RE-USE WATER PUMP STATION

TO SERVE SPIRIT AEROSYSTEMS

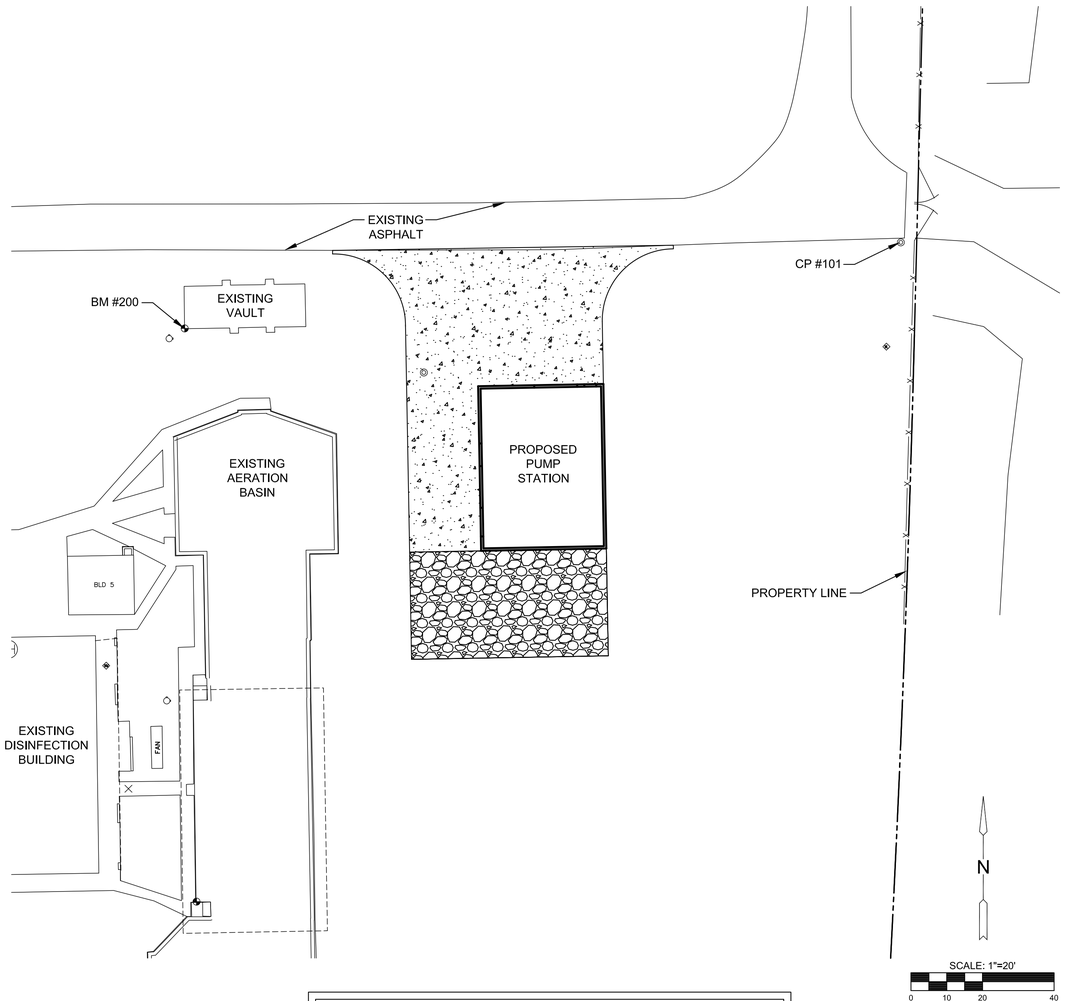
PROJECT NO. 468-85112

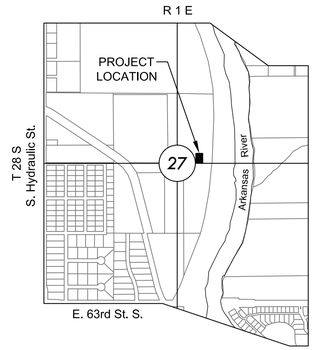
O.C.A. NO. 620784

THE CITY OF WICHITA, KANSAS

GARY JANZEN, P.E. - CITY ENGINEER

INDEX TO DRAWINGS





VICINITY MAP

No Scale

PROJECT CONTROL & INFORMATION

CONTROL:

Pt. No.	North	East	Elev	Description
101	1649787.611	1658833.460	1266.440	5/8" rebar w/ red MKEC CP ID cap
102	1650586.569	1658732.288	1266.260	5/8" rebar w/ red MKEC CP ID cap

Bench Marks

BM 200 - Chiseled square on S.W. corner of concrete vault for out flow pipe

N=1649763.546

E=1658633.307

Elev.=1264.490 (NAVD 88)

BM 201 - Chiseled square on the retaining wall at an inlet grate on the N. side of rock sprinkler pond #1

N=1650489.185

E=1658648.512

Elev.=1270.695 (NAVD 88)

DATUM:

1) The Project Horizontal Datum is based on the NAD83, Kansas State Plane Coordinate System, South Zone, (US Survey Feet Definition), with a Combined Adjustment Factor (CAF) of 1.000120014.
All coordinate and dimensions shown on these plans are modified to Ground values.
The following equations can be used for conversion:
Ground Coordinates to State Plane Coordinates = Ground x 1/CAF
State Plane Coordinates to Ground Coordinates = State Plane x CAF
2) The Vertical Datum used is NAVD88.

UTILITIES:

The underground utilities shown hereon were marked in the field by the utility owners in response to Kansas One Call Ticket Number:16059879, 16059923, 16059950, 16061251, 16061269, 16061294, 16066685, 16066718, 16081169, 16082890, 16082924, 16086816, 16086842, 16093649, 16093667, and 16105347. The surveyor makes no guarantee that the underground utilities shown comprise all such utilities in the area, either in service or abandoned. The surveyor further does not warrant that the underground utilities shown are in the exact location indicated although he does certify that they are located as accurately as possible from information available. The surveyor has not physically located the underground utilities.

GENERAL NOTES:

1. ALL MEASUREMENTS AND QUANTITIES SHOWN IN THE PLANS AND BID DOCUMENTS ARE FOR INFORMATION ONLY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING ALL QUANTITIES.
2. THIS PROJECT IS A LUMP SUM BID. UNIT PRICES WILL ONLY BE USED SHOULD THE PROJECT SCOPE OF WORK BE INCREASED OR DECREASED.

BRYCE L. BARKIS LICENSED 4-19-16 19755 KANSAS PROFESSIONAL ENGINEER

MKEC
Wichita, KS • 316-684-9600

CITY OF WICHITA, KANSAS

RE-USE WATER PUMP STATION

TO SERVE SPIRIT AEROSYSTEMS

TITLE SHEET

PROJECT NO.	468-85112
DATE	04/18/16
SCALE	AS NOTED

DESIGNED	DRAWN	CHECKED
BLB	MCW	MAB

NO.	REVISION	DATE
0	ISSUED FOR CONSTRUCTION	04/18/16

SHEET NO.

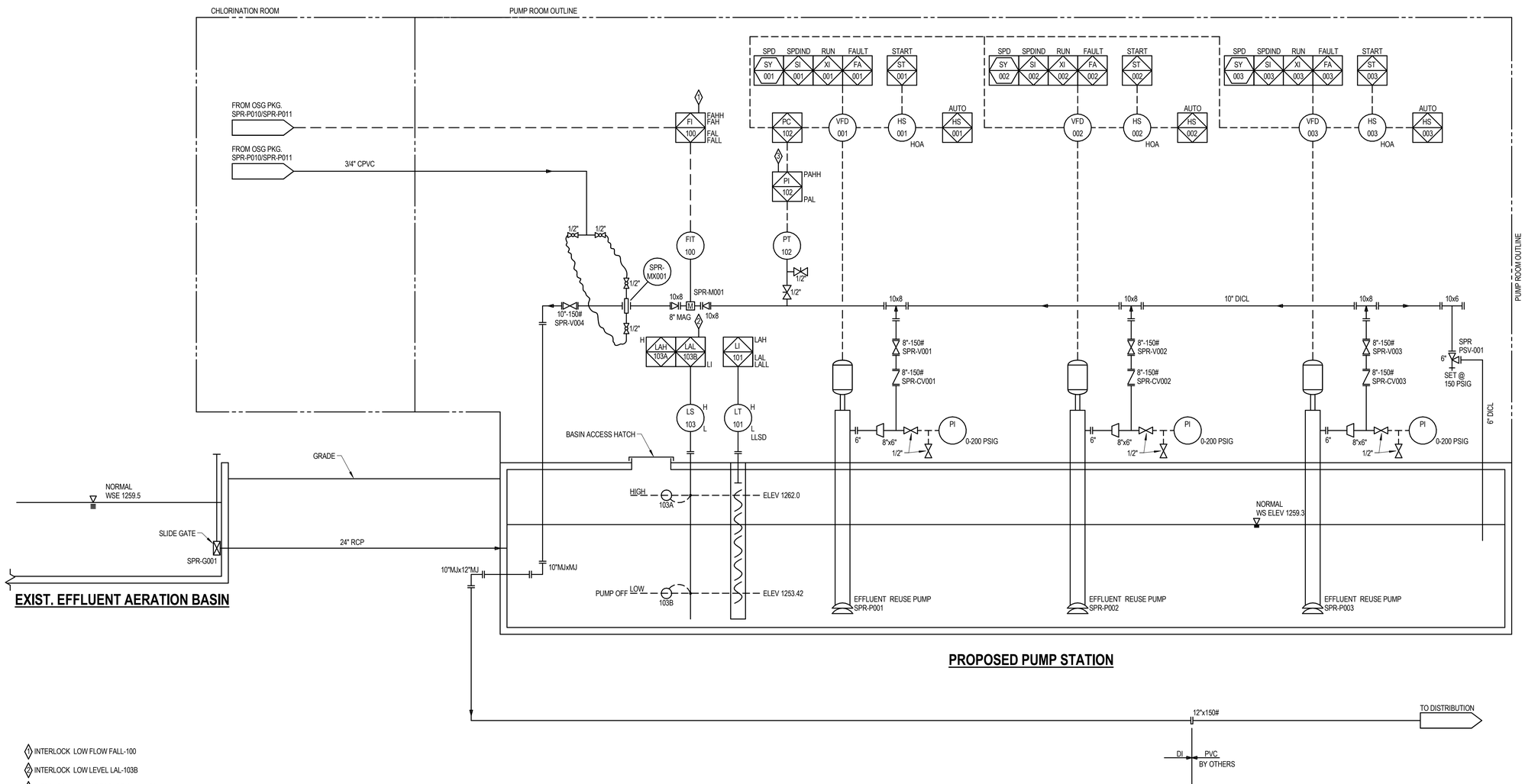
G1.0

4/22/2016 9:17:23 AM

SPR-P001
EFFLUENT REUSE PUMP
700 GPM @ 330 FT TDH
100HP @ 0-1800 RPM

SPR-P002
EFFLUENT REUSE PUMP
700 GPM @ 330 FT TDH
100 HP @ 0-1800 RPM

SPR-P003
EFFLUENT REUSE PUMP
700 GPM @ 330 FT TDH
100 HP @ 0-1800 RPM



EXIST. EFFLUENT AERATION BASIN

PROPOSED PUMP STATION

◇1 INTERLOCK LOW FLOW FALL-100
◇2 INTERLOCK LOW LEVEL LAL-103B
◇3 INTERLOCK HIGH PRESSURE PAHH-102

1 PIPING AND INSTRUMENTATION DIAGRAM

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CITY OF WICHITA, KANSAS

RE-USE WATER PUMP STATION

TO SERVE SPIRT AEROSYSTEMS

PIPING AND INST. DIAGRAM

PROJECT NO.	468-85112
DATE	04/18/16
SCALE	AS NOTED

DESIGNED	DRAWN	CHECKED
DAS	JA	KTS

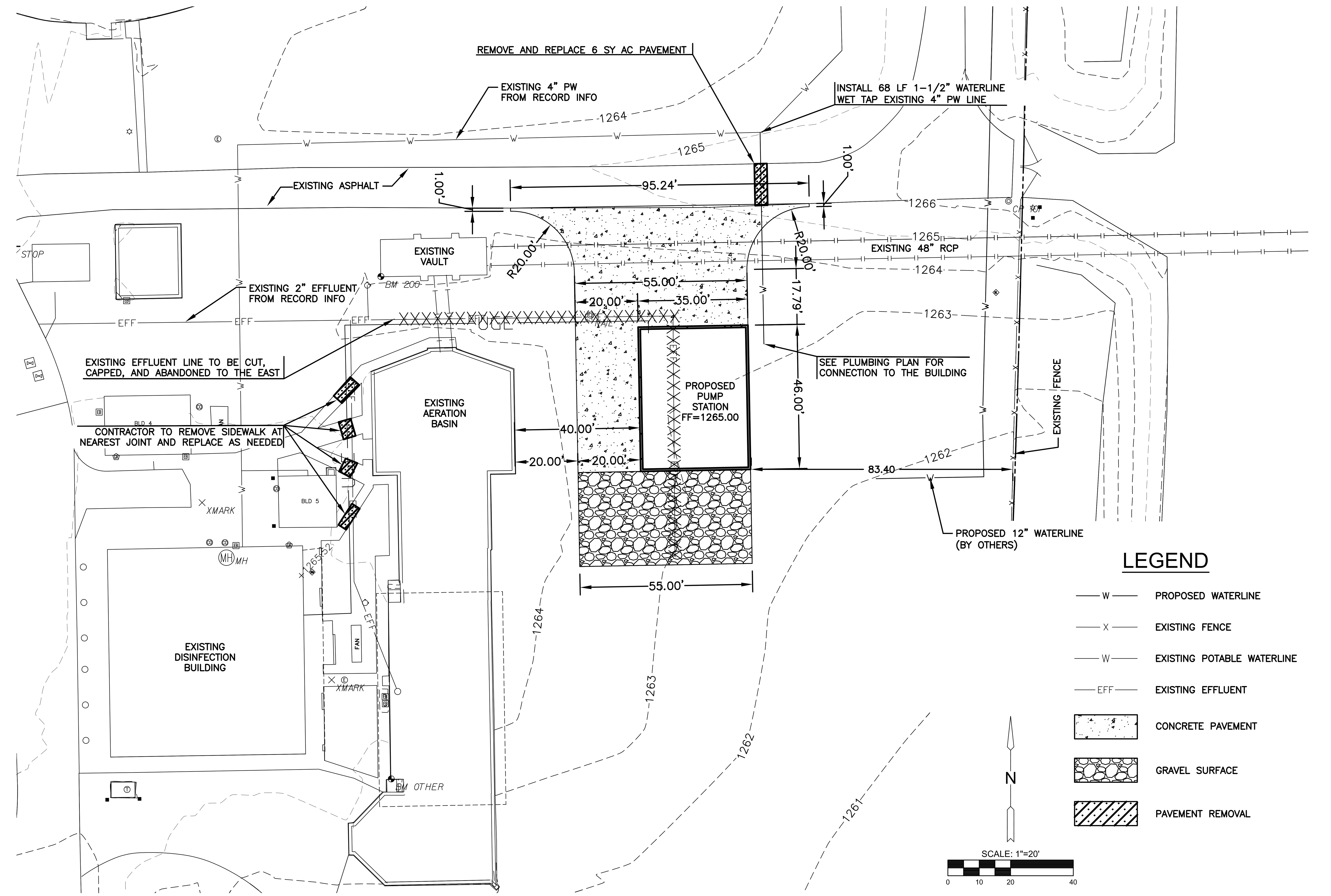
NO.	REVISION	DATE
0	ISSUED FOR CONSTRUCTION	04/18/16

KEITH T. SCARBERRY LICENSED 21496 KANSAS PROFESSIONAL ENGINEER 04/18/2016

SHEET NO.

G2.0

C:\Users\jaraiza\Documents\15823 - CCW WATER PUMP - MEP_jaraiza.rvt



GENERAL NOTES

1. UNLESS SHOWN OR STATED OTHERWISE ON THESE DRAWINGS, MATERIALS AND CONSTRUCTION SHALL BE IN ACCORDANCE WITH CITY OF WICHITA STANDARD SPECIFICATIONS.
2. THE CONTRACTOR SHALL FIELD VERIFY LOCATIONS AND ELEVATIONS OF EXISTING UTILITIES AND TOPOGRAPHIC FEATURES PRIOR TO THE COMMENCEMENT OF SITE WORK. THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER OF DISCREPANCIES OR VARIATIONS FROM THE PLANS.
3. ALL SPOT ELEVATIONS REPRESENT FINISHED SURFACE OR FLOWLINE GRADES UNLESS OTHERWISE NOTED.
4. ALL EXISTING UTILITY LOCATIONS SHOWN ARE APPROXIMATE. CONTACT "ONE CALL" (1-800-344-7233, LOCAL 687-2470) FOR UTILITY LOCATIONS, SEVENTY-TWO (72) HOURS PRIOR TO EXCAVATION.

AT&T (TELCOMMUNICATIONS)	316-268-2008
KANSAS GAS SERVICE(GAS)	316-831-5664
WESTAR ENERGY (ELECTRIC)	316-261-6320
COX COMMUNICATIONS (CABLE)	316-262-0661
CITY OF WICHITA WATER & SEWER	316-262-6000

5. BUILDING DIMENSIONS REFER TO THE OUTSIDE FACE OF BUILDING UNLESS OTHERWISE NOTED.
6. TRAFFIC CONTROL SIGNAGE (IF APPLICABLE) SHALL CONFORM TO THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES AND CITY OF WICHITA STANDARDS. THE CONTRACTOR SHALL FURNISH AND MAINTAIN ALL NECESSARY BARRICADES, WARNING SIGNS, LIGHTS AND FLAGMEN AS WARRANTED. COST SHALL BE SUBSIDIARY TO THE PROJECT.
7. THE CONTRACTOR SHALL ABIDE BY ALL OSHA, FEDERAL, STATE, AND LOCAL REGULATIONS WHEN OPERATING CRANES, BOOMS, HOISTS, ETC. IN CLOSE PROXIMITY TO OVERHEAD ELECTRIC LINES.
8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PRESERVING PROPERTY IRONS. THE CONTRACTOR WILL BE REQUIRED TO RE-ESTABLISH ANY PROPERTY IRONS WHICH ARE DAMAGED OR DESTROYED BY HIS CONSTRUCTION OPERATIONS. SUCH IRONS SHALL BE RE-ESTABLISHED BY A LICENSED LAND SURVEYOR IN ACCORDANCE WITH STATE LAWS.
9. ALL EXISTING AND PROPOSED EROSION CONTROL MEASURES SHALL BE INSTALLED PER THE STORMWATER POLLUTION PREVENTION PLAN (SWPPP) AND INFORMATION PROVIDED IN THESE PLANS AND MAINTAINED THROUGHOUT CONSTRUCTION BY THE CONTRACTOR UNTIL THE PROJECT IS COMPLETED AND THE EROSION CONTROL MEASURES ARE NO LONGER NEEDED. THE CONTRACTOR SHALL BE REQUIRED TO COMPLY WITH MAINTENANCE AND/OR REPLACEMENT OF EROSION CONTROL MEASURES AS DETERMINED BY THE ENGINEER UNTIL PROJECT IS ACCEPTED OR THE EROSION CONTROL MEASURES ARE NO LONGER NEEDED. COST SHALL BE SUBSIDIARY TO THE PROJECT.
10. THE CONTRACTOR SHALL SUBMIT PROPOSED SEQUENCE OF CONSTRUCTION TO OWNER REPRESENTATIVE FOR APPROVAL BEFORE BEGINNING CONSTRUCTION.
11. COST OF EXCAVATION, HAULING, AND DUMPING OF EXCESS EXCAVATION SHALL BE SUBSIDIARY TO THE PROJECT.
12. ALL EXISTING UTILITIES AND SERVICE LINES SHALL BE KEPT IN SERVICE AT ALL TIMES DURING CONSTRUCTION OF THIS PROJECT, UNLESS OTHERWISE AUTHORIZED BY THE OWNER'S REPRESENTATIVE.
13. THE CONTRACTOR SHALL PAY ALL PERMIT & OTHER ASSOCIATED FEES REQUIRED BY LOCAL, STATE, & FEDERAL AGENCIES.

GRADING NOTES

1. MKEC ENGINEERING, INC. HAS PREPARED THESE PLANS IN ACCORDANCE WITH THE NATIONAL POLLUTION DISCHARGE ELIMINATION SYSTEM (NPDES) REQUIREMENTS.
2. A MIN. 6 INCH LAYER OF TOPSOIL SHALL BE STRIPPED IN ALL AREAS OF CUT AND FILL. THE CONTRACTOR SHALL STOCKPILE AND RE-SPREAD TOPSOIL PER GRADING PLAN ON ALL DISTURBED AREAS TO BE SODDED, SEEDED, AND LANDSCAPED. STOCKPILE LOCATION SHALL BE APPROVED BY OWNER'S REPRESENTATIVE.
3. THE FINISHED GRADE INDICATES THE SURFACE ELEVATION AFTER THE LAYER OF TOPSOIL HAS BEEN PLACED. IN CASES WHERE GRADING IS DIRECTED UNDER TREE DRIP LINES, NO TOPSOIL STRIPPING SHALL BE PERFORMED WITHIN THESE AREAS.
4. THIS IS DESIGN GRADING. ALL GRADES SHALL BE CONTOURED SMOOTHLY WITH GENTLE ROUNDING/SHAPING OF ALL AFFECTED LAND SURFACES. ABRUPT TRANSITIONS AT THE TOP OF SLOPES WHERE PROPOSED GRADES MEET EXISTING ARE NOT ACCEPTABLE. SURVEY STAKES ARE FOR GENERAL GRADING PURPOSES ONLY. NOT ALL SLOPES ARE CONSTANT AND THEREFORE THE GRADING PLANS SHALL BE REFERRED TO FOR FINAL GRADE SHAPING. THE GRADING SHALL BE APPROVED BY THE OWNER'S REPRESENTATIVE PRIOR TO THE ADDITION OF THE TOPSOIL LAYER.
5. THE SITE GRADING OPERATIONS, WHEN COMPLETED, SHALL RESULT IN ALL AREAS BEING GRADED TO "PLAN SUBGRADE ELEVATION". THIS "PLAN SUBGRADE ELEVATION" SHALL BE CONSISTENT WITH THE GEOTECHNICAL REPORT FOR BUILDING AND PAVEMENT AREAS. THE "PLAN SUBGRADE ELEVATION" IN THE PAVED AREAS SHALL BE DETERMINED BY CHECKING THE PAVEMENT SECTION DETAILS AND REFERRING TO PAVING PLAN FOR LOCATIONS AND LIMITS OF VARIOUS PAVEMENT SECTIONS.
6. RUBBLE FROM THE REMOVAL OF MISCELLANEOUS STRUCTURES OR PAVEMENT REMOVAL WHICH IS TO BE WASTED SHALL BE DISPOSED OF ON SITES TO BE PROVIDED BY THE CONTRACTOR. THESE SITES SHALL BE APPROVED BY THE OWNER'S REPRESENTATIVE AS TO SUITABILITY, APPEARANCE AND SITE LOCATION. LOCATIONS THAT, IN THE OPINION OF THE OWNER'S REPRESENTATIVE, WILL LEAVE AN UNSIGHTLY APPEARANCE WILL NOT BE APPROVED. ALL DISPOSAL SITES MUST BE APPROVED BY THE KANSAS DEPARTMENT OF HEALTH AND ENVIRONMENT. MATERIAL EITHER STOCKPILED OR DISPOSED OF IN A FLOOD PLAIN WOULD REQUIRE A KANSAS STATE BOARD OF AGRICULTURE PERMIT. ANY MATERIAL DUMPED IN WATERS OF THE UNITED STATES OR WETLANDS IS SUBJECT TO U.S. CORPS OF ENGINEERS PERMITTING REGULATIONS. ANY MATERIAL BURIED OR STOCKPILED BEYOND APPROVED CONSTRUCTION LIMITS WOULD REQUIRE ADDITIONAL ARCHAEOLOGICAL INVESTIGATIONS UNLESS BURIED IN A PREVIOUSLY APPROVED BORROW LOCATION.
7. CONTRACTOR SHALL STOCKPILE EXCESS EXCAVATION ONSITE AT A LOCATION TO BE DETERMINED BY THE CITY.
8. ALL DISTURBED AREAS TO RECEIVE SEEDING. SEE EROSION CONTROL/SEEDING NOTES.

EROSION CONTROL/SEEDING NOTES

1. EROSION CONTROL IS TO MEET ALL FEDERAL, STATE, COUNTY AND LOCAL CODE STANDARDS.
2. CONTRACTOR SHALL COMPLETE STABILIZATION WHEN SOIL DISTURBING ACTIVITIES CEASE TEMPORARILY AND WILL NOT RESUME FOR 14 DAYS OR MORE.
3. SEEDING: ALL AREAS DISTURBED WITH EXCEPTION OF PROPOSED STREET PAVEMENT SHALL BE SEEDED (COST SUBSIDIARY TO PROJECT) AND FERTILIZED AS FOLLOWS:
   - ANNUAL RYE @ 150 LBS./ACRE
   - 10-20-10 @ 150 LBS./ACRE
4. ALL AREAS SHALL BE FINE GRADED AND SURFACE SHALL BE FREE FROM STICKS, SMALL STONES, AND OTHER EXTRANEOUS MATERIALS.
5. CONTRACTOR SHALL PROVIDE EROSION PROTECTION THROUGHOUT PROJECT CONSTRUCTION. THE PLAN PROVIDED HERE IS FOR FINAL PROTECTION, VARIOUS PHASES OF THIS PLAN SHALL BE IMPLEMENTED OR MODIFIED TO CONTROL EROSION. MODIFICATIONS OF THE PLAN SHALL BE APPROVED BY THE OWNER'S REPRESENTATIVE.
6. ALL SEED SHALL BE DISTRIBUTED WITH AN ACCEPTABLE DRILL INTENDED FOR SUCH OPERATIONS, OR OTHER EQUIPMENT APPROVED BY THE OWNER'S REPRESENTATIVE. SEEDING DEPTH SHALL BE 1/4 OF AN INCH.
7. ALL SEEDED AREAS SHALL BE IMMEDIATELY MULCHED WITH PRAIRIE HAY AT 2 TONS/ACRE. ANCHOR MULCH BY CRIMPING INTO TOPSOIL WITH SUITABLE MECHANICAL EQUIPMENT.
8. THE CONTRACTOR(S) ARE RESPONSIBLE FOR EROSION CONTROL IN CONFORMATION WITH THE APPROVED DRAWINGS UNTIL PROJECT COMPLETION.

PAVING NOTES

1. REFER TO PAVING PLAN & DIMENSIONING PLAN FOR CURRENT HORIZONTAL DIMENSIONS AND LAYOUT.
2. CONTRACTOR SHALL SUBMIT JOINTING PLAN TO ENGINEER FOR APPROVAL PRIOR TO CONSTRUCTION.
3. IN GENERAL, JOINT SPACING SHALL NOT EXCEED 24 TIMES THE CONCRETE THICKNESS AND NOT GREATER THAN 15'.

UTILITY NOTES

1. UNLESS OTHERWISE NOTED ON THE PLANS, ALL CIVIL SITE CONSTRUCTION SHALL BE IN ACCORDANCE WITH CITY OF WICHITA STANDARD SPECIFICATIONS FOR CONSTRUCTION.
2. CONTRACTOR TO VERIFY DEPTH & LOCATION OF EXISTING UTILITIES PRIOR TO CONSTRUCTION.
3. UNLESS OTHERWISE NOTED IN PROJECT SPECIFICATIONS PIPE MATERIALS SHALL BE AS FOLLOWS:
   WATER LINE
   2-1/2" OR SMALLER -ASTM D2241 SDR26
   3" OR LARGER -C900 OR C905 PVC
   NOTE: 4" OR LARGER WATERLINE MAY BE DUCTILE IRON PIPE IN ACCORDANCE WITH CITY OF WICHITA STANDARD SPECIFICATIONS.
4. PAVEMENT REMOVAL MAY BE REQUIRED TO ACCOMMODATE UTILITY SERVICE INSTALLATION. PAVEMENT TO BE SAWCUT ITS ENTIRE DEPTH PRIOR TO REMOVAL. PAVEMENT AND ANY SUBGRADE REMOVAL SHALL BE REPLACED IN KIND SO AS TO MATCH EXISTING INSTALLATION.
5. IN THE CASE OF CONCRETE PAVEMENT REMOVAL. IF REMOVAL IS WITHIN 3' OF AN EXISTING JOINT, THEN PAVEMENT SHALL BE REMOVED TO THE NEAREST JOINT. MATCH JOINT PATTERN OF EXISTING PAVEMENT. JOINTS SHALL BE SEALED.
6. INSTALLATION, BEDDING, & TESTING OF UTILITY INSTALLATIONS SHALL BE AS PER CITY OF WICHITA STANDARD SPECIFICATIONS.
7. UTILITY PIPE LENGTHS ARE PROVIDED FOR INFORMATION ONLY. CONTRACTOR TO VERIFY ACTUAL LENGTHS OF PIPE REQUIRED PRIOR TO BIDDING & INSTALLING UTILITY PIPE LINES.
8. UTILITY CONTRACTOR TO COORDINATE BUILDING CONNECTION POINTS WITH PLUMBING PLAN AND BUILDING CONTRACTOR.
9. CONTRACTOR IS RESPONSIBLE FOR DETERMINING ALL NECESSARY PIPE FITTINGS NEEDED FOR DOMESTIC WATER SERVICE LINES TO THE BUILDINGS.

TRENCH BACKFILL

1. SAND, FLUSH & VIBRATE SHALL BE USED FOR ALL TRENCHES UNDER VEHICULAR PAVEMENT.

BRYCE L. BARKUS LICENSED 4-18-16 19755 KANSAS PROFESSIONAL ENGINEER

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RE-USE WATER PUMP STATION

CITY OF WICHITA, KANSAS

TO SERVE SPIRIT AEROSYSTEMS

SITE PLAN

PROJECT NO.	468-85112
DATE	04/18/16
SCALE	1"=20'

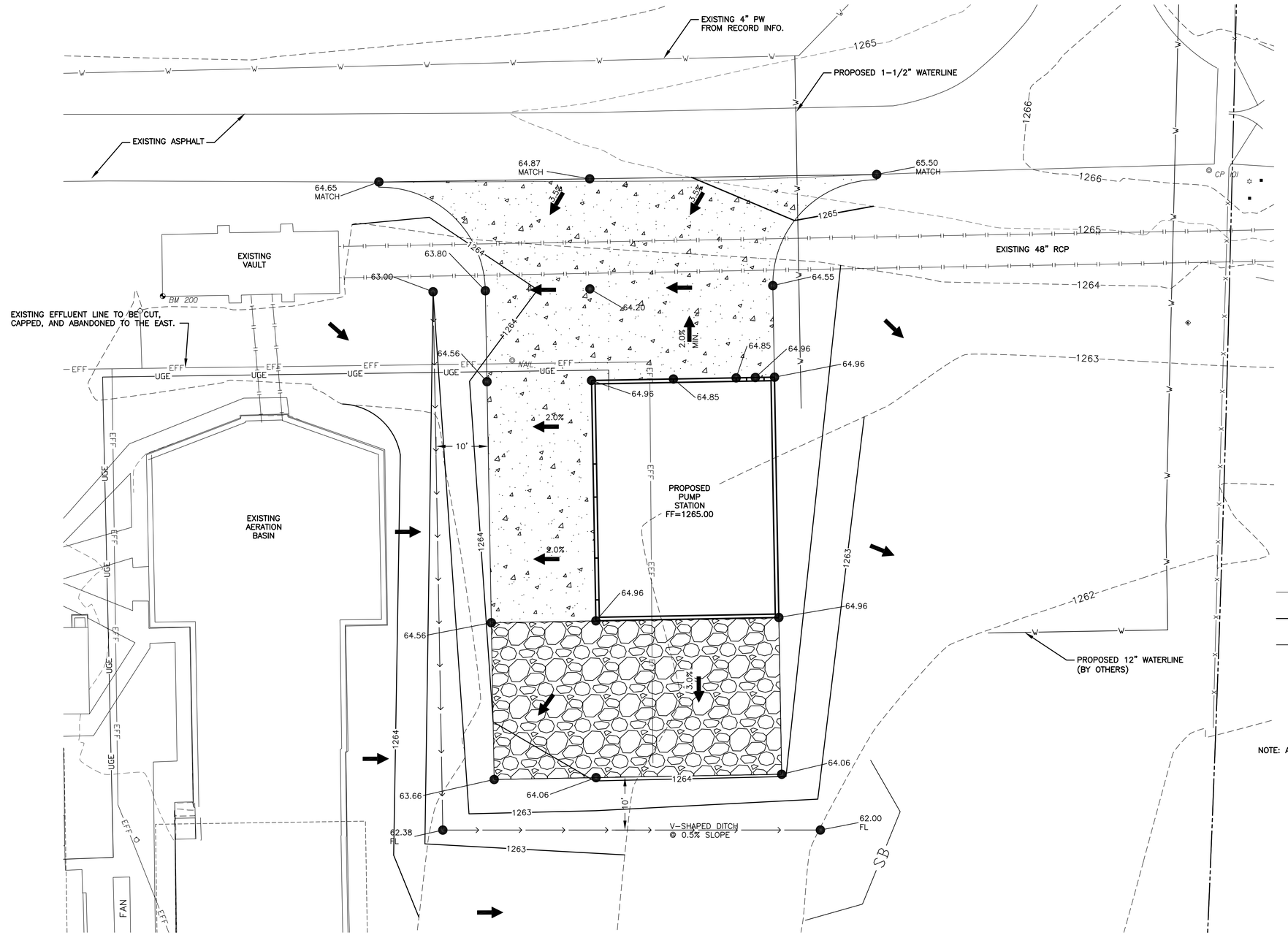
DESIGNED	DRAWN	CHECKED
BLB	MCW	MAB

NO.	REVISION	DATE
0	ISSUED FOR CONSTRUCTION	04/18/16

SHEET NO.

C1.0

PLOTTED: Thursday, April 21, 2016 @ 03:56PM
J:\PROJECTS\2015\1501010623_COW_REUSE_WATER_SUPPLY_SYSTEM_150623 CAD\SHTS\05 CIVIL\SITE\150632_SITE PLAN.DWG



LEGEND

- FLOW ARROW
- XXXX — EXISTING CONTOUR
- XXXX — PROPOSED CONTOUR
- SB — SILT BARRIER
- CONCRETE PAVEMENT
- GRAVEL SURFACE

NOTE: ALL SPOT ELEVATIONS ARE TO FINSIH GRADE.

N

SCALE: 1"=10'
0 10 20

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GRADING PLAN

PROJECT NO.	468-85112
DATE	04/18/16
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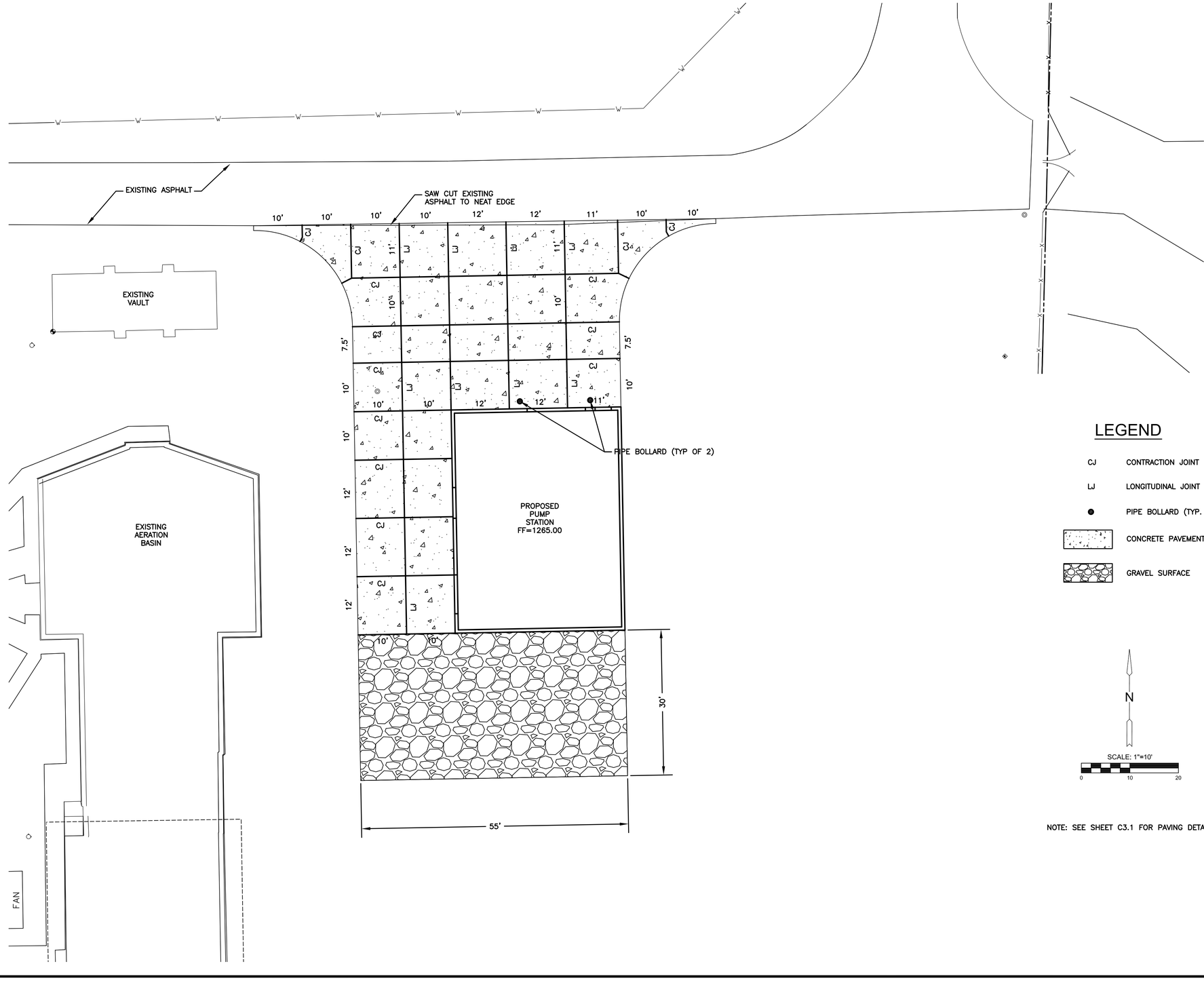
SHEET NO.
C2.0



LEGEND

CJ	CONTRACTION JOINT
LJ	LONGITUDINAL JOINT
●	PIPE BOLLARD (TYP. OF 2)
	CONCRETE PAVEMENT
	GRAVEL SURFACE

N

SCALE: 1"=10'

0 10 20

NOTE: SEE SHEET C3.1 FOR PAVING DETAILS.

BRYCE L. BARKUS LICENSED 19755 ARKANSAS PROFESSIONAL ENGINEER 4-18-16

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PAVING PLAN

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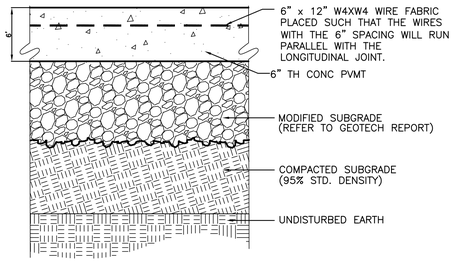
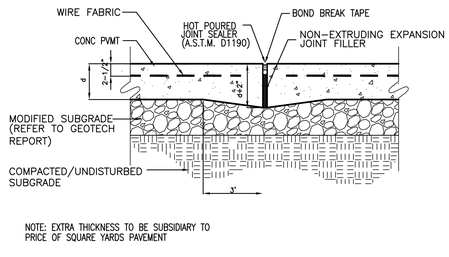
SHEET NO.

C3.0



1 TYP SECTION: 6" CONC. PVMT.

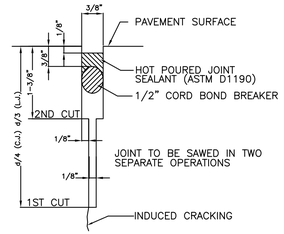
SCALE: 1 1/2" = 1'-0"



NOTE: EXTRA THICKNESS TO BE SUBSIDIARY TO PRICE OF SQUARE YARDS PAVEMENT

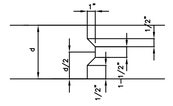
2 EXPANSION JOINT DETAIL

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



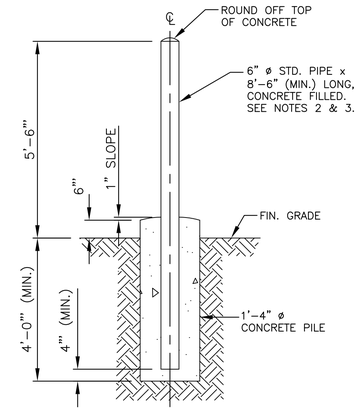
3 SAWCUT JOINT DETAIL

SCALE: 1-1/2" = 1'-0"
(VEHICULAR PVMNT. ONLY)



4 KEYWAY DETAIL

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

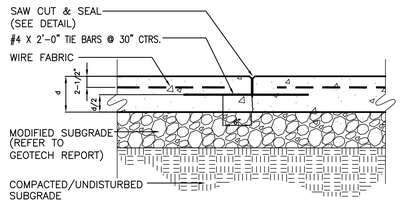


11 BOLLARD DETAIL

SCALE: NTS

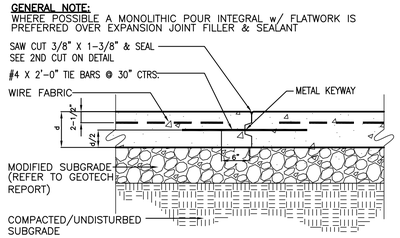
BOLLARD NOTES:

1. CONCRETE STRENGTH 3600 psi MIN. AND CEMENT TYPE BY DESIGN REQUIREMENT.
2. PIPE SHALL BE CLEANED & GIVEN ONE COAT OF RED OXIDE PRIMER BEFORE PLACING IN CONCRETE.
3. EXPOSED PORTIONS OF PIPE SHALL BE GIVEN ONE COAT OF SAFETY YELLOW PAINT.



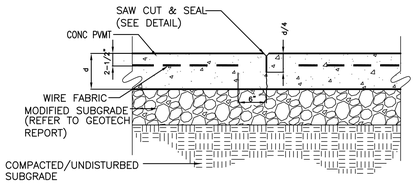
5 LONGITUDINAL JOINT DETAIL (L.J.)

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



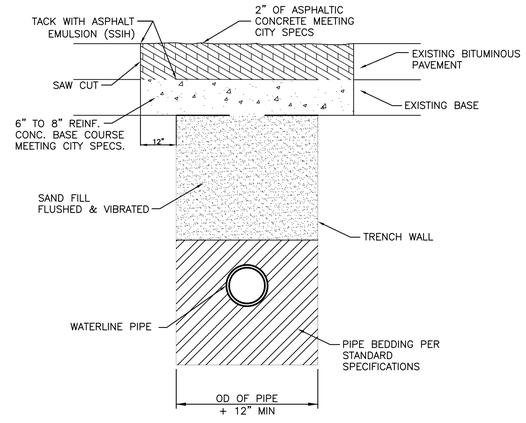
6 OPTIONAL LONGITUDINAL JOINT (L.J.)

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



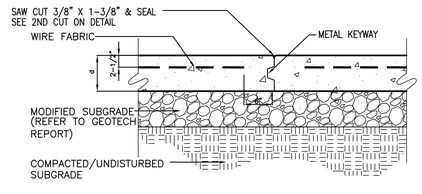
7 CONTRACTION JOINT DETAIL (C.J.)

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



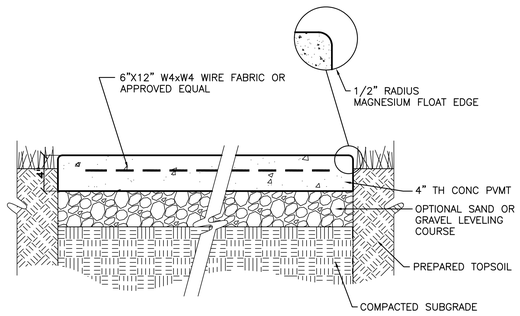
12 PAVEMENT & TRENCH SECTION UNDER ROADS

SCALE: NTS



8 OPTIONAL CONTRACTION JOINT (C.J.)

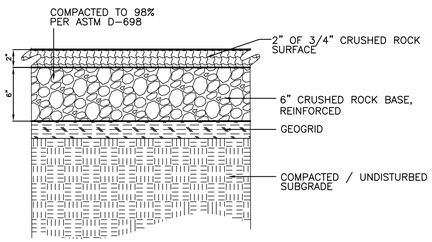
SCALE: 1-1/2" = 1'-0"



9 4" CONC. SIDEWALK

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

GENERAL NOTE:
SIDEWALKS SHALL NOT EXCEED 5% SLOPE OR EXCEED A 2% CROSS SLOPE.



10 GRAVEL SECTION

SCALE: NTS

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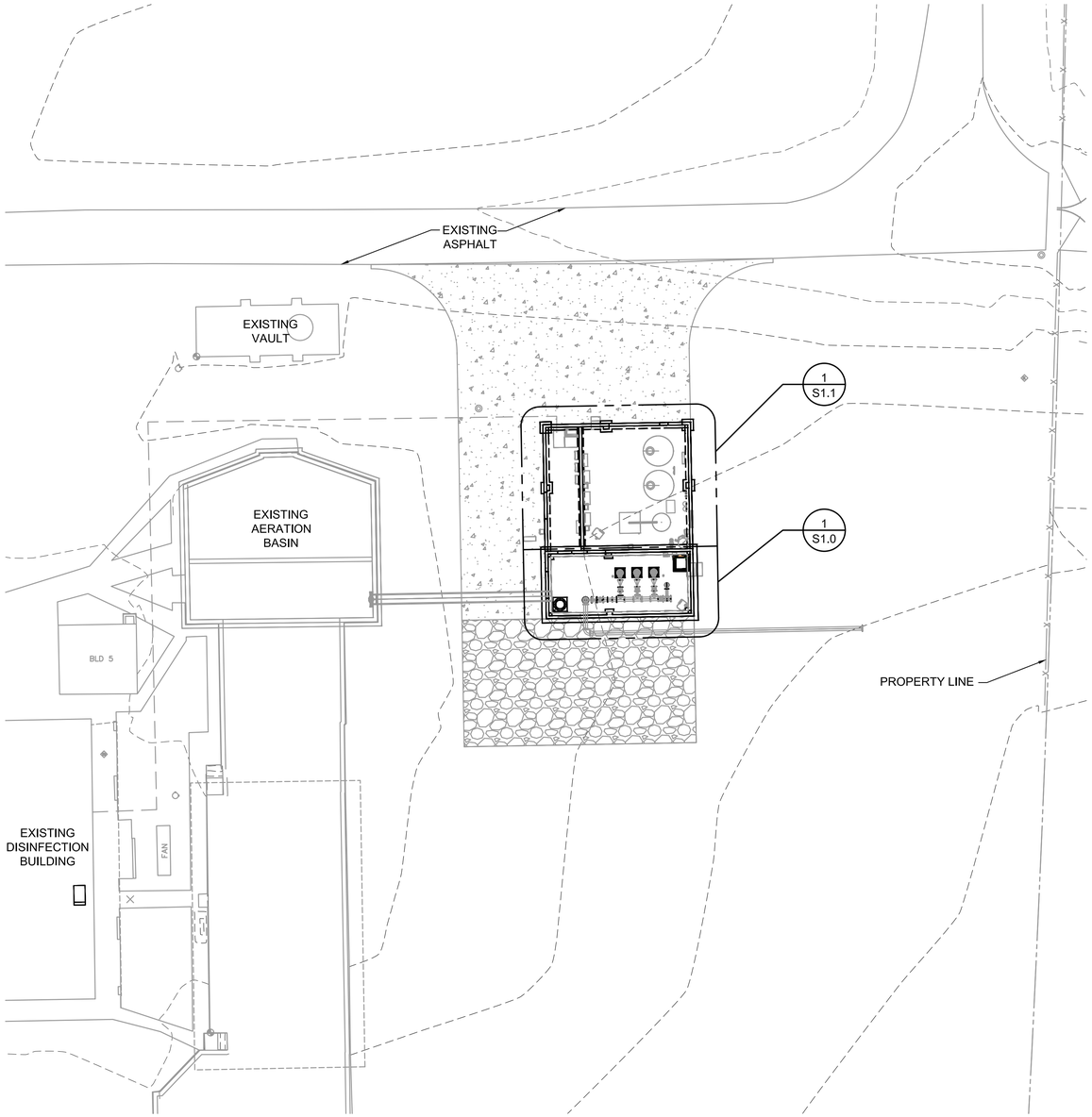
NO.	REVISION	DATE
0	ISSUED FOR CONSTRUCTION	04/18/16

BRYCE L. BARKUS LICENSED 19755 4-18-16 KANSAS PROFESSIONAL ENGINEER

SHEET NO.

C3.1



1 S0.1 LOCATION PLAN

SCALE: 1/16" = 1'-0"

STRUCTURAL GENERAL NOTES

1. DESIGN AND CONSTRUCTION SHALL CONFORM TO THE "INTERNATIONAL BUILDING CODE, 2006 EDITION," AS AMENDED AND ADOPTED BY THE CITY OF WICHITA AND SEDGWICK COUNTY, KANSAS METROPOLITAN AREA BUILDING AND CONSTRUCTION DEPARTMENT.
2. DESIGN CRITERIA AND LOADS: ROOF LIVE LOAD - 20 PSF WITH CODE PROVISIONS FOR SNOW DRIFTING (Pg = 15 PSF) AND NO REDUCTIONS FOR METAL BUILDING FRAMES: METAL BUILDING COLLATERAL ROOF DEAD LOAD - 3.0 PSF: VAULT CAP SLAB LIVE LOAD = 250 PSF: SLAB ON GRADE LIVE LOAD - 250 PSF: BASIC WIND SPEED - 90 MPH (3-SEC GUST), EXPOSURE C: SEISMIC DESIGN CATEGORY - B: SEISMIC SITE CLASS - D: WIND IMPORTANCE FACTOR - 1.15: SEISMIC IMPORTANCE FACTOR - 1.25: MAXIMUM METAL BUILDING LATERAL DRIFT - H/120.
3. THE NET ALLOWABLE TOTAL LOAD SOIL PRESSURES DO NOT EXCEED 1500 PSF ALLOWABLE BEARING FOR ALL FOOTINGS BEARING INTO NATIVE UNDISTURBED NON-ORGANIC SOILS OR INTO A CONTROLLED, COMPACTED, TESTED ENGINEERED FILL & 2000 PSF FOR FOUNDATIONS BEARING GREATER THAN 8 FEET BELOW GRADE. (REFER TO GEOTECHNICAL REPORT BY ALLIED LABORATORIES NO. 74-14229-001-0147, DATED JANUARY 2015) ALL FOOTINGS SHALL EXTEND AT LEAST 3'-0" BELOW FINAL ADJACENT GRADE. THE EXPOSED SUBGRADE IN THE PROPOSED BUILDING AREA SHOULD BE DENSIFIED IN PLACE AS RECOMMENDED BY THE SOILS ENGINEER. IF ACTUAL SITE CONDITIONS DO NOT SATISFY THESE REQUIREMENTS COORDINATE ADJUSTMENTS WITH THE ENGINEER/SOILS ENGINEER.
4. SURFACE WATER SHALL NOT BE ALLOWED TO STAND ADJACENT TO OR DRAIN TOWARDS THE FOUNDATION UNDER ANY CIRCUMSTANCES. PAVEMENTS OR GRADED SOIL AT THE PERIMETER OF THE BUILDING, EXCEPT AS REQUIRED AT EXITS OR AS NOTED, SHALL BE SLOPED AWAY AT 1/2 INCHES/FT. MINIMUM FOR THE FIRST 10 FEET.
5. FOOTINGS MAY BE POURED TO NEAT LINES OF EXCAVATIONS PROVIDING VERTICAL LINES OF EXCAVATIONS CAN BE MAINTAINED DURING CONCRETE PLACEMENT.
6. WET WELL VAULT FOUNDATION WALLS SHALL NOT BE BACKFILLED UNTILL THE FIRST FLOOR SLAB IS IN PLACE OR THE WALLS ARE PROPERLY SHORED.
7. BEAMS, COLUMNS, AND FOOTINGS CENTER SHALL BE CENTERED UNDER SUPPORTING MEMBERS (TYPICAL UNLESS NOTED).
8. CHAMFER ALL EXPOSED CONCRETE EDGES 3/4".
9. NO ALUMINUM SHALL BE EMBEDDED IN ANY CONCRETE.
10. ALL STRUCTURAL REGULAR WEIGHT CAST-IN-PLACE CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI AT 28 DAYS (TYPICAL UNLESS NOTED). ALL CONCRETE MIX DESIGNS SHALL HAVE WATER TO CEMENT RATIOS LESS THAN 0.45, WITH A MAXIMUM 60/40 FINE TO COARSE AGGREGATE RATIO. ALL CONCRETE SHALL BE IN CONFORMANCE WITH THE LATEST A.C.I. 301 STANDARDS PUBLICATION.
11. FLY ASH CONTENT SHALL NOT EXCEED 20% OF CEMENTIOUS MATERIALS BY WEIGHT.
12. ALL REINFORCING BARS SHALL MEET ASTM A615 GRADE 60.
13. REINFORCING BARS QUANTITIES SHOWN ARE FOR ESTIMATING PURPOSES ONLY.
14. CONCRETE PROTECTION FOR REINFORCEMENT SHALL BE 3" CLEAR FOR CONCRETE CAST AGAINST EARTH AND 2" CLEAR FOR FORMED SURFACES (TYPICAL UNLESS NOTED).
15. REINFORCEMENT SHALL BE CONTINUOUS AND PROVIDE MINIMUM LAP SPLICE PER A.C.I. 301 STANDARD (2'-6" MIN.) EXCEPT AS NOTED AND PROVIDE CORNER BARS OF SAME SIZE AND SPACING.
16. REINFORCEMENT SHALL BE DETAILED IN ACCORDANCE WITH THE LATEST A.C.I. DETAILING MANUAL BY A QUALIFIED AND EXPERIENCED PERSON AND FIRM. PLACE AND SUPPORT REINFORCING WITH ACCESSORIES: MAXIMUM SPACING - 48" CENTERS. USE 3" SBP SUPPORTS AT ALL FOOTINGS.
17. CONTRACTOR SHALL VERIFY THAT ALL REINFORCEMENT, INSERTS, SLEEVES AND EMBEDDED ITEMS ARE PROPERLY LOCATED AND RIGIDLY SECURED PRIOR TO CONCRETE PLACEMENT.
18. ALL POST INSTALLED ANCHORS OR FASTENERS WHERE NOTED SHALL BE MANUFACTURED BY HILTI, INC. AND INSTALLED PER HILTI SPECIFICATIONS. HY200 ANCHORS SHALL BE INSTALLED USING THE "SAFE-SET" INSTALLATION METHOD. SUBSTITUTIONS SHALL BE SUBMITTED FOR REVIEW AND APPROVAL WITH APPROPRIATE ICC EVALUATION REPORTS.
19. ALL STRUCTURAL STEEL SHALL BE GALV. PER ASTM A123. STRUCTURAL STEEL WIDE FLANGE SHAPES SHALL MEET ASTM A992 (Fy = 50 KSI MIN.), STRUCTURAL SHAPES OTHER THAN WIDE FLANGE SHALL MEET ASTM A36 (Fy = 36 KSI MIN.), STRUCTURAL SQUARE TUBING (HSS) - ASTM A500 GRADE B (Fy = 46 KSI MIN.), STRUCTURAL ROUND TUBING (HSS) - ASTM A53 (Fy = 35 KSI MIN.), STRUCTURAL STEEL ANCHOR RODS -ASTM F1554 (FY = 55 KSI MIN.), TYP. UNLESS NOTED OTHERWISE.
20. STRUCTURAL STEEL SHALL BE NEW AND MEET THE LATEST EDITION A.I.S.C. "SPECIFICATIONS FOR STRUCTURAL STEEL BUILDINGS AND BRIDGES", AND THE "CODE OF STANDARD PRACTICES FOR STEEL BUILDINGS AND BRIDGES", EXCLUDING SECTION 4.4.1.b.
21. ALL STRUCTURAL STEEL FIELD CONNECTIONS SHALL HAVE STANDARD A.I.S.C. FRAMING CONNECTIONS WITH GALV. A325N BOLTS AND WASHERS AS REQUIRED: INSTALLED WITH TURN-OF-THE-NUT" METHODS, UNLESS NOTED. ERECTION DRAWINGS SHALL SHOW ALL FIELD WELDS, AS APPROPRIATE.
22. STEEL BEAMS SHALL BE FABRICATED WITH MILL CAMBER UP.
23. ANY SHOP AND FIELD SPLICES WITHIN THE STEEL MEMBERS DESIGN LENGTH MUST BE MADE WITH A FULL PENETRATION WELD AND PROVED ADEQUATE BY NON-DESTRUCTIVE TESTING AT THE CONTRACTOR'S EXPENSE.
24. WELDING SHALL CONFORM TO THE CURRENT A.W.S. "STRUCTURAL WELDING CODE - STEEL" AND "STRUCTURAL WELDING CODE - SHEET STEEL" SPECIFICATIONS AND BE COMPLETED BY AN A.W.S. CERTIFIED WELDER. ALL FIELD WELDS SHALL BE COATED W/ ZINC RICH GALVANIZING REPAIR PAINT
25. PUMP ANCHOR RODS SHALL BE ASTM F1554 (FY = 105 KSI MIN.), TYP. UNLESS NOTED OTHERWISE
26. EPOXY GROUT INDICATED ON DRAWINGS UNDER EQUIPMENT BASE SHALL BE ESCOWELD 7505E OR APPROVED EQUIVALENT WITH MINIMUM COMPRESSIVE STRENGTH OF 14,000 PSI AT 14 DAYS CONFORMING TO ASTM C-579.
27. THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFICATION THAT ALL METAL BUILDING COLUMN BASE PLATES WILL FULLY BEAR ON CONCRETE PIER/FOOTINGS. INCREASE SIZE WHERE REQUIRED TO ACCOMMODATE FULL BEARING: COORDINATE WITH THE ENGINEER.
28. ANCHOR BOLTS SIZES AND PLACEMENT LOCATIONS BY METAL BUILDING MANUFACTURER. ANCHOR BOLTS SHALL BE FURNISHED BY THE GENERAL CONTRACTOR AND SET WITH A TEMPLATE.
29. METAL BUILDING MANUFACTURER TO BE A MEMBER OF THE METAL BUILDING MANUFACTURERS ASSOCIATION (MBMA) AND BE APPROVED BY THE OWNERS REPRESENTATIVE.
30. THE METAL BUILDING MANUFACTURER SHALL BE RESPONSIBLE FOR THE METAL BUILDING DESIGN. THE METAL BUILDING DESIGN AND CALCULATIONS SEALED BY A KANSAS LICENSED ENGINEER SHALL BE SUBMITTED TO THE OWNERS REPRESENTATIVE FOR APPROVAL BEFORE FABRICATION AND APPROVED BEFORE ANY CONCRETE FOOTINGS ARE POURED. THE METAL BUILDING MANUFACTURER SHALL PROVIDE ALL ACTUAL COLUMN LOCATIONS AND LOADS TO THE FOUNDATIONS FOR DESIGN VERIFICATIONS INCLUDING WIND COLUMN/BRACING CONDITIONS.
31. ALL METAL BUILDING COMPONENTS SHALL BE GALVANIZED. STRUCTURAL STEEL COMPONENTS SHALL BE GALVANIZED PER ASTM A123. LIGHT GAGE STEEL COMPONENTS SHALL BE FORMED FROM GALVANIZED SHEET STEEL.
32. METAL BUILDING DESIGN TO MEET LATEST MBMA SPECIFICATIONS AND LOCAL CODE REQUIREMENTS.
33. HOLES, PIPES, SLEEVES, ETC. NOT SHOWN ON THE DRAWINGS MUST BE REVIEWED BY THE ENGINEER BEFORE PLACEMENT THRU STRUCTURAL MEMBERS.
34. NO AREA OF THE STRUCTURE SHALL BELOADED WITH CONSTRUCTION MATERIALS OR EQUIPMENT THAT EXCEEDS FINAL DESIGN CRITERIA.
35. THE FOUNDATIONS AND STRUCTURES ARE DESIGNED TO BE SELF-SUPPORTING AND STABLE AFTER THE STRUCTURE IS FULLY COMPLETED. IT IS SOLELY THE CONTRACTOR'S RESPONSIBILITY TO EXECUTE AND DETERMINE FINAL ERECTION PROCEDURES, SEQUENCING AND TO INSURE THE SAFETY OF THE STRUCTURE AND ITS COMPONENT PARTS DURING ERECTION. THIS INCLUDES WHATEVER SHORING, SHEETING, TEMPORARY BRACING, GUYING OR TIE DOWNS WHICH MIGHT BE NECESSARY.
36. FABRICATORS AND SUPPLIERS SHALL CLEARLY NOTE AND HIGHLIGHT CHANGES MADE IN SHOP DRAWINGS WHICH DO NOT COMPLY WITH THE CONTRACT DOCUMENTS.
37. IF DISCREPANCIES EXIST BETWEEN STRUCTURAL PLANS, OTHER PLANS, OR SPECIFICATIONS, THE CONTRACTOR OR SUB-CONTRACTOR SHALL PROVIDE A WRITTEN REQUEST FOR CLARIFICATION FROM THE ENGINEER PRIOR TO PROCEEDING WITH THE WORK.
38. THE STRUCTURE IS NOT DESIGNED FOR FUTURE EXPANSION.
39. CONTRACTOR TO FIELD VERIFY ALL DIMENSIONS, ELEVATIONS AND EXISTING CONDITIONS AND REPORT ANY DISCREPANCIES TO THE ENGINEER IMMEDIATELY.

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CITY OF WICHITA, KANSAS

RE-USE WATER PUMP STATION

TO SERVE SPIRIT AEROSYSTEMS

LOCATION PLAN & STRUCTURAL GENERAL NOTES

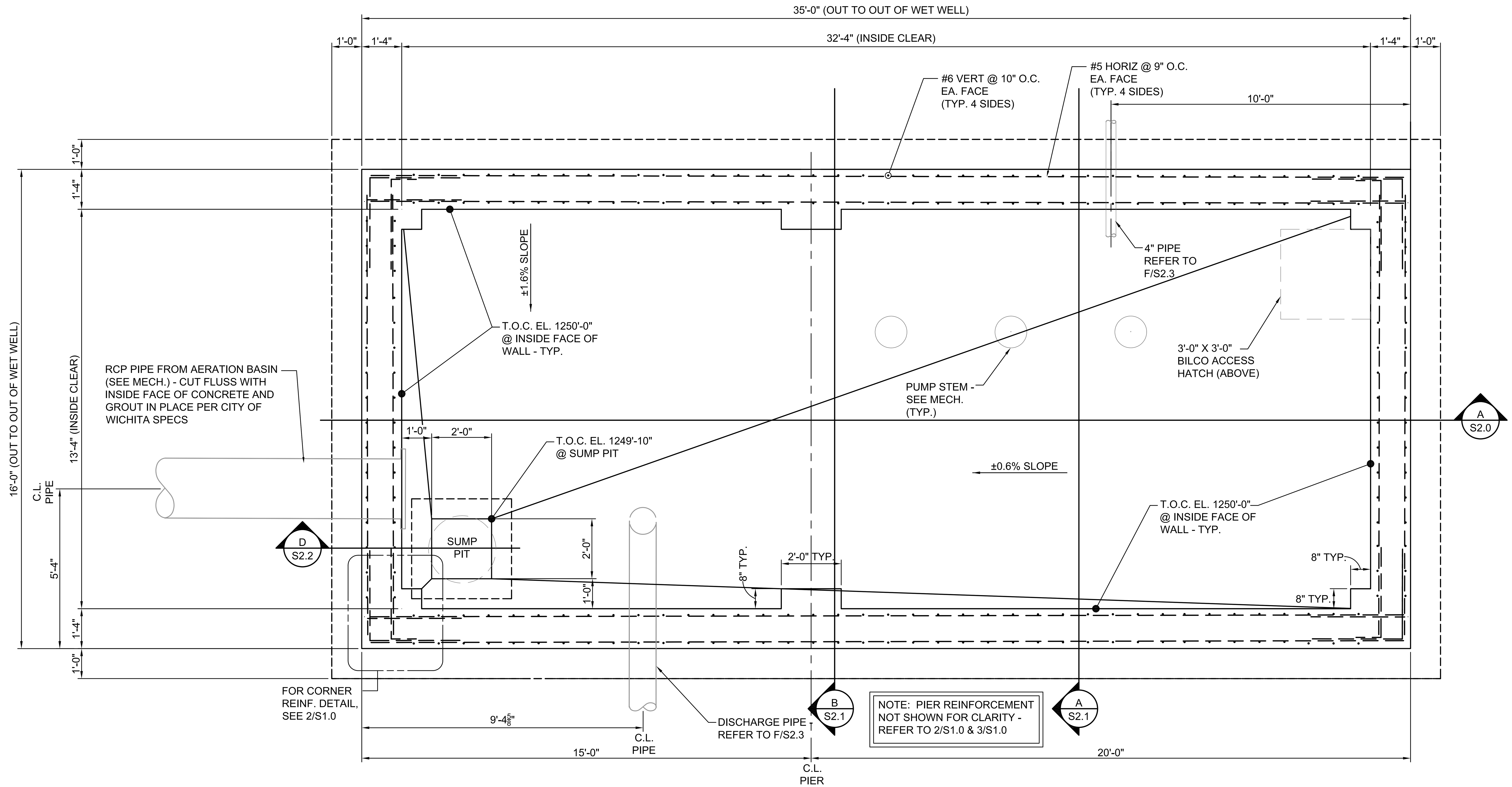
PROJECT NO.	468-85112
DATE	04/18/16
SCALE	AS NOTED

DESIGNED	DRAWN	CHECKED
SK	CAM	AR

NO.	REVISION	DATE
0	ISSUED FOR CONSTRUCTION	04/18/16

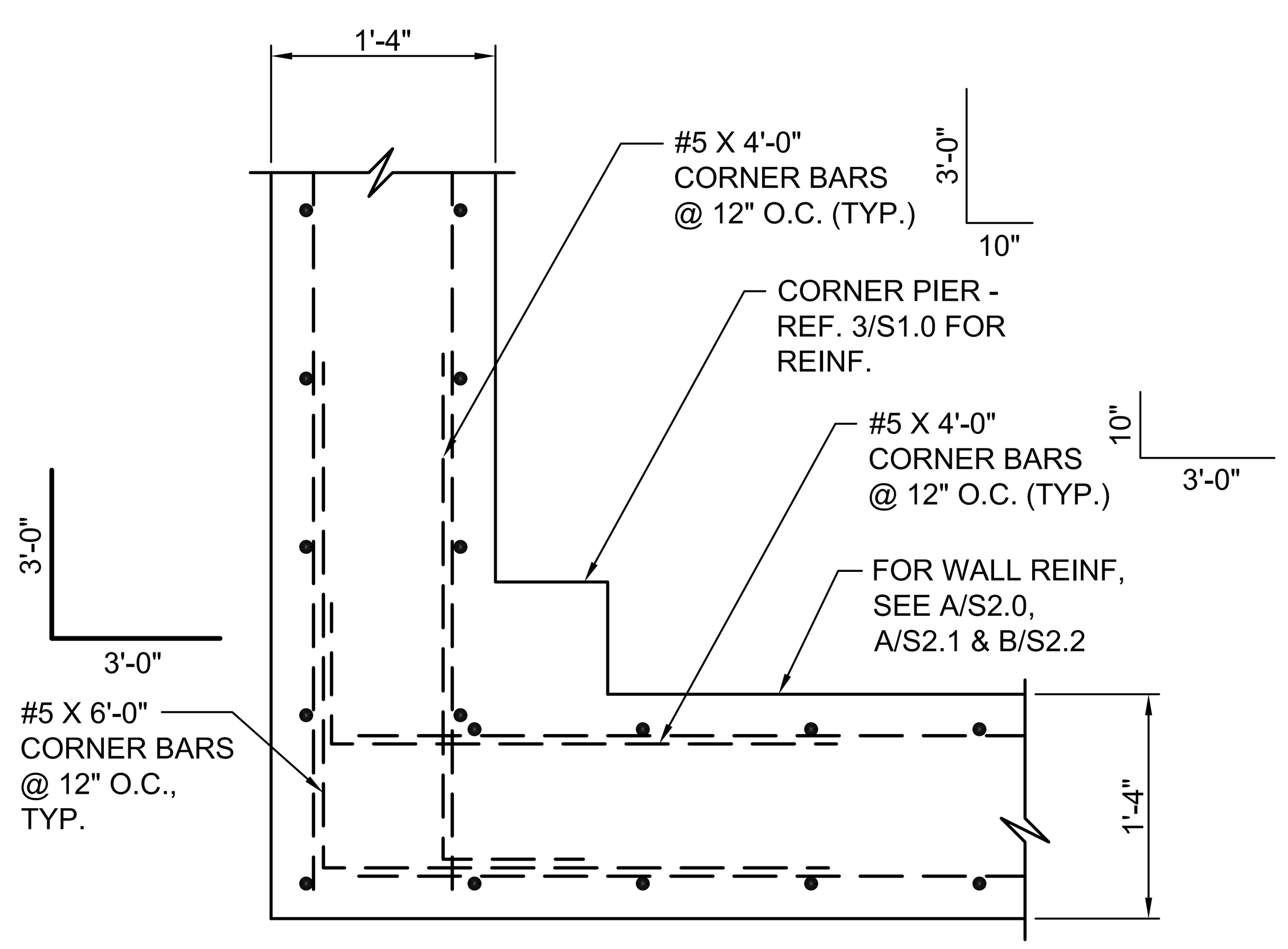
SHEET NO.

S0.1



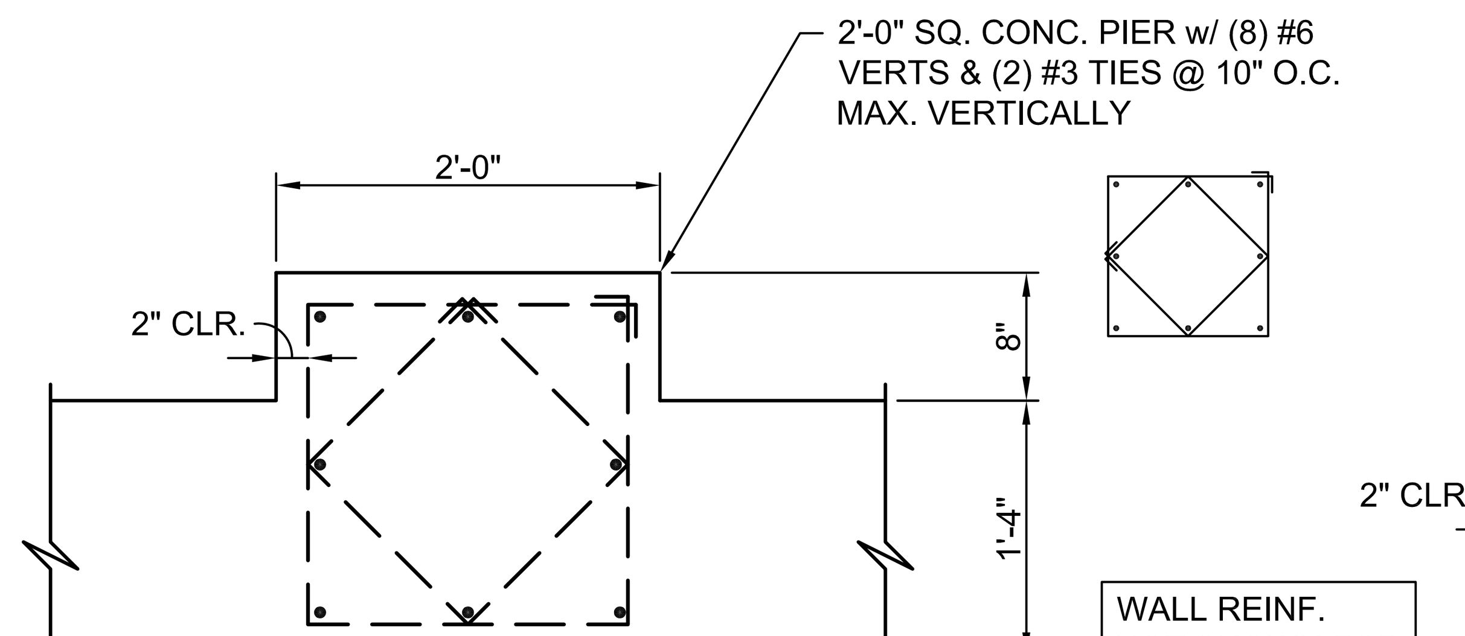
WET WELL
FOUNDATION PLAN
1 S1.0

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



CORNER DETAIL
2 S1.0

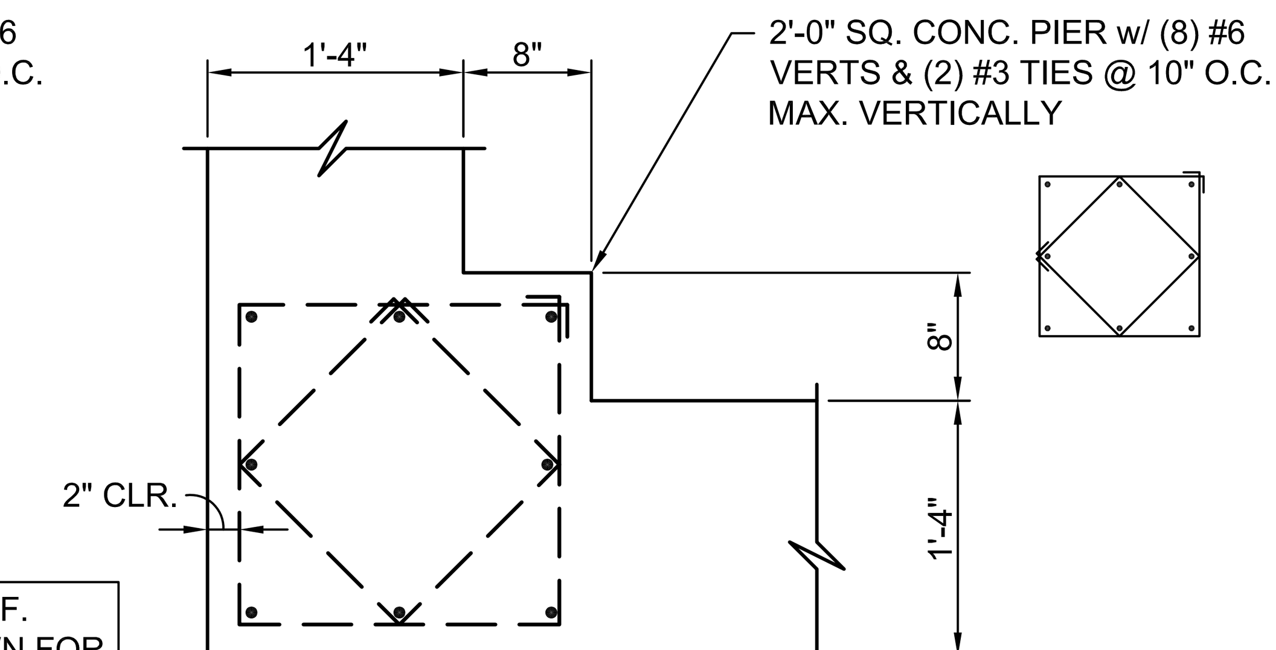
SCALE: 1" = 1'-0"



PIER DETAIL
2 S1.0

SCALE: 1" = 1'-0" (2 THUS)

WALL REINF. NOT SHOWN FOR CLARITY - REF. TO 1/S1.0



CORNER PIER DETAIL
3 S1.0

SCALE: 1" = 1'-0" (4 THUS)

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RE-USE WATER PUMP STATION
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PROFESSIONAL ENGINEER 20045 KANSAS 18/APR/16

FOUNDATION PLAN - WET WELL

PROJECT NO.	468-85112
DATE	04/18/16
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SK	CAM	AR

NO.	REVISION	DATE
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SHEET NO.
S1.0

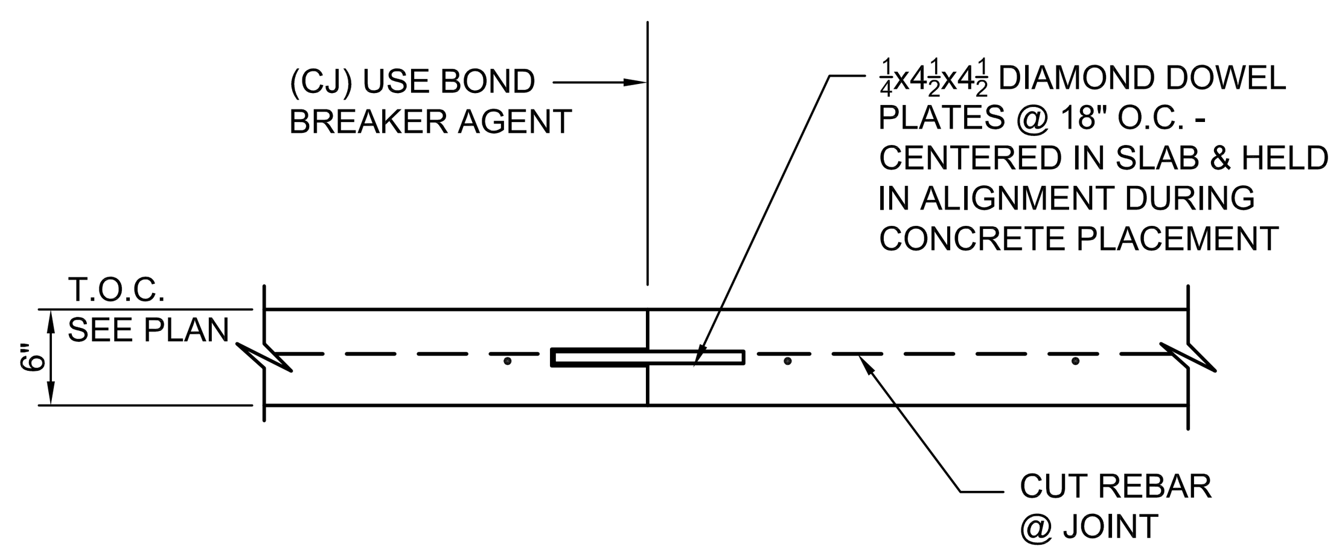
NOTE:
SAW CUT JOINTS OR KEYED CONSTRUCTION JOINTS IN 6" SLABS ON GRADE SHALL BE SPACED TO DIVIDE THE SLAB INTO PANELS NOT TO EXCEED 225 SQUARE FEET. THE LONGER DIMENSION OF EACH PANEL SHALL NOT EXCEED THE SHORTER DIMENSIONS BY MORE THAN 20%. LINE UP w/ C.L. OF BUILDING WHERE POSSIBLE. CONTRACTOR SHALL SUBMIT JOINT LAYOUT TO ARCHITECT FOR APPROVAL. REFER TO DETAILS A/S1.1 & B/S1.1.

FOOTING SCHEDULE

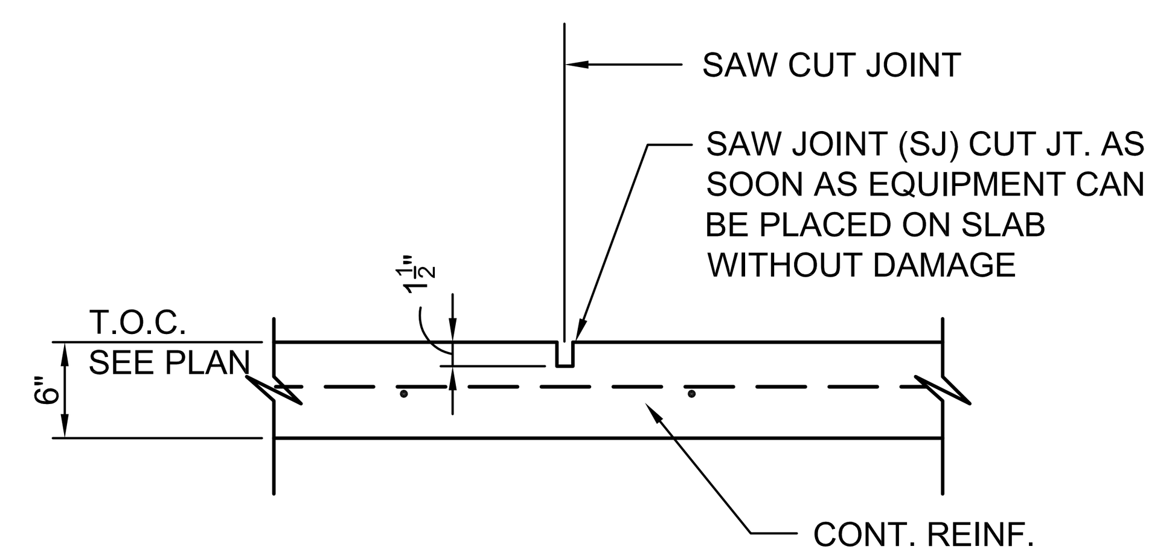
MARK	SIZE	REINF.
A	3'-6" SQ. X 1'-0" DP. MIN.	(4) #5 EA. WAY BOTT.

METAL BUILDING ANCHOR BOLT SCHEDULE

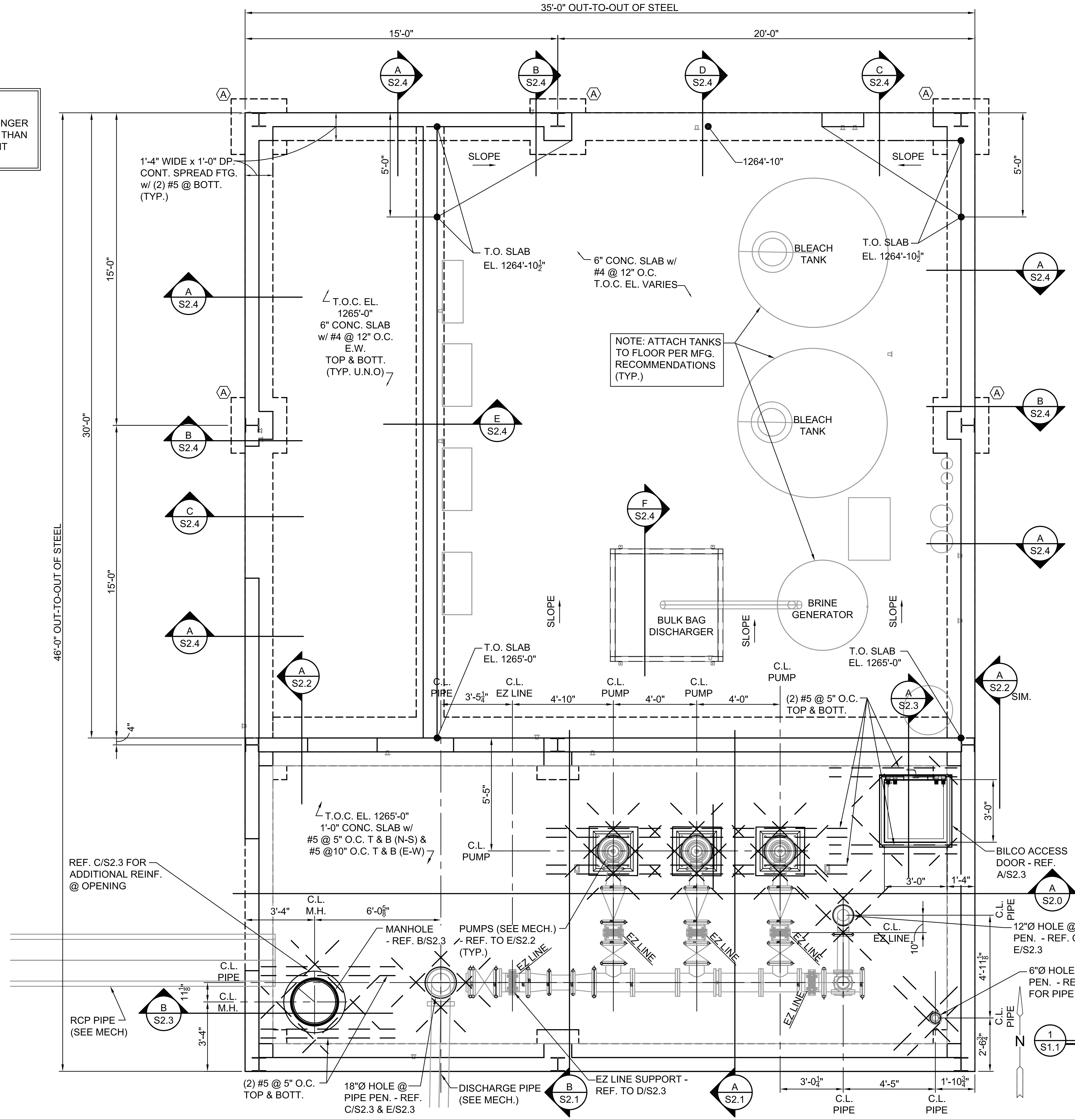
SIZE	LENGTH	DIAGRAM
5/8"Ø	1'-0" (TACK WELD BOTT. NUT)	T.O. SLAB; 3"; 7 1/2"; 1 1/2"
3/4"Ø	1'-1 1/2" (TACK WELD BOTT. NUT)	T.O. SLAB; 3"; 9"; 1 1/2"



A S1.1 TYP. DOWELED CONST. JT.
SCALE: 1" = 1'-0" (6" SLAB)



B S1.1 TYP. SAW CUT JOINT
SCALE: 1" = 1'-0" (6" SLAB)



1 S1.1 FOUNDATION PLAN
SCALE: 3/8" = 1'-0"

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CITY OF WICHITA, KANSAS

RE-USE WATER PUMP STATION

TO SERVE SPIRIT AEROSYSTEMS

PROFESSIONAL ENGINEER 20045 KANSAS 18/APR/16

FOUNDATION PLAN - BLDG

PROJECT NO.	468-85112
DATE	04/18/16
SCALE	AS NOTED

DESIGNED	DRAWN	CHECKED
SK	CAM	AR

NO.	REVISION	DATE
0	ISSUED FOR CONSTRUCTION	04/18/16

SHEET NO. S1.1

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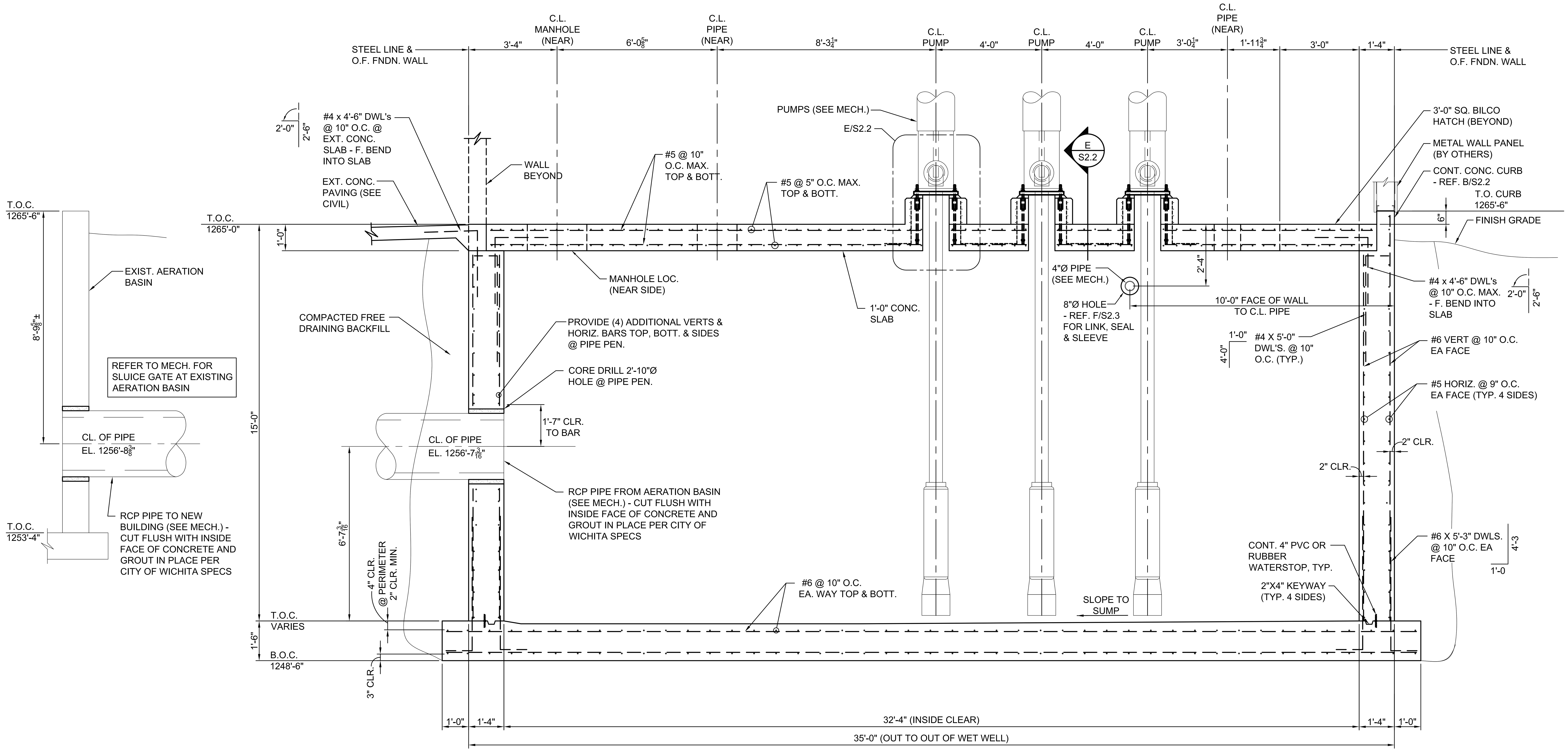

A
S2.0

FOUNDATION SECTION

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

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RE-USE WATER PUMP STATION

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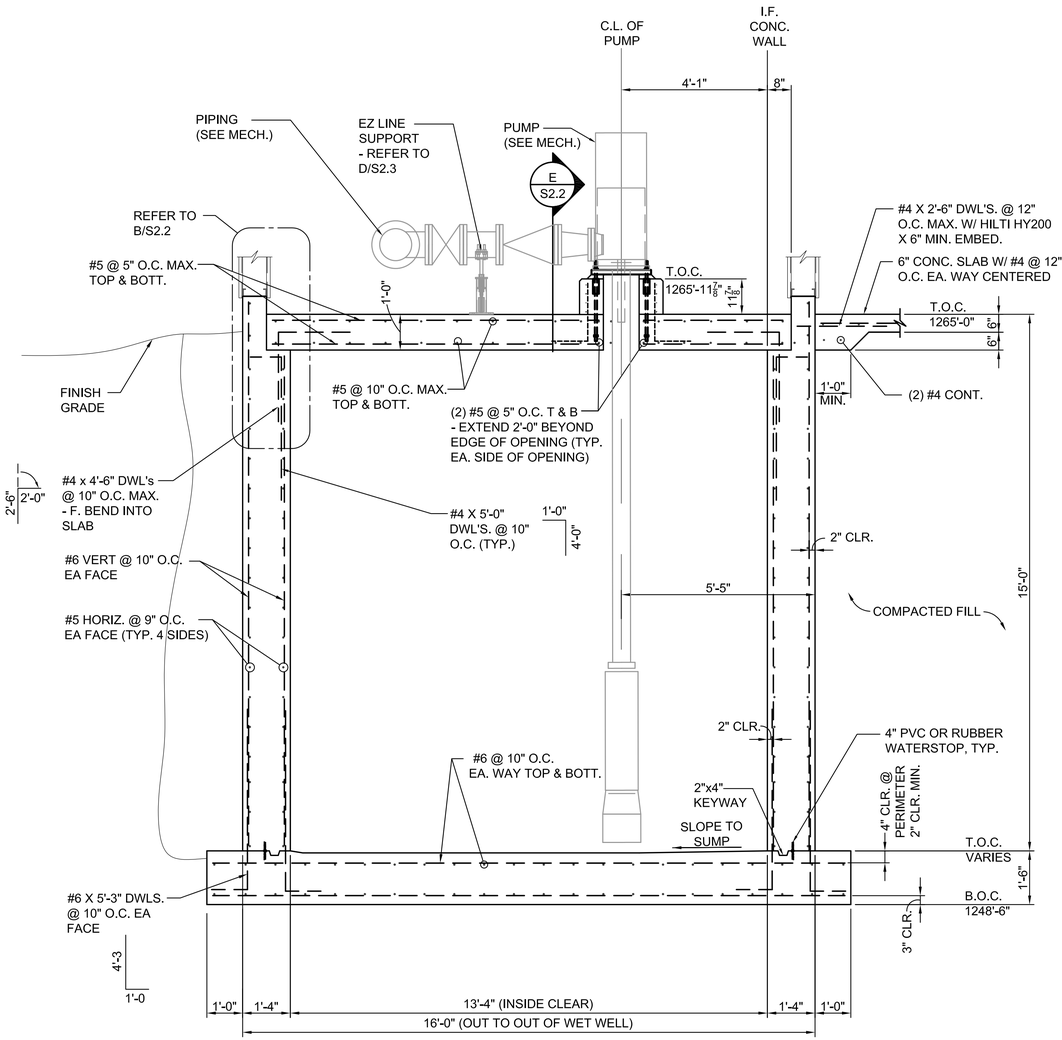
KANSAS PROFESSIONAL ENGINEER 20045
18/APR/16

SHEET NO.
S2.0



A S2.1 FOUNDATION SECTION

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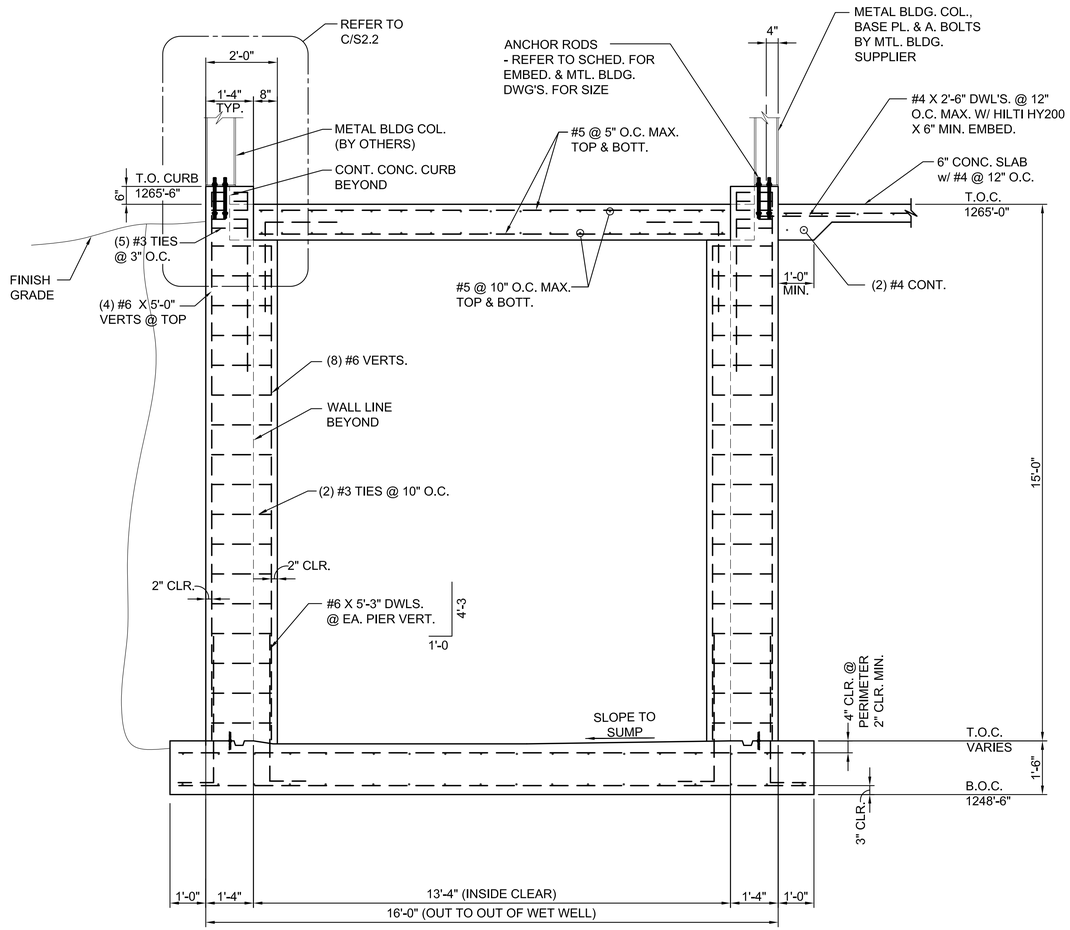

B S2.1 FOUNDATION SECTION

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

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RE-USE WATER PUMP STATION

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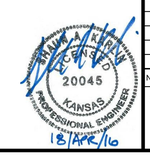
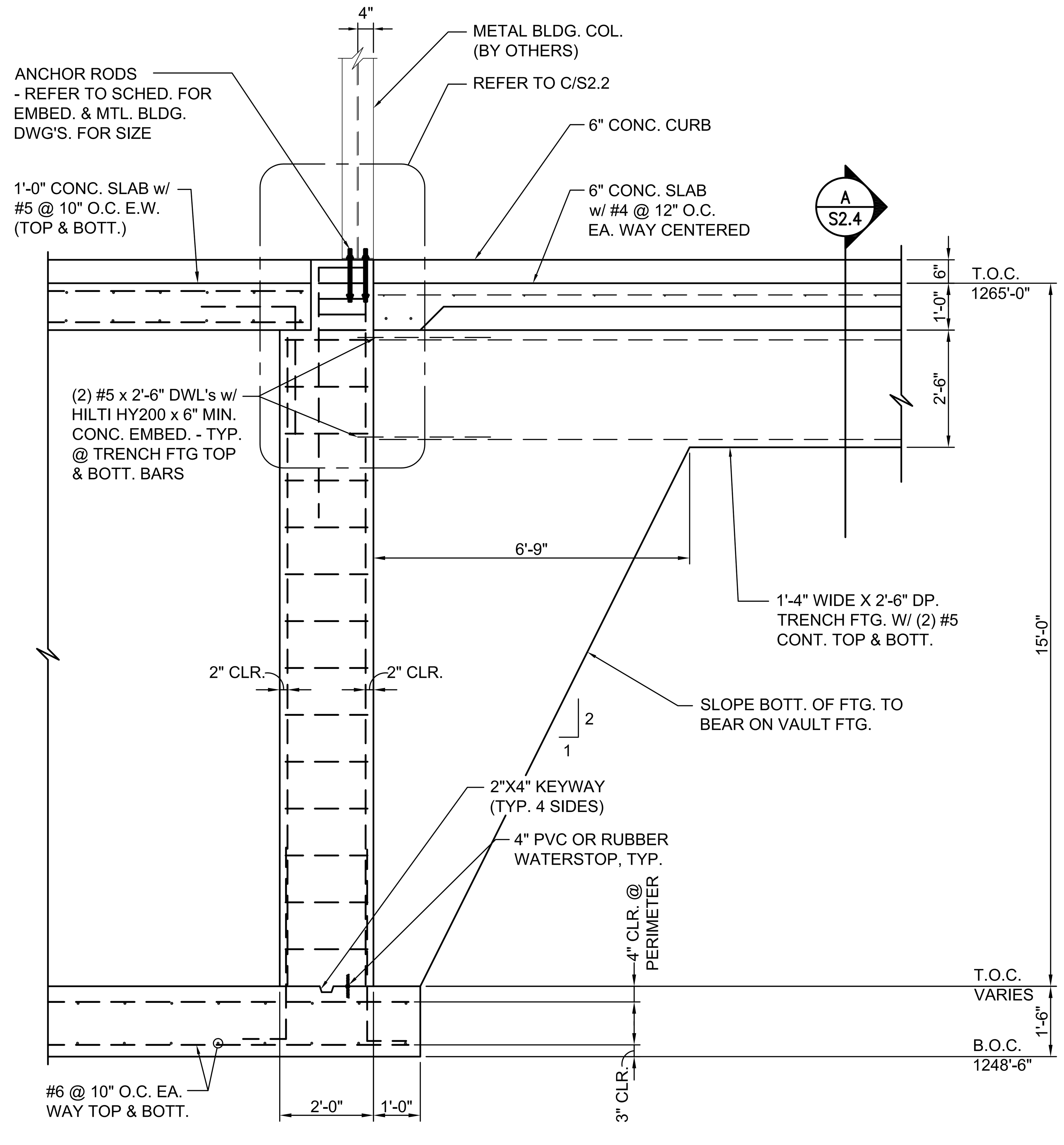
SHEET NO.

S2.1





A S2.2 FOUNDATION SECTION

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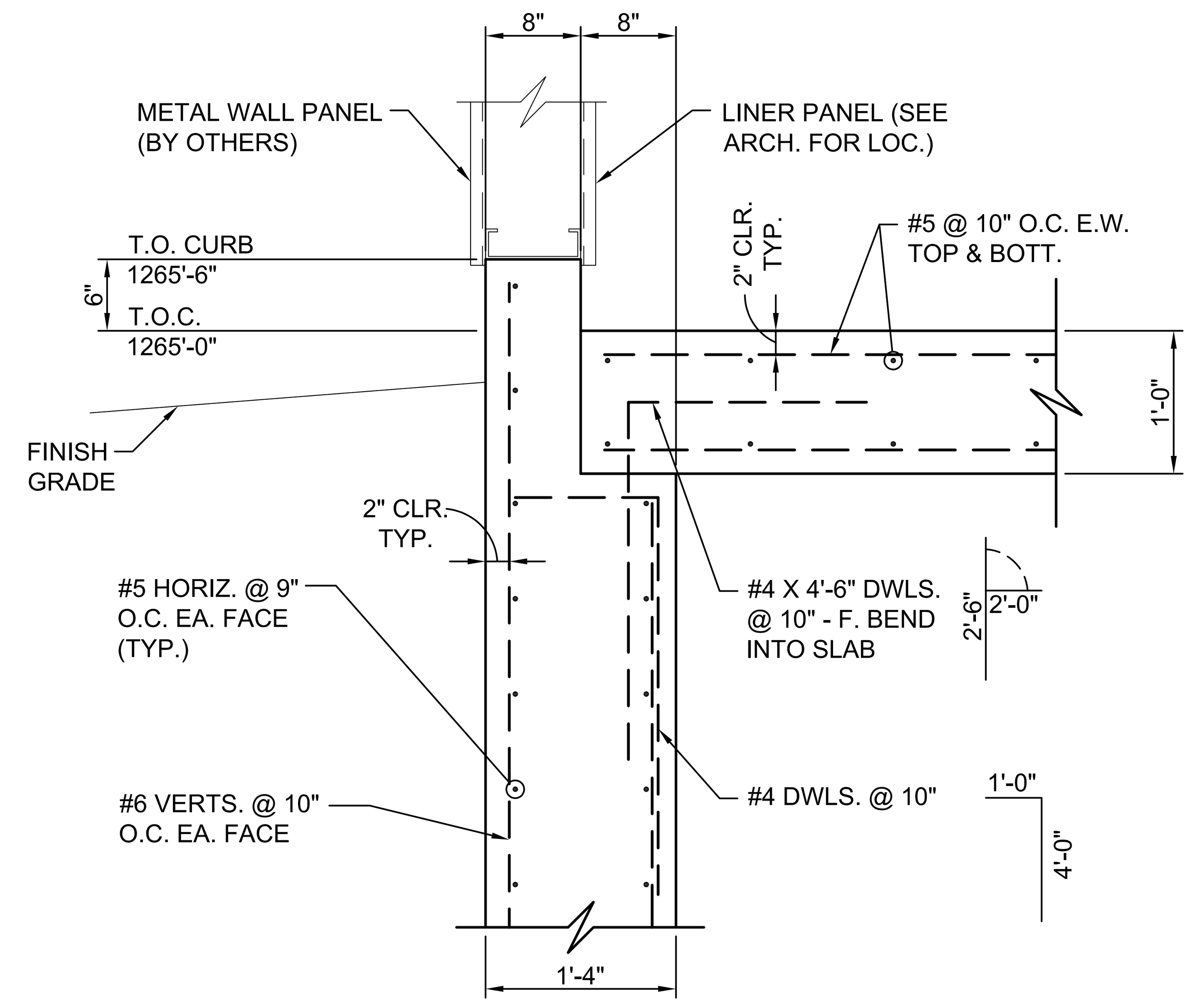
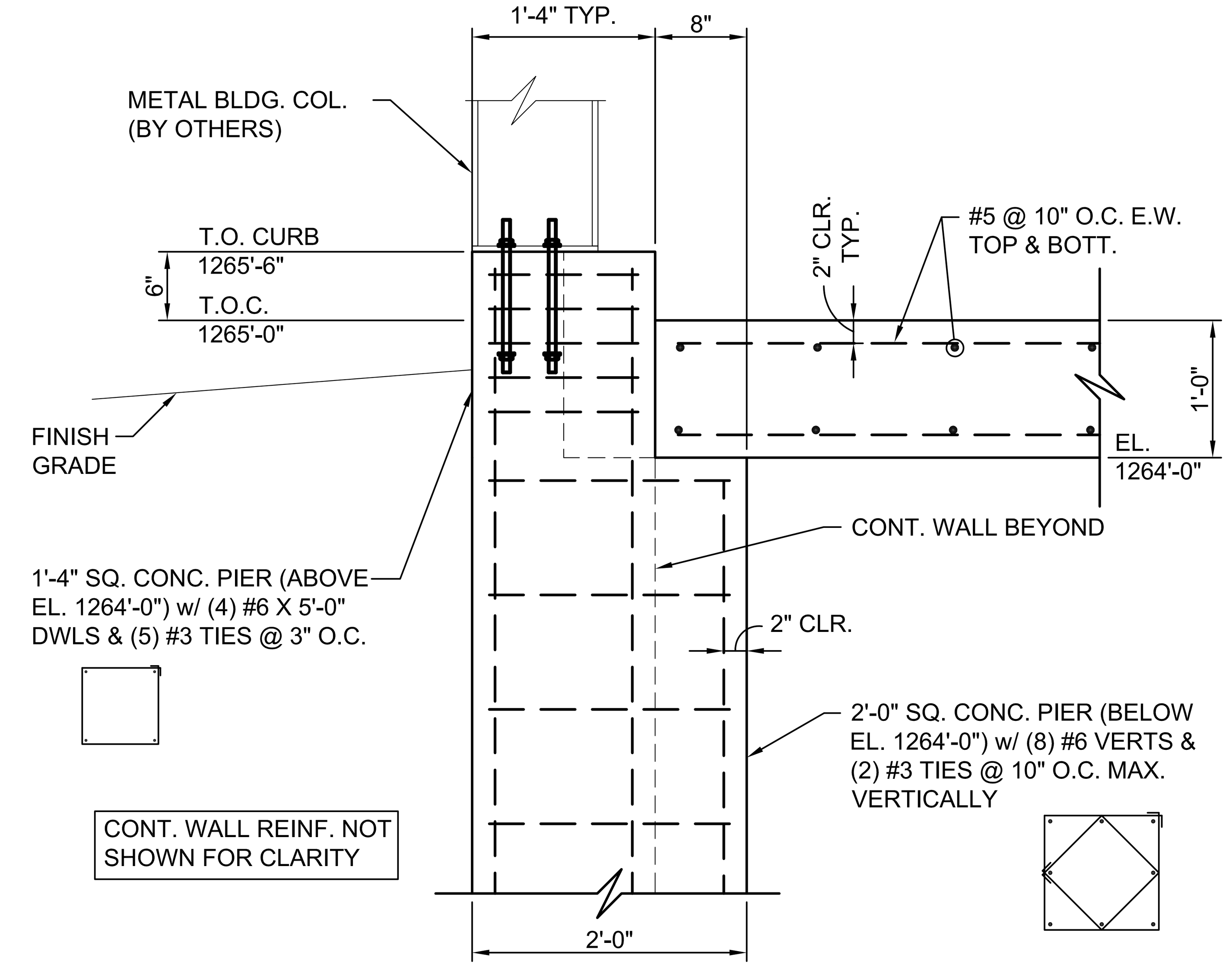


B S2.2 SECTION @ FLOOR

SCALE: 1" = 1'-0"



C S2.2 SECTION @ FLOOR

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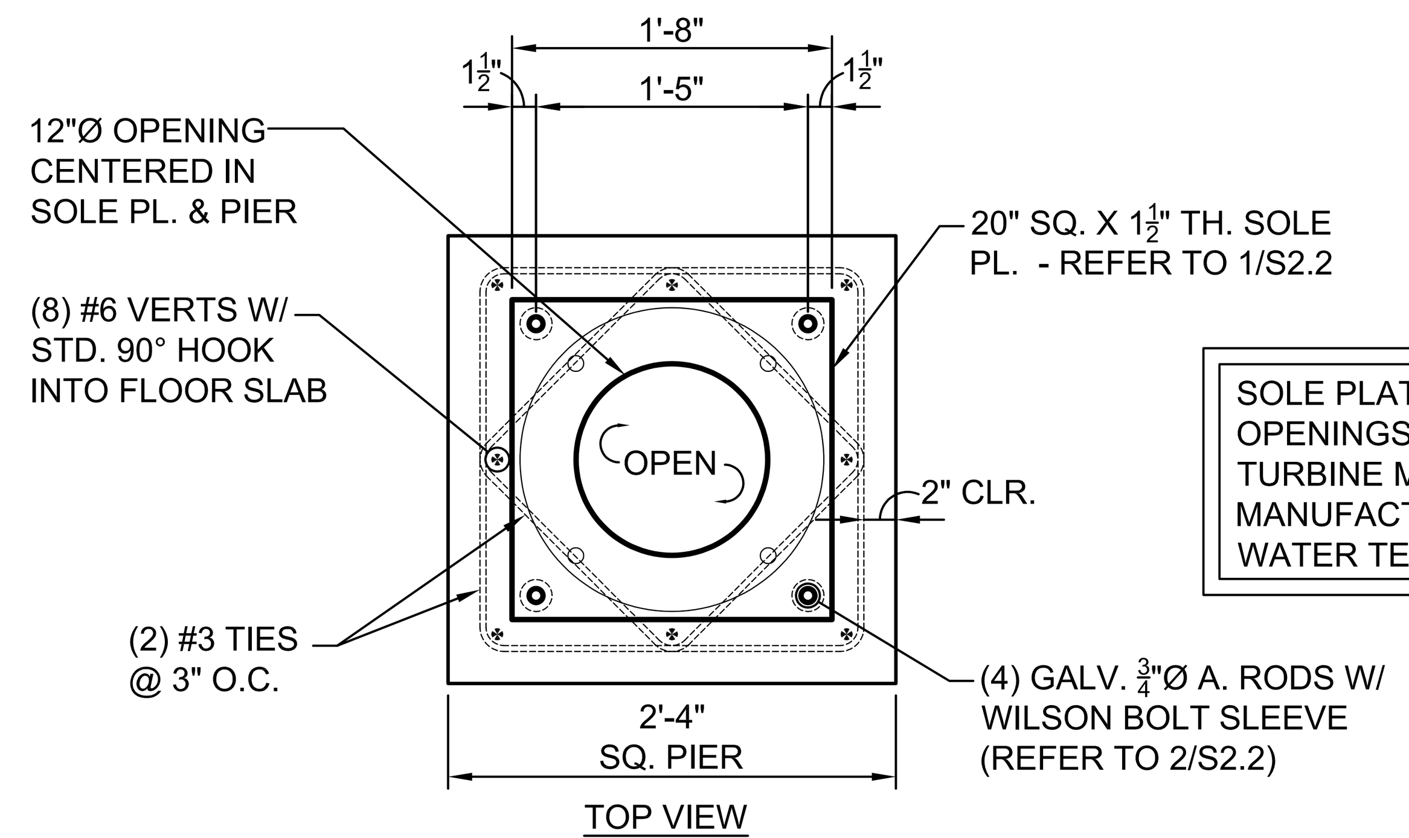
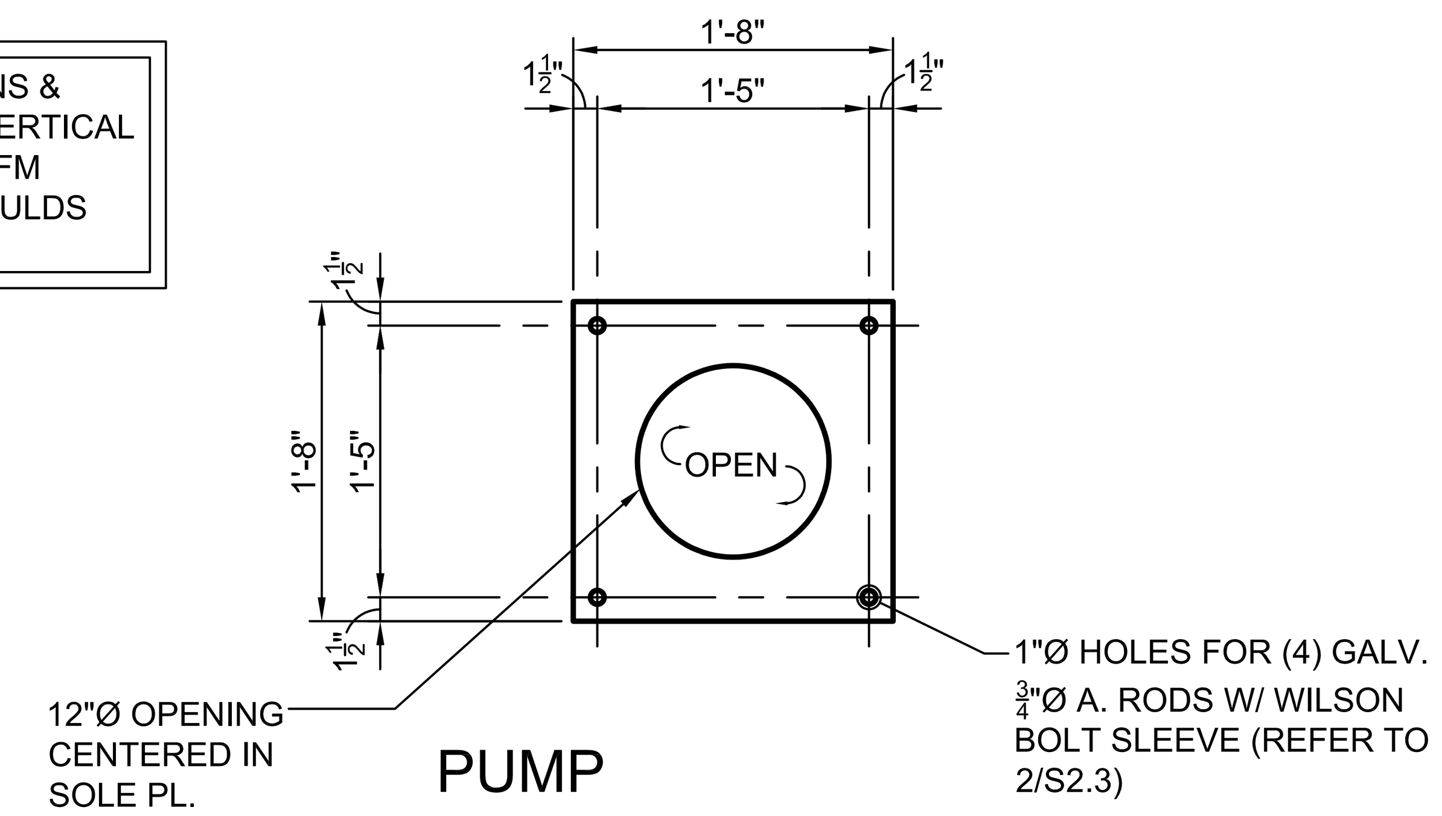
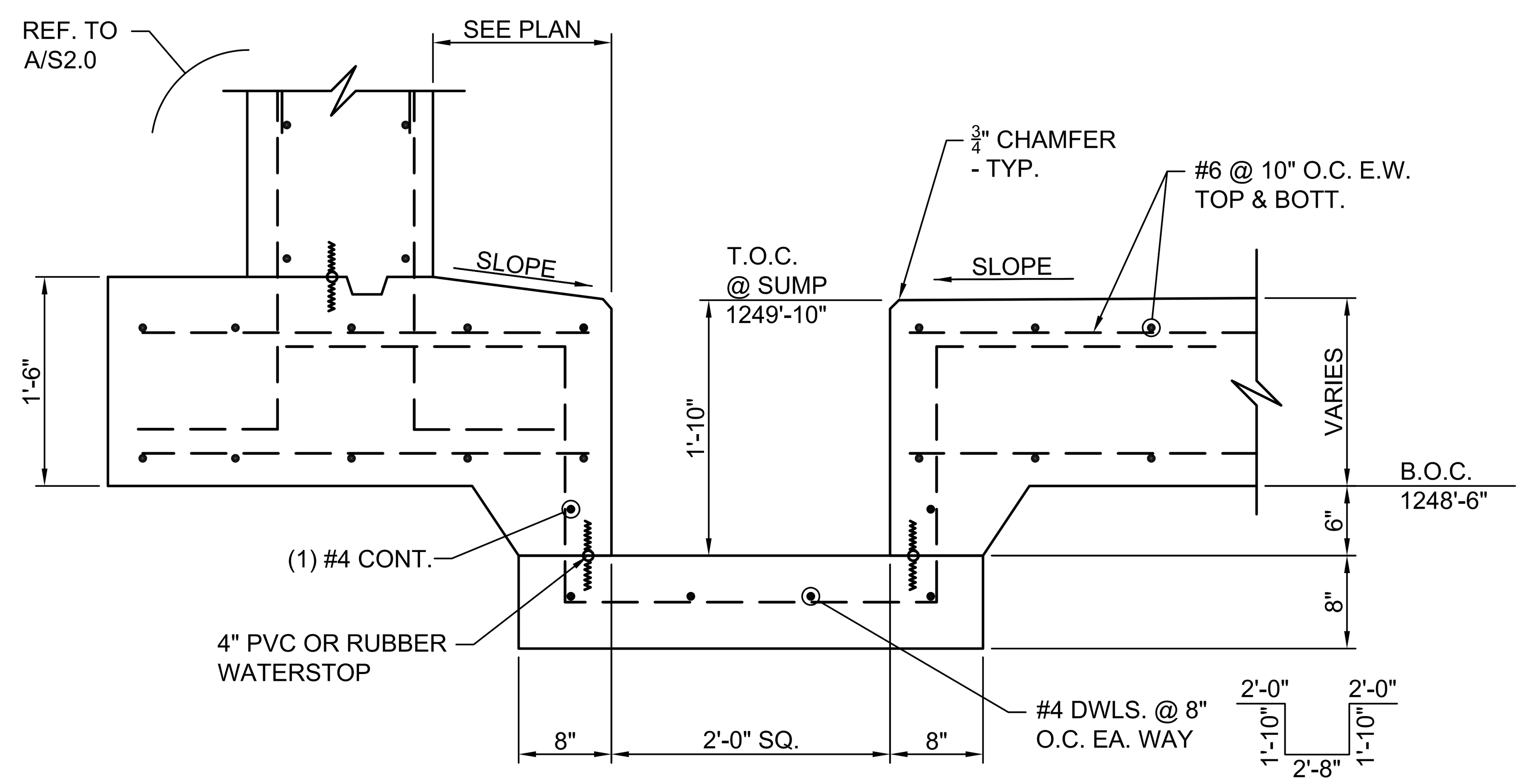


SOLE PLATE DIMENSIONS & OPENINGS BASED ON VERTICAL TURBINE MODEL VIT-FFFM MANUFACTURED BY GOULDS WATER TECHNOLOGY



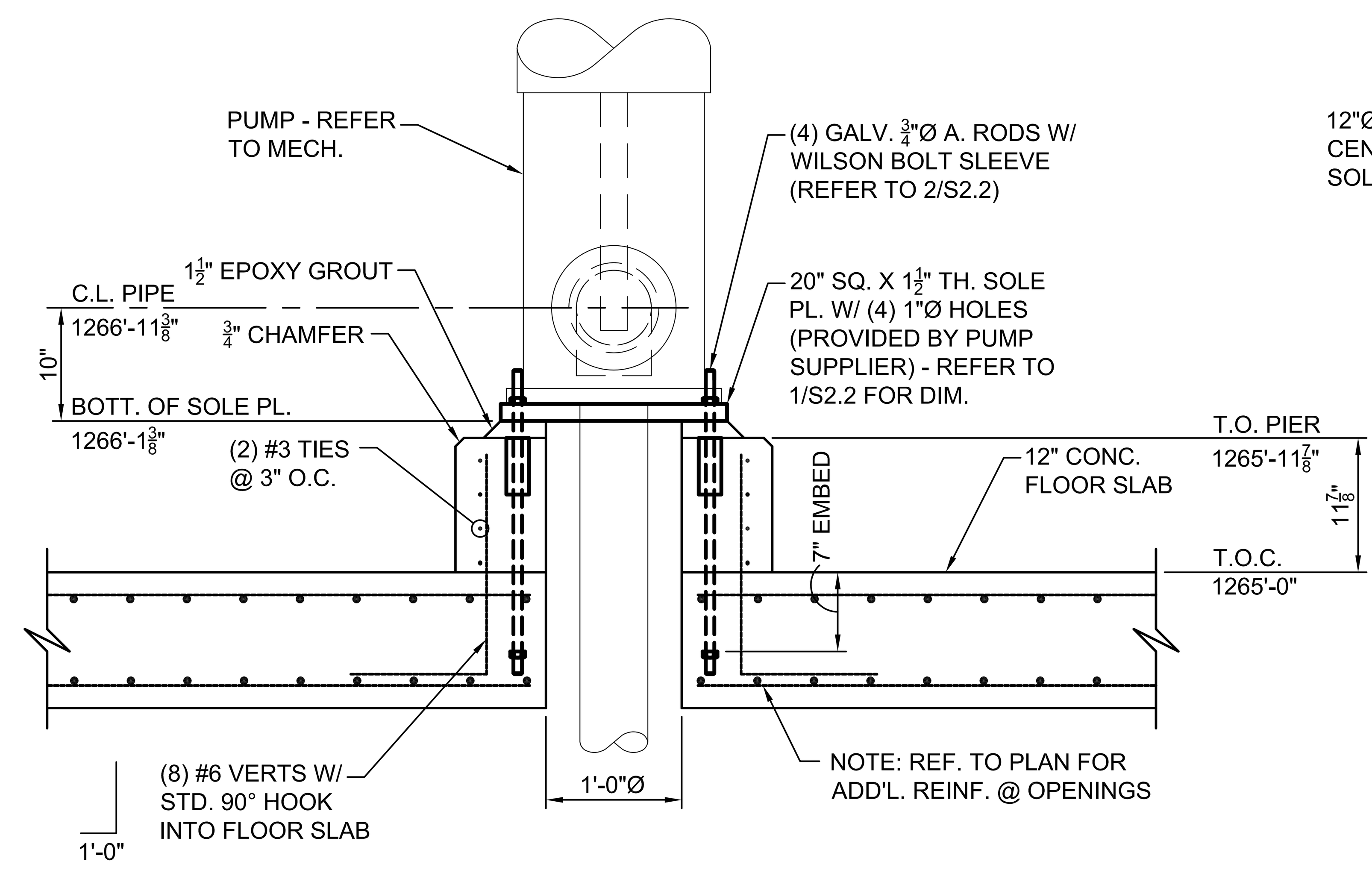
1 S2.2 PUMP ANCHOR BOLT PLAN

SCALE: 1" = 1'-0"



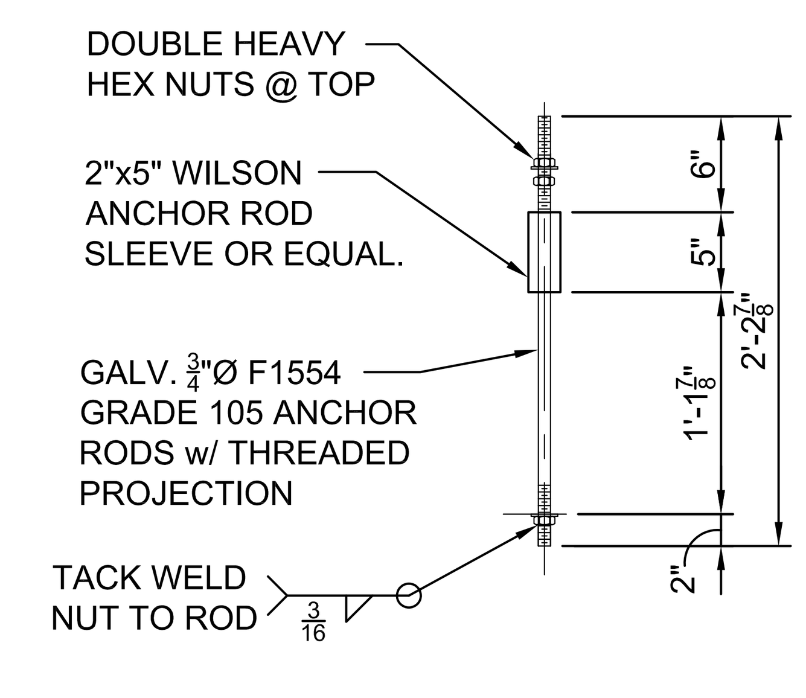
D S2.2 SECTION @ SUMP PIT

SCALE: 1" = 1'-0"



E S2.2 PUMP FND. DETAIL

SCALE: 1" = 1'-0"



QTY: 12

2 S2.2 A.R. DETAIL

SCALE: 1" = 1'-0"

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RE-USE WATER PUMP STATION

CITY OF WICHITA, KANSAS

TO SERVE SPIRIT AEROSYSTEMS

FOUNDATION SECTIONS

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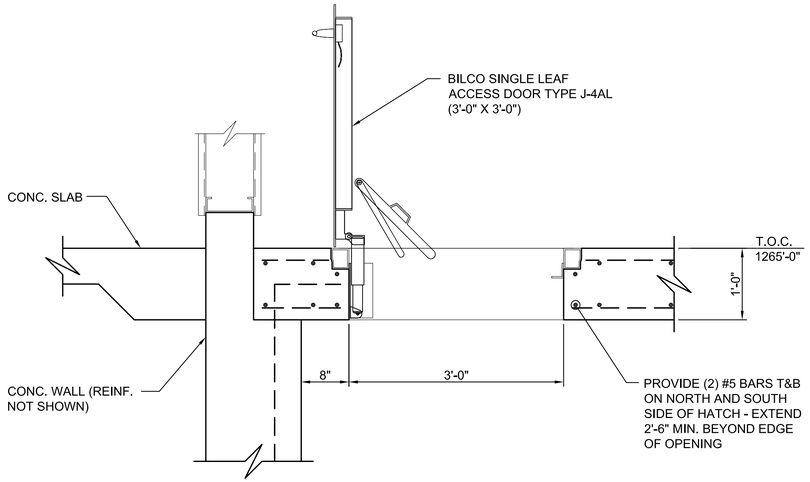
SHEET NO.

S2.2

20045 KANSAS PROFESSIONAL ENGINEER

18/APR/16

PLOTTED: Friday, April 22, 2016 @ 09:13AM



A S2.3 SECTION AT HATCH

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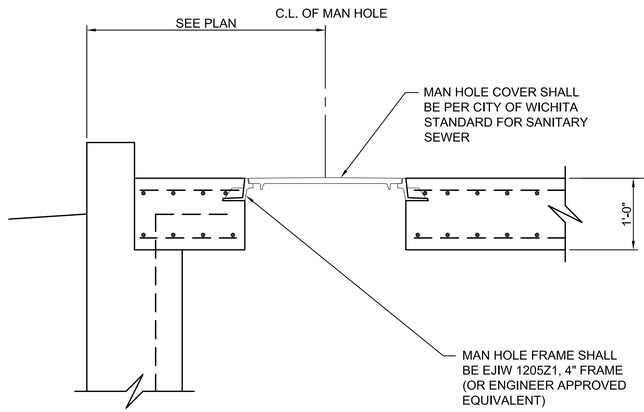

B S2.3 SECTION AT MANHOLE

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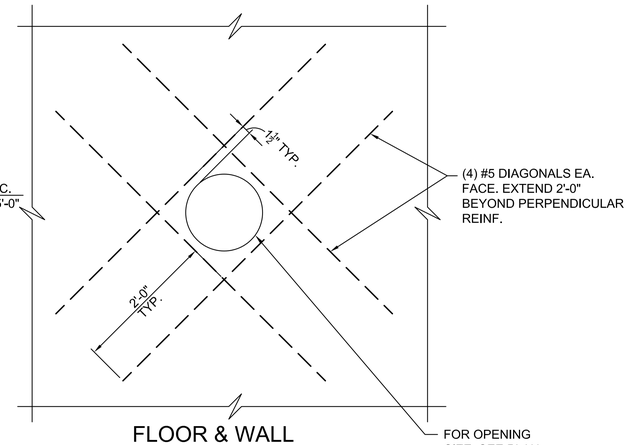
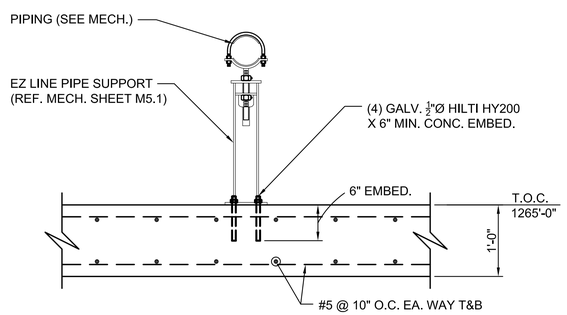


FLOOR & WALL
TYP. OPENING DETAIL

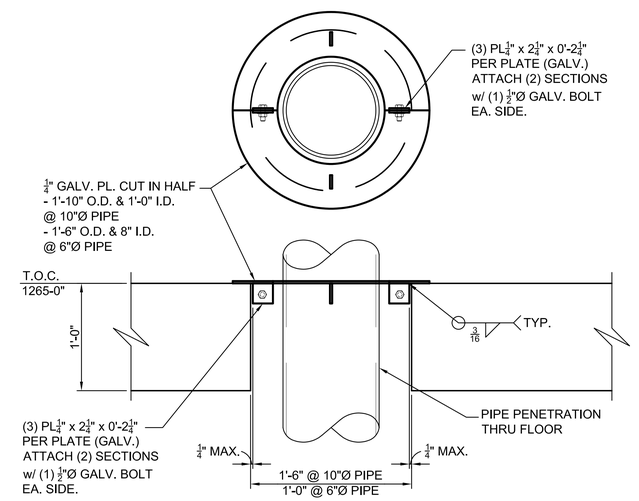
C S2.3

SCALE: 1" = 1'-0"



D S2.3 SECTION AT EZ LINE

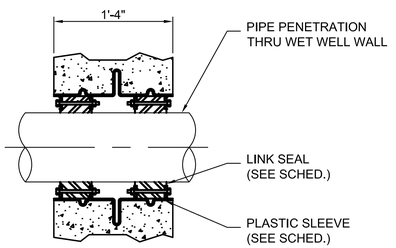
SCALE: 1" = 1'-0"



FLOOR PIPE PENETRATION
PLATE COVER DETAIL

E S2.3

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



LINKSEAL & SLEEVE SCHEDULE

PIPE SIZE & TYPE	LINKSEAL MODEL	SLEEVE MODEL	C.L. ELEVATION
10"Ø DICL	LS-410-S316-15	CS-14-16	1258'-10 7/16"
4"Ø PVC	LS-475-S316-8	CS-8-16	1262'-8"

NOTE: SEE PLAN FOR PIPE LOCATION.

WALL PIPE PENETRATION
LINK SEAL/SLEEVE DETAIL

F S2.3

SCALE: N.T.S.

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TO SERVE SPIRIT AEROSYSTEMS

FOUNDATION SECTIONS

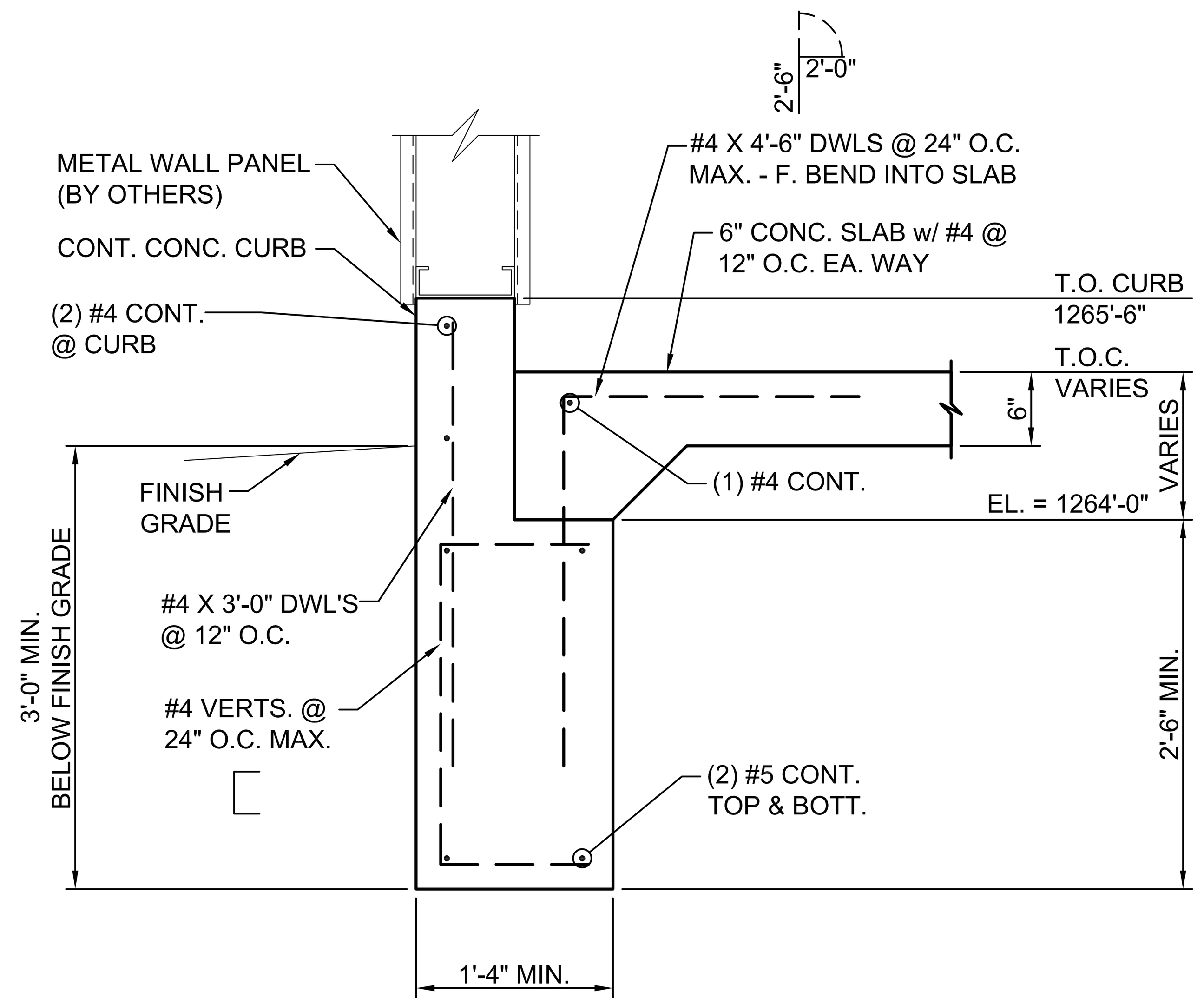
PROJECT NO.	468-85112
DATE	04/18/16
SCALE	AS NOTED

DESIGNED	DRAWN	CHECKED
SK	CAM	AR

NO.	REVISION	DATE
0	ISSUED FOR CONSTRUCTION	04/18/16

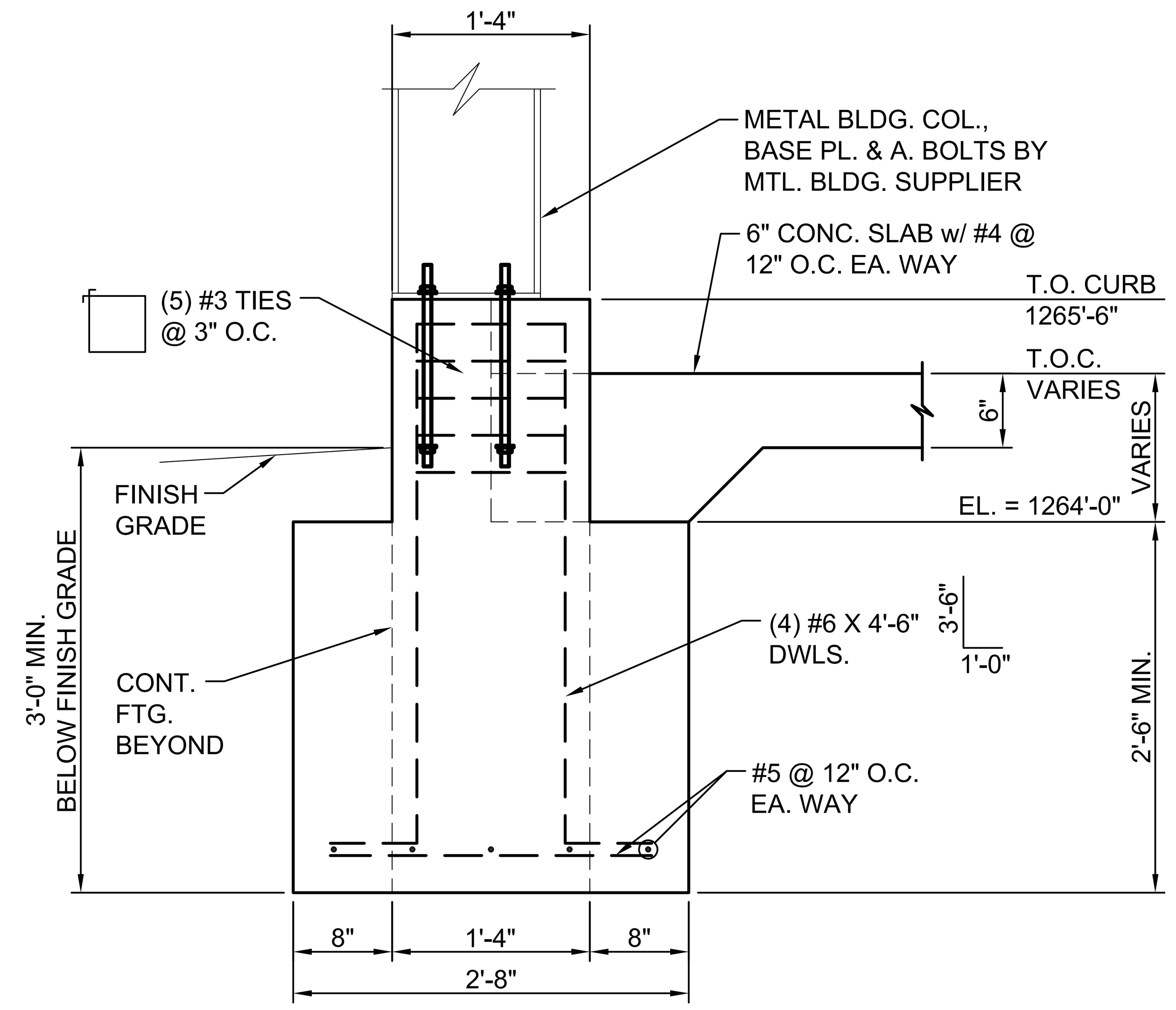
SHEET NO.

S2.3



A / S2.4 FOUNDATION SECTION

SCALE: 1" = 1'-0"



B / S2.4 FOUNDATION SECTION

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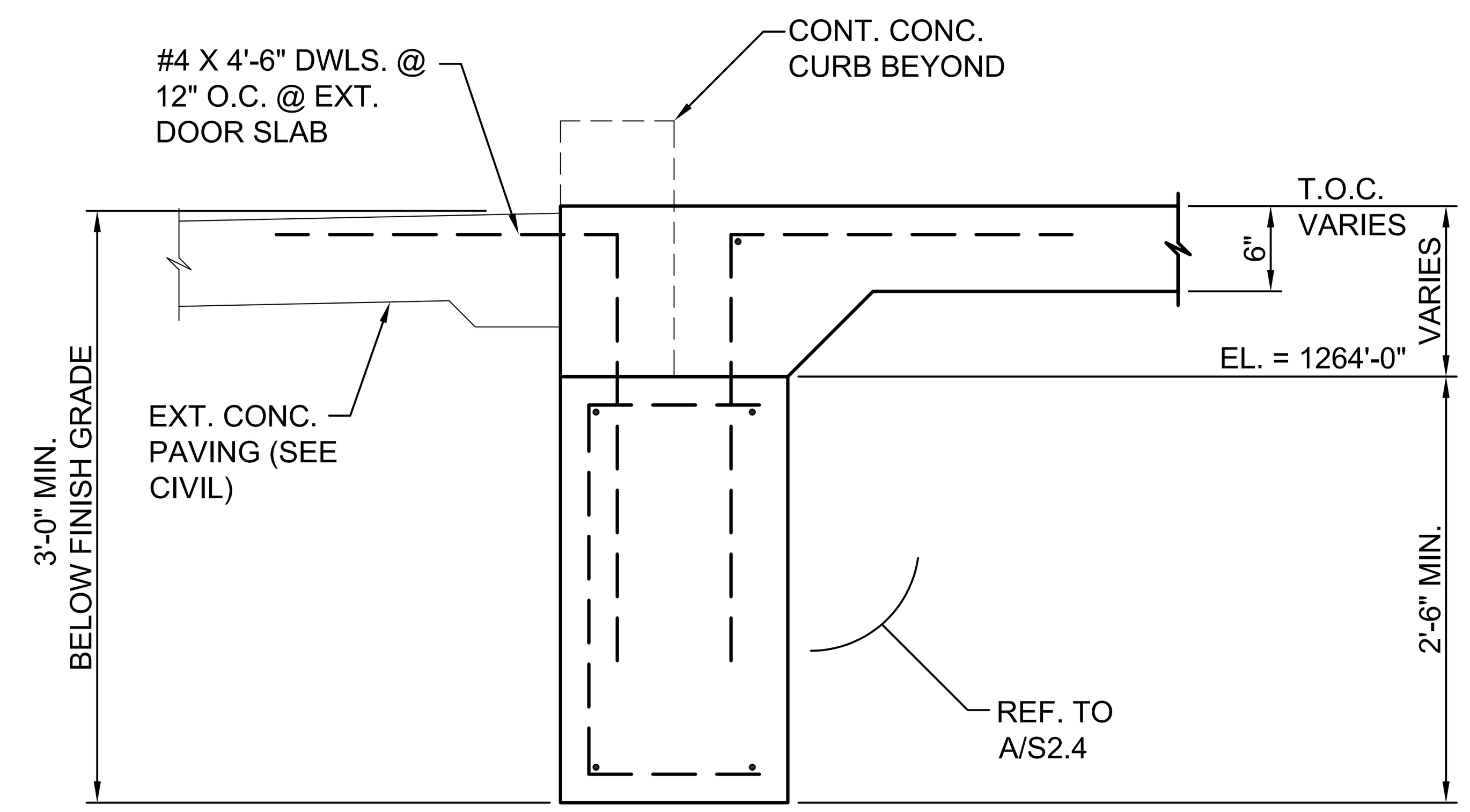
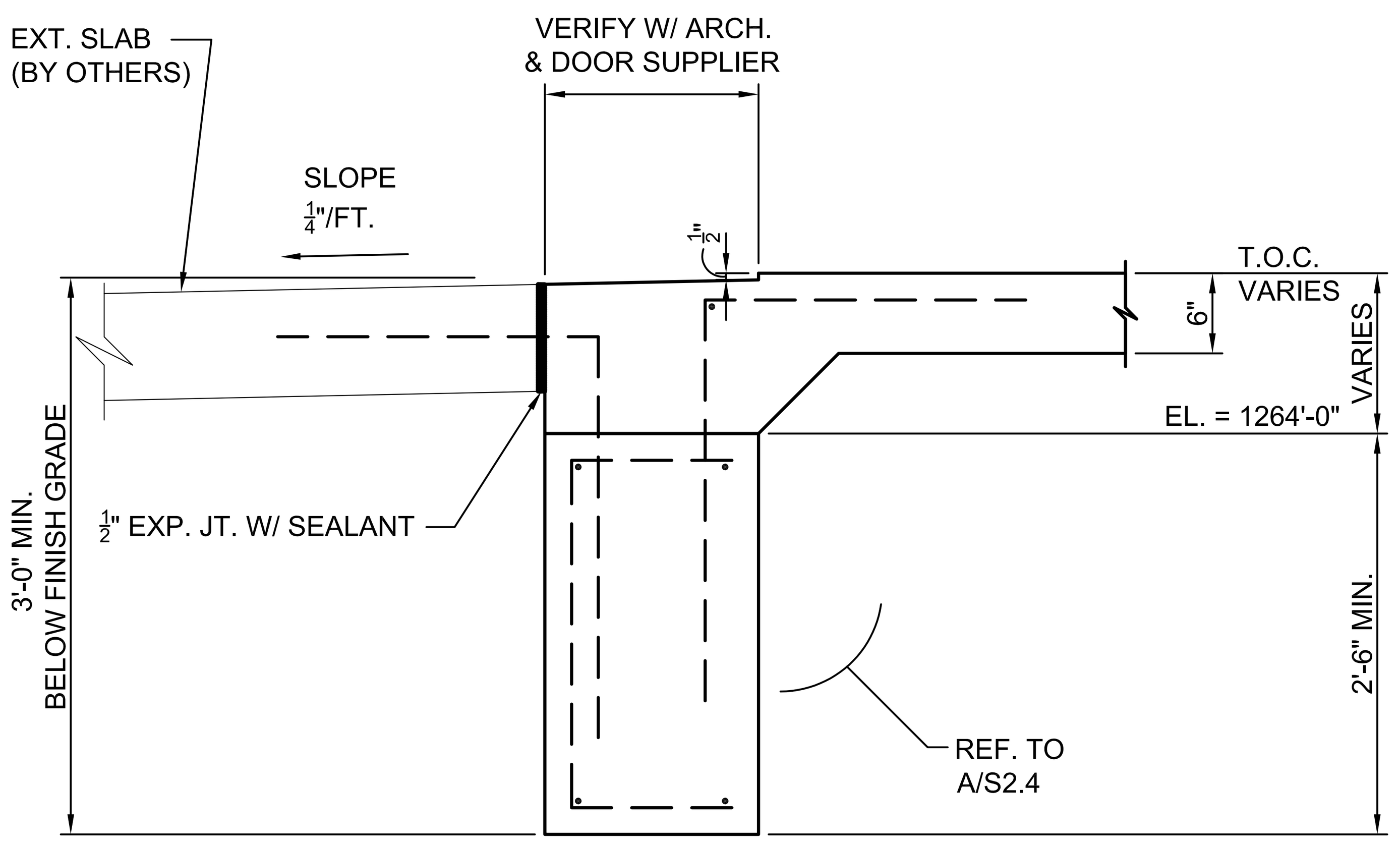


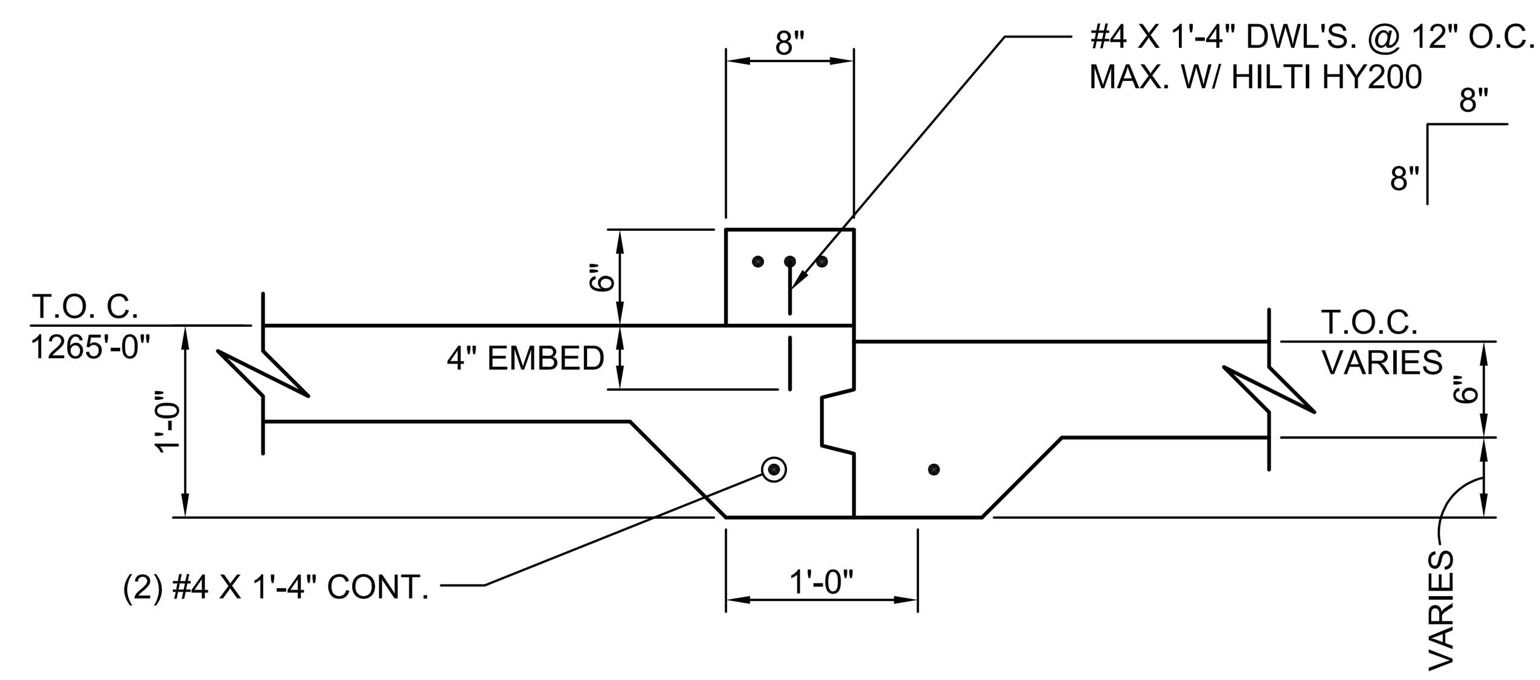
C / S2.4 FOUNDATION SECTION

SCALE: 1" = 1'-0"



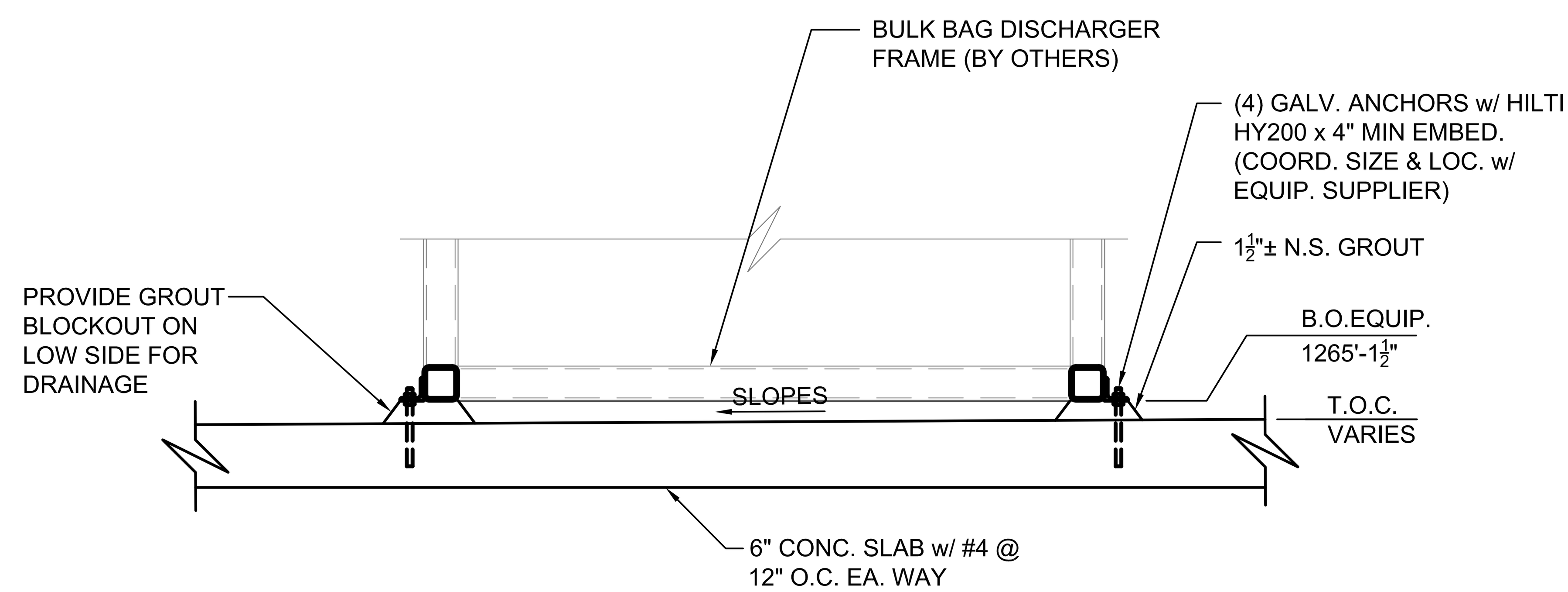
D / S2.4 FOUNDATION SECTION

SCALE: 1" = 1'-0"



E / S2.4 SECTION @ INT. CURB

SCALE: 1" = 1'-0"



BULK BAG DISCHARGER

F / S2.4 SECTION @ EQUIP.

SCALE: 1" = 1'-0"

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SHEET NO. S2.4

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18/APR/16

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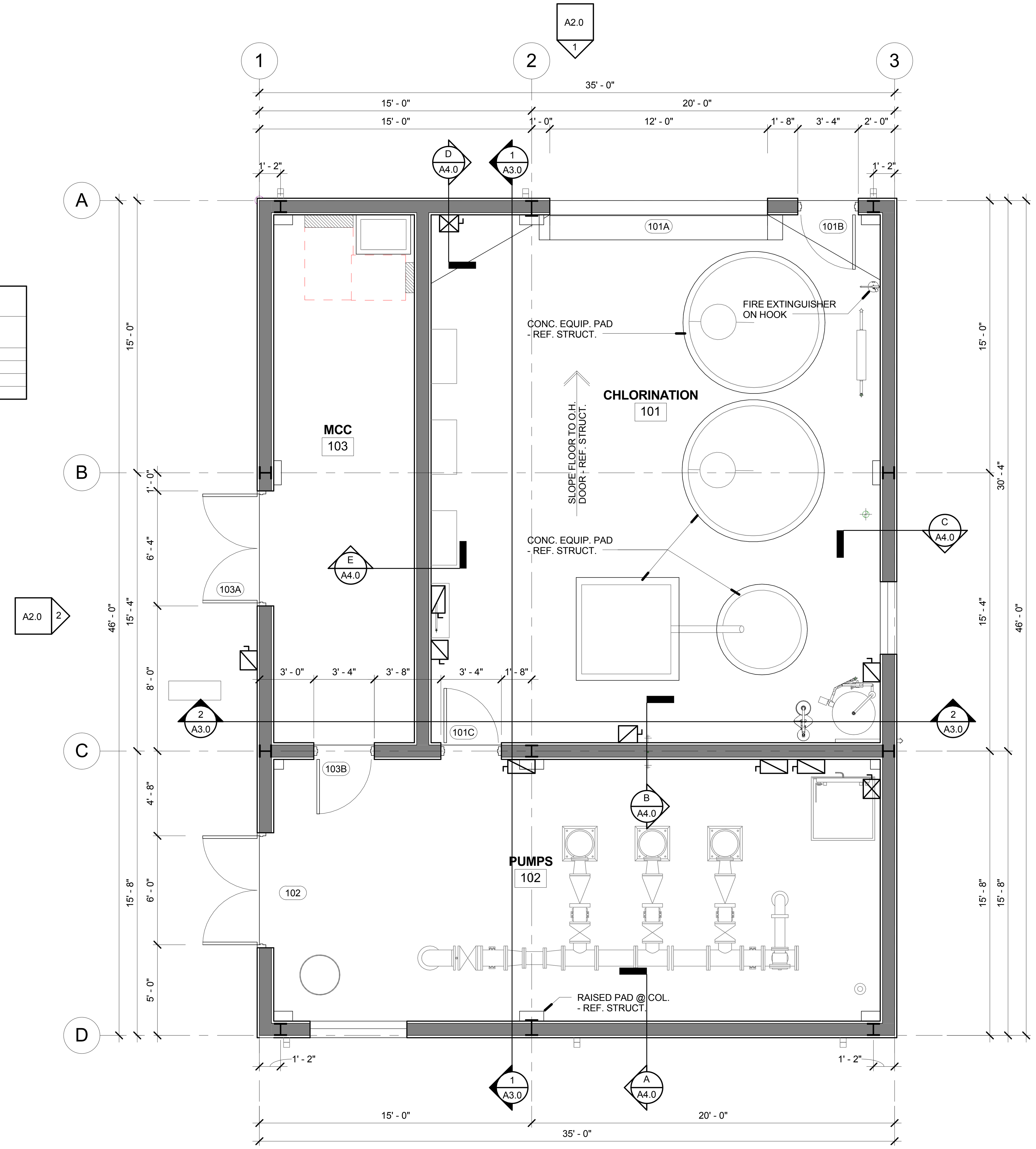
ROOM FINISH SCHEDULE

Room #	Room Name	Floor	Base	North Wall	South Wall	East Wall	West Wall	Ceiling Finish	Comments
101	CHLORINATION	SEALED CONC	SEALED CONC.	LINER PANEL	LINER PANEL	LINER PANEL	LINER PANEL	LINER PANEL	
102	PUMPS	SEALED CONC	SEALED CONC.	LINER PANEL	LINER PANEL	LINER PANEL	LINER PANEL	LINER PANEL	
103	MCC	SEALED CONC	SEALED CONC.	LINER PANEL	LINER PANEL	LINER PANEL	LINER PANEL	LINER PANEL	

CONCRETE SEALER SHALL BE SOLVENT BASED ACRYLIC (MPI #104) PER SPECIFICATIONS



A ARCHITECTURAL FLOOR PLAN
1/4" = 1'-0"
NORTH

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FLOOR PLANS

PROJECT NO.	468-85112
DATE	04-18-16
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DESIGNED	DRAWN	CHECKED
DGA	TEAM	DGA

NO.	REVISION	DATE
0	ISSUED FOR CONSTRUCTION	04/18/16

SHEET NO.
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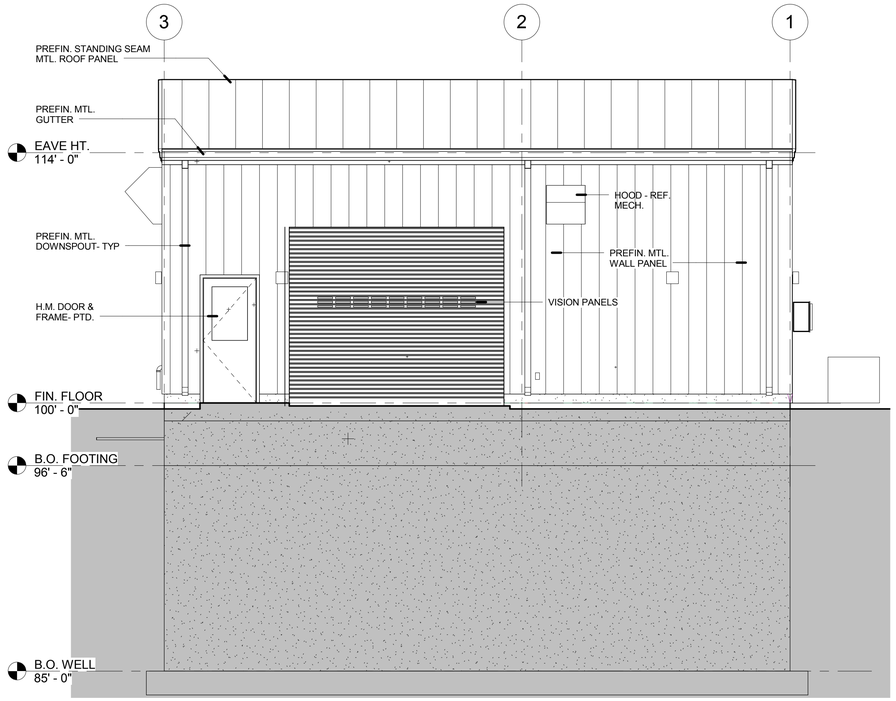
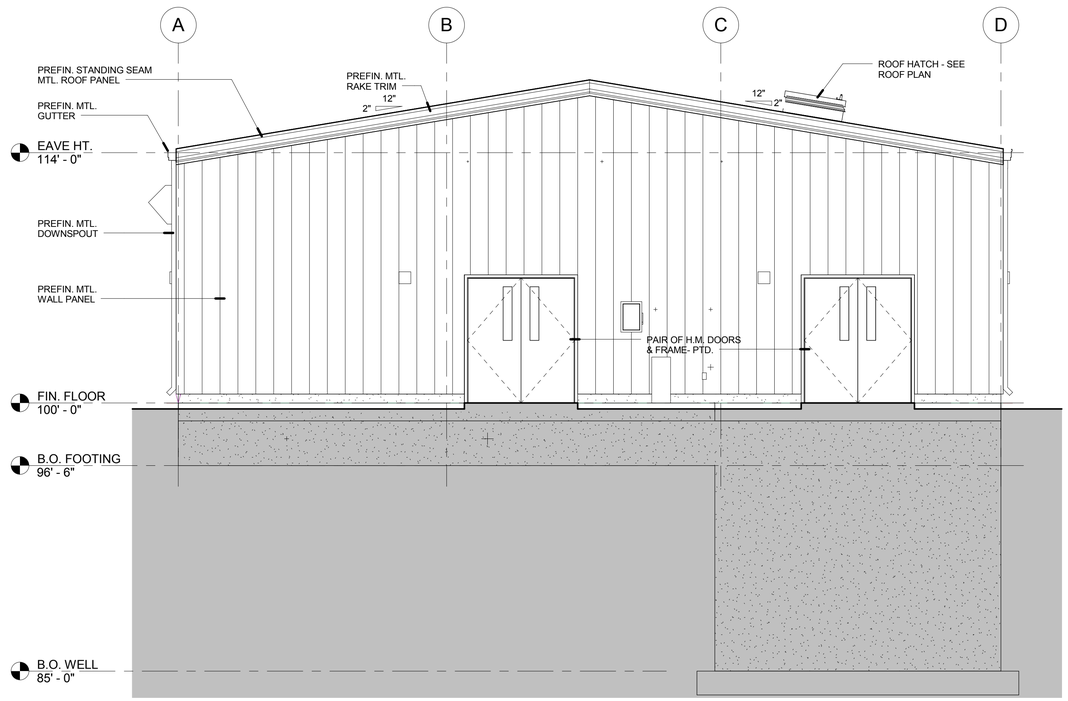


1 NORTH ELEVATION
1/4" = 1'-0"



2 EAST ELEVATION
1/4" = 1'-0"

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EXTERIOR ELEVATIONS

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DGA	TEAM	DGA

NO.	REVISION	DATE
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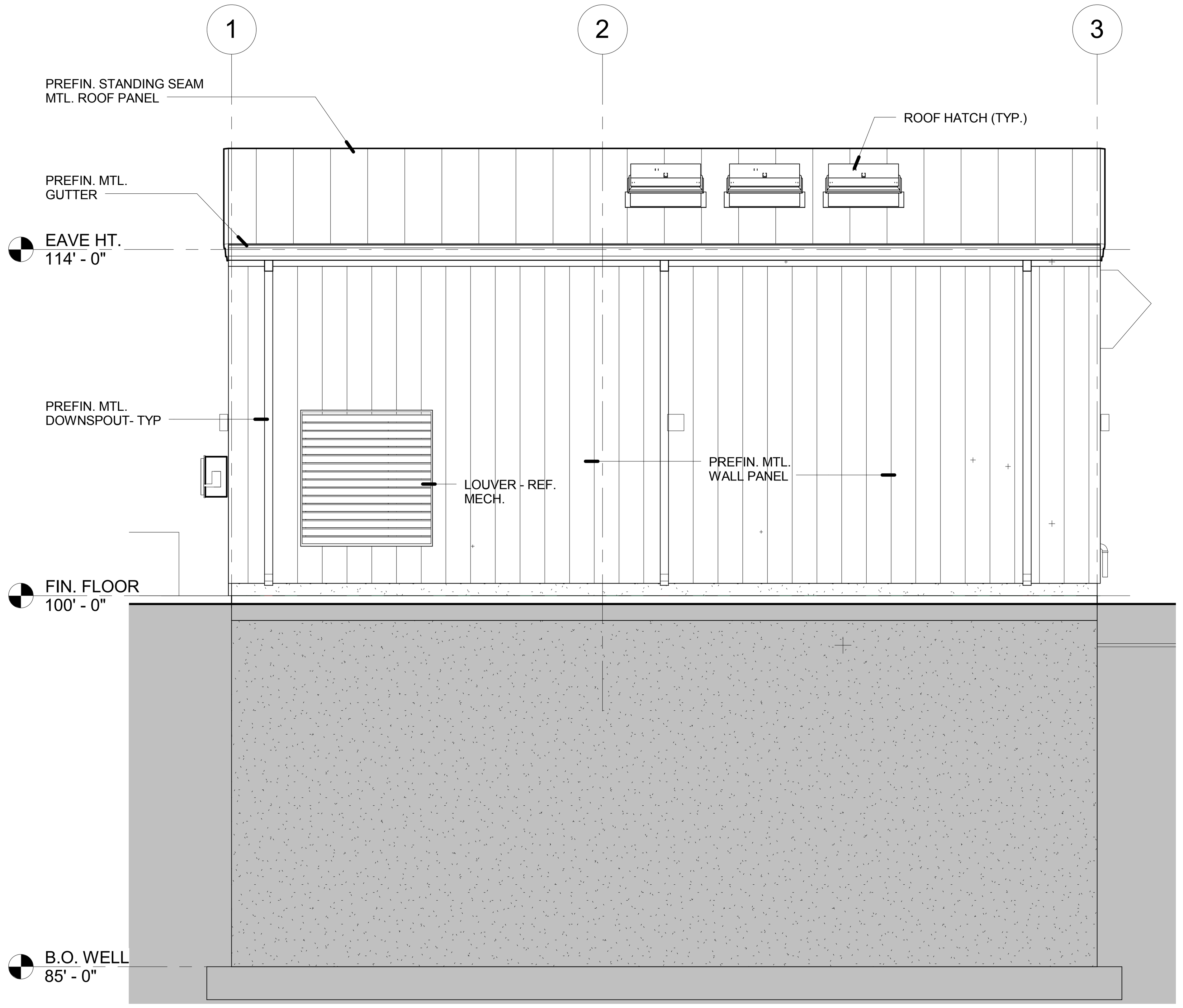
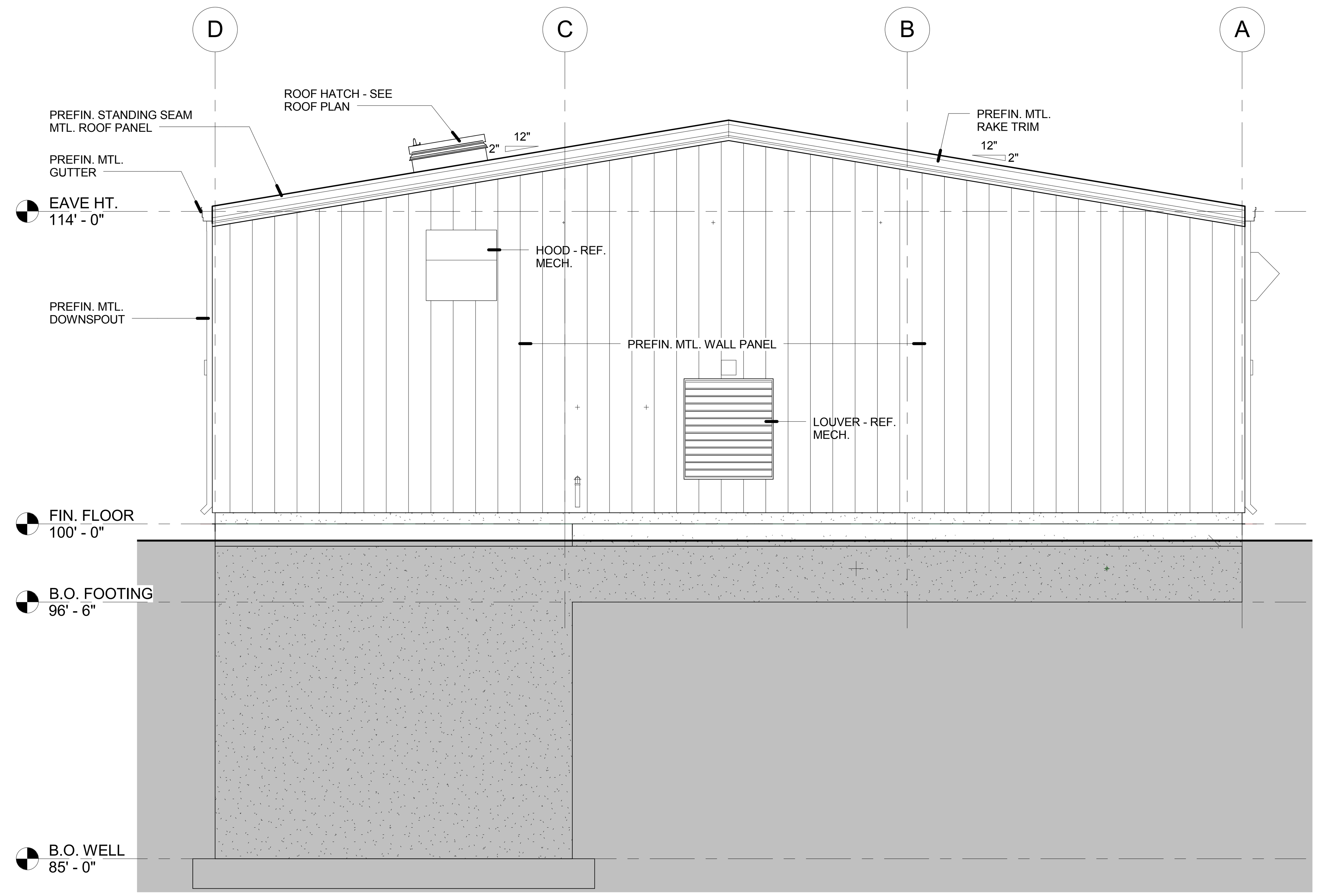


1 SOUTH ELEVATION
1/4" = 1'-0"



2 WEST ELEVATION
1/4" = 1'-0"

EXTERIOR ELEVATIONS

PROJECT NO.	468-85112
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DGA	TEAM	DGA

NO.	REVISION	DATE
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04-18-16

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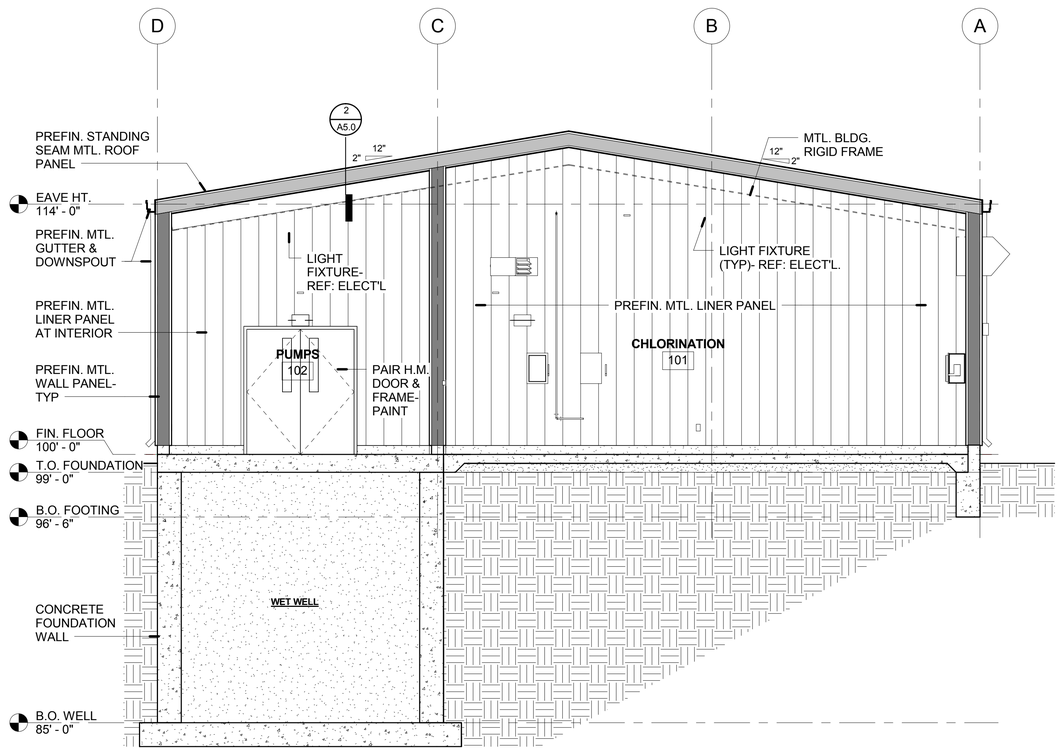
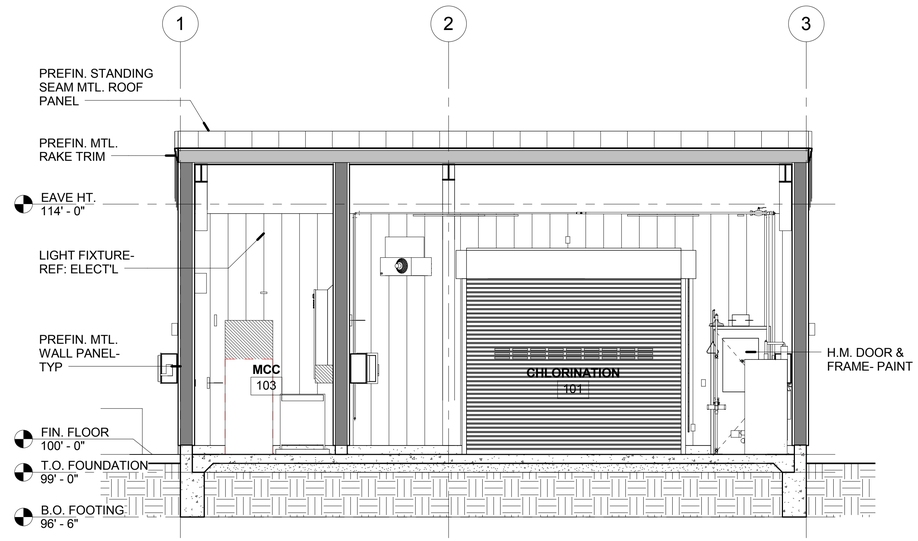


1 BUILDING THRU WET WELL

1/4" = 1'-0"



2 BUILDING CROSS-SECTION

1/4" = 1'-0"

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BUILDING SECTIONS

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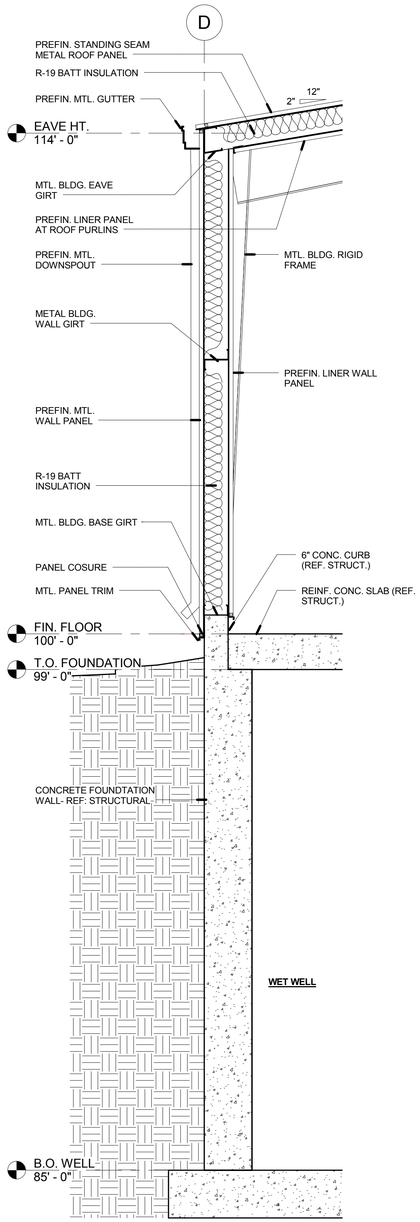
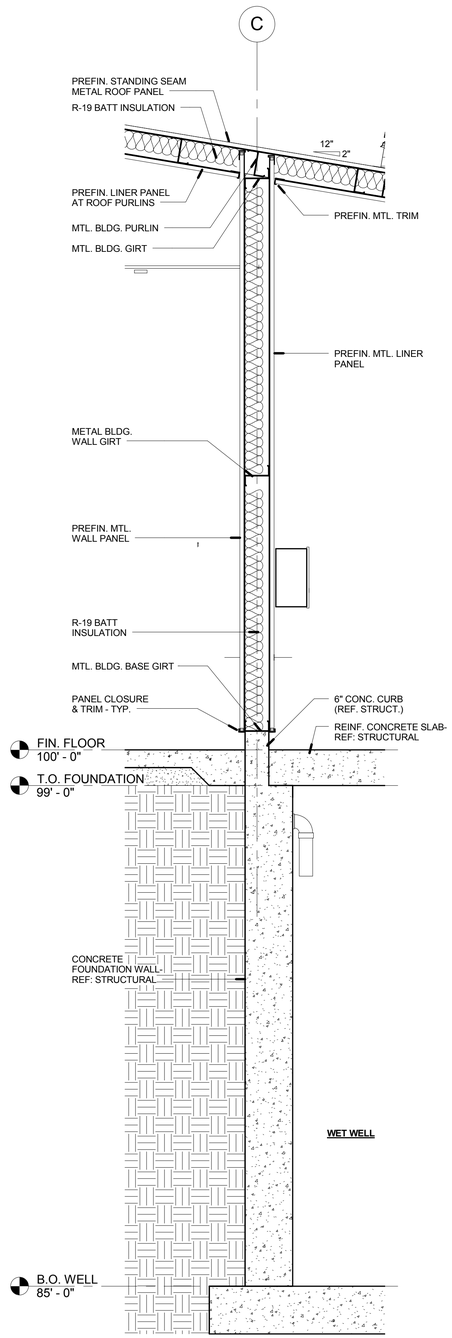
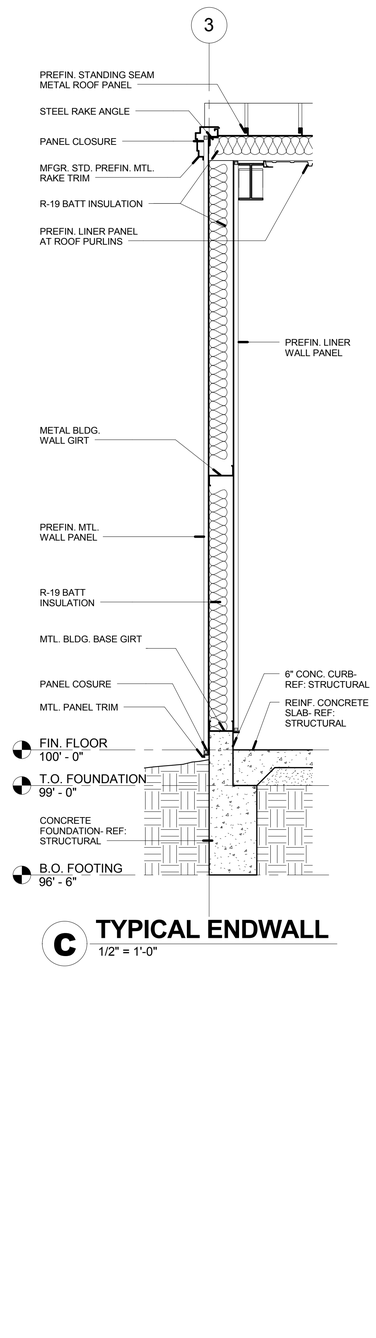


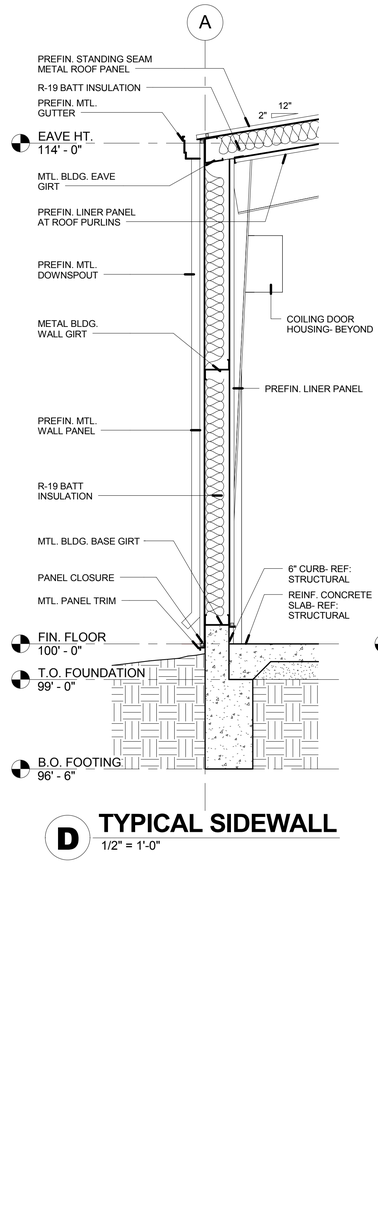
A SIDEWALL @ WET WELL
1/2" = 1'-0"



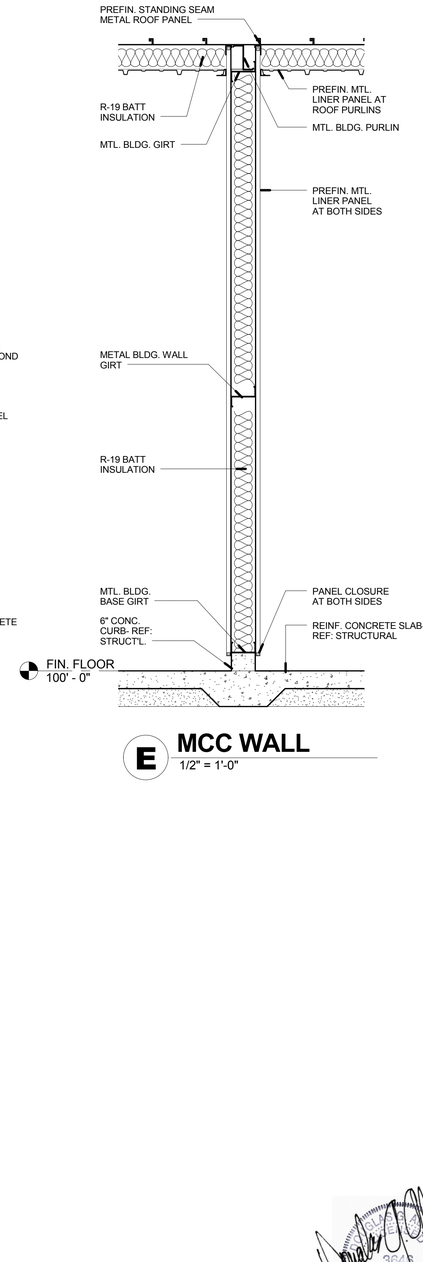
B INTERIOR WET WELL
1/2" = 1'-0"



C TYPICAL ENDWALL
1/2" = 1'-0"



D TYPICAL SIDEWALL
1/2" = 1'-0"



E MCC WALL
1/2" = 1'-0"

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WALL SECTIONS

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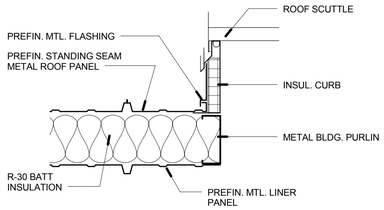
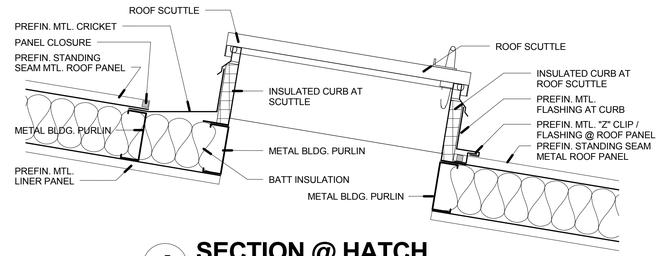
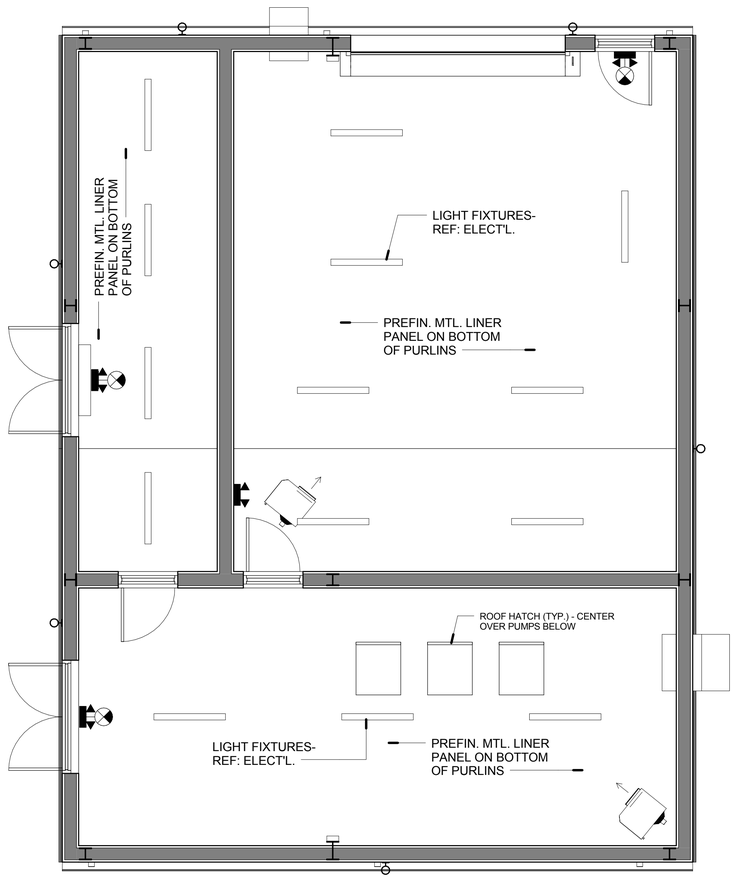


2 ROOF HATCH SIDECURB
1" = 1'-0"

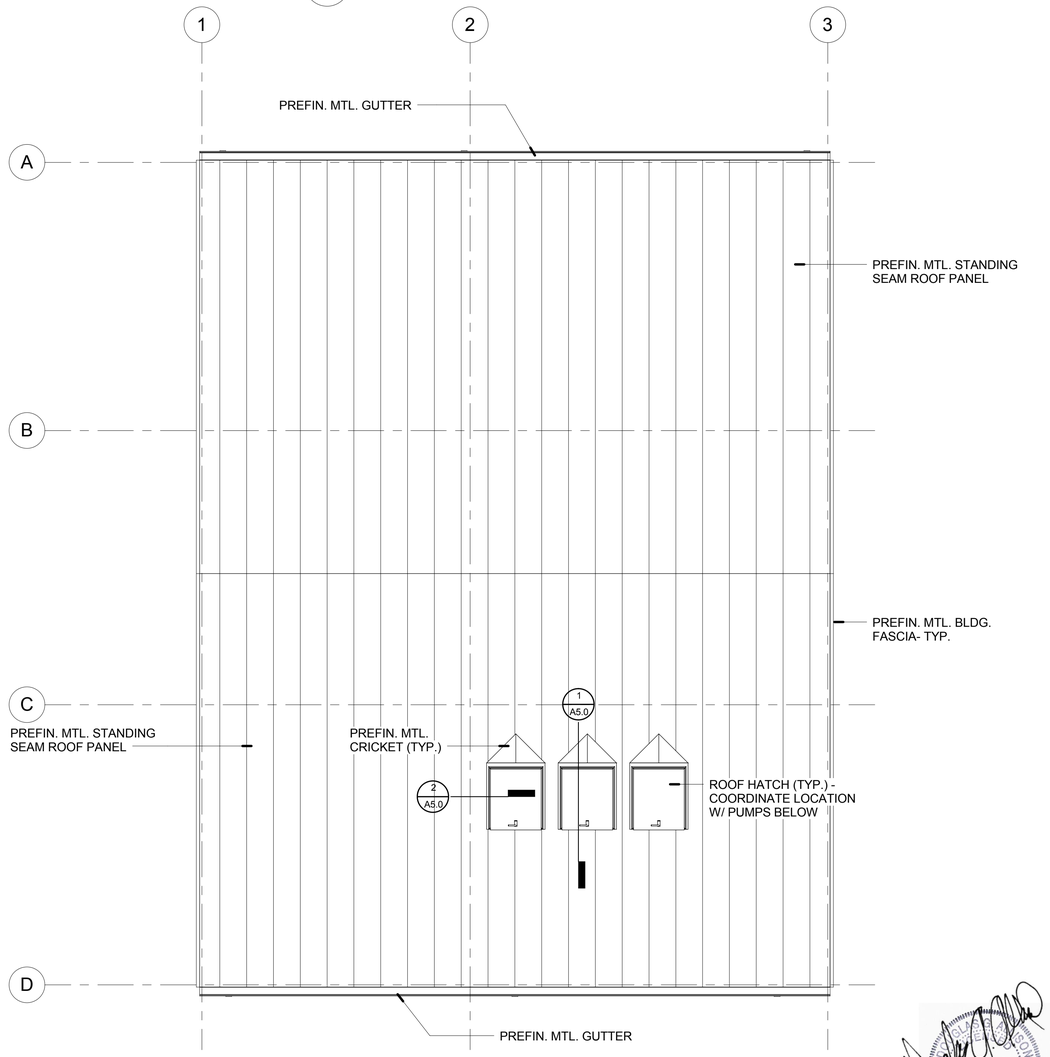


1 SECTION @ HATCH
1" = 1'-0"



B REFLECTED CEILING PLAN
1/4" = 1'-0"

0' 2' 4' 8' NORTH



A ROOF PLAN
1/4" = 1'-0"

0' 2' 4' 8' NORTH

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ROOF PLAN

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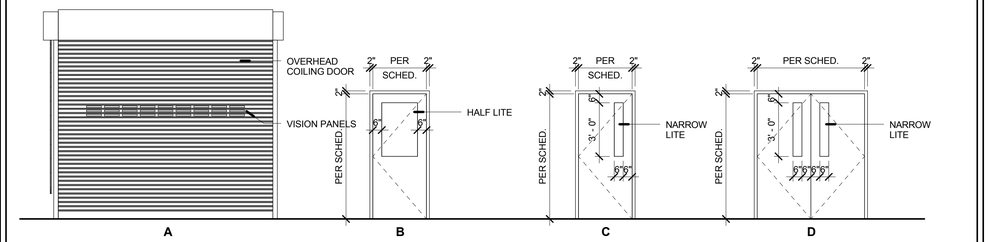
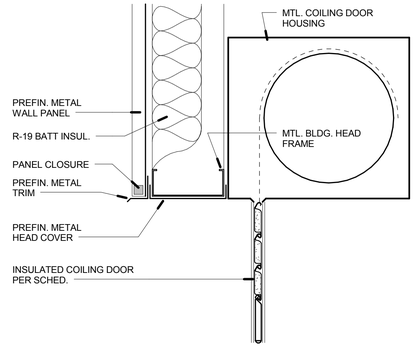
DOOR & FRAME SCHEDULE

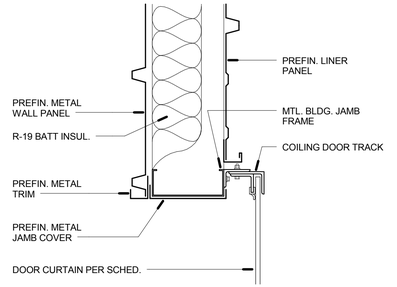
NO.	DOORS W	H	T	TYPE	MAT'L	Door Finish	FRAME TYPE	Frame Matl	FRAME FINISH	HRDWR	RATING	DETAILS HEAD	JAMB	SILL	REMARKS
101A	12' - 0"	10' - 0"	2"	A	STEEL	PREFIN.	A			SET 1	N/A	1/A6.1	2/A6.1	3/A6.1	
101B	3' - 0"	7' - 0"	1 3/4"	B	H.M.	PAINT	B	H.M.	PAINT	SET 2	N/A	4/A6.1	5/A6.1	6/A6.1	
101C	3' - 0"	7' - 0"	1 3/4"	C	H.M.	PAINT	C	H.M.	PAINT	SET 4	N/A	4/A6.1	5/A6.1	6/A6.1	
102	6' - 0"	7' - 0"	1 3/4"	D	H.M.	PAINT	D	H.M.	PAINT	SET 3	N/A	4/A6.1	5/A6.1	6/A6.1	
103A	6' - 0"	7' - 0"	1 3/4"	D	H.M.	PAINT	D	H.M.	PAINT	SET 3	N/A	4/A6.1	5/A6.1	6/A6.1	
103B	3' - 0"	7' - 0"	1 3/4"	C	H.M.	PAINT	C	H.M.	PAINT	SET 5	N/A	4/A6.1	5/A6.1	6/A6.1	

DOOR TYPES

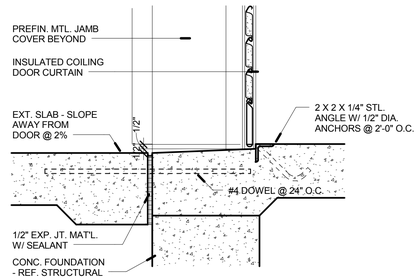




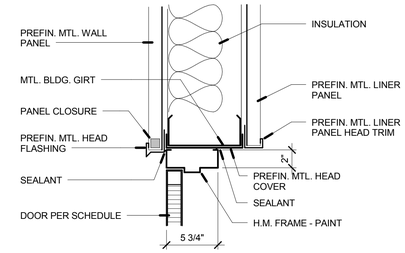
1 OH COILING DOOR HEAD
1 1/2" = 1'-0"



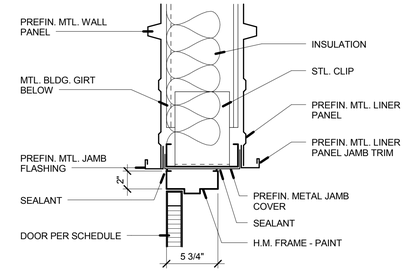
2 OH COILING DOOR JAMB
1 1/2" = 1'-0"



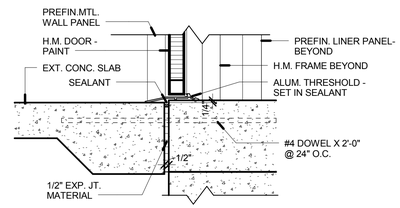
3 OH COILING DOOR SILL
1 1/2" = 1'-0"



4 MAN DOOR HEAD
1 1/2" = 1'-0"



5 MAN DOOR JAMB
1 1/2" = 1'-0"



6 EXT. H.M. DOOR SILL
1 1/2" = 1'-0"

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SCHEDULES & OPENING DETAILS

PROJECT NO.	468-85112
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ARCHITECTURAL SPECIFICATIONS

SECTION 077200 - ROOF ACCESSORIES

PART 1 - GENERAL
1.1 SUMMARY
A. Section Includes:
1. Roof hatches.
1.2 ACTION SUBMITTALS
A. Product Data: For each type of roof accessory.
B. Shop Drawings: For roof accessories.
1.3 CLOSEOUT SUBMITTALS
A. Operation and maintenance data.
PART 2 - PRODUCTS
2.1 ROOF HATCH
A. Roof Hatches: Metal roof-hatch units with lids and insulated double-walled curbs, welded or mechanically fastened and sealed corner joints, continuous lid-to-curb counterflashing and weathertight perimeter gasketing, straight sides, and integrally formed deck-mounting flange at perimeter bottom.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
a. Babcock-Davis.
b. Bilco Company (The).
c. JL Industries, Inc.; a division of the Activar Construction Products Group.
d. Milcor; Commercial Products Group of Hart & Cooley, Inc.
e. O'Keeffe's Inc.
B. Type and Size: Single-leaf lid, 30 by 36 inches.
C. Loads: Minimum 40-lbf/sq. ft. (1.9-kPa) external live load and 20-lbf/sq. ft. (0.95-kPa) internal uplift load.
D. Hatch Material: Zinc-coated (galvanized) steel sheet.
1. Thickness: Manufacturer's standard thickness for hatch size indicated.
2. Finish: Factory prime coating.
E. Construction:
1. Insulation: Polyisocyanurate board.
a. R-Value: 12.0 according to ASTM C 1363.
2. Hatch Lid: Opaque, insulated, and double walled, with manufacturer's standard metal liner of same material and finish as outer metal lid.
3. Curb Liner: Manufacturer's standard, of same material and finish as metal curb.
4. On ribbed or fluted metal roofs, form flange at perimeter bottom to conform to roof profile.
5. Fabricate curbs to minimum height of 12 inches (305 mm) above roofing surface unless otherwise indicated.
6. Sloping Roofs: Where slope or roof deck exceeds 1:48, fabricate curb with perimeter curb height that is constant. Equip hatch with water diverter or cricket on side that obstructs water flow.
F. Hardware: Spring operators, hold-open arm, galvanized-steel spring latch with turn handles, galvanized-steel butt- or pintle-type hinge system, and padlock hasps inside and outside.
2.2 METAL MATERIALS
A. Zinc-Coated (Galvanized) Steel Sheet: ASTM A 653/A 653M, G90 (Z275) coating designation and mill phosphatized for field painting where indicated.
1. Mill-Phosphatized Finish: Manufacturer's standard.
2. Factory Prime Coating: Where field painting is indicated, apply pretreatment and white or light-colored, factory-applied, baked-on epoxy primer coat, with a minimum dry film thickness of 0.2 mil (0.005 mm).
B. Steel Shapes: ASTM A 36/A 36M, hot-dip galvanized according to ASTM A 123/A 123M unless otherwise indicated.
C. Steel Tube: ASTM A 500/A 500M, round tube.
D. Galvanized-Steel Tube: ASTM A 500/A 500M, round tube, hot-dip galvanized according to ASTM A 123/A 123M.
E. Steel Pipe: ASTM A 53/A 53M, galvanized.
2.3 MISCELLANEOUS MATERIALS
A. General: Provide materials and types of fasteners, protective coatings, sealants, and other miscellaneous items required by manufacturer for a complete installation.
B. Polyisocyanurate Board Insulation: ASTM C 1289, thickness and thermal resistivity as indicated.
PART 3 - EXECUTION
3.1 INSTALLATION
A. General: Verify dimensions of roof openings for roof accessories. Install roof accessories according to manufacturer's written instructions.
1. Install roof accessories level; plumb; true to line and elevation; and without warping, jogs in alignment, buckling, or tool marks.
2. Anchor roof accessories securely in place so they are capable of resisting indicated loads.
3. Use fasteners, separators, sealants, and other miscellaneous items as required to complete installation of roof accessories and fit them to substrates.
4. Install roof accessories to resist exposure to weather without failing, rattling, leaking, or loosening of fasteners and seals.
B. Metal Protection: Protect metals against galvanic action by separating dissimilar metals from contact with each other or with corrosive substrates by painting contact surfaces with bituminous coating or by other permanent separation as recommended by manufacturer.
1. Underlayment: Where installing roof accessories directly on cementitious or wood substrates, install a course of underlayment and cover with manufacturer's recommended slip sheet.
C. Seal joints with elastomeric sealant as required by roof accessory manufacturer.
3.2 REPAIR AND CLEANING
A. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing according to ASTM A 780/A 780M.
B. Touch up factory-primed surfaces with compatible primer ready for field painting according to Section 099113 "Exterior Painting."
C. Clean exposed surfaces according to manufacturer's written instructions.
D. Replace roof accessories that have been damaged or that cannot be successfully repaired by finish touchup or similar minor repair procedures.
END OF SECTION 077200

SECTION 079200 - JOINT SEALANTS

PART 1 - GENERAL
1.1 SUMMARY
A. Section Includes:
1. Silicone joint sealants.
2. Urethane joint sealants.
3. Latex joint sealants.
1.2 ACTION SUBMITTALS
A. Product Data: For each joint-sealant product indicated.
B. Samples: For each kind and color of joint sealant required.
C. Joint-Sealant Schedule: Include the following information:
1. Joint-sealant application, joint location, and designation.
2. Joint-sealant manufacturer and product name.
3. Joint-sealant formulation.
4. Joint-sealant color.
1.3 INFORMATIONAL SUBMITTALS
A. Product test reports.
PART 2 - PRODUCTS
2.1 MATERIALS, GENERAL
A. Liquid-Applied Joint Sealants: Comply with ASTM C 920 and other requirements indicated for each liquid-applied joint sealant specified, including those referencing ASTM C 920 classifications for type, grade, class, and uses related to exposure and joint substrates.
B. Suitability for Contact with Food: Where sealants are indicated for joints that will come in repeated contact with food, provide products that comply with 21 CFR 177.2600.
2.2 SILICONE JOINT SEALANTS
A. Mildew-Resistant Neutral-Curing Silicone Joint Sealant: ASTM C 920.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
a. BASF Building Systems.
b. Dow Corning Corporation.
c. GE Advanced Materials - Silicones.
d. May National Associates, Inc.
e. Pecora Corporation.
f. Polymeric Sytems, Inc.
g. Schnee-Morehead, Inc.
h. Sika Corporation; Construction Products Division.
i. Tremco Incorporated.
2. Type: Single component (S) or multicomponent (M).
3. Grade: nonsag (NS).
4. Class: 100/50.
2.3 LATEX JOINT SEALANTS
A. Latex Joint Sealant: Acrylic latex or siliconized acrylic latex, ASTM C 834, Type OP, Grade NF.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
a. BASF Building Systems.
b. Bostik, Inc.
c. May National Associates, Inc.
d. Pecora Corporation.
e. Schnee-Morehead, Inc.
f. Tremco Incorporated.
2. For use with interior paintable surfaces only.
2.4 JOINT SEALANT BACKING
A. Cylindrical Sealant Backings: ASTM C 1330, Type C (closed-cell material with a surface skin), and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.
B. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer.
2.5 MISCELLANEOUS MATERIALS
A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.
B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials.
C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.
PART 3 - EXECUTION
3.1 PREPARATION
A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions.
1. Remove laitance and form-release agents from concrete.
2. Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants.
B. Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer or as indicated by preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.
C. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.
3.2 INSTALLATION
A. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
B. Install sealant backings of kind indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
1. Do not leave gaps between ends of sealant backings.
2. Do not stretch, twist, puncture, or tear sealant backings.
3. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.
C. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.
D. Install sealants using proven techniques that comply with the following and at the same time backings are installed:
1. Place sealants so they directly contact and fully wet joint substrates.
2. Completely fill recesses in each joint configuration.
3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.
E. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified in subparagraphs below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.
1. Remove excess sealant from surfaces adjacent to joints.
2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
3. Provide concave joint profile per Figure 8A in ASTM C 1193, unless otherwise indicated.
F. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.
END OF SECTION 079200

SECTION 081113 - HOLLOW METAL DOORS AND FRAMES

PART 1 - GENERAL
1.1 SUMMARY
A. Section includes hollow-metal work.
1.2 DEFINITIONS
A. Minimum Thickness: Minimum thickness of base metal without coatings according to NAAMM-HMMA 803 or SDI A250.8.
1.3 ACTION SUBMITTALS
A. Product Data: For each type of product.
B. Shop Drawings: Include elevations, door edge details, frame profiles, metal thicknesses, preparations for hardware, and other details.
C. Schedule: Prepared by or under the supervision of supplier, using same reference numbers for details and openings as those on Drawings.
1.4 INFORMATIONAL SUBMITTALS
A. Product test reports.
PART 2 - PRODUCTS
2.1 MANUFACTURERS
A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Amweld International, LLC.
2. Ceco Door Products; an Assa Abloy Group company.
3. Commercial Door & Hardware Inc.
4. Curries Company; an Assa Abloy Group company.
5. Mesker Door Inc.
6. Pioneer Industries, Inc.
7. Premier Products, Inc.
8. Republic Doors and Frames.
9. Security Metal Products Corp.
10. Steelcraft; an Ingersoll-Rand company.
2.2 INTERIOR DOORS AND FRAMES
A. Heavy-Duty Doors and Frames: SDI A250.8, Level 2.
1. Physical Performance: Level B according to SDI A250.4.
2. Doors:
a. Type: As indicated in the Door and Frame Schedule.
b. Thickness: 1-3/4 inches (44.5 mm).
c. Face: Metallic-coated, cold-rolled steel sheet, minimum thickness of 0.042 inch (1.0 mm).
d. Edge Construction: Model 1, Full Flush.
e. Core: Manufacturer's standard.
3. Frames:
a. Materials: Metallic-coated, steel sheet, minimum thickness of 0.053 inch (1.3 mm).
b. Construction: Face welded.
4. Exposed Finish: Prime.
2.3 EXTERIOR HOLLOW-METAL DOORS AND FRAMES
A. Extra-Heavy-Duty Doors and Frames: SDI A250.8, Level 3.
1. Physical Performance: Level A according to SDI A250.4.
2. Doors:
a. Type: As indicated in the Door and Frame Schedule.
b. Thickness: 1-3/4 inches (44.5 mm).
c. Face: Metallic-coated steel sheet, minimum thickness of 0.053 inch (1.3 mm), with minimum A40 (ZF120) coating.
d. Edge Construction: Model 1, Full Flush and Model 3, Stile and Rail.
e. Core: Manufacturer's standard insulation material.
3. Frames:
a. Materials: Metallic-coated steel sheet, minimum thickness of 0.053 inch (1.3 mm), with minimum A40 (ZF120) coating.
b. Construction: Full profile welded.
4. Exposed Finish: Prime.
2.4 FRAME ANCHORS
A. Jamb Anchors:
1. Masonry Type: Adjustable strap-and-stirrup or T-shaped anchors to suit frame size, not less than 0.042 inch (1.0 mm) thick, with corrugated or perforated straps not less than 2 inches (51 mm) wide by 10 inches (254 mm) long; or wire anchors not less than 0.177 inch (4.5 mm) thick.
2. Stud-Wall Type: Designed to engage stud, welded to back of frames; not less than 0.042 inch (1.0 mm) thick.
3. Compression Type for Drywall Slip-on Frames: Adjustable compression anchors.
4. Postinstalled Expansion Type for In-Place Concrete or Masonry: Minimum 3/8-inch- (9.5-mm-) diameter bolts with expansion shields or inserts. Provide pipe spacer from frame to wall, with throat reinforcement plate, welded to frame at each anchor location.
B. Floor Anchors: Formed from same material as frames, minimum thickness of 0.042 inch (1.0 mm), and as follows:
1. Monolithic Concrete Slabs: Clip-type anchors, with two holes to receive fasteners.
2. Separate Topping Concrete Slabs: Adjustable-type anchors with extension clips, allowing not less than 2-inch (51-mm) height adjustment. Terminate bottom of frames at finish floor surface.
2.5 MATERIALS
A. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B; suitable for exposed applications.
B. Hot-Rolled Steel Sheet: ASTM A 1011/A 1011M, Commercial Steel (CS), Type B; free of scale, pitting, or surface defects; pickled and oiled.
C. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B.
D. Frame Anchors: ASTM A 879/A 879M, Commercial Steel (CS), 04Z (12G) coating designation; mill phosphatized.
1. For anchors built into exterior walls, steel sheet complying with ASTM A 1008/A 1008M or ASTM A 1011/A 1011M, hot-dip galvanized according to ASTM A 153/A 153M, Class B.
E. Inserts, Bolts, and Fasteners: Hot-dip galvanized according to ASTM A 153/A 153M.
F. Power-Actuated Fasteners in Concrete: From corrosion-resistant materials.
G. Mineral-Fiber Insulation: ASTM C 665, Type I (blankets without membrane facing).
2.6 FABRICATION
A. Fabricate hollow-metal work to be rigid and free of defects, warp, or buckle. Accurately form metal to required sizes and profiles, with minimum radius for metal thickness. Where practical, fit and assemble units in manufacturer's plant. To ensure proper assembly at Project site, clearly identify work that cannot be permanently factory assembled before shipment.
B. Hollow-Metal Doors:
1. Exterior Doors: Provide weep-hole openings in bottoms of exterior doors to permit moisture to escape. Seal joints in top edges of doors against water penetration.
C. Hollow-Metal Frames: Where frames are fabricated in sections due to shipping or handling limitations, provide alignment plates or angles at each joint, fabricated of same thickness metal as frames.
1. Frames: Provide closed tubular members with no visible face seams or joints, fabricated from same material as door frame. Fasten members at crossings and to jambs by butt welding.
2. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated.
3. Floor Anchors: Weld anchors to bottoms of jambs with at least four spot welds per anchor; however, for slip-on drywall frames, provide anchor clips or countersunk holes at bottoms of jambs.
4. Jamb Anchors: Provide number and spacing of anchors as follows:
a. Stud-Wall Type: Locate anchors not more than 18 inches (457 mm) from top and bottom of frame. Space anchors not more than 32 inches (813 mm) o.c. and as follows:
1) Three anchors per jamb up to 60 inches (1524 mm) high.
2) Four anchors per jamb from 60 to 90 inches (1524 to 2286 mm) high.
3) Five anchors per jamb from 90 to 96 inches (2286 to 2438 mm) high.
4) Five anchors per jamb plus one additional anchor per jamb for each 24 inches (610 mm) or fraction thereof above 96 inches (2438 mm) high.
b. Compression Type: Not less than two anchors in each frame.
c. Postinstalled Expansion Type: Locate anchors not more than 6 inches (152 mm) from top and bottom of frame. Space anchors not more than 26 inches (660 mm) o.c.
5. Door Silencers: Except on weather-stripped frames, drill stops to receive door silencers.
a. Single-Door Frames: Drill stop in strike jamb to receive three door silencers.
b. Double-Door Frames: Drill stop in head jamb to receive two door silencers.
D. Hardware Preparation: Factory prepare hollow-metal work to receive templated mortised hardware; include cutouts, reinforcement, mortising, drilling, and tapping according to SDI A250.6, the Door Hardware Schedule, and templates.
1. Reinforce doors and frames to receive nontemplated, mortised, and surface-mounted door hardware.
2. Comply with applicable requirements in SDI A250.6 and BHMA A156.115 for preparation of hollow-metal work for hardware.
E. Stops and Moldings: Provide stops and moldings around glazed lites and louvers where indicated. Form corners of stops and moldings with mitered hairline joints.
1. Single Glazed Lites: Provide fixed stops and moldings welded on secure side of hollow-metal work.
2. Multiple Glazed Lites: Provide fixed and removable stops and moldings so that each glazed lite is capable of being removed independently.
3. Provide fixed frame moldings on outside of exterior and on secure side of interior doors and frames.
4. Provide loose stops and moldings on inside of hollow-metal work.
5. Coordinate rabbet width between fixed and removable stops with glazing and installation types indicated.
2.7 STEEL FINISHES
A. Prime Finish: Clean, pretreat, and apply manufacturer's standard primer.
1. Shop Primer: SDI A250.10.
PART 3 - EXECUTION
3.1 INSTALLATION
A. Hollow-Metal Frames: Install hollow-metal frames of size and profile indicated. Comply with SDI A250.11 or NAAMM-HMMA 840 as required by standards specified.
1. Set frames accurately in position; plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces, leaving surfaces smooth and undamaged.
a. Where frames are fabricated in sections because of shipping or handling limitations, field splice at approved locations by welding face joint continuously; grind, fill, dress, and make splice smooth, flush, and invisible on exposed faces.
b. Install frames with removable stops located on secure side of opening.
c. Remove temporary braces necessary for installation only after frames have been properly set and secured.
d. Check plumb, square, and twist of frames as walls are constructed. Shim as necessary to comply with installation tolerances.
2. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor, and secure with postinstalled expansion anchors.
a. Floor anchors may be set with power-actuated fasteners instead of postinstalled expansion anchors if so indicated and approved on Shop Drawings.
3. Metal-Stud Partitions: Solidly pack mineral-fiber insulation inside frames.
4. In-Place Metal or Wood-Stud Partitions: Secure slip-on drywall frames in place according to manufacturer's written instructions.
5. Installation Tolerances: Adjust hollow-metal door frames for squareness, alignment, twist, and plumb to the following tolerances:
a. Squareness: Plus or minus 1/16 inch (1.6 mm), measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
b. Alignment: Plus or minus 1/16 inch (1.6 mm), measured at jambs on a horizontal line parallel to plane of wall.
c. Twist: Plus or minus 1/16 inch (1.6 mm), measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
d. Plumbness: Plus or minus 1/16 inch (1.6 mm), measured at jambs at floor.

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RE-USE WATER PUMP STATION

TO SERVE SPIRT AEROSYSTEMS

ARCHITECTURAL SPECIFICATIONS

PROJECT NO.	468-85112
DATE	04-18-16
SCALE	AS NOTED

DESIGNED	DRAWN	CHECKED
DGA	TEAM	DGA

NO.	REVISION	DATE
0	ISSUED FOR CONSTRUCTION	04/18/16

SHEET NO.
A7.0

ARCHITECTURAL SPECIFICATIONS

B. Hollow-Metal Doors: Fit hollow-metal doors accurately in frames, within clearances specified below. Shim as necessary.
1. Non-Fire-Rated Steel Doors:
a. Between Door and Frame Jambs and Head: 1/8 inch (3.2 mm) plus or minus 1/32 inch (0.8 mm).
b. Between Edges of Pairs of Doors: 1/8 inch (3.2 mm) to 1/4 inch (6.3 mm) plus or minus 1/32 inch (0.8 mm).
c. At Bottom of Door: [3/4 inch (19.1 mm)] [5/8 inch (15.8 mm)] plus or minus 1/32 inch (0.8 mm).
d. Between Door Face and Stop: 1/16 inch (1.6 mm) to 1/8 inch (3.2 mm) plus or minus 1/32 inch (0.8 mm).
C. Glazing: Comply with installation requirements in Section 088000 "Glazing" and with hollow-metal manufacturer's written instructions.
1. Secure stops with countersunk flat- or oval-head machine screws spaced uniformly not more than 9 inches (230 mm) o.c. and not more than 2 inches (51 mm) o.c. from each corner.
3.2 ADJUSTING AND CLEANING
A. Final Adjustments: Check and readjust operating hardware items immediately before final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including hollow-metal work that is warped, bowed, or otherwise unacceptable.
B. Remove grout and other bonding material from hollow-metal work immediately after installation.
C. Prime-Coat Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat and apply touchup of compatible air-drying, rust-inhibitive primer.
END OF SECTION 081113

SECTION 083323 - OVERHEAD COILING DOORS

PART 1 - GENERAL
1.1 SUMMARY
A. Section Includes:
1. Insulated service doors.
1.2 ACTION SUBMITTALS
A. Product Data: For each type and size of overhead coiling door and accessory.
B. Shop Drawings: For each installation and for special components not dimensioned or detailed in manufacturer's product data.
C. Samples: For each exposed product and for each color and texture specified.
1.3 CLOSEOUT SUBMITTALS
A. Maintenance data.
1.4 QUALITY ASSURANCE
A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer for both installation and maintenance of units required for this Project.
PART 2 - PRODUCTS
2.1 DOOR ASSEMBLY
A. Insulated Service Door: Overhead coiling door formed with curtain of interlocking metal slats.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
a. Clopay Building Products.
b. Cookson Company.
c. Cornell Iron Works, Inc.
d. McKeon Rolling Steel Door Company, Inc.
e. Overhead Door Corporation.
f. Raynor.
g. Wayne-Dalton Corp.
B. Operation Cycles: Door components and operators capable of operating for not less than 50,000.
C. Curtain R-Value: 0.792 K x sq. m/W (4.5 deg F x h x sq. ft./Btu).
D. Door Curtain Material: Galvanized steel.
E. Door Curtain Slats: Flat profile slats of 67-mm (2-5/8-inch) center-to-center height.
1. Insulated-Slat Interior Facing: Metal.
F. Bottom Bar: Two angles, each not less than 38 by 38 by 3 mm (1-1/2 by 1-1/2 by 1/8 inch) thick; fabricated from hot-dip galvanized steel or aluminum extrusions and finished to match door.
G. Curtain Jamb Guides: Galvanized steel with exposed finish matching curtain slats.
H. Hood: Match curtain material and finish.
I. Locking Devices: Equip door with slide bolt for padlock.
J. Electric Door Operator:
1. Usage Classification: Standard duty, up to 25 cycles per hour and up to 90 cycles per day.
2. Safety: Listed according to UL 325 by a qualified testing agency for commercial or industrial use.
3. Motor Exposure: Interior.
4. Emergency Manual Operation: Crank type.
5. Obstruction-Detection Device: Automatic.
6. Control Station(s): Interior mounted and Exterior mounted.
K. Curtain Accessories: Equip door with weatherseals.
L. Door Finish:
1. Baked-Enamel or Powder-Coated Finish: Color as selected from manufacturer's full range.
2. Interior Curtain-Slat Facing: Match finish of exterior curtain-slat face.
2.2 MATERIALS, GENERAL
A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
2.3 DOOR CURTAIN MATERIALS AND CONSTRUCTION
A. Door Curtains: Fabricate overhead coiling-door curtain of interlocking metal slats, designed to withstand wind loading indicated, in a continuous length for width of door without splices. Unless otherwise indicated, provide slats of thickness and mechanical properties recommended by door manufacturer for performance, size, and type of door indicated, and as follows:
1. Insulation: Fill slats for insulated doors with manufacturer's standard thermal insulation complying with maximum flame-spread and smoke-developed indexes of 75 and 450, respectively, according to ASTM E 84 or UL 723. Enclose insulation completely within slat faces.
2. Metal Interior Curtain-Slat Facing: Match metal of exterior curtain-slat face, with minimum steel thickness of 0.25 mm (0.010 inch) and minimum aluminum thickness of 0.80 mm (0.032 inch).
B. Curtain Jamb Guides: Manufacturer's standard angles or channels and angles of same material and finish as curtain slats unless otherwise indicated, with sufficient depth and strength to retain curtain, to allow curtain to operate smoothly, and to withstand loading. Slot bolt holes for guide adjustment. Provide removable stops on guides to prevent overtravel of curtain.
2.4 HOODS
A. General: Form sheet metal hood to entirely enclose coiled curtain and operating mechanism at opening head. Contour to fit end brackets to which hood is attached. Roll and reinforce top and bottom edges for stiffness. Form closed ends for surface-mounted hoods and fascia for any portion of between-jamb mounting that projects beyond wall face. Equip hood with intermediate support brackets as required to prevent sagging.
1. Include automatic drop baffle on fire-rated doors to guard against passage of smoke or flame.
2. Exterior-Mounted Doors: Fabricate hood to act as weather protection and with a perimeter sealant-joint-bead profile for applying joint sealant.
2.5 LOCKING DEVICES
A. Slide Bolt: Fabricate with side-locking bolts to engage through slots in tracks for locking by padlock, located on both left and right jamb sides, operable from coil side.
B. Safety Interlock Switch: Equip power-operated doors with safety interlock switch to disengage power supply when door is locked.
2.6 CURTAIN ACCESSORIES
A. Weatherseals for Exterior Doors: Equip each exterior door with weather-stripping gaskets fitted to entire exterior perimeter of door for a weather-resistant installation unless otherwise indicated.
2.7 COUNTERBALANCING MECHANISM
A. General: Counterbalance doors by means of manufacturer's standard mechanism with an adjustable-tension, steel helical torsion spring mounted around a steel shaft and contained in a spring barrel connected to top of curtain with barrel rings. Use grease-sealed bearings or self-lubricating graphite bearings for rotating members.
B. Brackets: Manufacturer's standard mounting brackets of either cast iron or cold-rolled steel plate.
2.8 ELECTRIC DOOR OPERATORS
A. General: Electric door operator assembly of size and capacity recommended and provided by door manufacturer for door and operation-cycles requirement specified, with electric motor and factory-prewired motor controls, starter, gear-reduction unit, solenoid-operated brake, clutch, control stations, control devices, integral gearing for locking door, and accessories required for proper operation.
1. Comply with NFPA 70.
2. Control equipment complying with NEMA ICS 1, NEMA ICS 2, and NEMA ICS 6, with NFPA 70 Class 2 control circuit, maximum 24-V ac or dc.
B. Usage Classification: Electric operator and components capable of operating for not less than number of cycles per hour indicated for each door.
C. Motors: Reversible-type motor with controller (disconnect switch) for motor exposure indicated.
1. Motor Size: Minimum size as indicated. If not indicated, large enough to start, accelerate, and operate door in either direction from any position, at a speed not less than 203 mm/s (8 in./sec.) and not more than 305 mm/s (12 in./sec.), without exceeding nameplate ratings or service factor.
2. Operating Controls, Controllers, Disconnect Switches, Wiring Devices, and Wiring: Manufacturer's standard unless otherwise indicated.
D. Obstruction Detection Devices: External entrapment protection consisting of indicated automatic safety sensor capable of protecting full width of door opening. For non-fire-rated doors, activation of device immediately stops and reverses downward door travel.
1. Photoelectric Sensor: Manufacturer's standard system designed to detect an obstruction in door opening without contact between door and obstruction.
a. Self-Monitoring Type: Designed to interface with door operator control circuit to detect damage to or disconnection of sensing device. When self-monitoring feature is activated, door closes only with sustained or constant pressure on close button.
2. Electric Sensor Edge: Automatic safety sensor edge, located within astragal or weather stripping mounted to bottom bar. Contact with sensor activates device. Connect to control circuit using manufacturer's standard take-up reel or self-coiling cable.
E. Control Station: Three-button control station in fixed location with momentary-contact push-button controls labeled "Open" and "Stop" and sustained- or constant-pressure push-button control labeled "Close."
1. Interior-Mounted Units: Full-guarded, surface-mounted, heavy-duty type, with general-purpose NEMA ICS 6, Type 1 enclosure.
2. Exterior-Mounted Units: Full-guarded, standard-duty, surface-mounted, weatherproof type, NEMA ICS 6, Type 4 enclosure, key operated.
F. Emergency Manual Operation: Equip each electrically powered door with capability for emergency manual operation. Design manual mechanism so required force for door operation does not exceed 111 N (25 lbf).
G. Emergency Operation Disconnect Device: Equip operator with hand-operated disconnect mechanism for automatically engaging manual operator and releasing brake for emergency manual operation while disconnecting motor without affecting timing of limit switch. Mount mechanism so it is accessible from floor level. Include interlock device to automatically prevent motor from operating when emergency operator is engaged.
H. Motor Removal: Design operator so motor may be removed without disturbing limit-switch adjustment and without affecting emergency manual operation.
PART 3 - EXECUTION
3.1 INSTALLATION
A. Install overhead coiling doors and operating equipment complete with necessary hardware, anchors, inserts, hangers, and equipment supports; according to manufacturer's written instructions and as specified.
B. Power-Operated Doors: Install according to UL 325.
C. Adjust hardware and moving parts to function smoothly so that doors operate easily, free of warp, twist, or distortion. Lubricate bearings and sliding parts as recommended by manufacturer. Adjust seals to provide tight fit around entire perimeter.
3.2 DEMONSTRATION
A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain overhead coiling doors.
END OF SECTION 083323

SECTION 087100 - DOOR HARDWARE

PART 1 - GENERAL
1.1 RELATED DOCUMENTS
A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
1.2 SUMMARY
A. This Section includes commercial door hardware for the following:
1. Swinging doors.
2. Other doors to the extent indicated.
B. Door hardware includes, but is not necessarily limited to, the following:
1. Mechanical door hardware.
2. Cylinders specified for doors in other sections.
C. Related Sections:
1. Division 08 Section “Door Hardware Schedule”.
2. Division 08 Section “Hollow Metal Doors and Frames”.
D. Codes and References: Comply with the version year adopted by the Authority Having Jurisdiction.
1. ANSI A117.1 - Accessible and Usable Buildings and Facilities.
2. ICC/IBC - International Building Code.
3. NFPA 70 - National Electrical Code.
4. NFPA 80 - Fire Doors and Windows.
5. NFPA 101 - Life Safety Code.
6. NFPA 105 - Installation of Smoke Door Assemblies.
7. State Building Codes, Local Amendments.
E. Standards: All hardware specified herein shall comply with the following industry standards:
1. ANSI/BHMA Certified Product Standards - A156 Series
2. UL10C – Positive Pressure Fire Tests of Door Assemblies
1.3 SUBMITTALS
A. Product Data: Manufacturer's product data sheets including installation details, material descriptions, dimensions of individual components and profiles, operational descriptions and finishes.
B. Door Hardware Schedule: Prepared by or under the supervision of supplier, detailing fabrication and assembly of door hardware, as well as procedures and diagrams. Coordinate the final Door Hardware Schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.
1. Format: Comply with scheduling sequence and vertical format in DHI's "Sequence and Format for the Hardware Schedule."
2. Organization: Organize the Door Hardware Schedule into door hardware sets indicating complete designations of every item required for each door or opening. Organize door hardware sets in same order as in the Door Hardware Sets at the end of Part 3. Submittals that do not follow the same format and order as the Door Hardware Sets will be rejected and subject to resubmission.
3. Content: Include the following information:
a. Type, style, function, size, label, hand, and finish of each door hardware item.
b. Manufacturer of each item.
c. Fastenings and other pertinent information.
d. Location of door hardware set, cross-referenced to Drawings, both on floor plans and in door and frame schedule.
e. Explanation of abbreviations, symbols, and codes contained in schedule.
f. Mounting locations for door hardware.
g. Door and frame sizes and materials.
h. Warranty information for each product.
4. Submittal Sequence: Submit the final Door Hardware Schedule at earliest possible date, particularly where approval of the Door Hardware Schedule must precede fabrication of other work that is critical in the Project construction schedule. Include Product Data, Samples, Shop Drawings of other work affected by door hardware, and other information essential to the coordinated review of the Door Hardware Schedule.
C. Keying Schedule: After a keying meeting with the owner has taken place prepare a separate keying schedule detailing final instructions. Submit the keying schedule in electronic format. Include keying system explanation, door numbers, key set symbols, hardware set numbers and special instructions. Owner must approve submitted keying schedule prior to the ordering of permanent cylinders/cores.
D. Informational Submittals:
1. Product Test Reports: Indicating compliance with cycle testing requirements, based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified independent testing agency.
E. Operating and Maintenance Manuals: Provide manufacturers operating and maintenance manuals for each item comprising the complete door hardware installation in quantity as required in Division 01, Closeout Submittals.
1.4 QUALITY ASSURANCE
A. Manufacturers Qualifications: Engage qualified manufacturers with a minimum 5 years of documented experience in producing hardware and equipment similar to that indicated for this Project and that have a proven record of successful in-service performance.
B. Installer Qualifications: A minimum 5 years documented experience installing both standard and electrified door hardware similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.
C. Door Hardware Supplier Qualifications: Experienced commercial door hardware distributors with a minimum 5 years documented experience supplying both mechanical and electromechanical hardware installations comparable in material, design, and extent to that indicated for this Project. Supplier recognized as a factory direct distributor by the manufacturers of the primary materials with a warehousing facility in Project's vicinity. Supplier to have on staff a certified Architectural Hardware Consultant (AHC) available during the course of the Work to consult with Contractor, Architect, and Owner concerning both standard and electromechanical door hardware and keying.
D. Source Limitations: Obtain each type and variety of door hardware specified in this section from a single source unless otherwise indicated.
1. Electrified modifications or enhancements made to a source manufacturer's product line by a secondary or third party source will not be accepted.
E. Each unit to bear third party permanent label demonstrating compliance with the referenced standards.
F. Keying Conference: Conduct conference to comply with requirements in Division 01 Section "Project Meetings." Keying conference to incorporate the following criteria into the final keying schedule document:
1. Function of building, purpose of each area and degree of security required.
2. Plans for existing and future key system expansion.
3. Requirements for key control storage and software.
4. Installation of permanent keys, cylinder cores and software.
5. Address and requirements for delivery of keys.
G. Pre-Submittal Conference: Conduct coordination conference in compliance with requirements in Division 01 Section "Project Meetings" with attendance by representatives of Supplier(s), Installer(s), and Contractor(s) to review proper methods and the procedures for receiving, handling, and installing door hardware.
1. Prior to installation of door hardware, conduct a project specific training meeting to instruct the installing contractors' personnel on the proper installation and adjustment of their respective products. Product training to be attended by installers of door hardware (including electromechanical hardware) for aluminum, hollow metal and wood doors. Training will include the use of installation manuals, hardware schedules, templates and physical product samples as required.
2. Inspect and discuss electrical roughing-in, power supply connections, and other preparatory work performed by other trades.
3. Review sequence of operation narratives for each unique access controlled opening.
4. Review and finalize construction schedule and verify availability of materials.
5. Review the required inspecting, testing, commissioning, and demonstration procedures
H. At completion of installation, provide written documentation that components were applied to manufacturer's instructions and recommendations and according to approved schedule.
1.5 DELIVERY, STORAGE, AND HANDLING
A. Inventory door hardware on receipt and provide secure lock-up and shelving for door hardware delivered to Project site. Do not store electronic access control hardware, software or accessories at Project site without prior authorization.
B. Tag each item or package separately with identification related to the final Door Hardware Schedule, and include basic installation instructions with each item or package.
C. Deliver, as applicable, permanent keys, cylinders, cores, access control credentials, software and related accessories directly to Owner via registered mail or overnight package service. Instructions for delivery to the Owner shall be established at the "Keying Conference".
1.6 COORDINATION
A. Templates: Obtain and distribute to the parties involved templates for doors, frames, and other work specified to be factory prepared for installing standard and electrified hardware. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing hardware to comply with indicated requirements.
B. Door and Frame Preparation: Doors and corresponding frames are to be prepared, reinforced and pre-wired (if applicable) to receive the installation of the specified electrified, monitoring, signaling and access control system hardware without additional in-field modifications.
1.7 WARRANTY
A. General Warranty: Reference Division 01, General Requirements. Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.
B. Warranty Period: Written warranty, executed by manufacturer(s), agreeing to repair or replace components of standard and electrified door hardware that fails in materials or workmanship within specified warranty period after final acceptance by the Owner. Failures include, but are not limited to, the following:
1. Structural failures including excessive deflection, cracking, or breakage.
2. Faulty operation of the hardware.
3. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
4. Electrical component defects and failures within the systems operation.
C. Standard Warranty Period: One year from date of Substantial Completion, unless otherwise indicated.
D. Special Warranty Periods:
1. Ten years for extra heavy duty cylindrical (bored) locks and latches.
2. Twenty five years for manual surface door closer bodies.
1.8 MAINTENANCE SERVICE
A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.
PART 2 - PRODUCTS
2.1 SCHEDULED DOOR HARDWARE
A. General: Provide door hardware for each door to comply with requirements in Door Hardware Sets and each referenced specification products are to be supplied under.

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TO SERVE SPIRIT AEROSYSTEMS

ARCHITECTURAL SPECIFICATIONS

PROJECT NO.	468-85112
DATE	04-18-16
SCALE	AS NOTED

DESIGNED	DRAWN	CHECKED
DGA	TEAM	DGA

NO.	REVISION	DATE
0	ISSUED FOR CONSTRUCTION	04/18/16

SHEET NO.

A7.1

ARCHITECTURAL SPECIFICATIONS

B. Designations: Requirements for quantity, item, size, finish or color, grade, function, and other distinctive qualities of each type of door hardware are indicated in the Door Hardware Sets at the end of Part 3. Products are identified by using door hardware designations, as follows:
C. Named Manufacturer's Products: Product designation and manufacturer are listed for each door hardware type required for the purpose of establishing requirements. Manufacturers' names are abbreviated in the Door Hardware Schedule.
D. Substitutions: Requests for substitution and product approval for inclusive mechanical and electromechanical door hardware in compliance with the specifications must be submitted in writing and in accordance with the procedures and time frames outlined in Division 01, Substitution Procedures. Approval of requests is at the discretion of the architect, owner, and their designated consultants.
2.2 HANGING DEVICES
A. Continuous Geared Hinges: ANSI/BHMA A156.26 Grade 1-600 certified continuous geared hinge. with minimum 0.120-inch thick extruded 6060 T6 aluminum alloy hinge leaves and a minimum overall width of 4 inches. Hinges are non-handed, reversible and fabricated to template screw locations. Factory trim hinges to suit door height and prepare for electrical cut-outs.
1. Acceptable Manufacturers:
a. Bommer Industries (BO).
b. Hager Companies (HA).
c. McKinney Products (MK).
d. Pemko Manufacturing (PE).
2.3 DOOR OPERATING TRIM
A. Flush Bolts and Surface Bolts: ANSI/BHMA A156.3 and A156.16, Grade 1, certified.
1. Manual flush bolts to be furnished with top rod of sufficient length to allow bolt location approximately six feet from the floor.
2. Furnish dust proof strikes for bottom bolts.
3. Surface bolts to be minimum 8" in length and U.L. listed for labeled fire doors and U.L. listed for windstorm components where applicable.
4. Provide related accessories (mounting brackets, strikes, coordinators, etc.) as required for appropriate installation and operation.
5. Acceptable Manufacturers:
a. Burns Manufacturing (BU).
b. Door Controls International (DC).
c. Rockwood Manufacturing (RO).
2.4 CYLINDERS AND KEYING
A. General: Cylinder manufacturer to have minimum (10) years experience designing secured master key systems and have on record a published security keying system policy.
B. Source Limitations: Obtain each type of keyed cylinder and keys from the same source manufacturer as locksets and exit devices, unless otherwise indicated.
C. Cylinders: Original manufacturer cylinders complying with the following:
1. Mortise Type: Threaded cylinders with rings and cams to suit hardware application.
2. Rim Type: Cylinders with back plate, flat-type vertical or horizontal tailpiece, and raised trim ring.
3. Bored-Lock Type: Cylinders with tailpieces to suit locks.
4. Mortise and rim cylinder collars to be solid and recessed to allow the cylinder face to be flush and be free spinning with matching finishes.
5. Keyway: Match Facility Standard.
D. Keying System: Each type of lock and cylinders to be factory keyed.
1. Conduct specified "Keying Conference" to define and document keying system instructions and requirements.
2. Furnish factory cut, nickel-silver large bow permanently inscribed with a visual key control number as directed by Owner.
E. Key Quantity: Provide the following minimum number of keys:
1. Change Keys per Cylinder: Two (2)
2. Master Keys (per Master Key Level/Group): Five (5).
F. Key Registration List (Bitting List):
1. Provide keying transcript list to Owner's representative in the proper format for importing into key control software.
2. Provide transcript list in writing or electronic file as directed by the Owner.
G. Key Control Cabinet: Provide a key control system including envelopes, labels, and tags with self-locking key clips, receipt forms, 3-way visible card index, temporary markers, permanent markers, and standard metal cabinet. Key control cabinet shall have expansion capacity of 150% of the number of locks required for the project.
1. Acceptable Manufacturers:
a. Lund Equipment (LU).
b. MMF Industries (MM).
c. Telkee (TK).
2.5 MECHANICAL LOCKS AND LATCHING DEVICES
A. Tubular Locksets, Grade 1 (Extra-Heavy Duty): ANSI 156.2 Series 4000, Grade 1 certified.
1. Locksets to withstand 3000 inch pounds of torque applied to the locked lever without gaining access.
2. Locksets to fit a standard 2 1/8" bore without the use of through-bolts.
3. Lever handles to be made of solid material with no plastic fillers.
4. Latchbolt head to be one-piece stainless steel construction encased within the lock body.
5. Extended cycle test: Locks to have been cycle tested in ordinance with ANSI/BHMA 156.2 requirements to 20 million cycles
6. Furnish with standard 2 3/4" backset and 1/2" throw latchbolt (3/4" at rated paired openings).
7. Acceptable Manufacturers:
a. Corbin Russwin Hardware (RU) – CL3100 Series.
b. Sargent Manufacturing (SA) – 11 Line.
2.6 LOCK AND LATCH STRIKES
A. Strikes: Provide manufacturer's standard strike with strike box for each latch or lock bolt, with curved lip extended to protect frame, finished to match door hardware set, unless otherwise indicated, and as follows:
1. Flat-Lip Strikes: For locks with three-piece antifriction latchbolts, as recommended by manufacturer.
2. Extra-Long-Lip Strikes: For locks used on frames with applied wood casing trim.
3. Aluminum-Frame Strike Box: Provide manufacturer's special strike box fabricated for aluminum framing.
4. Double-lipped strikes: For locks at double acting doors. Furnish with retractable stop for rescue hardware applications.
B. Standards: Comply with the following:
1. Strikes for Mortise Locks and Latches: BHMA A156.13.
2. Strikes for Bored Locks and Latches: BHMA A156.2.
3. Strikes for Auxiliary Deadlocks: BHMA A156.5.
4. Dustproof Strikes: BHMA A156.16.
2.7 DOOR CLOSERS
A. All door closers specified herein shall meet or exceed the following criteria:
1. General: Door closers to be from one manufacturer, matching in design and style, with the same type door preparations and templates regardless of application or spring size. Closers to be non-handed with full sized covers including installation and adjusting information on inside of cover.
2. Standards: Closers to comply with UL-10C for Positive Pressure Fire Test and be U.L. listed for use of fire rated doors.
3. Cycle Testing: Provide closers which have surpassed 15 million cycles in a test witnessed and verified by UL.
4. Size of Units: Comply with manufacturer's written recommendations for sizing of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Where closers are indicated for doors required to be accessible to the physically handicapped, provide units complying with ANSI ICC/A117.1.
5. Closer Arms: Provide heavy duty, forged steel closer arms unless otherwise indicated in Hardware Sets.

6. Closers shall not be installed on exterior or corridor side of doors; where possible install closers on door for optimum aesthetics.
7. Closer Accessories: Provide door closer accessories including custom templates, special mounting brackets, spacers and drop plates, and through-bolt and security type fasteners as required for proper installation.
B. Door Closers, Surface Mounted (Large Body Cast Iron): ANSI/BHMA A156.4, Grade 1 surface mounted, heavy duty door closers with complete spring power adjustment, sizes 1 thru 6; and fully operational adjustable according to door size, frequency of use, and opening force. Closers to be rack and pinion type, one piece cast iron body construction, with adjustable backcheck and separate non-critical valves for closing sweep and latch speed control.
1. Acceptable Manufacturers:
a. Corbin Russwin Hardware (RU) - DC8000 Series.
b. Norton Door Controls (NO) – 9500 Series.
c. Sargent Manufacturing (SA) - 281 Series.
2.8 ARCHITECTURAL TRIM
A. Door Protective Trim
1. General: Door protective trim units to be of type and design as specified below or in the Hardware Sets.
2. Size: Fabricate protection plates (kick, armor, or mop) not more than 2" less than door width (LDW) on stop side of single doors and 1" LDW on stop side of pairs of doors, and not more than 1" less than door width on pull side. Coordinate and provide proper width and height as required where conflicting hardware dictates. Height to be as specified in the Hardware Sets.
3. Protection Plates: ANSI/BHMA A156.6 certified protection plates (kick, armor, or mop), fabricated from the following:
a. Stainless Steel: 300 grade, 050-inch thick.
4. Options and fasteners: Provide manufacturer's designated fastener type as specified in the Hardware Sets. Provide countersunk screw holes.
5. Acceptable Manufacturers:
a. Burns Manufacturing (BU).
b. Hager Companies (HA).
c. Hiawatha, Inc. (HI).
d. Rockwood Manufacturing (RO).
2.9 DOOR STOPS AND HOLDERS
A. General: Door stops and holders to be of type and design as specified below or in the Hardware Sets.
B. Door Stops and Bumpers: ANSI/BHMA A156.16, Grade 1 certified door stops and wall bumpers. Provide wall bumpers, either convex or concave types with anchorage as indicated, unless floor or other types of door stops are specified in Hardware Sets. Do not mount floor stops where they will impede traffic. Where floor or wall bumpers are not appropriate, provide overhead type stops and holders.
1. Acceptable Manufacturers:
a. Burns Manufacturing (BU).
b. Hager Companies (HA).
c. Hiawatha, Inc. (HI).
d. Rockwood Manufacturing (RO).
C. Overhead Door Stops and Holders: ANSI/BHMA A156.6, Grade 1 certified overhead stops and holders to be surface or concealed types as indicated in Hardware Sets. Track, slide, arm and jamb bracket to be constructed of extruded bronze and shock absorber spring of heavy tempered steel. Provide non-handed design with mounting brackets as required for proper operation and function.
1. Acceptable Manufacturers:
a. Rixson Door Controls (RF).
b. Rockwood Manufacturing (RO).
c. Sargent Manufacturing (SA).
2.10 ARCHITECTURAL SEALS
A. General: Thresholds, weatherstripping, and gasket seals to be of type and design as specified below or in the Hardware Sets. Provide continuous weatherstrip gasketing on exterior doors and provide smoke, light, or sound gasketing on interior doors where indicated. At exterior applications provide non-corrosive fasteners and elsewhere where indicated.
B. Smoke Labeled Gasketing: Assemblies complying with NFPA 105 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for smoke control ratings indicated, based on testing according to UL 1784.
1. Provide smoke labeled perimeter gasketing at all smoke labeled openings.
C. Fire Labeled Gasketing: Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to UL-10C.
1. Provide intumescent seals as indicated to meet UL10C Standard for Positive Pressure Fire Tests of Door Assemblies, and UBC 7-2, Fire Tests of Door Assemblies.
D. Sound-Rated Gasketing: Assemblies that are listed and labeled by a testing and inspecting agency, for sound ratings indicated.
E. Replaceable Seal Strips: Provide only those units where resilient or flexible seal strips are easily replaceable and readily available from stocks maintained by manufacturer.
F. Acceptable Manufacturers:
1. National Guard Products (NG).
2. Pemko Manufacturing (PE).
3. Reese Enterprises, Inc. (RE).
2.11 FABRICATION
A. Fasteners: Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. Provide screws according to manufacturers recognized installation standards for application intended.
2.12 FINISHES
A. Standard: Designations used in the Hardware Sets and elsewhere indicate hardware finishes complying with ANSI/BHMA A156.18, including coordination with traditional U.S. finishes indicated by certain manufacturers for their products.
B. Provide quality of finish, including thickness of plating or coating (if any), composition, hardness, and other qualities complying with manufacturer's standards, but in no case less than specified by referenced standards for the applicable units of hardware.
C. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
PART 3 - EXECUTION
3.1 EXAMINATION
A. Examine scheduled openings, with Installer present, for compliance with requirements for installation tolerances, labeled fire door assembly construction, wall and floor construction, and other conditions affecting performance.
B. Notify architect of any discrepancies or conflicts between the door schedule, door types, drawings and scheduled hardware. Proceed only after such discrepancies or conflicts have been resolved in writing.
3.2 PREPARATION
A. Hollow Metal Doors and Frames: Comply with ANSI/DHI A115 series.
B. Wood Doors: Comply with ANSI/DHI A115-W series.
3.3 INSTALLATION
A. Install each item of mechanical and electromechanical hardware and access control equipment to comply with manufacturer's written instructions and according to specifications.
1. Installers are to be trained and certified by the manufacturer on the proper installation and adjustment of fire, life safety, and security products including: hanging devices; locking devices; closing devices; and seals.
B. Mounting Heights: Mount door hardware units at heights indicated in following applicable publications, unless specifically indicated or required to comply with governing regulations:
1. Standard Steel Doors and Frames: DHI's "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."
2. Wood Doors: DHI WDHS.3, "Recommended Locations for Architectural Hardware for Wood Flush Doors."
3. Where indicated to comply with accessibility requirements, comply with ANSI A117.1 "Accessibility Guidelines for Buildings and Facilities."
4. Provide blocking in drywall partitions where wall stops or other wall mounted hardware is located.
C. Retrofitting: Install door hardware to comply with manufacturer's published templates and written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work specified in Division 9 Sections. Do not install surface-mounted items until finishes have been completed on substrates involved.
D. Thresholds: Set thresholds for exterior and acoustical doors in full bed of sealant complying with requirements specified in Division 7 Section "Joint Sealants."
E. Storage: Provide a secure lock up for hardware delivered to the project but not yet installed. Control the handling and installation of hardware items so that the completion of the work will not be delayed by hardware losses before and after installation.
3.4 FIELD QUALITY CONTROL
A. Field Inspection: Supplier will perform a final inspection of installed door hardware and state in report whether work complies with or deviates from requirements, including whether door hardware is properly installed, operating and adjusted.
3.5 ADJUSTING
A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.
3.6 CLEANING AND PROTECTION
A. Protect all hardware stored on construction site in a covered and dry place. Protect exposed hardware installed on doors during the construction phase. Install any and all hardware at the latest possible time frame.
B. Clean adjacent surfaces soiled by door hardware installation.
C. Clean operating items as necessary to restore proper finish. Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of owner occupancy.
3.7 DEMONSTRATION
A. Instruct Owner's maintenance personnel to adjust, operate, and maintain mechanical and electromechanical door hardware.
3.8 DOOR HARDWARE SETS
A. The hardware sets represent the design intent and direction of the owner and architect. They are a guideline only and should not be considered a detailed hardware schedule. Discrepancies, conflicting hardware and missing items should be brought to the attention of the architect with corrections made prior to the bidding process. Omitted items not included in a hardware set should be scheduled with the appropriate additional hardware required for proper application and functionality.
B. Manufacturer's Abbreviations:

1. PE - Pemko
2. RO - Rockwood
3. SA - Sargent
4. RF - Rixson

Hardware Schedule

Set: 1.0
Doors: 101A
Description: Exterior

Notes: All hardware furnished by Overhead Door Supplier.

Set: 2.0
Doors: 101B
Description: Exterior

1	Continuous Hinge	CFMHD1	PE		
1	Storeroom Lock	CPC 28 11G04 LL	MK	US26D	SA
1	Surface Overhead Stop	9 Series	630	RF	
1	Door Closer	SRI TB 281 O8	EN	SA	
1	Threshold	1715A x Opening Width		PE	
1	Gasketing	S773D (Head & Jambs)		PE	
1	Rain Guard	346C x Frame Width		PE	
1	Door Bottom	2221APK x Door Width		PE	

Set: 3.0
Doors: 102, 103A
Description: Exterior

2	Continuous Hinge	CFMHD1	PE		
2	Flush Bolt	555-12"	US26D	RO	
1	Dust Proof Strike	570	US26D	RO	
1	Storeroom Lock	CPC 28 11G04 LL	MK	US26D	SA
2	Door Closer	SRI TB 281 CPS	EN	SA	
2	Kick Plate	K1050 10" x 2" LDW 4BE	CSK	US32D	RO
2	Door Stop	462	US2C	RO	
1	Threshold	279x224AFGT x Opening Width		PE	
1	Gasketing	S773D (Head & Jambs)		PE	
1	Rain Guard	346C x Frame Width		PE	
2	Sweep	345ANB x Door Width		PE	
2	Astragal	305CN x Door Height		PE	

Set: 4.0
Doors: 101C
Description: Chlorine

1	Continuous Hinge	CFMHD1	PE		
1	Passage Set	CPC 28 11U15 LL	US26D	SA	
1	Wall Stop	409	US32D	RO	
3	Silencer	608	RO		

Set: 5.0
Doors: 103B
Description: Pumps

1	Continuous Hinge	CFMHD1	PE		
1	Passage Set	CPC 28 11U15 LL	US26D	SA	
1	Surface Overhead Stop	9 Series	630	RF	
3	Silencer	608	RO		

END OF SECTION 087100

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RE-USE WATER PUMP STATION

TO SERVE SPIRT AEROSYSTEMS

ARCHITECTURAL SPECIFICATIONS

PROJECT NO.	468-85112
DATE	04-18-16
SCALE	AS NOTED

DESIGNED	DRAWN	CHECKED
DGA	TEAM	DGA

NO.	REVISION	DATE
0	ISSUED FOR CONSTRUCTION	04/18/16

SHEET NO.

A7.2

ARCHITECTURAL SPECIFICATIONS

SECTION 099113 - EXTERIOR PAINTING

PART 1 - GENERAL
1.1 SUMMARY
A. Section includes surface preparation and the application of paint systems on exterior substrates.
1. Concrete.
2. Steel.
3. Galvanized metal.
4. Wood.
1.2 DEFINITIONS
A. Gloss Level 1: Not more than 5 units at 60 degrees and 10 units at 85 degrees, according to ASTM D 523.
B. Gloss Level 3: 10 to 25 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523.
C. Gloss Level 4: 20 to 35 units at 60 degrees and not less than 35 units at 85 degrees, according to ASTM D 523.
D. Gloss Level 5: 35 to 70 units at 60 degrees, according to ASTM D 523.
E. Gloss Level 6: 70 to 85 units at 60 degrees, according to ASTM D 523.
F. Gloss Level 7: More than 85 units at 60 degrees, according to ASTM D 523.
1.3 ACTION SUBMITTALS
A. Product Data: For each type of product. Include preparation requirements and application instructions.
B. Samples: For each type of paint system and each color and gloss of topcoat.
C. Product List: For each product indicated. Include printout of current "MPI Approved Products List" for each product category specified, with the proposed product highlighted.
1.4 MAINTENANCE MATERIAL SUBMITTALS
A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
1. Paint: 5 percent, but not less than 1 gal. (3.8 L) of each material and color applied.
PART 2 - PRODUCTS
2.1 PAINT, GENERAL
A. MPI Standards: Provide products that comply with MPI standards indicated and that are listed in its "MPI Approved Products List."
B. Material Compatibility:
1. Provide materials for use within each paint system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
2. For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.
C. Colors: As scheduled.
2.2 PRIMERS/SEALERS
A. Primer, Alkali Resistant, Water Based: MPI #3.
B. Primer, Bonding, Water Based: MPI #17.
C. Wood-Knot Sealer: Sealer recommended in writing by topcoat manufacturer for exterior use in paint system indicated.
2.3 METAL PRIMERS
A. Primer, Alkyd, Anti-Corrosive for Metal: MPI #79.
B. Primer, Galvanized: As recommended in writing by topcoat manufacturer.
2.4 WOOD PRIMERS
A. Primer, Latex for Exterior Wood: MPI #6.
2.5 WATER-BASED PAINTS
A. Latex, Exterior Flat (Gloss Level 1): MPI #10.
2.6 SOLVENT-BASED PAINTS
A. Alkyd, Exterior Flat (Gloss Level 1): MPI #8.
PART 3 - EXECUTION
3.1 EXAMINATION
A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:
1. Concrete: 12 percent.
2. Wood: 15 percent.
3. Gypsum Board: 12 percent.
C. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.
D. Proceed with coating application only after unsatisfactory conditions have been corrected.
1. Application of coating indicates acceptance of surfaces and conditions.
3.2 PREPARATION
A. Comply with manufacturer's written instructions and recommendations in "MPI Manual" applicable to substrates and paint systems indicated.
B. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.
1. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce paint systems indicated.
3.3 APPLICATION
A. Apply paints according to manufacturer's written instructions and recommendations in "MPI Manual."
B. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.
3.4 CLEANING AND PROTECTION
A. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.
B. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.5 EXTERIOR PAINTING SCHEDULE
A. Concrete Substrates, Nontraffic Surfaces:
1. Latex System:
a. Prime Coat: Primer, alkali resistant, water based, MPI #3.
b. Intermediate Coat: Latex, exterior, matching topcoat.
c. Topcoat: Latex, exterior flat (Gloss Level 1), MPI #10.
B. Steel Substrates:
1. Alkyd System:
a. Prime Coat: Primer, alkyd, anticorrosive for metal, MPI #79.
b. Intermediate Coat: Exterior alkyd enamel matching topcoat.
c. Topcoat: Alkyd, exterior, flat (Gloss Level 1), MPI #8.
C. Galvanized-Metal Substrates:
1. Alkyd System:
a. Prime Coat: Primer, galvanized metal, as recommended in writing by topcoat manufacturer for exterior use on galvanized-metal substrates with topcoat indicated.
b. Intermediate Coat: Exterior alkyd enamel matching topcoat.
c. Topcoat: Alkyd, exterior, flat (Gloss Level 5), MPI #8.
D. Wood Substrates:
1. Latex System:
a. Prime Coat: Primer, latex for exterior wood, MPI #6.
b. Intermediate Coat: Latex, exterior, matching topcoat.
c. Topcoat: Latex, exterior flat (Gloss Level 1), MPI #10.
END OF SECTION 099113

SECTION 099123 - INTERIOR PAINTING

PART 1 - GENERAL
1.1 SUMMARY
A. Section includes surface preparation and the application of paint systems on interior substrates.
1. Concrete.
2. Steel.
3. Galvanized metal.
4. Wood.
5. Gypsum board.
1.2 DEFINITIONS
A. Gloss Level 1: Not more than 5 units at 60 degrees and 10 units at 85 degrees, according to ASTM D 523.
B. Gloss Level 2: Not more than 10 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523.
C. Gloss Level 3: 10 to 25 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523.
D. Gloss Level 4: 20 to 35 units at 60 degrees and not less than 35 units at 85 degrees, according to ASTM D 523.
E. Gloss Level 5: 35 to 70 units at 60 degrees, according to ASTM D 523.
F. Gloss Level 6: 70 to 85 units at 60 degrees, according to ASTM D 523.
G. Gloss Level 7: More than 85 units at 60 degrees, according to ASTM D 523.
1.3 ACTION SUBMITTALS
A. Product Data: For each type of product. Include preparation requirements and application instructions.
B. Samples: For each type of paint system and in each color and gloss of topcoat.
C. Product List: For each product indicated. Include printout of current "MPI Approved Products List" for each product category specified in Part 2, with the proposed product highlighted.
1.4 MAINTENANCE MATERIAL SUBMITTALS
A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
1. Paint: 5 percent, but not less than 1 gal. (3.8 L) of each material and color applied.
PART 2 - PRODUCTS
2.1 PAINT, GENERAL
A. MPI Standards: Provide products that comply with MPI standards indicated and that are listed in its "MPI Approved Products List."
B. Material Compatibility:
1. Provide materials for use within each paint system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
2. For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.
C. Colors: As scheduled.
2.2 PRIMERS/SEALERS
A. Primer Sealer, Latex, Interior: MPI #50.
B. Primer, Latex, for Interior Wood: MPI #39.
C. Primer Sealer, Alkyd, Interior: MPI #45.
D. Primer, Bonding, Water Based: MPI #17.
E. Primer, Bonding, Solvent Based: MPI #69.
F. Wood-Knot Sealer: Sealer recommended in writing by topcoat manufacturer for use in paint systems indicated.
2.3 METAL PRIMERS
A. Primer, Alkyd, Anti-Corrosive, for Metal: MPI #79.
2.4 WATER-BASED PAINTS
A. Latex, Interior, Flat, (Gloss Level 1): MPI #53.
B. Latex, Interior, Semi-Gloss, (Gloss Level 5): MPI #54.
2.5 FLOOR COATINGS
A. Floor Paint, Latex, Low Gloss (Maximum Gloss Level 3): MPI #60.
PART 3 - EXECUTION
3.1 EXAMINATION
A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:
1. Concrete: 12 percent.
2. Wood: 15 percent.
3. Gypsum Board: 12 percent.
C. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.
D. Proceed with coating application only after unsatisfactory conditions have been corrected.
1. Application of coating indicates acceptance of surfaces and conditions.
3.2 PREPARATION
A. Comply with manufacturer's written instructions and recommendations in "MPI Manual" applicable to substrates indicated.
B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.
1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.
C. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.
1. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce paint systems indicated.

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RE-USE WATER PUMP STATION

TO SERVE SPIRT AEROSYSTEMS

ARCHITECTURAL SPECIFICATIONS

PROJECT NO.	468-85112
DATE	04-18-16
SCALE	AS NOTED

DESIGNED	DRAWN	CHECKED
DGA	TEAM	DGA

NO.	REVISION	DATE
0	ISSUED FOR CONSTRUCTION	04/18/16

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ARCHITECTURAL SPECIFICATIONS

3.3 APPLICATION
A. Apply paints according to manufacturer's written instructions and to recommendations in "MPI Manual."
B. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.
3.4 CLEANING AND PROTECTION
A. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.
B. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.
3.5 INTERIOR PAINTING SCHEDULE
A. Concrete Substrates, Traffic Surfaces:
1. Latex Floor Enamel System:
a. Prime Coat: Floor paint, latex, low gloss (maximum Gloss Level 3), MPI #60.
b. Intermediate Coat: Floor paint, latex, low gloss (maximum Gloss Level 3), MPI #60.
c. Topcoat: Floor paint, latex, low gloss (maximum Gloss Level 3), MPI # 60.
2. Water-Based Clear Sealer System:
a. First Coat: Sealer, water based, for concrete floors, MPI #99.
b. Topcoat: Sealer, water based, for concrete floors, MPI #99.
3. Solvent-Based Clear Sealer System:
a. First Coat: Sealer, solvent based, for concrete floors, MPI #104.
b. Topcoat: Sealer, solvent based, for concrete floors, MPI #104.
B. Steel Substrates:
1. Latex over Alkyd Primer System:
a. Prime Coat: Primer, alkyd, anti-corrosive, for metal, MPI #79.
b. Intermediate Coat: Latex, interior, matching topcoat.
c. Topcoat: Latex, interior, flat, (Gloss Level 1), MPI #53.
C. Galvanized-Metal Substrates:
1. Latex over Waterborne Primer System:
a. Prime Coat: Primer, galvanized, water based, MPI #134.
b. Intermediate Coat: Latex, interior, matching topcoat.
c. Topcoat: Latex, interior, flat, (Gloss Level 1), MPI #53.
D. Wood Substrates:
1. Latex System:
a. Prime Coat: Primer, latex, for interior wood, MPI #39.
b. Intermediate Coat: Latex, interior, matching topcoat.
c. Topcoat: Latex, interior, flat, (Gloss Level 1), MPI #53.
E. Gypsum Board Substrates:
1. Latex System:
a. Prime Coat: Primer sealer, latex, interior, MPI #50.
b. Intermediate Coat: Latex, interior, matching topcoat.
c. Topcoat: Latex, interior, semi-gloss, (Gloss Level 5), MPI #54.
END OF SECTION 099123

SECTION 104416 - FIRE EXTINGUISHERS

PART 1 - GENERAL
1.1 SUMMARY
A. Section includes portable, hand-carried fire extinguishers and mounting brackets for fire extinguishers.
1.2 ACTION SUBMITTALS
A. Product Data: For each type of product.
1.3 CLOSEOUT SUBMITTALS
A. Operation and maintenance data.
1.4 COORDINATION
A. Coordinate type and capacity of fire extinguishers with fire-protection cabinets to ensure fit and function.
PART 2 - PRODUCTS
2.1 PERFORMANCE REQUIREMENTS
A. NFPA Compliance: Fabricate and label fire extinguishers to comply with NFPA 10, "Portable Fire Extinguishers."
B. Fire Extinguishers: Listed and labeled for type, rating, and classification by an independent testing agency acceptable to authorities having jurisdiction.
2.2 PORTABLE, HAND-CARRIED FIRE EXTINGUISHERS
A. Fire Extinguishers: Type, size, and capacity for each fire-protection cabinet and mounting bracket indicated.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
a. Amerex Corporation.
b. Ansul Incorporated.
c. Guardian Fire Equipment, Inc.
d. JL Industries, Inc.; a division of the Activar Construction Products Group.
e. Larsens Manufacturing Company.
f. Nystrom Building Products.
2. Instruction Labels: Include pictorial marking system complying with NFPA 10, Appendix B, and bar coding for documenting fire-extinguisher location, inspections, maintenance, and recharging.
B. Multipurpose Dry-Chemical Type: UL-rated 4A-80B:C nominal capacity, with monoammonium phosphate-based dry chemical in manufacturer's standard enameled container.
2.3 MOUNTING BRACKETS
A. Mounting Brackets: Manufacturer's standard steel, designed to secure fire extinguisher to wall or structure, of sizes required for types and capacities of fire extinguishers indicated, with plated or red baked-enamel finish.
B. Identification: Lettering complying with authorities having jurisdiction for letter style, size, spacing, and location.
1. Identify bracket-mounted fire extinguishers with the words "FIRE EXTINGUISHER" in red letter decals applied to mounting surface.
PART 3 - EXECUTION
3.1 INSTALLATION
A. Examine fire extinguishers for proper charging and tagging.
1. Remove and replace damaged, defective, or undercharged fire extinguishers.
B. Install fire extinguishers and mounting brackets in locations indicated and in compliance with requirements of authorities having jurisdiction.
1. Mounting Brackets: 54 inches (1372 mm) above finished floor to top of fire extinguisher.
C. Mounting Brackets: Fasten mounting brackets to surfaces, square and plumb, at locations indicated.
END OF SECTION 104416

SECTION 133419 - METAL BUILDING SYSTEMS

PART 1 - GENERAL
1.1 SUMMARY
A. Section Includes:
1. Structural-steel framing.
2. Metal roof panels.
3. Metal wall panels.
4. Metal soffit / ceiling panels.
5. Thermal insulation.
6. Accessories.
1.2 ACTION SUBMITTALS
A. Product Data: For each type of metal building system component.
B. Shop Drawings: For metal building system components. Include plans, elevations, sections, details, and attachments to other work.
C. Samples: For each type of exposed finish required.
D. Delegated-Design Submittal: For metal building systems indicated to comply with performance requirements and design criteria, including analysis data and calculations signed and sealed by the qualified professional engineer responsible for their preparation.
1.3 CLOSEOUT SUBMITTALS
A. Maintenance data.
1.4 QUALITY ASSURANCE
A. Manufacturer Qualifications: A qualified manufacturer and member of MBMA.
1. Accreditation: According to the International Accreditation Service's AC472.
2. Engineering Responsibility: Preparation of comprehensive engineering analysis and Shop Drawings by a professional engineer who is legally qualified to practice in jurisdiction where Project is located.
B. Erector Qualifications: An experienced erector who specializes in erecting and installing work similar in material, design, and extent to that indicated for this Project and who is acceptable to manufacturer.
C. Welding Qualifications: Qualify procedures and personnel according to the following:
1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."
2. AWS D1.3, "Structural Welding Code - Sheet Steel."
D. Structural Steel: Comply with AISC 360, "Specification for Structural Steel Buildings," for design requirements and allowable stresses.
E. Cold-Formed Steel: Comply with AISI's "North American Specification for the Design of Cold-Formed Steel Structural Members" for design requirements and allowable stresses.
1.5 WARRANTY
A. Special Warranty on Metal Panel Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace metal panels that show evidence of deterioration of factory-applied finishes within specified warranty period.
1. Finish Warranty Period: 20 years from date of Substantial Completion.
B. Special Weathertightness Warranty for Standing-Seam Metal Roof Panels: Manufacturer's standard form in which manufacturer agrees to repair or replace standing-seam metal roof panel assemblies that leak or otherwise fail to remain weathertight within specified warranty period.
1. Warranty Period: 20 years from date of Substantial Completion.
PART 2 - PRODUCTS
2.1 METAL BUILDING SYSTEM PERFORMANCE
A. Delegated Design: Design metal building system, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.
B. Structural Performance: Metal building systems shall be designed according to procedures in MBMA's "Metal Building Systems Manual."
1. Design Loads: As indicated on Drawings.
2. Metal panel assemblies shall withstand the effects of gravity loads and loads and stresses within limits and under conditions indicated according to ASTM E 1592.
C. Thermal Movements: Allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base engineering calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
D. Water Penetration for Metal Roof Panels: No water penetration when tested according to ASTM E 1646 at test-pressure difference of 2.86 lbf/sq. ft. (137 Pa).
E. Water Penetration for Metal Wall Panels: No water penetration when tested according to ASTM E 331 at a wind-load design pressure of not less than 2.86 lbf/sq. ft. (137 Pa).
2.2 STRUCTURAL-STEEL FRAMING
A. Primary Framing: Manufacturer's standard primary-framing system, designed to withstand required loads and specified requirements. Primary framing includes transverse and lean-to frames; rafter, rake, and canopy beams; sidewall, intermediate, end-wall, and corner columns; and wind bracing.
1. General: Provide frames with attachment plates, bearing plates, and splice members. Factory drill for field-bolted assembly.
B. End-Wall Framing: Manufacturer's standard primary end-wall framing fabricated for field-bolted assembly.
C. Secondary Framing: Manufacturer's standard secondary framing, including purlins, girts, eave struts, flange bracing, base members, gable angles, clips, headers, jambs, and other miscellaneous structural members. Unless otherwise indicated, fabricate framing from either cold-formed, structural-steel sheet or roll-formed, metallic-coated steel sheet, prepainted with coil coating.
D. Bolts: Provide plain-finish bolts for structural-framing components that are primed or finish painted. Provide zinc-plated or hot-dip galvanized bolts for structural-framing components that are galvanized.
E. Finish: Galvanized.
2.3 METAL ROOF PANELS
A. Vertical-Rib, Standing-Seam Metal Roof Panels: Formed with ribs at panel edges and intermediate stiffening ribs symmetrically spaced flat pan between ribs; designed for sequential installation by mechanically attaching panels to supports using concealed clips located under one side of panels and engaging opposite edge of adjacent panels.
1. Material: Zinc-coated (galvanized) steel sheet, 0.028-inch (0.71-mm) nominal thickness.
a. Exterior Finish: Two-coat fluoropolymer.
b. Color: As selected by Owner or Architect from manufacturer's full range.
2. Clips: Manufacturer's standard, floating type to accommodate thermal movement; fabricated from zinc-coated (galvanized) steel sheet.
3. Joint Type: Mechanically seamed, folded according to manufacturer's standard.
4. Panel Coverage: 16 inches (406 mm) minimum.
5. Panel Height: 2 inches (51 mm).
2.4 METAL WALL PANELS
A. Tapered-Rib-Profile, Exposed-Fastener Metal Wall Panels: Formed with raised, trapezoidal major ribs and intermediate stiffening ribs symmetrically spaced between major ribs; designed to be installed by lapping side edges of adjacent panels and mechanically attaching panels to supports using exposed fasteners in side laps.
1. Material: Zinc-coated (galvanized) steel sheet, 0.028-inch (0.71-mm) nominal thickness.
a. Exterior Finish: Two-coat fluoropolymer.
b. Color: As selected by Owner or Architect from manufacturer's full range.
2. Major-Rib Spacing: 12 inches (305 mm) o.c.
3. Panel Coverage: 36 inches (914 mm).
4. Panel Height: 1.5 inches (38 mm).
2.5 METAL SOFFIT PANELS
A. General: Match wall panels.
2.6 THERMAL INSULATION
A. Faced Metal Building Insulation: ASTM C 991, Type II, glass-fiber-blanket insulation; 0.5-lb/cu. ft. (8-kg/cu. m) density; 2-inch- (51-mm-) wide, continuous, vapor-tight edge tabs; with a flame-spread index of 25 or less.
1. Vapor-Retarder Facing: ASTM C 1136, with permeance not greater than 0.02 perm (1.15 ng/Pa x s x sq. m) when tested according to ASTM E 96/E 96M, Desiccant Method.
2.7 ACCESSORIES
A. General: Provide accessories as standard with metal building system manufacturer and as specified. Fabricate and finish accessories at the factory to greatest extent possible, by manufacturer's standard procedures and processes. Comply with indicated profiles and with dimensional and structural requirements.
1. Form exposed sheet metal accessories that are without excessive oil-canning, buckling, and tool marks and that are true to line and levels indicated, with exposed edges folded back to form hems.
B. Roof Panel Accessories: Provide components required for a complete metal roof panel assembly including copings, fasciae, corner units, ridge closures, clips, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal roof panels unless otherwise indicated.
C. Wall Panel Accessories: Provide components required for a complete metal wall panel assembly including copings, fasciae, mullions, sills, corner units, clips, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal wall panels unless otherwise indicated.
D. Flashing and Trim: Formed from 0.022-inch (0.56-mm) nominal-thickness, metallic-coated steel sheet or aluminum-zinc alloy-coated steel sheet prepainted with coil coating; finished to match adjacent metal panels.
E. Gutters: Formed from 0.022-inch (0.56-mm) nominal-thickness, metallic-coated steel sheet or aluminum-zinc alloy-coated steel sheet prepainted with coil coating; finished to match roof fascia and rake trim. Match profile of gable trim, complete with end pieces, outlet tubes, and other special pieces as required. Fabricate in minimum 96-inch- (2438-mm-) long sections, sized according to SMACNA's "Architectural Sheet Metal Manual."
1. Gutter Supports: Fabricated from same material and finish as gutters.
2. Strainers: Bronze, copper, or aluminum wire ball type at outlets.
F. Downspouts: Formed from 0.022-inch (0.56-mm) nominal-thickness, zinc-coated (galvanized) steel sheet or aluminum-zinc alloy-coated steel sheet prepainted with coil coating; finished to match metal wall panels. Fabricate in minimum 10-foot- (3-m-) long sections, complete with formed elbows and offsets.
1. Mounting Straps: Fabricated from same material and finish as gutters.
G. Pipe Flashing: Premolded, EPDM pipe collar with flexible aluminum ring bonded to base.
2.8 FABRICATION
A. General: Design components and field connections required for erection to permit easy assembly.
1. Mark each piece and part of the assembly to correspond with previously prepared erection drawings, diagrams, and instruction manuals.
2. Fabricate structural framing to produce clean, smooth cuts and bends. Punch holes of proper size, shape, and location. Members shall be free of cracks, tears, and ruptures.
B. Tolerances: Comply with MBMA's "Metal Building Systems Manual" for fabrication and erection tolerances.
C. Primary Framing: Shop fabricate framing components to size and section, with baseplates, bearing plates, stiffeners, and other items required for erection welded into place. Cut, form, punch, drill, and weld framing for bolted field assembly.
D. Secondary Framing: Shop fabricate framing components to size and section by roll-forming or break-forming, with baseplates, bearing plates, stiffeners, and other plates required for erection welded into place. Cut, form, punch, drill, and weld secondary framing for bolted field connections to primary framing.
E. Metal Panels: Fabricate and finish metal panels at the factory to greatest extent possible, by manufacturer's standard procedures and processes, as necessary to fulfill indicated performance requirements. Comply with indicated profiles and with dimensional and structural requirements.
PART 3 - EXECUTION
3.1 ERECTION OF STRUCTURAL FRAMING
A. Erect metal building system according to manufacturer's written erection instructions and erection drawings.
B. Do not field cut, drill, or alter structural members without written approval from metal building system manufacturer's professional engineer.
C. Set structural framing accurately in locations and to elevations indicated, according to AISC specifications referenced in this Section. Maintain structural stability of frame during erection.
D. Base and Bearing Plates: Clean concrete- and masonry-bearing surfaces of bond-reducing materials, and roughen surfaces prior to setting plates. Clean bottom surface of plates.
1. Set plates for structural members on wedges, shims, or setting nuts as required.
2. Tighten anchor rods after supported members have been positioned and plumbed. Do not remove wedges or shims but, if protruding, cut off flush with edge of plate before packing with grout.
3. Promptly pack grout solidly between bearing surfaces and plates so no voids remain. Neatly finish exposed surfaces; protect grout and allow to cure. Comply with manufacturer's written installation instructions for shrinkage-resistant grouts.
E. Align and adjust structural framing before permanently fastening. Before assembly, clean bearing surfaces and other surfaces that will be in permanent contact with framing. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.
1. Level and plumb individual members of structure.
F. Primary Framing and End Walls: Erect framing level, plumb, rigid, secure, and true to line. Level baseplates to a true even plane with full bearing to supporting structures, set with double-nutted anchor bolts. Use grout to obtain uniform bearing and to maintain a level base-line elevation. Moist-cure grout for not less than seven days after placement.
1. Make field connections using high-strength bolts installed according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts" for bolt type and joint type specified.
a. Joint Type: Snug tightened or pretensioned.
G. Secondary Framing: Erect framing level, plumb, rigid, secure, and true to line. Field bolt secondary framing to clips attached to primary framing.
1. Provide rake or gable purlins with tight-fitting closure channels and fasciae.
2. Locate and space wall girts to suit openings such as doors and windows.
3. Locate canopy framing as indicated.
4. Provide supplemental framing at entire perimeter of openings, including doors, windows, louvers, ventilators, and other penetrations of roof and walls.
H. Bracing: Install bracing in roof and sidewalls where indicated on erection drawings.
1. Tighten rod and cable bracing to avoid sag.
2. Locate interior end-bay bracing only where indicated.
I. Framing for Openings: Provide shapes of proper design and size to reinforce openings and to carry loads and vibrations imposed, including equipment furnished under mechanical and electrical work. Securely attach to structural framing.
J. Erection Tolerances: Maintain erection tolerances of structural framing within AISC 303.
3.2 METAL PANEL INSTALLATION, GENERAL
A. General: Anchor metal panels and other components of the Work securely in place, with provisions for thermal and structural movement.
1. Field cut metal panels as required for doors, windows, and other openings. Cut openings as small as possible, neatly to size required, and without damage to adjacent metal panel finishes.
a. Field cutting of metal panels by torch is not permitted unless approved in writing by manufacturer.
2. Install metal panels perpendicular to structural supports unless otherwise indicated.
3. Flash and seal metal panels with weather closures at perimeter of openings and similar elements. Fasten with self-tapping screws.
4. Locate and space fastenings in uniform vertical and horizontal alignment.
5. Locate metal panel splices over, but not attached to, structural supports with end laps in alignment.
6. Lap metal flashing over metal panels to allow moisture to run over and off the material.
B. Lap-Seam Metal Panels: Install screw fasteners using power tools with controlled torque adjusted to compress EPDM washers tightly without damage to washers, screw threads, or metal panels. Install screws in predrilled holes.
1. Arrange and nest side-lap joints so prevailing winds blow over, not into, lapped joints. Lap ribbed or fluted sheets one full rib corrugation. Apply metal panels and associated items for neat and weathertight enclosure. Avoid "panel creep" or application not true to line.
C. Metal Protection: Where dissimilar metals contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with corrosion-resistant coating, by applying rubberized-asphalt underlayment to each contact surface, or by other permanent separation as recommended by metal roof panel manufacturer.

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ARCHITECTURAL SPECIFICATIONS

D. Joint Sealers: Install gaskets, joint fillers, and sealants where indicated and where required for weatherproof performance of metal panel assemblies. Provide types of gaskets, fillers, and sealants recommended by metal panel manufacturer.
1. Seal metal panel end laps with double beads of tape or sealant the full width of panel. Seal side joints where recommended by metal panel manufacturer.
2. Prepare joints and apply sealants to comply with requirements in Section 079200 "Joint Sealants."
3.3 METAL ROOF PANEL INSTALLATION
A. General: Provide metal roof panels of full length from eave to ridge unless otherwise indicated or restricted by shipping limitations.
1. Flash and seal metal roof panels with weather closures at eaves and rakes. Fasten with self-tapping screws.
B. Standing-Seam Metal Roof Panels: Fasten metal roof panels to supports with concealed clips at each standing-seam joint, at location and spacing and with fasteners recommended by manufacturer.
1. Install clips to supports with self-drilling or self-tapping fasteners.
2. Install pressure plates at locations indicated in manufacturer's written installation instructions.
3. Seamed Joint: Crimp standing seams with manufacturer-approved motorized seamer tool so that clip, metal roof panel, and factory-applied sealant are completely engaged.
4. Rigidly fasten eave end of metal roof panels and allow ridge end free movement due to thermal expansion and contraction. Predrill panels for fasteners.
5. Provide metal closures as indicated.
C. Metal Fascia Panels: Align bottom of metal panels and fasten with blind rivets, bolts, or self-drilling or self-tapping screws. Flash and seal metal panels with weather closures where fasciae meet soffits, along lower panel edges, and at perimeter of all openings.
3.4 METAL WALL PANEL INSTALLATION
A. General: Install metal wall panels in orientation, sizes, and locations indicated on Drawings. Install panels perpendicular to girts, extending full height of building, unless otherwise indicated. Anchor metal wall panels and other components of the Work securely in place, with provisions for thermal and structural movement.
1. Unless otherwise indicated, begin metal panel installation at corners with center of rib lined up with line of framing.
2. Shim or otherwise plumb substrates receiving metal wall panels.
3. When two rows of metal panels are required, lap panels 4 inches (102 mm) minimum.
4. When building height requires two rows of metal panels at gable ends, align lap of gable panels over metal wall panels at eave height.
5. Rigidly fasten base end of metal wall panels and allow eave end free movement due to thermal expansion and contraction. Predrill panels.
6. Flash and seal metal wall panels with weather closures at eaves, rakes, and at perimeter of all openings. Fasten with self-tapping screws.
7. Install screw fasteners in predrilled holes.
8. Install flashing and trim as metal wall panel work proceeds.
9. Apply elastomeric sealant continuously between metal base channel (sill angle) and concrete, and elsewhere as indicated; or, if not indicated, as necessary for waterproofing.
10. Align bottom of metal wall panels and fasten with blind rivets, bolts, or self-drilling or self-tapping screws.
11. Provide weatherproof escutcheons for pipe and conduit penetrating exterior walls.
B. Metal Wall Panels: Install metal wall panels on exterior side of girts. Attach metal wall panels to supports with fasteners as recommended by manufacturer.
3.5 METAL SOFFIT PANEL INSTALLATION
A. Provide metal soffit panels the full width of soffits. Install panels perpendicular to support framing.
B. Flash and seal metal soffit panels with weather closures where panels meet walls and at perimeter of all openings.
3.6 THERMAL INSULATION INSTALLATION
A. General: Install insulation concurrently with metal panel installation, in thickness indicated to cover entire surface, according to manufacturer's written instructions.
1. Set vapor-retarder-faced units with vapor retarder toward warm side of construction unless otherwise indicated. Do not obstruct ventilation spaces except for firestopping.
2. Tape joints and ruptures in vapor retarder, and seal each continuous area of insulation to the surrounding construction to ensure airtight installation.
3. Install factory-laminated, vapor-retarder-faced blankets straight and true in one-piece lengths, with both sets of facing tabs sealed, to provide a complete vapor retarder.
B. Blanket Roof Insulation: Comply with the following installation method:
1. Between-Purlin Installation: Extend insulation and vapor retarder between purlins. Carry vapor-retarder-facing tabs up and over purlin, overlapping adjoining facing of next insulation course and maintaining continuity of retarder. Hold in place with bands and crossbands below insulation.
2. Over-Purlin-with-Spacer-Block Installation: Extend insulation and vapor retarder over and perpendicular to top flange of secondary framing. Install layer of filler insulation over first layer to fill space formed by metal roof panel standoffs. Hold in place by panels fastened to standoffs.
a. Thermal Spacer Blocks: Where metal roof panels attach directly to purlins, install thermal spacer blocks.
3. Retainer Strips: Install retainer strips at each longitudinal insulation joint, straight and taut, nesting with secondary framing to hold insulation in place.
C. Blanket Wall Insulation: Extend insulation and vapor retarder over and perpendicular to top flange of secondary framing. Hold in place by metal wall panels fastened to secondary framing.
1. Retainer Strips: Install retainer strips at each longitudinal insulation joint, straight and taut, nesting with secondary framing to hold insulation in place.
2. Sound-Absorption Insulation: Where sound-absorption requirement is indicated for metal liner panels, cover insulation with polyethylene film and provide inserts of wire mesh to form acoustical spacer grid.
3.7 ACCESSORY INSTALLATION
A. General: Install accessories with positive anchorage to building and weathertight mounting, and provide for thermal expansion. Coordinate installation with flashings and other components.
1. Install components required for a complete metal roof panel assembly, including trim, copings, ridge closures, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items.
2. Install components for a complete metal wall panel assembly, including trim, copings, corners, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items.
3. Where dissimilar metals contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with corrosion-resistant coating, by applying rubberized-asphalt underlayment to each contact surface, or by other permanent separation as recommended by manufacturer.
B. Flashing and Trim: Comply with performance requirements, manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, and set units true to line and level as indicated. Install work with laps, joints, and seams that will be permanently watertight and weather resistant.
1. Install exposed flashing and trim that is without excessive oil-canning, buckling, and tool marks and that is true to line and levels indicated, with exposed edges folded back to form hems. Install sheet metal flashing and trim to fit substrates and to result in waterproof and weather-resistant performance.
2. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet (3 m) with no joints allowed within 24 inches (600 mm) of corner or intersection. Where lapped or bayonet-type expansion provisions cannot be used or would not be sufficiently weather resistant and waterproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with mastic sealant (concealed within joints).
C. Gutters: Join sections with riveted-and-soldered or lapped-and-sealed joints. Attach gutters to eave with gutter hangers spaced as required for gutter size, but not more than 36 inches (914 mm) o.c. using manufacturer's standard fasteners. Provide end closures and seal watertight with sealant. Provide for thermal expansion.
D. Downspouts: Join sections with 1-1/2-inch (38-mm) telescoping joints. Provide fasteners designed to hold downspouts securely 1 inch (25 mm) away from walls; locate fasteners at top and bottom and at approximately 60 inches (1524 mm) o.c. in between.
1. Provide elbows at base of downspouts to direct water away from building.
E. Pipe Flashing: Form flashing around pipe penetration and metal roof panels. Fasten and seal to panel as recommended by manufacturer.
END OF SECTION 133419

SECTION 313116 - TERMITE CONTROL

PART 1 - GENERAL
1.1 SUMMARY
A. Section Includes:
1. Soil treatment with termiticide.
1.2 ACTION SUBMITTALS
A. Product Data: For each type of product indicated. Include the EPA-Registered Label for termiticide products.
1.3 INFORMATIONAL SUBMITTALS
A. Product certificates.
B. Soil Treatment Application Report: Include the following:
1. Date and time of application.
2. Moisture content of soil before application.
3. Termiticide brand name and manufacturer.
4. Quantity of undiluted termiticide used.
5. Dilutions, methods, volumes used, and rates of application.
6. Areas of application.
7. Water source for application.
C. Warranties: Sample of special warranties.
1.4 QUALITY ASSURANCE
A. Installer Qualifications: A specialist who is licensed according to regulations of authorities having jurisdiction to apply termite control treatment and products in jurisdiction where Project is located and who employs workers trained and approved by manufacturer to install manufacturer's products.
B. Regulatory Requirements: Formulate and apply termiticides and termiticide devices according to the EPA-Registered Label.
1.5 PROJECT CONDITIONS
A. Environmental Limitations: To ensure penetration, do not treat soil that is water saturated or frozen. Do not treat soil while precipitation is occurring. Comply with requirements of the EPA-Registered Label and requirements of authorities having jurisdiction.
B. Coordinate soil treatment application with excavating, filling, grading, and concreting operations. Treat soil under footings, grade beams, and ground-supported slabs before construction.
1.6 WARRANTY
A. Soil Treatment Special Warranty: Manufacturer's standard form, signed by Applicator and Contractor, certifying that termite control work, consisting of applied soil termiticide treatment, will prevent infestation of subterranean termites. If subterranean termite activity or damage is discovered during warranty period, re-treat soil and repair or replace damage caused by termite infestation.
1. Warranty Period: Three years from date of Substantial Completion.
PART 2 - PRODUCTS
2.1 SOIL TREATMENT
A. Termiticide: Provide an EPA-Registered termiticide, complying with requirements of authorities having jurisdiction, in an aqueous solution formulated to prevent termite infestation. Provide quantity required for application at the label volume and rate for the maximum termiticide concentration allowed for each specific use, according to product's EPA-Registered Label.
1. Products: Subject to compliance with requirements, provide one of the following:
a. BASF Corporation, Agricultural Products; Termidor.
b. Bayer Environmental Science; Premise 75.
c. FMC Corporation, Agricultural Products Group; Dragnet FT, Talstar or Prevail.
d. Syngenta; Demon TC, Prelude, Probuild TC.
2. Service Life of Treatment: Soil treatment termiticide that is effective for not less than three years against infestation of subterranean termites.
PART 3 - EXECUTION
3.1 APPLICATION, GENERAL
A. General: Comply with the most stringent requirements of authorities having jurisdiction and with manufacturer's EPA-Registered Label for products.
3.2 APPLYING SOIL TREATMENT
A. Examine substrates, areas, and conditions, with Applicator present, for compliance with requirements for moisture content of soil per termiticide label requirements, interfaces with earthwork, slab and foundation work, landscaping, utility installation, and other conditions affecting performance of termite control.
B. Proceed with application only after unsatisfactory conditions have been corrected.
C. Soil Treatment Preparation: Remove foreign matter and impermeable soil materials that could decrease treatment effectiveness on areas to be treated. Loosen, rake, and level soil to be treated except previously compacted areas under slabs and footings. Termiticides may be applied before placing compacted fill under slabs if recommended in writing by termiticide manufacturer.
1. Fit filling hose connected to water source at the site with a backflow preventer, complying with requirements of authorities having jurisdiction.
D. Application: Mix soil treatment termiticide solution to a uniform consistency. Provide quantity required for application at the label volume and rate for the maximum specified concentration of termiticide, according to manufacturer's EPA-Registered Label, to the following so that a continuous horizontal and vertical termiticidal barrier or treated zone is established around and under building construction. Distribute treatment evenly.
1. Slabs-on-Grade and Basement Slabs: Under ground-supported slab construction, including footings, building slabs, and attached slabs as an overall treatment. Treat soil materials before concrete footings and slabs are placed.
2. Foundations: Adjacent soil, including soil along the entire inside perimeter of foundation walls; along both sides of interior partition walls; around plumbing pipes and electric conduit penetrating the slab; around interior column footers, piers, and chimney bases; and along the entire outside perimeter, from grade to bottom of footing. Avoid soil washout around footings.
E. Avoid disturbance of treated soil after application. Keep off treated areas until completely dry.
F. Protect termiticide solution, dispersed in treated soils and fills, from being diluted until ground-supported slabs are installed. Use waterproof barrier according to EPA-Registered Label instructions.
G. Post warning signs in areas of application.
H. Reapply soil treatment solution to areas disturbed by subsequent excavation, grading, landscaping, or other construction activities following application.
END OF SECTION 313116

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CITY OF WICHITA, KANSAS

RE-USE WATER PUMP STATION

TO SERVE SPIRT AEROSYSTEMS

ARCHITECTURAL SPECIFICATIONS

PROJECT NO.	468-85112
DATE	04-18-16
SCALE	AS NOTED

DESIGNED	DRAWN	CHECKED
DGA	TEAM	DGA

NO.	REVISION	DATE
0	ISSUED FOR CONSTRUCTION	04/18/16

SHEET NO.
A7.5

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PROJECT GENERAL NOTES

1. ALL WORK SHALL COMPLY WITH CURRENT FEDERAL, STATE, AND LOCAL CODES AND ORDINANCES AS WELL AS THE CONSTRUCTION DOCUMENTS. CONTRACTOR SHALL REPORT ANY CONFLICTS TO THE ENGINEER AS SOON AS THEY ARE DISCOVERED.
2. THE COMPLETE INSTALLATION SHALL BE IN ACCORDANCE WITH THE A.D.A.A.G. (AMERICANS WITH DISABILITIES ACT ACCESSIBILITY GUIDELINES).
3. THE CONTRACTOR SHALL REVIEW THE DRAWINGS AND SPECIFICATIONS PRIOR TO BIDDING JOB AND DURING CONSTRUCTION. EXCEPT AS OTHERWISE NOTED, THE CONTRACTOR SHALL PROVIDE ALL EQUIPMENT, MATERIALS, AND LABOR FOR A COMPLETE PROJECT AS SHOWN IN THE DRAWINGS AND SPECIFICATIONS. DRAWINGS AND SPECIFICATIONS CARRY EQUAL IMPORTANCE AND ITEMS LISTED IN EITHER SHALL BE FURNISHED AS IF LISTED IN BOTH. ALSO REVIEW DETAILS AND RISER DIAGRAMS FOR ADDITIONAL ITEMS/INSTRUCTIONS WHETHER SPECIFICALLY REFERRED TO ON PLANS OR NOT.
4. THE CONTRACTOR MUST VISIT THE SITE TO FAMILIARIZE HIMSELF WITH THE EXISTING SITE CONDITIONS WHICH WILL BE AFFECTED DURING CONSTRUCTION PRIOR TO SUBMITTING HIS BID PROPOSAL. INCLUDING THE EXTENT OF DEMOLITION AND CONFLICTS WITH PLANS.
5. DRAWINGS ARE DIAGRAMMATIC IN NATURE AND SHOW THE GENERAL INSTALLATION OF EQUIPMENT AND MATERIALS IN RELATIONSHIP TO STRUCTURE AND OTHER TRADES. THEY MAY NOT SHOW EVERY REQUIRED OFFSET, FITTING, ETC. CONTRACTOR SHALL FIELD VERIFY ACTUAL JOB CONDITIONS AND COORDINATE WORK WITH OTHER TRADES PRIOR TO BIDDING JOB AND PRIOR TO ORDERING EQUIPMENT, FABRICATION OF MATERIALS, OR STARTING WORK. CONTRACTOR SHALL NOT SCALE THE DRAWINGS.
6. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO COORDINATE ALL ITEMS THAT AFFECT OTHER DISCIPLINES WITH THE CORRESPONDING CONTRACTOR AND THE GENERAL CONTRACTOR IF EQUIPMENT, MATERIALS, ETC. OTHER THAN THOSE SCHEDULED AND SPECIFIED (PENDING PRE-APPROVAL) ARE FURNISHED.
7. CHANGE ORDERS WILL NOT BE GRANTED DUE TO LACK OF COORDINATION WITH JOB CONDITIONS AND/OR OTHER CONTRACTORS.
8. EXISTING EQUIPMENT, DUCTWORK, AND PIPING SIZES AND LOCATIONS ARE SHOWN FOR REFERENCE ONLY. ADJUST EXACT INSTALLATION AND CONNECTION OF NEW ITEMS ACCORDING TO ACTUAL CONDITIONS.
9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR STORAGE OF RELOCATED EQUIPMENT AND MATERIALS DURING CONSTRUCTION. ITEMS DAMAGED DURING CONSTRUCTION SHALL BE REPLACED AT THE CONTRACTOR'S EXPENSE.
10. UPON COMPLETION OF THE PROJECT THE CONTRACTOR SHALL PROVIDE AS-BUILT DRAWINGS TO THE OWNER, ARCHITECT, AND ENGINEER SHOWING EQUIPMENT, ETC. THAT DIFFERS FROM CONSTRUCTION DOCUMENTS AS THEY ARE ACTUALLY INSTALLED.
11. THE RESPONSIBILITY OF EACH CONTRACTOR IS NOT LIMITED TO THEIR SPECIFIC DISCIPLINE'S DRAWING SHEETS. REFER TO OTHER DISCIPLINES' DRAWING SHEETS AS REQUIRED FOR ADDITIONAL INFORMATION/INSTRUCTIONS.
12. FIRE STOP ALL PENETRATIONS THROUGH RATED WALLS. SLEEVE IN ENTIRETY WITH APPROPRIATE SLEEVE MATERIAL.

ELECTRICAL GENERAL NOTES

GENERAL:
1. DATA AND CONTROLS SYSTEMS EQUIPMENT, WIRING, AND RACEWAYS ARE PART OF THE WORK.

COORDINATION WITH OTHER TRADES:
1. CONTRACTOR SHALL VERIFY ALL EQUIPMENT LOCATIONS WITH ARCHITECTURAL, MECHANICAL, AND CIVIL PLANS, ELEVATIONS AND REVIEWED SHOP DRAWINGS PRIOR TO MAKING THE ACTUAL ELECTRICAL INSTALLATION.
2. ELECTRICAL CONTRACTOR SHALL VERIFY TOTAL CONNECT LOAD/HP WITH MECHANICAL AND ALL OTHER CONTRACTORS PRIOR TO WIRING OF ALL EQUIPMENT. MAKE ANY CHANGES TO OVERCURRENT DEVICES OR FEED SIZE PER THE NATIONAL ELECTRICAL CODE, APPLICABLE VERSION.
3. ALL TEMPERATURE CONTROL WIRING SHALL BE FURNISHED AND INSTALLED BY OTHERS. INSTALL CONDUIT FOR CABLE IN EXPOSED AREAS. REFER TO MECHANICAL PLANS AND SPECIFICATIONS AND THE TEMPERATURE CONTROLS CONTRACTOR FOR EXACT LOCATION OF MECHANICAL EQUIPMENT AND THERMOSTAT LOCATIONS.

CONDUIT AND WIRE:
1. ALL POWER WIRING OF ALL SYSTEMS SHALL BE COPPER WITH INSULATED GROUND WIRE IN STEEL CONDUIT AND STEEL BOXES UNLESS SPECIFICALLY NOTED OTHERWISE.
2. RACEWAYS SHALL BE ROUTED OVERHEAD UNLESS OTHERWISE NOTED ON THE DRAWINGS. UNDERSLAB RACEWAYS ARE ALLOWED FOR PANEL FEEDERS ONLY UNLESS OTHERWISE NOTED ON THE DRAWINGS. ALL PANEL BOARD BRANCH CIRCUITS SHALL BE ROUTED OVERHEAD WHERE POSSIBLE.
3. ALL CONNECTIONS TO EQUIPMENT SUBJECT TO MOVEMENT OR VIBRATIONS SHALL BE LIQUID TIGHT FLEXIBLE METAL CONDUIT, NOT LESS THAN 12" IN LENGTH, NOR GREATER THAN 36" IN LENGTH.
4. MULTIPLE CIRCUITS ON THE SAME PHASE SHALL NOT BE COMBINED IN A SINGLE RACEWAY UNLESS OTHERWISE SHOWN ON THE CONTRACT DRAWINGS. SINGLE PHASE BRANCH CIRCUIT HOME RUNS MAY BE COMBINED AT THE CONTRACTOR'S DISCRETION NOT GREATER THAN THREE CIRCUITS CONSISTING OF (3) PHASE CONDUCTORS, (3) NEUTRAL CONDUCTORS, AND GROUNDING CONDUCTOR.
5. THE MINIMUM WIRE SIZE SHALL BE #12 FOR ALL POWER CIRCUITS. EACH CIRCUIT SHALL HAVE A SEPARATE AND DEDICATED NEUTRAL FROM THE PANEL. SEE BRANCH CIRCUIT VOLTAGE DROP TABLE FOR SIZING OF CONDUCTORS.
6. THE MINIMUM CONDUIT SIZE IS 0.75".
7. REFER TO THE ARCHITECTURAL DRAWINGS FOR LOCATIONS OF BUILDING EXPANSION JOINTS. ALL CONDUITS CROSSING EXPANSION JOINTS SHALL BE INSTALLED WITH EXPANSION FITTINGS, UNLESS THE CONDUIT IS BELOW SLAB IN THE DENSE GRADE AGGREGATE. EXPANSION FITTINGS SHALL BE INSTALLED IN ACCORDANCE WITH THE NEC, AND MANUFACTURER'S WRITTEN RECOMMENDATIONS.
8. ALL EXPOSED CONDUIT SHALL BE INSTALLED PARALLEL OR PERPENDICULAR, AND SHALL BE RIGID GALVANIZED UNLESS OTHERWISE NOTED.
9. EXTERIOR EXPOSED CONDUIT RUNS WILL NOT BE PERMITTED.
10. UNDER-SLAB CONDUIT SHALL NOT BE IN THE SLAB, BUT BELOW IT IN THE DENSE GRADE AGGREGATE, AND PARALLEL TO THE SLAB. ALL CONDUIT UNDER GROUND SHALL BE A MINIMUM OF 1". THIS APPLIES FOR BOTH LINE VOLTAGE, DATA, AND CONTROLS. ALL BENDS UNDERGROUND, HORIZONTAL OR VERTICAL, SHALL BE RIGID GALVANIZED STEEL. NO EXCEPTION.
11. MAINTAIN MAXIMUM SPACE BETWEEN LOW VOLTAGE CABLES WITH METAL CONDUCTORS AND SOURCES OF INTERFERENCE INCLUDING: POWER WIRING, ALL LIGHT FIXTURES, AND ESPECIALLY MOTORS AND TRANSFORMERS. ELECTRICAL INTERFERENCE IS REDUCED BY DISTANCE FROM SOURCES.

DEVICES AND BOXES:
1. WHERE SEVERAL DEVICES ARE GANGED TOGETHER, THE COVERPLATE SHALL BE OF THE GANGED STYLE FOR THE NUMBER OF DEVICES USED.
2. RECEPTACLES SHALL NOT BE WIRED TO THE LOAD SIDE OF A GFCI RECEPTACLE.
3. WEATHERPROOF WHILE IN USE RECEPTACLE COVERS SHALL BE METAL, AND PAINTABLE UNLESS OTHERWISE NOTED.

ELECTRICAL-OTHER:
1. ALL PANELS SHALL BE PANELBOARD CONSTRUCTION WITH BOLT ON BREAKERS. TANDEM BREAKERS SHALL NOT BE USED.

ELECTRICAL SYMBOL LIST

	ABBR.	DESCRIPTION	MOUNTING OR AS INDICATED
LIGHTING	A	FLUORESCENT LIGHT FIXTURE WITH LETTER DESIGNATION	SURFACE OR RECESSED
	A	FLUORESCENT LIGHT FIXTURE W/ EM POWER W/ LETTER DESIGNATION	SURFACE OR RECESSED
	A	LIGHT FIXTURE WITH LETTER DESIGNATION	WALL, SURFACE, OR SUSPENDED
	A	LIGHT FIXTURE WITH EMERGENCY POWER WITH LETTER DESIGNATION	WALL, SURFACE, OR SUSPENDED
	A	LIGHT FIXTURE WITH LETTER DESIGNATION	SURFACE OR RECESSED
	EM A	LIGHT FIXTURE WITH EMERGENCY POWER WITH LETTER DESIGNATION	SURFACE OR RECESSED
	A	LIGHT FIXTURE WITH LETTER DESIGNATION	WALL
	EM A	LIGHT FIXTURE WITH EMERGENCY POWER WITH LETTER DESIGNATION	WALL
	XA	COMBINATION EXIT & EMERGENCY LIGHT WITH LETTER DESIG.	WALL
	XA	EXIT LIGHT WITH LETTER DESIG. (SHADE INDICATES FACE DIRECTION)	WALL - 6" ABOVE DOOR
	A	EMERGENCY LIGHT FIXTURE WITH LETTER DESIGNATION	WALL - 12" BFC
WIRING DEVICES	$	SINGLE POLE SWITCH	WALL - 44" AFF
	$3	THREE-WAY SWITCH	WALL - 44" AFF
	$4	FOUR-WAY SWITCH	WALL - 44" AFF
	$P	SWITCH WITH PILOT LIGHT	WALL - 44" AFF
	$K	KEY SWITCH	WALL - 44" AFF
	$T	TIME SWITCH (SET FOR 30 MIN.)	WALL - 44" AFF
	$M	HORSE POWER RATED TOGGLE SWITCH	--
	$D	DIMMER SWITCH	WALL - 44" AFF
	a,b,c,...	SWITCHING SCHEME	--
	#	MOTION DETECTOR (TYPE #)	WALL - 44" AFF
	#	PIR OCCUPANCY DETECTOR W/POWER PACK (TYPE #)	CEILING
	S	ULTRA SONIC SENSOR (TYPE #)	CEILING
		SINGLE RECEPTACLE (SAME RATING AS CIRCUIT)	WALL - 18" AFF
	IG	ISOLATED GROUND DUPLEX RECEPTACLE	WALL - 18" AFF
		DUPLEX RECEPTACLE (20 AMP)	WALL - 18" AFF
		CEILING MOUNTED RECEPTACLE	CEILING
	TR	TAMPER-RESISTANT DUPLEX RECEPTACLE (20 AMP)	WALL - 18" AFF
		QUAD-PLEX RECEPTACLE	WALL - 18" AFF
		SWITCHED DUPLEX RECEPTACLE	WALL - 18" AFF
		GFI DUPLEX RECEPTACLE (20 AMP)	WALL - 18" AFF
		GFI QUAD RECEPTACLE	WALL - 18" AFF
		SPECIAL OUTLET (SEE SCHEDULE)	WALL , FLOOR
		TELEPHONE OUTLET	WALL, FLOOR
		DATA OUTLET	WALL - 18" AFF
		COMBINATION DATA AND DATA OUTLET	WALL - 18" AFF
		CLOCK OUTLET	WALL
	TV	CABLE T.V. OUTLET	AS NOTED
	C	CONTROLLER	WALL - 48" AFF
	T	THERMOSTAT	48" AFF (SEE MECH. DWGS.)
POWER DISTRIBUTION	J	JUNCTION BOX	AS NOTED
	P	PULL BOX	WALL - 48" AFF
		SAFETY SWITCH (NON-FUSED)	6'-0" AFF TO TOP
		SAFETY SWITCH (FUSED)	6'-0" AFF TO TOP
	DS	TOGGLE DISCONNECT SWITCH	WALL
		COMBINATION STARTER	WALL
		EMERGENCY STOP-MUSHROOM HEAD MAINTAINED PUSH BUTTON	44" AFF OR AFG
	M	MOTOR	AS NOTED
		ELECTRICAL PANELBOARD (SURFACE MTD.)	48" AFF TO CENTER

SYMBOLS LIST NOTES:
1. SOME MAY NOT BE USED IN THIS SET OF PLANS.
2. ABBREVIATIONS MAY BE WITH OR WITHOUT PERIODS.
3. ALL MOUNTINGS APPLY UNLESS OTHERWISE NOTED.
4. LIGHT FIXTURE CAPITAL LETTER DESIGNATIONS KEY TO MATCHING ENTRIES IN THE LIGHTING FIXTURE SCHEDULE.
5. LIGHT FIXTURE SMALL CASE LETTER DESIGNATIONS (IF SHOWN) REPRESENT SWITCHING REQUIREMENTS.
6. ALL MOUNTING HEIGHTS SHALL BE TO CENTERLINE OF DEVICE U.O.N.

ABBREVIATIONS

ABBREV-IATIONS	DESCRIPTION	ABBREV-IATIONS	DESCRIPTION
A	AMPERES	HP	HORSE POWER
A/V	AUDIO/VISUAL	IG	ISOLATED GROUND
AFF	ABOVE FINISHED FLOOR	IP	INTERNET PROTOCOL
AFG	ABOVE FINISHED GRADE	J-BOX	JUNCTION BOX
AHJ	AUTHORITIES HAVING JURISDICTION	LTG	LIGHTING
ATS	AUTOMATIC TRANSFER SWITCH	MAX	MAXIMUM
BFC	BELOW FINISHED CEILING	MC	MECHANICAL CONTRACTOR
BFG	BELOW FINISHED GRADE	MCA	MINIMUM CIRCUIT AMPACITY
C	CONDUIT	MIN	MINIMUM
CB	CIRCUIT BREAKER	MOCP	MAXIMUM OVERCURRENT PROTECTION
CLG	CEILING	(N)	NEW
CT	MOUNTED 6" ABOVE COUNTER TOP	NL	NIGHT LIGHT
DN	DOWN	NO	NORMALLY OPEN
(E)	EXISTING	NTS	NOT TO SCALE
EC	ELECTRICAL CONTRACTOR	P	POLE
EM	INDICATES DEVICE ON EMERGENCY CIRCUIT OR WITH AN EMERGENCY BATTERY	SPD	SURGE PROTECTIVE DEVICE
		TCC	TEMPERATURE CONTROLS CONTRACTOR
FLA	FULL LOAD AMPS	TP	TAMPER PROOF OUTLET COVERS
FVNR	FULL VOLTAGE NON-REVERSING	TR	TAMPER RESISTANT DEVICE
FVR	FULL VOLTAGE REVERSING	TYP	TYPICAL
FWD	FORWARD	UCT	MOUNTED UNDER COUNTER TOP
FPC	FIRE PROTECTION CONTRACTOR	UON	UNLESS OTHERWISE NOTED
GC	GENERAL CONTRACTOR	V	VOLTS
GEC	GROUNDING ELECTRODE CONDUCTOR	WP	WEATHER PROOF
GFI / GFCI	GROUND FAULT INTERRUPTER	WPI	WP IN SERVICE (WITH PLUG IN SERVICE)
G/GND	GROUND	WR	WEATHER RESISTANT TYPE DEVICE

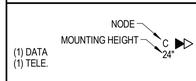
LINETYPES LEGEND

EXISTING/REFERENCE
WORK TO BE DONE
EXISTING TO BE DEMOLISHED

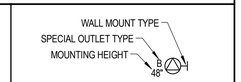
ELECTRICAL CONTACTS

ELECTRICAL:
JOEL WHEELER, P.E.
PHONE: 316.684.9600 x1255
E-MAIL: JWHEELER@MKEC.COM

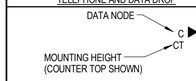
CIRCUITING LEGEND



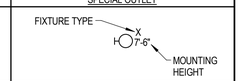
TELEPHONE AND DATA DROP



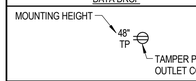
SPECIAL OUTLET



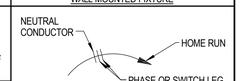
DATA DROP



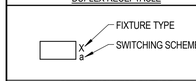
WALL MOUNTED FIXTURE



DUPLEX RECEPTACLE



NOTE: ALL CIRCUITS ARE TO BE ASSUMED AS (2)-#12 AND (1)-#12 GROUND U.O.N. GROUND CONDUCTORS ARE NOT INDICATED AND ARE ASSUMED TO BE PROVIDED WITH ALL CIRCUITS.



CEILING MOUNTED FIXTURE

CONDUIT RUN

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CITY OF WICHITA, KANSAS

RE-USE WATER PUMP STATION

TO SERVE SPIRT AEROSYSTEMS

ELECTRICAL COVERSHEET

PROJECT NO.	468-85112
DATE	04/18/16
SCALE	AS NOTED

DESIGNED	DRAWN	CHECKED
JRBW	JA	JRBW

NO.	REVISION	DATE
0	ISSUED FOR CONSTRUCTION	04/18/16

SHEET NO.
E1.0

Joel Richard Bradley Wheeler
24496
4-21-16
KANSAS
PROFESSIONAL ENGINEER

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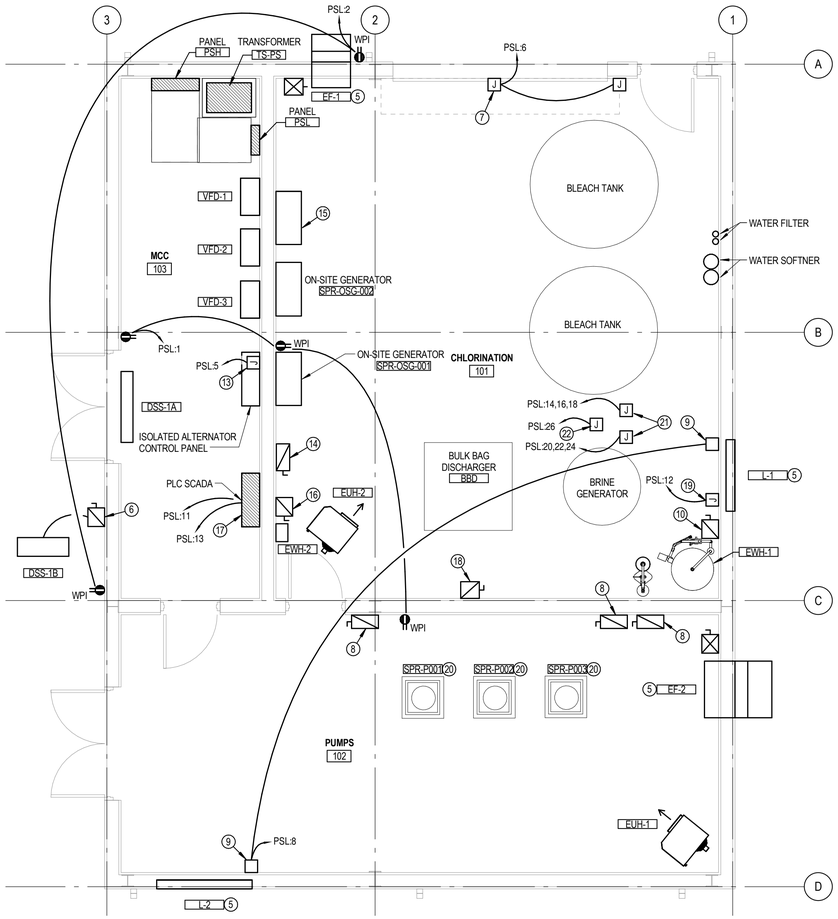
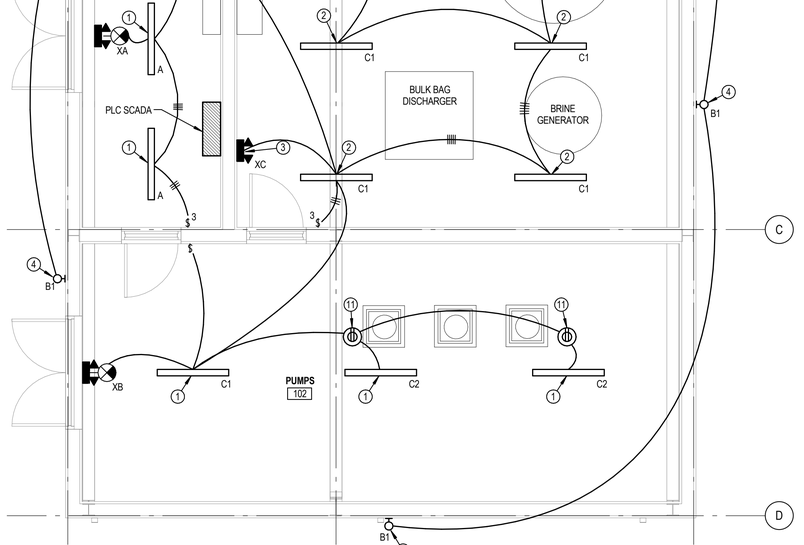


A POWER PLAN

1/4" = 1'-0"



B LIGHTING PLAN

1/4" = 1'-0"

GENERAL NOTES
1. REPAIR ALL WALL & FLOOR PENETRATIONS TO MAINTAIN THE REQUIRED FIRE/SMOKE RATING. REFER TO ARCHITECTURAL DRAWINGS FOR FIRE/SMOKE RATINGS AND LOCATIONS.
2. UPON COMPLETION OF PROJECT, E.C. SHALL PROVIDE A FULL TYPED PANEL DIRECTORY FOR EACH PANELBOARD.
3. FEEDER ROUTING INDICATED ON THE DRAWINGS DOES NOT INDICATE NEC CODE REQUIRED PULL BOXES. E.C. SHALL BE RESPONSIBLE FOR LOCATING AND INSTALLING REQUIRED PULL BOXES FOR EACH FEEDER.
4. ALL CONDUIT, HANGERS, SUPPORTS, AND ACCESSORIES SHALL BE INSTALLED AS HIGH AS POSSIBLE TO MAINTAIN MAXIMUM CLEARANCE ABOVE THE CEILING.

KEYED NOTES E2.0	
1.	SUSPEND FIXTURE 9'-0" AFF.
2.	SUSPEND FIXTURE 13'-4" AFF.
3.	WALL MOUNT FIXTURE 8'-0" AFF.
4.	WALL MOUNT FIXTURE 12'-0" AFF.
5.	PROVIDE RELAYS AND DEVICES AS REQUIRED TO INTERLOCK EXHAUST FAN, LOUVER, AND CONTROLS PER MECHANCIAL SEQUENCE OF OPERATIONS.
6.	WALL MOUNT DSS-1B DISCONNECT.
7.	PROVIDE FINAL 120V CONNECTION TO O/VERHEAD DOOR. PROVIDE 0.5" CONDUIT FROM MOTOR TO CONTROLLER. PROVIDE CONTROL CABLING PER MANUFACTURER'S RECOMMENDATION.
8.	WALL MOUNT PUMP DISCONNECT. SEE DETAIL 5/E4.1 FOR CONDUIT ROUTING.
9.	PROVIDE 120V CONNECTION TO LOUVER MOTORIZED ACTUATOR.
10.	WALL MOUNT EWH-1 DISCONNECT.
11.	PROVIDE SWITCHED RECEPTACLE ON CEILING FOR SUSPENDED LIGHT FIXTURE. PLUG FIXTURE C2 STOW CORD INTO RECEPTACLE. RECEPTACLE IS TO ALLOW FIXTURE REMOVAL DURING PUMP PULLS.
13.	PROVIDE FINAL 120V CONNECTION TO ON-SITE GENERATOR PLC. COORDINATE ALL REQUIREMENTS WITH MANUFACTURER.
14.	WALL MOUNT ON-SITE GENERATOR DISCONNECTS. STACK ABOVE THE OTHER.
15.	FUTURE ON-SITE GENERATOR SPR-OSG-003. SHOWN FOR REFERENCE ONLY.
16.	WALL MOUNT EWH-2 DISCONNECT SWITCH.
17.	PROVIDE (2)-120V, 20A DEDICATED CIRCUITS TO PLC SCADA.
18.	WALL MOUNT BULK BAG DISCHARGER DISCONNECT SWITCH.
19.	PROVIDE FINAL 120V CONNECTION TO H2 MONITOR. MONITOR PROVIDED BY CHLORINATION PACKAGE AND INSTALLED BY EC. SEE CONTROL PIPING PLAN FOR MORE INFORMATION.
20.	SEE DETAIL 5/E4.1 FOR CONDUIT ROUTING AND GROUNDING CONNECTION.
21.	PROVIDE FINAL 208V, 3-PHASE CONNECTION TO INJECTION PUMPS SPR-P010 AND SPR-P011. CIRCUIT WITH (3)-#12, #12 GROUND, IN 0.75" CONDUIT. COORDINATE FINAL LOCATION WITH GC.
22.	PROVIDE FINAL 120V CONNECTION TO BRINE PUMP.

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RE-USE WATER PUMP STATION

TO SERVE SPIRT AEROSYSTEMS

ELECTRICAL PLANS

PROJECT NO.	468-85112
DATE	04/18/16
SCALE	AS NOTED

DESIGNED	DRAWN	CHECKED
JRBW	JA	JRBW

NO.	REVISION	DATE
0	ISSUED FOR CONSTRUCTION	04/18/16

SHEET NO.

E2.0

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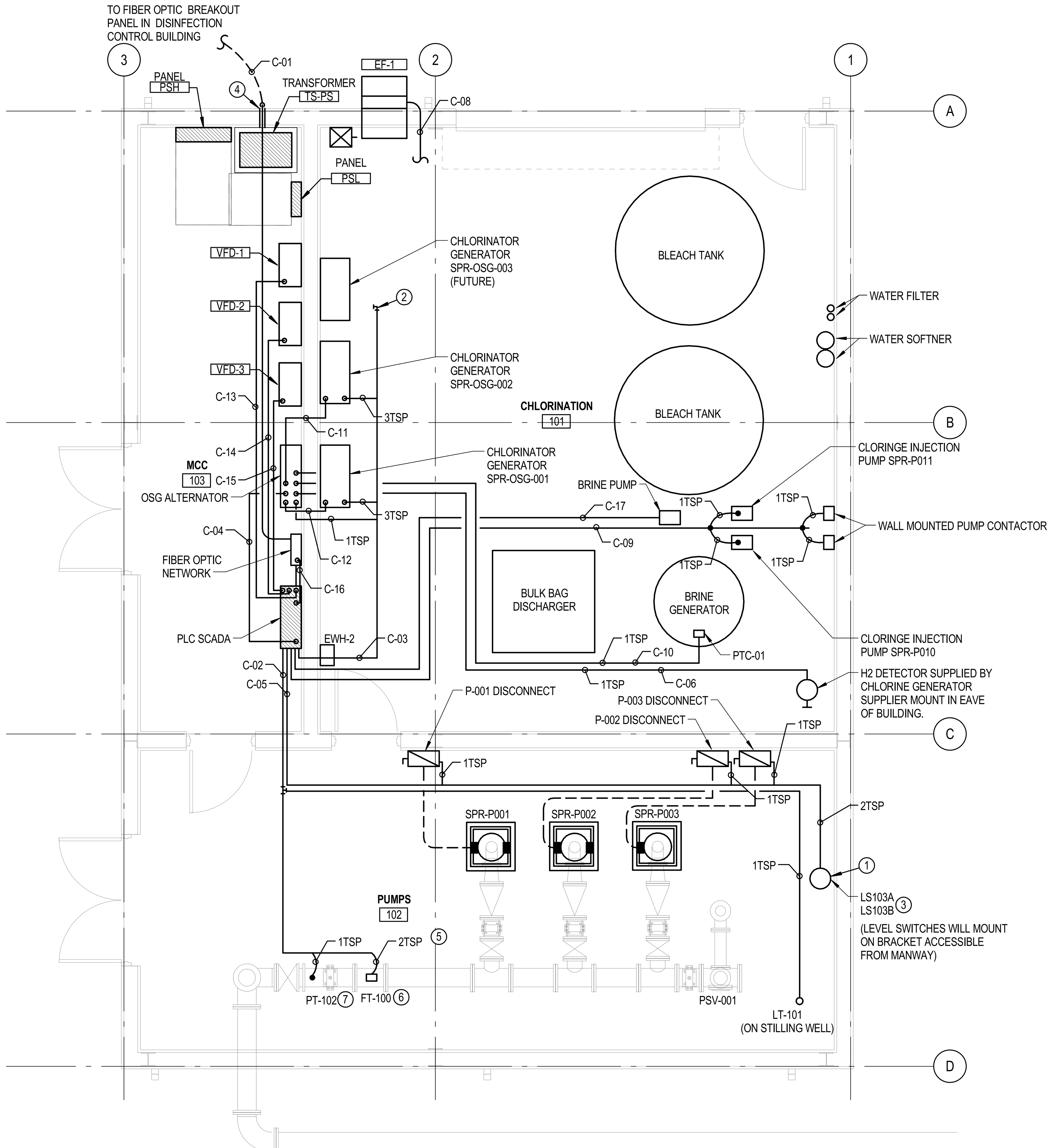
CABLE & CONDUIT SCHEDULE

CONDUIT RUN	DESCRIPTION		
	FROM	TO	WIRE SIZE / TYPE
C-01	FIBER OPTIC NETWORK	FIBER OPTIC BREAKOUT PANEL	2" GRC/PVC 12 STRAND FIBER OPTIC CABLE
C-02	PLC SCADA	PT-102 4-20, FT-100 4-20, FT-100 PWR 24VDC, LT--101 4-20, LT-101A PULSE	1" GRC 5 #18TSP
C-03	PLC SCADA	CHLORINATION SYSTEM	1.5" GRC 7 #18TSP
C-04	PLC SCADA	CHLORINATION SYSTEM	0.75" GRC 1 #18 ETHERNET
C-05	PLC SCADA	DISCONNECTS SPR-P001, SPR-P002, AND SPR-P003, HIGH LEVEL ALARM LS-103A, LOW LEVEL PUMPS LS-103B	1" GRC 4#18TSP
C-06	OSG ALTERNATOR	H2 DETECTOR TO CL CONTROL CABINET	0.75" GRC 1#18TSP
C-07	PLC SCADA	WATER HEATER	0.75" GRC 2 #18TSP
C-08	PLC/MCC	MAKEUP AIR FAN	0.75" GRC 6 #14THHN
C-09	PLC SCADA	CHLORENE INJECTION PUMP SPR-P010 AND SPR-P011	0.75" GRC 4 #18TSP
C-10	PTC-01 BRINE TANK	OSG-PLC	0.75" GRC 1 #18TSP
C-11	OSG ALTERNATOR	SPR-OSG-001	1.5" GRC 10 #18TSP
C-12	OSG ALTERNATOR	SPR-OSG-002	1.5" GRC 10 #18TSP
C-13	PLC SCADA	VFD-1	1.25" GRC 6#18TSP
C-14	PLC SCADA	VFD-2	1.25" GRC 6#18TSP
C-15	PLC SCADA	VFD-3	1.25" GRC 6#18TSP
C-16	FIBER OPTIC BREAKOUT PANEL	SCADA PLC	1.5" EMT - 4 FIBER OPTIC PATCH CABLES 2M - MM 62.5
C-17	BRINE PUMP	SCADA PLC	0.75" - 2 #18TSP

KEYED NOTES E2.1

1.	LS103A AND LS103B LEVEL SWITCHES WILL BE INSTALLED NEXT TO MANWAY.
2.	INSTALL 1 1/2" FITTING AND PLUG FOR FUTURE.
3.	HIGH AND LOW LEVEL SWITCH SEE DETAIL 4/E4.1
4.	SEE DETAIL 3/E4.1 FOR DUCT BANK WALL PENETRATION.
5.	SEE DETAIL 8/E4.1 FOR LEVEL TRANSMITTER.
6.	SEE DETAIL 7/E4.1 FOR FLOW TRANSMITTER.
7.	SEE DETAIL 6/E4.1 FOR PRESSURE TRANSMITTER.



A CONTROL CONDUIT PLAN

1/4" = 1'-0"

CONTROL CONDUIT PLAN

PROJECT NO.	468-85112
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Joel Richard Bradley Wheeler
24496
4-21-16
KANSAS
PROFESSIONAL ENGINEER

SHEET NO.

E2.1

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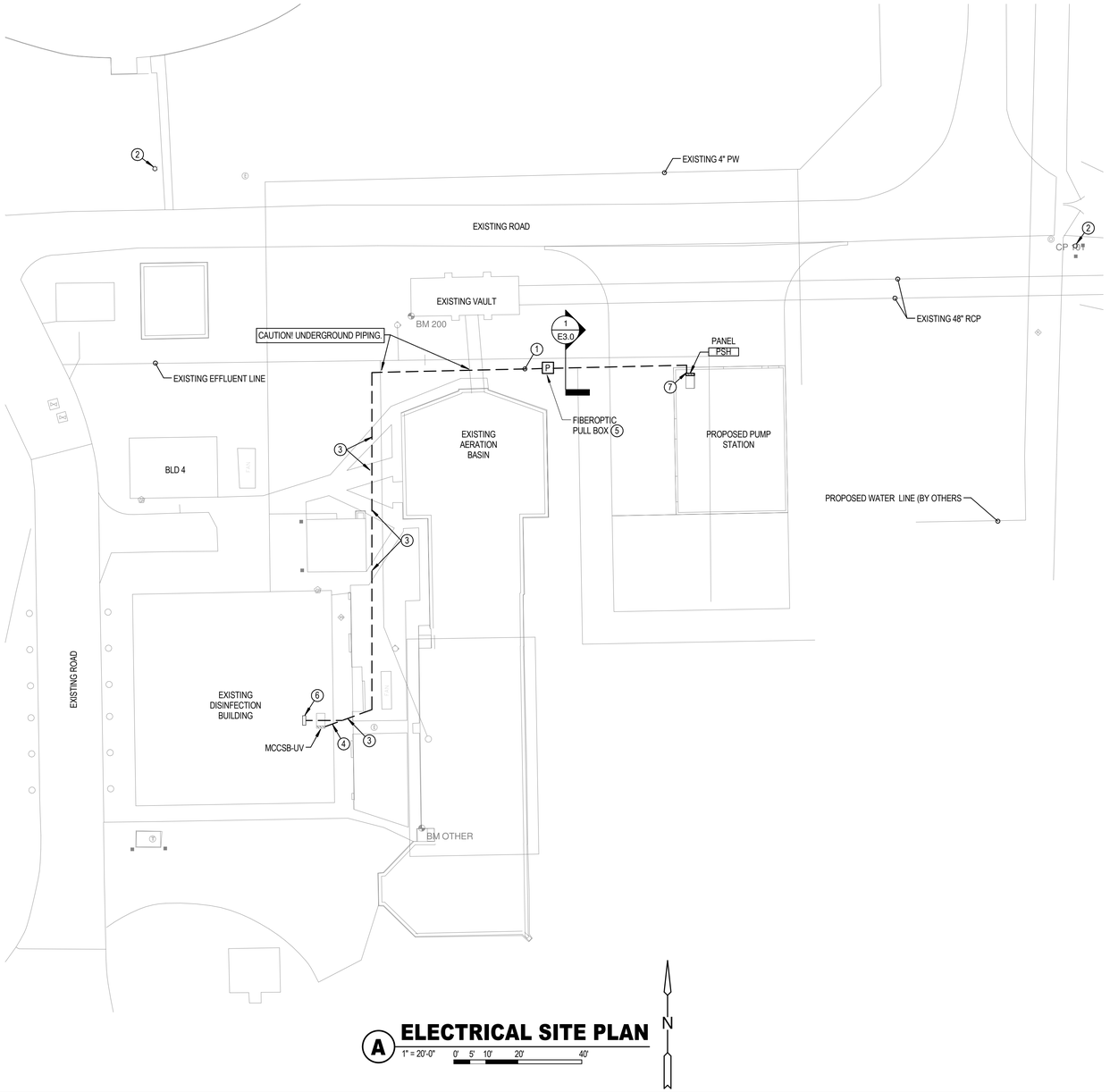
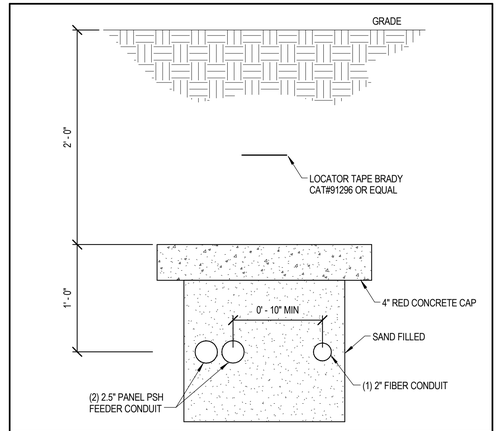


A ELECTRICAL SITE PLAN

1" = 20'-0" 0' 5' 10' 20' 40'

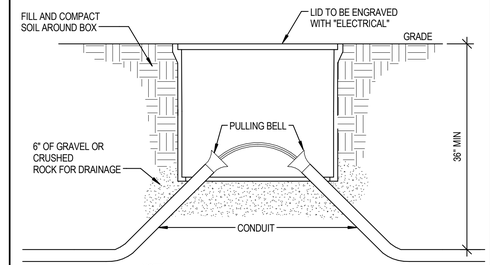
KEYED NOTES E3.0	
1.	SEE ONE-LINE DIAGRAM FOR DISTRIBUTION PANEL PSH FEEDER. SEE CONTROLS DRAWINGS FOR FIBER OPTIC LINE IN SAME TRENCH. SEE DETAIL 1 THIS SHEET FOR DUCT BANK CONSTRUCTION.
2.	EXISTING SITE AREA LIGHT. SHOWN FOR REFERENCE ONLY.
3.	SEE CIVIL PLANS FOR SIDEWALK REMOVAL AND REPLACEMENT.
4.	ROUTE POWER CONDUIT OUT OF BUILDING BELOW ROOF EAVE. SURFACE MOUNT TO BUILDING WALL TO BELOW GRADE.
5.	SEE DETAIL 2 THIS SHEET FOR PULL BOX DETAIL.
6.	FIBER OPTIC CABLE WILL BE INSTALLED AND CONNECTED TO EXISTING FIBER OPTIC NETWORK.
7.	FIBER OPTIC CABLE WILL BE INSTALLED IN PUMP STATION MCC AND CONNECTED TO FIBER OPTIC NETWORK PANEL INSTALLED ADJACENT TO SCADA/PLC CABINET.



1 DUCT BANK DETAIL

NO SCALE

PULL BOX SPECIFICATION:
1. QUAZITE OR EQUAL PULL BOX WITH MINIMUM DIMENSIONS 12"X12"X12".



NOTE:
PROVIDE PULL BOXES ON SITE WHERE REQUIRED BY NEC. DRAWINGS DO NOT INDICATE ALL REQUIRED PULL BOXES.

2 PULL BOX DETAIL

NO SCALE

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ELECTRICAL SITE PLAN

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0	ISSUED FOR CONSTRUCTION	04/18/16

Jeffrey Yard Bradley LICENSED 24496 4-21-16 KANSAS PROFESSIONAL ENGINEER

SHEET NO.

E3.0

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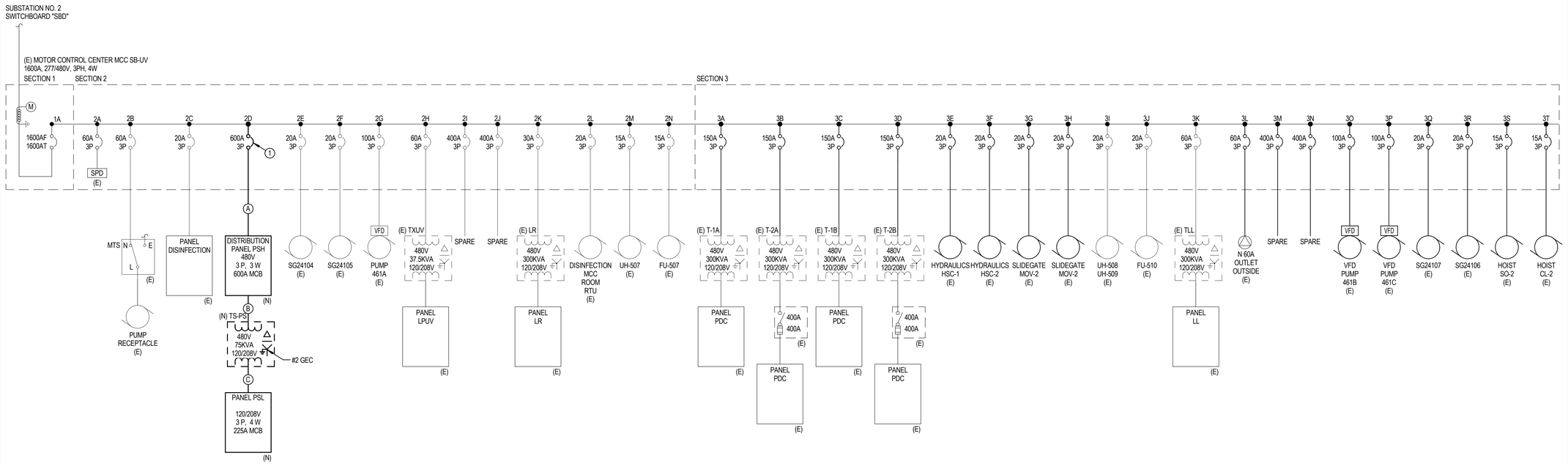
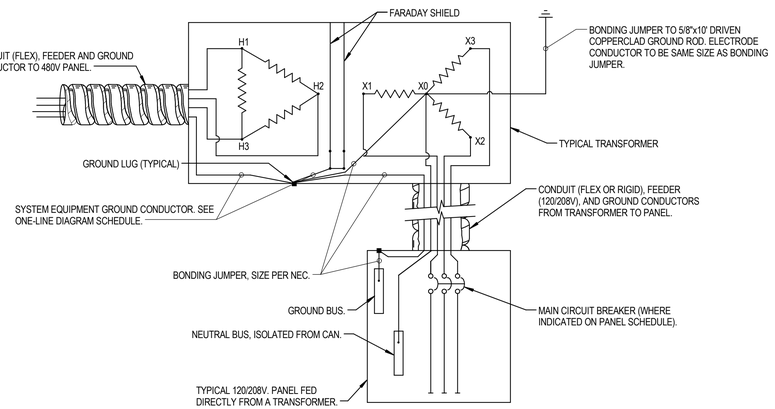
KEYED NOTES E4.0	
1.	INSTALL NEW CIRCUIT BREAKER IN EXISTING SPACE.

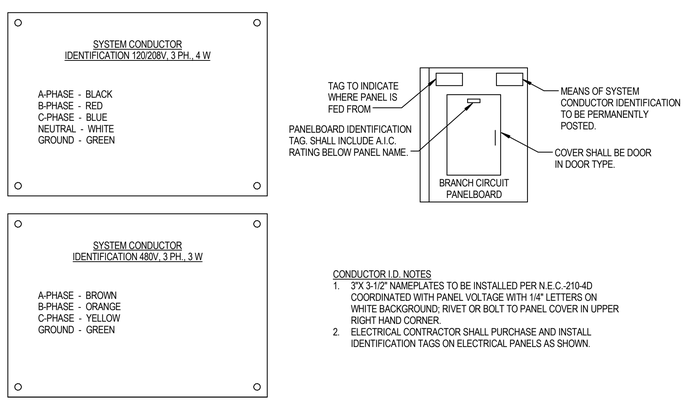
FEEDER SCHEDULE E4.0	
A	(2) SETS OF (3)-350KCMIL, #1 GND, IN 2.5"C.
B	(3)-#1, #6 GND, IN 1.25"C.
C	(4)-#4/0, #4 GND, IN 2.5"C.



1 PARTIAL ELECTRICAL ONE-LINE DIAGRAM
NO SCALE



2 TRANSFORMER GROUNDING DETAIL
NO SCALE



CONDUCTOR I.D. NOTES
1. 3"X 3-1/2" NAMEPLATES TO BE INSTALLED PER N.E.C.-210-4D COORDINATED WITH PANEL VOLTAGE WITH 1/4" LETTERS ON WHITE BACKGROUND; RIVET OR BOLT TO PANEL COVER IN UPPER RIGHT HAND CORNER.
2. ELECTRICAL CONTRACTOR SHALL PURCHASE AND INSTALL IDENTIFICATION TAGS ON ELECTRICAL PANELS AS SHOWN.

3 PANEL IDENTIFICATION TAGS
NO SCALE

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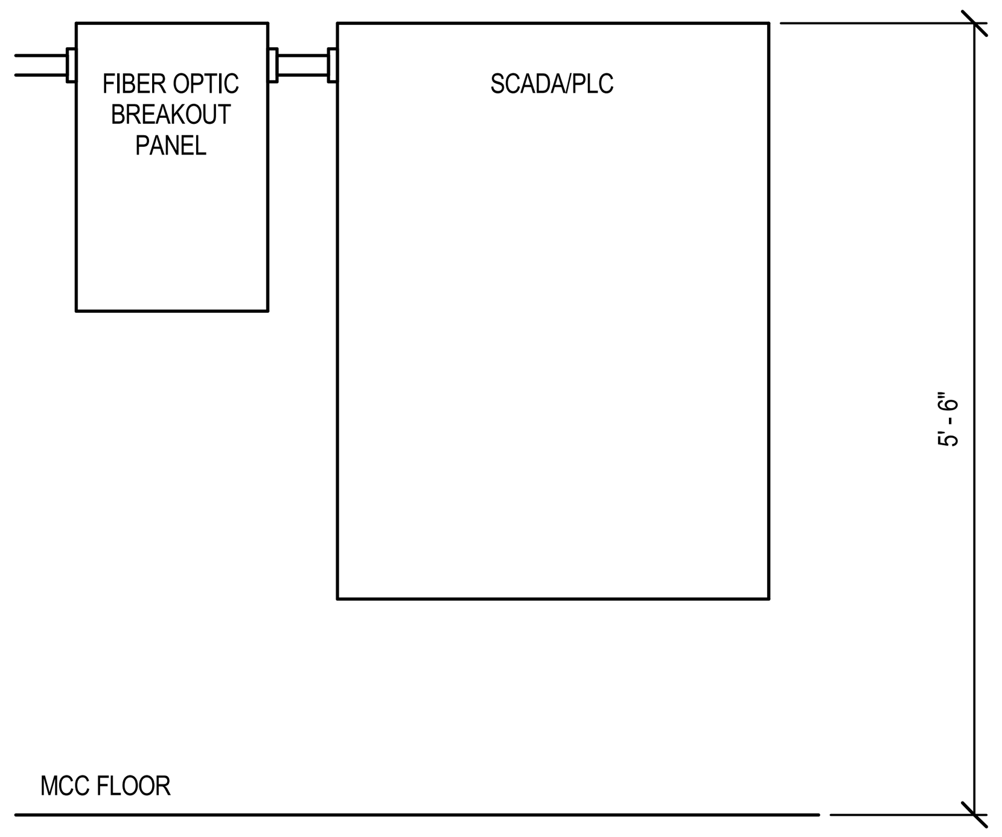
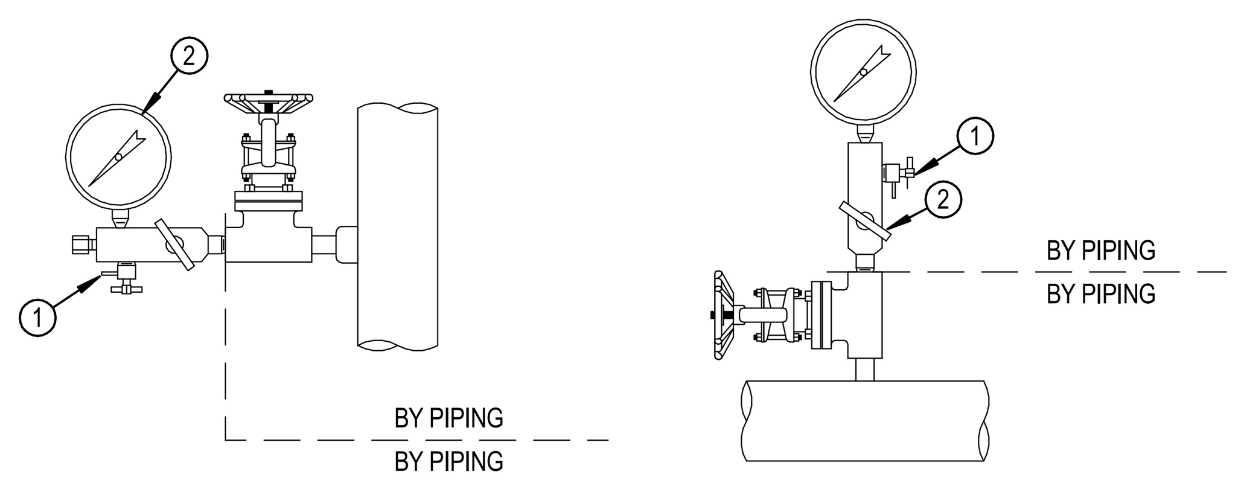
E4.0



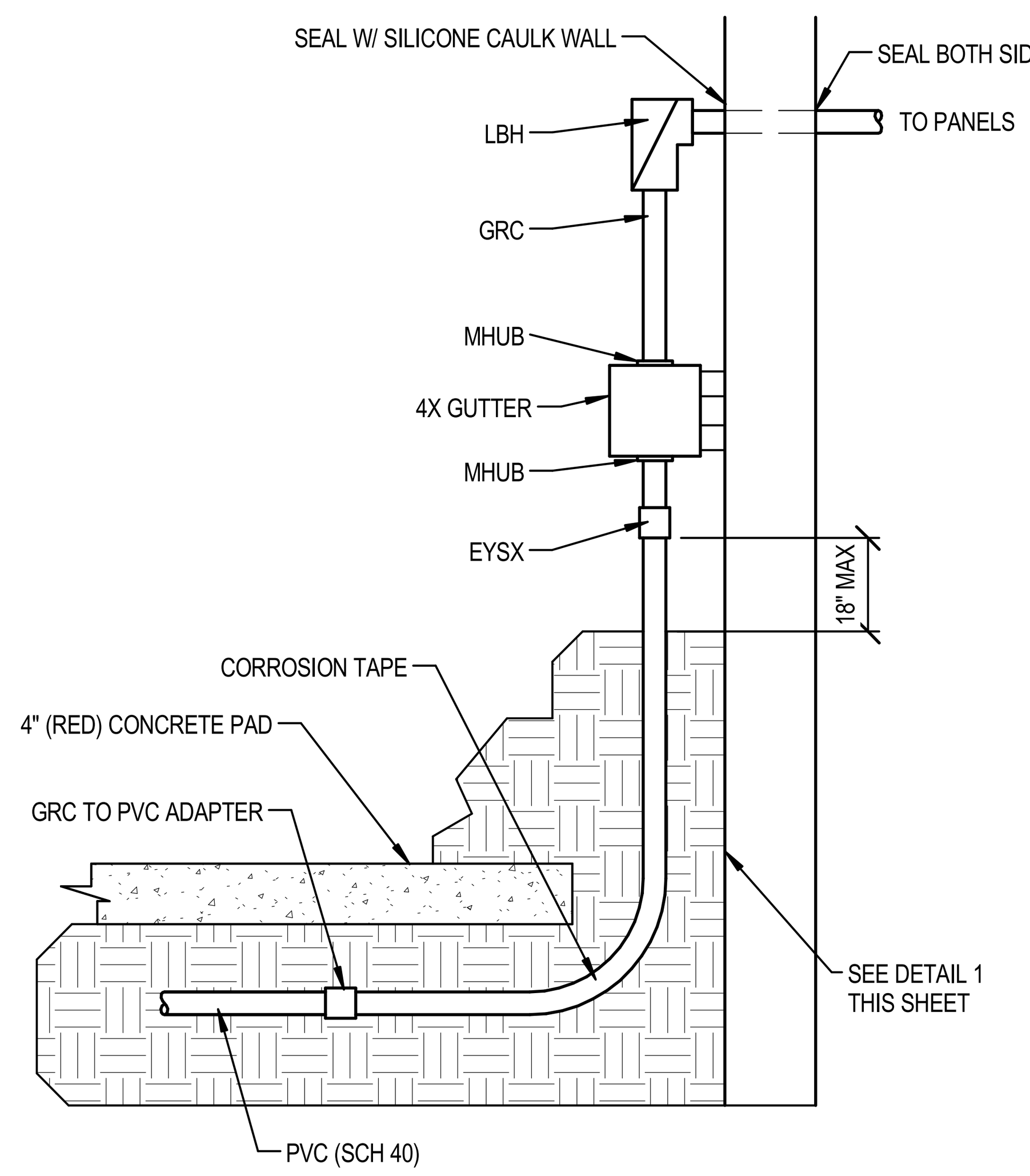
1 NO SCALE **PLC PANEL ELEVATION**



BILL OF MATERIAL

ITEM	QUANTITY	DESCRIPTION
1	1	MANIFOLD BLEED PLUG AGCO #M2SVIS4M
2	1	ASHCROFT-1279 0-200 PSIG (PART# 45-1279-RS 04L 0-200 PSIG) (4M-1/2" INLET MNPT X 1/2" OUTLET FNPT)
OR ENGINEER APPROVED EQUAL		

2 NO SCALE **PI-001, PI-002, PI-003 PRESSURE INDICATOR**

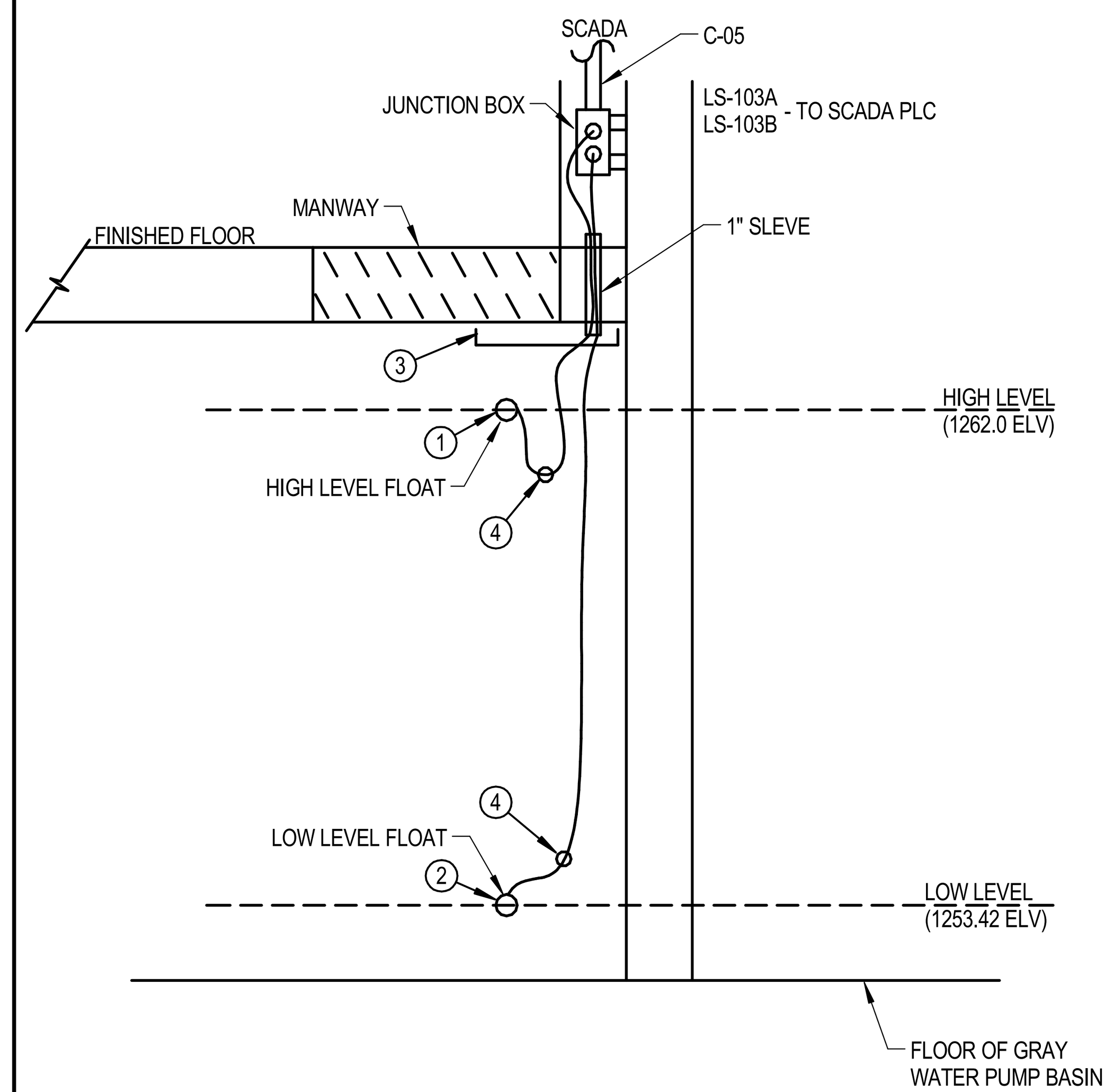


3 NO SCALE **TYPICAL DUCT BANK WALL PENETRATION**

NOTES:
1. SUPPORT JUNCTION BOX AS REQUIRED.
2. USE CGB COMPRESSION CONNECTORS FOR SWITCH CABLES.
3. TAPE OFF UNSUED SWITCH WIRES IN JUNCTION BOX.
4. CONTRACTOR TO FIELD ADJUST FLOATS TO SWITCH AT WATER LEVELS. LOW LEVELS SWITCH WILL SWITCH AT 1253.42 ELV. HIGH LEVEL SWITCH AT 1262.0 ELV.
5. AUTOMATION CONTRACTOR TO SELECT MOUNTING BRACKET AND SPLIT WEIGHT MANUFACTURE WITH ENGINEERS APPROVAL.
6. ANCHOR JUNCTION BOX TO WALL

HIGH WATER LEVEL LS- 103A PUMP SHUT DOWN — C / NO

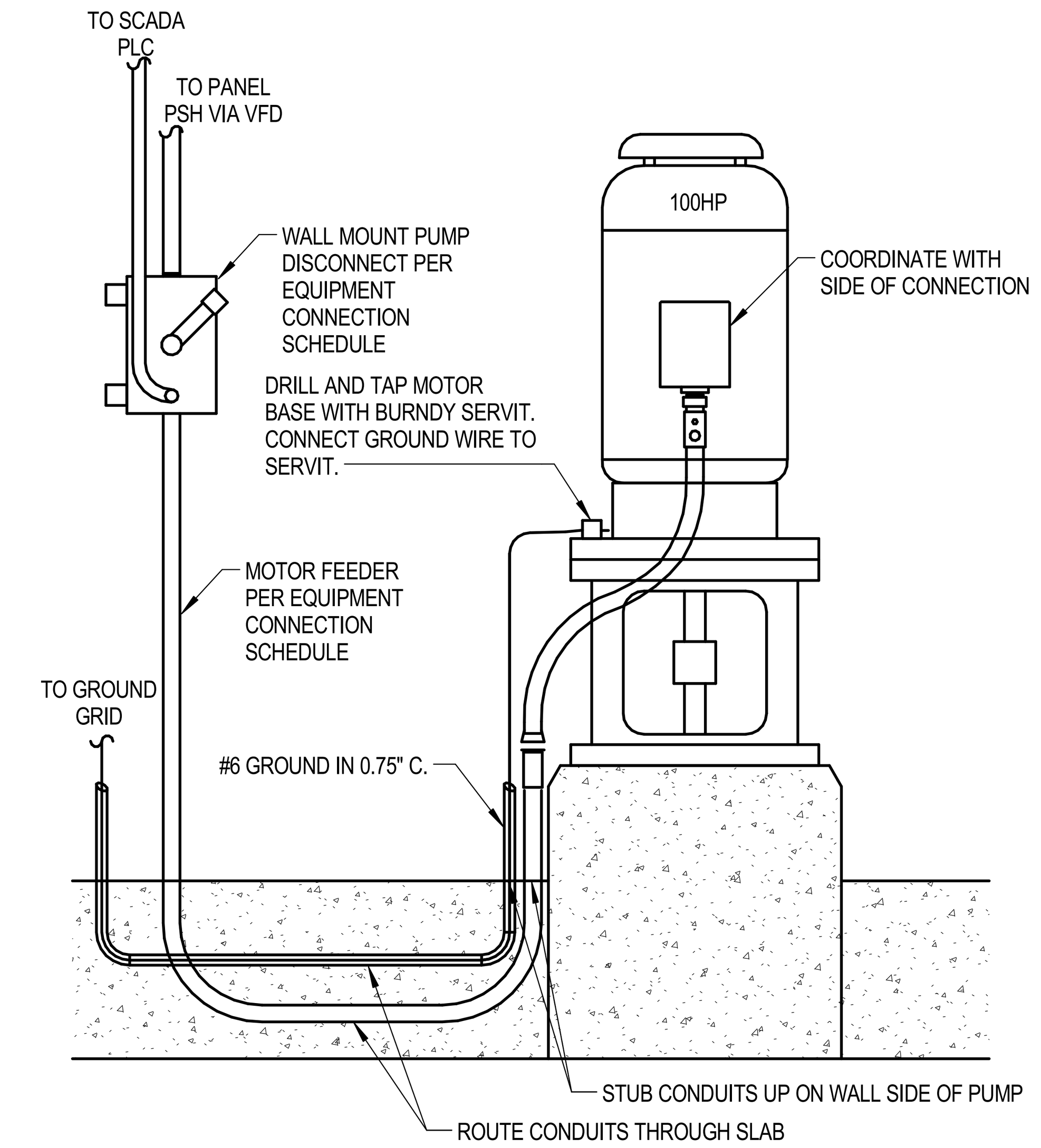
HIGH WATER LEVEL LS- 103A PUMP SHUT DOWN — C / NO



BILL OF MATERIAL

ITEM	QUANTITY	DESCRIPTION
1	1	FLOAT SWITCH PART #1006096 DESCRIPTION 205GMSPDTPC MANUFACTURER SJE RHOMBUS OR ENGINEERED APPROVED EQUAL.
2	1	FLOAT SWITCH PART #1006096 DESCRIPTION 205GMSPDTPC MANUFACTURER SJE RHOMBUS OR ENGINEERED APPROVED EQUAL.
3	1	3 HOLE BRACKET, STAINLESS BRACKETS (WILL ATTACT TO 3 FLOATS)
4	2	SPLIT WEIGHT ASSEMBLIES
OR ENGINEER APPROVED EQUAL		

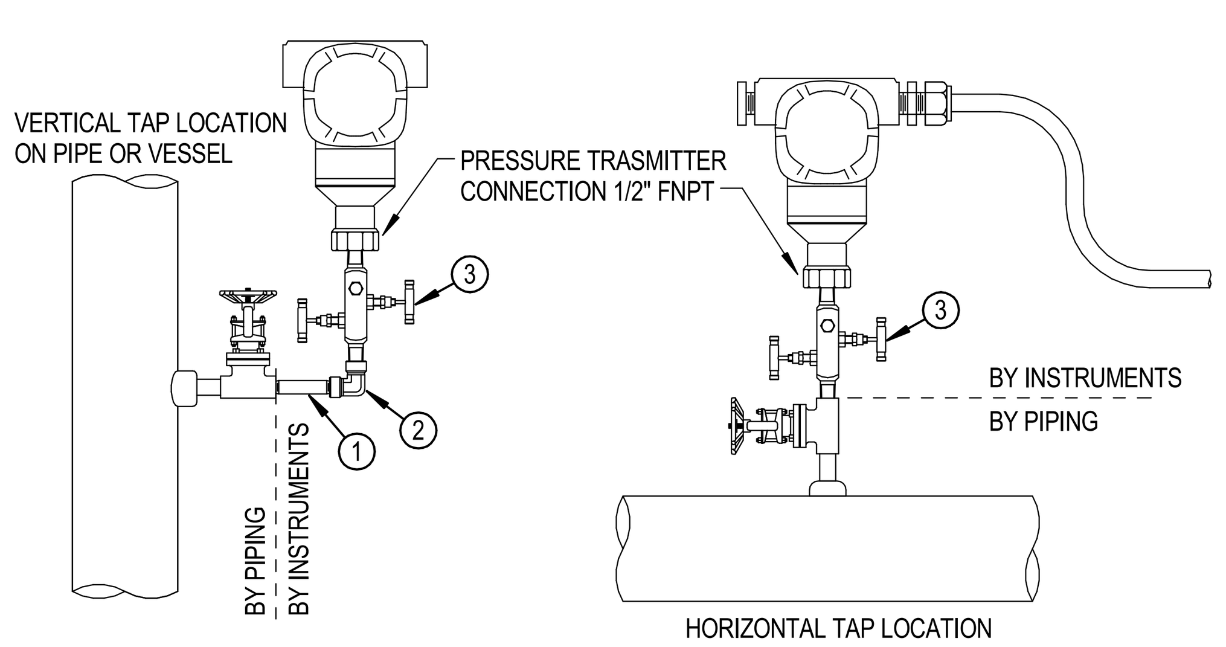
4 NO SCALE **LEVEL ALARM**



BILL OF MATERIAL

ITEM	QUANTITY	DESCRIPTION
1	2	2" LIQUID TIGHT CONNECTIONS WITH GROUND
2	1	2" METAL CORE LIQUID TIGHT AS REQUIRED
3	1	#6 GREEN THHN GROUND WIRE AS REQUIRED
4	1	2" GRC - 20'
5	2	2" FACTORY 90°'S
OR ENGINEER APPROVED EQUAL		

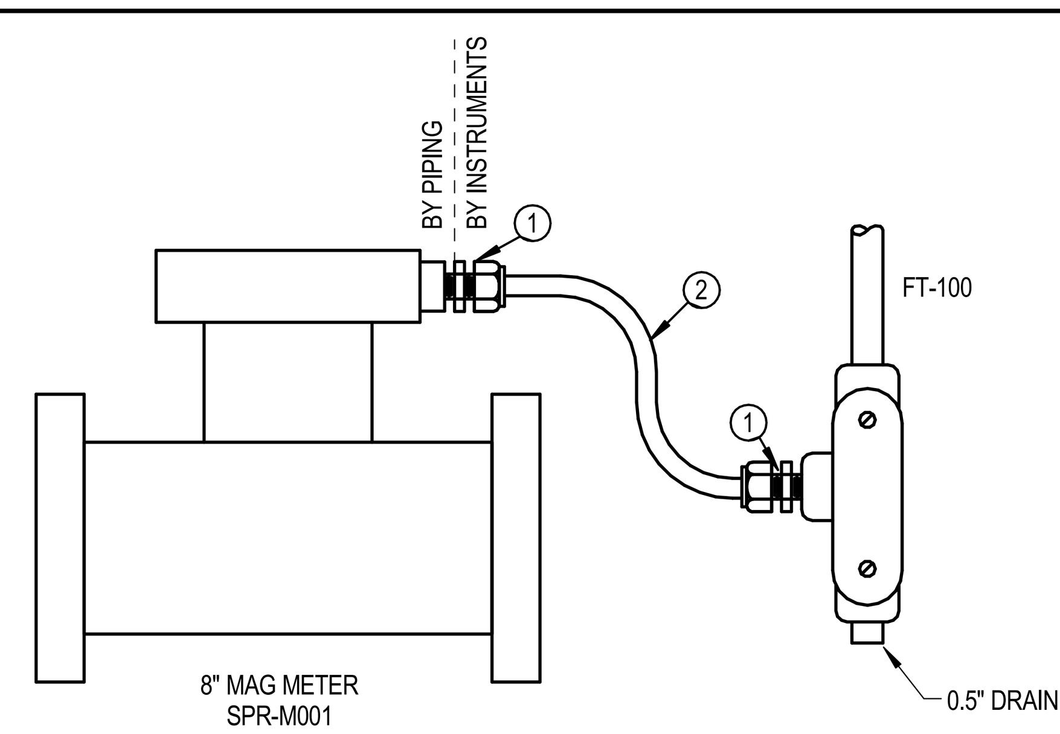
5 NO SCALE **PUMPS SPR-P001, SPR-P002, SPR-P003 CONNECTION DETAIL**



BILL OF MATERIAL

ITEM	QUANTITY	DESCRIPTION
1	1	NIPPLE, 0.75" X 3", S160ASTM A312-TP316, SMLS, TBE
2	1	ELL, 0.75" SCR 90, 600#, A182-F316
3	1	MANIFOLD, 2 VALVE, AGCO #M25VIS-46 OR EQUAL, (46 - 3/4" MNPT X 1/2" FNPT)
OR ENGINEER APPROVED EQUAL		

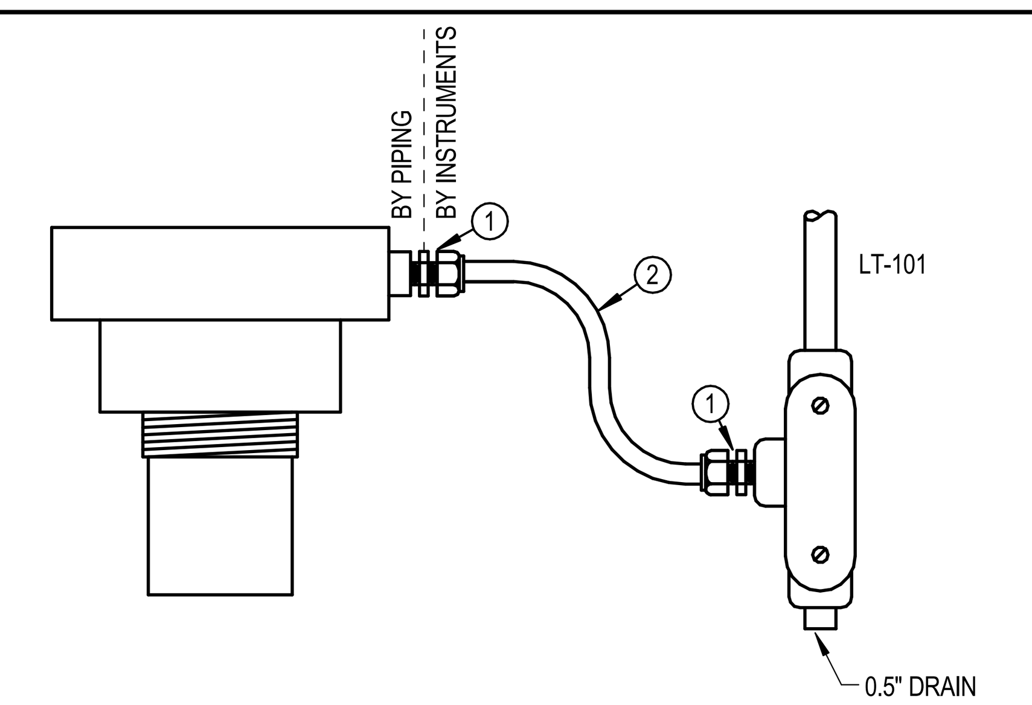
6 NO SCALE **PT-102 PRESSURE TRANSMITTER**



BILL OF MATERIAL

ITEM	QUANTITY	DESCRIPTION
1	2	3/4" T&B LIQUID TIGHT CONNECTORS
2	A/R	3/4"" LIQUID TIGHT METAL CORE
OR ENGINEER APPROVED EQUAL		

7 NO SCALE **SPR-M001 FLOW TRANSMITTER CONNECTION**



BILL OF MATERIAL

ITEM	QUANTITY	DESCRIPTION
1	2	3/4" T&B LIQUID TIGHT CONNECTORS
2	A/R	3/4"" LIQUID TIGHT METAL CORE
OR ENGINEER APPROVED EQUAL		

8 NO SCALE **LT-101 LEVEL TRANSMITTER CONNECTION**

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SHEET NO.
E4.1

PANEL: PSL					BRANCH PANELBOARD - NORMAL POWER										
LOCATION: MCC 103					VOLTAGE: 120/208V			A.I.C.: 10,000			LOAD TYPE:				
FED FROM: XFMR TS-PS					PHASE: 3			MAINS: 225 A			L = LIGHTING, R = RECEPTACLE, M = MOTORS,				
MOUNTING: SURFACE					WIRES: 4			M.C.B.: 225 A			Ho = HOSPITAL, K - KITCHEN, H = HEAT, Mi = MISC				
ENCLOSURE: TYPE 1															
CKT	LOAD DESCRIPTION	TRIP	POLE	TYPE	A		B		C		TYPE	POLE	TRIP	LOAD DESCRIPTION	CKT
1	RCPTS 101-103	20 A	1	R	540	360					R	1	20 A	RCPTS EXTERIOR	2
3	INTERIOR LIGHTS	20 A	1	L; Mi			999	236			L	1	20 A	EXTERIOR LIGHTS	4
5	OSG PLC	20 A	1	Mi					100	1000	M	1	20 A	OVERHEAD DOOR	6
7	DSS-1A/1B	25 A	2	M	1602	100					M	1	20 A	LOUVERS L-1 & L-2	8
9							1602	1752			M	1	20 A	EWH-1	10
11	PLC SCADA	20 A	1	Mi					500	100	Mi	1	20 A	H2N MONITOR	12
13	PLC SCADA	20 A	1	Mi	500	577					M	3	15 A	INJECTION PUMP SPR-P010	14
15	EWH-2	90 A	2	H			6999	577							16
17									6999	577					18
19	SPR-OSG-001	125 A	2	Mi	5408	577					M	3	15 A	INJECTION PUMP SPR-P011	20
21							5408	577							22
23	SPR-OSG-002	125 A	2	Mi					5408	577					24
25					5408	54					M	1	20 A	BRINE PUMP	26
27	FUTURE SPR-OSG-003	125 A	2	--			0	0			--	1	20 A	Spare	28
29									0	0	--	1	20 A	Spare	30
31	Spare	0 A	1	--	0	0					--	1	0 A	Spare	32
33	Spare	0 A	1	--			0	0			--	1	0 A	Spare	34
35	Spare	0 A	1	--					0	0	--	1	0 A	Spare	36
37	Spare	0 A	1	--	0	0					--	1	0 A	Spare	38
39	Spare	0 A	1	--			0	0			--	1	0 A	Spare	40
41	Spare	0 A	1	--					0	0	--	1	0 A	Spare	42
TOTAL LOAD / PHASE (VA)					15126 VA		18150 VA		15262 VA						
TOTAL AMPS / PHASE					126.1 A		151.4 A		127.4 A						

LOAD SUMMARY

LOAD TYPES	CONNECTED LOAD	DEMAND FACTOR	DEMAND	PANEL TOTALS	
LIGHTS	875 VA	1.25 CONTINUOUS	1094 VA		
RECEPTACLES	900 VA	Per NEC Table 220.13	900 VA	TOTAL CONN. LOAD (VA)	48538
MOTORS	9573 VA	Per NEC 220.14	10322 VA	TOTAL DEMAND LOAD (VA)	49506
HOSPITAL		Per NEC Table 220.11		TOTAL CONN. CURRENT	134.7
KITCHEN		Per NEC Table 220.20		TOTAL DEMAND CURRENT	137.4
HEAT	13998 VA	Per NEC 220.15	13998 VA		
MISC	23192 VA	1.00	23192 VA		

NOTES:
1. PROVIDE PANEL WITH HINGED COVER.

PSH	CIRCUIT BREAKER DISTRIBUTION PANEL SCHEDULE				
BRANCH DISTRIBUTION - NORMAL POWER					
TYPE: SQUARE D I-LINE HCP	MOUNTING: SURFACE		A.I.C. RATING: 35,000		
MAIN SIZE: 600A	VOLTAGE: 480V		LOCATION: MCC 103		
MAIN BREAKER: 600A	PHASE: 3		SERVED BY: UTILITY		
MOUNTING SPACE: 72"	WIRE: 3				
CKT	LOAD DESCRIPTION	FRAME (AMPS/POLE)	TRIP (AMPS)	CIRCUIT BREAKER TYPE	MOUNTING HEIGHT
1	PANEL PSL VIA XFMR TS-PSL	150/3	125	HG	4.1
2	EXHAUST FAN 'EF-1'	150/2	15	HG	4.1
3	EXHAUST FAN 'EF-2'	150/2	15	HG	4.1
4	ELECTRIC UNIT HEATER 'EUH-1'	150/3	15	HG	4.1
5	ELECTRIC UNIT HEATER 'EUH-2'	150/3	15	HG	4.1
6	PUMP 'SPR-001'	600/3	300	LG	5.5
7	PUMP 'SPR-002'	600/3	300	LG	5.5
8	PUMP 'SPR-003'	600/3	300	LG	5.5
9	BULK BAG DISCHARGER 'BBD'	150/3	15	HG	4.1
	SPACE	--	--	--	30.9
TOTALS					72

LOAD SUMMARY

LOAD TYPES	CONNECTED LOAD	DEMAND FACTOR	DEMAND
RECEPTACLES	900	Per NEC Table 220.13	900
MOTORS	320594	Per NEC 220.14	346367
LIGHTS	875	1.25 CONTINUOUS	1094
KITCHEN		Per NEC Table 220.20	
MISC	23192	1.00	23192
HEAT	30499	Per NEC 220.15	30499
		PANEL TOTALS	
		TOTAL CONN. LOAD (VA)	376060
		TOTAL DEMAND LOAD (VA)	402052
		TOTAL CONN. CURRENT	452.3
		TOTAL DEMAND CURRENT	483.6

NOTES:
1. PROVIDE PANEL WITH HINGED COVER.
2. PROVIDE SE RATED PANELBOARD.

TRANSFORMER SCHEDULE

MARK	EQUIPMENT SERVED	KVA RATING	PHASE	PRIMARY VOLTAGE	PRIMARY CONNECTION	SECONDARY VOLTAGE	SECONDARY CONNECTION	NOTES
TS-PS	PANEL PSL	75 kVA	3	480V	DELTA	120/208V	WYE	1,2

NOTES:
1. REFER TO SPECIFICATIONS FOR TRANSFORMER WINDING TYPE.
2. INSTALL FLOOR MOUNTED TRANSFORMERS ON 3.5" HOUSEKEEPING PAD. REFER TO DRAWINGS FOR LOCATIONS.

VARIABLE FREQUENCY DRIVE SCHEDULE

MARK	MANUFACTURER	MODEL NUMBER	EQUIPMENT SERVED	VOLTAGE	PHASE	HP	NEMA ENCLOSURE	NOTES
VFD-1	ABB	ACH550-BCR-125A-4+F267	SPR-001	480	3	100	1	1-7
VFD-2	ABB	ACH550-BCR-125A-4+F267	SPR-002	480	3	100	1	1-7
VFD-3	ABB	ACH550-BCR-125A-4+F267	SPR-003	480	3	100	1	1-7

NOTES
1. DRIVE SHALL BE PROVIDED WITH AN INTEGRAL BYPASS WITH CIRCUIT BREAKER.
2. THE VFD SHALL BE RATED FOR 100% SPEED OUTPUT WHILE LOCATED IN 105F AMBIENT CONDITIONS.
3. VFD SHALL BE SUPPLIED AND INSTALLED BY THE E.C.
4. PROVIDE WITH DIGITAL CUSTOMER INTERFACE THAT ALLOWS HAND-OFF-AUTO FUNCTIONS AND MANUAL SPEED CONTROL.
5. PROVIDE WITH INDICATOR LIGHTS FOR "RUN", "READY", AND "FAULT" STATUSES.
6. PROVIDE WITH ETHERNET CONNECTION, DEVICENET, AND OUTPUTS FOR HARDWIRING TO PUMPS.
7. SEE SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

LIGHT FIXTURE SCHEDULE

MARK	MFG.	CATALOG NUMBER	LAMPS NO	LAMPS TYPE	BALLAST NO	BALLAST TYPE	FIXT. VOLT.	MOUNTING	WATT	REMARKS	SPECIFIC NOTES
A	WILLIAMS	76-4-L53/850-VBY-DRV-UNV	-	LED	1	DRIVER	120	SUSPENDED	48	4' LED STRIP LIGHT	
B1	COOPER	XTOR2A-PC1	-	LED	1	DRIVER	120	WALL	18	LED WALLPACK WITH PHOTOCELL.	
B2	COOPER	XTOR9ARL-PC1	-	LED	1	DRIVER	120	WALL	82	LARGE LED WALLPACK WITH PHOTOCELL.	
C1	WILLIAMS	96-4-L40/835-DCL-WET/2-SSCMB-SSLATCH-DRV-UNV	-	LED	1	DRIVER	120	SUSPENDED	40	4' WET LOCATION LED STRIP LIGHT.	
C2	WILLIAMS	96-4-L40/835-DCL-3WC6-WET/2-SSCMB-SSLATCH-DRV-UNV	-	LED	1	DRIVER	120	SUSPENDED	40	4' WET LOCATION LED STRIP LIGHT W/ STOW RECEPTACLE CORD.	
XA	WILLIAMS	EXIT/EM/LED-SF-R-WHT	-	LED	1	DRIVER	120	WALL	4	COMBINATION EXIT AND EMERGENCY LIGHT.	
XB	WILLIAMS	EXIT/EM/WET-R-WHT	2	7.2W INCAN	-	-	120	WALL	14	COMBINATION EXIT AND EMERGENCY LIGHT. WET LOCATION RATED.	
XC	WILLIAMS	EMER/MR16/CP/WET-GRAY	2	7W MR16	-	-	120	WALL	14	EMERGENCY LIGHT. WET LOCATION RATED.	

GENERAL NOTES (APPLY TO ALL LIGHTING):
A. ALL LIGHTING FIXTURES SHALL BE RATED FOR LIGHTING POWER CIRCUIT VOLTAGE. CONTRACTOR MUST VERIFY ALL LOCATIONS.
B. ELECTRICAL CONTRACTOR SHALL CHECK AND COORDINATE ALL LIGHTING FIXTURE CATALOG NUMBERS WITH THE INTENT OF FIXTURE DESCRIPTIONS, LISTED ACCESSORIES AND TYPE OF INSTALLATION.
C. ELECTRICAL CONTRACTOR SHALL PROVIDE EACH LIGHTING FIXTURE COMPLETE WITH PLASTER FRAMES AND ALL OTHER INSTALLATION AND HANGING HARDWARE AS REQUIRED FOR A COMPLETE AND FINISHED INSTALLATION AT EACH FIXTURE LOCATION.
D. ALL FIXTURES SHALL BE LISTED BY A NATIONALLY RECOGNIZED TESTING LABORATORY (NRTL) AND LABELED. ALL LIGHTING FIXTURES EXPOSED TO WEATHER, MOISTURE, OR OTHER ENVIRONMENTS SHALL BEAR THE APPLICABLE ENVIRONMENTAL OR APPLICATION LABEL.
E. ALL EXIT/DIRECTIONAL SIGNS SHALL BE INSTALLED COMPLETE WITH ALL INSTALLATION AND HANGING ACCESSORIES TO PROVIDE AN UNOBSTRUCTED VIEW OF EACH SIGN FACE. SIGNS WILL BE ADJUSTED AS NECESSARY WITHOUT ADDITIONAL COST TO THE OWNER.
F. SIGNS TO READ "EXIT". SIGNS WILL BE SINGLE FACE. SHADED PORTION OF EXIT SUMBOL DENOTES ILLUMINATION FACE. WALL MOUNT SIGN.
G. REFER TO APPLICABLE SECTIONS OF THE SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS FOR LIGHTING FIXTURES.
H. FIXTURE SUBSTITUTIONS: SHALL BE SUBMITED IN WRITING TO THE ENGINEER FOR APPROVAL, 7 BUSINESS DAYS PRIOR TO BID. SUBMIT CUT SHEETS OF SPECIFIED ITEM ALONG WITH A CUT SHEET OF THE DESIRED SUBSTITUTION, WITH ALL DIFFERENCES NOTED. MAIL OR DELIVER CUT SHEETS INCLUDING PHOTOMETRIC INFORMATION TO: MKEC ENGINEERING CONSULTANTS, INC., 411 N. WEBB ROAD, WICHITA, KS. 67206, FAX TRANSMISSIONS ARE NOT ACCEPTABLE. SUBSTITUTIONS NOT SUBMITTED AS PER THIS PROCEDURE, WILL NOT BE CONSIDERED. THE ENGINEER'S DECISION OF APPROVAL OR DISAPPROVAL OF A PROPOSED SUBSTITUTE SHALL BE FINAL.
I. SHOP DRAWINGS: DIFFERENCES SHALL BE SPECIFICALLY NOTED ON THE "SHOP DRAWINGS," THIS INCLUDES BUT IS NOT LIMITED TO: FIXTURE SUBSTITUTIONS, LAMPS, VOLTAGE, MOUNTING, PHYSICAL DIMENSIONS AND FINISHES. FAILURE TO COMPLY DOES NOT RELIEVE THE CONTRACTOR OF DESIGN DOCUMENT INTENTION AND WILL NOT BE REASON FOR ADDITIONAL REINBURSEMENT. ADDITIONAL REQIREMENTS MAY BE FOUND ELSEWHERE IN THE DRAWINGS OR SPECIFICATIONS.

EQUIPMENT CONNECTION SCHEDULE

MARK	DESCRIPTION	UNIT VOLTAGE	PHASE	FULL LOAD AMPS	MOCP	PANEL	CIRCUIT NUMBER	# OF POLES	DISCONNECT TYPE	DISCONNECT ENCL. RATING (NEMA)	DISCONNECT FUSE SIZE AMPS*	STARTER TYPE	STARTER ENCL. RATING (NEMA)	STARTER NEMA SIZE	FEEDER SETS	FEEDER WIRE AND CONDUIT	CONTROLLER	REMARKS
BBD	BULK BAG DISCHARGER	480	3	2.1	15	PSH	9	3	S-15A	4X	-	PWE	PWE	PWE	1	(3)-#12, (1)-#12 GND IN 0.75"C.	E/M CONTROLS	
DSS-1A	DUCTLESS SPLIT SYSTEM-1A	208	1	1.0	25	PSL	7,9	2	T-20A	1	-	PWE	PWE	PWE	1	(3)-#12, (1)-#12 GND IN 0.75"C.	THERMOSTAT	2
DSS-1B	DUCTLESS SPLIT SYSTEM-1B	208	1	14.4	25	PSL	7,9	2	S-30A	4X	-	PWE	PWE	PWE	1	(2)-#10, (1)-#10 GND IN 0.75"	THERMOSTAT	2
EF-1	EXHAUST FAN-1	480	1	1.6	15	PSH	2	2	PWE	PWE	PWE	MS	4X	00	1	(2)-#12, (1)-#12 GND IN 0.75"C.	THERMOSTAT	3
EF-2	EXHAUST FAN-2	480	1	1.6	15	PSH	3	2	PWE	PWE	PWE	MS	4X	00	1	(2)-#12, (1)-#12 GND IN 0.75"C.	THERMOSTAT	3
EUH-1	ELECTRIC UNIT HEATER-1	480	3	9.0	15	PSH	4	3	PWE	PWE	PWE	-	-	-	1	(3)-#12, (1)-#12 GND IN 0.75"C.	THERMOSTAT	
EUH-2	ELECTRIC UNIT HEATER-2	480	3	9.0	15	PSH	5	3	PWE	PWE	PWE	-	-	-	1	(3)-#12, (1)-#12 GND IN 0.75"C.	THERMOSTAT	
EWH-1	ELECTRIC WATER HEATER-1	120	1	14.6	20	PSL	10	1	S-30A	4X	-	-	-	-	1	(2)-#12, (1)-#12 GND IN 0.75"C.	E/M CONTROLS	
EWH-2	ELECTRIC WATER HEATER-2	208	1	67.3	90	PSL	15,17	2	S-100A	4X	-	-	-	-	1	(2)-#2, (1)-#8 GND IN 1"C.	PLC SCADA	
SPR-OSG-001	ON-SITE GENERATOR	208	1	52.0	125	PSL	19,21	2	S-200A	4X	-	-	-	-	1	(2)-#1/0, (1)-#6 GND IN 1.25"C.	PLC SCADA	
SPR-OSG-002	ON-SITE GENERATOR	208	1	52.0	125	PSL	23,25	2	S-200A	4X	-	-	-	-	1	(2)-#1/0, (1)-#6 GND IN 1.25"C.	PLC SCADA	
SPR-P001	PUMP	480	3	124.0	300	PSH	6	3	S-400A	4X	-	SEE	VFD	SCHEDULE	1	(3)-#350KCMIL, (1)-#4 GND IN 2.5"C	PLC SCADA	1
SPR-P002	PUMP	480	3	124.0	300	PSH	7	3	S-400A	4X	-	SEE	VFD	SCHEDULE	1	(3)-#350KCMIL, (1)-#4 GND IN 2.5"C	PLC SCADA	1
SPR-P003	PUMP	480	3	124.0	300	PSH	8	3	S-400A	4X	-	SEE	VFD	SCHEDULE	1	(3)-#350KCMIL, (1)-#4 GND IN 2.5"C	PLC SCADA	1

TABLE ABBREVIATIONS:

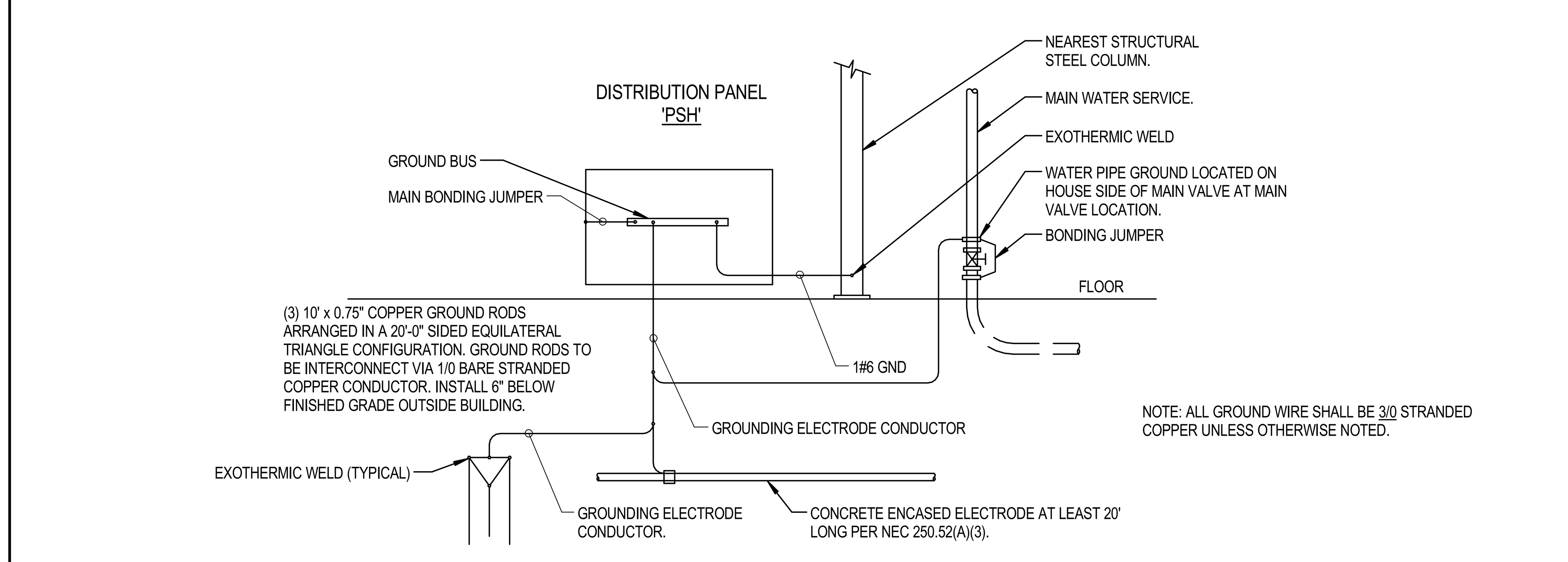
GENERAL
ENCL - ENCLOSURE
PWE - PROVIDED WITH EQUIPMENT. WIRING CONNECTIONS BY ELECTRICAL CONTRACTOR.

STARTERS
MS - MAGNETIC OR SOLID STATE
V - VARIABLE FREQUENCY DRIVE
M (OR **T**) **-** MANUAL - SEE DISCONNECT FOR T.

DISCONNECTS
S - SAFETY SWITCH
T - TOGGLE TYPE

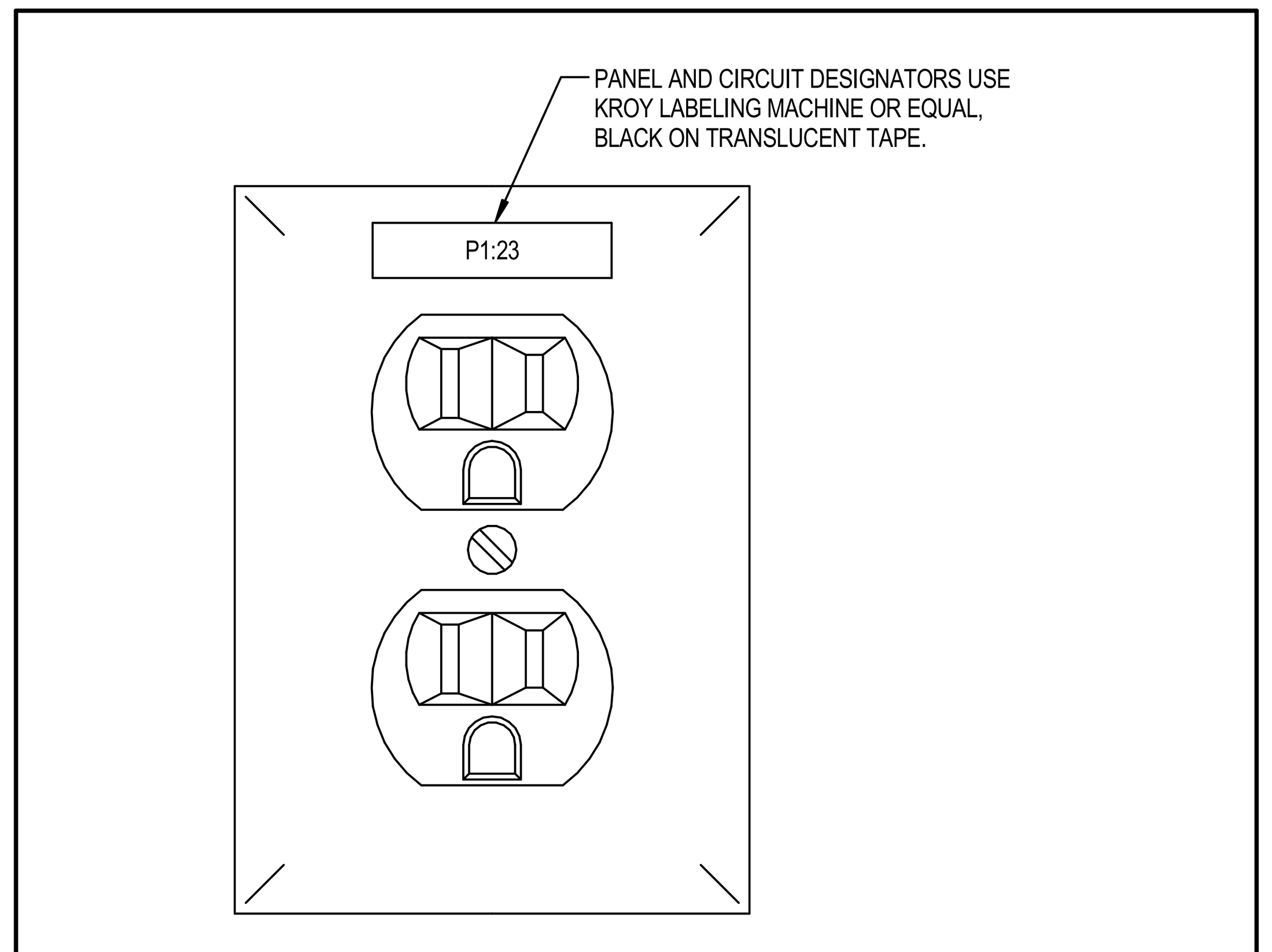
CONTROLLERS
I - INTERLOCK
E/M - EQUIPMENT MANUFACTUER CONTROL

REMARKS:
1. PROVIDE CONTACTS IN DISCONNECT SWITCH FOR RUN INDICATION TO PLC SCADA.
2. INDOOR DUCTLESS SPLIT SYSTEM UNIT IS POWERED FROM OUTDOOR DUCTLESS SPLIT SYSTEM UNIT. PROVIDE CABLING PER MANUFACTURER'S INSTRUCTIONS.
3. PROVIDE CONTACTS IN MOTOR STARTERS FOR INTERLOCK WITH LOUVERS AND CONTROLS.



1 NO SCALE

BUILDING GROUNDING DETAIL



2 NO SCALE

DEVICE IDENTIFICATION DETAIL

MKEC
Wichita, KS • 316-684-9600

CITY OF WICHITA, KANSAS

RE-USE WATER PUMP STATION

TO SERVE SPIRT AEROSYSTEMS

ELECTRICAL SCHEDULES

PROJECT NO.	468-85112
DATE	04/18/16
SCALE	AS NOTED

DESIGNED	DRAWN	CHECKED
JRBW	JA	JRBW

NO.	REVISION	DATE
0	ISSUED FOR CONSTRUCTION	04/18/16

SHEET NO.
E4.2

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ELECTRICAL SPECIFICATIONS

A. GENERAL:

1. SCOPE OF SERVICES - WORK SHALL INCLUDE THE FURNISHING AND INSTALLING OF A COMPLETE AND FUNCTIONING ELECTRICAL SYSTEMS FOR COMPONENTS INDICATED ON THE DRAWINGS AND THESE SPECIFICATIONS. THIS SHALL INCLUDE ACCESSORIES NECESSARY, WHETHER SPECIFICALLY STATED OR NOT, TO MAKE THE REQUIRED ELECTRICAL SYSTEMS COMPLETE AND OPERATIONAL. THIS WILL INCLUDE EVERY ARTICLE, DEVICE OR ACCESSORY NECESSARY TO FACILITATE EACH SYSTEM FUNCTIONING AS INDICATED BY THE DESIGN AND THE EQUIPMENT SPECIFIED. THE CONTRACTOR SHALL BECOME FAMILIAR WITH THE SITE AND ALL EXISTING CONDITIONS PRIOR TO BIDDING.

2. MATERIAL AND WORKMANSHIP - ALL EQUIPMENT AND MATERIALS PROVIDED SHALL BE NEW EXCEPT AS OTHERWISE STATED ON THE DRAWINGS. ALL EQUIPMENT PROVIDED SHALL BE UL LISTED WHEN SUCH STANDARDS EXIST FOR THE TYPE OF EQUIPMENT FURNISHED AND ACCEPTABLE FOR INSTALLATION OF THE LOCAL BUILDING AUTHORITY. ALL WORKMANSHIP SHALL BE BY LICENSED AND EXPERIENCED ELECTRICIANS OR JOURNEYMEN. ALL TOOLS, MACHINERY AND EQUIPMENT REQUIRED OF THE PERFORMANCE OF THE ELECTRICAL WORK SHALL BE FURNISHED BY THIS CONTRACTOR.

3. COORDINATION - THE CONTRACTOR SHALL COORDINATE ALL WORK WITH OTHER CONTRACTORS AND SUBCONTRACTORS SO THAT VARIOUS COMPONENTS OF THE ELECTRICAL SYSTEMS WILL BE INSTALLED AT THE PROPER TIME, WILL FIT THE AVAILABLE SPACE, AND WILL ALLOW PROPER SERVICE ACCESS TO ALL EQUIPMENT. THE CONTRACTOR SHALL REFER TO ARCHITECTURAL, STRUCTURAL AND MECHANICAL DRAWINGS AND TO RELEVANT EQUIPMENT DRAWINGS TO DETERMINE THE EXTENT OF CLEAR SPACES.

4. ORDINANCES AND CODES - CONTRACTOR'S PERFORMANCE, WORKMANSHIP AND MATERIALS SHALL COMPLY WITH APPLICABLE NATIONAL FIRE PROTECTION ASSOCIATION CODES, STATE AND LOCAL BUILDING CODES, AND/OR ALL OTHER APPLICABLE CODES AND ORDINANCES. ALL PERMITS, LICENSES AND FEES THAT ARE REQUIRED BY THE GOVERNING AUTHORITIES FOR THE PERFORMANCE OF THE ELECTRICAL WORK SHALL BE OBTAINED AND PAID FOR BY THE CONTRACTOR. FILLING OUT FORMS FOR APPLICATIONS BY THE ENGINEER WILL BE BILLED HOURLY TO THE CONTRACTOR.

B. COMMON WORK AND BASIC MATERIALS/EQUIPMENT:

1. GUARANTEE - GUARANTEE AGAINST DEFECTIVE WORKMANSHIP AND MATERIAL FOR A PERIOD OF ONE YEAR FROM THE DATE OF FINAL PAYMENT. GUARANTEE SHALL INCLUDE MATERIAL/EQUIPMENT TO BE REPLACED AND ALL LABOR REQUIRED.

2. TESTING, CHECK-OUT AND CLEANING - REPLACE ALL BURNED-OUT LED COMPONENTS. THE CONTRACTOR SHALL CLEAN ALL MATERIAL AND EQUIPMENT INSTALLED UNDER THE ELECTRICAL CONTRACT. DIRT, DUST, PLASTER, STAINS AND FOREIGN MATTER SHALL BE REMOVED FROM ALL SURFACES. ALL EQUIPMENT SHALL HAVE FINISH TOUCHED UP PRIOR TO INSPECTION. DAMAGED ELECTRICAL EQUIPMENT DURING THE CONSTRUCTION PROCESS SHALL BE REPLACED WITH NEW EQUIPMENT. ALL COSTS ASSOCIATED WITH THE DAMAGED EQUIPMENT SHALL BE ASSUMED BY THE INSTALLING CONTRACTOR.

3. CUTTING AND PATCHING - THIS CONTRACTOR SHALL DO ALL CUTTING OF WALLS, FLOORS, CEILINGS, ETC. AS REQUIRED TO INSTALL WORK UNDER THIS SECTION. CONTRACTOR SHALL PATCH WALLS, FLOORS, ETC. TO MATCH THE ORIGINAL MATERIAL AND CONSTRUCTION. CONTRACTOR SHALL REPAIR ALL FIRE/SMOKE RATED PENETRATIONS TO RETAIN RATING.

4. CONDUIT INSTALLATION - ALL WIRING SHALL BE ROUTED IN CONDUIT. CONDUIT SHALL BE INSTALLED CONCEALED WHEREVER POSSIBLE. EXPOSED CONDUIT SHALL BE PAINTED TO MATCH SURROUNDINGS. ALL CONDUIT BOXES SHALL BE ACCESSIBLE TO COMPLY WITH THE NEC. THE MINIMUM CONDUIT SIZE SHALL BE 0.75" UNLESS OTHERWISE NOTED ON THE DRAWINGS. CONDUIT TYPES SHALL BE THE FOLLOWING:

   RMC - SHALL BE USED ABOVE GRADE AT CONNECTIONS TO EQUIPMENT, UNDERGROUND CONDUIT ELBOWS, AND ELBOWS EXTENDING UP THROUGH THE SLAB. PROVIDE WITH GASKETED FITTINGS IN PUMP ROOM AND CHLORINATION ROOM.

   PVC - SHALL BE USED IN UNDERGROUND CONDUIT APPLICATIONS.

   LMC - SHALL BE USED FOR CONNECTIONS TO EQUIPMENT SUBJECT TO MOVEMENT OR VIBRATION. CONDUIT SHALL BE NO GREATER THAN 36" IN LENGTH AND FOR LIGHITNG WHIPS. CONDUIT SHALL BE PROVIDED WITH SEPARATE GROUND CONDUCTOR. CONDUIT MAY NOT BE UTILIZED AS GROUND PATH.

   EMT AND FMC ARE NOT ALLOWED.

5. UNDERGROUND CONDUIT - SCHEDULE 40 PVC WITH RMC FOR ELBOWS AND ABOVE GRADE. WHERE INSTALLED BELOW SLAB, CONDUIT SHALL BE SURROUNDED ON ALL SIDES WITH 2" OF AGGREGATE.

6. WIRE - ALL WIRE SHALL HAVE COPPER CONDUCTORS, WITH U.L. LISTING. ALL FEEDER AND BRANCH CIRCUIT WIRE #8 AWG AND LARGER SHALL BE TYPE THWN OR XHHW, BOTH WITH STRANDED CONDUCTORS. ALL WIRE #10 AND SMALLER AWG SHALL BE TYPE THWN (WET OR DAMP LOCATIONS, OR IN CONDUIT BELOW GRADE OR SLAB) OR THHN (DRY LOCATIONS ONLY AND ABOVE GROUND). BOTH WITH SOLID CONDUCTORS. ALL BRANCH CIRCUIT WIRING SHALL BE NOT SMALLER THAN #12 AWG WIRE.

7. WIRING INSTALLATION - ALL WIRING SHALL BE INSTALLED IN APPROVED RACEWAY AND ENCLOSURES. ALL SPLICES OR TAPS SHALL OCCUR IN APPROVED BOXES AND ENCLOSURES, AND SHALL BE MADE UP WITH APPROVED SOLDERLESS CONNECTORS. FOR #10 CONDUCTORS AND SMALLER THE CONDUCTORS SHALL HAVE INSULATION OF THE PROPER COLOR TO MATCH NEC COLOR CODE SYSTEM. FOR CONDUCTORS OF #8 AND LARGER THE CONTRACTOR MAY USE COLORED PRESSURE SENSITIVE PLASTIC TAPE AT EACH END TO PROPERLY IDENTIFY THE CONDUCTOR VOLTAGE PER THE NEC. ALL BRANCH CIRCUITS SHALL HAVE AN EQUIPMENT GROUNDING CONDUCTOR INSTALLED IN THE RACEWAY, SIZED IN ACCORDANCE WITH NEC 250-122. COMPLY WITH VOLTAGE DROP SECTION IN THIS SPECIFICATION.

8. HANGERS AND SUPPORTS - SUPPORTS FOR RMC SHALL BE AS REQUIRED BY NFPA 70. THE MINIMUM HANGER ROD SIZE SHALL BE 1/4" DIAMETER. TRAPEZE STYLE SUPPORTS FABRICATED TO SUPPORT MULTIPLE RACEWAYS SHALL BE SIZED SUCH THAT CAPACITY CAN BE INCREASED BY 25% IN FUTURE WITHOUT EXCEEDING LOAD LIMITS. COORDINATE MOUNTING ANCHORAGE TYPES WITH STRUCTURAL SUPPORT SYSTEM PRESENT IN BUILDING. THE FOLLOWING ANCHORAGE TYPES WILL BE ALLOWED BASED ON APPROVAL FROM THE STRUCTURAL ENGINEER:
   NEW CONCRETE: BOLT TO CONCRETE INSERTS.
   EXISTING CONCRETE: EXPANSION ANCHOR FASTENERS.
   MASONRY: APPROVED TOGGLE TYPE BOLTS ON HOLLOW MASONRY UNITS AND EXPANSION ANCHOR FASTENERS ON SOLID MASONRY UNITS.
   STEEL: WELDED THREADED STUDS WITH LOCK WASHERS AND NUTS OR BEAM CLAMPS.
   LIGHT STEEL: SHEET METAL SCREWS.

9. LOW VOLTAGE CABLING SUPPORT - ALL LOW VOLTAGE CABLING SHALL BE ROUTED IN CONDUIT.

10. DEVICES - DEVICES SHALL BE SPECIFICATION GRADE. COMMERCIAL OR RESIDENTIAL GRADE DEVICES ARE NOT ACCEPTABLE. DEVICES SHALL BE GRAY. DEVICE PLATES SHALL BE STEEL. ACCEPTABLE MANUFACTURERS SHALL BE ARROW HART, BRYANT, HUBBELL, LEVITON, AND PASS & SEYMOUR.
    GROUND FAULT CIRCUIT INTERRUPTER RECEPTACLES SHALL BE CORROSION RESISTANCE NEMA 5-20R TYPE WITH FAULT SENSOR DESIGNED TO DETECT 4-6 mA LEAKAGE IN 25 MILLISECONDS OR LESS.
    SWITCHES SHALL BE 20A, SINGLE POLE, DOUBLE THROW. 3-WAY AND 4-WAY SWITCHES SHALL BE DOUBLE POLE.

11. BOXES - ALL BOXES SHALL BE METALLIC TYPE UNLESS OTHERWISE NOTED ON THE DRAWINGS

    INTERIOR BOXES SHALL BE GALVANIZED SHEET STEEL. BOXES FOR SWITCHES AND RECEPTACLES SHALL BE 4" SQUARE, 2-1/8" DEEP. BOXES SHALL BE INSTALLED SUCH THAT DEVICE COVERS ARE TIGHT AND PLUMB WITH FINISHED SURFACE.

    EXTERIOR BOXES SHALL BE CORROSION RESISTANT, CAST-METAL, WEATHERPROOF OUTLET WIRING BOXES. RECEPTACLES SHALL HACK A METAL, EXTRA DUTY, WEATHER PROOF-IN-CASE COVER.

    JUNCTION BOXES AND PULL BOXES SHALL BE INSTALLED WHERE REQUIRED FOR CONDUCTOR PULLING AND BEND RADIUS REQUIREMENTS PER THE NEC.

12. VOLTAGE DROP - ALL BRANCH CIRCUITS SUPPLYING EQUIPMENT, LIGHTING, OR DEVICES SHALL BE SIZED NOT TO EXCEED 3% VOLTAGE DROP, AND NOT EXCEED 5% VOLTAGE DROP FROM SOURCE (E.G. TRANSFORMER, SERVICE, ETC) TO LOAD. DERATE CONDUCTORS PER NEC WHEN ROUTED IN RACEWAY CONTAINING MORE THAN THREE CURRENT CARRYING CONDUCTORS. PROVIDE BUCK-BOOST TRANSFORMERS MEETING THE REQUIREMENTS OF THE TRANSFORMER SECTION WHEN VOLTAGE DROP EXCEEDS 3% FROM OVERCURRENT DEVICE TO END DEVICE.

13. EQUIPMENT AND DEVICE GROUNDING - ALL CONDUCTORS, CONDUITS, MOTOR FRAMES, ETC. WHICH REQUIRE GROUNDING SHALL BE PERMANENTLY AND EFFECTIVELY GROUNDED BY THIS CONTRACTOR IN A THOROUGH AND EFFICIENT MANNER CONFORMING IN ALL PARTICULARS TO THE NATIONAL ELECTRICAL CODE. ALL CIRCUITS MUST BE PROVIDED WITH A SEPARATE GROUND CONDUCTOR. CONTRACTOR SHALL NOT UTILIZE THE RACEWAY AS A GROUND PATH UNDER ANY CIRCUMSTANCE.

14. BUILDING GROUNDING - GROUND THE BUILDING ELECTRICAL SERVICE PER THE ADOPTED VERSION OF THE NEC AND DETAILS INDICATED ON THE DRAWINGS. GROUND RODS UTILIZED FOR BUILDING GROUNDING SHALL BE 3/4" DIAMETER AND 10'-0" IN LENGTH. A MINIMUM OF (2) GROUND RODS SHALL BE INSTALLED WITH A COUPLER TO CREATE A 20'-0" LONG GROUND ROD. CONTRACTOR SHALL BOND THE BUILDING GROUND TO ALL AVAILABLE GROUNDING LOCATIONS PER ARTICLE 250 OF THE NEC.

15. EQUIPMENT PADS AND CONCRETE BASES - INTERIOR PADS AND BASES - UNLESS SPECIFIED ELSEWHERE IN THE CONTRACT DRAWINGS, PROVIDE MINIMUM 4" THICK CONCRETE PAD 28 DAY 3000 PSI. PAD SHALL EXTEND 4" BEYOND EQUIPMENT FOOTPRINT ON ALL SIDES.

16. MOTORS - CONTRACTOR SHALL FURNISH AND INSTALL ALL COMPONENTS FOR A COMPLETE AND FUNCTIONING SYSTEM INCLUDING BUT NOT LIMITED TO DISCONNECTS, STARTERS AND CONTROL WIRING. SIZE FEEDER TO ACCOUNT FOR VOLTAGE DROP PER THIS SPECIFICATION.

17. LABELING - ALL DEVICES SHALL BE LABELED THAT ARE MODIFIED IN ANY WAY BY THIS PROJECT.

a. ALL PANELBOARDS (NEW OR THAT HAVE CIRCUITS MODIFIED) SHALL HAVE INSTALLED A NEW TYPED CIRCUIT DIRECTORY UPDATED WITH ALL AVAILABLE INFORMATION.
b. ALL NEW OR AFFECTED DISCONNECTS, STARTERS, TRANSFORMERS, AND PANELS SHALL HAVE A PHENOLIC, WHITE TEXT ON BLACK, MINIMUM 1/2 INCH HIGH TEXT LABELING WITH THE DEVICES NAME, VOLTAGE AND WIRING SYSTEM (EXAMPLE: "PANEL A, 120/208V, 3 PHASE, 4 WIRE") AND OTHER INFORMATION PER THE OWNER.
c. ALL NEW, RELOCATED, OR REWIRED RECEPTACLES, SWITCHES AND OTHER DEVICES INCLUDING THOSE ABOVE SHALL BE LABELED WITH THE SOURCE OF POWER. THIS LABEL SHALL BE ON THE DEVICE COVER PLATE AND SHALL HAVE BLACK ON WHITE HELVETICA MEDIUM FONT LETTERING 1/4 INCH HIGH, DESIGNATING PANELBOARD AND CIRCUIT NUMBER SEPARATED BY COLON. THE SAME TYPE LABEL SHALL ALSO BE INSTALLED ON THE DEVICE BEHIND THE COVERPLATE.

C. DISTRIBUTION EQUIPMENT:

1. MANUFACTURERS - ALL COMPONENTS SHALL BE BY ONE OF THE FOLLOWING UNLESS OTHERWISE NOTED: EATON CUTLER HAMMER, GENERAL ELECTRIC, SIEMENS, OR SQUARE D.

2. GROUND BUS - ALL PANELS, DISTRIBUTION PANELS, AND SWITCHBOARDS SHALL BE PROVIDED WITH A COPPER GROUND BUS.

3. SERIES RATING - SERIES RATING OF CIRCUIT BREAKERS IN NOT ALLOWED UNLESS SPECIFICALLY NOTED ON THE CONTRACT DRAWINGS.

4. PANELBOARDS - FURNISH AND INSTALL PANELBOARDS AS SCHEDULED AND NOTED ON THE DRAWINGS. THE PANELBOARDS SHALL BE COMPLETE WITH THERMAL MAGNETIC PLASTIC CASE CIRCUIT BREAKERS OF THE BOLT-ON TYPE ASSEMBLED IN A FINISHED CABINET. ALL 2 AND 3 POLE BREAKERS MUST BE COMMON TRIP. EACH PANEL SHALL CONTAIN A TYPEWRITTEN OR COMPUTER PRINTED CIRCUIT DIRECTORY. ALL PANELBOARDS SHALL BE FURNISHED WITH A HINGED FRONT COVER. PANELBOARDS SHALL BE INSTALLED WITH TOP AT 6'-6" A.F.F. UNLESS OTHERWISE NOTED SUCH THAT BREAKER ACCESSIBILITY LOCATIONS COMPLY WITH NFPA 70.

   PANELBOARDS SHALL BE DEAD FRONT TYPE AND BUS BARS SHALL BE TIN PLATED ALUMINUM.

   THE MINIMUM SHORT CIRCUIT RATING OF ANY DEVICE INSTALLED IN A PANEL SHALL BE 10,000 AIC OPERATING AT 120/208V.

5. LOW VOLTAGE TRANSFORMERS (600V AND LESS) - TRANSFORMERS SHALL BE RATED FOR 150 DEG C INSULATION CLASS. TRANSFORMER SHALL BE ALUMINUM OR COPPER WOUND TYPE. TRANSFORMERS LOCATED INDOORS IN DRY LOCATIONS SHALL BE PROVIDED WITH VENTILATED, NEMA TYPE 2 RATED ENCLOSURES. TRANSFORMERS SHALL BE GROUNDED AS SEPARATELY DERIVED SYSTEMS PER NFPA 70.

6. SAFETY SWITCHES - FURNISH AND INSTALL FUSED OR NON-FUSED (AS REQUIRED) HEAVY DUTY SAFETY SWITCHES WHERE NOT FURNISHED WITH THE EQUIPMENT, AND AT ALL OTHER POINTS REQUIRED BY CODE. CONSTRUCTION SHALL BE OF A NEMA DESIGN SUITABLE FOR THE ENVIRONMENT INSTALLED. ALL FUSES SHALL BE BUSSMAN, LITTELFUSE OR FERRAZ-SHAWMUT, SIZE AND TYPE AS REQUIRED OR INDICATED.

7. SURGE PROTECTIVE DEVICES - PROVIDE SURGE PROTECTIVE DEVICES AS INDICATED ON THE DRAWINGS. SURGE PROTECTIVE DEVICES LOCATED INTEGRAL TO THE PANEL MAY BY SUPPLIED BY EATON CUTLER HAMMER, SQUARE D, SIEMENS, OR GE. SURGE PROTECTIVE DEVICES MOUNTED OUTSIDE OF THE PANEL MAY BE SUPPLIED BY LIEBERT, CURRENT TECHNOLOGY, OR ADVANCED PROTECTION TECHNOLOGIES.

   SURGE PROTECTIVE DEVICES SHALL BE RATED AS FOLLOWS:

   SERVICE ENTRANCE LOCATIONS: 250 kA PER PHASE AND 125 kA PER MODE.

   BRANCH PANELS: 120 kA PER PHASE AND 60 kA PER MODE.

   SPD'S MOUNTED EXTERNAL TO PANELS SHALL BE LOCATED SUCH THAT THE CONDUCTOR/CONDIT RUN BETWEEN THE EQUIPMENT IS AS SHORT AND STRAIGHT AS POSSIBLE. PROVIDE OVERCURRENT PROTECTION OF THE SPD AS REQUIRED BY THE EQUIPMENT MANUFACTURER.

8. VARIABLE FREQUENCY DRIVES - 6 PULSE WITH THE FOLLOWING UNLESS OTHERWISE SPECIFIED ON THE DRAWINGS:

8.1. THE VFD SHALL BE ENCLOSED IN A UL LISTED TYPE 1 ENCLOSURE. THE TOLERATED VOLTAGE WINDOW SHALL ALLOW THE VFD TO OPERATE FROM A LINE OF +30% NOMINAL, AND -35% NOMINAL VOLTAGE AS A MINIMUM.
8.1.1. ENVIRONMENTAL OPERATING CONDITIONS: 0 TO 40C CONTINUOUS DUTY. VFD'S THAT CAN OPERATE AT 40 C INTERMITTENTLY (DURING A 24 HOUR PERIOD) ARE NOT ACCEPTABLE AND MUST BE OVERSIZED. ALTITUDE 0 TO 3300 FEET ABOVE SEA LEVEL, LESS THAN 95% HUMIDITY, NON-CONDENSING.
8.2. ALL VFD'S SHALL HAVE THE FOLLOWING STANDARD FEATURES:
8.2.1. ALL VFD'S SHALL HAVE THE SAME CUSTOMER INTERFACE, INCLUDING DIGITAL DISPLAY, AND KEYPAD. THE KEYPAD SHALL BE REMOVABLE, CAPABLE OF REMOTE MOUNTING AND ALLOW FOR UPLOADING AND DOWNLOADING OF PARAMETER SETTINGS AS AN AID FOR START-UP OF MULTIPLE VFD'S.
8.2.2. THE KEYPAD SHALL INCLUDE HAND-OFF-AUTO SELECTIONS AND MANUAL SPEED CONTROL. THE DRIVE SHALL INCORPORATE "BUMPLESS TRANSFER" OF SPEED REFERENCE WHEN SWITCHING BETWEEN "HAND" AND "AUTO" MODES. THERE SHALL BE FAULT RESET AND "HELP" BUTTONS ON THE KEYPAD. THE HELP BUTTON SHALL INCLUDE "ON-LINE" ASSISTANCE FOR PROGRAMMING AND TROUBLESHOOTING.
8.2.3. THERE SHALL BE A BUILT-IN TIME CLOCK IN THE VFD KEYPAD. THE CLOCK SHALL BE USED TO DATE AND TIME STAMP FAULTS AND RECORD OPERATING PARAMETERS AT THE TIME OF FAULT. THE CLOCK SHALL ALSO BE PROGRAMMABLE TO CONTROL START/STOP FUNCTIONS, CONSTANT SPEEDS, PID PARAMETER SETS AND OUTPUT RELAYS.
8.2.4. UTILIZE PRE-PROGRAMMED APPLICATION MACROS SPECIFICALLY DESIGNED TO FACILITATE START-UP. THE APPLICATION MACROS SHALL PROVIDE ONE COMMAND TO REPROGRAM ALL PARAMETERS AND CUSTOMER INTERFACES FOR A PARTICULAR APPLICATION TO REDUCE PROGRAMMING TIME.
8.2.5. CAPABLE OF STARTING INTO A COASTING LOAD (FORWARD OR REVERSE) UP TO FULL SPEED AND ACCELERATE OR DECELERATE TO SETPOINT WITHOUT SAFETY TRIPPING OR COMPONENT DAMAGE (FLYING START).
8.2.6. THE VFD SHALL HAVE THE ABILITY TO AUTOMATICALLY RESTART AFTER AN OVER-CURRENT, OVER-VOLTAGE, UNDER-VOLTAGE, OR LOSS OF INPUT SIGNAL PROTECTIVE TRIP. THE NUMBER OF RESTART ATTEMPTS, TRIAL TIME, AND TIME BETWEEN ATTEMPTS SHALL BE PROGRAMMABLE.
8.2.7. THE VFD SHALL HAVE AN INTEGRAL 5% IMPEDANCE REACTOR. THE 5% IMPEDANCE MAY BE FROM DUAL (POSITIVE AND NEGATIVE DC BUS) REACTORS, OR 5% AC LINE REACTORS. VFD'S WITH ONLY ONE DC REACTOR SHALL ADD AC LINE REACTORS.
8.2.8. THE VFD SHALL INCLUDE A COORDINATED AC TRANSIENT PROTECTION SYSTEM CONSISTING OF 4-120 JOULE RATED MOV'S (PHASE TO PHASE AND PHASE TO GROUND), A CAPACITOR CLAMP, AND 5% IMPEDANCE REACTORS.
8.2.9. THE VFD SHALL BE CAPABLE OF SENSING A LOSS OF LOAD (BROKEN BELT / BROKEN COUPLING) AND SIGNAL THE LOSS OF LOAD CONDITION. THE DRIVE SHALL BE PROGRAMMABLE TO SIGNAL THIS CONDITION VIA A KEYPAD WARNING, RELAY OUTPUT AND/OR OVER THE SERIAL COMMUNICATIONS BUS. RELAY OUTPUTS SHALL INCLUDE PROGRAMMABLE TIME DELAYS THAT WILL ALLOW FOR DRIVE ACCELERATION FROM ZERO SPEED WITHOUT SIGNALING A FALSE UNDERLOAD CONDITION.
8.2.10. IF THE INPUT REFERENCE (4-20MA OR 2-10V) IS LOST, THE VFD SHALL GIVE THE USER THE OPTION OF EITHER (1) STOPPING AND DISPLAYING A FAULT, (2) RUNNING AT A PROGRAMMABLE PRESET SPEED, (3) HOLD THE VFD SPEED BASED ON THE LAST GOOD REFERENCE RECEIVED, OR (4) CAUSE A WARNING TO BE ISSUED, AS SELECTED BY THE USER. THE DRIVE SHALL BE PROGRAMMABLE TO SIGNAL THIS CONDITION VIA A KEYPAD WARNING, RELAY OUTPUT AND/OR OVER THE SERIAL COMMUNICATION BUS.
8.3. ALL VFD'S TO HAVE THE FOLLOWING ADJUSTMENTS:
8.3.1. TWO (2) PID SETPOINT CONTROLLERS IN THE DRIVE. TWO (2) PROGRAMMABLE ANALOG INPUTS SHALL ACCEPT CURRENT OR VOLTAGE SIGNALS.
8.3.2. TWO (2) PROGRAMMABLE ANALOG OUTPUTS (0-20MA OR 4-20 MA) PROGRAMMABLE TO OUTPUT PROPORTIONAL TO FREQUENCY, MOTOR SPEED, OUTPUT VOLTAGE, OUTPUT CURRENT, MOTOR TORQUE, MOTOR POWER (KW), DC BUS VOLTAGE, ACTIVE REFERENCE, AND OTHER DATA.
8.3.3. SIX (6) PROGRAMMABLE DIGITAL INPUTS. THERE SHALL BE A RUN PERMISSIVE CIRCUIT FOR DAMPER OR VALVE CONTROL. AT ANY RUN COMMAND, THE VFD SHALL PROVIDE A DRY CONTACT CLOSURE THAT WILL SIGNAL THE DAMPER TO OPEN. WHEN THE DAMPER IS FULLY OPEN, A NORMALLY OPEN DRY CONTACT SHALL CLOSE. THE CLOSED END-SWITCH IS WIRED TO AN VFD DIGITAL INPUT AND ALLOWS VFD MOTOR OPERATION. TWO SEPARATE SAFETY INTERLOCK INPUTS SHALL BE PROVIDED. WHEN EITHER SAFETY IS OPENED, THE MOTOR SHALL BE COMMANDED TO COAST TO STOP, AND THE DAMPER SHALL BE COMMANDED TO CLOSE. THE KEYPAD SHALL DISPLAY "START ENABLE 1 (OR 2) MISSING". THE SAFETY STATUS SHALL ALSO BE TRANSMITTED OVER THE SERIAL COMMUNICATIONS BUS. ALL DIGITAL INPUTS SHALL BE PROGRAMMABLE TO INITIATE UPON AN APPLICATION OR REMOVAL OF 24VDC.
8.3.4. THREE (3) PROGRAMMABLE DIGITAL FORM-C RELAY OUTPUTS. THE RELAYS SHALL INCLUDE PROGRAMMABLE ON AND OFF DELAY TIMES AND ADJUSTABLE HYSTERESIS. DEFAULT SETTINGS SHALL BE FOR RUN, NOT FAULTED, AND RUN PERMISSIVE. THE RELAYS SHALL BE RATED FOR MAXIMUM SWITCHING CURRENT 8 AMPS AT 24 VDC AND 0.4 A AT 250 VAC; MAXIMUM VOLTAGE 300 VDC AND 250 VAC; CONTINUOUS CURRENT RATING 2 AMPS RMS. OUTPUTS SHALL BE TRUE FORM C TYPE CONTACTS.
8.3.5. THE VFD SHALL INCLUDE A MOTOR FLUX OPTIMIZATION CIRCUIT THAT WILL AUTOMATICALLY REDUCE APPLIED MOTOR VOLTAGE TO THE MOTOR.
8.3.6. THE VFD SHALL INCLUDE A CARRIER FREQUENCY CONTROL CIRCUIT THAT REDUCES THE CARRIER FREQUENCY BASED ON ACTUAL VFD TEMPERATURE THAT ALLOWS THE HIGHEST CARRIER FREQUENCY WITHOUT DERATING THE VFD OR OPERATING AT HIGH CARRIER FREQUENCY ONLY AT LOW SPEEDS.
8.4. SERIAL COMMUNICATIONS
8.4.1. EACH VFD SHALL HAVE AN RS-485 PORT AS STANDARD WITH MODBUS, JOHNSON CONTROLS N2 BUS, AND SIEMENS BUILDING TECHNOLOGIES FLN PROTOCOLS. OPTIONAL PROTOCOLS FOR LONWORKS, BACNET, PROFIBUS, ETHERNET, AND DEVICENET SHALL BE AVAILABLE. ALL PROTOCOLS SHALL BE "CERTIFIED" BY THE GOVERNING AUTHORITY.
8.4.2. SERIAL COMMUNICATION CAPABILITIES SHALL INCLUDE RUN-STOP CONTROL, SPEED SET ADJUSTMENT, PROPORTIONAL/INTEGRAL/DERIVATIVE PID CONTROL ADJUSTMENTS, CURRENT LIMIT, ACCEL/DECEL TIME ADJUSTMENTS, AND LOCK AND UNLOCK THE KEYPAD. THE DRIVE SHALL HAVE THE CAPABILITY OF ALLOWING THE CONTROL SYSTEM TO MONITOR FEEDBACK SUCH AS PROCESS VARIABLE FEEDBACK, OUTPUT SPEED / FREQUENCY, CURRENT, % TORQUE, POWER, KILOWATT HOUR, OPERATING HOURS, AND DRIVE TEMPERATURE. THE CONTROL SYSTEM SHALL ALSO BE CAPABLE OF MONITORING THE VFD RELAY OUTPUT STATUS, DIGITAL INPUT STATUS, AND ALL ANALOG INPUT AND ANALOG OUTPUT VALUES. ALL DIAGNOSTIC WARNING AND FAULT INFORMATION SHALL BE TRANSMITTED OVER THE SERIAL COMMUNICATIONS BUS. REMOTE VFD FAULT RESET SHALL BE POSSIBLE. THE FOLLOWING ADDITIONAL STATUS INDICATIONS AND SETTINGS SHALL BE TRANSMITTED OVER THE SERIAL COMMUNICATIONS BUS - KEYPAD "HAND" OR "AUTO" SELECTED, BYPASS SELECTED, THE ABILITY TO CHANGE THE PID SETPOINT, AND THE ABILITY TO FORCE THE UNIT TO BYPASS. THE CONTROL SYSTEM SYSTEM SHALL ALSO BE ABLE TO MONITOR IF THE MOTOR IS RUNNING IN THE VFD MODE OR BYPASS MODE OVER SERIAL COMMUNICATIONS. A MINIMUM OF 15 FIELD PARAMETERS SHALL BE CAPABLE OF BEING MONITORED.
8.5. EMI / RFI FILTERS. ALL VFD'S SHALL INCLUDE EMI/RFI FILTERS.
8.6. BYPASS FEATURES - FEATURES TO BE FURNISHED AND MOUNTED BY THE DRIVE MANUFACTURER.
8.6.1. A COMPLETE FACTORY WIRED AND TESTED BYPASS SYSTEM CONSISTING OF AN OUTPUT CONTACTOR AND BYPASS CONTACTOR. OVERLOAD PROTECTION AND SHALL BE PROVIDED IN BOTH MODES.
8.6.2. DOOR INTERLOCKED, PADLOCKABLE CIRCUIT BREAKER THAT WILL DISCONNECT ALL INPUT POWER FROM THE DRIVE AND ALL INTERNALLY MOUNTED OPTIONS.
8.6.3. FAST ACTING FUSES EXCLUSIVE TO THE VFD - FAST ACTING FUSES ALLOW THE VFD TO DISCONNECT FROM THE LINE PRIOR TO CLEARING UPSTREAM BRANCH CIRCUIT PROTECTION, MAINTAINING BYPASS CAPABILITY. BYPASS DESIGNS, WHICH HAVE NO SUCH FUSES, OR THAT INCORPORATE FUSES COMMON TO BOTH THE VFD AND THE BYPASS WILL NOT BE ACCEPTED.
8.6.4. THE DRIVE / BYPASS SHALL PROVIDE SINGLE-PHASE MOTOR PROTECTION IN BOTH MODES.
8.6.5. THE FOLLOWING INDICATING LIGHTS (LED TYPE) SHALL BE PROVIDED. A TEST MODE OR PUSH TO TEST FEATURE SHALL BE PROVIDED: POWER-ON (READY), RUN ENABLE (SAFETIES) OPEN, DRIVE MODE SELECT DAMPER OPENING, BYPASS MODE SELECTED, DRIVE RUNNING, BYPASS RUNNING, DRIVE FAULT, BYPASS FAULT, BYPASS H-O-A MODE, AUTOMATIC TRANSFER TO BYPASS SELECTED, SAFETY OPEN, DAMPER OPENING, DAMPER END-SWITCH MADE
8.6.6. THE FOLLOWING RELAY (FORM C) OUTPUTS FROM THE BYPASS SHALL BE PROVIDED: SYSTEM STARTED, . SYSTEM RUNNING, BYPASS OVERRIDE ENABLED, DRIVE FAULT, BYPASS FAULT (MOTOR OVERLOAD OR UNDERLOAD), BYPASS H-O-A POSITION.
8.6.7. THE DIGITAL INPUTS FOR THE SYSTEM SHALL ACCEPT 24V OR 115VAC (SELECTABLE). THE BYPASS SHALL INCORPORATE INTERNALLY SOURCED POWER SUPPLY.
8.6.8. DEDICATED DIGITAL INPUT THAT WILL TRANSFER MOTOR FROM VFD MODE TO BYPASS MODE UPON DRY CONTACT CLOSURE FOR FIREMAN'S OVERRIDE. TWO MODES OF OPERATION ARE REQUIRED:
8.6.8.1. ONE MODE FORCES THE MOTOR TO BYPASS OPERATION AND OVERRIDES BOTH THE VFD AND BYPASS H-O-A SWITCHES AND FORCES THE MOTOR TO OPERATE ACROSS THE LINE. THE SYSTEM WILL ONLY RESPOND TO THE DIGITAL INPUTS AND MOTOR PROTECTIONS.
8.6.8.2. THE SECOND FIREMAN'S OVERRIDE MODE REMAINS AS ABOVE, BUT WILL ALSO DEFEAT THE OVERLOAD AND SINGLE-PHASE PROTECTION FOR BYPASS AND IGNORE ALL KEYPAD AND DIGITAL INPUTS TO THE SYSTEM (RUN UNTIL DESTRUCTION).
8.6.9. THE VFD SHALL INCLUDE A "RUN PERMISSIVE CIRCUIT" THAT WILL PROVIDE A NORMALLY OPEN CONTACT WHENEVER A RUN COMMAND IS PROVIDED (LOCAL OR REMOTE START COMMAND IN VFD OR BYPASS MODE). THE VFD SYSTEM SHALL NOT OPERATE THE MOTOR UNTIL IT RECEIVES A DRY CONTACT CLOSURE FROM A DAMPER OR VALVE END-SWITCH. WHEN THE VFD SYSTEM SAFETY INTERLOCK (FIRE DETECTOR, FREEZESTAT, HIGH STATIC PRESSURE SWITCH, ETC) OPENS, THE MOTOR SHALL COAST TO A STOP AND THE RUN PERMISSIVE CONTACT SHALL OPEN, CLOSING THE DAMPER OR VALVE.
8.6.10. CLASS 20 OR 30 (SELECTABLE) ELECTRONIC MOTOR OVERLOAD PROTECTION SHALL BE INCLUDED.
8.6.11. THERE SHALL BE AN INTERNAL SWITCH TO SELECT MANUAL OR AUTOMATIC BYPASS.
8.6.12. THERE SHALL BE AN ADJUSTABLE CURRENT SENSING CIRCUIT FOR THE BYPASS TO PROVIDE LOSS OF LOAD INDICATION (BROKEN BELT) WHEN IN THE BYPASS MODE.
8.7. INSTALLATION
8.7.1. INSTALLATION SHALL BE THE RESPONSIBILITY OF THE MECHANICAL CONTRACTOR. THE CONTRACTOR SHALL INSTALL THE DRIVE IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE VFD MANUFACTURER AS OUTLINED IN THE INSTALLATION MANUAL.
8.7.2. POWER WIRING SHALL BE COMPLETED BY THE ELECTRICAL CONTRACTOR. 3 COPPER CONDUCTORS AND A GROUND WIRE ARE REQUIRED. SEPARATE THE INPUT POWER WIRING FROM THE OUTPUT POWER WIRING IN INDIVIDUAL METALLIC CONDUIT. DO NOT COMBINE PROVIDE A SEPARATE METALLIC CONDUIT FOR CONTROL WIRING. THE CONTRACTOR SHALL COMPLETE ALL WIRING IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE VFD MANUFACTURER AS OUTLINED IN THE INSTALLATION MANUAL.
8.8. START-UP
8.8.1. CERTIFIED FACTORY START-UP SHALL BE PROVIDED FOR EACH DRIVE BY A FACTORY AUTHORIZED SERVICE CENTER. A CERTIFIED START-UP FORM SHALL BE FILLED OUT FOR EACH DRIVE WITH A COPY PROVIDED TO THE OWNER, AND A COPY KEPT ON FILE AT THE MANUFACTURER.
8.9. PRODUCT SUPPORT
8.9.1. FACTORY TRAINED APPLICATION ENGINEERING AND SERVICE PERSONNEL THAT ARE THOROUGHLY FAMILIAR WITH THE VFD PRODUCTS OFFERED SHALL BE LOCALLY AVAILABLE AT BOTH THE SPECIFYING AND INSTALLATION LOCATIONS. A 24/365 TECHNICAL SUPPORT LINE SHALL BE AVAILABLE ON A TOLL-FREE LINE.
8.10. WARRANTY
8.10.1. WARRANTY SHALL BE 24 MONTHS FROM THE DATE OF CERTIFIED START-UP, NOT TO EXCEED 30 MONTHS FROM THE DATE OF SHIPMENT. THE WARRANTY SHALL INCLUDE ALL PARTS, LABOR, TRAVEL TIME AND EXPENSES. THERE SHALL BE 365/24 SUPPORT AVAILABLE VIA A TOLL FREE PHONE NUMBER.

D. DATA AND INSTRUMENTATION:

9. FLOW TRANSMITTER - FIT-100
9.1. RECOMMENDED METER - FOXBORO 9300A FLOW TUBE, MOD # 9308 - 8" FLANGED #150
9.1.1. FLOW TRANSMITTER WILL MEASURE WATER FLOW FROM P-001, 002, 003, PUMPS. METER WILL HAVE 4-20 MA OUTPUT AS WILL AS SCALABLE PULSE OUTPUTS. TRANSMITTER WILL BE MOUNTED ON FLOW TUBE. TRANSMITTER CONTROL PANEL WITH PUSH BUTTON CONTROLS WILL FACE WALK WAY TO AID FIELD ADJUSTMENTS. TRANSMITTER WILL BE A FOXBORO MODEL IMT25 I/A SERIES INTELLIGENT MAGNETIC FLOW TRANSMITTER WITH HART COMMUNICATION PROTOCOL. THE METER WILL COME WITH NECESSARY SOFTWARE CONFIGURATION FOR COMMUNICATION TO SCADA- PLC, TOTALS AND SET POINTS WILL BE PROTECTED IN NONVOLATILE MEMORY IN THE EVENT OF POWER LOSS. RELAY (2) OUTPUTS WILL BE FIELD PROGRAMMABLE FOR FLOW ALARMS. TRANSMITTER BODY & FLOW METER TERMINALS WILL BE ENCLOSED IN A NEMA 4X RATED ENCLOSURE. POWER FOR THE FLOW METER WILL BE 24VDC SUPPLIED FROM PLC/SCADA POWER SUPPLIES.
10. LEVEL TRANSMITTER - LT-101
10.1. RECOMMENDED - NON CONTACT RADAR, ROSEMONT 5400 SERIES OR KPSI MODEL 750 SUBMERSIBLE LEVEL TRANSDUCER WITH VENTED CABLE ASSEMBLY, NON FOULING DIAPHRAGM, VENT FILTER AND 4-20MA OUTPUT.
10.1.1. THE LEVEL TRANSMITTER WILL MEASURE WATER LEVEL IN THE WET WELL BASIN. LT-101 WILL HAVE A 4-20MA OUTPUT AND BE FIELD ADJUSTABLE.
11. PRESSURE TRANSMITTER - PT-102
11.1. RECOMMENDED - FOXBORO - IGP10 WITH A ANDERSON GREENWOOD M25VIS4M TWO VALVE MANIFOLD
11.1.1. THE PRESSURE TRANSMITTER SHALL MEASURE GAUGE PRESSURE TO MAINTAIN CONSTANT PRESSURE READINGS AND OUTPUT TO 4-20MA TO PLC - PRESSURE CONTROLLER (PC-102). PT-102 WILL BE A HIGH PERFORMANCE D/P CELL TRANSMITTER - IT WILL HAVE A LOCAL DIGITAL READOUT. TRANSMITTER WILL COMMUNICATE HART WITH ANALOG OUTPUTS. METER WILL READ IN GAUGE PRESSURES AND BE PAIRED WITH A 2 VALUE BLOCK & BLEED TYPE MANIFOLD FOR MAINTENANCE & CALIBRATION OF THE METER. THE METER WILL OUT PUT PUMP STATION PRESSURE. THE METER WILL HAVE A REFERENCE ACCURACY OF 0.025% OF SPAN.
12. LEVEL SWITCH - LS 103A AND LS 103B
12.1. RECOMMENDED MANUF. SJE RHOMBUS MODEL # 20SGMSPDTPC PART # 1006096
12.1.1. CABLE IS 18 GAUGE (MIN) 20 FOOT LONG 3 CONDUCTOR (UL) SJOW, WATER RESISTANT (CPE) FLOAT 2.75" DIA. X 4.83 IN LONG HIGH IMPACT CORROSION RESISTANT POLYPROPYLENE FOR USE IN SEWAGE AND WATER UP TO 140°F (60°C) MUST BE MERURY FREE. ELECTRICAL RATING - 5AMP, 125/250VAC, 50/60HZ
13. PLC CONTROL PANEL
13.1. SHALL INCLUDE BUT NOT LIMITED TO THE FOLLOWING:
13.1.1. THE WWTP NO.2 GRAY WATER PUMP STATION PLC CONTROL PANEL.
13.1.2. WILL OPERATE ON 120 VAC/60 HZ/1 PHASE ELECTRICAL SERVICE.
13.1.3. NEMA 12 WALL MOUNT , PAINTED STEEL ENCLOSURE (APROX. 48"H X36"W X 16D") WITH BACK PANEL.
13.1.4. INCOMING TVSS WITH SERVICE BREAKER.
13.1.5. GE RX3I PLC RACK WITH PROCESSOR, POWER SUPPLY & I/O AS REQUIRED.
13.1.6. GE RX3I ETHERNET COMMUNICATIONS MODULE
13.1.7. PHOENIX CONTACT 21.5" INDUSTRIAL TOUCH PANEL PC WITH WONDERWARE SYSTEM PLATFORM RUNTIME LICENSE.
13.1.8. MOXA INDUSTRIAL COPPER / FIBER ETHERNET SWITCH (TYPE SC, MULTI-MODE).
13.1.9. NETWORK DC POWER SUPPLY.
13.1.10. 1500 VA UPS WITH SIMPLEX PLUG IN RECEPTACLE.
13.1.11. 12 PORT FIBER OPTIC PATCH PANEL. (TYPE SC, MULTI-MODE)
13.1.12. (2) FIBER OPTIC JUMPER ASSEMBLIES.
13.1.13. WIRING TERMINALS, WIRE WAYS, RECEPTACLES, FUSES, BREAKERS, RELAYS, ETC. AS REQUIRED…
14. UV BUILDING SCADA CONTROL PANEL (EXISTING) MODIFICATIONS
14.1. SHALL INCLUDE BUT NOT LIMITED TO THE FOLLOWING:
14.1.1. MOXA INDUSTRIAL COPPER/ FIBER ETHERNET SWITCH (TYPE SC, MULTI MODE) .
14.1.2. DC POWER SUPPLY.
14.1.3. 12 PORT FIBER OPTIC PATCH PANEL. (TYPE SC, MULTI-MODE).
14.1.4. FIBER OPTIC JUMPER CABLE ASSEMBLIES AS REQUIRED.
14.1.5. WIRING TERMINALS, FUSES, ECT. AS REQUIRED.
14.2. INSTALLATION AND WIRING OF PANEL MOUNTED COMPONENTS FURNISHED BY R.E. PEDROTTI CO.
15. DOCUMENTATION
15.1. ALL DOCUMENTATION AND AS-INSTALLED O&M MANUALS WILL BE PROVIDED TO MKEC AND THE CITY OF WICHITA FOR APPROVAL AND RECORDS.
15.2. ALL RED LINED, DURING CONSTRUCTION, DRAWINGS AND PROGRAMMING DOCUMENTS WILL BE RETURNED TO MKEC AND CITY OF WICHITA BY THE CONTRACTOR RESPONSIBLE FOR THE INSTALLATION.
16. PLC / SCADA PROGRAMMING
16.1. PUMP STATION PLC/HMI PROGRAMMING DEVELOPMENT AND SYSTEM WIDE SCADA APPLICATION UPDATES TO INCORPORATE NEW GRAY WATER PUMP STATION IN TO WPC SCADA SYSTEM.
17. ONSITE OPERATOR TRAINING AND TESTING:
17.1. ONSITE CONTROL PANEL AND INSTRUMENT START UP, TESTING AND OPERATOR TRAINING WILL BE PROVIDED BY THE AUTOMATION CONTRACTOR.
18. ETHERNET CABLING:
18.1. SOLID CONDUCTOR - BONDED PAIRS
18.2. SHALL HAVE ADJUSTABLE PULL TENSION FOR INSTALLATION
18.3. OIL RESISTANT
18.4. AV SUN RESISTANCE
18.5. 600V WHERE EXPOSED TO ELECTRICAL VOLTAGES -> 300V
18.6. INDUSTRIAL GRADE JACKET - PVC
18.7. CABLE SHALL BE SUITABLE FOR DATA SPEEDS
19. CABLE TERMINATIONS
19.1. SHALL BE SUITABLE FOR THE CABLE SELECTED
19.2. CABLE TERMINAL ENDS - WILL MEET MANUFACTURER'S REQUIREMENTS. MUST BE ROBUST IN NATURE CONNECTION AND SERVICEABLE.

D. LIGHTING:

1. GENERAL - THE LOCATIONS, NUMBERS, SIZES AND TYPES OF LIGHTING FIXTURES SHALL BE AS SHOWN ON THE CONTRACT DOCUMENTS. ALL LIGHTING FIXTURES FURNISHED UNDER THIS CONTRACT TO HAVE UL LABELS ATTACHED TO EACH FIXTURE OR AN INTEGRAL PART OF THE DEVICES FOR 120V AND 277V SOLID-STATE EQUIPMENT. FOR DEVICES WITHOUT INTEGRAL LINE VOLTAGE SURGE PROTECTION, FIELD MOUNTING SURGE PROTECTION SHALL COMPLY WITH IEEE C62.41, WITH UL 1449. METAL PARTS SHALL BE FREE FROM BURRS, SHARP CORNERS AND EDGES. DOORS, FRAMES AND OTHER INTERNAL ACCESSES SHALL BE SMOOTH OPERATING, FREE FROM LIGHT LEAKAGE UNDER OPERATING CONDITIONS, AND ARRANGED TO PERMIT RELAMPING WITHOUT USE OF TOOLS. ARRANGE DOORS, FRAMES, LENSES, DIFFUSERS AND OTHER PIECES TO PREVENT ACCIDENTAL FALLING DURING RELAMPING AND WHEN SECURED IN OPERATING POSITION. LENSES, DIFFUSERS, COVERS AND GLOBES SHALL BE 100 PERCENT VIRGIN ACRYLIC PLASTIC OR ANNEALED CRYSTAL GLASS, UNLESS OTHERWISE INDICATED. PLASTIC SHALL BE HIGH RESISTANCE TO YELLOWING AND OTHER CHANGES DUE TO AGING, EXPOSURE TO HEAT AND ULTRAVIOLET RADIATION.
   CLEAN ALL LIGHT FIXTURES AFTER INSTALLATION AND PRIOR TO OWNER ACCEPTANCE. TEST EACH FIXTURE AND REPLACE ALL MALFUNCTIONING LEDS AND DRIVERS.

2. LED FIXTURES AND DRIVERS - MANUFACTURERS SHALL BE AS SHOWN ON THE CONTRACT DRAWINGS. LED DRIVER AND HEAT SINK SHALL BE MATCHED TO PROVIDE 50,000 HOURS OF LAMP LIFE.

E. CONSTRUCTION:

1. SUBMITTALS - SUBMIT FOR REVIEW ELECTRONIC SETS OF MANUFACTURERS CUT SHEETS AND/OR SHOP DRAWINGS OF LIGHT FIXTURES WITH LAMPS AND LIGHT FIXTURE BASE, AND ALL ITEMS IN THIS SPECIFICATION OTHER THAN WIRE AND CONDUIT. ALSO SUBMIT ITEMS REQUIRING COORDINATION BETWEEN CONTRACTORS. BEFORE SENDING SUBMITTALS, THE CONTRACTOR SHALL VERIFY THAT ALL EQUIPMENT SUBMITTED IS MUTUALLY COMPATIBLE AND SUITABLE FOR THE INTENDED USE, AND SHALL FIT THE AVAILABLE SPACE AND ALLOW AMPLE ROOM FOR MAINTENANCE. THE ENGINEER'S REVIEW AND COMMENT ON SUCH SUBMITTALS SHALL NOT RELIEVE THE CONTRACTOR FROM RESPONSIBILITY FOR ERRORS IN DIMENSIONS, DETAILS, SIZE OF MEMBERS, OR QUANTITIES; OR OMISSIONS OF COMPONENTS OR FITTINGS; OR FOR COORDINATING ITEMS WITH ACTUAL PROJECT CONDITIONS.

F. SUBSTITUTIONS:

1. MATERIAL ALTERNATES SHALL BE SUBMITTED IN COMPLETE DETAIL TO THE ENGINEER NO LATER THAN 10 CALENDAR DAYS PRIOR TO BID DATE. DECISION ON ACCEPTANCE OF A SUBSTITUTION IS SOLELY UP TO THE ENGINEER.

Joel Richard Bradley Wheeler
LICENSED
24496
4-21-16
KANSAS
PROFESSIONAL ENGINEER

C:\Users\jaraiza\Documents\15623 - COW WATER PUMP - MEP_jaraiza.rvt

MKEC
Wichita. KS • 316-684-9600

CITY OF WICHITA, KANSAS

RE-USE WATER PUMP STATION

TO SERVE SPIRT AEROSYSTEMS

ELECTRICAL SPECIFICATIONS

PROJECT NO.	468-85112	
DATE	04/18/16	
SCALE	AS NOTED	
DESIGNED	DRAWN	CHECKED
JRBW	JA	JRBW

NO.	REVISION	DATE
0	ISSUED FOR CONSTRUCTION	04/18/16

SHEET NO.
E4.3

PROJECT GENERAL NOTES

1. ALL WORK SHALL COMPLY WITH CURRENT FEDERAL, STATE, AND LOCAL CODES AND ORDINANCES AS WELL AS THE CONSTRUCTION DOCUMENTS. CONTRACTOR SHALL REPORT ANY CONFLICTS TO THE ENGINEER AS SOON AS THEY ARE DISCOVERED.
2. THE COMPLETE INSTALLATION SHALL BE IN ACCORDANCE WITH THE A.D.A.A.G. (AMERICANS WITH DISABILITIES ACT ACCESSIBILITY GUIDELINES).
3. THE CONTRACTOR SHALL REVIEW THE DRAWINGS AND SPECIFICATIONS PRIOR TO BIDDING JOB AND DURING CONSTRUCTION. EXCEPT AS OTHERWISE NOTED, THE CONTRACTOR SHALL PROVIDE ALL EQUIPMENT, MATERIALS, AND LABOR FOR A COMPLETE PROJECT AS SHOWN IN THE DRAWINGS AND SPECIFICATIONS. DRAWINGS AND SPECIFICATIONS CARRY EQUAL IMPORTANCE AND ITEMS LISTED IN EITHER SHALL BE FURNISHED AS IF LISTED IN BOTH. ALSO REVIEW DETAILS AND RISER DIAGRAMS FOR ADDITIONAL ITEMS/INSTRUCTIONS WHETHER SPECIFICALLY REFERRED TO ON PLANS OR NOT.
4. THE CONTRACTOR MUST VISIT THE SITE TO FAMILIARIZE HIMSELF WITH THE EXISTING SITE CONDITIONS WHICH WILL BE AFFECTED DURING CONSTRUCTION PRIOR TO SUBMITTING HIS BID PROPOSAL, INCLUDING THE EXTENT OF DEMOLITION AND CONFLICTS WITH PLANS.
5. DRAWINGS ARE DIAGRAMMATIC IN NATURE AND SHOW THE GENERAL INSTALLATION OF EQUIPMENT AND MATERIALS IN RELATIONSHIP TO STRUCTURE AND OTHER TRADES. THEY MAY NOT SHOW EVERY REQUIRED OFFSET, FITTING, ETC. CONTRACTOR SHALL FIELD VERIFY ACTUAL JOB CONDITIONS AND COORDINATE WORK WITH OTHER TRADES PRIOR TO BIDDING JOB AND PRIOR TO ORDERING EQUIPMENT, FABRICATION OF MATERIALS, OR STARTING WORK. CONTRACTOR SHALL NOT SCALE THE DRAWINGS.
6. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO COORDINATE ALL ITEMS THAT AFFECT OTHER DISCIPLINES WITH THE CORRESPONDING CONTRACTOR AND THE GENERAL CONTRACTOR IF EQUIPMENT, MATERIALS, ETC. OTHER THAN THOSE SCHEDULED AND SPECIFIED (PENDING PRE-APPROVAL) ARE FURNISHED.
7. CHANGE ORDERS WILL NOT BE GRANTED DUE TO LACK OF COORDINATION WITH JOB CONDITIONS AND/OR OTHER CONTRACTORS.
8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR STORAGE OF RELOCATED EQUIPMENT AND MATERIALS DURING CONSTRUCTION. ITEMS DAMAGED DURING CONSTRUCTION SHALL BE REPLACED AT THE CONTRACTOR'S EXPENSE.
9. UPON COMPLETION OF THE PROJECT THE CONTRACTOR SHALL PROVIDE AS-BUILT DRAWINGS TO THE OWNER, ARCHITECT, AND ENGINEER SHOWING EQUIPMENT, DUCTWORK, PIPING, ETC. THAT DIFFERS FROM CONSTRUCTION DOCUMENTS AS THEY ARE ACTUALLY INSTALLED.
10. THE RESPONSIBILITY OF EACH CONTRACTOR IS NOT LIMITED TO THEIR SPECIFIC DISCIPLINE'S DRAWING SHEETS. REFER TO OTHER DISCIPLINES' DRAWING SHEETS AS REQUIRED FOR ADDITIONAL INFORMATION/INSTRUCTIONS.
11. FIRE STOP ALL PENETRATIONS THRU RATED WALLS. SLEEVE IN ENTIRETY WITH APPROPRIATE SLEEVE MATERIAL.

MECHANICAL GENERAL NOTES

1. UPON COMPLETION OF INSTALLATION ON NEW HVAC SYSTEMS, ALL SYSTEMS SHALL BE BALANCED BY INSTALLING CONTRACTOR.
2. REFER TO PLUMBING FIXTURE SCHEDULE FOR PIPING RUNOUT SIZES TO INDIVIDUAL PLUMBING FIXTURES.
3. DO NOT ROUTE ANY PIPING OVER ELECTRICAL ROOMS, COMPUTER ROOMS, OR ELECTRICAL PANELS.
4. WATER PIPING INSTALLED IN EXTERIOR WALLS SHALL BE INSTALLED ON CONDITIONED SIDE OF INSULATION.
5. ALL DOMESTIC WATER PIPING IN CEILING SPACE SHALL BE ROUTED BELOW CEILING INSULATION.
6. PROVIDE PRESSURE REDUCERS AS REQUIRED IN WATER SUPPLY LINES TO KEEP PRESSURE BELOW 70 PSI AT ALL OUTLETS.
7. PROVIDE APPROVED BACKFLOW PREVENTION OR ANTI-SIPHON DEVICES AT ALL FIXTURES THAT COULD CONTAMINATE THE POTABLE WATER SYSTEM.
8. INSTALL VENTS THRU ROOF AS REQUIRED TO MAINTAIN MINIMUM 10'-0" CLEARANCE FROM OUTSIDE AIR INTAKES. COORDINATE WITH M.C.
9. PROVIDE NEOPRENE VIBRATION ISOLATORS FOR ALL MECHANICAL EQUIPMENT PER MANUFACTURERS INSTALLATION INSTRUCTIONS.
10. THE M.C. SHALL COORDINATE ALL ROOF OR FLOOR PENETRATIONS WITH THE EQUIPMENT BEING PROVIDED BY THE CONTRACTOR, STRUCTURAL MEMBER LAYOUT, AND GENERAL CONTRACTOR. IF THE M.C. ELECTS TO PROVIDE EQUAL EQUIPMENT WHICH IS NOT SCHEDULED OR DESIGNED ON THESE DRAWINGS, THE M.C. SHALL BE FULLY RESPONSIBLE FOR ANY REQUIRED CURBS OR COORDINATION NECESSARY TO INSTALL THE EQUAL EQUIPMENT.
11. ALL RECTANGULAR ELBOWS REGARDLESS OF SIZE, SHALL BE PROVIDED WITH TURNING VANES PER THE SPECIFICATIONS.

MECHANICAL SYMBOL LIST

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	SUPPLY AIR DOWN	XXXX/XXX	GRD TAG
	SUPPLY AIR UP AND THRU		REVISION TAG
	RETURN AIR DOWN		ROUND FLOOR DRAIN
	RETURN AIR UP AND THRU		SQUARE FLOOR DRAIN / FLOOR SINK
	EXHAUST AIR DOWN		FLOOR CLEANOUT
	EXHAUST AIR UP AND THRU		WALL / END CLEANOUT
	MANUAL DAMPER		SHUT-OFF VALVE
	MITERED ELBOW WITH TURNING VANES		SOLENOID VALVE
	RADIUSED ELBOW		2 WAY CONTROL VALVE
	CONNECT/REMOVE TO EXISTING		3 WAY CONTROL VALVE
T	THERMOSTAT		PRESSURE REDUCING VALVE
H	HUMIDISTAT		CHECK VALVE
M	MOTORIZED DAMPER ACTUATOR		CIRCUIT SETTER
XXX-X	EQUIPMENT / PLUMBING FIXTURE TAG		STRAINER
#	KEYED NOTE		UNION
	DIRECTION OF AIRFLOW		FLOW DIRECTION ARROW
BD	BACKDRAFT DAMPER		PIPE BREAK
CD	CONTROL DAMPER		PIPE CAP
	FIRE/SMOKE DAMPER		PIPE REDUCER
	FIRE DAMPER		
	SMOKE DAMPER		

ABBREVIATIONS

ABBREV-IATIONS	DESCRIPTION	ABBREV-IATIONS	DESCRIPTION
A	AMPERES	HWC	DOMESTIC HOT WATER CIRCULATING
AV	AUDIO/VISUAL	IG	ISOLATED GROUND
AFF	ABOVE FINISHED FLOOR	IP	INTERNET PROTOCOL
AFG	ABOVE FINISHED GRADE	J-BOX	JUNCTION BOX
AHJ	AUTHORITIES HAVING JURISDICTION	LTG	LIGHTING
ATS	AUTOMATIC TRANSFER SWITCH	MAX	MAXIMUM
BFC	BELOW FINISHED CEILING	MC	MECHANICAL CONTRACTOR
BFG	BELOW FINISHED GRADE	MCA	MINIMUM CIRCUIT AMPACITY
C	CONDUIT	MIN	MINIMUM
CB	CIRCUIT BREAKER	MOCP	MAXIMUM OVERCURRENT PROTECTION
CLG	CEILING	(N)	NEW
CO	CLEANOUT	NC	NORMALLY CLOSED
CT	MOUNTED 6" ABOVE COUNTER TOP	NL	NIGHT LIGHT
DCW	DOMESTIC COLD WATER	NO	NORMALLY OPEN
DHW	DOMESTIC HOT WATER	NTS	NOT TO SCALE
DN	DOWN	OA	OUTSIDE AIR
(E)	EXISTING	P	POLE
EA	EXHAUST AIR	PRV	PRESSURE RELIEF VALVE/REDUCING VALVE
EC	ELECTRICAL CONTRACTOR	RA	RETURN AIR
EM	INDICATES DEVICE ON EMERGENCY CIRCUIT OR WITH AN EMERGENCY BATTERY	SA	SUPPLY AIR
		SPD	SURGE PROTECTIVE DEVICE
FCO	FLOOR CLEANOUT	TCC	TEMPERATURE CONTROLS CONTRACTOR
FLA	FULL LOAD AMPS	TP	TAMPER PROOF OUTLET COVERS
FVNR	FULL VOLTAGE NON-REVERSING	TR	TAMPER RESISTANT DEVICE
FVR	FULL VOLTAGE REVERSING	TYP	TYPICAL
FWD	FORWARD	UCT	MOUNTED UNDER COUNTER TOP
FPC	FIRE PROTECTION CONTRACTOR	UON	UNLESS OTHERWISE NOTED
GC	GENERAL CONTRACTOR	V	VOLTS
GCO	GRADE CLEANOUT	VTR	VENT THRU ROOF
GEC	GROUNDING ELECTRODE CONDUCTOR	WCO	WALL CLEANOUT
GFI / GFCI	GROUND FAULT INTERRUPTER	WP	WEATHER PROOF
G/GND	GROUND	WPI	WP IN SERVICE (WITH PLUG IN SERVICE)
HP	HORSE POWER	WR	WEATHER RESISTANT TYPE DEVICE

LINETYPES LEGEND

- EXISTING/REFERENCE
- EXISTING TO BE DEMOLISHED
- WORK TO BE DONE
- DOMESTIC COLD WATER
- DOMESTIC HOT WATER
- DOMESTIC HOT WATER CIRCULATING
- SANITARY SEWER / WASTE
- VENT
- G — NATURAL GAS

MECHANICAL CONTACTS

MECHANICAL DESIGN
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CITY OF WICHITA, KANSAS

RE-USE WATER PUMP STATION

TO SERVE SPIRT AEROSYSTEMS

MECHANICAL COVERSHEET

PROJECT NO.	468-85112
DATE	04/18/16
SCALE	AS NOTED

DESIGNED	DRAWN	CHECKED
RLB	CJK	RLB

NO.	REVISION	DATE
0	ISSUED FOR CONSTRUCTION	04/18/16

SHEET NO.

M1.0

RICHARD L. BARTLETT — 14093 — 4/18/16 — KANSAS — PROFESSIONAL ENGINEER

KEYED NOTES M2.0

1.	INSTALL EXHAUST FAN ON WALL AS SHOWN. PROVIDE AND INSTALL 45° WEATHER HOOD. BOTTOM OF EXHAUST FAN TO BE INSTALLED AT 10'-0" AFF. PROVIDE ALL MANUFACTURER'S CLEARANCES AS REQUIRED. FAN TO BE INTERLOCKED WITH ASSOCIATED LOUVER AS SHOWN ON PLAN.
2.	INSTALL LOUVER AS SHOWN ON PLAN. BOTTOM OF LOUVER TO BE INSTALLED 2'-0" AFF. MOTORIZED LOUVER ACTUATOR TO BE INTERLOCKED WITH ASSOCIATED EXHAUST FAN AS SHOWN ON PLAN. SEE SEQUENCE OF OPERATIONS FOR ADDITIONAL INFORMATION.
3.	MOUNT BOTTOM OF DSS-1A AT APPROXIMATELY 1'-0" ABOVE DOOR AT THIS LOCATION. ROUTE CONDENSATE FROM UNIT TO OUTDOORS WITH SPLASH BLOCK. COORDINATE EXACT INSTALLATION WITH EXIT SIGN ABOVE DOOR AT THIS LOCATION.
4.	PROVIDE AND INSTALL CONDENSING UNIT ON 4" CONCRETE PAD. MAINTAIN ALL MANUFACTURER'S CLEARANCES. ROUTE REFRIGERANT LINESET TO INDOOR UNIT. SEAL BUILDING PENETRATION WEATHER TIGHT. INSULATE LINESET FOR SPECIFICATIONS.
5.	SUPPORT UNIT HEATER FROM METAL BUILDING STRUCTURE SUCH THAT BOTTOM OF UNIT IS AT 10'-0" AFF. INSTALL PER MANUFACTURER'S REQUIREMENTS. PROVIDE ALL SERVICE CLEARANCES.

SEQUENCE OF OPERATIONS

1. CHLORINATION ROOM

   ENERGIZE EF-1 AND OPEN LOUVER L-1 UPON CALL FOR COOLING AT THERMOSTAT SET AT 85 DEG (ADJ). DE-ENERGIZE EF-1 AND CLOSE LOUVER L-2 WHEN TEMPERATURE IS BELOW 85 DEG (ADJ).

   ENERGIZE EF-1 AND OPEN LOUVER L-1 UPON HYDROGEN ALARM CONDITION INITIATED BY CHLORINATION PROCESS EQUIPMENT. COORDINATE WITH CHLORINATION EQUIPMENT FOR AUXILIARY CONTACTS AT ALARM CONDITION. DE- ENERGIZE EF-1 AND CLOSE LOUVER L-1 WHEN ALARM CONDITION CEASES.

   CYCLE FAN AND ENERGIZE HEAT AT EUH-2 UPON CALL FOR HEATING AT INTEGRAL THERMOSTAT SET AT 50 DEG (ADJ).

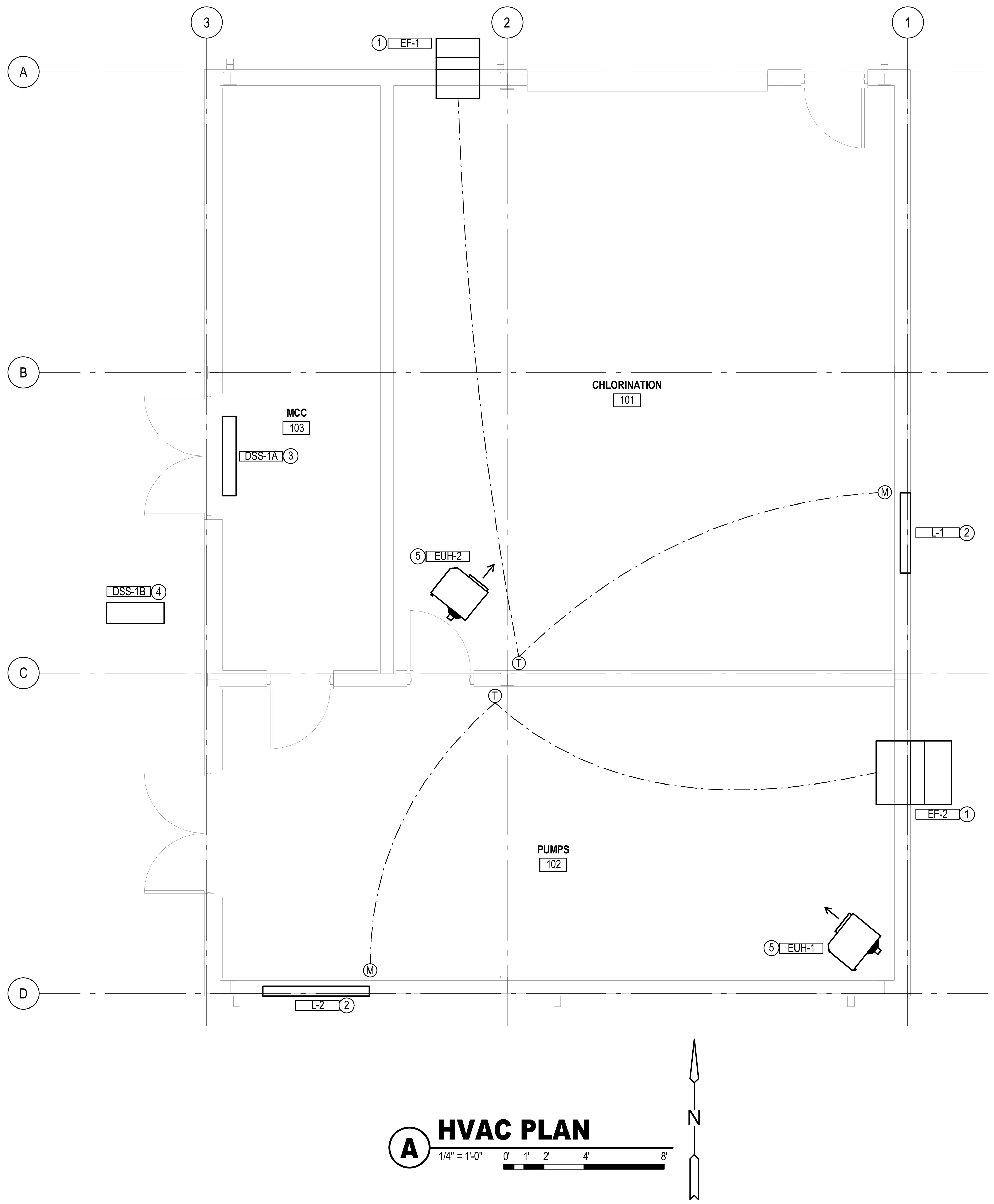
2. PUMPS ROOM

   ENERGIZE EF-2 AND OPEN LOUVER L-2 UPON CALL FOR COOLING AT THERMOSTAT SET AT 85 DEG (ADJ). DE-ENERGIZE EF-2 AND CLOSE LOUVER L-2 WHEN TEMPERATURE IS BELOW 85 DEG (ADJ).

   CYCLE FAN AND ENERGIZE HEAT AT EUH-1 UPON CALL FOR HEATING AT INTEGRAL THERMOSTAT SET AT 50 DEG (ADJ).

3. MCC

   DSS-1A SHALL CYCLE COOLING AND HEATING AS NECESSSARY TO MAINTAIN THERMOSTAT TEMPERATURE SETTINGS ADJUSTED BY OWNER.



A HVAC PLAN

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

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HVAC PLAN

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FAN SCHEDULE

MARK	MANUFACTURER	MODEL	ASSOCIATED LOUVER	TYPE	DRIVE	CFM	ESP	MOTOR (HP/W)	VOLTAGE	PHASE	FLA	MOCP	WEIGHT (LBS)	REMARKS
EF-1	GREENHECK	SE2-20-420-A	L-1	WALL	DIRECT	5,000	0.25	3/4 HP	460	1	1.6	15	56	1-4
EF-2	GREENHECK	SE2-30-618-C	L-2	WALL	DIRECT	7,000	0.25	3/4 HP	460	1	1.6	15	99	1-4

REMARKS
(1) UNIT TO BE PROVIDED WITH DISCONNECT.
(2) PROVIDE BACKDRAFT DAMPER AND WALL SLEEVE.
(3) FAN TO BE INTERLOCKED WITH ASSOCIATED PIECE OF EQUIPMENT AS SCHEDULED. SEE ELECTRICAL DOCUMENTS FOR ADDITIONAL INFORMATION.
(4) PROVIDE FAN WITH 45° WEATHER HOOD.

UNIT HEATER SCHEDULE (ELECTRIC)

MARK	MANUFACTURER	MODEL	TYPE	LOCATION	CFM	HEATING (MBH)	ELECTRICAL DATA			WEIGHT (LBS.)	REMARKS
							VOLTS	PHASE	KW		
EUH-1	REZNOR	EGHB-7	HORIZONTAL	CHLORINATION - 101	700	25	460	3	7.5	45	1-6
EUH-2	REZNOR	EGHB-7	HORIZONTAL	PUMP - 102	700	25	460	3	7.5	45	1-6

REMARKS:
(1) UNIT TO BE PROVIDED WITH HEAVY GUAGE WELDED STEEL CABINET WITH POWDER COATED FINISH AND CONTROL COMPARTMENT WITH A HINGED AND LATCHED ACCESS DOOR.
(2) UNIT TO BE PROVIDED WITH AUTOMATIC RESETTING TYPE LIMIT CONTROLS TO DEENERGIZE THE HEATER SHOULD AN OVER-TEMPERATURE SITUATION OCCUR.
(3) UNIT TO BE PROVIDED WITH TOTALLY ENCLOSED, PERMANENTLY LUBRICATED, THERMALLY PROTECTED, SINGLE PHASE MOTORS.
(4) UNIT TO BE PROVIDED WITH INTERGRAL THERMOSTAT.
(5) UNIT TO BE PROVIDED WITH WALL MOUNTING BRACKETS AND TO BE INSTALLED AS SHOWN ON PLAN.
(6) UNIT TO BE PROVIDED WITH ELECTRICAL DISCONNECT SWITCH, SUMMER FAN SWITCH AND FAN DELAY.

LOUVER SCHEDULE

MARK	MANUFACTURER	MODEL	SIZE (WXH)(IN.)	ASSOCIATED FAN	MATERIAL	FRAME TYPE	FINISH	DEPTH	FREE AREA (SQ FT)	MAX FREE AREA VELOCITY (FPM)	CFM	PRESSURE DROP (IN)	REMARKS
L-1	GREENHECK	ECD-601	48"x54"	EF-1	ALUMINUM	CHANNEL	MILL	6"	8.35	600	5,000	0.03	1-3
L-2	GREENHECK	ECD-601	54"x66"	EF-2	ALUMINUM	CHANNEL	MILL	6"	12.13	575	7,000	0.03	1-3

REMARKS
(1) PROVIDE WITH METAL BIRDSCREEN. COORDINATE FINISH WITH ARCHITECT.
(2) LOUVER TO BE A COMBINATION LOUVER/DAMPER.
(3) LOUVER TO BE PROVIDED WITH A MOTORIZED 120V ACTUATOR AND INTERLOCKED WITH ASSOCIATED FAN.

DUCTLESS SPLIT SYSTEM SCHEDULE

MARK	MANUFACTURER	INDOOR UNIT MODEL	OUTDOOR UNIT MODEL	AIRFLOW (CFM)		HEATING (MBh)	ELECTRIC DATA					REMARKS
					TOTAL		VOLTS	PHASE	FLA	MCA	MOCP	
DSS-1A/1B	LG	LSN360HSV3	LSU360HSV3	795	22	35.2	208	1	15.40	19	25	1,2,3,4

REMARKS:
(1) INDOOR UNIT IS POWERED FROM OUTDOOR UNIT.
(2) E.C. TO PROVIDE ELECTRICAL DISCONNECTS.
(3) ALL INDOOR UNITS SHALL BE FURNISHED FROM FACTORY WITH CONTROL RELAY / TRANSFORMER KITS AND 24 VOLT 7 DAY DIGITAL PROGRAMMABLE THERMOSTATS.
(4) OUTDOOR UNIT SHALL BE FURNISHED FROM FACTORY WITH HARD START KITS AND LOW AMBIENT CONTROLS.

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RE-USE WATER PUMP STATION
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MECHANICAL DETAILS & SCHEDULES

PROJECT NO.	468-85112
DATE	04/18/16
SCALE	AS NOTED

DESIGNED	DRAWN	CHECKED
RLB	MSS	RLB

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0	ISSUED FOR CONSTRUCTION	04/18/16

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SECTION 15010 - BASIC MECHANICAL REQUIREMENTS

PART 1 - GENERAL

1.1 CODES AND REGULATORY REQUIREMENTS

A. EXECUTE WORK IN COMPLIANCE WITH ALL APPLICABLE FEDERAL, STATE AND MUNICIPAL LAWS, CODES, ORDINANCES, AND LOCAL CUSTOMS REGARDING THE TRADE TO PERFORM THE WORK.

B. CODES SHALL GOVERN IN CASE OF ANY DIRECT CONFLICT BETWEEN CODES AND PLANS AND SPECIFICATIONS; EXCEPT WHEN PLANS AND SPECIFICATIONS REQUIRE HIGHER STANDARDS THAN THOSE REQUIRED BY CODE. VARIANCE FROM THE PLAN AND SPECIFICATIONS MADE TO COMPLY WITH CODE MUST BE APPROVED BY OWNER. IF APPROVED THEY SHALL BE MADE WITH NO INCREASED COST TO OWNER.

C. IN ADDITION, THE FOLLOWING PUBLISHED STANDARDS AND REGULATIONS SHALL BE ADHERED TO AS APPLICABLE TO THE WORK INVOLVED.
1. APPLICABLE NFPA PAMPHLETS.
2. APPLICABLE ANSI STANDARDS.
3. CURRENT EDITIONS OF INTERNATIONAL BUILDING CODE, INTERNATIONAL MECHANICAL CODE AND UNIFORM PLUMBING CODE.

1.2 SUBMITTALS

A. SUBMIT TECHNICAL PRODUCT DATA FOR EQUIPMENT INCLUDING SPECIFICATIONS, CAPACITY RATINGS, PERFORMANCE CURVES WITH OPERATING POINT CLEARLY INDICATED, GAUGES, AND FINISHES OF MATERIALS, DIMENSIONS, WEIGHTS, ACCESSORIES FURNISHED, WIRING DIAGRAMS, INSTALLATION INSTRUCTION AND MAINTENANCE DATA.

B. INCREASE, BY THE QUANTITY LISTED BELOW, THE NUMBER OF MECHANICAL RELATED SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES SUBMITTED, TO ALLOW FOR REQUIRED DISTRIBUTION PLUS ONE COPY OF EACH SUBMITTAL REQUIRED, WHICH WILL BE RETAINED BY THE MECHANICAL CONSULTING ENGINEER.
1. SHOP DRAWINGS - INITIAL SUBMITTAL: 1 ADDITIONAL BLUE OR BLACK LINE PRINTS.
2. PRODUCT DATA: 1 ADDITIONAL COPY OF EACH ITEM.
3. SAMPLES: 1 ADDITIONAL SET.

C. ADDITIONAL COPIES MAY BE REQUIRED BY INDIVIDUAL SECTIONS OF THESE SPECIFICATIONS.

D. SUBMITTAL OF SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES WILL BE ACCEPTED ONLY WHEN SIGNED AND SUBMITTED BY THE MECHANICAL CONTRACTOR AND THE GENERAL CONTRACTOR.

1.3 RECORD DOCUMENTS

A. PREPARE RECORD DOCUMENTS IN ACCORDANCE WITH THE REQUIREMENTS IN SPECIAL AND GENERAL CONDITIONS CONTRACTOR - FURNISHED DRAWINGS, DATA, SAMPLES AND PRODUCT OPTIONS AND AS-BUILT DATA." THESE DRAWINGS SHALL REFLECT THE ACTUAL "AS-BUILT" CONDITION INCLUDING ANY CHANGE ORDERS, OF THE MECHANICAL SYSTEMS AND INSTALLATION. IN ADDITION TO THE REQUIREMENTS SPECIFIED IN SPECIAL AND GENERAL CONDITIONS, INDICATE THE FOLLOWING INSTALLED CONDITIONS:

1. EQUIPMENT LOCATIONS (EXPOSED AND CONCEALED), DIMENSIONED FROM PROMINENT BUILDING LINES.
2. APPROVED SUBSTITUTIONS, CONTRACT MODIFICATIONS, AND ACTUAL EQUIPMENT AND MATERIALS INSTALLED.
3. CONTRACT MODIFICATIONS, ACTUAL EQUIPMENT AND MATERIALS INSTALLED.

1.4 OPERATING AND MAINTENANCE DATA

A. SUBMISSION: SUBMIT TWO TYPED AND BOUND COPIES OF OPERATING AND MAINTENANCE MANUAL, 8-1/2 X 11 INCHES IN SIZE TO THE ENGINEER FOR APPROVAL PRIOR TO SCHEDULING ANY SYSTEMS DEMONSTRATION FOR THE OWNER.

B. REQUIREMENT CONTENTS: MANUALS SHALL HAVE INDEX WITH TAB DIVIDERS FOR EACH MAJOR EQUIPMENT SECTION TO FACILITATE LOCATING INFORMATION ON SPECIFIC PIECE OF EQUIPMENT. IDENTIFY DATA WITHIN EACH SECTION WITH DRAWING CODE NUMBERS AS THEY APPEAR ON DRAWINGS AND SPECIFICATIONS. INCLUDE AS MINIMUM THE FOLLOWING DATA:
1. ALPHABETICAL LIST OF SYSTEM COMPONENTS, WITH THE NAME, ADDRESS AND 24 HOUR TELEPHONE NUMBER OF THE COMPANY RESPONSIBLE FOR SERVICING AND EACH ITEM DURING THE FIRST YEAR OF OPERATION.
2. OPERATING INSTRUCTIONS FOR COMPLETE SYSTEM INCLUDING:
   A. EMERGENCY PROCEDURES FOR FIRE OR FAILURE OF MAJOR EQUIPMENT.
   B. MAJOR START, OPERATION AND SHUTDOWN PROCEDURES.
3. MAINTENANCE INSTRUCTIONS INCLUDING:
   A. VALVE TAGS AND OTHER IDENTIFIED EQUIPMENT LISTS.
   B. PROPER LUBRICANTS AND LUBRICATING INSTRUCTIONS FOR EACH PIECE OF EQUIPMENT.
   C. NECESSARY CLEANING, REPLACEMENT AND/OR ADJUSTMENT SCHEDULE.
4. PRODUCT DATA ON EACH PIECE OF EQUIPMENT INCLUDING:
   A. INSTALLATION INSTRUCTIONS.
   B. DRAWINGS AND SPECIFICATIONS.
   C. PARTS LISTS.
   D. COMPLETE WIRING AND TEMPERATURE CONTROL DIAGRAMS (AS-BUILT).
   E. MARKED OR CHANGED PRINTS LOCATING CONCEALED PARTS AND VARIATIONS FROM THE ORIGINAL SYSTEM DESIGN.

1.5 WARRANTIES

A. IN ADDITION TO THE REQUIREMENTS IN THE SPECIAL AND GENERAL CONDITIONS REFER TO INDIVIDUAL EQUIPMENT SPECIFICATIONS FOR WARRANTY REQUIREMENTS.

B. COMPILE AND ASSEMBLE THE WARRANTIES, INTO A SEPARATED SET OF VINYL COVERED, THREE RING BINDERS, TABULATED AND INDEXED FOR EASY REFERENCE.

C. PROVIDE COMPLETE WARRANTY INFORMATION FOR EACH ITEM TO INCLUDE PRODUCT OR EQUIPMENT TO INCLUDE DATE OF BEGINNING OF WARRANTY OR BOND; DURATION OF WARRANTY OR BOND; AND NAMES, ADDRESSES, AND TELEPHONE NUMBERS AND PROCEDURES FOR FILING A CLAIM AND OBTAINING WARRANTY SERVICES.

D. THIS CONTRACTOR SHALL WARRANT ALL MATERIAL AND EQUIPMENT INSTALLED BY HIM FOR A PERIOD OF 1 YEAR AFTER COMPLETION OF THE PROJECT.

END OF SECTION 15010

SECTION 15767 - PROPELLER ELECTRIC UNIT HEATERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS
A. DRAWINGS AND GENERAL PROVISIONS OF THE CONTRACT, INCLUDING GENERAL AND SUPPLEMENTARY CONDITIONS AND OTHER DIVISION 1 SPECIFICATION SECTIONS, APPLY TO THIS SECTION.

1.2 QUALITY ASSURANCE
A. ELECTRICAL COMPONENTS, DEVICES, AND ACCESSORIES: LISTED AND LABELED AS DEFINED IN NFPA 70, ARTICLE 100, BY A TESTING AGENCY ACCEPTABLE TO AUTHORITIES HAVING JURISDICTION, AND MARKED FOR INTENDED USE.

PART 2 - PRODUCTS

2.1 MANUFACTURERS
A. MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY ONE OF THE FOLLOWING:
1. REZNOR.
2. INDEECO.
4. MODINE.
5 RUFFNECK HEATERS
6. TRANE.

2.2 UNIT HEATERS
A. DESCRIPTION: AN ASSEMBLY INCLUDING CASING, COIL, FAN, AND MOTOR IN HORIZONTAL DISCHARGE CONFIGURATION WITH ADJUSTABLE DISCHARGE LOUVERS.

2.3 CASING
A. 14 GA CABINET: REMOVABLE PANELS FOR MAINTENANCE ACCESS TO CONTROLS.
B. CABINET FINISH: MANUFACTURER'S STANDARD EPOXY COATING APPLIED TO FACTORY-ASSEMBLED AND -TESTED PROPELLER UNIT HEATER BEFORE SHIPPING.
C. DISCHARGE LOUVER: ADJUSTABLE FIN DIFFUSER FOR HORIZONTAL UNITS.

2.4 ELECTRIC-RESISTANCE HEATING ELEMENTS
A. STAINLESS STEEL TUBULAR.

2.5 FAN
A. PROPELLER TYPE, ALUMINUM WHEEL DIRECTLY MOUNTED ON MOTOR SHAFT IN THE FAN VENTURI.

2.6 FAN MOTORS
A. MOTOR TYPE: THERMALLY PROTECTED, TOTALLY ENCLOSED, FACTORY LUBRICATED.

2.7 CONTROLS
A. CONTROL DEVICES:
1. UNIT-MOUNTED FAN-SPEED SWITCH.
2. UNIT-MOUNTED THERMOSTAT.

PART 3 - EXECUTION

3.1 EXAMINATION
A. EXAMINE AREAS TO RECEIVE PROPELLER UNIT HEATERS FOR COMPLIANCE WITH REQUIREMENTS FOR INSTALLATION TOLERANCES AND OTHER CONDITIONS AFFECTING PERFORMANCE.
B. EXAMINE ROUGHING-IN FOR PIPING AND ELECTRICAL CONNECTIONS TO VERIFY ACTUAL LOCATIONS BEFORE PROPELLER UNIT-HEATER INSTALLATION.
C. PROCEED WITH INSTALLATION ONLY AFTER UNSATISFACTORY CONDITIONS HAVE BEEN CORRECTED.

3.2 INSTALLATION
A. INSTALL PROPELLER UNIT HEATERS LEVEL AND PLUMB.
B. INSTALL PROPELLER UNIT HEATERS TO COMPLY WITH NFPA 90A.
C. SUSPEND PROPELLER UNIT HEATERS FROM STRUCTURE WITH ALL-THREAD HANGER RODS.

3.3 CONNECTIONS
A. ELECTRICAL INSTALLATION REQUIREMENTS ARE SPECIFIED IN OTHER SPECIFICATION SECTIONS.
B. INSTALL ELECTRICAL CONDUIT ADJACENT TO MACHINE TO ALLOW SERVICE AND MAINTENANCE.

END OF SECTION 15767

SECTION 15820 - LOUVERS AND DAMPERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS
A. DRAWINGS AND GENERAL PROVISIONS OF THE CONTRACT, INCLUDING GENERAL AND SUPPLEMENTARY CONDITIONS AND DIVISION 1 SPECIFICATION SECTIONS, APPLY TO THIS SECTION.

1.2 SUMMARY
A. THIS SECTION INCLUDES THE FOLLOWING:
1. COMBINATION DAMPER/LOUVERS

1.3 SUBMITTALS
A. PRODUCT DATA: FOR THE FOLLOWING:.
1. COMBINATION DAMPER/LOUVERS

B. SHOP DRAWINGS: DETAIL EQUIPMENT ASSEMBLIES AND INDICATE DIMENSIONS, WEIGHTS, LOADS, REQUIRED CLEARANCES, METHOD OF FIELD ASSEMBLY, COMPONENTS, AND LOCATION AND SIZE OF EACH FIELD CONNECTION.
1. MOTORIZED-CONTROL DAMPER INSTALLATIONS.
2. WIRING DIAGRAMS: POWER, SIGNAL, AND CONTROL WIRING..

1.4 QUALITY ASSURANCE
A. COMPLY WITH NFPA 90A, "INSTALLATION OF AIR CONDITIONING AND VENTILATING SYSTEMS," AND NFPA 90B, "INSTALLATION OF WARM AIR HEATING AND AIR CONDITIONING SYSTEMS."

PART 2 - PRODUCTS

2.1 COMBINATION LOUVER/DAMPERS
A. MANUFACTURERS:
1. ARROW UNITED INDUSTRIES
2. LOUVERS AND DAMPERS
3. RUSKIN
4. GREENHECK.
5. METALAIRE.

B. GENERAL DESCRIPTION: AMCA-RATED, PARALLEL BLADE DESIGN; EXTRUDED ALUMINUM 6063-T6/T52 ALLOY FRAME AND BLADE, FRAME 0.080" THICK, BLADE 0.80" THICK ON 4-1/2" CTRS.
1. ADJUSTABLE BLADE: EXTRUDED ALUMINUM 6063-T6/T52 ALLOY, 0.125" THICK.
2. LINKAGE: EXTRUDED ALUMINUM, CONCEALED IN CHANNEL OUT OF AIRSTREAM. PIVOTS ARE 0.5" DIA. MACHINED STEEL, CADMIUM PLATED AND CHROMATE TREATED. PIVOTS ROTATE INA CELCON BEARING. A 0.312" DIA ALUMINUM LINKAGE ROD IS LOCKED TO THE PIVOT BY A SET SCREW WITH AN EPOXY LOCKING PATCH.
3. SHAFTS: 0.5" DIA. ALUMINUM "PIN-LOCK" ROD.
4. SEALS: EXTRUDED SILICONE RUBBER SEAL AT BLADE EDGE. STAINLESS STEEL AT JAMB.
5. BIRD SCREEN: 0.5" FLATTENED ALUMINUM, 0.051" THICK.
6. PROVIDE LOUVERS WITH WATER PENETRATION AND PRESSURE DROP NO GREATER THAN SPECIFIED LOUVER, AND WITH FREE AREA NO LESS THAN SPECIFIED LOUVER.
7. PROVIDE 120 VOLT DAMPER OPERATORS WITH SPRING RETURN & AUXILIARY END SWITCH.

PART 3 - EXECUTION

3.1 APPLICATION AND INSTALLATION
A. INSTALL DUCT ACCESSORIES ACCORDING TO APPLICABLE DETAILS IN SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS--METAL AND FLEXIBLE" FOR METAL DUCTS.
B. PROVIDE DUCT ACCESSORIES OF MATERIALS SUITED TO DUCT MATERIALS.

END OF SECTION 15820

SECTION 15870 - POWER VENTILATORS

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK
A. EXTENT OF POWER VENTILATOR WORK REQUIRED BY THIS SECTION IS INDICATED ON DRAWINGS AND SCHEDULES, AND BY REQUIREMENTS OF THIS SECTION.

1.2 QUALITY ASSURANCE
A. CODES AND STANDARDS:
8. AMCA COMPLIANCE: PROVIDE LOUVERS, POWER VENTILATORS AND PENTHOUSES WHICH HAVE BEEN TESTED AND RATED IN ACCORDANCE WITH AMCA STANDARDS, AND BEAR AMCA CERTIFIED RATINGS SEAL
9. UL COMPLIANCE: PROVIDE POWER VENTILATORS WHICH ARE DESIGNED, MANUFACTURED, AND TESTED IN ACCORDANCE WITH UL 705 "POWER VANTILATORS."
10. NEMA COMPLIANCE: PROVIDE MOTORS AND ELECTRICAL ACCESSORIES COMPLYING WITH NEMA STANDARDS.

1.3 SUBMITTALS
A. PRODUCT DATA: SUBMIT MANUFACTURER'S TECHNICAL DATA FOR POWER VENTILATORS, INCLUDING SPECIFICATIONS, CAPACITY RATINGS, DIMENSIONS, WEIGHTS, MATERIALS, ACCESSORIES FURNISHED, AND INSTALLED INSTRUCTIONS.

PART 2 - PRODUCTS

2.1 WALL MOUNTED EXHAUST FANS
A. GENERAL: EXCEPT AS OTHERWISE INDICATED, PROVIDE STANDARD PREFABRICATED POWER VENTILATOR UNITS OF TYPE AND SIZE INDICATED, MODIFIED AS NECESSARY TO COMPLY WITH REQUIREMENTS, AND AS REQUIRED FOR COMPLETE INSTALLATION.
B. DRIVES: PULLEYS AND BELTS FOR BELT DRIVE UNITS SHALL BE DESIGNED AND SELECTED FOR 150% (MINIMUM) OF THE MOTOR HORSEPOWER. ADJUSTABLE SHEAVE, BELT GUARD.
C. MANUFACTURERS:
1. AEROVENT
2. HARTZELL
3. BUFFALO
4. COOK
5. GREENHECK
6. PENN
7. JENNAIR

2.2 DIRECT DRIVE, AXIAL SIDEWALL PROPELLER FANS
A. FANS SHALL BE OF THE DIRECT DRIVE PANEL TYPE AND SHALL BE OF THE SIZE AND CAPACITY AS INDICATED IN THE FAN SCHEDULE. DIRECT DRIVE PANEL FANS SHALL BE TESTED AND CERTIFIED IN ACCORDANCE WITH ANSI/ASHRAE 51-1985 AND ANSI/AMCA 210-85 TEST CODES AND GUARANTEED BY THE MANUFACTURER TO DELIVER AT THE RATED PUBLISHED PERFORMANCE LEVEL. IN ADDITION, EACH UNIT SHALL BE FACTORY RUN TESTED PRIOR TO SHIPMENT. THE DIRECT DRIVE PANEL FANS MUST BE LICENSED TO BEAR THE AMCA CERTIFIED RATING SEAL FOR AIR PERFORMANCE.

B. CONSTRUCTION - THE FAN CASING SHALL BE CONSTRUCTED OF MILD STEEL WITH AN INTEGRAL DEEP SPUN ORIFICE PANEL OR RING.

-FOR PANEL SIZES THROUGH 21", THE HOUSING WILL BE 16-GAUGE.
-FOR PANEL SIZES 24" THROUGH 48", THE HOUSING WILL BE 14-GAUGE.
-FOR PANEL SIZES 54" THROUGH 72", THE HOUSING WILL BE 12-GAUGE.

C. THE DIRECT DRIVE PANEL FANS SHALL BE CONSTRUCTED WITH A WELDED REINFORCED MOTOR BASE PLATE WHICH IS SUPPORTED BY A WELDED SPIDER TYPE FRAME. THIS CONSTRUCTION ALLOWS FOR MOUNTING THE UNIT FROM THE FLANGED FRONT ENTRANCE ORIFICE.

D. PROPELLERS - THE PRECISION AIRFOIL FAN BLADES AND HUB SHALL BE CAST OF A319 ALUMINUM ALLOY. THE PROPELLER SHALL BE MOUNTED DIRECTLY ON THE MOTOR SHAFT.

E. BALANCING - THE PROPELLER ASSEMBLY SHALL BE STATICALLY AND DYNAMICALLY BALANCED IN ACCORDANCE WITH ANSI / AMCA 204 - 96 "BALANCE QUALITY AND VIBRATION LEVELS FOR FANS" TO FAN APPLICATION CATEGORY BV - 3, BALANCE QUALITY GRADE G6.3.

F. MOTORS - FAN MOTORS SHALL BE FOOT-MOUNTED NEMA DESIGN B, STANDARD INDUSTRIAL CONTINUOUS DUTY, BALL BEARING, VARIABLE TORQUE TYPE SUITABLE FOR OPERATION ON VOLTAGE, PHASE AND HERTZ, AS LISTED IN THE FAN SCHEDULE. MOTOR BEARINGS SHALL HAVE A MINIMUM L-10 LIFE, AS DEFINED BY AFBMA, OF AT LEAST 40,000 HOURS (200,000 HOURS AVERAGE LIFE).

G. FINISH - THE UNIT, AFTER FABRICATION, SHALL BE CLEANED AND CHEMICALLY PRETREATED BY A PHOSPHATIZING PROCESS AND SHALL BE PAINTED INSIDE AND OUTSIDE WITH AN AIR DRY ENAMEL.

H. ACCESSORIES -
1. MOTORIZED DAMPER (STEEL/ALUMINUM)
2. WEATHERHOOD WITH BIRDSCREEN
3. DISCONNECT SWITCH
4. FULL ASSEMBLY
5. WALL SLEEVE

PART 3 - EXECUTION

3.1 INSPECTION
A. GENERAL: EXAMINE AREAS AND CONDITIONS UNDER WHICH POWER VENTILATORS ARE TO BE INSTALLED. DO NOT PROCEED WITH WORK UNTIL UNSATISFACTORY CONDITIONS HAVE BEEN CORRECTED.

3.2 INSTALLATION OF WALL MOUNTED FANS AND HOODS
A. GENERAL: EXCEPT AS OTHERWISE INDICATED OR SPECIFIED, INSTALL VENTILATORS IN ACCORDANCE WITH MANUFACTURER'S INSTALLATION INSTRUCTIONS AND RECOGNIZED INDUSTRY PRACTICES TO INSURE THAT VENTILATORS SERVE THEIR INTENDED FUNCTION. INSTALL EXHAUST FANS SO THAT IT MAY BE REMOVED FOR ACCESS TO THE DAMPERS.
B. COORDINATE VENTILATOR WORK WITH WORK OF WALLS AND CEILINGS, AS NECESSARY FOR PROPER INTERFACING.
C. ELECTRICAL WIRING: INSTALL ELECTRICAL DEVICES FURNISHED BY MANUFACTURER BUT NOT SPECIFIED TO BE FACTORY MOUNTED. FURNISH COPY OF MANUFACTURER'S WIRING DIAGRAM SUBMITTAL TO ELECTRICAL INSTALLER.
1. VERIFY THAT ELECTRICAL WIRING INSTALLATION IS IN ACCORDANCE WITH MANUFACTURER'S SUBMITTAL AND INSTALLATION REQUIREMENTS OF DIVISION 16 SECTIONS. VERIFY PROPER ROTATION DIRECTION OF FAN WHEELS. DO NOT PROCEED WITH EQUIPMENT STARTUP UNTIL WIRING INSTALLATION IS ACCEPTABLE TO EQUIPMENT INSTALLER.
D. REMOVE SHIPPING BOLTS AND TEMPORARY SUPPORTS WITHIN VENTILATORS. ADJUST DAMPERS FOR FREE OPERATION.

END OF SECTION 15870

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CITY OF WICHITA, KANSAS

RE-USE WATER PUMP STATION

TO SERVE SPIRT AEROSYSTEMS

MECHANICAL SPECIFICATIONS

PROJECT NO.	468-85112
DATE	04/18/16
SCALE	AS NOTED

DESIGNED	DRAWN	CHECKED
RLB	CJK	RLB

NO.	REVISION	DATE
0	ISSUED FOR CONSTRUCTION	04/18/16

SHEET NO.

M4.0

EDWARD A. BARTLETT — 14093 — 4/18/16 — KANSAS — PROFESSIONAL ENGINEER

C:\Users\cjksmn\Documents\19923 - COW WATER PUMP - MEP_cjksmn.rvt

SECTION 15880 - SPLIT-SYSTEM AIR-CONDITIONERS

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 CLOSEOUT SUBMITTALS

A. OPERATION AND MAINTENANCE DATA: FOR SPLIT-SYSTEM AIR-CONDITIONING UNITS TO INCLUDE IN EMERGENCY, OPERATION, AND MAINTENANCE MANUALS.

1.3 QUALITY ASSURANCE

A. ELECTRICAL COMPONENTS, DEVICES, AND ACCESSORIES: LISTED AND LABELED AS DEFINED IN NFPA 70, BY A QUALIFIED TESTING AGENCY, AND MARKED FOR INTENDED LOCATION AND APPLICATION.

B. ASHRAE COMPLIANCE:

1. FABRICATE AND LABEL REFRIGERATION SYSTEM TO COMPLY WITH ASHRAE 15, "SAFETY STANDARD FOR REFRIGERATION SYSTEMS."

2. ASHRAE COMPLIANCE: APPLICABLE REQUIREMENTS IN ASHRAE 62.1, SECTION 4 - "OUTDOOR AIR QUALITY," SECTION 5 - "SYSTEMS AND EQUIPMENT," SECTION 6 - " PROCEDURES," AND SECTION 7 - "CONSTRUCTION AND SYSTEM START-UP.

1.4 COORDINATION

A. COORDINATE SIZES AND LOCATIONS OF CONCRETE BASES WITH ACTUAL EQUIPMENT PROVIDED. CAST ANCHOR-BOLT INSERTS INTO BASES.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY ONE OF THE FOLLOWING:

1. ENVIROMASTER
2. LG
3. MITSUBISHI ELECTRIC & ELECTRONICS USA, INC.; HVAC ADVANCED PRODUCTS DIVISION.
4. SANYO NORTH AMERICA CORPORATION; SANYO FISHER COMPANY.

2.2 INDOOR UNITS (5 TONS OR LESS)

A. WALL MOUNTED EVAPORATOR-FAN COMPONENTS:

1. REFRIGERANT COIL: COPPER TUBE, WITH MECHANICALLY BONDED ALUMINUM FINS AND THERMAL-EXPANSION VALVE. COMPLY WITH ARI 206/110.
2. ELECTRIC COIL: HELICAL, NICKEL-CHROME, RESISTANCE-WIRE HEATING ELEMENTS; WITH REFRACTORY CERAMIC SUPPORT BUSHINGS, AUTOMATIC-RESET THERMAL CUTOUT, BUILT-IN MAGNETIC CONTACTORS, MANUAL-RESET THERMAL CUTOUT, AIRFLOW PROVING DEVICE, AND ONE-TIME FUSES IN TERMINAL BOX FOR OVERCURRENT PROTECTION.
3. FAN: FORWARD-CURVED, DOUBLE-WIDTH WHEEL OF GALVANIZED STEEL; DIRECTLY CONNECTED TO MOTOR.
4. FAN MOTORS:
   a. MULTITAPPED, MULTISPEED WITH INTERNAL THERMAL PROTECTION AND PERMANENT LUBRICATION.
   b. WIRING TERMINATIONS: CONNECT MOTOR TO CHASSIS WIRING WITH PLUG CONNECTION.
5. FILTERS: PERMANENT, WASHABLE.
6. CONDENSATE DRAIN PANS:
   a. SINGLE-WALL, POLYSTYRENE.
   b. DRAIN CONNECTION: LOCATED AT LOWEST POINT OF PAN AND SIZED TO PREVENT OVERFLOW. TERMINATE WITH THREADED NIPPLE ON ONE END OF PAN.

2.3 OUTDOOR UNITS (5 TONS OR LESS)

A. AIR-COOLED, COMPRESSOR-CONDENSER COMPONENTS:

1. CASING: STEEL, FINISHED WITH BAKED ENAMEL IN COLOR SELECTED BY ARCHITECT, WITH REMOVABLE PANELS FOR ACCESS TO CONTROLS, WEEP HOLES FOR WATER DRAINAGE, AND MOUNTING HOLES IN BASE. PROVIDE BRASS SERVICE VALVES, FITTINGS, AND GAGE PORTS ON EXTERIOR OF CASING.
2. COMPRESSOR: HERMETICALLY SEALED WITH CRANKCASE HEATER AND MOUNTED ON VIBRATION ISOLATION DEVICE. COMPRESSOR MOTOR SHALL HAVE THERMAL- AND CURRENT-SENSITIVE OVERLOAD DEVICES, START CAPACITOR, RELAY, AND CONTACTOR.
   a. COMPRESSOR TYPE: SCROLL.
   b. REFRIGERANT CHARGE: R-410A.
   c. REFRIGERANT COIL: COPPER TUBE, WITH MECHANICALLY BONDED ALUMINUM FINS AND LIQUID SUBCOOLER. COMPLY WITH ARI 206/110.
3. HEAT-PUMP COMPONENTS: REVERSING VALVE AND LOW-TEMPERATURE-AIR CUTOFF THERMOSTAT.
4. FAN: ALUMINUM-PROPELLER TYPE, DIRECTLY CONNECTED TO MOTOR.
5. MOTOR: PERMANENTLY LUBRICATED, WITH INTEGRAL THERMAL-OVERLOAD PROTECTION.
6. LOW AMBIENT KIT: PERMITS OPERATION DOWN TO 0 DEG F.

2.4 ACCESSORIES

A. THERMOSTAT: LOW VOLTAGE WITH SUBBASE TO CONTROL COMPRESSOR AND EVAPORATOR FAN.

B. AUTOMATIC-RESET TIMER TO PREVENT RAPID CYCLING OF COMPRESSOR.

C. REFRIGERANT LINE KITS: SOFT-ANNEALED COPPER SUCTION AND LIQUID LINES FACTORY CLEANED, DRIED, PRESSURIZED, AND SEALED; FACTORY-INSULATED SUCTION LINE WITH FLARED FITTINGS AT BOTH ENDS.

D. DRAIN HOSE: FOR CONDENSATE.

E. WIND BAFFLE FOR LOW AMBIENT OPERATION.

PART 3 - EXECUTION

3.1 INSTALLATION

A. INSTALL UNITS LEVEL AND PLUMB.

B. INSTALL EVAPORATOR-FAN COMPONENTS USING MANUFACTURER'S STANDARD MOUNTING DEVICES SECURELY FASTENED TO BUILDING STRUCTURE.

C. EQUIPMENT MOUNTING:

1. INSTALL GROUND-MOUNTED, COMPRESSOR-CONDENSER COMPONENTS ON CAST-IN-PLACE CONCRETE EQUIPMENT BASE(S).

D. INSTALL AND CONNECT PRECHARGED REFRIGERANT TUBING TO COMPONENT'S QUICK-CONNECT FITTINGS. INSTALL TUBING TO ALLOW ACCESS TO UNIT.

3.2 FIELD QUALITY CONTROL

A. MANUFACTURER'S FIELD SERVICE: ENGAGE A FACTORY-AUTHORIZED SERVICE REPRESENTATIVE TO INSPECT, TEST, AND ADJUST COMPONENTS, ASSEMBLIES, AND EQUIPMENT INSTALLATIONS, INCLUDING CONNECTIONS.

3.3 STARTUP SERVICE

A. PERFORM STARTUP SERVICE.

1. COMPLETE INSTALLATION AND STARTUP CHECKS ACCORDING TO MANUFACTURER'S WRITTEN INSTRUCTIONS.

END OF SECTION 15880

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TO SERVE SPIRT AEROSYSTEMS

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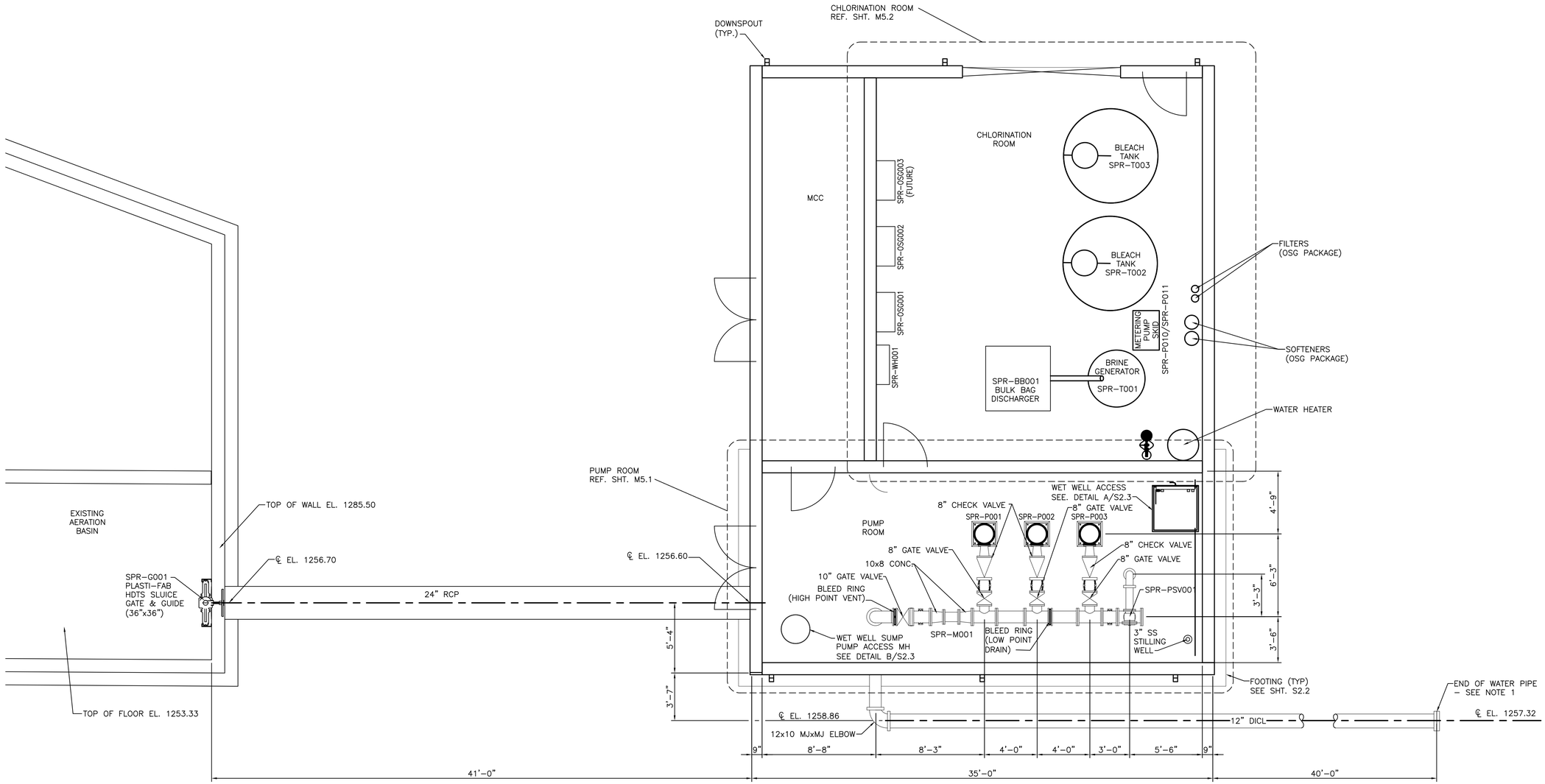
SHEET NO.

M4.1



MECHANICAL PLAN

N

4 2 0 4 8

SCALE IN FEET

NOTES:
1. CONTRACTOR TO INSTALL 12" DI BLIND FLANGE AT END OF PIPE AND SET A LATH AT THE SURFACE WITH THE FOLLOWING TEXT "END OF PIPE" SO THAT IT IS EASILY LOCATED BY THE PIPELINE CONTRACTOR.

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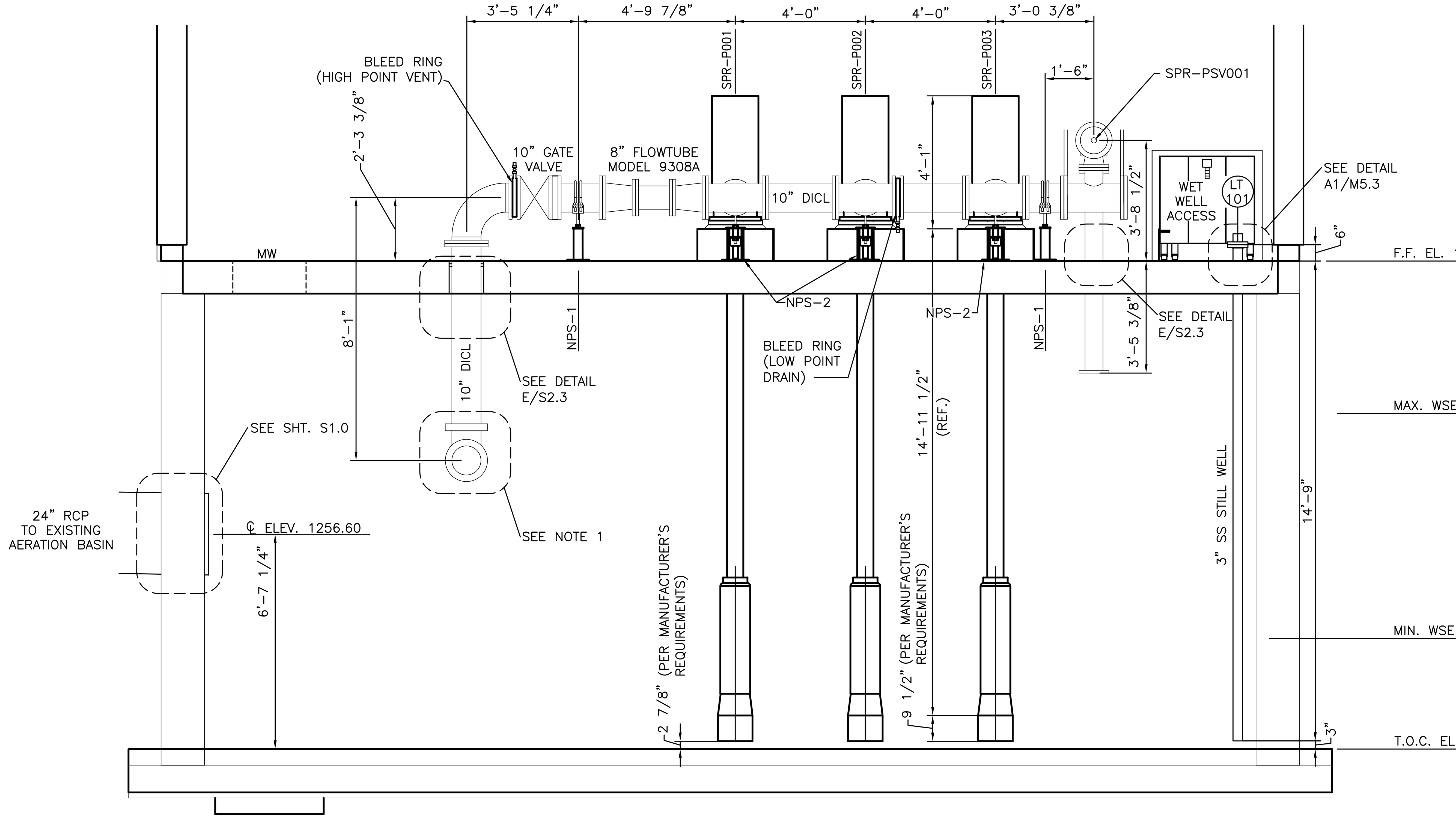
SHEET NO.

M5.0

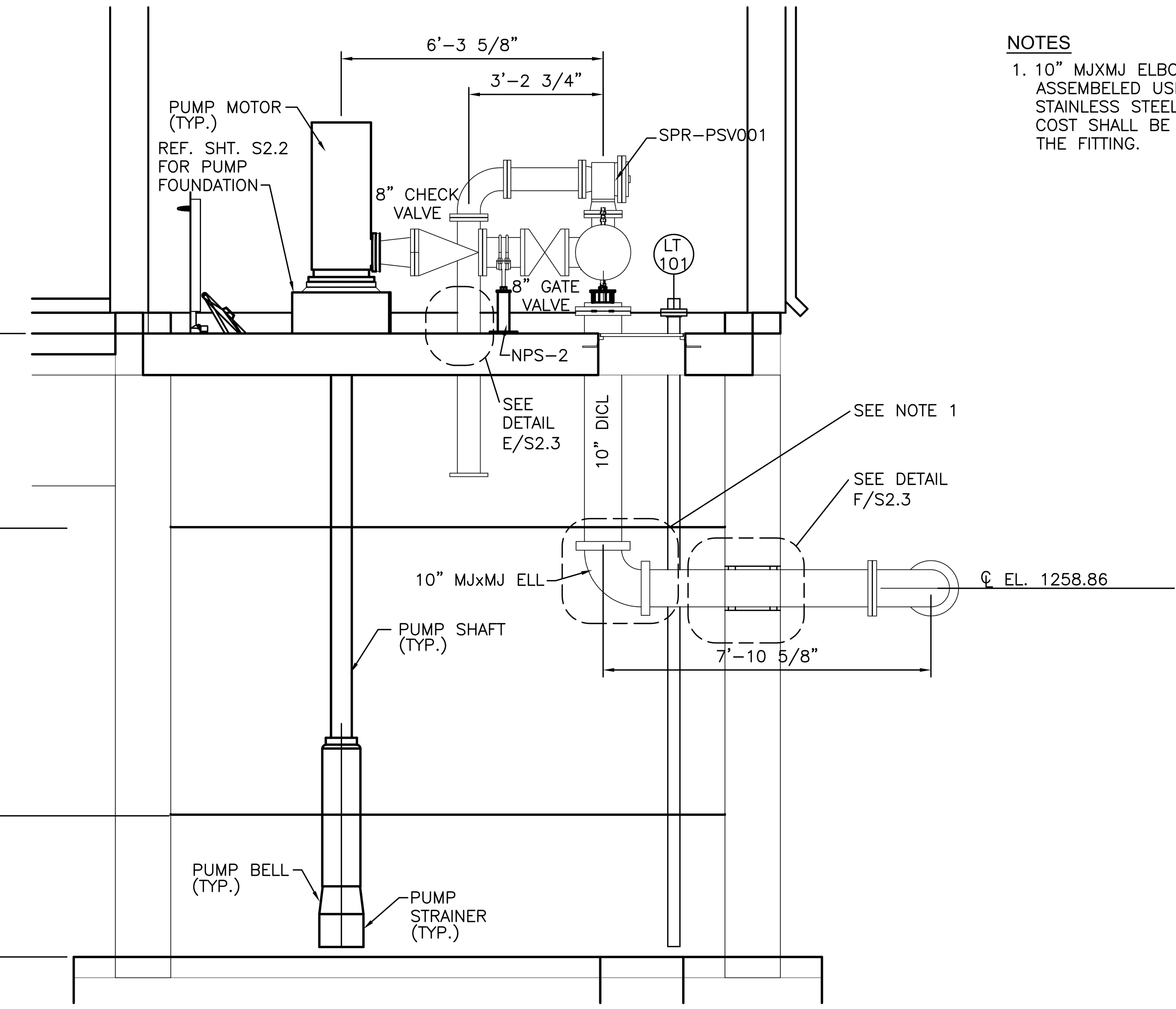
KEITH T. SCARBERRY LICENSED 21496 KANSAS PROFESSIONAL ENGINEER



AA ELEVATION A-A

(LOOKING NORTH)

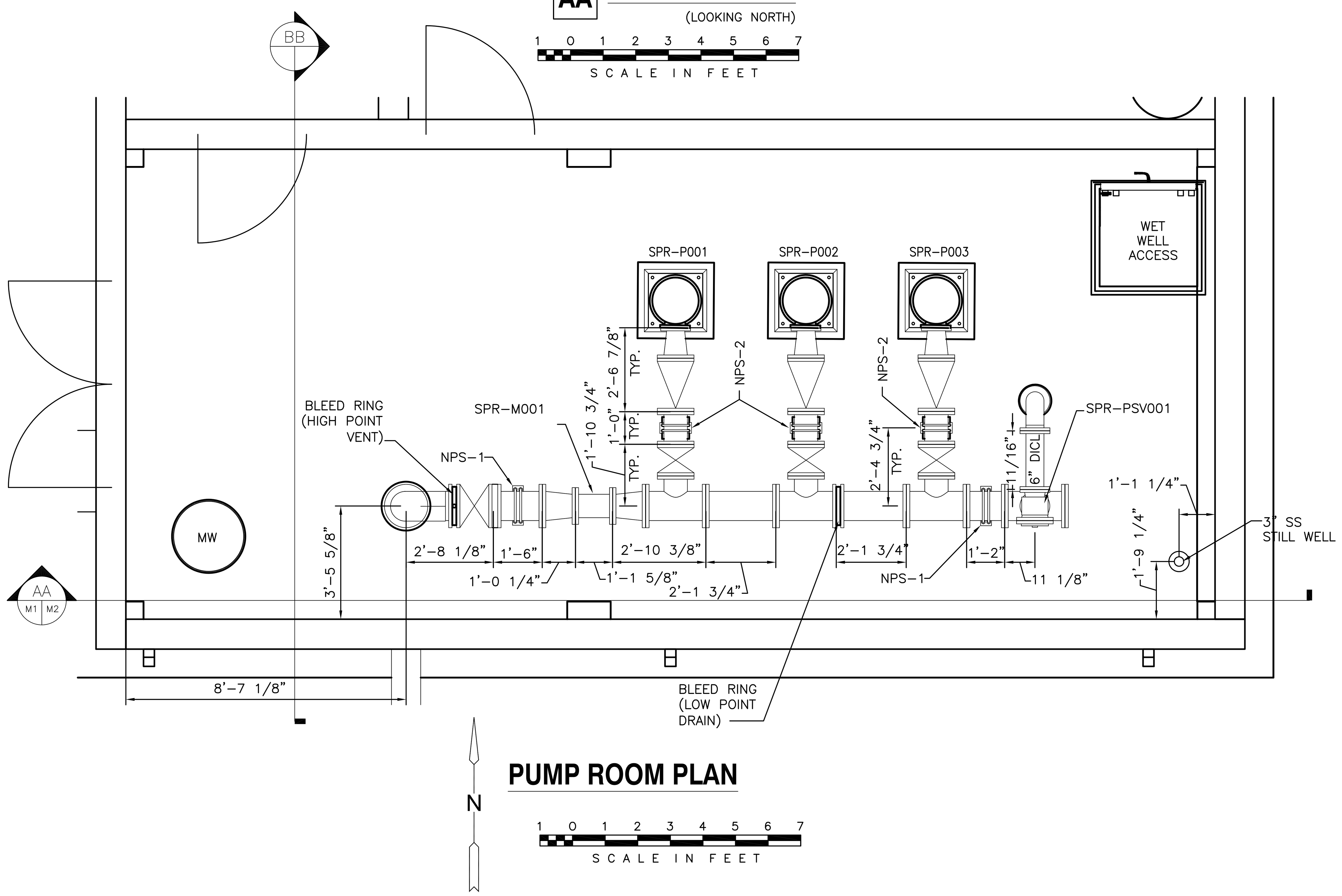
1 0 1 2 3 4 5 6 7
SCALE IN FEET



BB ELEVATION B-B

(LOOKING EAST)

1 0 1 2 3 4 5 6 7
SCALE IN FEET

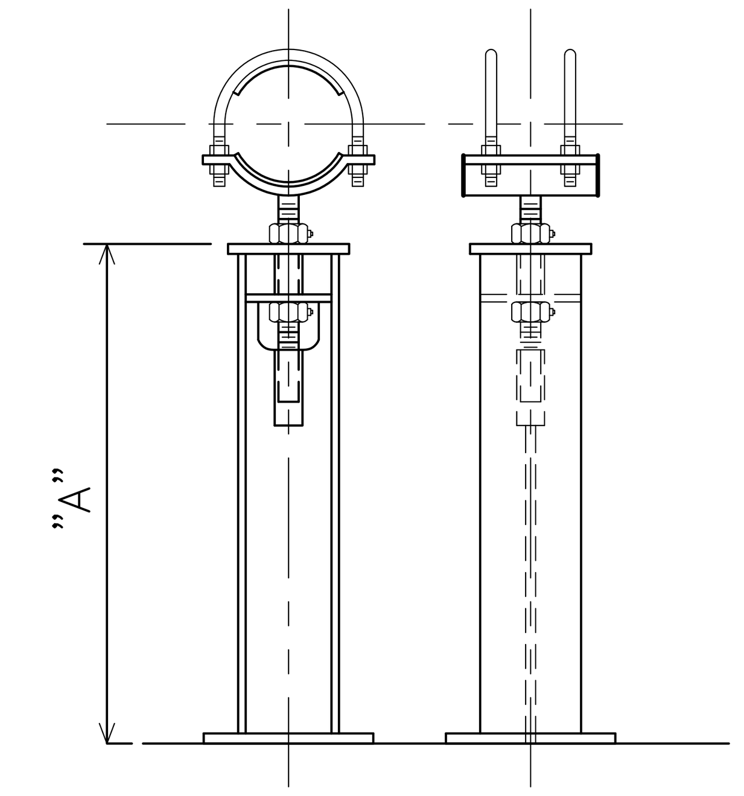


PUMP ROOM PLAN

1 0 1 2 3 4 5 6 7
SCALE IN FEET

NOTES

1. 10" MJXMJ ELBOW SHALL BE ASSEMBELED USING ALL STAINLESS STEEL HARDWARE. COST SHALL BE SUBSIDIARY TO THE FITTING.



PIPE SUPPORT SCHEDULE ("E-Z" LINE) (713) 675-6693

NPS#	QUANTITY	PIPE SIZE	MODEL #	FIGURE #	"A"
NPS-1	2	10"	510	F	1'-4"
NPS-2	3	8"	510	F	1'-5"

NOTES:

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PUMP ROOM DETAILS

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KEITH T. SCARBERRY LICENSED 21495 KANSAS PROFESSIONAL ENGINEER 04/18/2016

SHEET NO.
M5.1

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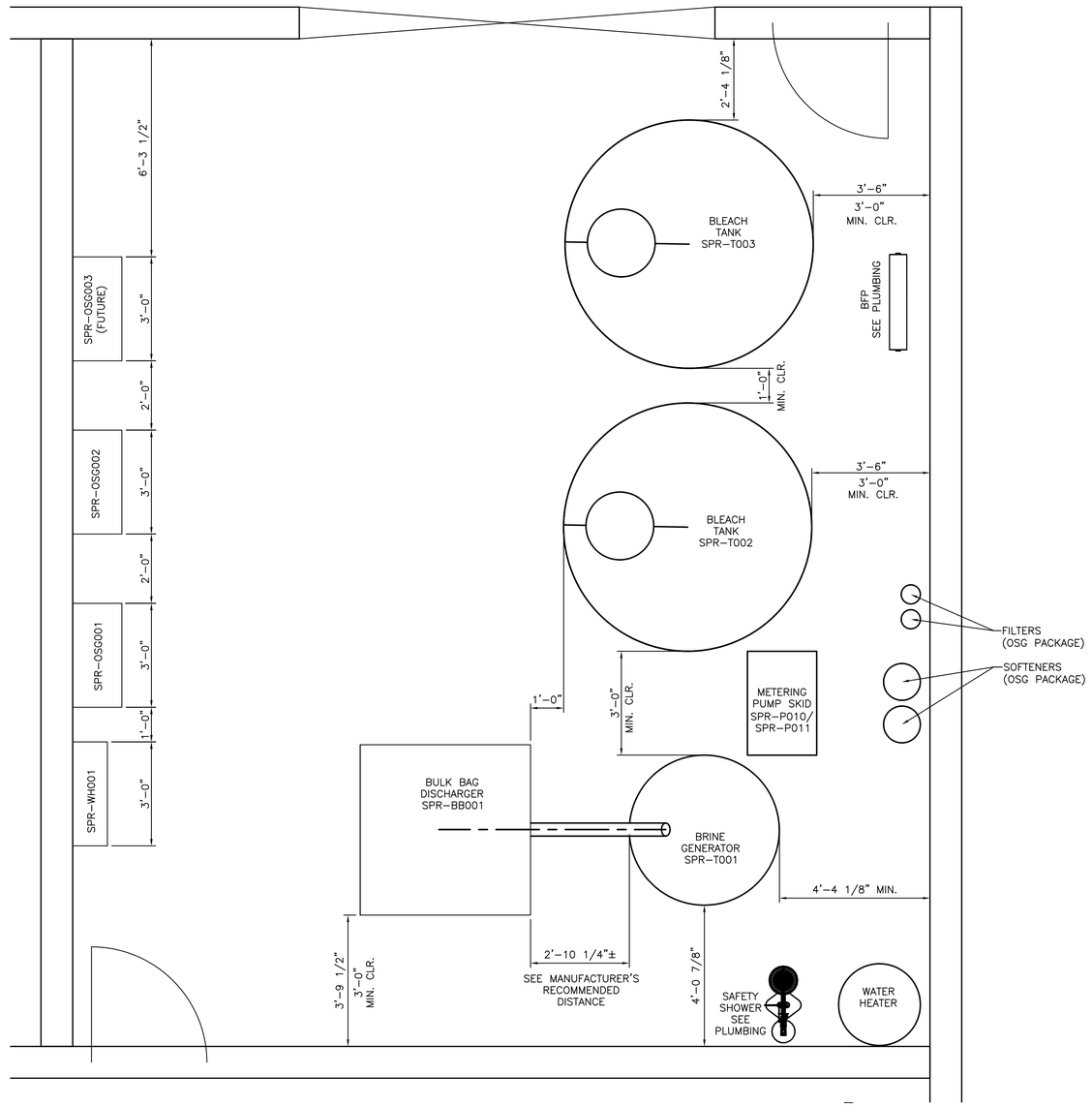

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CHLORINATION ROOM PLAN

2 0 2 4

SCALE IN FEET

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RE-USE WATER PUMP STATION

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CHLORINATION ROOM PLAN

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SHEET NO.

M5.2

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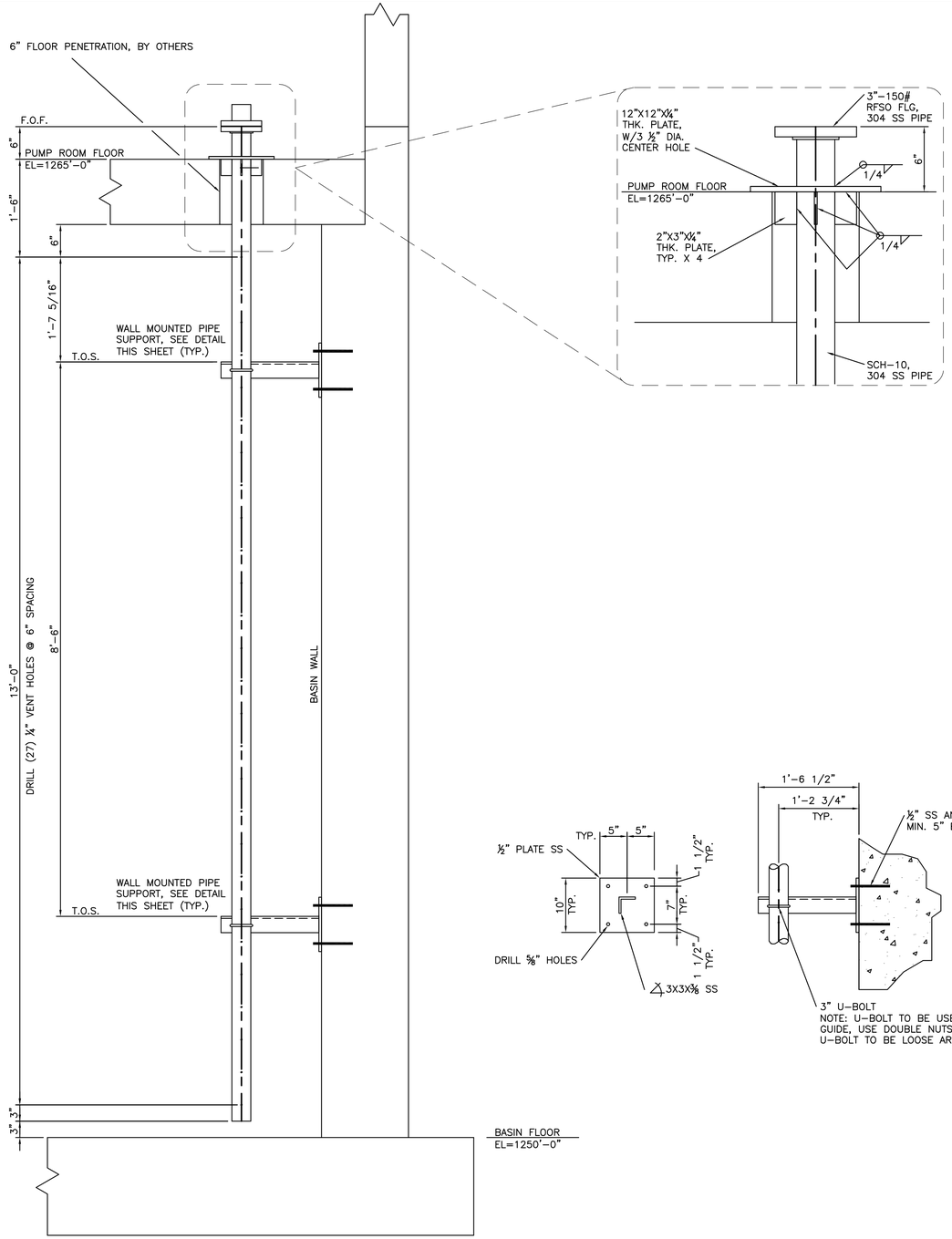

A1 STILL WELL DETAIL

1 0 1 2
SCALE IN FEET

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RE-USE WATER PUMP STATION

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PIPING DETAILS

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BWT	BWT	KTS

NO.	REVISION	DATE
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SHEET NO.

M5.3

KEITH T. SCARBERRY LICENSED 21496 KANSAS PROFESSIONAL ENGINEER 04/18/2016

GENERAL PROCESS EQUIPMENT AND PIPING NOTES

NOTES ON THIS SHEET ARE APPLICABLE TO WORK RELATED TO PROCESSES, PIPING, AND EQUIPMENT WITHIN THE REUSE PUMP STATION.

GENERAL NOTES

A. CONSTRUCTION OF THE REUSE PUMP STATION FACILITIES, INCLUDING, BUT NOT LIMITED TO, PROCEDURES, MATERIALS, CLEANING AND DISINFECTION, SHALL BE IN ACCORDANCE WITH KDHE STANDARDS AND THE PROJECT PLANS AND SPECIFICATIONS.
B. ANY DISCREPANCIES OR CONFLICTS SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER FOR RESOLUTION.
C. THE CONTRACTOR SHALL MAINTAIN AS-BUILT PLANS THROUGHOUT CONSTRUCTION AND SUBMIT THESE PLANS TO ENGINEER UPON COMPLETION OF WORK.
D. CONTRACTOR SHALL NOT START WORK ON THE PROJECT UNTIL THE PROJECT INSPECTOR IS ASSIGNED TO THE PROJECT AND IS PRESENT ON THE SITE.
E. SEE MECHANICAL AND ELECTRICAL SHEETS FOR GAS, COMMUNICATION, LIGHTING, FACILITY POTABLE WATER, SANITARY SEWER, AND ELECTRICAL INFORMATION.
F. UNLESS SHOWN OR STATED OTHERWISE ON THESE DRAWINGS AND SPECIFICATIONS, MATERIALS AND CONSTRUCTION SHALL BE IN ACCORDANCE WITH CITY OF WICHITA STANDARD SPECIFICATIONS.

SPECIFICATIONS

DIVISION 40: PROCESS INTEGRATION

40 05 13 COMMON WORK RESULTS FOR PROCESS PIPING

40 05 13 1.01 GENERAL

A. THE CONTRACTOR SHALL FURNISH AND INSTALL ALL PIPING SYSTEMS SHOWN AND SPECIFIED, IN ACCORDANCE WITH THE REQUIREMENTS OF THE CONTRACT DOCUMENTS AND INDUSTRY PRACTICES. EACH SYSTEM SHALL BE COMPLETE WITH ALL NECESSARY FITTINGS, HANGERS, SUPPORTS, ANCHORS, EXPANSION JOINTS, FLEXIBLE CONNECTORS, VALVES, ACCESSORIES, TESTING, AND DISINFECTION, TO PROVIDE A PROFESSIONAL AND FUNCTIONAL INSTALLATION.

40 05 13 1.02 REFERENCES

A. ANSI/NSF-14 – PLASTIC PIPING COMPONENTS AND RELATED MATERIALS
B. ASTM D1784 – RIGID POLY(VINYL CHLORIDE) (PVC) COMPOUNDS AND CHLORINATED POLY(VINYL CHLORIDE) (CPVC) COMPOUNDS
C. ASTM D1785 – POLY(VINYL CHLORIDE) (PVC) PLASTIC PIPE, SCHEDULES 40, 80, AND 120
D. ASTM D2464 – THREADED POLY(VINYL CHLORIDE) (PVC) FITTINGS, SCHEDULE 80
E. ASTM D2467 – POLY(VINYL CHLORIDE) (PVC) PLASTIC PIPE FITTINGS, SCHEDULE 80
F. ASTM D2564 – SOLVENT CEMENTS FOR POLY(VINYL CHLORIDE) PLASTIC PIPING SYSTEMS
G. ASTM D2855 – MAKING SOLVENT-CEMENTED JOINTS WITH POLY(VINYL CHLORIDE) (PVC) PIPE AND FITTINGS
H. AWWA C110 – DUCTILE & GRAY IRON FITTINGS
I. AWWA C111 – RUBBER-GASKET JOINTS FOR DUCTILE-IRON PRESSURE PIPE AND FITTINGS
J. AWWA C153 – DUCTILE-IRON COMPACT FITTINGS FOR WATER SERVICE
K. AWWA C509 – RESILIENT SEATED GATE VALVES FOR WATER SUPPLY SERVICE
L. AWWA C518 – DUAL-DISC SWING-CHECK VALVES FOR WATERWORKS SERVICE
NOTE: LATEST VERSION OF EACH STANDARD APPLIES.

40 05 13 1.03 CONTRACTOR SUBMITTALS

A. THE CONTRACTOR SHALL SUBMIT COMPLETE SHOP DRAWINGS AND CERTIFICATES, TEST REPORTS, AFFIDAVITS OF COMPLIANCE, FOR ALL PIPING SYSTEMS, IN ACCORDANCE WITH THE REQUIREMENTS OF THE PROJECT PLANS AND SPECIFICATION AND CITY STANDARD SPECIFICATION.
B. CERTIFICATIONS: PRIOR TO INSTALLATION, THE CONTRACTOR SHALL FURNISH AN AFFIDAVIT OF COMPLIANCE CERTIFIED BY THE PIPE MANUFACTURER THAT THE PIPE, FITTINGS, AND SPECIALS FURNISHED UNDER THIS CONTRACT COMPLY WITH ALL APPLICABLE PROVISIONS OF AWWA, ASTM, NSF, AND THESE SPECIFICATIONS.
C. ALL EXPENSES INCURRED IN MAKING SAMPLES FOR CERTIFICATION OF TESTS SHALL BE BORNE BY THE CONTRACTOR.

40 05 13 1.04 MATERIAL DELIVERY, STORAGE, AND PROTECTION

A. ALL PIPING MATERIALS, FITTINGS, VALVES, ACCESSORIES, AND APPURTENANCES SHALL BE DELIVERED IN A CLEAN AND UNDAMAGED CONDITION AND STORED OFF THE GROUND AND PROTECTED FROM UV. ALL DEFECTIVE OR DAMAGED MATERIALS SHALL BE REPLACED WITH NEW MATERIALS AT THE CONTRACTOR'S EXPENSE.

40 05 13.73 PLASTIC PROCESS PIPING

40 05 13.73 1.01 PVC PIPE

A. PIPE: 3 INCH AND SMALLER PIPE SHALL BE DOMESTICALLY PRODUCED BY AN ISO 9001 MANUFACTURER OF TYPE I, GRADE I, PVC CELL CLASS 12454, ASTM D1784, ASTM D1785, SCHEDULE 80 MATERIAL.
B. FITTINGS: 3 INCH AND SMALLER FITTINGS SHALL BE DOMESTICALLY PRODUCED BY AN ISO 9001 MANUFACTURER OF TYPE I, GRADE I, PVC CELL CLASS 12454, ASTM D1784, ASTM D1785, SCHEDULE 80 MATERIAL, SCHEDULE 80, SOCKET WELD TYPE CONFORMING TO ASTM D2467. ALL THREADED CONNECTIONS SHALL UTILIZE SOCKET WELD BY THREADED ADAPTERS. THE PIPE SHALL NOT BE THREADED. FLANGE CONNECTIONS SHALL UTILIZE SOCKET WELD VAN STONE STYLE FLANGES WITH 1/8 INCH, FULL FACE, VITON GASKETS. DRY FIT OF FITTING SOCKETS MUST BE SNUG. LOOSE FITTINGS SHALL CAUSE REJECTION OF THE PIPE AND/OR FITTINGS AS FAULTY BECAUSE OF IMPROPER SIZE. BUILDING UP JOINT TO OVERCOME LOOSE FIT WILL NOT BE PERMITTED.
C. INSTALLATION: INSTALLATION SHALL COMPLY WITH THE LATEST INSTALLATION INSTRUCTIONS PUBLISHED BY THE MANUFACTURER AND SHALL CONFORM TO ALL PLUMBING, BUILDING, AND FIRE CODE REQUIREMENTS. SOLVENT CEMENT JOINTS SHALL BE MADE IN A TWO STEP PROCESS WITH PRIMER MANUFACTURED FOR THERMOPLASTIC PIPING SYSTEMS IN POTABLE WATER SERVICE AND SOLVENT CEMENT CONFORMING TO ASTM D2564. THE SYSTEM SHALL BE PROTECTED FROM CHEMICAL AGENTS, FIRE STOPPING MATERIALS, THREAD SEALANT, PLASTICIZED VINYL PRODUCTS, OR OTHER AGGRESSIVE CHEMICAL AGENTS NOT COMPATIBLE WITH PVC COMPOUNDS. SYSTEMS SHALL BE HYDROSTATICALLY TESTED AFTER INSTALLATION. WARNING! NEVER TEST WITH OR TRANSPORT/STORE COMPRESSED AIR OR GAS IN PVC PIPE OR FITTINGS.

40 05 13.73 1.02 CPVC PIPE

A. PIPE: 3 INCH AND SMALLER PIPE SHALL BE DOMESTICALLY PRODUCED BY AN ISO 9001 MANUFACTURER OF TYPE I, GRADE I, CPVC CELL CLASS 12454, ASTM D1784, ASTM D1785, SCHEDULE 80 MATERIAL.
B. FITTINGS: 3 INCH AND SMALLER FITTINGS SHALL BE DOMESTICALLY PRODUCED BY AN ISO 9001 MANUFACTURER OF TYPE I, GRADE I, CPVC CELL CLASS 12454, ASTM D1784, ASTM D1785, SCHEDULE 80 MATERIAL, SCHEDULE 80, SOCKET WELD TYPE CONFORMING TO ASTM D2467. ALL THREADED CONNECTIONS SHALL UTILIZE SOCKET WELD BY THREADED ADAPTERS. THE PIPE SHALL NOT BE THREADED. FLANGE CONNECTIONS SHALL UTILIZE SOCKET WELD VAN STONE STYLE FLANGES WITH 1/8 INCH, FULL FACE, VITON GASKETS. DRY FIT OF FITTING SOCKETS MUST BE SNUG. LOOSE FITTINGS SHALL CAUSE REJECTION OF THE PIPE AND/OR FITTINGS AS FAULTY BECAUSE OF IMPROPER SIZE. BUILDING UP JOINT TO OVERCOME LOOSE FIT WILL NOT BE PERMITTED.
C. INSTALLATION: INSTALLATION SHALL COMPLY WITH THE LATEST INSTALLATION INSTRUCTIONS PUBLISHED BY THE MANUFACTURER AND SHALL CONFORM TO ALL PLUMBING, BUILDING, AND FIRE CODE REQUIREMENTS. SOLVENT CEMENT JOINTS SHALL BE MADE IN A TWO STEP PROCESS WITH PRIMER MANUFACTURED FOR THERMOPLASTIC PIPING SYSTEMS IN POTABLE WATER SERVICE AND SOLVENT CEMENT CONFORMING TO ASTM D2564. THE SYSTEM SHALL BE PROTECTED FROM CHEMICAL AGENTS, FIRE STOPPING MATERIALS, THREAD SEALANT, PLASTICIZED VINYL PRODUCTS, OR OTHER AGGRESSIVE CHEMICAL AGENTS NOT COMPATIBLE WITH PVC COMPOUNDS. SYSTEMS SHALL BE HYDROSTATICALLY TESTED AFTER INSTALLATION. WARNING! NEVER TEST WITH OR TRANSPORT/STORE COMPRESSED AIR OR GAS IN CPVC PIPE OR FITTINGS.

40 05 23.12 BALL VALVES

A. SPECIFICATION: UNLESS OTHERWISE SPECIFIED, 2 INCH AND SMALLER VALVES SHALL BE FULL PORT, SOCKET WELD, TRUE UNION STYLE. BALL VALVES SHALL BE APPROVED BY NSF FOR USE WITH POTABLE WATER.
B. MATERIALS: BODIES AND BALLS SHALL BE PVC WITH DOUBLE O-RING FPM/FKM SEALS AND PTFE SEATS.
C. OTHER FEATURES: THE VALVE SHALL INCORPORATE A SAFETY STEM WITH A PRE-DETERMINED BREAKING POINT ABOVE THE O-RINGS, PREVENTING ANY MEDIA LEAKING IN THE EVENT OF DAMAGE. ADJUSTABLE SEAT CARRIER SHALL BE REVERSE THREAD OPPOSITE THAT OF THE UNION NUT. ALL PTFE SEATS SHALL HAVE BACKING O-RINGS. FOR BALL VALVES IN HYPOCHLORITE SERVICE: BALL SHALL HAVE A PROVISION FOR VENTING THE CAVITY IN THE CLOSED POSITION TO THE UPSTREAM SIDE AND SHALL BE INSTALLED AS SUCH.
D. APPROVED MANUFACTURERS: HAYWARD AND ENGINEER APPROVED EQUAL.

40 05 59.26 FIBERGLASS-REINFORCED PLASTIC SLIDE GATE

A. GENERAL
1. GATE SHALL MEET AWWA C-563 REQUIREMENTS FOR LEAKAGE RATE AND SHALL SEAL ON ALL FOUR SIDES.
2. GATE SHALL BE HEAVY DUTY, TITESEAL SLUICE GATE AS MANUFACTURED BY PLASTI-FAB, INC. OR ENGINEER APPROVED EQUAL.
3. GATE BODY AND OPENING SHALL BE CENTERED ON PIPE CENTER.
4. A QUALIFIED MANUFACTURER'S REPRESENTATIVE SHALL:
a. PROVIDE MAINTENANCE AND OPERATION TRAINING FOR OWNER'S STAFF.
b. INSPECT INSTALLATION AND COMPLETE A CERTIFICATION OF PROPER INSTALLATION TO THE OWNER, ENGINEER, AND CONTRACTOR.
5. MANUFACTURER SHALL WARRANTEE GATE FOR A PERIOD OF NOT LESS THAN ONE YEAR FROM SUBSTANTIAL COMPLETION OR EIGHTEEN MONTHS FROM DELIVERY, WHICH EVER IS EARLIER.
B. SUBMITTALS: CONTRACTOR SHALL SUBMIT THE FOLLOWING FOR ACCEPTANCE:
1. APPROVAL DRAWINGS SHOWING ALL CRITICAL DIMENSIONS, PRINCIPAL PARTS, AND MATERIALS.
2. SPARE PARTS LIST
C. CONSTRUCTION
1. GATE BODY
a. COMPOSITION OF THE SLUICE GATE LAMINATE SHALL BE IN ACCORDANCE WITH THE RECOMMENDATIONS SHOWN IN THE QUALITY ASSURANCE REPORT FOR REINFORCED THERMOSET PLASTIC (RTP) CORROSION RESISTANT EQUIPMENT PREPARED UNDER THE SPONSORSHIP OF THE SOCIETY OF THE PLASTICS INDUSTRY, INC. (SPI), AND THE MATERIAL TECHNOLOGY INSTITUTE (MTI) OF THE CHEMICAL PROCESS INDUSTRY FOR "HAND LAY-UP LAMINATES", AND SHALL MEET THE SPECIFICATIONS FOR TYPE I, GRADE 10 LAMINATES SHOWN IN APPENDIX M-1 OF SAID REPORT.
b. INFUSION MOLDED TO CREATE A SEAMLESS CORROSION BARRIER IMPERVIOUS TO MOISTURE.
c. FRP RESIN SHALL BE VINYL ESTER RESIN.
d. INTERNAL STEEL REINFORCING SHALL BE CARBON STEEL AS NEEDED FOR DEFLECTION REQUIREMENTS AND SHALL BE FULLY ENCAPSULATED.
e. INTERNAL CORE FOAM SHALL BE 2 LB. POLYISOCYANURATE CLOSED CELL RIGID FOAM AND SHALL BE FULLY ENCAPSULATED. CORE MATERIALS MUST BE 100% RESISTANT TO DECAY AND ATTACK BY FUNGUS AND BACTERIA AND BE RESISTANT TO HYDROCARBONS.
f. GATE BODY SHALL HAVE UV STABILIZING PIGMENT IN THE RESIN TO PROVIDE LONG TERM UV PROTECTION.
g. THE SURFACE SHALL BE FREE OF EXPOSED REINFORCING FIBERS.
2. GATE FRAME, STEM, GATE HARDWARE, SEAL CLAMPING BAR AND FASTENERS, AND ANCHOR BOLTS SHALL ALL BE 304L STAINLESS STEEL.
3. SIDE, TOP, AND BOTTOM SEALS SHALL BE A HOLLOW BULB J SEAL OF EXTRUDED VIRGIN EPDM AND SHALL BE MOUNTED ON THE GATE COVER AND REPLACEABLE WITHOUT DEWATERING THE BASIN.
4. LIFT NUTS AND THRUST NUTS SHALL BE MANGANESE BRONZE (ASTM B-584, ALLOY 865).
5. STEM COVER SHALL BE BUTYRATE.
6. STEM GUIDES SHALL BE UHMW.
7. GATE SHALL UTILIZE AN ADJUSTABLE WEDGING ASSEMBLY TO ENSURE TIGHT SEAL AND EASE OF MANTENANCE.
8. GATE OPERATOR SHALL UTILIZE A RISING STEM OPERATOR WITH A TWO INCH AWWA NUT. A HAND CRANK SHALL BE SUPPLIED THAT FITS THE AWWA NUT.
9. FOR NON-SELF CONTAINED GUIDE FRAMES, A WALL MOUNTED PEDESTAL SHALL BE FURNISHED FOR MOUNTING THE OPERATOR. PEDISTAL AND WALL MOUNT HARDWARE AND BRACKETS SHALL BE 304L STAINLESS STEEL.
D. DIMENSIONS:
1. THE GATE SHALL BE THIRTY-SIX INCHES (36") BY THIRTY-SIX INCHES (36").
2. THE CENTERLINE OF THE GATE IN THE CLOSED POSITION SHALL MATCH THE CENTERLINE OF THE PIPE AND IS APPROXIMATELY 8.8 FEET TO THE TOP OF WALL.

DIVISION 43: PROCESS GAS AND LIQUID HANDLING, PURIFICATION, AND STORAGE EQUIPMENT

43 21 13 CENTRIFUGAL LIQUID PUMPS

A. SCOPE: PUMPS THAT ARE SUPPLIED UNDER THIS SPECIFICATION SHALL BE VERTICAL TURBINE OPEN LINESHAFT DESIGN WITH PRODUCT LUBRICATION, INCLUDING A BOWL ASSEMBLY, COLUMN ASSEMBLY, DISCHARGE HEAD AND DRIVER. THE DISCHARGE HEAD SHALL BE DESIGNED TO CARRY THE ENTIRE WEIGHT OF THE BOWL AND COLUMN ASSEMBLY ALONG WITH THE SPECIFIED DRIVER WITHOUT EXCESSIVE VIBRATION OR NOISE. ALL OF THE SUPPLIED EQUIPMENT SHALL CONFORM TO THIS SPECIFICATION.
B. QUALITY ASSURANCES
1. WARRANTY: THE MANUFACTURER SHALL WARRANT THEIR PUMPS TO BE FREE OF DEFECTS FOR A PERIOD OF NOT LESS THAN ONE YEAR AFTER THE PRODUCT IS PUT INTO OPERATION OR NOT LESS THAN EIGHTEEN MONTHS FROM THE DELIVERY DATE, WHICHEVER OCCURS FIRST.
2. CERTIFICATIONS:
a. THE PUMP MANUFACTURER SHALL BE CERTIFIED TO THE ISO 9001 STANDARD FOR DESIGN AND MANUFACTURE OF VERTICAL TURBINE PUMPS.
b. THE MANUFACTURER SHALL BE CAPABLE OF PRODUCING VERTICAL TURBINE PUMPS CERTIFIED TO NSF/ANSI 61 & 372.
c. PRESSURE CONTAINING FABRICATIONS SHALL BE WELDED ONLY BY THOSE WHOM ARE QUALIFIED ON ASME CODE SECTION IX. WELDER CERTIFICATION SHALL BE PROVIDED WITH THE SUBMITTAL PACKAGE.
3. FOUNDRY: THE MANUFACTURER SHALL OWN AND OPERATE ITS OWN U.S. BASED FOUNDRY PRODUCING VERTICAL TURBINE COMPONENTS.
4. TESTING STANDARDS: ALL VERTICAL TURBINE PUMPS SHALL CONFORM TO ANSI/AWWA E101-88 AND TO THE MOST CURRENT EDITION OF HYDRAULIC INSTITUTE STANDARDS.
C. SUBMITTALS
1. WITH THE PROPOSAL, THE CONTRACTOR SHALL SUBMIT COMPLETE FABRICATION AND ASSEMBLY DRAWINGS TOGETHER WITH DETAILED SPECIFICATIONS COVERING MATERIALS, PARTS, DEVICES, AND ACCESSORIES. THE DATA AND SPECIFICATIONS FOR EACH PUMPING UNIT SHALL INCLUDE, BUT NOT BE LIMITED TO THE FOLLOWING:
a. NAME OF MANUFACTURER
b. TYPE AND MODEL
c. DESIGN ROTATIONAL SPEED
d. NUMBER OF STAGES
e. TYPE OF BOWL BEARINGS
f. TYPE OF LINE SHAFT BEARINGS
g. SIZE OF SHAFTING
h. SIZE OF PUMP COLUMN
i. SIZE OF DISCHARGE OUTLET
j. OD OF PUMP BOWLS
k. WEIGHT
l. TYPE OF FINISH
m. TOTAL WEIGHT
n. TOTAL PUMP LENGTH
o. COMPLETE PERFORMANCE CURVES SHOWING CAPACITY VERSUS HEAD, NPSH REQUIRED, EFFICIENCY, AND BHP PLOTTED SCALES CONSISTENT WITH PERFORMANCE REQUIREMENTS

D. MANUFACTURER: GOULDS WATER TECHNOLOGY, A XYLEM BRAND OR ENGINEER APPROVED EQUAL.
1. ALL PUMPS AND PUMP COMPONENTS SPECIFIED IN THIS SPECIFICATION SHALL BE SUPPLIED BY A SINGLE PUMP MANUFACTURER. THE PUMP MANUFACTURER SHALL BE REQUIRED TO SUPPLY THE PUMPS AND DRIVERS, AND SHALL BE RESPONSIBLE FOR THEIR COMPATIBILITY ONLY.
2. A FACTORY AUTHORIZED SERVICE FACILITY SHALL HAVE TRAINED SERVICE TECHNICIANS AND BE ABLE TO SHOW EVIDENCE OF PARTS INVENTORY FOR ROUTINE MAINTENANCE ITEMS SUCH AS BEARINGS, GASKETS, SHAFTS, AND SLEEVES.

E. OPERATION SELECTION
1. STATED TOTAL DYNAMIC HEAD (TDH) INCLUDES LIFT AND ALL SYSTEM PRESSURE. PUMP MANUFACTURER SHALL INCLUDE PUMP'S INTERNAL LOSES.

a. PUMP ITEM NUMBERS:	SPR-P001, SPR-P002, SPR-P003
b. NUMBER OF REQUIRED UNITS:	3
c. CONDITION "A" (DESIGN POINT),	
CAPACITY, GPM:	700
TDH, HEAD IN FEET:	330
d. MAXIMUM DRIVER HORSEPOWER:	100
e. MINIMUM BOWL EFFICIENCY,PERCENT (DESIGN POINT):	80%
f. MAXIMUM PUMP OPERATING SPEED:	1,800

2. CONDITION "A" AS LISTED ABOVE IS THE DESIGN POINT AND WILL BE USED FOR ANY PERFORMANCE EVALUATION IN ACCORDANCE WITH THE SET TOLERANCE GRADE STANDARDS OF THE HYDRAULIC INSTITUTE.
3. THE PUMP HORSEPOWER REQUIREMENTS FOR ANY POINT ON THE CURVE SHALL NOT UTILIZE THE SERVICE FACTOR NOR EXCEED THE MOTOR NAMEPLATE HORSEPOWER RATING.

F. SERVICE CONDITIONS

1. LIQUID TO BE PUMPED:	MUNICIPAL WWTP EFFLUENT
2. PUMPING TEMPERATURE (PT):	AMBIENT
3. SPECIFIC GRAVITY AT PT:	1.0
4. AVAILABLE LIQUID LEVEL FROM SUMP FLOOR:	41" MIN.
5. DISTANCE FROM CENTERLINE OF DISCHARGE FLANGE TO THE BOTTOM OF SUMP:	16'11"

G. MATERIALS AND CONSTRUCTION:
1. THE VERTICAL TURBINE LINESHAFT WETWELL PUMP SHALL CONFORM TO THE MATERIALS OF CONSTRUCTION FOR OPEN LINESHAFT DESIGN.

DISCHARGE HEAD ASSEMBLY

DESCRIPTION	MATERIAL DESCRIPTION	ASTM
DISCHARGE HEAD	STEEL	A53
COUPLING ASSEMBLY	SST 416	A582 S41600
SEAL HOUSING	CAST IRON	A48 CL30
SEAL HOUSING BEARING	BRONZE	B584 C90300
SEAL HOUSING GASKET	ACRYLIC GASKET	GARLOCK BLUE GUARD

COLUMN AND LINESHAFT ASSEMBLY

COLUMN PIPE (FLG)	STEEL	A53
COLUMN BOLTING	GRADE 8	SAE J429 GR8
LINESHAFT	SST 416	A582 S41600
LINESHAFT COUPLING	SST 416	A582 S41600
BEARING RETAINER	SST 304	A744 C30400
LINESHAFT BEARING	RUBBER EPDM	D3568

BOWL ASSEMBLY

BOWL SHAFT	SST 416	A582 S41600
INTERMEDIATE BOWL	COATED CAST IRON	A48 CL30
INTER BOWL BEARING	BRONZE	B584 C90300
IMPELLER	SST 316	A744 C31600
IMPELLER TAPER LOCK	STEEL 1018	A108 G10180
SUCTION BOWL / BELL	COATED CAST IRON	A48 CL30
SUCTION BEARING	BRONZE	B584 C90300
SAND COLLAR	SST304	A744 S30400
PLUG	MAL IRON	A197
HEX BOLT	GRADE 8	SAE J429 GR8

2. BOWL ASSEMBLY
a. THE SUCTION BELL SHALL BE DESIGNED TO PROVIDE CONSERVATIVE ENTRANCE VELOCITIES AND DIRECT THE FLOW TO THE FIRST STAGE IMPELLER. THE INNER SURFACE OF THE SUCTION BELL SHALL BE SMOOTH AND FREE OF SHARP PROJECTIONS WHICH COULD CAUSE TURBULENCE OR CAVITATION. THE SUCTION CASING SHALL BE DESIGNED TO HOUSE THE SUCTION BELL BEARING BY MEANS OF FOUR VANES.
b. THE BOWLS SHALL BE SMOOTH AND FREE OF SHARP PROJECTIONS AND SHALL HAVE REGISTER FITS FOR ALIGNMENT AND BE CONNECTED BY FLANGED AND BOLTED CONSTRUCTION. BOWL SIZES 6" TO 15" SHALL BE GLASS ENAMELED ON THE BOWL INTERIOR.
c. THE IMPELLERS SHALL BE MACHINED AND FINISHED SMOOTH TO INSURE PROPER PERFORMANCE. THEY ARE TO BE BALANCED PRIOR TO ASSEMBLY. THE IMPELLERS SHALL BE CONNECTED TO THE BOWL SHAFT BY MEANS OF COLLET DESIGN.
d. THE SUCTION STRAINER SHALL BE A THREADED BASKET DESIGN AND HAVE A FREE INLET AREA OF AT LEAST 3-4 TIMES THE IMPELLER EYE AREA. THE SUCTION STRAINER SHALL BE CONNECTED TO THE BOWL ASSEMBLY SUCTION CASING.
3. COLUMN ASSEMBLY
a. THE COLUMN SHALL INCLUDE FLANGED CONNECTIONS AND SHALL BE OF OPEN DESIGN WITH PRODUCT LUBRICATION.
b. THE BEARING SPACING SHALL BE SELECTED TO INSURE OPERATION AT A MINIMUM OF 25% ABOVE OR BELOW THE FIRST CRITICAL SPEED. BEARING SPACING SHALL NOT EXCEED 10 FEET.
c. FOR 3"-12" PRODUCT LUBRICATED COLUMN ASSEMBLIES, THE COLUMN SHALL BE DESIGNED WITH DROP-IN STEEL OR CAST-IRON BEARING RETAINERS. THE INTERIOR OF THE COLUMN SHALL BE FREE OF OFFSETS, BURRS, DISCONTINUITIES AND IRREGULARITIES.
d. THE LINESHAFT SHALL BE OF ADEQUATE SIZE TO TRANSMIT THE FULL POWER OF THE PUMP WITHOUT SLIP, EXCESSIVE VIBRATION OR ELONGATION, AND SHALL HAVE THREADED JOINTS. LINESHAFT LENGTHS SHALL NOT EXCEED 10 FEET. THE LINESHAFT SHALL HAVE LEFT HAND THREADS THAT TIGHTEN DURING PUMP OPERATION.
4. DISCHARGE HEAD ASSEMBLY
a. THE DISCHARGE HEAD SHALL BE FITTED WITH A FLANGED DISCHARGE CONNECTION. THE FLANGES SHALL BE A 150 LB RF ANSI FLANGE FOR FABRICATED STEEL HEADS. THE DISCHARGE HEAD SHALL BE DESIGNED TO CARRY THE ENTIRE WEIGHT OF THE COMPLETE PUMP AND DRIVER WITHOUT DISTORTION WHEN SPANNING AN OPENING OF SUFFICIENT SIZE TO PERMIT REMOVAL OF THE COMPLETE PUMP ASSEMBLY. THE DISCHARGE HEAD SHALL BE PROVIDED WITH A COUPLING GUARD. LIFTING LUGS SHALL BE PROVIDED AS STANDARD.
b. THE SEAL HOUSING SHALL BE DESIGNED TO ACCEPT A DOUBLE MECHANICAL SEAL WITH FRESH WATER BARRIER FLUID FLUSH.
5. DRIVER
a. THE DRIVER WILL BE A VERTICAL HOLLOW SHAFT ELECTRIC MOTOR THAT IS INVERTER-DUTY RATED, PREMIUM EFFICIENT, AND CONTAINED IN A WPI ENCLOSURE. THE MOTOR SHALL INCLUDE APPROPRIATE BEARING GROUNDING TO PREVENT CIRCULATING BEARING CURRENTS.
b. THE DRIVER AND ANY RELATED EQUIPMENT WILL SHIP UNMOUNTED FROM THE PUMP.
6. COATING: THE EXTERIOR OF THE BOWL, COLUMN, AND DISCHARGE HEAD ASSEMBLIES AS WELL AS THE INTERIOR OF THE COLUMN AND DISCHARGE HEAD ASSEMBLIES SHALL BE COATED WITH TNEMEC 141; MINIMUM DRY FILM THICKNESS: 16 MILS. COLORS TO BE SELECTED BY OWNER DURING SUBMITTAL PROCESS.

MKEC
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CITY OF WICHITA, KANSAS

RE-USE WATER PUMP STATION

TO SERVE SPIRIT AEROSYSTEMS

EQUIPMENT AND PIPING NOTES

PROJECT NO.	468-85112
DATE	04/18/16
SCALE	NONE

DESIGNED	DRAWN	CHECKED
ALF	ALF	KTS

NO.	REVISION	DATE
0	ISSUED FOR CONSTRUCTION	04/18/16

SHEET NO.

M6.0

KEITH T. SCARBERRY LICENSED 21496 04/18/2016 KANSAS PROFESSIONAL ENGINEER

GENERAL PROCESS EQUIPMENT AND PIPING NOTES (CONTINUED)

43 21 13 CENTRIFUGAL LIQUID PUMPS (CONTINUED)

H. TESTING
1. ALL FACTORY TESTING SHALL CONFORM TO THE MOST CURRENT EDITION OF THE HYDRAULIC INSTITUTE STANDARDS. ALL PUMP PERFORMANCE TESTING SHALL BE PERFORMED AT THE MANUFACTURER'S FACILITY. (SPECIFY IF THERE ARE ANY ADDITIONAL STANDARDS)
2. PERFORMANCE TESTING SHALL BE VIRTUALLY WITNESSED AND PERFORMED ON THE FULLY ASSEMBLED UNIT WITH A JOB MOTOR. THE TEST SHALL COVER SEVEN POINTS INCLUDING THE DESIGN POINT (HI 14.6). THE DESIGN POINT SHALL BE USED FOR ANY PERFORMANCE EVALUATION.
3. HYDROSTATIC TESTING SHALL BE NON-WITNESSED IN COMPLIANCE WITH HI14.6. HYDRO TESTING IS TO BE PERFORMED ON THE PRESSURE CONTAINING COMPONENTS. CERTIFIED TEST RESULTS SHALL BE PROVIDED FOR APPROVAL PURPOSES PRIOR TO SHIPMENT.
4. A STANDARD 10 BUSINESS DAYS' NOTICE SHALL BE GIVEN TO THE ENGINEER BEFORE STARTING ANY WITNESS TESTING. THE MANUFACTURER SHALL NOT BE RESPONSIBLE FOR EXPENSES INCLUDING, BUT NOT LIMITED TO TRAVEL, FOOD, AND LODGING TO OBSERVE ALL WITNESS TESTING.
5. A WRITTEN APPROVAL FOR ALL WITNESS TESTING IS REQUIRED PRIOR TO RELEASE FOR SHIPMENT. ALL NON-WITNESS TESTING SHALL REQUIRE WRITTEN PRIOR TO RELEASE FOR SHIPMENT.
6. FIELD/FUNCTIONAL TESTING WILL BE PERFORMED BY THE CONTRACTOR TO INSURE PROPER MECHANICAL OPERATION AT THE JOBSITE. ALL TESTING DATA TO BE USED FOR EVALUATION SHALL BE PERFORMED AT THE PUMP MANUFACTURER'S FACILITY.
7. MOTOR TESTS AND TEST REPORTS SHALL BE PROVIDED AS REQUIRED IN ACCORDANCE WITH THE MOTOR SPECIFICATION.

I. SHIPPING: PUMPS THAT ARE LESS THAN 30 FEET IN LENGTH SHALL BE SHIPPED FULLY ASSEMBLED WITH THE DRIVER AND SHAFT SEAL UNMOUNTED. THE DISCHARGE FLANGE SHALL BE PROTECTED WITH A WOODEN FLANGE COVER.

J. STORAGE, HANDLING, AND INSTALLATION: THE SKIDDED PUMP AND RELATED EQUIPMENT SHALL BE UNLOADED, STORED, AND INSTALLED IN AGREEMENT WITH THE MANUFACTURER'S OPERATION AND INSTALLATION MANUALS. IF STORAGE IS PLANNED TO BE LONGER THAN SIX MONTHS OR IN HARSH ENVIRONMENT, LONG TERM STORAGE PRACTICES SHOULD BE FOLLOWED PER THE MANUFACTURER'S OPERATION AND INSTALLATION MANUALS.

K. START-UP FIELD SERVICES: THE PUMP MANUFACTURER SHALL INCLUDE TWO DAYS OF START-UP FIELD SERVICES WITH THE PROPOSAL FOR THE PURPOSE OF SUPERVISING THE START-UP AND INSTRUCTIONS OF PROPER MAINTENANCE AND OPERATIONS.

SERVICE PROVIDED BY FACTORY REPRESENTATIVE TIME ON SITE

INSPECT AND APPROVE INSTALLATION	½ DAY
SUPERVISE INITIAL ADJUSTMENT	½ DAY
SUPERVISE FIELD RUN TEST	½ DAY
INSTRUCT OWNER IN PROPER START-UP AND O&M	½ DAY

ADDITIONAL TIME ON SITE SHALL BE BILLED AT THE RATE DEEMED BY THE MANUFACTURER.

DIVISION 46: WATER AND WASTEWATER EQUIPMENT

46 33 13 SODIUM HYPOCHLORITE GENERATING EQUIPMENT

A. GENERAL SCOPE
CONTRACTOR SHALL FURNISH AND INSTALL ON-SITE CHLORINATION SYSTEM ASPECIFIED HEREIN. CHLORINATION SYSTEM SHALL CONSIST OF ON-SITE SODIUM HYPOCHLORITE GENERATION (OSG) SYSTEM EQUIPMENT AS SHOWN ON THE DRAWINGS AND AS SPECIFIED HEREIN, INCLUDING ALL ACCESSORIES AND CONTROLS NECESSARY FOR A COMPLETE AND OPERABLE CHLORINATION SYSTEM.

A. GENERAL SCOPE OF WORK
WORK SPECIFIED SHALL INCLUDE MANUFACTURING, FURNISHING, INSTALLING, STARTUP, AND TESTING OF ALL EQUIPMENT NECESSARY TO PROVIDE A COMPLETE OSG SYSTEM SUITABLE FOR DISINFECTION OF MUNICIPAL WASTEWATER FOR REUSE. CONTRACTOR SHALL PROVIDE THE SERVICES OF A QUALIFIED MANUFACTURER'S REPRESENTATIVE TO INSTALL, INSPECT, STARTUP, CALIBRATE, AND PROVIDE EQUIPMENT AND OPERATOR TRAINING TO OWNER'S PERSONNEL. OSG SYSTEM EQUIPMENT FURNISHED AND INSTALLED FOR THIS PROJECT SHALL INCLUDE, BUT NOT BE LIMITED TO, THE FOLLOWING ITEMS:

QTY	EQUIPMENT
1	DUPLEX WATER SOFTENER SYSTEM
1	CARTRIDGE FILTER SYSTEM
1	ON-DEMAND WATER HEATER
1	BRINE STORAGE TANK AND APPURTENANCES
2	BRINE BOOST PUMPS
1	BULK BAG HANDLING SYSTEM
1	GENERATOR CONTROLLER
2	SELF CLEANING SODIUM HYPOCHLORITE GENERATORS
2	SODIUM HYPOCHLORITE STORAGE TANKS AND APPURTENANCES
2	SODIUM HYPOCHLORITE DOSING PUMPS WITH SPEED CONTROL

B. GENERAL OPERATIONAL DESCRIPTION
THE OSG SYSTEM SHALL BE CAPABLE OF A CONTINUOUS PRODUCTION OF SODIUM HYPOCHLORITE FROM SALT, WATER AND ELECTRICITY. SUPPLY WATER SHALL PASS THROUGH THE WATER SOFTENER AND PROVIDE WATER FOR THE SALT SATURATOR AND MAKE-UP WATER FOR BRINE DILUTION. SATURATED BRINE SOLUTION WATER SHALL MIX WITH MAKE-UP WATER TO FORM A BRINE SOLUTION WHICH SHALL ENTER THE HYPOCHLORITE GENERATOR WHICH SHALL CONVERT THE BRINE SOLUTION TO A CONSISTENT SOLUTION (NOT LESS THAN 0.65%) OF SODIUM HYPOCHLORITE WITH THE ADDITION OF A DC CURRENT. SODIUM HYPOCHLORITE SOLUTION SHALL BE STORED IN THE STORAGE TANKS AS SHOWN ON THE DRAWINGS. DOSING PUMPS SHALL DRAW OFF THE STORAGE TANK AND INJECT SODIUM HYPOCHLORITE INTO THE DISCHARGE PIPING AT THE LOCATION SHOWN ON THE DRAWINGS.

C. APPROVED OSG SYSTEM MANUFACTURERS: PARKSON AND ENGINEER APPROVED EQUAL.

D. SUBMITTALS
THE CONTRACTOR SHALL PREPARE AND SUBMIT COMPLETE AND ORGANIZED SHOP DRAWINGS AS SPECIFIED HEREIN AND AS REQUIRED BY THE PROJECT PLANS AND SPECIFICATIONS AND SHALL INCLUDE, BUT NOT BE LIMITED TO THE FOLLOWING:
1. DETAILED SPECIFICATIONS, FABRICATION, ASSEMBLY, DIMENSIONS, MATERIALS OF CONSTRUCTION, PERFORMANCE CHARACTERISTICS, AND INSTALLATION INSTRUCTIONS FOR ALL EQUIPMENT PROVIDED.
2. OSG SYSTEM EQUIPMENT DRAWINGS, SPECIFICATIONS, WIRING DIAGRAMS, CONDUIT ROUTING PLANS, AND INSTALLATION INSTRUCTIONS.
3. EQUIPMENT SEISMIC DESIGN CALCULATIONS (INCLUDING EQUIPMENT ANCHORAGE) FOR THE WATER SOFTENERS, CHLORINE SOLUTION STORAGE TANKS, BRINE TANK, BULK BAG HANDLING SYSTEM, AND SODIUM HYPOCHLORITE GENERATORS.
4. OPERATION AND MAINTENANCE MANUALS FOR EACH ITEM OF EQUIPMENT SPECIFIED HEREIN.

F. PRODUCTS
1. GENERAL
ON-SITE SODIUM HYPOCHLORITE GENERATOR SYSTEM EQUIPMENT SHALL BE FURNISHED WITH ALL FEATURES AND ACCESSORIES NECESSARY TO PROVIDE SODIUM HYPOCHLORITE GENERATING, METERING, STORAGE, INJECTING, AND DOSING AS SHOWN ON THE DRAWINGS AND SPECIFIED HEREIN.
2. SODIUM HYPOCHLORITE GENERATORS
GENERATOR SHALL BE CAPABLE OF GENERATING AN EQUIVALENT OF 100 LBS. OF FREE AVAILABLE CHLORINE (FAC) PER DAY IN THE FORM OF SODIUM HYPOCHLORITE SOLUTION, AT NOT LESS THAN 0.65% CONCENTRATION. GENERATOR SHALL UTILIZE ONLY SOFTENED WATER, DC POWER, AND BRINE SOLUTION. GENERATOR SHALL CONSIST OF ALL METERING, PUMPING, CONTROLS, ACCESSORIES, AND APPURTENANCES TO AUTOMATICALLY DELIVER A CONSISTENT BRINE SOLUTION TO THE GENERATOR. THE GENERATOR SHALL BE SELF CLEANING AND SHALL UTILIZE A MODULAR ELECTROLYTIC CELL CONFIGURATION. THE GENERATOR SHALL START AND STOP BASED ON LEVEL IN THE SODIUM HYPOCHLORITE TANKS. GENERATOR SHALL BE SUITABLE FOR WALL MOUNTING AND SHALL NOT CONSUME MORE THAN THE FOLLOWING:

WATER:	22.0 GALLONS/POUND FAC
SALT:	3.0 POUNDS/POUND FAC
ELECTRICITY:	2.0 KW-HR/POUND FAC

GENERATOR SHALL BE FULLY CAPABLE OF AUTOMATIC CONTROL AND BE PROVIDED WITH AN OPERATOR INTERFACE. UNIT SHALL HAVE ETHERNET CONNECTIVITY TO THE FACILITY SCADA SYSTEM FOR SYSTEM STATUS AND ALARMS.
3. GENERATOR CONTROLLER
THE GENERATOR CONTROLLER SHALL BE FULLY CAPABLE OF AUTOMATIC CONTROL AND BE PROVIDED WITH AN OPERATOR INTERFACE. ALL CONTROLS SHALL BE HOUSED IN A MINIMUM NEMA 12 ENCLOSURE SUITABLE FOR WALL MOUNTING. CONTROL SHALL BE CAPABLE OF OPERATING ON 120/220 VOLTS SINGLE PHASE POWER. PANEL SHALL RECEIVE 4-20 MA SIGNALS FROM THE SODIUM HYPOCHLORITE STORAGE TANK LEVEL AND WILL START AND STOP THE GENERATORS BASED ON CHLORINE SOLUTION TANK LEVELS.
THE CONTROLS SHALL PROVIDE THE FOLLOWING FUNCTIONS:
a. START/STOP OF THE CHLORINE GENERATION SYSTEM BASED ON LEVEL IN THE CHLORINE SOLUTION TANKS.
ALARMS WITH LCD DISPLAYED DESCRIPTIONS AND OUTPUT TO THE FACILITY SCADA SYSTEM:
a. CHLORINE GENERATOR SYSTEM FAIL
b. LOW CHLORINE STORAGE TANK LEVEL
c. LEVEL CONTROL OF THE BRINE TANK.
3. SODIUM HYPOCHLORITE STORAGE TANKS
SODIUM HYPOCHLORITE STORAGE TANKS SHALL BE OF SINGLE WALL, VERTICAL STYLE, AND CONSTRUCTED OF HIGH DENSITY CROSS LINKED POLYETHYLENE CONSTRUCTION SUITABLE FOR STORAGE OF SODIUM HYPOCHLORITE. TANK SHALL HAVE A NOMINAL CAPACITY OF 2000 GALLONS, EQUIPPED WITH A 4" TOP MOUNTED FLANGED OUTLET WITH 4" VENT TO THE OUTSIDE OF THE BUILDING. 4" TOP MOUNTED FLANGED OUTLET WITH BLIND FLANGE FOR FUTURE FORCED VENTILATION FAN (LOCATED 180° FROM 4" VENT OUTLET), 2" FLANGED OUTLET FILL PIPE AT TOP OF TANK, 1" OUTLET AT BOTTOM OF TANK, 2" OUTLET AT BOTTOM OF TANK FOR LEVEL TRANSMITTER, AND ANY OTHER CONNECTION NECESSARY FOR A COMPLETE SYSTEM. TANK SHALL BE FURNISHED WITH CABLES FOR SEISMIC ANCHORAGE, COMPLETE WITH FLOOR ANCHOR SYSTEM.
4. BRINE TANK
THE BRINE TANK SHALL CONSIST OF A HEAVY-DUTY PLASTIC TANK (MINIMUM 500 GALLONS, MAXIMUM 60" TALL) WITH LID, SCREENED MANIFOLD 1/2" NPT WATER INLET WITH LEVEL CONTROL, 1" NPT OUTLET, OVERFLOW DRAIN, AND 1" DRAIN TANK.
5. BRINE BOOST PUMPS
BRINE BOOST PUMPS SHALL BE PROVIDED TO ALLOW A GREATER DISTANCE BETWEEN THE BRINE TANK AND THE GENERATOR UNITS. PUMP SHALL BE A MAGNETIC DRIVE, SEALLESS CENTRIFUGAL PUMP. WETTED PARTS SHALL BE NON-METALLIC AND COMPATIBLE WITH SATURATED BRINE. THE PUMP SHALL BE SUPPLIED WITH A BACKPRESSURE/BYPASS VALVE, CHECK VALVE, DISCHARGE PRESSURE GAUGE WITH GAUGE GUARD AND TWO TRUE UNION BALL VALVES. PUMP SHALL BE MODEL BC-3CP-MD AS MANUFACTURED BY MARCH PUMP OR ENGINEER APPROVED EQUAL.
6. CARTRIDGE FILTER SYSTEM
CARTRIDGE FILTER SYSTEM SHALL BE A DUPLEX 2.5" X 10" HEAVY-DUTY COMMERCIAL FILTER SYSTEM. FILTER CARTRIDGE TYPE AND SPECIFICATION SHALL BE OSG SYSTEM PROVIDER.
7. WATER SOFTENERS
WATER SOFTENER SHALL BE AN ION EXCHANGE SYSTEM, PROVIDED TO REMOVE CALCIUM, MAGNESIUM, IRON, AND MANGANESE TO ACCEPTABLE LEVELS FOR THE SOFTENED WATER TO BE USED IN THE SYSTEM. WATER SOFTENER SHALL BE OF THE ALTERNATING TWIN TANK DESIGN CAPABLE OF OPERATING ONE VESSEL IN SERVICE WHILE THE OTHER IS REGENERATING.
8. WATER HEATER
A WATER HEATER SHALL BE PROVIDED TO ENSURE WATER TEMPERATURE ENTERING THE GENERATORS IS SUFFICIENT TO ALLOW FOR EFFICIENT OPERATION. WATER HEATER SHALL BE A TANKLESS ELECTRIC WATER HEATER RATED AT 14 KW. WATER HEATER SHALL BE MODEL TX014-2R AS MANUFACTURED BY HUBBELL OR ENGINEER APPROVED EQUAL.
9. SODIUM HYPOCHLORITE DOSING PUMPS
THE CHEMICAL METERING PUMPS SHALL BE POSITIVE DISPLACEMENT, PROGRESSIVE CAVITY OR EXTERNAL GEAR STYLE. THE PUMP SHALL SELF-PRIME WITH 10 FEET OF WATER SUCTION LIFT.
THE MOTOR SHALL BE NOT GREATER THAN 1.0 HP, 208 VOLT, 3 PHASE, INVERTER-DUTY RATED, TEFC. THE PUMP(S) SHALL BE CAPABLE OF OPERATING AGAINST THE MAXIMUM PRESSURE OF 150 PSI. ONCE PRIMED, THE METERING PUMP(S) SHALL OPERATE WITH A MINIMUM OF 10 FOOT OF WATER SUCTION LIFT. WETTED PUMP MATERIALS SHALL BE PVDF AND/OR TEFLON. METERING PUMP(S) AND APPURTENANCES SHALL BE FURNISHED BY A SINGLE SUPPLIER TO ASSURE UNIFORMITY, COMPATIBILITY AND SYSTEM RESPONSIBILITY. PUMPS SHALL BE SKID MOUNTED WITH APPROPRIATE ISOLATION, CHECK, BACK PRESSURE, AND RELIEF VALVES, CALIBRATION COLUMN, PULSATION DAMPENER, AND VARIABLE SPEED DRIVES.
CHEMICAL METERING PUMPS AND BE SUITABLE FOR THE FOLLOWING:
MAXIMUM DISCHARGE PRESSURE = 150 PSI
LIQUID PUMPED = 0.5 TO 1 PERCENT SODIUM HYPOCHLORITE
PH = 8 - 9
SPECIFIC GRAVITY = 1 TO 1.3
TEMPERATURE RANGE = 40 TO 100 DEGREES F
QUANTITY = TWO, ONE DUTY AND ONE STANDBY
FLOW RATE = 140 GALLONS PER HOUR, MAXIMUM OUTPUT
10. BULK BAG HANDLING SYSTEM
A BULK BAG HANDLING SYSTEM SHALL BE PROVIDED FOR THE HANDLING AND EMPTYING OF BULK BAGS OF SALT AND SUBSEQUENT TRANSFER TO THE BRINE TANK. SYSTEM CAPACITY SHALL BE CAPABLE OF HANDLING TWO TON BULK BAGS. SYSTEM SHALL CONSIST OF THREE MAJOR COMPONENTS: LOWER FRAME, UPPER FRAME, AND CONVEYOR.
THE LOWER FRAME SHALL BE ANCHORED TO THE FRAME AND PROVIDE THE STRUCTURAL SUPPORT FOR THE REMAINDER OF THE SYSTEM. THE LOWER FRAME SHALL PROVIDE THE NECESSARY COMPONENTS TO RECEIVE THE SALT FROM A BULK BAG IN THE UPPER FRAME AND TRANSFER IT TO THE CONVEYOR, VIA AN IRIS VALVE, WHILE CONTAINING THE SALT DUST. THE LOWER FRAME SHALL BE OF POWDER COATED CARBON STEEL.
THE UPPER FRAME SHALL BE MOVABLE BY A FORKTRUCK FROM EITHER TOP OR BOTTOM, AND SHALL SUPPORT THE BULK BAG VIA THE LOOPS ON THE BAG FROM THE TOP OF THE FRAME WHILE BEING POSITIONED ON THE LOWER FRAME. THE UPPER FRAME SHALL BE OF POWDER COATED CARBON STEEL CONSTRUCTION.
THE CONVEYOR SHALL TRANSFER THE SALT FROM THE RECEIVING HOPPER OF LOWER FRAME TO THE BRINE TANK. THE CONVEYOR SHALL BE A STRAIGHT SHAFT STAINLESS STEEL SCREW CONVEYOR. CONVEYOR BEARINGS SHALL BE ADEQUATELY ISOLATED AND SEALED TO PREVENT INTRUSION OF SALT IN TO THE BEARINGS OR LEAKAGE OF LUBRICANT INTO THE SALT. CONVEYOR MOTOR SHALL BE TEFC, SEVERE-DUTY RATED.
11. APPURTENANCES
CONTRACTOR SHALL FURNISH APPURTENANCES AS SPECIFIED HEREIN OR SHOWN ON THE DRAWINGS, TO PROVIDE A COMPLETE AND OPERABLE SYSTEM. WHERE MATERIALS OF CONSTRUCTION ARE NOT SPECIFIED, THE MANUFACTURER SHALL FURNISH MATERIALS COMPATIBLE WITH THE INTENDED SERVICE CONDITION AND SHALL SUBMIT SUPPORTING DATA AS REQUIRED.
EACH VFD SHALL BE PROVIDED WITH CONTROL TO RECEIVE A 4-20 MA SIGNAL TO VARY OUTPUT FOR VARIABLE SPEED CONTROL OF THE ATTACHED EQUIPMENT.

G. GENERAL EXECUTION
THE ON-SITE SODIUM HYPOCHLORITE GENERATOR SYSTEM EQUIPMENT SHALL BE INSTALLED AND TESTED AS SHOWN ON THE DRAWINGS AND SPECIFIED HEREIN:
1. THE CONTRACTOR SHALL ARRANGE TO HAVE THE MANUFACTURER/ SUPPLIER OF THE EQUIPMENT SPECIFIED IN THIS SECTION FURNISH THE SERVICES OF COMPETENT FACTORY-TRAINED PERSONNEL TO PROVIDE THE INSTALLATION AND START UP OF ALL EQUIPMENT. ALLOWANCE FOR THIS SERVICE SHALL BE INCLUDED BY THE MANUFACTURER IN THE PRICE OF HIS EQUIPMENT. INSTALLATION AND ERECTION OF ALL ASSEMBLIES AND COMPONENTS SHALL BE IN ACCORDANCE WITH THE DETAILS INDICATED ON THE DRAWINGS, APPROVED SHOP DRAWINGS, AND THE PRINTED INSTRUCTION OF THE MANUFACTURER.
2. AFTER INSTALLATION, THE SYSTEMS SHALL BE PUT THROUGH ALL OPERATIONS IN THE PRESENCE OF THE OWNER. VISUAL INSPECTION WILL BE MADE FOR PROPER INSTALLATION, OPERATION, ALIGNMENT, AND LUBRICATION. MANUFACTURER SHALL PROVIDE A CERTIFICATE STATING INSTALLATION IS SATISFACTORY.
3. CRITICAL SPARE PARTS SHALL BE INCLUDED AS A PART OF THE SYSTEM INSTALLATION AND DELIVERED TO THE OWNER AS A PORTION OF SUBSTANTIAL COMPLETION.

H. INSTRUCTION
AFTER THE EQUIPMENT HAS BEEN INSTALLED, TESTED, AND ADJUSTED, AND PLACED IN SATISFACTORY OPERATING CONDITION, THE EQUIPMENT MANUFACTURER SHALL PROVIDE CLASSROOM INSTRUCTION TO OWNER'S OPERATING PERSONNEL IN THE USE AND MAINTENANCE OF THE EQUIPMENT. CONTRACTOR SHALL GIVE THE OWNER FORMAL WRITTEN NOTICE OF THE PROPOSED INSTRUCTION PERIOD AT LEAST TWO WEEKS PRIOR TO COMMENCEMENT OF THE INSTRUCTION PERIOD. SCHEDULED TRAINING SHALL BE AT A TIME MUTUALLY ACCEPTABLE TO THE OWNER AND THE MANUFACTURER. DURING THIS INSTRUCTION PERIOD, THE MANUFACTURER SHALL ANSWER ANY QUESTIONS FROM THE OPERATING PERSONNEL. THE MINIMUM INSTRUCTION PERIOD SHALL BE AS LONG AS NECESSARY TO ADDRESS DETAILS OF OPERATION, ROUTINE MAINTENANCE, REPAIR, AND SPECIAL EQUIPMENT FEATURES AND OPERATIONS AND MAINTENANCE QUESTIONS.

I. WARRANTY
THE MANUFACTURER SHALL WARRANT THEIR PUMPS TO BE FREE OF DEFECTS FOR A PERIOD OF NOT LESS THAN ONE YEAR AFTER THE PRODUCT IS PUT INTO OPERATION OR NOT LESS THAN EIGHTEEN MONTHS FROM THE DELIVERY DATE, WHICHEVER OCCURS FIRST.

46 41 17 INLINE STATIC MIXERS

A. STATIC MIXER SHALL BE WESTFALL'S MODEL 2800 OR ENGINEER APPROVED EQUAL.
B. MATERIALS: CPVC BODY W/ VITON GASKETS.
C. STATIC MIXER SHALL BE WAFER STYLE, HAVE A 0.8 BETA RATIO AND TWO (2) ½" CHEMICAL INJECTION INLETS.

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RE-USE WATER PUMP STATION

TO SERVE SPIRIT AEROSYSTEMS

EQUIPMENT AND PIPING NOTES (CONT.)

PROJECT NO.	468-85112
DATE	04/18/16
SCALE	AS NOTED

DESIGNED	DRAWN	CHECKED
ALF	ALF	KTS

NO.	REVISION	DATE
0	ISSUED FOR CONSTRUCTION	04/18/16

SHEET NO.

M6.1

KEITH T. SEARBERT LICENSED 21496 KANSAS PROFESSIONAL ENGINEER

4/21/2016 3:33:39 PM

PLUMBING FIXTURE SCHEDULE

MARK	FIXTURE TYPE	MFG	MODEL	MATERIAL	COLOR	SIZE (IN)	MOUNTING	VALVE				PIPE ROUGH-IN SIZE					REMARKS
								MFG	MODEL	GPM/GPF	FINISH	P-TRAP	WASTE	VENT	DCW	DHW	
EWS-1	EMERGENCY WASH STATION	STINGRAY	S5510	SS	ST	SEE PLANS	FLOOR	--	--	--	--	--	--	--	1 1/4"	--	1,2,3
EWH-1	EMERGENCY WASH STATION WATER HEATER	STINGRAY	S9300	--	ST	SEE PLANS	FLOOR	--	--	--	--	--	--	--	1 1/4"	--	4,5
HB-1	HOSE BIBB	ZURN	Z1341	BR	ST	--	WALL	--	--	--	--	--	--	--	3/4"	--	

PLUMBING FIXTURE SCHEDULE ABBREVIATIONS

ST	MFG STANDARD FINISH
NB	NICKEL BRONZE
SS	STAINLESS STEEL
CI	CAST IRON
BR	BRASS

PLUMBING REMARKS

REMARKS	DESCRIPTION
1	PROVIDE SHUT-OFF VALVE IN TEMPERED WATER SUPPLY LINE TO FIXTURE.
2	TEMPERED WATER (60°- 100°) SHALL BE PROVIDE TO THE FIXTURE.
3	INSTALL FIXTURE PER MANUFACTURERS RECOMMENDATIONS
4	INSTALL WATER HEATER PER MANUFACTURERS RECOMMENDATIONS.
5	PROVIDE SHUT-OFF VALVE IN CW CONNECTION TO WATER HEATER.

KEYED NOTES P1.1

1.	DOMESTIC WATER LINE TO BE EXTENDED TO CONNECT TO PROCESS EQIUPMENT IN THIS AREA. SEE MANUFACTURERS EQUIPMENT CONECTION REQUIREMENTS FOR ADDITIONAL INFORMATION.
2.	M.C. TO PROVIDE AND INSTALL A WATTS MODEL LF009 (OR EQUAL) BACKFLOW PREVENTER AS SHOWN.
3.	PROVIDE BACKFLOW PREVENTOR WITH WATTS MODEL 009M2 AIR GAP FITTING. ROUTE DRAIN PIPING TO OUTDOORS.
4.	EXTEND WASTE LINE TO WET WELL AND DISCHARGE WITH DOWN TUNED ELBOW. DISCHARGE FLOWLINE SHALL BE ABOVE 1259.75.
5.	EXTEND 4" WASTE LINE UP THROUGH FLOOR IN THIS AREA. TERMINATE 1'-0" ABOVE FINISH FLOOR. COORDINATE EXACT LOCATION WITH WATER SOFTENER EQUIPMENT.
6.	PROVIDE 3/4"CW LINE WITH SHUT-OFF VALVE TO WATER SOFTENING SYSTEM.
7.	EXTEND 2" DRAIN LINE FROM EYE WASH STATION TO EXTERIOR WALL. TERMINATE THRU WALL WITH DOWN TURNED ELBOW AND SPLASH BLOCK.

PIPING SYSTEMS

WORK INCLUDED: INSTALLATION OF ALL PIPING SYSTEMS.

DOMESTIC WATER: TYPE "L" HARD COPPER ASME B88 PIPE. WROUGHT COPPER ASTM B16.22 FITTINGS. SWEAT 95-5 TIN ANTIMONY SOLDER JOINTS. USE TYPE "K" COPPER BELOW GRADE. PLUMBING INSTALLER SHALL MINIMIZE PIPING JOINTS BELOW FLOOR. WHERE JOINTS ARE NECESSARY, ALL JOINTS SHALL BE BRAZED WITH SILVER BEARING SOLDER.

SOIL, WASTE AND VENT

PVC PIPE: ASTM D2665, SCHEDULE 40 DWV PVC PIPE WITH ASTM D3311, PVC FITTINGS. JOINTS TO BE ASTM D2855, SOLVENT WELD WITH ASTM D2564 SOLVENT CEMENT.

PIPE HANGERS AND SUPPORTS:
PROVIDE PIPE HANGERS AND SUPPORTS DESIGNED TO CARRY THE LOAD WITH A SAFETY FACTOR OF 5 OR LARGER. HANGERS OVER SIZED TO FIT PIPE AND INSULATION ON INSULATED LINES. COPPER HANGERS SHALL BE USED FOR SUPPORT OF COPPER PIPING.

PIPE HANGER SPACING:

5'-0" ON CENTER FOR CAST IRON SOIL PIPE, 4'-0" ON CENTER FOR ABS & PVC PLASTIC PIPE.
6'-0" ON CENTER FOR COPPER, IRON AND STEEL PIPING UP TO 1 1/4" DIAMETER.
10'-0" ON CENTER FOR COPPER, IRON AND STEEL PIPING ABOVE 1 1/2" DIAMETER AND LARGER.

VALVES & COCKS:

GENERAL: ALL VALVES OF A GIVEN TYPE SHALL BE OF ONE MANUFACTURER. PROVIDE ALL VALVES WHERE REQUIRED FOR OPERATION, SERVICE AND MAINTENANCE OF SYSTEMS AND EQUIPMENT. 150 PSIG WORKING PRESSURE OR FOR PRESSURE AND SERVICE SPECIFIED HEREIN. ALL VALVES SHALL BE OF A SUITABLE TYPE FOR INTENDED SERVICE.

SWEAT JOINTS VALVES IN COPPER PIPING. PROTECT VALVES FROM HEAT DURING INSTALLATION. ALL VALVES IN INSULATED PIPING SYSTEM WILL BE INSTALLED WITH OPERATING HANDLES ABOVE INSULATION THROUGH USE OF EXTENSION STEMS, EXTENDED NECKS OR RISING STEMS.

BALL VALVES: BRONZE, SWING-AWAY DESIGN, FULL PORT, CHROME PLATED BRONZE BALL WITH TEFLON SEATS, 125 SWP, 400 WOG SCREWED OR SOLDERED ENDS.

DRAIN VALVES: BRONZE, COMPRESSION STOP WITH NIPPLE AND CAP OR HOSE THREAD.

INSULATION

WORK INCLUDED: ALL PIPING SYSTEM INSULATION

ACCEPTABLE MANUFACTURERS:

A. FIBERGLASS INSULATION
1. OWENS CORNING
2. JOHNS-MANVILLE
3. KNAUF
4. CERTAINTEED

DOMESTIC COLD WATER AND HOT WATER PIPING:
INSULATE ALL DOMESTIC HOT WATER AND COLD WATER PIPING WITH FIBERGLASS SSK-11 ASJ PIPE INSULATION WITH SELF SEALING LAP. THE MAINS, MANIFOLDS, AND VALVES SHALL BE INSULATED.

ALL INSULATION SHALL BE CONTINUOUS THROUGH WALL AND CEILING OPENINGS AND SLEEVES. INSULATION ON ALL COLD SURFACES WHERE VAPOR BARRIER JACKETS ARE USED, WILL BE APPLIED WITH A CONTINUOUS, UNBROKEN VAPOR SEAL. HANGERS, SUPPORTS, ANCHORS, ETC., WHICH ARE SECURED DIRECTLY TO COLD SURFACES MUST BE ADEQUATELY INSULATED AND VAPOR-SEALED TO PREVENT CONDENSATION. CRUSHING OF INSULATION AT HANGERS IS NOT PERMITTED AND WILL REQUIRE PIPE SADDLES OR HIGH DENSITY FOAM GLASS INSERTS. PIPE SADDLES SHALL BE INSULATED AS REQUIRED TO COMPLETE A CONTINUOUS UNBROKEN INSULATION OF PIPE AS SPECIFIED FOR THE PIPING BEING SUPPORTED. SPECIFIED ADHESIVES MASTICS AND COATINGS SHALL BE APPLIED AT THE MANUFACTURER'S RECOMMENDED MINIMUM COVERAGE PER GALLON.

FITTINGS:
ALL FITTINGS, VALVES, FLANGES, SHALL BE COVERED WITH PVC PRE-MOLDED ONE PIECE FITTING COVERS UTILIZING FACTORY SUPPLIED HI-LO TEMPERATURE INSULATION INSERT. INSULATION INSERT SHALL BE APPLIED TO THE FITTING WITH ENDS OF INSERT TUCKED SNUGLY INTO THROAT OF FITTING AND EDGES ADJACENT TO PIPE. NO GAPS SHALL OCCUR BETWEEN FITTING INSULATION AND PIPE INSULATION. SECURE PVC PRE-MOLDED

INSULATION	PIPE
½"	DOMESTIC COLD WATER

COVER TO INSULATED FITTING BY STAPLING AND TAPING EDGES OF COVER WITH ZESTON COLOR MATCHING Z-TAPE. COLD WATER SYSTEMS, FITTINGS, VALVES, FLANGES, PVC PRE-MOLDED FITTING COVER SHALL BE SECURED WITH ZESTON VAPOR BARRIER ADHESIVE OR EQUAL (FOSTERS 85-20). CIRCUMFERENTIAL EDGES OF COVER SHALL BE WRAPPED WITH ZESTON COLOR MATCHING Z-TAPE. THE TAPE SHALL EXTEND OVER ADJACENT PIPE INSULATION AND OVERLAP ITSELF AT LEAST 2" ON THE DOWNWARD SIDE.

PIPING INSTALLATION:
PIPING INSTALLATION: EVENLY SPACED - RUN HARMONIOUSLY WITH THE BUILDING WALLS AND CEILINGS. INSTALL IN THE DESIRED LOCATION AS INDICATED ON DRAWINGS. CERTAIN BRANCH PIPING MAY BE REROUTED, PROVIDING REROUTING DOES NOT ALTER INTENDED DESIGN. TAKEOFFS FROM WATER MAINS SHALL BE TYPICALLY FROM BOTTOM OF PIPING (UNLESS PLANS SHOW DIFFERENTLY). INSTALLED IN STRICT ACCORDANCE WITH BEST PIPING PRACTICE. PIPING NOT SIZED ON DRAWINGS SHALL BE SIZED BY THE ENGINEER. REDUCTION IN PIPE SIZE MADE WITH ECCENTRIC REDUCERS IN HORIZONTAL LINES TO AVOID AIR AND WATER POCKETS.

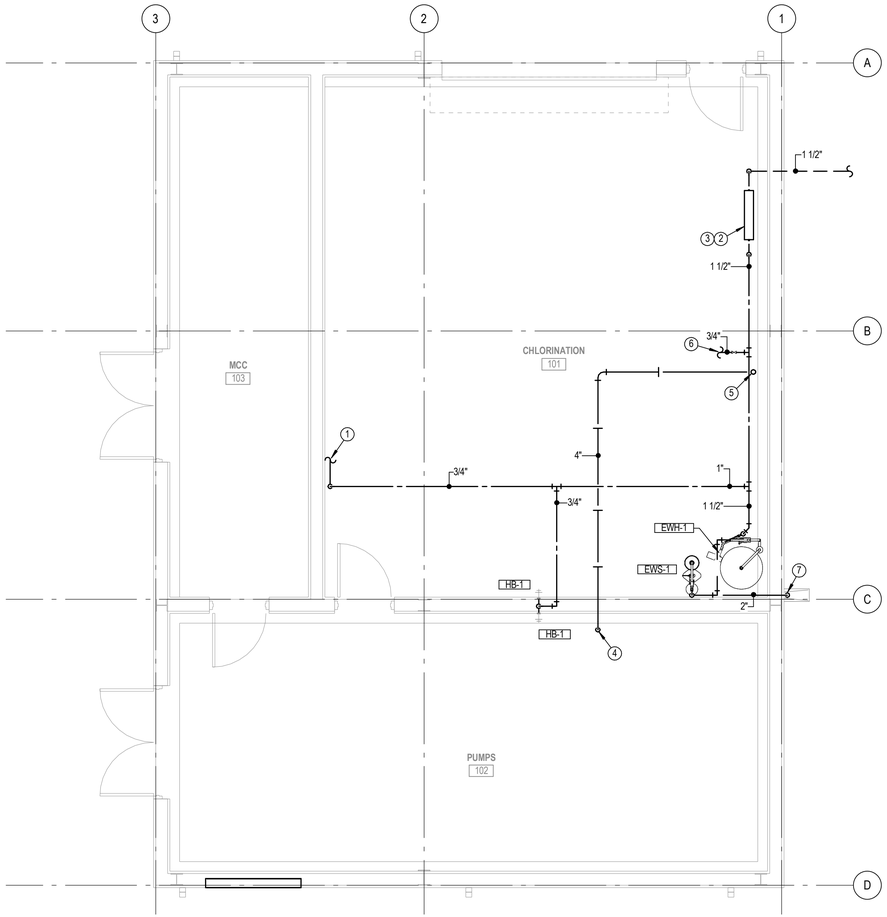
PROVIDE UNIONS AND ISOLATION VALVES AT ALL EQUIPMENT TO FACILITATE REMOVAL. USE NON-CONDUCTING FITTINGS WHERE JOINTING DISSIMILAR METALS. SLOPE ALL DRAINAGE PIPING 1/4" PER FOOT (1/8" PER FOOT FOR DWV PIPING 4" AND LARGER). ARRANGE PIPING IN A MANNER TO ALLOW FOR EXPANSION AND CONTRACTION. THOROUGHLY CLEAN BEFORE INSTALLING - NO SAND, DIRT, FILINGS, ETC.

PREPARATION: ALL TESTING OF PIPING SHALL BE COMPLETED AND ALL LEAKS REPAIRED PRIOR TO APPLICATION OF INSULATION.

PLUMBING SYSTEMS/PLUMBING FIXTURES

WORK INCLUDED:
ALL PLUMBING SYSTEMS AND PLUMBING FIXTURES AND TRIM.

PLUMBING INSTALLATION:
PROVIDE TRAPS AT ALL FIXTURE WASTE CONNECTIONS. PROVIDE STOPS AT ALL INDIVIDUAL PLUMBING FIXTURES AND EQUIPMENT. INSTALL ADDITIONAL WALL SUPPORT FRAMING FOR ALL WALL HUNG FIXTURES (WHERE CARRIERS ARE NOT PROVIDED).



A WATER & GAS PLAN

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

N

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RE-USE WATER PUMP STATION

TO SERVE SPIRT AEROSYSTEMS

PLUMBING PLANS

PROJECT NO.	468-85112
DATE	04/18/16
SCALE	AS NOTED

DESIGNED	DRAWN	CHECKED
RLB	CJK	RLB

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P1.0

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