATIVE: -49.50 PSF

WALL ZONE 5: POSITIVE: 45.61 PSF
NEGATIVE: -61.10 PSF

ROOF OVERHANG ZONE 2: -71.00 PSF
ROOF OVERHANG ZONE 3: -116.81 PSF

DESIGN WIND PRESSURE IS COMPUTED BASED ON ULTIMATE WIND SPEED USING 10 SQUARE FOOT OF AREA.

SEISMIC LOAD CRITERIA: AS PER SECTION 1613 (2012 IBC) WITH:
RISK CATEGORY = II
SEISMIC IMPORTANCE FACTOR, Ie = 1.0
Ss = 0.186g, S1 = 0.062g
SOIL SITE CLASS = D
SPECTRAL RESPONSE COEFFICIENTS, Sds = 0.198G, Sd1 = 0.149g
SEISMIC DESIGN CATEGORY, B
BASIC SEISMIC-FORCE-RESISTING SYSTEM: BEARING WALL, INTERMEDIATE REINFORCED MASONRY SHEAR WALLS
DESIGN BASE SHEAR, V = 0.057W
RESPONSE MODIFICATION FACTOR, R = 3.5
ANALYSIS PROCEDURE USED: EQUIVALENT LATERAL FORCE PROCEDURE

ASSUMED BEARING PRESSURE: 3000 PSF

1. SHOULD ANY OF THE DETAILED INSTRUCTIONS SHOWN ON THE PLANS CONFLICT WITH THE GENERAL STRUCTURAL NOTES, THE SPECIFICATIONS, OR WITH EACH OTHER, THE STRICTEST PROVISION SHALL GOVERN.

2. THE STRUCTURE IS DESIGNED TO BE SELF-SUPPORTING AND STABLE AFTER THE BUILDING IS FULLY COMPLETED. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO DETERMINE ERECTION PROCEDURE AND SEQUENCE AND TO INSURE THE SAFETY OF THE BUILDING AND ITS COMPONENT PARTS DURING ERECTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, SHEETING, TEMPORARY BRACING, GUYS OR TIEDOWNS WHICH MIGHT BE NECESSARY. SUCH MATERIAL SHALL REMAIN THE CONTRACTOR'S PROPERTY AFTER COMPLETION OF THE PROJECT.

3. THE STRUCTURE UTILIZES SHEAR WALLS TO PROVIDE LATERAL STABILITY. THEREFORE, TEMPORARY BRACING, GUYS, ETC. MUST BE MAINTAINED UNTIL ALL MASONRY SHEAR WALLS HAVE BEEN ERECTED AND ATTACHED TO STEEL FRAMING.

4. LOADS, OPENINGS AND STRUCTURE IN ANY WAY RELATED TO REQUIREMENTS OF OTHER (NON-STRUCTURAL) DISCIPLINES ARE SHOWN FOR BIDDING PURPOSES ONLY. THE CONTRACTOR SHALL OBTAIN FROM THE HEATING AND VENTILATING, ELECTRICAL, PLUMBING AND OTHER SUBCONTRACTORS THE FINAL APPROVED SIZE AND LOCATION OF ALL OPENINGS AND WORK TO BE PROVIDED FOR THEIR TRADE IN ROOFS, FLOORS AND WALLS, WHETHER SHOWN OR NOT SHOWN ON STRUCTURAL DRAWINGS. CONTRACTOR SHALL BE RESPONSIBLE FOR TRANSMISSION OF REQUIREMENTS, LOCATIONS AND DETAILS TO STRUCTURAL SUBCONTRACTORS. EXCESS COST RELATED TO VARIATION IN MECHANICAL REQUIREMENTS ARE NOT TO BE BORNE BY THE OWNER.

5. MECHANICAL EQUIPMENT WEIGHTS USED IN DESIGN OF SUPPORTING ELEMENTS HAVE BEEN INDICATED ON THE DRAWINGS. CONTRACTOR SHALL NOTIFY THE ARCHITECT PRIOR TO INSTALLATION IF ACTUAL WEIGHT EXCEEDS WEIGHT SHOWN ON DRAWINGS.

6. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO FOLLOW ALL APPLICABLE SAFETY CODES AND REGULATIONS DURING ALL PHASES OF CONSTRUCTION.

7. SHOP DRAWINGS ARE TO BE CHECKED BY THE CONTRACTOR AND SUBCONTRACTOR AND BEAR CHECKER'S INITIALS BEFORE BEING SUBMITTED TO THE ARCHITECT FOR APPROVAL.

8. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS, ELEVATIONS, ANGLES AND EXISTING CONDITIONS BEFORE PROCEEDING WITH ANY WORK.

9. ALL SECTIONS AND DETAILS SHALL BE CONSIDERED TYPICAL AND APPLY FOR THE SAME AND SIMILAR SITUATIONS THROUGHOUT THE BUILDING, UNLESS OTHERWISE SPECIFICALLY NOTED.

10. CONTRACTOR SHALL REVIEW ALL ARCHITECTURAL AND STRUCTURAL DRAWINGS PRIOR TO SUBMITTING THEIR BID FOR REFERENCE TO ALL NOTES ON ARCHITECTURAL DRAWINGS REFERRING TO ASEE STRUCTURAL DRAWINGS@. IF THE SIZE OF ELEMENTS AND DETAILING OF MEMBERS IS NOT INDICATED, THE CONTRACTOR SHALL CONTACT THE ARCHITECT TO REQUEST THE MISSING INFORMATION IN PREPARATION OF THEIR BID. THESE REFERENCED ITEMS SHALL BE PART OF THE BASE BID.

11. IN CASES OF DISCREPANCIES BETWEEN CONTRACT DOCUMENTS AND SUBMITTED SHOP DRAWINGS, THE CONTRACT DOCUMENTS SHALL GOVERN INSTALLATION OF MATERIALS.

FOUNDATIONS

1. BACKFILLING SHALL BE ACCOMPLISHED TO EQUAL HEIGHTS ON BOTH SIDES OF FOUNDATION WALLS TO PREVENT MOVEMENTS DUE TO UNBALANCED EARTH PRESSURE. WHERE EARTH IS ON ONE SIDE ONLY, BACKFILLING AND COMPACTION SHALL NOT START UNTIL FLOOR SLAB OR ADEQUATE BRACING IS PROVIDED FOR WALL SUPPORT (EXCEPT AT RETAINING WALLS).

2. ALL FOOTINGS ARE TO REST ON SUBGRADE PREPARED AND IMPROVED AS DEFINED IN THE GEOTECHNICAL REPORT, REGARDLESS OF ELEVATIONS SHOWN ON DRAWINGS. FOOTING BOTTOM ELEVATIONS SHALL NOT BE HIGHER THAN INDICATED ON THE FOUNDATION PLAN, NOR LESS THAN 3'-6" BELOW FINISH GRADES.

3. IF FILL MATERIALS ARE ENCOUNTERED AT FOOTING BEARING ELEVATIONS, ALL FILL MATERIAL SHALL BE EXCAVATED AND DISPOSED OF LEGALLY OFF-SITE. THE OVER EXCAVATION SHALL BE BACKFILLED WITH CONTROLLED COMPACTED FILL TO THE BOTTOM OF FOOTING ELEVATION AS REQUIRED.

4. ALL CONTROLLED COMPACTED BACKFILL UNDER FOOTINGS AND WITHIN THE FOOTPRINT OF THE STRUCTURE SHALL BE COMPACTED TO 95% OF THE MODIFIED OPTIMUM DENSITY.

5. BOTTOM OF ALL EXTERIOR FOOTINGS SHALL BE AT LEAST 3'-6" BELOW FINISHED GRADE. PRIOR TO PROCEEDING WITH FOOTING EXCAVATION, THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE COORDINATION OF FINISH GRADES AND BOTTOM OF EXTERIOR FOOTING ELEVATIONS TO MAINTAIN THE 3'-6" FROST PROTECTION.

6. ALL SOIL SURROUNDING AND UNDER ALL FOOTINGS SHALL BE PROTECTED FROM FREEZING AND FROST ACTION DURING THE COURSE OF CONSTRUCTION.

7. FOOTING BOTTOMS SHALL STEP AT THE RATE OF 1 UNIT VERTICAL TO 2 UNITS HORIZONTAL WITH A MAXIMUM VERTICAL STEP OF 2'-0".

8. WHERE SUBSURFACE PIPING PASSES THROUGH FOUNDATION WALLS, THE TOP OF THE FOOTINGS SHALL BE AT LEAST 8" BELOW THE INVERT ELEVATION OF THE PIPING AND CONDUITS. COORDINATE ALL INVERTS WITH MECHANICAL, PLUMBING, FIRE PROTECTION, ELECTRICAL, SITE AND SITE UTILITY DRAWINGS.

9. WHERE FOOTINGS ARE IN CLOSE PROXIMITY OF SUBSURFACE PIPING OR CONDUIT, BOTTOM OF FOOTINGS SHALL BE AT LEAST 8" BELOW INVERT ELEVATION OF PIPING OR CONDUITS.

10. KEEP FOUNDATION EXCAVATIONS FREE OF WATER AT ALL TIMES.

11. USE LEAN CONCRETE (f'c=1500) OR CONTROLLED COMPACTED FILL FOR OVER-EXCAVATION OF FOOTINGS.

12. PLACEMENT OF ALL COMPACTED FILL MATERIALS MUST BE UNDER SUPERVISION OF AN APPROVED TESTING LABORATORY (SEE SPECIFICATIONS). CONCRETE FOUNDATIONS SHALL NOT BE PLACED UNTIL SUBGRADE HAS BEEN CHECKED IN PLACE AND APPROVED BY TESTING LABORATORY.

13. EXISTING ON-SITE EXCAVATED MATERIALS SHALL NOT BE ACCEPTABLE BACKFILL MATERIAL BELOW BUILDING FOUNDATIONS, SLABS ON GRADE, OR FOR BACKFILLING OF FOUNDATION WALLS, OR WITHIN 2 FEET OF PAVEMENT GRADES UNLESS APPROVED BY THE GEOTECHNICAL ENGINEER OF RECORD.

14. CONTROL JOINT SPACING IN FOUNDATION WALLS SHALL NOT EXCEED 30 FEET. 50% OF HORIZONTAL REINFORCEMENT SHALL EXTEND THROUGH JOINT AND HAVE A CLASS "B" SPLICE (PER ACI 318-95).

15. WHERE REQUIRED, CONSTRUCTION JOINTS SHALL BE KEYED AND OCCUR AT CONTROL JOINT INTERVALS. PROVIDE BENTONITE WATERSTOP FULL HEIGHT IN ALL WALL CONSTRUCTION JOINTS BELOW GRADE.

16. SEE ARCHITECTURAL DRAWINGS FOR LOCATIONS OF BRICK OR CONCRETE MASONRY BLOCK SHELF ELEVATIONS IN THE FOUNDATION WALLS.

17. THE FOUNDATION DESIGN OF THE STRUCTURE HAS BEEN PREPARED BASED ON THE SOIL BORINGS, SOILS REPORT AND RECOMMENDATIONS PROVIDED BY THE GEOTECHNICAL ENGINEER, GEODESIGN, DATED NOVEMBER 2, 2018. IT IS THE CONTRACTORS RESPONSIBILITY TO REVIEW THE MATERIAL PRIOR TO PREPARING HIS BID TO ASSURE HE UNDERSTANDS THE SOIL CONDITIONS AND THE RECOMMENDATIONS OF THE GEOTECHNICAL ENGINEER.

18. FOUNDATION DESIGN SITE PREPARATION: THE FOUNDATION DESIGN AS INDICATED ON THE STRUCTURAL DRAWINGS HAS BEEN BASED ON THE FOLLOWING SITE PREPARATION. THE SITE HAS BEEN PREPARED BY THE EXCAVATION AND REMOVAL FROM THE SITE OF ALL EXISTING FILL AND CONTAMINATED SOILS. THE FOUNDATION DESIGN IS BASED ON THE SITE IMPROVEMENT USING RAMMED AGGREGATE PIERS OR EQUAL.

19. PROVIDE CONTINUOUS BENTONITE WATERSTOPS BETWEEN THE TOP OF FOOTING AND BOTTOM OF ALL WALLS WHERE THE SLAB ON GRADE IS BELOW THE FINISH GRADE. PLACE THE WATERSTOP WITH A MINIMUM OF 2" CLEAR FROM THE FACE OF WALL, OR PER THE MANUFACTURER=S WRITTEN INSTALLATION INSTRUCTIONS. ATTACH WATERSTOP TO THE CONCRETE PER THE MANUFACTURER=S WRITTEN INSTALLATION INSTRUCTIONS.

SLAB ON GRADE

1. ALL SLABS ON GRADE SHALL BEAR ON A 15 MIL, CLASS A, VAPOR RETARDER OVER A MINIMUM OF 12 INCHES COMPACTED GRAVEL FILL OR CRUSHED STONE, OVER PROOF ROLLED BASE COURSE.

ALL JOINTS OF THE VAPOR RETARDER SHALL BE SEALED WITH TAPE. TURN THE VAPOR BARRIER UP AT ALL TERMINATIONS AGAINST FOUNDATION WALLS AND SEAL JOINT BY CONTINUOUSLY TAPING.

2. IF FILL MATERIALS ARE ENCOUNTERED SLAB SUBGRADE ELEVATIONS, ALL FILL MATERIAL SHALL BE EXCAVATED AND DISPOSED OF LEGALLY OFF-SITE. THE OVER EXCAVATION SHALL BE BACKFILLED WITH CONTROLLED COMPACTED FILL TO THE BOTTOM OF THE SLAB SUBGRADE AS REQUIRED. ALL CONTROLLED COMPACTED BACKFILL UNDER SLABS WITHIN THE FOOTPRINT OF THE STRUCTURE SHALL BE COMPACTED TO 95% OF THE MODIFIED OPTIMUM DENSITY.

3. EXISTING ON-SITE EXCAVATED MATERIALS SHALL NOT BE ACCEPTABLE BACKFILL MATERIAL BELOW BUILDING SLABS ON GRADE UNLESS APPROVED BY THE GEOTECHNICAL ENGINEER OF RECORD.

4. CONSTRUCTION JOINTS AS REQUIRED SHALL BE KEYED AND DOWELED AND LOCATED AT INTERVALS OF A MAXIMUM OF 75 FEET ON CENTER.

5. SEE ARCHITECTURAL DRAWINGS FOR LOCATION AND SIZE OF DEPRESSED AREAS IN CONCRETE SLABS AND FOR CONCRETE PADS. MAINTAIN FULL SLAB THICKNESS IN DEPRESSED AREAS, UNLESS OTHERWISE SHOWN.

6. CONTRACTOR SHALL CONSOLIDATE ALL SLAB CONCRETE USING VIBRATIONAL METHODS IN CONFORMANCE WITH ACI 309, AGUIDE FOR CONSOLIDATION OF CONCRETE.

CONCRETE

MATERIALS:

CONCRETE SHALL MEET THE REQUIREMENTS OF EXPOSURE F3 PER ACI 318-14 CHAPTER 19, SHALL HAVE A MAXIMUM WATER TO CEMENT RATIO OF 0.4, SHALL HAVE A TARGET AIR CONTENT OF 6 PERCENT, AND SHALL DEVELOP STRENGTH IN 28 DAYS AS FOLLOWS:

LOCATION	STRENGTH (PSI)
FOUNDATIONS	5000
WALLS	5000
SLABS ON GRADE	5000

1. ALL DETAILING, FABRICATION AND ERECTION OF REINFORCING BARS MUST FOLLOW THE LATEST ACI CODE AND THE LATEST ACI "MANUAL OF STANDARD PRACTICE FOR DETAILING REINFORCED CONCRETE STRUCTURES".

2. REINFORCING STEEL SHALL BE 60,000 PSI YIELD.

3. NO TACK WELDING OF REINFORCING WILL BE PERMITTED.

4. UNLESS NOTED OTHERWISE, ALL LAP SPLICES SHALL BE CLASS B, IN ACCORDANCE WITH ACI 318-14.

5. WELDED WIRE FABRIC SHALL CONFORM TO ASTM A-1064.

6. WIRE MESH REINFORCEMENT MUST LAP ONE MESH SIZE AT SIDES AND ENDS AND BE WIRED TOGETHER.

7. WELDED WIRE FABRIC SIDE LAPS SHALL BE STAGGERED TO AVOID FOUR MESH THICKNESS AT COINCIDING END LAP AND SIDE LAP LOCATION.

8. NO CALCIUM CHLORIDE OR ADMIXTURES CONTAINING MORE THAN 0.1% CHLORIDE BY WEIGHT OF ADMIXTURE SHALL BE USED IN THE CONCRETE.

9. BOTTOM OF ALL EXTERIOR FOOTINGS SHALL BE AT LEAST 3'-6" BELOW FINISHED GRADE. PRIOR TO PROCEEDING WITH FOOTING FORMWORK, THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE COORDINATION OF BOTTOM OF EXTERIOR FOOTING ELEVATIONS WITH THE FINISH GRADES AND MAINTAINING THE 3'-6" FROST PROTECTION. WHERE SUBSURFACE PIPING PASSES THROUGH FOUNDATION WALLS, THE TOP OF FOOTINGS SHALL BE AT LEAST 8" BELOW THE INVERT ELEVATION OF THE PIPING AND CONDUITS. COORDINATE ALL INVERTS WITH MECHANICAL, PLUMBING, FIRE PROTECTION, ELECTRICAL, SITE AND SITE UTILITY DRAWINGS. PIPING OR CONDUITS SHALL NOT PASS THROUGH COLUMNS OR PIERS.

10. ALL HORIZONTAL STEEL SHOWN IN SECTIONS AND DETAILS SHALL BE CONTINUOUS, UNLESS OTHERWISE NOTED. ALL LAPS SHALL BE CLASS B SPLICES IN ACCORDANCE WITH ACI 318.

11. AT INTERSECTIONS OF REINFORCED CONCRETE WALLS, PROVIDE CORNER DOWELS OF SAME SIZE AND AT THE SAME SPACING AS THE SMALLER HORIZONTAL REINFORCING. DOWELS SHALL HAVE A CLASS B LAP WITH HORIZONTAL REINFORCING IN EACH DIRECTION.

12. PROVIDE CORROSION RESISTANT ACCESSORIES IN ALL EXPOSED CONSTRUCTION.

13. ALL KEYS IN CONCRETE WALLS SHALL BE 2 X 4 UNLESS NOTED OTHERWISE.

14. CONCRETE PIERS: PLACE CONCRETE PIERS AND WALLS TOGETHER. SET PIER REINFORCING AND SET WALL REINFORCING THROUGH PIER VERTICAL BARS. PROVIDE DOWELS WITH STANDARD HOOK FROM FOOTING AT ALL PIERS. SIZE AND QUANTITY OF DOWELS TO MATCH VERTICAL PIER REINFORCING, PROVIDE CLASS "B" SPLICE.

15. SEE ARCHITECTURAL, MECHANICAL, PLUMBING, FIRE PROTECTION, ELECTRICAL, SITE, SITE UTILITY AND EQUIPMENT DRAWINGS FOR CONCRETE PADS, SLEEVES, OPENINGS, RECESSES, AND BUILT-IN WORK IN CONCRETE ELEMENTS.

16. THE CONTRACTOR SHALL FURNISH, LOCATE AND INSTALL ALL ACCESSORIES FOR PROPER ANCHORAGE OF WOOD AND METAL FRAMING, WOOD BLOCKING, BRICK WORK AND MASONRY UNITS. HE SHALL BE SOLELY RESPONSIBLE FOR FURNISHING, LOCATING AND ENSURING PROPER QUANTITY OF ALL FASTENING DEVICES.

17. ALL CONCRETE TO REMAIN EXPOSED TO VIEW SHALL RECEIVE A SMOOTH RUBBED FINISH (SEE SPECIFICATIONS).

18. ALL CONCRETE CORNERS WITH BOTH SIDES EXPOSED TO VIEW SHALL BE SQUARE UNLESS OTHERWISE SHOWN OR NOTED. THE EDGE SHALL BE RUBBED, PRODUCING A SMOOTH, DENSE SURFACE WITHOUT PITS OR IRREGULARITIES.

19. PROVIDE CLEARANCE FROM EDGE OF REINFORCING TO EDGE OF CONCRETE AS FOLLOWS:

FOOTINGS (AGAINST EARTH)	3"
COLUMNS AND PIERS (VERTICAL REINFORCING)	2"
WALLS, INTERIOR FACE	3/4"
WALLS, EXTERIOR FACE (#5 AND SMALLER)	1 1/2"
WALLS, EXTERIOR FACE (#6 AND LARGER)	2"
SLABS (INTERIOR)	3/4"
SLABS (EXTERIOR)	1 1/2"
SLABS ON GRADE (W.W.F.)	1/3 X THK. FROM TOP SURFACE

20. NO SLEEVES, HOLES OR INSERTS SHALL BE PLACED IN SLABS WITHIN 2'-0" OF THE EDGE OF COLUMNS, OR ANYWHERE IN BEAMS, COLUMNS OR JOISTS WITHOUT APPROVAL OF THE ARCHITECT.

21. PROVIDE LENGTH OF BEARING ON MASONRY WALLS AS FOLLOWS, UNLESS NOTED OTHERWISE:

REINFORCED CONCRETE BEAMS: 8 INCHES
SOLID CONCRETE SLABS: 4 INCHES

22. JOINTS NOT INDICATED ON THE DRAWINGS SHALL BE MADE SO AS TO LEAST IMPAIR THE STRENGTH OF THE STRUCTURE. THERE SHALL BE NO HORIZONTAL JOINTS IN BEAMS OR SUSPENDED SLABS.

23. PROVIDE THE FOLLOWING AT OPENINGS IN ALL CONCRETE WALLS AND FRAMED SLABS, UNLESS OTHERWISE INDICATED:

1-#5 AT EACH FACE ON EACH SIDE OF OPENING, EXTENDING 2'-0" BEYOND OPENING.

1-#5 X 4'-0" LONG AT EACH FACE DIAGONALLY AT EACH CORNER.

24. REINFORCING STEEL SHOP DRAWINGS SHALL INDICATE THE SEQUENCE IN WHICH LAYERS OF CROSSING REINFORCING SHOULD BE PLACED, IN ORDER TO PRODUCE THE CORRECT OUTERMOST LAYER AS INDICATED ON THE DRAWINGS.

25. SHOP DRAWINGS SHALL INDICATE LOCATIONS OF ALL WALL CONTROL AND CONSTRUCTION JOINTS.

STRUCTURAL STEEL

MATERIALS:

STRUCTURAL STEEL	ASTM A 36
ALL W SHAPES	ASTM A 992, GR.50
STRUCTURAL STEEL TUBING	ASTM A500, GRADE B
STRUCTURAL STEEL PIPE	ASTM A53, GRADE B
BOLTS	ASTM A325
ANCHOR BOLTS	ASTM F1554, GRADE 36
WELDING ELECTRODE	ASTM E 70

1. DESIGN, FABRICATION, AND ERECTION OF STRUCTURAL STEEL SHALL CONFORM TO CURRENT AMERICAN INSTITUTE OF STEEL CONSTRUCTION SPECIFICATION. ALL REACTIONS SHOWN ON PLAN HAVE BEEN DEVELOPED USING ALLOWABLE STRESS DESIGN.

2. WELDING SHALL CONFORM TO THE CODE FOR "ARC AND GAS WELDING IN BUILDING CONSTRUCTION" OF THE AMERICAN WELDING SOCIETY.

3. ALL LOOSE BEAM LINTELS SHALL HAVE 8" MINIMUM BEARING. SEE ARCHITECTURAL JAMB DETAILS FOR LENGTHS.

4. FOR MISCELLANEOUS STEEL REFER TO ARCHITECTURAL DRAWINGS.

5. ALL WELDING SHALL BE DONE BY A CERTIFIED WELDER IN ACCORDANCE WITH A.W.S. STANDARDS.

CONNECTIONS SHALL BE MADE USING 3/4" DIAMETER ASTM A325 BOLTS (SNUG TIGHT OR SLIP CRITICAL) OR WELDS, UNLESS NOTED OTHERWISE. IF TENSION CONTROL BOLTS ARE USED, CONNECTIONS SHALL BE DESIGNED FOR SLIP CRITICAL BOLT ALLOWABLE LOAD VALUES USING CLASS A FAYING SURFACE.

PROVIDE SLOTTED BOLTED CONNECTIONS WHERE SHOWN WITH 13/16" X 1 7/8" SLOTTED HOLES USING ASTM A 325 BOLTS WITH WASHERS. NUTS SHALL BE FASTENED SNUG TIGHT, THEN UNTIGHTENED BY ONE-HALF TURN. PEEN THREADS TO PREVENT FURTHER LOOSENING OF NUT.

USE LARGER OF 1/4" FILLET WELDS OR MINIMUM SIZE PER AISC REQUIREMENTS WHERE NO WELD SIZE IS SHOWN ON DRAWINGS.

WELDS IN EXCESS OF 24" IN LENGTH SHALL BE 3" STITCH WELDS AT 8" ON CENTERS, UNLESS SPECIFICALLY SHOWN ON DRAWINGS TO BE CONTINUOUS.

MOMENT CONNECTIONS SHALL BE DESIGNED TO DEVELOP FULL MOMENT CAPACITY OF THE ELEMENTS CONNECTED, UNLESS SPECIFIC MOMENT IS INDICATED ON THE DRAWINGS.

6. NO WELDING OR FINAL BOLTING SHALL BE DONE UNTIL AS MUCH OF THE STRUCTURE THAT WILL BE STIFFENED THEREBY HAS BEEN PROPERLY ALIGNED.

7. SEQUENCE OF PLACING WELDS SHALL BE SUCH AS TO AVOID DISTORTION OF MEMBERS.

8. SUBSTITUTION OF STRUCTURAL STEEL MEMBERS IS PERMITTED TO FACILITATE DELIVERY AT NO ADDITIONAL COST TO THE OWNER. SUBSTITUTED MEMBERS MUST BE OF THE SAME NOMINAL DEPTH AS THE MEMBER ORIGINALLY INDICATED AND HAVE A WEIGHT GREATER THAN THAT INDICATED. BEAM FLANGES MUST NOT INFRINGE ON ADJACENT ARCHITECTURAL ELEMENTS.

9. ALL STRUCTURAL STEEL BEAMS AND COLUMNS ADJACENT TO MASONRY SHALL HAVE THE FOLLOWING MASONRY ANCHORAGE:

16 GAGE GALVANIZED CHANNEL SLOTS (DUR-O-WAL, INC. D/A 901) WELDED TO COLUMNS AND BEAMS WITH 1/4" GALVANIZED STRAP ANCHORS (DUR-O-WAL, INC. D/A 914) SPACED 1'-4" O.C. AT COLUMNS AND 1'-4" AT BEAMS (UNLESS OTHERWISE NOTED). INSTALL PER MANUFACTURER'S SPECIFICATIONS.

12. PROVIDE DEFORMED BAR ANCHORS ON THE TOP OF ALL BEAMS SUPPORTING CONCRETE MASONRY UNIT WALLS OR MULTI-WYTHE BRICK WALLS. THE ANCHORS SHALL BE WELDED AT 24" ON CENTER AND SHALL BE THE SAME SIZE AS THE WALL REINFORCING. DEFORMED BAR ANCHORS SHALL BE PLACED BY A TIMED STUD WELDING MACHINE.

13. STEEL MEMBERS SHOWN CONNECTED TO MASONRY WITH EXPANSION ANCHORS SHALL HAVE 3/4" DIAMETER EXPANSION ANCHORS AT 2'-8" ON CENTERS IN VERTICALLY SLOTTED HOLES, UNLESS OTHERWISE INDICATED.

14. BEAMS BEARING ON MASONRY SHALL HAVE ANGLE WALL ANCHORS WELDED TO THE BEAM, AS DETAILED IN THE A.I.S.C. MANUAL OF STEEL CONSTRUCTION.

15. PROVIDE 8" X 8" X 5/8" BEARING PLATES FOR ALL WALL BEARING BEAMS UNLESS NOTED OTHERWISE. ALL PLATES SHALL HAVE A MINIMUM OF (2)-3/4" DIAMETER X 5" LONG WELDED STUDS ON THE BOTTOM TO SET IN CONCRETE OR MASONRY WALLS.

16. PROVIDE 1/4" CLOSURE PLATES WITH FULL SEAL WELDS FOR ALL TUBE OR PIPE HOLLOW STEEL SECTIONS, UNLESS OTHERWISE NOTED ON THE DRAWINGS.

17. STEEL CONTRACTOR SHALL PROVIDE SKETCHES FOR ALL CORRECTIVE FIELD WORK WHICH SHALL BE SUBMITTED TO THE ENGINEER OF RECORD FOR APPROVAL. ALL SKETCHES SHALL BE SIGNED AND SEALED BY THE STEEL FABRICATORS CONNECTIONS ENGINEER.

CONCRETE MASONRY

MATERIALS:

HOLLOW LOAD BEARING UNITS: ASTM C 90
MORTAR: (TYPE S) ASTM C 270
(COMPRESSIVE STRENGTH OF MASONRY, f'm = 1500 PSI)
GROUT FOR REINFORCED MASONRY: ASTM C-476
(COMPRESSIVE STRENGTH AT 28 DAYS = 2500 PSI)
GROUT FOR REINFORCED MASONRY: ASTM C 476
SOLID LOAD BEARING UNITS: (GRADE N-I) ASTM C 145
CONCRETE BRICK: (GRADE N-I) ASTM C 55

1. WALLS INDICATED ON STRUCTURAL DRAWINGS ARE FOR REFERENCE ONLY. SEE ARCHITECTURAL DRAWINGS FOR LOCATION, THICKNESS AND COMPOSITION OF MASONRY WALLS.

2. ALL MASONRY WALLS SHALL CONTAIN THE FOLLOWING REINFORCING:

1-#5 VERTICAL BAR AT 24" ON CENTER.

2-#6 VERTICAL BARS AT BOTH SIDES OF DOOR, WINDOW AND MECHANICAL OPENINGS.

2-#5 HORIZONTAL BAR MINIMUM ABOVE AND BELOW ALL WINDOW AND MECHANICAL OPENINGS AND ABOVE ALL DOOR OPENINGS. PROVIDE ADDITIONAL BARS ABOVE DOORS, WINDOWS AND MECHANICAL OPENINGS AS REQUIRED IN ACCORDANCE WITH LINTEL SCHEDULE ON ARCHITECTURAL DRAWINGS.

2-#5 HORIZONTAL AT TOP OF ALL WALLS, AND AT BOND BEAMS CONNECTED TO FLOORS AND ROOFS, UNLESS OTHERWISE INDICATED.

2-#6 VERTICAL BARS AT ENDS OF ALL WALLS, AND EACH SIDE OF CONTROL JOINTS.

STANDARD LADUR TYPE DESIGN DUR-O-WAL HORIZONTAL REINFORCING @ 16" O.C. VERTICAL. SIDE WIRE SIZE SHALL BE #9 GAGE WIRE.

3. MORTAR PROTRUSIONS EXTENDING INTO CELLS OR CAVITIES TO BE REINFORCED AND/OR GROUTED SHALL BE REMOVED.

4. ALL MASONRY WALLS SHALL BE BRACED AT THE TOP WHERE MASONRY ENDS AT THE UNDERSIDE OF ROOF CONSTRUCTION. REFER TO TYPICAL DETAILS.

5. ALL MASONRY WALLS THAT DO NOT EXTEND TO BOTTOM OF FLOOR OR ROOF STRUCTURE ABOVE SHALL BE BRACED AT THE TOP, UNLESS BRACED HORIZONTALLY BY COLUMNS OR INTERSECTING WALLS AT A MAXIMUM SPACING OF 11 FEET FOR 4" WALLS, 17 FEET FOR 6" WALLS, 23 FEET FOR 8" WALLS, AND 33 FEET FOR 12" WALLS. THE ENDS OF THE WALLS MUST BE ANCHORED TO INTERSECTING WALLS BY EITHER TOOTHING OR MECHANICAL ANCHORS. THERE SHALL BE NO VERTICAL CONTROL JOINTS WITHIN THE HORIZONTAL SPAN OF THE WALL BETWEEN THE INTERSECTING WALLS.

6. IN MASONRY WALLS, NO CHASES, RISERS, CONDUITS, OR TOOTHING OF MASONRY SHALL OCCUR WITHIN 17" OF CENTERLINE OF BEAM BEARING OR LOAD CONCENTRATION.

7. SOLID UNITS SHALL BE LAID WITH FULL HEAD AND BED JOINTS.

8. COLLAR (VERTICAL LONGITUDINAL) JOINTS BETWEEN THE FACING AND BACKING WYTHES IN WALLS SHALL BE COMPLETELY FILLED WITH MORTAR OR GROUT AND WORKED IN WITH A TROWEL.

9. ALL INTERSECTING LOAD BEARING WALLS SHALL BE TIED TOGETHER IN MASONRY BOND UNLESS NOTED OTHERWISE.

10. MINIMUM DEVELOPMENT LENGTH AND SPLICE LENGTH OF MASONRY REINFORCING SHALL BE AS FOLLOWS:

	BAR SIZE	DEVELOPMENT LENGTH	SPLICE LENGTH
2.	JOINT REINFORCING	9"	12"
3.	#4	18"	24"
4.	#5	25"	30"
5.	#6	27"	36"
6.	#7	32"	42"

11. IF EPOXY COATED REINFORCING IS SPECIFIED IN THE MASONRY SPECIFICATIONS, THEN ALL SPLICE LENGTHS SHALL BE INCREASED BY 50% PER THE ACI 530 MASONRY CODE.

12. SUBMIT SHOP DRAWINGS INDICATING THE PLACEMENT OF ALL REINFORCING REQUIRED IN MASONRY WALLS. REFER TO SPECIFICATIONS FOR SUBMITTAL REQUIREMENTS. SHOP DRAWINGS SHALL INDICATE THE LOCATION OF ALL CONTROL JOINTS, AND THE REQUIRED LAP SPLICES FOR ALL REINFORCING.

13. SUBMIT SHOP DRAWINGS INDICATING THE PLACEMENT OF TOP OF WALL PARTITION ANCHORS AT ALL INTERIOR CMU WALLS. COORDINATE LOCATIONS WITH ARCHITECTURAL DRAWINGS.

14. PROVIDE MASONRY CONTROL JOINTS AT A MAXIMUM SPACING OF 30 FEET ON CENTER. PROVIDE CONTROL JOINTS BETWEEN MAIN AND INTERSECTING WALLS, AT CHANGES IN WALL HEIGHT, CHANGES IN WALL THICKNESS AND NO GREATER THAN 4'-0" FROM CORNERS.

PRECAST CONCRETE

MATERIALS:

CONCRETE SHALL DEVELOP STRENGTH AS FOLLOWS:

AT RELEASE: 3500 PSI
AT 28 DAYS: 5000 PSI

1. ALL DETAILING, FABRICATION AND ERECTION OF PRECAST ELEMENTS SHALL FOLLOW THE LATEST ACI CODE AND THE LATEST ACI "MANUAL OF STANDARD PRACTICE FOR DETAILING REINFORCED CONCRETE STRUCTURES".

2. FABRICATOR MUST BE A PRODUCER MEMBER OF THE PRESTRESSED CONCRETE INSTITUTE AND/OR PARTICIPATE IN ITS PLANT CERTIFICATION PROGRAM, FABRICATOR SHALL HAVE A MINIMUM OF 2 YEARS EXPERIENCE IN FABRICATION OF PRECAST CONCRETE UNITS.

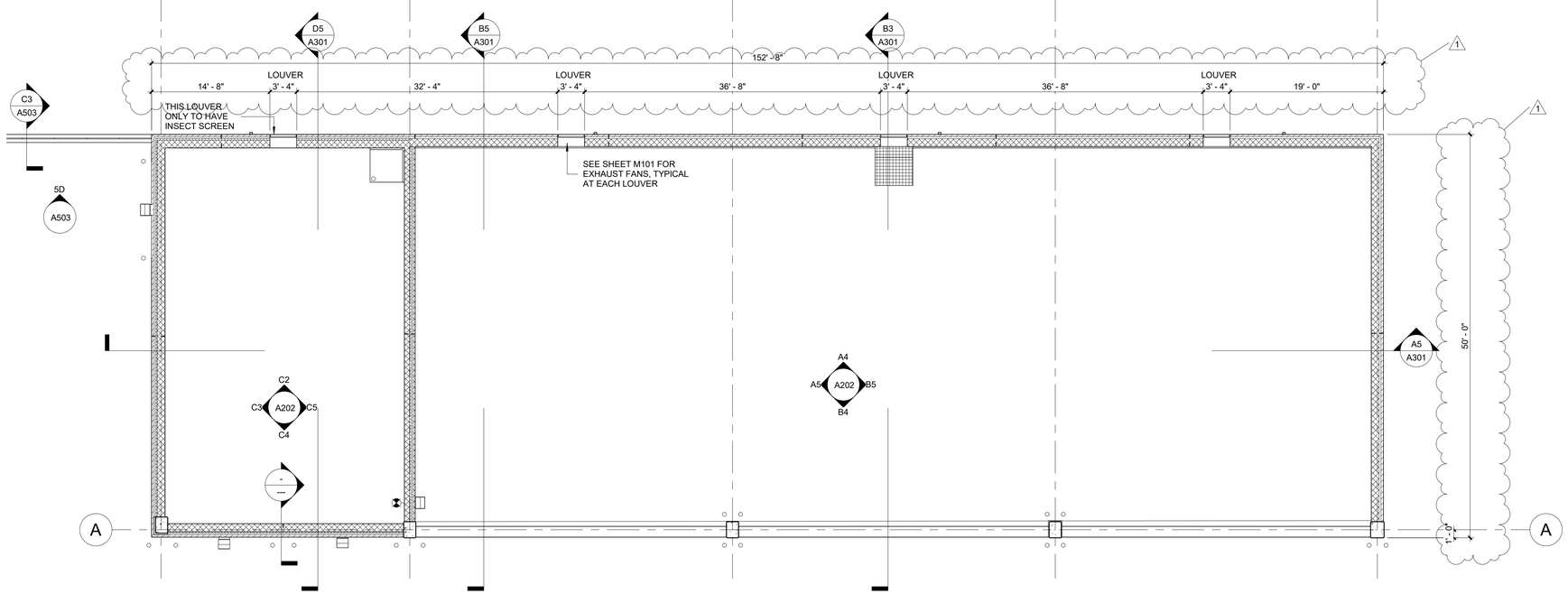
3. FABRICATOR SHALL FOLLOW THE STANDARDS OF THE PRESTRESSED CONCRETE INSTITUTE MNL 116, "MANUAL FOR QUALITY CONTROL FOR PLANTS AND PRODUCTION OF PRECAST CONCRETE PRODUCTS".

4. PRESTRESSING TENDON SHALL BE HIGH TENSILE STRENGTH SEVEN-WIRE STRESS RELIEVED STRAND.

5. NON-PRESTRESSED REINFORCING SHALL HAVE 60,000 PSI YIELD STRENGTH.

6. FABRICATOR SHALL BE RESPONSIBLE FOR DESIGN OF ALL PRECAST ELEMENTS AND THEIR CONNECTIONS.

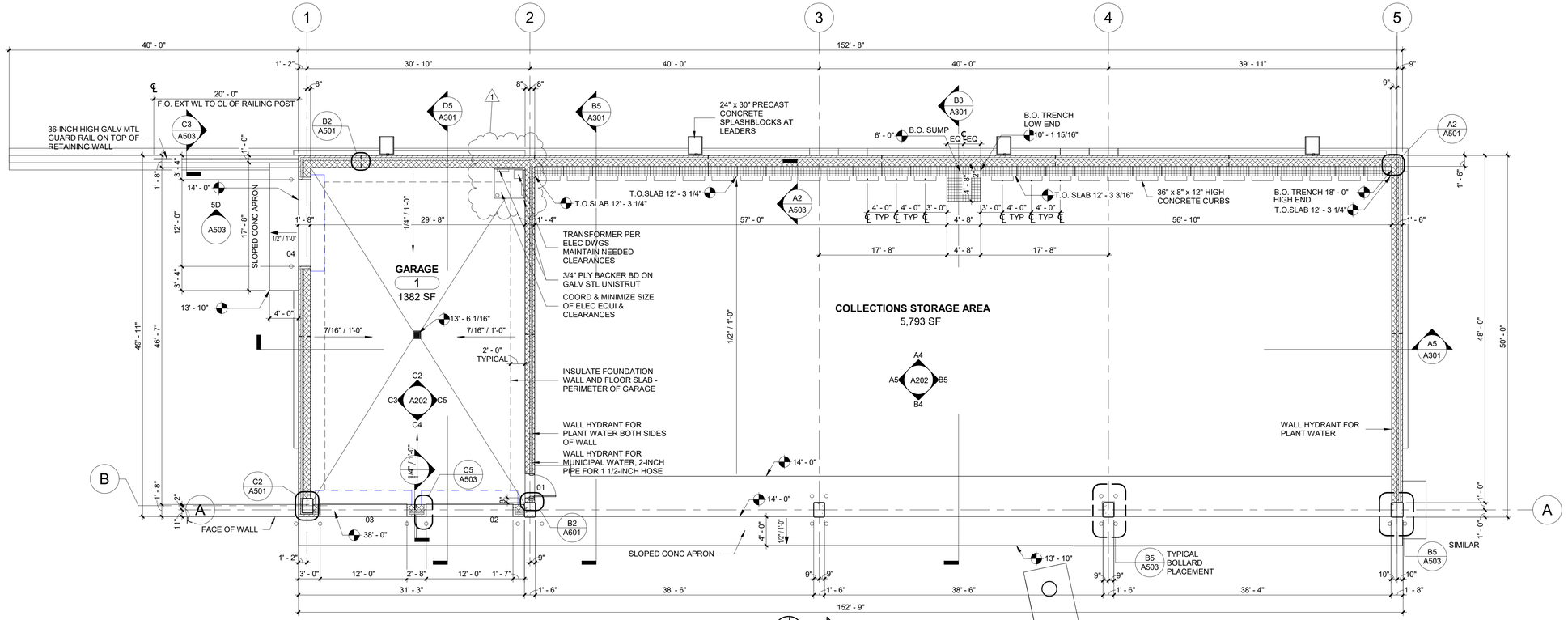
7. ALL PRECAST ELEMENTS SHALL BE DESIGNED TO MINIMIZE CRACKING UNDER SERVICE LO



C5 FLOOR PLAN AT ELEVATION +18'-0"

1/8" = 1'-0"

TRUE NORTH PROJECT NORTH



A5 FLOOR PLAN AT ELEVATION +6'-0"

1/8" = 1'-0"

TRUE NORTH PROJECT NORTH

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FOR CONSTRUCTION

5/23/2022

ESWPAF COLLECTIONS MAINTENANCE FACILITY

GNHWPCA PROJECT NO: SSF 2018-01

EAST SHORE WATER POLLUTION ABATEMENT FACILITY
345 EAST SHORE PARKWAY, NEW HAVEN, CONNECTICUT 06512

MARK	DATE	DESCRIPTION
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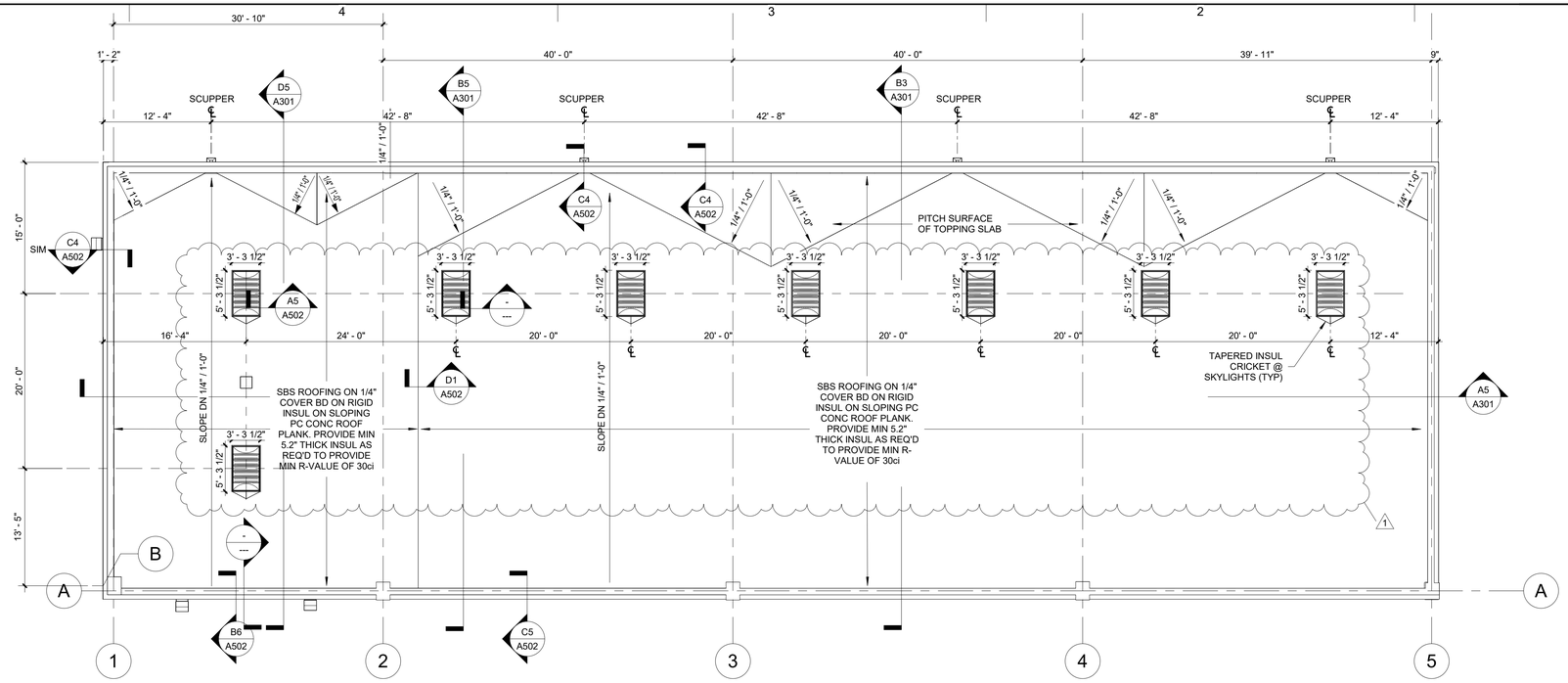
FLOOR PLANS

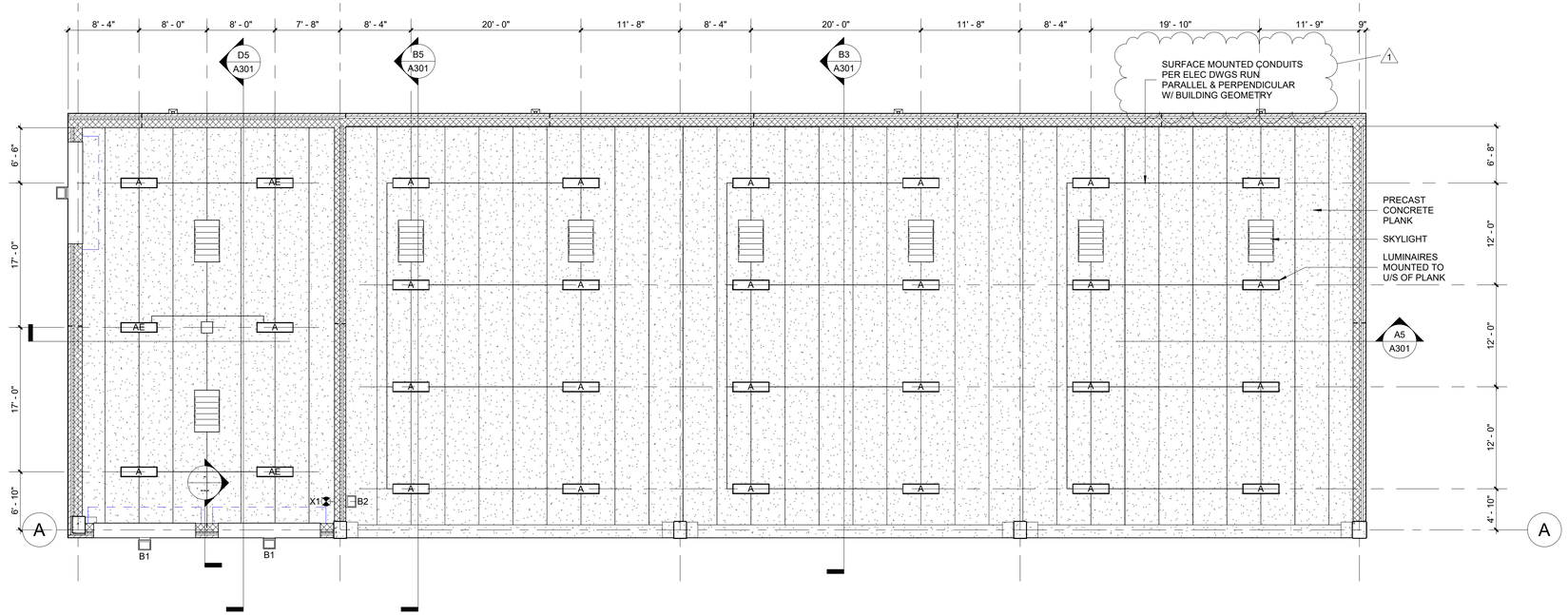
A111



C5 ROOF PLAN

1/8" = 1'-0"

TRUE NORTH PROJECT NORTH



A5 REFLECTED CEILING PLAN

1/8" = 1'-0"

TRUE NORTH PROJECT NORTH

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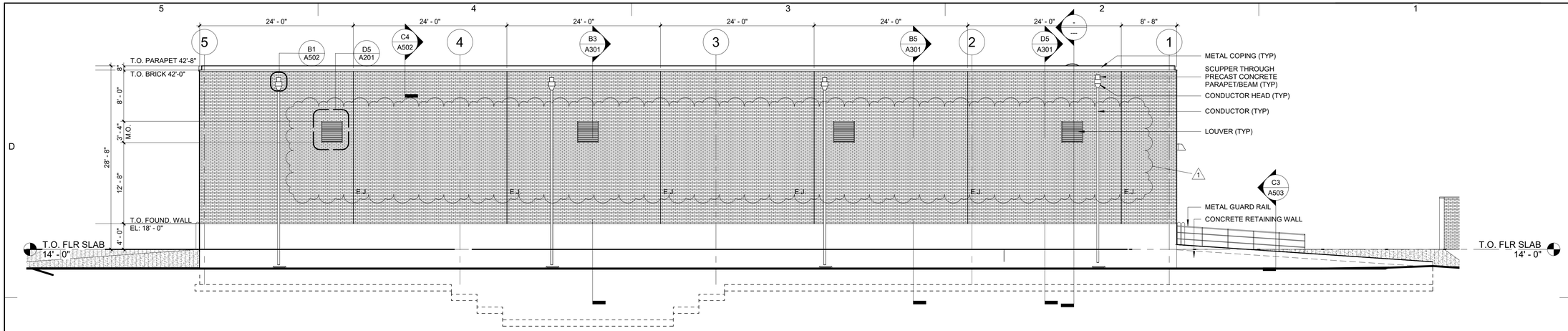
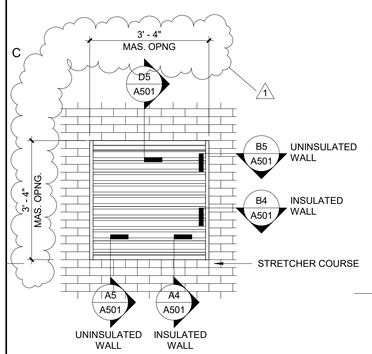
REFLECTED CEILING AND ROOF PLANS

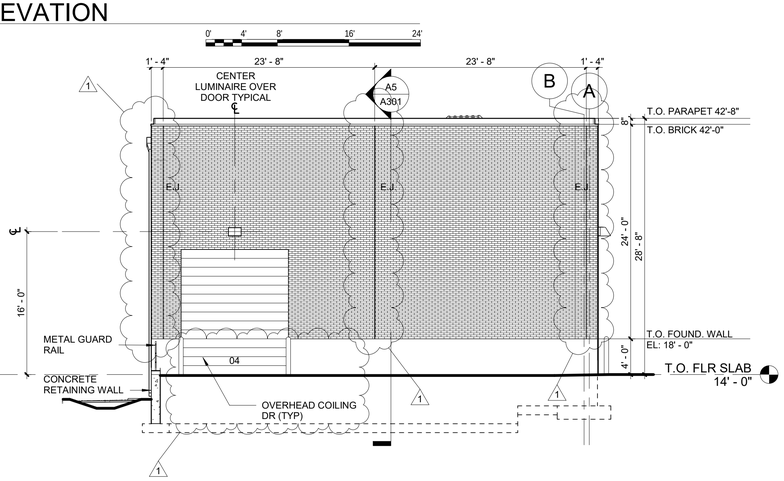
A112



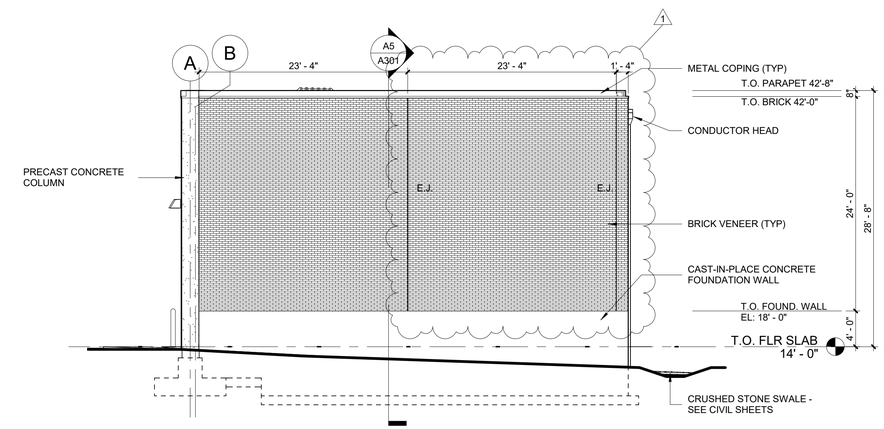
D4 WEST ELEVATION
1/8" = 1'-0"



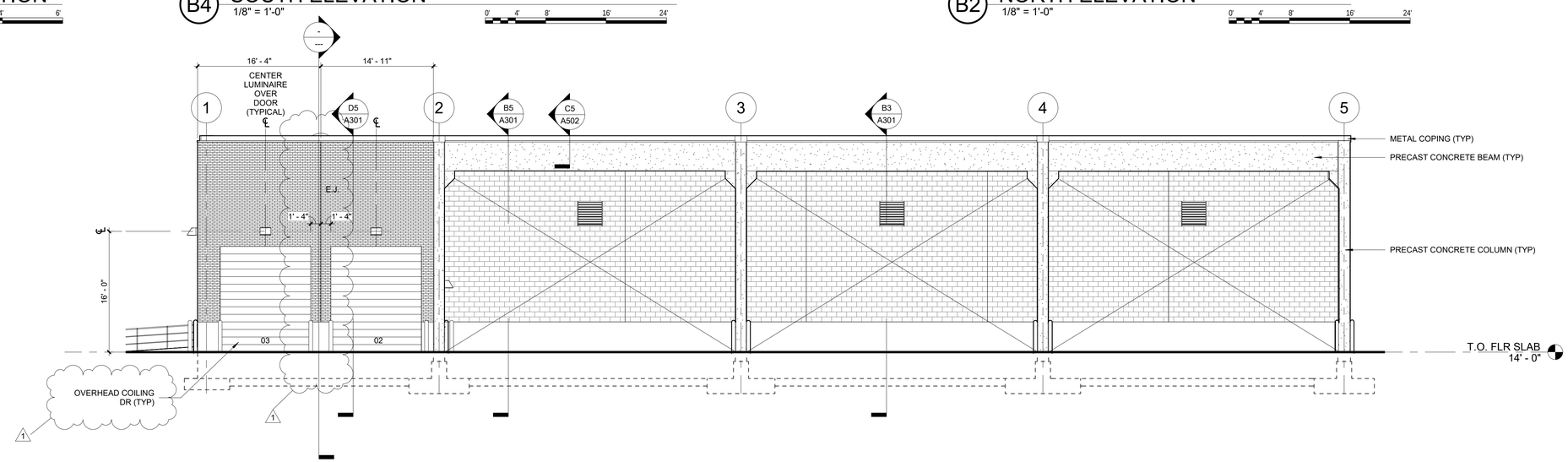
D5 LOUVER ELEVATION
1/2" = 1'-0"



B4 SOUTH ELEVATION
1/8" = 1'-0"



B2 NORTH ELEVATION
1/8" = 1'-0"



A4 EAST ELEVATION
1/8" = 1'-0"

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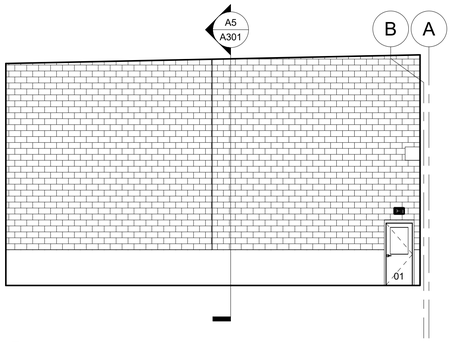
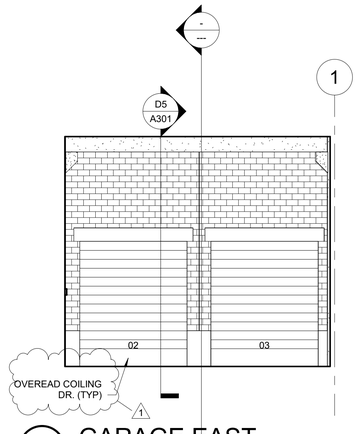
EXTERIOR ELEVATIONS

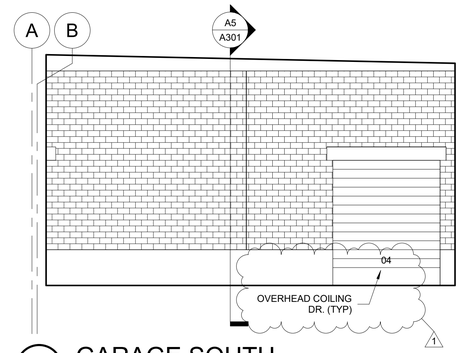
A201



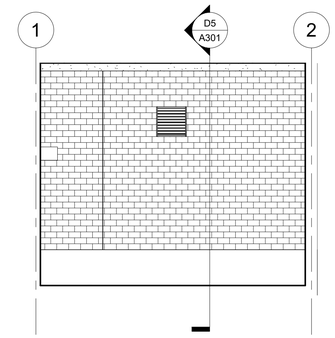
C5 GARAGE NORTH
1/8" = 1'-0"



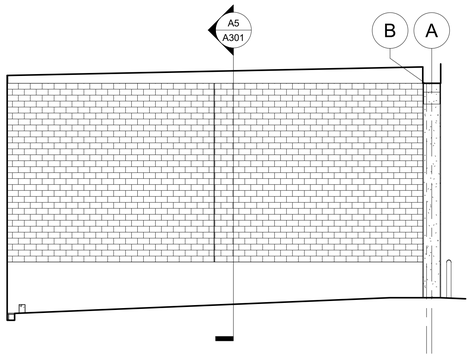
C4 GARAGE EAST
1/8" = 1'-0"



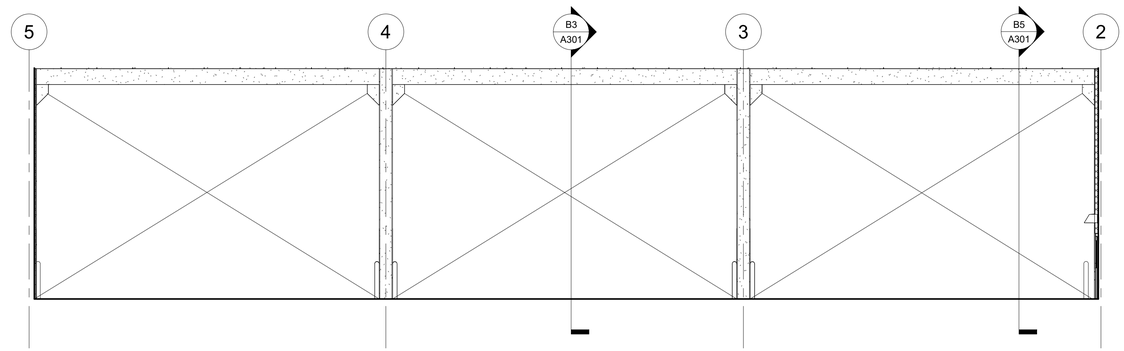
C3 GARAGE SOUTH
1/8" = 1'-0"



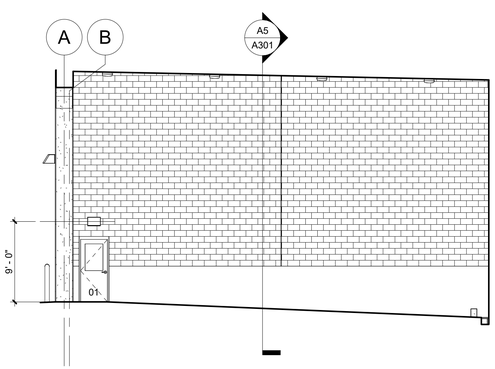
C2 GARAGE WEST
1/8" = 1'-0"



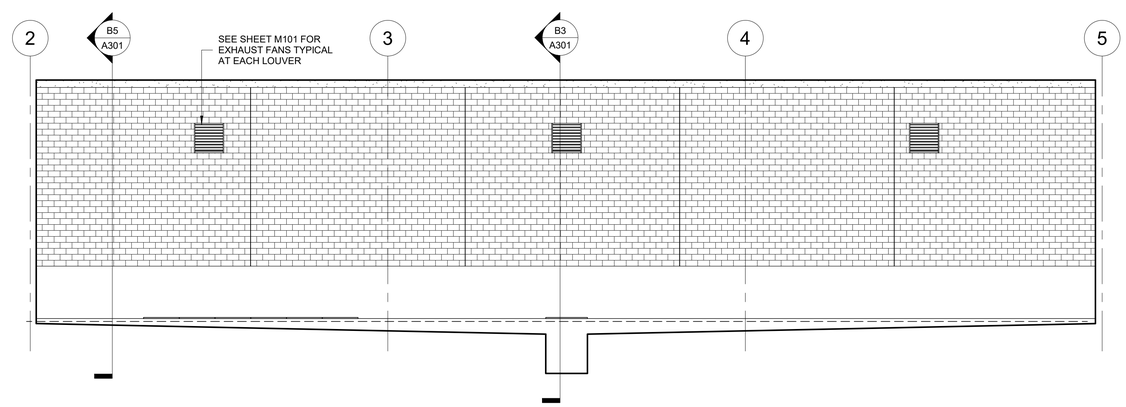
B5 INTERIOR NORTH
1/8" = 1'-0"



B4 INTERIOR EAST
1/8" = 1'-0"



A5 INTERIOR SOUTH
1/8" = 1'-0"



A4 INTERIOR WEST
1/8" = 1'-0"

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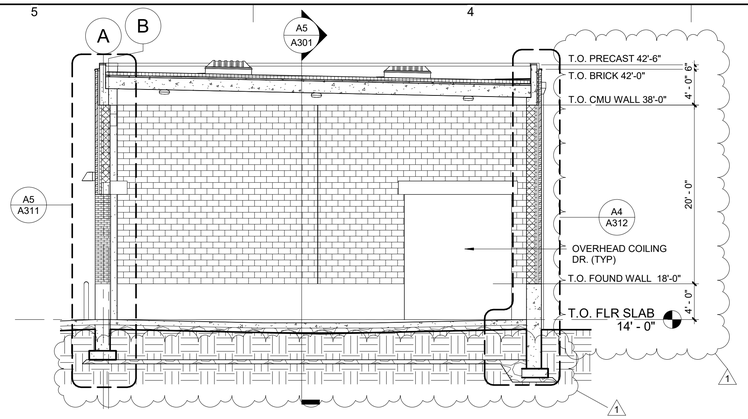
INTERIOR ELEVATIONS

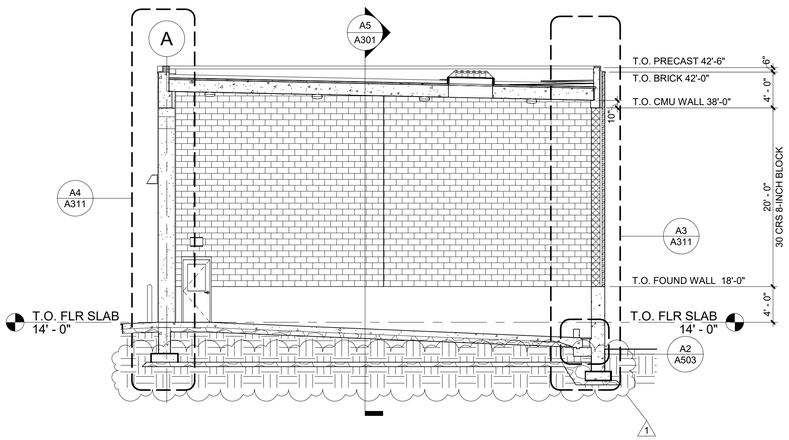
A202



D5 CROSS SECTION THROUGH GARAGE

1/8" = 1'-0"

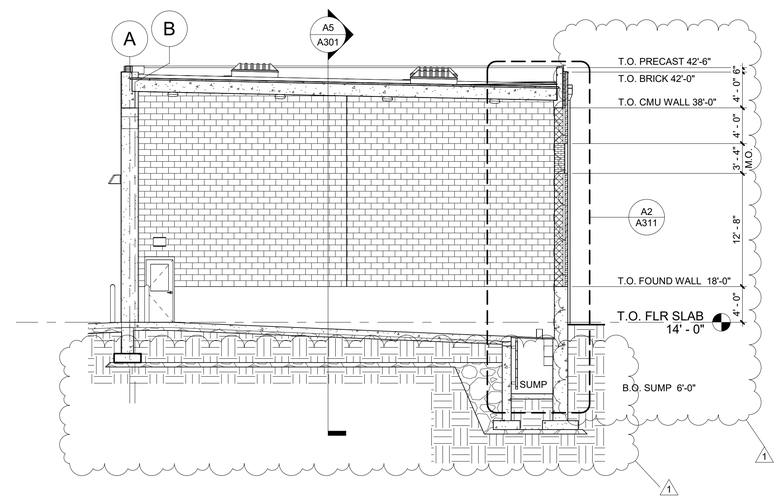
0' 4' 8' 16' 24'



B5 CROSS SECTION

1/8" = 1'-0"

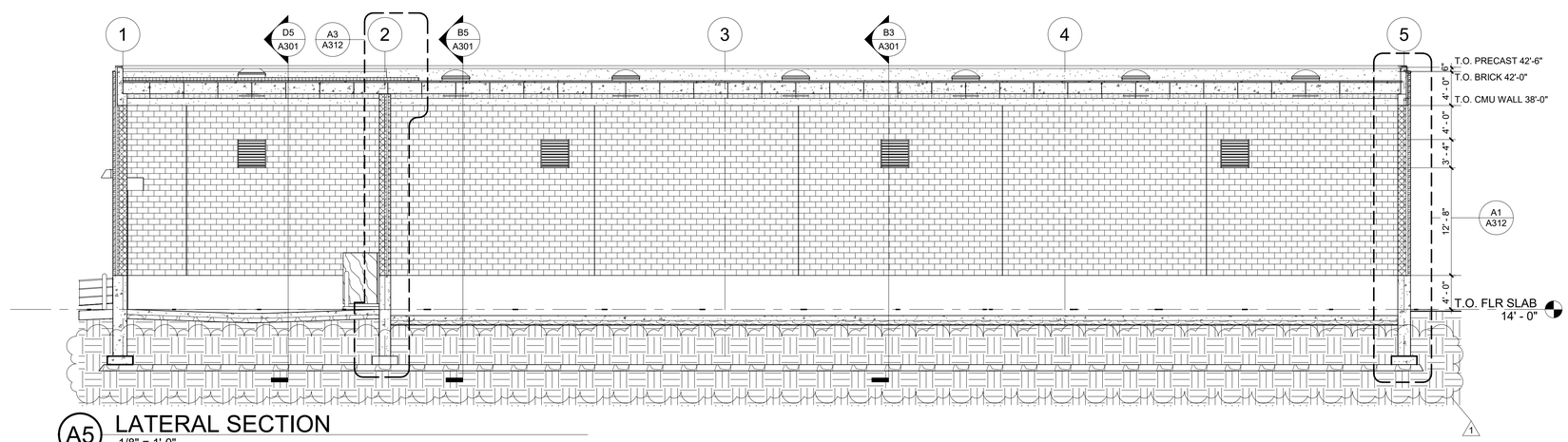
0' 4' 8' 16' 24'



B3 CROSS SECTION THROUGH SUMP

1/8" = 1'-0"

0' 4' 8' 16' 24'



A5 LATERAL SECTION

1/8" = 1'-0"

0' 4' 8' 16' 24'

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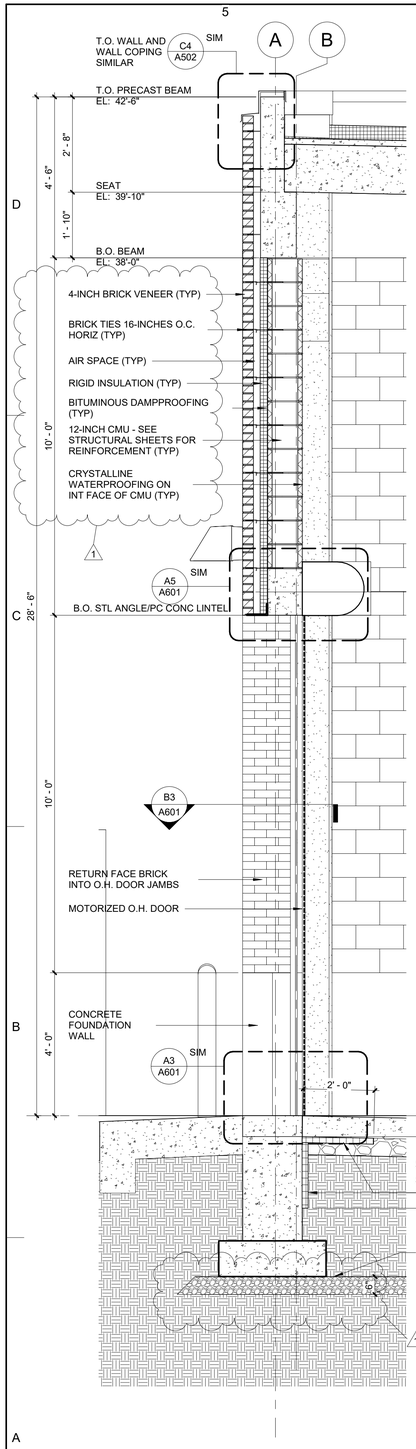
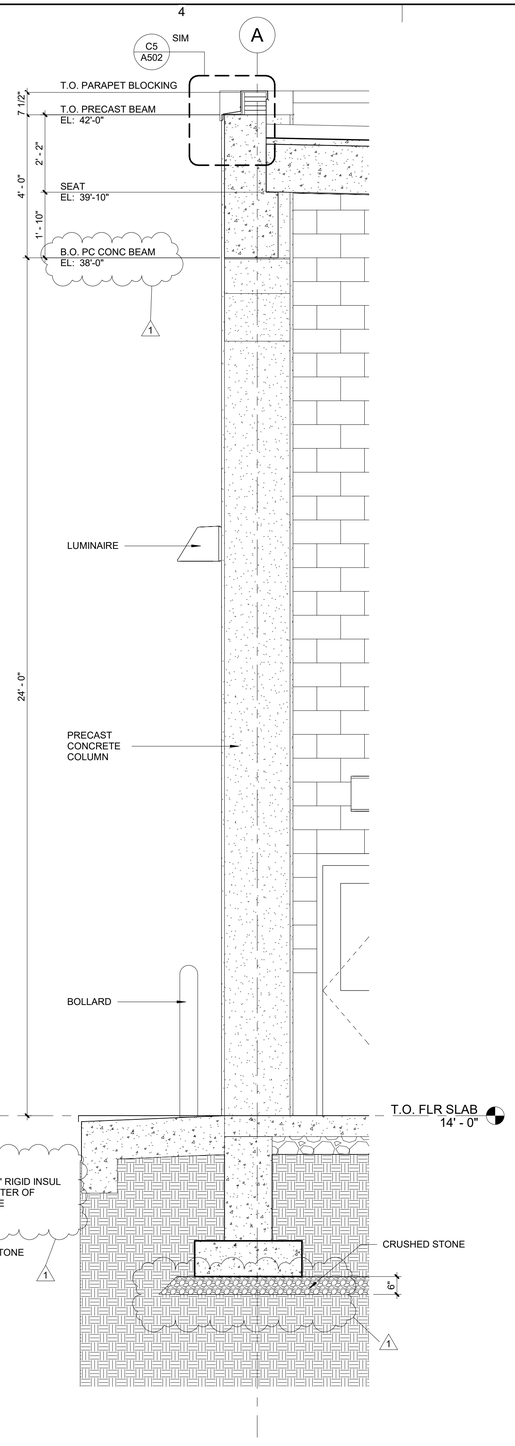
BUILDING SECTIONS

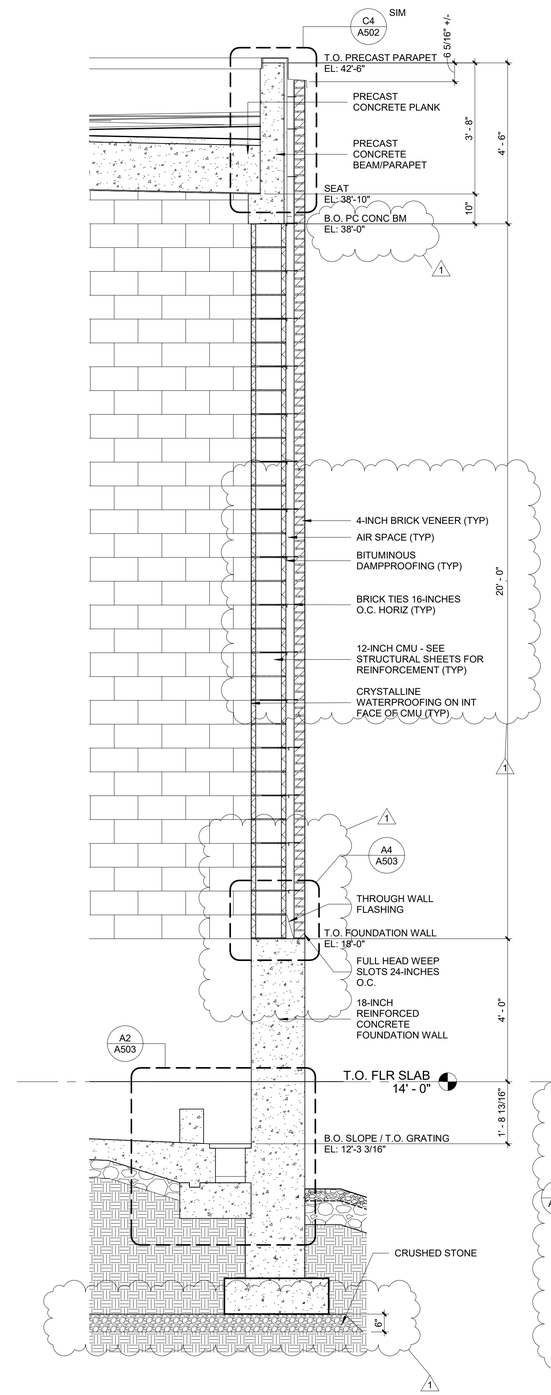
A301



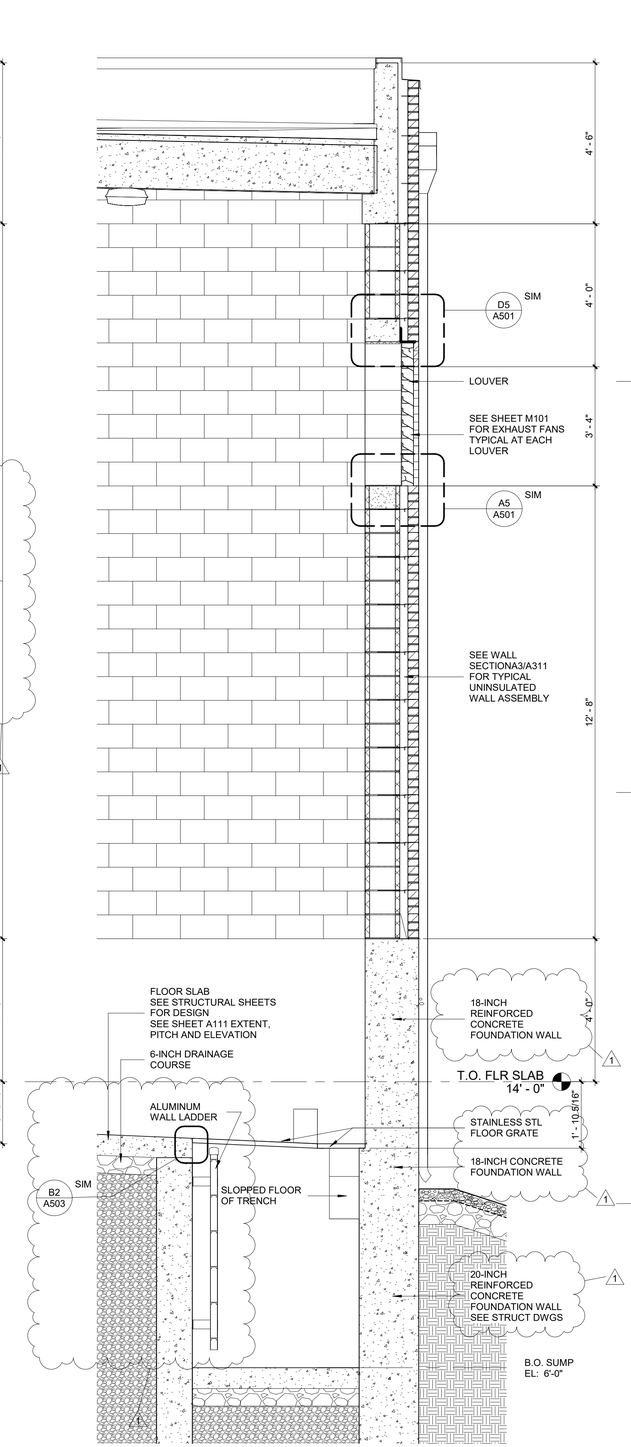
A5 EAST WALL SECTION thru O.H. DOOR
1/2" = 1'-0"



A4 EAST WALL SECTION 02
1/2" = 1'-0"



A3 WEST WALL SECTION Thru TRENCH
1/2" = 1'-0"



A2 WEST WALL SECTION Thru SUMP
1/2" = 1'-0"

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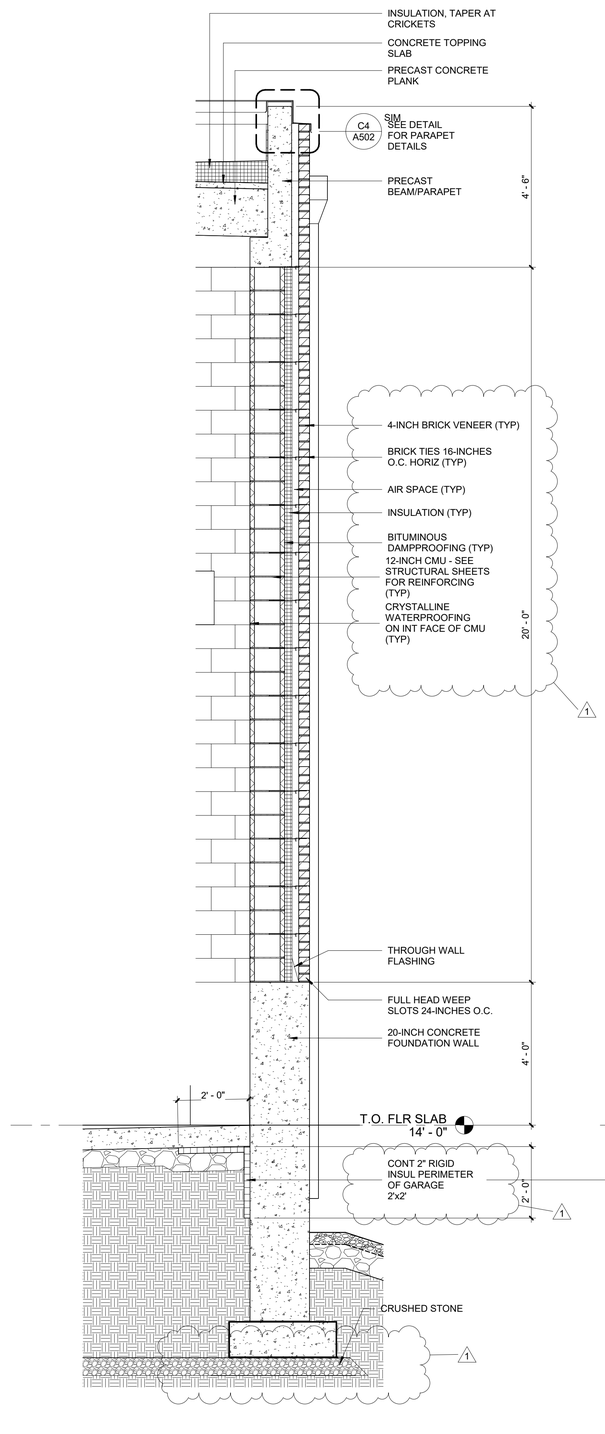
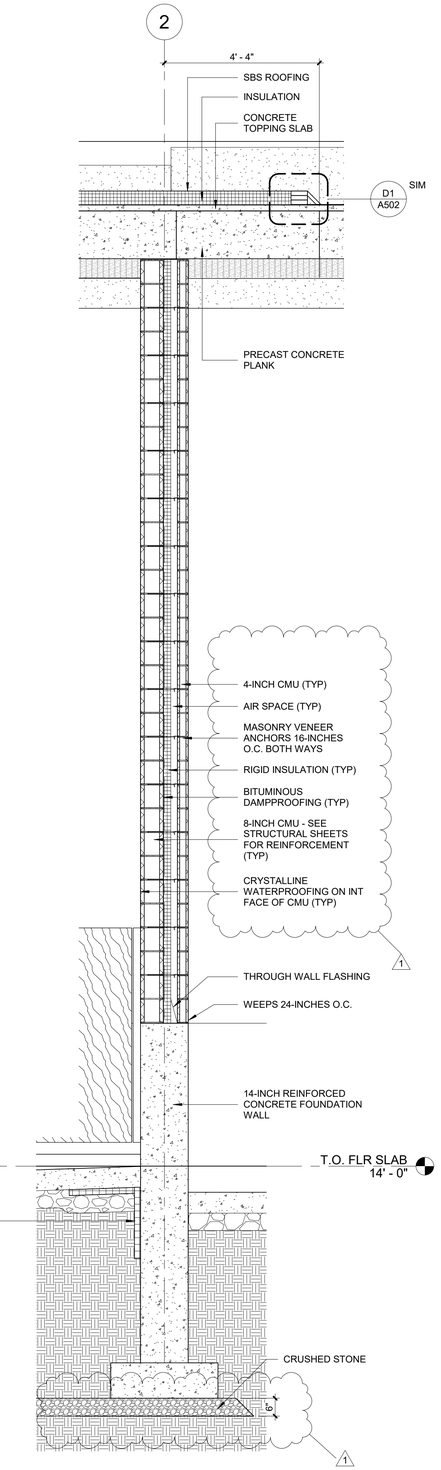
WALL SECTIONS

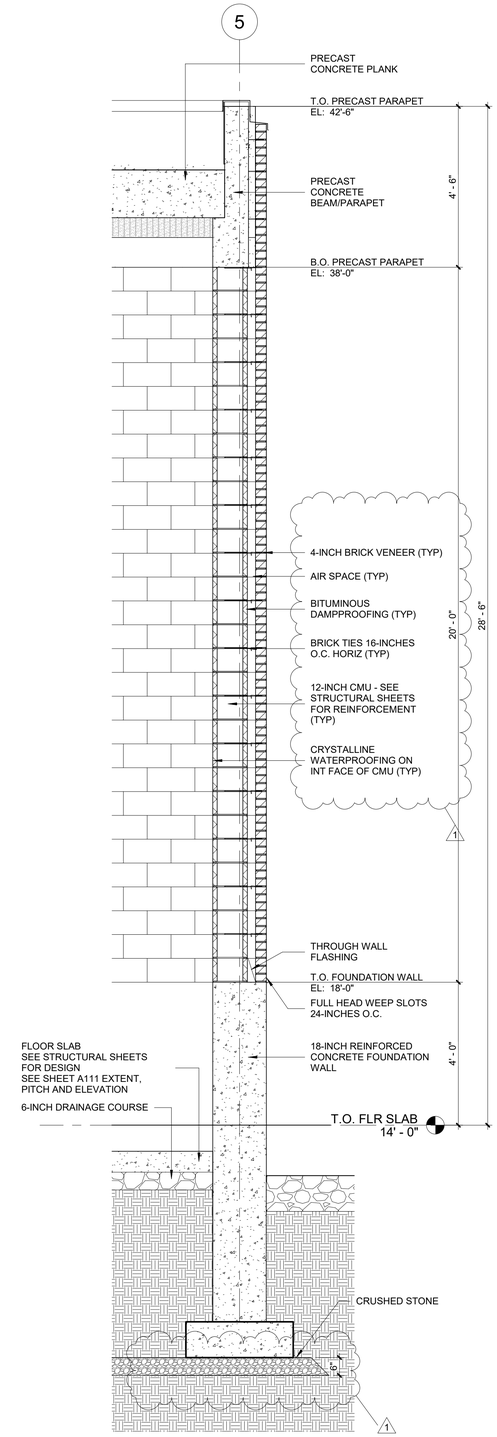
A311



A4 WEST WALL Thru GARAGE
1/2" = 1'-0"



A3 LATERAL WALL SECTION 01
1/2" = 1'-0"



A1 LATERAL WALL SECTION 02
1/2" = 1'-0"

OWNER

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FOR CONSTRUCTION

5/23/2022

ESWPAF COLLECTIONS MAINTENANCE FACILITY

GNHWPCA PROJECT NO: SSF 2018-01

EAST SHORE WATER POLLUTION ABATEMENT FACILITY
345 EAST SHORE PARKWAY, NEW HAVEN, CONNECTICUT 06512

MARK	DATE	DESCRIPTION
1	11/02/22	ADDENDUM 2

PROJECT NO:	SSF 2018-01
CWA PROJECT NO.:	1801
DRAWN BY:	Author
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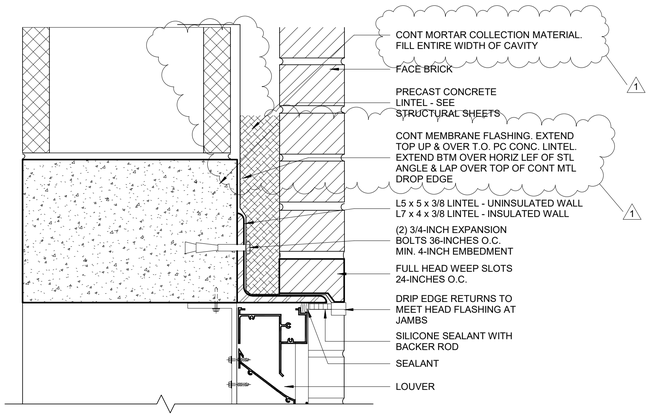
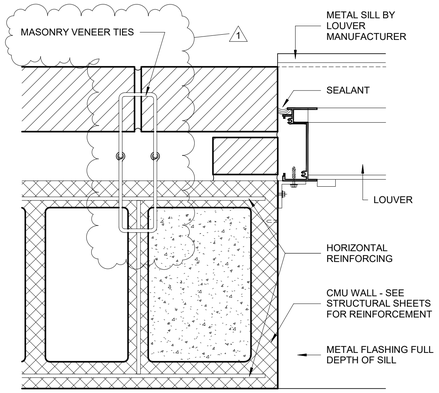
WALL SECTIONS

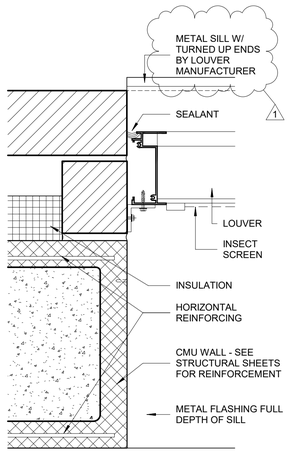
A312



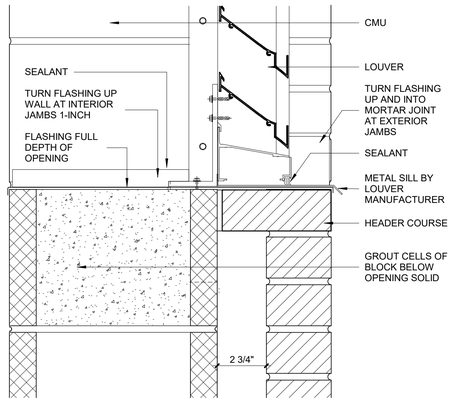
D5 LOUVER HEAD
3" = 1'-0"



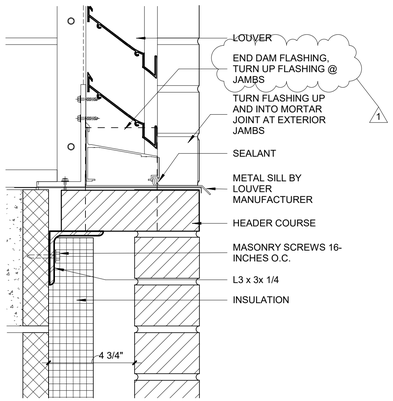
B5 LOUVER JAMB UNINSULATED WALL
3" = 1'-0"



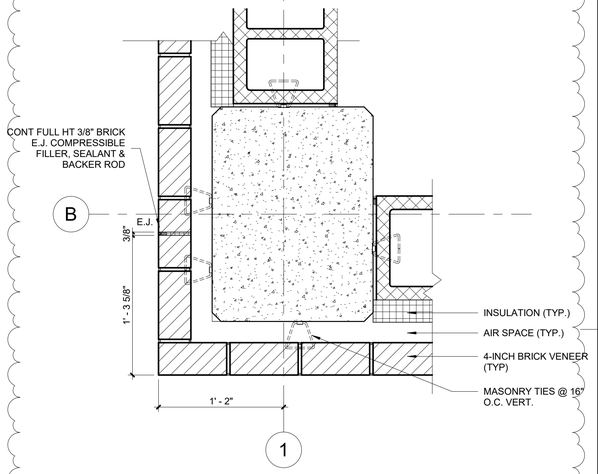
B4 LOUVER JAMB INSULATED WALL
3" = 1'-0"



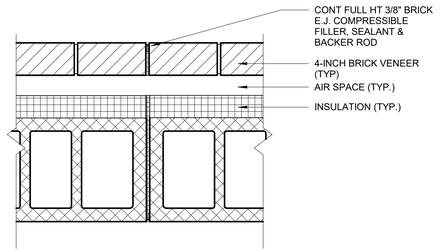
A5 LOUVER SILL SECTION UNINSULATED WALL
3" = 1'-0"



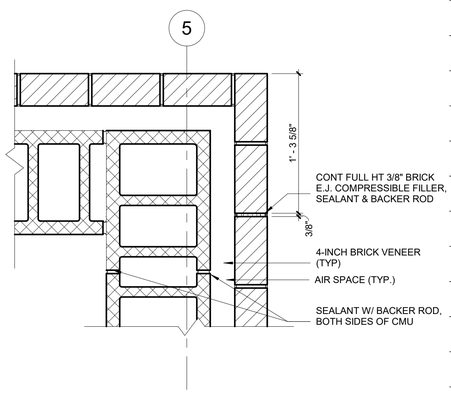
A4 LOUVER SILL PARTIAL SECTION -INSULATED WALL
3" = 1'-0"



C2 COL & JOINT SOUTHEAST CORNER
1 1/2" = 1'-0"



B2 EXP JT @ INSULATED WALL
1 1/2" = 1'-0"



A2 EXP JT @ NORTH WEST CORNER
1 1/2" = 1'-0"

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CWA PROJECT NO.: 1801
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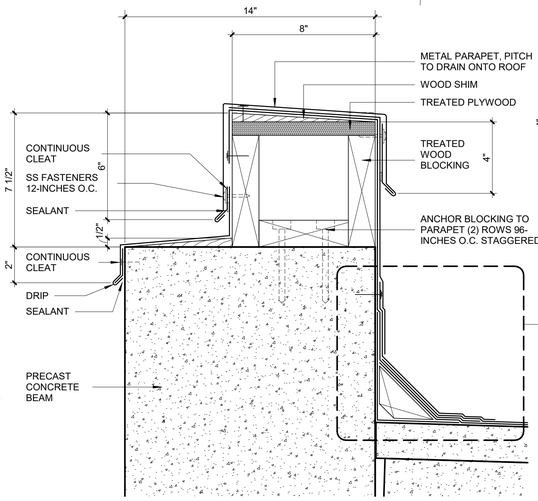
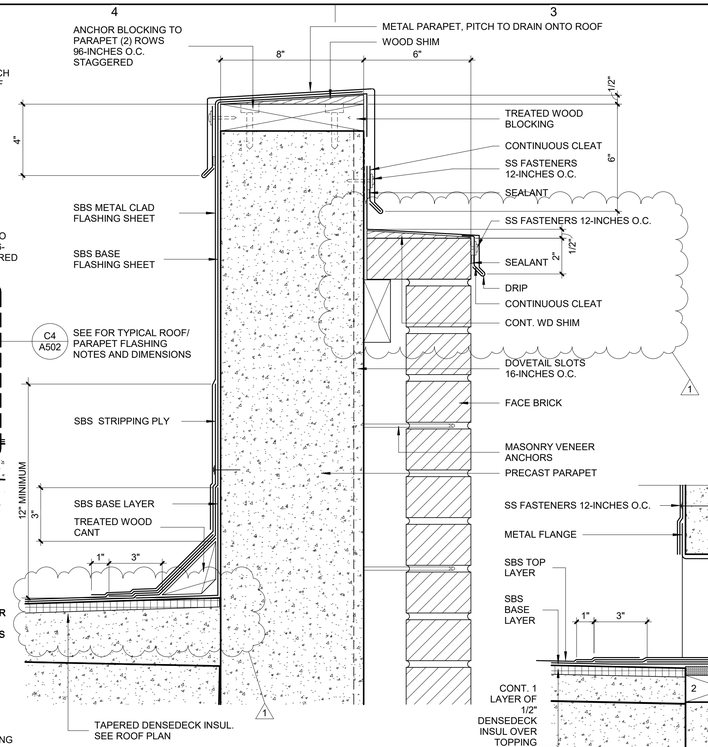
OPENING DETAILS

A501



C5 EAST PARAPET SECTION - NORTH
3" = 1'-0"



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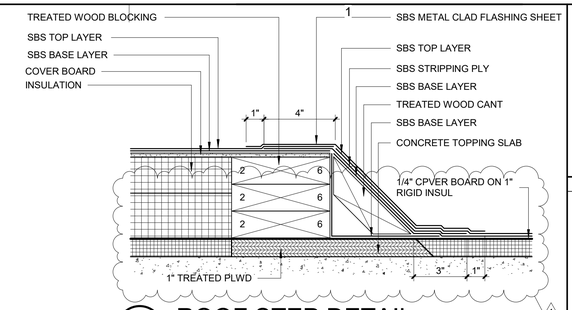
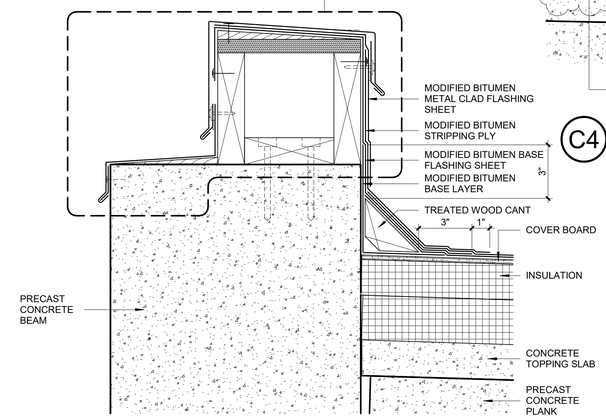
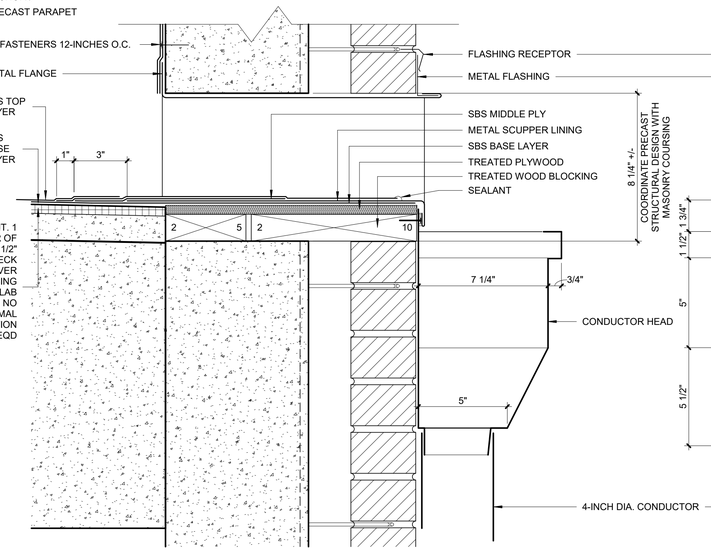


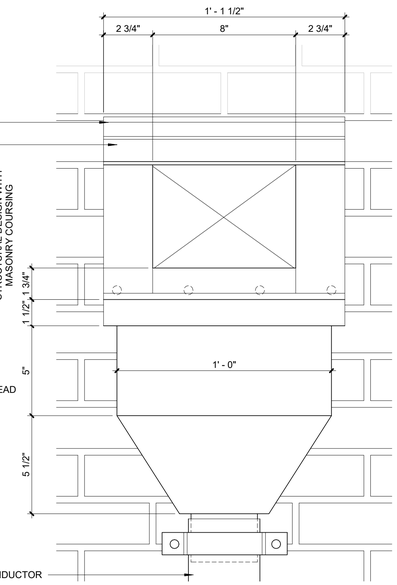
D1 ROOF STEP DETAIL
3" = 1'-0"



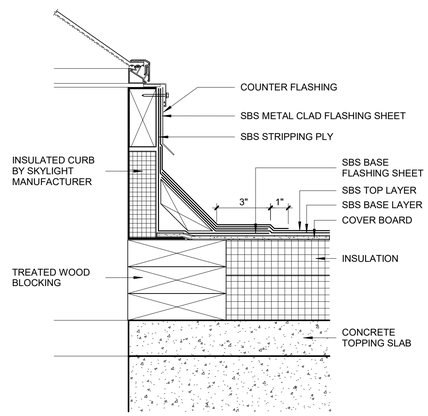
B6 EAST PARAPET SECTION - SOUTH
3" = 1'-0"



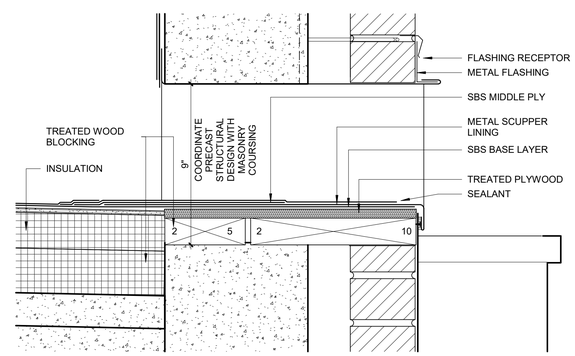
B3 SCUPPER SECTION - UNINSULATED ROOF
3" = 1'-0"



B1 SCUPPER ELEVATION
3" = 1'-0"



A5 SKYLIGHT CURB SECTION
3" = 1'-0"



A3 SCUPPER SECTION - INSULATED ROOF
3" = 1'-0"

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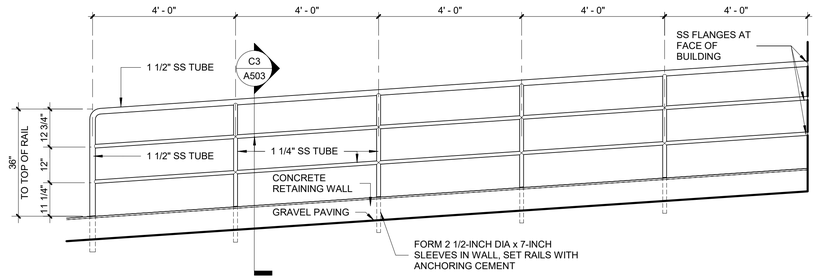
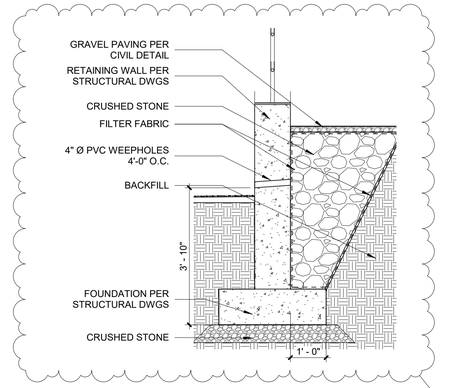
ROOF DETAILS

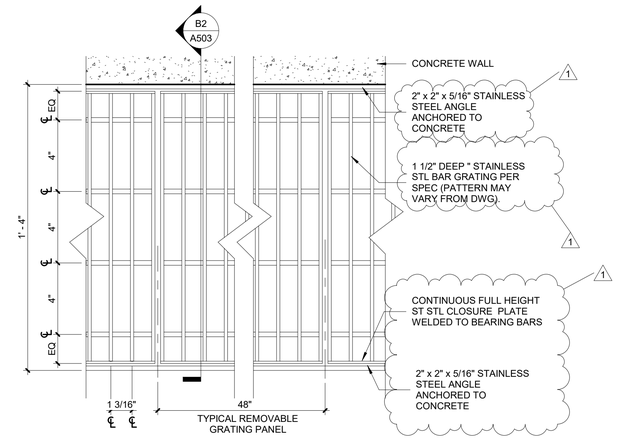
A502



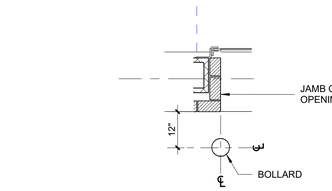
5D EXTERIOR GUARDRAIL ELEVATION Looking WEST
1/2" = 1'-0"



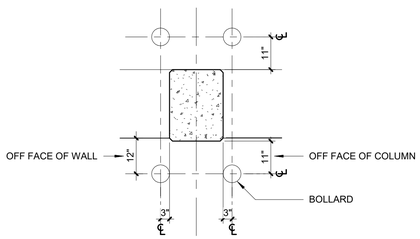
C3 RETAINING WALL
1/2" = 1'-0"



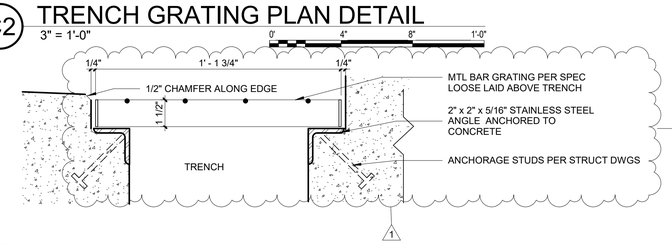
C2 TRENCH GRATING PLAN DETAIL
3" = 1'-0"



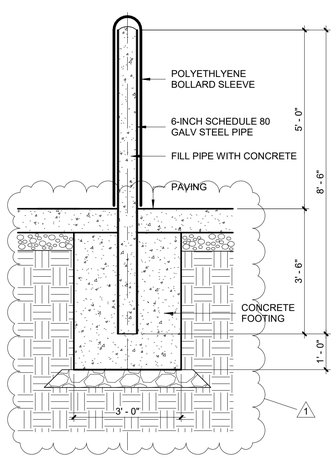
C5 TYPICAL BOLLARD LOCATION AT O.H. DOOR
1/2" = 1'-0"



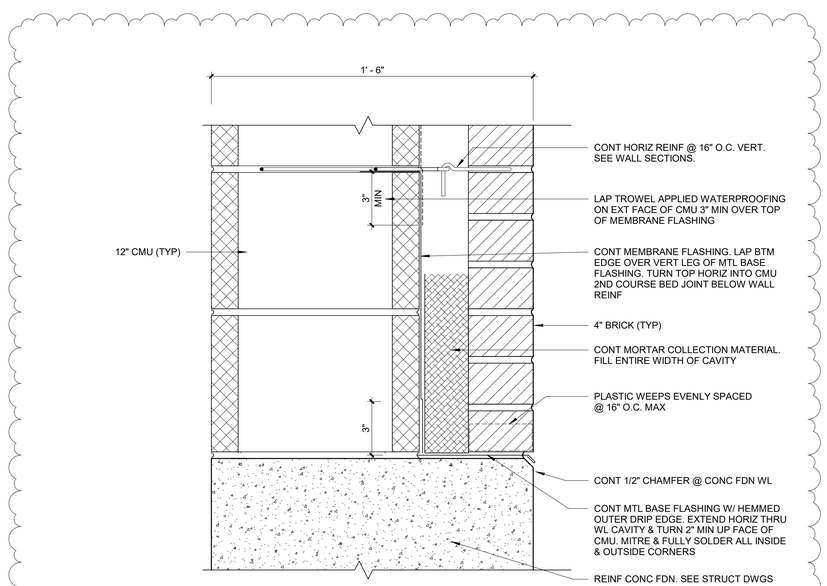
B5 TYPICAL BOLLARD LOCATION
1/2" = 1'-0"



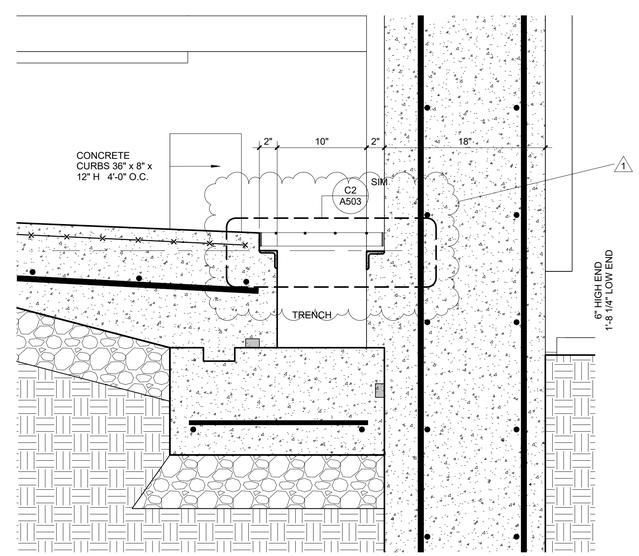
B2 TRENCH GRATING SECTION
3" = 1'-0"



A5 BOLLARD SECTION
1/2" = 1'-0"



A4 TYPICAL BOTTOM OF MASONRY CAVITY WALL
3" = 1'-0"



A2 TRENCH SECTION
1 1/2" = 1'-0"

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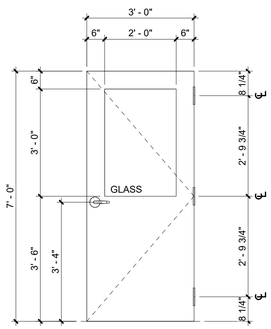
DETAILS

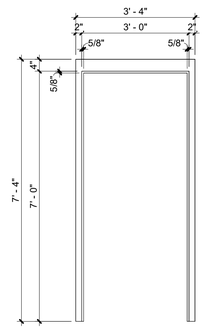
A503

DOOR SCHEDULE

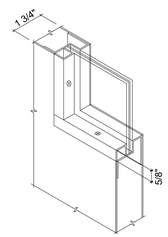
DOOR NUMBER	ROOM	DBL. LEAF DOOR	SLIDING DOOR	OVERHEAD DOOR	DOOR SIZE (in inches) WIDTH	HEIGHT	THICK.	DOOR TYPE	SPEC. SECTION	MATERIAL	FINISH	GLAZING	FRAME TYPE	SPEC. SECTION	MATERIAL	FINISH	DETAIL/SHEET NUMBER HEAD DETAIL	JAMB DETAIL	MULLION DETAIL	THRESHOLD DETAIL	FIRE RATING (Hours)	NOTES
01	GARAGE				36"	84"	1 3/4"	A	08 1113	GALV. STEEL	P-1	GLASS, CLEAR LAMINATED	1	08 1113	GALV. STEEL	P-1	D1/A501	C1/A501	-	B1-A501	0	
02	GARAGE			X	168"	168"	1"	B	08 3323	GALV. STEEL	POWDER COAT	-	-	08 3323	GALV. STEEL	P-1	A5/A601	B3/A601	-	A3/A601	0	
03	GARAGE			X	168"	168"	1"	B	08 3323	GALV. STEEL	POWDER COAT	-	-	08 3323	GALV. STEEL	P-1	A5/A601	B3/A601	-	A3/A601	0	
04	GARAGE			X	168"	168"	1"	B	08 3323	GALV. STEEL	POWDER COAT	-	-	08 3323	GALV. STEEL	P-1	A5/A601	B3/A601	-	A3/A601	0	



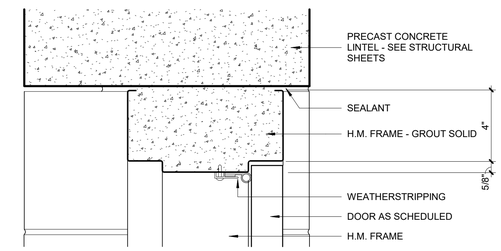
DOOR TYPE A



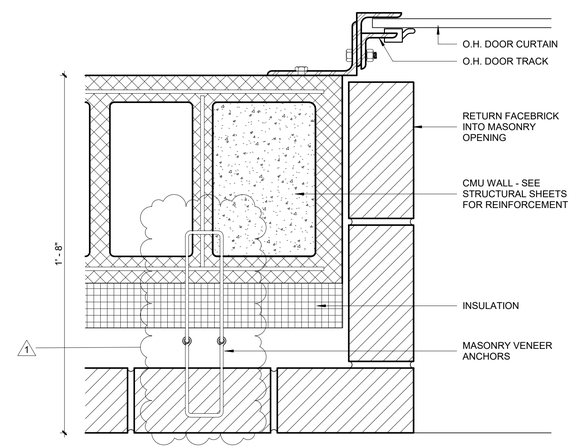
FRA ME TYPE 1



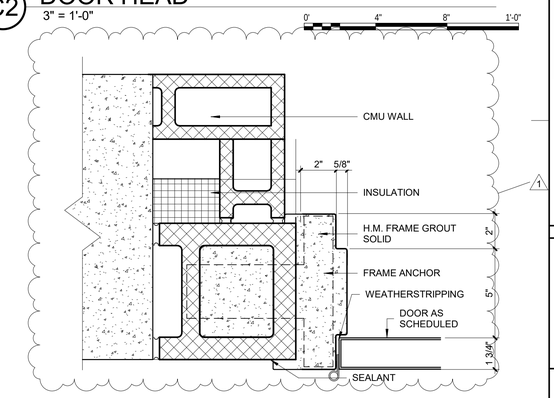
1 08 DOOR GLAZING DETAIL
3" = 1'-0"



C2 DOOR HEAD
3" = 1'-0"



B3 O.H. DOOR JAMB
3" = 1'-0"



B2 DOOR JAMB
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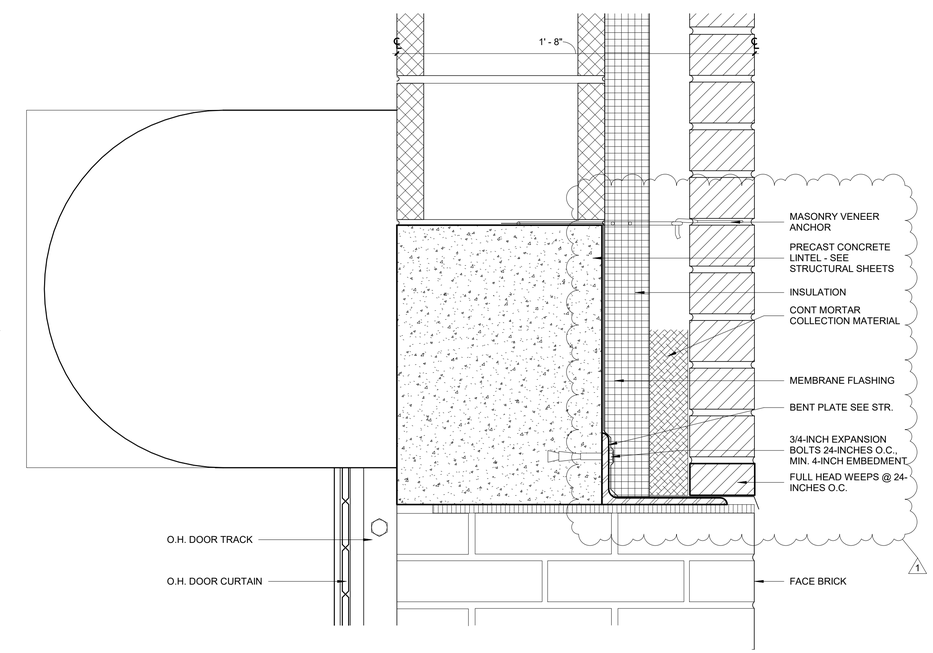
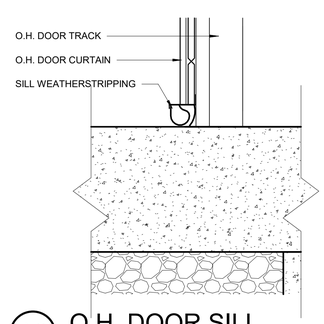
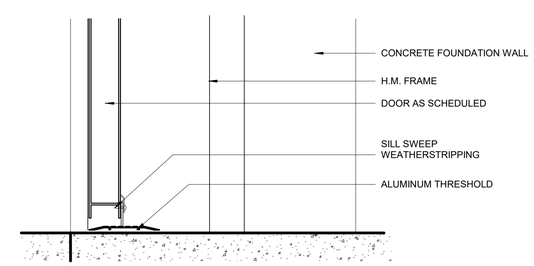


A5 O.H. DOOR HEAD
3" = 1'-0"



A3 O.H. DOOR SILL
3" = 1'-0"



A2 DOOR SILL
3" = 1'-0"

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ENGINEERING DESIGN GROUP, INC.
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ROGER K. DUSENBERY JOSEPH G. ZELSKI

FOR CONSTRUCTION

5/23/2022

ESWPAF COLLECTIONS MAINTENANCE FACILITY
GNHWPCA PROJECT NO: SSF 2018-01

EAST SHORE WATER POLLUTION ABATEMENT FACILITY
345 EAST SHORE PARKWAY, NEW HAVEN, CONNECTICUT 06512

MARK	DATE	DESCRIPTION
1	11/02/22	ADDENDUM 2

PROJECT NO: SSF 2018-01
CWA PROJECT NO.: 1801
DRAWN BY: Author
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SHEET TITLE
SCHEDULES

A601

PLUMBING SPECIFICATIONS

1.01 SCOPE OF WORK

A. The work to be done under this Division of the specifications shall include the furnishing of all equipment, supplies, supervision, and all materials not specifically mentioned ready for use, all plumbing systems, equipment and associated items.

1. Plumbers work to start 6" above floor. See floor plan for distribution.
2. All hose bibbs as indicated.
3. All waste piping to points indicated.
4. Insulation of all new cold water piping.
5. Sanitary to point indicated.

1.02 SOIL, WASTE AND VENT PIPING

A. All soil and waste piping below grade shall be PVC plastic piping. Fittings on waste and soil lines shall be drainage pattern.

B. All soil and waste piping above grade shall be PVC.

C. Plastic pipe and fittings shall conform to commercial standards CS 272-65 (PVC) and ASTM D-2661. Exposed lavatory waste piping shall be C.P. brass.

D. Run all soil, waste and vent piping shown or required by code. Piping shown is a minimum and in accordance with state code.

E. Flash all vents through roof.

F. Cleanouts shall be installed at base of all stacks, at all changes of direction, and long lines at maximum 50 ft. intervals.

G. Gas piping shall be black iron with malleable fittings or trac-pipe.

1.03 INTERIOR WATER PIPING

A. All domestic water piping above ground shall be Type "L" copper tubing with sweat type fittings, and all joints shall be made 95-5 solder or

1 B. Plant water piping shall be equal to Charlotte Pipe Reuze made with flowguard gold.

1.04 INTERIOR WATER VALVES

A. Install all globe, cocks, check, etc., valves as shown, all others to be ball type. All valves shall be high quality, equal to Jamesbury "Clincher" or Apollo.

1.05 INSULATION

A. Insulate all new hot, cold and recirculating water piping with 1" thick heavy density fiberglass 25 ASJ with vapor barrier and lap adhesive jacket. Insulation on fittings shall be covered with fiberglass reinforcing cloth and fitting mastic.

1.06 EXAMINATION OF SITE

A. The Contractor shall be assumed to have visited the premises and noted all pertinent facts and details including the conditions under which the work must be carried out. No allowance will be made for failure to have done so.

B. Each bidder shall thoroughly familiarize himself with the requirements and intent of all drawings of all Divisions of the specifications so as to include all of the heating, ventilating and plumbing work intended.

1.07 INSURANCE

A. This Contractor shall be fully insured, including Workmen's Compensation, Public Liability for injury and property damage. Proof of such insurance shall be submitted to the Owner before signing the contract to proceed with the work.

1.08 CODES

A. All work shall comply with the requirements of the National Board of Fire Underwriters, the National Plumbing Code, the Building Department, Fire Department, local utilities and all local and state codes which apply, and the Fire Insurance Rating Organization.

1.09 PERMITS

A. This Contractor shall obtain all permits required for this work.

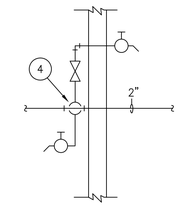
1.10 GUARANTEE

A. All equipment, materials and workmanship shall be guaranteed for a period of one year from date of acceptance, by Owners, of the entire installation.

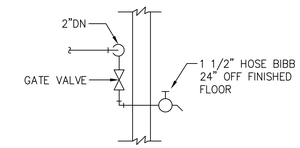
LEGEND

1. FLOOR DRAIN PER CIVIL DRAWINGS
2. CITY WATER AND PLANT WATER TO BUILDING BY OTHERS. PLUMBERS WORK TO START 6" ABOVE FLOOR
3. RUN BELOW FLOOR
4. 2" DOWN TO 1 1/2" HOSE BIBB, MOUNT 24" OFF FINISHED FLOOR. SEE 1 1/2" HOSE BIBB DETAIL "B"
5. 2" MUNICIPAL WATER DOWN ON WALL. TERMINATE 24" OFF FINISHED FLOOR. SEE 1 1/2" HOSE BIBB DETAIL "A"
6. RUN EXPOSED HIGH AS POSSIBLE
7. CONNECT TO OIL SEPARATOR BY OTHERS
8. CONNECT TO B.O. SUMP
9. PROVIDE INSULATION OVER HEAT TAPE
10. HOSE BIBBS: DIXON AV151. CONFIRM THREAD FOR HOSE CONNECTION WITH OWNER
11. PROVIDE SHUTOFF VALVE @ BLDG ENTRANCE, 2'-0" AFF
12. FLOOR DRAIN SHALL BE EQUAL TO J.R. SMITH MODEL #470 SIZE 4

1



1 1/2" HOSE BIBB DETAIL "B"
NTS



1 1/2" HOSE BIBB DETAIL "A"
NTS

MINIMUM CONNECTION SCHEDULE

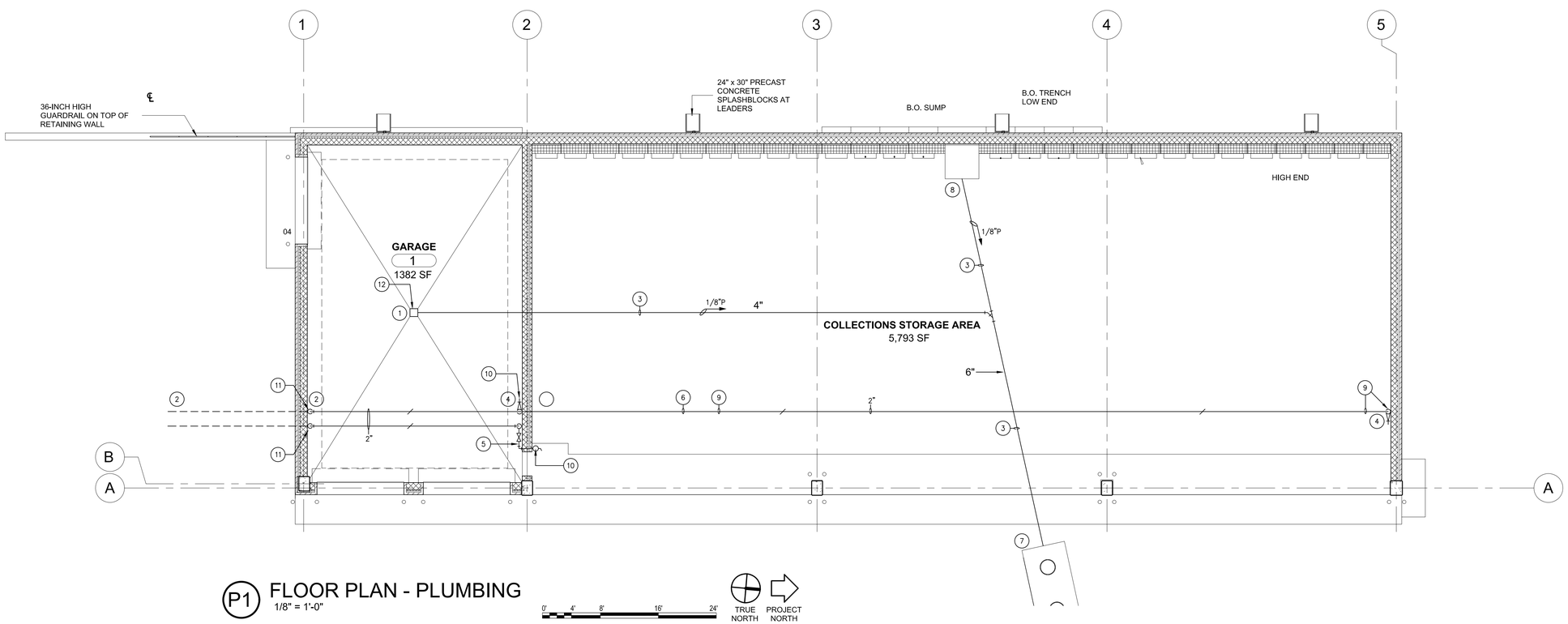
FIXTURE	HOT	COLD	WASTE	VENT
WATER CLOSET	–	1/2"	4"	2"
LAVATORY	1/2"	1/2"	1 1/2"	1 1/2"
JANITORS SINK	1/2"	1/2"	1 1/2"	1 1/2"
KITCHEN SINK	1/2"	1/2"	1 1/2"	1 1/2"
LAUNDRY MATE	1/2"	1/2"	2"	1 1/2"
CLOTHES WASHER	1/2"	1/2"	2"	1 1/2"
URINAL	–	3/4"	2"	1 1/2"
SHOWER VALVE	1/2"	1/2"	–	–

PLUMBING ABBREVIATIONS

C.W.	COLD WATER
H.W.	HOT WATER
W.C.	WATER CLOSET
LAV.	LAVATORY
D.W.	DISHWASHER
K.S.	KITCHEN SINK
W.H.	WALL HYDRANT
CW.	CLOTHES WASHER
S.V.	SHOWER VALVE
R.D.	ROOF DRAIN
R.L.	ROOF LEADER
C.O.	CLEAN OUT
F.D.	FLOOR DRAIN

PLUMBING SYMBOLS LIST

	COLD WATER
	HOT WATER
	PITCH DIRECTION
—S—	SOIL AND WASTE
— — —	VENT
	GATE VALVE
	CHECK VALVE
	GAS COCK
	FLOW DIRECTION
	SHOWER VALVE
—G—	GAS PIPING
	STORM PIPING
	RECIRCULATING LINE
—PD—	PUMPED DISCHARGE
	TEMPERED HOT WATER
—C—	CONDENSATE DRAIN



P1 FLOOR PLAN - PLUMBING
1/8" = 1'-0"

0' 4' 8' 16' 24'

TRUE NORTH PROJECT NORTH

OWNER

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FLOOR PLAN
PLUMBING

P101

HVAC SPECIFICATIONS

1.01 SCOPE OF WORK

A. Provide all labor, materials, and equipment required to produce a complete heating, ventilating, and air conditioning system as indicated on the drawings and herein specified, including but not limited to the following:

1. Furnish and install electric unit heater and exhaust fans.
2. All exhaust ductwork including hangers, louvers and motorized dampers.
3. Balancing and adjusting to ± 10%, by and independant agency.
4. Seismic bracing as required.
5. Carbon monoxide and nitrogin dioxide control system.
7. All temperature control wiring of units and thermostats.
8. Operation and Maintenance Manuals.

1.02 INSURANCE

A. This Contractor shall be fully insured, including Workmen's Compensation, Public Liability for injury and property damage. Proof of such insurance shall be submitted to the Owner before signing the Contract to proceed with the work.

1.03 CODES

A. All work shall comply with the requirements of the National Board of Fire Underwriters, the National Electrical Code, the Building Department, Fire Department, local utilities and all local and state codes which apply.

1.04 PERMITS

A. This Contractor shall obtain and pay for all permits required for this work.

1.05 GUARANTEE

A. All equipment, materials, and workmanship shall be guaranteed for a period of one year from date of acceptance, by the Owner of the entire installation.

1.06 EXAMINATION OF SITE

A. The Contractor shall be assumed to have visited the premises and noted all pertinent facts and details, including the conditions under which the work must be carried out, and no allowances will be made for failure to have done so.

B. Each bidder shall thoroughly familiarize himself with the requirements and intent of all drawings of all Divisions of the Specifications so as to include all of the heating, ventilating, and plumbing work intended.

1.07 AIR DISTRIBUTION

A. Furnish and install all ductwork for the heating, ventilating, and air conditioning system as shown on drawings.

B. All ductwork shall be constructed of gauges as called for in the "Duct Manual and Sheet Metal for Ventilating Air-Conditioning Systems" and as recommended by the ASHRAE.

C. Insulate all air conditioning supply, return and outside air ductwork with 2" fiberglass duct wrap where concealed.

D. Provide duct turns in ducts at all changes of direction where space does not permit long radius elbows.

E. Furnish and install hangers, brackets, and supports for all sheet metal work. No wire, chains, or perforated metal bands will be permitted in any part of the work.

F. Furnish sheet metal coordination shop drawings at 1/4" = 1'-0" scale. Include all required offsets and transitions to avoid pipes, lights, conduits, or obstructions.

G. Provide volume dampers at all take-off branches.

H. Seal all ductwork air tight.

I. All ductwork shall be 22ga galv steel with PCD 4x4mil coating, (inside & outside). All hangers shall be galv steel. Fasteners to bldg structure shall be stainless steel.

K. Wall mounted fans shall be supported angle brackets, hot dip galvanized after fabrication, bolted to wall w/ stainless steel bolts.
Angle size= 2x2x1/4", bolted connections, with stainless steel bolts.

1

EQUIPMENT SPECIFICATIONS

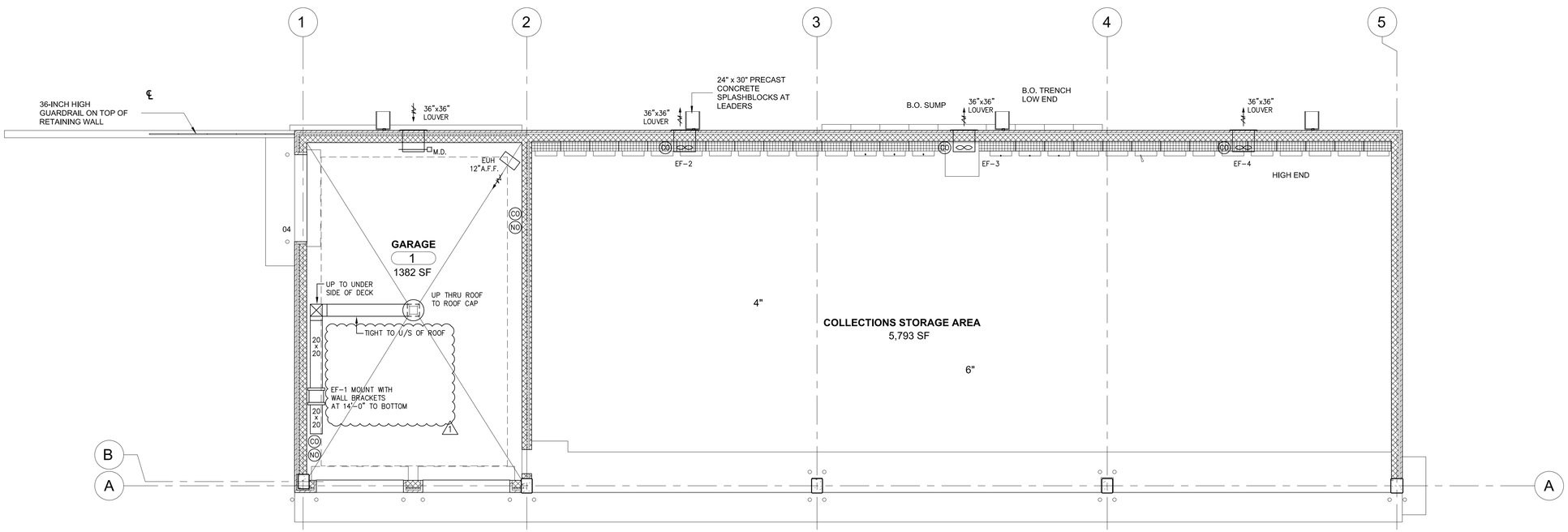
EUH — ELECTRICAL UNIT HEATER SHALL BE EQUAL TO QMARK, MODEL MUH304F, RATED 30KW, 480/3/60. MOTOR SHALL BE 1/4HP, 115/1/60. FURNISH WITH THERMOSTAT, POINT SUSPENSION KIT, THERMOSTAT GUARD WITH LOCKING COVER.

EF-1 — INLINE EXHAUST FAN SHALL BE EQUAL TO GREENHECK MODEL NO. BSQ180, RATED 3616 CFM 0.5"S.P. 1037 RPM WITH 3/4HP, 480/3/60 MOTOR. FURNISH WITH MODEL GRS24 ROOF CAP ON A 12" HIGH ROOF CURB.

EF-2,3,4 — SIDEWALL EXHAUST FAN SHALL BE EQUAL TO GREENHECKMODEL NO. SE2-18-430-B4, RATED 2084 CFM @ .20"S.P. WITH 1/4HP, 115/1/60. FURNISH WITH BACKDRAFT DAMPER MODEL WD320, WALL COLLAR AND MOTOR SIZE GUARD.

GARAGE CARBON MONOXIDE AND NITROGEN DIOXIDE SYSTEMS SHALL BE EQUAL TO HONEYWELL MODEL E3POINT301C MULTI-GAS DETECTION AND CONTROL SYSTEM. PROVIDE TWO SENSORS TO DETECT CARBON MONOXIDE GAS LOCATED 5'-0" ABOVE FINISHED FLOOR. PROVIDE TWO SENSORS TO DETECT NITROGEN GAS LOCATED 26'-0" ABOVE FINISHED FLOOR. SENSORS SHALL BE FURNISHED BY THE MANUFACTURER AND INSTALLED BY THE ELECTRICAL CONTRACTOR. INCLUDE RELAY FOR EXHAUST FAN AND MOTORIZED DAMPER INTERLOCK. PANEL TO BE 120/1/60. COORDINATE INSTALLATION WITH MANUFACTURER.

STORAGE AREA CARBON MONOXIDE CONTROL SHALL BE THREE HONEYWELL E3POINT-CO STAND ALONE SINGLE SENSORS WITH SPLASH GUARD ENCLOSURES.



M1 FLOOR PLAN - MECHANICAL
1/8" = 1'-0"

0' 4' 8' 16' 24'

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FLOOR PLAN MECHANICAL

M101

LEGEND

1. PANEL HP1 – NEMA–3R
2. TRANSFORMER HP1PPA – NEMA–3R
3. PANEL PPA – NEMA–3R
4. 2#12 THHN PLUS GROUND–3/4"G.C. TO 20A–1PC/B IN PANEL PPA
5. 2#12 THHN PLUS GROUND–3/4"G.C. UNDERGROUND
6. 2#12 THHN PLUS GROUND–3/4"G.C. TO RESPECTIVE WEATHERTIGHT SWITCH AND 20A–1PC/B IN PANEL PPA
7. OVERHEAD DOORS – 120V–1ø – 2#12 THHN PLUS GROUND–3/4"G.C. TO 20A–1PC/B IN PANEL PPA
8. ELECTRIC UNIT HEATER – 30kw–480V–3ø – 3#6 THHN PLUS GROUND–3/4"C. TO 50A–3PC/B IN PANEL HP1
9. EXHAUT FAN – 3/4HP–480V–3ø – 3#12 THHN PLUS GROUND–3/4"G.C. TO STARTER IN CONTROL PANEL
10. CARBON MONOXIDE CONTROL PANEL BY MECHANICAL CONTRACTOR – 3#12 THHN PLUS GROUND–3/4"G.C. TO 20A–3PC/B IN PANEL HP1. SEE MANUFACTURER'S WIRING DIAGRAM FOR FINAL WIRING REQUIREMENTS
11. NO SENSOR BY THE MECHANICAL CONTRACTOR WIRED TO CONTROL PANEL PER MANUFACTURER'S WIRING DIAGRAM
12. MOTORIZED DAMPER – 120V–1ø – PROVIDE RIB RELAY 120V TO 480V – 2#12 THHN PLUS GROUND–3/4"G.C. TO CONTROL PANEL
13. HEAT TRACE CABLE CONTROL PANEL – CHROMALOX – CTCI–000, 2#12 THHN PLUS GROUND–3/4"G.C. TO 20A–2PC/B IN PANEL PPA
14. AMBIENT SENSOR – CHROMALOX – AS–BM MOUNTED 10' ABOVE FINISHED FLOOR. WIRE TO CONTROL PANEL IN 3/4"G.C.
15. HEAT TRACE CABLE – CHROMALOX #CPR5–2CT SELF REGULATING WITH ALL NECESSARY ACCESSORIES. MOUNTED ON WATER PIPING AND HOSE BIBS IN THE OPEN BAYS CONNECTED TO THE CONTROL PANEL. INSTALL WARNING LABELS
16. 3–WEATHERIGHT SWITCHES
17. 2#10 THHN–DC–3/4"G.C.
18. FIRE ALARM JUNCTION WITH RED COVER PLATE – WEATHERTIGHT
19. EXHAUST FAN – 120V–1ø – WIRED TO CONTROL PANEL
20. CARBON MONOXIDE CONTROL PANEL BY THE MECHANICAL CONTRACTOR – 2#12 THHN PLUS GROUND–3/4"G.C. TO 20A–1PC/B IN PANEL PPA. SEE MANUFACTURER'S WIRING DIAGRAM FOR FINAL WIRING REQUIREMENTS
21. 1–WEATHERTIGHT SWITCH
22. STROBE LIGHT BY THE MECHANICAL CONTRACTOR WIRED TO THE CONTROL PANEL PER THE MANUFACTURER'S WIRING DIAGRAM

SYMBOLS LIST

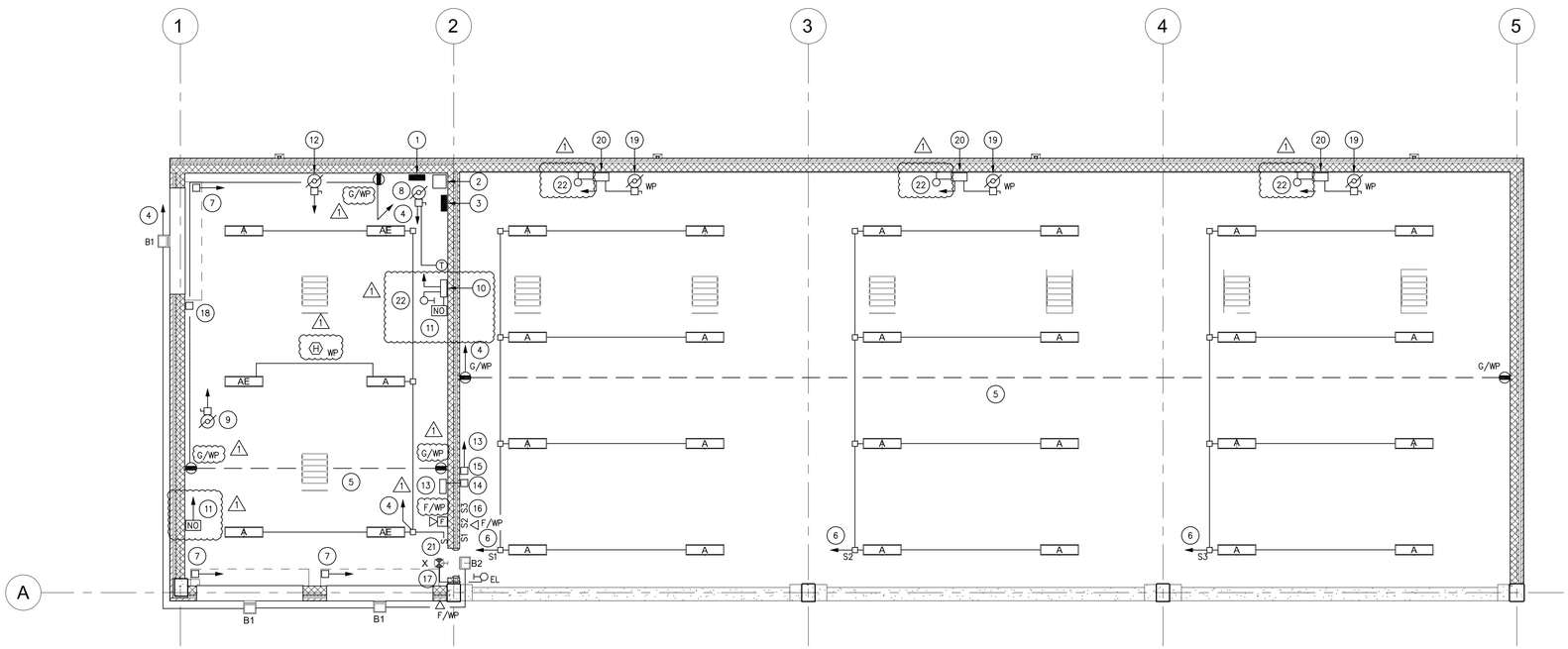
SYMBOL	DESCRIPTION
	RECESSED DOWN LIGHT
	SURFACE MOUNTED LIGHT
	SURFACE MOUNTED LIGHT
	EXIT SIGN
S	SINGLE POLE SWITCH
G	GROUND FAULT RECEPTACLE
	DISCONNECT SWITCH
	MOTOR – SIZE AS INDICATED
F	FIRE ALARM PULL STATION – NOTIFIER #NBG–12LX
F	HORN/STROBE LIGHT – NOTIFIER #P2W–L
F WP	HORN/STROBE LIGHT WEATHERPROOF – NOTIFIER #P2WK
H	FIRE ALARM–HEAT DETECTOR – NOTIFIER #FST–951
WP	WEATHERPROOF

LIGHTING FIXTURE SPECIFICATION

TYPE	MANUFACTURER	CATALOG NO.	DESCRIPTION
A	H.E. WILLIAMS	EGL2–4–L197–8–40–HIAFR–SSV–DIM–UNV	4' PENDANT MOUNTED LED LIGHT. VAPORTIGHT–GASKETED. NEMA–4X–120V–19,700 LUMENS 4000'k.
AE	H.E. WILLIAMS	EGL2–4–L197–8–40–HIAFR–EM/10W–SSV–DIM–UNV	SIMILAR TO TYPE A, EXCEPT WITH EMERGENCY BATTERY.
B1	TRACE LITE	RWE–M–60–VS–CP–BR	WALL MOUNTED LED LIGHTL FULL CUTOOF. FP–65 RATED WET LOCATION–120V–40W–5595 LUMENS–4000'k–PHOTOCELL.
B2	TRACE LITE	MWQ–20–C–BR	SIMILAR TO TYPE B1, EXCEPT 20W–2800 LUMENS – 4000k
EL	CHLORIDE	TPR–2–LM5–W–G	REMOTE TWIN HEADED GASKETED WET LOCATION EMERGENCY HEADS. 2–12V–5W.
X	CHLORIDE	TPCW–RL–I–R–W–IC	SELF CONTAINED FULLY AUTOMATIC AC/DC–LED WET LOCATION EXIT SIGN WITH REMOTE CAPACITY.

ELECTRICAL GENERAL SPECIFICATION

1. THE ELECTRICAL CONTRACTOR SHALL FURNISH ALL LABOR, MATERIALS,AND SERVICE REQUIRED TO COMPLETE THE INSTALLATION OF ALL WORK CALLED FOR AND SHOWN.
2. ALL WORK SHALL COMPLY WITH THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE, OSHA, ALL STATE, LOCAL CODES, ORDINANCES AND REQUIREMENTS AND WITH ALL AUTHORITIES HAVING JURISDICTION.
3. ALL PERMITS FOR THE ELECTRICAL WORK SHALL BE OBTAINED AND PAID FOR BY THE ELECTRICAL CONTRACTOR. UPON COMPLETION, A CERTIFICATION OF FINAL APPROVAL SHALL BE SUBMITTED, SIGNED BY THE PROPER AUTHORITIES.
4. ALL MATERIALS SHALL BE NEW OF FIRST QUALITY AND SHALL CONFORM TO U.L. STANDARDS WHERE SUCH IS APPLICABLE. ONLY THE BEST WORKMANSHIP IN ACCORDANCE WITH PRESENT DAY STANDARDS WILL BE ACCEPTABLE. ANY WORK INSTALLED IN WHICH WORKMANSHIP IS ADJUDGED BY THE ENGINEER TO BE BELOW ACCEPTED STANDARDS SHALL BE TAKEN OUT AND REPLACED WITH PROPERLY DONE WORK AT THIS CONTRACTOR'S EXPENSE.
5. MINIMUM SIZE OF WIRE FOR ANY CIRCUIT SHALL BE #12 A.W. GAUGE THHN 3/4"G.C. CABLE UNLESS OTHERWISE NOTED.
6. RACEWAYS AT EVERY OUTLET MUST TERMINATE IN SUITABLE OUTLET BOXES OF APPROVED FORM AND DIMENSIONS, ADAPTED IN ALL INSTANCES TO LOCATION AND USE OR NUMBER OF WIRES TERMINATING THEREIN.
7. HOMERUNS EXCEEDING 100' FROM SOURCE OF SUPPLY SHALL BE A MINIMUM OF #10 AWG–COPPER UNLESS OTHERWISE INDICATED.
8. THE ELECTRICAL CONTRACTOR MUST VERIFY CEILING FINISH CONSTRUCTION WITH FINAL ARCHITECTURAL DRAWINGS PRIOR TO ORDERING FIXTURES AND ORDER FIXTURES WITH PROPER MOUNTING ARRANGEMENTS TO BE COMPATIBLE WITH TYPE OF CEILING IN WHICH FIXTURES ARE TO BE MOUNTED.
9. ALL EQUIPMENT CONNECTIONS ARE SHOWN IN THEIR APPROXIMATE LOCATIONS. THE CONTRACTOR SHALL VERIFY EXACT LOCATION OF ALL CONNECTIONS WITH OTHER TRADES SUPPLYING EQUIPMENT TO AVOID CONFLICTS AT INSTALLATION.
10. THE CONTRACTOR SHALL ASSIGN BREAKERS IN THE PANELBOARDS TO THE BRANCH CIRCUITS CALLED FOR ON THE DRAWINGS IN SUCH A MANNER TO INSURE BALANCE OF LOADS BETWEEN THE PHASES. AS BUILT DRAWINGS FURNISHED BY THE CONTRACTOR SHALL SHOW THE PANELBOARD CIRCUIT NUMBERS ACTUALLY USED FOR THE BRANCH CIRCUITS.
11. PROVIDE NEW ADDRESSIBLE FIRE ALARM DEVICES AS SHOWN ON THE DRAWINGS WIRED PER THE MANUFACTURER'S REQUIREMENTS TO THE NEW FIRE ALARM SYSTEM. RUN WIRING IN 3/4"G.C. CONTACT FIRETECH 1–800–253–7685.
12. PROVIDE NEW LIGHTING FIXTURES HUNG AND CONNECTED.
13. PROVIDE NEW SWITCHES, RECEPTACLES (GFI) AND COVER PLATES.
14. PROVIDE NEW SERVICE SYSTEM FROM EXISTING MCC IN EXISTING SUPPLEMENTAL CARBON BUILDING WITH UNDERGROUND RACEWAYS, NEW CIRCUIT BREAKER/BUCKET, PANELS AND TRANSFORMER.
15. SUPPORT ALL EQUIPMENT AS PER CODES AND SEISMIC REQUIREMENTS.
16. PROVIDE HEAT TRACING SYSTEM FOR WATER PIPING IN THE OPEN BAYS. COORDINATE WITH THE PLUMBING CONTRACTOR.
17. PROVIDE ALL POWER AND CONTROL WIRING FOR ALL MECHANICAL AND PLUMBING EQUIPMENT. COORDINATE FINAL LOCATIONS WITH THE CONTRACTORS.
18. FIRE STOP ALL WALL AND FLOOR OPENINGS MADE FOR ELECTRICAL WORK.
19. ALL EQUIPMENT, MATERIAL AND WORKMANSHIP SHALL BE GUARANTEED FOR A PERIOD OF ONE(1) YEAR FROM THE DATE OF ACCEPTANCE BY OWNER OF THE ENTIRE INSTALLATION.
20. BEFORE SUBMITTING PROPOSAL, EXAMINE ALL PLANS RELATING TO THIS WORK, VERIFY ALL GOVERNING CONDITIONS AT THE SITE, BECOME FULLY INFORMED AS TO THE EXTENT AND CHARACTER OF THE WORK REQUIRED AND ITS RELATION TO WORK OF OTHER TRADES. NO CONSIDERATION WILL BE GRANTED FOR ANY ALLEGED MISUNDERSTANDING OF THE MATERIALS TO BE FURNISHED OR WORK TO BE DONE, IT BEING UNDERSTOOD THAT THE SUBMISSION OF A PROPOSAL IS AN AGREEMENT TO ALL CONDITIONS REFERRED TO HEREIN OR INDICATED ON THE PLANS.



E1 FLOOR PLAN - ELECTRICAL

1/8" = 1'-0"

0' 4' 8' 16' 24'

TRUE NORTH PROJECT NORTH

NOTE

1. FEED EACH EMERGENCY LIGHT AND EXIT SIGN FROM LOCAL CONSTANT LIGHTING CIRCUIT.

OWNER

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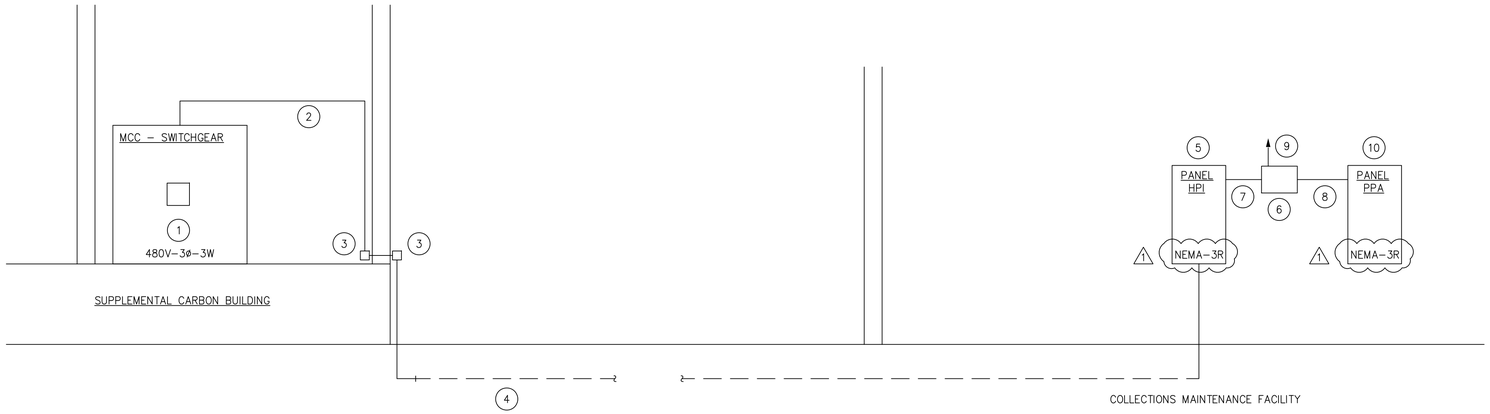
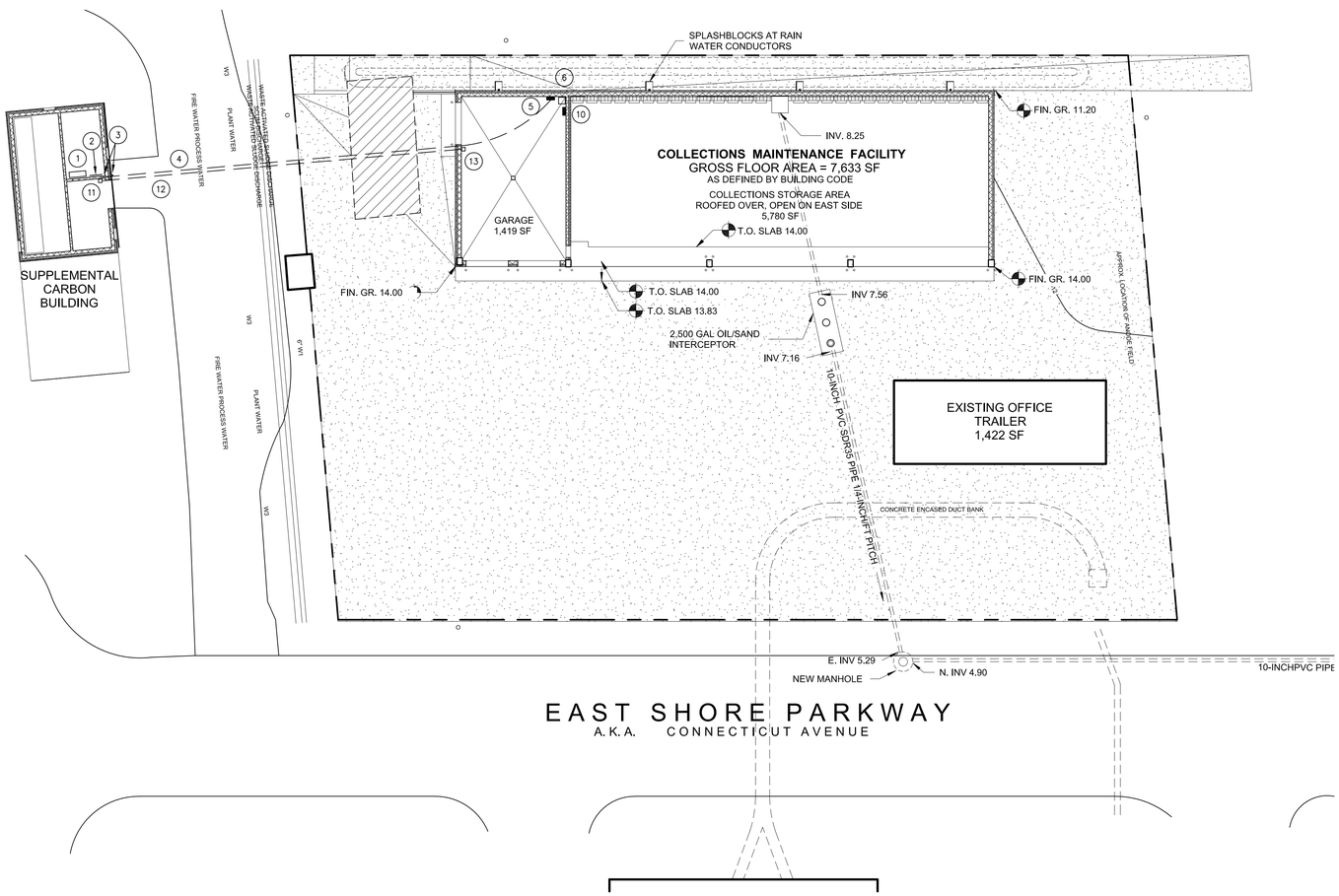
FLOOR PLANS ELECTRICAL

E101



PANEL RISER DIAGRAM
NTS



SE1 SITE PLAN - ELECTRICAL
1" = 20'-0"

0' 10' 20' 40' 60'

TRUE NORTH PROJECT NORTH

LEGEND

1. CONFIRM EXISTING MOTOR CONTROL CENTER SWITCHGEAR. PROVIDE NEW 100A–3PC/B, BUCKET WITH COVERPLATE AND ALL NECESSARY HARDWARE. GE – EVOLUTION – E9000 – 600AMPS @ 480V–3ø–3W
2. 1 1/2"G.C. WITH 3#2 XHHW PLUS 1#8 XHHW GROUND
3. GALVANIZED L.B. FITTING – CORE THROUGH EXISTING BUILDING WALL
4. 1 1/2"G.C. WITH 3#2 XHHW PLUS 1#8 XHHW GROUND UNDERGROUND
5. PANEL HPI – 100A–3PMNC/B–480V–3ø–3W WITH 1–50A–3PC/B, 1–40A–3PC/B, 2–20A–3PC/B AND 12 SPACES
6. (1) DRY CORE TRANSFORMER – HPIPPA 25kva–480V–3ø–3W TO 120/208V–3ø–4W – NEMA–3R
7. 3/4"G.C. WITH 3#8 THHN PLUS GROUND TO 40A–3PC/B
8. 1 1/4"G.C. WITH 4#2 THHN PLUS 1#8 GROUND
9. 3/4"G.C. WITH 1#8 THHN GROUND TO BUILDING STEEL
10. PANEL PPA – 100A–3PMNC/B 120/208V–3ø–4W WITH 2–20A–2PC/B, 14–20A–1PC/B AND 6 SPACES
11. EXISTING FIRE ALARM CONTROL PANEL. COORDINATE NEW WORK WITH FIRETECH – 1–800–253–7685
12. 1"G.C. WITH L.B. CORED THROUGH EXISTING BUILDING WALL DOWN UNDERGROUND WITH FIRE ALARM WIRING PER FIRETEK
13. (1) JUNCTION BOX ON WALL WITH RED COVER PLATE – WEATHERTIGHT

CONDUCTOR COLORS FOR 120/208 VOLT SYSTEM

PHASE A – BLACK
PHASE B – RED
PHASE C – BLUE
NEUTRAL – WHITE
GROUND – GREEN

CONDUCTOR COLORS FOR 277/480 VOLT SYSTEM

PHASE A – BROWN
PHASE B – ORANGE
PHASE C – YELLOW
NEUTRAL – GRAY
GROUND – GREEN

OWNER

Greater New Haven Water Pollution Control Authority
260 East Street New Haven, CT 06511
203.466.5280 p 203.772.1564 f www.gnhwpca.com

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FOR CONSTRUCTION

10/25/2019

ESWPAF COLLECTIONS MAINTENANCE FACILITY
GNHWPCA PROJECT NO: SSF 2018-01
EAST SHORE WATER POLLUTION ABATEMENT FACILITY
345 EAST SHORE PARKWAY, NEW HAVEN, CONNECTICUT 06512

MARK	DATE	DESCRIPTION
1	11/1/2022	ADDENDUM #2

PROJECT NO: SSF 2018-01
CWA PROJECT NO.: 1801
DRAWN BY: C.F.
CHK'D BY: P.C.
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SHEET TITLE
SITE PLAN ELECTRICAL

SE101

SECTION 04 2000 - UNIT MASONRY

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. Section Includes:

1. Concrete masonry units.
2. Clay face brick.
3. Mortar and grout.
4. Steel reinforcing bars.
5. Masonry-joint reinforcement.
6. Ties and anchors.
7. Self-adhering membrane flashing.
8. Metal flashing.
9. All Miscellaneous masonry accessories as required for complete installation of work specified under this Section.

B. Products Installed but not Specified under this Section:

1. Steel lintels in unit masonry specified under Section 05 5000
2. ~~Steel shelf angles for supporting unit masonry.~~
3. Cavity wall insulation specified under Section 07 2100
4. Crystalline waterproofing specified under Section 07 1616
5. Bituminous dampproofing specified under Section 07 1113

C. Related Sections:

1. 03 3000 – Cast-In-Place Concrete
2. 03 4100 – Precast Structural Concrete
3. 05 5000 – Metal Fabrications

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: Reinforcing Steel: Detail bending, lap lengths, and placement of unit masonry reinforcing bars. Comply with ACI 315

C. Samples for Initial Selection:

1. Clay face brick.
2. Colored mortar.

D. Mix Designs: For each type of mortar Include description of type and proportions of ingredients.

E. Statement of Compressive Strength of Masonry: For each combination of masonry unit type and mortar type, provide statement of average net-area compressive strength of masonry units, mortar type, and resulting net-area compressive strength of masonry determined according to TMS 602/ACI 530.1/ASCE 6.

F. Cold-Weather and Hot-Weather Procedures: Detailed description of methods, materials, and equipment to be used to comply with requirements.

1.4 QUALITY ASSURANCE

A. Testing Agency Qualifications: Qualified according to ASTM C 1093 for testing indicated.

B. Sample Panels: Build sample panels to verify selections made under Sample submittals and to demonstrate aesthetic effects. Comply with requirements in Section 014000 "Quality Requirements" for mockups.

1. Build sample panels for typical exterior wall 48 inches x 48 inches.
2. Build sample panels facing south.
3. Where masonry is to match existing, build panels adjacent and parallel to existing surface.
4. Clean one-half of exposed faces of panels with masonry cleaner indicated.
5. Protect approved sample panels from the elements with weather-resistant membrane.
6. Approval of sample panels is for color, texture, and blending of masonry units; relationship of mortar and sealant colors to masonry unit colors; tooling of joints; aesthetic qualities of workmanship; and other material and construction qualities specifically approved by Architect in writing.

    a. Approval of sample panels does not constitute approval of deviations from the Contract Documents contained in sample panels unless Architect specifically approves such deviations in writing.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Store masonry units on elevated platforms in a dry location. If units are not stored in an enclosed location, cover tops and sides of stacks with waterproof sheeting, securely tied. If units become wet, do not install until they are dry.

B. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.

C. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.

D. Deliver preblended, dry mortar mix in moisture-resistant containers. Store preblended, dry mortar mix in delivery containers on elevated platforms in a dry location or in covered weatherproof dispensing silos.

E. Store masonry accessories, including metal items, to prevent corrosion and accumulation of dirt and oil.

1.6 MEMBRANE FLASHING WARRANTY

A. Standard Product Warranty:

1. Submit manufacturer's warranty that flashing and accessories are free of defects at time of delivery, and are manufactured to meet manufacturer's published physical properties and material specifications.
2. Five years from date of completion of the flashing installation.
3. Installer shall warrant that flashing and accessories have been installed in accordance with manufacturer's recommendations.

1.7 FIELD CONDITIONS

A. Protection of Masonry: During construction, cover tops of walls, projections, and sills with waterproof sheeting at end of each day's work. Cover partially completed masonry when construction is not in progress.

1. Extend cover a minimum of 24 inches down both sides of walls, and hold cover securely in place.
2. Where one wythe of multiwythe masonry walls is completed in advance of other wythes, secure cover a minimum of 24 inches down face next to unconstructed wythe, and hold cover in place.

B. Do not apply uniform floor or roof loads for at least 12 hours and concentrated loads for at least three days after building masonry walls or columns.

C. Stain Prevention: Prevent grout, mortar, and soil from staining the face of masonry to be left exposed or painted. Immediately remove grout, mortar, and soil that come in contact with such masonry.

1. Protect base of walls from rain-splashed mud and from mortar splatter by spreading coverings on ground and over wall surface.
2. Protect sills, ledges, and projections from mortar droppings.
3. Protect surfaces of window and door frames, as well as similar products with painted and integral finishes, from mortar droppings.
4. Turn scaffold boards near the wall on edge at the end of each day to prevent rain from splashing mortar and dirt onto completed masonry.

D. Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen substrates. Remove and replace unit masonry damaged by frost

or by freezing conditions. Comply with cold-weather construction requirements contained in TMS 602/ACI 530.1/ASCE 6.

1. Cold-Weather Cleaning: Use liquid cleaning methods only when air temperature is 40 deg F and higher and will remain so until masonry has dried, but not less than seven days after completing cleaning.

E. Hot-Weather Requirements: Comply with hot-weather construction requirements contained in TMS 602/ACI 530.1/ASCE 6.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Source Limitations for Masonry Units: Obtain exposed masonry units of a uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, from single source from single manufacturer for each product required.

B. Source Limitations for Mortar Materials: Obtain mortar ingredients of a uniform quality, including color for exposed masonry, from single manufacturer for each cementitious component and from single source or producer for each aggregate.

2.2 PERFORMANCE REQUIREMENTS

A. Provide structural unit masonry that develops indicated net-area compressive strengths at 28 days.

1. Determine net-area compressive strength of masonry from average net-area compressive strengths of masonry units and mortar types (unit-strength method) according to TMS 602/ACI 530.1/ASCE 6.
2. Determine net-area compressive strength of masonry by testing masonry prisms according to ASTM C 1314.

2.3 UNIT MASONRY, GENERAL

A. Masonry Standard: Comply with TMS 602/ACI 530.1/ASCE 6, except as modified by requirements in the Contract Documents.

B. Defective Units: Referenced masonry unit standards may allow a certain percentage of units to contain chips, cracks, or other defects exceeding limits stated. Do not use units where such defects are exposed in the completed Work and will be within 20 feet vertically and horizontally of a walking surface.

C. Fire-Resistance Ratings: Comply with requirements for fire-resistance-rated assembly designs indicated.

1. Where fire-resistance-rated construction is indicated, units shall be listed and labeled by a qualified testing agency acceptable to authorities having jurisdiction.

2.4 CONCRETE MASONRY UNITS (CMUs)

A. Shapes: Provide shapes indicated and as follows, with exposed surfaces matching exposed faces of adjacent units unless otherwise indicated.

1. Provide special shapes for lintels, corners, jambs, sashes, movement joints, headers, bonding, and other special conditions.
2. Provide square-edged units for outside corners unless otherwise indicated.

B. CMUs: ASTM C 90.

1. Unit Compressive Strength: Provide units with minimum average net-area compressive strength of 2000 psi.
2. Density Classification: Lightweight.
3. Size (Width): Manufactured to dimensions 3/8 inch less than nominal dimensions.
4. Exposed Faces: Provide color and texture matching the range represented by Architect's sample.

~~2.5 CONCRETE LINTELS~~

~~A. Concrete Lintels: ASTM C 1623, matching CMUs in color, texture, and density classification; and with reinforcing bars indicated. Provide lintels with net-area compressive strength not less than that of CMUs.~~

2.6 BRICK

A. General: Provide shapes indicated

B. Clay Face Brick:

1. Manufacturer: Carolina Ceramics Brick company, Columbia South Carolina
2. Product: Carolina Ceramics Commmercial Collection, Color: Teakwood Velour

2.7 MORTAR AND GROUT MATERIALS

A. Portland Cement: ASTM C 150, Type I or II, except Type III may be used for cold-weather construction. Provide natural color or white cement as required to produce mortar color indicated.

1. Alkali content shall not be more than 0.1 percent when tested according to ASTM C 114.

B. Hydrated Lime: ASTM C 207, Type S.

C. Portland Cement-Lime Mix: Packaged blend of portland cement and hydrated lime containing no other ingredients.

D. Masonry Cement: ASTM C .

E. Mortar Cement: ASTM C 1329

F. Mortar Pigments: Natural and synthetic iron oxides and chromium oxides, compounded for use in mortar mixes and complying with ASTM C 979. Use only pigments with a record of satisfactory performance in masonry mortar.

G. Colored Cement Products: Packaged blend made from portland cement and hydrated lime or masonry cement and mortar pigments, all complying with specified requirements, and containing no other ingredients.

1. Formulate blend as required to produce color indicated or, if not indicated, as selected from manufacturer's standard colors.
2. Pigments shall not exceed 10 percent of portland cement by weight.
3. Pigments shall not exceed 5 percent of masonry cement or mortar cement by weight.

H. Aggregate for Mortar: ASTM C 144.

1. For mortar that is exposed to view, use washed aggregate consisting of natural sand or crushed stone.
2. For joints less than 1/4 inch thick, use aggregate graded with 100 percent passing the No. 16 sieve.
3. White-Mortar Aggregates: Natural white sand or crushed white stone.
4. Colored-Mortar Aggregates: Natural sand or crushed stone of color necessary to produce required mortar color.

I. Aggregate for Grout: ASTM C 404.

J. Cold-Weather Admixture: Nonchloride, noncorrosive, accelerating admixture complying with ASTM C 494/C 494M, Type C, and recommended by manufacturer for use in masonry mortar of composition indicated.

K. Water: Potable.

2.8 REINFORCEMENT

A. Uncoated-Steel Reinforcing Bars: ASTM A 615 or ASTM A 996, Grade 60

B. Reinforcing Bar Positioners: Wire units designed to fit into mortar bed joints spanning masonry unit cells and to hold reinforcing bars in center of cells. Units are formed from 0.148-inch steel wire, hot-dip galvanized after fabrication. Provide units designed for number of bars indicated.

~~C. Masonry-Joint Reinforcement, General: ASTM A 951~~

~~1. Walls: Hot-dip galvanized carbon steel.~~

~~2. Wire Size for Veneer Ties: 0.148-inch diameter.~~
~~3. Spacing of Cross Rods, Tabs, and Cross Ties: Not more than 16 inches o.c.~~
~~4. Provide in lengths of not less than 10 feet, with prefabricated corner and tee units.~~

~~D. Masonry-Joint Reinforcement for Single-Wythe Masonry: Ladder or truss type with single pair of side rods.~~

C. Horizontal Masonry Joint Reinforcement:

1. Material: ASTM A580 AISI Type 304 stainless steel.
2. Single-Wythe Masonry: Ladder type with a single pair of continuous side rods and single cross rods spaced at 16-inches o.c.
3. Multi-wythe Masonry: Ladder type with a single pair of continuous side rods and single cross rods with eye wires spaced at 16-inches o.c. horizontally to receive separate adjustable veneer tie hooks (pintles).

   a. Veneer Ties: 3/16” diameter rods with compressed leg hooks (pintles).
   b. Provide lengths as required to provide a minimum 1 1/2" embedment in brick and CMU veneers.
   c. Provide additional ties within 8 inches of openings and discontinuities, such as wall openings, vertical expansion joints, etc.

4. Wire Size for Side and Cross Rods: 3/16” diameter.
5. Provide reinforcement in lengths of not less than 10 feet, with prefabricated corner and tee units.
6. All masonry joint reinforcement shall be installed at 16-inches on center vertically.

2.9 TIES AND ANCHORS

A. General: Ties and anchors shall extend at least 1-1/2 inches into veneer but with at least a 5/8-inch cover on outside face.

~~B. Materials: Provide ties and anchors specified in this article that are made from materials that comply with the following unless otherwise indicated:~~

~~1. Hot-Dip Galvanized, Carbon-Steel Wire: ASTM A 82, with ASTM A 153/, Class B-2 coating.~~

~~C. Individual Wire Ties: Rectangular units with closed ends and not less than 4 inches wide.~~

~~1. Use adjustable ties with pintle-and-eye connections having a maximum adjustment of 1-1/4 inches.~~
~~2. Wire: Fabricate from 3/16-inch stainless-steel wire~~

D. Anchors for tying brick veneer to concrete columns at wall cavities where there is no insulation. Provide anchors that allow vertical or horizontal adjustment but resist tension and compression forces perpendicular to plane of wall.

1. Anchor:

a. 5 1/2" long x 3" mechanically fastened to concrete and designed to receive wire ties.
b. Material: ASTM A666, ASTM A480 and ASTM A240 AISI Type 304 stainless steel sheet.

2. Wire Tie:

a. Prefabricated triangular shaped 3/16" diameter ASTM A580 AISI Type 304 stainless steel.
b. Provide tie lengths as required to provide minimum 1 1/2" embedment into CMU and brick veneers.

E. Anchors for tying ends of CMU to concrete columns

1. Anchors: ASTM A666, A480 and A240 AISI Type 304 stainless steel strap for mechanical attachment to concrete columns and designed to wrap around flexible wire tie.
2. Wire Ties: Prefabricated triangular-shaped 3/16" diameter ASTM A666, ASTM A480 and ASTM A240 AISI Type 304 Stainless Steel.

a. Provide tie lengths as required to provide minimum 1 1/2" embedment into CMU and brick veneers.

F. Partition Top Anchors: 0.105-inch- thick metal plate with a 3/8-inch- diameter metal rod 6 inches long welded to plate and with closed-end plastic tube fitted over rod that allows rod to move in and out of tube. Fabricate from hot-dip galvanized after fabrication.

~~G. Adjustable Masonry Veneer Anchors:~~

~~1. General: Provide anchors that allow vertical adjustment but resist a 100-lbf load in both tension and compression perpendicular to plane of wall without deforming or developing play in excess of 1/16 inch~~
~~2. Fabricate wire ties from 0.187-inch- diameter, stainless-steel wire unless otherwise indicated.~~

2.10 METAL FLASHING

A. Metal Flashing: Provide metal flashing complying with SMACNA's "Architectural Sheet Metal Manual"and as follows:

1. Tin-zinc coated copper, 16 oz
2. Fabricate continuous flashings in sections 96 inches long minimum, but not exceeding 12 feet. Provide splice plates at joints of formed, smooth metal flashing.
~~3. Fabricate through-wall metal flashing embedded in masonry from tin-zinc coated copper, with ribs at 3-inch intervals along length of flashing to provide an integral mortar bond.~~
4. Fabricate through-wall flashing with drip edges unless otherwise indicated. Fabricate by extending flashing 1/2 inch out from wall, with outer edge bent down 30 degrees and hemmed.
5. Mitre and continuously solder inside & outside corners of all metal base flashing.

B. Solder: ASTM B32 ~~Solder and Sealants for Sheet Metal Flashings~~

~~C. Adhesives, Primers, and Seam Tapes for Flashings: Flashing manufacturer's standard products or products recommended by flashing manufacturer for bonding flashing sheets to each other and to substrates.~~

D. Membrane Flashing:

1. Flashing Description: 0.8 mm (32 mils) of self-adhesive rubberized asphalt integrally bonded to 0.2 mm (8 mils) of cross-laminated, high-density polyethylene film to provide a min. 1.0 mm (40 mil) thick membrane. Membrane shall be interleaved with disposable silicone-coated release paper until installed.
2. Performance Requirements:

   a. Water Vapor Transmission: ASTM E96, Method B – 2.9 ng/m2sPa (0.05 perms) maximum.
   b. Water Absorption: ASTM D570 – Max. 0.1% by weight.
   c. Puncture Resistance: ASTM E154 – 356 N (80 lbs).
   d. Tear Resistance:

      1) Initiation – ASTM D1004 – min. 58 N (13.0 lbs) M.D.
      2) Propagation – ASTM D1938 – min. 40 N (9.0 lbs) M.D.

   e. Lap Adhesion at -4ºC (25ºF): ASTM D1876 – 880 N/M (5.0 lbs/in.) of width
   f. Low Temperature Flexibility – ASTM D1970 – Unaffected to -43ºC (-45ºF)
   g. Tensile Strength: ASTM D412, Die C Modified – Min. 5.5 MPa (800 psi)
   h. Elongation, Ultimate Failure of Rubberized Asphalt: ASTM D412, Die C – Min. 200%

E. Membrane Flashing Accessories:

1. Primer.

   a. Description: Water-based primer which imparts an aggressive, high tack finish on the treated substrate.escription: Water-based primer which imparts an aggressive, high tack finish on the treated substrate.
   b. Flash Point: No flash to boiling point
   c. Solvent Type: Water
   d. VOC Content: Not to exceed 10 g/L
   e. Application Temperature: -4ºC (25ºF) and above
   f. Freezing point (as packaged): -7ºC (21ºF)

2. Termination Mastic:

   a. Rubberized asphalt-based mastic with 200 g/L max. VOC Content.

2.11 MISCELLANEOUS MASONRY ACCESSORIES

A. Compressible Filler: Premolded filler strips complying with ASTM D 1056, Grade 2A1; compressible up to 35 percent; of width and thickness indicated; formulated from urethane.

B. Bond-Breaker Strips: Asphalt-saturated felt complying with ASTM D 226, Type I (No. 15 asphalt felt).

2.12 MASONRY CLEANERS

A. Proprietary Acidic Cleaner: Manufacturer's standard-strength cleaner designed for removing mortar/grout stains, efflorescence, and other new construction stains from new masonry without discoloring or damaging masonry surfaces. Use product expressly approved for intended use by cleaner manufacturer and manufacturer of masonry units being cleaned.

2.13 MORTAR AND GROUT MIXES

A. General: Do not use admixtures, including pigments, air-entraining agents, accelerators, retarders, water-repellent agents, antifreeze compounds, or other admixtures unless otherwise indicated.

1. Do not use calcium chloride in mortar or grout.

B. Preblended, Dry Mortar Mix: Furnish dry mortar ingredients in form of a preblended mix. Measure quantities by weight to ensure accurate proportions, and thoroughly blend ingredients before delivering to Project site.

C. Mortar for Unit Masonry: Comply with ASTM C 270, Specification. Provide the following types of mortar for applications stated unless another type is indicated.

1. For reinforced masonry, use Type S.
2. For exterior, above-grade, nonload-bearing walls and parapet walls;; for interior nonload-bearing partitions; and for other applications where another type is not indicated, use Type N.

D. Pigmented Mortar: Use colored cement product or select and proportion pigments with other ingredients to produce color required. Do not add pigments to colored cement products].

1. Pigments shall not exceed 10 percent of portland cement by weight.
2. Pigments shall not exceed 5 percent of masonry cement or mortar cement by weight.
3. Mix to match Architect's sample.
4. Application: Use pigmented mortar for exposed mortar joints with Clay face brick:

E. Grout for Unit Masonry: Comply with ASTM C 476.

1. Use grout of type indicated or, if not otherwise indicated, of type (fine or coarse) that will comply with TMS 602/ACI 530.1/ASCE 6 for dimensions of grout spaces and pour height.
2. Proportion grout in accordance with ASTM C 476, Table 1 or paragraph 4.2.2 for specified 28-day compressive strength indicated, but not less than 2000 psi.
3. Provide grout with a slump of 8 to 11 inches as measured according to ASTM C 143/C 143M.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

1. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.
2. Verify that foundations are within tolerances specified.
3. Verify that reinforcing dowels are properly placed.
4. Verify that substrates are free of substances that impair mortar bond.

B. Before installation, examine rough-in and built-in construction for piping systems to verify actual locations of piping connections.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

A. Thickness: Build cavity and composite walls and other masonry construction to full thickness shown. Build single-wythe walls to actual widths of masonry units, using units of widths indicated.

B. Build chases and recesses to accommodate items specified in this and other Sections.

C. Leave openings for equipment to be installed before completing masonry. After installing equipment, complete masonry to match construction immediately adjacent to opening.

D. Use full-size units without cutting if possible. If cutting is required to provide a continuous pattern or to fit adjoining construction, cut units with motor-driven saws; provide clean, sharp, unchipped edges. Allow units to dry before laying unless wetting of units is specified. Install cut units with cut surfaces and, where possible, cut edges concealed.

E. Select and arrange units for exposed unit masonry to produce a uniform blend of colors and textures. Mix units from several pallets or cubes as they are placed.

F. Matching Existing Masonry: Match coursing, bonding, color, and texture of existing masonry.

G. Wetting of Brick: Wet brick before laying if initial rate of absorption exceeds 30 g/30 sq. in. per minute when tested according to ASTM C 67. Allow units to absorb water so they are damp but not wet at time of laying.

3.3 TOLERANCES

A. Dimensions and Locations of Elements:

1. For dimensions in cross section or elevation, do not vary by more than plus 1/2 inch or minus 1/4 inch

2. For location of elements in plan, do not vary from that indicated by more than plus or minus 1/2 inch.
3. For location of elements in elevation, do not vary from that indicated by more than plus or minus 1/4 inch in a story height or 1/2 inch total.

B. Lines and Levels:

1. For bed joints and top surfaces of bearing walls, do not vary from level by more than 1/4 inch in 10 feet (or 1/2-inch maximum.
2. For conspicuous horizontal lines, such as lintels, sills, parapets, and reveals, do not vary from level by more than 1/8 inch in 10 feet, 1/4 inch in 20 feet or 1/2-inch maximum.
3. For vertical lines and surfaces, do not vary from plumb by more than 1/4 inch in 10 feet, 3/8 inch in 20 feet , or 1/2-inch maximum.
4. For conspicuous vertical lines, such as external corners, door jambs, reveals, and expansion and control joints, do not vary from plumb by more than 1/8 inch in 10 feet, 1/4 inch in 20 feet, or 1/2-inch maximum.
5. For lines and surfaces, do not vary from straight by more than 1/4 inch in 10 feet (, 3/8 inch in 20 feet or 1/2-inch maximum.
6. For vertical alignment of exposed head joints, do not vary from plumb by more than 1/4 inch in 10 feet or 1/2-inch maximum.
7. For faces of adjacent exposed masonry units, do not vary from flush alignment by more than 1/16 inch) except due to warpage of masonry units within tolerances specified for warpage of units.

C. Joints:

1. For bed joints, do not vary from thickness indicated by more than plus or minus 1/8 inch , with a maximum thickness limited to 1/2 inch.
2. For exposed bed joints, do not vary from bed-joint thickness of adjacent courses by more than 1/8 inch .
3. For head and collar joints, do not vary from thickness indicated by more than plus 3/8 inch (9 mm) or minus 1/4 inch .
4. For exposed head joints, do not vary from thickness indicated by more than plus or minus 1/8 inch Do not vary from adjacent bed-joint and head-joint thicknesses by more than 1/8 inch
5. For exposed bed joints and head joints of stacked bond, do not vary from a straight line by more than 1/16 inch from one masonry unit to the next.

3.4 LAYING MASONRY WALLS

A. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint thicknesses and for accurate location of openings, movement-type joints, returns, and offsets. Avoid using less-than-half-size units, particularly at corners, jambs, and, where possible, at other locations.

B. Bond Pattern for Exposed Masonry: Unless otherwise indicated, lay exposed masonry in running bond do not use units with less-than-nominal 4-inch horizontal face dimensions at corners or jambs.

C. Lay concealed masonry with all units in a wythe in running bond or bonded by lapping not less than 4 inches Bond and interlock each course of each wythe at corners. Do not use units with less-than-nominal 4-inch horizontal face dimensions at corners or jambs.

D. Stopping and Resuming Work: Stop work by stepping back units in each course from those in course below; do not tooth. When resuming work, clean masonry surfaces that are to receive mortar, remove loose masonry units and mortar, and wet brick if required before laying fresh masonry.

E. Built-in Work: As construction progresses, build in items specified in this and other Sections. Fill in solidly with masonry around built-in items.

F. Fill space between steel frames and masonry solidly with mortar unless otherwise indicated.

G. Where built-in items are to be embedded in cores of hollow masonry units, place a layer of metal lath, wire mesh, or plastic mesh in the joint below, and rod mortar or grout into core.

H. Fill cores in hollow CMUs with grout 24 inches under bearing plates, beams, lintels, posts, and similar items unless otherwise indicated.

I. Build nonload-bearing interior partitions full height of story to underside of solid floor or roof structure above unless otherwise indicated.

1. Install compressible filler in joint between top of partition and underside of structure above.
2. Fasten partition top anchors to structure above and build into top of partition. Grout cells of CMUs solidly around plastic tubes of anchors and push tubes down into grout to provide 1/2-inch clearance between end of anchor rod and end of tube. Wedge nonload-bearing partitions against structure above with small pieces of tile, slate, or metal. Fill joint with mortar after dead-load deflection of structure above approaches final position.
3. At fire-rated partitions, treat joint between top of partition and underside of structure above to comply with Section 078443 "Joint Firestopping."

3.5 MORTAR BEDDING AND JOINTING

A. Lay CMUs as follows:

1. Bed face shells in mortar and make head joints of depth equal to bed joints.
2. Bed webs in mortar in all courses of piers, columns, and pilasters.
3. Bed webs in mortar in grouted masonry, including starting course on footings.
4. Fully bed entire units, including areas under cells, at starting course on footings where cells are not grouted.
5. Fully bed units and fill cells with mortar at anchors and ties as needed to fully embed anchors and ties in mortar.

B. Lay solid masonry units with completely filled bed and head joints; butter ends with sufficient mortar to fill head joints and shove into place. Do not deeply furrow bed joints or slush head joints.

C. Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than joint thickness unless otherwise indicated.

D. Cut joints flush for masonry walls to receive plaster or other direct-applied finishes (other than paint) unless otherwise indicated.

E. Cut joints flush where indicated to receive waterproofing cavity wall insulation unless otherwise indicated.

3.6 CAVITY WALLS

A. Bond wythes of cavity walls together as follows:

1. Individual Metal Ties: Provide ties as shown installed in horizontal joints, but not less than one metal tie for 1.77 sq. ft. of wall area spaced not to exceed 16 inches (406 mm)] o.c. horizontally and 16 inches o.c. vertically. Stagger ties in alternate courses. Provide additional ties within 12 inches of openings and space not more than 36 inches apart around perimeter of openings. At intersecting and abutting walls, provide ties at no more than 24 inches o.c. vertically.

   a. Where bed joints of wythes do not align, use adjustable-type (two-piece-type) ties.
   b. Where one wythe is of clay masonry and the other of concrete masonry, use adjustable-type (two-piece-type) ties to allow for differential movement regardless of whether bed joints align.

2. Masonry-Joint Reinforcement: Installed in horizontal mortar joints. use adjustable-type (two-piece-type) reinforcement to allow for differential movement regardless of whether bed joints align.

B. Keep cavities clean of mortar droppings and other materials during construction. Bevel beds away from cavity, to minimize mortar protrusions into cavity. Do not attempt to trowel or remove mortar fins protruding into cavity.

C. Installing Cavity Wall Insulation: Place small dabs of adhesive, spaced approximately 12 inches o.c. both ways, on inside face of insulation boards, or attach with plastic fasteners designed for this purpose. Fit courses of insulation between wall ties and other confining obstructions in cavity, with edges butted tightly both ways. Press units firmly against inside wythe of masonry or other construction as shown.

1. Fill cracks and open gaps in insulation with crack sealer compatible with insulation and masonry.

3.7 ANCHORED MASONRY VENEERS

A. Anchor masonry veneers to concrete and masonry backup] with masonry-veneer anchors to comply with the following requirements:

1. Embed tie sections in masonry joints.
2. Locate anchor sections to allow maximum vertical differential movement of ties up and down.

3. Space anchors as indicated, but not more than 16 inches o.c. vertically and 16 inches o.c. horizontally, BIA Technical Notes 28B recommends 2 inches (50 mm) of airspace. Wider airspaces require closer tie spacing.

B. Provide not less than 2 inches of airspace between back of masonry veneer and face of insulation.

1. Keep airspace clean of mortar droppings and other materials during construction. Bevel beds away from airspace, to minimize mortar protrusions into airspace. Do not attempt to trowel or remove mortar fins protruding into airspace.

C. General: Install entire length of longitudinal side rods in mortar with a minimum cover of 5/8 inch on exterior side of walls, 1/2 inch elsewhere. Lap reinforcement a minimum of 6 inches .

D. Provide continuity at wall intersections by using prefabricated T-shaped units.

E. Provide continuity at corners by using prefabricated L-shaped units.

F. Cut and bend reinforcing units as directed by manufacturer for continuity at[**corners,**] returns, offsets, column fireproofing, pipe enclosures, and other special conditions.

G. Anchor masonry to concrete, where masonry abuts or faces structural steel or concrete, to comply with the following:

H. Install steel lintels where indicated.

I. Provide lintels where shown and where openings of more than 12 inches for brick-size units and 24 inches for block-size units are shown without structural steel or other supporting lintels.

J. Provide minimum bearing of 8 inches at each jamb unless otherwise indicated.

K. General: Install embedded flashing and weep holes in masonry at shelf angles, lintels, ledges, other obstructions to downward flow of water in wall, and where indicated

L. Install flashing as follows unless otherwise indicated:

1. Prepare masonry surfaces so they are smooth and free from projections that could puncture flashing. Where flashing is within mortar joint, place through-wall flashing on sloping bed of mortar and cover with mortar. Before covering with mortar, seal penetrations in flashing with adhesive, sealant, or tape as recommended by flashing manufacturer.
2. At bottoms of multi-wythe masonry walls, including cavity walls, extend flashing 16-inches up exterior face of inner wythe and turn 4” minimum into horizontal bed joints. Lap bottom edge over vertical leg of metal base flashing.
3. ~~At masonry-veneer walls, extend flashing through veneer, across airspace behind veneer, and up face of sheathing at least 8 inches; with upper edge tucked under~~
4. At lintels and shelf angles, extend flashing vertically up face of inner wythe of masonry and turn 4” minimum into horizontal bed above top of mortar collection material. At heads and sills, extend flashing minimum 8 inches beyond wall openings, fold and turn up ends and turn up not less than 2 inches to form end dams. Do not cut flashing to form end dams.
5. Interlock end joints of ribbed sheet metal flashing by overlapping ribs not less than 1-1/2 inches or as recommended by flashing manufacturer, and seal lap with elastomeric sealant complying with requirements in Section 079200 "Joint Sealants" for application indicated.

M. Install single-wythe CMU flashing system in bed joints of CMU walls where indicated to comply with manufacturer's written instructions. Install CMU cell pans with upturned edges located below face shells and webs of CMUs above and with weep spouts aligned with face of wall. Install CMU web covers so that they cover upturned edges of CMU cell pans at CMU webs and extend from face shell to face shell.

N. Install reglets and nailers for flashing and other related construction where they are shown to be built into masonry.

O. Install weep holes in exterior wythes and veneers in head joints of first course of masonry immediately above embedded flashing.

1. Use open-head joints to form weep holes.

P. Place pea gravel in cavities as soon as practical to a height equal to height of first course above top of flashing, but not less than 2 inches, to maintain drainage.

Q. Temporary Formwork and Shores: Construct formwork and shores as needed to support reinforced masonry elements during construction.

1. Construct formwork to provide shape, line, and dimensions of completed masonry as indicated. Make forms sufficiently tight to prevent leakage of mortar and grout. Brace, tie, and support forms to maintain position and shape during construction and curing of reinforced masonry.
2. Do not remove forms and shores until reinforced masonry members have hardened sufficiently to carry their own weight and that of other loads that may be placed on them during construction.

R. Placing Reinforcement: Comply with requirements in TMS 602/ACI 530.1/ASCE 6.

S. Grouting: Do not place grout until entire height of masonry to be grouted has attained enough strength to resist grout pressure.

1. Comply with requirements in TMS 602/ACI 530.1/ASCE 6 for cleanouts and for grout placement, including minimum grout space and maximum pour height.
2. Limit height of vertical grout pours to not more than 60 inches.

T. Testing and Inspecting: Owner will engage special inspectors to perform tests and inspections and prepare reports. Allow inspectors access to scaffolding and work areas as needed to perform tests and inspections. Retesting of materials that fail to comply with specified requirements shall be done at Contractor's expense.

U. Inspections: Special inspections according to Level C in TMS 402/ACI 530/ASCE 5.

1. Begin masonry construction only after inspectors have verified proportions of site-prepared mortar.
2. Place grout only after inspectors have verified compliance of grout spaces and of grades, sizes, and locations of reinforcement.
3. Place grout only after inspectors have verified proportions of site-prepared grout.

V. Testing Prior to Construction: One set of tests.

W. Testing Frequency: One set of tests for each 5000 sq. ft. of wall area or portion thereof.

X. Concrete Masonry Unit Test: For each type of unit provided, according to ASTM C 140 for compressive strength.

Y. Mortar Aggregate Ratio Test (Proportion Specification): For each mix provided, according to ASTM C 780.

Z. Mortar Test (Property Specification): For each mix provided, according to ASTM C 780. Test mortar for mortar air content.

3.8 REPAIRING, POINTING, AND CLEANING

A. Remove and replace masonry units that are loose, chipped, broken, stained, or otherwise damaged or that do not match adjoining units. Install new units to match adjoining units; install in fresh mortar, pointed to eliminate evidence of replacement.

B. In-Progress Cleaning: Clean unit masonry as work progresses by dry brushing to remove mortar fins and smears before tooling joints.

C. Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:

1. Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.
2. Test cleaning methods on sample wall panel; leave one-half of panel uncleaned for comparison purposes. Obtain Architect's approval of sample cleaning before proceeding with cleaning of masonry.
3. Protect adjacent stone and nonmasonry surfaces from contact with cleaner by covering them with liquid strippable masking agent or polyethylene film and waterproof masking tape.
4. Wet wall surfaces with water before applying cleaners; remove cleaners promptly by rinsing surfaces thoroughly with clear water.
5. Clean brick by bucket-and-brush hand-cleaning method described in BIA Technical Notes 20.
6. Clean concrete masonry by applicable cleaning methods indicated in NCMA TEK 8-4A.
7. Clean masonry with a proprietary acidic cleaner applied according to manufacturer's written instructions.
8. Clean stone trim to comply with stone supplier's written instructions.
9. Clean limestone units to comply with recommendations in ILI's "Indiana Limestone Handbook."

END OF SECTION 04 2000

SECTION 05 5000 - METAL FABRICATIONS

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. Section Includes:

1.~~Miscellaneous steel trim including plumbing pipe protection~~.

1. Metal bollards.
2. Miscellaneous steel trim including plumbing pipe protection.
3. Loose lintels for masonry walls.
4. Shelf Angles to support masonry.
5. Aluminum Ladder.
6. Embedded plates, angles and anchors frame for casting into concrete for applications where they are not specified in other Sections.
7. ~~1.~~ Steel angle frames to support wall mounted exhaust fans.

B. Products furnished, but not installed, under this Section include Loose steel lintels:

C. Related Requirements: 042000 "Unit Masonry" for installing loose lintels, anchor bolts, and other items

1.3 COORDINATION

A. Coordinate selection of shop primers with topcoats to be applied over them. See 09 9600 “High Performance Coatings”

B. Coordinate installation of metal fabrications that are anchored to or that receive other work. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

1.4 ACTION SUBMITTALS

A. Shop Drawings: Show fabrication and installation details

1.5 QUALITY ASSURANCE

A. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."

B. Welding Qualifications: AWS D1.1/D1.1M, "Structural Welding Code - Steel."

1.6 FIELD CONDITIONS

A. Field Measurements: Verify actual locations of walls and other construction contiguous with metal fabrications by field measurements before fabrication.

PART 2 - PRODUCTS

2.1 METALS

A. Metal Surfaces, General: Provide materials with smooth, flat surfaces unless otherwise indicated. For metal fabrications exposed to view in the completed Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes.

B. Steel Plates, Shapes, and Bars: ASTM A 36, G90 hot dip galvanized.

~~B.~~C. Stainless-Steel Bars and Shapes: ASTM A 276, Type 304.

D. Steel Pipe for Bollards: ASTM A 53, Heavy ~~Standard~~ Weight (Schedule 840) unless otherwise indicated.

E. Ladder: Aluminum Heavy Duty Fixed Vertical Ladder and Components: Ladder, ,floor mounting brackets, wall mounting brackets, and side rails. Height and width as indicated.
1. Basis of Design: Precision Ladders, LLC, which is located at: P. O. Box 2279 ; Morristown, TN 37816-2279; Toll Free Tel: 800-225-7814; Tel: 423-586-2265; Email: info@PrecisionLadders.com; Web: www.PrecisionLadders.com.
2. Capacity: Unit shall support a 1500 lb loading without failure, and individual treads shall withstand a 3,000 lb loading without failure.
3. Performance Standard: Units designed and manufactured to meet or exceed ANSI A14.3 and OSHA 1910.27.
4. Components:
   a. Ladder Stringer: 3 inch by 1 inch by 1/8 inch extruded 6005-T5 aluminum tubing. Pitch: 90 degrees.
   b. Ladder Tread: 2-1/4 inch by 3/4 inch by 1/4 inch extruded 6005-T5 aluminum with deeply serrated top surface.
   c. Ladder Mounting Bracket: 8-1/2 inch by 2 inch by 3 inch by 1/4 inch thick aluminum angle.
   d. Floor Brackets: Floor bracket at foot of each stringer, 3 by 2 by 1/4 inch.
   e. Finishes:
   f. Standard: Mill finish on aluminum ladder components.

~~C.~~5.

2.2 FASTENERS

A. General: Unless otherwise indicated, provide Type 316 stainless-steel fasteners.

B. Steel Bolts and Nuts: Regular hexagon-head bolts, ASTM A 307, Grade A (ASTM F 568M, Property Class 4.6); with hex nuts, ASTM A 563 (ASTM A 563M); and, where indicated, flat washers.

~~A.~~C. High-Strength Bolts, Nuts, and Washers: ASTM F 3125/F 3125M,Grade A325 (Grade A325M), Type 3, heavy-hex steel structural bolts; ASTM A 563, Grade DH3, (ASTM A 563M, Class 10S3) heavy-hex carbon-steel nuts; and where indicated, flat washers.

2.3 MISCELLANEOUS MATERIALS

A. Concrete: Comply with requirements in Section 033000 "Cast-in-Place Concrete" for normal-weight, air-entrained, concrete with a minimum 28-day compressive strength of 3000 psi.

B. Universal Shop Primer: Fast-curing, lead- and chromate-free, universal modified-alkyd primer complying with MPI#79 and compatible with topcoat.

C. Shop Primer for Galvanized Steel: Primer formulated for exterior use over zinc-coated metal and compatible with finish paint systems indicated.

D. Galvanizing Repair Paint: High-zinc-dust-content paint complying with SSPC-Paint 20 and compatible with paints specified to be used over it.

E. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187/D 1187M.

F. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107/C 1107M. Provide grout specifically recommended by manufacturer for interior and exterior applications.

~~A.~~G.

2.4 BOLLARD SLEEVES

A. Subject to compliance with specified requirements provide products by one of the following manufacturers:

1. Eagle Manufacturing Company
2. Encore Commercial Products
3. Ideal Shield.
4. Quick Switch

B. Domed decorative bollard sleeves with one or more 1 to 2-inch wide reflective stripes

1. Material: UV stabilized ¼-inch polyethylene thermoplastic
2. Size – to fit bollards
3. Color: selected by Architect from manufacturer's full range of standard colors (standard colors must include minimum 8 colors including gray)
4. Bollards will have one or two bands of reflective tape.

2.5 FABRICATION, GENERAL

A. Shop Assembly: Preassemble items in the shop to greatest extent possible. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.

B. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch Remove sharp or rough areas on exposed surfaces.

C. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.

D. Form exposed work with accurate angles and surfaces and straight edges.

E. Weld corners and seams continuously to comply with the following:

1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
2. Obtain fusion without undercut or overlap.
3. Remove welding flux immediately.

F. Fabricate seams and other connections that are exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.

G. Cut, reinforce, drill, and tap metal fabrications as indicated to receive finish hardware, screws, and similar items.

H. Provide for anchorage of type indicated; coordinate with supporting structure. Space anchoring devices to secure metal fabrications rigidly in place and to support indicated loads.

2.6 METAL BOLLARDS

A. Fabricate metal bollards from Schedule 80 steel pipe.

B. Prime bollards with primer specified in Section 099600 "High-Performance Coatings."

2.7 PIPE GUARDS

A. Fabricate pipe guards from steel shapes indicated.

B. Galvanize pipe guards.

C. Prime pipe guards with primer specified in Section 099600 "High-Performance Coatings."

2.8 LOOSE STEEL LINTELS

A. Fabricate loose steel lintels from steel angles and shapes of size indicated for openings and recesses in masonry walls and partitions at locations indicated. Fabricate in single lengths for

each opening unless otherwise indicated. Weld adjoining members together to form a single unit where indicated.

B. Size loose lintels to provide bearing length at each side of openings equal to 8 inches

C. Galvanize loose steel lintels located in exterior walls.

D. Prime loose steel lintels located in exterior walls with [primer specified in Section 099600 "High-Performance Coatings."

2.9 FINISHES, GENERAL

A. Finish metal fabrications after assembly.

2.10 STEEL FINISHES

A. Galvanizing: Hot-dip galvanize items as indicated to comply with ASTM A 153/A 153M for steel and iron hardware and with ASTM A 123/A 123M for other steel and iron products.

1. Do not quench or apply post galvanizing treatments that might interfere with paint adhesion.

B. Preparation for Shop Priming Galvanized Items: After galvanizing, thoroughly clean railings of grease, dirt, oil, flux, and other foreign matter, and treat with metallic phosphate process.

C. Shop prime steel items.

1. Shop prime with primers specified in Section 09 9600 "High-Performance Coatings"

~~1.~~2.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal fabrications. Set metal fabrications accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.

B. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations. Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections.

C. Field Welding: Comply with the following requirements:

1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.

2. Obtain fusion without undercut or overlap.
3. Remove welding flux immediately.
4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.

D. Fastening to In-Place Construction: Provide anchorage devices and fasteners where metal fabrications are required to be fastened to in-place construction. Provide threaded fasteners for use with concrete and masonry inserts, toggle bolts, through bolts, lag screws, wood screws, and other connectors.

E. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.

~~**3.2 INSTALLING PREFABRICATED BUILDING COLUMNS**~~

~~A. Install prefabricated building columns to comply with AISC 360, "Specifications for Structural Steel Buildings," and with requirements applicable to listing and labeling for fire-resistance rating indicated.~~

~~3.3~~3.2 INSTALLING METAL BOLLARDS

A. Fill bollards solidly with concrete, mounding top surface to shed water. Shop prime before filling with concrete and installing, inside and out.

~~3.4~~3.3 INSTALLING BOLLARD SLEEVES

A. Install immediately before substantial completion

~~3.5~~3.4 ADJUSTING AND CLEANING

A. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas. Paint uncoated and abraded areas with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.

B. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A 780/A 780M.

~~A.~~

END OF SECTION 05 5000

SECTION 05 5313 - BAR GRATINGS

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. Section includes metal bar gratings and metal frames and supports for gratings

1.3 COORDINATION

A. Coordinate installation of anchorages for gratings, grating frames, and supports. Furnish setting drawings, templates, and directions for installing anchorages

1.4 ACTION SUBMITTALS

A. Shop Drawings: Include plans, sections, details, and attachments to other work.

1.5 QUALITY ASSURANCE

A. Welding Qualifications: Qualify procedures and personnel according to the following:

1. AWS D1.6/D1.6M, "Structural Welding Code - Stainless Steel."

1.6 FIELD CONDITIONS

A. Field Measurements: Verify actual locations of walls and other construction contiguous with gratings by field measurements before fabrication.

PART 2 - PRODUCTS

2.1 METAL BAR GRATINGS

A. Metal Bar Grating Standards: ~~Comply with NAAMM MBG 531, "Metal Bar Grating Manual"~~ Basis of Design: McNICHOLS Bar Grating, Standard-Duty Welded, Rectangular Bar, GW-150, 19-W-4 Spacing, Stainless Steel, Type 304L, Mill Finish, 1-1/2" Height x 3/16" Thick Rectangular Bearing Bars, Spaced 1-3/16" on Center with 1" Clear Space Between Bearing Bars, Smooth Surface, Bearing Bars Run Parallel to Length of Panel, Cross Bars Spaced 4" on Center, 77% Open Area

2.2 FERROUS METALS

A. Stainless-Steel Sheet, Strip, Plate, and Flat Bars: ASTM A 240/A 240M, Type 316L

B. Stainless-Steel Bars and Shapes: ASTM A 276, Type 316L.

2.3 FASTENERS

A. General: provide Type 316 stainless-steel fasteners

2.4 FABRICATION

A. Shop Assembly: Fabricate grating sections in shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.

B. Cut, drill, and punch material cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.

C. Form from materials of size, thickness, and shapes indicated, but not less than that needed to support indicated loads.

D. Fit exposed connections accurately together to form hairline joints.

E. Welding: Comply with AWS recommendations and the following:

1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
2. Obtain fusion without undercut or overlap.
3. Remove welding flux immediately.

F. Provide for anchorage of type indicated; coordinate with supporting structure. Fabricate and space the anchoring devices to secure gratings, frames, and supports rigidly in place and to support indicated loads.

G. Removable Grating Sections: Fabricate with banding bars attached by welding to entire perimeter of each section. Include anchors and fasteners of type indicated or, if not indicated, as recommended by manufacturer for attaching to supports.

2.5 GRATING FRAMES AND SUPPORTS

A. Fabricate from metal shapes, plates, and bars of welded construction to sizes, shapes, and profiles indicated and as necessary to receive gratings. Miter and weld connections for perimeter angle frames. Cut, drill, and tap units to receive hardware and similar items.

1. Unless otherwise indicated, fabricate from same basic metal as gratings.

2. Equip units indicated to be cast into concrete or built into masonry with integrally welded anchors. Space anchors 24 inches o.c.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing gratings. Set units accurately in location, alignment, and elevation; measured from established lines and levels and free of rack.

B. Provide temporary bracing or anchors in formwork for items that are to be built into concrete.

C. Fit exposed connections accurately together to form hairline joints.

D. Attach toeplates to gratings by welding at locations indicated.

E. Field Welding: Comply with AWS recommendations and the following:

1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
2. Obtain fusion without undercut or overlap.
3. Remove welding flux immediately.

END OF SECTION 05 5313

SECTION 07 2100 - THERMAL INSULATION

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. Section Includes:

1. Extruded polystyrene rigid insulation below concrete slabs and at concrete foundation walls.
2. Exterior masonry cavity wall insulation.

B. Related Sections:

1. Section 03 3000 - Cast in Place Concrete
2. Section 31 2000 - Earth Moving

1.3 ACTION SUBMITTALS

A. Product Data: ~~Extruded polystyrene board insulation:~~ Submit manufacturer's specifications and installation instructions for each type of insulation. Include certifications and laboratory test reports as may be required to show compliance with these Specifications.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Protect insulation materials from physical damage and from deterioration due to moisture, soiling, and other sources. Store inside and in a dry location. Comply with manufacturer's written instructions for handling, storing, and protecting during installation.

B. Protect foam-plastic board insulation as follows:

1. Do not expose to sunlight except to necessary extent for period of installation and concealment.
2. Protect against ignition at all times. Do not deliver foam-plastic board materials to Project site until just before installation time.
3. Quickly complete installation and concealment of foam-plastic board insulation in each area of construction.

PART 2 - PRODUCTS

2.1 ~~POLYISOCYANURATE FOAM PLASTIC BOARD INSULATION~~ INSULATION BELOW CONCRETE SLABS ON GRADE AND AT FACES OF CONCRETE FOUNDATION WALLS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following,

1. ~~Carlisle Coatings & Waterproofing Inc~~
2. Dow Chemical Company (The)
3. ~~Firestone Building Products.~~
4. ~~GAF~~
5. Owens-Corning
6. Johns Manville

B. Extruded Closed Cell Polystyrene Insulation: ASTM C578, Types X, IV, VI and VII.

1. R-Value Per Inch: 5
2. Minimum Compressive Strength: 40 lbs per sq in.
3. Maximum Water Absorption: 0.1 percent by volume.
4. Thickness: 2”

2.2 EXTERIOR MASONRY CAVITY WALL INSULATION

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

1. Dow Chemical Company (The)
2. Owens-Corning
3. Johns Manville

B. Polyisocyanurate Board Insulation, Foil Faced: ASTM C1289, foil faced, Type I, Class 1.

1. Board Size: 48 x 96 inch
2. Board Thickness: 2 1/2" inches
3. Board Edges: Square
4. Facings: Silver/Opaque Foil
5. R-Value Per Inch: 6.0.
6. Water Absorption (ASTM C209): ASTM C209, 0.1 percent by volume
7. Water Vapor Transmission (ASTM E96): 0.05 perms
8. Compressive Strength (ASTM D1621): $\geq$ 16 psi
9. Flame Spread (ASTM E84): 4”: $\leq$ 25
10. Smoke Developed (ASTM E84): $\leq$ 450

PART 3 - EXECUTION

3.1 PREPARATION

A. Clean substrates of substances that are harmful to insulation, including removing projections capable of puncturing insulation or vapor retarders, or that interfere with insulation attachment.

3.2 INSTALLATION, GENERAL

A. Comply with insulation manufacturer's written instructions applicable to products and applications.

B. Install insulation that is undamaged, dry, and unsoiled and that has not been left exposed to ice, rain, or snow at any time.

C. Install insulation with manufacturer's R-value label exposed after insulation is installed.

D. Extend insulation to envelop entire area to be insulated. Fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.

E. Provide sizes to fit applications and selected from manufacturer's standard thicknesses, widths, and lengths. Apply single layer of insulation units unless multiple layers are otherwise shown or required to make up total thickness or to achieve R-value.

3.3 INSTALLATION OF FOUNDATION WALL INSULATION

A. Butt panels together for tight fit.

B. Anchor Installation: Install board insulation on concrete substrates by adhesively attached, spindle-type insulation anchors as follows:

1. Fasten insulation anchors to concrete substrates with insulation anchor adhesive according to anchor manufacturer's written instructions.
2. Space anchors according to insulation manufacturer's written instructions for insulation type, thickness, and application.
3. Apply insulation standoffs to each spindle to create cavity width indicated on Drawings between concrete substrate and insulation.
4. After adhesive has dried, install board insulation by pressing insulation into position over spindles and securing it tightly in place with insulation-retaining washers, taking care not to compress insulation.
5. Where insulation will not be covered by other building materials, apply capped washers to tips of spindles.

C. Adhesive Installation: Install with adhesive or press into tacky waterproofing or dampproofing according to manufacturer's written instructions.

3.4 INSTALLATION OF CAVITY-WALL INSULATION

A. Install pads of adhesive spaced approximately 24 inches (610 mm) o.c. both ways on inside face and as recommended by manufacturer.

1. Fit courses of insulation between wall ties and other obstructions, with edges butted tightly in both directions, and with faces flush.
2. Press units firmly against inside substrates.
3. Supplement adhesive attachment of insulation by securing boards with two-piece wall ties designed for this purpose and specified in Section 042000 "Unit Masonry."

3.5 PROTECTION

A. Protect installed insulation from damage due to harmful weather exposures, physical abuse, and other causes.

B. Provide temporary coverings or enclosures where insulation is subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.

END OF SECTION 07 2100

SECTION 07 5200 – SBS ROOFING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Iincludes:

1. Styrene-butadiene-styrene (SBS)-modified bituminous protected membrane roofing.
2. Cover Board
3. Roof insulation.

1.2 BASIS OF DESIGN:

A. The design basis of this section
B. Submit 3 sets of the following to the Owners Representative and receive written approval before ordering materials
C. is the Siplast, Inc., Paradiene 20TG/30FRTG system.

1. This is not intended to limit competition, and products of other Roofing System Manufacturers (RSM) may be submitted for approval.
2. Wherever the phrase “or as approved” is used in this section it means that materials, components and equipment may be proposed for work in lieu of those named. They will be considered acceptable if, in the opinion of the Owners Representative, they will perform the functions imposed by the general design and, if they meet the standards of the items named and the Manufacturer agrees in writing to the provisions of this section of the specifications.

1.3 SUBMITTALS

A. Samples.

1. Samples of materials to be used as part of the roofing system.
2. Current RSM technical literature pertaining to the installation of the roofing system.
2. Dimensioned roof plan, including defined “perimeter” and “corner “areas, and shop drawings bearing approval by the RSM. These, where applicable, should be prepared in conjunction with other Sections.
3. A letter from an authorized technical representative of the RSM, including as an attachments a Contractor submitted "Project Registration" form and specimen warranty, stating:

   a. The Contractor is an authorized applicator of the RSM’s warranted roofing systems.
   b. The RSM has reviewed and accepted the attached "Project Registration" form.
   c. The specified RSM warranty will be issued upon successful completion of the project.

B. Prior to the commencement of work the Contractor shall provide a resume for the Foreman and Project Manager assigned to the Project. If these individuals are replaced during the Project, resumes for their replacements shall also be submitted.

C. At the completion of the Project provide:

1. "As built" drawings showing the location of all projections and penetrations, and any modifications that were made.
2. RSM's printed recommendations for proper maintenance of the roofing system including recommended inspection frequencies, roof modification notification policies, temporary repair recommendations and leak reporting procedures.

1.4 QUALITY ASSURANCE

A. Roofing Installers must be authorized by the RSM to install the Roof System specified or approved.

1. Installer of the roofing system must have had at least 10 years experience in the application of the specified or approved roofing systems on projects of similar scope.
2. The Foreman, including any substitute or replacement Foreman, assigned to the Project must have a minimum of 10 years experience with both built-up and torch applied roofing membranes.
3. FM Global: Install system in accordance with FM Global 1-150 requirements. The roof system must be installed in strict accordance with RoofNAV #: 21856-49238-0.

B. RSM Qualifications

1. Company specializing in the manufacture of the materials specified or submitted for approval for not less than 10 years in the United States.
2. RSM shall agree to perform weekly inspections with direct trained personnel and conduct a final inspection upon Project completion.

C. Materials shall be the products of or be approved by the RSM.

1.5 WARRANTY:

A. Deliver to the Owner the RSM's 20-year labor and materials warranty. It shall cover all roofing system components. The warranty shall not be prorated nor shall it have any deductibles or limitation on coverage amount.

1. Warranty coverage shall meet the windspeed for the area (110 mph).
2. Neither the Warranty nor any attachment referenced in the Warranty shall impose record keeping obligations on the Owner.
3. The warranty shall contain no provisions that allow for post issuance cancellation based on failure of the warranted roof to conform to the RSM's technical specifications.

1.6 DELIVERY, STORAGE AND HANDLING

A. Packing and Shipping: Deliver materials in manufacturer's original, unopened containers and rolls with labels intact and legible. Deliver materials requiring fire resistance classification with labels attached and packaged as required by labeling service. Deliver materials in sufficient quantity to allow continuity of roofing installation.

B. Storage and Protection

1. Handle rolled goods so as to prevent damage to edge or ends. Select and operate material handling equipment without damaging existing construction or installed roofing.
2. Store insulation, roofing and related materials on clean, raised platform with weather-protective covering when stored outdoors. Factory wrappings are not considered

weather-protective coverings. Properly secure insulation to prevent blow-off. Store rolled goods on end. Provide continuous protection of materials against wetting and moisture absorption. Protect materials against damage by construction traffic. Manufacturers' wrappings do not constitute weather protective covering.

a. Comply with fire and safety regulations.
b. Store adhesives and sealants in secure, well-ventilated, watertight place. Do not leave unused materials on roof overnight or when roofing installation is not in progress.

3. Remove wet material from Site.

1.7 Project /Site Conditions

A. Environmental Conditions: Proceed with roofing installation only when weather conditions comply with RSM's recommended limitations, and when conditions permit installation to proceed in accordance with specified requirements and RSM's recommendations.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. This section is based principally on specified products manufactured by Siplast, Inc., Arkadelphia, Arkansas. Systems based on approved products supplied by other RSM's may be used.

B. Single Source - Maintain single source responsibility for performance of membrane system and comply with Manufacturer's warranty requirements.

1. Obtain SBS based roofing and flashing sheets, stripping plies, SBS adhesives, asphalt primers, asphalt mastics from a single RSM.
2. Obtain other components of the roofing system covered by Roofing System Manufacturer's Warranty from suppliers approved by the RSM.

2.2 Roof Insulation shall consist of flat and tapered polyisocyanurate ~~isocyanurate~~ with a waterproof gypsum overlay. Maximum size of insulation and overlay boards as delivered to jobsite shall be 4 feet X 4 feet. Two-layers of 2-inch flat polyisocyanurate insulation.

A. Tapered and flat stock polyisocyanurate ~~isocyanurate~~ insulation shall be 25 PSI, manufactured by Siplast, or as approved. The physical properties of the foam shall be:

Property	Test Method	Result
Water absorption	ASTM C209	<1% (foam only)
Dimensional Stability`	ASTM D2126	2% max (7 days (Length and Width)
Compressive Strength	ASTM D1621	25 PSI
Moisture vapor Trans	ASTM E96	<1 perm
Service temperature		-100F-250F
Flame Spread	ASTM E84	@25 (foam core only)

~~B. Gypsum sheathing overlay shall be 1/4 inch. Dens-Deck Prime Gypsum Roof Board, manufactured by Georgia Pacific Corporation: Atlanta, GA. Alternate overlays acceptable to the~~

~~RSM will be approved. Maximum size of insulation and overlay boards as delivered to jobsite shall be 4 feet X 4 feet.~~

~~C.~~B. Insulation adhesive: Siplast Parastik

2.3 SBS MINERAL SURFACED ROOFING.

A. Modified Bitumen Base Layer and Stripping Ply: Siplast Paradiene 20 TG (torch grade)

B. Modified Bitumen Top Layer: Siplast Paradiene 30 FRTG (torch grade, White)

2.4 ROOFING SYSTEM FLASHING

A. Flashing Membrane Assembly:

1. Metal-Clad Modified Bitumen Flashing Sheet: Siplast Veral Aluminum.
2. Modified Bitumen Flashing Sheet: Siplast Paradiene 40FRTG.
3. First Layer Flashing: Siplast Paradiene 20TG or approved equal
4. Stripping Ply: Siplast Paradiene 20 SA

B. Fluid Applied Flashing: Siplast Parapro 123.

2.5 BITUMINOUS CUTBACK MATERIALS

A. Primer: Siplast PA-1125 Asphalt Primer

B. Self-Adhereing Membrane Primer: Siplast TA-119

~~D.~~C. Mastic: Siplast PA-828

2.6 INSULATION

A. General: Preformed roof insulation boards manufactured[or approved] by roof membrane manufacturer,.

B. Polyisocyanurate Board Insulation: ASTM C 1289, Type II, Class 3, Grade 2, felt or glass-fiber mat facer on both major surfaces

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

   a. Atlas EPS; a Division of Atlas Roofing Corporation.
   b. Atlas Roofing Corporation.
   c. Carlisle SynTec Incorporated.
   d. CertainTeed Corporation.
   e. Firestone Building Products.
   f. GAF.
   g. Hunter Panels.
   h. Johns Manville; a Berkshire Hathaway company.

2. Compressive Strength: 20 psi min.
3. Size: 48 by 48 inches.
4. Thickness:

a. Base Layer: 2-1/2 inches .
b. Upper Layer: 2-inches

5. Provide tapered insulation where required to provide pitch shown on roof plan.

2.7 COVER BOARD

A. **Coverboard shall ½" thick HD Polyisocyanurate.** ~~Gypsum sheathing overlay shall be 1/4 inch. Dens-Deck Prime Gypsum Roof Board, manufactured by Georgia Pacific Corporation: Atlanta, GA. Alternate overlays acceptable to the RSM will be approved. Maximum size of insulation and overlay boards as delivered to jobsite shall be 4 feet X 4 feet~~

2.8 RELATED COMPONENTS

A. Sealants

1. Sealant: Siplast PS 209.
2. Butyl tape: shall be 1/8 inch thick X ½ inch wide Tremco 440 or as approved.

B. Mineral Granules: Siplast supplied mineral granules.
~~B.~~C. Insulation Adhesive: Siplast Para-Stik Insulation Adhesive.

~~C.~~D. Fasteners:

1. Wood to wood: Rawl: # 12 Perma-seal deck screws or as approved. Length shall be sufficient to achieve 1-inch penetration. Nails are not permitted.
2. Fasteners for securing wood nailers to steel angles: Dekfast #14
3. Fasteners for securing membrane to concrete or brick: RAWL: stainless steel Zamac Nailin® or as approved. Length shall be sufficient to achieve 1-inch embedment.

PART 3 - EXECUTION

3.1 GENERAL

These Specifications may limit the installation options from those generally acceptable to the RSM. These conditions shall also apply to any materials approved as an equal

These requirements include:

A. Application of the top layer of modified material may not be installed until

1. The first layer has been completed in its entirety.
2. The edging, drains and other flanged penetrations have been installed and stripped.
3. The first layer of roofing has been inspected and approved by both the Owners Representative and a technical representative of the RSM.

B. Apply Asphalt Bleed granules, regardless of width, at the time the top layer is installed. Work shall not proceed unless granules are on site.

C. Maximum width of flashing shall be the width of the roll.

3.2 SUBSTRATE PREPARATION

A. General

1. Assure surface is free of debris and standing water prior to final roof installation, mechanically scarify deck as necessary. Surface must meet manufacturer's requirements. Any deck repairs necessary shall be brought to the attention of the architect upon discovery.
2. Roofing shall not proceed if rain is forecast for any portion of the time that the roof covering will be removed. Maintain on hand on the roof level being worked, emergency tarpaulins or other covering materials in sufficient quantity to temporarily cover open areas on the roof in the event of unanticipated rainfall.

3.3 INSTALLATION

Although this Specification is based principally on products manufactured by Siplast, the requirements contained herein may be more stringent.

A. Comply with instructions and recommendations of roofing materials manufacturer for specified roofing system to ensure watertight installation in normal weather exposures and no deterioration in excess of manufacturer's published limitations.

1. Confinement of Materials: Do not allow fluid and plastic materials to spill or migrate beyond surfaces of intended application, or to flow into drains or conductors.

B. Insulation Installation: Comply with recommendations and instructions of SBS roofing system manufacturer and insulation manufacturer for handling and installation of insulation. Cut insulation to fit around all projections.

1. Multiple Layers: Stagger joints of each layer at least 12" in each Direction.
2. Secure all insulation layers and siliconized gypsum with specified adhesive over concrete deck areas.

    a. Entire Area
        i. Adhesive=3" on center beads (4'x4' board)

C. Installation of Roofing System: Install roofing system in strict accordance with manufacturer's recommendations and instructions, unless otherwise indicated. Thoroughly clean debris from surface of insulation prior to installation of roofing system. Install flashings in strict accordance with manufacturer's recommendations.

D. Flashing Installation: Generally follow Manufacturer's printed requirements and the instructions on the Drawing.

END OF SECTION 07 5200

SECTION 31 6613 – RIGID INCLUSION GROUND IMPROVEMENT

PART 1 - GENERAL REQUIREMENTS

1.01 DESCRIPTION

Work shall consist of designing, furnishing and installing Rigid Inclusion (RI) ground improvement to the lines and grades designated on the project foundation plans and as specified herein. RI elements shall be in a columnar-type configuration and shall be used for support of footing and slab-on-grade loads. RI elements shall be constructed by either augering a cavity or driving a hollow mandrel to the design depth and vertically ramming lifts of grouted aggregate or concrete using the specially designed tamper head and high-energy impact densification equipment to create the compacted aggregate pier or concrete element.

1.02 WORK INCLUDED

A. Provision of all equipment, material, labor, and supervision to design and install RI elements. Design shall rely on subsurface information presented in the project geotechnical report by GeoDesign, Inc. dated November 2, 2018. Survey layout of RI elements, spoil removal (as required), footing excavations, and footing/slab subgrade preparation following RI installation is not included.

B. The RI design and installation shall adhere to all methods and standards described in this Specification.

C. Drawings and General Provisions of the Contract, including General and Supplemental Conditions, and Division 1 Specifications, apply to the work in this specification.

1.03 APPROVED INSTALLERS

A. The RI Installer (the Installer) shall be approved by the Owner's Geotechnical Representative. Installers must submit documentation of their qualifications with their bids which strictly comply with Paragraphs 1.03.B and 1.05.A. The Owner's Geotechnical Representative is hereinafter referred to as "Geotechnical Representative".

B. Installers shall have a minimum of 5 years of experience with the installation of RI systems, completed at least 50 RI projects in Connecticut, and completed at least 10 RI projects in the State of Connecticut.

1.04 REFERENCE STANDARDS

A. Design

1. "Control of Settlement and Uplift of Structures Using Short Aggregate Piers," by Evert C. Lawton (Assoc. Prof., Dept. of Civil Eng., Univ. of Utah), Nathaniel S. Fox (President, Geopier Foundation Co., Inc.), and Richard L. Handy (Distinguished Prof. Emeritus, Iowa State Univ., Dept. of Civil Eng.), reprinted from *IN-SITU DEEP SOIL IMPROVEMENT, Proceedings of sessions sponsored by the Geotechnical Engineering Division/ASCE in conjunction with the ASCE National Convention held October 9-13, 1994, Atlanta, Georgia*.

2. "Settlement of Structures Supported on Marginal or Inadequate Soils Stiffened with Short Aggregate Piers," by Evert C. Lawton and Nathaniel S. Fox. *Geotechnical Special Publication No. 40: Vertical and Horizontal Deformations of Foundations and Embankments,* ASCE, 2, 962-974.

3. "Technical Bulletin No. 12, Proper Load Testing Procedures to Verify Adequate Design of Geopier-Supported Foundation Systems," by Kord Wissmann and W. Lake Carter, Geopier Foundation Company, Inc. ©2015.

B. Modulus Testing

1. ASTM D 1143 - Pile Load Test Procedures
2. ASTM D 1194 - Spread Footing Load Test

C. Materials and Inspection

1. ASTM D 1241 - Aggregate Quality
2. ASTM D 422 - Gradation of Soils

D. Where specifications and reference documents conflict, the RI Designer (the Designer) shall make the final determination of the applicable document.

1.05 CERTIFICATIONS AND SUBMITTALS

A. Qualifications – With reference to Paragraph 1.03.B, the Installer shall submit the following <u>with their proposal</u> to document/demonstrate the minimum experience requirements for this project.

1. Documentation verifying a minimum of 50 previous projects completed in Connecticut.

2. For the minimum 10 previous projects completed in the State of Connecticut, the Installer shall submit references with contact information for the Geotechnical Representative and General Contractor.

A. Design Submittal - The Installer shall submit detailed design calculations and construction drawings prepared by the Designer for review and approval by the Geotechnical Representative and the project Structural Engineer. All plans shall be sealed by a Professional Engineer licensed in the State of Connecticut. The submittal shall include grout/cement mix design as applicable.

B. Professional Liability Insurance - The Designer shall have Errors and Omissions design insurance for the work. The insurance policy should provide a minimum coverage of $2 million per occurrence.

C. Modulus Test Reports - A modulus test(s) shall be performed on a non-production RI element as required by the Designer to verify the design assumptions. The Installer shall furnish the General Contractor a description of the installation equipment, installation records, complete test data, analysis of the test data and verification of the design parameter values based on the modulus test results. The report shall be prepared under direction of a Registered Professional Engineer licensed in the State of Connecticut.

D. Daily RI Progress Reports - The Installer shall furnish a complete and accurate record of RI installation to the General Contractor. The record shall indicate the element location, length,

volume of grouted aggregate or concrete used or number of lifts, densification forces during installation, and final elevations or depths of the base and top of elements. The record shall also indicate the type and size of the installation equipment used, and the type of material used. The Installer shall immediately report any unusual conditions encountered during installation to the General Contractor, the Designer, and the Geotechnical Representative.

PART 2 - MATERIALS

2.01 GROUT/CEMENT

A. For grouted RI elements, grout shall consist of a homogeneous mixture of Type II Portland Cement and clean, potable water. Documentation for other additives shall be submitted for review.

PART 3 - DESIGN REQUIREMENTS

3.01 RI DESIGN

A. The RI system shall be designed in accordance with locally-accepted engineering practice and the methods described in Section 1 of these Specifications.

B. The design shall meet the following performance criteria:

Footings

*Maximum Allowable Bearing Pressure for Footings
Supported by RI Reinforced Soils 3,000 psf

Total Settlement for Footings: ≤ 1-inch

Differential Settlement of Adjacent Footings: ≤ ½-inch

*Note that the maximum allowable bearing pressure already includes a live load reduction. The Designer shall not assume or apply further live load reductions unless specifically approved by the structural engineer prior to submitting a bid proposal.

Slab-on-Grade Settlement of Slabs-on-Grade: ≤ 1-inch

C. If fully grouted/cemented elements (Rigid Inclusions) are proposed in lieu of ungrouted/uncemented or partially grouted/cemented RI elements, then a granular Footing Pad (or "Load Transfer Platform") shall be required below all footings and slabs to be supported by Rigid Inclusions. The system shall be designed and perform to limit penetration (punching) of ground improvement elements into the Footing Pad.

D. If any boring (or other exploration) with the proposed building footprint indicates an organic layer (peat or organic silt) and/or soft clay layer that is ≥ 3-feet-thick within the ground improvement zone, the RI design submittal for the slab-on-grade shall include a Finite Element Analysis (FEA) to demonstrate that the maximum bending moment and maximum shear stress at the midpoint of the most widely-spaced slab support RI elements are within tolerances

specified by the project Structural Engineer. For the FEA, the minimum RI stiffness modulus value shall be determined based on modulus testing (see Section 5.02). The stiffness modulus value shall be reduced exponentially for each foot of radial distance away from the edge of the RI element in accordance with a referenced industry-accepted standard(s).

E. The RI elements shall be designed using a stiffness modulus to be verified by the results of the modulus test described in Section 5.02.

3.02 DESIGN SUBMITTAL

A. The Installer shall submit detailed design calculations, construction drawings, and shop drawings, (the Design Submittal), for review and approval at least 2 week(s) prior to the beginning of construction.

B. The design information shall include, but not be limited to, element configurations, materials, capacity and spacing, details and design of Footing Pads (if Footing Pads are required), bearing capacity analysis, settlement analyses, explanation of soil properties, element installation termination criteria, embedment depth into the bearing stratum, and all other relevant information.

C. With reference to paragraph 5.02.C, the design calculations shall quantify the RI element's maximum design stress on an individual element (which attracts more stress than the surrounding matrix soil).

D. A detailed explanation of the design parameters for settlement calculations shall be included in the Design Submittal.

E. The quality control test program for the RI system, meeting the design requirements described herein, shall be submitted.

F. All calculations and drawings shall be prepared and sealed by a Professional Engineer licensed in the State of Connecticut.

G. Submittals shall be submitted electronically only unless otherwise required by specific submittal instructions.

PART 4 - EXECUTION

4.01 APPROVED INSTALLATION PROCEDURES

The following sections provide general criteria for the construction of the RI elements. Unless otherwise approved by the Designer, the installation method used for RI element construction shall be that as used in the construction of the successful modulus test. Displacement methods that do not generate auger spoils are required on this project to help minimize cost premiums associated with offsite soil disposal.

A. General

1. The Installer shall provide a qualified, <u>full-time</u>, <u>solely-dedicated</u>, quality control (QC) <u>person</u> on-site during the installation process. The QC person shall not be dual-purposed

as crew laborer or operator. Automated, electronic, and/or remote quality control will not be accepted as a replacement for the QC person. Refer to Section 5.01 for further detail.

2. At a minimum, RI elements must be designed and installed to fully-penetrate through the fill layers and into underlying natural sand. RI elements terminating within fill or organic soil layers will not be accepted, even if mandrel/probe resistance is demonstrated to be relatively high based on crowd testing or amperage build-up.

3. Vibration levels at existing buildings must be maintained below 2.0 inches per second.

B. RI elements installed using displacement installation methods.

1. Displacement RI systems shall be constructed by advancing a specially designed mandrel with a minimum 15 ton static force augmented by dynamic vertical ramming energy to the full design depth. The hollow-shaft mandrel, filled with grouted aggregate or concrete, is incrementally raised, permitting the grouted aggregate or concrete to be released into the cavity, and then lowered by vertically advancing and/or ramming to densify the grouted aggregate or concrete and force it laterally into the adjacent soil. The cycle of raising and lowering the mandrel is repeated to the top of RI element elevation. The cycle distance shall be determined by the Designer.

2. Special high-energy impact densification apparatus shall be employed to vertically densify the RI elements during installation of each constructed lift.

3. Densification shall be performed using a mandrel/tamper. The mandrel/tamper foot is required to adequately increase the lateral earth pressure in the matrix soil during installation.

4. Downward crowd pressure shall be applied to the mandrel during installation.

5. Pre-augering may be used to help the mandrel penetrate through relatively dense soil areas.

4.02 PLAN LOCATION AND ELEVATION OF RI ELEMENTS

The as-built center of each RI element shall be within 6 inches of the locations indicated on the plans.

4.03 REJECTED RI ELEMENTS

RI elements installed beyond the maximum allowable tolerances shall be abandoned and replaced with new elements, unless the Designer approves the condition or provides other remedial measures. All material and labor required to replace rejected elements shall be provided at no additional cost to the Owner, unless the cause of rejection is due to an obstruction or mislocation.

PART 5 - QUALITY CONTROL

5.01 QUALITY CONTROL TECHNICIAN

The Installer shall have a qualified, full-time, solely-dedicated, quality control (QC) person to verify and report all installation procedures. The Installer shall immediately report any unusual

conditions encountered during installation to the Designer, the General Contractor, and to the observing Geotechnical Representative. The quality control procedures shall include the preparation of RI Progress Reports completed during each day of installation containing the following information:

A. Footing and RI element location.
B. Pre-auger diameter and soil conditions encountered during drilling (if required).
C. RI element length.
D. Planned and actual RI element elevations at the top and bottom of the element.
E. Average lift thickness of each RI element.
F. Volume of grout or concrete used in each element.
G. Documentation of any unusual conditions encountered.
H. Type and size of densification equipment used.

5.02 SINGLE-ELEMENT RI MODULUS TEST(S)

A minimum of one single-element RI Modulus Test shall be performed at a location agreed upon by the Designer and the Geotechnical Representative to verify or modify the RI design. The modulus tests shall be of the type and installed in a manner specified herein.

A. Modulus test procedures shall utilize appropriate portions of ASTM D 1143 and ASTM D 1194 and comply with Technical Bulletin No. 12 (Wissmann and Carter, 2015).

B. The test plate/cap shall have the same diameter as the RI element design diameter and shall not extend beyond the edge of the RI element and over the matrix soil.

C. With reference to Technical Bulletin No. 12 (Wissmann and Carter, 2015), the test element shall be tested to a load equal to the element area times at least 150 percent of the RI element's maximum design stress (not allowable bearing pressure for footings) to demonstrate that the element exhibits safe response during service loading. The RI element's maximum design stress is the maximum stress on the individual element (which attracts more stress than the surrounding matrix soil) and is typically at least 3 to 5 times the allowable bearing pressure for footings. Single-element modulus tests that are proposed to be loaded as a function of allowable bearing pressure are not considered standard practice and will not be accepted since the allowable bearing pressure is often only a fraction of the RI element's maximum design stress. Modulus tests that are proposed to be loaded as a function of allowable bearing pressure shall be performed per Paragraph 5.02.I.

D. A telltale shall be installed at the bottom of the test element so that bottom-of-element deflections may be determined. For ungrouted/uncemented RI elements, acceptable performance is indicated when the bottom of the element deflection is no more than 30% of the top of element deflection at the design stress level.

E. ASTM D-1143 general test procedures shall be used as a guide to establishing load increments, load increment duration, and load decrements. As a minimum, the following loading increments, decrements and duration shall be used.

Increment	Approximate Load (percent design)	Minimum Duration (min)	Maximum Duration (min)
Seat	< 9	0	N/A
1	17	15	60

2	33	15	60
3	50	15	60
4	67	15	60
5	83	15	60
6	100	15	60
7	117	15	60
8	133	60	120
9	150	15	60
10	167	15	60
11	183	15	60
12	200	15	60
13	100	N/A	N/A
14	66	N/A	N/A
15	33	N/A	N/A
16	0	N/A	N/A

F. With the exception of the load increment representing approximately 117% of the RI element maximum design stress, all load increments shall be held for a minimum of 15 minutes. Loads are then maintained until the rate of deflection reduces to 0.01 inch per hour or for the maximum of 1 hour, whichever is occurs first.

G. Creep Test - The load increment that represents approximately 133% of the RI element maximum design stress shall be held for a minimum of 15 minutes. Loads are then maintained until the rate of deflection reduces to 0.01 inch per hour or for the maximum of 4 hours, whichever is occurs first.

H. A seating load equal to 5 percent of the total load shall be applied to the loaded steel plate prior to application of load increments and prior to measurement of deflections to compensate for surficial disturbance.

I. Single-element modulus tests that are proposed to be loaded as a function of allowable bearing pressure are not considered standard practice and will not be accepted. Modulus tests that are proposed to be loaded as a function of allowable bearing pressure must consist of full-scale spread footing load tests that include a test footing supported by a minimum of three RI elements and having a RI area-replacement ratio ($Area_{RIs}/Area_{Footing}$) that is representative of the smallest area replacement ratio used in the RI design. The test spread footing shall be loaded to at least 200 percent of the allowable bearing pressure to demonstrate that the RI-supported footing exhibits safe response during service loading.

5.03 BOTTOM STABILIZATION TESTING (BSTS) / CROWD STABILIZATION TESTING (CSTS)

Bottom stabilization testing (BSTs) or Crowd stabilization testing (CSTs) shall be performed by the Quality Control Technician during the installation of the modulus test element. Additional testing as required by the Designer shall be performed on selected production RI elements to compare results with the modulus test element.

PART 6 - OWNER'S QUALITY ASSURANCE

6.01 OWNER'S INDEPENDENT QUALITY ASSURANCE

The Installer shall provide full-time Quality Control monitoring of RI construction activities. The Owner is responsible for retaining their observing Geotechnical Representative to provide Quality Assurance services.

6.02 RESPONSIBILITIES OF THE OWNER'S INDEPENDENT QUALITY ASSURANCE

A. The Geotechnical Representative shall monitor the modulus test element installation and testing. The Installer shall provide and install all dial indicators and other measuring devices.

B. The Geotechnical Representative shall monitor the installation of RI elements to verify that the production installation practices are similar to those used during the installation of the modulus test element(s).

C. With reference to Paragraph 4.01.A.5, the Geotechnical Representative shall monitor vibrations as necessary and immediately report to the Installer and General Contractor if specified tolerances are exceeded.

D. The Geotechnical Representative shall report any discrepancies to the Installer and General Contractor immediately.

E. The Geotechnical Representative shall observe the excavation, compaction and placement of the foundations as described in Section 7.05.

PART 7 - RESPONSIBILITIES OF THE GENERAL CONTRACTOR

7.01 SITE PREPARATION AND PROTECTION

A. The General Contractor shall locate and protect underground and aboveground utilities and other structures from damage during installation of the RI elements.

B. Ground elevations and bottom of footing elevations shall be provided to the Installer in sufficient detail to estimate installation depth elevations to within 3 inches.

C. The General Contractor will provide site access to the Installer, after site preparation in the area has been completed. A flat and stable working pad subgrade shall be established and maintained by the General Contractor to provide wet weather protection of the subgrade and to provide access for efficient operation of the RI installation. Preparation of a flat and stable working pad may include placement of crushed stone and geotextile fabric. Any excavation or backfilling that occurs for working pad preparation shall be in accordance with the Designer's submittal.

D. Prior to, during and following RI installation, the General Contractor shall provide positive drainage to protect the site from wet weather and surface ponding of water.

E. If spoils are generated by RI installation, spoil removal from the RI work area in a timely manner to prevent interruption of RI installation is required.

7.02 RI LAYOUT

The location of individual RI elements shall be marked in the field using flagged and numbered whiskers at locations shown on the drawings.

7.03 EXCAVATIONS FOR OBSTRUCTIONS

A. Should any obstruction be encountered during RI installation, the General Contractor shall be responsible for promptly removing such obstruction or the element shall be relocated if possible. Obstructions include, but are not limited to, boulders, timbers, concrete, granite blocks, utilities, etc., which shall prevent placing the elements to the required depth or shall cause the RI element to drift from the required location.

B. Dense natural rock or weathered rock layers shall not be deemed obstructions, and RI elements may be terminated short of design lengths on such materials.

7.04 UTILITY EXCAVATIONS

The General Contractor shall coordinate all excavations made subsequent to RI installations so that excavations do not encroach on the elements as shown in the RI construction drawings. Protection of completed RI elements is the responsibility of the General Contractor. In the event that excavations are required in close proximity to the installed RI elements, the General Contractor shall contact the Designer immediately to develop construction solutions to minimize impacts on the installed RI elements.

7.05 FOOTING AND SLAB SUBGRADE PREPARATION

A. Excavation and subgrade preparation of all footing and slab subgrades shall be the responsibility of the General Contractor and performed in conformance with the Project Specifications and RI design submittal.

B. Excavations will expose the tops of RI elements and shall be made in a workman-like manner that protects the subgrade until structural fill or concrete placement. Procedures and equipment shall be selected to avoid subgrade/RI element disturbance and exposure to water.

C. All excavations for footing bottoms supported by RI elements shall be prepared in the following manner by the General Contractor. Recommended procedures for achieving these goals are to:

1. Limit over-excavation below the bottom of the footing to 6-inches (including disturbance from the teeth of the excavation equipment).

2. Compaction of surface soil shall be prepared using a motorized impact compactor (“Wacker Packer,” “Jumping Jack,” or similar). Sled-type tamping devices shall only be used in granular soils and when approved by the Designer. Loose or soft surficial soil over the entire footing bottom shall be recompacted or removed, respectively.

3. Place footing concrete immediately after footing excavation is made and approved, preferably the same day as the excavation. Footing concrete must be placed on the same day if the footing is bearing on moisture-sensitive soils. If same day placement of footing concrete is not possible, open excavations shall be protected from surface water accumulation. A lean concrete mud-mat may be used to accomplish this. Other methods must be pre-approved by the Designer.

D. The following criteria shall apply, and a written inspection report sealed by the project Geotechnical Representative shall be furnished to the Installer to confirm:

1. That water has not been allowed to pond in the footing excavation at any time. Ponded water may soften the unconfined matrix soil between and around the RI elements, and may have detrimental effects on the supporting capability of the RI reinforced subgrade.
2. A granular Footing Pad shall be required below all footings and slabs to be supported by Rigid Inclusions. The Footing Pad shall be designed by the Designer and shall be 6-inches-thick.
3. That all RI elements designed for each footing have been exposed in the footing excavation.
4. That immediately before footing construction, the tops of RI elements exposed in each footing excavation have been inspected and recompacted as necessary with mechanical compaction equipment.
5. That no excavations (elevator, etc) have been made after installation of RI elements within the excavation limits described in the RI construction drawings, without the written approval of the Installer or Designer.

E. Failure to provide the above inspection and certification by the Geotechnical Representative, which is beyond the responsibility of the Installer, may void any written or implied warranty on the performance of the RI system.

PART 8 - PAYMENT

8.01 METHOD OF MEASUREMENT

A. Payment shall cover one mobilization, one modulus test, preparation of RI plans and specifications, installation of RI elements, and demobilization. Excavation of unsuitable materials and obstructions by others, delays, re-engineering, added modulus tests, added RI elements, and added mobilization/demobilization as documented by the Geotechnical Representative and approved by the Owner or General Contractor, shall be paid for under separate pay items.

END OF SECTION 31 6613

GNHWPCA
Protecting the Environment
Greater New Haven Water Pollution Control Authority
260 East Street New Haven, CT 06511
203.466.5280 p 203 772.1564 f www.gnhwpca.com

PRE-BID MEETING
GREATER NEW HAVEN WATER POLLUTION CONTROL AUTHORITY
Collections Maintenance Facility
GNHWPCA Project Number: SSF 2018-01
Meeting Held : Thursday, October 6, 2022

Minutes

I. **Project Team**

a. **GNHWPCA**

i.	**Joseph Megale**	**Deputy Director of Operations**	**203-466-5280x357**
ii.	**Charlie Biggs**	**Maintenance Administrator**	**203-466-5280 x245**
iii.	**Pete Santoro**	**Project Engineer**	**203-466-5280 x341**
iv.	**Rick Hurlburt**	**Superintendent of Sewers**	**203-466-5263**

b. **CWA**

i.	**Chris Williams**	**Architect**	**203-776-0184**
ii.	**Dan Hanisko**		**203-776-0184**

II. PROJECT DESCRIPTION

- Background
- Site Work
- Building

III. PROJECT SCHEDULE

- Questions Due By: ~~October 19, 2022~~ October 28, 2022
- Bid Opening ~~October 26, 2022~~ November 16,2022
- Anticipated Notice to Proceed: ~~December 15, 2022~~ -Mid January 2023
- Time to Complete: 450 days

IV. CONSTRUCTION

- Permits –
  - Architect made application
  - **Contractor required to pay permit Fees**

- Hours of work
  - GNH Staff Hours 8-4

- Office Trailer
  - Architech/Owner use only
  - Clean and leave in condition as found.

- Allowance for off -site disposal of Soil

V. BIDS

- Must purchase Project Specifications and Standard Specifications to Bid
  - Purchase at 260 East St, New Haven - Bridget Buckley 203-466-4113

- Return BID Package Forms
- Include Bid Bond
- Acknowledge all Addendums
- If Bid opening is Virtual, you will be sent a TEAMS invite
  - Not required to be present, Results will be sent to all Bidders

VI. OPEN ISSUES / QUESTIONS

- GNHWPCA – ALL QUESTIONS IN WRITING BY ~~October 19, 2022~~ October 28
- Response will be by Addendum to all Bidders

VII Attendee List Attached

GNHWPCA
Protecting the Environment

SSF 2018-01
Collections Maintenance Facility
Pre-Bid Attendance
Thursday, October 6, 2022 @ 10:30 AM
Sign-In Sheet

NAME (Please Print)	SIGNATURE	COMPANY	Phone	EMAIL
Joseph Megale		GNHWPCA	203 836 1740	Jmegale.gnhwpca.com
Charlie Briggs		"	203-410-3488	cbriggs@gnhwpca.com
Chris Williams		CWA	203-530-4235	cwilliams@cwarchitects.com
Rick Hurlburt		GNHWPCA	203-376-5831	rhurlburt@gnhwpca.com
DAN HANISKO		CWA	203-715-5821	dhanisko@cwarch.testsite.com
Ed McCormick		EBI	203-395-2011	John@ebibuilders.com
Ken Procino		MAJOR OAK / Sunrise	203-767-1729	KPROCINO@MAJOR-OAK.COM
James Nenninger		Boston Construction	203 234 2353	jnenninger@bostonconstruction.com
Jonathan Prete		A. Prete Construction	203 996 3453	J Prete @ A Prete.com
CHRIS MALERBA		SUMMIT MASONRY	203.996.9980	CMALERBA@SUMMIT-MASONRY.COM
Tyler Fries		Camputaro	203 887 7522	TFries@camputaroandson.com

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BID RFI LOG

GNHWPCA
COLLECTIONS MAINTENANCE FACILITY

RFI#	Status (open/ closed)	Dwg/Spec Reference	RFI from	Date Issued	Question	Response - New responses are in RED lettering. Open items are shaded.	Date Answered	Answered by
1	Closed		RDI Equipment	9/26/22	Does the GNHWPCA anticipate any vechicle lifts to be included in the solicitation?	No	10/21/2022	GNHWPCA
2	Closed		Epifano Builders	10/11/22	Is the GC allowed to utilize the on site office trailer? If so, is there a csost for the power or rental?	No	10/21/2022	GNHWPCA
3	Closed		Epifano Builders	10/11/22	Can power from the office trailer or the Supplemental Carbon building be used for the project?	Temp power from trailer or Carbon Building is acceptable, limited to (4) four 120 volt/20 amp circuit. The Contractor is responsible for all connections and removals.	10/21/2022	GNHWPCA
4	Closed		Epifano Builders	10/11/22	Is there on-site water for the project at the office trailer or Supplemental Carbon building?	Hose bibbs are availble at the supplemental carbon bldg and a yard Hydrant is located next to the Office Trailer.	10/21/2022	GNHWPCA
5	Closed	08 1113	Epifano Builders	10/11/22	Please provide a vendor & series for the "large-missle test" glazed openings.	This is a manufacturer's requirement regarding opening requirements. It can be deleted.	11/1/2022	CWA
6	Closed		Banton Construction	10/12/22	Please confirm that Builder's Risk is not required for this project	Not required. Insurance defined in 107-6, page 58-60.	10/21/2022	GNHWPCA
7	Closed		A.Prete Construction	10/13/22	What are the liquation Damages?	Please refer to the spec. It is $500.00/day. Time for completion is 450 days from the NTP issued by the GNHWPCA.	10/21/2022	GNHWPCA
8	Closed		A.Prete Construction	10/13/22	What are the specifications for the electrical panels and transformer? What are the enclosure ratings?	NEMA-3R (GE, Sq-D or Eaton)	10/21/2022	EDG
9	Closed		A.Prete Construction	10/13/22	What are the panels schedules and circuit quantities for the electrical panels? Are the electrical panels to have main circuit breakers?	See Items # 5 & 10- SE101 SE 101 shows the electrical panels with main circuit breakers.	10/21/2022	EDG
10	Closed		A.Prete Construction	10/13/22	As the ceiling appears to be precast, what are the mounting requirements for light fixtures, etc?	See Electrical Drawings and RCP. Everything is surface mounted.	11/1/2022	EDG
11	Closed		A.Prete Construction	10/13/22	Are all electrical boxes, covers, etc. within the interior of the building to be NEMA 3R rated?	YES	10/21/2022	EDG
12	Closed		A.Prete Construction	10/13/22	What is the time line or schedule for this project?	We anticipate to Provide a Notice of Award within 30 days of the Bid Date and a Notice to Proceed within 60 days of the Bid Date. Time for Completion will be 450 Days from Notice to Proceed.	10/21/2022	GNHWPCA
13	Closed	S300; 6 & 7	Epifano Builders	10/14/22	Detail 6&7/S300 show trench angle to be 5/16" x 2" x 2" galvanized; and positioned at the outside corner. However details A2, B2, C2/A503 show two different angle sizes, stainless stell and positioned at the inside corner. Please clarify angle size, material and position.	MHAI: Please follow structural angle size and orientation.	11/1/2022	MHAI
14	Open	07 1616	Epifano Builders	10/14/22	Confirm that Crystaline Waterproofing is required only at CMU walls as shown on dwg A312 and not required with CIP concrete?	CONFIRMED	10/21/2022	
15	Open	A5;B5/A503	Epifano Builders	10/14/22	a. Bollard footings are shown at 3" x 3" will be encroach the adjacent precast CIP piers, b. The bottom of Bollard footings is shown at 5'-6" which is lower than the continous footing at 4'-6". 1. Can the bollard BOF be raised? 2. Can bollard be resized to accomodate CIP pier footprint?	The bottom of bollard footing has been revised to coordinate with the CIP pier footings.	11/1/2022	CWA

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16	Closed	C3/D5/A501	A.Prete Construction	10/14/22	Steel lintels; F&I by misc metals, Furnished by misc metals, installed by masonry? F&I by masonry?	Who furnishes misc metal is up to the GC and not the design team or owner.	10/21/2022	CWA
17	Closed	A4/A501	A.Prete Construction	10/14/22	Angles at louver sills; F&I by misc metals? Furnished by misc metals, installed by masonry? F&I by masonry?	Who furnishes misc metal is up to the GC and not the design team or owner.	10/21/2022	CWA
18	Closed	A4/A501	A.Prete Construction	10/14/22	Angles clips for top of masonry walls; F&I by misc metals? Furnished by misc metals, installed by masonry? F&I by masonry?	Who furnishes misc metal is up to the GC and not the design team or owner.	10/21/2022	CWA
19	Closed		A.Prete Construction	10/14/22	Precast loose linels at door/louver opernings; Furnished by precast sub installed by masonry? Please confirm.	Who furnishes precast loose lintels is up to the GC and not the design team or owner.	10/21/2022	CWA
20	Closed		Major Oak Builders	10/16/22	Please advise if all of the materials for the precast would need to be "domestically produced products" or is the specification open to use products manufactured outside of the USA?	No	10/21/2022	GNHWPCA
21	Closed		Major Oak Builders	10/16/22	Please advise / confirm that the oil / sand separator does not require the soil improvements – grouted aggregate piers.	Given the location of the oil/sand separator and the available subsurface information, the oil/sand separator will be underlain by significant thickness of existing fill. These materials are not suitable for support of the oil/sand separator. As such, the oil/sand separator should be supported on grouted aggregate piers.	10/21/2022	Geotech
22	Closed		Major Oak Builders	10/16/22	Please provide the skylight sizing.	Skylight opening sizes are indicated in specification section 08 6200 UNIT SKYLIGHTS.	10/21/2022	CWA
23	Closed	S400	Major Oak Builders	10/16/22	Drawing S400, detail 8, states to refer to the geotechnical report for the retaining wall and weep requirements. This information could jot be located in the Geotech. Please advise.	See ADDENDUM 2 . Detail C3/A503	11/1/2022	Geotech
24	Closed	P101	Major Oak Builders	10/16/22	Please provide the floor drain specification	See ADDENDUM 2-Sheet P101	11/1/2022	EDG
25	Closed		Major Oak Builders	10/16/22	Article 9 of the contract (specification section 01 0000), states the requirement of a 25% maintenance bond. Please confirm that this bond is required for this project.	Required	10/21/2022	GNHWPCA
26	Closed		Major Oak Builders	10/16/22	Please advise on the thickness of the topping slab on the precast planks.	2" per note 1 on drawing S112.	11/1/2022	MHAI
27	Closed	31 6613	Major Oak Builders	10/16/22	Specification Section 31 6613-1.03 states that rigid inclusion ground improvement installers must be prequalified by the Geotechnical Engineer. Please provide a list of the already approved installers from the Geotechnical Engineer.	Qualified installers include: Keller 30 Martin Street Cumberland RI 02864 Brian Eastmen 401-334-2565	10/21/2022	CWA
						Geopier Philip Dunaj 860-209-5978 pdunaj@geopier.com	10/21/2022	

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	Closed					All ground improvement contractors submitting bids must comply with Specification 1.03.B (i.e., 5 years of experience installing rigid inclusions, completion of a minimum of 50 rigid inclusion projects, and completion of a minimum of 10 rigid inclusion projects in Connecticut). Based on our experience with previous projects, we anticipate that Keller and Helical Drilling will meet the requirements included therein. Regardless, installers should submit documentation of their experience installing rigid inclusions to be considered for prequalification.	11/1/2022	Geotech
28	Closed		Major Oak Builders	10/16/22	In reference to the geotechnical report – page 10 – Soil re-use and disposal: Please confirm that the soil from the Borings B1/B2/B3 can be disposed of at the onsite WPCA landfill area, with the understanding that the GCs will include a $20k allowance for any materials that cannot be disposed at this location.	Soil can be stored on site. It is expected that Soils will be able to be reused on-site. If unsuitable soils are encountered as determined by the Engineer then there is an allowance for off-site disposal.	10/21/2022	GNHWPCA
29	Closed		Epifano Builders	10/17/22	Please provide a foundation and slab loading plan for Rigid Inclusion ground improvments.	MHAI: Per the general notes the slab on grade loading is 40PSF plus a 45,500 axle load. The foundation loading should be considered as the foundation size multiplied by the allowable bearing pressure of 1.5 Tons/SF as noted on drawing S111.	11/1/2022	MHAI
30	Closed	31 6613	Epifano Builders	10/17/22	Section 31 6613 states installer to be approved 2 weeks prior to bid opening. Geotechnical Report states Geo design can assist with provided a Geotech specialty contractor. Please provide a list of design team pre-approved Geotech contractors for the work in section 31 6613	This note will be removed from specification section. However the identity and qualifications of the specialty contractor must be submitted with the bid and approved by the Geotechnical Engineer.	10/21/2022	Geotech
31	Closed		Major Oak Builders	10/17/22	Please provide a specification for the hose bibb.	See ADDENDUM 2-P101.	10/21/2022	EDG
32	Closed	31 6613	Epifano Builders	10/18/22	Part 7.03 Excavations for Obstructions A states the GC is responsible for all costs associated with underground obstructions. Futher, paragraph A provides examples of obstructions. Please confirm the GC is not responsible for any such costs which are not shown within the bid documents. Underground obstructions not shown within the bid documents shall be considered unforseen obstructions. The GC shall be compensated for potential unforeseen obstructions.	Per Specification 7.03, the GC must assume responsibility for removing underground obstructions encountered during rigid inclusion installation. Specification 7.03 further states that obstructions include, but are not limited to, boulders, timbers, concrete, granite blocks, utilities, etc., which shall prevent placing the elements to the required depth or shall cause the RI element to drift from the required location. Based on conversations with rigid inclusion installers, we anticipate that obstructions of approximately 12 inches or greater in diameter will prevent placing the elements to the required depth or cause the elements to drift from the required location.	11/1/2022	Geotech
33	Closed	5/A300	Epifano Builders	10/18/22	Should the trench grating detail also occur around the perimeter of the sump put? Is there a ladder, railing bollards required at this location?	No. See ADDENDUM 2. SHEET A/503. A ladder has been added.	11/1/2022	CWA

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34	Closed	31 6613	Epifano Builders	10/18/22	Can the design team provide the column baseplate loads, wall loads, and slab load? For the slab load, can the design team provide an appropriate wheel pressure for the type of trucks to be used in this facility? Are there any specific pieces of equipment/bins/racks/etc. the bear on the slab that may require direct support by ground improvement? Confirm all ground improvement element must be fully grouted through the organic soil layer.	Per the general notes the slab on grade loading is 40PSF plus a 45,500 axle load. The foundation loading should be considered as the foundation size multiplied by the allowable bearing pressure of 1.5 Tons/SF as noted on drawing S111.	11/1/2022	MHAI
35	Closed		Major Oak Builders	10/19/22	Please see the information attached information from Norwalk Marine Contractors, as they would like to become pre-approved to use their timber inclusion piles for the ground improvement system.	Per our geotechnical report and specifications, the proposed structure should be constructed on a subgrade of in situ soils improved using rigid inclusions. Timber inclusion piles are not recommended. Consistent with Section 1.03, all contractors should provide documentation of at least 5 years experience with rigid inclusion projects, 50 completed rigid inclusion projects, and at least 10 completed rigid inclusion projects in the state of Connecticut.	11/1/2022	Geotech
36	Closed		A.Prete Construction	10/19/22	Please provide a door hardware schedule	The door hardware schedule is included in the specification section 08 7100 Door Hardware.	10/21/2022	CWA
37	Closed		A.Prete Construction	10/19/22	Please confirm all surplus soil will be disposed of at the project location and any additional testing will be by the Owner.	Yes Surplus Soil will be stored on Site. Testing will be by the Owner.	10/21/2022	GNHWPCA
38	Closed	AS111	Epifano Builders	10/19/22	Please provide a connection detail showing the relationship between the CMU and precast columns.	See ADDENDUM 2-Sheet A501.	11/1/2022	CWA
39	Closed		Lawrence Brunoli, Inc.	10/19/22	Does the GNHWPCA have a preference Bid Bond Form? Is an AIA form acceptable?	Yes AIA is Acceptable	10/21/2022	GNHWPCA
40	Closed		Banton Construction	10/19/22	1. The Geotech report is not conclusive if dewatering activities will require treating the groundwater. Please advise if we are to include contaminated groundwater handling in the bid.	Geotech-Discharge back to the treatment planty. See table 2, ground water sampling results.	10/21/2022	GNHWPCA
41	Closed		Banton Construction	10/19/22	2. Please confirm the stated duration of calendar days for construction. The "Itemized Proposal" contained in the specifications states 270 calendar days.	The time for Completion is 450 Calendar days.	10/21/2022	GNHWPCA
42	Closed		Banton Construction	10/19/22	3. Several specification sections state unit pricing as the method of measurement for payment. Please confirm this project is a lump sum with no unit pricing.	This is a Lump Sum Bid	10/21/2022	GNHWPCA
43	Closed		Banton Construction	10/19/22	4. Please confirm that AIA A310 will be an acceptable Bid Bond Form.	Yes AIA A310 is acceptable.	10/21/2022	GNHWPCA
44	Closed		Epifano Builders	10/19/22	Can pro-press be used instead of soldered joints?	Pro-press is acceptable.	10/21/2022	GNHWPCA
45	Closed		Epifano Builders	10/19/22	No sizes are given for underground soil piping.	See ADDENDUM 2-Sheet P102	11/1/2022	EDG
46	Closed		Epifano Builders	10/19/22	What are the specs for the 1-1/2" hose bibb heat trace?	See ADDENDUM 2-Sheet P101	11/1/2022	EDG

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47	Closed		Epifano Builders	10/19/22	Can grouted rammed aggregate pier (GAP) that **"fizzles"** the grout sp there is clean stone at the bottom of the footing elevation be performed?	Based on conversations with a local ground improvement contractor, we understand that "fizzling" refers to terminating grout placement some distance above the organic soil layer. The top of the organic layer varies in the borings and will vary between boring locations. If the rigid inclusion contractor can demonstrate a method to determine with enough precision the top of the organic layer, we have no objection to terminating the grouted portion of the rigid inclusion some distance above the organic layer. The rigid inclusion designer must demonstrate that the grout is installed to a safe distance above the top of the organic layer. This may require additional explorations by the designer.	11/1/2022	Geotech
48	Closed		Epifano Builders	10/19/22	There is a gas line which seems to dead end above the replacement sanitary line (see attached sketch in red). Is this gas live or abandoned?	The gas line is live and supplies a GNHWPCA building. It is not above the sanitary sewer line but adjacent to it.	11/1/2022	GNHWPCA
49	Closed		Epifano Builders	10/19/22	The drainage line connected to the existing sanitary (see attached sketch in green)?	Please clarify what the question is.	10/21/2022	CWA
50	Closed		Epifano Builders	10/19/22	Please provide vertical pier doweling pier dowel sizing. Reference 6/S600.	Pier detail P1 has been added to the revised drawings dated 11/1/22	11/1/2022	MHAI
51	Closed		Epifano Builders	10/20/22	Are excavated spoils to remain on site? If so, please provide a permanent location.	SEE ADDENDUM 2-SHEET C101. Location Shown	11/1/2022	CWA
52	Closed		Epifano Builders	10/20/22	Please provide finish grades from the building to the street.	SEE ADDENDUM 2-SHEET C102-Added notes and Detail B2/C102. Spot elevations are shown on the Site Plan. The site shall be evenly graded to the street line/top of curb and driveway cut at a constant slope. Provide any borrowed fill necessary to fill any voids or depressions.	11/1/2022	CWA
53	Closed		Epifano Builders	10/20/22	Is the anti tracking pad to be removed at the end of the project?	YES, However the stone can be used in the subbase and as fill to grade the site.	11/1/2022	CWA
54	Closed	03 3000	Epifano Builders	10/21/22	03 3000, 2.9A describes Joint Filler Strips. None are shown on drawings. Please provide location if required? If so, is a sealant required on top?	See ADDENDUM 2-Detail B2/C102: Apron detail.	11/1/2022	CWA
55	Closed		Epifano Builders	10/21/22	03 3000, 2.9B describes bonding agent. Is this for repairs only? Is the bond agent required on Precast Plank to receive topping slab?	MHAI: The bonding agent is required as noted in the concrete specification. A bonding agent is not required between the precast plank and the topping slab,	11/1/2022	MHAI
56	Closed		Epifano Builders	10/25/22	The CL5 foundation wall shows a haunch built in above the trench footing/SOG, reference A3/A311, A2/A503. There is no haunch shown in Sctions 6/S300, 7/S300, A2/A311. Please clarify is CL6 foundation haunch is required.	MHAI: There is a haunch shown in sections 6 and 7 on S300.	11/1/2022	MHAI
57	Closed	31 6613	Epifano Builders	10/25/22	Section 31 6613-1.03 states rigid inclusion improvement installers must be prequalified by the Geotechnical Engineer. Would the following (2) contractors be allowed to bid this project? 1. CNC Foundations, Inc. 2. Subsurface Constructors, Inc.	All ground improvement contractors submitting bids must comply with Specification 1.03.B. Namely, they should have a minimum of 5 years experience with the installation of rigid inclusion systems, completed at least 50 rigid inclusion projects, and completed at least 10 rigid inclusion projects in the State of Connecticut. Installers should submit documentation of the above experience to be considered for prequalification.	11/1/2022	Geotech

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COLLECTIONS MAINTENANCE FACILITY

RFI#	Status (open/ closed)	Dwg/Spec Reference	RFI from	Date Issued	Question	Response - New responses are in RED lettering. Open items are shaded.	Date Answered	Answered by
58	Closed	S700	Epifano Builders	10/26/22	FOUNDATION Note 2/S700 states 'All footings are to rest on Undisturbed Natural Soil....or Controlled Compacted Fill' The Geotechnical Engineering Report 'Footing Design Criteria', page 5 states 'A working matt/bearing pad of at least 6" of compacted Gravel Fill or Crushed Stone should be provided on the footing bearing surfaces'.	Consistent with the recommendations presented in the geotechnical report, a working mat/bearing pad of at least 6 inches of compacted Gravel Fill or Crushed Stone should be provided on the footing bearing surfaces	11/1/2022	Geotech
	Closed	S700	Epifano Builders	10/26/22	FOUNDATION Note 2/S700 states 'All footings are to rest on Undisturbed Natural Soil....or Controlled Compacted Fill' The Geotechnical Engineering Report 'Footing Design Criteria', page 5 states 'A working matt/bearing pad of at least 6" of compacted Gravel Fill or Crushed Stone should be provided on the footing bearing surfaces'.	This note has been updated on the revised drawings dated 11/1/22	11/1/2022	MHAI
59	Closed		A.Prete Construction	10/27/22	The below company would like to be approved from the Geotech engineer as a ground improvement installer Subsurface Constructors, Inc. 8919 New Falls Road, Suite 15 Levittown, PA 19054 (609) 577-2724	See response to RFI No. 57.	11/1/2022	Geotech