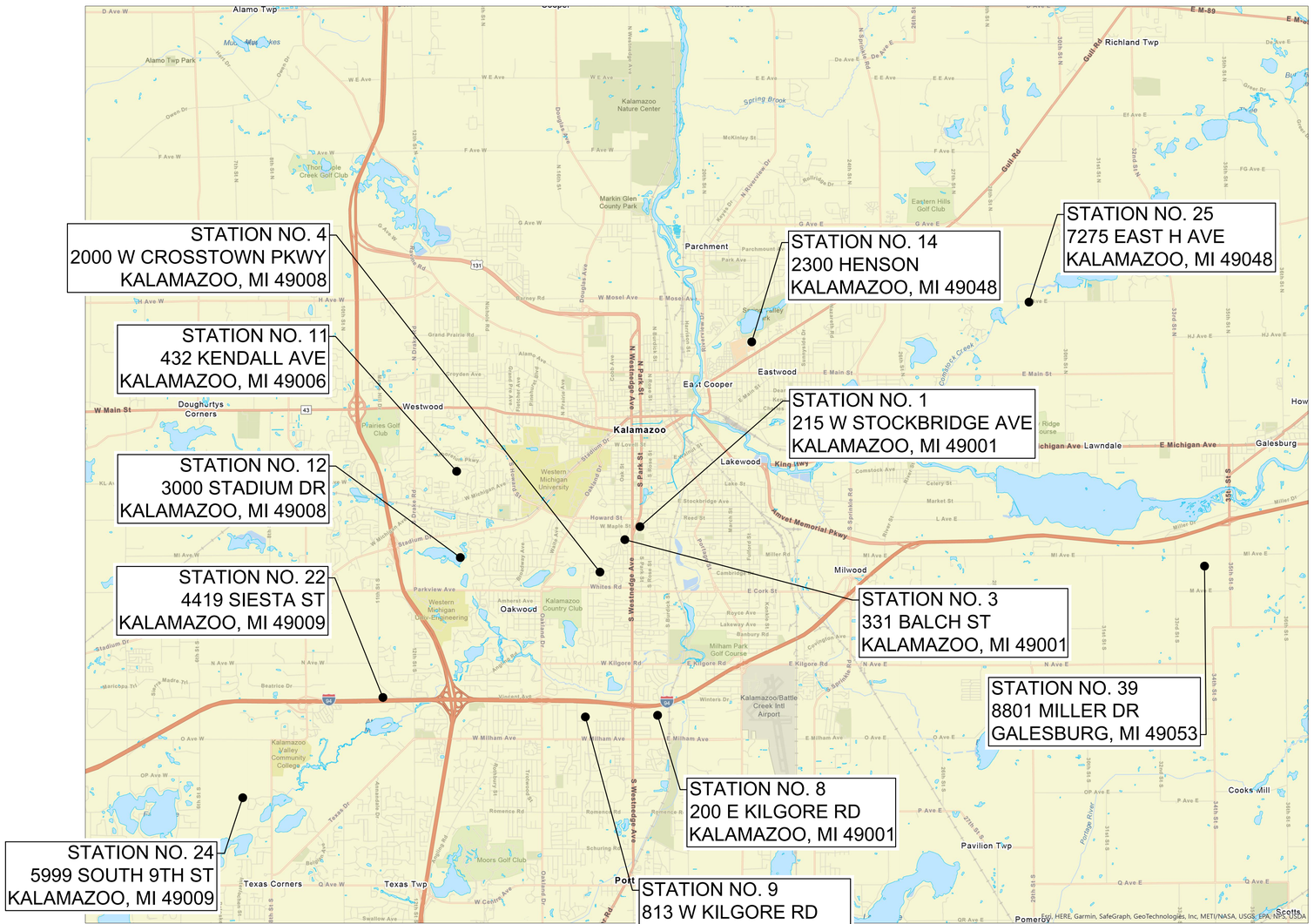
CITY OF KALAMAZOO, MICHIGAN
WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

1136 OAK VALLEY DRIVE, SUITE 100
ANN ARBOR, MI 48108
PHONE: (734) 665-6000 FAX: (734) 213-3003
www.tetratech.com

TETRA TECH



PROJECT LOCATION:

MULTIPLE SITE LOCATIONS
REFERENCE DRAWING G-001
FOR MAP AND SITE LOCATIONS

CLIENT INFORMATION:

CITY OF KALAMAZOO
415 STOCKBRIDGE AVE.
KALAMAZOO, MI 49001

Tt PROJECT No.:

200-19743-19004

CLIENT PROJECT No.:

PROJECT DESCRIPTION / NOTES:

REPLACE THE EXISTING CHEMICAL FEED SYSTEM AT SELECTED PUMP STATIONS WITH A NEW POLYPHOSPHATE FEED SYSTEM FOR THE WATER DISTRIBUTION SYSTEM.

ISSUED:

NOVEMBER 29, 2023 - ISSUED FOR BID

VICINITY MAP:

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37	S-116	PUMP STATION NO. 14 PROPOSED PLAN
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MARK	DATE	DESCRIPTION
	11/29/23	ISSUED FOR BID

CITY OF KALAMAZOO, MICHIGAN
WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

SHEET INDEX

Project No.: 200-19743-19004
Designed By:
Drawn By:
Checked By:

G-002

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Bar Measures 1 inch

11/28/2023 9:44:26 AM - O:\PROJECTS\ANN ARBOR\IER\197432\200-19743-190041\CAD\SHEETFILES\CIVIL\G-002 SHEET INDEX.DWG - GUARD, STEVEN

SITE LEGEND

SITE SYMBOLS

FEATURES

- EXISTING SIGN
- PROPOSED SIGN
- TRASH RECEPTACLE
- POST
- POWER METER
- FLAG POLE
- GUY WIRE
- UTILITY POLE
- DECIDUOUS TREE
- EVERGREEN TREE
- BUSH
- STUMP

STORM / DRAINAGE

- EXISTING MANHOLE
- PROPOSED MANHOLE
- EXISTING CULVERT
- PROPOSED CULVERT
- EXISTING INLET BASIN
- PROPOSED INLET BASIN
- PROPOSED INLET BASIN

MISCELLANEOUS

- MONITORING WELL
- SOIL BORING
- MANHOLE W/ ID
- SPOT ELEVATION
- SLOPE ARROW
- SLOPE ARROW
- HANDICAP MARKING
- (F) FUTURE IMPROVEMENTS

SURVEY

- FOUND PROPERTY CORNER
- SET PROPERTY CORNER
- FOUND MONUMENT
- SET MONUMENT
- OWNERSHIP TIE
- SECTION CORNER
- BM# BENCHMARK
- KEY NOTE
- SOIL EROSION AND SEDIMENTATION CONTROL NOTE

UTILITY SYMBOLS

WATER

- EXISTING VALVE IN BOX
- PROPOSED VALVE IN BOX
- EXISTING CURB STOP
- PROPOSED CURB STOP
- METER
- EXISTING VALVE MANHOLE
- PROPOSED VALVE MANHOLE
- EXISTING WELL
- PROPOSED WELL
- EXISTING FIRE HYDRANT
- PROPOSED FIRE HYDRANT
- SPRINKLER HEAD
- SPIGOT

NON POTATBLE WATER

- PROPOSED YARD HYDRANT

SANITARY SEWER

- EXISTING MANHOLE
- PROPOSED MANHOLE
- EXISTING AIR RELEASE STRUCTURE
- PROPOSED AIR RELEASE STRUCTURE
- EXISTING IN-LINE FLUSH CONNECTION
- PROPOSED IN-LINE FLUSH CONNECTION
- EXISTING IN-LINE FLUSH CONNECTION
- PROPOSED IN-LINE FLUSH CONNECTION
- EXISTING CLEAN OUT
- PROPOSED CLEAN OUT
- EXISTING SEWER VALVE
- PROPOSED SEWER VALVE
- EXISTING CURB STOP
- PROPOSED CURB STOP
- PUMP STATION (SIMPLEX)
- PUMP STATION (DUPLEX)
- SEWER LATERAL

NATURAL GAS

- MARKER
- VALVE

CABLE TV

- RISER
- JUNCTION BOX

COMMUNICATIONS

- TEL TELEPHONE
- TB BOX OR RISER
- TJ JUNCTION BOX
- FO FIBER OPTIC BOX
- FO FIBER OPTIC FLAG
- TEL MANHOLE
- TEL VAULT

UTILITY SYMBOLS (CONT'D.)

ELECTRICAL

- EM METER
- ET TRANSFORMER
- EB BOX OR RISER
- LIGHT POLE
- EXTERIOR BUILDING LIGHT
- TSP TRAFFIC SIGNAL POLE
- TS TRAFFIC SIGNAL CONTROL (BOX)
- ELEC MANHOLE
- EJ JUNCTION BOX

FEATURE HATCHING

- EXISTING STRUCTURE OR PIPING TO BE REMOVED / DEMOLISHED
- EXISTING ASPHALT TO BE REMOVED / DEMOLISHED
- EXISTING GRAVEL TO BE REMOVED / DEMOLISHED
- PROPOSED PAVEMENT
- PROPOSED CONCRETE PAVEMENT
- PROPOSED LIGHT DUTY ASHPALT PAVEMENT
- PROPOSED HEAVY DUTY ASHPALT PAVEMENT
- PROPOSED GRAVEL
- WETLAND AREA
- PROPOSED SOD

FEATURES & FEATURE LINES

- GRADING LIMITS
- RIGHT OF WAY LINE
- SECTION LINE
- UTILITY EASEMENTS
- 900 EXISTING CONTOUR - MAJOR
- 899 EXISTING CONTOUR - MINOR
- PROPERTY LINE
- 899 PROPOSED CONTOUR - MAJOR
- 899 PROPOSED CONTOUR - MINOR
- SF EROSION SILT FENCE
- SSF EROSION SUPER SILT FENCE
- FENCE (WOOD)
- FENCE (STEEL)
- FLOOD HAZARD AREA
- FLOW ARROW
- GRAVEL ROAD OR DRIVE
- ROCK RETAINING WALL
- TREE / BRUSH LINES
- CLEARING & GRUBBING LIMITS
- WATER EDGES
- DITCH CENTER LINE
- WETLAND BOUNDARY
- PROPOSED SUPERSTRUCTURE
- EXISTING SUPERSTRUCTURE
- STRUCTURE (TANKS, ETC.)
- EXISTING UNDERGROUND STRUCTURE
- FUTURE STRUCTURE

UTILITY LINES

- OTV CABLE TV OVERHEAD
- UTV CABLE TV UNDERGROUND
- FO COMMUNICATION FIBER OPTIC
- OT COMMUNICATION OVERHEAD
- UT COMMUNICATION UNDERGROUND
- DE ELECTRIC OVERHEAD
- UE ELECTRIC UNDERGROUND
- G NATURAL GAS
- HPG NATURAL GAS HIGH PRESSURE
- JT JET FUEL
- FM SANITARY FORCEMAIN
- SS SANITARY SEWER LINE
- SD STORM DRAIN
- RD STORM ROOF DRAIN
- F FIRE PROTECTION
- W WATER MAIN
- 36"SS UTILITY LINE 36" AND LARGER

NOTE: HEAVIER LINE WEIGHTS INDICATE PROPOSED WORK.

REFERENCE SYMBOLS

DETAIL REFERENCE

X — DENOTES DETAIL NUMBER IDENTIFICATION

X-XX — DENOTES DRAWING NO WHERE DETAIL IS LOCATED

DETAIL TITLE

X — DENOTES DETAIL NUMBER IDENTIFICATION

DETAIL

SCALE:

— DENOTES DRAWING NO WHERE DETAIL IS LOCATED

GENERAL NOTES:

1. UNDERGROUND UTILITIES AS SHOWN HEREIN WERE TAKEN FROM SURVEY AND EXISTING PLANS AND ARE APPROXIMATE LOCATIONS ONLY. UNDERGROUND UTILITY LOCATIONS HAVE NOT BEEN FIELD VERIFIED. CONTRACTOR IS RESPONSIBLE FOR FIELD VERIFICATION OF ALL UNDERGROUND UTILITIES.
2. ALL TREES AND SIZES MAY NOT BE LABELED. REMOVAL OF ALL TREES IMPACTED BY WORK IS INCLUDED IN CONTRACT PRICE.
3. BENCHMARKS ARE BASED ON NAVD 88 DATUM.
4. CONTRACTOR SHALL NOT UTILIZE ANY PAVED ROADWAYS OUTSIDE CONSTRUCTION AREAS FOR TRACK EQUIPMENT OPERATION OR STORAGE. ALL DAMAGED ROADWAYS CAUSED BY CONTRACTOR TO BE REPAIRED AT CONTRACTORS EXPENSE.
5. THE CONTRACTOR AND SUBCONTRACTOR(S) SHALL MAKE A PERSONAL INVESTIGATION OF THE SITE AND EXISTING SURFACE AND SUBSURFACE CONDITIONS. THE CONTRACTOR IS RESPONSIBLE TO ACQUAINT THEMSELVES WITH CONDITIONS OF THE WORK AREA. THE CONTRACTOR IS ADVISED TO DETERMINE THE SUBSURFACE SOIL AND GROUND WATER CONDITIONS. DEWATERING, IF DETERMINED NECESSARY BY THE CONTRACTOR AND IF NOT SPECIFICALLY CALLED OUT IN THE CONTRACT DOCUMENTS, WILL BE INCIDENTAL TO THE COST OF INSTALLATION.
6. EQUIPMENT SHALL BE POSITIONED TO ALLOW ACCESS FOR ALL PIPING AND UTILITY CONNECTIONS AND ALLOW ALL REQUIRED CLEARANCES FOR OPERATION AND MAINTENANCE.
7. AT THE END OF EACH WORK DAY SITE SHALL BE SECURE, CLEAN, WITH NO EQUIPMENT, MATERIALS, OR DEBRIS ON THE ROAD. ROAD SHALL BE MECHANICALLY SWEPT WEEKLY (MINIMUM) DURING SITE WORK AND AS REQUIRED DURING THE REMAINING WORK.
8. ALL EXISTING SITE CONDITIONS SHOWN ON THE PLANS ARE FOR REFERENCE ONLY.
9. ALL DISTURBED AREAS SHALL BE RESTORED.
10. THE SOIL BORINGS REPRESENT POINT INFORMATION. PRESENTATION OF THIS INFORMATION IN NO WAY IMPLIES THAT SUB-SURFACE CONDITIONS ARE THE SAME OTHER THAN THE EXACT LOCATION OF THE BORINGS. THE SOIL BORING LOGS ARE CONTAINED IN THE PROJECT MANUAL.
11. CONTRACTOR TO COORDINATE ACCESS TO SITE WITH CITY OF KALAMAZOO WWTP STAFF.
12. PER SPECIFICATIONS, ALL PIPE TRENCHES AND EXCAVATIONS SHALL BE KEPT FREE OF WATER. THE CONTRACTOR IS RESPONSIBLE FOR SUBMITTING A DEWATERING PLAN FOR APPROVAL CAPABLE OF MEETING THIS REQUIREMENT. INFORMATION REGARDING GROUND WATER ELEVATIONS CAN BE FOUND IN THE SOIL REPORT FOUND IN THE PROJECT MANUAL
13. REPAVE ROAD EXCAVATED AS PART OF YARD PIPING AND DUCTBANK WORK. SECTIONS SHALL HAVE STRAIGHT SAW CUT BETWEEN EXISTING AND NEW ROAD SECTION.

UTILITIES:

FOR ALL PROTECTION OF UNDERGROUND UTILITIES, THE CONTRACTOR SHALL CALL MISS-DIG A MINIMUM OF 3 WORKING DAYS PRIOR TO EXCAVATING IN THE VICINITY OF UTILITY LINES. ALL MISS-DIG PARTICIPATING MEMBERS WILL THUS BE ROUTINELY NOTIFIED. THIS DOES NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY OF NOTIFYING UTILITY OWNERS WHO MAY NOT BE PART OF THE MISS-DIG ALERT SYSTEM. THE FOLLOWING UTILITY COMPANIES HAVE FACILITIES WITHIN THE PROJECT LIMITS:

• ELECTRIC	CONSUMERS	(800) 276-2722
• NATURAL GAS	CONSUMERS	(800) 276-2722
• SANITARY SEWER	CITY OF KALAMAZOO ENGINEERING DEPARTMENT	(269) 337-8000
• STORM DRAINAGE	CITY OF KALAMAZOO PUBLIC SERVICES DEPARTMENT WATER RESOURCES DIVISION ENVIRONMENTAL SERVICES	(269) 337-8583
• WATER	CITY OF KALAMAZOO DEPARTMENT OF PUBLIC WORKS	(269) 337-8000
• TELEPHONE	AT&T	(800) 288-2020
• CATV	XFINITY	(800) 934-6449

PRIOR TO WORK ON FACILITIES BELONGING TO THE ABOVE UTILITIES, A MINIMUM OF 72 HOURS NOTICE (DURING BUSINESS HOURS) MUST BE GIVEN IN ORDER TO ENSURE PROPER INSPECTION BY THE RESPECTIVE MUNICIPAL OR PRIVATE UTILITY OWNER.

THE CONTRACTOR SHALL LOCATE ALL ACTIVE UNDERGROUND UTILITIES PRIOR TO STARTING WORK, AND SHALL CONDUCT HIS OPERATIONS IN SUCH A MANNER AS TO ENSURE THAT THOSE UTILITIES NOT REQUIRING RELOCATION WILL NOT BE DISTURBED.

ALL GAS FACILITIES SHALL BE PROTECTED AND SUPPORTED PER CONSUMERS DISTRIBUTION STANDARDS.

MISS DIG System Inc. 1-800-482-7171

Please allow for 3 full working days before you dig - call the MISS DIG System at 811 or 800-482-7171.

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MARK	DATE	DESCRIPTION
	11/29/23	ISSUED FOR BID

BY

CITY OF KALAMAZOO, MICHIGAN
WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

LEGEND & GENERAL NOTES

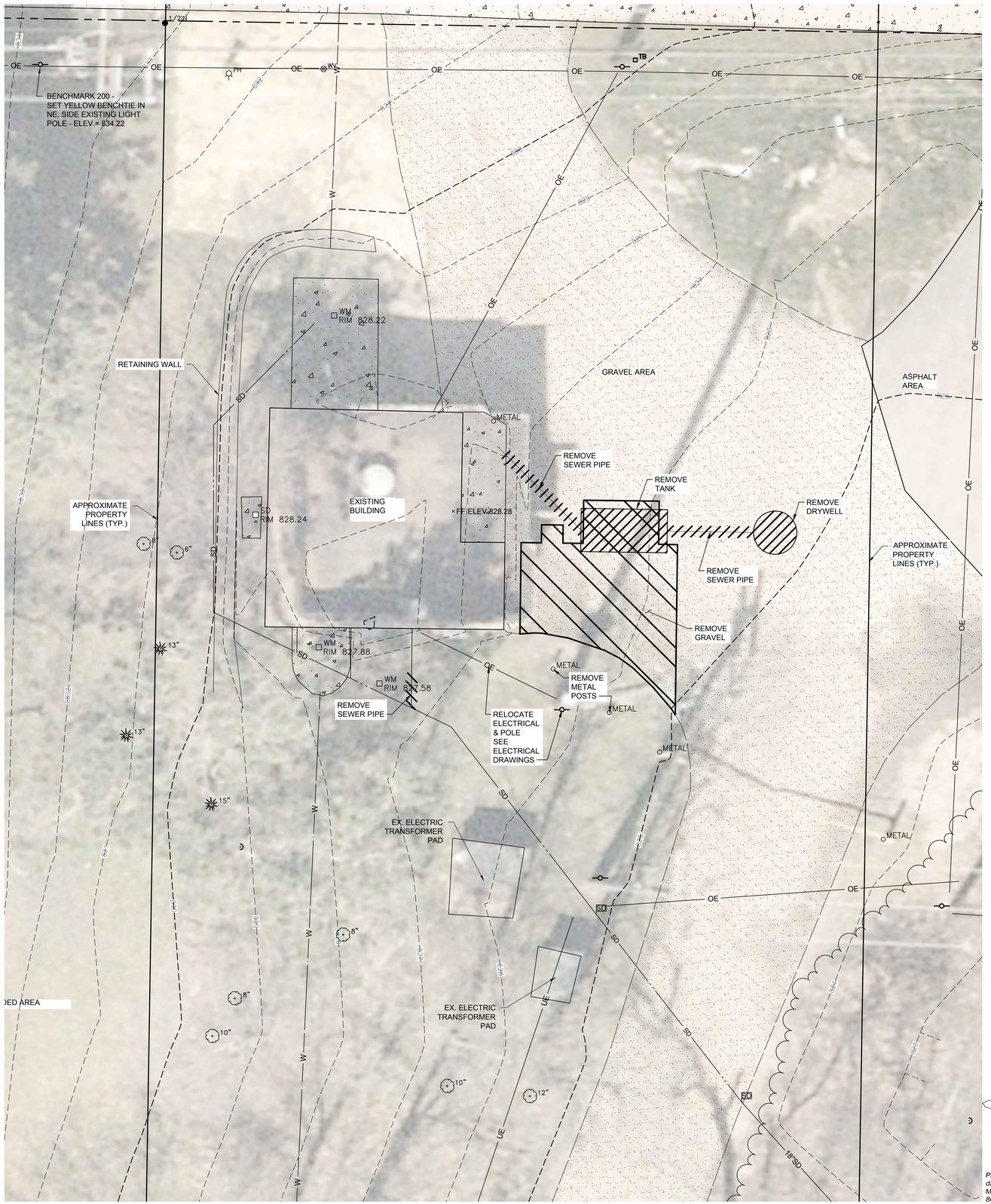
Project No.:	200-19743-19004
Designed By:	
Drawn By:	
Checked By:	

G-003

Copyright: Tetra Tech

Bar Measures 1 inch

11/28/2023 9:46:13 AM - O:\PROJECTS\ANN ARBOR\IER\19743\200-19743-19004\CAD\SHEETFILES\CIVIL\G-003 LEGEND-GENERAL NOTES.DWG - GUARD, STEVEN



NOTES:

1. LOCATION OF UNDERGROUND REMOVALS BASED ON RECORD DRAWINGS AND LOCATIONS SHOWN ARE APPROXIMATE.

MISS DIG System Inc.
1-800-482-7171

Please allow for 3 full working days before you dig - call the MISS DIG System at 811 or 800-482-7171.

N

0 2.5' 5' 10'
SCALE: 1" = 5'

Bar Measures 1 inch

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CITY OF KALAMAZOO, MICHIGAN

WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

PUMP STATION NO. 8 EXISTING CONDITIONS & DEMOLITION PLAN

Project No.:	200-19743-19004
Designed By:	D. WARREN
Drawn By:	A. RODRIGUEZ
Checked By:	J. BARBER

C-101

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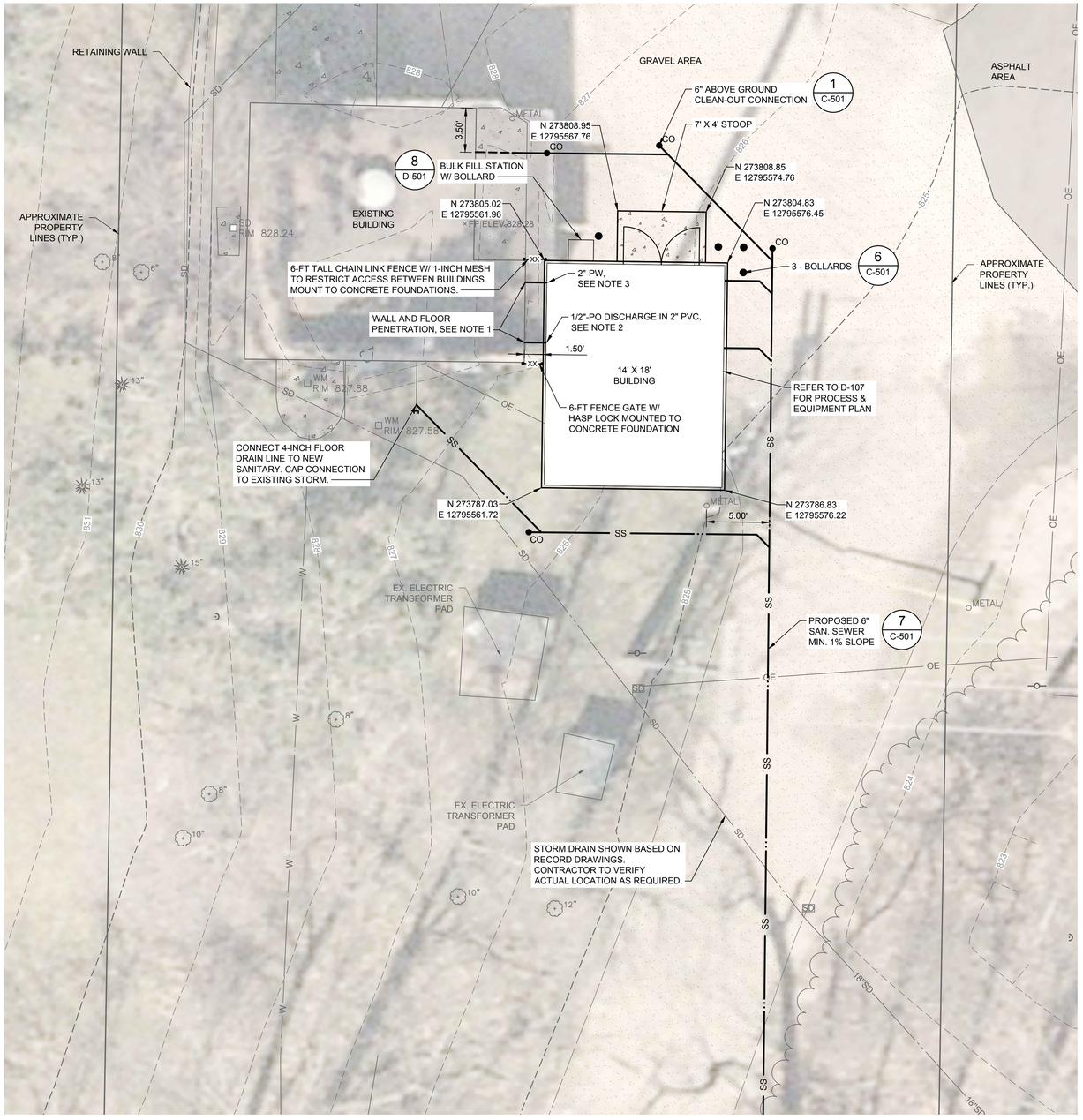
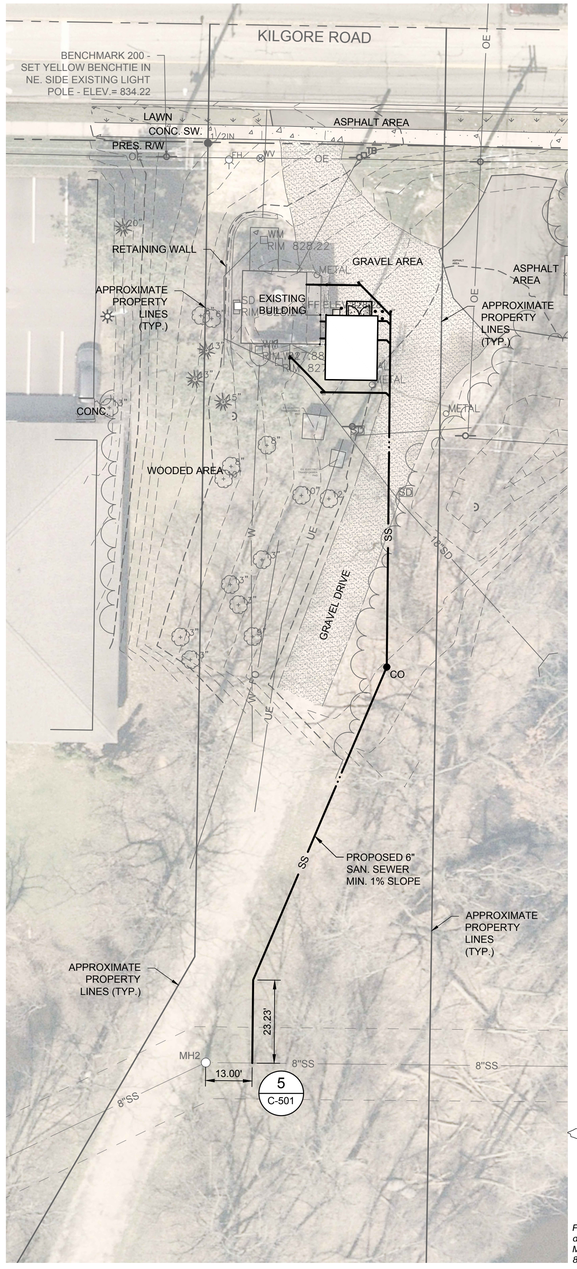
11/28/2023 9:49:12 AM - O:\PROJECTS\ANN ARBOR\IER\19743\200-19743-19004\CAD\SHEETFILES\CIVIL\C-101 PS-08 EXST COND-DEMO PLAN.DWG - GUARD, STEVEN



PLAN - INSET

SCALE: 1" = 5'



PLAN

SCALE: 1" = 20'

MISS DIG System Inc.
1-800-482-7171

Please allow for 3 full working days before you dig - call the MISS DIG System at 811 or 800-482-7171.

NOTES:

1. REFER TO DETAIL 6/D-501 AND 9/D-501 FOR PENETRATION DETAILS (TYP).
2. ROUTE 1/2" CHEMICAL FEED LINE IN A 2" PVC CARRIER PIPE TO EXISTING BUILDING. CONNECT TO EXISTING TAP ON 12" PUMP SUCTION, 2/D-502.
3. ROUTE 2" POTABLE WATER PVC PIPE FROM EYEWASH STATION CONNECTION IN THE EXISTING BUILDING CHEMICAL ROOM TO NEW BUILDING.
4. SEE PROCESS DRAWINGS FOR PROCESS PIPE CONTINUATIONS INSIDE THE NEW AND EXISTING PUMP STATION BUILDINGS.
5. SEE STRUCTURAL DRAWINGS FOR NEW AND EXISTING PUMP STATION BUILDING INFORMATION.
6. HEAT TRACE AND INSULATE ALL PROPOSED OUTDOOR WATER, PHOSPHATE CONTAINMENT AND CARRIER PIPING.
7. CONTRACTOR TO VERIFY SITE CONDITIONS FOR MAINTAINING MINIMUM 1-FT CLEARANCE BETWEEN THE CHEMICAL OR WATER PIPING TO ANY OTHER EXISTING PIPE OR STRUCTURE.
8. CONTRACTOR TO VERIFY SITE CONDITIONS TO MAINTAIN AT LEAST 1.5-FT CLEARANCE BETWEEN THE CHEMICAL AND WATER PIPING ON THE SITE.
9. ALL THE CHEMICAL AND WATER PIPING IN THE SITE SHALL MAINTAIN A MINIMUM COVER OF 2-FT BELOW THE GROUND SURFACE.

TETRA TECH
www.tetratech.com
1136 OAK VALLEY DRIVE, SUITE 100
ANN ARBOR, MI 48108
PHONE: (734) 665-6000 FAX: (734) 213-3003

MARK	DATE	DESCRIPTION
	11/29/23	ISSUED FOR BID

CITY OF KALAMAZOO, MICHIGAN
WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

PUMP STATION NO. 8
SITE LAYOUT & UTILITY PLAN
12' X 12' BUILDING

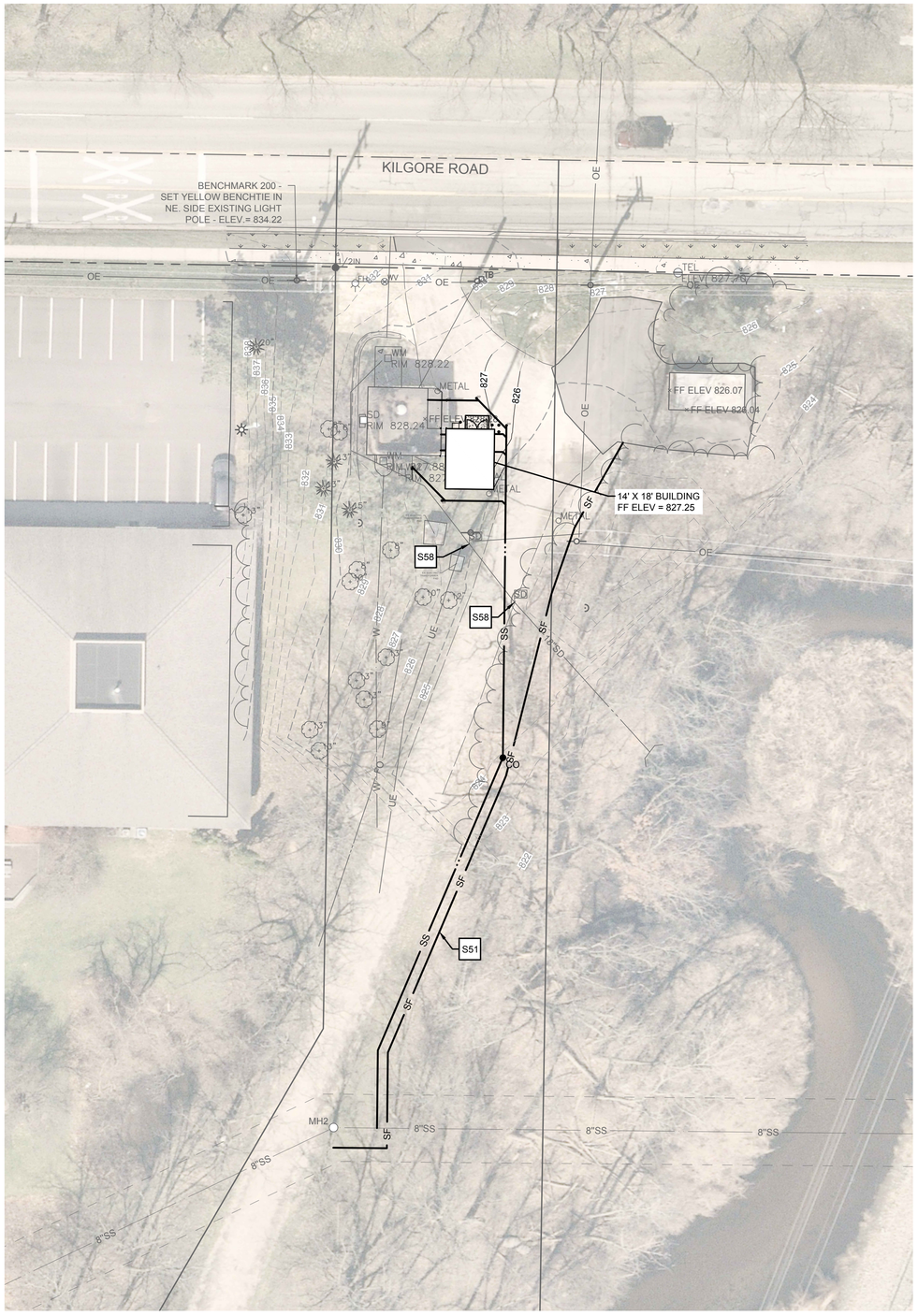
Project No.:	200-19743-19004
Designed By:	D. WARREN
Drawn By:	A. RODRIGUEZ
Checked By:	J. BARBER

C-102

Copyright: Tetra Tech

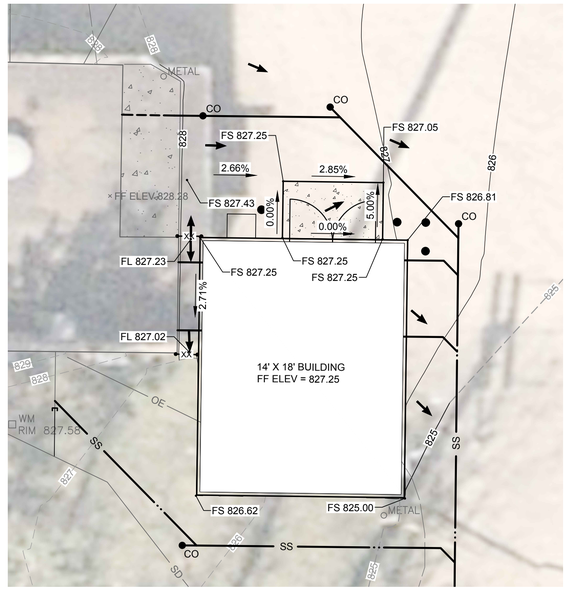
Bar Measures 1 inch

11/28/2023 9:52:35 AM - O:\PROJECTS\ANN ARBOR\IER\19743\200-19743-19004\CAD\SHEETFILES\CIVIL\C-102 PS-08 SITE-UTILITY PLAN.DWG - GUARD, STEVEN



PLAN

SCALE: 1" = 20'



PLAN - INSET

SCALE: 1" = 5'

LEGAL DESCRIPTION:

K3-16 SEC 3-3-11 COM AT N1/4 POST SD SEC 3 TH S 89DEG 17 MIN E ALG N LI SD SEC 3 615.07FT FOR PL OF BEG TH S 0DEG 43MIN W AT RT ANG 260.71FT TH S 29DEG 53MIN 30SEC W 1104.7 FT TH S 60DEG 25MIN 30SEC W 136FT WHICH LI IS 25FT DIST- NWLY-FROM WELL NO 6 TH S 0DEG 25MIN 30SEC W PAR TO N&S 1/4 LI & 25FT AT RT ANG FROM WELL NO 6 SO-CALLED 180.43FT TO CEN LI PORTAGE CREEK TH ELY & NELY ALG CEN LI PORTAGE CRK 287FT M-O-L TH N 60DEG 06MIN 30SEC W 16FT M-O-L TH N29DEG 53MIN 30 SEC E PAR & 100FT DIST FROM 2ND DESCR COURSE 1057.64FT TH AT RT ANG S 60DEG 06MIN 30SEC E 25FT M-O-L TO CTR LI PORTAGE CRK TH NELY ALG CEN LI PORTAGE CRK 28FT M-O-L TO EXT OF A LI PAR TO & 66FT DIST FROM 1ST DESCR COURSE TH N 0DEG 43MIN E 386.38FT TO N LI SEC 3-3-11 TH N 89DEG 17MIN W ALG SD LI 66FT TO BEG EXC N 33FT FOR HWY PURPOSES.

AREA: 3.8 AC

ESTIMATED AREA WITHIN EARTH DISTURBANCE LIMITS

>1.0 ACRES

S.E.S.C. KEYING SYSTEM

KEY	BEST MANAGEMENT PRACTICES	WHERE USED
	EROSION CONTROLS	
E8	PERMANENT SEEDING	Stabilization method utilized on sites where earth change has been completed (final grading attained).
S51	SILT FENCE	Use adjacent to critical areas, to prevent sediment laden sheet flow from entering these areas.
E9	MULCH BLANKET	On exposed slopes, newly seeded areas, new ditch bottoms, or areas subject to erosion.
S58	INLET PROTECTION - FABRIC DROP	Use at stormwater inlets, especially at construction sites.
S53	STABILIZED CONSTRUCTION ACCESS	Used at every point where construction traffic enters or leaves a construction site

NOTES:
1. ALL DISTURBED AREAS TO BE PROTECTED WITH TEMPORARY SEED MIX UNTIL FINAL GRADE IS ESTABLISHED AND PERMANENT SEEDING CAN OCCUR.
2. SEE SHEET C-502 FOR ADDITIONAL SESC NOTES AND DETAILS.

SESC SCHEDULE & SEQUENCING

CONSTRUCTION SCHEDULE & SEQUENCING	2023		2024											2025									
	NOVEMBER	DECEMBER	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER
PLACE AND MAINTAIN TEMPORARY EROSION CONTROLS																								
TOPSOIL STRIPPING & STOCKPILING																								
ON-SITE UTILITIES/BUILDING CONSTRUCTION																								
SITE GRADING & EARTHWORK																								
TOPSOIL SPREADING																								
PERMANENT SEEDING																								
FINAL INSPECTIONS & REMOVE TEMPORARY EROSION CONTROLS																								

SOILS MAP

GRADING AS INDICATED:
SEE PLAN

SOIL TYPE:
URBAN LAND-GLENDORA COMPLEX (Ug) AND URBAN LAND-KALAMAZOO COMPLEX, 0 TO 6 PERCENT SLOPES (UkB)

COUNTY DRAIN IMPACT:
N/A

NEAREST COUNTY DRAIN:
MILWOOD DRAIN, 3,100-FT NE

AREA IMPACTED:
0.37 AC

DISTANCE TO NEAREST WATER BODY:
50-FT WEST OF PORTAGE CREEK

TETRA TECH
www.tetratech.com
1136 OAK VALLEY DRIVE, SUITE 100
ANN ARBOR, MI 48108
PHONE: (734) 665-6000 FAX: (734) 213-3003

MARK	DATE	DESCRIPTION
	11/29/23	ISSUED FOR BID

CITY OF KALAMAZOO, MICHIGAN
WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

PUMP STATION NO. 8
GRADING & SESC PLAN

Project No.:	200-19743-19004
Designed By:	D. WARREN
Drawn By:	A. RODRIGUEZ
Checked By:	J. BARBER

C-103

Copyright: Tetra Tech

Bar Measures 1 inch

11/29/2023 9:56:10 AM - O:\PROJECTS\ANN ARBOR\IER\19743\200-19743-19004\CAD\SHEETFILES\CIVIL\C-103 PS-08 GRADING-SESC PLAN.DWG - GUARD, STEVEN

TETRA TECH
www.tetratech.com
1136 OAK VALLEY DRIVE, SUITE 100
ANN ARBOR, MI 48108
PHONE: (734) 665-6000 FAX: (734) 213-3003

MARK	DATE	DESCRIPTION
	11/29/23	ISSUED FOR BID

CITY OF KALAMAZOO, MICHIGAN

WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

PUMP STATION NO. 12
EXISTING CONDITIONS & DEMOLITION PLAN

Project No.:	200-19743-19004
Designed By:	
Drawn By:	
Checked By:	

C-104

MISS DIG System Inc.
811
1-800-482-7171

Please allow for 3 full working days before you dig - call the MISS DIG System at 811 or 800-482-7171.

N

0 2.5' 5' 10'
SCALE: 1" = 5'

Bar Measures 1 inch

Copyright: Tetra Tech

11/28/2023 10:32:53 AM - O:\PROJECTS\ANN ARBOR\IER\19743\200-19743-19004\CAD\SHEETFILES\CIVIL\C-104 PS-12 EXST COND-DEMO PLAN.DWG - GUARD, STEVEN

NOTES:

1. REFER TO DETAIL 6/D-501 AND 9/D-501 FOR PENETRATION DETAILS (TYP).
2. ROUTE 1/2" CHEMICAL FEED LINE IN A 2" PVC CARRIER PIPE TO EXISTING BUILDING. CONNECT TO EXISTING TAP ON 12" PUMP SUCTION, 2/D-502.
3. ROUTE 2" POTABLE WATER PVC PIPE FROM EYEWASH STATION CONNECTION IN THE EXISTING BUILDING CHEMICAL ROOM TO NEW BUILDING.
4. SEE PROCESS DRAWINGS FOR PROCESS PIPE CONTINUATIONS INSIDE THE NEW AND EXISTING PUMP STATION BUILDINGS.
5. SEE STRUCTURAL DRAWINGS FOR NEW AND EXISTING PUMP STATION BUILDING INFORMATION.
6. HEAT TRACE AND INSULATE ALL PROPOSED OUTDOOR WATER, PHOSPHATE CONTAINMENT AND CARRIER PIPING.
7. CONTRACTOR TO VERIFY SITE CONDITIONS FOR MAINTAINING MINIMUM 1-FT CLEARANCE BETWEEN THE CHEMICAL OR WATER PIPING TO ANY OTHER EXISTING PIPE OR STRUCTURE.
8. CONTRACTOR TO VERIFY SITE CONDITIONS TO MAINTAIN AT LEAST 1.5-FT CLEARANCE BETWEEN THE CHEMICAL AND WATER PIPING ON THE SITE.
9. ALL THE CHEMICAL AND WATER PIPING IN THE SITE SHALL MAINTAIN A MINIMUM COVER OF 2-FT BELOW THE GROUND SURFACE.

Line Table		
LINE #	LENGTH	BEARING
L1	24.95'	N 81°57'15" E
L2	12.00'	S 38°55'01" E
L3	15.15'	S 16°31'20" E

TETRA TECH
www.tetratech.com
1136 OAK VALLEY DRIVE, SUITE 100
ANN ARBOR, MI 48108
PHONE: (734) 665-6000 FAX: (734) 213-3003

MARK	DATE	DESCRIPTION
	11/29/23	ISSUED FOR BID

CITY OF KALAMAZOO, MICHIGAN

WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

PUMP STATION NO. 12
SITE LAYOUT & UTILITY PLAN
16' X 18' BUILDING

Project No.:	200-19743-19004
Designed By:	D. WARREN
Drawn By:	A. RODRIGUEZ
Checked By:	J. BARBER

C-105

MISS DIG System Inc.
811
1-800-482-7171

Please allow for 3 full working days before you dig - call the MISS DIG System at 811 or 800-482-7171.

N

0 2.5' 5' 10'
SCALE: 1" = 5'

Bar Measures 1 inch

Copyright: Tetra Tech

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ESTIMATED AREA WITHIN EARTH DISTURBANCE LIMITS

0.5 ACRES

S.E.S.C. KEYING SYSTEM

KEY	BEST MANAGEMENT PRACTICES	WHERE USED
	EROSION CONTROLS	
E8	PERMANENT SEEDING	Stabilization method utilized on sites where earth change has been completed (final grading attained).
S51	SILT FENCE	Use adjacent to critical areas, to prevent sediment laden sheet flow from entering these areas.
E9	MULCH BLANKET	On exposed slopes, newly seeded areas, new ditch bottoms, or areas subject to erosion.
S58	INLET PROTECTION - FABRIC DROP	Use at stormwater inlets, especially at construction sites.
S53	STABILIZED CONSTRUCTION ACCESS	Used at every point where construction traffic enters or leaves a construction site

NOTES:
1. ALL DISTURBED AREAS TO BE PROTECTED WITH TEMPORARY SEED MIX UNTIL FINAL GRADE IS ESTABLISHED AND PERMANENT SEEDING CAN OCCUR.
2. SEE SHEET C-502 FOR ADDITIONAL SESC NOTES AND DETAILS.

SESC SCHEDULE & SEQUENCING

CONSTRUCTION SCHEDULE & SEQUENCING	2023		2024											2025										
	NOVEMBER	DECEMBER	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER
PLACE AND MAINTAIN TEMPORARY EROSION CONTROLS																								
TOPSOIL STRIPPING & STOCKPILING																								
ON-SITE UTILITIES/BUILDING CONSTRUCTION																								
SITE GRADING & EARTHWORK																								
TOPSOIL SPREADING																								
PERMANENT SEEDING																								
FINAL INSPECTIONS & REMOVE TEMPORARY EROSION CONTROLS																								

SOILS MAP

GRADING AS INDICATED:
SEE PLAN

SOIL TYPE:
URBAN LAND-GLENDORA COMPLEX (Ug) AND
URBAN LAND-KALAMAZOO COMPLEX, 0 TO 6
PERCENT SLOPES (UkB)

COUNTY DRAIN IMPACT:
N/A

NEAREST COUNTY DRAIN:
11,300-FT FROM SOUTH WESTNEDGE DRAIN

AREA IMPACTED:
0.37 AC

DISTANCE TO NEAREST WATER BODY:
250-FT FROM ARCADIA CREEK

LEGAL DESCRIPTION:

G29-49-1&50-2 Section 29 T2S R11W Beginning at the intersection of the southerly line of the Michigan Central Railroad right-of-way & the west line of Section 29; thence South 00deg 06min 30sec East 775.76ft along the west line of Section 29 to the northerly line of US Highway 12 (Stadium Drive); thence North 82deg 05min East 778.81ft along the northerly line of US Highway 12 (Stadium Drive); thence North 00deg 01min East 545.02ft to the southerly line of the Michigan Central Railroad right-of-way; thence North 80deg 55min 30sec West 782.81ft along the southerly line of the Michigan Central Railroad right-of-way to the point of beginning. Also a strip of land lying in Section 30 T2S R 11W being 50ft wide lying South of the southerly line of the Michigan Central Railroad right-of-way & North of the northerly line of US Highway 12 & West of and adjacent to the east line of Section 30.

AREA: 12.6 AC

N

0 5' 10' 20'
SCALE: 1" = 10'

TETRA TECH
www.tetratech.com
1136 OAK VALLEY DRIVE, SUITE 100
ANN ARBOR, MI 48108
PHONE: (734) 665-6000 FAX: (734) 213-3003

MARK	DATE	DESCRIPTION
	11/29/23	ISSUED FOR BID

BY

CITY OF KALAMAZOO, MICHIGAN
WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

PUMP STATION NO. 12
GRADING & SESC PLAN

Project No.:	200-19743-19004
Designed By:	D. WARREN
Drawn By:	A. RODRIGUEZ
Checked By:	J. BARBER

C-106

Copyright: Tetra Tech

Bar Measures 1 inch

11/28/2023 10:42:08 AM - O:\PROJECTS\ANN ARBOR\IER\19743\200-19743-19004\CAD\SHEETFILES\CIVIL\C-106 PS-12 GRADING-SESC PLAN.DWG - GUARD, STEVEN

BENCHMARK 206 -
SW. CORNER OF BLACK
BALLARD - ELEV.= 817.76

METAL

SD
ELEV 818.50

ASPHALT
DRIVE

SAWCUT

REMOVE ASPHALT

SD
ELEV 819.74

METAL

CONC

METAL

WM
ELEV 820.6

FF ELEV 822.51

FF ELEV 822.46

EXISTING
BUILDING

SPRING VALLEY DRIVE

ASPHALT DRIVE

EXISTING WOODED/BRUSH AREA

BENCHMARK 207 -
SET RAILROAD SPIKE IN
NE. SIDE EXISTING UTILITY
POLE - ELEV.=825.73

818 819 820 821 822 823 824 825 826 827 828 829 830

SD FO UE W OE

Please allow for 3 full working days before you dig - call the MISS DIG System at 811 or 800-482-7171.

MISS DIG System Inc.
811
1-800-482-7171

SCALE: 1" = 5'

Bar Measures 1 inch

TETRA TECH
www.tetratech.com
1136 OAK VALLEY DRIVE, SUITE 100
ANN ARBOR, MI 48108
PHONE: (734) 665-6000 FAX: (734) 213-3003

MARK	DATE	DESCRIPTION
	11/29/23	ISSUED FOR BID

CITY OF KALAMAZOO, MICHIGAN

WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

PUMP STATION NO. 14
EXISTING CONDITIONS & DEMOLITION PLAN

Project No.:	200-19743-19004
Designed By:	
Drawn By:	
Checked By:	

C-107

Copyright: Tetra Tech

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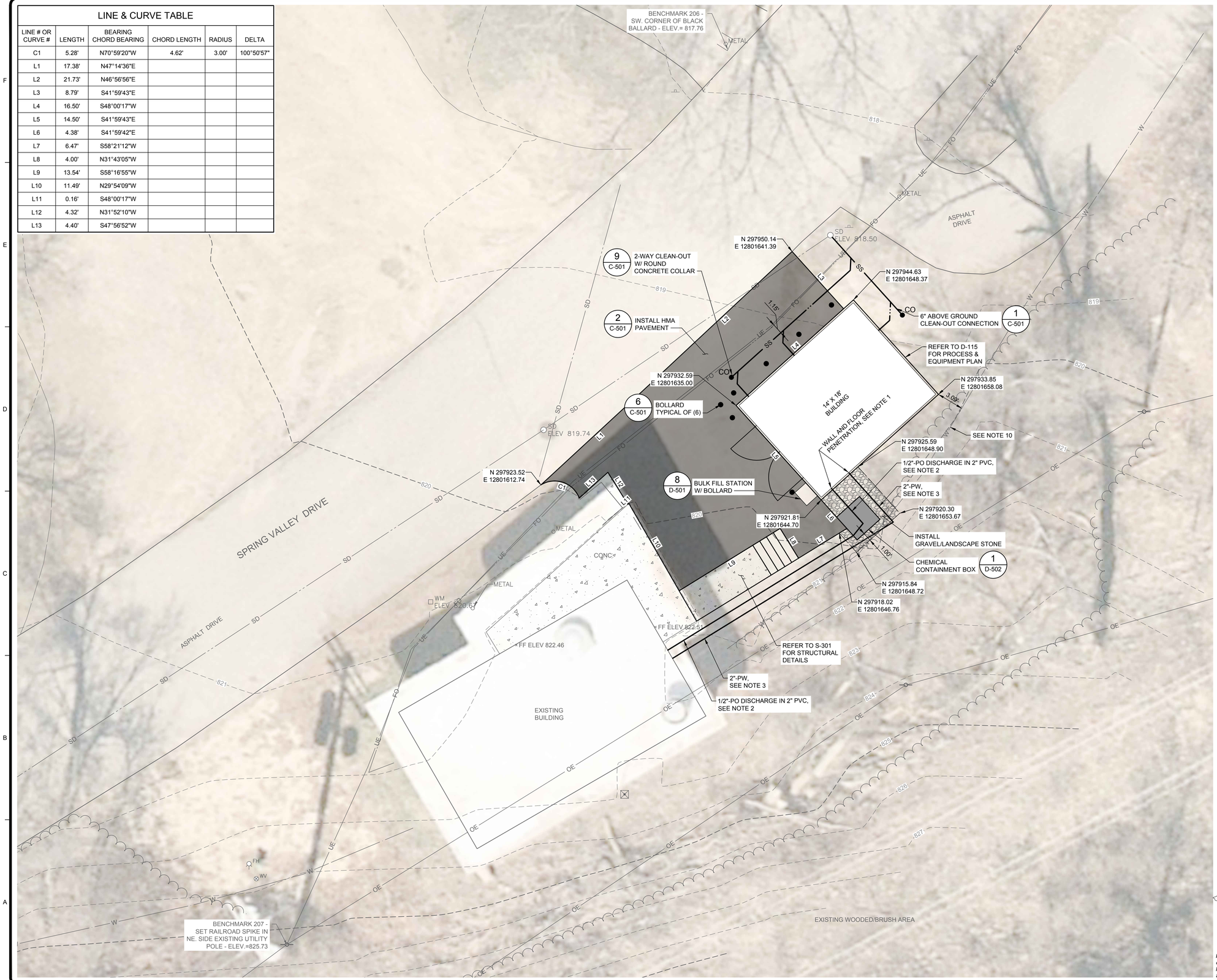
LINE & CURVE TABLE

LINE # OR CURVE #	LENGTH	BEARING CHORD BEARING	CHORD LENGTH	RADIUS	DELTA
C1	5.28'	N70°59'20"W	4.62'	3.00'	100°50'57"
L1	17.38'	N47°14'36"E			
L2	21.73'	N46°56'56"E			
L3	8.79'	S41°59'43"E			
L4	16.50'	S48°00'17"W			
L5	14.50'	S41°59'43"E			
L6	4.38'	S41°59'42"E			
L7	6.47'	S58°21'12"W			
L8	4.00'	N31°43'05"W			
L9	13.54'	S58°16'55"W			
L10	11.49'	N29°54'09"W			
L11	0.16'	S48°00'17"W			
L12	4.32'	N31°52'10"W			
L13	4.40'	S47°56'52"W			



NOTES:

1. REFER TO DETAIL 6/D-501 AND 9/D-501 FOR PENETRATION DETAILS (TYP).
2. ROUTE 1/2" CHEMICAL FEED LINE IN A 2" PVC CARRIER PIPE TO EXISTING BUILDING. CONNECT TO EXISTING TAP ON 12" PUMP SUCTION, 2/D-502.
3. ROUTE 2" POTABLE WATER PVC PIPE FROM EYEWASH STATION CONNECTION IN THE EXISTING BUILDING CHEMICAL ROOM TO NEW BUILDING.
4. SEE PROCESS DRAWINGS FOR PROCESS PIPE CONTINUATIONS INSIDE THE NEW AND EXISTING PUMP STATION BUILDINGS.
5. SEE STRUCTURAL DRAWINGS FOR NEW AND EXISTING PUMP STATION BUILDING INFORMATION.
6. HEAT TRACE AND INSULATE ALL PROPOSED OUTDOOR WATER, PHOSPHATE CONTAINMENT AND CARRIER PIPING.
7. CONTRACTOR TO VERIFY SITE CONDITIONS FOR MAINTAINING MINIMUM 1-FT CLEARANCE BETWEEN THE CHEMICAL OR WATER PIPING TO ANY OTHER EXISTING PIPE OR STRUCTURE.
8. CONTRACTOR TO VERIFY SITE CONDITIONS TO MAINTAIN AT LEAST 1.5-FT CLEARANCE BETWEEN THE CHEMICAL AND WATER PIPING ON THE SITE.
9. ALL THE CHEMICAL AND WATER PIPING IN THE SITE SHALL MAINTAIN A MINIMUM COVER OF 2-FT BELOW THE GROUND SURFACE.
10. LOCATION OF 12-INCH WATER MAIN IS APPROXIMATE. CONTRACTOR TO FIELD VERIFY AND ADJUST PO AND PW PIPING AS NECESSARY.

Please allow for 3 full working days before you dig - call the MISS DIG System at 811 or 800-482-7171.

SCALE: 1" = 5'

Bar Measures 1 inch

TETRA TECH
www.tetratech.com
1136 OAK VALLEY DRIVE, SUITE 100
ANN ARBOR, MI 48108
PHONE: (734) 665-6000 FAX: (734) 213-3003

MARK	DATE	DESCRIPTION
	11/29/23	ISSUED FOR BID

BY

CITY OF KALAMAZOO, MICHIGAN
WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

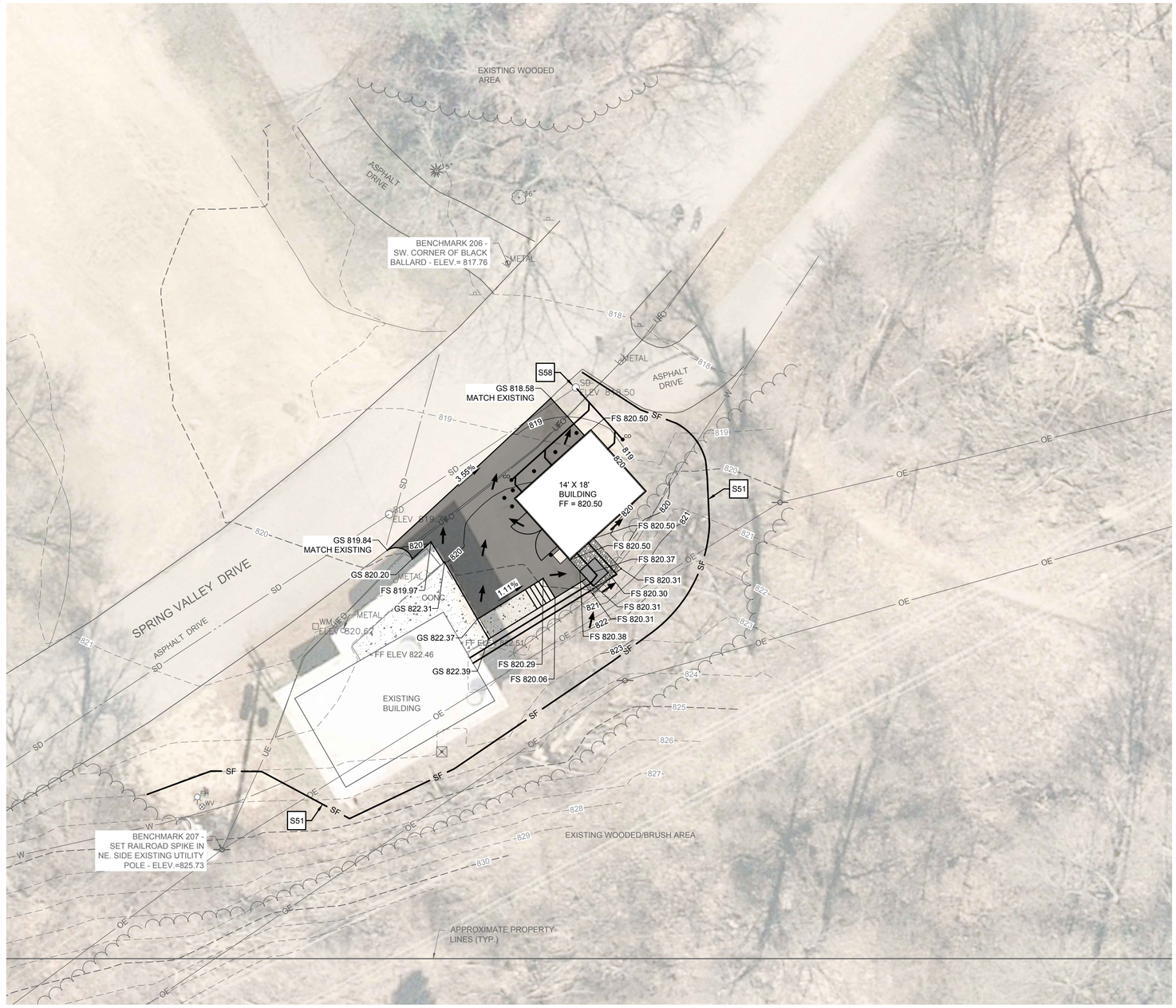
PUMP STATION NO. 14
SITE LAYOUT & UTILITY PLAN
14' X 16' BUILDING

Project No.:	200-19743-19004
Designed By:	D. WARREN
Drawn By:	A. RODRIGUEZ
Checked By:	J. BARBER

C-108

Copyright: Tetra Tech

11/28/2023 10:48:02 AM - O:\PROJECTS\ANN ARBOR\IER\19743\200-19743-19004\CAD\SHEETFILES\CIVIL\C-108 PS-14 SITE-UTILITY PLAN.DWG - GUARD, STEVEN



LEGAL DESCRIPTION:

Com at the ctr post, Sect 11 T2S, R11W, th N alg corrected 1/4 li, 1323ft m-or-l, to a pt 234.57ft S of Mount Olivet Road and 2.31ft W of the N&S 1/4 li for the P.o.B. for the following description: th N 89deg 25min E 79.0ft; th N 42deg 7min E 373.28ft; th N 40deg 7min W 81.4ft to a pt 118.6ft from Mount Olivet Road; th N 55deg 30min E 184.72ft; th N 54deg 37min E 251.31ft; th N 16deg 44min W 219.46ft; th N 16deg 57min W 37.58ft to the ctr li of Furnace Road (now Mount Olivet Road); th alg sd ctr li N 45deg 9min E 536.0ft; th S 16deg 43min 30secE 180.0ft; th S 46deg 15min W 175.0ft; th S 15deg 36min E 150.0ft; th N 65deg 30min E 175.0ft; th N 61deg 3min E 284.88ft to the N&S 1/8 li; th N alg sd 1/8 li 148.54ft to a pt 208.88ft m-or-l S of the N li of sd Sect; th N 85deg 38min E 374.10ft; th N 89deg 10min 30sec E 292.78ft to the W li of the E 1/2 of the E 1/2 of the NE 1/4 of sd Sect; th N 178.61ft alg sd li to the N li of Sect 11; th E alg sd li N 89deg 51min E 664.29ft to the NE cor post of Sect 11, sd post also being the NW cor post of Sect 12, T2S, R11W; th E 12.28ft alg the N li of Sect 12 to the SW cor of Lot 100 of OLIVET HEIGHTS (Liber 20 of Plats, Page 15); th N 0deg 6min W 95.55ft; th N 68deg 40min 40sec E 643.60ft; th N 0deg 6min W 150.0ft to Oakcreek Avenue; th N 68deg 40min 40sec E alg sd Avenue 70.62ft; th S 74deg 33min E alg Brook Drive 56.41ft to the NE cor of Lot 100, th S 74deg 33min E 197.20ft alg the N li of Lot 75 of the PLAT OF HOMELAND (Liber 9 of Plats, Page 30); th S 4deg 54min E 81.72ft; th S 26deg 37min 25sec E 176.51ft; th S 28deg 9min E 74.84ft to a pt 251.09ft W of the SE cor of Lot 77 of the PLAT OF HOMELAND; th S 1deg 20min E 132.29ft to the N li of Sect 12, sd pt being in the S li of Lot 79 of the PLAT OF HOMELAND 286.5ft W of the ctr li of Brook Drive; th S 31deg 19min W 374.33ft; th S 21deg 57min 45sec W 427.30ft; th S 4deg 28min W 315.39ft; th S 0deg 26min E 174.07ft to a pt 660ft E of the W li of Sect 12; th E 97.12ft; th S 0deg 5min 10sec E 562.65ft; th W 509.08ft; th N 194ft; th W 198.75ft; th N 70.22ft; th W 770ft; th S 5deg 5min 22secW 344.63ft; th S 29deg 54min 9sec W 207.53ft; th S 0deg 11min 3sec E 200.0ft; th S 89deg 48min 57sec W 478.45ft m-or-l to the N&S 1/8 li; th N alg sd li 16.74ft m-or-l, th S 77deg 34min W 270.25ft; th S 194.2ft; th S 0deg 39min 30sec E 150ft to the NE cor of Lot 22 of GULL HEIGHTS (Liber 411, page 129); th S alg the E li of Lot 22, 163.52ft to the SE cor of Lot 22; th W alg the S li of Lot 22, 49.5ft to the SW cor of Lot 22; th N alg the W li of Lot 22, 139.89ft; th S 73deg 42min W 294.15ft alg the N li of GULL HEIGHTS; th S 89deg 20min 30sec W 298.82ft to the W li of Shafer Street, th S 0deg 39min 30sec E 35.35ft alg the W li of Shafer Street to the NE cor of Lot 61 of GULL HEIGHTS; th S 89deg 20min 30sec W 411.52ft alg the N li of Lot 61 to the NW cor of Lot 61; th N 11deg? 5min 30sec W 115.4ft to the ctr post of Sect 11; th N 00deg 59min 48sec W 594.74ft alg the N&S 1/4 li of sd Sect 11; th S 89deg 00min 12sec W 66.00ft to the WLY r-o-w li of Spring Valley Drive (66ft wide); th NWLY 25.51ft, alg a non-tangent curve to the left (Radius = 41.00ft, central angle of 35deg 38min 42sec, chord = N 59deg 16min 14sec W 25.10ft); th NWerly 66.37ft alg a reverse curve to the right (Radius = 219.00ft, central angle of 17deg 21min 52, chord = N 68deg 24min 39sec W 66.12ft); th N 59deg 43min 43sec W 85.67ft; th N 63deg 36min 51sec W 28.68ft; th Werly 135.53ft alg a curve to the left (Radius = 171.00ft, central angle of 45deg 24min 44sec, chord = N 86deg 19min 13sec W 132.01ft); th S 70deg 58min 25sec W 63.64ft; th S 65deg 41min 02sec W 15.89ft; th S 52deg 54min 51sec W 8.55ft; th SLY 148.72ft alg a curve to the left (Radius = 176.00ft, central angle of 48deg 24min 58sec, chord = S 28deg 42min 22sec W 144.34ft); th SLY 99.45ft alg a compound curve to the left (Radius = 476.00ft, central angle of 11deg 58min 14sec, chord = S 01deg 29min 14sec E 99.27ft); th S 07deg 28min 21sec E 148.13ft; th S 10deg 13min 49sec E 217.84ft; th SWLY 160.32ft alg a curve to the right (Radius = 156.00ft, central angle of 58deg 53min 00sec, chord = S 19deg 12min 41sec W 153.36ft); th S 48deg 39min 11sec W 8.99ft; th SWLY 76.19ft alg a curve to the right (Radius = 310.00ft, central angle of 14deg 04min 58sec, chord = S 55deg 41min 40sec W 76.00ft); th S 62deg 44min 15sec W 9.45ft; th SWLY 60.87ft alg a curve to the right (Radius = 172.00ft, central angle of 20deg 16min 35sec, chord = S 72deg 52min 26sec W 60.55ft); th S 36deg 27min 14sec W 70.30ft; th S 63deg 38min 20sec W 168.04ft; th N 79deg 15min 58sec W 70.69ft; th SWLY 159.02ft alg a non-tangent curve to the right (Radius = 1149.00ft, central angle of 07deg 55min 47sec, chord = S 55deg 51min 16sec W 158.89ft); th SWLY 123.72ft alg a reverse curve to the left (Radius = 276.00ft, central angle of 25deg 41min 02sec, chord = S 46deg 58min 39sec W 122.69ft); th S 34deg 08min 08sec W 174.76ft; th SLY 125.71ft alg a curve to the left (Radius = 206.00ft, central angle of 34deg 57min 54sec, chord = S 16deg 39min 11sec W 123.77ft); th SLY 131.99ft alg a reverse curve to the right (Radius = 231.00ft, central angle of 32deg 44min 18sec, chord = S 15deg 32min 23sec W 130.20ft) to the E li of the NW 1/4 of the SW 1/4 of sd Sect 11; th S 00deg 55min 50sec E 520.42ft, alg said E li to the SE cor of the NW 1/4 of the SW 1/4 of Sect 11; th W alg the S li of the NW 1/4 of the SW 1/4 of sd Sect 11 781.24ft to a pt 440ft E of the ctr li of Riverview Drive; th N 1deg 51min W parallel to the ctr li of sd Drive 99ft; th S 88deg 24min W 440ft to the ctr li of Riverview Drive; th N 1deg 51min W alg the ctr li of sd Drive 66ft; th N 88deg 24min E 308ft; th N 1deg 51min W parallel to the ctr li of Riverview Drive 200ft; th S 88deg 24min W 183ft; th N 1deg 51min W parallel to the ctr li of sd Drive 131.56ft; th N 49deg 37min W 68.81ft; th N 44deg 42min E along the ctr li of Mount Olivet Road 30ft; th S 49deg 37min E 119.78ft; th N 56deg 10min E 182.82ft; th N 36deg 30min E 132ft; th N 61deg E 159.72ft; th S 54deg 45min E 170.94ft; th N 77deg 15min E 234.3ft; th N 27deg 35min E 474.54ft; th N 44deg 45min E 110.1ft to a pt in the E li of the NW 1/4 of the SW 1/4 of Sect 11, sd pt being 151.42ft S of the NE cor thereof; th S alg the E li of the NW 1/4 of the SW 1/4 of Sect 11 75.08ft; th N 81deg 35min E 230.8ft; th N 9deg 55min W 41.2ft; th N 81deg 35min E 207.3ft; th N 7deg 43min W 121ft m-or-l to the E&W 1/4 li of Sect 11; th N 7deg 37min 30sec W 300.78ft; th N 45deg 22min E 231.97ft; th N 7deg 37min 30sec W 341.33ft to the ctr li of Mount Olivet Road; th N 45deg 22min E 100.0ft alg the ctr li of Mount Olivet Road; th S 44deg 38min E 185.71ft; th N 7deg 12min W 98.71ft; th N 44deg 38min W 107.33ft to the ctr li of Mount Olivet Road; th N 45deg 22min E 115ft alg the ctr li of Mount Olivet Road; th cont N 45deg 22min E 298.28ft alg the ctr li of Mount Olivet Road; th S 6deg 40min E 300ft to a creek, th NELY 320ft (N 85deg E?) alg sd creek; th N 0deg 52min W 580ft to the ctr li of Mount Olivet Road, sd bearing also being alg the W li of Spring Valley Drive; th N 45deg 56min E 89ft m-or-l alg the ctr li of Mount Olivet Road to a pt 234.57ft N of P.o.B. of this description, sd pt also being on the N&S 1/4 li of Sect 11 and also being the E li of Spring Valley Drive; th S 234.57ft alg sd N&S 1/4 li to the p.o.b. for the description. Excluding from this description all lands lying within the right-of-ways of Riverview Drive and Mount Olivet Road. Also an easement for park purposes over the following parcel of land: Beg at the NE corner of ASSESSOR'S PLAT OF GULL HEIGHTS; th N 402.4ft; th S 77deg 34min W 270.25ft; th S 344.2ft to the N li of said Plat; th E 264ft to p.o.b, excepting the S 150ft thereof.

AREA: 182.800 AC

ESTIMATED AREA WITHIN EARTH DISTURBANCE LIMITS

0.25 ACRES

S.E.S.C. KEYING SYSTEM

KEY	BEST MANAGEMENT PRACTICES	WHERE USED
	EROSION CONTROLS	
E8	PERMANENT SEEDING	Stabilization method utilized on sites where earth change has been completed (final grading attained).
S51	SILT FENCE	Use adjacent to critical areas, to prevent sediment laden sheet flow from entering these areas.
E9	MULCH BLANKET	On exposed slopes, newly seeded areas, new ditch bottoms, or areas subject to erosion.
S58	INLET PROTECTION - FABRIC DROP	Use at stormwater inlets, especially at construction sites.
S53	STABILIZED CONSTRUCTION ACCESS	Used at every point where construction traffic enters or leaves a construction site

NOTES:
1. ALL DISTURBED AREAS TO BE PROTECTED WITH TEMPORARY SEED MIX UNTIL FINAL GRADE IS ESTABLISHED AND PERMANENT SEEDING CAN OCCUR.
2. SEE SHEET C-502 FOR ADDITIONAL SESC NOTES AND DETAILS.

SESC SCHEDULE & SEQUENCING

CONSTRUCTION SCHEDULE & SEQUENCING	2023		2024										2025									
	NOVEMBER	DECEMBER	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER
PLACE AND MAINTAIN TEMPORARY EROSION CONTROLS																								
TOPSOIL STRIPPING & STOCKPILING																								
ON-SITE UTILITIES/BUILDING CONSTRUCTION																								
SITE GRADING & EARTHWORK																								
TOPSOIL SPREADING																								
PERMANENT SEEDING																								
FINAL INSPECTIONS & REMOVE TEMPORARY EROSION CONTROLS																								

SOILS MAP

GRADING AS INDICATED:
SEE PLAN

SOIL TYPE:
OSHTEMO SANDY LOAM, 6 TO 12 PERCENT SLOPES (OsC) AND
OSHTEMO SANDY LOAM, 12 TO 18 PERCENT SLOPES (OsD)

COUNTY DRAIN IMPACT:
N/A

NEAREST COUNTY DRAIN:
6,000-FT FROM THE STATE DITCH AND BRANCH DRAIN

AREA IMPACTED:
0.23 AC

DISTANCE TO NEAREST WATER BODY:
150FT FROM SPRING VALLEY LAKE

N

0 5' 10' 20'
SCALE: 1" = 10'

Bar Measures 1 inch

TETRA TECH
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1136 OAK VALLEY DRIVE, SUITE 100
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MARK	DATE	DESCRIPTION
	11/29/23	ISSUED FOR BID

BY

CITY OF KALAMAZOO, MICHIGAN
WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

PUMP STATION NO. 14
GRADING & SESC PLAN

Project No.:	200-19743-19004
Designed By:	D. WARREN
Drawn By:	A. RODRIGUEZ
Checked By:	J. BARBER

C-109

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ASPHALT DRIVE

WOODED AREA

BENCHMARK 203 -
SET RAILROAD SPIKE
IN NE. SIDE OF UTILITY
POLE - ELEV.= 933.59

METAL

CONC.

ANTENNA

METAL

METAL

RETAINING WALL

EX. ELECTRIC TRANSFORMER PAD

EX. ELECTRIC TRANSFORMER PAD

SD
ELEV 933.84

EXISTING BUILDING

*FF ELEV 929.45

W
ELEV 929.32

EX. A.C. UNIT

*FF ELEV 932.11

REMOVE CONCRETE PORCH (REFER TO S-117 FOR STRUCTURAL PLAN)

ASPHALT AREA

LIGHT POLE

936

935

934

933

932

931

930

929

928

927

W

OE

FO

WV

FH

P

Please allow for 3 full working days before you dig - call the MISS DIG System at 811 or 800-482-7171.

MISS DIG System Inc.
811
1-800-482-7171

0 3' 6' 12'
SCALE: 1" = 6'

Bar Measures 1 inch

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MARK	DATE	DESCRIPTION	BY
	11/29/23	ISSUED FOR BID	

CITY OF KALAMAZOO, MICHIGAN
WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

PUMP STATION NO. 22
EXISTING CONDITIONS & DEMOLITION PLAN

Project No.:	200-19743-19004
Designed By:	
Drawn By:	
Checked By:	

C-110

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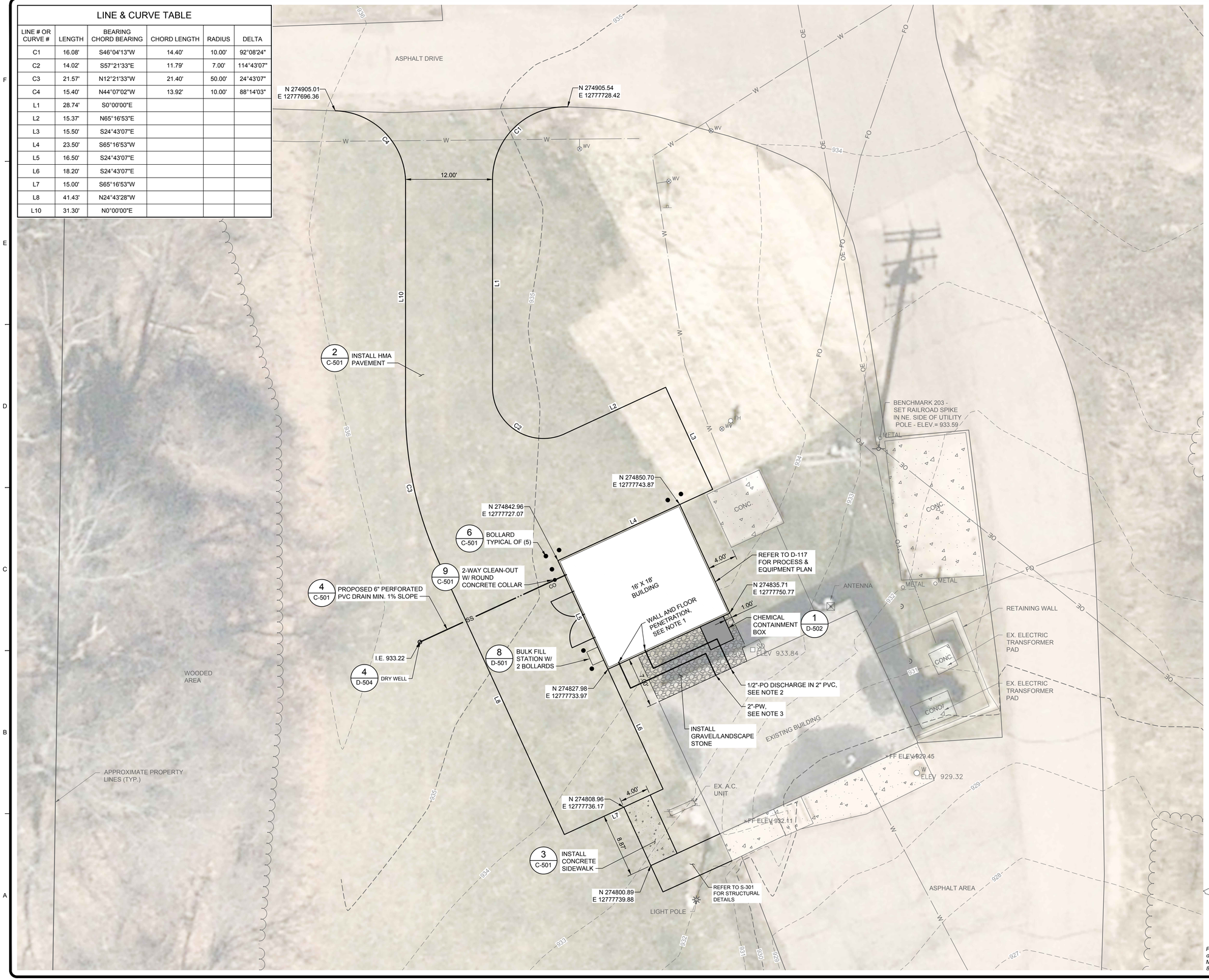
LINE & CURVE TABLE

LINE # OR CURVE #	LENGTH	BEARING CHORD BEARING	CHORD LENGTH	RADIUS	DELTA
C1	16.08'	S46°04'13"W	14.40'	10.00'	92°08'24"
C2	14.02'	S57°21'33"E	11.79'	7.00'	114°43'07"
C3	21.57'	N12°21'33"W	21.40'	50.00'	24°43'07"
C4	15.40'	N44°07'02"W	13.92'	10.00'	88°14'03"
L1	28.74'	S0°00'00"E			
L2	15.37'	N65°16'53"E			
L3	15.50'	S24°43'07"E			
L4	23.50'	S65°16'53"W			
L5	16.50'	S24°43'07"E			
L6	18.20'	S24°43'07"E			
L7	15.00'	S65°16'53"W			
L8	41.43'	N24°43'28"W			
L10	31.30'	N0°00'00"E			



NOTES:
1. REFER TO DETAIL 6/D-501 AND 9/D-501 FOR PENETRATION DETAILS (TYP).
2. ROUTE 1/2" CHEMICAL FEED LINE IN A 2" PVC CARRIER PIPE TO EXISTING BUILDING. CONNECT TO EXISTING TAP ON 12" PUMP SUCTION, 2/D-502.
3. ROUTE 2" POTABLE WATER PVC PIPE FROM EYEWASH STATION CONNECTION IN THE EXISTING BUILDING CHEMICAL ROOM TO NEW BUILDING.
4. SEE PROCESS DRAWINGS FOR PROCESS PIPE CONTINUATIONS INSIDE THE NEW AND EXISTING PUMP STATION BUILDINGS.
5. SEE STRUCTURAL DRAWINGS FOR NEW AND EXISTING PUMP STATION BUILDING INFORMATION.
6. HEAT TRACE AND INSULATE ALL PROPOSED OUTDOOR WATER, PHOSPHATE CONTAINMENT AND CARRIER PIPING.
7. CONTRACTOR TO VERIFY SITE CONDITIONS FOR MAINTAINING MINIMUM 1-FT CLEARANCE BETWEEN THE CHEMICAL OR WATER PIPING TO ANY OTHER EXISTING PIPE OR STRUCTURE.
8. CONTRACTOR TO VERIFY SITE CONDITIONS TO MAINTAIN AT LEAST 1.5-FT CLEARANCE BETWEEN THE CHEMICAL AND WATER PIPING ON THE SITE.
9. ALL THE CHEMICAL AND WATER PIPING IN THE SITE SHALL MAINTAIN A MINIMUM COVER OF 2-FT BELOW THE GROUND SURFACE.

Please allow for 3 full working days before you dig - call the MISS DIG System at 811 or 800-482-7171.

SCALE: 1" = 6'

Bar Measures 1 inch

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MARK	DATE	DESCRIPTION	BY
	11/29/23	ISSUED FOR BID	

CITY OF KALAMAZOO, MICHIGAN
WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

PUMP STATION NO. 22
SITE LAYOUT & UTILITY PLAN
16' X 18' BUILDING

Project No.:	200-19743-19004
Designed By:	D. WARREN
Drawn By:	A. RODRIGUEZ
Checked By:	J. BARBER

C-111

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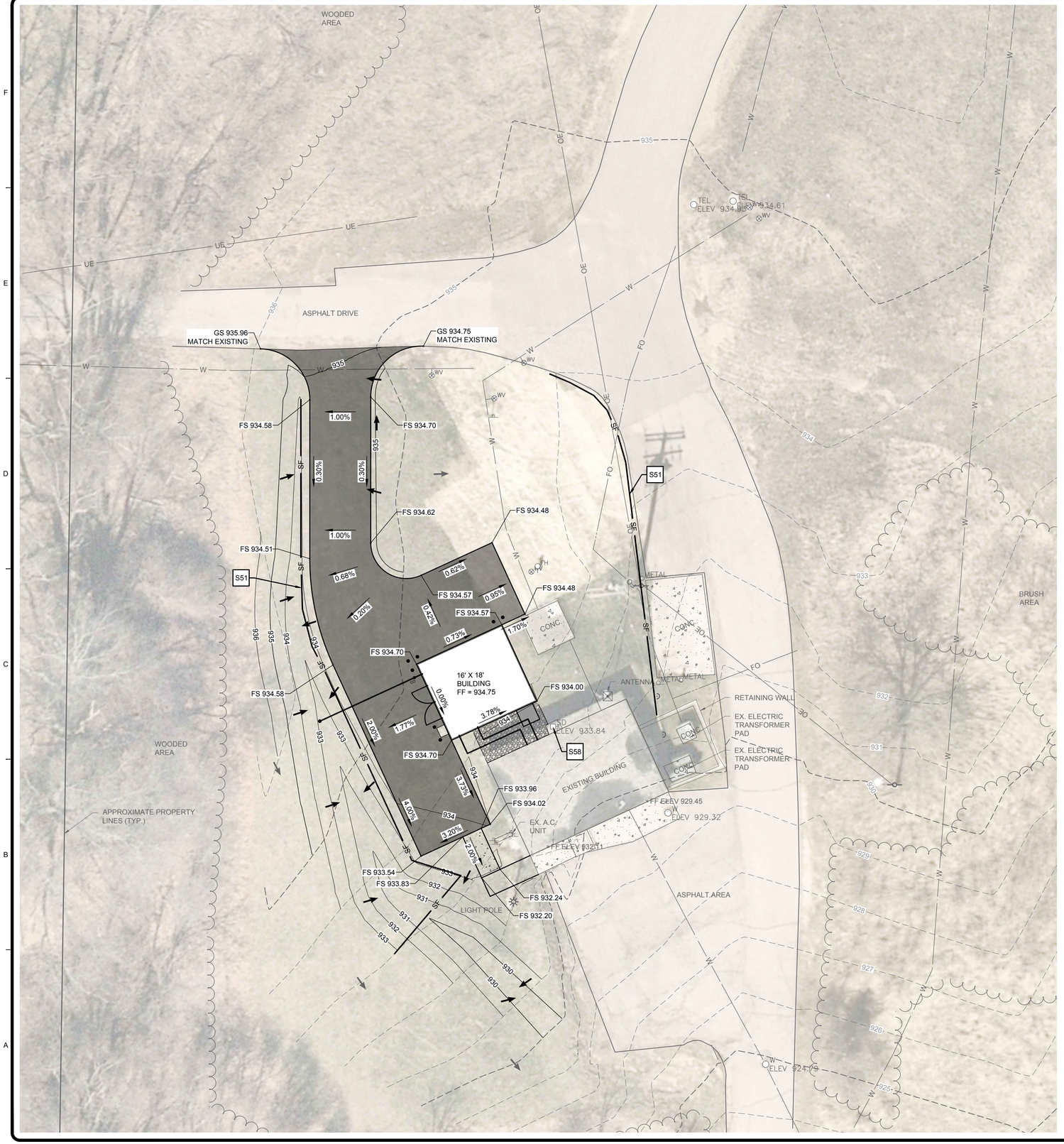

ESTIMATED AREA WITHIN EARTH DISTURBANCE LIMITS

0.45 ACRES

S.E.S.C. KEYING SYSTEM

KEY	BEST MANAGEMENT PRACTICES	WHERE USED
	EROSION CONTROLS	
E8	PERMANENT SEEDING	Stabilization method utilized on sites where earth change has been completed (final grading attained).
S51	SILT FENCE	Use adjacent to critical areas, to prevent sediment laden sheet flow from entering these areas.
E9	MULCH BLANKET	On exposed slopes, newly seeded areas, new ditch bottoms, or areas subject to erosion.
S58	INLET PROTECTION - FABRIC DROP	Use at stormwater inlets, especially at construction sites.
S53	STABILIZED CONSTRUCTION ACCESS	Used at every point where construction traffic enters or leaves a construction site

NOTES:
1. ALL DISTURBED AREAS TO BE PROTECTED WITH TEMPORARY SEED MIX UNTIL FINAL GRADE IS ESTABLISHED AND PERMANENT SEEDING CAN OCCUR.
2. SEE SHEET C-502 FOR ADDITIONAL SESC NOTES AND DETAILS.

SESC SCHEDULE & SEQUENCING

CONSTRUCTION SCHEDULE & SEQUENCING	2023		2024											2025										
	NOVEMBER	DECEMBER	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER
PLACE AND MAINTAIN TEMPORARY EROSION CONTROLS																								
TOPSOIL STRIPPING & STOCKPILING																								
ON-SITE UTILITIES/BUILDING CONSTRUCTION																								
SITE GRADING & EARTHWORK																								
TOPSOIL SPREADING																								
PERMANENT SEEDING																								
FINAL INSPECTIONS & REMOVE TEMPORARY EROSION CONTROLS																								

SOILS MAP

LEGAL DESCRIPTION:

G31-2A Section 31-2-11 Commencing at the southwest corner of Section 31; thence East 319ft along the south line of Section 31 to the point of beginning; thence North 164.88ft parallel with the west line of Section 31; thence East 1002.32ft parallel with the south line of Section 31 to the West 1/8 line of Section 31; thence North along said 1/8 line to the westerly right-of-way line of US HWY 131; thence Southerly along said westerly right-of-way line to the south line of Section 31; thence West along the south line of Section 31 to the point of beginning. Also the North 30ft of Lot 79 of COLONY FARM PLAT NO. 2, Liber 21 of Plats Page 46.

AREA: 16.600 AC

GRADING AS INDICATED:
SEE PLAN

SOIL TYPE:
KALAMAZOO LOAM, 2 TO 6 PERCENT SLOPES (KaB)

COUNTY DRAIN IMPACT:
N/A

NEAREST COUNTY DRAIN:
12,000-FT FROM PORTAGE TOWNSHIP CONSOLIDATED DRAIN NO. 1

AREA IMPACTED:
0.01 AC

DISTANCE TO NEAREST WATER BODY:
1600-FT FROM HOWARD LAKE

N

0 5' 10' 20'
SCALE: 1" = 10'

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MARK	DATE	DESCRIPTION	BY
	11/29/23	ISSUED FOR BID	

CITY OF KALAMAZOO, MICHIGAN
WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

PUMP STATION NO. 22
GRADING & SESC PLAN

Project No.:	200-19743-19004
Designed By:	D. WARREN
Drawn By:	A. RODRIGUEZ
Checked By:	J.BARBER

C-112

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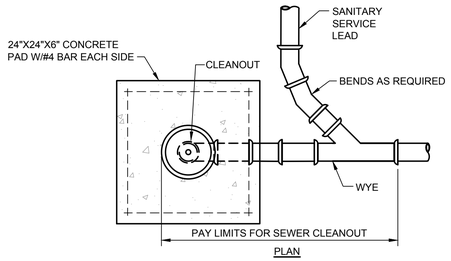
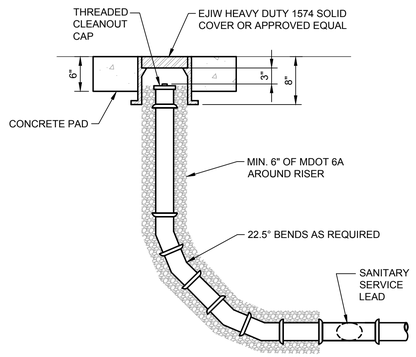
Bar Measures 1 inch

11/28/2023 11:00:33 AM - O:\PROJECTS\ANN ARBOR\IER\197432\200-19743-19004\CAD\SHEETFILES\CIVIL\C-112 PS-22 GRADING-SESC PLAN.DWG - GUARD, STEVEN



PLAN

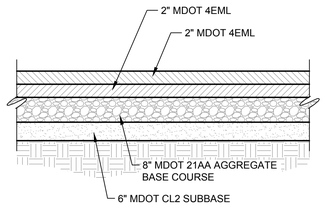


ELEVATION

NOTES:

1. ALL CONNECTION SHALL BE BELL AND SPIGOT TYPE.
2. CLEANOUT IS TO BE SAME DIAMETER AS SERVICE LEAD.
3. CONCRETE PAD REQUIRED UNLESS OTHERWISE DETERMINED BY THE CITY.
4. THERE MUST BE A 3" GAP FROM THE BOTTOM OF THE CLEAN OUT LID TO THE TOP OF THE THREADED CAP.

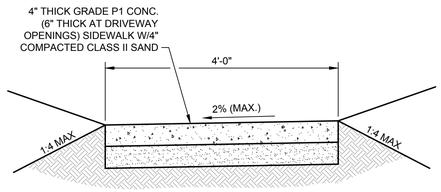
1 SEWER CLEANOUT
SCALE: NONE



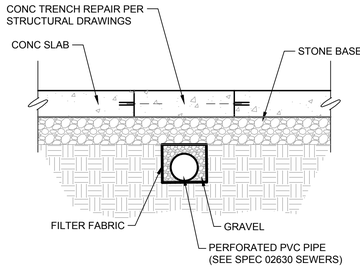
2 HEAVY DUTY HMA PAVEMENT SECTION
SCALE: NONE

NOTES:

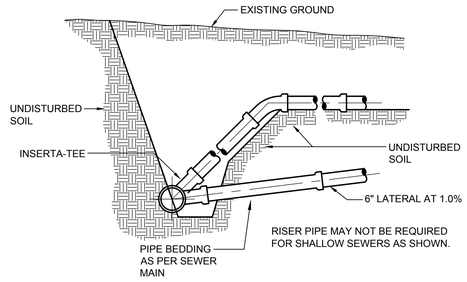
1. IF GRADE CUT RESULTS IN LESS THAN 4" THICK OF COMPACTED PULVERIZED MATERIAL (EXISTING PAVEMENT BASE) THEN MATERIAL SHALL BE REMOVED AND REPLACED W/4" CLASS II SAND.
2. IN AREAS WHERE FILL WILL BE REQUIRED TO MEET GRADE, COMPACTED CLASS II SAND SHALL BE PLACED ON TOP OF THE COMPACTED PULVERIZED MATERIAL UNTIL THE PROPER ELEVATION IS MET.



3 SIDEWALK DETAIL
SCALE: NONE

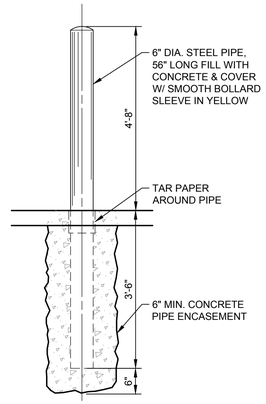


4 UNDERDRAIN / FOUNDATION DRAIN DETAIL
SCALE: NONE



NOTE: CONNECT TO THE EXISTING 8-INCH RCP SANITARY WITH THE INSERTA-TEE. CONTRACTOR TO VERIFY ALL ELEVATIONS.

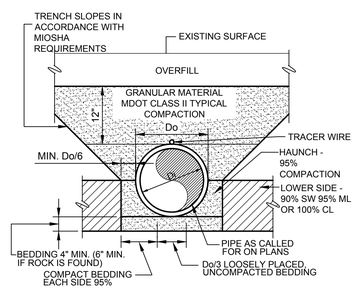
5 STANDARD SEWER LEAD / RISER DETAIL (PVC PIPE)
SCALE: NONE



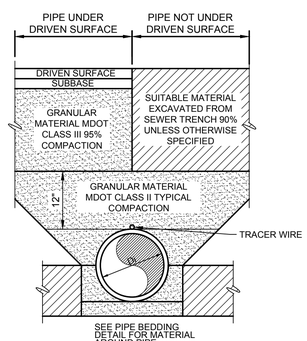
6 STEEL BOLLARD
SCALE: NONE

NOTES:

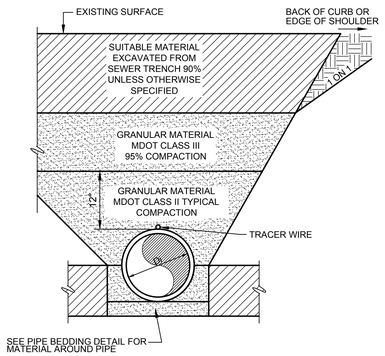
1. COMPACTION PRESENTED AS MINIMUM STANDARD PROCTOR VALUES.
2. MATERIALS AROUND THERMOPLASTIC PIPE WITH DIAMETER < 6 INCHES SHALL PASS 0.5 INCH SIEVE, MATERIALS AROUND OTHER PIPES SHALL PASS 1.5 INCH SIEVE.
3. DRIVEN SURFACE IS DRIVEWAY, PARKING AREA, ROAD BED OR SHOULDER.
4. UTILITY TRENCHES LOCATED WITHIN A MDOT ROW SHALL CONFORM TO MDOT STANDARD DETAIL R-83.
5. FOR ALL EXCAVATION WITHIN THE WETLAND LIMITS THE TOP TWO FEET OF TOP SOIL SHOULD BE STOCKPILED ON SITE AND SHALL BE REPLACED IN THE SAME LOCATION.
6. 12-INCHES WITHIN WATER MAIN SHALL BE BEDDED WITH MDOT CLASS IIIA GRANULAR MATERIAL.
7. MDOT 6A TO BE USED FOR PIPE BEDDING FOR PVC SEWER PIPES AND IN AREAS WITH HIGH WATER TABLE



PIPE BEDDING

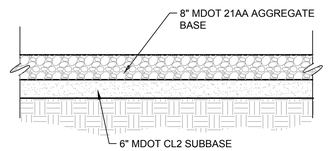


PIPE UNDER/NOT UNDER DRIVEN SURFACE

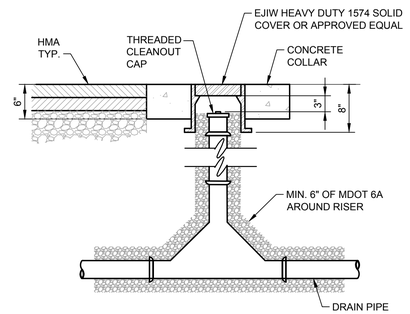


PIPE WITHIN INFLUENCE OF DRIVEN SURFACE

7 TRENCH EXCAVATION & PIPE BEDDING
SCALE: NONE



8 21AA AGGREGATE DRIVE SECTION
SCALE: NONE



PLAN

ELEVATION

NOTES:

1. ALL CONNECTION SHALL BE BELL AND SPIGOT TYPE.
2. CLEANOUT IS TO BE SAME DIAMETER AS SERVICE PIPE.
3. THERE MUST BE A 3" GAP FROM THE BOTTOM OF THE CLEAN OUT LID TO THE TOP OF THE THREADED CAP.

9 TWO-WAY SEWER CLEANOUT
SCALE: NONE

TETRA TECH
www.tetratech.com
1136 OAK VALLEY DRIVE, SUITE 100
ANN ARBOR, MI 48108
PHONE: (734) 665-6000 FAX: (734) 213-3003

MARK	DATE	DESCRIPTION	BY
	11/29/23	ISSUED FOR BID	

CITY OF KALAMAZOO, MICHIGAN
WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

STANDARD DETAILS

Project No.:	200-19743-19004
Designed By:	D. WARREN
Drawn By:	A. RODRIGUEZ
Checked By:	J. BARBER

C-501

Copyright: Tetra Tech

Bar Measures 1 inch

11/28/2023 11:02:26 AM - O:\PROJECTS\ANN ARBOR\IER\19743\200-19743-19004\CAD\SHEETFILES\CIVIL\C-501 STANDARD DETAILS.DWG - GUARD, STEVEN

SOIL EROSION AND SEDIMENTATION CONTROL NOTES AND MAINTENANCE NOTES

THIS PROJECT SHALL BE CONSTRUCTED IN COMPLIANCE WITH PART 91 OF ACT 451 OF 1994, AS AMENDED, THE SOIL EROSION AND SEDIMENTATION CONTROL ACT AND THE KALAMAZOO COUNTY SOIL EROSION AND SEDIMENTATION CONTROL ORDINANCE.

ALL EROSION AND SEDIMENTATION CONTROL WORK SHALL CONFORM TO THE STANDARDS AND SPECIFICATIONS OF THE KALAMAZOO COUNTY PUBLIC WORKS OFFICE.

EROSION AND ANY SEDIMENTATION FROM WORK ON THIS SITE SHALL BE CONTAINED ON THE SITE AND NOT ALLOWED TO COLLECT ON ANY OFF SITE AREAS OR IN WATERWAYS. WATERWAYS INCLUDE BOTH NATURAL AND MAN MADE OPEN DITCHES, STREAMS, STORM DRAINS, LAKES AND PONDS.

STAGING THE WORK WILL BE DONE BY THE LANDOWNER OR LANDOWNER'S REPRESENTATIVE AS DIRECTED IN THESE PLANS AND AS REQUIRED TO ENSURE PROGRESSIVE STABILIZATION OF DISTURBED EARTH CHANGE.

THE LANDOWNER OR LANDOWNER'S REPRESENTATIVE SHALL BE RESPONSIBLE FOR INSTALLATION AND MAINTENANCE OF SOIL EROSION AND SEDIMENTATION CONTROL DEVICES.

THE LANDOWNER OR LANDOWNER'S REPRESENTATIVE SHALL IMPLEMENT AND MAINTAIN THE SOIL EROSION CONTROL MEASURES AS SHOWN ON THE PLANS BEFORE AND AT ALL TIMES DURING CONSTRUCTION ON THIS PROJECT. ANY MODIFICATIONS OR ADDITIONS TO SOIL EROSION CONTROL MEASURES DUE TO CONSTRUCTION OR CHANGED CONDITIONS SHALL BE COMPLIED WITH AS REQUIRED OR DIRECTED BY THE KALAMAZOO COUNTY PUBLIC WORKS OFFICE.

IF ANY OF THE SESC MEASURES ON THE SITE ARE DEEMED INADEQUATE OR INEFFECTIVE, THE KALAMAZOO COUNTY PUBLIC WORKS OFFICE SESC DIVISION HAS THE RIGHT TO REQUIRE ADDITIONAL SESC MEASURES AT THE EXPENSE OF THE LANDOWNER.

INSTALL SILT FENCE AS INDICATED ON THE PLAN AND AT ADDITIONAL AREAS AS NECESSARY.

A. SILT FENCE SHALL BE INSTALLED PER DETAIL.
B. BUILD UP OF SEDIMENT SHALL BE REMOVED WHEN SEDIMENT ACCUMULATES TO 1/3 TO 1/2 OF THE HEIGHT OF THE SILT FENCE.
C. IF SILT FENCE FABRIC DECOMPOSES OR BECOMES INEFFECTIVE PRIOR TO THE END OF EXPECTED USABLE LIFE AND THE BARRIER IS STILL REQUIRED, THE SILT FENCE SHALL BE REPLACED PROMPTLY.
D. SILT FENCE SHALL IN INSPECTED WEEKLY UNDER NORMAL CONDITIONS, WITHIN 24 HOURS OF RAINFALL AND DAILY DURING A PROLONGED RAIN EVENT. REQUIRED MAINTENANCE SHALL BE PROVIDED PROMPTLY.

INSTALL INLET FILTER ON ALL PAVEMENT CATCH BASINS PER DETAIL.

A. INLET FILTERS SHALL BE INSPECTED WEEKLY UNDER NORMAL CONDITIONS, WITHIN 24 HOURS OF A RAINFALL AND DAILY DURING A PROLONGED RAIN EVENT.
B. BUILDUP OF SEDIMENT AND DEBRIS SHALL BE REMOVED PROMPTLY.
C. IF FABRIC DECOMPOSES OR BECOMES INEFFECTIVE PRIOR TO THE END OF EXPECTED USABLE LIFE AND THE BARRIER IS STILL REQUIRED, THE FABRIC SHALL BE REPLACED PROMPTLY.

ALL STOCKPILED SOILS SHALL BE MAINTAINED IN SUCH A WAY AS TO PREVENT EROSION FROM LEAVING THE SITE. IF THE STOCKPILE WILL BE ON SITE FOR MORE THAN 30 DAYS, THEN THE STOCKPILE MUST BE SEEDED. SILT FENCE MUST BE INSTALLED AROUND THE PERIMETER OF THE STOCKPILE.
IMMEDIATELY AFTER SEEDING, MULCH ALL SEEDED AREAS WITH UNWEATHERED SMALL GRAIN STRAW, SPREAD UNIFORMLY AT THE RATE OF 1 TO 2 TONS PER ACRE OR 100 POUNDS (2-3 BALES) PER 1000 SQUARE FEET. THIS MULCH SHOULD BE ANCHORED WITH DISC TYPE MULCH ANCHORING TOOL OR OTHER MEANS AS APPROVED BY THE KALAMAZOO COUNTY PUBLIC WORKS OFFICE. MULCH MATTING MAY BE USED IN LIEU OF LOOSE MULCH.

IF ANY DEWATERING IS NEEDED, IT SHALL BE DISCHARGED THROUGH A FILTER BAG OVER A WELL-VEGETATED AREA. THE PUMP MUST DISCHARGE AT A NON-EROSIVE VELOCITY. IF NECESSARY, AN APPROVED ENERGY DISSIPATER MAY BE USED.

ALL DIRT TRACKED ONTO ANY ROADWAY SHALL BE REMOVED IMMEDIATELY.

STREETS AND OR PARKING AREAS WILL BE SCRAPED ON A DAILY BASIS AND SWEPT AT A MINIMUM OF ONCE PER WEEK BY THE LANDOWNER OR LANDOWNER'S REPRESENTATIVE.

DURING DRY PERIODS, ALL DISTURBED AREAS SHALL BE WATERED FOR DUST CONTROL.

PERMANENT SOIL EROSION CONTROL MEASURES FOR ALL SLOPES, CHANNELS, DITCHES, OR ANY DISTURBED LAND AREA SHALL BE COMPETED WITHIN 5 CALENDAR DAYS AFTER FINAL GRADING OR THE FINAL EARTH CHANGE HAS BEEN COMPLETED. WHEN IT IS NOT POSSIBLE TO PERMANENTLY STABILIZE A DISTURBED AREA AFTER EARTH CHANGE ACTIVITY CEASES, TEMPORARILY SOIL EROSION CONTROL MEASURES SHALL BE IMPLEMENTED IMMEDIATELY. ALL TEMPORARY SOIL EROSION CONTROL SHALL BE MAINTAINED UNTIL PERMANENT SOIL EROSION CONTROL MEASURES ARE IMPLEMENTED. ALL PERMANENT SOIL EROSION CONTROL MEASURES WILL BE IMPLEMENTED AND ESTABLISHED BEFORE A CERTIFICATE OF COMPLIANCE IS ISSUED.

FINAL GRADE, ESTABLISH VEGETATION AND OR LANDSCAPE ALL DISTURBED AREAS NOT BUILT OR PAVED UPON.

REMOVE ALL TEMPORARY SOIL EROSION DEVICES AFTER PERMANENT STABILIZATION IS ESTABLISHED.

E8 - PERMANENT SEEDING

WHEN
TO FINALIZE STABILIZATION OF TEMPORARY SEEDING AREAS OR WHEN AN AREA NEEDS PERMANENT STABILIZATION FOLLOWING COMPLETION OF CONSTRUCTION. ALSO USED WHEN VEGETATIVE ESTABLISHMENT CAN CORRECT EXISTING SOIL EROSION OR SEDIMENTATION PROBLEM. WITHIN 5 DAYS OF FINAL GRADE.

WHY
TO STABILIZE SOIL AND PREVENT OR REDUCE SOIL EROSION/SEDIMENTATION PROBLEMS FROM DEVELOPING.

WHERE
USED ON CONSTRUCTION AND EARTH CHANGE SITES WHICH REQUIRE PERMANENT VEGETATIVE STABILIZATION.

HOW
1. REVIEW SESC PLAN AND CONSTRUCTION PHASING TO IDENTIFY AREAS IN NEED OF PERMANENT VEGETATIVE STABILIZATION.
2. SELECT PERENNIAL GRASS AND GROUND COVER FOR PERMANENT COVER.
3. SEED MIXES VARY. HOWEVER, THEY SHOULD CONTAIN NATIVE SPECIES.
4. SEED MIXES SHOULD BE SELECTED THROUGH CONSULTATION WITH A CERTIFIED
5. SEED PROVIDER AND WITH CONSIDERATION OF SOIL TYPE, LIGHT, MOISTURE, USE APPLICATIONS AND NATIVE SPECIES CONTENT. SOIL TESTS SHOULD BE PERFORMED TO DETERMINE THE NUTRIENT AND PH LEVELS IN THE SOIL. THE PH MAY NEED TO BE ADJUSTED TO BETWEEN 6.5 AND 7.0.
6. PREPARE A 3-5" DEEP SEEDBED, WITH THE TOP 3-4" CONSISTING OF TOPSOIL.
7. SLOPES STEEPER THAN 1:3 SHOULD BE ROUGHENED.
8. APPLY SEED AS SOON AS POSSIBLE AFTER SEEDBED PREPARATION. SEED MAY BE BROADCAST BY HAND, HYDROSEEDING, OR BY USING MECHANICAL DRILLS.
9. MULCH IMMEDIATELY AFTER SEEDING.
10. DORMANT SEED MIXES ARE FOR USE AFTER THE GROWING SEASON, USING SEED WHICH LIES DORMANT IN THE WINTER AND BEGINS GROWING AS SOON AS SITE CONDITIONS BECOME FAVORABLE.
11. PROTECT SEEDED AREAS FROM PEDESTRIAN OR VEHICULAR TRAFFIC.
12. DIVERT CONCENTRATED FLOWS AWAY FROM THE SEEDED AREA UNTIL VEGETATION IS ESTABLISHED.

MAINTENANCE
INSPECT WEEKLY AND WITHIN 24 HOURS FOLLOWING EACH RAIN EVENT IN THE FIRST FEW MONTHS FOLLOWING INSTALLATION TO BE SURE SEED HAS GERMINATED AND PERMANENT VEGETATIVE COVER IS BEING ESTABLISHED. ADD SUPPLEMENTAL SEED AS NECESSARY.

LIMITATIONS

- SEEDS NEED ADEQUATE TIME TO ESTABLISH.
- MAY NOT BE APPROPRIATE IN AREAS WITH FREQUENT TRAFFIC.
- SEEDED AREAS MAY REQUIRE IRRIGATION DURING DRY PERIODS.
- SEEDING SUCCESS IS SITE SPECIFIC, CONSIDER MULCHING OR SODDING WHEN NECESSARY.

PLANTING ZONES	LOWER PENINSULA (SOUTH OF T20N) ZONE 1	LOWER PENINSULA (NORTH OF T20N) ZONE 2	UPPER PENINSULA ZONE 3
SEEDING WINDOW PERMANENT SEEDING	4/15 - 10/10	5/1 - 10/1	5/1 - 9/20
SEEDING WINDOW DORMANT SEEDING	11/15 - FREEZE	11/1 - FREEZE	11/1 - FREEZE

(Source: Adapted from MDOT 2020 Standard Specifications for Construction)

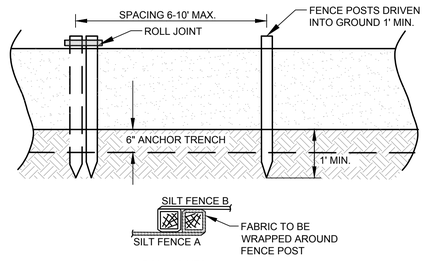
	ZONE 1 LOWER PENINSULA (SOUTH OF US-10)	ZONE 2 LOWER PENINSULA (NORTH OF US-10)	ZONE3 UPPER PENINSULA
SEEDING DATES: (WITH IRRIGATION OR MULCH)	4/1 - 8/1	5/1 - 9/20	5/1 - 9/10
SEEDING DATES: (WITHOUT IRRIGATION OR MULCH)	5/1 - 9/20 OR 8/10 - 10/1	5/1 - 6/10 OR 8/10 - 9/20	5/1 - 6/15 OR 8/10 - 9/20
DORMANT SEEDING DATES	11/1 - FREEZE	10/25 - FREEZE	10/25 - FREEZE

(Source: Adapted from USDA NRCS Technical Guide #342 (1999)

(Source: Adapted from USDA NRCS Technical Guide #342 (1999)

* DORMANT SEEDING IS FOR USE IN THE LATE FALL AFTER THE SOIL TEMPERATURE REMAINS CONSISTENTLY BELOW 50° F, PRIOR TO THE GROUND FREEZING. THIS PRACTICE IS APPROPRIATE IF CONSTRUCTION ON A SITE IS COMPLETED IN THE FALL BUT THE SEED WAS NOT PLANTED PRIOR TO RECOMMENDED SEEDING DATES. NO SEED GERMINATION WILL TAKE PLACE UNTIL SPRING. A COOL SEASON ANNUAL GRASS MAY BE ADDED IN AN ATTEMPT TO HAVE SOME FALL GROWTH.

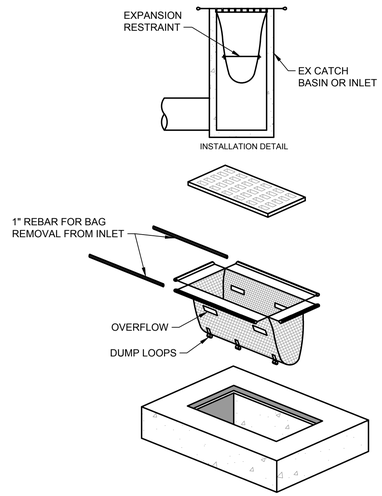
- MULCH MUST BE USED WITH DORMANT SEED.
- DO NOT SEED WHEN THE GROUND IS FROZEN OR SNOW COVERED.
- DO NOT USE A DORMANT SEED MIX ON GRASSED WATERWAYS.



S51 SILT FENCE
SCALE: NONE

SESC NOTES

1. CONTRACTOR SHALL COMPLY WITH THE REQUIREMENTS OF THE CITY OF KALAMAZOO ENGINEERING DEPARTMENT AND THE CONTRACT DOCUMENTS.
2. CONTRACTOR REQUIRED TO PROVIDE CERTIFIED STORM WATER OPERATOR. INSPECTION REPORTS TO BE SUBMITTED AFTER EACH RAIN EVENT.
3. CONTRACTOR SHALL SUBMIT A NOTICE OF COVERAGE FROM EGLE FOR THE SITE PRIOR TO THE START OF CONSTRUCTION.
4. ALL APPLICABLE SOIL EROSION AND SEDIMENTATION CONTROL MEASURES WILL BE INSTALLED PRIOR TO OR IN CONJUNCTION WITH THE START OF CONSTRUCTION AND REMAIN IN EFFECT UNTIL AREAS ARE STABILIZED.
5. CONTRACTOR/BUILDER WILL INSTRUCT ALL TRUCK DRIVERS TO CLEAN SOIL-MATERIALS FROM TIRES IN FRONT OF THE STREET, PAVED PARKING LOT AND DRIVE AISLES. SOIL WILL THEN BE REMOVED IMMEDIATELY FROM THE EXISTING PAVEMENT BY CONTRACTOR/BUILDER. STREETS MUST BE KEPT CLEAN.
6. PERMANENT SOIL EROSION CONTROL MEASURES SHALL BE REQUIRED FOR ALL AREAS DISTURBED DUE TO CONSTRUCTION, SEEDING SHALL COMMENCE WITHIN 5 DAYS OF FINAL GRADING. THE CONTRACTOR SHALL AT NO ADDITIONAL COST, RE-SEED AREAS WHERE GERMINATION FAILS TO TAKE PLACE.
7. DAILY INSPECTION SHALL BE MADE BY THE CONTRACTORS TO DETERMINE THE EFFECTIVENESS OF EROSION AND SEDIMENT CONTROL WORK, AND ANY NECESSARY REPAIRS SHALL BE MADE WITHOUT DELAY.
8. EROSION AND SEDIMENTATION FROM WORK ON THIS SITE SHALL BE CONTAINED ON THE SITE AND NOT ALLOWED TO COLLECT ON ANY OFF-SITE AREAS OR IN WATERWAYS. WATERWAYS INCLUDE BOTH MAN MADE OPEN DITCHES, STREAMS, STORM DRAINS, LAKES AND PONDS.
9. EROSION AND SEDIMENT CONTROL MEASURES ARE TO BE PLACED PRIOR TO OR AS THE FIRST STEP IN CONSTRUCTION. SEDIMENT CONTROL PRACTICES WILL BE APPLIED AS A PERIMETER DEFENSE AGAINST ANY TRANSPORTING OF SILT OFF THE SITE.
10. CONTRACTOR SHALL APPLY TEMPORARY EROSION AND SEDIMENTATION CONTROL MEASURES AS REQUIRED AND AS DIRECTED ON THESE PLANS. CONTRACTOR SHALL REMOVE TEMPORARY MEASURES AS SOON AS PERMANENT STABILIZATION OF SLOPES, DITCHES, AND OTHER EARTH CHANGES HAS BEEN ACCOMPLISHED.
11. PERMANENT SOIL EROSION CONTROL MEASURES FOR ALL SLOPES, CHANNELS, DITCHES OR ANY DISTURBED LAND AREA SHALL BE COMPLETED WITHIN 5 CALENDAR DAYS AFTER FINAL GRADING OR WITHIN SEEDING DATES AS LISTED. WHEN IT IS NOT POSSIBLE TO PERMANENTLY STABILIZE A DISTURBED AREA AFTER AN EARTH CHANGE HAS BEEN COMPLETED OR WHERE SIGNIFICANT EARTH CHANGE ACTIVITY CEASES. TEMPORARY SOIL EROSION CONTROL MEASURES SHALL BE IMPLEMENTED WITHIN 30 CALENDAR DAYS. ALL TEMPORARY SOIL EROSION CONTROL MEASURES SHALL BE MAINTAINED UNTIL PERMANENT SOIL EROSION CONTROL MEASURES ARE IMPLEMENTED. ALL PERMANENT SOIL EROSION MEASURES WILL BE IMPLEMENTED AND ESTABLISHED BEFORE A CERTIFICATE OF COMPLIANCE IS ISSUED. ALL MUD OR DIRT TRACKED ONTO THE ROAD FROM THIS SITE, DUE TO CONSTRUCTION SHALL BE PROMPTLY REMOVED BY THE CONTRACTOR.
12. CONTINUED MAINTENANCE OF PERMANENT SOIL EROSION MEASURES SHALL REMAIN THE RESPONSIBILITY OF THE OWNER.
13. THE CONTRACTOR SHALL HAVE A POWERED BROOM OR OTHER MECHANICAL SWEEPING DEVICE CAPABLE OF REMOVING DEBRIS FROM THE PAVED SURFACES THAT ARE THE RESULT OF THEIR OPERATIONS. THE PAVED ROADWAYS IN AND AROUND THE WORK AREA(S) SHALL BE SWEPT AT THE END OF EACH WORK DAY AND AT TIMES DURING THE DAY WHERE SPILLED SOILS ON THE PAVEMENT PRESENT A DUST NUISANCE OR OTHERWISE ADVERSELY AFFECT THE SAFE OPERATION OF THE ROADWAY.
14. CONTRACTOR SHALL KEEP SOIL MOIST WHERE WIND COULD CAUSE EROSION IN SANDY SOILS.



S58 SACK TYPE INLET FILTER

TETRA TECH
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PHONE: (734) 665-6000 FAX: (734) 213-3003

MARK	DATE	DESCRIPTION	BY
	11/29/23	ISSUED FOR BID	

CITY OF KALAMAZOO, MICHIGAN
WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

STANDARD DETAILS

Project No.: 200-19743-19004
Designed By:
Drawn By:
Checked By:

C-502

Copyright: Tetra Tech

Bar Measures 1 inch

11/29/2023 11:04:01 AM - O:\PROJECTS\ANN ARBOR\IER\19743\200-19743-19004\CAD\SHEETFILES\CIVIL\C-502 STANDARD DETAILS.DWG - GUARD, STEVEN

STRUCTURAL GENERAL NOTES

1. THESE GENERAL NOTES PRESENT AND/OR SUMMARIZE KEY PROJECT INFORMATION FOR THE DRAWING READER'S CONVENIENCE. SEE ALSO INDIVIDUAL DRAWING NOTES AND PROJECT SPECIFICATIONS FOR FURTHER DETAILS AND REQUIREMENTS.
2. ALL REFERENCED STANDARDS HEREIN ARE TO MOST RECENT ISSUE IN EFFECT AS OF THE DATE OF THESE DOCUMENTS, UNLESS NOTED OTHERWISE IN PROJECT SPECIFICATIONS OR ON THE DRAWING..
3. ALL EXISTING DIMENSIONS SHOWN WITH THE ± SYMBOL ARE APPROXIMATE AND SHALL BE FIELD VERIFIED BY THE CONTRACTOR BEFORE FABRICATION AND CONSTRUCTION.
4. DIMENSIONS MARKED WITH A "X" SHALL BE DETERMINED BY EQUIPMENT MANUFACTURER AND COORDINATED BY CONTRACTOR
5. SUBMIT SHOP DRAWINGS, PROJECT DATA AND SAMPLES AS SPECIFIED IN PROJECT SPECIFICATIONS.
6. ABBREVIATIONS

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

FOUNDATIONS

1. SEE GEOTECHNICAL/SUBSURFACE INVESTIGATION REPORT BY SME, DATED 9/15/23. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE WHETHER OR NOT ADDITIONAL GEOTECHNICAL INFORMATION IS REQUIRED AND TO PROVIDE SUCH INFORMATION AS THE CONTRACTOR DEEMS NECESSARY AT NO ADDITIONAL COST TO THE OWNER.
2. ALLOWABLE BEARING PRESSURES AS FOLLOWS:
   A. PUMP STATION MAT FOUNDATIONS: 2000 PSF
3. GEOTECHNICAL ENGINEER SHALL BE RETAINED BY THE CONTRACTOR TO PROVIDE OBSERVATION AND TESTING SERVICES DURING THE GRADING AND FOUNDATION PHASE OF CONSTRUCTION. INSPECTION AND TESTING REPORTS SHALL BE SUBMITTED TO THE STRUCTURAL ENGINEER.
4. PRIOR TO PLACING ENGINEERED FILL, THE SITE SHALL BE STRIPPED AND PROOF ROLLED. ANY SOFT SPOTS ENCOUNTERED SHALL BE REMOVED AND REPLACED WITH ENGINEERED FILL. REFER TO EARTHWORK SPECIFICATION FOR ADDITIONAL INFORMATION.
5. FOR STRUCTURES WITH CONCRETE TOP SLABS, THERE SHALL BE NO BACKFILLING OPERATIONS UNTIL THE TOP SLAB IS IN PLACE, HAS BEEN CURED A MINIMUM OF 7 DAYS, AND HAS REACHED 70% OF ITS 28 DAY DESIGN STRENGTH, UNLESS NOTED OTHERWISE OR APPROVED BY THE ENGINEER.
6. THERE SHALL BE NO BACKFILLING OPERATIONS UNTIL THE CONCRETE WALLS HAVE REACHED THEIR 28 DAY DESIGN STRENGTH, UNLESS NOTED OTHERWISE OR APPROVED BY THE ENGINEER IN WRITING.
7. HEAVY EQUIPMENT OR WHEELED/TRACKED VEHICLES EXCEEDING 20 PSF CONTACT PRESSURE ARE NOT ALLOWED ON ELEVATED SLABS, ROOFS, OR WITHIN 10 FT OF EARTH RETAINING WALLS UNLESS NOTED OTHERWISE ON PLANS OR APPROVED BY STRUCTURAL ENGINEER OF RECORD PRIOR TO CONSTRUCTION.

DESIGN CRITERIA

1. REFERENCES:
   A. ICC INTERNATIONAL BUILDING CODE AND ICC INTERNATIONAL EXISTING BUILDING CODE, 2015 EDITION, RISK CATEGORY III IN ACCORDANCE WITH TABLE 1604.5
   B. STATE BUILDING CODE: 2015 MICHIGAN BUILDING CODE
   C. ASCE/SEI 7-10 - MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES
2. DEAD LOADS:

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

   A. *COLLATERAL LOAD INCLUDES PROVISION FOR HANGING LOADS INCLUDING SPRINKLERS, DUCTWORK, PLUMBING, CEILING AND OTHER COMPONENTS. REFER TO DRAWINGS FOR CONCENTRATED LOADING.
3. LIVE LOADS (U.N.O.):

ROOF	= 20 PSF
STAIRS, WALKWAYS, OR PLATFORMS	= 100 PSF
PROCESS FLOORS	= 200 PSF

4. FROST DEPTH = 3'-6"
5. ROOF SNOW LOAD:

GROUND SNOW LOAD, Pg	= 25 PSF
UNIFORM ROOF DESIGN SNOW LOAD	= 27 PSF
SNOW EXPOSURE FACTOR, Ce	= 1.0
SNOW LOAD IMPORTANCE FACTOR, I	= 1.1
THERMAL FACTOR, Ct	= 1.0

6. WIND LOAD:

BASIC DESIGN WIND SPEED, V	= 120 MPH
NOMINAL DESIGN WIND SPEED, Vasd	= 93 MPH
RISK CATEGORY	= III
WIND EXPOSURE CATEGORY	= C
DIRECTIONALITY FACTOR, Kd	= 0.85
TOPOGRAPHIC FACTOR, Kzt	= 1.0
INTERNAL PRESSURE COEFFICIENT, GCpi	= ± 0.18
BUILDING ENCLOSURE CLASSIFICATION	= ENCLOSED

7. SEISMIC DESIGN DATA:

RISK CATEGORY	= III
SEISMIC IMPORTANCE FACTOR, Ie	= 1.25
SDS	= 0.093
SD1	= 0.079
SS	= 0.087
S1	= 0.05
SITE CLASS	= D
SEISMIC DESIGN CATAGORY	= B

DEMOLITION

1. REFER TO WORK RESTRICTIONS IN THE PROJECT SPECIFICATIONS. CLOSELY FOLLOW THE PROJECT SPECIFICATIONS FOR THE LOCATIONS AND TYPES OF BARRICADES, WORKING HOURS, AND NOTIFICATIONS TO THE OWNER. COORDINATE DEMOLITION TO MAINTAIN PROTECTION OF THE EXISTING FACILITIES.
2. COORDINATE DEMOLITION WORK WITH ALL DISCIPLINES.
3. ITEMS SHOWN OR NOTED TO BE DEMOLISHED ON THE DRAWINGS ARE EXISTING ITEMS TO BE REMOVED FROM SITE BY CONTRACTOR.
4. PRIOR TO EXCAVATION FIELD LOCATE EXISTING UTILITIES. CONTRACTOR SHALL ALSO CONDUCT LAYOUT FOR HARDWARE AND BELOW GRADE SUBSTRUCTURES. MARK AND LOCATE PRIOR TO START OF EXCAVATION WORK. TETRA TECH AND THE OWNER SHALL BEAR NO RESPONSIBILITY FOR EXPENSES INCURRED AS A RESULT OF FAILURE ON THE PART OF THE CONTRACTOR TO VERIFY SITE CONDITIONS PRIOR TO BEGINNING WORK. DO NOT SCALE DRAWINGS.
5. ALL HAZARDOUS MATERIALS WILL BE ADDRESSED BY GOVERNMENT REGULATIONS. IF HAZARDOUS MATERIALS ARE ENCOUNTERED DURING DEMOLITION OPERATIONS THE CONTRACTOR SHALL NOTIFY THE OWNER AS WELL AS LOCAL, STATE AND FEDERAL AUTHORITIES IMMEDIATELY.
6. CONTRACTOR IS RESPONSIBLE TO REMOVE SITE DEBRIS, TRASH, AND OTHER DISCARDED MATERIALS AND/OR EQUIPMENT RESULTING FROM DEMOLITION OPERATIONS. TRANSPORT AND LEGALLY DISPOSE OFF SITE. ALL DEMOLITION SHALL BE DISPOSED OF IN A MANNER ACCEPTABLE TO LOCAL AND STATE REGULATORY AGENCIES OR AS DIRECTED BY OWNER.
7. SURFACES ADJACENT TO AREAS OF DEMOLITION WHICH ARE AFFECTED BY THE WORK SHALL BE REPAIRED AND FINISHED TO MATCH EXISTING CONDITIONS AND ADJACENT SURFACES (MATERIAL, COLOR, SLOPE, TEXTURE AND APPEARANCE).
8. CONTRACTOR SHALL PROVIDE TEMPORARY MEANS TO MITIGATE DUST AND DEBRIS FROM TRAVELING OFF-SITE. USE WATER MIST, TEMPORARY ENCLOSURES, AND OTHER SUITABLE METHODS TO LIMIT SPREAD OF DUST AND DIRT. COMPLY WITH ENVIRONMENTAL PROTECTION REGULATIONS.
9. CONDUCT DEMOLITION AND DEBRIS REMOVAL OPERATIONS TO ENSURE MINIMUM INTERFERENCE WITH ROADS, STREETS, WALKWAYS AND OTHER ADJACENT OCCUPIED OR USED FACILITIES. DO NOT CLOSE OR OBSTRUCT ROADS, WALKWAYS, AND OTHER ADJACENT OCCUPIED OR USED FACILITIES WITHOUT PERMISSION FROM AUTHORITIES HAVING JURISDICTION. PROVIDE ALTERNATE ROUTES AROUND CLOSED OR OBSTRUCTED TRAFFIC WAYS IF REQUIRED BY GOVERNING REGULATIONS.
10. WHERE BELOW GRADE STRUCTURES ARE INDICATED TO BE REMOVED, SUCH AS FOUNDATIONS, THESE AREAS ARE TO BE BACKFILLED WITH ENGINEERED FILL AND MATCH EXISTING CONDITIONS AND ADJACENT SURFACES. FILL TO BE PLACED TO AN ELEVATION MATCHING EXISTING GRADE AND SLOPED TO PROVIDE DRAINAGE AWAY FROM THE EXISTING FACILITIES.
11. DEMOLITION CONTRACTOR IS TO USE CARE WHEN REMOVING STRUCTURAL ELEMENTS SCHEDULED FOR REMOVAL THAT ARE ADJACENT OR ABOVE EXISTING STRUCTURES THAT ARE SCHEDULED TO REMAIN. CONTRACTOR IS TO TAKE ALL NECESSARY PRECAUTIONS TO PROTECT REMAINING STRUCTURES FROM DAMAGE.
12. PROVIDE AND MAINTAIN SHORING BRACING, OR STRUCTURAL SUPPORT TO PRESERVE STABILITY AND PREVENT MOVEMENT, SETTLEMENT, OR COLLAPSE OF ITEMS TO BE SELECTIVELY DEMOLISHED OR STABILIZED AND ITEMS WHICH ARE IMMEDIATELY ADJACENT TO THOSE BEING REMOVED.
13. PROVIDE TEMPORARY BARRICADES AND OTHER PROTECTION REQUIRED TO PREVENT INJURY TO PEOPLE AND DAMAGE TO ADJACENT BUILDINGS AND FACILITIES. ERECT TEMPORARY PROTECTION SUCH AS FENCES, RAILINGS, CANOPIES, AND COVERED PASSAGEWAYS, WHERE REQUIRED BY AUTHORITIES HAVING JURISDICTION.
14. IN PLACES WHERE BELOW GRADE CONSTRUCTION IS REMOVED, MAINTAIN APPROPRIATE TEMPORARY SECURITY AROUND ALL OPENINGS IN GRADE TO MAINTAIN SAFETY.
15. PROMPTLY PATCH AND REPAIR DAMAGE CAUSED TO ADJACENT CONSTRUCTION BY DEMOLITION WORK. RESTORE EXPOSED FINISHES OF PATCHED AREAS IN A MANNER THAT ELIMINATES EVIDENCE OF PATCHING AND REFINISHING.
16. CLEAN ADJACENT STRUCTURES AND IMPROVEMENTS OF DUST, DIRT, AND DEBRIS CAUSED BY DEMOLITION OPERATIONS. RETURN ADJACENT AREAS TO EXISTING CONDITION BEFORE DEMOLITION OPERATIONS BEGAN.
17. CONTRACTOR SHALL FOLLOW THE OWNER'S REQUIREMENTS AS WELL AS LOCAL AND STATE REGULATIONS FOR EROSION PROTECTION CONTROL.

CONCRETE MASONRY

1. REFERENCES
   A. TMS 402/ACI 530-08/ASCE 5-08 BUILDING CODE REQUIREMENTS AND SPECIFICATIONS FOR MASONRY STRUCTURES.
2. MATERIALS
   A. MASONRY WALLS SHALL CONSIST OF ASTM C-90, GRADE N-1, HOLLOW CONCRETE MASONRY UNIT
   B. MASONRY SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH f'm = 1500 PSI.
   C. MORTAR SHALL COMPLY WITH ASTM C-270, AND SHALL BE TYPE S (1900 PSI)
   D. CORE FILL GROUT SHALL COMPLY WITH ASTM C-476, WITH A MINIMUM COMPRESSIVE STRENGTH OF 2500 PSI.
3. MASONRY SHALL BE LAID IN A RUNNING BOND PATTERN UNLESS OTHERWISE NOTED. NO CONTINUOUS VERTICAL JOINTS ARE PERMITTED AT WALL CORNERS, INTERSECTIONS, AND OPENING EDGES. SAW TOOTH BLOCK EACH ALTERNATE COURSE AT THESE LOCATIONS TO ACHIEVE MONOLITHIC CONSTRUCTION.
4. VERTICAL REINFORCEMENT: LOCATION, SIZE AND SPACING SHALL BE AS INDICATED ON THE STRUCTURAL DRAWINGS. WALLS SHALL BE REINFORCED FULL HEIGHT IN GROUT FILLED CELLS AT ALL WALL CORNERS, INTERSECTIONS, ENDS, AND ADJACENT TO OPENINGS.
5. PROVIDE REINFORCING STEEL DOWELS INTO STRUCTURE ABOVE AND BELOW WITH SIZE AND SPACING TO MATCH VERTICAL REINFORCEMENT, UNLESS OTHERWISE NOTED.
6. PROVIDE DOWELS TO THE FOUNDATIONS WITH SIZE AND SPACING TO MATCH VERTICAL REINFORCING. LAP SPLICES SHALL BE MEASURED ABOVE THE STEM WALL.
7. VERTICAL REINFORCEMENT SHALL BE CENTERED IN GROUT FILLED CELLS UNLESS NOTED OTHERWISE. REINFORCEMENT SHALL BE HELD SECURELY IN POSITION AT THE TOP AND BOTTOM OF WALL.
8. HORIZONTAL JOINT REINFORCEMENT SHALL BE 9 GAGE GALVANIZED DUR-O-WAL LADDER TYPE OR ENGINEER APPROVED SUBSTITUTE, LOCATED AT SIXTEEN (16) INCHES VERTICALLY.
9. PROVIDE HORIZONTAL JOINT REINFORCING IN PARAPETS AND FREE STANDING WALLS AT EIGHT (8) INCHES VERTICALLY.
10. CONTROL JOINTS SHALL BE PROVIDED AS SPECIFIED ON PLAN AND COORDINATED WITH ARCHITECT. TERMINATE JOINT REINFORCEMENT EACH SIDE OF CONTROL JOINTS. SEE ARCHITECTURAL DRAWINGS FOR SEALANT REQUIREMENTS AT CONTROL JOINTS.
11. MASONRY CONTROL JOINTS SHALL BE LOCATED A MINIMUM OF 2'-0" FROM ALL WALL OPENINGS, INTERSECTIONS, AND CORNERS, UNLESS NOTED OTHERWISE.
12. MASONRY CONTROL JOINTS SHALL NOT BE LOCATED ABOVE OR BELOW ANY WALL OPENING.
13. GROUTING: CONTRACTOR SHALL SUBMIT PROPOSED GROUT MIX DESIGN FOR ENGINEER REVIEW AND APPROVAL PRIOR TO CONSTRUCTION. GROUT SLUMP SHALL BE BETWEEN 8 AND 11 INCHES. USE OF SUPERPLASTICIZER IS PROHIBITED. CELLS WHICH ARE TO RECEIVE GROUT SHALL BE VERTICALLY ALIGNED WITH A CLEAR, UNOBSTRUCTED AND CONTINUOUS VERTICAL SPACE. CELLS SHALL BE FILLED COMPLETELY AND VIBRATION CONSOLIDATED. GROUTING OPERATIONS SHALL BE CONTINUOUS AND SHALL NOT BE STOPPED FOR A PERIOD EXCEEDING ONE HOUR. WALL SHALL BE CONSTRUCTED IN MAXIMUM 5'-0" LIFTS BETWEEN GROUT POURS
14. GROUTING AND REINFORCING: ALL MASONRY AND GROUTING AND REINFORCING WORK SHALL BE PERFORMED BY MASONRY CRAFTWORKERS WHO HAVE SUCCESSFULLY COMPLETED THE INTERNATIONAL MASONRY INSTITUTE (1-800-IMI-0988) TRAINING COURSE FOR GROUTING AND REINFORCED MASONRY CONSTRUCTION, OR EQUAL."
15. ELECTRICAL CONDUITS NOT PERMITTED IN GROUT FILLED CELLS OF CMU WALL UNLESS APPROVED BY EOR PRIOR TO PLACEMENT. CONTRACTOR TO COORDINATE WITH ELECTRICAL DRAWINGS. VERTICAL CONDUITS, PIPES OR SLEEVES PLACED IN MASONRY COLUMNS OR PILASTERS SHALL NOT DISPLACE MORE THAN 2 PERCENT OF THE NEW CROSS SECTION.
16. CONDUITS, PIPES AND SLEEVES IN HOLLOW MASONRY SHALL BE SPACED NO CLOSER THAN 3X THEIR DIAMETER ON CENTER. MINIMUM SPACING OF CONDUITS, PIPES OR SLEEVES OF DIFFERENT DIAMETER SHALL BE DETERMINED USING LARGER DIAMETER.

STRUCTURAL STEEL

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

WIDE FLANGES	ASTM A992, GRADE 50
CHANNELS, ANGLES, AND PLATES	ASTM A36
SHEAR CONNECTOR PLATES	ASTM A572, GRADE 50

   B. WELDED STUDS: ASTM A108, GRADE 60
   C. ANCHOR BOLTS: ASTM F1554, GRADE 55, WELDABLE.
   D. STRUCTURAL BOLTS: ASTM A325-N
   E. WELDS: E70XX ELECTRODES
3. CONNECTIONS
   A. AISC MANUAL STANDARD CONNECTIONS UNLESS NOTED OTHERWISE. HIGH-STRENGTH BOLTS: ASTM A325-N, 3/4" UNLESS NOTED OTHERWISE. BEARING TYPE INSTALLED IN CONFORMANCE WITH "SPECIFICATIONS FOR STRUCTURAL JOINTS USING ASTM A325 OR A490 BOLTS", RESEARCH COUNCIL ON RIVETED AND BOLTED STRUCTURAL JOINTS. UNLESS NOTED OTHERWISE, STANDARD AISC "USUAL GAGE" DIMENSIONS SHALL BE USED FOR LOCATING HOLES FOR BOLTS, EXPANSION ANCHORS, ETC. IN ALL ANGLES, BEAM FLANGES, ETC.
   B. THE ASSEMBLY SURFACE, INCLUDING THOSE ADJACENT TO THE WASHER, SHALL BE FREE OF MILL SCALE, OIL, PAINT OR OTHER COATINGS.
   C. ALL HIGH STRENGTH BOLTS SHALL BE TIGHTENED TO A BOLT TENSION NOT LESS THAN THAT SPECIFIED IN THE AISC MANUAL. FULL TENSIONING SHALL BE BY THE TURN OF NUT METHOD, BY A DIRECT TENSION INDICATOR, OR BY PROPERLY CALIBRATED WRENCHES. PROVIDE HARDENED WASHERS UNDER THE NUT OR BOLT HEAD, WHICHEVER IS THE ELEMENT TURNED IN TIGHTENING.
   D. WELDING - PERFORM ALL WELDING IN ACCORDANCE WITH AWS D1.1 CODE, LATEST EDITION, WELDS SHALL BE MADE ONLY BY OPERATORS CERTIFIED BY AWS IN PERFORMING THE TYPE OF WORK INDICATED.
4. TOLERANCES: AISC CODE OF STANDARD PRACTICE (LATEST EDITION)
5. CAMBER: PROVIDE POSITIVE CAMBER AS NOTED ON DRAWINGS. WHERE NO CAMBER IS NOTED, RESIDUAL MILL CAMBER IS TO BE UPWARDS.
6. ALL EXPOSED ANGLE AND PLATE LINTELS FOR BLOCK/BRICK SUPPORT SHALL BE HOT DIPPED GALVANIZED.
7. PAINTING: AFTER MATERIAL HAS BEEN PROPERLY CLEANED AND TREATED, APPLY SHOP PRIME COAT TO ALL SURFACES, EXCEPT THOSE INTENDED FOR EMBEDMENT INTO CONCRETE OR TO RECEIVE FIELD WELDING, SLIP CRITICAL BOLTS, OR CEMENTITIOUS FIREPROOFING.

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MARK	DATE	DESCRIPTION
	11/28/23	ISSUED FOR BID

BY

CITY OF KALAMAZOO, MICHIGAN
WATER SYSTEM CORROSION CONTROL IMPROVEMENTS
GENERAL NOTES

PROJ:	200-19743-19004
DESN:	AJF
DRWN:	KDK
CHKD:	TJM

S-001

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11/28/2023 1:20:19 PM Autodesk Docs://200-19743-19004-KZOO PS UPGRADES/S-PS-19743-19004-20023.rvt

Bar measures 1 inch, otherwise drawing is not to scale

CONCRETE

1. REFERENCES

   A. ACI 318-14 BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE
   B. ACI SP-66 ACI DETAILING MANUAL
   C. ACI 301-16 SPECIFICATION FOR STRUCTURAL CONCRETE
   D. ACI 117-10 SPECIFICATION FOR TOLERANCES FOR CONCRETE CONSTRUCTION AND MATERIALS
   E. CRSI MSP-2-01 MANUAL OF STANDARD PRACTICE
   F. CRSI REINFORCING BAR DETAILING
   G. CRSI PLACING REINFORCING BARS

2. MATERIALS

   A. STRUCTURAL CONCRETE

      a. MINIMUM COMPRESSIVE STRENGTH AT 28 DAYS (f'c): 4500 PSI
      b. UNLESS NOTED OTHERWISE ON THE PLANS, ALL CONCRETE TO HAVE THE FOLLOWING EXPOSURE CLASSIFICATION AS DEFINED IN ACI 318-14, CHAPTER 19: F2, S0, W1, C2
      c. ALL CONCRETE EXPOSED TO THE ELEMENTS SHALL BE AIR-ENTRAINED IN ACCORDANCE WITH ASTM C260. SEE SPECIFICATIONS.

   B. REINFORCEMENT

      a. REINFORCING BARS: ASTM A615, GRADE 60
      b. WELDED SMOOTH WIRE FABRIC - ASTM A185 (SHEETS ONLY, ROLL FABRIC NOT ALLOWED)

   C. ACCESSORIES

      a. BAR SUPPORTS CLASS 1, MAXIMUM PROTECTION (CRSI MANUAL OF STANDARD PRACTICE) FOR ALL SLABS AND BEAMS WITH SOFFITS EXPOSED TO VIEW

   D. CAST-IN-PLACE ANCHOR RODS

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

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

3. REINFORCEMENT DETAILING

   A. ALL REINFORCING STEEL DETAILS SHALL BE IN ACCORDANCE WITH THE ACI CODE REQUIREMENTS (ACI 318 OR 350 - CURRENT EDITIONS).
   B. REINFORCING STEEL PLACING DRAWINGS AND BAR LISTS SHALL CONFORM TO THE ACI OR CRSI DETAILING MANUALS. ALL BAR AND MESH SUPPORTS MUST BE CLEARLY DETAILED
   C. CONCRETE COVER FOR REINFORCING SHALL BE INDICATED ON THE APPLICABLE REINFORCING STEEL SHOP DRAWINGS. HOWEVER, NO REINFORCING IN AREAS EXPOSED TO EARTH, WEATHER ,SEWAGE OR WATER SHALL HAVE COVER LESS THAN TWO INCHES.

   D. SPECIFIED COVER FOR REINFORCING PER ACI 318 (BUILDING STRUCTURES):

FOOTINGS (BOTTOM)	3.0" (CAST AGAINST EARTH)
FOOTINGS	2.0" (FORMED)
WALLS (EXTERIOR)	1.5"
WALLS (INTERIOR)	3/4"
SLAB-ON-GRADE (WWF)	1/3 x DEPTH FROM TOP OF SLAB
SLAB-ON-GRADE (REBAR)	2" FROM TOP OF SLAB (U.N.O.)

   E. REINFORCEMENT IN WALLS AND STRIP FOOTINGS SHALL BE CONTINUOUS. HORIZONTAL BAR LAP SPLICES SHALL BE STAGGERED
   F. PROVIDE CORNER BARS AT ALL WALL AND FOUNDATION CORNERS, AND LAP WITH THE HORIZONTAL BARS. CORNER BARS ARE TO MATCH THE HORIZONTAL BARS IN SIZE, GRADE AND SPACING UNLESS OTHERWISE SHOWN.
   G. HOOKS AND BENDS SHALL MEET ACI STANDARD UNLESS OTHERWISE INDICATED.
   H. SPLICES: CONTINUOUS REINFORCING BARS SHALL BE FURNISHED WITH CLASS 'B' TENSION LAPS SPLICES INCLUDING CORNER BARS, UNLESS NOTED OTHERWISE.
   I. MECHANICAL SPLICES SHALL NOT BE PERMITTED UNLESS SHOWN ON THE DRAWINGS OR APPROVED BY THE ENGINEER
   J. REINFORCING STEEL FABRICATION AND PLACEMENT SHALL BE IN ACCORDANCE WITH CRSI MANUAL OF STANDARD PRACTICE AND CRSI PLACING REINFORCING BARS (LATEST EDITIONS).
   K. REINFORCING STEEL IN FOOTINGS SHALL BE ASSEMBLED IN MAT GRILLES EQUALLY SPACED AND SECURELY WIRED TOGETHER BEFORE THE CONCRETE IS POURED.
   L. WALL FOOTING DOWELS ARE TO HAVE A FULL TENSION LAP SPLICE WITH THE WALL STEEL UNLESS NOTED OTHERWISE.
   M. SPREAD BARS AROUND SMALL OPENINGS AND SLEEVESIN SLABS AND WALLS WHERE POSSIBLE AND WHERE BAR SPACING WILL NOT EXCEED 1.5 TIMES THE NORMAL SPACING. DISCONTINUE BARS AT LARGE OPENINGS WHERE NECESSARY AND PROVIDE AN AREA OF RIENFORCEMENT EQUAL TO THE INTERRUPTED REINFORCEMENT DISTRIBUTING ONE-HALF OF THIS REINFORCEMENT EACH SIDE OF THE OPENING (TENSION LAP SPLICED). HOLES LARGER THAN 12 INCHES IN ANY DIRECTION SHALL HAVE (2) #6 X 4'-0" DIAGONAL BARS IN BOTH FACES AT EACH CORNER.
   N. ALL REINFORCING SHALL BE HELD SECURELY IN POSITION WITH STANDARD ACCESSORIES IN CONCRETE
   O. NO REINFORCING STEEL SHALL BE FIELD BENT WITHOUT THE APPROVAL OF THE STRUCTURAL ENGINEER. FIELD BENDING OF PLAIN REINFORCEMENT, IF PERMITTED, SHALL BE PERFORMED USING AN APPROVED AND APPROPRIATE SIZED PORTABLE HYDRAULIC DEVICE THAT MAKES ACI STANDARD RADIUS BENDS. NO OTHER FIELD BENDING METHOD SHALL BE PERMITTED.
   P. WELDING, INCLUDING TACK WELDING, FOR REINFORCING STEEL IS PROHIBITED. WELDING OF REINFORCING STEEL AND HIGH STRENGTH BOLTS, IE. A36, F1554, WILL BE PERMITTED ONLY BY WRITTEN APPROVAL OF THE ENGINEER.
   Q. ALL OPENINGS THROUGH WALLS, SLABS OR OTHER STRUCTURAL ELEMENTS NOT DETAILED ON THE STRUCTURAL DRAWINGS MUST BE LOCATED BY THE CONTRACTOR AND SHOWN ON THE APPLICABLE REINFORCING STEEL SHOP DRAWINGS. THE FINAL LOCATION OF ALL OPENINGS MUST BE REVIEWED BY THE ENGINEER BEFORE THE CONCRETE IS POURED.

4. FORMWORK

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

5. CONCRETE FINISHES: SEE SPECIFICATIONS

   A. FORMED SURFACES:

      a. EXPOSED TO VIEW: GROUT CLEANED FINISH.
      b. COVERED OR AS NOTED ON PLANS: AS-CAST

   B. FLATWORK:

      a. EXPOSED TO VIEW: TROWELED
      b. TILED OR CARPETED: TROWELED
      c. STAIRS OR RAMPS: BROOMED
      d. SIDEWALKS, DRIVEWAYS: BROOMED

6. CURING AND PROTECTION: SEE SPECIFICATIONS.

7. SEE THE MECHANICAL, ELECTRICAL AND SUPPLIERS DRAWINGS AND THE SPECIFICATIONS FOR THE LOCATIONS OF SPECIAL ANCHORS, CHAMFERS, SLEEVES, PIPES, CONDUITS AND OTHER DETAILS NOT SHOWN ON THE STRUCTURAL DRAWINGS.

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

9. SIZE AND LOCATION OF EQUIPMENT PADS AND ANCHOR BOLTS SHALL BE AS REQUIRED BY THE EQUIPMENT MANUFACTURER. ALL CONDUIT PLACED IN SLAB SHALL BE APPROVED BY STRUCTURAL ENGINEER OF RECORD PRIOR TO INSTALLING CONDUIT AND POURING SLAB

CONCRETE POST-INSTALLED ANCHORS

1. MECHANICAL (TORQUE-CONTROLLED) ANCHORS

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

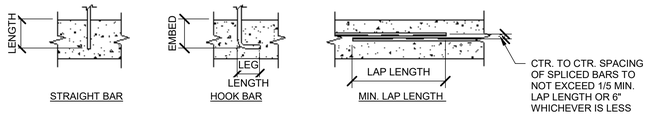
2. ADHESIVE ANCHORS

   A. APPROVED SYSTEMS INCLUDE HILTI HIT-RE 500 V3 (ICC ESR 3814) OR HILTI HIT-HY 200 ADHESIVE WITH HAS/HIT-V THREADED ROD WITH SAFESET TECHNOLOGY (ICC ESR 3187) OR EQUAL CONSIDERING LOAD RESISTANCE, IN-SERVICE AND INSTALLATION TEMPERATURE, AVAILABILITY OR COMPREHENSIVE INSTALLATION INSTRUCTIONS, AND CREEP. ADHESIVE ANCHORS SHALL BE APPROVED FOR USE WITH CRACKED CONCRETE PER ACI 308. CURRENT ICC-ESR SHALL BE SUBMITTED.
   B. ALL PERSONNEL INSTALLING ANCHORS SHALL BE TRAINED BY THE MANUFACTURER ON PROPER INSTALLATION TECHNIQUE. TRAINING DOCUMENTATION FROM THE MANUFACTURER SHALL BE AVAILABLE ON REQUEST.
   C. HOLE SIZES AND INSTALLATION SHALL BE IN ACCORDANCE WITH MANUFACTURER'S PRINTED INSTALLATION INSTRUCTIONS (MPII)
   D. ADHESIVE FOR REBAR AND ANCHORS SHALL HAVE BEEN TESTED IN ACCORDANCE WITH ACI 355.4 AND ICC-ES AC308 FOR CRACKED CONCRETE AND SEISMIC APPLICATIONS. DESIGN ADHESIVE BOND STRENGTH SHALL BE BASED ON ACI 355.4 TEMPERATURE CATEGORY A WITH INSTALLATIONS INTO DRY HOLES DRILLED USING A CARBIDE DRILL BIT INTO CONCRETE THAT HAS BEEN CURED FOR AT LEAST 21 DAYS.
   E. ANY ADHESIVE ANCHOR INSTALLED HORIZONTALLY OR IN A VERTICALLY INCLINED PLANE SHALL BE INSTALLED BY CERTIFIED ADHESIVE ANCHOR INSTALLER, PER ACI 318-14 17.8.2.2, AND SHALL BE INSPECTED PER ACI 318-14 17.8.2.4.
   F. FILL IN ALL ABANDONED HOLES WITHIN 2" OF NEW ANCHOR LOCATIONS..

3. EQUIPMENT/BUILDING ANCHORS:
   A. SIZE, LENGTH, AND LOCATION OF EQUIPMENT/BUILDING ANCHORS SHALL BE PROVIDED BY EQUIPMENT/BUILDING MANUFACTURER.

TENSION DEVELOPMENT / LAP SPLICE SCHEDULE (UNCOATED BARS)

BAR SIZE	DEVELOPMENT LENGTH (IN)		CLASS 'B' LAP SPLICE LENGTH (IN)		STD 90 DEG. HOOK (IN)		
	DEVELOPMENT / LAP SPLICE LENGTH IN CONCRETE (f'c = 4500 PSI)						
	BAR TYPE 1	BAR TYPE 2	BAR TYPE 1	BAR TYPE 2	EMBED	LEG LENGTH	BEND DIA.
4	18	27	24	35	9	8	3
5	23	34	30	44	12	10	3 3/4
6	27	41	35	53	14	12	4 1/2
7	40	59	51	77	16	14	5 1/4
8	45	67	59	88	18	16	6
9	51	76	66	99	21	20	9 1/2
10	57	86	74	111	23	22	10 1/4



STRAIGHT BAR | HOOK BAR | MIN. LAP LENGTH

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

OR

CLEAR SPACING OF BARS BEING DEVELOPED OR SPLICED NOT LESS THAN 2*Db AND CLEAR COVER NOT LESS THAN Db.

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

FIBERGLASS REINFORCED PLASTIC GRATING

1. GRATING SHALL BE OF A ONE PIECE MOLDED CONSTRUCTION WITH TOPS AND BOTTOMS OF BEARING BARS AND CROSS BARS IN THE SAME PLANE. GRATING SHALL HAVE A SQUARE MESH PATTERN PROVIDING BI-DIRECTIONAL STRENGTH.

2. NON-SLIP SURFACING: GRATING SHALL BE MANUFACTURED WITH A CONCAVE, MENISCUS PROFILE ON THE TOP OF EACH BAR PROVIDING MAXIMUM SLIP RESISTANCE.

3. COLOR: TO BE SELECTED BY OWNER.

4. DEPTH: 1 1/2" ± 1/16"

5. MESH CONFIGURATION: 2" x 2" MESH, CENTERLINE TO CENTERLINE

6. LOAD/DEFLECTION: FOR THE SPANS SHOWN ON THE DRAWINGS, GRATING SHALL SUPPORT A UNIFORM DISTRIBUTED LOAD OF 200 PSF OR A CONCENTRATED MIDSPAN LINE LOAD OF 300 LB/FT, WITH A MAXIMUM DEFLECTION OF 3/8" OR SPAN (INCHES)/120, WHICHEVER IS LESS.

7. LAYOUT: EACH GRATING SECTION SHALL BE READILY REMOVABLE, UNLESS NOTED OTHERWISE. MANUFACTURER TO PROVIDE OPENINGS AND HOLES WHERE LOCATED ON THE DRAWINGS. GRATING OPENINGS THAT FIT AROUND PROTRUSIONS SHALL BE DISCONTINUOUS AT APPROXIMATELY THE CENTERLINE OF OPENING SO THAT EACH SECTION IS READILY REMOVABLE.

8. ALL MECHANICAL GRATING CLIPS SHALL BE MANUFACTURED OF TYPE 316 STAINLESS STEEL. GRATING CLIPS SHALL BE PROVIDED AT A MAXIMUM SPACING OF 48", WITH A MINIMUM OF FOUR CLIPS PER PIECE OF GRATING.

9. WHEN REQUIRED, FIELD CUT AND DRILL FRP GRATING WITH CARBIDE OR DIAMOND TIPPED BITS AND BLADES. CUT OR DRILLED SURFACES SHALL BE SEALED IN ACCORDANCE WITH MANUFACTURER'S WRITTEN INSTRUCTIONS.

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MARK	DATE	DESCRIPTION
	11/28/23	ISSUED FOR BID

BY

CITY OF KALAMAZOO, MICHIGAN
WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

GENERAL NOTES

PROJ:	200-19743-19004
DESN:	AJF
DRWN:	KDK
CHKD:	TJM

S-002

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INSPECTION DEFINITIONS

PERFORM: PERFORM TASKS FOR THE NOTED LINE ITEM.

OBSERVE: OBSERVE THESE ITEMS RANDOMLY DURING THE COURSE OF EACH WORK DAY TO ENSURE THAT APPLICABLE REQUIREMENTS ARE BEING MET. OPERATIONS NEED NOT BE DELAYED PENDING THESE INSPECTIONS AT CONTRACTOR'S RISK.

DOCUMENT: DOCUMENT, WITH A REPORT, THAT THE WORK HAS BEEN PERFORMED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.

CONTINUOUS: CONSTANT MONITORING OF IDENTIFIED TASKS BY A SPECIAL INSPECTOR OVER THE DURATION OF PERFORMANCE OF SAID TASKS.

SOILS INSPECTION - VERIFY THE FOLLOWING ARE IN COMPLIANCE IBC 1705.6			
TASK		**INSPECTION TYPE**	**DESCRIPTION**
1.	MATERIALS BELOW SHALLOW FOUNDATIONS ARE ADEQUATE TO ACHIEVE THE DESIGN BEARING CAPACITY.	OBSERVE	
2.	EXCAVATIONS ARE EXTENDED TO PROPER DEPTH AND HAVE REACHED PROPER MATERIAL.	OBSERVE	
3.	VERIFY USE OF PROPER MATERIALS, DENSITIES AND LIFT THICKNESSES DURING PLACEMENT AND COMPACTION OF COMPACTED FILL.	**CONTINUOUS**	
4.	PRIOR TO PLACEMENT OF COMPACTED FILL, INSPECT SUBGRADE AND VERIFY THAT SITE HAS BEEN PREPARED PROPERLY.	OBSERVE	DURING FILL PLACEMENT, THE SPECIAL INSPECTOR SHALL VERIFY THAT PROPER MATERIALS AND PROCEDURES ARE USED IN ACCORDANCE WITH THE PROVISIONS OF THE APPROVED GEOTECHNICAL REPORT.
NOTES:			

CONCRETE CONSTRUCTION, INCLUDING COMPOSITE DECK - VERIFY THE FOLLOWING ARE IN COMPLIANCE WITH IBC TABLE 1705.3 (ACI 318 REFERENCES NOTED IN IBC TABLE)			
TASK		**INSPECTION TYPE**	**DESCRIPTION**
1.	INSPECT REINFORCEMENT AND VERIFY PLACEMENT	OBSERVE	VERIFY PRIOR TO PLACING CONCRETE THAT REINFORCING IS OF SPECIFIED TYPE, GRADE AND SIZE; THAT IS FREE OF OIL, DIRT, AND UNACCEPTABLE RUST; THAT IT IS LOCATED AND SPACED PROPERLY; THAT HOOKS, BENDS, TIES, STIRRUPS, AND SUPPLEMENTAL REINFORCEMENT ARE PLACED CORRECTLY; THAT LAP LENGTHS, STAGGER AND OFFSETS ARE PROVIDED; AND THAT ALL MECHANICAL CONNECTIONS ARE INSTALLED PER THE MANUFACTURER'S INSTRUCTIONS AND/OR EVALUATION REPORT.
2.	ALL OTHER WELDING	**CONTINUOUS**	VISUALLY INSPECT ALL WELDS IN ACCORDANCE WITH AWS D1.4
3.	CAST IN PLACE ANCHORS AND POST INSTALLED DRILLED ANCHORS (DOWNWARD INCLINED)	OBSERVE	VERIFY PRIOR TO PLACING CONCRETE THAT CAST IN PLACE ANCHORS AND POST INSTALLED DRILLED ANCHORS HAVE PROPER EMBEDMENT, SPACING AND EDGE DISTANCE.
4.	POST-INSTALLED ADHESIVE ANCHORS IN HORIZONTAL OR UPWARD INCLINED ORIENTATIONS	**CONTINUOUS AND DOCUMENT**	INSPECT AS REQUIRED PER APPROVED ICC-ES REPORT; VERIFY THAT INSTALLER IS CERTIFIED FOR INSTALLATION OF HORIZONTAL AND OVERHEAD INSTALLATION APPLICATIONS; INSPECT PROOF LOADING AS REQUIRED BY THE CONTRACT DOCUMENTS
5.	VERIFY USE OF REQUIRED MIX DESIGN	OBSERVE	VERIFY THAT ALL MIXES USED COMPLY WITH THE APPROVED CONSTRUCTION DOCUMENTS.
6.	PRIOR TO CONCRETE PLACEMENT, FABRICATE SPECIMENS FOR STRENGTH TESTS, PERFORM SLUMP AND AIR CONTENT TESTS, AND DETERMINE THE TEMPERATURE OF THE CONCRETE	**CONTINUOUS**	AT THE TIME FRESH CONCRETE IS SAMPLED TO FABRICATE SPECIMENS FOR STRENGTH TEST VERIFY THESE TESTS ARE PERFORMED BY QUALIFIED TECHNICIANS.
7.	INSPECT CONCRETE AND/OR SHOTCRETE PLACEMENT FOR PROPER APPLICATION TECHNIQUES.	**CONTINUOUS**	VERIFY PROPER APPLICATION TECHNIQUES ARE USED DURING CONCRETE CONVEYANCE AND DEPOSITING AVOIDS SEGREGATION OR CONTAMINATION. VERIFY THAT CONCRETE IS PROPERLY CONSOLIDATED.
8.	VERIFY MAINTENANCE OF SPECIFIED CURING TEMPERATURE AND TECHNIQUE	OBSERVE	INSPECT CURING, COLD WEATHER PROTECTION, AND HOT WEATHER PROTECTION PROCEDURES
9.	INSPECT FORMWORK FOR SHAPE, LOCATION AND DIMENSIONS OF THE CONCRETE MEMBER BEING FORMED.	OBSERVE	
NOTES:			

2015 MASONRY CONSTRUCTION - VERIFY THE FOLLOWING ARE IN COMPLIANCE WITH IBC 1705.4 (ACI 530-13 TABLE 3.1.2 & 3.1.3)			
TASK		**INSPECTION TYPE**	**DESCRIPTION**
1.	VERIFY COMPLIANCE WITH THE APPROVED SUBMITTALS PRIOR TO START	OBSERVE	
AS MASONRY CONSTRUCTION BEGINS, VERIFY THAT THE FOLLOWING ARE IN COMPLIANCE:			
2.	PROPORTIONS OF SITE-PREPARED MORTAR	OBSERVE	
3.	CONSTRUCTION OF MORTAR JOINTS	OBSERVE	
4.	LOCATION OF REINFORCEMENT, CONNECTORS, AND ANCHORAGES	OBSERVE	
PRIOR TO GROUTING, VERIFY THAT THE FOLLOWING ARE IN COMPLIANCE:			
TASK		**INSPECTION TYPE**	**DESCRIPTION**
5.	GROUT SPACE	OBSERVE	
6.	GRADE, TYPE, AND SIZE OF REINFORCEMENT AND ANCHOR BOLTS, AND ANCHORAGES	OBSERVE	
7.	PLACEMENT OF REINFORCEMENT, CONNECTORS, AND ANCHORAGES	OBSERVE	
8.	PROPORTION OF SITE PREPARED GROUT	OBSERVE	
9.	CONSTRUCTION OF MORTAR JOINTS	OBSERVE	
DURING CONSTRUCTION, VERIFY THAT THE FOLLOWING ARE IN COMPLIANCE:			
TASK		**INSPECTION TYPE**	**DESCRIPTION**
10.	SIZE AND LOCATION OF STRUCTURAL ELEMENTS	OBSERVE	
11.	TYPE, SIZE, AND LOCATION OF ANCHORS, INCLUDING OTHER DETAILS OF ANCHORAGE OF MASONRY TO STRUCTURAL ELEMENTS, FRAMES, OR OTHER CONSTRUCTION	OBSERVE	
12.	PREPARATION, CONSTRUCTION, AND PROTECTION OF MASONRY DURING COLD WEATHER (TEMPERATURE BELOW 40°F (4.4°C)) OR HOT WEATHER (TEMPERATURE ABOVE 90°F (32.2°C))	OBSERVE	
13.	OBSERVE PREPARATION OF GROUT SPECIMENS, MORTAR SPECIMENS, AND/OR PRISMS	OBSERVE	
NOTES: FOR LEVEL B QUALITY ASSURANCE ONLY: MINIMUM QUALITY ASSURANCE PROGRAM FOR MASONRY IN RISK CATEGORY I, II, OR III STRUCTURES.			

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MARK	DATE	DESCRIPTION
	11/28/23	ISSUED FOR BID

BY

CITY OF KALAMAZOO, MICHIGAN
WATER SYSTEM CORROSION CONTROL IMPROVEMENTS
SPECIAL INSPECTIONS

PROJ:	200-19743-19004
DESN:	AJF
DRWN:	KDK
CHKD:	TJM

S-003

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2015 STEEL INSPECTION PRIOR TO WELDING - VERIFY THE FOLLOWING ARE IN COMPLIANCE - IBC 1705.2.1, AISC 360-10 - TABLE N5.4-1			
TASK		**INSPECTION TYPE**	**DESCRIPTION**
1.	VERIFY THAT THE WELDING PROCEDURES SPECIFICATION (WPS) IS AVAILABLE	**PERFORM**	
2.	VERIFY MANUFACTURER CERTIFICATIONS FOR WELDING CONSUMABLES ARE AVAILABLE	**PERFORM**	
3.	VERIFY MATERIAL IDENTIFICATION	OBSERVE	TYPE AND GRADE
4.	WELDER IDENTIFICATION SYSTEM	OBSERVE	THE FABRICATIOR OR ERECTOR, AS APPLICABLE, SHALL MAINTAIN A SYSTEM BY WHICH A WELDER WHO HAS WELDED A JOINT OR MEMBER CAN BE IDENTIFIED. STAMPS, IF USED, SHALL BE THE LOW STRESS TYPE.
5.	FIT-UP OF GROOVE WELDS (INCLUDING JOINT GEOMETRY)	OBSERVE	JOINT PREPARATION; DIMENSIONS (ALIGNMENT, ROOT OPENING, ROOT FACE, BEVEL); CLEANLINESS (CONDITION OF STEEL SURFACES); TACKING (TACK WELD QUALITY AND LOCATION); BACKING TYPE AND FIT (IF APPLICABLE)
6.	CONFIGURATION AND FINISH OF ACCESS HOLES	OBSERVE	
7.	FIT-UP OF FILLET WELDS	OBSERVE	DIMENSIONS (ALIGNMENT, GAPS AT ROOT); CLEANLINESS (CONDITION OF STEEL SURFACES); TACKING (TACK WELD QUALITY AND LOCATION)

2015 STEEL INSPECTION DURING WELDING - VERIFY THE FOLLOWING ARE IN COMPLIANCE - IBC 1705.2.1, AISC 360-10 - TABLE N5.4-2			
TASK		**INSPECTION TYPE**	**DESCRIPTION**
8.	USE OF QUALIFIED WELDERS	OBSERVE	WELDING BY WELDERS, WELDING OPERATORS, AND TACK WELDERS WHO ARE QUALIFIED IN CONFORMANCE WITH...
9.	CONTROL AND HANDLING OF WELDING CONSUMABLES	OBSERVE	PACKAGING; EXPOSURE CONTROL
10.	NO WELDING OVER CRACKED TACK WELDS	OBSERVE	
11.	ENVIRONMENTAL CONDITIONS	OBSERVE	WIND SPEED WITHIN LIMITS; PRECIPITATION AND TEMPERATURE
12.	WELDING PROCEDURES AND SPECIFICATIONS FOLLOWED	OBSERVE	SETTINGS ON WELDING EQUIPMENT; TRAVEL SPEED; SELECTED WELDING MATERIALS; SHIELDING GAS TYPE/FLOW RATE; PREHEAT APPLIED; INTERPASS TEMPERATURE MAINTAINED (MIN/MAX); PROPER POSITION (F, V, H, OH); INTERMIX OF FILLER METALS AVOIDED
13.	WELDING TECHNIQUES	OBSERVE	INTERPASS AND FINAL CLEANING; EACH PASS WITHIN PROFILE LIMITATIONS; EACH PASS MEETS QUALITY REQUIREMENTS

2015 STEEL INSPECTION AFTER WELDING - VERIFY THE FOLLOWING ARE IN COMPLIANCE - IBC 1705.2.1, AISC 360-10 - TABLE N5.4-3			
TASK		**INSPECTION TYPE**	**DESCRIPTION**
14.	WELDS CLEANED	OBSERVE	
15.	SIZE, LENGTH, AND LOCATION OF ALL WELDS	**PERFORM**	SIZE, LENGTH, AND LOCATION OF ALL WELDS CONFORM TO THE REQUIREMENTS OF THE DETAIL DRAWINGS.
16.	WELDS MEET VISUAL ACCEPTANCE CRITERIA	**PERFORM AND DOCUMENT**	CRACK PROHIBITION; WELD/BASE-METAL FUSION; CRATER CROSS SECTION; WELD PROFILES; WELD SIZE; UNDERCUT; POROSITY
17.	ARC STRIKES	**PERFORM**	
18.	K-AREA	**PERFORM**	WHEN WELDING OF DOUBLER PLATES, CONTINUITY PLATES OR STIFFENERS HAS BEEN PERFORMED IN THE K-AREA, VISUALLY INSPECT THE WEB K-AREA FOR CRACKS WITHIN 3 INCHES (75 MM) OF THE WELD
19.	BACKING REMOVED, WELD TABS REMOVED (IF REQUIRED) AND FINISHED, AND FILLET WELDS ADDED WHERE REQUIRED	**PERFORM**	
20.	REPAIR ACTIVITIES	**PERFORM AND DOCUMENT**	
21.	DOCUMENT ACCEPTANCE OR REJECTION OF WELDED JOINT OR MEMBER	**PERFORM**	

NOTES:

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MARK	DATE	DESCRIPTION
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BY

CITY OF KALAMAZOO, MICHIGAN
WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

SPECIAL INSPECTIONS

PROJ:	200-19743-19004
DESN:	AJF
DRWN:	KDK
CHKD:	TJM

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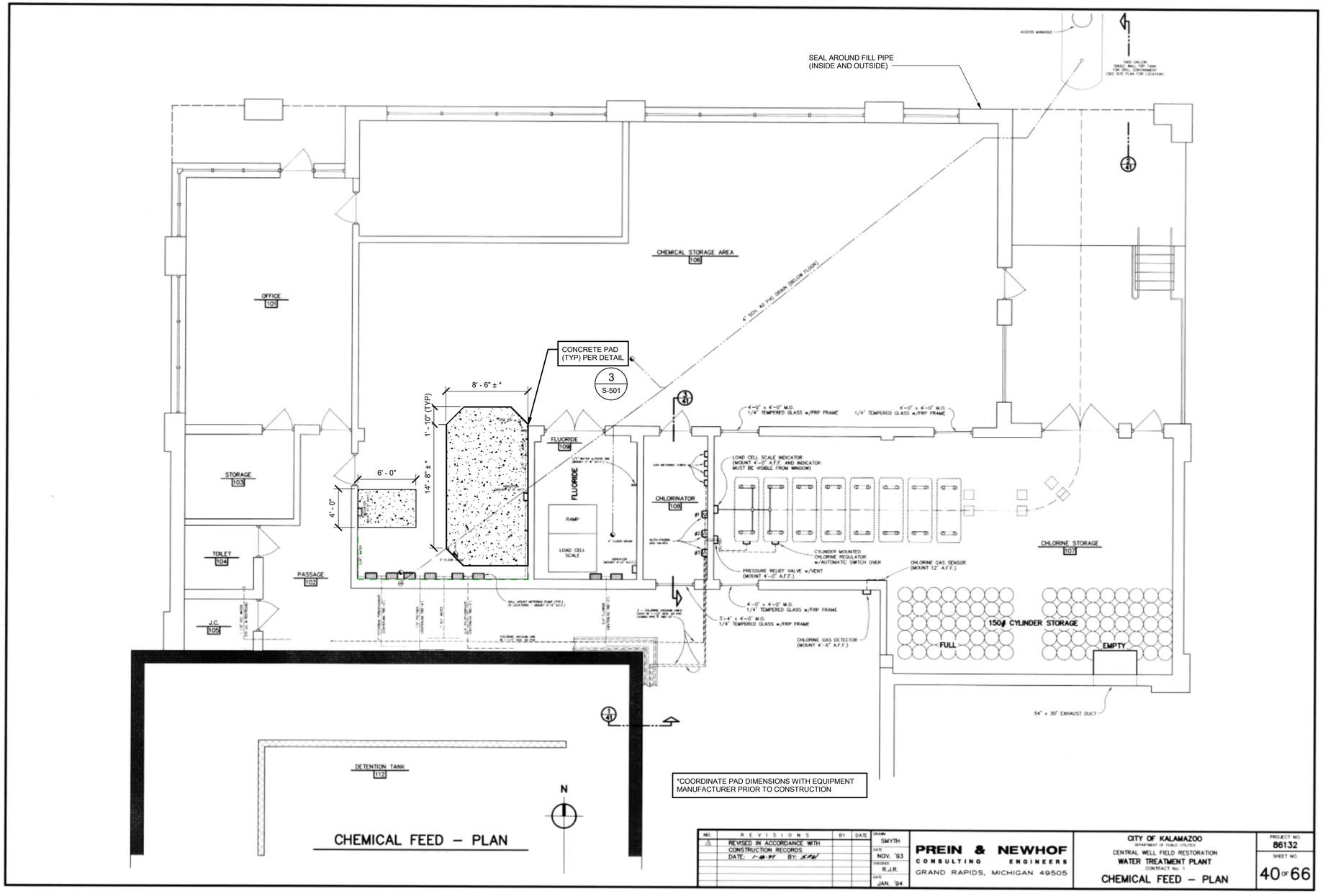

*COORDINATE PAD DIMENSIONS WITH EQUIPMENT MANUFACTURER PRIOR TO CONSTRUCTION

NO.	REVISIONS	BY	DATE
1	REVISED IN ACCORDANCE WITH CONSTRUCTION RECORDS DATE: 7-8-97 BY: KDK		

DRAWN: SMYTH
DATE: NOV. '93
CHECKED: R.J.R.
DATE: JAN. '94

PREIN & NEWHOF
CONSULTING ENGINEERS
GRAND RAPIDS, MICHIGAN 49505

CITY OF KALAMAZOO
DEPARTMENT OF PUBLIC UTILITIES
CENTRAL WELL FIELD RESTORATION
WATER TREATMENT PLANT
CONTRACT No. 1
CHEMICAL FEED – PLAN

PROJECT NO. 86132
SHEET NO. 40 OF 66

PLAN NOTES:

1. SEE SHEETS S-001 THROUGH S-004 FOR GENERAL NOTES AND SPECIAL INSPECTION REQUIREMENTS.
2. COORDINATE LOCATIONS OF ALL EQUIPMENT PADS WITH PROCESS DRAWINGS.
3. ALL EXPOSED CONCRETE EDGES TO BE CHAMFERED, PER DETAIL. 1 / S-501

LEGEND:

- DENOTES EQUIPMENT PAD

PUMP STATION NO. 1 MODIFICATION PLAN

SCALE: NTS

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CITY OF KALAMAZOO, MICHIGAN
WATER SYSTEM CORROSION CONTROL IMPROVEMENTS
PUMP STATION NO. 1
MODIFICATION PLAN

PROJ:	200-19743-19004
DESN:	AJF
DRWN:	KDK
CHKD:	TJM

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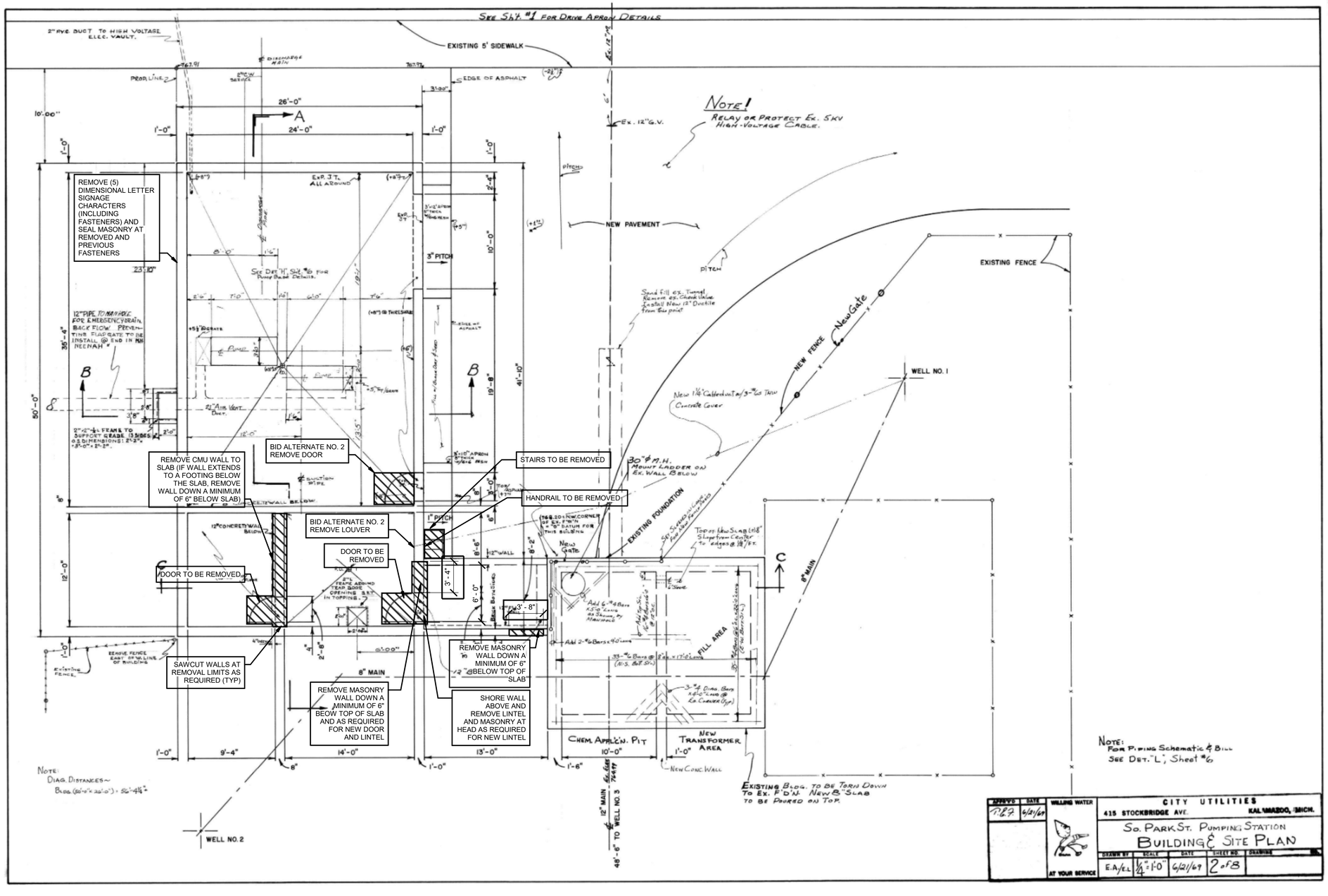

PUMP STATION NO. 3 DEMO PLAN

SCALE: NTS

DEMO PLAN NOTES:

1. SEE SHEETS S-001 THROUGH S-004 FOR GENERAL NOTES AND SPECIAL INSPECTION REQUIREMENTS.

LEGEND:

▨ - DENOTES ITEMS TO BE REMOVED

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CITY OF KALAMAZOO, MICHIGAN
WATER SYSTEM CORROSION CONTROL IMPROVEMENTS
PUMP STATION NO. 3
DEMO PLAN

PROJ:	200-19743-19004
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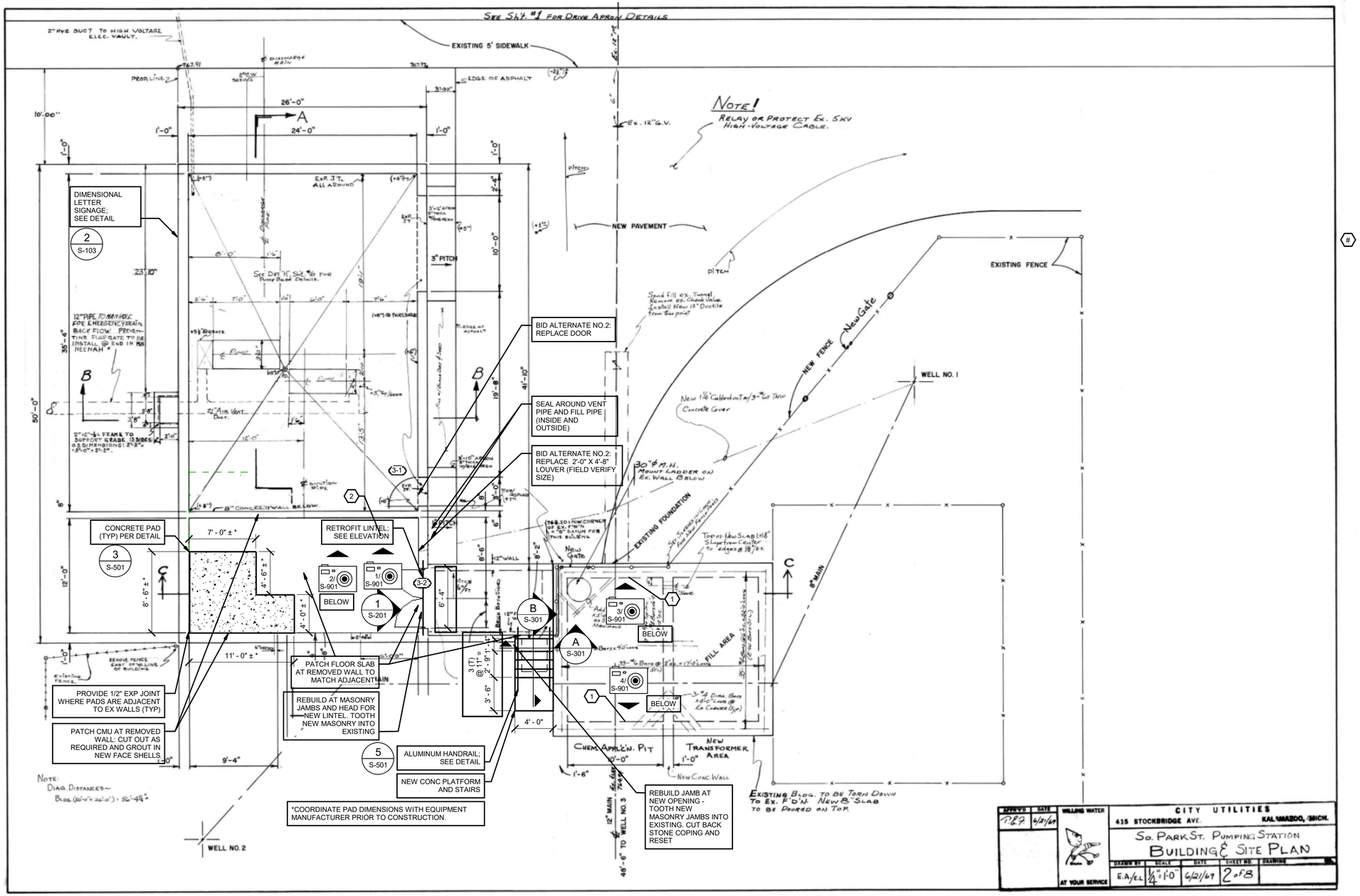
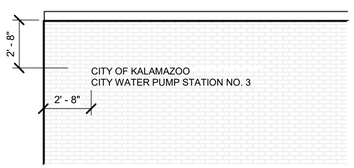


PUMP STATION NO. 3 MODIFICATION PLAN

SCALE: NTS



DIMENSIONAL LETTER SIGNAGE

2 S-103 SCALE: 1/4" = 1'-0"

PLAN NOTES:

1. SEE SHEETS S-001 THROUGH S-004 FOR GENERAL NOTES AND SPECIAL INSPECTION REQUIREMENTS.
2. COORDINATE LOCATIONS OF ALL EQUIPMENT PADS WITH PROCESS DRAWINGS.
3. ALL EXPOSED CONCRETE EDGES TO BE CHAMFERED PER DETAIL. 1 S-501

(#) KEY NOTE - REPAIR TYPES

1. CONCRETE CRACK REPAIR. (SEE DETAIL 1/S-502)
2. CONCRETE SHALLOW SPALL REPAIR. (SEE DETAIL 2/S-502)
3. CONCRETE DEEP SPALL REPAIR. (SEE DETAIL 3/S-502)

LEGEND:

- DENOTES EQUIPMENT PAD

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MARK	DATE	DESCRIPTION
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CITY OF KALAMAZOO, MICHIGAN
WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

PUMP STATION NO. 3 MODIFICATION PLAN

PROJ:	200-19743-19004
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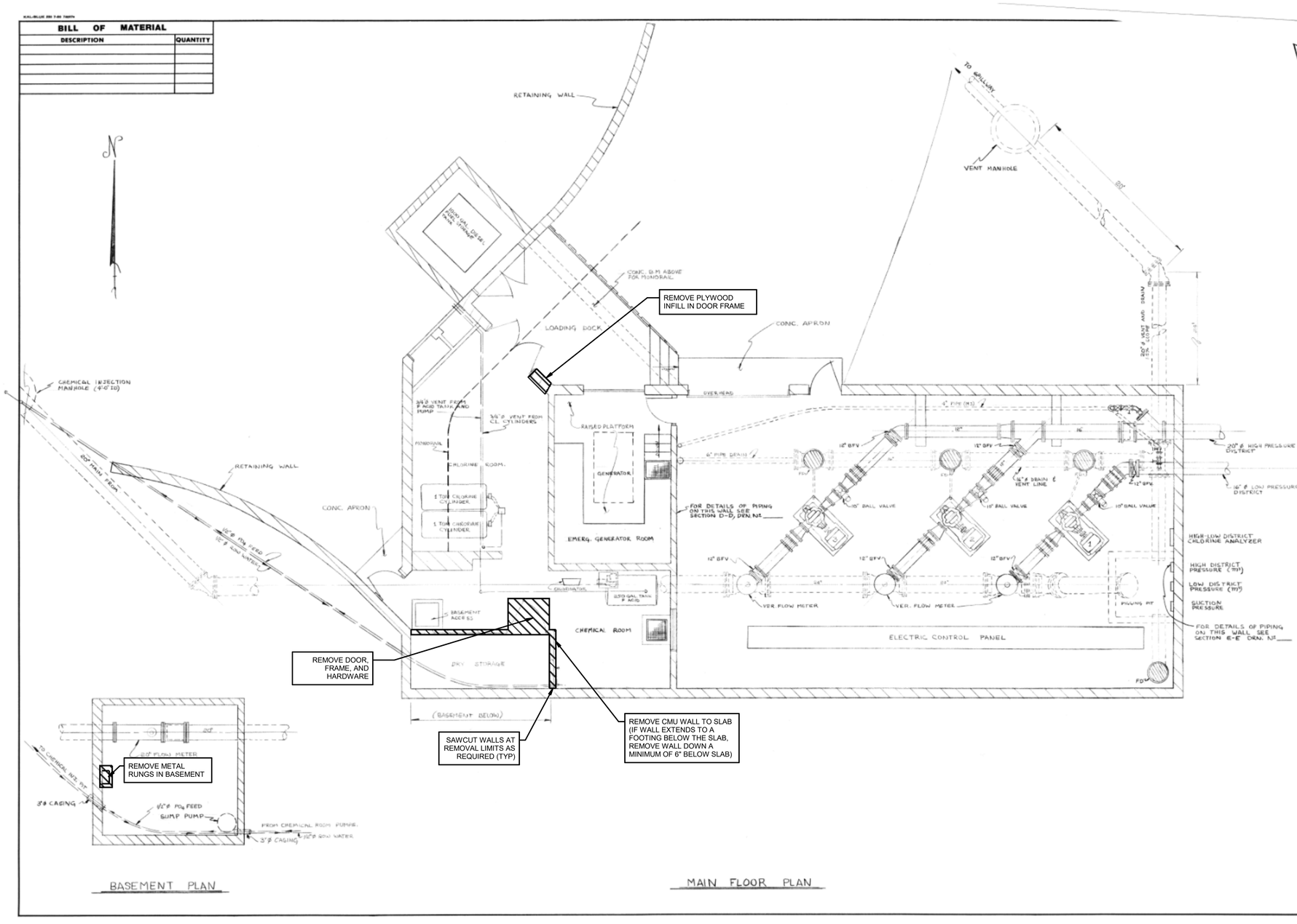
BILL OF MATERIAL	
DESCRIPTION	QUANTITY



DEMO PLAN NOTES:

1. SEE SHEETS S-001 THROUGH S-004 FOR GENERAL NOTES AND SPECIAL INSPECTION REQUIREMENTS.

LEGEND:

▨ - DENOTES ITEMS TO BE REMOVED

PUMP STATION NO. 4 DEMO PLAN

SCALE: NTS

DEPARTMENT OF PUBLIC UTILITIES
415 STOCKBRIDGE AVE, KALAMAZOO MI 49001 PH.(616) 385-8189

FILE NO. ST N°4
SHEET 1 OF 1

REVISION	DATE

SCALE: 1/4" = 1'-0" DATE
DRAWN BY: AJF 11-98
APPROVED BY:
W.O. NO.

STATION N° 4
MAIN FLOOR PIPING PLAN

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BY	MARK	DATE	DESCRIPTION
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CITY OF KALAMAZOO, MICHIGAN
WATER SYSTEM CORROSION CONTROL IMPROVEMENTS
PUMP STATION NO. 4
DEMO PLAN

PROJ:	200-19743-19004
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DRWN:	KDK
CHKD:	TJM

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BILL OF MATERIAL	
DESCRIPTION	QUANTITY

RETAINING WALL

SEAL AROUND FILL PIPE (INSIDE AND OUTSIDE)

INFILL DOOR FRAME WITH (APPROX. 2'-0" X 10'-0") INSULATED METAL PANEL, FIELD VERIFY PANEL SIZE AND PROVIDE HOLE WITH GROMMET FOR FILL PIPE. COORDINATE HOLE OPENING LOCATION PRIOR TO FABRICATION.

CONC. SLAB ABOVE FOR MANHOLE

LOADING DOCK

CONC. APRON

CHEMICAL INJECTION MANHOLE (4'-0" ID)

3/4" Ø VENT FROM P. ACID TANK AND PUMP

3/4" Ø VENT FROM CL. CYLINDERS

MINIRAIL

CHLORINE ROOM

1 TON CHLORINE CYLINDER

1 TON CHLORINE CYLINDER

RETAINING WALL

CONC. APRON

PATCH CMU AT REMOVED WALL: CUT OUT AS REQUIRED AND GROUT IN NEW FACE SHELLS

EMERG. GENERATOR ROOM

GENERATOR

RAISED PLATFORM

OVERHEAD

FOR DETAILS OF PIPING ON THIS WALL SEE SECTION D-D, DRN. NO.___

6" PIPE DRAIN

4" PIPE (TYP.)

12" BFV

10" BALL VALVE

16" Ø DRAIN & VENT LINE

20" Ø HIGH PRESSURE DISTRICT

16" Ø LOW PRESSURE DISTRICT

HIGH-LOW DISTRICT CHLORINE ANALYZER

HIGH DISTRICT PRESSURE (TYP.)

LOW DISTRICT PRESSURE (TYP.)

SUCTION PRESSURE

VER. FLOW METER

PIPING PIT

FOR DETAILS OF PIPING ON THIS WALL SEE SECTION E-E DRN. NO.___

ELECTRIC CONTROL PANEL

FD

6' - 0" ± *

4' - 0" ± *

3' - 6" ± *

6' - 0" ± *

2' - 0" ± *

4' - 0" ± *

(BASEMENT BELOW)

PLASTIC MANHOLE RUNGS PER DETAIL OR PAINTED STEEL LADDER PER DETAIL

6 / S-502

5 / S-502

CONCRETE PAD (TYP) PER DETAIL

3 / S-501

PROVIDE 1/2" EXP JOINT WHERE PADS ARE ADJACENT TO EX WALLS (TYP)

PATCH FLOOR SLAB AT REMOVED WALL TO MATCH ADJACENT

SEAL AROUND VENT PIPE (INSIDE AND OUTSIDE)

*COORDINATE PAD DIMENSIONS WITH EQUIPMENT MANUFACTURER PRIOR TO CONSTRUCTION.

20" FLOW METER

TO CHEMICAL INJ. PT.

3/4" CASING

5/ S-901

SUMP PUMP

FROM CHEMICAL ROOM PUMPS

3/4" CASING

12" Ø RAW WATER

2

BASEMENT PLAN

MAIN FLOOR PLAN

PUMP STATION NO. 4 MODIFICATION PLAN

SCALE: NTS

PLAN NOTES:

1. SEE SHEETS S-001 THROUGH S-004 FOR GENERAL NOTES AND SPECIAL INSPECTION REQUIREMENTS.
2. COORDINATE LOCATIONS OF ALL EQUIPMENT PADS WITH PROCESS DRAWINGS.
3. ALL EXPOSED CONCRETE EDGES TO BE CHAMFERED, PER DETAIL. 1 / S-501

(#) KEY NOTE - REPAIR TYPES

1. CONCRETE CRACK REPAIR. (SEE DETAIL 1/S-502)
2. CONCRETE SHALLOW SPALL REPAIR. (SEE DETAIL 2/S-502)
3. CONCRETE DEEP SPALL REPAIR. (SEE DETAIL 3/S-502)

LEGEND:

- DENOTES EQUIPMENT PAD

MISS DIG 811 AT YOUR SERVICE

FILE NO. STN4 | SHEET 1 OF 1

REVISION	DATE

SCALE: 1/4" = 1'-0" | DATE 11-9-82

DRAWN BY: AF | APPROVED BY: | W.O. NO.

DEPARTMENT OF PUBLIC UTILITIES
415 STOCKBRIDGE AVE. KALAMAZOO MI. 49001 PH.(616) 385-8149

STATION Nº 4
MAIN FLOOR PIPING PLAN

TETRA TECH
www.tetratech.com
1136 OAK VALLEY DRIVE, SUITE 100
ANN ARBOR, MI 48108
TEL: (734) 665-6000 FAX: (734) 213-3003

MARK	DATE	DESCRIPTION
	11/28/23	ISSUED FOR BID

BY

CITY OF KALAMAZOO, MICHIGAN
WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

PUMP STATION NO. 4
MODIFICATION PLAN

PROJ:	200-19743-19004
DESN:	AJF
DRWN:	KDK
CHKD:	TJM

S-105

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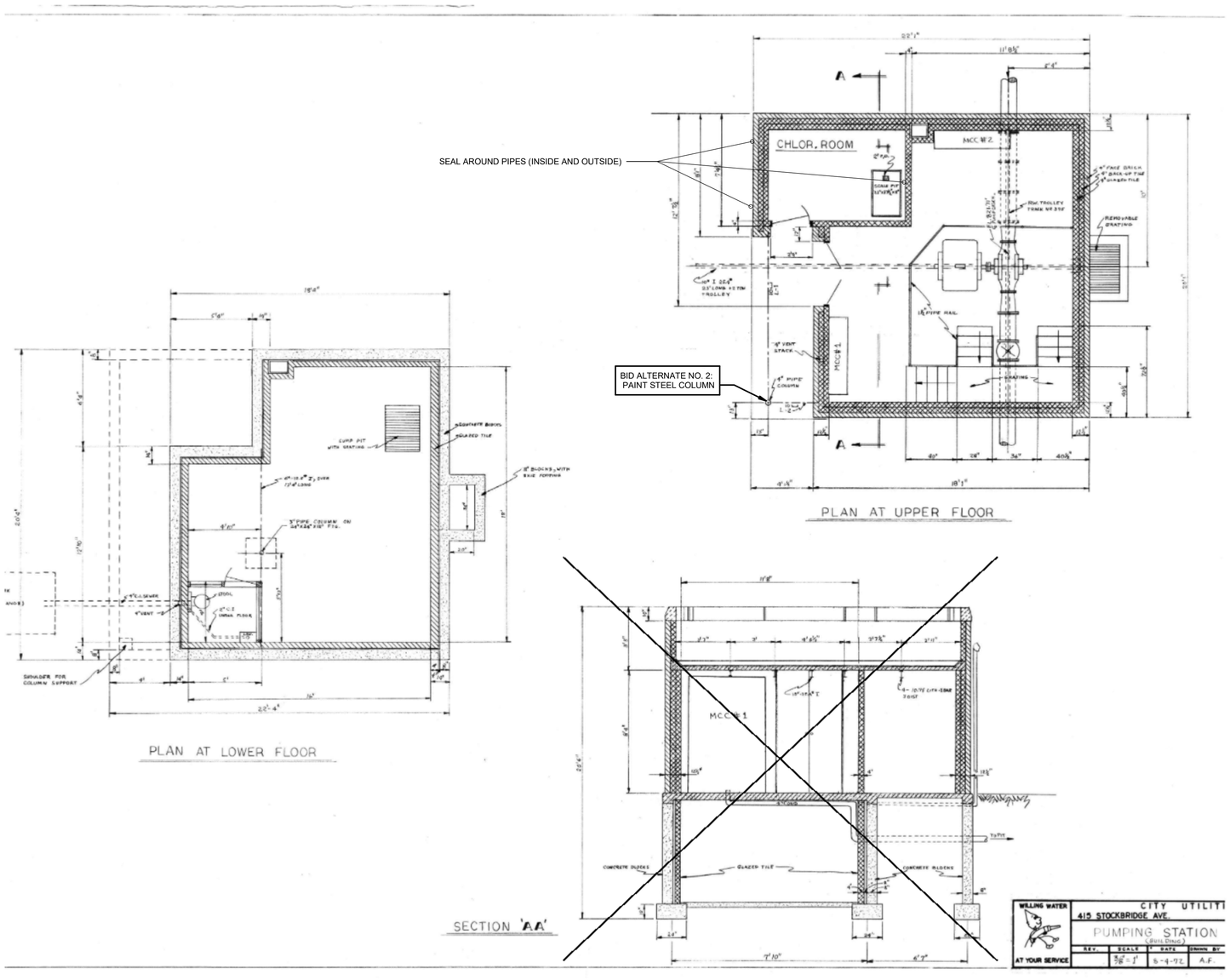
Bar measures 1 inch, otherwise drawing is not to scale



PLAN NOTES:

1. SEE SHEETS S-001 THROUGH S-004 FOR GENERAL NOTES AND SPECIAL INSPECTION REQUIREMENTS.

PUMP STATION NO. 8 MODIFICATION PLAN

SCALE: NTS

TETRA TECH
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ANN ARBOR, MI 48108
TEL: (734) 665-6000 FAX: (734) 213-3003

MARK	DATE	DESCRIPTION	BY
	11/29/23	ISSUED FOR BID	

CITY OF KALAMAZOO, MICHIGAN

WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

PUMP STATION NO. 8
MODIFICATION PLAN

PROJ:	200-19743-19004
DESN:	AJF
DRWN:	KDK
CHKD:	TJM

S-106

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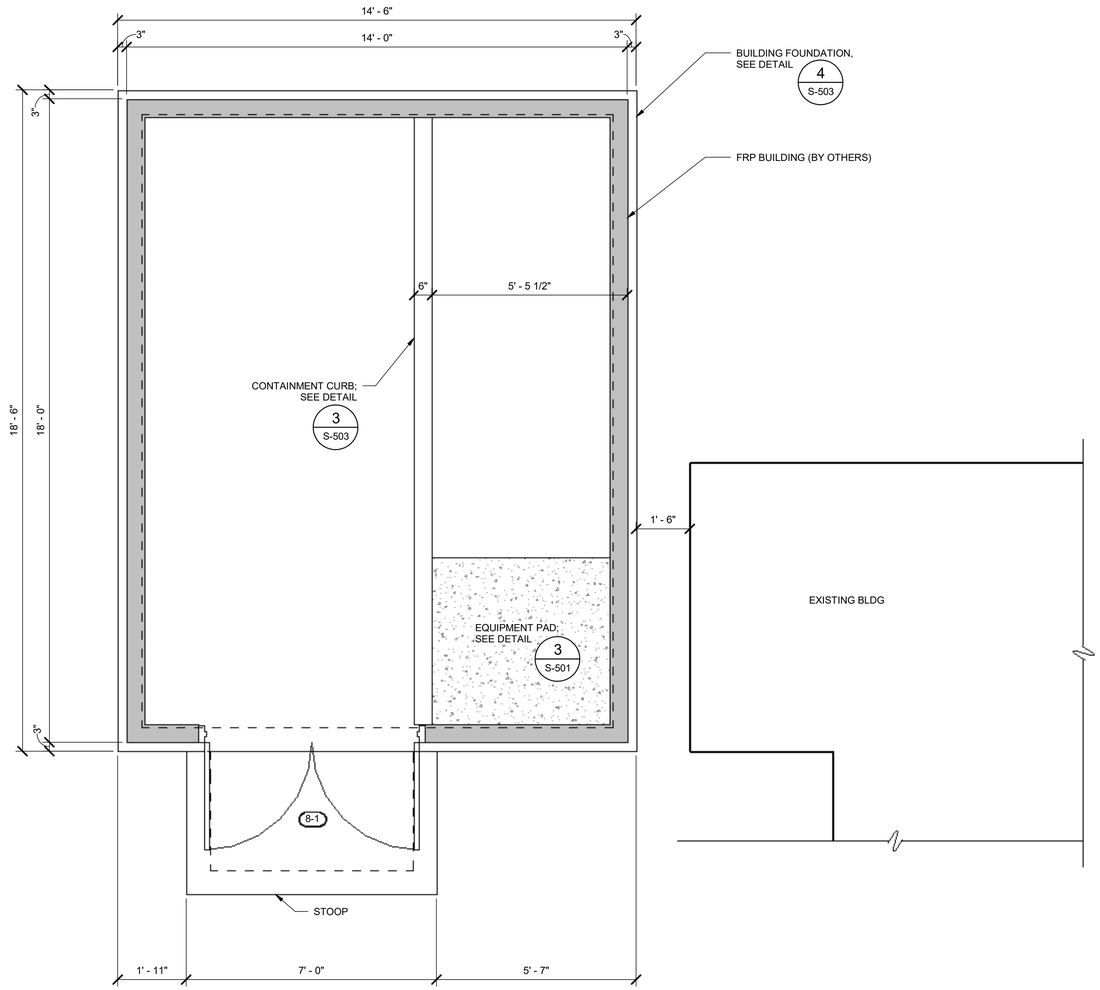
Bar measures 1 inch, otherwise drawing is not to scale

PLAN NOTES:

1. SEE SHEETS S-001 THROUGH S-004 FOR GENERAL NOTES AND SPECIAL INSPECTION REQUIREMENTS.
2. COORDINATE LOCATIONS OF ALL EQUIPMENT PADS WITH PROCESS DRAWINGS.
3. ALL EXPOSED CONCRETE EDGES TO BE CHAMFERED, PER DETAIL. (1 / S-501)

LEGEND:

- DENOTES EQUIPMENT PAD



PUMP STATION NO. 8 PROPOSED PLAN

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

TETRA TECH
www.tetratech.com
1136 OAK VALLEY DRIVE, SUITE 100
ANN ARBOR, MI 48108
TEL: (734) 665-6000 FAX: (734) 213-3003

MARK	DATE	DESCRIPTION	BY
	11/29/23	ISSUED FOR BID	

CITY OF KALAMAZOO, MICHIGAN

WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

PUMP STATION NO. 8
PROPOSED PLAN

PROJ:	200-19743-19004
DESN:	AJF
DRWN:	GJZ
CHKD:	TJM

S-107

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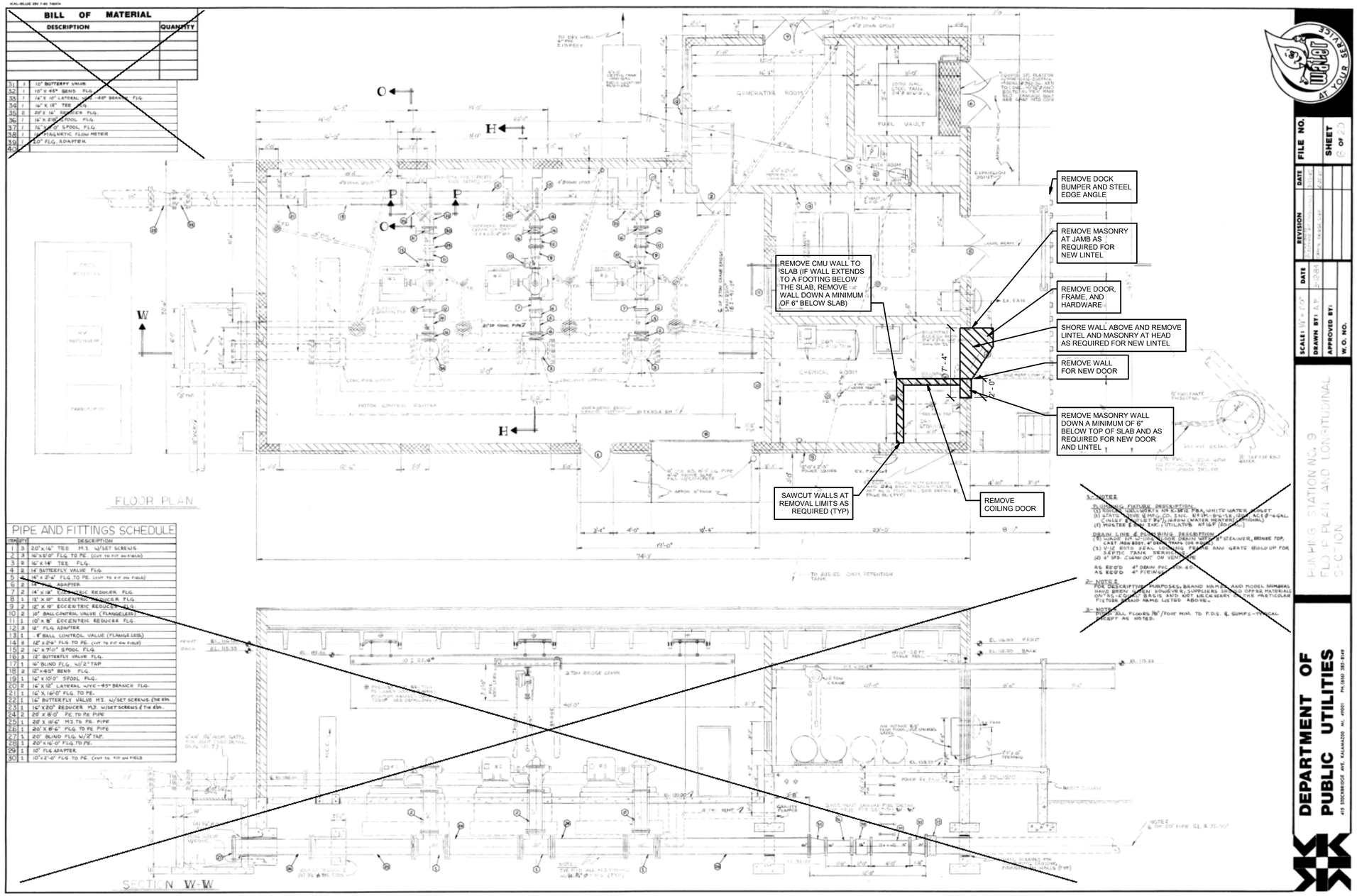
Bar measures 1 inch, otherwise drawing is not to scale



DEMO PLAN NOTES:

1. SEE SHEETS S-001 THROUGH S-004 FOR GENERAL NOTES AND SPECIAL INSPECTION REQUIREMENTS.

LEGEND:

▨ - DENOTES ITEMS TO BE REMOVED

DEPARTMENT OF PUBLIC UTILITIES
415 STOCKBRIDGE AVE. KALAMAZOO MI. 49001 PH.(616) 387-8949

FILE NO. SHEET OF

REVISION	DATE

SCALE: 1/4"=1'-0" DATE
DRAWN BY: AJF 2-8-23
APPROVED BY:
W.O. NO.

MARK	DATE	DESCRIPTION
	11/29/23	ISSUED FOR BID

BY

CITY OF KALAMAZOO, MICHIGAN
WATER SYSTEM CORROSION CONTROL IMPROVEMENTS
PUMP STATION NO. 9
DEMO PLAN

PROJ:	200-19743-19004
DESN:	AJF
DRWN:	KDK
CHKD:	TJM

S-108

TETRA TECH
www.tetratech.com
1136 OAK VALLEY DRIVE, SUITE 100
ANN ARBOR, MI 48108
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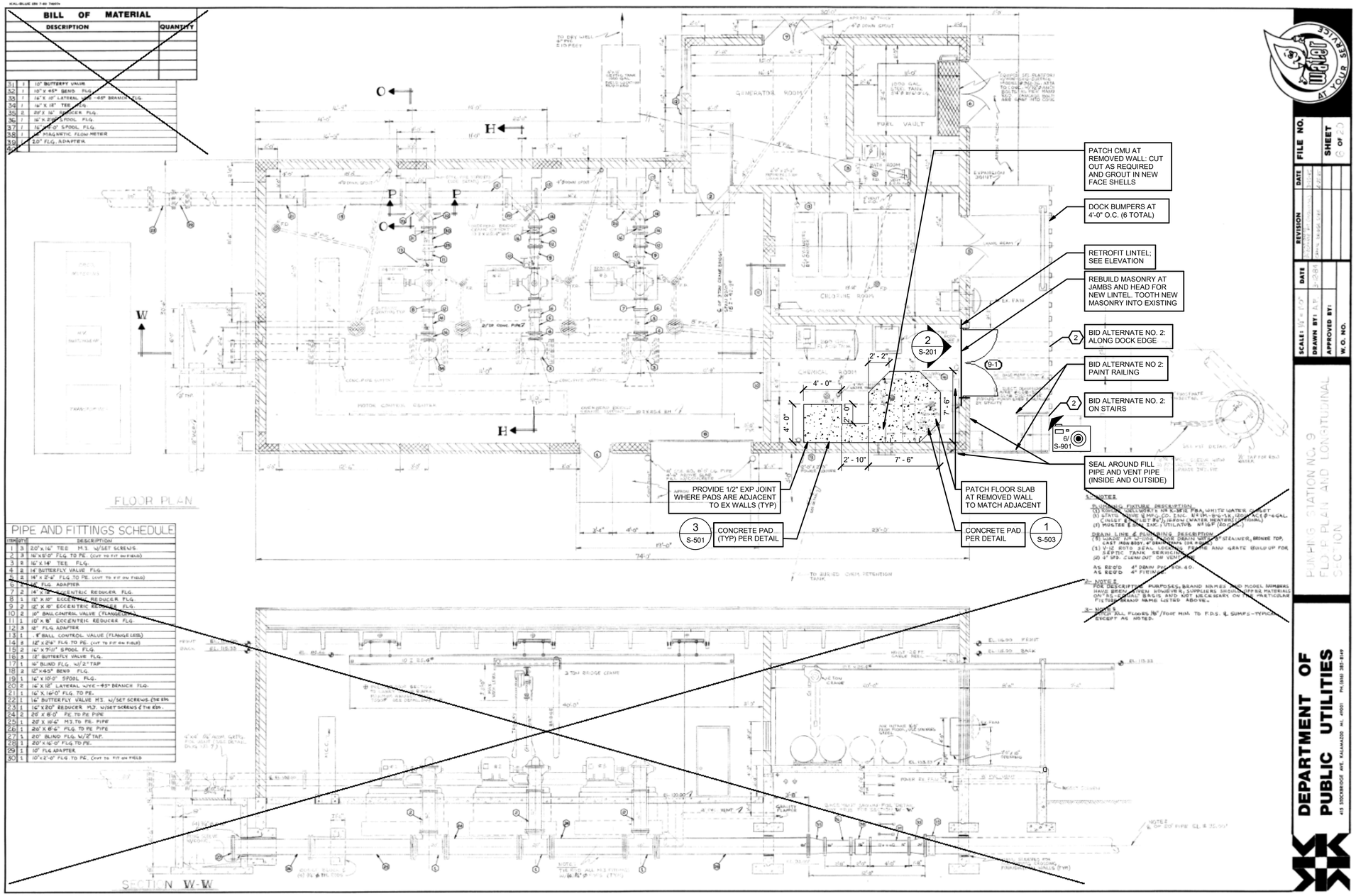
Bar measures 1 inch, otherwise drawing is not to scale


BILL OF MATERIAL
DESCRIPTION
QUANTITY
51 1 10" BUTTERFLY VALVE
52 1 10" x 45° BEND FLG.
53 1 16" X 10" LATERAL WYE -45° BRANCH FLG.
54 1 14" X 14" TEE FLG.
55 2 24" X 16" REDUCER FLG.
56 1 16" X 2'-0" SPOOL FLG.
57 1 12" X 10'-0" SPOOL FLG.
58 1 12" MAGNETIC FLOW METER
59 1 12" FLG. ADAPTER
60
FLOOR PLAN
PIPE AND FITTINGS SCHEDULE
ITEM QTY DESCRIPTION
1 3 20"x14" TEE M.J. w/SET SCREWS.
2 3 16"x5'-0" FLG. TO PE. (CUT TO FIT ON FIELD)
3 2 16" X 14" TEE FLG.
4 2 14" BUTTERFLY VALVE FLG.
5 2 14" x 2'-6" FLG. TO PE. (CUT TO FIT ON FIELD)
6 3 14" FLG. ADAPTER
7 2 14" X 8" ECCENTRIC REDUCER FLG.
8 1 16" X 10" ECCENTRIC REDUCER FLG.
9 2 12" X 10" ECCENTRIC REDUCER FLG.
10 2 10" BALL CONTROL VALVE (FLANGELESS)
11 1 10" X 8" ECCENTRIC REDUCER FLG.
12 3 12" FLG. ADAPTER
13 1 8" BALL CONTROL VALVE (FLANGELESS)
14 2 12" x 2'-6" FLG. TO PE. (CUT TO FIT ON FIELD)
15 2 16" x 7'-0" SPOOL FLG.
16 3 12" BUTTERFLY VALVE FLG.
17 1 16" BLIND FLG. w/ 2" TAP
18 2 12"x45° BEND FLG.
19 1 16" x 10'-0" SPOOL FLG.
20 2 16" X 12" LATERAL WYE -45° BRANCH FLG.
21 1 16" X 16'-0" FLG. TO PE.
22 1 16" BUTTERFLY VALVE M.J. w/SET SCREWS. (THE KEN.
23 1 16" x 20" REDUCER M.J. w/SET SCREWS & THE KEN.
24 2 20" x 8'-0" PE TO PE PIPE
25 1 20" X 10'-6" M.J. TO PE. PIPE
26 1 20" X 8'-6" FLG. TO PE PIPE
27 1 20" BLIND FLG. w/ 2" TAP.
28 1 20" X 16'-0" FLG TO PE.
29 1 10" FLG ADAPTER
30 1 10"x2'-0" FLG. TO PE. (CUT TO FIT ON FIELD
SECTION W-W
PATCH CMU AT REMOVED WALL: CUT OUT AS REQUIRED AND GROUT IN NEW FACE SHELLS
DOCK BUMPERS AT 4'-0" O.C. (6 TOTAL)
RETROFIT LINTEL; SEE ELEVATION
REBUILD MASONRY AT JAMBS AND HEAD FOR NEW LINTEL. TOOTH NEW MASONRY INTO EXISTING
BID ALTERNATE NO. 2: ALONG DOCK EDGE
BID ALTERNATE NO 2: PAINT RAILING
BID ALTERNATE NO. 2: ON STAIRS
SEAL AROUND FILL PIPE AND VENT PIPE (INSIDE AND OUTSIDE)
PATCH FLOOR SLAB AT REMOVED WALL TO MATCH ADJACENT
CONCRETE PAD PER DETAIL
PROVIDE 1/2" EXP JOINT WHERE PADS ARE ADJACENT TO EX WALLS (TYP)
CONCRETE PAD (TYP) PER DETAIL
4' - 0"
2' - 2"
2' - 10"
7' - 6"
7' - 6"
4' - 0"
2 S-201
9-1
6/ S-901
1 S-503
3 S-501
PLUMBING FIXTURE DESCRIPTION
DRAIN LINE & PLUMBING DESCRIPTION
NOTES
AS REQ'D 4" DRAIN PVC SCH 40
AS REQ'D 4" PIPING
NOTE 2
NOTE 3
TO BURIED CHEM. RETENTION TANK
EL. 116.90 FRONT
EL. 116.90 BACK
EL. 115.33 FRONT
EL. 115.33 BACK
125 TON CRANE
3 TON BRIDGE CRANE
EL. 135.67
EL. 130.92
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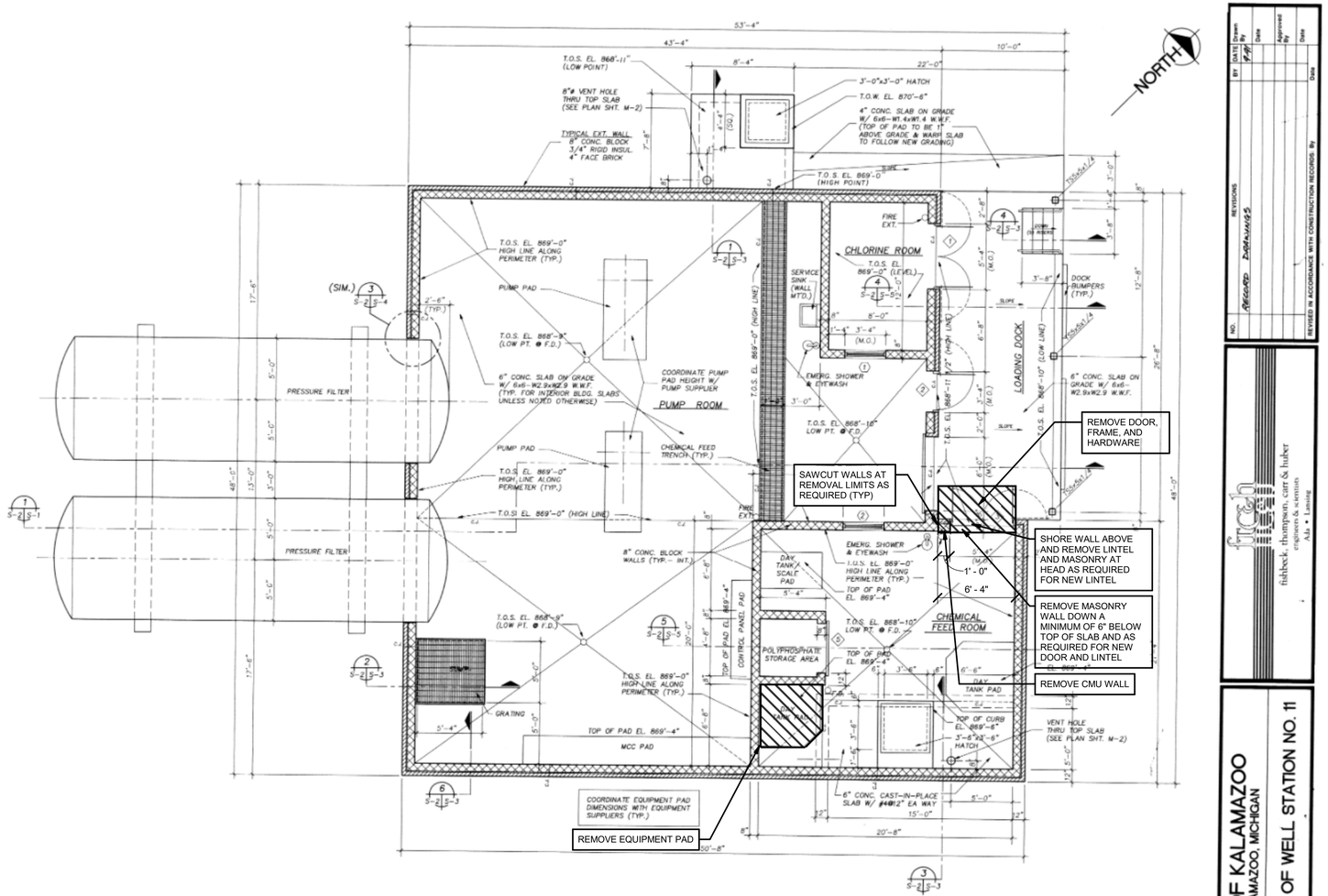
DEMO PLAN NOTES:

1. SEE SHEETS S-001 THROUGH S-004 FOR GENERAL NOTES AND SPECIAL INSPECTION REQUIREMENTS.

LEGEND:

- DENOTES EQUIPMENT PAD



FILTER BUILDING FLOOR PLAN
SCALE : 1/4" = 1'-0"

PUMP STATION NO. 11 DEMO PLAN
SCALE: NTS

NO.	REVISIONS	BY	DATE
	RECORD DRAWINGS	AJF	

REVISED IN ACCORDANCE WITH CONSTRUCTION RECORDS By Date

Drawn By AJF Date
Approved By Date

fishbeck, thompson, carr & huber
engineers & scientists
Ada • Lansing

CITY OF KALAMAZOO
KALAMAZOO, MICHIGAN
REACTIVATION OF WELL STATION NO. 11

PROJECT NO. 87013A
SHEET NO. S-2

TETRA TECH
www.tetratech.com
1136 OAK VALLEY DRIVE, SUITE 100
ANN ARBOR, MI 48108
TEL: (734) 665-6000 FAX: (734) 213-3003

MARK	DATE	DESCRIPTION
	11/28/23	ISSUED FOR BID

BY

CITY OF KALAMAZOO, MICHIGAN
WATER SYSTEM CORROSION CONTROL IMPROVEMENTS
PUMP STATION NO. 11
DEMO PLAN

PROJ:	200-19743-19004
DESN:	AJF
DRWN:	KDK
CHKD:	TJM

S-110

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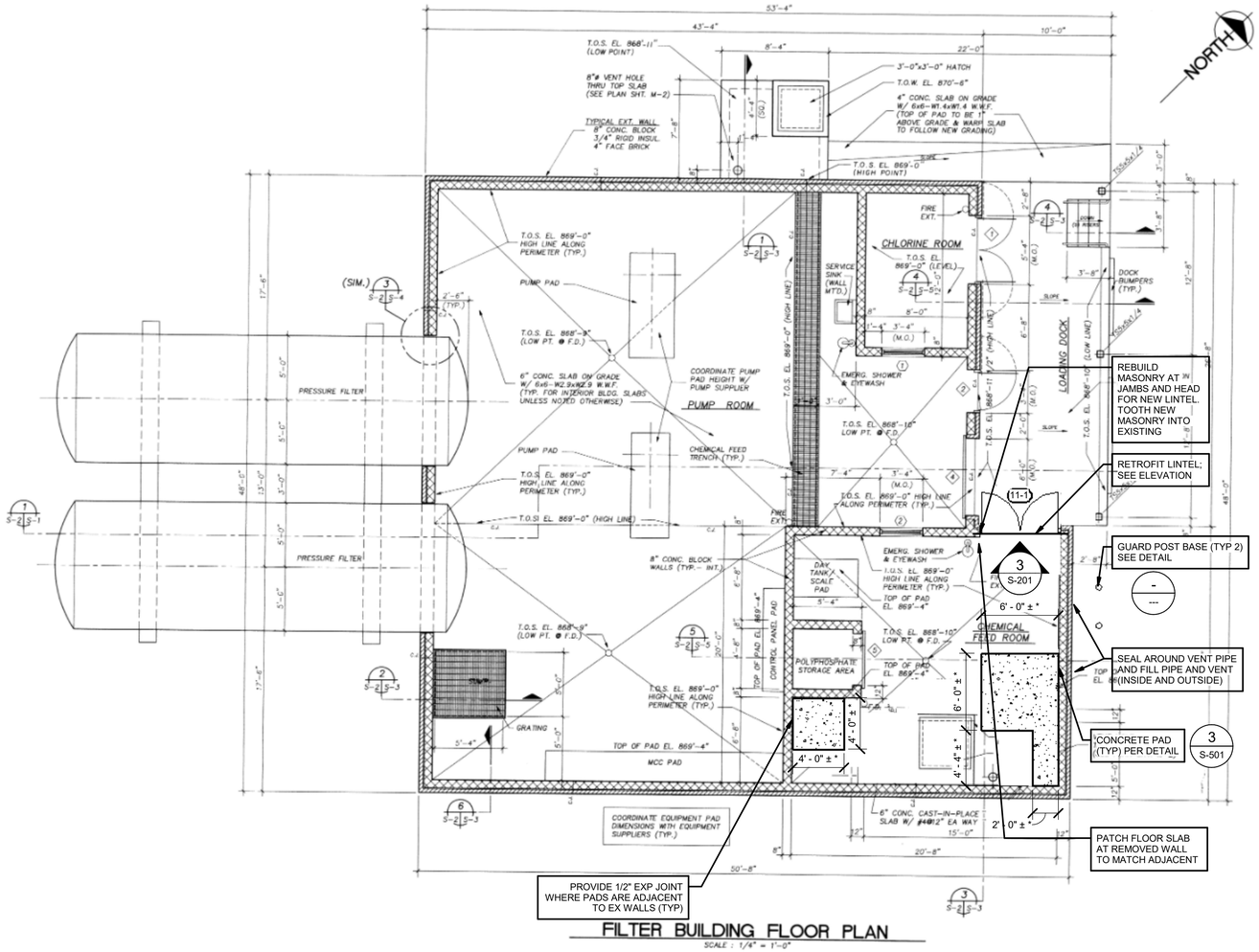
Bar measures 1 inch, otherwise drawing is not to scale



FILTER BUILDING FLOOR PLAN

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

*COORDINATE PAD DIMENSIONS WITH EQUIPMENT MANUFACTURER PRIOR TO CONSTRUCTION.

PLAN NOTES:

1. SEE SHEETS S-001 THROUGH S-004 FOR GENERAL NOTES AND SPECIAL INSPECTION REQUIREMENTS.
2. COORDINATE LOCATIONS OF ALL EQUIPMENT PADS WITH PROCESS DRAWINGS.
3. ALL EXPOSED CONCRETE EDGES TO BE CHAMFERED, PER DETAIL. (1 / S-501)

LEGEND:

- DENOTES EQUIPMENT PAD

PUMP STATION NO. 11 MODIFICATION PLAN

SCALE: NTS

REVISIONS

NO.	DATE	Drawn By	Approved By	Date
REGARD DRAWINGS				

REVISED IN ACCORDANCE WITH CONSTRUCTION RECORDS By Date

fishbeck, thompson, carr & huber engineers & scientists Ada • Lansing

CITY OF KALAMAZOO
KALAMAZOO, MICHIGAN
REACTIVATION OF WELL STATION NO. 11

PROJECT NO. 87013A
SHEET NO. S-2

TETRA TECH
www.tetratech.com
1136 OAK VALLEY DRIVE, SUITE 100
ANN ARBOR, MI 48108
TEL: (734) 665-6000 FAX: (734) 213-3003

MARK	DATE	DESCRIPTION
	11/28/23	ISSUED FOR BID

CITY OF KALAMAZOO, MICHIGAN
WATER SYSTEM CORROSION CONTROL IMPROVEMENTS
PUMP STATION NO. 11 MODIFICATION PLAN

PROJ:	200-19743-19004
DESN:	AJF
DRWN:	KDK
CHKD:	TJM

S-111

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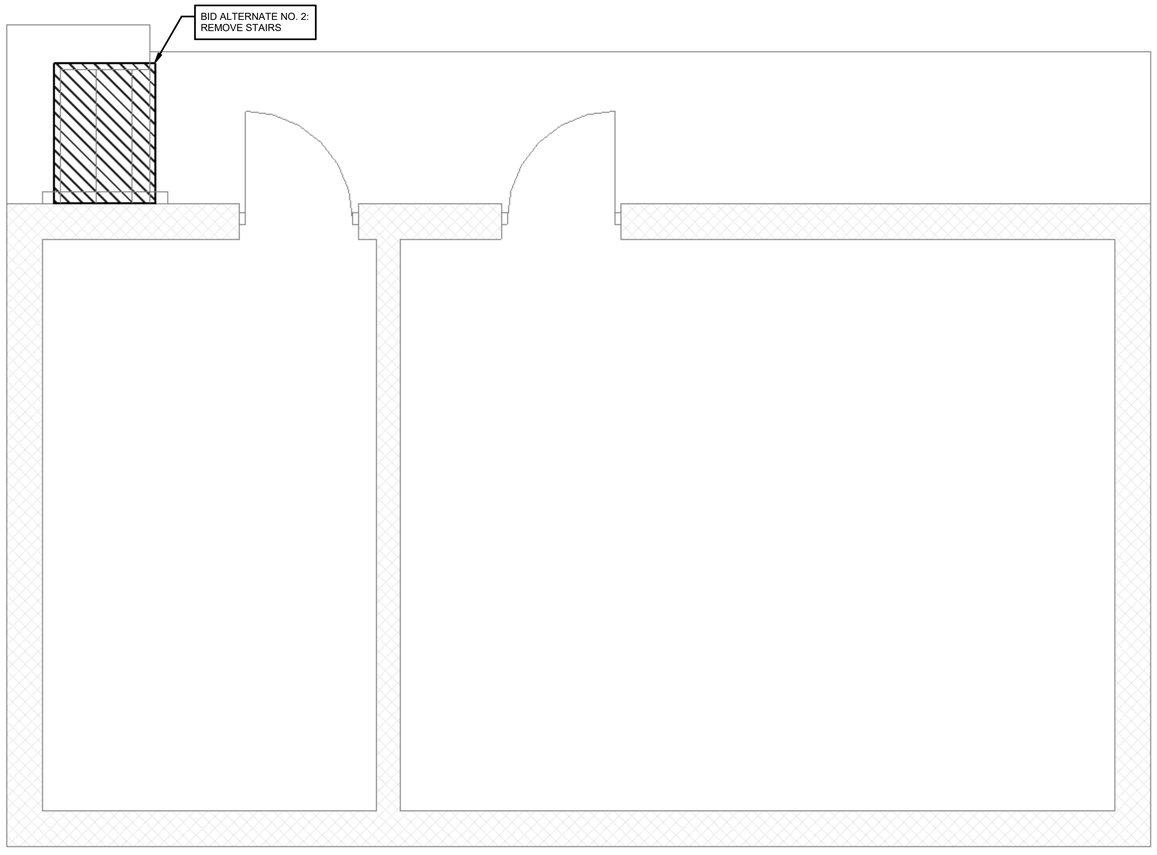
Bar measures 1 inch, otherwise drawing is not to scale



PUMP STATION NO. 12 DEMO PLAN

SCALE: NTS

DEMO PLAN NOTES:

1. SEE SHEETS S-001 THROUGH S-004 FOR GENERAL NOTES AND SPECIAL INSPECTION REQUIREMENTS.

LEGEND:

- DENOTES ITEMS TO BE REMOVED

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MARK	DATE	DESCRIPTION
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CITY OF KALAMAZOO, MICHIGAN

WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

PUMP STATION NO. 12
DEMO PLAN

PROJ:	200-19743-19004
DESN:	AJF
DRWN:	KDK
CHKD:	TJM

S-112

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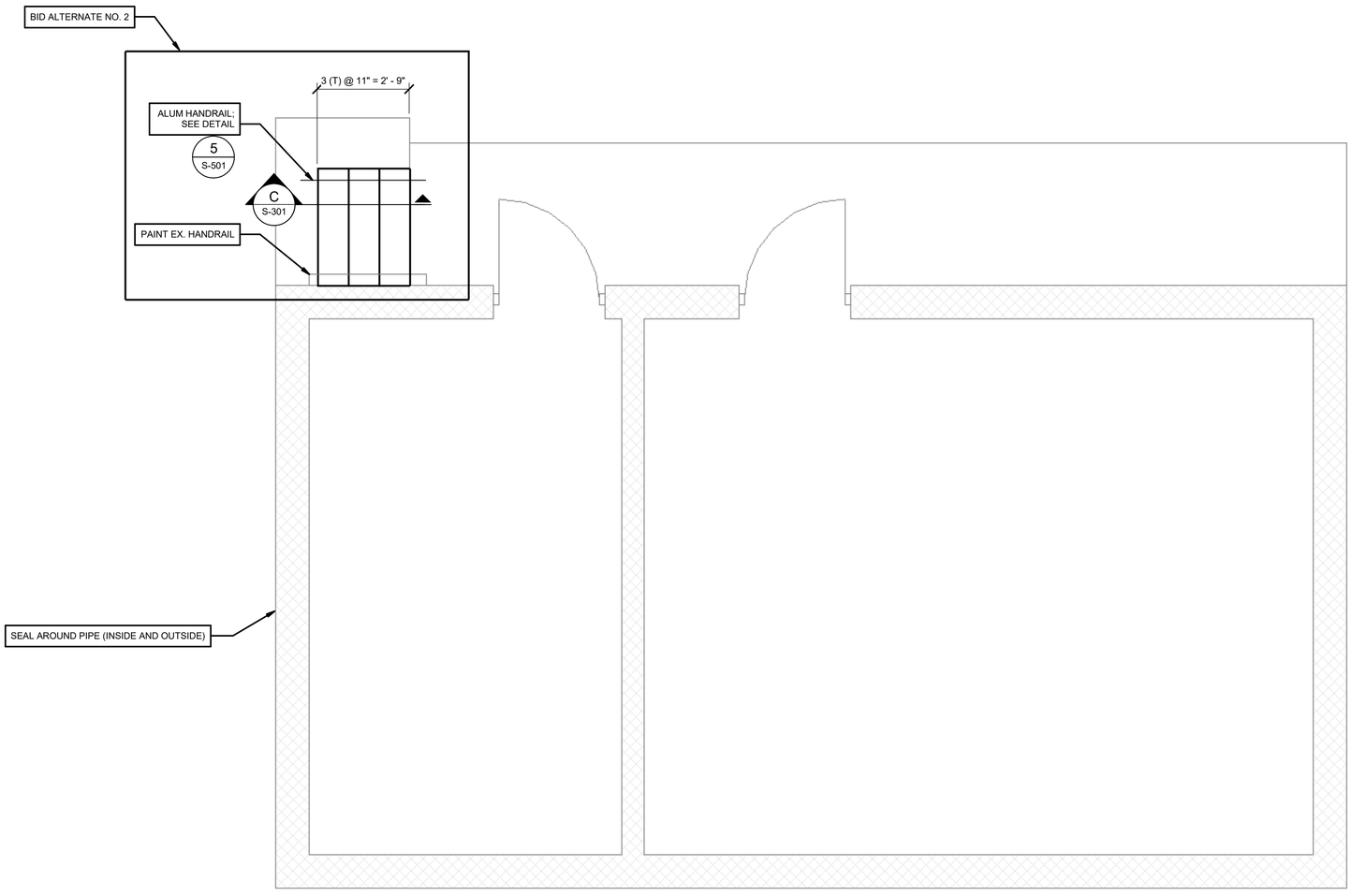

PUMP STATION NO. 12 MODIFICATION PLAN

SCALE: NTS

PLAN NOTES:

1. SEE SHEETS S-001 THROUGH S-004 FOR GENERAL NOTES AND SPECIAL INSPECTION REQUIREMENTS.
2. COORDINATE LOCATIONS OF ALL EQUIPMENT PADS WITH PROCESS DRAWINGS.
3. ALL EXPOSED CONCRETE EDGES TO BE CHAMFERED, PER DETAIL. (1 / S-501)

LEGEND:

- DENOTES EQUIPMENT PAD

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MARK	DATE	DESCRIPTION
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CITY OF KALAMAZOO, MICHIGAN

WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

PUMP STATION NO. 12
MODIFICATION PLAN

PROJ:	200-19743-19004
DESN:	AJF
DRWN:	KDK
CHKD:	TJM

S-113

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Bar measures 1 inch, otherwise drawing is not to scale

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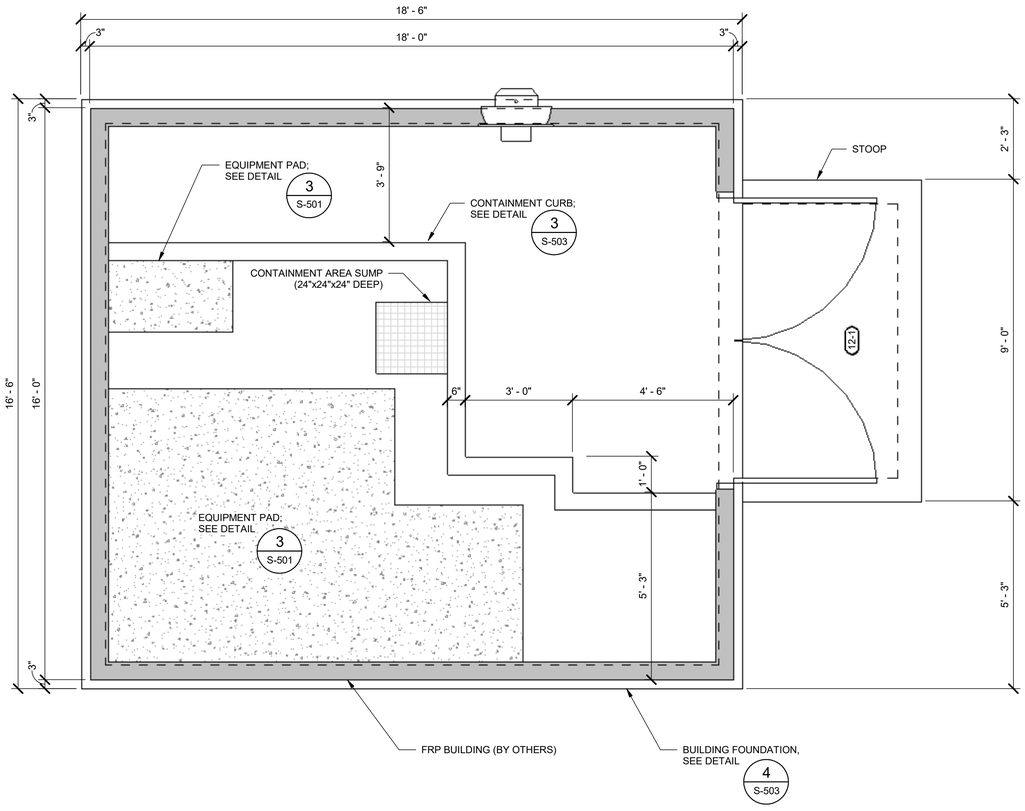

PUMP STATION NO. 12 PROPOSED PLAN

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

PLAN NOTES:

1. SEE SHEETS S-001 THROUGH S-004 FOR GENERAL NOTES AND SPECIAL INSPECTION REQUIREMENTS.
2. COORDINATE LOCATIONS OF ALL EQUIPMENT PADS WITH PROCESS DRAWINGS.
3. ALL EXPOSED CONCRETE EDGES TO BE CHAMFERED, PER DETAIL. (1 / S-501)

LEGEND:

- DENOTES EQUIPMENT PAD

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MARK	DATE	DESCRIPTION
	11/29/23	ISSUED FOR BID

CITY OF KALAMAZOO, MICHIGAN

WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

PUMP STATION NO. 12
PROPOSED PLAN

PROJ:	200-19743-19004
DESN:	AJF
DRWN:	GJZ
CHKD:	TJM

S-114

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Bar measures 1 inch, otherwise drawing is not to scale

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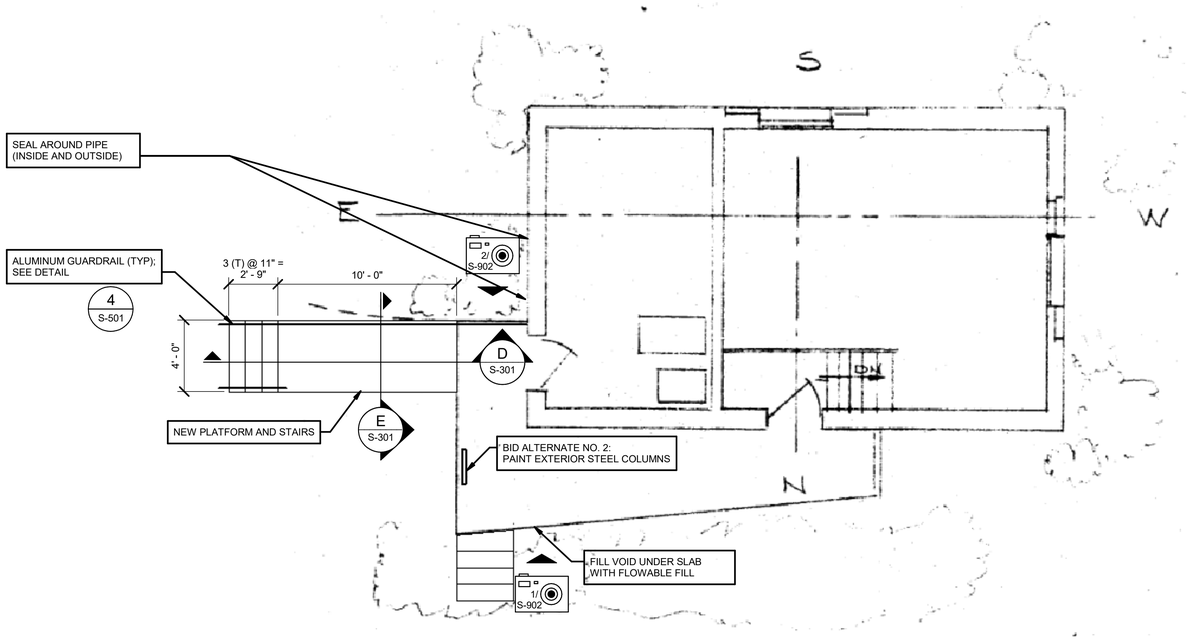
PLAN NOTES:

1. SEE SHEETS S-001 THROUGH S-004 FOR GENERAL NOTES AND SPECIAL INSPECTION REQUIREMENTS.
2. COORDINATE LOCATIONS OF ALL EQUIPMENT PADS WITH PROCESS DRAWINGS.
3. ALL EXPOSED CONCRETE EDGES TO BE CHAMFERED PER DETAIL. (1 / S-501)
4. FOR FOUNDATION WALL CORNER BARS, SEE DETAIL. (2 / S-501)

LEGEND:

- DENOTES EQUIPMENT PAD



PUMP STATION NO. 14 MODIFICATION PLAN

SCALE: NTS

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MARK	DATE	DESCRIPTION
	11/29/23	ISSUED FOR BID

CITY OF KALAMAZOO, MICHIGAN

WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

PUMP STATION NO. 14 MODIFICATION PLAN

PROJ:	200-19743-19004
DESN:	AJF
DRWN:	GJZ
CHKD:	TJM

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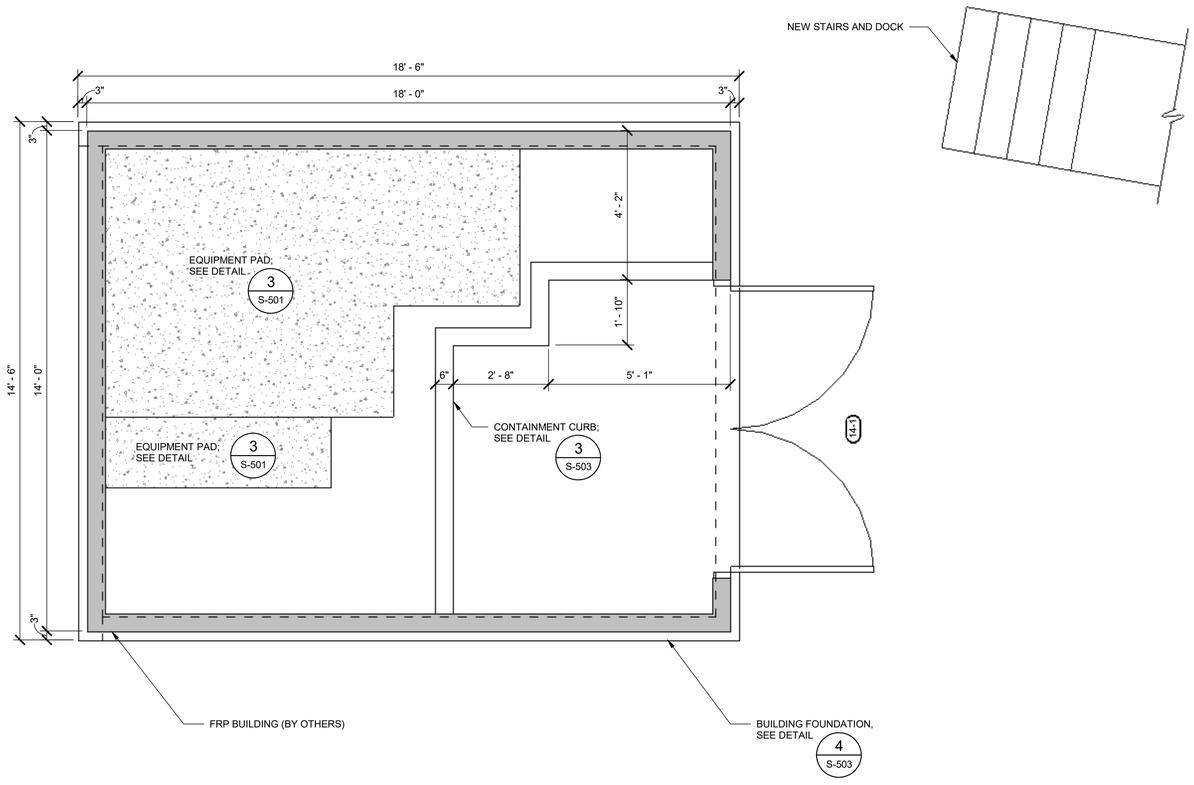
Bar measures 1 inch, otherwise drawing is not to scale

PLAN NOTES:

1. SEE SHEETS S-001 THROUGH S-004 FOR GENERAL NOTES AND SPECIAL INSPECTION REQUIREMENTS.
2. COORDINATE LOCATIONS OF ALL EQUIPMENT PADS WITH PROCESS DRAWINGS.
3. ALL EXPOSED CONCRETE EDGES TO BE CHAMFERED, PER DETAIL. (1 / S-501)

LEGEND:

- DENOTES EQUIPMENT PAD



PUMP STATION NO. 14 PROPOSED PLAN

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

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MARK	DATE	DESCRIPTION
	11/29/23	ISSUED FOR BID

CITY OF KALAMAZOO, MICHIGAN

WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

PUMP STATION NO. 14
PROPOSED PLAN

PROJ:	200-19743-19004
DESN:	AJF
DRWN:	GJZ
CHKD:	TJM

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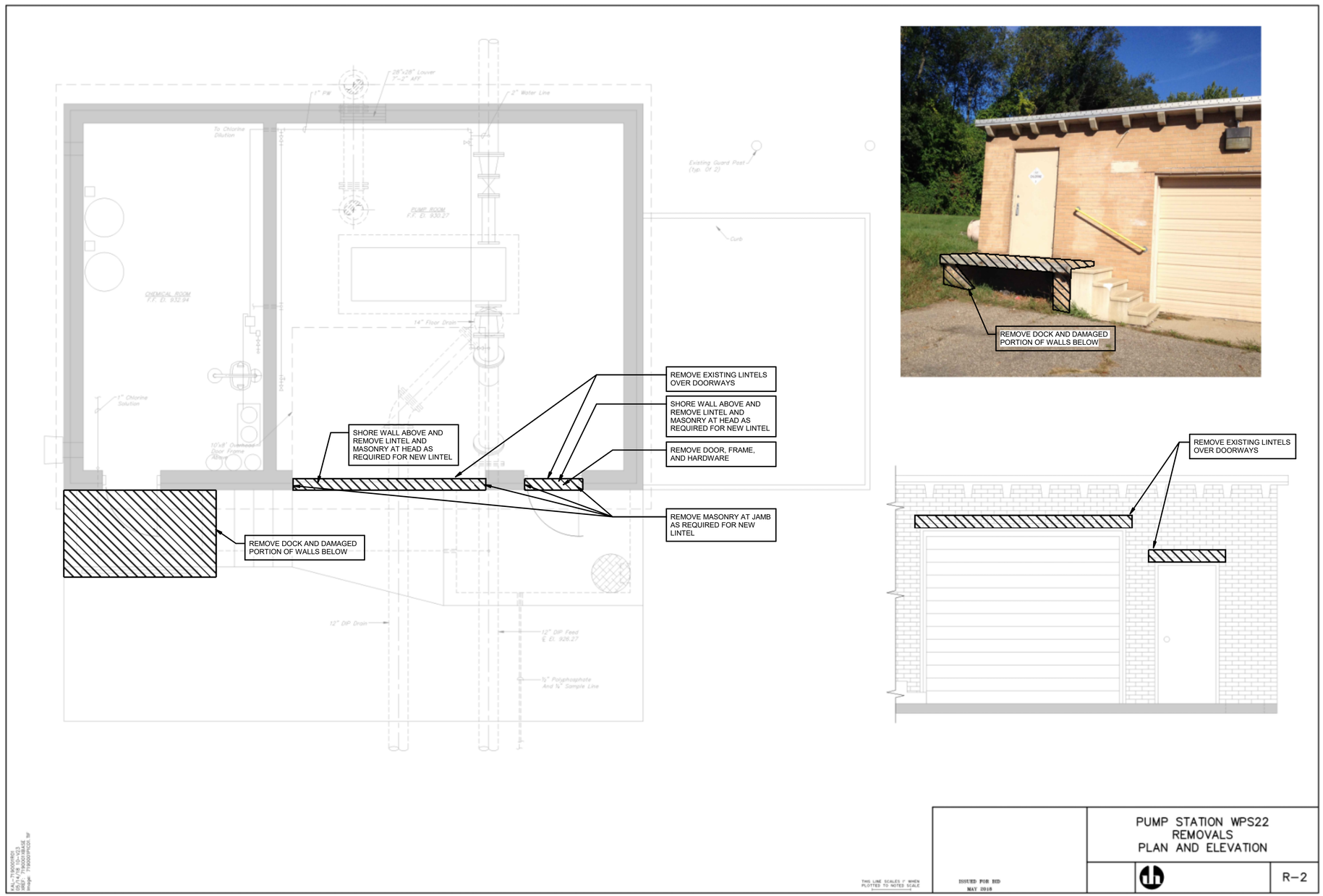
Bar measures 1 inch, otherwise drawing is not to scale



PUMP STATION NO. 22 DEMO PLAN

SCALE: NTS

DEMO PLAN NOTES:

1. SEE SHEETS S-001 THROUGH S-004 FOR GENERAL NOTES AND SPECIAL INSPECTION REQUIREMENTS.

LEGEND:

- DENOTES ITEMS TO BE REMOVED

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MARK	DATE	DESCRIPTION
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CITY OF KALAMAZOO, MICHIGAN
WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

PUMP STATION NO. 22 DEMO PLAN

PROJ:	200-19743-19004
DESN:	AJF
DRWN:	KDK
CHKD:	TJM

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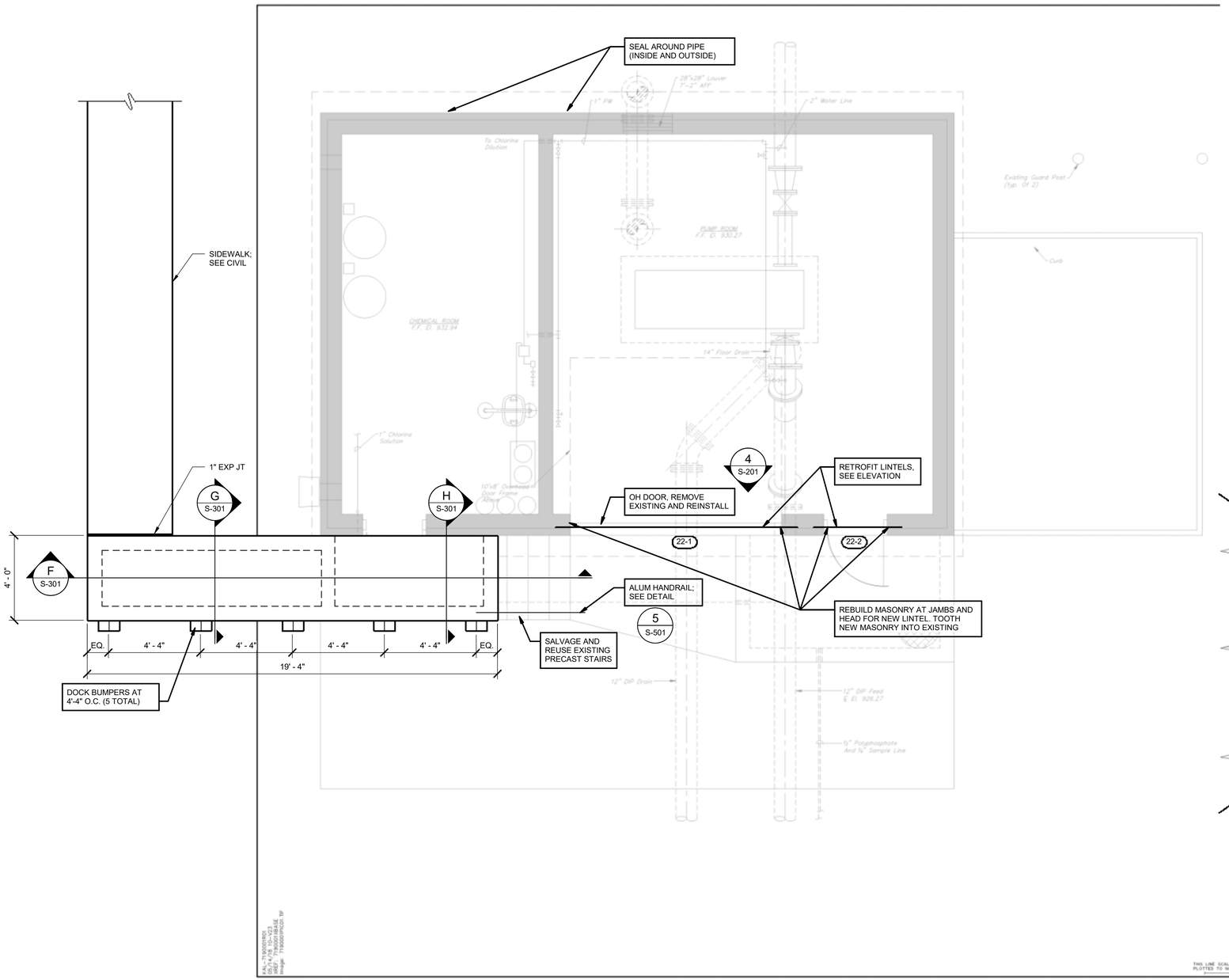
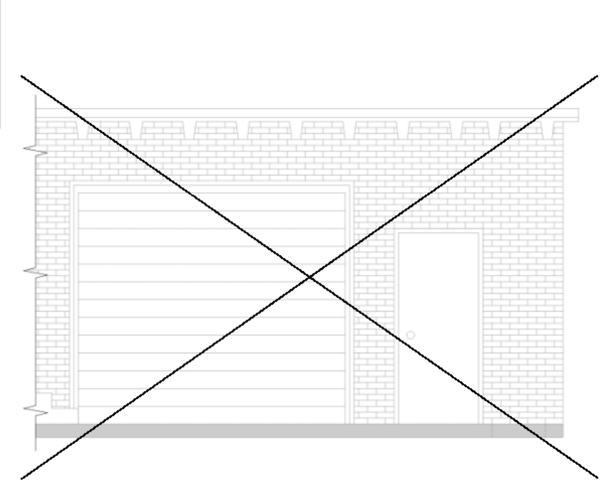
Bar measures 1 inch, otherwise drawing is not to scale





PLAN NOTES:

1. SEE SHEETS S-001 THROUGH S-004 FOR GENERAL NOTES AND SPECIAL INSPECTION REQUIREMENTS.
2. COORDINATE LOCATIONS OF ALL EQUIPMENT PADS WITH PROCESS DRAWINGS.
3. ALL EXPOSED CONCRETE EDGES TO BE CHAMFERED, PER DETAIL. (1 / S-501)

LEGEND:

- DENOTES EQUIPMENT PAD

PUMP STATION WPS22
REMOVALS
PLAN AND ELEVATION

R-2

ISSUED FOR BID
MAY 2018

THIS LINE SCALES 1" WHEN PLOTTED TO NOTED SCALE

PUMP STATION NO. 22 MODIFICATION PLAN

SCALE: NTS

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WATER SYSTEM CORROSION CONTROL IMPROVEMENTS
PUMP STATION NO. 22
MODIFICATION PLAN

PROJ:	200-19743-19004
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S-118

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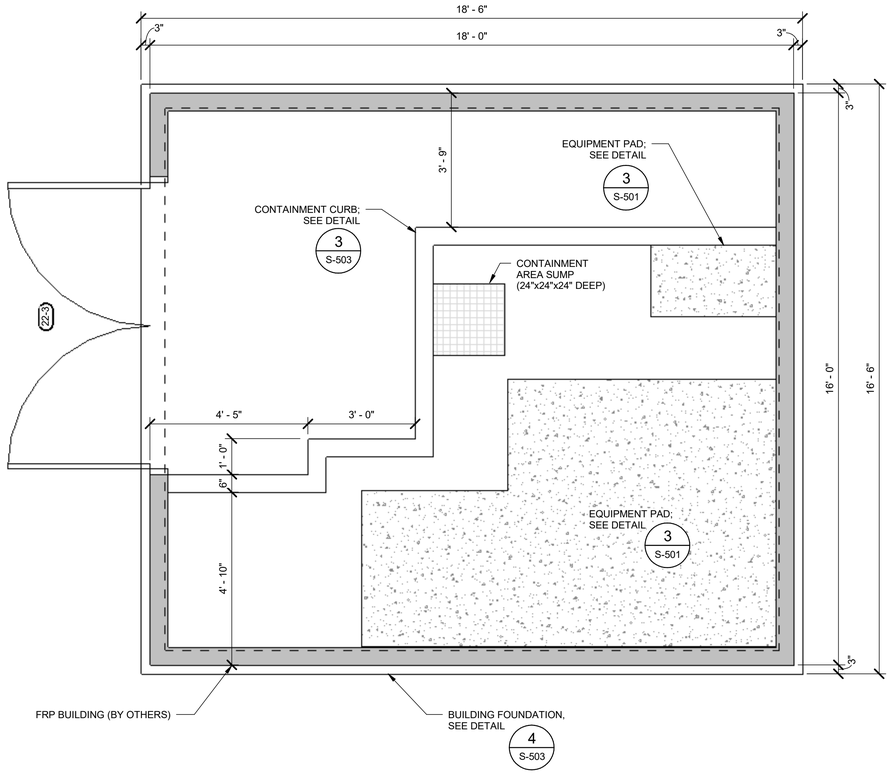
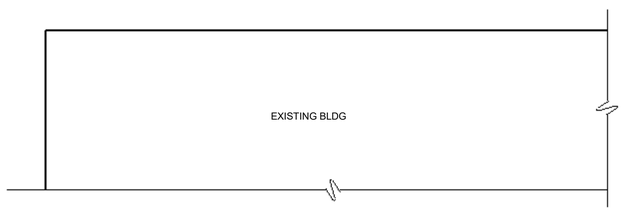
Bar measures 1 inch, otherwise drawing is not to scale





PUMP STATION NO. 22 PROPOSED PLAN

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

PLAN NOTES:

1. SEE SHEETS S-001 THROUGH S-004 FOR GENERAL NOTES AND SPECIAL INSPECTION REQUIREMENTS.
2. COORDINATE LOCATIONS OF ALL EQUIPMENT PADS WITH PROCESS DRAWINGS.
3. ALL EXPOSED CONCRETE EDGES TO BE CHAMFERED, PER DETAIL. 1 / S-501

LEGEND:

- DENOTES EQUIPMENT PAD

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MARK	DATE	DESCRIPTION
	11/29/23	ISSUED FOR BID

CITY OF KALAMAZOO, MICHIGAN
WATER SYSTEM CORROSION CONTROL IMPROVEMENTS
PUMP STATION NO. 22
PROPOSED PLAN

PROJ:	200-19743-19004
DESN:	AJF
DRWN:	GJZ
CHKD:	TJM

S-119

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Bar measures 1 inch, otherwise drawing is not to scale

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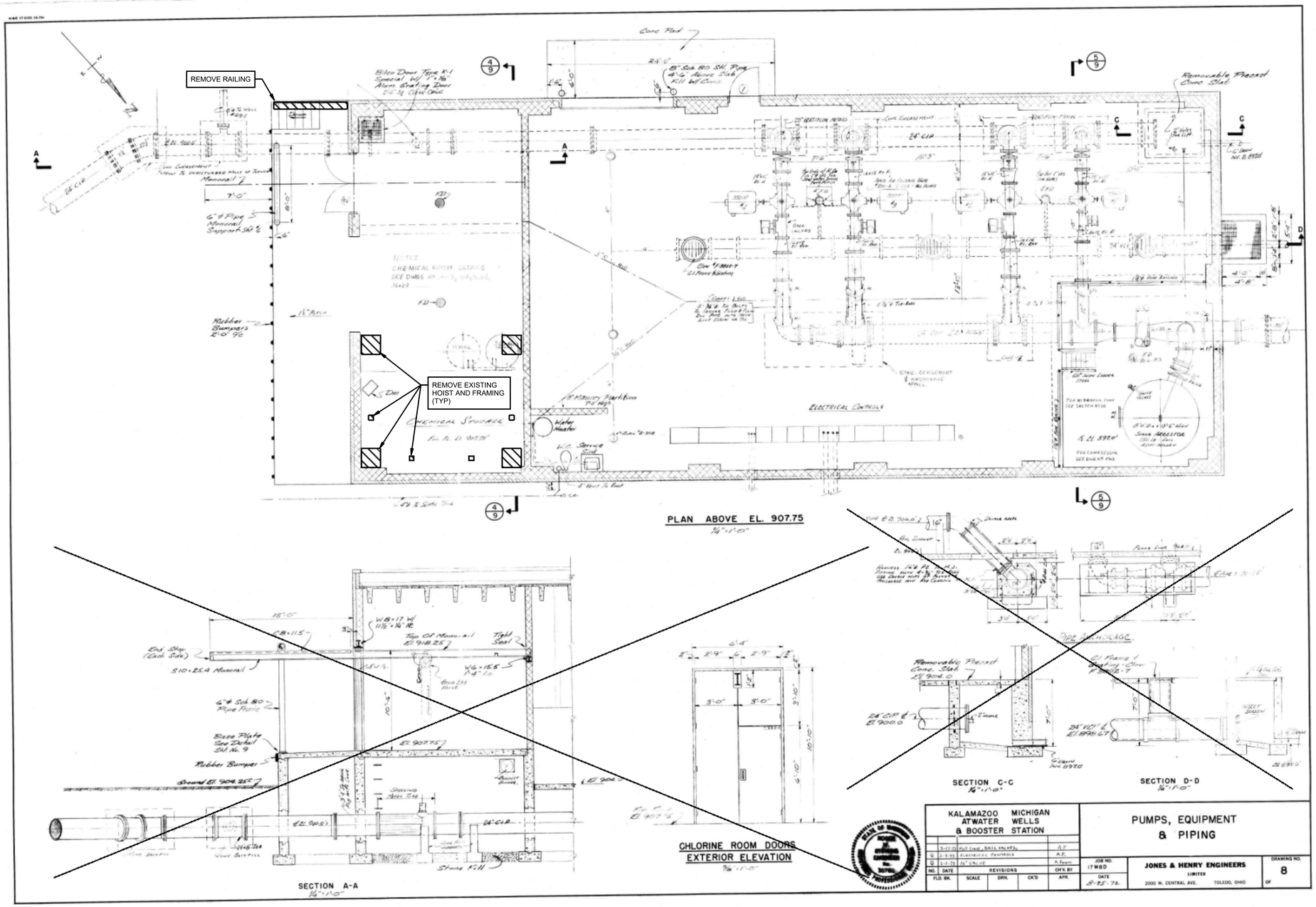
DEMO PLAN NOTES:

1. SEE SHEETS S-001 THROUGH S-004 FOR GENERAL NOTES AND SPECIAL INSPECTION REQUIREMENTS.

LEGEND:

▨ - DENOTES ITEMS TO BE REMOVED



KALAMAZOO MICHIGAN
ATWATER WELLS
& BOOSTER STATION

PUMPS, EQUIPMENT & PIPING

JOB NO. 17 WBD
DATE 8-22-72

JONES & HENRY ENGINEERS LIMITED
2000 W. CENTRAL AVE. TOLEDO, OHIO

DRAWING NO. 8 OF

NO.	DATE	REVISIONS	CK'D	CK'K. BY
3	11-17-72	Add Check, BALL VALVES		A.F.
2	9-1-72	ELECTRICAL CHANGES		A.F.
1	8-7-72	24" VALVE		A. Fearn

FLD. BK. | SCALE | DRN. | CK'D | APR.

PUMP STATION NO. 24 DEMO PLAN

SCALE: NTS

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www.tetratech.com
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ANN ARBOR, MI 48108
TEL: (734) 665-6000 FAX: (734) 213-3003

MARK	DATE	DESCRIPTION	BY
	11/29/23	ISSUED FOR BID	

CITY OF KALAMAZOO, MICHIGAN
WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

PUMP STATION NO. 24 DEMO PLAN

PROJ:	200-19743-19004
DESN:	Designer
DRWN:	Author
CHKD:	TJM

S-120

Copyright: Tetra Tech

Bar measures 1 inch, otherwise drawing is not to scale

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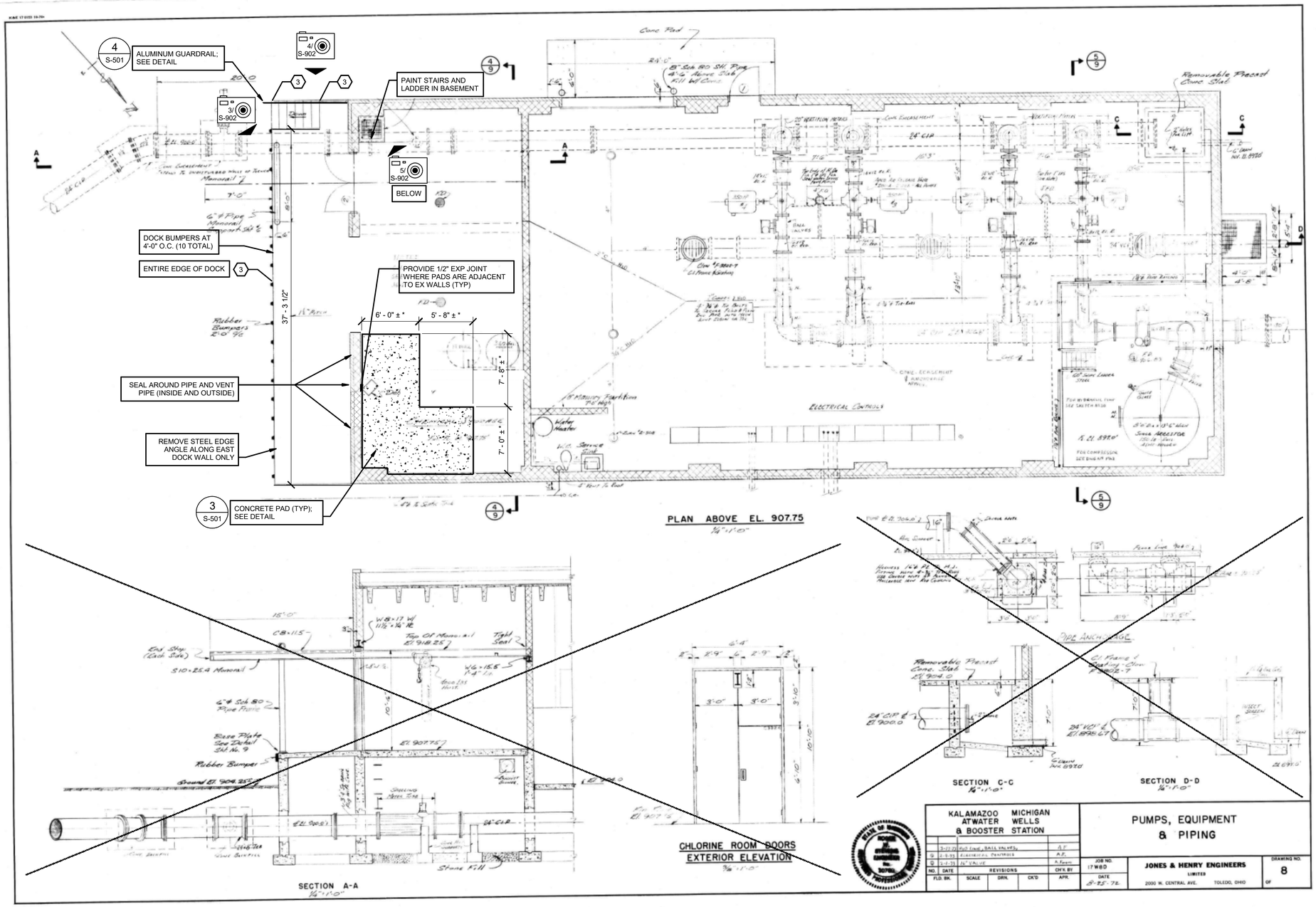

PLAN NOTES:

1. SEE SHEETS S-001 THROUGH S-004 FOR GENERAL NOTES AND SPECIAL INSPECTION REQUIREMENTS.
2. COORDINATE LOCATIONS OF ALL EQUIPMENT PADS WITH PROCESS DRAWINGS.
3. ALL EXPOSED CONCRETE EDGES TO BE CHAMFERED, PER DETAIL. (1 / S-501)

(#) KEY NOTE - REPAIR TYPES

1. CONCRETE CRACK REPAIR. (SEE DETAIL 1/S-502)
2. CONCRETE SHALLOW SPALL REPAIR. (SEE DETAIL 2/S-502)
3. CONCRETE DEEP SPALL REPAIR. (SEE DETAIL 3/S-502)

LEGEND:

- DENOTES EQUIPMENT PAD

KALAMAZOO MICHIGAN
ATWATER WELLS
& BOOSTER STATION

PUMPS, EQUIPMENT & PIPING

JONES & HENRY ENGINEERS LIMITED
2000 W. CENTRAL AVE. TOLEDO, OHIO

JOB NO. 17 W&D
DATE 3-25-72
DRAWING NO. 8 OF

NO.	DATE	REVISIONS	DRN.	CK'D	APR.
1	3-17-72	4"Ø Line, BALL VALVES			A.F.
2	2-9-73	ELECTRICAL CONTROLS			A.F.
3	2-7-73	16" VALVE			A. Fenn

FLD. BK. | SCALE | CK'D BY

PUMP STATION NO. 24 MODIFICATION PLAN

SCALE: NTS

*COORDINATE PAD DIMENSIONS WITH EQUIPMENT MANUFACTURER PRIOR TO CONSTRUCTION.

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MARK	DATE	DESCRIPTION
	11/28/23	ISSUED FOR BID

BY

CITY OF KALAMAZOO, MICHIGAN
WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

PUMP STATION NO. 24
MODIFICATION PLAN

PROJ:	200-19743-19004
DESN:	AJF
DRWN:	KDK
CHKD:	TJM

S-121

Copyright: Tetra Tech

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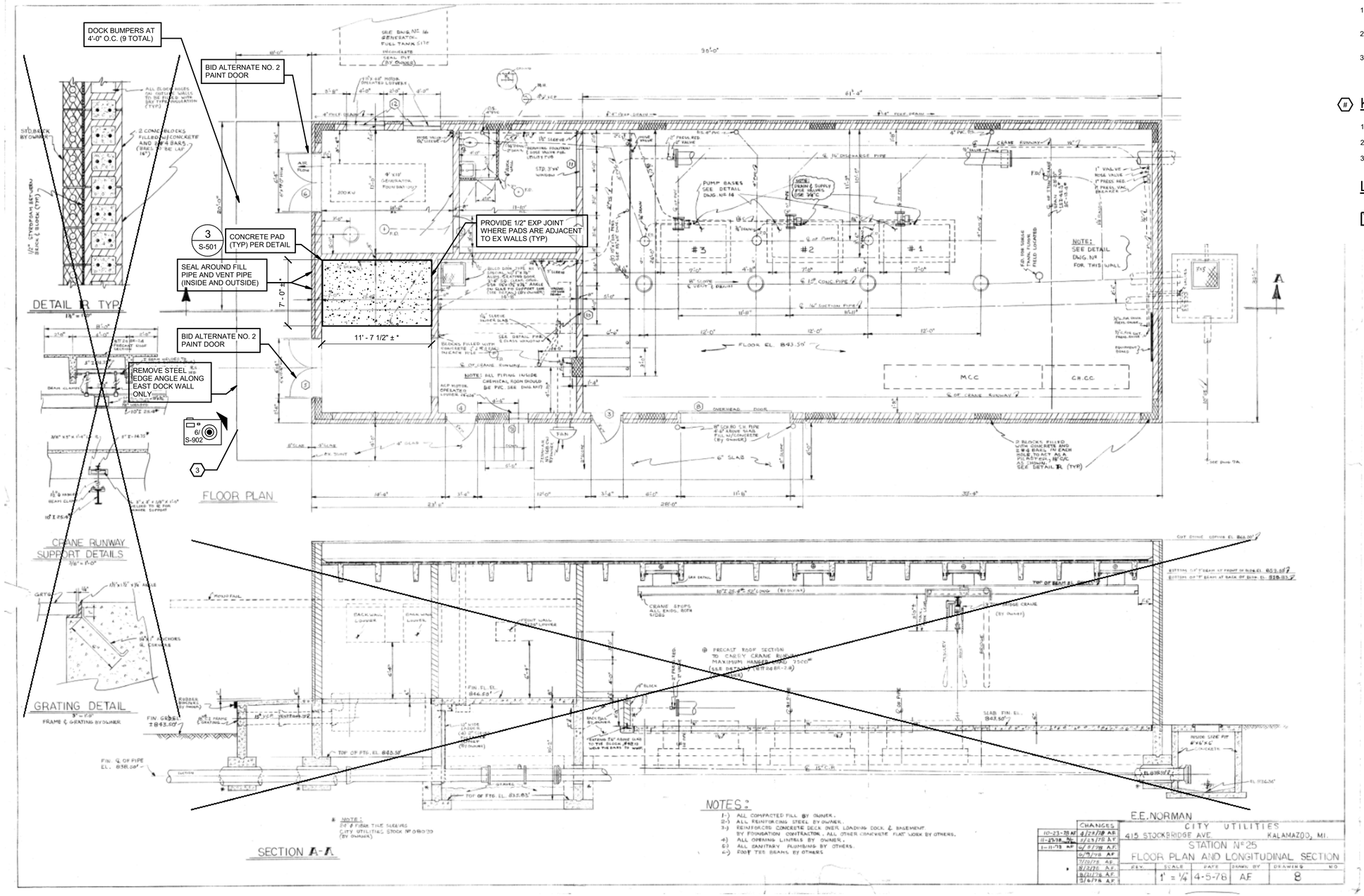
Bar measures 1 inch, otherwise drawing is not to scale



PUMP STATION NO. 25 MODIFICATION PLAN

SCALE: NTS

*COORDINATE PAD DIMENSIONS WITH EQUIPMENT MANUFACTURER PRIOR TO CONSTRUCTION.

PLAN NOTES:

1. SEE SHEETS S-001 THROUGH S-004 FOR GENERAL NOTES AND SPECIAL INSPECTION REQUIREMENTS.
2. COORDINATE LOCATIONS OF ALL EQUIPMENT PADS WITH PROCESS DRAWINGS.
3. ALL EXPOSED CONCRETE EDGES TO BE CHAMFERED, PER DETAIL. 1 / S-501

(#) KEY NOTE - REPAIR TYPES

1. CONCRETE CRACK REPAIR. (SEE DETAIL 1/S-502)
2. CONCRETE SHALLOW SPALL REPAIR. (SEE DETAIL 2/S-502)
3. CONCRETE DEEP SPALL REPAIR. (SEE DETAIL 3/S-502)

LEGEND:

- DENOTES EQUIPMENT PAD

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MARK	DATE	DESCRIPTION
	11/29/23	ISSUED FOR BID

CITY OF KALAMAZOO, MICHIGAN
WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

PUMP STATION NO. 25 MODIFICATION PLAN

PROJ:	200-19743-19004
DESN:	AJF
DRWN:	KDK
CHKD:	TJM

S-122

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Bar measures 1 inch, otherwise drawing is not to scale

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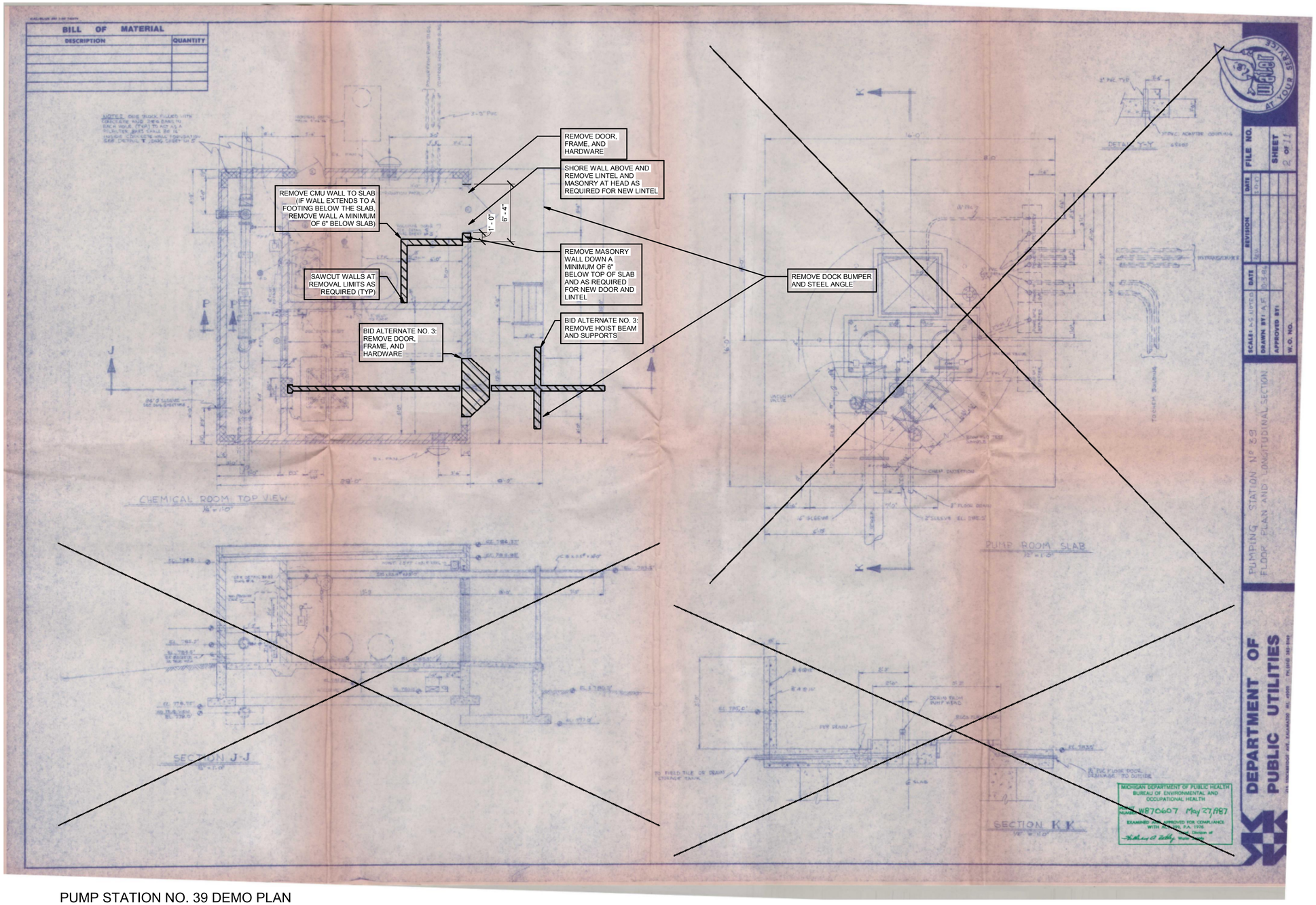

PUMP STATION NO. 39 DEMO PLAN

SCALE: NTS

DEMO PLAN NOTES:

1. SEE SHEETS S-001 THROUGH S-004 FOR GENERAL NOTES AND SPECIAL INSPECTION REQUIREMENTS.

LEGEND:

▨ - DENOTES ITEMS TO BE REMOVED

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MARK	DATE	DESCRIPTION
	11/29/23	ISSUED FOR BID

CITY OF KALAMAZOO, MICHIGAN

WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

PUMP STATION NO. 39
DEMO PLAN

PROJ:	200-19743-19004
DESN:	AJF
DRWN:	KDK
CHKD:	TJM

S-123

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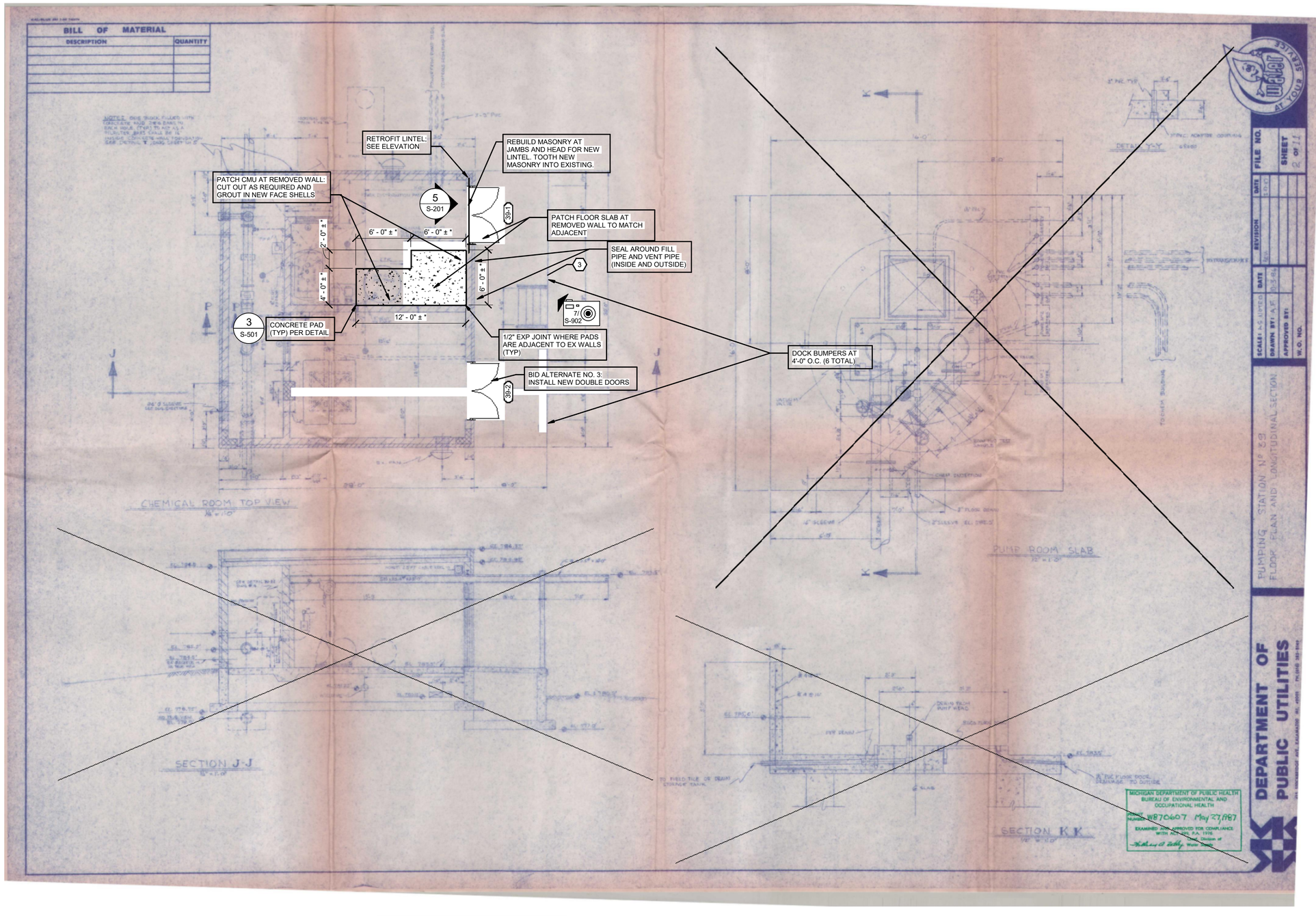
Bar measures 1 inch, otherwise drawing is not to scale



PLAN NOTES:

1. SEE SHEETS S-001 THROUGH S-004 FOR GENERAL NOTES AND SPECIAL INSPECTION REQUIREMENTS.
2. COORDINATE LOCATIONS OF ALL EQUIPMENT PADS WITH PROCESS DRAWINGS.
3. ALL EXPOSED CONCRETE EDGES TO BE CHAMFERED, PER DETAIL. (1 / S-501)

(#) KEY NOTE - REPAIR TYPES

1. CONCRETE CRACK REPAIR. (SEE DETAIL 1/S-502)
2. CONCRETE SHALLOW SPALL REPAIR. (SEE DETAIL 2/S-502)
3. CONCRETE DEEP SPALL REPAIR. (SEE DETAIL 3/S-502)

LEGEND:

- DENOTES EQUIPMENT PAD

PUMP STATION NO. 39 MODIFICATION PLAN

SCALE: NTS

*COORDINATE PAD DIMENSIONS WITH EQUIPMENT MANUFACTURER PRIOR TO CONSTRUCTION.

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ANN ARBOR, MI 48108
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MARK	DATE	DESCRIPTION
	11/29/23	ISSUED FOR BID

CITY OF KALAMAZOO, MICHIGAN
WATER SYSTEM CORROSION CONTROL IMPROVEMENTS
PUMP STATION NO. 39 MODIFICATION PLAN

PROJ:	200-19743-19004
DESN:	AJF
DRWN:	KDK
CHKD:	TJM

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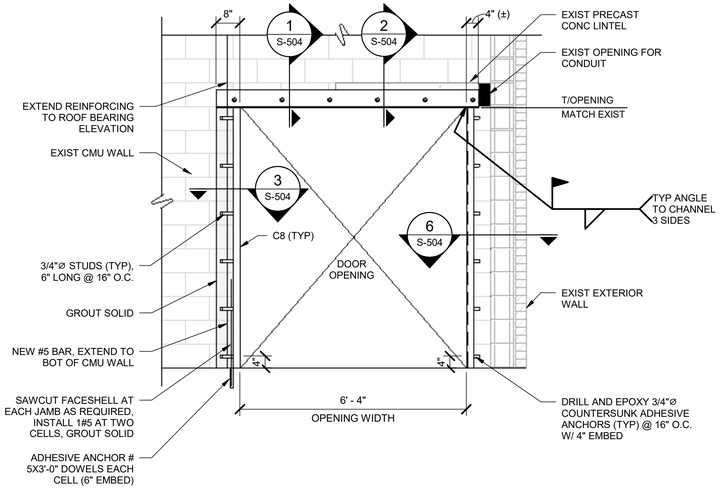
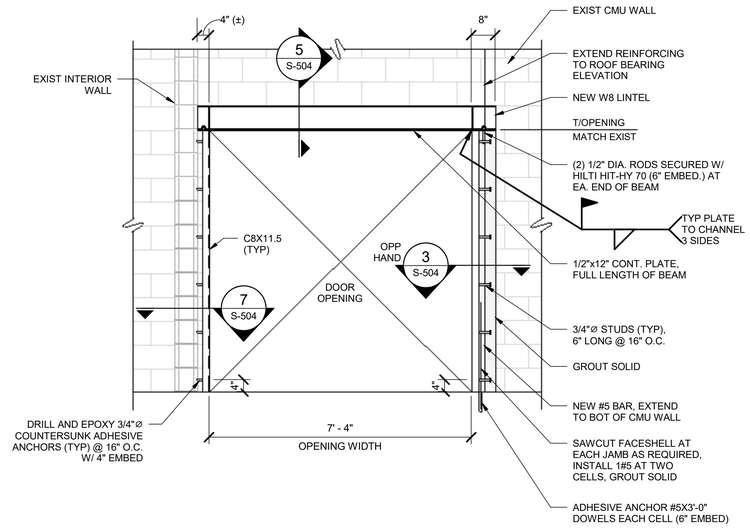
Bar measures 1 inch, otherwise drawing is not to scale



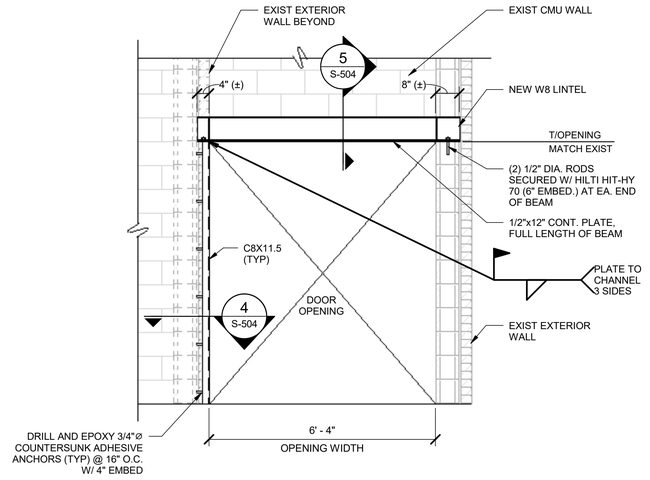
1 S-201 PS NO. 3 LINTEL IN EXIST. CMU WALL - ELEVATION

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



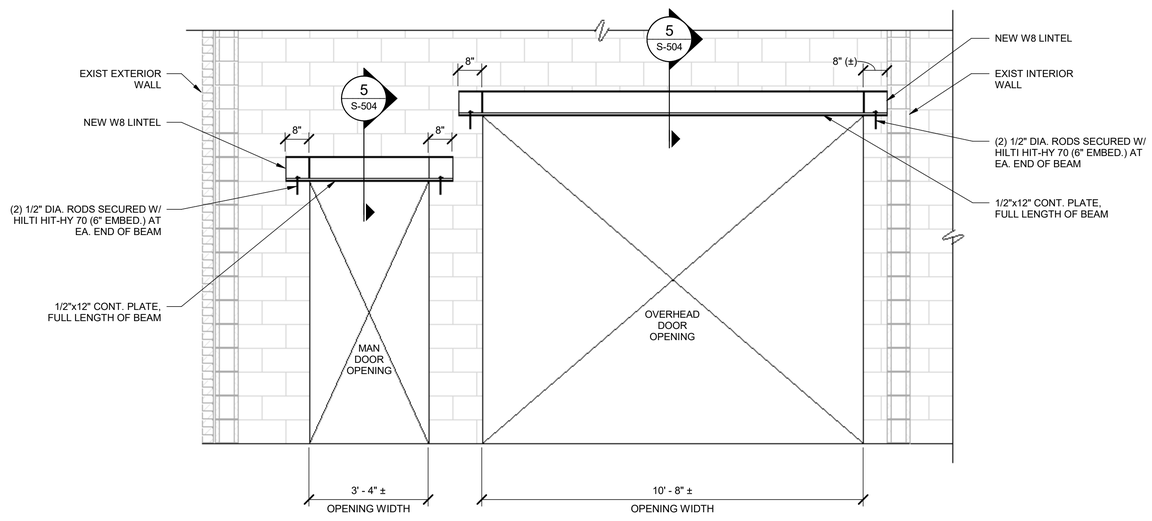
2 S-201 PS NO. 9 LINTEL IN EXIST. CMU WALL - ELEVATION

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



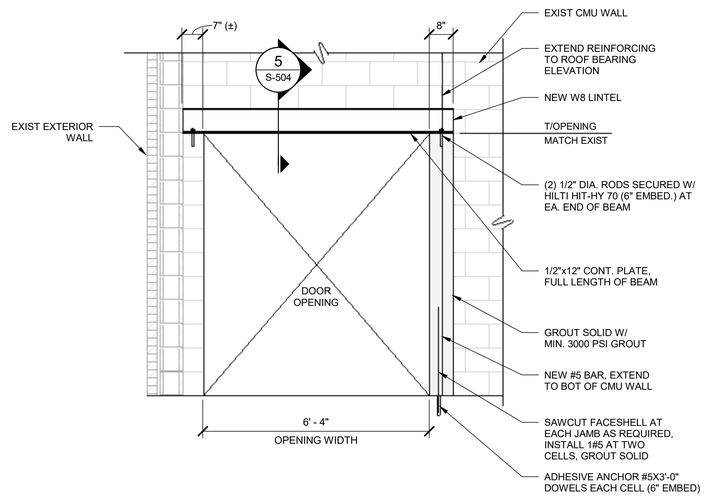
3 S-201 PS NO. 11 LINTEL IN EXIST. CMU WALL - ELEVATION

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



4 S-201 PS NO. 22 LINTEL IN EXIST. CMU WALL - ELEVATION

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



5 S-201 PS NO. 39 LINTEL IN EXIST. CMU WALL - ELEVATION

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

2' 0' 2' 4'

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

Bar measures 1 inch, otherwise drawing is not to scale

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CITY OF KALAMAZOO, MICHIGAN

WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

ELEVATIONS

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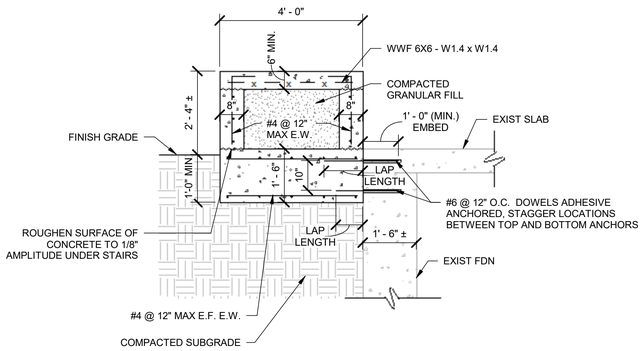
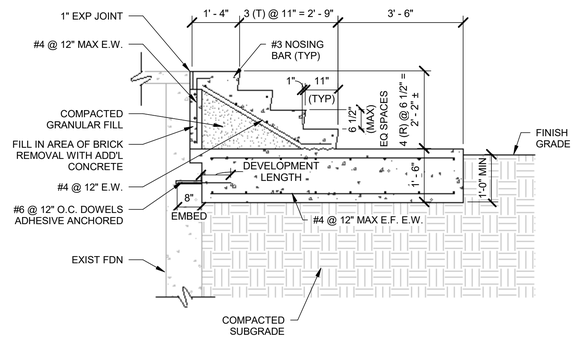


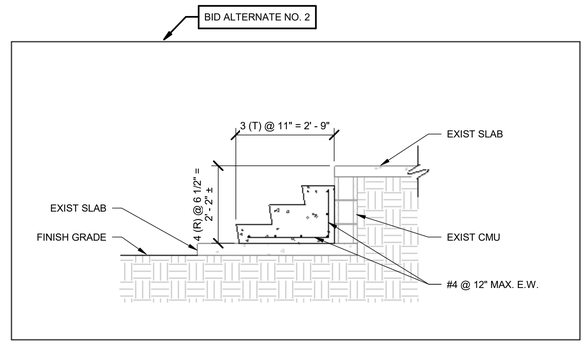
PS NO. 3 - STAIR TRANSVERSE SECTION

A / S-301 SCALE: 1/2" = 1'-0"



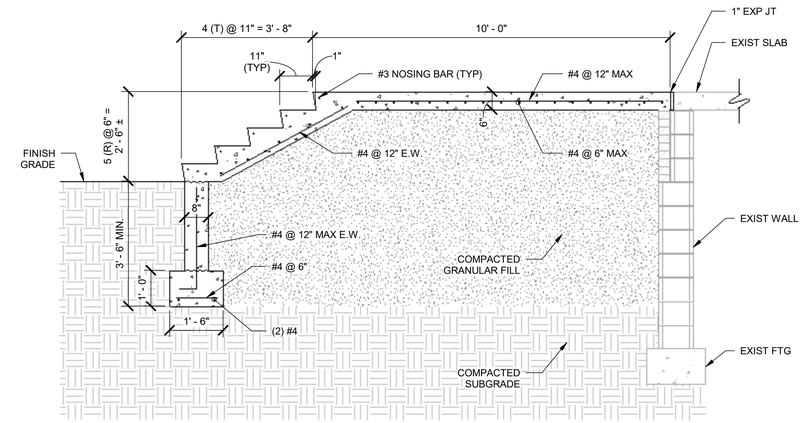
PS NO. 3 - STAIR LONGITUDINAL SECTION

B / S-301 SCALE: 1/2" = 1'-0"



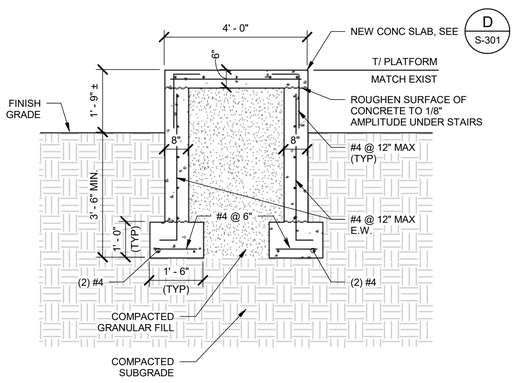
PS NO. 12 - STAIR SECTION

C / S-301 SCALE: 1/2" = 1'-0"



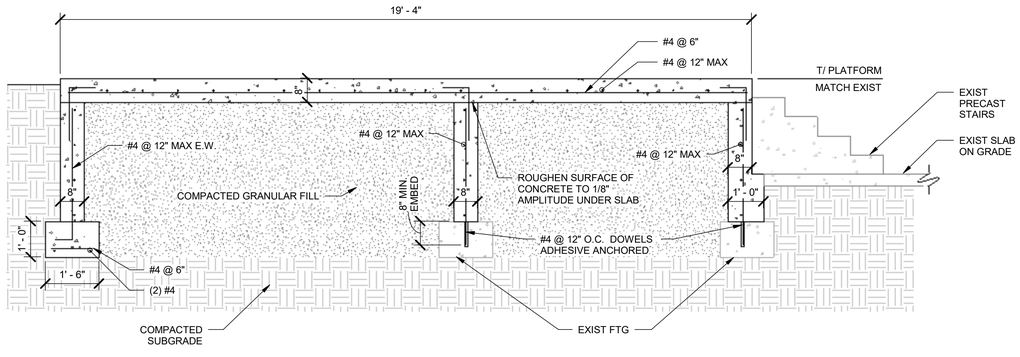
PS NO. 14 LOADING PLATFORM - LONGITUDINAL SECTION

D / S-301 SCALE: 1/2" = 1'-0"



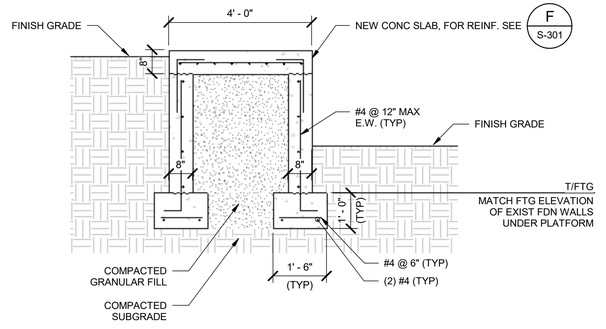
PS NO. 14 LOADING PLATFORM - TRANSVERSE SECTION

E / S-301 SCALE: 1/2" = 1'-0"



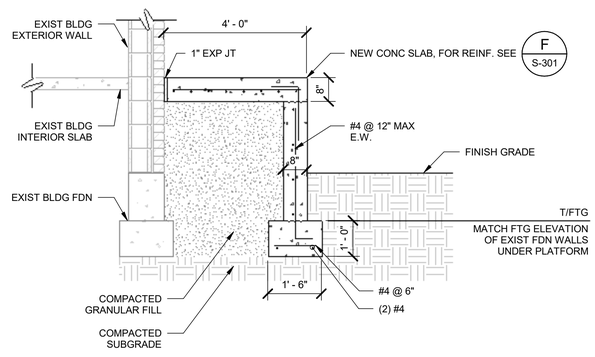
PS NO. 22 LOADING PLATFORM - LONGITUDINAL SECTION

F / S-301 SCALE: 1/2" = 1'-0"



PS NO. 22 LOADING PLATFORM - TRANSVERSE SECTION

G / S-301 SCALE: 1/2" = 1'-0"



PS NO. 22 LOADING PLATFORM - TRANSVERSE SECTION AT EXISTING BUILDING

H / S-301 SCALE: 1/2" = 1'-0"

2' 0' 2' 4'

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

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WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

SECTIONS

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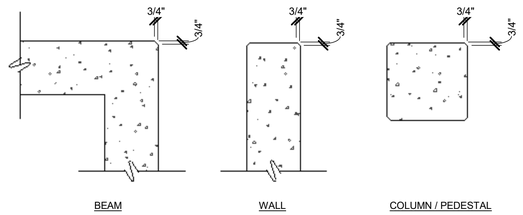
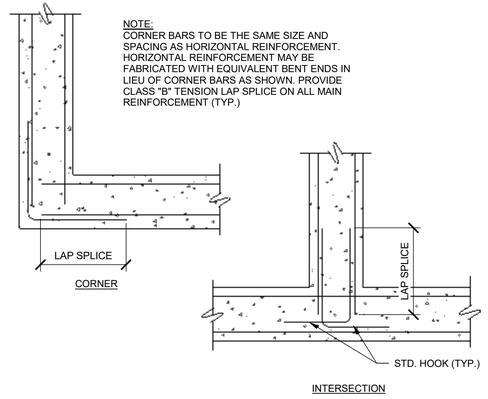
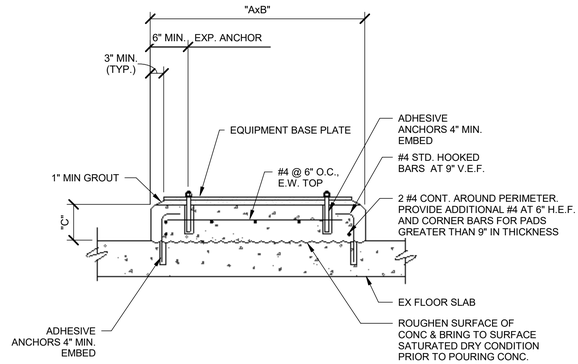


1 CHAMFER DETAILS
SCALE: NTS

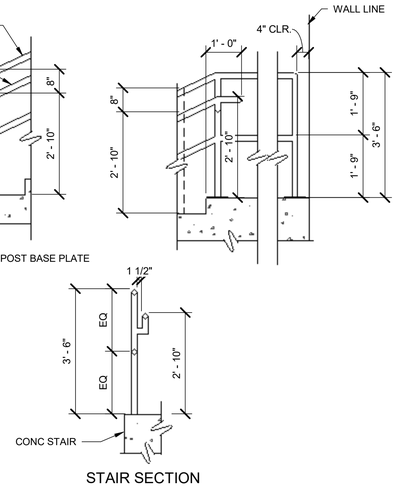


2 WALL CORNERS @ BLDG WALLS
SCALE: NTS



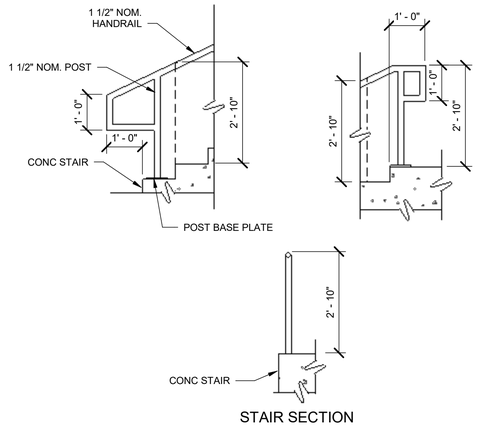
NOTE:
"A","B" & "C" DIMS. AS REQ'D TO SUIT EQUIPMENT. PADS TO BE 6" LARGER THAN EQUIPMENT ON ALL SIDES ("C" = 6" TYP. U.N.O.)

3 TYP. EQUIPMENT PAD
SCALE: NTS



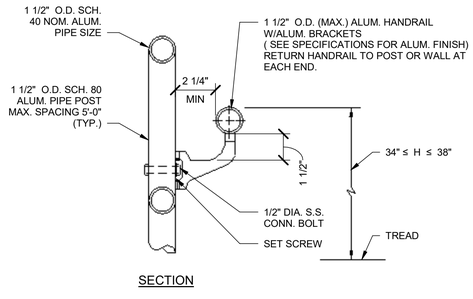
STAIR SECTION

4 TYP. GUARDRAIL DETAILS
SCALE: NTS



STAIR SECTION

5 TYP. HANDRAIL DETAILS
SCALE: NTS



SECTION

6 HANDRAIL ATTACHMENT AT GUARDRAIL
SCALE: NTS

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CHKD:	TJM

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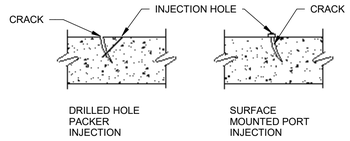
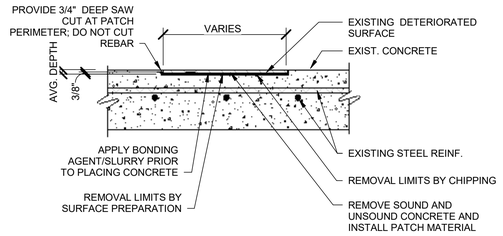


NOTES:

1. IDENTIFY CRACKS TO BE INJECTED. LOCATION OF CRACKS TO INJECTED ARE TO BE CONFIRMED AND APPROVED BY THE ENGINEER.
2. LOCATE REINFORCING STEEL IN CONCRETE STRUCTURE. LOCATE INJECTION HOLE POSITION AND WORK WITH CARE TO AVOID DAMAGE TO EXISTING REINFORCING STEEL. DRILL HOLE SIZED AS RECOMMENDED BY THE INJECTION MATERIAL MANUFACTURER, AT A 45 DEGREE ANGLE TO THE SURFACE, AND BEGINNING AT A DISTANCE AWAY FROM THE CRACK SO THAT THE DRILLED HOLE INTERCEPTS THE CRACK AT APPROXIMATELY ONE-HALF THE CONCRETE DEPTH.
3. INSERT INJECTION PACKERS AS RECOMMENDED BY THE INJECTION MATERIAL MANUFACTURER,INTO THE DRILLED HOLES AND TIGHTEN.
4. CLEAN CONCRETE SURFACE IN ACCORDANCE WITH SPECIFICATIONS
5. PUMP INJECTOR MATERIAL THROUGH THE INJECTION PACKER UNTIL THE HOLE WILL NOT TAKE MORE MATERIAL, OR THE MATERIAL IS NO LONGER VISIBLE SEEPING OUT OF THE CRACKS.
6. INJECTION MAY BE HORIZONTAL, VERTICAL OR OVERHEAD.
7. AFTER EPOXY ADHESIVE HAS SET, REMOVE INJECTION PORTS AND GRIND SURFACES SMOOTH.

1 CONCRETE CRACK INJECTION
SCALE: NTS

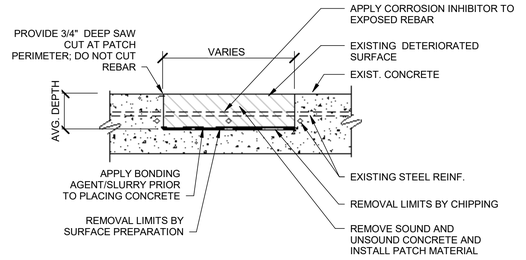


NOTES:

1. THIS DETAIL APPLIES TO DETERIORATED AREAS THAT ARE NOT DEEP ENOUGH TO IMPACT STEEL REINFORCEMENT AND ARE LOCATED AT THE TOP SIDE HORIZONTAL SURFACE WHERE A TRAFFIC MEMBRANE WILL BE APPLIED, OVERHEAD OR VERTICAL SURFACES.
2. REMOVE ALL DETERIORATED SOUND AND UNSOUND CONCRETE IN HATCHED AREA PER SPECIFICATIONS TO FORM RECTANGULAR AREA.
3. PREPARE PATCH AREA PER SPECIFICATIONS.
4. PATCH MATERIAL SHALL BE PER SPECIFICATIONS AS APPROVED BY ENGINEER.
5. CHECK EXISTING REINFORCEMENT FOR DETERIORATION AND ADD ADDITIONAL REINFORCEMENT AS REQUIRED PER DETAIL.

4 S-502

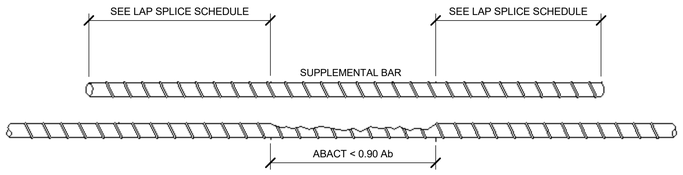
2 CONCRETE SHALLOW SPALL REPAIR
SCALE: NTS



DETAIL 3 NOTES:

1. THIS DETAIL APPLIES TO DETERIORATED AREAS THAT ARE DEEP ENOUGH TO IMPACT STEEL REINFORCEMENT AND ARE LOCATED AT THE TOP SIDE HORIZONTAL SURFACE WHERE A TRAFFIC MEMBRANE WILL BE APPLIED, OVERHEAD OR VERTICAL SURFACES.
2. REMOVE ALL DETERIORATED SOUND AND UNSOUND CONCRETE IN HATCHED AREA PER SPECIFICATIONS TO FORM RECTANGULAR AREA.
3. PREPARE PATCH AREA PER SPECIFICATIONS, INCLUDING CLEANING AND COATING OF REINFORCEMENT.
4. MINIMUM CLEAR DISTANCE BETWEEN REBAR AND CONCRETE DEMO SHALL BE 3/4".
5. PATCH MATERIAL SHALL BE AS PER SPECIFICATIONS AS APPROVED BY ENGINEER.

3 CONCRETE DEEP SPALL REPAIR
SCALE: NTS

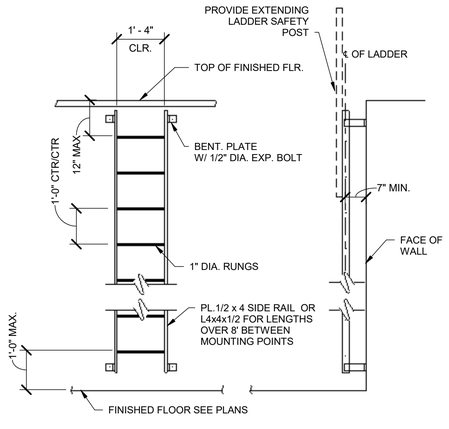


NOTES:

1. SUPPLEMENTAL BAR SHALL BE TIED TO EXISTING BAR (TYP.)
2. ABACT = EXISTING CROSS SECTIONAL AREA OF REBAR.
3. Ab = ORIGINAL CROSSSECTIONAL AREA OF REBAR
4. CLASS B LAP SPLICE LENGTH BASED ON ACI 318
5. CONTRACTOR TO USE MECHANICAL SPLICE CONNECTORS AS DIRECTED BY ENGINEER IN LIEU OF LAP SPLICE

LAP SPLICE SCHEDULE LENGTH (IN)						
NOMINAL BAR #	DIAMETER OF BAR d_b (IN.)	DEPTH OF CONCRETE COVER OVER BAR C_b				
		C_b <1"	1" ≤ C_b <1.25"	1.25" ≤ C_b <1.5"	1.5" ≤ C_b <1.75"	1.75" ≤ C_b <2"
4	0.5	11	10	9	8	8
5	0.625	17	15	14	12	12
6	0.75	25	22	20	18	17
7	0.875	34	30	27	24	22
8	1	44	39	35	32	30

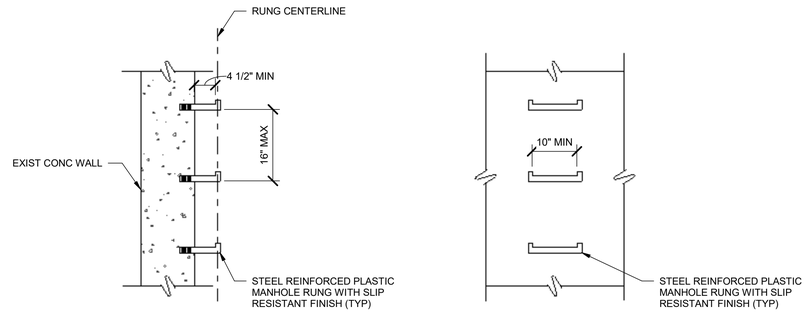
4 REPAIR OF DAMAGED OR DETERIORATED REINFORCEMENT
SCALE: NTS



STEEL LADDER, MEMBER SIZES PER MANUFACTURER OF LADDER

MINIMUN CLEARANCE TO ANY OBSTRUCTION ADJACENT TO LADDER 2'-6" ON CLIMBING SIDE. 1'-3" EACH SIDE OF CENTER LINE, ON EACH SIDE OF LADDER.

5 STEEL LADDER DETAIL
SCALE: NTS



NOTES:
1. MANHOLE RUNG TO MEET REQUIREMENTS OF ASTM C-478, ASTM D-4101, AND ASTM A-615.

6 PLASTIC MANHOLE RUNG DETAIL
SCALE: NTS

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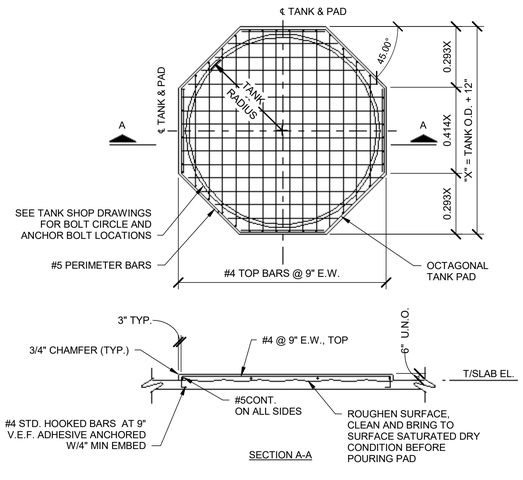
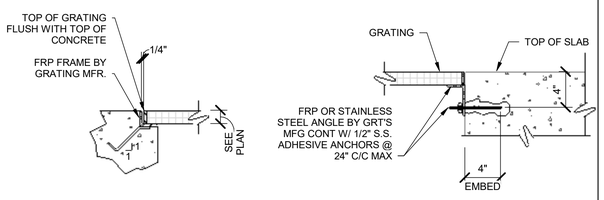


1 TYP. OCTAGONAL TANK PAD
SCALE: NTS

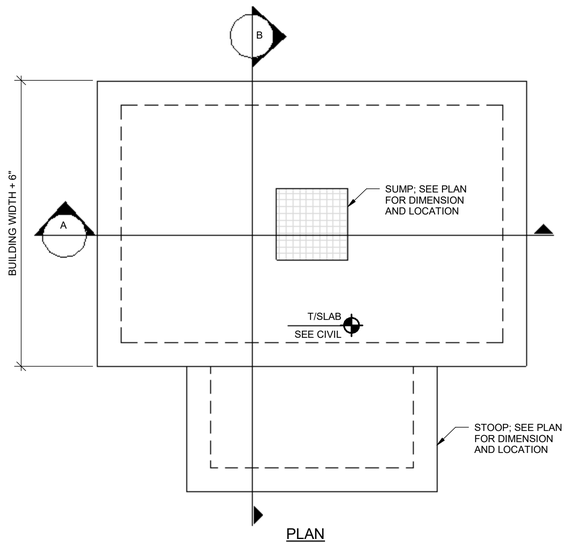


GRATING TO SLAB

NOTES:

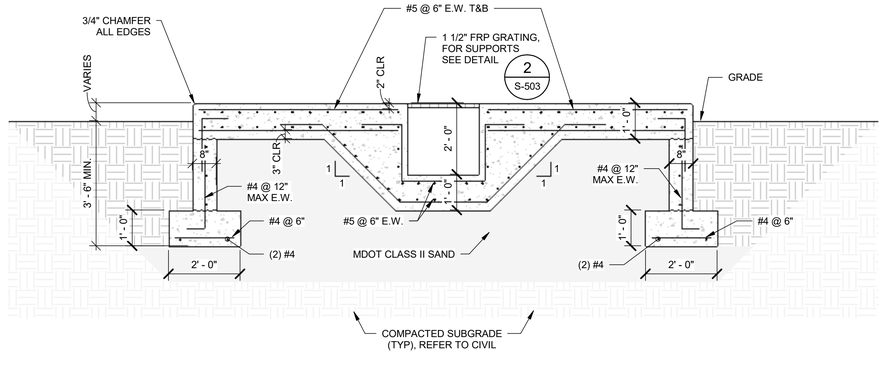
1. GRATING MATERIAL AND THICKNESS TO BE AS SPECIFIED ON PLANS.
2. ALL FRAMES AND ACCESSORIES TO BE AS SHOWN, UNLESS OTHERWISE SPECIFIED.

2 TYP. FRP GRATING DETAIL
SCALE: NTS

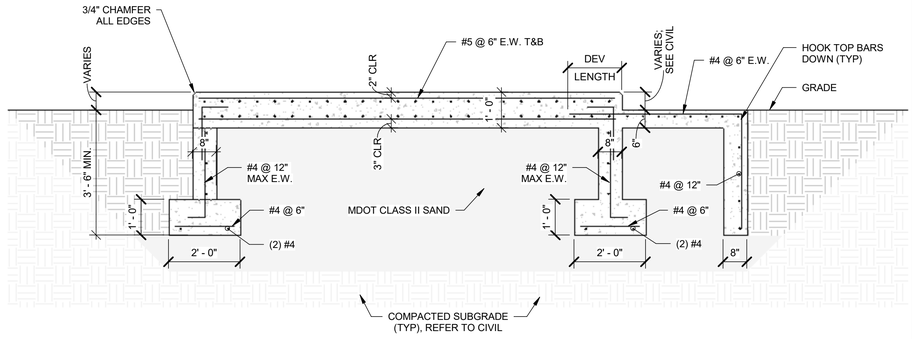


PLAN

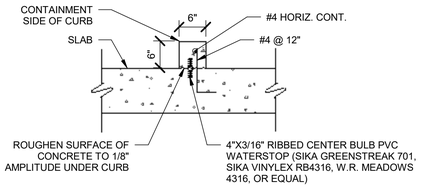
NOTES:
1. COORDINATE PAD DIMENSIONS WITH BUILDING MFR AND CONTRACT DRAWINGS. PROVIDE A BROOM FINISH TO TOP CONCRETE SURFACE.
2. ANCHOR BUILDING TO CONC PER MFR RECOMMENDATIONS.



SECTION A-A



SECTION B-B



3 CONTAINMENT CURB DETAIL
SCALE: NTS

4 EXTERIOR FIBERGLASS BUILDING PAD
SCALE: NTS

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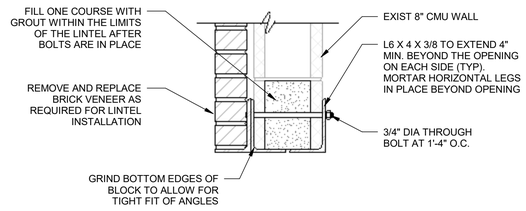
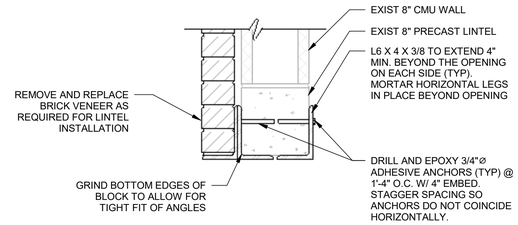


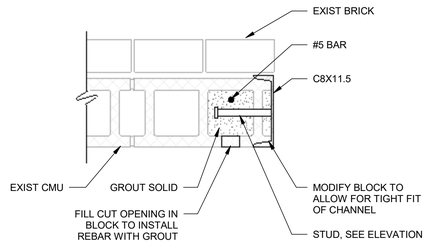
1 RETROFIT LINTEL DETAIL AT CMU

SCALE: NTS



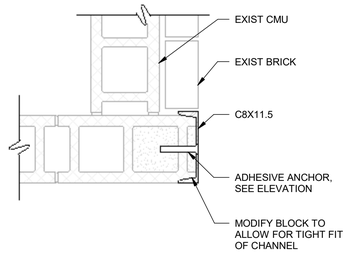
2 RETROFIT LINTEL DETAIL AT PRECAST CONCRETE

SCALE: NTS



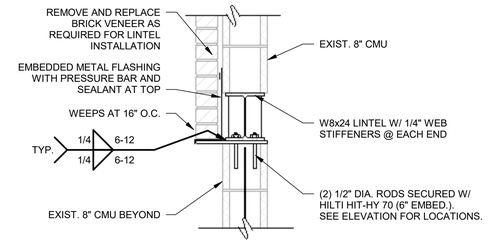
3 SECTION AT RETROFIT DOOR JAMB AT EXISTING HOLLOW CMU

SCALE: NTS



4 SECTION AT RETROFIT DOOR JAMB AT EXISTING GROUTED CMU

SCALE: NTS

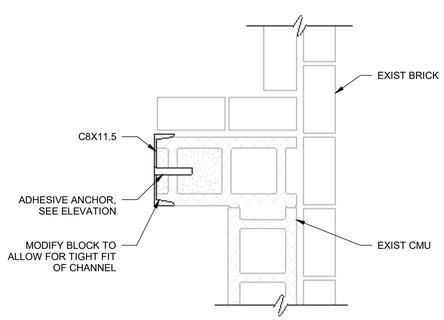


REINF. RETROFIT NOTES:

1. VERIFY EXIST. REINF. LOCATION AND NOTIFY STRUCTURAL ENGINEER.
2. SECURE NEW REINF. W/ TIES AND SPACERS.
3. FORM INSIDE FACE OF CMU AND FILL CELLS W/ GROUT IN 4' LIFTS.
4. CUT/REMOVE EXIST. BOND BEAM AS REQ'D FOR CONT. VERT. REBAR.
5. ENSURE NO CONCENTRATED LOADS ARE OCCURING ABOVE OPENING.
6. CONTRACTOR TO SHORE WALL ABOVE OPENING AS NEEDED TO PREVENT CRACKING.
7. NEW LINTEL CANNOT BE INSTALLED UNTIL CMU BELOW BEARING IS GROUTED AND CURED IN PLACE.

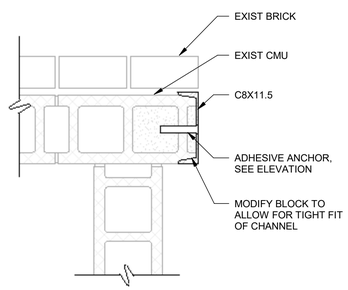
5 LINTEL IN EXIST. 8" CMU WALL

SCALE: NTS



6 SECTION AT RETROFIT DOOR JAMB AT EXISTING GROUTED CMU NEAR EXTERIOR INTERSECTION

SCALE: NTS



7 SECTION AT RETROFIT DOOR JAMB AT EXISTING GROUTED CMU NEAR INTERIOR INTERSECTION

SCALE: NTS

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MARK	DATE	DESCRIPTION
	11/29/23	ISSUED FOR BID

BY

CITY OF KALAMAZOO, MICHIGAN

WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

STANDARD DETAILS

PROJ:	200-19743-19004
DESN:	AJF
DRWN:	GJZ
CHKD:	TJM

S-504

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Bar measures 1 inch, otherwise drawing is not to scale

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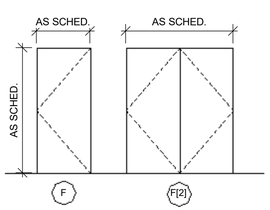
DOOR SCHEDULE

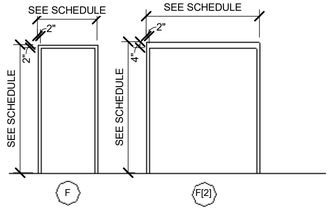
PUMP STATION NO.	DOOR NO.	STC RATING	DOOR						FRAME			DETAILS			HARDWARE SET	COMMENTS
			TYPE	SIZE WIDTH	SIZE HEIGHT	SIZE THICKNESS	MATERIAL	FINISH	TYPE	MATERIAL	FINISH	HEAD	JAMB	SILL		
PUMP STATION NO. 3	3-1		F	3'-0"	7'-0"	1 3/4"	FRP	FACTORY FINISH	F	FRP	FACTORY FINISH	3 / S-601	2 / S-601	1 / S-601	1	1
PUMP STATION NO. 3	3-2		F[2]	3'-0"	7'-0"	1 3/4"	FRP	FACTORY FINISH	F2	FRP	FACTORY FINISH	3 / S-601	2 / S-601	1 / S-601	2	1
PUMP STATION NO. 8	8-1		F[2]	3'-0"	7'-0"	1 3/4"	FRP	FACTORY FINISH	F2	FRP	FACTORY FINISH	3 / S-601	2 / S-601	1 / S-601	2	
PUMP STATION NO. 9	9-1		F[2]	3'-0"	7'-0"	1 3/4"	FRP	FACTORY FINISH	F2	FRP	FACTORY FINISH	3 / S-601	2 / S-601	1 / S-601	2	1
PUMP STATION NO. 11	11-1		F[2]	3'-0"	7'-0"	1 3/4"	FRP	FACTORY FINISH	F2	FRP	FACTORY FINISH	3 / S-601	2 / S-601	1 / S-601	2	1
PUMP STATION NO. 12	12-1		F[2]	3'-0"	7'-0"	1 3/4"	FRP	FACTORY FINISH	F2	FRP	FACTORY FINISH	3 / S-601	2 / S-601	1 / S-601	2	
PUMP STATION NO. 14	14-1		F[2]	3'-0"	7'-0"	1 3/4"	FRP	FACTORY FINISH	F2	FRP	FACTORY FINISH	3 / S-601	2 / S-601	1 / S-601	2	
PUMP STATION NO. 22	22-1		OH										2 / S-601			1,2
PUMP STATION NO. 22	22-2		F	3'-0"	7'-0"	1 3/4"	FRP	FACTORY FINISH	F	FRP	FACTORY FINISH	3 / S-601	2 / S-601	1 / S-601	1	1
PUMP STATION NO. 22	22-3		F[2]	3'-0"	7'-0"	1 3/4"	FRP	FACTORY FINISH	F2	FRP	FACTORY FINISH	3 / S-601	2 / S-601	1 / S-601	2	
PUMP STATION NO. 39	39-1		F[2]	3'-0"	7'-0"	1 3/4"	FRP	FACTORY FINISH	F2	FRP	FACTORY FINISH	3 / S-601	2 / S-601	1 / S-601	2	1
PUMP STATION NO. 39	39-2		F[2]	3'-0"	7'-0"	1 3/4"	FRP	FACTORY FINISH	F2	FRP	FACTORY FINISH	3 / S-601	2 / S-601	1 / S-601	2	1

NOTE:

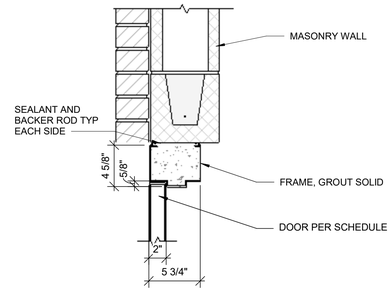
1. FIELD VERIFY DOOR OPENING SIZE.
2. REMOVE AND REINSTALL DOOR AND JAMBS AS REQUIRED TO REPLACE LINTEL.



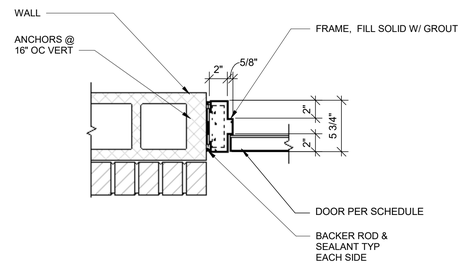
DOOR TYPES
SCALE: 1/4" = 1'-0"



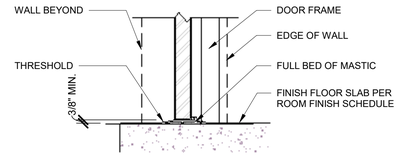
DOOR FRAME TYPES
SCALE: 1/4" = 1'-0"



3 S-601 HEAD @ CMU
SCALE: 1 1/2" = 1'-0"



2 S-601 JAMB @ CMU
SCALE: 1 1/2" = 1'-0"



1 S-601 DOOR SILL
SCALE: 1 1/2" = 1'-0"

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

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

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MARK	DATE	DESCRIPTION
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BY

CITY OF KALAMAZOO, MICHIGAN

WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

DOOR SCHEDULE AND DETAILS

PROJ:	200-19743-19004
DESN:	Designer
DRWN:	Author
CHKD:	Checker

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1 S-901 PS NO. 3 - FLOOR REPAIR
SCALE: NTS

2 S-901 PS NO. 3 - DOUBLE TEE
SCALE: NTS

3 S-901 PS NO. 3 - BASEMENT WALL
SCALE: NTS

4 S-901 PS NO. 3 - BASEMENT WALL WEST
SCALE: NTS

5 S-901 PS NO. 4 - BASEMENT WALL CONCRETE REPAIR
SCALE: NTS

6 S-901 PS NO. 9 - PLATFORM REPAIR
SCALE: NTS

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PHOTOS

PROJ:	200-19743-19004
DESN:	AJF
DRWN:	AVZ
CHKD:	TJM

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Bar measures 1 inch, otherwise drawing is not to scale

1 S-902 PS NO. 14 - SLAB VOID LOOKING SOUTH
SCALE: NTS

2 S-902 PS NO. 14 - SLAB VOID LOOKING NORTH
SCALE: NTS

3 S-902 PS NO. 24 - PLATFORM REPAIR
SCALE: NTS

4 S-902 PS NO. 24 - STAIR REPAIR
SCALE: NTS

5 S-902 PS NO. 24 - BASEMENT STAIRS AND LADDER
SCALE: NTS

6 S-902 PS NO. 25 - PLATFORM REPAIR
SCALE: NTS

7 S-902 PS NO. 39 - PLATFORM REPAIR
SCALE: NTS

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PHOTOS

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Bar measures 1 inch, otherwise drawing is not to scale

GENERAL NOTES (ALL DRAWINGS):

1. THESE GENERAL NOTES PRESENT AND/OR SUMMARIZE KEY PROJECT INFORMATION FOR THE DRAWINGS. FOR ADDITIONAL INFORMATION REFER TO DRAWING NOTES AND PROJECT SPECIFICATIONS FOR FURTHER DETAILS AND REQUIREMENTS.
2. ALL EXISTING DIMENSIONS SHOWN WITH THE (+/-) SYMBOL ARE APPROXIMATE AND SHALL BE FIELD VERIFIED BY THE CONTRACTOR BEFORE FABRICATION AND CONSTRUCTION.
3. THE INTENT OF THE DRAWINGS IS THAT THE CONTRACTOR SHALL FURNISH ALL LABOR, MATERIALS, TOOLS, EQUIPMENT AND TRANSPORTATION NECESSARY FOR THE PROPER EXECUTION OF THE WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS AND ALL INCIDENTAL WORK NECESSARY TO COMPLETE THE PROJECT IN AN ACCEPTABLE MANNER, READY FOR USE BY THE OWNER.
4. THE CONTRACTOR SHALL REVIEW AND COORDINATE THE SCHEDULING OF ALL CONSTRUCTION WITH THE OWNER AND SUBMIT DETAILED CONSTRUCTION SCHEDULE PRIOR TO BEGINNING WORK.
5. ALL GENERAL NOTES APPLY TO THE SCOPE OF THIS TOTAL PROJECT.
6. THE GENERAL CONTRACTOR SHALL ENSURE THAT ALL CONSTRUCTION MEETS OR EXCEEDS APPLICABLE CODES AND STANDARD PRACTICES, INCLUDING ALL FEDERAL, STATE AND LOCAL BUILDING AND ACCESSIBILITY REQUIREMENTS AND REGULATIONS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY VIOLATION OF THE SAME AND SHALL MAKE ALL WORK ACCEPTABLE TO THE AUTHORITY HAVING JURISDICTION INVOLVED WITHOUT EXTRA CHARGE.
7. EACH TRADE SHALL VERIFY ALL REQUIREMENTS PERTAINING TO WORK PERFORMED IN THE PROJECT AND ANY REQUIRED PERMITS. ALL SUBCONTRACTORS SHALL DIRECT QUESTIONS, CHANGES OR REQUESTS THROUGH THE GENERAL CONTRACTOR. THE GENERAL CONTRACTOR SHALL SUBMIT ALL REQUESTS, CHANGES OR QUESTIONS TO THE OWNER'S REPRESENTATIVE IN WRITING.
8. THE CONTRACTOR IS RESPONSIBLE FOR ALL FEDERAL, STATE, AND LOCAL CODE REVIEW, PERMITTING AND ASSOCIATED FEES.
9. THE CONTRACTOR SHALL MEET ALL OCCUPATIONAL SAFETY AND HEALTH STANDARDS (OSHA), PART 1910 AND EQUIVALENT MIOSHA AND FEDERAL STANDARDS.
10. PROVIDE ADEQUATE PROTECTION TO PREVENT DAMAGE TO ADJACENT STRUCTURES.
11. CONTRACTOR SHALL COORDINATE WITH OWNER AND ENGINEER FOR ALL RELOCATING AND REROUTING OF EQUIPMENT, PIPING, CONDUIT, ETC.
12. ALL HARDWARE TO BE 304 STAINLESS STEEL, UNLESS INDICATED TO BE 316 STAINLESS STEEL, INCLUDING NUTS, BOLTS, WASHERS, ANCHORS, STRUTS, ETC. THIS NOTE HAS PRECEDENCE OVER ALL DRAWINGS, DETAILS, AND PROJECT MANUAL/SPECIFICATIONS.
13. PROVIDE TEMPORARY SUPPORTS AS REQUIRED FOR INSTALLATION OF ALL NEW PIPES AND UTILITIES. PROVIDE PERMANENT PIPE SUPPORTS, WALL HANGERS, AND FASTENERS IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS. SUPPORTING DEVICES ARE NOT SHOWN ON DRAWINGS.
14. ALL EXISTING SITE CONDITIONS SHOWN ON THE PLANS ARE FOR REFERENCE ONLY.
15. UTILITIES AS SHOWN HEREIN WERE TAKEN FROM EXISTING PLANS AND ARE APPROXIMATE LOCATIONS ONLY. UTILITY LOCATIONS HAVE NOT BEEN FIELD VERIFIED. CONTRACTOR IS RESPONSIBLE FOR FIELD VERIFICATION OF ALL UTILITIES. ALL EX. UTILITIES MAY NOT BE SHOWN. COORDINATE WITH EXISTING OWNER DRAWINGS.
16. CONTRACTOR SHALL NOT UTILIZE ANY PAVED ROADWAYS FOR TRACK EQUIPMENT OPERATION OR STORAGE. ALL DAMAGED ROADWAYS CAUSED BY CONTRACTOR TO BE REPAIRED AT CONTRACTORS EXPENSE.
17. THE CONTRACTOR AND SUBCONTRACTOR SHALL MAKE A PERSONAL INVESTIGATION OF THE SITE AND EXISTING SURFACE AND SUBSURFACE CONDITIONS. THE CONTRACTOR IS RESPONSIBLE TO ACQUAINT THEMSELVES WITH CONDITIONS OF THE WORK AREA.
18. ALL DISTURBED AREAS SHALL BE RESTORED.
19. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE TO THE PROPERTY.
20. ALL NEW PIPING AND VALVES SHALL BE PAINTED. VERIFY ALL COLORS WITH OWNER.
21. ALL PIPING, JOINTS, VALVES, ETC. MATERIALS IN CONTACT WITH POTABLE WATER SHALL MEET REQUIREMENTS OF NSF 61 FOR USE WITH MUNICIPAL POTABLE WATER.
22. WHERE INDICATED OR REQUIRED, PIPE OR FITTINGS SHALL BE TAPPED TO RECEIVE SMALL OR SPECIAL FITTINGS FOR CONNECTING PROPOSED CHEMICAL FEED AND/OR SAMPLE PIPING. REQUIRED TAPS SHALL BE PROVIDED AS PART OF THIS WORK.
23. ALL CHEMICAL FEED, SAMPLE, DRAIN, AND VENT PIPING SHALL BE NEW FROM PROPOSED EQUIPMENT TO THE POINT OF CONNECTION, UNLESS OTHERWISE NOTED. ALL CHEMICAL PIPING SHALL BE SCH 80 PVC OR POLYTUBING INSTALLED WITHIN SCH 80 PVC CARRIER PIPE. ANALYZER SAMPLE PIPING SHALL BE COPPER. DRAIN PIPING SHALL BE SCH 80 PVC. SLOPE ANALYZER DRAINS FROM ANALYZER TO OUTLET SHOWN ON DRAWINGS.
24. EQUIPMENT PADS NOT SHOWN ON DRAWINGS. PROVIDE CONCRETE PAD FOR EACH NEW TANK AND PUMP/PUMP SKID. SEE STRUCTURAL FOR DETAIL.
25. PROPOSED PIPING ON PUMP STATION PLAN DRAWINGS REPRESENTS INTENDED PIPE ROUTING ONLY. REFER TO SHEET D-003 FOR REQUIRED PIPING, VALVES AND ACCESSORIES.
26. HEAT TRACE AND INSULATE ALL PROPOSED OUTDOOR WATER, PHOSPHATE CONTAINMENT AND CARRIER PIPING.

GENERAL DEMOLITION NOTES (ALL DRAWINGS):

1. DEMOLITION DRAWINGS MAY NOT SHOW ALL DEMOLITION WORK REQUIRED UNDER THIS CONTRACT. OTHER CONTRACT DRAWINGS MAY ALSO SHOW DEMOLITION WORK.
2. SITE INVESTIGATION PRIOR TO BIDS IS STRONGLY RECOMMENDED TO DETERMINE THE COMPLETE EXTENTS OF DEMOLITION REQUIRED. THESE DRAWINGS DO NOT INDICATE ALL MATERIALS THAT ARE TO BE REMOVED OR REROUTED IN AREA OF PROPOSED WORK.
3. PRIOR TO STARTING WORK THE DEMOLITION CONTRACTOR IS TO FIELD VERIFY NOTED AREAS OF DEMOLITION TO DETERMINE ACTUAL SCOPE OF DEMOLITION, AND TO REVIEW SCOPE WITH THE OWNER'S REPRESENTATIVE TO CONFIRM SPECIFIC ITEMS TO BE SALVAGED AND STORED FOR REUSE.
4. COORDINATE WITH OWNER DURING ANY INTERRUPTION OF SERVICE, SO THAT THAT OPERATION OF THE PROCESS EQUIPMENT IS NOT EFFECTED. REVIEW WORK ITEMS WITH ENGINEER PRIOR TO PERFORMING WORK.
5. PRIOR TO THE START OF ANY DEMOLITION WORK, COORDINATE WITH OWNER THE LOCATION OF ALL UTILITIES. PLANT LOCK OUT/TAG OUT PROCEDURES SHALL BE STRICTLY FOLLOWED.
6. EXPANSION AND ANCHOR BOLTS REMAINING IN WALL, CEILINGS OR FLOORS SHALL BE POUNDED OR CUT FLUSH WITH SURFACE. IN FINISHED AREAS THEY SHALL BE RECESSED AND PATCHED TO MATCH EXISTING FINISH.
7. ALL OPENINGS REMAINING IN FLOORS, WALLS, OR CEILINGS, INCLUDING SLEEVES, AFTER PIPING AND DUCT DEMOLITION SHALL BE PATCHED TO MATCHING EXISTING FINISH AND AS DETAILED ON DRAWINGS. PENETRATION IN CHANNELS AND TANK WALLS ARE TO BE PATCHED AND SEALED WATER TIGHT. PENETRATIONS BETWEEN AREAS LABELED NEMA 4 AND NEMA 7 SHALL BE SEALED AIR TIGHT.
8. CAP AND BLIND FLANGE MATERIAL TO BE SAME AS PIPE BEING CAPPED.
9. PROMPTLY PATCH AND REPAIR DAMAGE CAUSED TO ADJACENT BUILDING ELEMENTS BY DEMOLITION WORK. RESTORE EXPOSED FINISHES OF PATCHED AREAS IN A MANNER THAT ELIMINATES EVIDENCE OF PATCHING AND REFINISHING.
10. OWNER RESERVES RIGHT TO RETAIN ANY EQUIPMENT OR MATERIALS REMOVED UNDER THIS CONTRACT. CONTRACTOR IS RESPONSIBLE TO HAUL AND DISPOSE OF OFFSITE ALL REMAINING REMOVED EQUIPMENT, MATERIAL, PIPING, CONDUIT, SOILS AND DEBRIS, NOT RETAINED BY OWNER, IN ACCORDANCE WITH ALL APPLICABLE CODES, LAWS, AND ORDINANCES.
11. WHEN EQUIPMENT ITEMS ARE INDICATED FOR DEMOLITION, ALL ANCILLARY UTILITIES, PIPING, ELECTRICAL ITEMS, CONCRETE SUPPORTS AND STRUCTURAL STEEL SUPPORTS SHALL BE COMPLETELY REMOVED UNLESS INDICATED OTHERWISE. ALL THE ABOVE MENTIONED ITEMS MAY NOT BE INDICATED ON THE DRAWINGS. SITE VISIT PRIOR TO BID DATE IS RECOMMENDED TO QUANTIFY COMPLETE EXTENT OF EQUIPMENT DEMOLITION.
12. CONCRETE FLOOR SLABS UNDER DEMOLISHED CONCRETE EQUIPMENT PADS, THAT WILL BE EXPOSED IN THE FINISHED CONSTRUCTION SHALL BE PATCHED SMOOTH AND ANY DOWELS OR ANCHORS SHALL BE CUT OFF 2" BELOW THE SURFACE AND PATCHED SMOOTH. IF REQUIRED, EXISTING FLOOR SURFACE SHALL BE CHIPPED OR ROUGHENED AND PATCH APPLIED OVER BONDING AGENT.
13. ALL PIPING SHOWN AS BEING DEMOLISHED SHALL BE COMPLETELY REMOVED INCLUDING INSULATION, HANGERS, EXPANSION AND ANCHOR BOLTS AND PIPE SUPPORTS. CAP PIPES LEFT IN PLACE AS REQUIRED. CONTRACTOR SHALL REMOVE PIPE CONTENTS AS WELL WHICH MAY CONTAIN WATER, SLUDGE, WASTEWATER, ETC.
14. FLOORS, WALLS, AND CEILING SURFACES ARE TO BE CLEANED IN EACH AREA AFTER DEMOLITION IS COMPLETE. SURFACES SCHEDULED FOR PAINTING OR PROTECTIVE COATING SHALL BE WET BRUSHED, SCRAPED, SWEPT, ETC. AS REQUIRED TO REMOVE DIRT, LOOSE CRYSTAL, SCALE, RUST, AND DUST PRIOR TO COATING. FLOORS ARE TO BE POWER WASHED.
15. FLOOR DRAINS SHALL BE PROTECTED FROM DIRT AND DEBRIS.
16. PIPE TO BE REMOVED AND REPLACED IS TO BE REPLACED IN KIND UNLESS NOTED OTHERWISE.
17. CONTRACTOR SHALL REMOVE AND DISPOSE OF ALL MATERIALS GENERATED DURING DEMOLITION WORK.
18. DO NOT LEAVE ANY OPENINGS UNCOVERED AT END OF WORKING DAY, DURING WIND-DRIVEN PRECIPITATION, OR DURING EXCESSIVELY COLD WEATHER.
19. EXISTING SODIUM HEXAMETAPHOSPHATE SYSTEM SHALL REMAIN OPERATIONAL UNTIL NEW CHEMICAL SYSTEM IS TESTED AND APPROVED AND COORDINATED WITH OWNER.

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MARK	DATE	DESCRIPTION
	11/29/23	ISSUED FOR BID

CITY OF KALAMAZOO, MICHIGAN

PROCESS & EQUIPMENT GENERAL NOTES AND DEMOLITION NOTES

Project No.:	200-19743-19004
Designed By:	NR
Drawn By:	SG
Checked By:	VC

D-001

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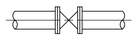
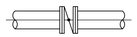
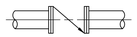
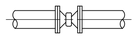
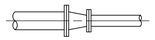
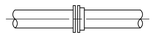
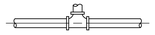
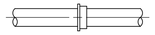
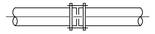
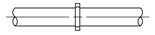
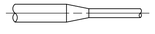
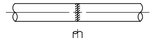
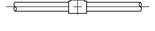
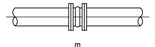
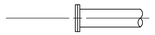
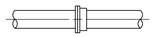
Bar Measures 1 inch

11/28/2023 11:12:29 AM - O:\PROJECTS\ANN ARBOR\IER\197431200-19743-19004\CAD\SHEETFILES\D-001 PROCESS & EQUIPMENT GENERAL NOTES AND DEMOLITION NOTES.DWG - GUARD, STEVEN

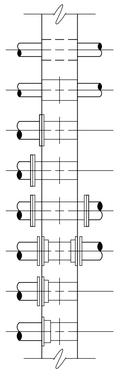
VALVE DESIGNATIONS

SYMBOL: PIPEWORK DRAWINGS	SYMBOL: FLOW DIAGRAMS	MARK	TYPE
		A	GATE VALVE
		B	BUTTERFLY VALVE
		CC	CUSHION CHECK VALVE
		P	PLUG VALVE
		BV	BALL VALVE
		BP	BACK PRESSURE VALVE

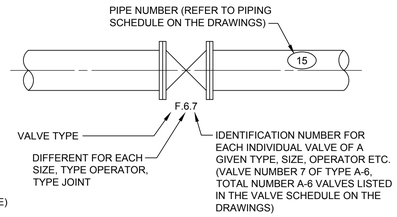
JOINT DESIGNATIONS

SYMBOLS	MARK	TYPE
	FJ	FLANGED JOINT
	MJ	MECHANICAL JOINT
	SJ	SCREWED JOINT
	POJ	PUSH ON JOINT
	BFC	BOLTED FLEXIBLE COUPLING
	GC	GROOVED COUPLING
	WJ	SHOP WELDED JOINT (STEEL PIPE)
	FWJ	FIELD WELDED JOINT (STEEL PIPE)
	STJ	SOCKET TYPE JOINT (FRP OR PVC PIPE)
	EJ	EXPANSION JOINT
	BF	BLIND FLANGE
	AFC	ADAPTER FLANGE COUPLING

SLEEVE AND WALL PIPE DESIGNATIONS

SYMBOL	DESCRIPTION
	CORED HOLE IN EXISTING WALL
	WALL SLEEVE W/WATER COLLAR (STANDARD)
	FLANGE X PLAIN END WALL PIPE
	FLANGE X PLAIN END WALL PIPE
	FLANGE X FLANGE WALL PIPE
	MECHANICAL JOINT X MECHANICAL JOINT WALL PIPE
	MECHANICAL JOINT X PLAIN END WALL PIPE
	PUSH ON BELL JOINT X PLAIN END WALL PIPE

VALVE & PIPE IDENTIFICATION



PIPING AND EQUIPMENT SYMBOLS

(SCHEMATICS ONLY)

SYMBOL	DESCRIPTION
VTR	VENT TO ROOF
	ELBOW UP
	ELBOW DOWN
	TEE UP
	TEE DOWN
	REDUCER
	WYE STRAINER
	UNION
	FLEX CONNECTION
	CAM LOCK CONNECTION
FD	FLOOR DRAIN
ED	EQUIPMENT DRAIN
CO	CLEANOUT-FLOOR
CO	CLEANOUT-HORIZONTAL
	FLANGED TANK OUTLET
D	PIPE TO DRAIN
	FLOW METER XX = M = MAGNETIC
D	VALVE WITH DIAPHRAGM SEAL
	PRESSURE SAFETY VALVE
XX - YY	PRESSURE GAUGE XX - YY = RANGE Z = D = GAUGE WITH DIAPHRAGM = P = GAUGE WITH PULSATION DAMPENER
	PUMP
	METERING PUMP
S	SOLENOID
	CALIBRATION CHAMBER
	PULSATION DAMPENER

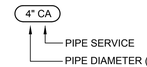
HATCHING LEGEND

ASPHALT OR CONCRETE SURFACE (SIDEWALK OR ROADWAY)	PRECAST CONCRETE
ROADWAY/SIDEWALK OPEN CUT RESURFACE	GROUT
SODDED OR SEEDED AND MULCHED AREA OR EXISTING WETLAND	CONCRETE UNIT MASONRY (PLAN)
EARTH	CONCRETE SLAB
EXISTING PIPES, STRUCTURES, EQUIPMENT TO BE DEMOLISHED	PROPOSED STRUCTURE
EXISTING CONCRETE TO BE DEMOLISHED	GRATING

MECHANICAL/DRAFTING LEGEND

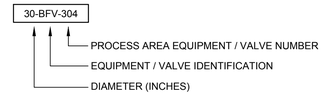
	EXISTING	PROPOSED
VISIBLE LINE		
HIDDEN LINE		
CENTER LINE		
PHANTOM LINE		
MATCHLINE		
BREAK LINE		
DIMENSION LINES AND LEADERS		

PIPING TAGS

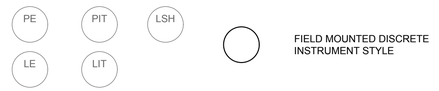


SERVICE	ABBREVIATION
CHLORINE	CL
COMPRESSED AIR	CA
DRAIN	DR
SAMPLE	SA
STORM DRAIN	SD
POTABLE WATER	PW

VALVE/EQUIPMENT TAGS



INSTRUMENT SYMBOLS



PIPING AND VALVES GENERAL NOTES

1. INSTALL ALL PIPING SUPPORTS AND PIPING IN ACCORDANCE WITH THE LATEST EDITION OF THE ASME ANSI POWER PIPING CODE B 31.1.
2. LOCATE PRESSURE TAPS ON THE TOP OF PROCESS PIPES OR AS APPROVED IN ACCESSIBLE LOCATION.
3. LOCATE SAMPLE TAPS ON THE SIDE OF PROCESS PIPES.
4. LOCATE DRAIN TAPS ON THE BOTTOM OF PROCESS PIPES.
5. UNLESS OTHERWISE NOTED PIPE ELEVATIONS SHOWN ON PIPING DRAWINGS REFER TO CENTERLINE OF THE PIPE.
6. ALL GROUND BURIED PIPING TO HAVE A MINIMUM OF 5'-6" OF EARTH COVER OR AS DETAILED ON THE DRAWINGS. MAINTAIN MINIMUM CLEARANCE BETWEEN PIPES OF 6".
7. INSTALL ALL PLUG, BUTTERFLY AND BALL VALVES WITH THE SHAFT IN THE HORIZONTAL POSITION, UNLESS OTHERWISE DIRECTED.
8. ALL HARDWARE SHALL BE 304 STAINLESS STEEL, THIS INCLUDES ANCHOR BOLTS, NUTS, BOLTS, WASHERS, STRUT, HANGERS, ETC.
9. ALL EQUIPMENT LOCATED ON GRADE OR FLOOR CONCRETE SLAB PROVIDE HOUSEKEEPING/EQUIPMENT PAD. SEE STRUCTURAL FOR DETAILS.
10. EQUIPMENT OR PANELS MOUNTED TO WALLS OR FREE STANDING MOUNT WITH 304 STAINLESS STEEL UNISTRUT. SEE ELECTRICAL FOR TYPICAL DETAIL.
11. HEAT TRACE AND INSULATE ALL PROPOSED OUTDOOR WATER, PHOSPHATE CONTAINMENT AND CARRIER PIPING.

PROCESS ABBREVIATIONS

AIR	LOW PRESSURE AIR
BP	BYPASS
CE	CHLORINATED EFFLUENT
CIP	CLEAN IN PLACE
CON	CONCENTRATE
D	DRAIN
FE	FILTER EFFLUENT
FI	FILTER INFLUENT
FTW	FILTER TO WASTE
HS	HIGH SERVICE
N.C.	NORMALLY CLOSED
N.O.	NORMALLY OPEN
OF	OVERFLOW
PO	POLY-ORTHOPHOSPHATE
PW	POTABLE WATER
RC	RECYCLED
RW	RAW WATER
SAM	SAMPLE
SPD	SUMP PUMP DISCHARGE
SWW	SURFACE WASHWATER
V	VENT
W	WATER MAIN
WTP	WATER TREATMENT PLANT
WW	WASTEWATER

SYSTEM MONITORING SYMBOLS

- LIT — LEVEL ELEMENT / TRANSMITTER
- PIT — PRESSURE ELEMENT / TRANSMITTER
- POA — ORTHO-PHOSPHATE ANALYZER
- PSH — PRESSURE SWITCH HIGH

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MARK	DATE	DESCRIPTION
	11/29/23	ISSUED FOR BID

BY

CITY OF KALAMAZOO, MICHIGAN

PROCESS & EQUIPMENT LEGEND

Project No.:	200-19743-19004
Designed By:	NR
Drawn By:	SG
Checked By:	VC

D-002

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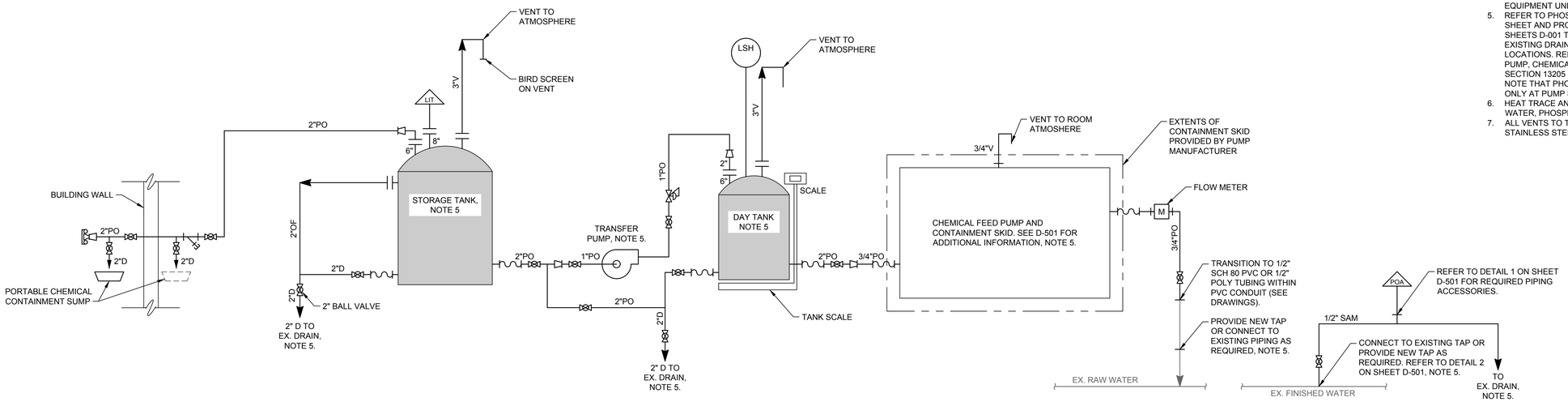
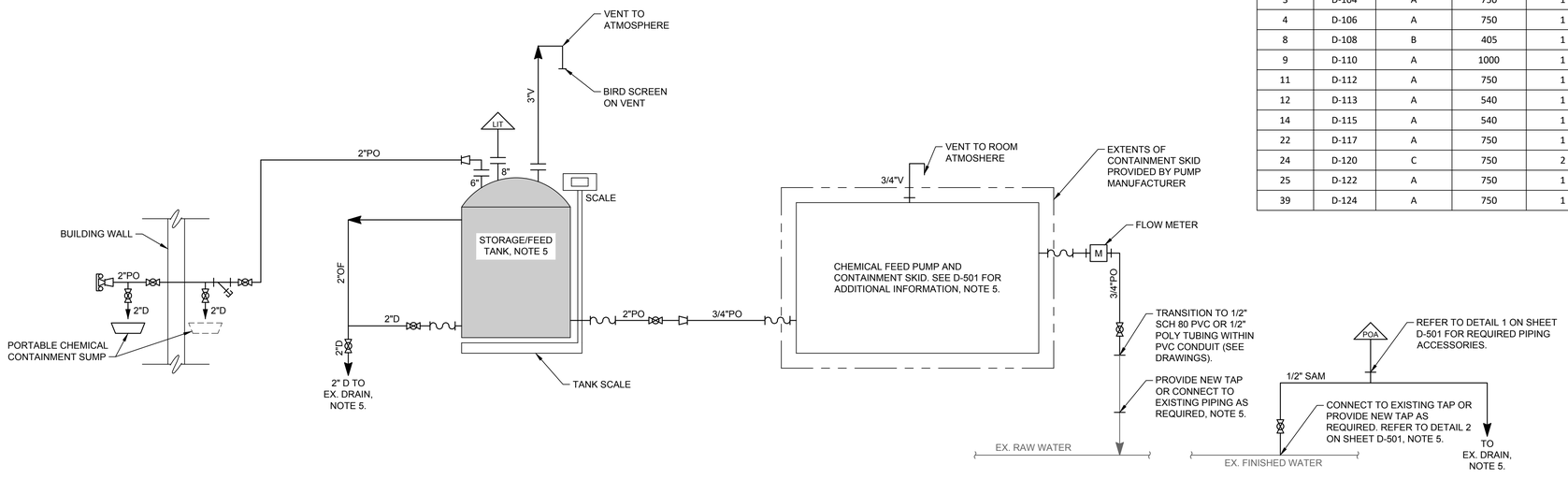
NOTES (TYP. ALL SCHEMATICS):

1. ALL VALVE AND FITTINGS SEALS AND O-RINGS SHALL BE SUITABLE FOR CHEMICAL USED.
2. ALL CHEMICAL PIPING AND VALVES SHALL BE SCH 80 CPVC.
3. UNIONS NOT SHOWN FOR CLARITY.
4. METERING PUMPS AND ASSOCIATED PIPING, VALVES, AND ACCESSORIES SHALL BE MOUNTED ON CONTAINMENT SKID. EQUIPMENT AND PIPING SHALL BE FACTORY MOUNTED. ALL ITEMS ON PUMP CONTAINMENT SKID BY PUMP MANUFACTURER. PROVIDE MANUFACTURER STANDARD EQUIPMENT UNLESS OTHERWISE INDICATED.
5. REFER TO PHOSPHATE FEED SHEMATIC SCHEDULE THIS SHEET AND PROCESS & EQUIPMENT PUMP STATION PLANS, SHEETS D-001 THROUGH D-114 FOR CONNECTIONS TO EXISTING DRAINS, FEED LOCATIONS, AND SAMPLE LOCATIONS. REFER TO SECTION 11243 FOR TRANSFER PUMP, CHEMICAL FEED PUMP, AND SCALE SCHEDULE AND SECTION 13205 FOR CHEMICAL STORAGE TANK SCHEDULE. NOTE THAT PHOSPHATE ANALYZERS WILL BE INSTALLED ONLY AT PUMP STATIONS 1, 3 AND 8.
6. HEAT TRACE AND INSULATE ALL PROPOSED OUTDOOR WATER, PHOSPHATE CONTAINMENT AND CARRIER PIPING.
7. ALL VENTS TO THE ATMOSPHERE MUST BE EQUIPPED WITH STAINLESS STEEL BIRD SCREEN MESH COVERS.



PHOSPHATE FEED SCHEMATIC A - STORAGE & DAY TANK SYSTEMS

PHOSPHATE FEED SCHEMATIC SCHEDULE						
PUMP STATION NO.	PLAN SHEET	PHOSPHATE FEED SCHEMATIC	STORAGE TANK CAPACITY (GAL)	NUMBER OF STORAGE TANKS	DAY TANK CAPACITY (GAL)	PHOSPHATE ANALYZERS
1	D-102	C	1000	2	105	YES, SEE PLAN SHEET
3	D-104	A	750	1	55	YES, SEE PLAN SHEET
4	D-106	A	750	1	55	NA
8	D-108	B	405	1	N/A	YES, SEE PLAN SHEET
9	D-110	A	1000	1	55	NA
11	D-112	A	750	1	55	NA
12	D-113	A	540	1	55	NA
14	D-115	A	540	1	55	NA
22	D-117	A	750	1	55	NA
24	D-120	C	750	2	55	NA
25	D-122	A	750	1	55	NA
39	D-124	A	750	1	55	NA



PHOSPHATE FEED SCHEMATIC B - COMMON STORAGE/FEED TANK SYSTEMS

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MARK	DATE	DESCRIPTION	BY
	11/29/23	ISSUED FOR BID	

CITY OF KALAMAZOO, MICHIGAN

PROCESS & EQUIPMENT
CHEMICAL FEED SCHEMATICS I

Project No.:	200-19743-19004
Designed By:	NR
Drawn By:	SG
Checked By:	VC

D-003

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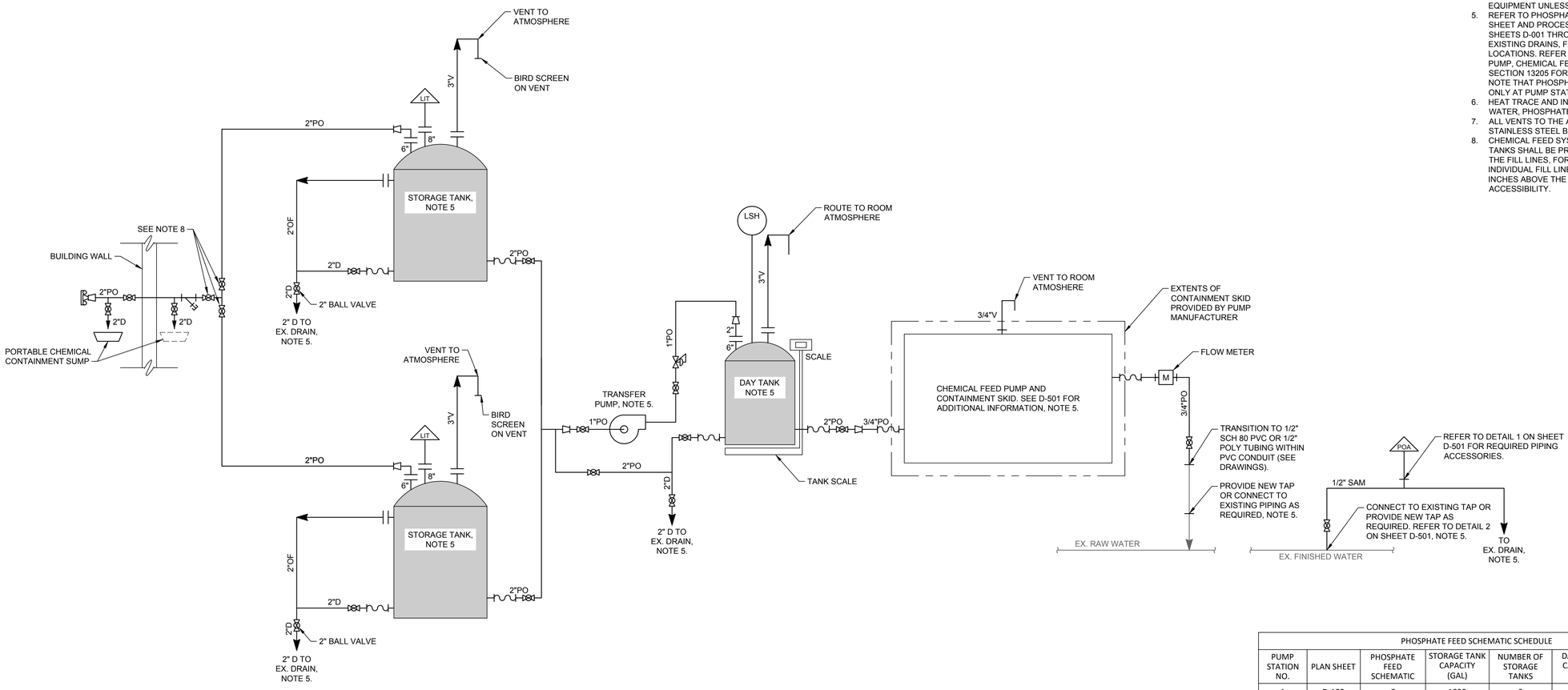

NOTES (TYP. ALL SCHEMATICS):

1. ALL VALVE AND FITTINGS SEALS AND O-RINGS SHALL BE SUITABLE FOR CHEMICAL USED.
2. ALL CHEMICAL PIPING AND VALVES SHALL BE SCH 80 CPVC.
3. UNIONS NOT SHOWN FOR CLARITY.
4. METERING PUMPS AND ASSOCIATED PIPING, VALVES, AND ACCESSORIES SHALL BE MOUNTED ON CONTAINMENT SKID. EQUIPMENT AND PIPING SHALL BE FACTORY MOUNTED. ALL ITEMS ON PUMP CONTAINMENT SKID BY PUMP MANUFACTURER. PROVIDE MANUFACTURER STANDARD EQUIPMENT UNLESS OTHERWISE INDICATED.
5. REFER TO PHOSPHATE FEED SHEMATIC SCHEDULE THIS SHEET AND PROCESS & EQUIPMENT PUMP STATION PLANS, SHEETS D-001 THROUGH D-114 FOR CONNECTIONS TO EXISTING DRAINS, FEED LOCATIONS, AND SAMPLE LOCATIONS. REFER TO SECTION 11243 FOR TRANSFER PUMP, CHEMICAL FEED PUMP, AND SCALE SCHEDULE AND SECTION 13205 FOR CHEMICAL STORAGE TANK SCHEDULE. NOTE THAT PHOSPHATE ANALYZERS WILL BE INSTALLED ONLY AT PUMP STATIONS 1, 3 AND 8.
6. HEAT TRACE AND INSULATE ALL PROPOSED OUTDOOR WATER, PHOSPHATE CONTAINMENT AND CARRIER PIPING.
7. ALL VENTS TO THE ATMOSPHERE MUST BE EQUIPPED WITH STAINLESS STEEL BIRD SCREEN MESH COVERS.
8. CHEMICAL FEED SYSTEMS EQUIPPED WITH TWO BULK TANKS SHALL BE PROVIDED WITH ISOLATION VALVES ON THE FILL LINES, FOR BOTH THE COMMON HEADER AND INDIVIDUAL FILL LINES POSITIONED BETWEEN 36 TO 42 INCHES ABOVE THE FINISHED FLOOR FOR OPERATOR ACCESSIBILITY.

PHOSPHATE FEED SCHEMATIC C - STORAGE & DAY TANK SYSTEMS

PHOSPHATE FEED SCHEMATIC SCHEDULE

PUMP STATION NO.	PLAN SHEET	PHOSPHATE FEED SCHEMATIC	STORAGE TANK CAPACITY (GAL)	NUMBER OF STORAGE TANKS	DAY TANK CAPACITY (GAL)	PHOSPHATE ANALYZERS
1	D-102	C	1000	2	105	YES, SEE PLAN SHEET
3	D-104	A	750	1	55	YES, SEE PLAN SHEET
4	D-106	A	750	1	55	NA
8	D-108	B	405	1	N/A	YES, SEE PLAN SHEET
9	D-110	A	1000	1	55	NA
11	D-112	A	750	1	55	NA
12	D-113	A	540	1	55	NA
14	D-115	A	540	1	55	NA
22	D-117	A	750	1	55	NA
24	D-120	C	750	2	55	NA
25	D-122	A	750	1	55	NA
39	D-124	A	750	1	55	NA

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MARK	DATE	DESCRIPTION
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BY

CITY OF KALAMAZOO, MICHIGAN

PROCESS & EQUIPMENT
CHEMICAL FEED SCHEMATICS II

Project No.: 200-19743-19004
Designed By: NR
Drawn By: SG
Checked By: VC

D-003A

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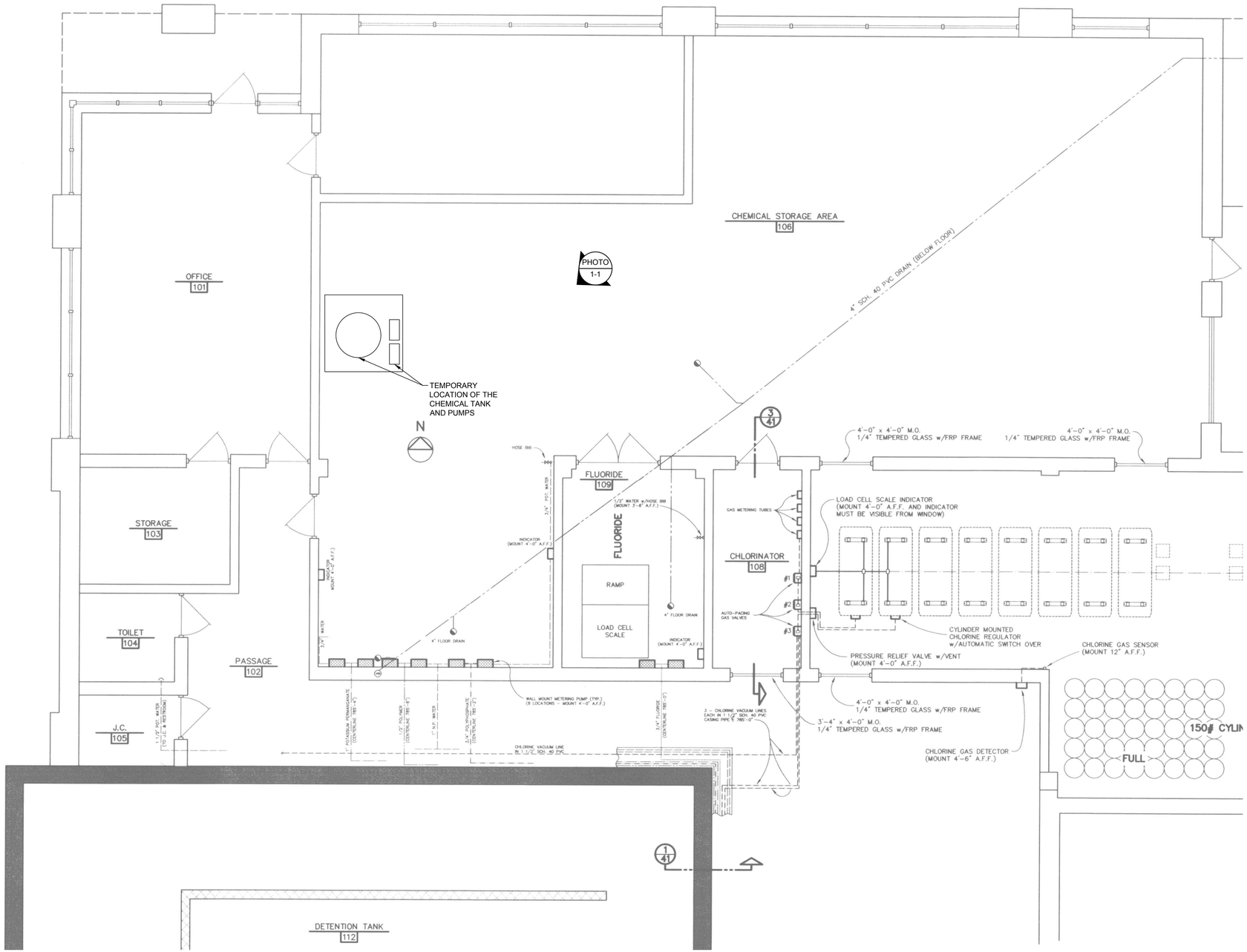

PUMP STATION NO. 1 PLAN
SCALE: 1/8" = 1'-0"

PHOTO 1-1

NOTES:

1. REFER TO STRUCTURAL DRAWINGS FOR ADDITIONAL DEMOLITION ITEMS AND DETAILS.

- TO BE REMOVED

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

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PUMP STATION NO. 1
DEMOLITION PLAN

Project No.:	200-19743-19004
Designed By:	NR
Drawn By:	SG
Checked By:	VC

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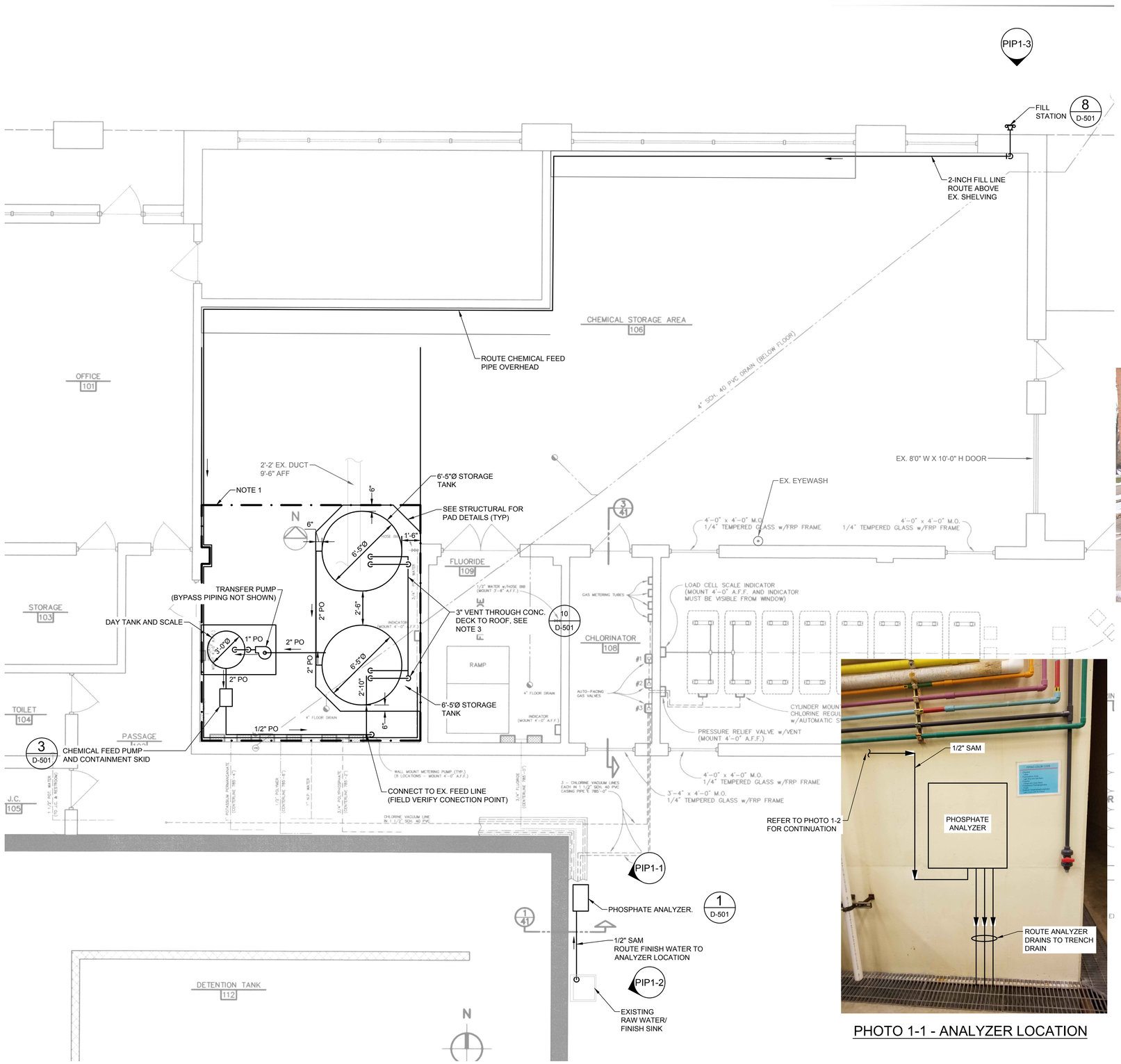
11/28/2023 11:33:10 AM - O:\PROJECTS\ANN ARBOR\IER\197432\200-19743-19004\CAD\SHEETFILES\D-101 PUMP STATION NO. 1 DEMOLITION PLAN.DWG - GUARD, STEVEN



PUMP STATION NO. 1 PLAN

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

NOTES:

1. PROVIDE PROTECTIVE FLOOR COATING TYPE SC3 IN ACCORDANCE WITH SECTION 09960 WITHIN LIMITS SHOWN ON DRAWING. FLOOR COATING SHALL ENCOMPASS EXISTING AND PROPOSED EQUIPMENT BASES. WHEN COATING LIMIT IS BOUND BY A WALL, EXTEND COATING ON WALL A MINIMUM 4-INCHES FROM FINISHED FLOOR. ALL WORK RELATED TO FLOOR COATING SHALL BE INCLUDED IN BID ALTERNATE NO. 1.
2. REFER TO STRUCTURAL SHEETS FOR TANK AND EQUIPMENT PAD DIMENSIONS.
3. CONTRACTOR TO VERIFY LOCATION OF STRANDS IN THE EXISTING ROOF PRECAST PLANKS PRIOR TO CUTTING AND DEMOLITION FOR ROOF OPENING TO AVOID ANY STRUCTURAL FAILURE.
4. HEAT TRACE AND INSULATE ALL PROPOSED OUTDOOR WATER, PHOSPHATE CONTAINMENT AND CARRIER PIPING.
5. CHEMICAL FEED SYSTEMS EQUIPPED WITH TWO BULK TANKS SHALL BE PROVIDED WITH ISOLATION VALVES ON THE FILL LINES, FOR BOTH THE COMMON HEADER AND INDIVIDUAL FILL LINES POSITIONED BETWEEN 36 TO 42 INCHES ABOVE THE FINISHED FLOOR FOR OPERATOR ACCESSIBILITY.
6. REFER TO D-003A FOR PIPE SIZING AND VALVE LOCATIONS.
7. ALL PIPING, VALVES AND FITTINGS ARE NOT SHOWN. CONTRACTOR SHALL PROVIDE ALL PIPING, FITTINGS AND VALVES AS SHOWN ON DRAWINGS D-003, D-003A AND DETAIL 3 ON D-501 TO PRODUCE A COMPLETE AND OPERATIONAL CHEMICAL STORAGE AND FEED SYSTEM.
8. APPROXIMATE LOCATIONS FOR CORE WALL PENETRATIONS FOR THE FILL STATION PIPING AND TANK VENT PIPING ARE SHOWN ON THE PLANS. CONTRACTOR TO SITE VERIFY LOCATION OF CORE WALL PENETRATIONS FOR FILL STATION PIPING AND VENT PIPING PRIOR TO CORE DRILLING.

PHOTO 1-3 - PHOSPHATE FILL STATION

PHOTO 1-1 - ANALYZER LOCATION

PHOTO 1-2 - RAW WATER / FINISH SINK

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

Bar Measures 1 inch

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MARK	DATE	DESCRIPTION
	11/29/23	ISSUED FOR BID

CITY OF KALAMAZOO, MICHIGAN

PUMP STATION NO. 1
PROCESS EQUIPMENT PLAN

Project No.:	200-19743-19004
Designed By:	NR
Drawn By:	SG
Checked By:	VC

D-102

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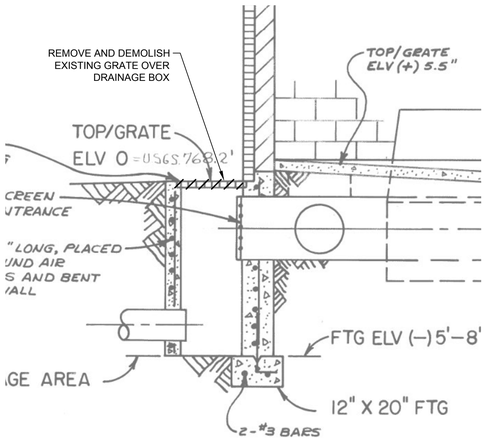
11/28/2023 11:37:51 AM - O:\PROJECTS\ANN ARBOR\IER\19743\200-19743-19004\CAD\SHEETFILES\D-102 PUMP STATION NO. 1 PROCESS EQUIPMENT PLAN.DWG - GUARD, STEVEN

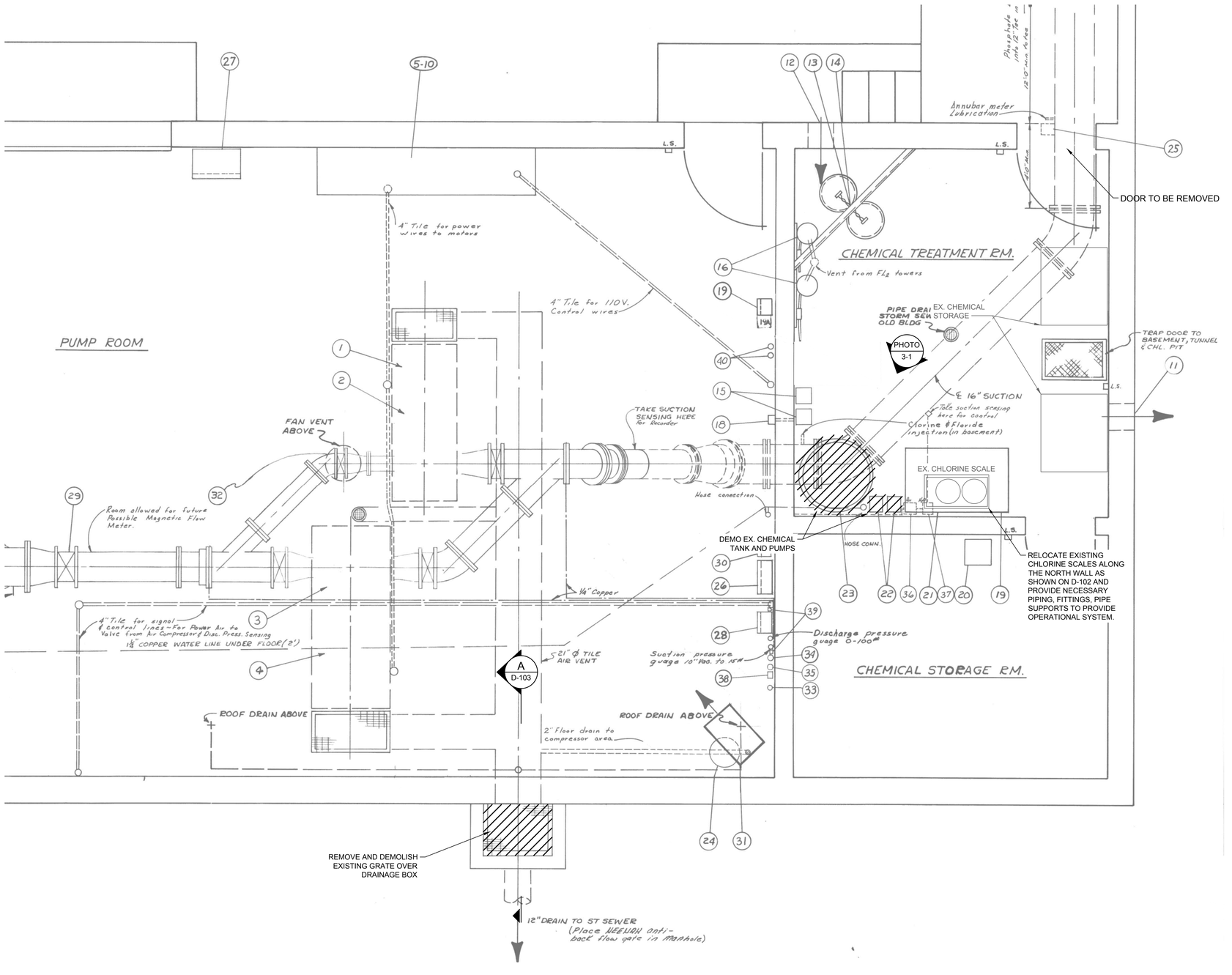


A D-103 SECTION
SCALE: 1/2" = 1'-0"

PHOTO 3-1

NOTES:

1. EXISTING PHOSPHATE CHEMICAL FEED SYSTEM AND TANK TO BE RELOCATED DURING THE INSTALLATION OF THE NEW SYSTEM. EXISTING SHALL NOT BE DEMOLISHED UNTIL THE NEW SYSTEM IS FULLY FUNCTIONAL. ALL RELOCATIONS AND DEMOLITION PLANS WILL NEED TO BE DISCUSSED WITH THE CITY. CONTRACTOR SHALL SCHEDULE A DEMOLITION MEETING FOR EACH STATION TO DISCUSS THE PHASING PLAN WITH THE CITY FOR THEIR APPROVAL PRIOR TO DEMOLITION.
2. REFER TO STRUCTURAL DRAWINGS FOR ADDITIONAL DEMOLITION ITEMS AND DETAILS.



PUMP STATION NO. 3 PLAN
SCALE: 1/2" = 1'-0"

- TO BE REMOVED

0 12' 24' 48'
SCALE: 1/2" = 1'-0"

TETRA TECH
www.tetratech.com
1136 OAK VALLEY DRIVE, SUITE 100
ANN ARBOR, MI 48108
PHONE: (734) 665-6000 FAX: (734) 213-3003

MARK	DATE	DESCRIPTION
	11/29/23	ISSUED FOR BID

BY

CITY OF KALAMAZOO, MICHIGAN

PUMP STATION NO. 3
DEMOLITION PLAN

Project No.:	200-19743-19004
Designed By:	NR
Drawn By:	SG
Checked By:	VC

D-103

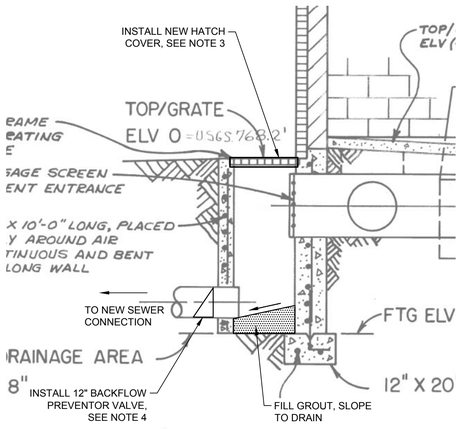
Copyright: Tetra Tech

Bar Measures 1 inch

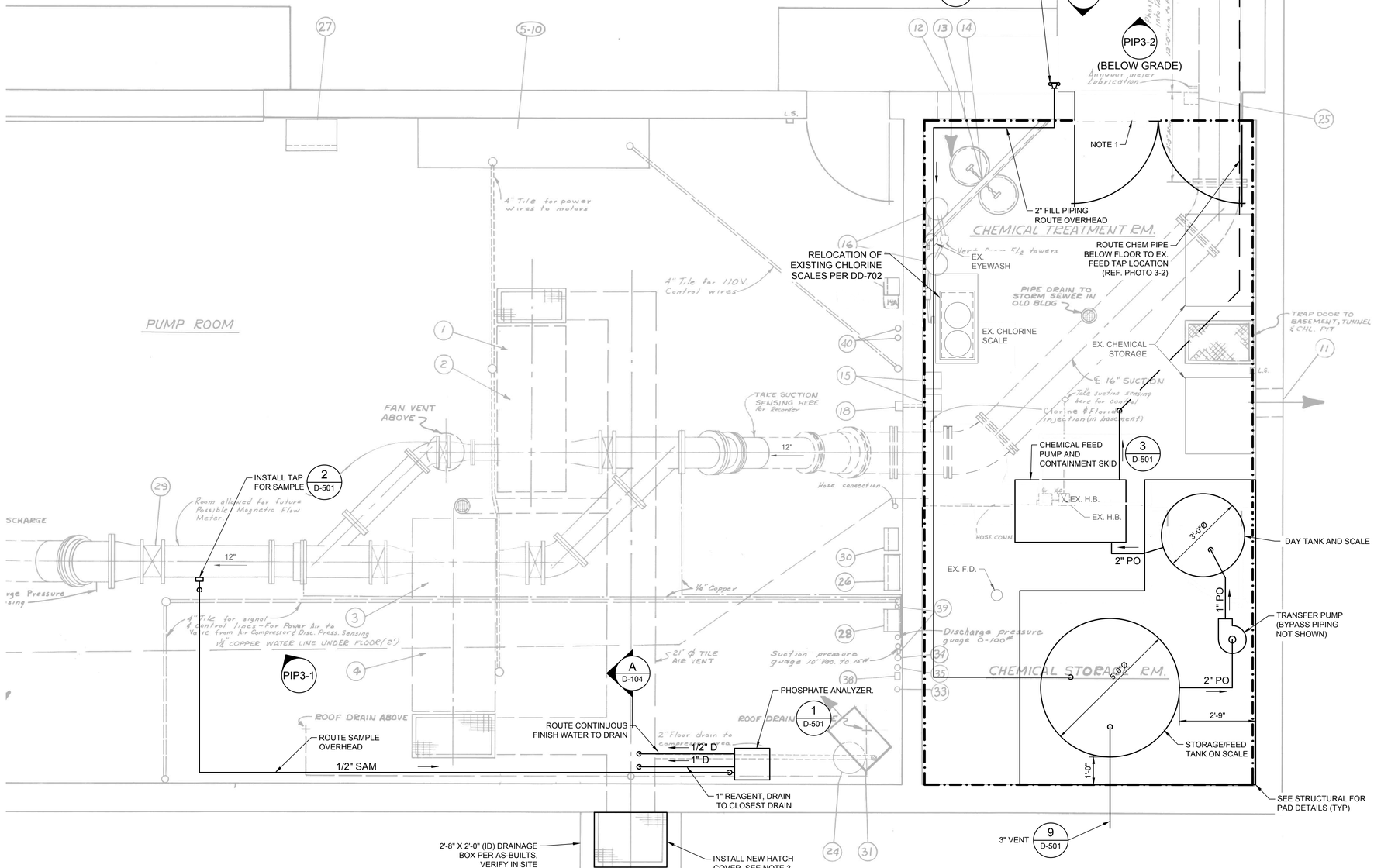
11/28/2023 11:45:33 AM - O:\PROJECTS\ANN ARBOR\IER\19743\200-19743-19004\CAD\SHEETFILES\D-103 PUMP STATION NO. 3 DEMOLITION PLAN.DWG - GUARD, STEVEN

NOTES:

1. PROVIDE PROTECTIVE FLOOR COATING TYPE SC2 IN ACCORDANCE WITH SECTION 09960 WITHIN LIMITS SHOWN ON DRAWING. FLOOR COATING SHALL ENCOMPASS EXISTING AND PROPOSED EQUIPMENT BASES. WHEN COATING LIMIT IS BOUND BY A WALL, EXTEND COATING ON WALL A MINIMUM 4-INCHES FROM FINISHED FLOOR. ALL WORK RELATED TO FLOOR COATING SHALL BE INCLUDED IN BID ALTERNATE NO. 1.
2. HEAT TRACE AND INSULATE ALL PROPOSED OUTDOOR WATER, PHOSPHATE CONTAINMENT AND CARRIER PIPING.
3. REPLACE EXISTING GRATE IN THE 2'-8" X 2'-0" (ID) DRAINAGE BOX WITH A WATER TIGHT COVER. WATER TIGHT HATCH COVER SHALL BE HALLIDAY SERIES F1R OR ENGINEER APPROVED EQUAL.
4. INSTALL NEW 12" BACKFLOW PREVENTOR VALVE BY RED VALVE TIDEFLEX (MODEL CHECKMATE® ULTRAFLEX® INLINE CHECK VALVE) OR ENGINEER APPROVED EQUAL.
5. ALL PIPING, VALVES AND FITTINGS ARE NOT SHOWN. CONTRACTOR SHALL PROVIDE ALL PIPING, FITTINGS AND VALVES AS SHOWN ON DRAWINGS D-003, D-003A AND DETAIL 3 ON D-501 TO PRODUCE A COMPLETE AND OPERATIONAL CHEMICAL STORAGE AND FEED SYSTEM.
6. APPROXIMATE LOCATIONS FOR CORE WALL PENETRATIONS FOR THE FILL STATION PIPING AND TANK VENT PIPING ARE SHOWN ON THE PLANS. CONTRACTOR TO SITE VERIFY LOCATION OF CORE WALL PENETRATIONS FOR FILL STATION PIPING AND VENT PIPING PRIOR TO CORE DRILLING.



A SECTION
D-104 SCALE: 1/2" = 1'-0"



PUMP STATION NO. 3 PLAN
SCALE:1/2" = 1'-0"

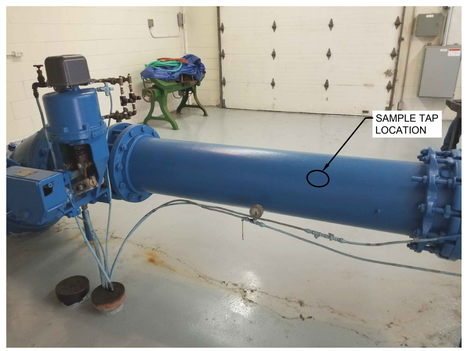


PHOTO 3-1 - SAMPLE TAP LOCATION

PHOTO 3-2 - PHOSPHATE FEED LOCATION (BELOW GRADE)

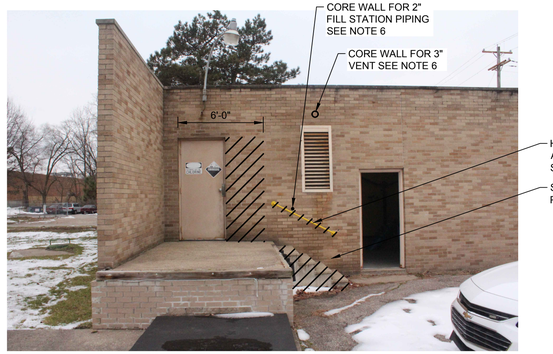


PHOTO 3-3 - PHOSPHATE FILL STATION

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

TETRA TECH
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ANN ARBOR, MI 48108
PHONE: (734) 665-6000 FAX: (734) 213-3003

MARK	DATE	DESCRIPTION
	11/29/23	ISSUED FOR BID

CITY OF KALAMAZOO, MICHIGAN

PUMP STATION NO. 3
PROCESS EQUIPMENT PLAN

Project No.:	200-19743-19004
Designed By:	NR
Drawn By:	SG
Checked By:	VC

D-104

Copyright: Tetra Tech

Bar Measures 1 inch

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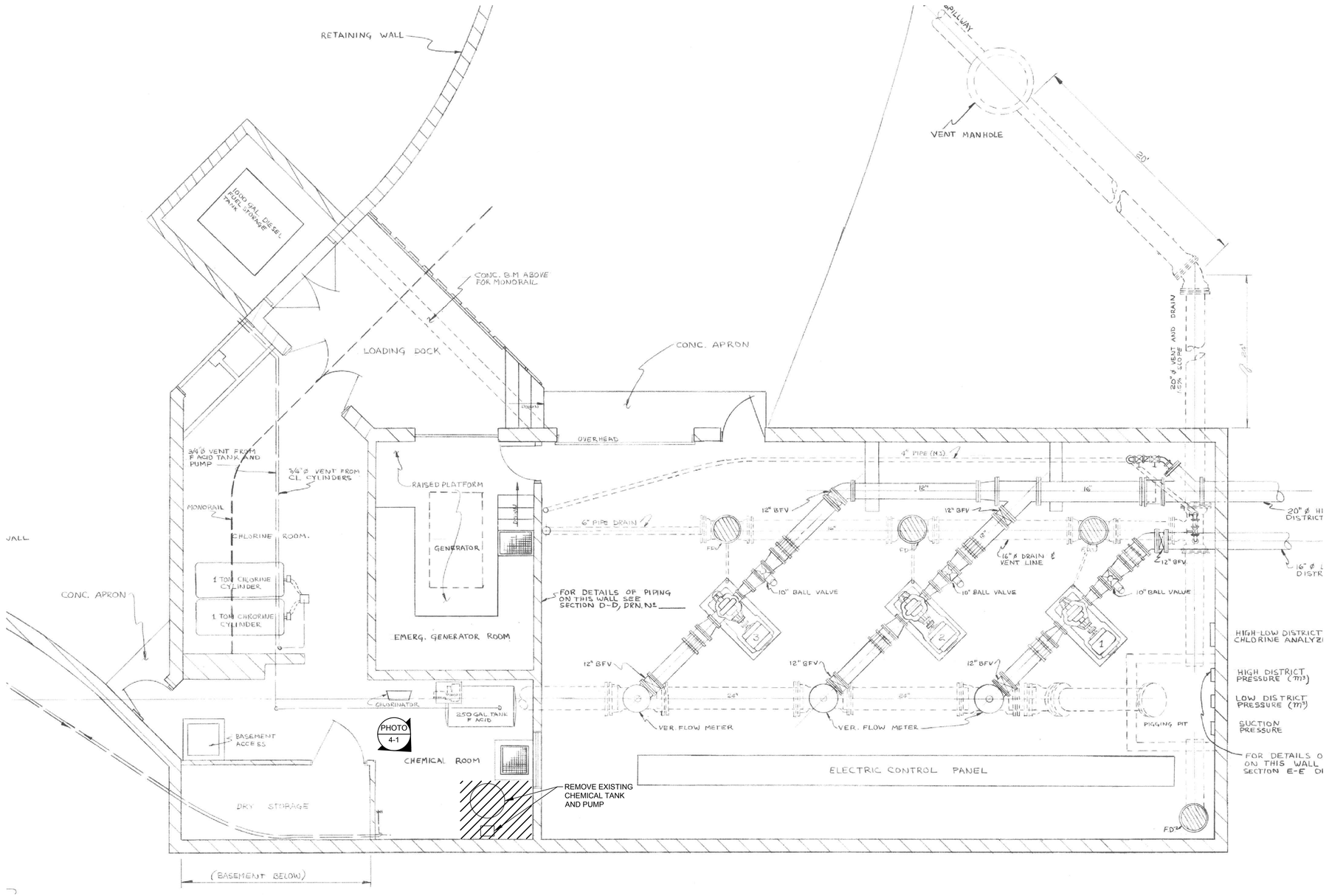

PUMP STATION NO. 4 PLAN

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

PHOTO 4-1

NOTES:

1. EXISTING PHOSPHATE CHEMICAL FEED SYSTEM AND TANK TO BE RELOCATED DURING THE INSTALLATION OF THE NEW SYSTEM. EXISTING SHALL NOT BE DEMOLISHED UNTIL THE NEW SYSTEM IS FULLY FUNCTIONAL. ALL RELOCATIONS AND DEMOLITION PLANS WILL NEED TO BE DISCUSSED WITH THE CITY. CONTRACTOR SHALL SCHEDULE A DEMOLITION MEETING FOR EACH STATION TO DISCUSS THE PHASING PLAN WITH THE CITY FOR THEIR APPROVAL PRIOR TO DEMOLITION.
2. REFER TO STRUCTURAL DRAWINGS FOR ADDITIONAL DEMOLITION ITEMS AND DETAILS.

- TO BE REMOVED

N

0 24' 48' 96'

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

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ANN ARBOR, MI 48108
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MARK	DATE	DESCRIPTION
	11/29/23	ISSUED FOR BID

CITY OF KALAMAZOO, MICHIGAN

PUMP STATION NO. 4 DEMOLITION PLAN

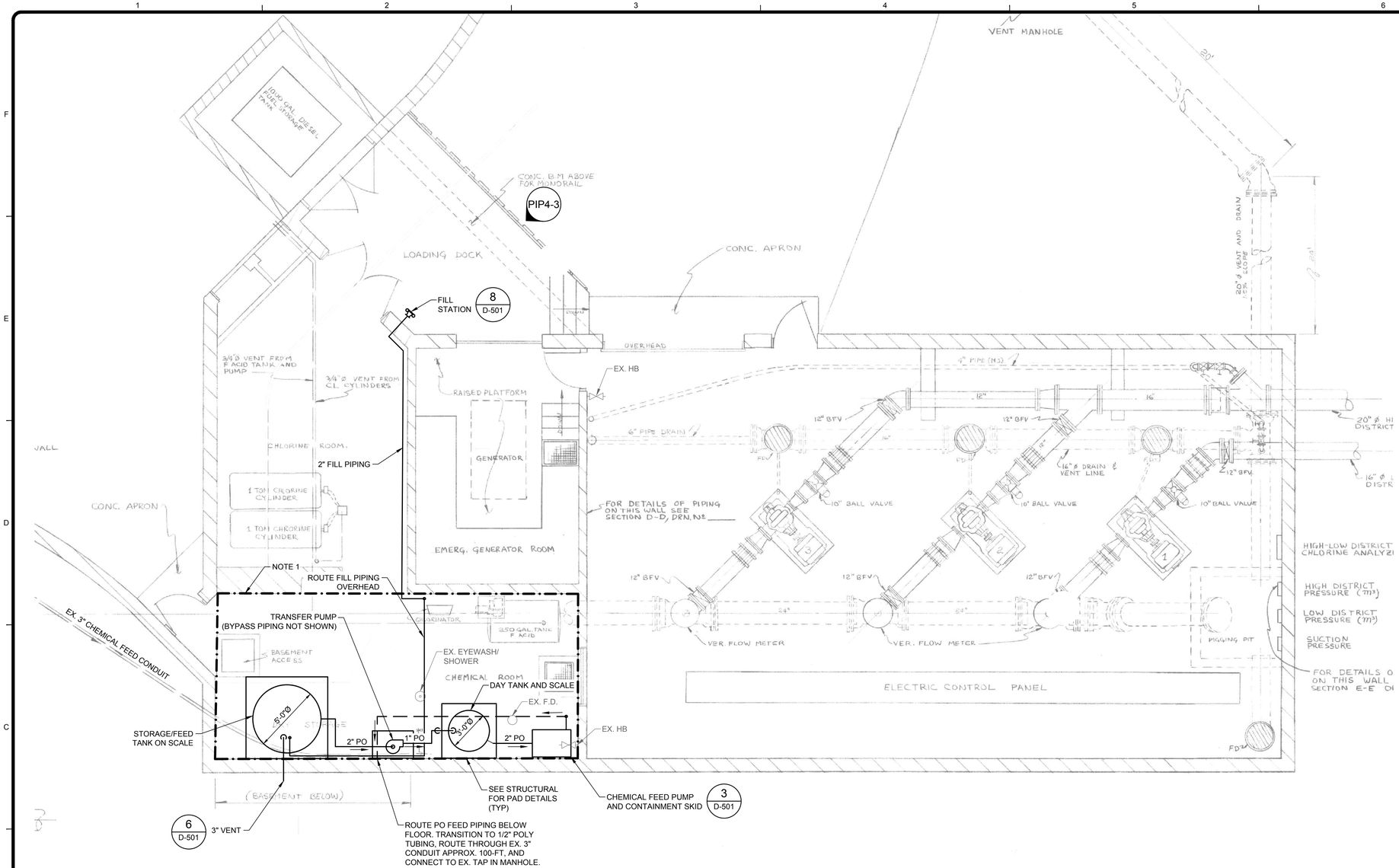
Project No.:	200-19743-19004
Designed By:	NR
Drawn By:	SG
Checked By:	VC

D-105

Copyright: Tetra Tech

Bar Measures 1 inch

11/28/2023 11:50:50 AM - O:\PROJECTS\ANN ARBOR\IER\19743\200-19743-19004\CAD\SHEETFILES\D-105 PUMP STATION NO. 4 DEMOLITION PLAN.DWG - GUARD, STEVEN



PUMP STATION NO. 4 PLAN

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

PHOTO 4-3 - PHOSPHATE FILL STATION

NOTES:

1. PROVIDE PROTECTIVE FLOOR COATING TYPE SC2 IN ACCORDANCE WITH SECTION 09960 WITHIN LIMITS SHOWN ON DRAWING. FLOOR COATING SHALL ENCOMPASS EXISTING AND PROPOSED EQUIPMENT BASES. WHEN COATING LIMIT IS BOUND BY A WALL, EXTEND COATING ON WALL A MINIMUM 4-INCHES FROM FINISHED FLOOR. ALL WORK RELATED TO FLOOR COATING SHALL BE INCLUDED IN BID ALTERNATE NO. 1.
2. HEAT TRACE AND INSULATE ALL PROPOSED OUTDOOR WATER, PHOSPHATE CONTAINMENT AND CARRIER PIPING.
3. ALL PIPING, VALVES AND FITTINGS ARE NOT SHOWN. CONTRACTOR SHALL PROVIDE ALL PIPING, FITTINGS AND VALVES AS SHOWN ON DRAWINGS D-003, D-003A AND DETAIL 3 ON D-501 TO PRODUCE A COMPLETE AND OPERATIONAL CHEMICAL STORAGE AND FEED SYSTEM.
4. APPROXIMATE LOCATIONS FOR WALL PENETRATIONS FOR THE FILL STATION PIPING AND TANK VENT PIPING ARE SHOWN ON THE PLANS. CONTRACTOR TO SITE VERIFY LOCATION OF WALL PENETRATIONS FOR FILL STATION PIPING AND VENT PIPING PRIOR TO CREATING THE HOLE.

N

0 2' 4' 8'

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

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ANN ARBOR, MI 48108
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MARK	DATE	DESCRIPTION
	11/29/23	ISSUED FOR BID

CITY OF KALAMAZOO, MICHIGAN

PUMP STATION NO. 4 PROCESS EQUIPMENT PLAN

Project No.:	200-19743-19004
Designed By:	NR
Drawn By:	SG
Checked By:	VC

D-106

Copyright: Tetra Tech

Bar Measures 1 inch

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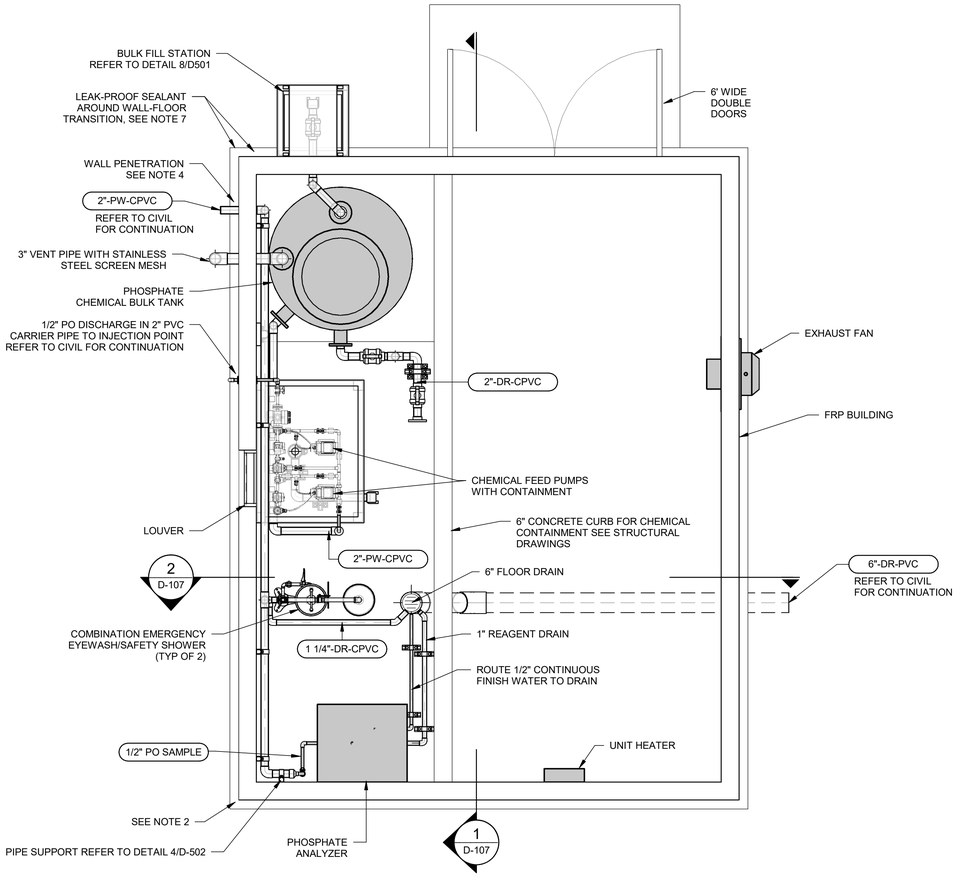
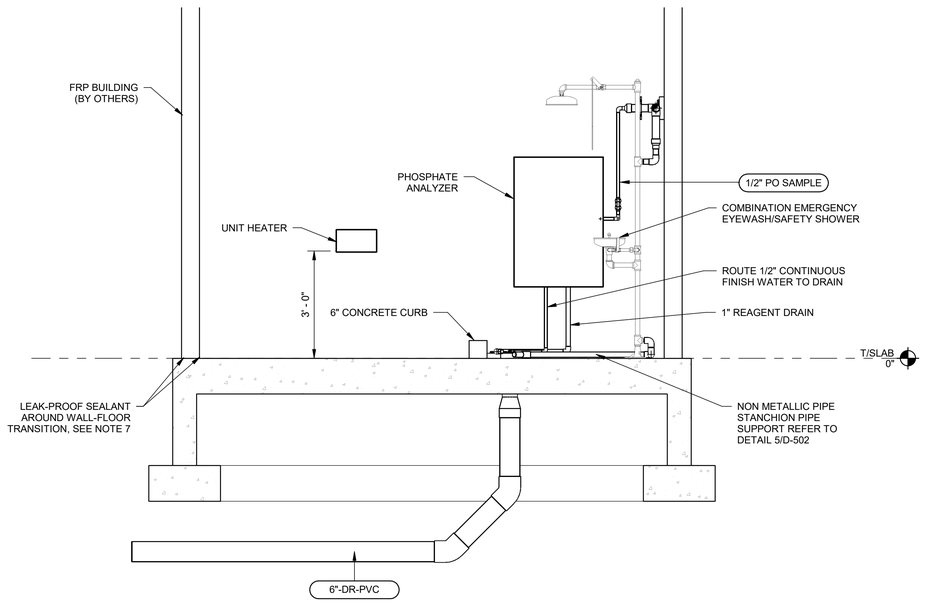


EQUIPMENT PLAN

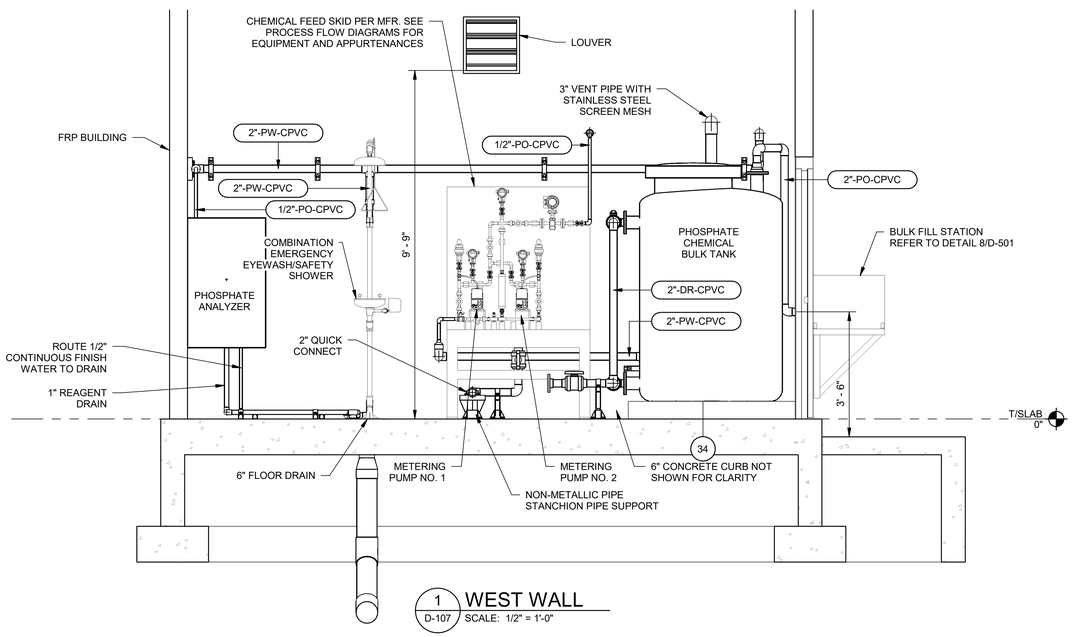
SCALE: 1/2" = 1'-0"



2 D-107 SOUTH WALL

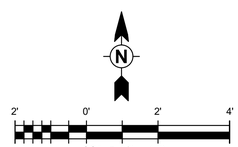
SCALE: 1/2" = 1'-0"

NOTES:
1. HEAT TRACE AND INSULATE ALL PROPOSED OUTDOOR WATER, PHOSPHATE CONTAINMENT AND CARRIER PIPING.
2. SEE STRUCTURAL FOR BUILDING FOUNDATION DETAILS.
3. MAINTAIN 1-FT MINIMUM SEPARATION BETWEEN CHEMICAL AND DRAIN PIPE.
4. WALL PENETRATION TO BE COORDINATED WITH FRP BUILDING SUPPLIER.
5. PROVIDE PROTECTIVE FLOOR COATING OF ENTIRE FLOOR TYPE SC2 IN ACCORDANCE WITH SECTION 09960 WITHIN LIMITS SHOWN ON DRAWING. FLOOR COATING SHALL ENCOMPASS EXISTING AND PROPOSED EQUIPMENT BASES. WHEN COATING LIMIT IS BOUND BY A WALL, EXTEND COATING ON WALL A MINIMUM 4-INCHES FROM FINISHED FLOOR. ALL WORK RELATED TO FLOOR COATING SHALL BE INCLUDED IN BID ALTERNATE NO. 1.
6. ALL THE BUILDING WALL AND ROOF PENETRATIONS SHOWN ON THE DRAWINGS SHALL BE COORDINATED WITH THE BUILDING MANUFACTURER.
7. SEAL FRP BUILDING FLOOR-TO-WALL TRANSITION ON THE INSIDE AND OUTSIDE USING SIKA DUOFLEX SEALANT OR ENGINEER APPROVED EQUAL FOR WATERPROOFING AND LEAKPROOF JOINTS.
8. ALL PIPING, VALVES AND FITTINGS ARE NOT SHOWN. CONTRACTOR SHALL PROVIDE ALL PIPING, FITTINGS AND VALVES AS SHOWN ON DRAWINGS D-003, D-003A AND DETAIL 3 ON D-501 TO PRODUCE A COMPLETE AND OPERATIONAL CHEMICAL STORAGE AND FEED SYSTEM.



1 D-107 WEST WALL

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



Bar measures 1 inch, otherwise drawing is not to scale

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1136 OAK VALLEY DRIVE, SUITE 100
ANN ARBOR, MI 48108
TEL: (734) 665-6000 FAX: (734) 213-3003

MARK	DATE	DESCRIPTION
	11/29/23	ISSUED FOR BID

BY

CITY OF KALAMAZOO, MICHIGAN
WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

NEW PUMP STATION NO. 8 PROCESS EQUIPMENT PLAN

PROJ:	200-19743-19004
DESN:	NR
DRWN:	SG
CHKD:	VC

D-107

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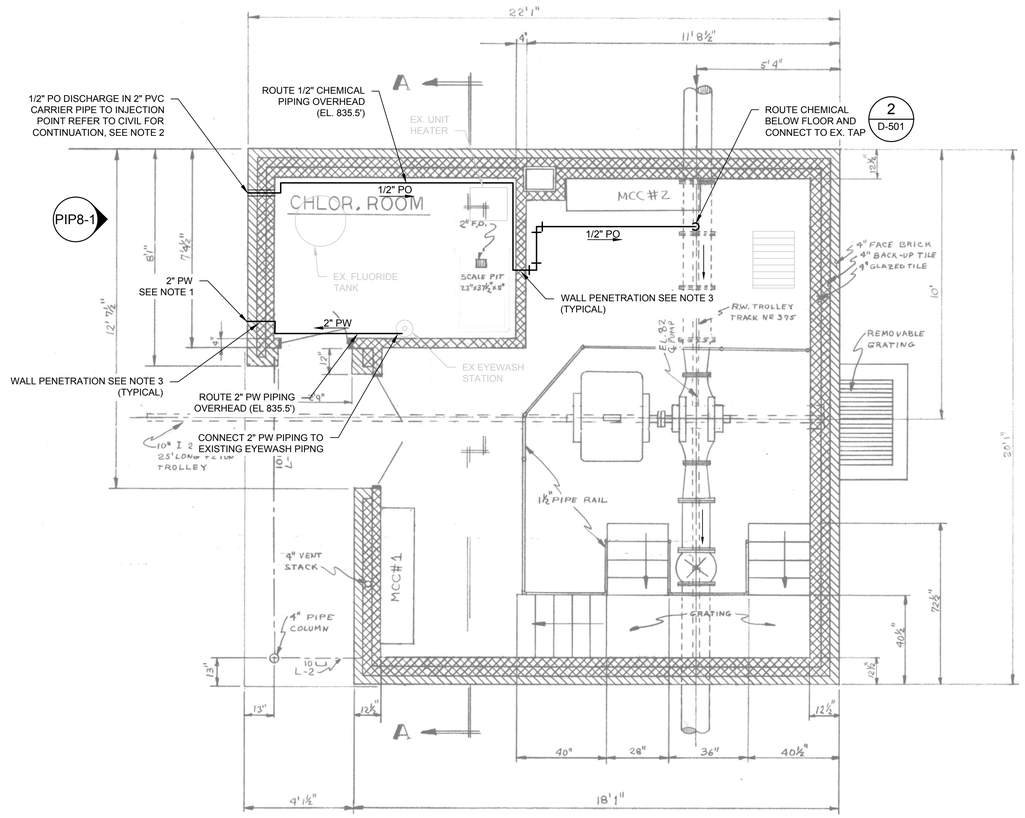

PUMP STATION NO. 8 PLAN

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

PHOTO 8-1
EXISTING PUMP STATION WALL PENETRATION LOCATIONS

NOTES:

1. ROUTE 2" POTABLE WATER PVC PIPE FROM EMERGENCY EYEWASH STATION CONNECTION IN THE EXISTING BUILDING CHEMICAL ROOM TO NEW BUILDING, REFER TO CIVIL FOR PIPE PENETRATION LOCATIONS.
2. ROUTE 1/2" PO CHEMICAL FEED LINE IN A 2" PVC CARRIER PIPE TO EXISTING BUILDING, REFER TO CIVIL FOR PIPE PENETRATION LOCATIONS. CONNECT TO EXISTING TAP, 2/D-502.
3. REFER TO DETAIL 6/D-501 AND 9/D-501 FOR PENETRATION DETAILS (TYP).
4. ALL THE PROPOSED NEW WATER AND CHEMICAL CONTAINMENT PIPES OUTSIDE THE BUILDING SHALL BE HEAT TRACED AND INSULATED.
5. ALL PIPING, VALVES AND FITTINGS ARE NOT SHOWN. CONTRACTOR SHALL PROVIDE ALL PIPING, FITTINGS AND VALVES AS SHOWN ON DRAWINGS D-003, D-003A AND DETAIL 3 ON D-501 TO PRODUCE A COMPLETE AND OPERATIONAL CHEMICAL STORAGE AND FEED SYSTEM.

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PHONE: (734) 665-6000 FAX: (734) 213-3003

MARK	DATE	DESCRIPTION
	11/28/23	ISSUED FOR BID

CITY OF KALAMAZOO, MICHIGAN

EXISTING PUMP STATION NO. 8 PROCESS EQUIPMENT PLAN

Project No.:	200-19743-19004
Designed By:	NR
Drawn By:	SG
Checked By:	VC

D-108

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

Copyright: Tetra Tech

Bar Measures 1 inch

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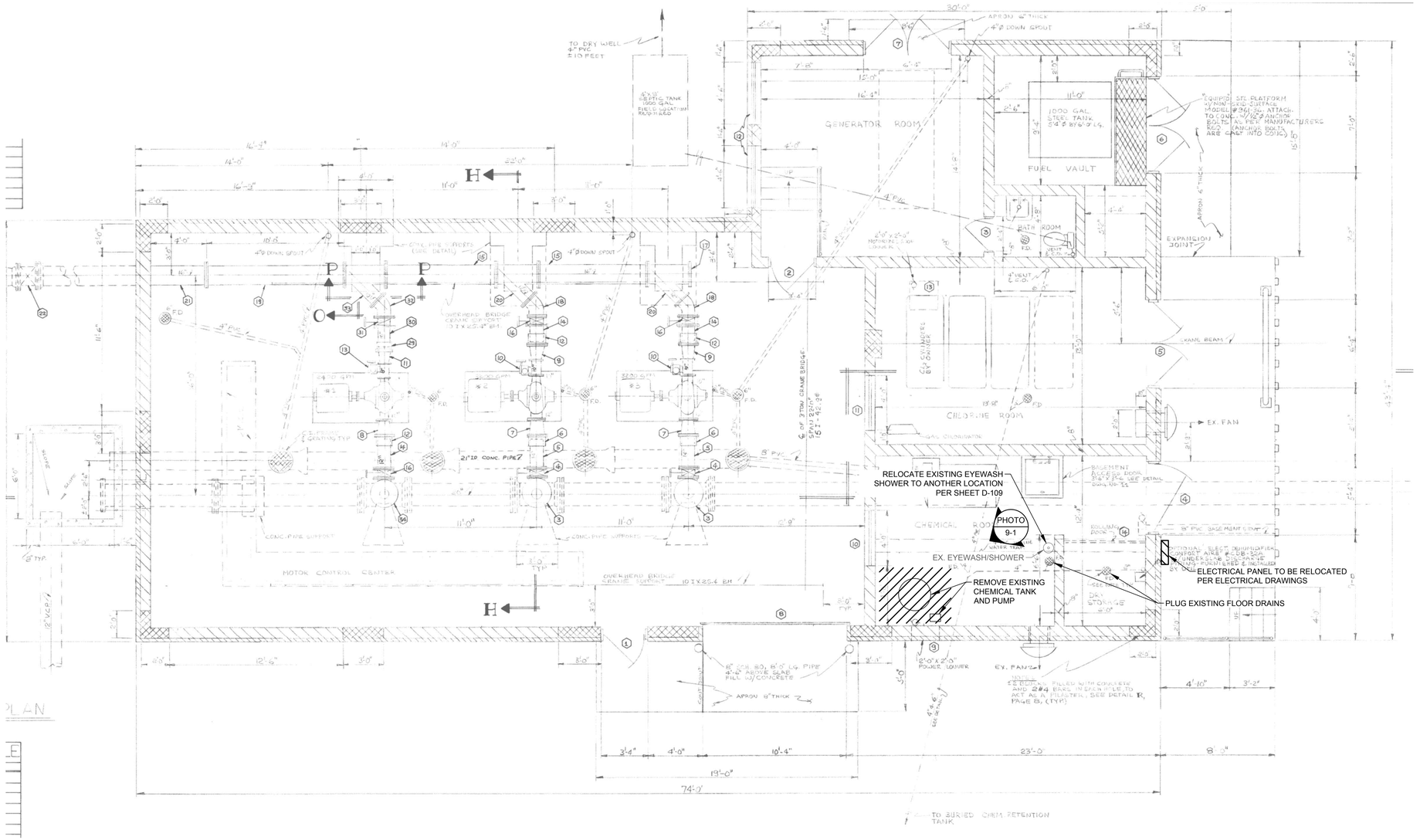

PUMP STATION NO. 9 PLAN

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

PHOTO 9-1

NOTES:

1. EXISTING PHOSPHATE CHEMICAL FEED SYSTEM AND TANK TO BE RELOCATED DURING THE INSTALLATION OF THE NEW SYSTEM. EXISTING SHALL NOT BE DEMOLISHED UNTIL THE NEW SYSTEM IS FULLY FUNCTIONAL. ALL RELOCATIONS AND DEMOLITION PLANS WILL NEED TO BE DISCUSSED WITH THE CITY. CONTRACTOR SHALL SCHEDULE A DEMOLITION MEETING FOR EACH STATION TO DISCUSS THE PHASING PLAN WITH THE CITY FOR THEIR APPROVAL PRIOR TO DEMOLITION.
2. REFER TO STRUCTURAL DRAWINGS FOR ADDITIONAL DEMOLITION ITEMS AND DETAILS.

- TO BE REMOVED

N

0 2' 4' 8'

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

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ANN ARBOR, MI 48108
PHONE: (734) 665-6000 FAX: (734) 213-3003

MARK	DATE	DESCRIPTION
	11/29/23	ISSUED FOR BID

CITY OF KALAMAZOO, MICHIGAN

PUMP STATION NO. 9 DEMOLITION PLAN

Project No.:	200-19743-19004
Designed By:	NR
Drawn By:	SG
Checked By:	VC

D-109

Copyright: Tetra Tech

Bar Measures 1 inch

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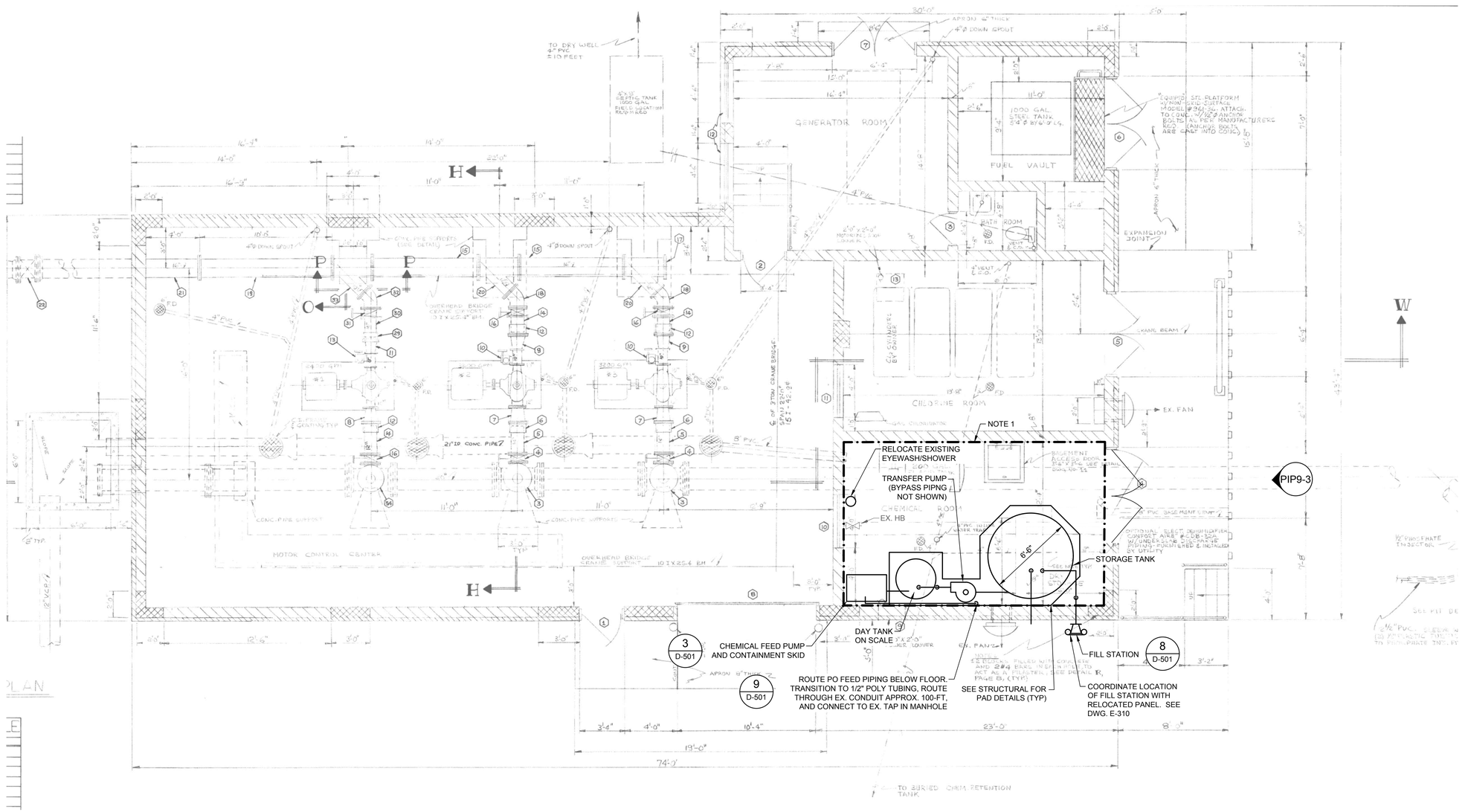

PLAN

PUMP STATION NO. 9 PLAN

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

NOTES:

1. PROVIDE PROTECTIVE FLOOR COATING TYPE SC2 IN ACCORDANCE WITH SECTION 09960 WITHIN LIMITS SHOWN ON DRAWING. FLOOR COATING SHALL ENCOMPASS EXISTING AND PROPOSED EQUIPMENT BASES. WHEN COATING LIMIT IS BOUND BY A WALL, EXTEND COATING ON WALL A MINIMUM 4-INCHES FROM FINISHED FLOOR. ALL WORK RELATED TO FLOOR COATING SHALL BE INCLUDED IN BID ALTERNATE NO. 1.
2. HEAT TRACE AND INSULATE ALL PROPOSED OUTDOOR WATER, PHOSPHATE CONTAINMENT AND CARRIER PIPING.
3. ALL PIPING, VALVES AND FITTINGS ARE NOT SHOWN. CONTRACTOR SHALL PROVIDE ALL PIPING, FITTINGS AND VALVES AS SHOWN ON DRAWINGS D-003, D-003A AND DETAIL 3 ON D-501 TO PRODUCE A COMPLETE AND OPERATIONAL CHEMICAL STORAGE AND FEED SYSTEM.
4. APPROXIMATE LOCATIONS FOR CORE WALL PENETRATIONS FOR THE FILL STATION PIPING AND TANK VENT PIPING ARE SHOWN ON THE PLANS. CONTRACTOR TO SITE VERIFY LOCATION OF CORE WALL PENETRATIONS FOR FILL STATION PIPING AND VENT PIPING PRIOR TO CORE DRILLING SEE DETAIL 6/D-501.

PHOTO 9-3 - PHOSPHATE FILL STATION

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

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ANN ARBOR, MI 48108
PHONE: (734) 665-6000 FAX: (734) 213-3003

MARK	DATE	DESCRIPTION
	11/29/23	ISSUED FOR BID

CITY OF KALAMAZOO, MICHIGAN

PUMP STATION NO. 9
PROCESS EQUIPMENT PLAN

Project No.:	200-19743-19004
Designed By:	NR
Drawn By:	SG
Checked By:	VC

D-110

Copyright: Tetra Tech

Bar Measures 1 inch

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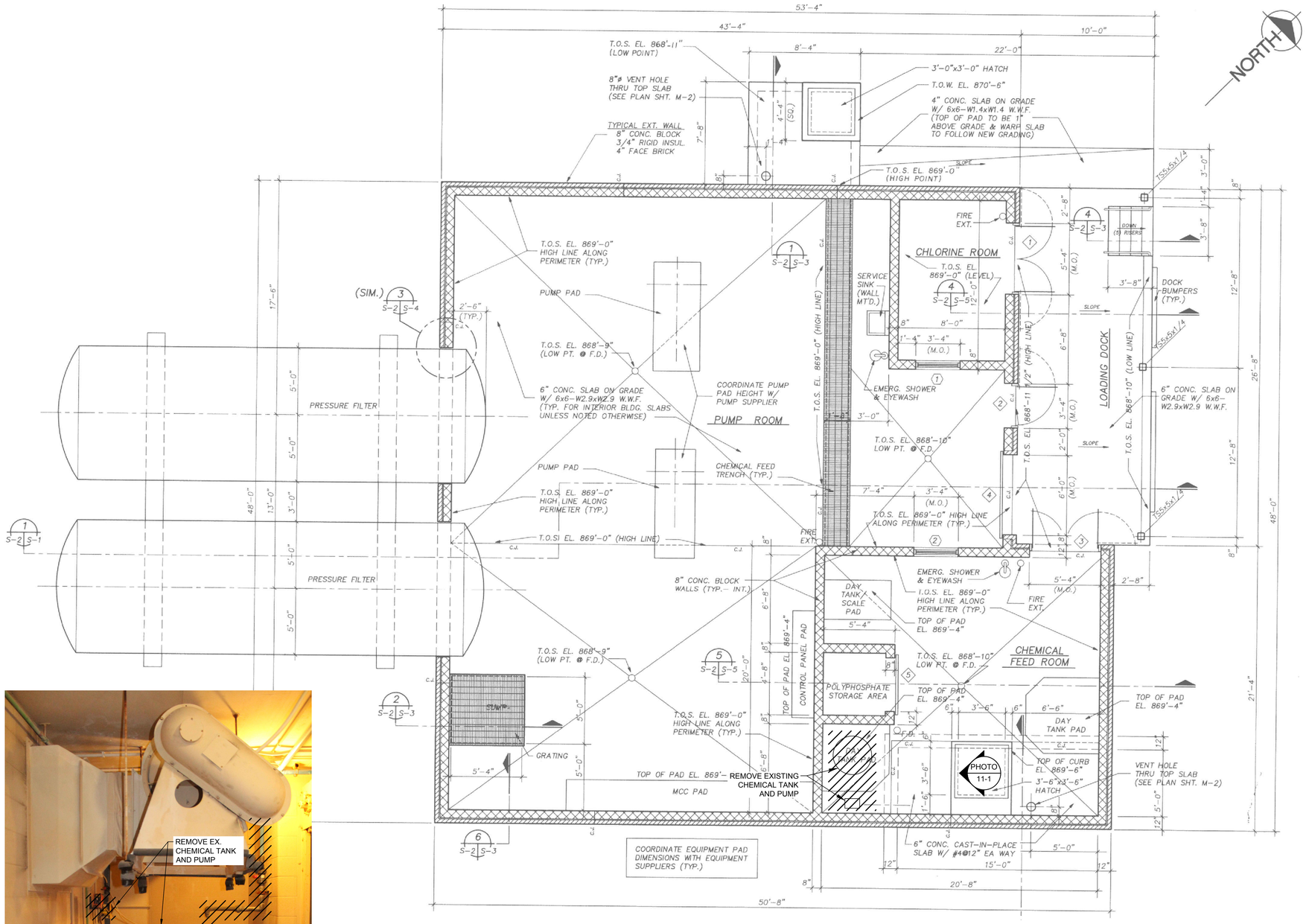

PUMP STATION NO. 11 PLAN

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

PHOTO 11-1

NOTES:

1. EXISTING PHOSPHATE CHEMICAL FEED SYSTEM AND TANK TO BE RELOCATED DURING THE INSTALLATION OF THE NEW SYSTEM. EXISTING SHALL NOT BE DEMOLISHED UNTIL THE NEW SYSTEM IS FULLY FUNCTIONAL. ALL RELOCATIONS AND DEMOLITION PLANS WILL NEED TO BE DISCUSSED WITH THE CITY. CONTRACTOR SHALL SCHEDULE A DEMOLITION MEETING FOR EACH STATION TO DISCUSS THE PHASING PLAN WITH THE CITY FOR THEIR APPROVAL PRIOR TO DEMOLITION.
2. REFER TO STRUCTURAL DRAWINGS FOR ADDITIONAL DEMOLITION ITEMS AND DETAILS.

- TO BE REMOVED

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

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www.tetratech.com
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ANN ARBOR, MI 48108
PHONE: (734) 665-6000 FAX: (734) 213-3003

MARK	DATE	DESCRIPTION
	11/29/23	ISSUED FOR BID

CITY OF KALAMAZOO, MICHIGAN

PUMP STATION NO. 11 DEMOLITION PLAN

Project No.:	200-19743-19004
Designed By:	NR
Drawn By:	SG
Checked By:	VC

D-111

Copyright: Tetra Tech

Bar Measures 1 inch

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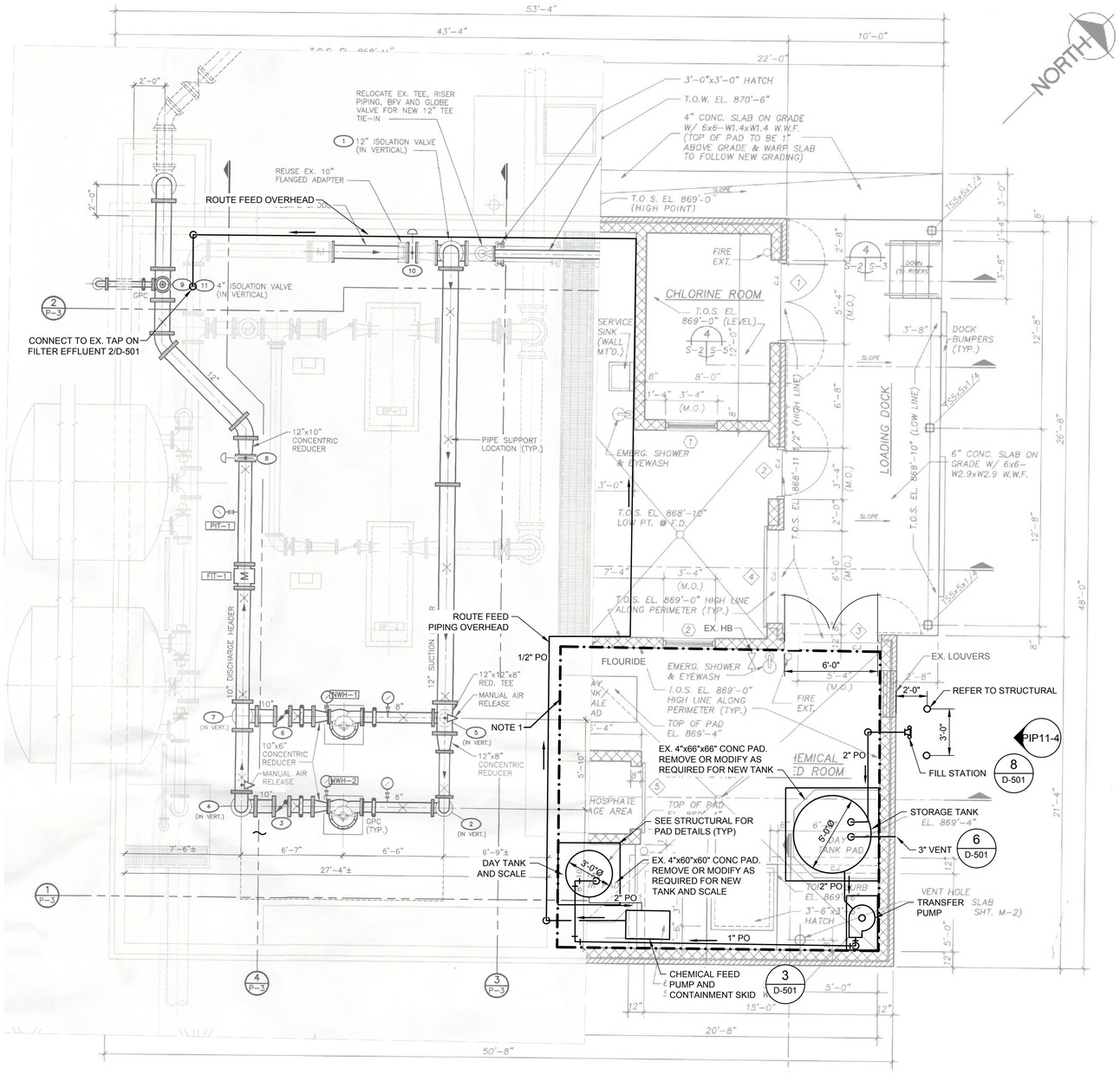

PUMP STATION NO. 11 PLAN

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

NOTES:

1. PROVIDE PROTECTIVE FLOOR COATING TYPE SC2 IN ACCORDANCE WITH SECTION 09960 WITHIN LIMITS SHOWN ON DRAWING. FLOOR COATING SHALL ENCOMPASS EXISTING AND PROPOSED EQUIPMENT BASES. WHEN COATING LIMIT IS BOUND BY A WALL, EXTEND COATING ON WALL A MINIMUM 4-INCHES FROM FINISHED FLOOR. ALL WORK RELATED TO FLOOR COATING SHALL BE INCLUDED IN BID ALTERNATE NO. 1.
2. HEAT TRACE AND INSULATE ALL PROPOSED OUTDOOR WATER, PHOSPHATE CONTAINMENT AND CARRIER PIPING.
3. ALL PIPING, VALVES AND FITTINGS ARE NOT SHOWN. CONTRACTOR SHALL PROVIDE ALL PIPING, FITTINGS AND VALVES AS SHOWN ON DRAWINGS D-003, D-003A AND DETAIL 3 ON D-501 TO PRODUCE A COMPLETE AND OPERATIONAL CHEMICAL STORAGE AND FEED SYSTEM.
4. APPROXIMATE LOCATIONS FOR CORE WALL PENETRATIONS FOR THE FILL STATION PIPING AND TANK VENT PIPING ARE SHOWN ON THE PLANS. CONTRACTOR TO SITE VERIFY LOCATION OF CORE WALL PENETRATIONS FOR FILL STATION PIPING AND VENT PIPING PRIOR TO CORE DRILLING.

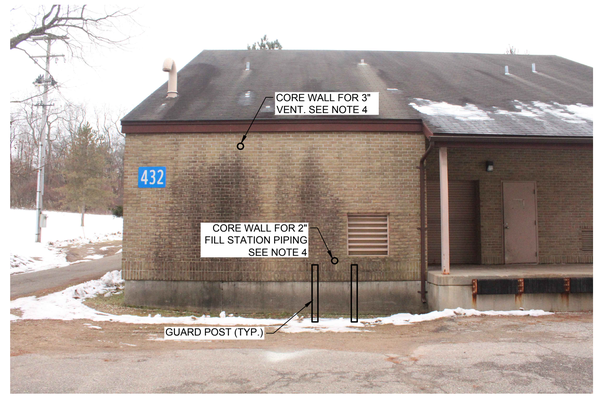

PHOTO 11-4 - PHOSPHATE FILL STATION

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

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MARK	DATE	DESCRIPTION	BY
	11/29/23	ISSUED FOR BID	

CITY OF KALAMAZOO, MICHIGAN

PUMP STATION NO. 11
PROCESS EQUIPMENT PLAN

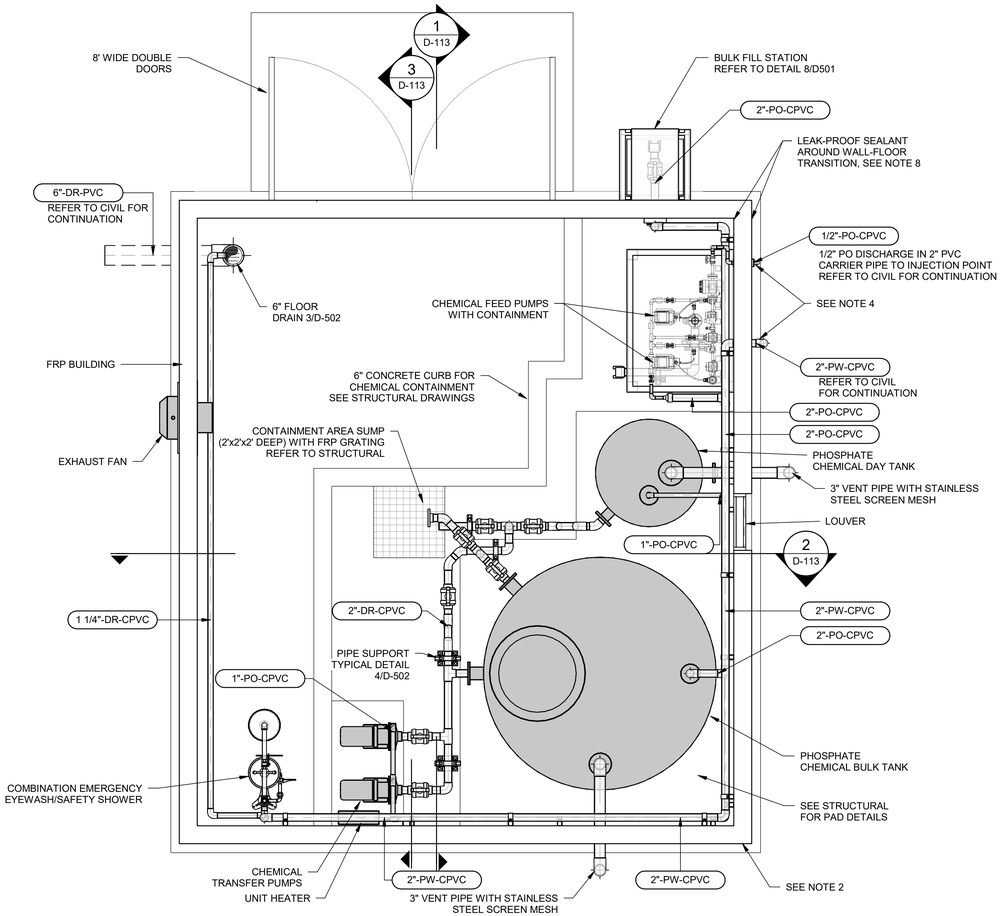
Project No.:	200-19743-19004
Designed By:	NR
Drawn By:	SG
Checked By:	VC

D-112

Copyright: Tetra Tech

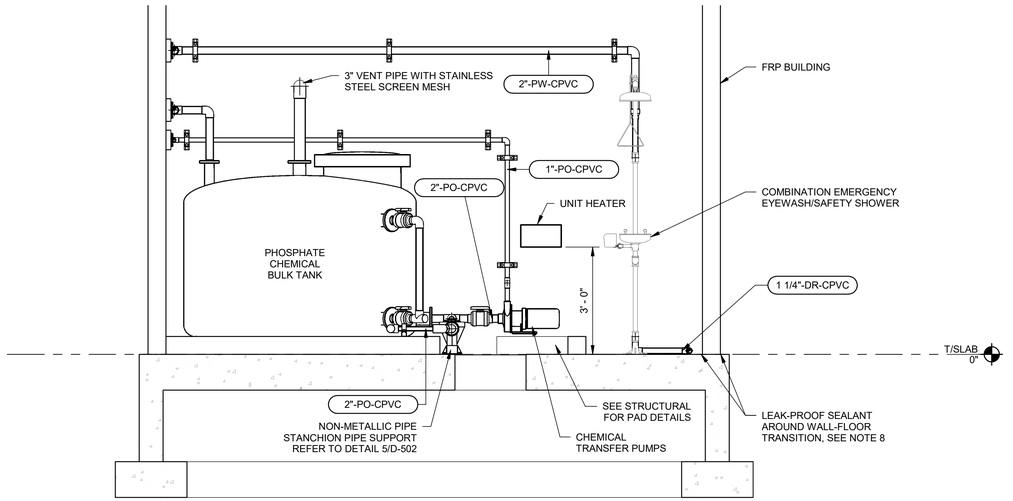
Bar Measures 1 inch

11/28/2023 12:18:58 PM - O:\PROJECTS\ANN ARBOR\IER\19743\200-19743-19004\CAD\SHEETFILES\D-112 PUMP STATION NO. 11 PROCESS EQUIPMENT PLAN.DWG - GUARD, STEVEN



EQUIPMENT PLAN

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

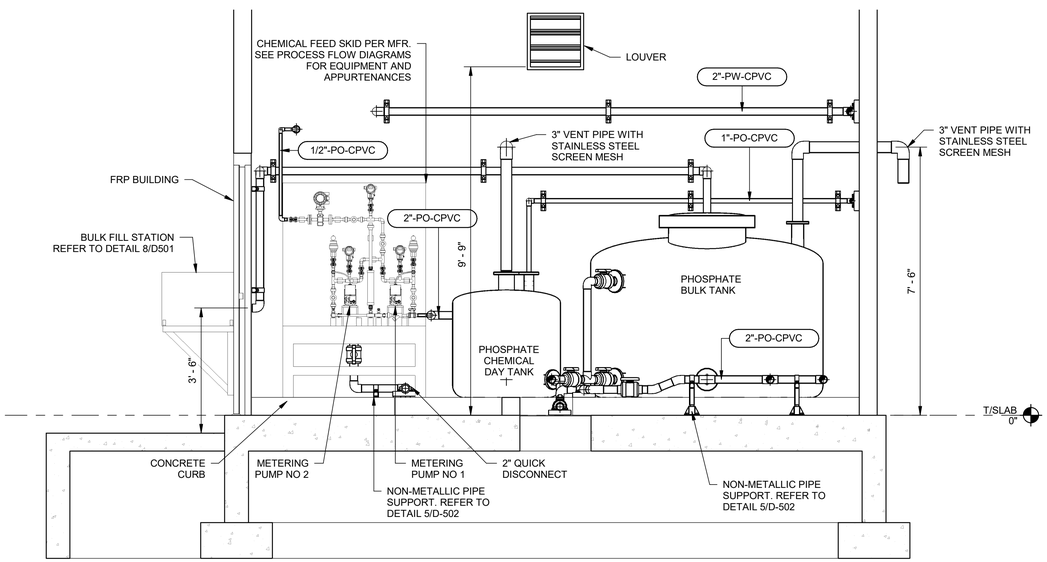


2 D-113 WEST WALL

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

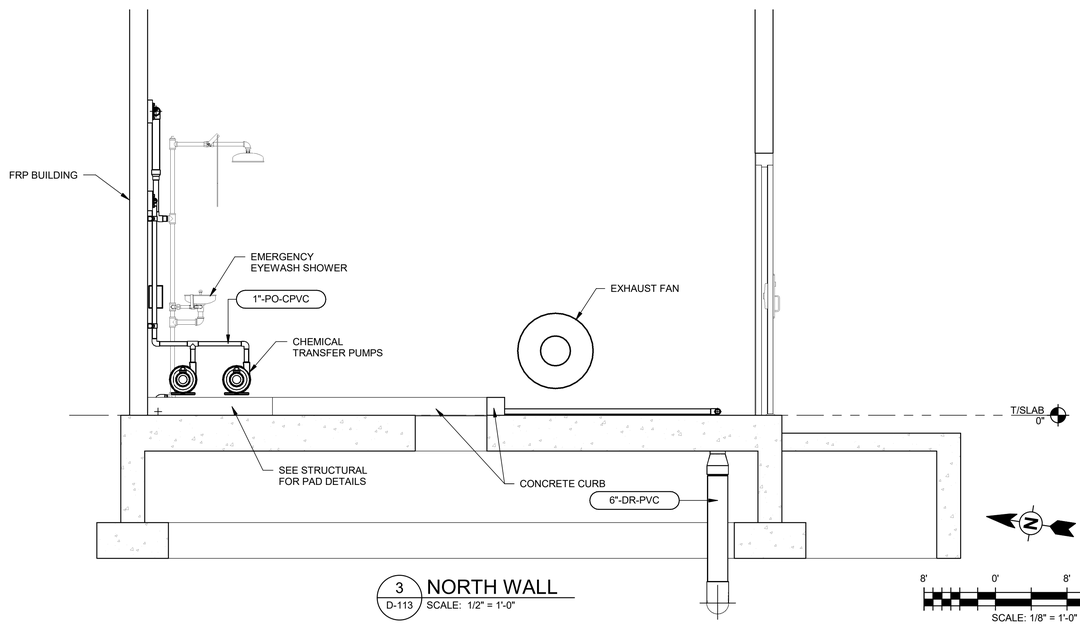
NOTES:

1. HEAT TRACE AND INSULATE ALL PROPOSED OUTDOOR WATER, PHOSPHATE CONTAINMENT AND CARRIER PIPING.
2. SEE STRUCTURAL FOR BUILDING FOUNDATION DETAILS.
3. MAINTAIN 1-FT MINIMUM SEPARATION BETWEEN CHEMICAL AND DRAIN PIPE.
4. WALL PENETRATION TO BE COORDINATED WITH FRP BUILDING SUPPLIER.
5. PROVIDE PROTECTIVE FLOOR COATING OF ENTIRE FLOOR TYPE SC2 IN ACCORDANCE WITH SECTION 09960 WITHIN LIMITS SHOWN ON DRAWING. FLOOR COATING SHALL ENCOMPASS EXISTING AND PROPOSED EQUIPMENT BASES. WHEN COATING LIMIT IS BOUND BY A WALL, EXTEND COATING ON WALL A MINIMUM 4-INCHES FROM FINISHED FLOOR. ALL WORK RELATED TO FLOOR COATING SHALL BE INCLUDED IN BID ALTERNATE NO. 1.
6. 6-IN DRAIN FROM THE EMERGENCY SHOWER AND EYEWASH SHOWER SHALL BE DRAIN TO A GRAVEL PAD. MICHIGAN PLUMBING CODE 2018, SECTION 411.2 WASTE CONNECTION STATES THAT WASTE CONNECTIONS SHALL NOT BE REQUIRED FOR EMERGENCY SHOWERS AND EYEWASH STATIONS.
7. ALL THE BUILDING WALL AND ROOF PENETRATIONS SHOWN ON THE DRAWINGS SHALL BE COORDINATED WITH THE BUILDING MANUFACTURER.
8. SEAL FRP BUILDING FLOOR-TO-WALL TRANSITION ON THE INSIDE AND OUTSIDE USING SIKA DUOFLEX SEALANT OR ENGINEER APPROVED EQUAL FOR WATERPROOFING AND LEAKPROOF JOINTS.
9. . ALL PIPING, VALVES AND FITTINGS ARE NOT SHOWN. CONTRACTOR SHALL PROVIDE ALL PIPING, FITTINGS AND VALVES AS SHOWN ON DRAWINGS D-003, D-003A AND DETAIL 3 ON D-501 TO PRODUCE A COMPLETE AND OPERATIONAL CHEMICAL STORAGE AND FEED SYSTEM.



1 D-113 SOUTH WALL

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



3 D-113 NORTH WALL

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

8' 0' 8' 16'

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

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TEL: (734) 665-6000 FAX: (734) 213-3003

MARK	DATE	DESCRIPTION
	11/29/23	ISSUED FOR BID

CITY OF KALAMAZOO, MICHIGAN

WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

NEW PUMP STATION NO. 12 PROCESS EQUIPMENT PLAN

PROJ:	200-19743-19004
DESN:	NR
DRWN:	SG
CHKD:	VC

D-113

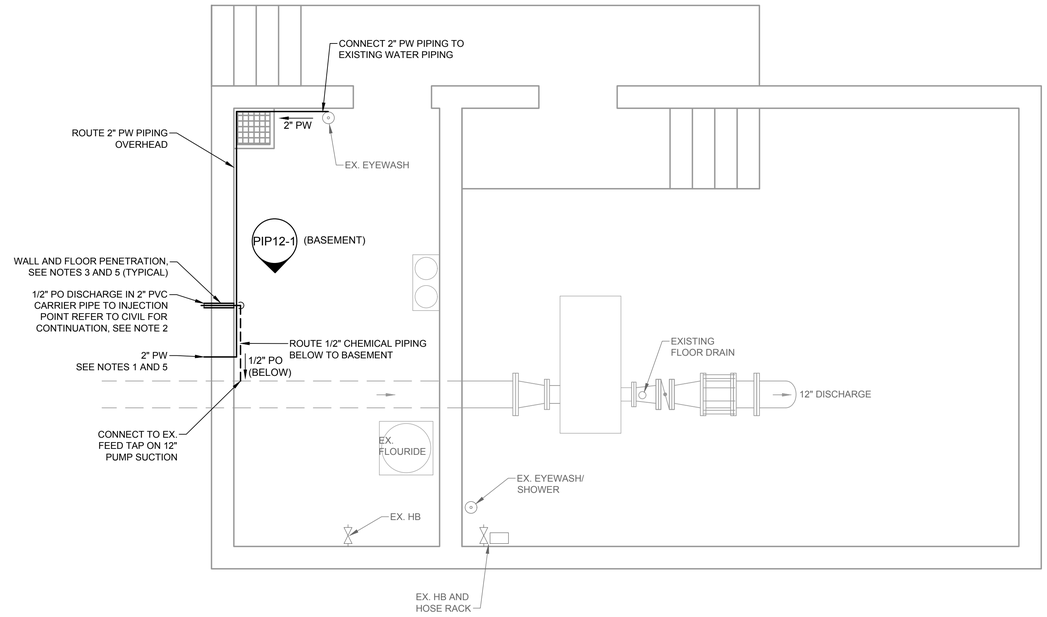
Copyright: Tetra Tech

Bar measures 1 inch, otherwise drawing is not to scale

11/28/2023 6:02:32 PM Autodesk Docs://200-19743-19004-KZOO PS UPGRADES/D-PS12-19743-19004-2023.rvt

NOTES:

1. ROUTE 2" POTABLE WATER PVC PIPE FROM EMERGENCY EYEWASH STATION CONNECTION IN THE EXISTING BUILDING CHEMICAL ROOM TO NEW BUILDING, REFER TO CIVIL FOR PIPE PENETRATION LOCATIONS.
2. ROUTE 1/2" PO CHEMICAL FEED LINE IN A 2" PVC CARRIER PIPE TO EXISTING BUILDING, REFER TO CIVIL FOR PIPE PENETRATION LOCATIONS. CONNECT TO EXISTING TAP, 2/D-502.
3. REFER TO DETAIL 6/D-501 AND 9/D-501 FOR PENETRATION DETAILS (TYP).
4. ALL THE PROPOSED NEW WATER AND CHEMICAL CONTAINMENT PIPES OUTSIDE THE BUILDING SHALL BE HEAT TRACED AND INSULATED.
5. CONTRACTOR TO FIELD VERIFY LOCATION OF THE CHEMICAL AND WATER LINE PENETRATIONS AT THE EXISTING BUILDINGS. ANY WALL PENETRATIONS FOR PIPING MUST BE POSITIONED IN A MANNER THAT ALLOWS THE CHEMICAL AND WATER PIPES TO ENTER THE CHEMICAL ROOM AT THE CURRENT FINISHED FLOOR LEVEL OR WITHIN 1 FOOT OF THE FINISHED FLOOR LEVEL.



PUMP STATION NO. 12 PLAN

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

PHOTO 12-1 - FEED TAP LOCATION (BASEMENT)

0 1'-6" 3'-0" 6'-0"

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

Bar Measures 1 inch

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MARK	DATE	DESCRIPTION	BY
	11/29/23	ISSUED FOR BID	

CITY OF KALAMAZOO, MICHIGAN

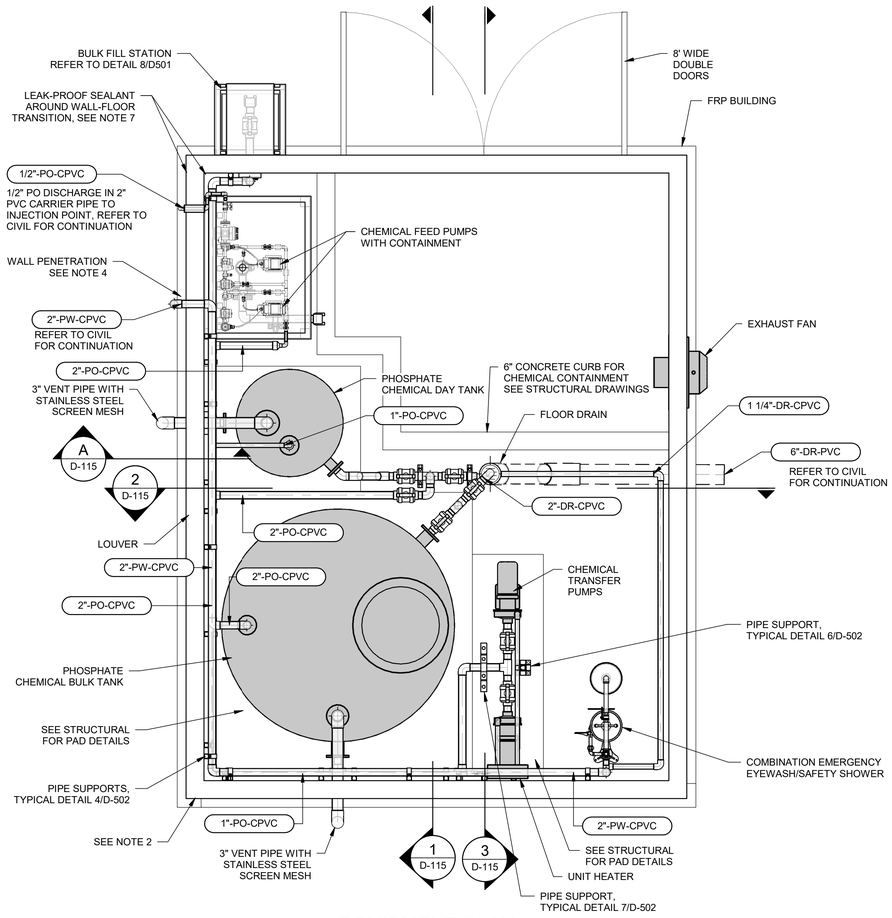
EXISTING PUMP STATION NO. 12 PROCESS EQUIPMENT PLAN

Project No.:	200-19743-19004
Designed By:	NR
Drawn By:	SG
Checked By:	VC

D-114

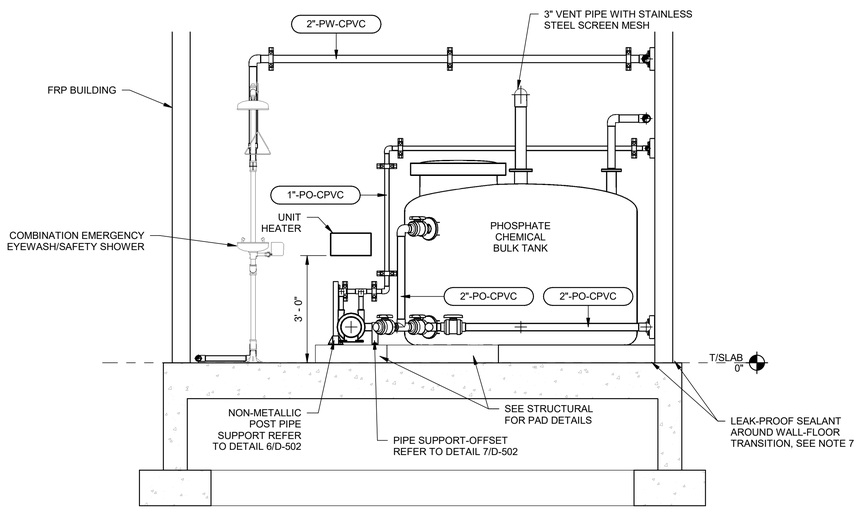
Copyright: Tetra Tech

11/28/2023 12:21:09 PM - O:\PROJECTS\ANN ARBOR\IER\19743\200-19743-19004\CAD\SHEETFILES\D-114 EXISTING PUMP STATION NO.12 PROCESS EQUIPMENT PLAN.DWG - GUARD, STEVEN



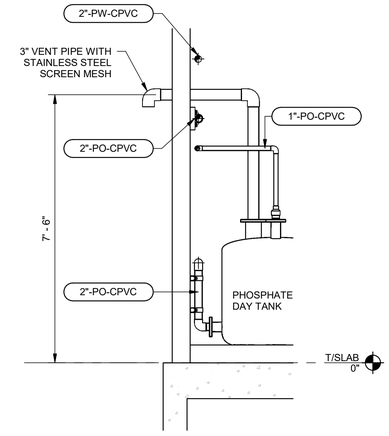
EQUIPMENT PLAN

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



2 EAST WALL

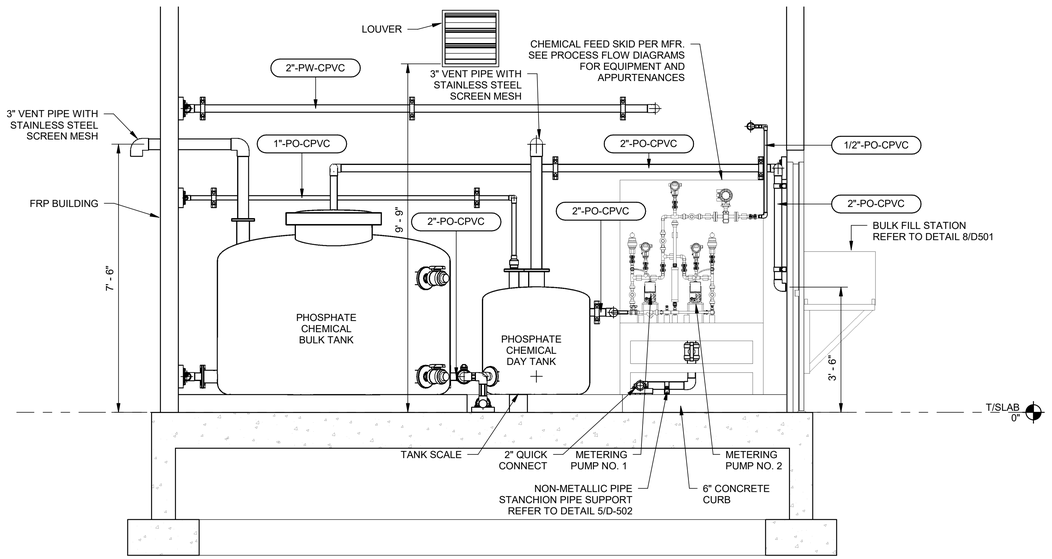
D-115 SCALE: 1/2" = 1'-0"



A SECTION A

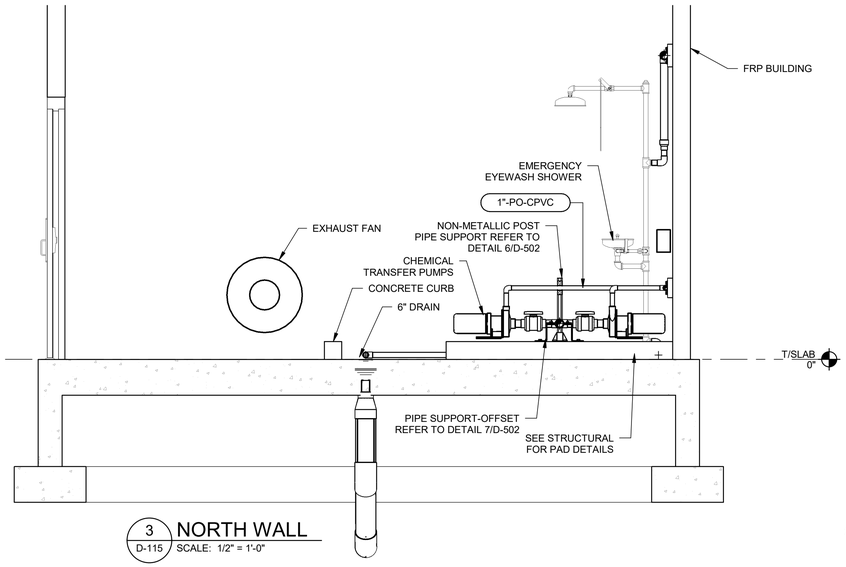
D-115 SCALE: 1/2" = 1'-0"

NOTES:
1. HEAT TRACE AND INSULATE ALL PROPOSED OUTDOOR WATER, PHOSPHATE CONTAINMENT AND CARRIER PIPING.
2. SEE STRUCTURAL FOR BUILDING FOUNDATION DETAILS.
3. MAINTAIN 1-FT MINIMUM SEPARATION BETWEEN CHEMICAL AND DRAIN PIPE.
4. WALL PENETRATION TO BE COORDINATED WITH FRP BUILDING SUPPLIER.
5. PROVIDE PROTECTIVE FLOOR COATING OF ENTIRE FLOOR TYPE SC2 IN ACCORDANCE WITH SECTION 09960 WITHIN LIMITS SHOWN ON DRAWING. FLOOR COATING SHALL ENCOMPASS EXISTING AND PROPOSED EQUIPMENT BASES. WHEN COATING LIMIT IS BOUND BY A WALL, EXTEND COATING ON WALL A MINIMUM 4-INCHES FROM FINISHED FLOOR. ALL WORK RELATED TO FLOOR COATING SHALL BE INCLUDED IN BID ALTERNATE NO. 1.
6. ALL THE BUILDING WALL AND ROOF PENETRATIONS SHOWN ON THE DRAWINGS SHALL BE COORDINATED WITH THE BUILDING MANUFACTURER.
7. SEAL FRP BUILDING FLOOR-TO-WALL TRANSITION ON THE INSIDE AND OUTSIDE USING SIKA DUOFLEX SEALANT OR ENGINEER APPROVED EQUAL FOR WATERPROOFING AND LEAKPROOF JOINTS.
8. ALL PIPING, VALVES AND FITTINGS ARE NOT SHOWN. CONTRACTOR SHALL PROVIDE ALL PIPING, FITTINGS AND VALVES AS SHOWN ON DRAWINGS D-003, D-003A AND DETAIL 3 ON D-501 TO PRODUCE A COMPLETE AND OPERATIONAL CHEMICAL STORAGE AND FEED SYSTEM.



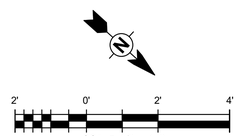
1 SOUTH WALL

D-115 SCALE: 1/2" = 1'-0"



3 NORTH WALL

D-115 SCALE: 1/2" = 1'-0"



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MARK	DATE	DESCRIPTION
	11/28/23	ISSUED FOR BID

BY

CITY OF KALAMAZOO, MICHIGAN
WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

NEW PUMP STATION NO. 14
PROCESS EQUIPMENT PLAN

PROJ:	200-19743-19004
DESN:	NR
DRWN:	SG
CHKD:	VC

D-115

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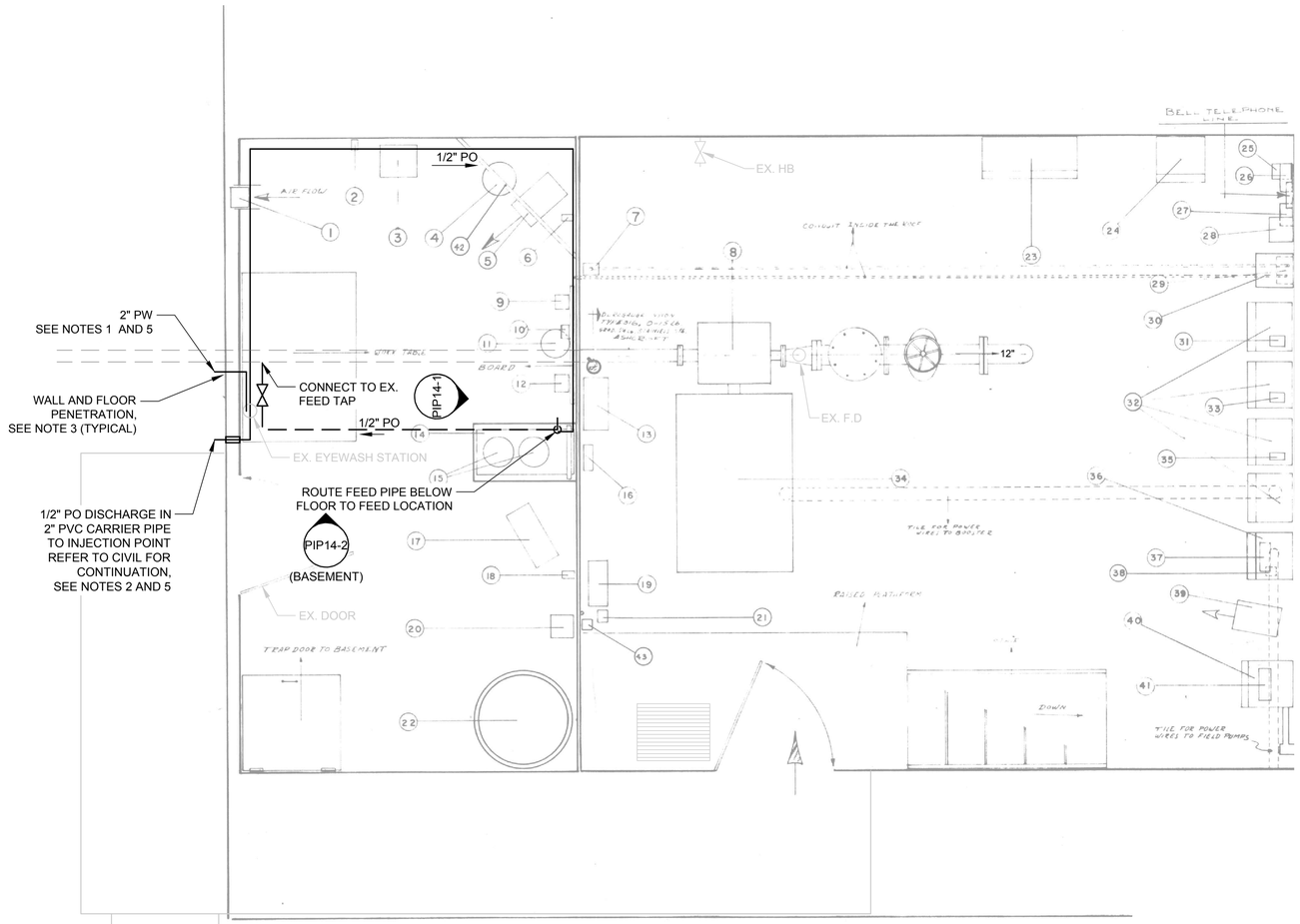
11/28/2023 3:59:29 PM Autodesk Docs://200-19743-19004-KZOO PS UPGRADES/D-PS14-19743-19004-2023.rvt

Bar measures 1 inch, otherwise drawing is not to scale



PUMP STATION NO. 14 PLAN

SCALE: NONE

NOTES:

1. ROUTE 2" POTABLE WATER PVC PIPE FROM EMERGENCY EYEWASH STATION CONNECTION IN THE EXISTING BUILDING CHEMICAL ROOM TO NEW BUILDING, REFER TO CIVIL FOR PIPE PENETRATION LOCATIONS.
2. ROUTE 1/2" PO CHEMICAL FEED LINE IN A 2" PVC CARRIER PIPE TO EXISTING BUILDING, REFER TO CIVIL FOR PIPE PENETRATION LOCATIONS. CONNECT TO EXISTING TAP, 2/D-502.
3. REFER TO DETAIL 6/D-501 AND 9/D-501 FOR PENETRATION DETAILS (TYP).
4. ALL THE PROPOSED NEW WATER AND CHEMICAL CONTAINMENT PIPES OUTSIDE THE BUILDING SHALL BE HEAT TRACED AND INSULATED.
5. CONTRACTOR TO FIELD VERIFY LOCATION OF THE CHEMICAL AND WATER LINE PENETRATIONS AT THE EXISTING BUILDINGS. ANY WALL PENETRATIONS FOR PIPING MUST BE POSITIONED IN A MANNER THAT ALLOWS THE CHEMICAL AND WATER PIPES TO ENTER THE CHEMICAL ROOM AT THE CURRENT FINISHED FLOOR LEVEL OR WITHIN 1 FOOT OF THE FINISHED FLOOR LEVEL.

PHOTO 14-1 - CHEMICAL FEED FLOOR PENETRATION

PHOTO 14-2- FEED TAP LOCATION (BASEMENT)

0 1' 2' 4'

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

Bar Measures 1 inch

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ANN ARBOR, MI 48108
PHONE: (734) 665-6000 FAX: (734) 213-3003

MARK	DATE	DESCRIPTION	BY
	11/29/23	ISSUED FOR BID	

CITY OF KALAMAZOO, MICHIGAN

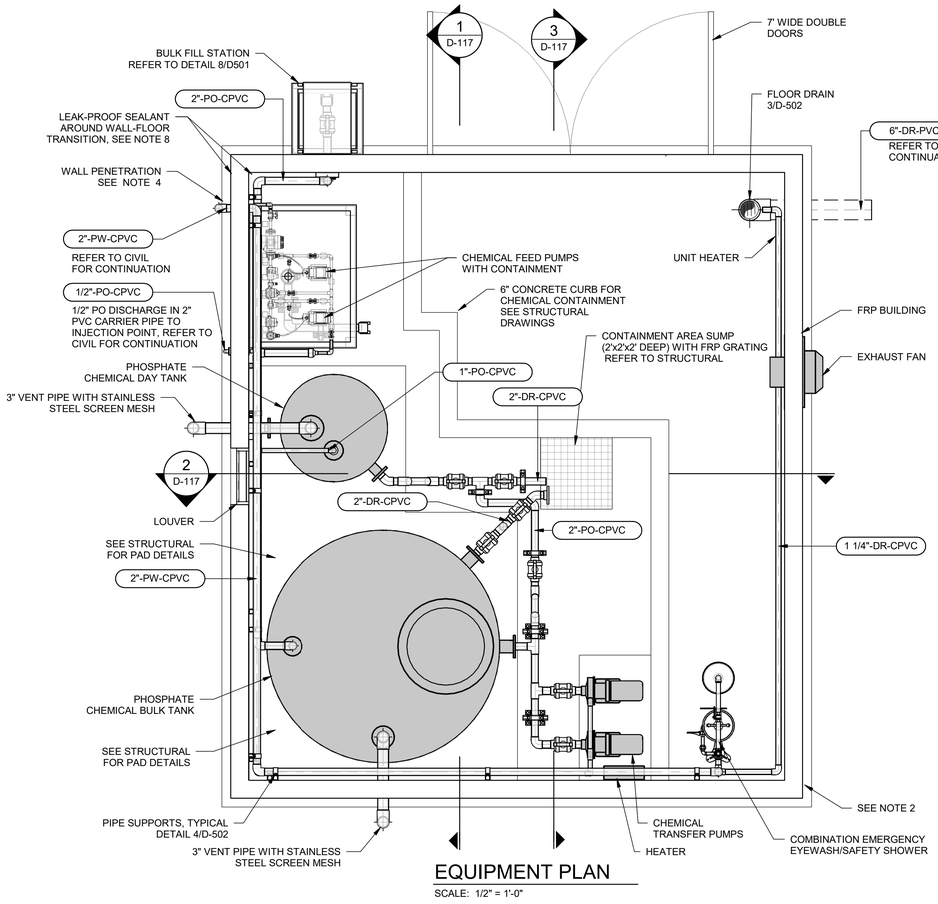
EXISTING PUMP STATION NO.14
PROCESS EQUIPMENT PLAN

Project No.:	200-19743-19004
Designed By:	NR
Drawn By:	SG
Checked By:	VC

D-116

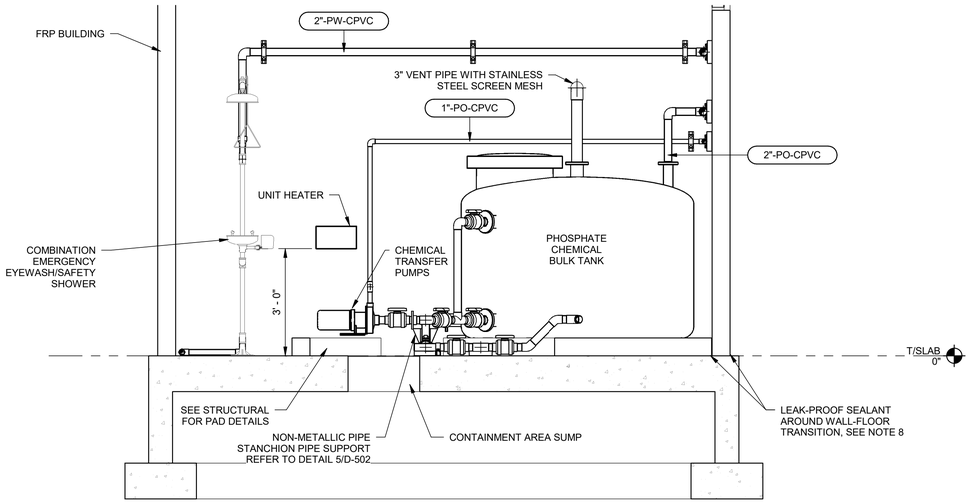
Copyright: Tetra Tech

11/28/2023 12:23:52 PM - O:\PROJECTS\ANN ARBOR\IER\19743\200-19743-19004\CAD\SHEETFILES\D-116 EXISTING PUMP STATION NO.14 PROCESS EQUIPMENT PLAN.DWG - GUARD, STEVEN



EQUIPMENT PLAN

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

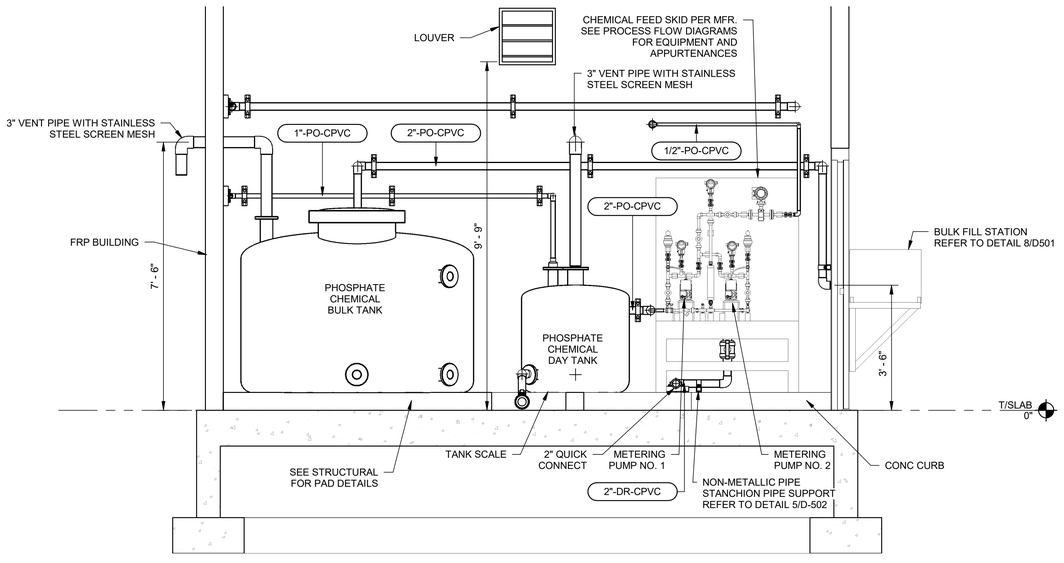


2 EAST WALL

D-117 SCALE: 1/2" = 1'-0"

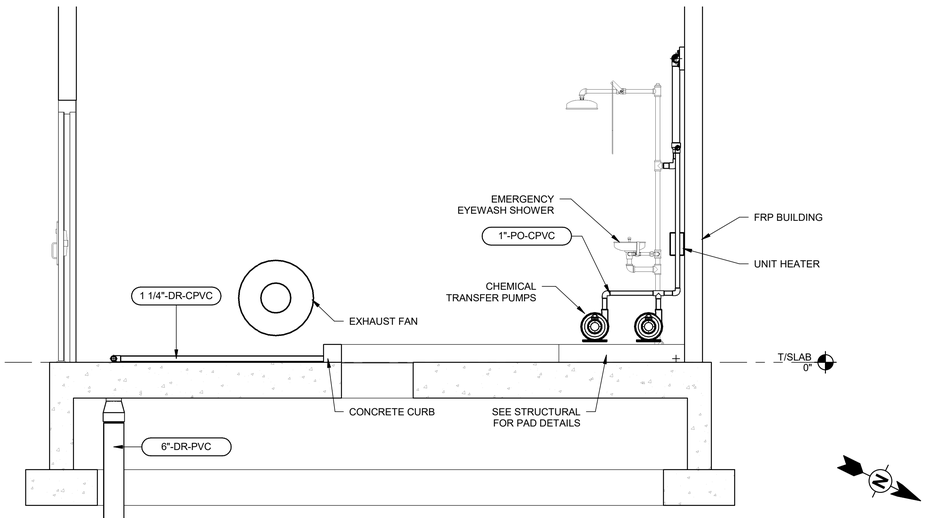
NOTES:

1. HEAT TRACE AND INSULATE ALL PROPOSED OUTDOOR WATER, PHOSPHATE CONTAINMENT AND CARRIER PIPING.
2. SEE STRUCTURAL FOR BUILDING FOUNDATION DETAILS.
3. MAINTAIN 1-FT MINIMUM SEPARATION BETWEEN CHEMICAL AND DRAIN PIPE.
4. WALL PENETRATION TO BE COORDINATED WITH FRP BUILDING SUPPLIER.
5. PROVIDE PROTECTIVE FLOOR COATING OF ENTIRE FLOOR TYPE SC2 IN ACCORDANCE WITH SECTION 09960 WITHIN LIMITS SHOWN ON DRAWING. FLOOR COATING SHALL ENCOMPASS EXISTING AND PROPOSED EQUIPMENT BASES. WHEN COATING LIMIT IS BOUND BY A WALL, EXTEND COATING ON WALL A MINIMUM 4-I INCHES FROM FINISHED FLOOR. ALL WORK RELATED TO FLOOR COATING SHALL BE INCLUDED IN BID ALTERNATE NO. 1.
6. 6-IN DRAIN FROM THE EMERGENCY SHOWER AND EYEWASH SHOWER SHALL BE DRAIN TO A GRAVEL PAD. MICHIGAN PLUMBING CODE 2018, SECTION 411.2 WASTE CONNECTION STATES THAT WASTE CONNECTIONS SHALL NOT BE REQUIRED FOR EMERGENCY SHOWERS AND EYEWASH STATIONS.
7. ALL THE BUILDING WALL AND ROOF PENETRATIONS SHOWN ON THE DRAWINGS SHALL BE COORDINATED WITH THE BUILDING MANUFACTURER.
8. SEAL FRP BUILDING FLOOR-TO-WALL TRANSITION ON THE INSIDE AND OUTSIDE USING SIKA DUOFLEX SEALANT OR ENGINEER APPROVED EQUAL FOR WATERPROOFING AND LEAKPROOF JOINTS.
9. ALL PIPING, VALVES AND FITTINGS ARE NOT SHOWN. CONTRACTOR SHALL PROVIDE ALL PIPING, FITTINGS AND VALVES AS SHOWN ON DRAWINGS D-003, D-003A AND DETAIL 3 ON D-501 TO PRODUCE A COMPLETE AND OPERATIONAL CHEMICAL STORAGE AND FEED SYSTEM.



1 SOUTH WALL

D-117 SCALE: 1/2" = 1'-0"



3 NORTH WALL

D-117 SCALE: 1/2" = 1'-0"

2' 0' 2' 4'

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

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www.tetratech.com
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ANN ARBOR, MI 48108
TEL: (734) 665-6000 FAX: (734) 213-3003

MARK	DATE	DESCRIPTION
	11/29/23	ISSUED FOR BID

CITY OF KALAMAZOO, MICHIGAN
WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

NEW PUMP STATION NO. 22
PROCESS EQUIPMENT PLAN

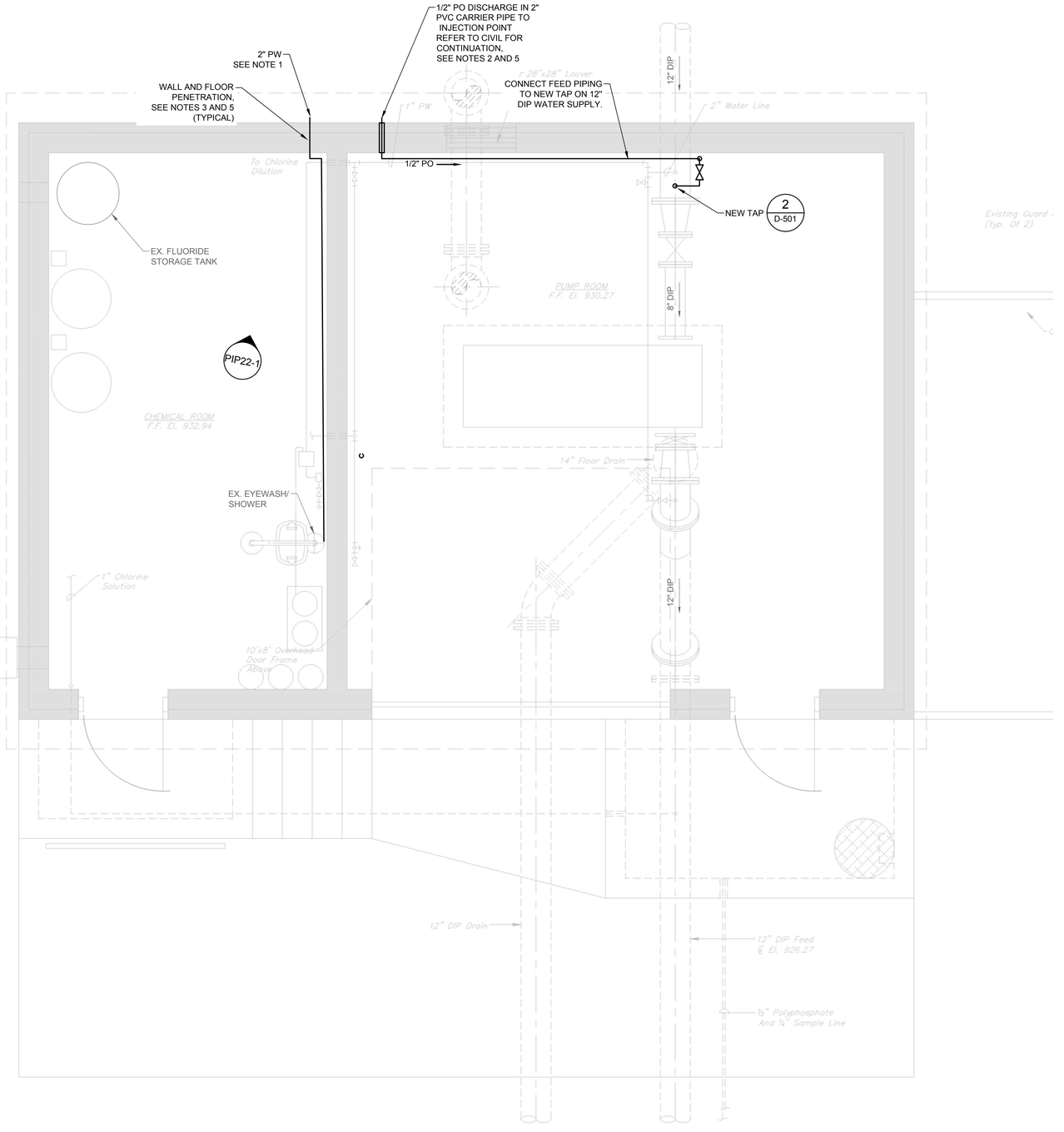
PROJ:	200-19743-19004
DESN:	NR
DRWN:	SG
CHKD:	VC

D-117

Copyright: Tetra Tech

11/28/2023 6:10:14 PM Autodesk Docs://200-19743-19004-KZOO PS UPGRADES/D-PS22-19743-19004-2023_steve guard.rvt

Bar measures 1 inch, otherwise drawing is not to scale



PUMP STATION NO. 22 - PLAN

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

NOTES:

1. ROUTE 2" POTABLE WATER PVC PIPE FROM EMERGENCY EYEWASH STATION CONNECTION IN THE EXISTING BUILDING CHEMICAL ROOM TO NEW BUILDING, REFER TO CIVIL FOR PIPE PENETRATION LOCATIONS.
2. ROUTE 1/2" PO CHEMICAL FEED LINE IN A 2" PVC CARRIER PIPE TO EXISTING BUILDING, REFER TO CIVIL FOR PIPE PENETRATION LOCATIONS. CONNECT TO EXISTING TAP, 2/D-502.
3. REFER TO DETAIL 6/D-501 AND 9/D-501 FOR PENETRATION DETAILS (TYP).
4. ALL THE PROPOSED NEW WATER AND CHEMICAL CONTAINMENT PIPES OUTSIDE THE BUILDING SHALL BE HEAT TRACED AND INSULATED.
5. CONTRACTOR TO FIELD VERIFY LOCATION OF THE CHEMICAL AND WATER LINE PENETRATIONS AT THE EXISTING BUILDINGS. ANY WALL PENETRATIONS FOR PIPING MUST BE POSITIONED IN A MANNER THAT ALLOWS THE CHEMICAL AND WATER PIPES TO ENTER THE CHEMICAL ROOM AT THE CURRENT FINISHED FLOOR LEVEL OR WITHIN 1 FOOT OF THE FINISHED FLOOR LEVEL.

PHOTO 22-1 CHEMICAL ROOM

N

0 2' 4' 8'

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

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ANN ARBOR, MI 48108
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MARK	DATE	DESCRIPTION
	11/29/23	ISSUED FOR BID

BY

CITY OF KALAMAZOO, MICHIGAN

EXISTING PUMP STATION NO. 22 PROCESS EQUIPMENT PLAN

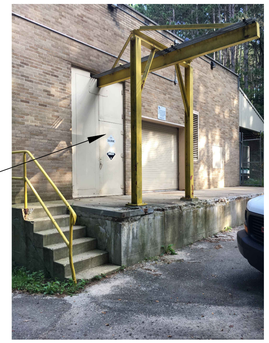
Project No.:	200-19743-19004
Designed By:	NR
Drawn By:	SG
Checked By:	VC

D-118

Copyright: Tetra Tech

Bar Measures 1 inch

11/28/2023 12:27:21 PM - O:\PROJECTS\ANN ARBOR\IER\19743\200-19743-19004\CAD\SHEETFILES\D-118 EXISTING PUMP STATION NO. 22 PROCESS EQUIPMENT PLAN.DWG - GUARD, STEVEN



ACCESS LOCATION. (TYP.)

PHOTO 3
NO SCALE

PHOTO 2
NO SCALE

PHOTO 6
NO SCALE

PHOTO 7
NO SCALE

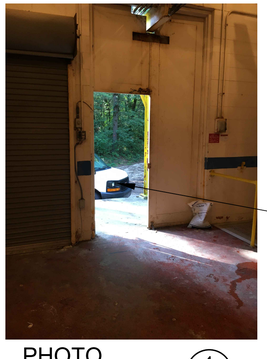


PHOTO 4
NO SCALE

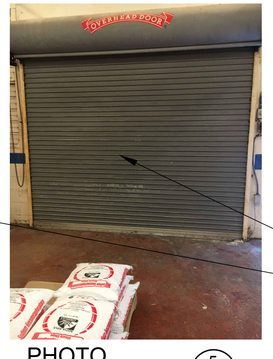


PHOTO 5
NO SCALE

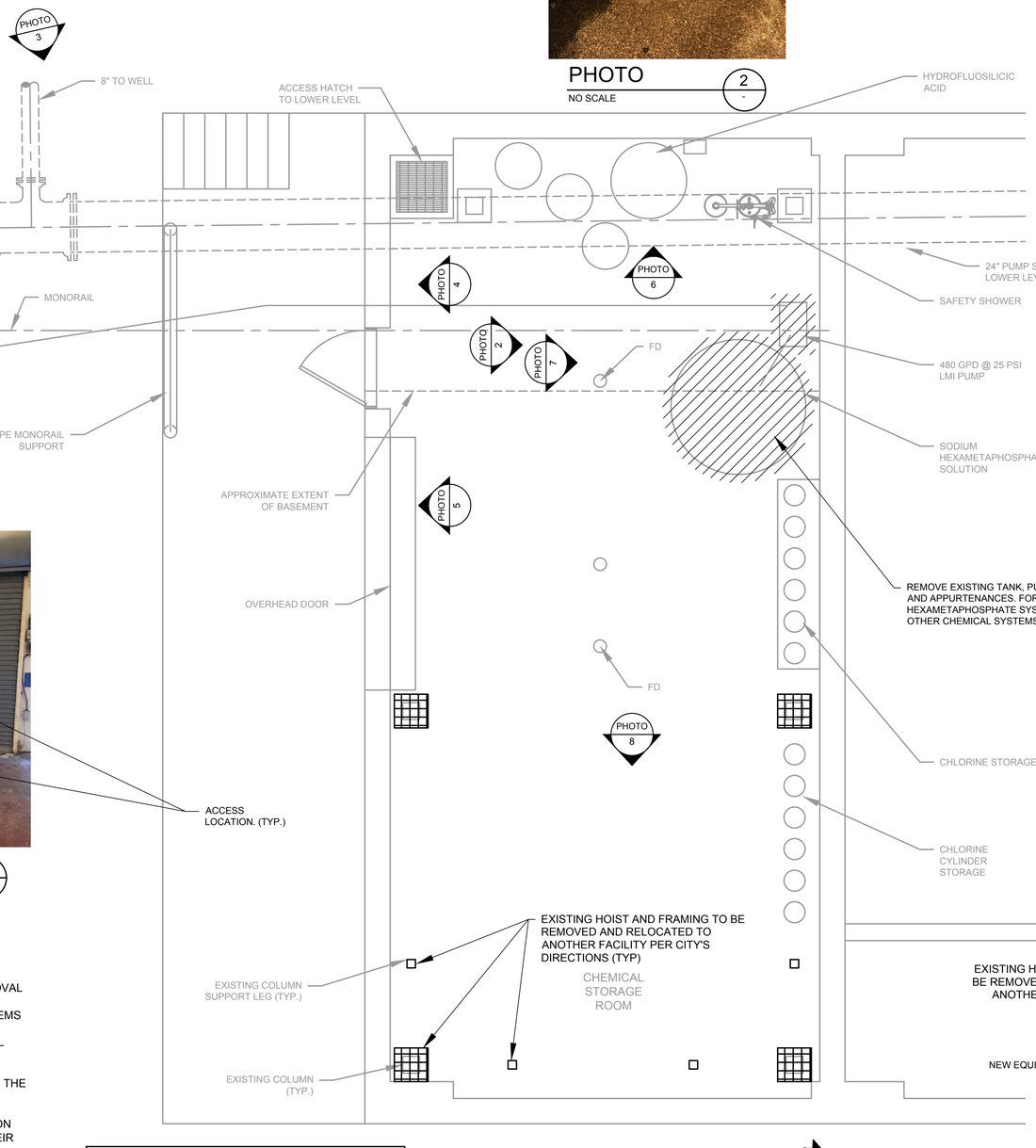


PHOTO 8
NO SCALE

NOTES:

1. COORDINATE WITH OWNER PRIOR TO ALL WORK.
2. ALL NEW WORK TO BE INSTALLED, TESTED, AND FULLY OPERATIONAL PRIOR TO REMOVAL OF EXISTING EQUIPMENT. COORDINATE WITH OWNER.
3. REVIEW WITH OWNER PRIOR TO ANY DEMOLITION WORK. OWNER MAY RETAIN ANY ITEMS AS REQUIRED THAT ARE DEMOLISHED.
4. EXISTING SODIUM HEXAMETAPHOSPHATE SYSTEM SHALL REMAIN OPERATIONAL UNTIL NEW CHEMICAL SYSTEM IS OPERATIONAL OR AS APPROVED AND COORDINATED WITH OWNER.
5. EXISTING PHOSPHATE CHEMICAL FEED SYSTEM AND TANK TO BE RELOCATED DURING THE INSTALLATION OF THE NEW SYSTEM. EXISTING SHALL NOT BE DEMOLISHED UNTIL THE NEW SYSTEM IS FULLY FUNCTIONAL. ALL RELOCATIONS AND DEMOLITION PLANS WILL NEED TO BE DISCUSSED WITH THE CITY. CONTRACTOR SHALL SCHEDULE A DEMOLITION MEETING FOR EACH STATION TO DISCUSS THE PHASING PLAN WITH THE CITY FOR THEIR APPROVAL PRIOR TO DEMOLITION.
6. REFER TO STRUCTURAL DRAWINGS FOR ADDITIONAL DEMOLITION ITEMS AND DETAILS.

NOTE: EXISTING DRAWING FROM DRAWING NO. 8 OF JONES & HENRY ENGINEERS JOB 17W8D KALAMAZOO MICHIGAN ATWATER WELLS & BOOSTER STATION 08-25-1972. PROPOSED WORK SHOWN BOLD, CROSSHATCHED, AND/OR CIRCLED.

PUMP STATION NO. 24 PLAN

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

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

Bar Measures 1 inch

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MARK	DATE	DESCRIPTION	BY
	11/29/23	ISSUED FOR BID	

CITY OF KALAMAZOO, MICHIGAN

PUMP STATION NO. 24 DEMOLITION PLAN

Project No.:	200-19743-19004
Designed By:	NR
Drawn By:	SG
Checked By:	VC

D-119

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11/28/2023 12:30:05 PM - O:\PROJECTS\ANN ARBOR\IER\19743\200-19743-19004\CAD\SHEETFILES\D-119 PUMP STATION NO. 24 PUMP STATION NO. 24.DWG - GUARD, STEVEN

NOTES:

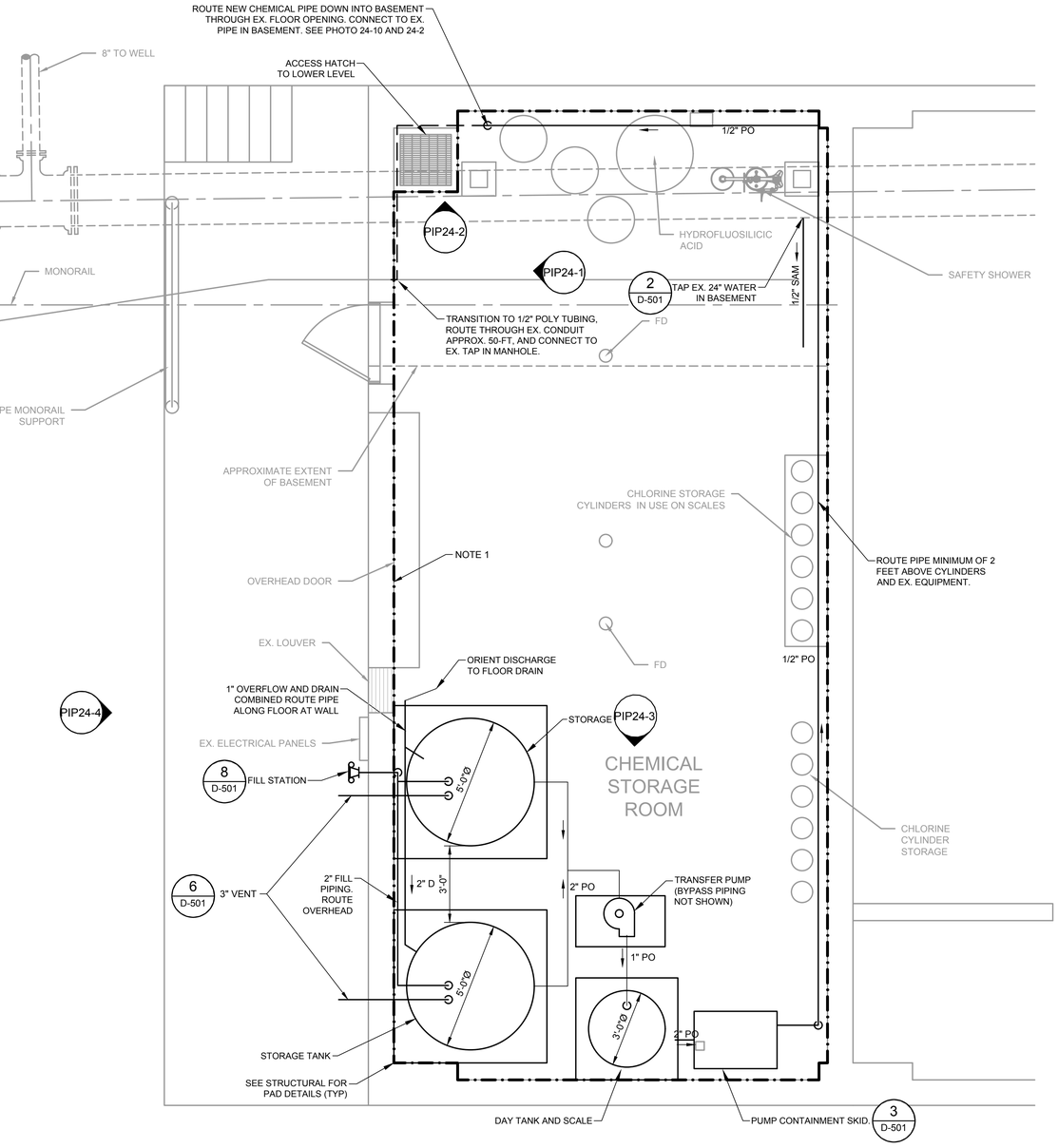
1. PROVIDE PROTECTIVE FLOOR COATING TYPE SC2 IN ACCORDANCE WITH SECTION 09960 WITHIN LIMITS SHOWN ON DRAWING. FLOOR COATING SHALL ENCOMPASS EXISTING AND PROPOSED EQUIPMENT BASES. WHEN COATING LIMIT IS BOUND BY A WALL, EXTEND COATING ON WALL A MINIMUM 4-INCHES FROM FINISHED FLOOR. ALL WORK RELATED TO FLOOR COATING SHALL BE INCLUDED IN BID ALTERNATE NO. 1.
2. HEAT TRACE AND INSULATE ALL PROPOSED OUTDOOR WATER, PHOSPHATE CONTAINMENT AND CARRIER PIPING.
3. CHEMICAL FEED SYSTEMS EQUIPPED WITH TWO BULK TANKS SHALL BE PROVIDED WITH ISOLATION VALVES ON THE FILL LINES, FOR BOTH THE COMMON HEADER AND INDIVIDUAL FILL LINES POSITIONED BETWEEN 36 TO 42 INCHES ABOVE THE FINISHED FLOOR FOR OPERATOR ACCESSIBILITY.
4. REFER TO D-003A FOR PIPE SIZING AND VALVE LOCATIONS.
5. ALL PIPING, VALVES AND FITTINGS ARE NOT SHOWN. CONTRACTOR SHALL PROVIDE ALL PIPING, FITTINGS AND VALVES AS SHOWN ON DRAWINGS D-003, D-003A AND DETAIL 3 ON D-501 TO PRODUCE A COMPLETE AND OPERATIONAL CHEMICAL STORAGE AND FEED SYSTEM.
6. APPROXIMATE LOCATIONS FOR CORE WALL PENETRATIONS FOR THE FILL STATION PIPING AND TANK VENT PIPING ARE SHOWN ON THE PLANS. CONTRACTOR TO SITE VERIFY LOCATION OF CORE WALL PENETRATIONS FOR FILL STATION PIPING AND VENT PIPING PRIOR TO CORE DRILLING.

PHOTO 24-4 - PHOSPHATE FILL STATION

PHOTO 24-3 - STORAGE AND FEED EQIUPEMENT LOCATION

PHOTO 24-2 - FEED PIPE FLOOR PENETRATION

PHOTO 24-1 - FEED PIPE WALL PENETRATION (BASEMENT)



PUMP STATION NO. 24 - PLAN

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

N

0 1'-6" 3'-0" 6'-0"

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

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MARK	DATE	DESCRIPTION
	11/28/23	ISSUED FOR BID

CITY OF KALAMAZOO, MICHIGAN

PUMP STATION NO. 24
PROCESS EQUIPMENT PLAN

Project No.:	200-19743-19004
Designed By:	MR
Drawn By:	SVG
Checked By:	EB

D-120

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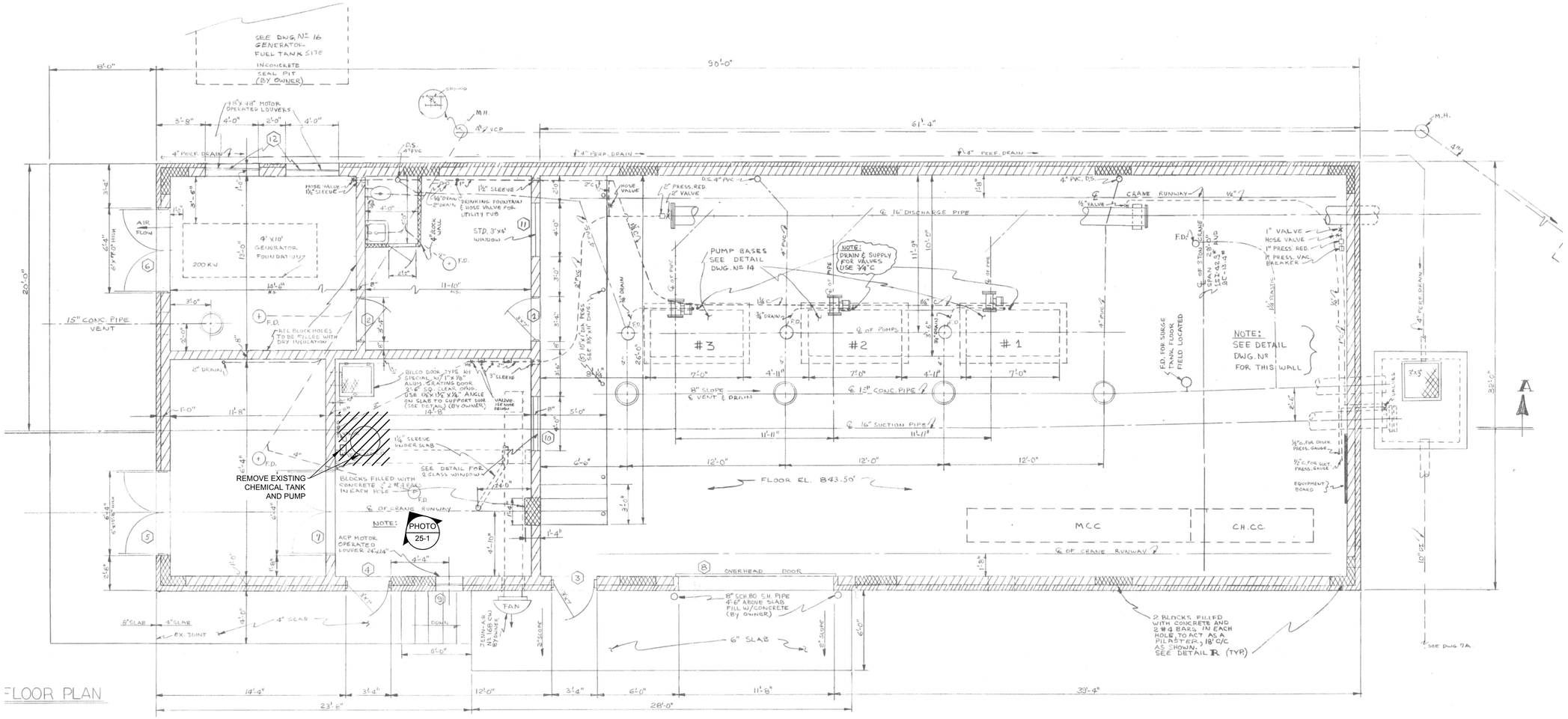
Bar Measures 1 inch

11/28/2023 12:32:54 PM - O:\PROJECTS\ANN ARBOR\ER\19743\200-19743-19004\CAD\SHEETFILES\D-120 PUMP STATION NO. 24 PROCESS EQUIPMENT PLAN.DWG - GUARD, STEVEN



FLOOR PLAN

PUMP STATION NO. 25 PLAN
SCALE: 1/4" = 1'-0"

PHOTO 25-1

NOTES:

1. EXISTING PHOSPHATE CHEMICAL FEED SYSTEM AND TANK TO BE RELOCATED DURING THE INSTALLATION OF THE NEW SYSTEM. EXISTING SHALL NOT BE DEMOLISHED UNTIL THE NEW SYSTEM IS FULLY FUNCTIONAL. ALL RELOCATIONS AND DEMOLITION PLANS WILL NEED TO BE DISCUSSED WITH THE CITY. CONTRACTOR SHALL SCHEDULE A DEMOLITION MEETING FOR EACH STATION TO DISCUSS THE PHASING PLAN WITH THE CITY FOR THEIR APPROVAL PRIOR TO DEMOLITION.
2. REFER TO STRUCTURAL DRAWINGS FOR ADDITIONAL DEMOLITION ITEMS AND DETAILS.

- TO BE REMOVED

N

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

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MARK	DATE	DESCRIPTION
	11/29/23	ISSUED FOR BID

CITY OF KALAMAZOO, MICHIGAN

PUMP STATION NO. 25 DEMOLITION PLAN

Project No.:	200-19743-19004
Designed By:	NR
Drawn By:	SG
Checked By:	VC

D-121

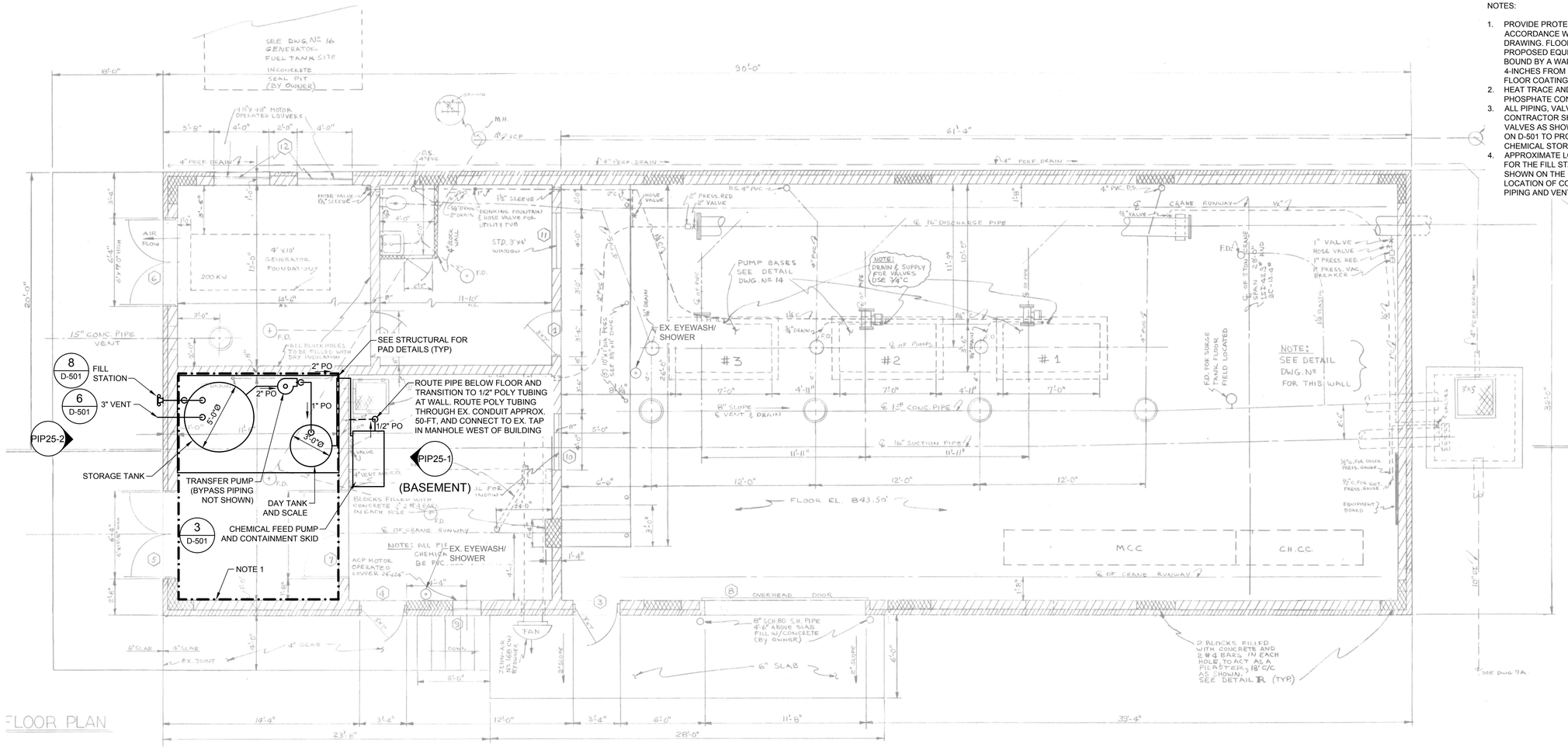
Copyright: Tetra Tech

Bar Measures 1 inch

11/28/2023 12:35:28 PM - O:\PROJECTS\ANN ARBOR\IER\197433\200-19743-19004\CAD\SHEETFILES\D-121 PUMP STATION NO. 25 DEMOLITION PLAN.DWG - GUARD, STEVEN

NOTES:

1. PROVIDE PROTECTIVE FLOOR COATING TYPE SC2 IN ACCORDANCE WITH SECTION 09960 WITHIN LIMITS SHOWN ON DRAWING. FLOOR COATING SHALL ENCOMPASS EXISTING AND PROPOSED EQUIPMENT BASES. WHEN COATING LIMIT IS BOUND BY A WALL, EXTEND COATING ON WALL A MINIMUM 4-INCHES FROM FINISHED FLOOR. ALL WORK RELATED TO FLOOR COATING SHALL BE INCLUDED IN BID ALTERNATE NO. 1.
2. HEAT TRACE AND INSULATE ALL PROPOSED OUTDOOR WATER, PHOSPHATE CONTAINMENT AND CARRIER PIPING.
3. ALL PIPING, VALVES AND FITTINGS ARE NOT SHOWN. CONTRACTOR SHALL PROVIDE ALL PIPING, FITTINGS AND VALVES AS SHOWN ON DRAWINGS D-003, D-003A AND DETAIL 3 ON D-501 TO PRODUCE A COMPLETE AND OPERATIONAL CHEMICAL STORAGE AND FEED SYSTEM.
4. APPROXIMATE LOCATIONS FOR CORE WALL PENETRATIONS FOR THE FILL STATION PIPING AND TANK VENT PIPING ARE SHOWN ON THE PLANS. CONTRACTOR TO SITE VERIFY LOCATION OF CORE WALL PENETRATIONS FOR FILL STATION PIPING AND VENT PIPING PRIOR TO CORE DRILLING.



PUMP STATION NO. 25 - PLAN

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

PHOTO 25-1 - BASEMENT
CHEMICAL FEED ROUTING

PHOTO 25-2 - FILL STATION

N

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

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CITY OF KALAMAZOO, MICHIGAN

PUMP STATION NO. 25 PROCESS EQUIPMENT PLAN

Project No.:	200-19743-19004
Designed By:	NR
Drawn By:	SG
Checked By:	VC

D-122

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Bar Measures 1 inch

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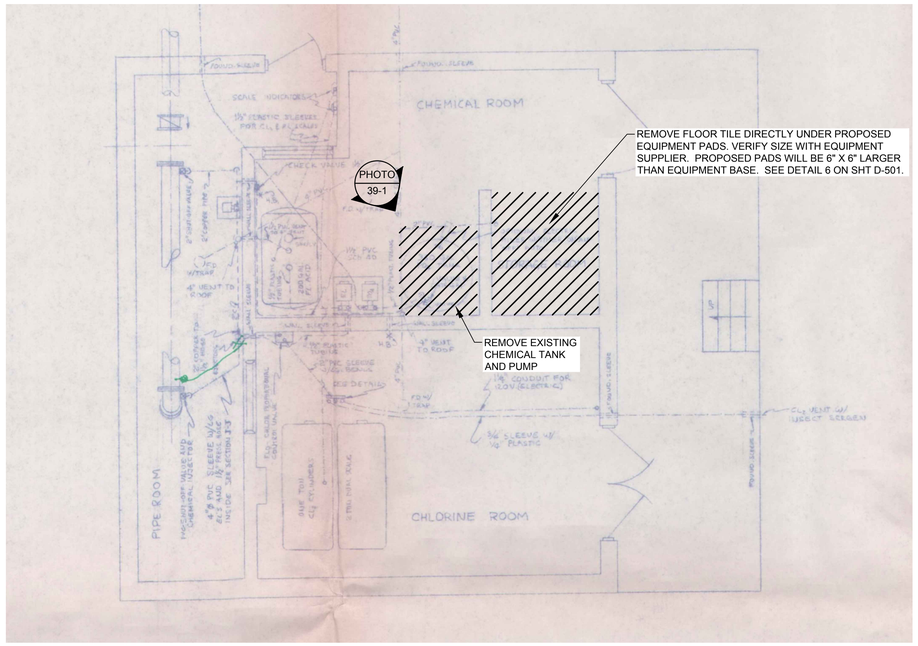

PUMP STATION NO. 39 PLAN
SCALE: 1/4" = 1'-0"

PHOTO 39-1

NOTES:

1. EXISTING PHOSPHATE CHEMICAL FEED SYSTEM AND TANK TO BE RELOCATED DURING THE INSTALLATION OF THE NEW SYSTEM. EXISTING SHALL NOT BE DEMOLISHED UNTIL THE NEW SYSTEM IS FULLY FUNCTIONAL. ALL RELOCATIONS AND DEMOLITION PLANS WILL NEED TO BE DISCUSSED WITH THE CITY. CONTRACTOR SHALL SCHEDULE A DEMOLITION MEETING FOR EACH STATION TO DISCUSS THE PHASING PLAN WITH THE CITY FOR THEIR APPROVAL PRIOR TO DEMOLITION.
2. REFER TO STRUCTURAL DRAWINGS FOR ADDITIONAL DEMOLITION ITEMS AND DETAILS.

- TO BE REMOVED

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

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CITY OF KALAMAZOO, MICHIGAN

PUMP STATION NO. 39 DEMOLITION PLAN

Project No.:	200-19743-19004
Designed By:	NR
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Checked By:	VC

D-123

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Bar Measures 1 inch

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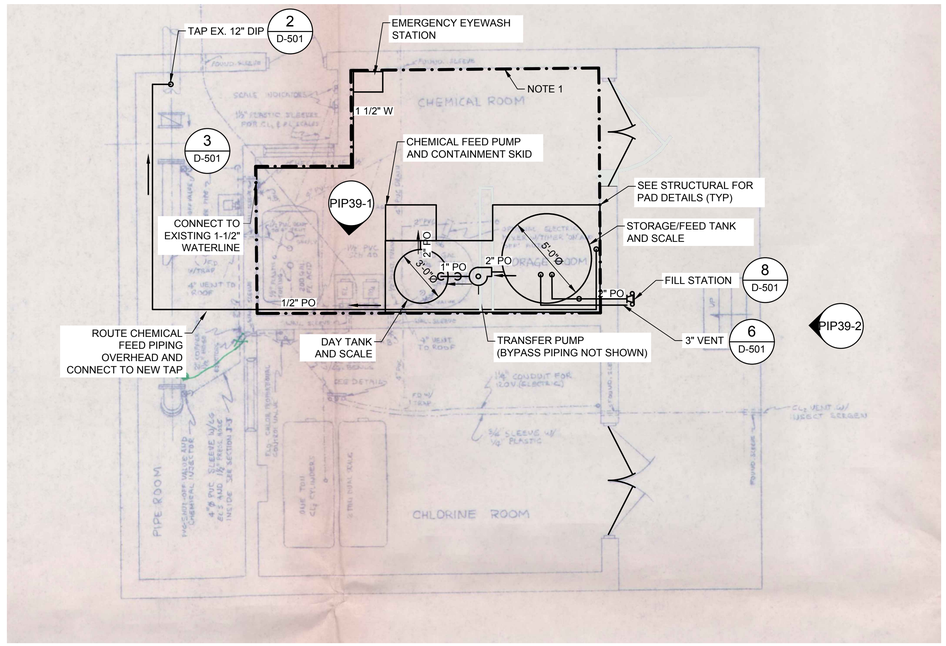

PUMP STATION NO. 39 - PLAN

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

PHOTO 39-1 - EXISTING FLOOR PENETRATION

PHOTO 39-2 - PHOSPHATE FILL STATION

NOTES:

1. PROVIDE PROTECTIVE FLOOR COATING TYPE SC2 IN ACCORDANCE WITH SECTION 09960 WITHIN LIMITS SHOWN ON DRAWING. FLOOR COATING SHALL ENCOMPASS EXISTING AND PROPOSED EQUIPMENT BASES. WHEN COATING LIMIT IS BOUND BY A WALL, EXTEND COATING ON WALL A MINIMUM 4-INCHES FROM FINISHED FLOOR. ALL WORK RELATED TO FLOOR COATING SHALL BE INCLUDED IN BID ALTERNATE NO. 1
2. HEAT TRACE AND INSULATE ALL PROPOSED OUTDOOR WATER, PHOSPHATE CONTAINMENT AND CARRIER PIPING.
3. ALL PIPING, VALVES AND FITTINGS ARE NOT SHOWN. CONTRACTOR SHALL PROVIDE ALL PIPING, FITTINGS AND VALVES AS SHOWN ON DRAWINGS D-003, D-003A AND DETAIL 3 ON D-501 TO PRODUCE A COMPLETE AND OPERATIONAL CHEMICAL STORAGE AND FEED SYSTEM.
4. APPROXIMATE LOCATIONS FOR CORE WALL PENETRATIONS FOR THE FILL STATION PIPING AND TANK VENT PIPING ARE SHOWN ON THE PLANS. CONTRACTOR TO SITE VERIFY LOCATION OF CORE WALL PENETRATIONS FOR FILL STATION PIPING AND VENT PIPING PRIOR TO CORE DRILLING.

N

0 2' 4' 8'

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

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MARK	DATE	DESCRIPTION
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BY

CITY OF KALAMAZOO, MICHIGAN

PUMP STATION NO. 39
PROCESS EQUIPMENT PLAN

Project No.:	200-19743-19004
Designed By:	NR
Drawn By:	SG
Checked By:	VC

D-124

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Bar Measures 1 inch

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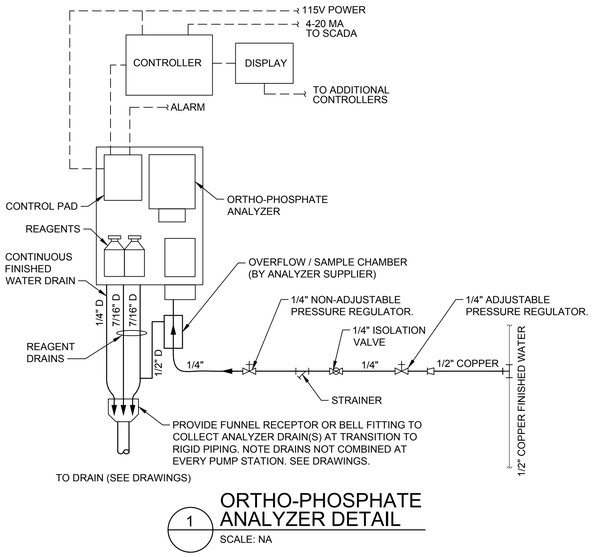
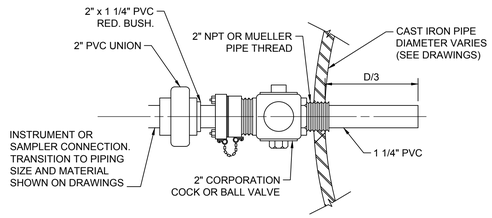
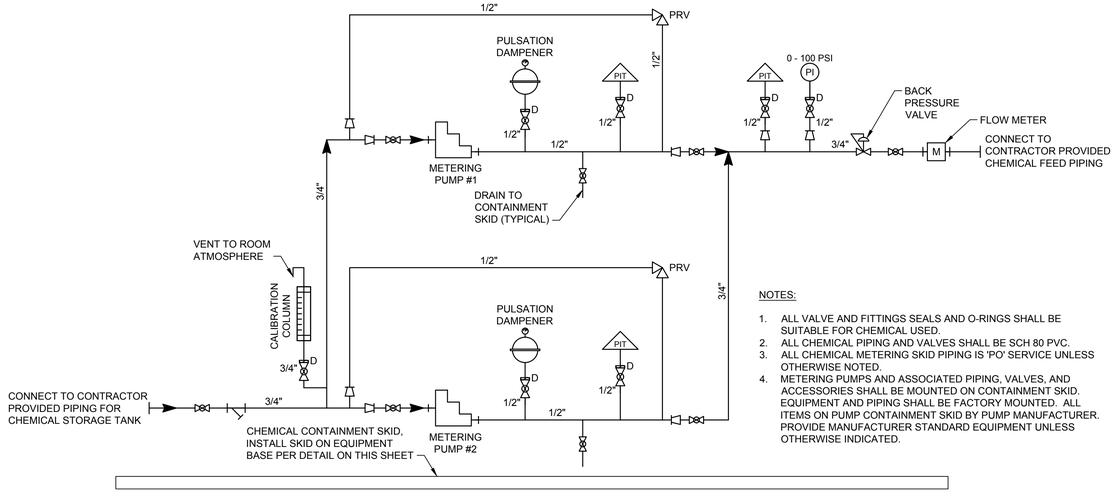


1 ORTHO-PHOSPHATE ANALYZER DETAIL
SCALE: NA

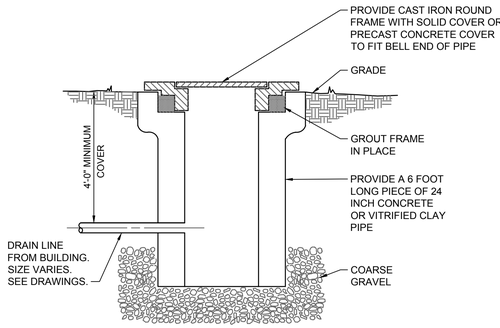


2 PIPE TAP DETAIL
SCALE: NA



NOTES:
1. ALL VALVE AND FITTINGS SEALS AND O-RINGS SHALL BE SUITABLE FOR CHEMICAL USED.
2. ALL CHEMICAL PIPING AND VALVES SHALL BE SCH 80 PVC.
3. ALL CHEMICAL METERING SKID PIPING IS 'PO' SERVICE UNLESS OTHERWISE NOTED.
4. METERING PUMPS AND ASSOCIATED PIPING, VALVES, AND ACCESSORIES SHALL BE MOUNTED ON CONTAINMENT SKID. EQUIPMENT AND PIPING SHALL BE FACTORY MOUNTED. ALL ITEMS ON PUMP CONTAINMENT SKID BY PUMP MANUFACTURER. PROVIDE MANUFACTURER STANDARD EQUIPMENT UNLESS OTHERWISE INDICATED.

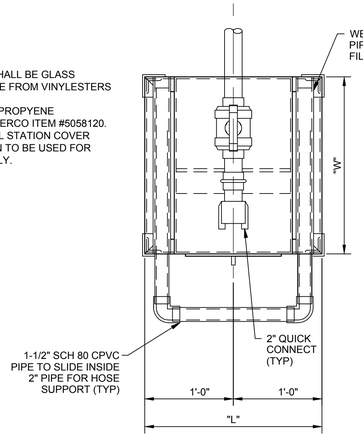
3 CHEMICAL FEED PUMP AND CONTAINMENT SKID
SCALE:N/A



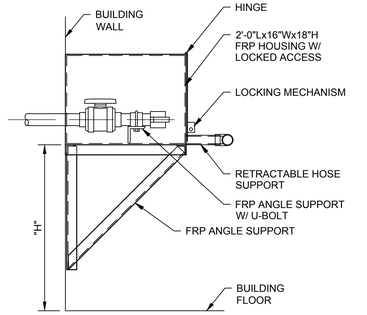
4 DRY WELL DETAIL
SCALE: NA

5 NOT UTILIZED
D-501
SCALE: NA

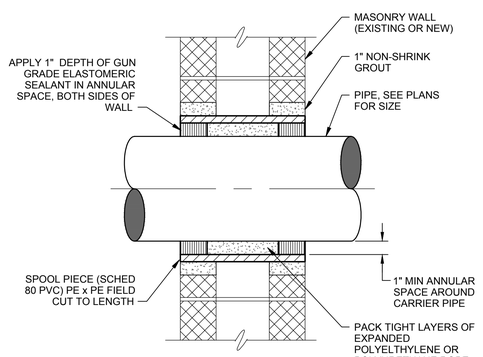
NOTES:
1. ALL SUPPORTS AND FASTENERS SHALL BE GLASS FIBER-REINFORCED PLASTICS MADE FROM VINYLESTERS WITH UV INHIBITORS.
2. QUICK CONNECT SHALL BE A POLYPROPYENE DRY-DISCONNECT FITTING, RYAN HERCO ITEM #5058120.
3. INCLUDE A NAMEPLATE ON THE FILL STATION COVER INDICATING THAT THE FILL STATION TO BE USED FOR ORTHO PHOSPHATE CHEMICAL ONLY.



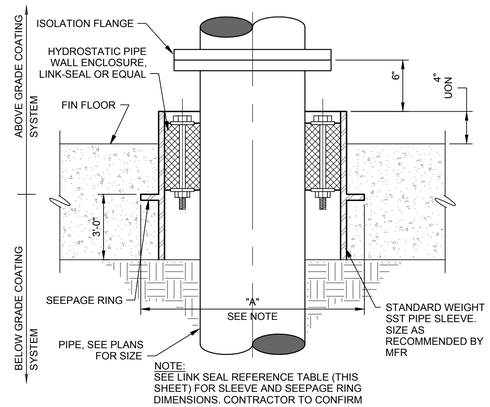
FILL STATION	WIDTH (W)	HEIGHT (H)	LENGTH (L)
SINGLE	2'-0"	3'-0"	2'-0"



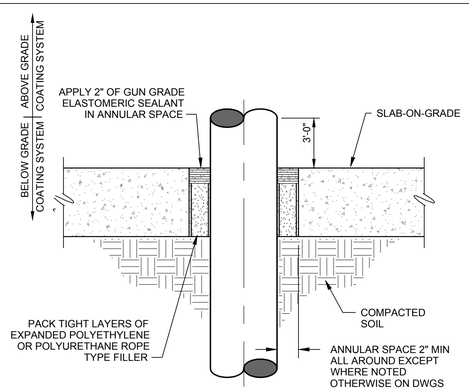
8 CHEMICAL FILL STATION DETAIL
SCALE: NONE



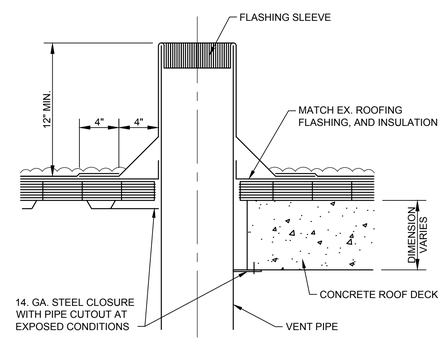
6 WALL PENETRATION - MASONRY
NO SCALE



7 WALL PENETRATION - CONCRETE (FLOOR)
NO SCALE



9 PIPE PENETRATION - SLAB ON GRADE
NO SCALE



10 ROOF VENT DETAIL
D-501
SCALE: NA

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MARK	DATE	DESCRIPTION
	11/29/23	ISSUED FOR BID

CITY OF KALAMAZOO, MICHIGAN

PROCESS & EQUIPMENT DETAILS I

Project No.:	200-19743-19004
Designed By:	NR
Drawn By:	SG
Checked By:	VC

D-501

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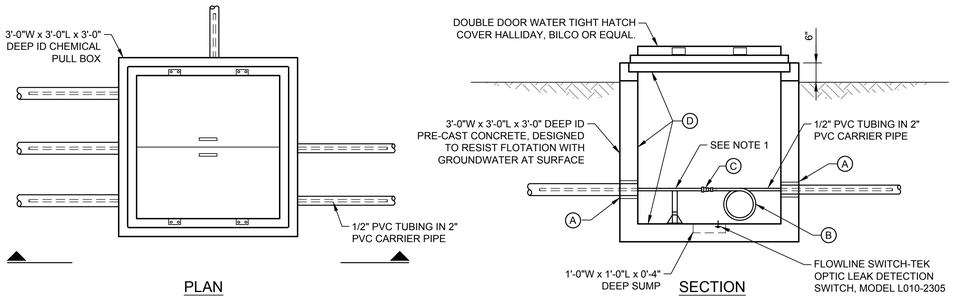
Bar Measures 1 inch

11/28/2023 12:48:58 PM - O:\PROJECTS\ANN ARBOR\ER\19743\200-19743-19004\CAD\SHEETFILES\D-501 PROCESS & EQUIPMENT DETAILS I.DWG - GUARD, STEVEN



(A) 5" DIA OPENING IN CONCRETE WALL TO ACCOMMODATE 2" DIAMETER PVC CARRIER PIPE. FILL VOID USING NON-SHRINK GROUT.

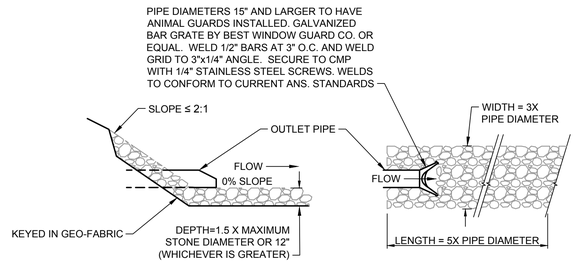
(B) LOOP OR COIL TUBING USING AT LEAST 10% MORE THAN THE MINIMUM ALLOWABLE RADIUS BEND AND SUPPORT LOOP USING NON-METALLIC PIPE SUPPORTS AND PLASTIC STRAPS OR CABLE TIES. DO NOT KINK TUBING.

(C) WHEN TRANSITIONING FROM PVC TUBING TO SCHEDULE 80 PVC RIGID PIPE USE SINGLE BARB x SCK TRANSITION FITTING W/ SST TUBING CLAMP.

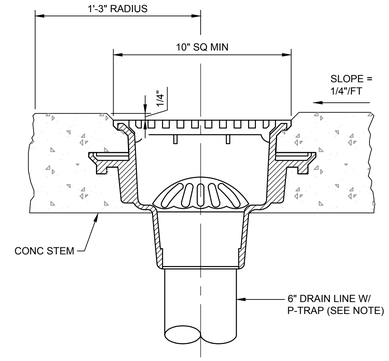
(D) COAT INTERIOR CONCRETE SURFACES OF CHEMICAL PULL BOX WITH CHEMICAL RESISTANT COATING PER SECTION 09900.

(E) HEAT TRACE AND INSULATE ALL PROPOSED OUTDOOR WATER, PHOSPHATE CONTAINMENT AND CARRIER PIPING IN THE CHEMICAL CONTAINMENT BOXES.

1 - CHEMICAL CONTAINMENT PULL BOX
N.T.S.

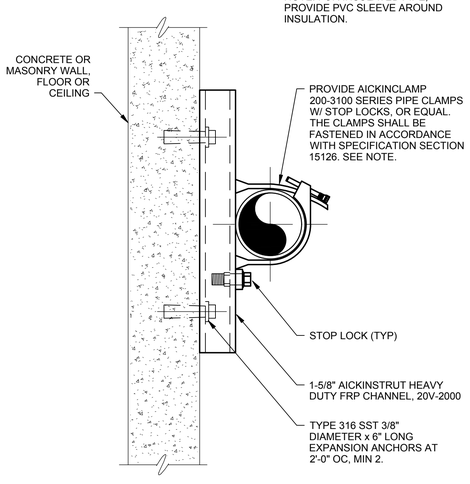


2 - RIP-RAP
N.T.S.

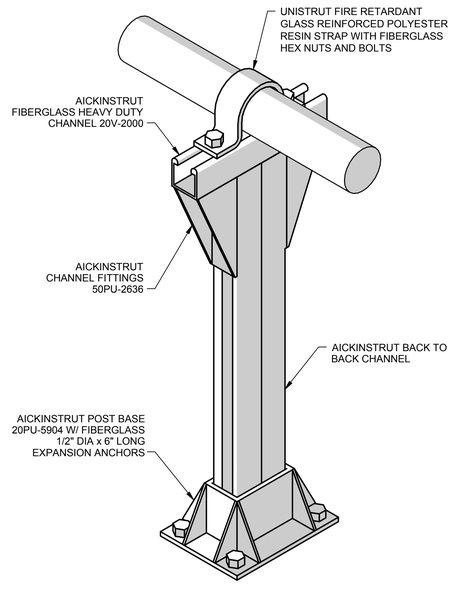


NOTE:
FOR EXTERIOR APPLICATIONS
P-TRAP IS NOT REQUIRED

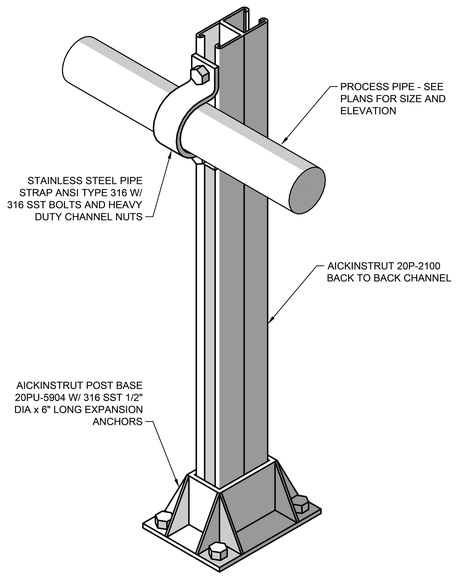
3 - FLOOR DRAIN
N.T.S.



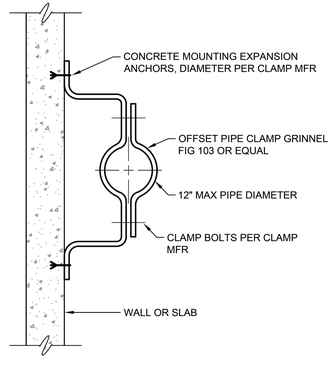
4 - PIPE SUPPORT - NON-METALLIC
N.T.S.



5 - NON-METALLIC PIPE STANCHION PIPE SUPPORT
N.T.S.



6 - PIPE SUPPORT - NON-METALLIC POST
N.T.S.



NOTE:
ALL MATERIALS OF CONSTRUCTION SHALL BE 316 STAINLESS STEEL OR ALUMINUM. ALL MOUNTING HARDWARE SHALL BE 316 STAINLESS STEEL.

7 - PIPE SUPPORT - OFFSET
N.T.S.

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PHONE: (734) 665-6000 FAX: (734) 213-3003

MARK	DATE	DESCRIPTION
	11/29/23	ISSUED FOR BID

CITY OF KALAMAZOO, MICHIGAN

PROCESS & EQUIPMENT DETAILS II

Project No.:	200-19743-19004
Designed By:	NR
Drawn By:	SG
Checked By:	VC

D-502

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Bar Measures 1 inch

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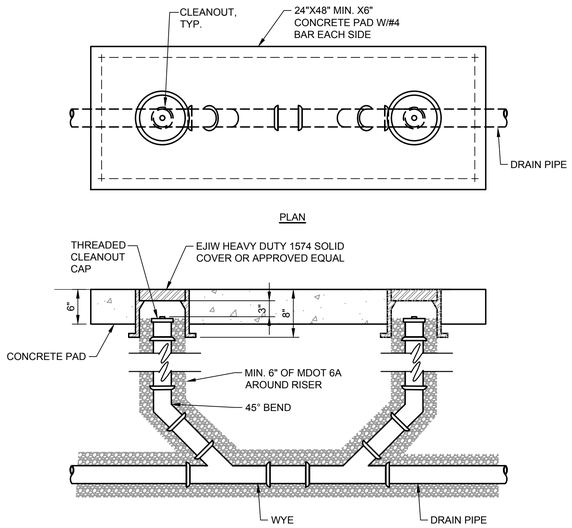

PLAN

ELEVATION

NOTES:

1. ALL CONNECTION SHALL BE BELL AND SPIGOT TYPE.
2. CLEANOUT IS TO BE SAME DIAMETER AS SERVICE PIPE.
3. CONCRETE PAD REQUIRED UNLESS OTHERWISE DETERMINED BY THE CITY.
4. THERE MUST BE A 3" GAP FROM THE BOTTOM OF THE CLEAN OUT LID TO THE TOP OF THE THREADED CAP.

1 / - TWO WAY SEWER CLEANOUT DETAIL

N.T.S.

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www.tetratech.com
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ANN ARBOR, MI 48108
PHONE: (734) 665-6000 FAX: (734) 213-3003

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	11/28/23	ISSUED FOR BID

CITY OF KALAMAZOO, MICHIGAN

PROCESS & EQUIPMENT DETAILS

Project No.:	200-19743-19004
Designed By:	NR
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Checked By:	VC

D-503

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BACKGROUND PLAN AND ONE LINE SYMBOLS

SYMBOL	DESCRIPTION
	CONTROL SWITCH (SEL. OR P.B.) SEE CIRCUITS FOR SPECIFIC TYPE
F FL	SEE CIRCUITS FOR SPECIFIC TYPE FLOAT SWITCH - FLOW SWITCH
T M	TEMPERATURE - HUMIDISTAT SWITCH (SUBSCRIPT=NO. OF STAGES)
L P V	LIMIT (PROXIMITY TYPE) PRESSURE - VACUUM SWITCH
ALT	ELECTRICAL OR MECHANICAL ALTERNATOR (SEE WIRING)
OS	OVERLOAD SWITCH OR DEVICE
TB	TERMINAL BOX
	SOLENOID VALVE
PC	PHOTOCELL LINE VOLTAGE
	AS NOTED (LIGHTING PANEL, CONTROL PANEL, DISTRIBUTION PANEL, ETC.) WALL MOUNTED
JB	JUNCTION BOX
	TRANSFORMER
	CONDUIT WITH CONDUIT SEAL FITTING
	CONDUIT EXPOSED
	CONDUIT CONCEALED
E	DIRECT BURIED CONDUIT
UG	DIRECT BURIED CABLE
OH	OVERHEAD LINE
DB	UNDERGROUND DUCT BANK
EDB	EXISTING UNDERGROUND DUCT BANK
1 2 3 4 5 6	CONCRETE ENCASED DUCT BANK WITH CABLE LOCATIONS, AND SPARE DUCTS AS INDICATED ON DRAWINGS
	CABLE REEL
L L L L	MULTI-STACK ALARM LIGHTS
	SELECTOR SWITCH / PUSHBUTTON. FUNCTIONS AS SHOWN IN WIRING DIAGRAMS
	LOW VOLTAGE DISCONNECT SWITCH
	LOW VOLTAGE FUSE (BELOW 600V)
	HIGH VOLTAGE FUSE (ABOVE 600V)
1 RV, 2 FVR, 3 2S,2W	ALL STARTERS SHALL BE FULL VOLTAGE, NON-REVERSING UNLESS OTHERWISE INDICATED. (FVR) FULL VOLTAGE REVERSING (RV) REDUCED VOLTAGE (2S, 2W) TWO SPEED, TWO WINDING
	600V, 3 POLE MOLDED CASE CIRCUIT BREAKER, FRAME & RATING AS SHOWN
1 2 A-3	SINGLE PHASE, FRACTIONAL HP MOTOR TO LOCATION INDICATED (SEE NOTE 2 ON STANDARD NOTE SHEET)
86	DEVICE SYMBOL WITH TYPE DEVICE
A 1	THREE PHASE LOAD WITH IDENTIFICATION

SYMBOL	DESCRIPTION
FT 10	TAG NO. (BALLOON) FOR DEVICE INDICATED
FT 10, A-3, MCP OR CP-1	FOR POWER (SEE NOTE 2 ON STANDARD NOTE SHEET) 3/4"C(2/C#18SH) CONDUIT AND WIRE RUN FROM DEVICE INDICATED TO LOCATION INDICATED
	CAPACITOR, 3 PHASE, SIZE AS INDICATED
F C	DISCONNECT SWITCH (F) = FUSED, (C) = CIRCUIT BREAKER
	MAGNETIC STARTER (BACKGROUND DRAWINGS ONLY)
SIZE 2	COMBINATION MAGNETIC STARTER FUSED UNLESS NOTED (CIRCUIT BREAKER)
LC	COMBINATION LIGHTING CONTACTOR WITH HAND-OFF-AUTO SWITCH
	MANUAL STARTER (R) = REVERSING
CP	CONTROL PANEL
1/8 UH-19	UNIT HEATER, 1/8 HORSEPOWER
	LIGHTING ARRESTOR
A-3	LOW VOLTAGE HOME RUNS 120/208V, 120/240V (SEE NOTE 2 ON STANDARD NOTE SHEET)
NEMA 4	WATERTIGHT
NEMA 4X	WATERTIGHT AND CORROSION PROOF
NEMA 7	EXPLOSION PROOF - CLASS I, DIVISION 1, GROUP D
NEMA 9	EXPLOSION PROOF - CLASS II, DIVISION 1
K	KEYLOCK
SD	SMOKE DETECTOR
E	EXIT LIGHT
	FLUORESCENT LUMINAIRE
	INCANDESCENT LUMINAIRE
	HIGH INTENSITY DISCHARGE LIGHT
EM	EMERGENCY BATTERY PACK
DS	DESK INTERCOM SET
	CAMERA
PTZ	DOME CAMERA (PAN, TILT, ZOOM)
52	DRAW OUT CIRCUIT BREAKER (ABOVE 600 VOLT)
	CIRCUIT BREAKER WITH STAB CONNECTION
(3) 50/5	CURRENT TRANSFORMER, AND RATIO (WITH NUMBER REQUIRED SHOWN)

WIRING DEVICE SCHEDULE

SYMBOL	DESCRIPTION	NEMA TYPE
	125V, 2P, DUPLEX, 3W	5-20 R
	SIMPLEX RECEPTACLE	
	QUAD RECEPTACLE	
S	20A, 120/277V SWITCH	SPST

CONTROL CIRCUIT & PILOT DEVICE LEGEND

SYMBOL	DESCRIPTION
	PRESSURE ACTUATED SWITCH
	FLOW ACTUATED SWITCH
	LIMIT SWITCH - NORMALLY OPEN
	LIMIT SWITCH - NORMALLY CLOSED - HELD OPEN
	LATCHING CABLE SWITCH
	MOMENTARY PUSHBUTTON OPERATOR-NORMALLY CLOSED
	MOMENTARY PUSHBUTTON OPERATOR-NORMALLY OPEN
	CONTROL RELAY CONTACT - NORMALLY OPEN
INST.	TIMING RELAY INSTANTANEOUS CONTACT
CR	CONTROL RELAY COIL
CR L, CR U	TWO COIL LATCHING RELAY
	TIMED CLOSED CONTACT ON ENERGIZATION
	TIMED OPEN CONTACT ON DE-ENERGIZATION
	ZERO SPEED OR ANTI-PLUGGING SWITCH
	MAINTAINED STOP-START PUSHBUTTON OPERATOR
	MAINTAINED PUSH - PULL OPERATOR
	LOCAL TERMINALS WITH EXTERNAL WIRING
T	TIMING RELAY COIL
T 1	TIMING RELAY COIL (OFF DELAY)
G	INDICATING LIGHT
	PUSH-TO-TEST INDICATING LIGHT
X1 X2	SECONDARY TRANSFORMER
	MOLDED CASE CIRCUIT BREAKER
	GENERAL DISCONNECT SWITCH

SYMBOL	DESCRIPTION
	SELECTOR SWITCH - NORMALLY OPEN
	FLOAT ACTUATED SWITCH
	TEMP. ACTUATED SWITCH
	LIMIT SWITCH - NORMALLY CLOSED
	LIMIT SWITCH - NORMALLY OPEN - HELD CLOSED
	TIME DELAY FUSE
	PUSHBUTTON OPERATOR WITH MUSHROOM HEAD
(F)	FIELD LOCATED STOP BUTTON
	CONTROL RELAY CONTACT - NORMALLY CLOSED
INST.	TIMING RELAY INSTANTANEOUS CONTACT
O, H, C	SELECTOR SWITCH OPERATOR WITH FUNCTION SHOWN
	TIMED OPEN CONTACT ON ENERGIZATION
	TIMED CLOSED CONTACT ON DE-ENERGIZATION
1 R	PUSH-TO-TEST INDICATING LIGHT
1	MAINTAINED STOP - MOMENTARY START PUSHBUTTON (JOG)
	SOLENOID OR CLUTCH
ETI	ELAPSED TIME INDICATOR
X1 X2	120VAC TRANSFORMER
	PUSHBUTTON OPERATOR WITH MUSHROOM HEAD
	THERMAL OVERLOAD
(F)	FIELD LOCATED
	TERMINAL POINT
	TERMINAL
	LOW VOLTAGE FUSE
	FUSIBLE TERMINAL BLOCK
	CONTROL POWER TRANSFORMER
	RECEPTACLE

NOTE: THE PLC I/O ADDRESS SHALL BE USED AS THE WIRING TAG SCHEME FOR ALL PANEL AND FIELD CONTROL WIRING. COORDINATE WITH ELECTRICAL CONTRACTOR.

NOTE:

NOTE: I/O WIRE TAGS FOR CONTROL WIRING INSIDE ALL CONTROL PANELS TO BE POLYPROPYLENE.

NOTE: FIBER, AND ETHERNET PATCH CABLES SHALL BE THE FOLLOWING COLORS

PINK - BUSINESS NETWORK

YELLOW - VIDEO NETWORK

BLUE - SCADA/LAN NETWORK - WATER

ORANGE - PLC-I/O NETWORK

RED - AUDIO NETWORK (IP PHONE)

GREEN - SCADA/LAN NETWORK - WASTEWATER

COPPER, AND FIBER PATCH CABLES: (6 FEET IN LENGTH MINIMUM, EACH)

I.S.A. STANDARD LETTER FUNCTIONS

SYMBOL	FIRST LETTER	SUCCEEDING LETTERS
A	ANALYSIS, ANALOG	ALARM
B	BURNER, FLAME	BATCH
C	CONDUCTIVITY, COMMAND	CONTROL (FEEDBACK TYPE)
D	DENSITY, SPECIFIC GRAVITY	
E	VOLTAGE	PRIMARY ELEMENT
F	FLOW RATE	RATIO
G	GAGING	GLASS
H	HAND, MANUAL	HIGH
I	CURRENT	INDICATE
J	POWER	SCAN
K	TIME, TIME SCHEDULE	CONTROL (NO FEEDBACK)
L	LEVEL, LIGHT	LOW
M	MOISTURE, HUMIDITY	MIDDLE, MODULATE
N		
O	OVERLOAD	ORIFICE
P	PRESSURE, VACUUM	POINT
Q	QUANTITY	TOTALIZE, INTEGRATE
R	RADIOACTIVITY	RECORD, PRINT, RECEIVE
S	SPEED, FREQUENCY, SOLENOID	SWITCH
T	TEMPERATURE, TURBIDITY	TRANSMIT, TRANSFORM
U	MULTIVARIABLE	MULTIFUNCTION
V	VIBRATION, VISCOSITY	VALVE, DAMPER, LOUVER
W	WEIGHT, FORCE	
X		
Y		RELAY, COMPUTE
Z	POSITION	DRIVE, ACTUATE

PROTECTIVE RELAY LEGEND

DEVICE NO.	DESCRIPTION
2	SYNC. TIMER 0-5 MIN.
25	SYNCHRONIZING
27	SHORT TIME UNDERVOLTAGE
32	REVERSE POWER RELAY
38	TEMPERATURE
40	LOSS OF EXCITATION
43	SELECTOR SWITCH
47	PHASE SEQUENCE & UNDERVOLTAGE
49	THERMAL
50/51	INSTANTANEOUS AND VERY INVERSE
51	VERY INVERSE
51G	INVERSE GROUND FAULT
51N	NEUTRAL OVERCURRENT
51V	OVERCURRENT RELAY WITH VOLTAGE RESTRAINT
52/CS	CONTROL SWITCH
59	INSTANTANEOUS OVERVOLTAGE
60	VOLTAGE BALANCE
62	TIME DELAY
64	SHORT TIME LOW PICK UP OVERVOLTAGE
67	DIRECTIONAL OVERCURRENT
69	LOCKOUT CONTROL SWITCH
78	OUT OF STEP
81	OVER/UNDER FREQUENCY RELAY
83	MULTI-CONTACT AUXILIARY
86/HR	MULTI-CONTACT AUX. HAND RESET
87	DIFFERENTIAL OVERCURRENT

SYMBOL LEGEND

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
PT	POTENTIAL TRANSFORMER	W	WATTMETER
CT	CURRENT TRANSFORMER	AP	ALARM POINT
A	AMMETER	CPT	CONTROL POWER TRANSFORMER
V	VOLTMETER	(2) (3)	NUMBER OF DEVICES REQUIRED
PF	POWER FACTOR METER	ETI	ELAPSED TIME METER

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MARK	DATE	DESCRIPTION	BY
	11/29/23	ISSUED FOR BID	

CITY OF KALAMAZOO, MICHIGAN
WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

ELECTRICAL LEGEND

Project No.: 200-19743-19004
Designed By: GCJ
Drawn By: JLS
Checked By: WAP/GCJ

E-001
OF 43

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Bar Measures 1 inch

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NOTES:

1. FIELD VERIFY CONDUIT ROUTING AT THE PUMP STATIONS WITH OWNER. CORE HOLES AS REQUIRED TO SUIT INSTALLATION OF THE CONDUITS SHOWN. PATCH WITH NON-SHRINK GROUT.
2. TURN OVER TO OWNER AT PROJECT COMPLETION OPERATION AND MAINTENANCE MANUALS (QUANTITY AS SPECIFIED) TO OWNER.
3. IN ADDITION TO PATCH CABLES SUPPLIED FOR THE PROJECT, FURNISH 30-10FT LONG MULTIMODE DUPLEX FIBER OPTIC PATCH CABLES (LC-LC) CONNECTORS, AND 30-10FT CAT-6 PURPLE PATCH CABLES FOR OWNERS USE. TURN OVER CABLES TO OWNER.
4. MULTIMODE FIBER OPTIC PATCH CABLES, AND ETHERNET PATCH CABLES SUPPLIED IN THE PROJECT SHALL BE COLORED PURPLE.
5. FIBER OPTIC PATCH PANELS SHALL BE THE PRODUCT OF CORNING CABLE SYSTEMS. (RACK OR SURFACE MOUNTED AS SHOWN", LC STYLE CONNECTORS, WITH QUANTITY OF BULKHEADS AS SHOWN.

GENERAL CONSTRUCTION NOTES:

1. ELECTRICAL MATERIALS AND EQUIPMENT ITEMS SHOWN IN LIGHT LINE WEIGHTS ON THE DRAWINGS ARE EXISTING ITEMS TO REMAIN. ELECTRICAL MATERIALS AND EQUIPMENT ITEMS SHOWN IN HEAVY LINE WEIGHTS ARE NEW THIS CONTRACT.
2. ITEMS SHOWN OR NOTED TO BE DEMOLISHED ON THE DRAWINGS ARE EXISTING ITEMS TO BE REMOVED FROM SITE BY CONTRACTOR UNLESS NOTED TO BE TURNED OVER TO OWNER.
3. FOR ITEMS INDICATED AS "FIELD LOCATE", THE CONTRACTOR SHALL FIELD VERIFY FOR INTERFERENCE AND FOR LOCATIONS OF MOUNTING FLANGES, CONNECTION POINTS, ETC.
4. CONDUIT ROUTINGS SHOWN ON BACKGROUND PLANS ARE INTENDED ROUTINGS ONLY. EXACT CONDUIT ROUTINGS FOR CONDUITS, AND LENGTH SHALL BE FIELD LOCATED AND VERIFIED BY THE CONTRACTOR. COORDINATE CONDUIT ROUTING IN FINISHED AREAS WITH OWNER. CONDUIT TO BE CONCEALED IN THESE AREAS.
5. REFER TO THE CABLE MANUFACTURER'S RECOMMENDATIONS FOR MINIMUM BEND RADIUS FOR FIBER OPTIC CABLES. INSTALL NEW PULL BOXES (PB) AS REQUIRED FOR CONDUITS. SIZE PULL BOXES AS REQUIRED PER FIBER OPTIC CABLE MANUFACTURERS RECOMMENDATIONS.
6. PANELS SHALL BE MOUNTED OFF WALLS WITH STRUT, CONDUITS SHALL BE MOUNTED ON STRUT INCLUDING SINGLE RUNS.
7. CONDUIT ENTERING CONTROL PANELS AND ELECTRICAL EQUIPMENT ENCLOSURES SHALL BE FILLED WITH DUCT SEAL, INCLUDING OPENINGS IN BOTTOM OF PANELS, AND EQUIPMENT.
8. REPAIR SIDEWALKS AND ROADWAYS DUE TO SITE WORK ADDITIONS. THE EXTENT OF THE REPAIR REQUIRED SHALL BE FIELD VERIFIED PRIOR TO BIDS IN CONJUNCTION WITH THE WORK SHOWN IN THE CONTRACT DOCUMENTS. PRIOR TO TRENCHING, FIELD LOCATE EXISTING GAS LINES, TELEPHONE LINES, SPRINKLER LINES, ETC. COORDINATE WITH OWNER
9. PULL CORDS SHALL BE INSTALLED IN CONDUITS CONTAINING NETWORK CABLES, AND FIBER OPTIC CABLES.
10. CORE HOLES AS REQUIRED TO SUIT INSTALLATION OF CONDUIT AND WIRING/CABLING AS SHOWN. FIELD VERIFY EXACT EXTENT OF WORK REQUIRED.
11. FURNISH PULL BOXES FOR FIBER OPTIC CABLE. COORDINATE EXACT BENDING RADIUS WITH MANUFACTURER.
12. NEW CONDUITS INSTALLED THIS CONTRACT WITH FIBER OPTIC CABLES SHALL BE LABELED WITH PHENOLIC TAGS (AT BEGINNING TO END) TO INDICATE THE NUMBER OF STRANDS, ORIGINATION AND DESTINATION. TAGS TO BE COLOR CODED ORANGE FOR MULTIMODE.
13. WHERE NEW CONDUITS SHOWN TO BE INSTALLED PASS UNDER ROADWAYS, CONDUITS SHALL BE CONCRETE ENCASED.
14. PRIOR TO EXCAVATION, FIELD LOCATE EXISTING UTILITIES. COORDINATE WITH OWNER.
15. AREAS WHERE CAMERAS ARE SHOWN TO BE INSTALLED SHALL BE CLASSIFIED AS NEMA 4, UNLESS CALLED OUT OTHERWISE.
16. THE ASSOCIATED INSTRUMENTATION DRAWINGS SHOW EXISTING WIRES AND TERMINAL NUMBERS REQUIRED TO PROPERLY INTERFACE WITH NEW EQUIPMENT. THIS INFORMATION WAS COLLECTED FROM AS-BUILT DRAWINGS AND EXTENSIVE FIELD VERIFICATION. THE INFORMATION SHALL BE USED AS A GUIDE IN RE-TERMINATION. IT SHALL REMAIN THE CONTRACTOR'S RESPONSIBILITY TO EXAMINE THE WIRING AND TO REVISE TO SUIT AS REQUIRED. CHANGES IN THE CONTRACT OR COST WILL NOT BE GRANTED FOR THIS COORDINATION. IT IS THE CONTRACTOR'S RESPONSIBILITY TO EXAMINE PROPOSED WORK SHOWN.
17. CONDUIT ROUTINGS SHOWN ON BACKGROUND PLANS ARE PROPOSED ROUTINGS ONLY. EXACT CONDUIT ROUTINGS AND LENGTH SHALL BE FIELD LOCATED AND VERIFIED BY THE CONTRACTOR. COORDINATE CONDUIT ROUTING IN FINISHED AREAS WITH OWNER. CONDUIT TO BE CONCEALED IN THESE AREAS.
18. CONDUIT/RACEWAYS, PULL BOXES, TERMINAL BOXES, AND JUNCTION BOXES TO BE INSTALLED WITH 316 STAINLESS STEEL FASTENERS SUPPORTS, AND THREADED ROD, ETC. (CHANNEL STRUT TO ALSO BE STAINLESS STEEL). MINIMUM STRUT LENGTH TO BE 12 INCHES, WHERE POSSIBLE. TYPICAL FOR NEMA 12, 4, AND 7 AREAS.
19. WIRING FOR STARTERS SHALL BE IN ACCORDANCE WITH NEMA CLASS II B STANDARDS. SUBMIT ENGINEERED SHOP DRAWINGS FOR ALL STARTERS SHOWN TO BE WIRED.
20. WIRE NUMBERS (1, 3, 5, ETC.) SHALL BE PREFIXED WITH STARTER TAG NUMBERS. THE WIRE NUMBER AFTER THE PREFIX SHALL BE THE MANUFACTURER'S WIRE NUMBERING SYSTEM. WIRE MARKERS SHALL BE USED AT EACH WIRE TERMINATION POINT.
21. IN AREAS WHERE EQUIPMENT AND CONDUIT IS REMOVED, REPAIR WALL AND FLOOR SURFACES AS REQUIRED TO MATCH SURROUNDING AREA. WHERE DEVICES ARE REMOVED FROM CONCEALED BOXES, FURNISH AND INSTALL A BLANK COVER ON THE BOX.
22. FIBER OPTIC CABLE SHALL BE AS CALLED OUT ON SYSTEM CONFIGURATION DRAWINGS, MULTIMODE, ALL DIELECTRIC, SUITABLE FOR INSTALLATION UNDERGROUND IN WET CONDUIT.
23. LEGEND PLATES/EQUIPMENT NAMETAGS TO BE MATTE WHITE BACKGROUND, BLACK LETTERING. THIS IS TYPICAL FOR MOTOR CONTROL CENTERS, CONTROL PANELS, SWITCHGEAR, PANELBOARDS, DISCONNECT SWITCHES, LIGHT SWITCHES, FIELD INSTRUMENTS, LIGHT CONTACTORS, FIELD STARTERS, ETC.
24. FURNISH, AND INSTALL PHENOLIC NAMETAGS ON THE EXTERIOR OF ALL NEW CONDUITS (THIS PROJECT" CONTAINING E-FO, F.O., E-NET, POWER, SIGNAL, AND CABLES. NAMETAGS TO BE INSTALLED ON EACH CONDUIT AT EACH END, BETWEEN ENCLOSURES ORANGE BACKGROUND, WHITE LETTERING, FOR MULTIMODE FIBER, YELLOW BACKGROUND, WHITE LETTERING, SINGLE MODE FIBER, EXAMPLE: "24 - E-FO - TFPP TO FPP-1". FOR POWER: "480V POWER FROM MCC-S TO MCC-B1". FOR CONTROL: "CONTROL WIRES - TO BPP". FOR SIGNAL: "SIGNAL WIRES - TO BPP".

GENERAL NOTES:

1. PRIOR TO SUBMITTING A BID FOR THE WORK DETAILED UNDER THIS CONTRACT, BIDDER SHALL VISIT THE PUMPING STATIONS. THE BIDDER SHALL FULLY ACQUAINT ONESELF WITH EXISTING FIELD CONDITIONS AT EACH SITE. NO BULLETINS WILL BE WRITTEN FOR WORK DUE TO LACK OF VERIFICATION OF EXISTING SITE CONDITIONS AND WIRING.
2. NO WIRES SHALL BE TERMINATED TO TERMINAL STRIPS, OR OTHER EQUIPMENT WITHOUT FIRST VERIFYING SIGNAL TYPE. DAMAGES RESULTING FROM LACK OF VERIFICATION SHALL BE BORNE BY THE CONTRACTOR. CONTRACTOR SHALL COORDINATE SIGNAL TYPE AND VOLTAGE WITH I/O CARDS SHOWN.
3. WITHIN CONTROL PANELS, NAMEPLATES SHALL BE PROVIDED TO INDICATE DIFFERENT VOLTAGE LEVELS WITHIN PANELS. ALSO, A NAME TAG (YELLOW BACKGROUND, RED LETTERING) SHALL BE LOCATED ON THE FRONT OF EVERY PANEL INDICATING THAT WHEN MAIN PANEL IS DISCONNECTED 120V IS STILL PRESENT FROM FIELD DEVICES (YELLOW WIRING/ISOLATED INPUT CARDS.)
4. PHENOLIC TAGS ON FACE OF CONTROL PANELS SHALL HAVE WHITE BACKGROUND AND BLACK LETTERING (EXCEPT WARNING TAGS; YELLOW BACKGROUND RED LETTERING).
5. PROVIDE SAFETY COVERS ON 480V MOLDED CASE MAIN CIRCUIT BREAKERS TO INSULATE THE INCOMING CABLES AND SIDE CONDUCTORS FROM CONTACT. (TYP. FOR CONTROL PANELS.) PROVIDE BREAKER LOCKS FOR PUMP CIRCUIT BREAKERS (MCP)AND MAIN PANEL BREAKERS.
6. REFER TO WIRING DIAGRAMS FOR ADDITIONAL INFORMATION ON ISOLATED I/O. A COMMON NEUTRAL MAY BE USED FOR SEVERAL ISOLATED INPUTS FROM THE SAME STARTER. PROVIDE NEUTRAL JUMPERS WIRES WITHIN THE PANEL AS REQUIRED.
7. ELECTRICAL MATERIALS AND EQUIPMENT ITEMS SHOWN IN LIGHT LINE WEIGHTS ON THE DRAWINGS ARE EXISTING ITEMS TO REMAIN. ELECTRICAL MATERIALS AND EQUIPMENT ITEMS SHOWN IN HEAVY LINE WEIGHTS ARE NEW THIS CONTRACT.
8. ITEMS SHOWN CROSSHATCHED (OR NOTED TO BE DEMOLISHED) ON THE DRAWINGS ARE EXISTING ITEMS TO BE REMOVED, FROM SITE BY CONTRACTOR.
9. INSTALL A SINGLE CONDUCTOR INSULATED (RHW, THWN, OR XHHW) COPPER GROUND WIRE IN EACH CONDUIT, SIZE AS SHOWN ON DRAWINGS, OR AS A MINIMUM PER THE NATIONAL ELECTRICAL CODE. THIS GROUND WIRE SHALL BE CONNECTED AT EACH END TO THE EQUIPMENT GROUND. THIS ALSO INCLUDES INSTRUMENTATION DEVICES SUCH AS LEVEL, PRESSURE, FLOW TRANSMITTERS, LIMIT SWITCHES, CONDUITS, NETWORK AND I/O CABLES.
10. THE FOLLOWING EXAMPLE COMPONENT IDENTIFICATION SHALL BE USED AS APPROPRIATE:

(F) FIELD MOUNTED, NOT AT STARTER OR OTHER CONTROL PANELS
(S) STARTER PANEL MOUNTED
(MCP)AT MAIN CONTROL PANEL
(1) AT CONTROL PANEL NO.1
(2) AT CONTROL PANEL NO.2
(TCP) AT TEMPERATURE CONTROL PANEL

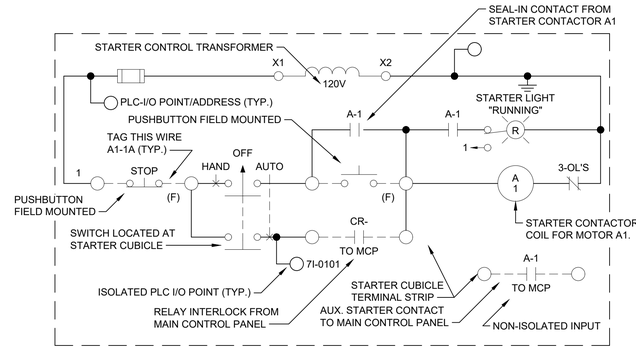
11. REFER TO DETAIL SHEETS. CONTRACTOR SHALL FURNISH AND INSTALL HARDWARE AND APPURTENANCES (I.E. PIPE TAPS, WETWELL BUBBLER TUBES, VALVES, COPPER TUBING, BALL VALVES, PNEUMATIC PIPING, SPOOL PIECES, ETC.) FOR FIELD DEVICES SHOWN (FLOWMETERS, PRESSURE TRANSMITTERS, LEVEL TRANSMITTERS, ETC.). WORK SHALL BE COORDINATED WITH OTHER TRADES (MECHANICAL INSTRUMENTATION, ETC.) CONTRACTOR SHALL BE RESPONSIBLE FOR SYSTEM COORDINATION AND INSTALLATION.
12. ETHERNET AND FIBER OPTIC TERMINATIONS SHALL BE PERFORMED BY A QUALIFIED REPRESENTATIVE OF CABLE MANUFACTURER, THE CABLES SHALL BE TESTED. NO SPLICING SHALL BE PERMITTED OF FIBER OPTIC CABLES, BETWEEN PANELS. FIBERS SHALL BE TERMINATED AT PATCH PANELS, INCLUDING SPARES.
13. REFER TO THE CABLE MANUFACTURER'S RECOMMENDATIONS FOR MINIMUM BEND RADIUS FOR FIBER OPTIC CABLES. INSTALL NEW PULL BOXES (PB) AS REQUIRED FOR CONDUITS. SIZE PULLBOXES AS REQUIRED PER FIBER OPTIC CABLE MANUFACTURERS RECOMMENDATIONS.
14. CABLES (INCLUDING FIBER, ETHERNET, CONTROL WIRE, ETC.) WHERE PASSING THROUGH A PULLBOX SHALL BE LABELED AND COMPLETELY IDENTIFIED WITH IDENTIFICATION NUMBERS AND ORIGINATION/DESTINATION. THIS ALSO INCLUDES ALL CABLE BUNDLES ENTERING CONTROL PANELS, PULLBOXES, ETC.
15. CONTROL WIRES SHALL BE TAGGED WITH THE PLC I/O ADDRESS, AND A DESCRIPTION ADDRESS IN THE FIELD AND AT THE PANEL. REFER TO INSTRUMENTATION DRAWINGS, CONTROL PANEL WIRING DIAGRAMS. (TYP.)
16. THE FIELD DEVICES SHOWN ON THE P&ID'S, ELECTRICAL BACKGROUNDS, AND DETAILS SHEETS MAKEUP THE FIELD DEVICE EQUIPMENT REQUIREMENTS. NOT ALL FIELD DEVICES REQUIRED ARE SHOWN ON THE P&ID'S.
17. UPS SELECTED SHALL BE COMPATIBLE WITH ISOLATION TRANSFORMERS. (TYP.)
18. REFER TO I/O DRAWING LAYOUT FOR ADDITIONAL SIGNALS NOT SHOWN ON P&ID FLOW DIAGRAMS.
19. TURN OVER TO OWNER EXISTING PLC, AND RADIO EQUIPMENT DEMOLISHED IN THIS CONTRACT.
20. CONTRACTOR TO ALSO REFER TO DEMOLITION SHEETS, "D" SHEETS IN CONTRACT DRAWING SET FOR ADDITIONAL DEMOLITION REQUIREMENTS FOR CONDUIT/ WIRE AND EQUIPMENT.
21. REFER TO PROCESS DRAWINGS FOR EXACT EQUIPMENT LOCATION. FURNISH, AND INSTALL CONDUIT/WIRE AS SHOWN.
22. REFER TO SHEET I-104 FOR WORK ASSOCIATED WITH NEW SUCTION AND DISCHARGE PRESSURE TRANSMITTERS. PROVIDE NEW PLUMBING CONNECTIONS, AND BRASS BALL SHUT OFF VALVES. REWORK AND RECONNECT EXISTING CONDUIT AND SHIELDED CABLES FROM EXISTING TRANSMITTERS TO NEW TRANSMITTERS.

STATION NOTES: (TYP. FOR STATIONS 1, 3, 4, 9, 11, 24, 25, AND 39.)

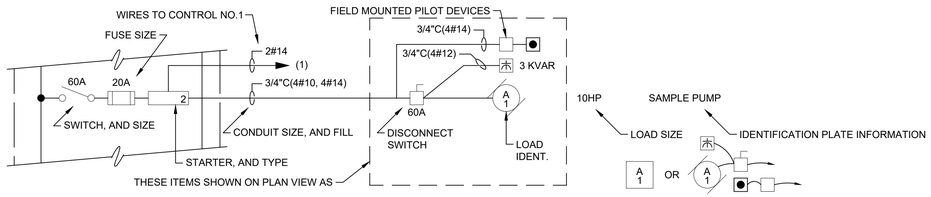
1. TERMINAL BOXES WERE INSTALLED IN PREVIOUS CONTRACT FOR 120VAC POWER TO MPZ-A, 4-20MA WIRING BACK TO MAIN PROCESSOR PANEL, DISCRETE IO BACK TO MAIN PROCESSOR PANEL, AND ETHERNET CABLES BACK TO MAIN PROCESSOR PANEL.
2. NEW CONDUIT AND WIRE WITHIN THE CHEMICAL ROOM IS TO HOMERUN TO EACH OF THESE TERMINAL BOXES. CONNECTIONS ALREADY EXIST BACK TO THE MAIN PROCESSOR PANEL.
3. PRIOR TO MAKING ANY CONNECTIONS WITHIN THE EXISTING ABOVE TERMINAL BOXES, OBTAIN FROM OWNER A SET OF THE WEST MICHIGAN INSTRUMENTATION SYSTEMS INC., SET OF WIRING DIAGRAMS TO ASSIST IN MAKING WIRE CONNECTIONS WITHIN THE BOXES, AND ALSO SHOW THE I/O CONNECTIONS INSIDE THE CONTROL PANELS.
4. AT STATION NO.9, THE EXISTING UNLOADING INDICATOR PANEL IS TO BE MOVED TO SUIT THE NEW DOORWAY. RELOCATE THIS PANEL AS SHOWN. REWORK EXISTING CONDUITS FOR POWER, CONTROL AND SIGNAL BACK TO THE TERMINAL BOXES WITHIN THE EXISTING CHEMICAL ROOM. RECONNECT TO MATCH EXISTING. SEAL HOLES IN WALL AS REQUIRED. INSTALL NEW SEAL FITTINGS AND GROUND AS REQUIRED.
5. CONTRACTOR TO FIELD VERIFY, AND LOCATE THE FOUR (4) EXISTING TERMINAL BOXES. (TB-ETHERNET, TB-CONTROL, TB-POWER, TB-SIGNAL.) PRIOR TO BIDS.

STATION NOTES: (TYP. FOR STATIONS 8, 12, 14 AND 22.)

1. NEW PREFABRICATED BUILDINGS ARE BEING PROVIDED FOR THESE FOUR STATIONS.
2. THE EQUIPMENT IN THESE BUILDINGS IS TO BE WIRED TO A NEW REMOTE IO PANEL. THIS PANEL WILL BE CONNECTED TO THE EXISTING MAIN PROCESSOR PANEL WITH 50 MICRON MULTIMODE FIBER OPTIC CABLING BY CONTRACTOR THIS CONTRACT AS SHOWN ON DRAWINGS.
3. THE EXISTING MINI POWER ZONE AND TRANSFER PUMP STARTER PREVIOUSLY INSTALLED IN PRIOR CONTRACT ARE TO BE RELOCATED AND REWIRED AS SHOWN ON THE CONTRACT DRAWINGS TO EACH NEW PREFABRICATED BULDING.
4. WITHIN THE NEW PREFABRICATED BUILDINGS, FURNISH AND INSTALL NEW LIGHTS, SWITCHES, OUTLETS, FIXTURES, CONDUIT AND WIRE. FURNISH AND INSTALL THE NEW HEAT TRACE AS SHOWN. FURNISH AND INSTALL STAINLESS STEEL STRUT FOR SUPPORTING AND MOUNTING NEW PANELS, CONDUIT AND WIRE WITHIN THE NEW PREFABRICATED BUILDINGS.
5. NEW STRUT SUPPORTS FOR EQUIPMENT IS TO BE BOLTED TO NEW CONCRETE PAD AND SUPPORTED TO WALL AND CEILING. CONTRACTOR IS TO COORDINATE WITH PREFABRICATED BUILDING MANUFACTURER FOR MOUNTING AND SUPPORTING OF STRUT, CONDUITS, AND ELECTRICAL AND INSTRUMENTATION EQUIPMENT SHOWN TO BE INSTALLED.
6. FURNISH, AND INSTALL INSTRUMENTATION EQUIPMENT SHOWN IN NEW BUILDINGS.
7. AT STATION NO.22, THE EXISTING UNLOADING INDICATOR PANEL IS TO BE MOVED TO SUIT THE NEW DOORWAY. RELOCATE THIS PANEL AS SHOWN. REWORK EXISTING CONDUITS FOR POWER, CONTROL AND SIGNAL BACK TO THE TERMINAL BOXES WITHIN THE EXISTING CHEMICAL ROOM. RECONNECT TO MATCH EXISTING. SEAL HOLES IN WALL AS REQUIRED. INSTALL NEW SEAL FITTINGS AND GROUND AS REQUIRED.



A 1 EXAMPLE PUMP — STARTER NAMEPLATE
(TAG A1)
(EXAMPLE CIRCUIT)



MCC SAMPLE LEGEND EXAMPLE

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MARK	DATE	DESCRIPTION	BY
	11/29/23	ISSUED FOR BID	

CITY OF KALAMAZOO, MICHIGAN
WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

ELECTRICAL NOTES

Project No.:	200-19743-19004
Designed By:	GCJ
Drawn By:	JLS
Checked By:	WAP/GCJ

E-002
OF 43

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Bar Measures 1 inch

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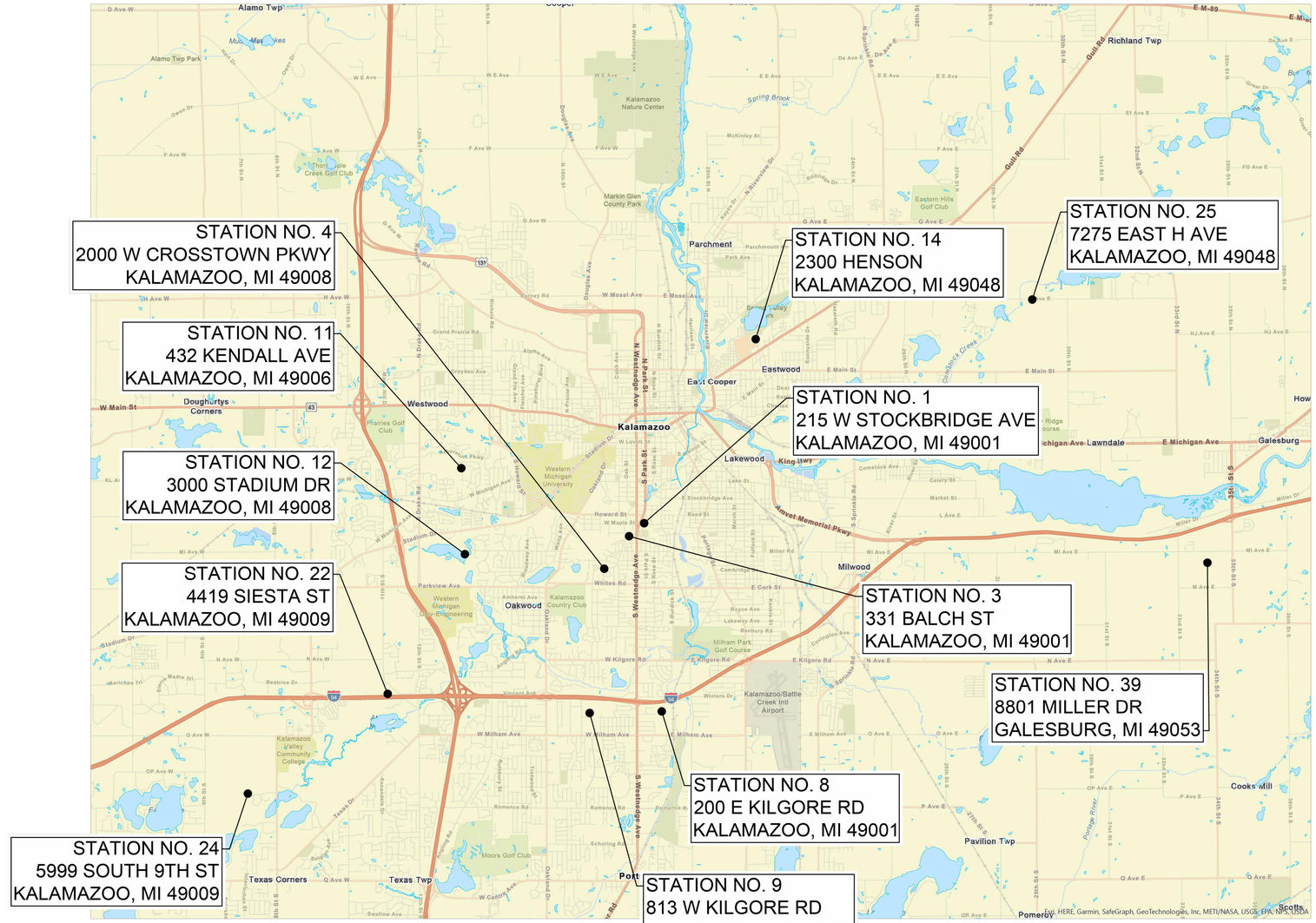

PUMP STATION LOCATION MAP

SCALE: 1" = 4000'

N

0 2000' 4000' 8000'

SCALE: 1" = 4000'

Bar Measures 1 inch

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	11/29/23	ISSUED FOR BID	

CITY OF KALAMAZOO, MICHIGAN
WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

ELECTRICAL SITE PLAN

Project No.:	200-19743-19004
Designed By:	GCJ
Drawn By:	JLS
Checked By:	WAP/GCJ

E-003

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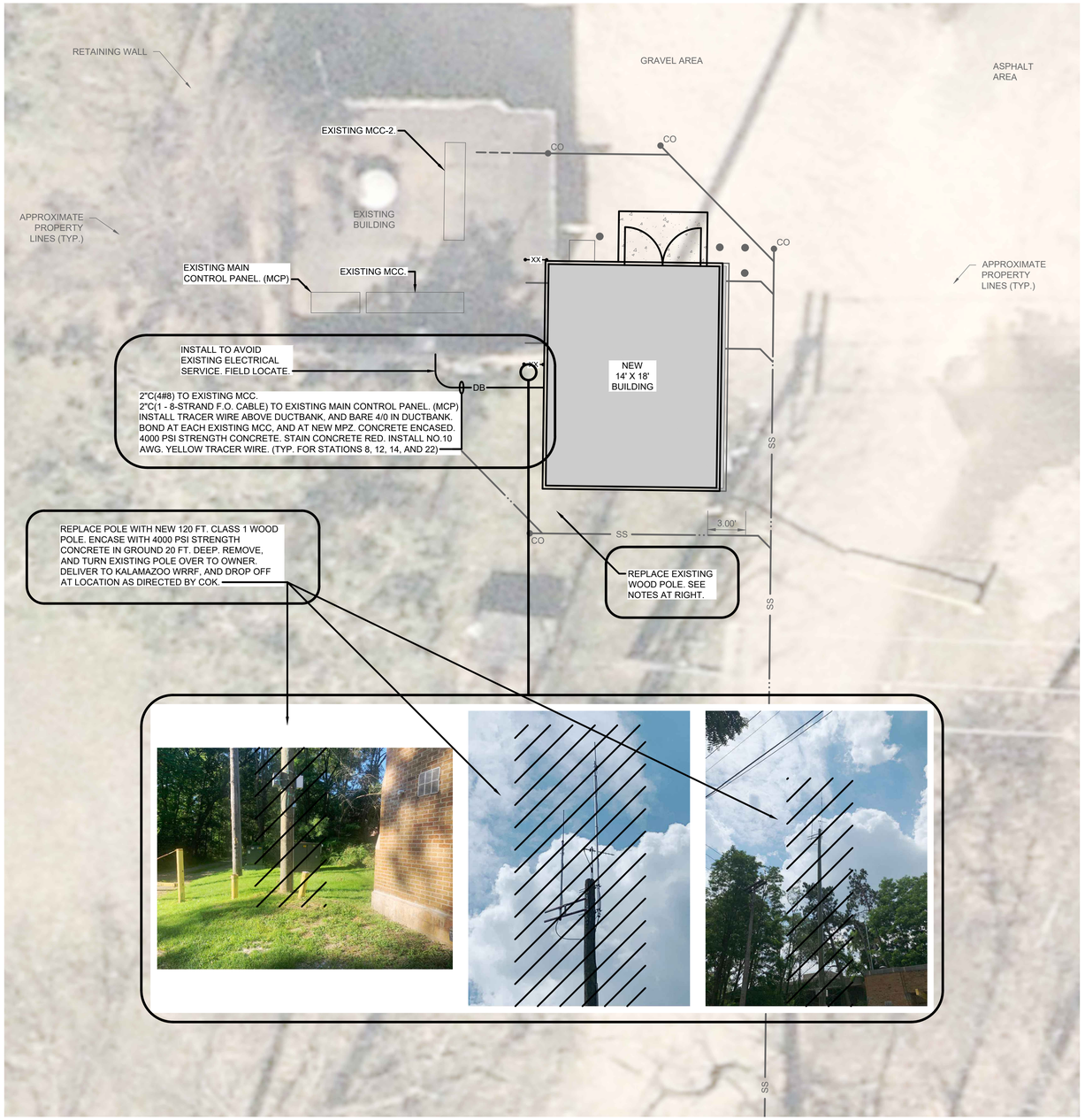
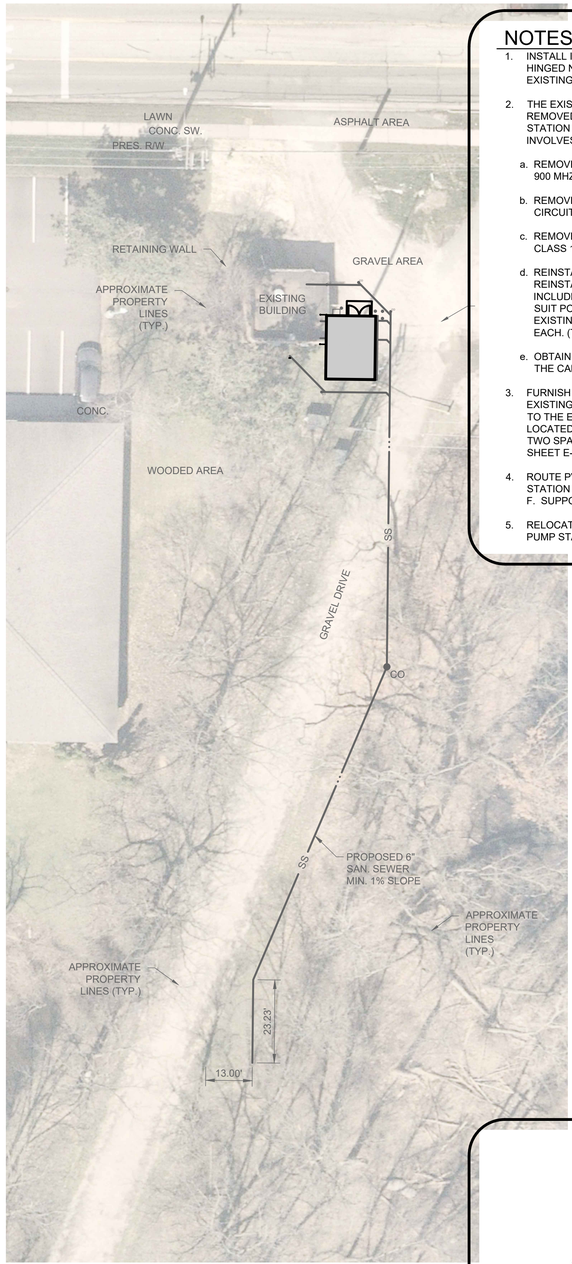


PLAN - INSET

0 2.5' 5' 10'
SCALE: 1" = 5'

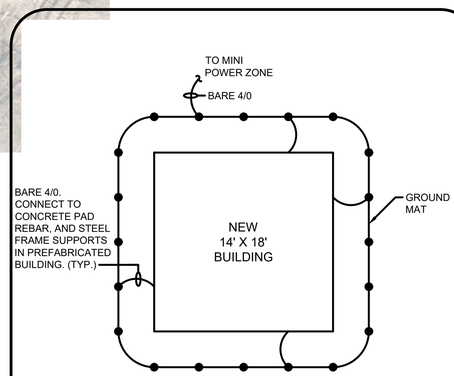


PLAN

0 10' 20' 40'
SCALE: 1" = 20'

NOTES:

1. INSTALL IN PLACE OF THE REMOVED AND RELOCATED MINI POWER ZONE A HINGED NEMA 12 TERMINAL BOX WITH 46 TERMINAL BLOCKS AND RECONNECT EXISTING WIRES FOR FUTURE USE.
2. THE EXISTING WOOD COMMUNICATIONS POLE BEHIND THE STATION IS TO BE REMOVED, AND REPLACED TO A NEW LOCATION BEHIND THE EXISTING STATION TO SUIT INSTALLATION OF THE NEW PREFABRICATED BUILDING. THIS INVOLVES THE FOLLOWING:
   a. REMOVE THE EXISTING 450MHZ OMNI ANTENNA, 900MHZ OMNI ANTENNA AND 900 MHZ YAGI ANTENNA AND ASSOCIATED CABLES.
   b. REMOVE THE EXISTING SMART METERING CABINET, CONDUIT AND 120VAC CIRCUIT.
   c. REMOVE THE EXISTING 70 FOOT WOOD POLE AND INSTALL A NEW 120 FT. CLASS 1 WOOD POLE 10 FEET FROM THE CURRENT LOCATION.
   d. REINSTALL THE EXISTING ANTENNAS, NEW CABLING, METERING CABINET AND REINSTALL THE EXISTING 1 INCH CONDUIT AND WIRE ONTO THE NEW POLE. INCLUDE IN BID TO REWORK 50 FEET OF 1 INCH RMC CONDUIT AND WIRE TO SUIT POLE RELOCATION. FURNISH 3 - 150 FT. OF 1/2" COAX CABLES TO MATCH EXISTING CABLES RE-TERMINATE, AND TEST. GROUND NEW CABLES 3-TIMES EACH. (TOP, BOTTOM, AND AT BUILDING WALL.)
   e. OBTAIN THE SERVICES OF DREW WIRELESS TO RE-TERMINATE, AND TEST THE CABLES. ((616) 262-5454).
3. FURNISH AND INSTALL A 1 INCH CONDUIT WITH 3#10 WIRES FROM THE EXISTING RADIO PANEL AND POWER MONITORING PANEL INSIDE THE STATION TO THE EXISTING PANELBOARD INSIDE THE MOTOR CONTROL CENTER LOCATED NEAR THE EXISTING MAIN CONTROL PANEL. (MCP) CONNECT TO TWO SPARE 120V 20A CIRCUIT BREAKER INSIDE EXISTING PANELBOARD. SEE SHEET E-307.
4. ROUTE PVC-RMC CONDUITS FOR 480V POWER, AND FIBER FROM EXISTING STATION TO NEW STATION. SEAL CONDUITS AT EACH END WITH POLY WATER F. SUPPORT CONDUITS AS REQUIRED.
5. RELOCATE AND REWIRE THE EXISTING MINI POWER ZONE AND TRANSFER PUMP STARTER TO THE NEW PREFABRICATED BUILDING.



GROUND MAT DETAIL
NO SCALE

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MARK	DATE	DESCRIPTION
	11/29/23	ISSUED FOR BID

BY

CITY OF KALAMAZOO, MICHIGAN
WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

ELECTRICAL PUMP STATION NO.8 ELECTRICAL SITE PLAN

Project No.:	200-19743-19004
Designed By:	GCJ
Drawn By:	JLS
Checked By:	WAP/GCJ

E-004
OF 43

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Bar Measures 1 inch

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NOTES:

1. INSTALL IN PLACE OF THE REMOVED AND RELOCATED MINI POWER ZONE A HINGED NEMA 12 TERMINAL BOX WITH 46 TERMINAL BLOCKS AND RECONNECT EXISTING WIRES FOR FUTURE USE.
2. FURNISH AND INSTALL A 1 INCH CONDUIT WITH 3#10 WIRES FROM THE EXISTING RADIO PANEL AND POWER MONITORING PANEL INSIDE THE STATION TO THE EXISTING PANELBOARD INSIDE THE MOTOR CONTROL CENTER LOCATED NEAR THE EXISTING MAIN CONTROL PANEL. (MCP). CONNECT TO TWO SPARE 120V 20A CIRCUIT BREAKER INSIDE EXISTING PANELBOARD. SEE SHEET E-315.
3. FOR THE NEW CONDUITS BETWEEN THE EXISTING PUMP STATION BUILDING AND THE NEW PREFABRICATED BUILDING, SEAL CONDUITS AT EACH END WITH POLY WATER F. SUPPORT CONDUITS AS REQUIRED.
4. RELOCATE AND REWIRE THE EXISTING MINI POWER ZONE AND TRANSFER PUMP STARTER TO THE NEW PREFABRICATED BUILDING.

GRAVEL AREA

FH

INSTALL HMA PAVEMENT

L4

L3

L2

L1

ASPHALT PARKING LOT

RCP
I.E. 858.88

2"C(4#8) TO EXISTING MCC.
2"C(1 - 8-STRAND F.O. CABLE) TO EXISTING MAIN CONTROL PANEL. (MCP). INSTALL TRACER WIRE ABOVE DUCTBANK, AND BARE 4/0 IN DUCTBANK. BOND AT EACH EXISTING MCC, AND AT NEW MPZ.

SAW CUT EXISTING ROADWAY. PATCH BACK TO ORIGINAL CONDITION. (TYP.)

INSTALL TO AVOID EXISTING ELECTRICAL SERVICE. FIELD LOCATE.

SS

CO

NEW
16' X 18'
BUILDING

FUTURE ROAD TO WELL LOCATIONS

DB

FF ELEV 863.94

EXISTING MCC.

EXISTING
BUILDING

RETAINING WALL

EXISTING MAIN CONTROL PANEL. (MCP)

CHEMICAL CONTAINMENT BOX

ASPHALT DRIVE

TEL
ELEV 863.92

FO

UE

W

M

CHEMICAL PIPE LEAK ALARM SENSOR.
RIOP
1"C(8#14)
1"C(3#10)
MPZ-A9
NEMA 4X AREA
CONDUIT TO BE PVC-RMC.

TO MINI POWER ZONE
BARE 4/0
BARE 4/0. CONNECT TO CONCRETE PAD REBAR, AND STEEL FRAME SUPPORTS IN PREFABRICATED BUILDING. (TYP.)
NEW
16' X 18'
BUILDING
GROUND MAT

GROUND MAT DETAIL
NO SCALE

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MARK	DATE	DESCRIPTION
	11/29/23	ISSUED FOR BID

CITY OF KALAMAZOO, MICHIGAN
WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

ELECTRICAL
PUMP STATION NO.12
ELECTRICAL SITE PLAN

Project No.:	200-19743-19004
Designed By:	GCJ
Drawn By:	JLS
Checked By:	WAP/GCJ

E-005
OF 43

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Bar Measures 1 inch

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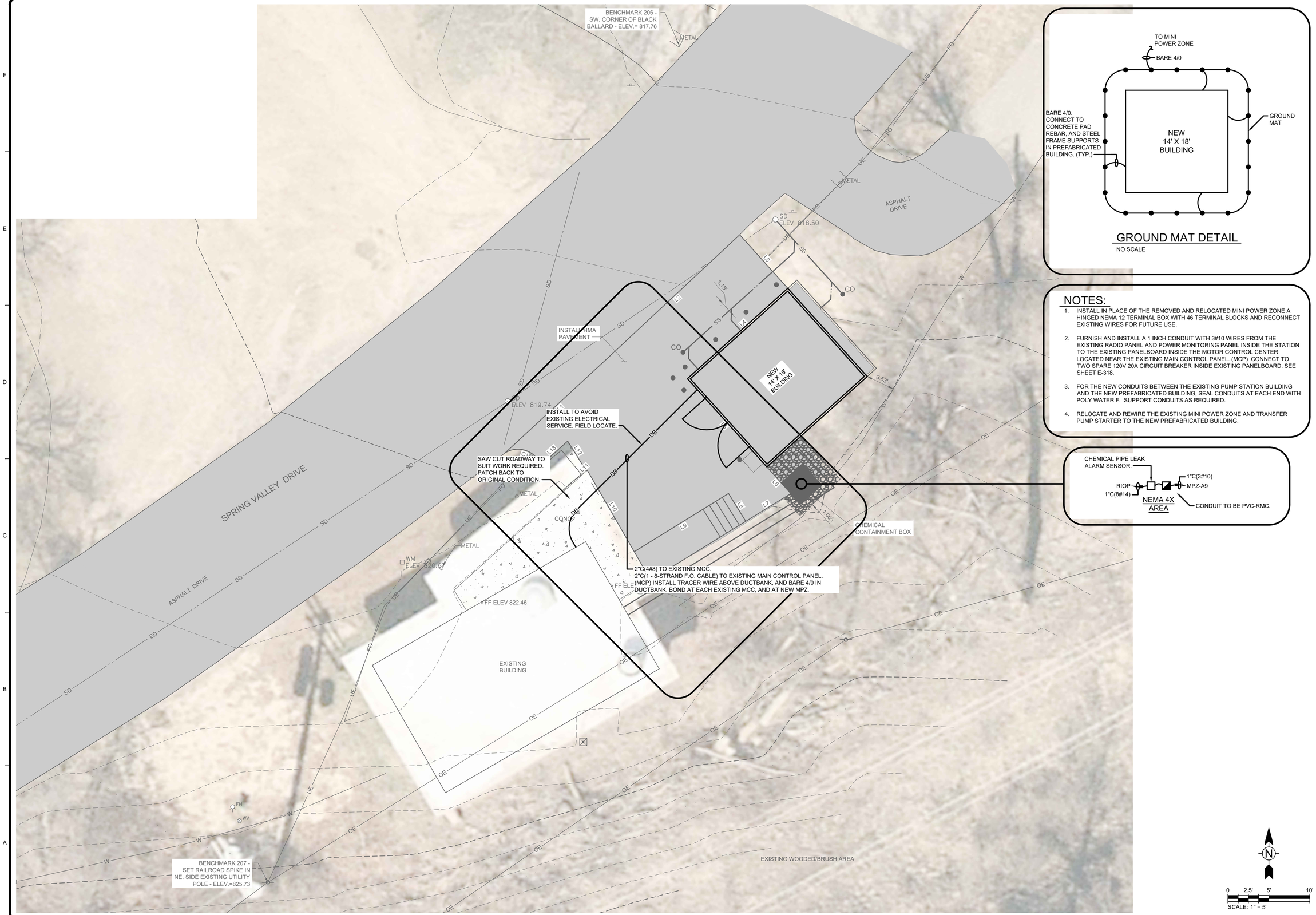

GROUND MAT DETAIL

NO SCALE

NOTES:

1. INSTALL IN PLACE OF THE REMOVED AND RELOCATED MINI POWER ZONE A HINGED NEMA 12 TERMINAL BOX WITH 46 TERMINAL BLOCKS AND RECONNECT EXISTING WIRES FOR FUTURE USE.
2. FURNISH AND INSTALL A 1 INCH CONDUIT WITH 3#10 WIRES FROM THE EXISTING RADIO PANEL AND POWER MONITORING PANEL INSIDE THE STATION TO THE EXISTING PANELBOARD INSIDE THE MOTOR CONTROL CENTER LOCATED NEAR THE EXISTING MAIN CONTROL PANEL. (MCP). CONNECT TO TWO SPARE 120V 20A CIRCUIT BREAKER INSIDE EXISTING PANELBOARD. SEE SHEET E-318.
3. FOR THE NEW CONDUITS BETWEEN THE EXISTING PUMP STATION BUILDING AND THE NEW PREFABRICATED BUILDING, SEAL CONDUITS AT EACH END WITH POLY WATER F. SUPPORT CONDUITS AS REQUIRED.
4. RELOCATE AND REWIRE THE EXISTING MINI POWER ZONE AND TRANSFER PUMP STARTER TO THE NEW PREFABRICATED BUILDING.

Bar Measures 1 inch

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	11/29/23	ISSUED FOR BID	

CITY OF KALAMAZOO, MICHIGAN

WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

ELECTRICAL PUMP STATION NO.14 ELECTRICAL SITE PLAN

Project No.:	200-19743-19004
Designed By:	GCJ
Drawn By:	JLS
Checked By:	WAP/GCJ

E-006

OF 43

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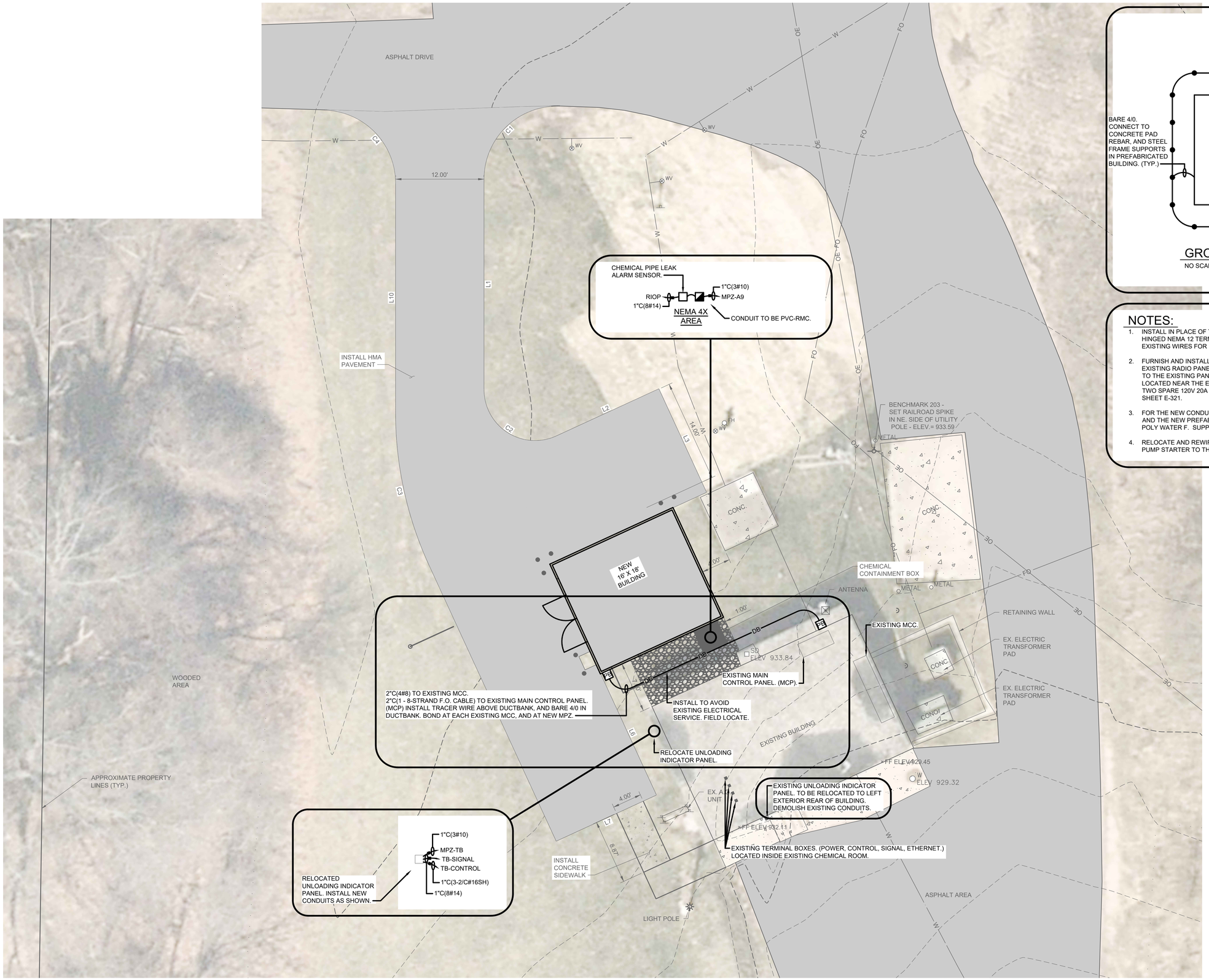

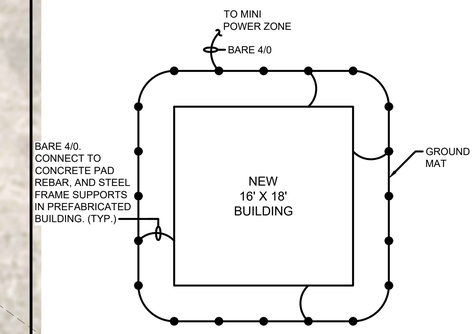

GROUND MAT DETAIL

NO SCALE

NOTES:

1. INSTALL IN PLACE OF THE REMOVED AND RELOCATED MINI POWER ZONE A HINGED NEMA 12 TERMINAL BOX WITH 46 TERMINAL BLOCKS AND RECONNECT EXISTING WIRES FOR FUTURE USE.
2. FURNISH AND INSTALL A 1 INCH CONDUIT WITH 3#10 WIRES FROM THE EXISTING RADIO PANEL AND POWER MONITORING PANEL INSIDE THE STATION TO THE EXISTING PANELBOARD INSIDE THE MOTOR CONTROL CENTER LOCATED NEAR THE EXISTING MAIN CONTROL PANEL. (MCP). CONNECT TO TWO SPARE 120V 20A CIRCUIT BREAKER INSIDE EXISTING PANELBOARD. SEE SHEET E-321.
3. FOR THE NEW CONDUITS BETWEEN THE EXISTING PUMP STATION BUILDING AND THE NEW PREFABRICATED BUILDING, SEAL CONDUITS AT EACH END WITH POLY WATER F. SUPPORT CONDUITS AS REQUIRED.
4. RELOCATE AND REWIRE THE EXISTING MINI POWER ZONE AND TRANSFER PUMP STARTER TO THE NEW PREFABRICATED BUILDING.

SCALE: 1" = 6'

Bar Measures 1 inch

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CITY OF KALAMAZOO, MICHIGAN
WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

ELECTRICAL PUMP STATION NO.22 ELECTRICAL SITE PLAN

Project No.:	200-19743-19004
Designed By:	GCJ
Drawn By:	JLS
Checked By:	WAP/GCJ

E-007
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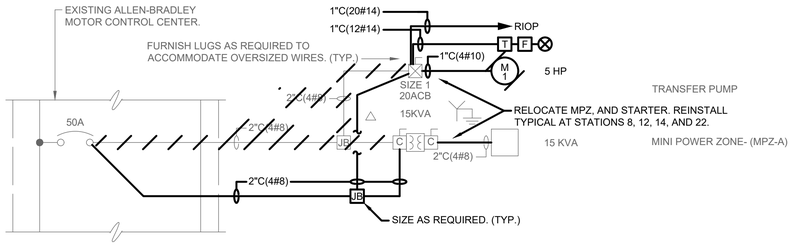
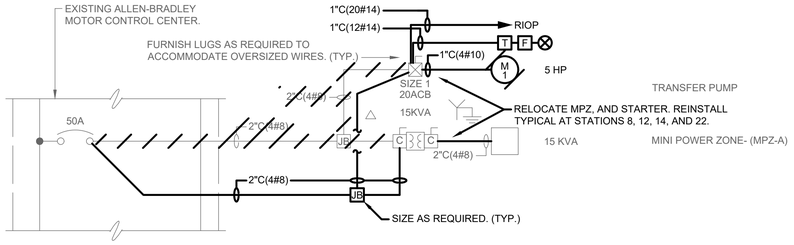
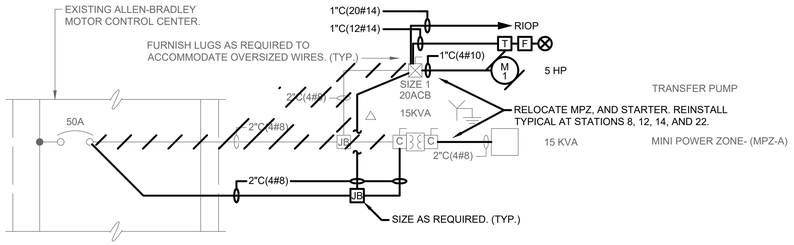
EXISTING DRAWING FROM PREVIOUS PROJECT.
PROPOSED WORK SHOWN BOLD,
CROSSHATCHED, AND/OR CIRCLED.



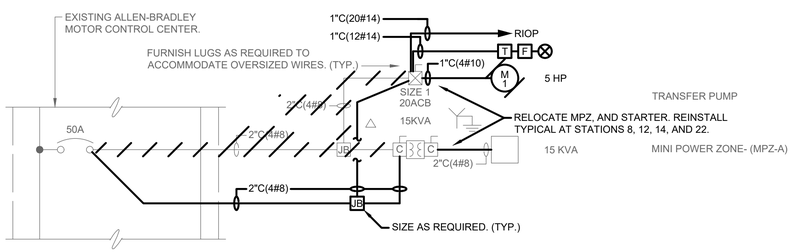
EXISTING PUMP STATION NO.8
MCC PARTIAL ONE-LINE DIAGRAM PROPOSED WORK



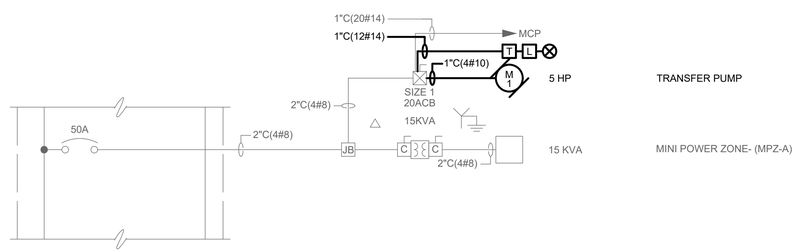
EXISTING PUMP STATION NO.12
MCC PARTIAL ONE-LINE DIAGRAM PROPOSED WORK



EXISTING PUMP STATION NO.14
MCC PARTIAL ONE-LINE DIAGRAM PROPOSED WORK



EXISTING PUMP STATION NO.22
MCC PARTIAL ONE-LINE DIAGRAM PROPOSED WORK



EXISTING TRANSFER PUMP
PARTIAL ONE-LINE DIAGRAM - PROPOSED WORK

(TYP. FOR PUMP STATIONS 1, 3, 4, 9, 11, 24, 25, AND 39.)

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CITY OF KALAMAZOO, MICHIGAN
WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

ELECTRICAL
EXISTING MCC PARTIAL
ONE-LINE DIAGRAMS

Project No.:	200-19743-19004
Designed By:	GCJ
Drawn By:	JLS
Checked By:	WAP/GCJ

E-100
OF 43

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Bar Measures 1 inch

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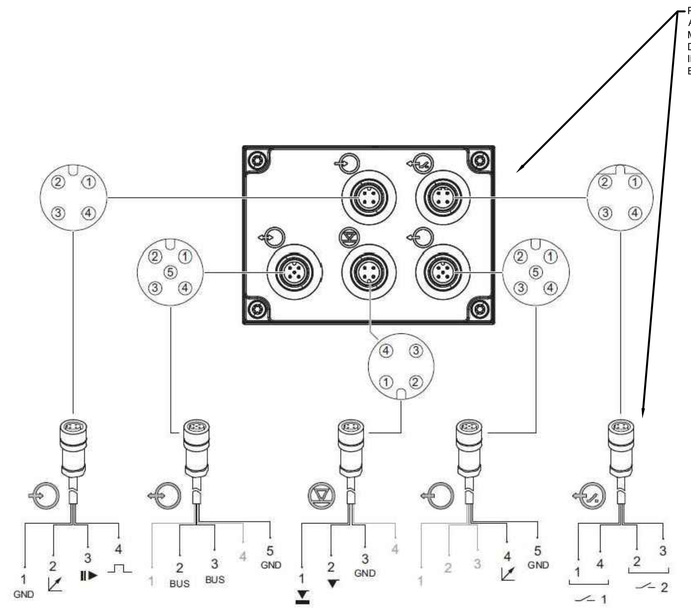
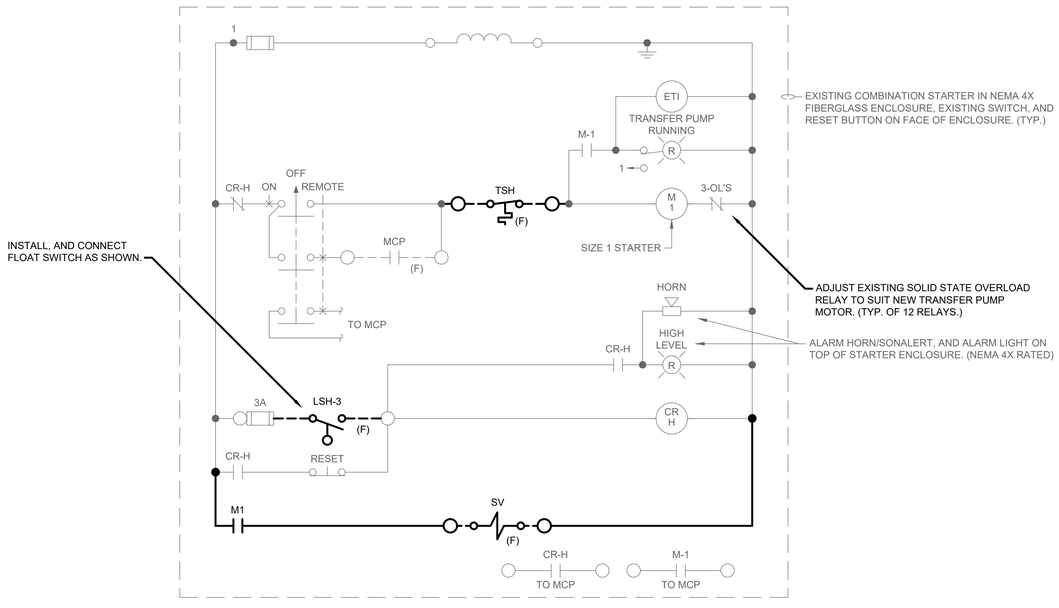


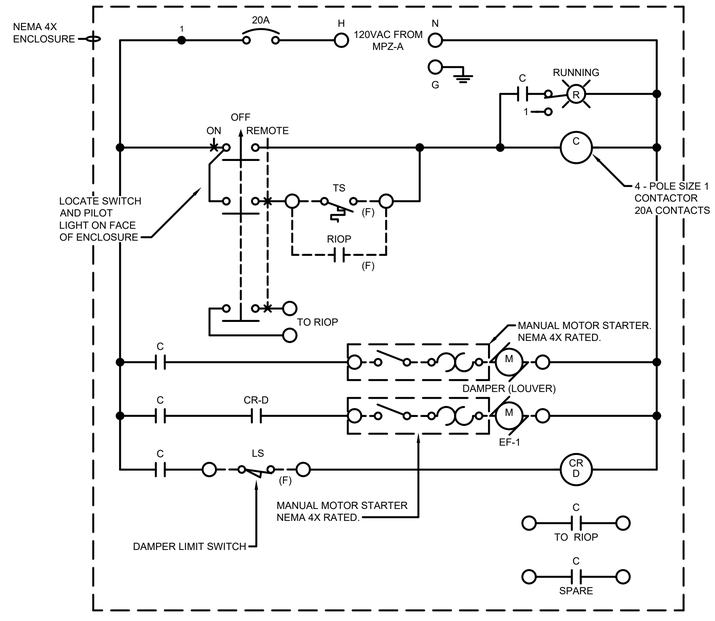
CHEMICAL FEED PUMP NO.1 (TYP. FOR PUMP NO.2)

(TYP. FOR 12 PUMP STATIONS, 24 TOTAL PUMPS)



EXISTING TRANSFER PUMP, STARTER WIRING DIAGRAM PROPOSED WORK

(TYP. OF 12 COMBINATION MOTOR STARTERS)



EXHAUST FAN NO.1 CONTACTOR (EF-1)

(TYP. FOR STATIONS 8, 12, 14, AND 22.)

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MARK	DATE	DESCRIPTION
	11/29/23	ISSUED FOR BID

CITY OF KALAMAZOO, MICHIGAN
WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

ELECTRICAL WIRING DIAGRAM

Project No.:	200-19743-19004
Designed By:	GCJ
Drawn By:	JLS
Checked By:	WAP/GCJ

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Bar Measures 1 inch

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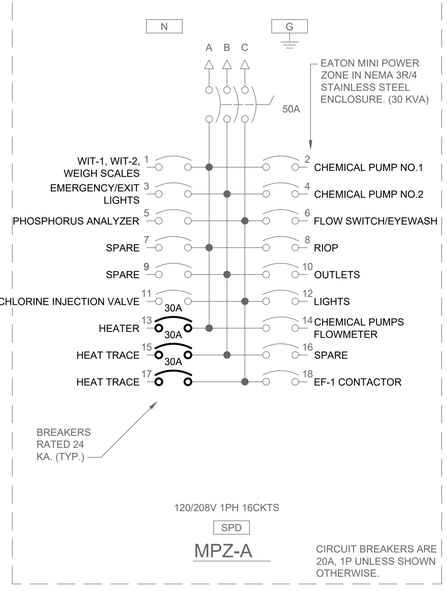
NEMA 4 STAINLESS STEEL ENCLOSURE

EXISTING PANELBOARD - MPZ-A

LOCATION:
VOLTAGE: 120/208V, 3PH
BUS RATING: 100A



120/208V 1PH 16CKTS

SPD

MPZ-A

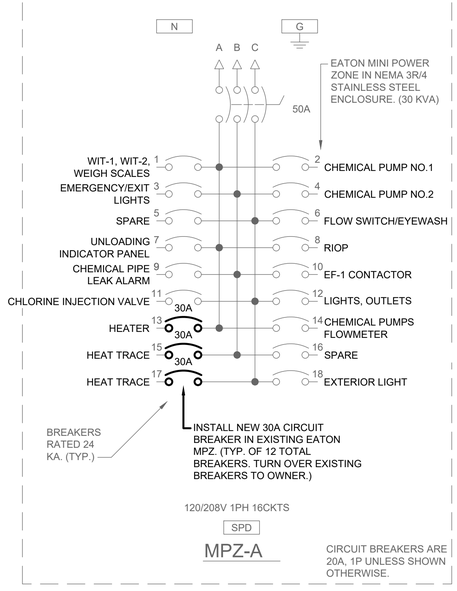
CIRCUIT BREAKERS ARE 20A, 1P UNLESS SHOWN OTHERWISE.

PUMP STATION NO.8

NEMA 4 STAINLESS STEEL ENCLOSURE

EXISTING PANELBOARD - MPZ-A

LOCATION:
VOLTAGE: 120/208V, 3PH
BUS RATING: 100A



120/208V 1PH 16CKTS

SPD

MPZ-A

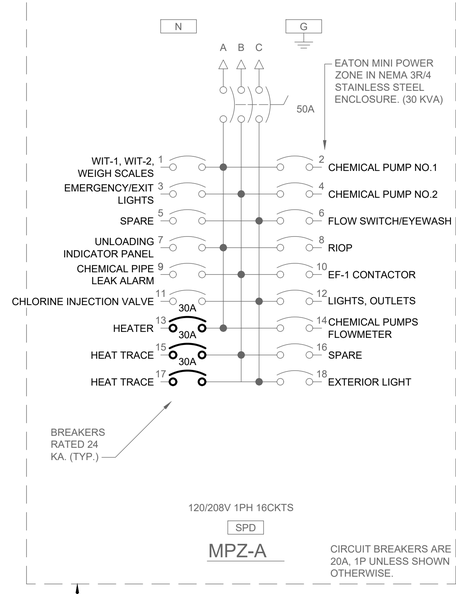
CIRCUIT BREAKERS ARE 20A, 1P UNLESS SHOWN OTHERWISE.

PUMP STATION NO.12

NEMA 4 STAINLESS STEEL ENCLOSURE

EXISTING PANELBOARD - MPZ-A

LOCATION:
VOLTAGE: 120/208V, 3PH
BUS RATING: 100A



120/208V 1PH 16CKTS

SPD

MPZ-A

CIRCUIT BREAKERS ARE 20A, 1P UNLESS SHOWN OTHERWISE.

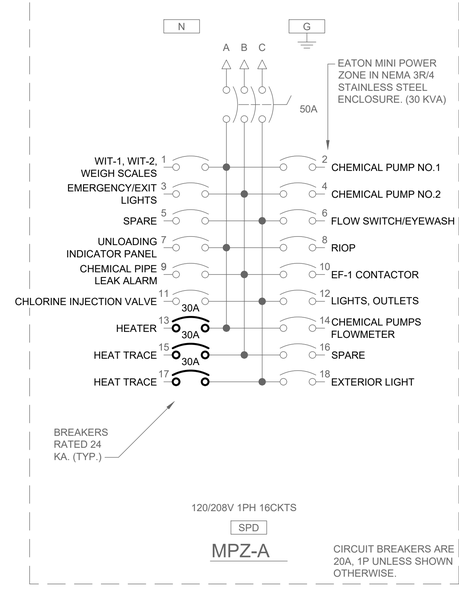
PUMP STATION NO.14

INSTALL NEW PANELBOARD DIRECTORY FOR RELOCATED MPZ-A. (TYP. OF 4)

NEMA 4 STAINLESS STEEL ENCLOSURE

EXISTING PANELBOARD - MPZ-A

LOCATION:
VOLTAGE: 120/208V, 3PH
BUS RATING: 100A



120/208V 1PH 16CKTS

SPD

MPZ-A

CIRCUIT BREAKERS ARE 20A, 1P UNLESS SHOWN OTHERWISE.

PUMP STATION NO.22

TETRA TECH
www.tetratech.com
1136 OAK VALLEY DRIVE, SUITE 100
ANN ARBOR, MI 48108
PHONE: (734) 665-6000 FAX: (734) 213-3003

MARK	DATE	DESCRIPTION
	11/29/23	ISSUED FOR BID

CITY OF KALAMAZOO, MICHIGAN
WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

EXISTING PANELBOARD SCHEDULES

Project No.:	200-19743-19004
Designed By:	GCJ
Drawn By:	JLS
Checked By:	WAP/GCJ

E-201

OF 43

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Bar Measures 1 inch

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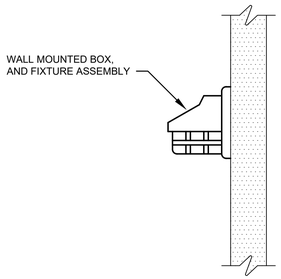
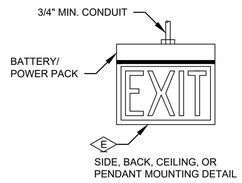


VAPORTIGHT OR WEATHERPROOF FIXTURE
WALL MOUNTING DETAIL

NO SCALE



EXIT SIGN

SCALE: NONE

FURNISH 5 YEAR MANUFACTURER WARRANTY (MINIMUM) ON ALL FIXTURE TYPES, AND ASSOCIATED LIGHTING COMPONENTS.

EM - LITHONIA ELM2-LED, 120V AC POWERED, WHITE HOUSING. NEMA 12, NEMA 4 AREAS. PROVIDE WITH BATTERIES.

E - HUBBELL DUAL LITE SEWL SERIES SRWE4X, 120V AC, NEMA 4/4X RATED, AND SUITABLE FOR INSTALLATION IN WET LOCATIONS. NEMA 12, NEMA 4 AREAS. PROVIDE WITH BATTERIES.

FURNISH WALL BRACKETS TO ALLOW FOR ADJUSTMENT OF FIXTURE. (TYP. ALL FIXTURES)

A - LITHONIA LED STRIP LIGHT - 120V AC, NEMA 4 RATED IN-LINE FUSING, ASYMETRIC LITHONIA - VAP LED, 114 WATTS, WET LOCATION FITTING AS REQUIRED, WITH SURFACE MOUNT BRACKETS, COVER, AND GUARD AS REQUIRED, OR CREE EQUIVALENT.

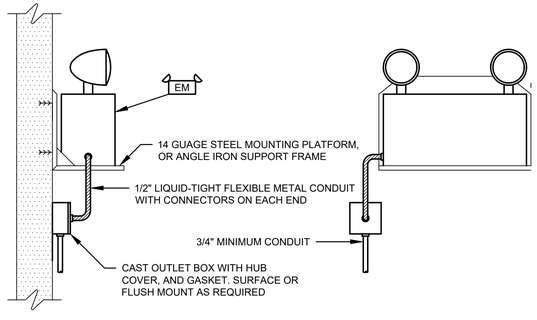
WHERE SHOWN ON DRAWINGS AS "NL/BP" FURNISH FIXTURE WITH INTEGRAL BATTERY PACK (BP), 90 MINUTE DURATION. (TYP.)

B - LED PERIMETER WALL PAK - 120V AC, NEMA 4 RATED, HUBBEL LNC2-48L-35-5K7-4W-120-DBT-EH. PROVIDE WITH INTEGRAL PHOTOCELL, LIGHT POLLUTION SHIELD, AND BATTERY BACKUP. BATTERY BACK-UP ONLY REQUIRED AT EXTERIOR DOOR LOCATIONS.

PROVIDE THE APPROPRIATE FIXTURE MODEL NUMBER AS REQUIRED TO SUIT THE DESCRIPTION, AND APPLICATION SHOWN. THIS REQUIREMENT IS TYPICAL FOR ALL FIXTURE MODEL NUMBERS SHOWN.

SD - NEMA 4, AND NEMA 12 AREAS - JOHNSON CONTROLS 24V DC SMOKE DETECTOR WITH FORM C CONTACT 4098-9601-SMOKE DETECTOR 4098-9682-DETECTOR BASE.

SMOKE DETECTOR



EMERGENCY LIGHT MOUNTING DETAIL

NO SCALE

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www.tetratech.com
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MARK	DATE	DESCRIPTION
	11/20/23	ISSUED FOR BID

BY

CITY OF KALAMAZOO, MICHIGAN
WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

LIGHTING SCHEDULE

Project No.:	200-19743-19004
Designed By:	GCJ
Drawn By:	JLS
Checked By:	WAP/GCJ

E-202

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Bar Measures 1 inch

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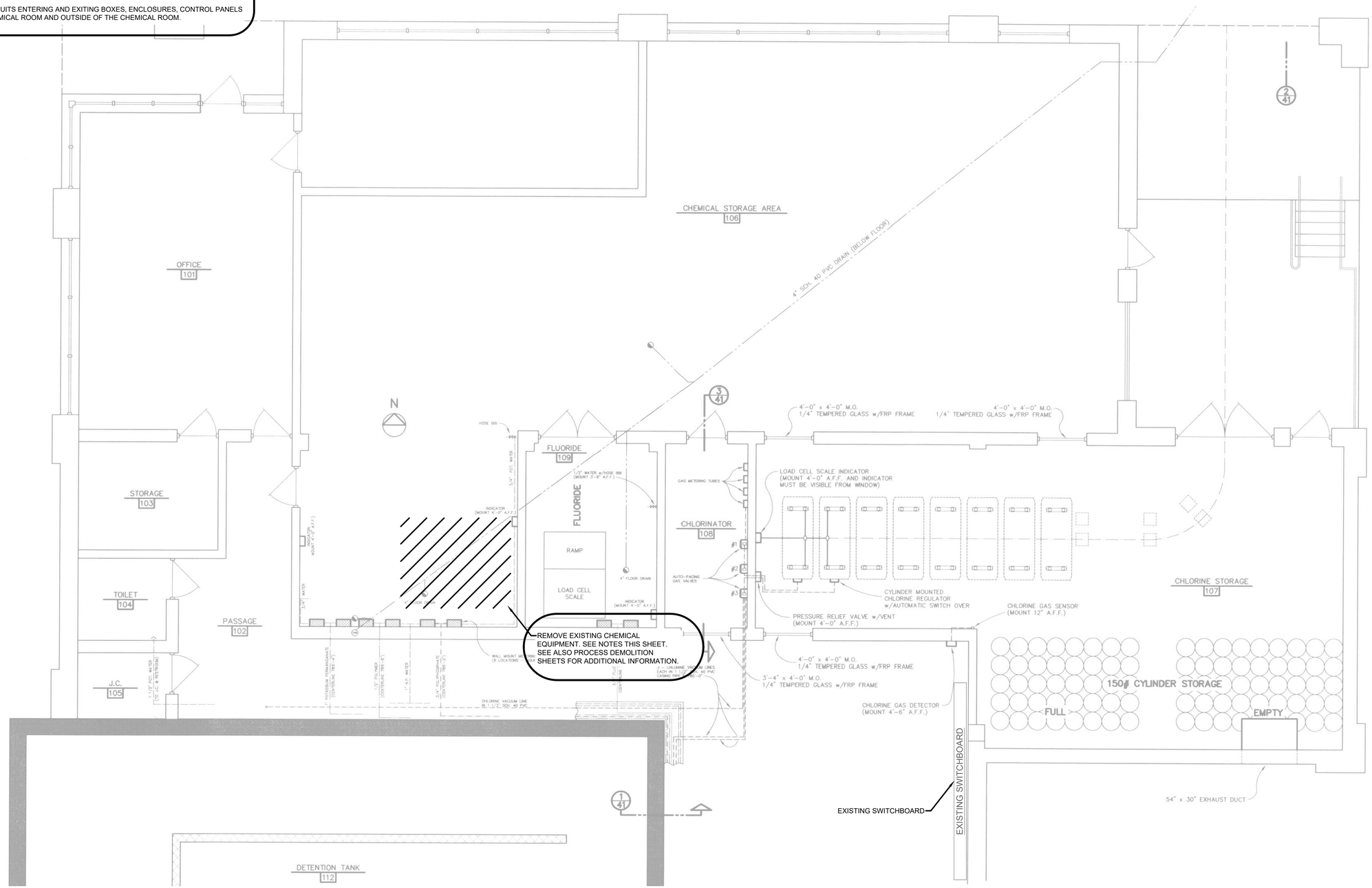
NOTES:

1. REFER TO PROCESS DEMOLITION DRAWINGS. DEMOLISH EXISTING CONDUIT, WIRE, DISCONNECT SWITCHES, SHIELDED CABLES, ETC. FOR PUMPS, TANKS, SENSORS, ETC.
2. PATCH HOLES IN WALL AND FLOOR FROM DEMOLISHED ELECTRICAL EQUIPMENT. SEAL HOLES IN WALL AND FLOOR WITH MORTAR.
3. FIELD VERIFY EXACT EXTENT OF DEMOLITION REQUIRED PRIOR TO BIDS AT EACH PUMP STATION.
4. DUCT SEAL CONDUITS ENTERING AND EXITING BOXES, ENCLOSURES, CONTROL PANELS ETC., IN THE CHEMICAL ROOM AND OUTSIDE OF THE CHEMICAL ROOM.



PUMP STATION NO.1 ELECTRICAL BACKGROUND PLAN DEMOLITION

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

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

EXISTING DRAWING FROM PREVIOUS PROJECT.
PROPOSED WORK SHOWN BOLD,
CROSSHATCHED, AND/OR CIRCLED.

TETRA TECH
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ANN ARBOR, MI 48108
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MARK	DATE	DESCRIPTION
	11/29/23	ISSUED FOR BID

CITY OF KALAMAZOO, MICHIGAN
WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

PUMP STATION NO.1 BACKGROUND PLAN DEMOLITION

Project No.:	200-19743-19004
Designed By:	GCJ
Drawn By:	JLS
Checked By:	WAP/GCJ

E-300

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Bar Measures 1 inch

11/28/2023 3:10:09 PM - \\TT.LOCAL\ER\PROJECTS\ANN ARBOR\ER\19743\200-19743-19004\CAD\SHEETFILES\E\WATER SYSTEM CORROSION CONTROL IMPROVEMENTS\E-300_PS 1 BACKGROUND PLAN DEMO.DWG - SHANK, JASON

EXISTING BOXES TO REMAIN. SEE NOTES NO.4, AND NO.5.

TB — MCP — 2"C(50#14) — CONTROL
TB — MPZ-A — 2"C(20#12) — POWER
TB — MCP — 2"C(20-2/C#16SH) — SIGNAL
2"C(10-CAT-6 CABLES)
TB — MCP — ETHERNET

HEAT TRACE IS FUTURE. PROVIDE ELECTRICAL EQUIPMENT, CONDUIT/WIRE AS SHOWN. (TYP.)

MCP
1"C(4#14) — HEAT TRACE
1"C(3#10) — MPZ-A15
C 30A
1"C(4-2/C#16SH) — MCP — MCP
1"C(14#14) — MPZ-A7
1"C(3#10)
CHEMICAL UNLOADING INDICATOR/ALARM PANEL.

NOTES:

1. CONDUIT IN NEMA 4X AREAS TO BE PVC SCHEDULE 80.
2. COORDINATE WITH THE PUMP MANUFACTURER AND FURNISH THE NECESSARY CONNECTORS TO INTERFACE THE CONTROL WIRES AND SHIELDED CABLES FROM THE PUMPS TO THE CONDUIT/WIRE/RACEWAY SYSTEM. PROVIDE MANUFACTURER CONNECTORS, CORDS, ETC AS REQUIRED.
3. FURNISH SEAL FITTINGS ON CONDUIT RUNS EXITING CHEMICAL AREAS.
4. TERMINAL BOXES WERE INSTALLED IN PREVIOUS CONTRACT FOR 120VAC POWER TO MPZ-A, 4-20MA WIRING BACK TO MAIN CONTROL PANEL. (MCP), DISCRETE IO BACK TO MAIN CONTROL PANEL. (MCP), AND ETHERNET CABLES BACK TO MAIN CONTROL PANEL. (MCP).
5. NEW CONDUIT AND WIRE WITHIN THE CHEMICAL ROOM IS TO HOMERUN TO EACH OF THESE EXISTING TERMINAL BOXES. CONNECTIONS ALREADY EXIST BACK TO THE MAIN CONTROL PANEL. (MCP.)
6. PRIOR TO MAKING ANY CONNECTIONS WITHIN THE EXISTING ABOVE TERMINAL BOXES, OBTAIN FROM OWNER A SET OF THE WEST MICHIGAN INSTRUMENTATION SYSTEMS INC., SET OF WIRING DIAGRAMS TO ASSIST IN MAKING WIRE CONNECTIONS WITHIN THE BOXES AND MAIN CONTROL PANEL.

OFFICE 101

CHEMICAL STORAGE AREA 106

4" SCH. 40 PVC DRAIN (BELOW FLOOR)

EXISTING RADIO CONCENTRATOR PANEL, PLC COMMUNICATIONS PANEL.

EXISTING TRANSFER PUMP STARTER
2"C(4#8) — SWITCHBOARD
MCP — 1"C(20#14)

SEE ONE-LINE DIAGRAM AND WIRING DIAGRAMS FOR PROPOSED WORK REQUIRED.

STORAGE 103

SERVER ROOM NEMA 12 AREA

NEMA 4X AREA

TOILET 104

PASSAGE 102

FLUORIDE 109

NEMA 4X AREA

RAMP

EXISTING CHLORINE PUMP

EXISTING SCALE
LOAD CELL SCALE — 1"C(2/C#16SH) — MCP

1"C(2/C#16SH) — MCP
1"C(2/C#16SH) — MCP
EXISTING CHLORINE PUMP
EXISTING — MCP
1"C(2/C#16SH)

FURNISH, AND INSTALL CONDUIT/WIRE TO EXISTING EQUIPMENT AS SHOWN. (TYP.)

1"C(2/C#16SH)

PHOSPHATE ANALYZER. INSTALL, AND CONNECT CONDUIT/WIRE SHOWN. SEE NOTES. (TYP.) MOUNT UPS ON SHELF NEAR UNIT. SUPPORT WITH 316 STAINLESS STEEL STRUT. (TYP.) COORDINATE EXACT WIRING REQUIREMENTS WITH ANALYZER MANUFACTURER.

PHOSPHATE ANALYZER. INSTALL, AND CONNECT CONDUIT/WIRE SHOWN. SEE NOTES. (TYP.) MOUNT UPS ON SHELF NEAR UNIT. SUPPORT WITH 316 STAINLESS STEEL STRUT. (TYP.) COORDINATE EXACT WIRING REQUIREMENTS WITH ANALYZER MANUFACTURER.

4'-0" x 4'-0" M.O. 1/4" TEMPERED GLASS w/FRP FRAME

4'-0" x 4'-0" M.O. 1/4" TEMPERED GLASS w/FRP FRAME

LOAD CELL SCALE INDICATOR (MOUNT 4'-0" A.F.F. AND INDICATOR MUST BE VISIBLE FROM WINDOW)

NEMA 4X AREA
CHLORINATOR 108

EXISTING CHLORINE CONTROL VALVES. (TYP. OF 3)

1"C(3-2/C#16SH) — PLC
1"C(3-2/C#16SH) — PLC
1"C(3-2/C#16SH) — PLC

1"C(2/C#16SH) EACH.
MCP
MCP
PRESSURE RELIEF VALVE w/VENT
MOUNT ON STRUT SUPPORT RACK. (TYP.)

CYLINDER MOUNTED CHLORINE REGULATOR w/AUTOMATIC SWITCH OVER

CHLORINE GAS SENSOR (MOUNT 12" A.F.F.)

NEMA 4X AREA

CHLORINE GAS DETECTOR (MOUNT 4'-6" A.F.F.)

4'-0" x 4'-0" M.O. 1/4" TEMPERED GLASS

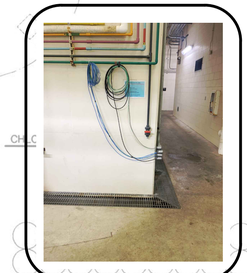
EXISTING CL LEAK DETECTOR

3'-4" x 4'-0" M.O.

RELOCATE EXISTING LIGHT SWITCHES, DEMOLISH EXISTING OUTLET. RELOCATE EXISTING START/STOP PUSH BUTTON.

150# CYLINDER STORAGE

FULL — EMPTY



54" x 30" EXHAUST DUCT

MPZ-A12 — LVUS — MCP — POWER MONITOR ENCLOSURE
1"C(3#10)
2"C(12#10)
1"C(2-50 MICRON, MULTIMODE FIBER ZIP CORDS (LC-LC))

POWER MONITORS — EXISTING LVUS
1"C(3#10)

MPZ-A12 — LVUS — MCP — POWER MONITOR ENCLOSURE
2"C(12#10)
1"C(2-50 MICRON, MULTIMODE FIBER ZIP CORDS (LC-LC))

1"C(CAT-6 CABLE) — MCP MCP
AE 1 — 1"C(2/C#16SH) — MPZ-A5 1"C(3#12)
1"C(7#14) — MCP — AIT 1
PHOSPHORUS ANALYZER
MCP 1"C(6#12)
SV 2 — SV 1
CONNECT TO SPARE 24V DC INPUT. POWER FROM SPARE 24V DC BREAKER. (TYP.)
SD — MCP 1"C(5#14)
EXISTING MAIN CONTROL PANEL. (MCP).
NEMA 4 AREA

FREE CHLORINE ANALYZER — MCP-TB SIGNAL — 1"C(2/C#16SH) — 1"C(MFR. CABLES)
AE 2 — MPZ-A3 TB POWER 1"C(3#12) — AIT 2

MCP-TB SIGNAL — MCP-TB-ENET — 1"C(2/C#16SH) — 1"C(CAT-6)
WE 1 — MPZ-A1 TB POWER 3/4"C(3#12) — WIT 1

MCP-TB SIGNAL — 1"C(MFR. CABLES) — 1"C(2/C#16SH)
FE 1 — MPZ-A14 TB POWER 1"C(3#10) — FIT 1

MCP-TB SIGNAL — MCP-TB-ENET — 1"C(2/C#16SH) — 1"C(CAT-6)
WE 2 — MPZ-A1 POWER 3/4"C(3#12) — WIT 2

PIT 1 — PY 1 — MCP-TB SIGNAL 3/4"C(2/C#16SH)
PIT 2 — PY 2 — MCP-TB SIGNAL 3/4"C(2/C#16SH)
PIT 3 — PY 3 — MCP-TB SIGNAL 3/4"C(2/C#16SH)

LE 1 — LT 1 — LI 1 — 3/4"C(2-2/C#16SH) MCP-TB SIGNAL
LE 2 — LT 2 — LI 2 — 3/4"C(2-2/C#16SH) MCP-TB SIGNAL

M 1
SEAL FITTING. (TYP.)
LSH 2 — MCP-TB CONTROL 1"C(5#14) — LSH 1 — MCP-TB CONTROL 1"C(5#14)
LSH 3 — TRANSFER PUMP STARTER 1"C(5#14)

MCP-TB SIGNAL — 1"C(2/C#16SH) — MPZ-A9 TB POWER 1"C(3#10) — CHLORINE CONTROL/ INJECTION VALVE.

1"C(2-2/C#16SH) — MCP-TB SIGNAL — MCP-TB CONTROL 1"C(16#16) — 1 — MPZ-A2 TB POWER 1"C(3#12)
1"C(2-2/C#16SH) — MCP-TB SIGNAL — MCP-TB CONTROL 1"C(16#16) — 2 — MPZ-A4 TB POWER 1"C(3#12)

CHEMICAL FEED PUMPS

MCP-TB CONTROL — 1"C(5#14) — EYEWASH — MPZ-A6 TB POWER 1"C(3#10)

NOTE:

1. CONDUIT SHALL BE PVC - SCHEDULE 80. GROUND SEAL FITTINGS AS REQUIRED.
2. REFER TO PROCESS DRAWINGS FOR EXACT EQUIPMENT LOCATIONS. (TYP. OF 12 LOCATIONS.)

NEMA 4X AREA
REFER TO PROCESS DRAWINGS FOR EXACT EQUIPMENT LOCATIONS. (TYP.)

PUMP STATION NO.1 ELECTRICAL BACKGROUND PLAN PROPOSED WORK

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

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

EXISTING DRAWING FROM PREVIOUS PROJECT. PROPOSED WORK SHOWN BOLD, CROSSHATCHED, AND/OR CIRCLED.

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MARK	DATE	DESCRIPTION	BY
	11/29/23	ISSUED FOR BID	

CITY OF KALAMAZOO, MICHIGAN
WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

PUMP STATION NO.1
BACKGROUND PLAN
PROPOSED WORK

Project No.:	200-19743-19004
Designed By:	GCJ
Drawn By:	JLS
Checked By:	WAP/GCJ

E-301
OF 43

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Bar Measures 1 inch

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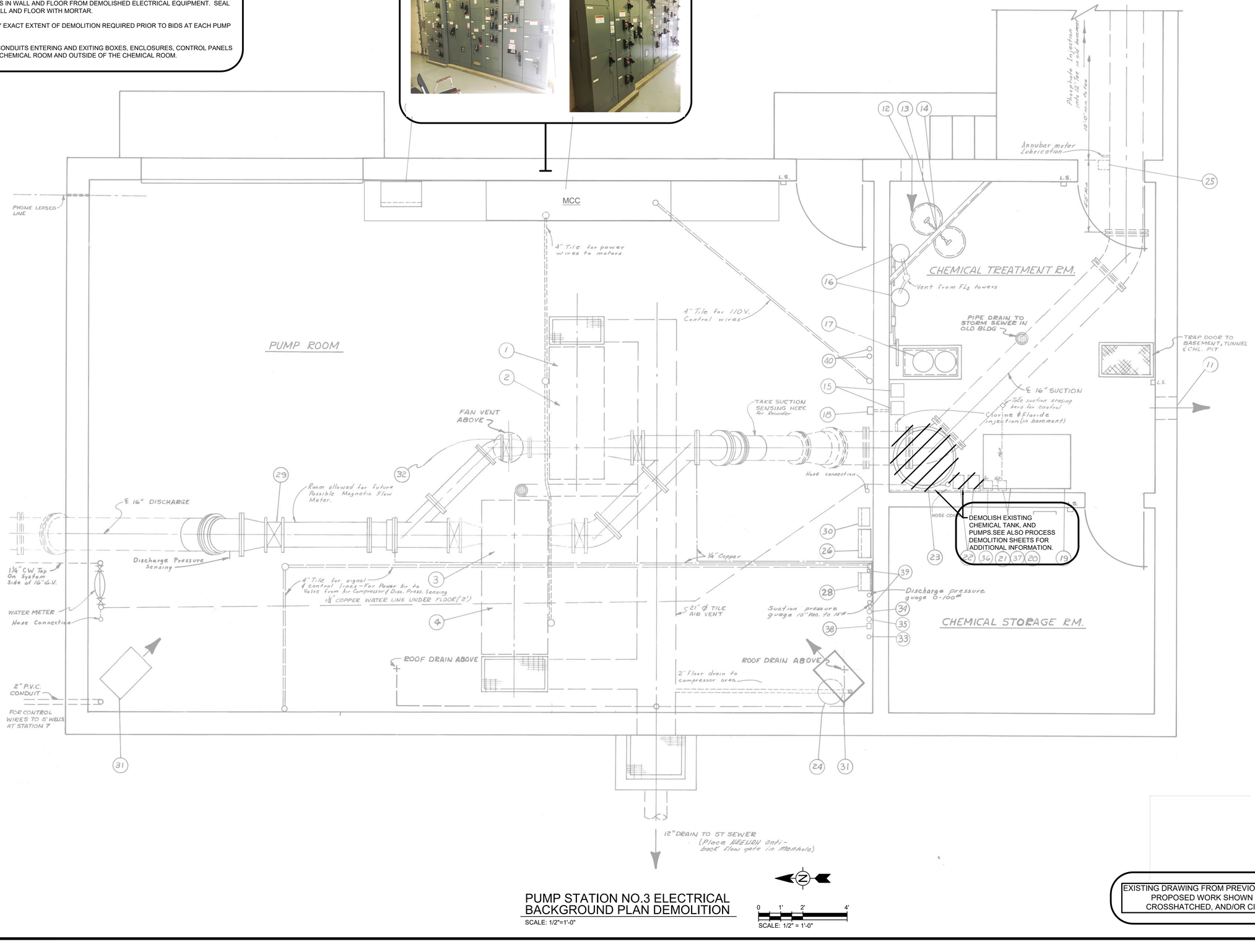
NOTES:

1. REFER TO PROCESS DEMOLITION DRAWINGS. DEMOLISH EXISTING CONDUIT, WIRE, DISCONNECT SWITCHES, SHIELDED CABLES, ETC. FOR PUMPS, TANKS, SENSORS, ETC.
2. PATCH HOLES IN WALL AND FLOOR FROM DEMOLISHED ELECTRICAL EQUIPMENT. SEAL HOLES IN WALL AND FLOOR WITH MORTAR.
3. FIELD VERIFY EXACT EXTENT OF DEMOLITION REQUIRED PRIOR TO BIDS AT EACH PUMP STATION.
4. DUCT SEAL CONDUITS ENTERING AND EXITING BOXES, ENCLOSURES, CONTROL PANELS ETC., IN THE CHEMICAL ROOM AND OUTSIDE OF THE CHEMICAL ROOM.



PUMP STATION NO.3 ELECTRICAL BACKGROUND PLAN DEMOLITION

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

0 1' 2' 4'

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

EXISTING DRAWING FROM PREVIOUS PROJECT. PROPOSED WORK SHOWN BOLD, CROSSHATCHED, AND/OR CIRCLED.

TETRA TECH
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ANN ARBOR, MI 48108
PHONE: (734) 665-6000 FAX: (734) 213-3003

MARK	DATE	DESCRIPTION	BY
	11/28/23	ISSUED FOR BID	

CITY OF KALAMAZOO, MICHIGAN
WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

PUMP STATION NO.3
BACKGROUND PLAN
DEMOLITION

Project No.:	200-19743-19004
Designed By:	GCJ
Drawn By:	JLS
Checked By:	WAP/GCJ

E-302
OF 43

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Bar Measures 1 inch

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NOTES:

1. CONDUIT IN NEMA 4X AREAS SHALL BE PVC SCHEDULE 80.
2. COORDINATE WITH THE PUMP MANUFACTURER AND FURNISH THE NECESSARY CONNECTORS TO INTERFACE THE CONTROL WIRES AND SHIELDED CABLES FROM THE PUMPS TO THE CONDUIT/WIRE/RACEWAY SYSTEM. PROVIDE MANUFACTURER CONNECTORS, CORDS, ETC., AS REQUIRED.
3. FURNISH SEAL FITTINGS ON CONDUIT RUNS EXITING CHEMICAL AREAS.
4. TERMINAL BOXES WERE INSTALLED IN PREVIOUS CONTRACT FOR 120VAC POWER TO MPZ-A, 4-20MA WIRING BACK TO MAIN CONTROL PANEL. (MCP), DISCRETE IO BACK TO MAIN CONTROL PANEL. (MCP), AND ETHERNET CABLES BACK TO MAIN CONTROL PANEL. (MCP).
5. NEW CONDUIT AND WIRE WITHIN THE CHEMICAL ROOM IS TO HOMERUN TO EACH OF THESE TERMINAL BOXES. CONNECTIONS ALREADY EXIST BACK TO THE MAIN CONTROL PANEL. (MCP).
6. PRIOR TO MAKING ANY CONNECTIONS WITHIN THE EXISTING ABOVE TERMINAL BOXES, OBTAIN FROM OWNER A SET OF THE WEST MICHIGAN INSTRUMENTATION SYSTEMS INC., SET OF WIRING DIAGRAMS TO ASSIST IN MAKING WIRE CONNECTIONS WITHIN THE BOXES AND MAIN CONTROL PANEL.

NOTE (CONDUIT/WIRE REQUIREMENTS FOR CHEMICAL SYSTEM INSTRUMENTS, AND CHEMICAL PUMPS):

CONDUIT, AND WIRE REQUIREMENTS FOR CHEMICAL EQUIPMENT/INSTRUMENTS, AND CHEMICAL PUMPS, TRANSFER PUMP.

1. INSTALL CONDUIT/POWER/CONTROL/SHIELDED CABLES TO THE EXISTING TERMINAL BOXES SHOWN. THESE WERE PROVIDED, AND INSTALLED/WIRED BACK TO MCP, AND MPZ-A UNDER PREVIOUS CONTRACT.

PHONE LEASED LINE

1"C(3#10)
MPZ-A16
MPC
1"C(2-DUPLEX 50 MICRON MULTIMODE FIBER ZIP CABLES)
RADIO PANEL

POWER MONITOR ENCLOSURE
MCC
1"C(3#10)
MPZ-A12
2"C(12#10)
MCP
1"C(2-50 MICRON, MULTIMODE FIBER ZIP CORDS (LC-LC))
MCC

4" Tile for power wires to motors

EXISTING BOXES TO REMAIN. SEE NOTES NO.4, AND NO.5.

4" Tile for 110V. Control wires

PUMP ROOM

TB MCP 2"C(50#14) CONTROL
TB MPZ-A 2"C(20#12) POWER
2"C(10-CAT-6 CABLES)
TB MCP 2"C(20-2/C#16SH) SIGNAL
TB MCP ETHERNET

1"C(5#14) MCP SC
EXISTING MCP
4" THICK CONCRETE PAD.

CHEMICAL TREATMENT RM.
Vent from Fl2 towers
PIPE DRAIN TO STORM SEWER IN OLD BLDG
1"C(2/C#16SH) MCP
Chlorine & Floride injection (in basement)
E 16" SUCTI
Take suction sensing here for control

NEMA 4 AREA

FAN VENT ABOVE
TAKE SUCTION SENSING HERE for Recorder
Hose connection MPZ-A
E 16" DISCHARGE
Room allowed for future Possible Magnetic Flow Meter.
Discharge Pressure Sensing
1½" CW Tap On System Side of 16" G.V.
WATER METER
Hose connection
4" Tile for signal & control lines - For Power Air to Valve from Air Compressor & Discharge Pressure Sensing
1½" COPPER WATER LINE UNDER FLOOR(2')
DRAIN ABOVE
5'-2" Ø TILE AIR VENT
Suction pressure guage 10"Hg. to 15#
ROOF DRAIN ABOVE
2" Floor drain to compressor area.
12" DRAIN TO ST SEWER (Place NEFUSH Ontl-
HOSE CONN.
¼" Copper
Phosphate Injection into 12" line in old basement
Annubar meter Lubrication
HEAT TRACE
1"C(4#14) MCP
1"C(4-2/C#16SH) MCP MCP
C 30A
1"C(3#10) MPZ-A15
1"C(14#14) MPZ-A7
1"C(3#10)
CHEMICAL UNLOADING INDICATOR/ALARM PANEL.
L.S.

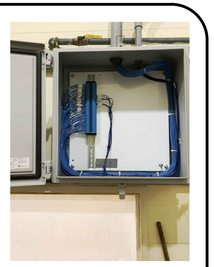
SEE ONE-LINE DIAGRAM AND WIRING DIAGRAMS FOR PROPOSED WORK REQUIRED.

TRANSFER PUMP STARTER
2"C(4#8) MCC
MCP 1"C(20#14)

CHEMICAL STORAGE RM.
NEMA 4X AREA

PHOSPHATE ANALYZER. INSTALL, AND CONNECT CONDUIT/WIRE SHOWN. SEE NOTES. (TYP.) MOUNT UPS ON SHELF NEAR UNIT. SUPPORT WITH 316 STAINLESS STEEL STRUT. (TYP.) COORDINATE EXACT WIRING REQUIREMENTS WITH ANALYZER MANUFACTURER.

PHOSPHORUS ANALYZER
1"C(CAT-6 CABLE) MCP MCP
AE 1
1"C(2/C#16SH) MPZ-A5 1"C(3#12)
1"C(7#14) AIT 1 MCP
SV 2
SV 1
MCP 1"C(6#12)



EXISTING DRAWING FROM PREVIOUS PROJECT. PROPOSED WORK SHOWN BOLD, CROSSHATCHED, AND/OR CIRCLED.

NOTE:

1. CONDUIT SHALL BE PVC - SCHEDULE 80. GROUND SEAL FITTINGS AS REQUIRED.
2. REFER TO PROCESS DRAWINGS FOR EXACT EQUIPMENT LOCATIONS. (TYP. OF 12 LOCATIONS.)

NEMA 4X AREA
REFER TO PROCESS DRAWINGS FOR EXACT EQUIPMENT LOCATIONS. (TYP.)

FREE CHLORINE ANALYZER
1"C(MFR. CABLES) MCP-TB SIGNAL 1"C(2/C#16SH)
MPZ-A3 TB POWER 1"C(3#12)
AE 2 AIT 2

MCP-TB SIGNAL 1"C(MFR. CABLES) 1"C(2/C#16SH)
MPZ-A14 TB POWER 1"C(3#10)
FE 1 FIT 1

MCP-TB SIGNAL MCP-TB-ENET 1"C(2/C#16SH) 1"C(CAT-6)
MPZ-A1 TB POWER 3/4"C(3#12)
WE 1 WIT 1

MCP-TB SIGNAL MCP-TB-ENET 1"C(2/C#16SH) 1"C(CAT-6)
MPZ-A1 POWER 3/4"C(3#12)
WE 2 WIT 2

PIT 1 PY 1 MCP-TB SIGNAL 3/4"C(2/C#16SH)
PIT 2 PY 2 MCP-TB SIGNAL 3/4"C(2/C#16SH)
PIT 3 PY 3 MCP-TB SIGNAL 3/4"C(2/C#16SH)

LE 1 LT 1 3/4"C(2-2/C#16SH) MCP-TB SIGNAL LI 1
LE 2 LT 2 3/4"C(2-2/C#16SH) MCP-TB SIGNAL LI 2

M 1
SEAL FITTING. (TYP.)
LSH 2 MCP-TB CONTROL 1"C(5#14) LSH 1 MCP-TB CONTROL 1"C(5#14)
LSH 3 TRANSFER PUMP STARTER 1"C(5#14)
MCP-TB SIGNAL 1"C(2/C#16SH) MPZ-A9 TB POWER 1"C(3#10) CHLORINE CONTROL/ INJECTION VALVE.

1"C(2-2/C#16SH) MCP-TB SIGNAL MCP-TB CONTROL 1"C(16#16) 1 MPZ-A2 TB POWER 1"C(3#12)
1"C(2-2/C#16SH) MCP-TB SIGNAL MCP-TB CONTROL 1"C(16#16) 2 MPZ-A4 TB POWER 1"C(3#12)

CHEMICAL FEED PUMPS
MCP-TB CONTROL 1"C(5#14) MPZ-A6 TB POWER 1"C(3#10)
EYEWASH

PUMP STATION NO.3 ELECTRICAL BACKGROUND PLAN PROPOSED WORK

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

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

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	11/29/23	ISSUED FOR BID

CITY OF KALAMAZOO, MICHIGAN
WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

PUMP STATION NO.3 BACKGROUND PLAN PROPOSED WORK

Project No.:	200-19743-19004
Designed By:	GCJ
Drawn By:	JLS
Checked By:	WAP/GCJ

E-303
OF 43

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Bar Measures 1 inch

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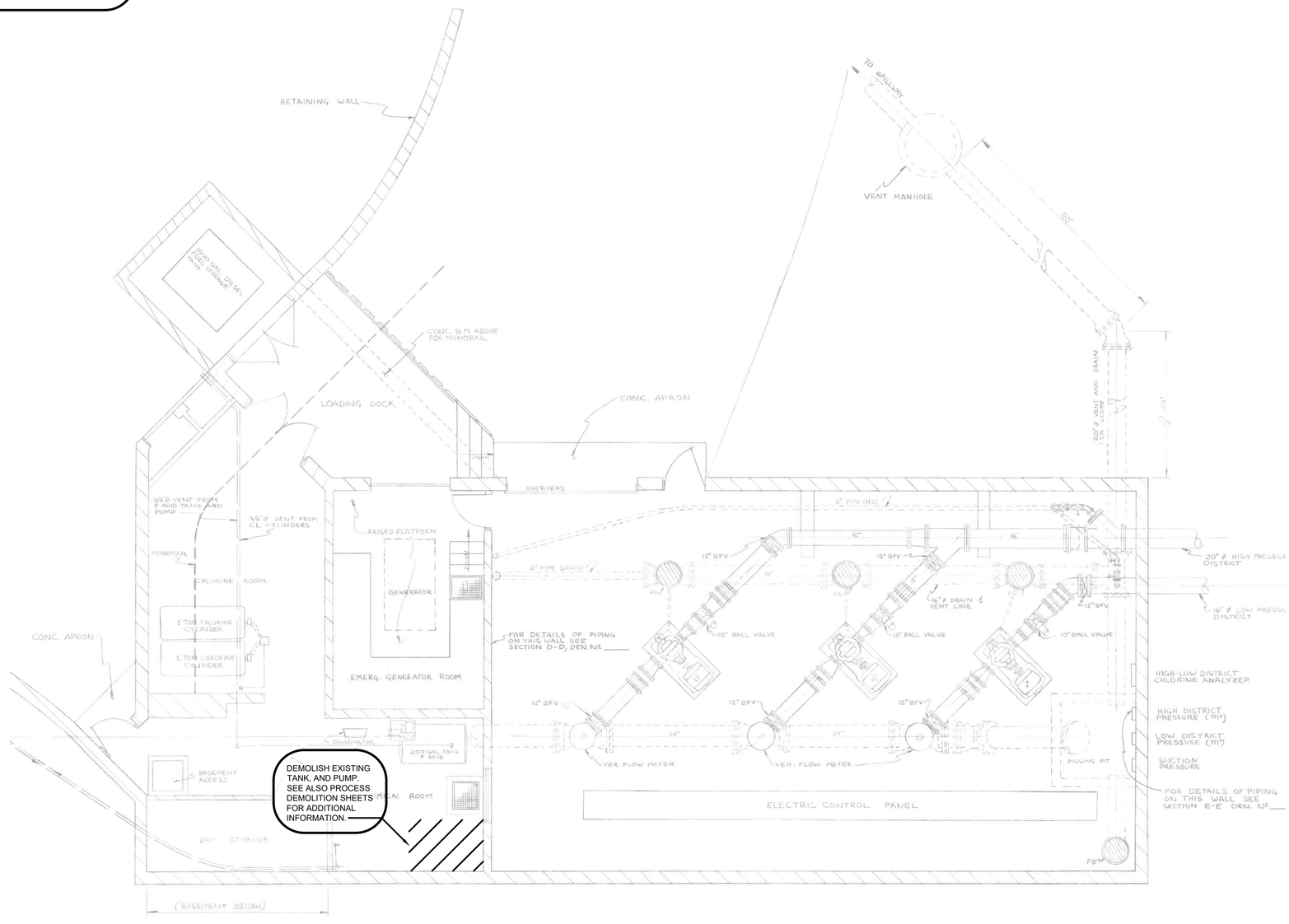
NOTES:

1. REFER TO PROCESS DEMOLITION DRAWINGS. DEMOLISH EXISTING CONDUIT, WIRE, DISCONNECT SWITCHES, SHIELDED CABLES, ETC. FOR PUMPS, TANKS, SENSORS, ETC.
2. PATCH HOLES IN WALL AND FLOOR FROM DEMOLISHED ELECTRICAL EQUIPMENT. SEAL HOLES IN WALL AND FLOOR WITH MORTAR.
3. FIELD VERIFY EXACT EXTENT OF DEMOLITION REQUIRED PRIOR TO BIDS AT EACH PUMP STATION.
4. DUCT SEAL CONDUITS ENTERING AND EXITING BOXES, ENCLOSURES, CONTROL PANELS ETC., IN THE CHEMICAL ROOM AND OUTSIDE OF THE CHEMICAL ROOM.



PUMP STATION NO.4 ELECTRICAL BACKGROUND PLAN DEMOLITION

NO SCALE

N

0 2' 4' 8'

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

EXISTING DRAWING FROM PREVIOUS PROJECT. PROPOSED WORK SHOWN BOLD, CROSSHATCHED, AND/OR CIRCLED.

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CITY OF KALAMAZOO, MICHIGAN

WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

PUMP STATION NO.4 BACKGROUND PLAN DEMOLITION

Project No.:	200-19743-19004
Designed By:	GCJ
Drawn By:	JLS
Checked By:	WAP/GCJ

E-304

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Bar Measures 1 inch

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11/28/2023 3:11:10 PM - \\TT-LOCAL\IER\PROJECTS\ANN ARBOR\IER\19743\200-19743-19004\CAD\SHEETFILES\WATER SYSTEM CORROSION CONTROL IMPROVEMENTS\E-305_PS 4 BACKGROUND PLAN PR.DWG - SHANK, JASON

FREE CHLORINE ANALYZER
MCP-TB SIGNAL
1"C(2/C#16SH)
1"C(MFR. CABLES)
MPZ-A3 TB POWER 1"C(3#12)
AE 2
AIT 2

MCP-TB SIGNAL
1"C(2/C#16SH)
1"C(MFR. CABLES)
MPZ-A14 TB POWER 1"C(3#10)
FE 1
FIT 1

MCP-TB SIGNAL
MCP-TB-ENET
1"C(2/C#16SH)
1"C(CAT-6)
MPZ-A1 TB POWER 3/4"C(3#12)
WE 1
WIT 1

MCP-TB SIGNAL
MCP-TB-ENET
1"C(2/C#16SH)
1"C(CAT-6)
MPZ-A1 POWER 3/4"C(3#12)
WE 2
WIT 2

MCP-TB SIGNAL
3/4"C(2/C#16SH)
PIT 1
PY 1
PIT 2
PY 2
PIT 3
PY 3

3/4"C(2-2/C#16SH)
MCP-TB SIGNAL
LE 1
LT 1
LI 1
LE 2
LT 2
LI 2

M 1
SEAL FITTING. (TYP.)
MCP-TB CONTROL 1"C(5#14)
LSH 2
LSH 1
LSH 3
TRANSFER PUMP STARTER 1"C(5#14)

MCP-TB SIGNAL
1"C(2/C#16SH)
MPZ-A9 TB POWER 1"C(3#10)
CHLORINE CONTROL/ INJECTION VALVE.

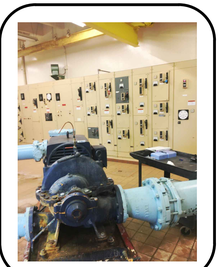
1"C(2-2/C#16SH)
MCP-TB SIGNAL
MCP-TB CONTROL 1"C(16#16)
MPZ-A2 TB POWER 1"C(3#12)
1
2
MPZ-A4 TB POWER 1"C(3#12)

CHEMICAL FEED PUMPS

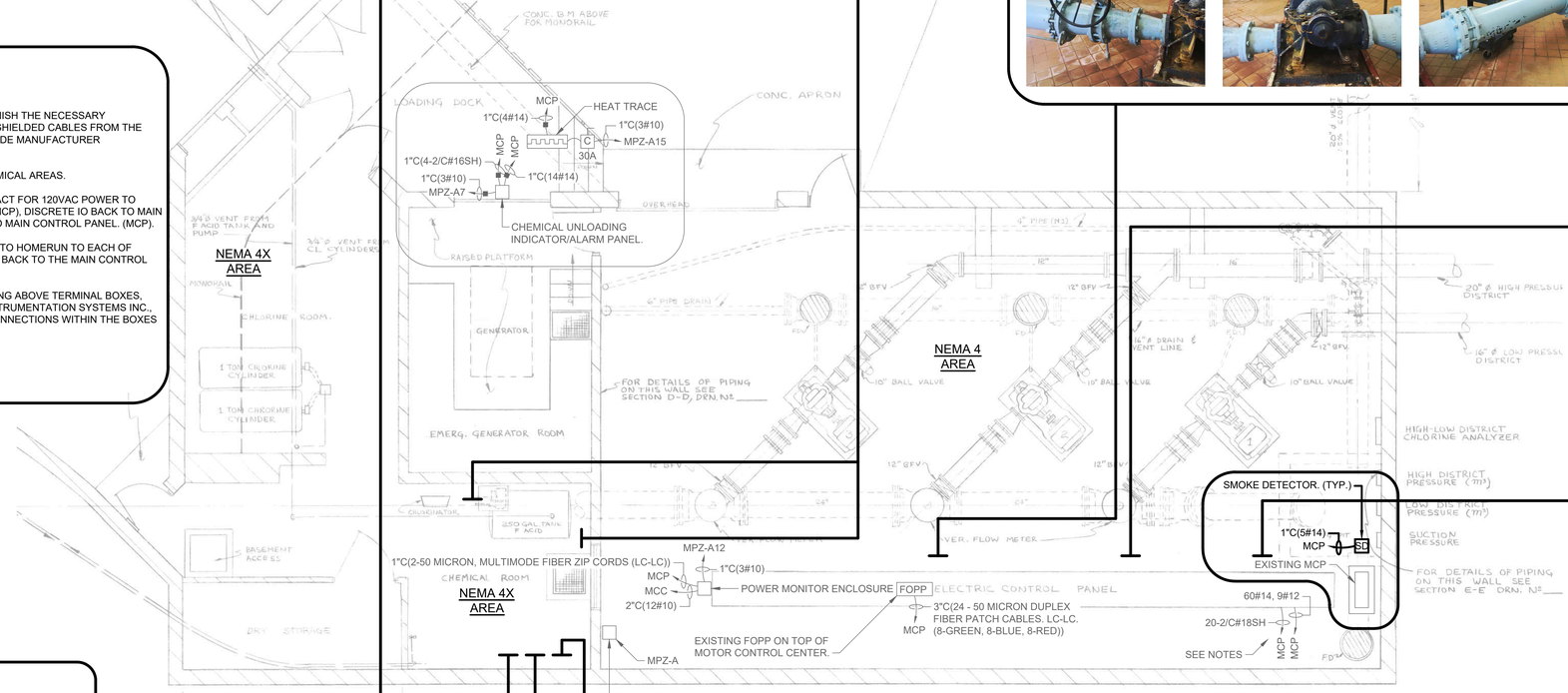
MCP-TB CONTROL 1"C(5#14)
MPZ-A6 TB POWER 1"C(3#10)
EYEWASH

NOTE:
1. CONDUIT SHALL BE PVC - SCHEDULE 80. GROUND SEAL FITTINGS AS REQUIRED.
2. REFER TO PROCESS DRAWINGS FOR EXACT EQUIPMENT LOCATIONS. (TYP. OF 12 LOCATIONS.)

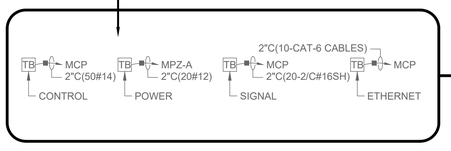
NEMA 4X AREA
REFER TO PROCESS DRAWINGS FOR EXACT EQUIPMENT LOCATIONS. (TYP.)



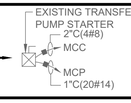
NOTES:
1. CONDUIT IN NEMA 4X AREAS SHALL BE PVC SCHEDULE 80.
2. COORDINATE WITH THE PUMP MANUFACTURER AND FURNISH THE NECESSARY CONNECTORS TO INTERFACE THE CONTROL WIRES AND SHIELDED CABLES FROM THE PUMPS TO THE CONDUIT/WIRE/RACEWAY SYSTEM. PROVIDE MANUFACTURER CONNECTORS, CORDS, ETC., AS REQUIRED.
3. FURNISH SEAL FITTINGS ON CONDUIT RUNS EXITING CHEMICAL AREAS.
4. TERMINAL BOXES WERE INSTALLED IN PREVIOUS CONTRACT FOR 120VAC POWER TO MPZ-A, 4-20MA WIRING BACK TO MAIN CONTROL PANEL. (MCP), DISCRETE IO BACK TO MAIN CONTROL PANEL. (MCP), AND ETHERNET CABLES BACK TO MAIN CONTROL PANEL. (MCP).
5. NEW CONDUIT AND WIRE WITHIN THE CHEMICAL ROOM IS TO HOMERUN TO EACH OF THESE TERMINAL BOXES. CONNECTIONS ALREADY EXIST BACK TO THE MAIN CONTROL PANEL. (MCP).
6. PRIOR TO MAKING ANY CONNECTIONS WITHIN THE EXISTING ABOVE TERMINAL BOXES, OBTAIN FROM OWNER A SET OF THE WEST MICHIGAN INSTRUMENTATION SYSTEMS INC., SET OF WIRING DIAGRAMS TO ASSIST IN MAKING WIRE CONNECTIONS WITHIN THE BOXES AND MAIN CONTROL PANEL.



EXISTING BOXES TO REMAIN. SEE NOTES NO.4, AND NO.5. FIELD LOCATE EXACT LOCATIONS IN ROOM.



SEE ONE-LINE DIAGRAM AND WIRING DIAGRAMS FOR PROPOSED WORK REQUIRED.



NOTE (CONDUIT/WIRE REQUIREMENTS CHEMICAL SYSTEM INSTRUMENTS, AND CHEMICAL PUMPS):

CONDUIT, AND WIRE REQUIREMENTS FOR CHEMICAL EQUIPMENT//INSTRUMENTS, AND CHEMICAL PUMPS, TRANSFER PUMP.

1. INSTALL CONDUIT/POWER/CONTROL/SHIELDED CABLES TO THE EXISTING TERMINAL BOXES SHOWN. THESE WERE PROVIDED, AND INSTALLED/WIRED BACK TO MCP, AND MPZ-A UNDER PREVIOUS CONTRACT.

PUMP STATION NO.4 ELECTRICAL BACKGROUND PLAN PROPOSED WORK

NO SCALE

N

0 2' 4' 8'

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

EXISTING DRAWING FROM PREVIOUS PROJECT. PROPOSED WORK SHOWN BOLD, CROSSHATCHED, AND/OR CIRCLED.

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CITY OF KALAMAZOO, MICHIGAN
WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

PUMP STATION NO.4
BACKGROUND PLAN
PROPOSED WORK

Project No.:	200-19743-19004
Designed By:	GCJ
Drawn By:	JLS
Checked By:	WAP/GCJ

E-305
OF 43

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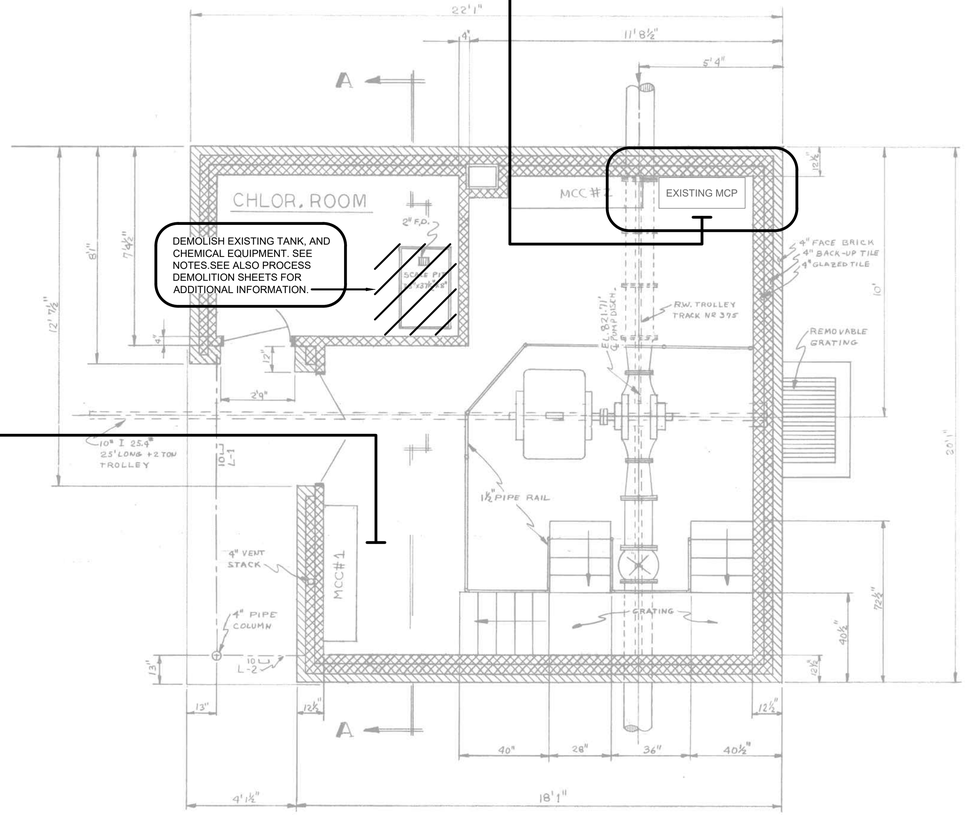
Bar Measures 1 inch

NOTES:

1. REFER TO PROCESS DEMOLITION DRAWINGS. DEMOLISH EXISTING CONDUIT, WIRE, DISCONNECT SWITCHES, SHIELDED CABLES, ETC. FOR PUMPS, TANKS, SENSORS, ETC.
2. PATCH HOLES IN WALL AND FLOOR FROM DEMOLISHED ELECTRICAL EQUIPMENT. SEAL HOLES IN WALL AND FLOOR WITH MORTAR.
3. FIELD VERIFY EXACT EXTENT OF DEMOLITION REQUIRED PRIOR TO BIDS AT EACH PUMP STATION.
4. DUCT SEAL CONDUITS ENTERING AND EXITING BOXES, ENCLOSURES, CONTROL PANELS ETC., IN THE CHEMICAL ROOM AND OUTSIDE OF THE CHEMICAL ROOM.



PLAN AT UPPER FLOOR

PUMP STATION NO.8 ELECTRICAL BACKGROUND PLAN DEMOLITION

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

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

EXISTING DRAWING FROM PREVIOUS PROJECT. PROPOSED WORK SHOWN BOLD, CROSSHATCHED, AND/OR CIRCLED.

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CITY OF KALAMAZOO, MICHIGAN

WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

PUMP STATION NO.8
BACKGROUND PLAN
DEMOLITION

Project No.:	200-19743-19004
Designed By:	GCJ
Drawn By:	JLS
Checked By:	WAP/GCJ

E-306

OF 43

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Bar Measures 1 inch

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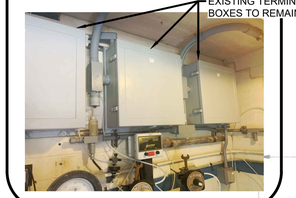
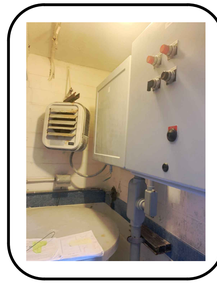
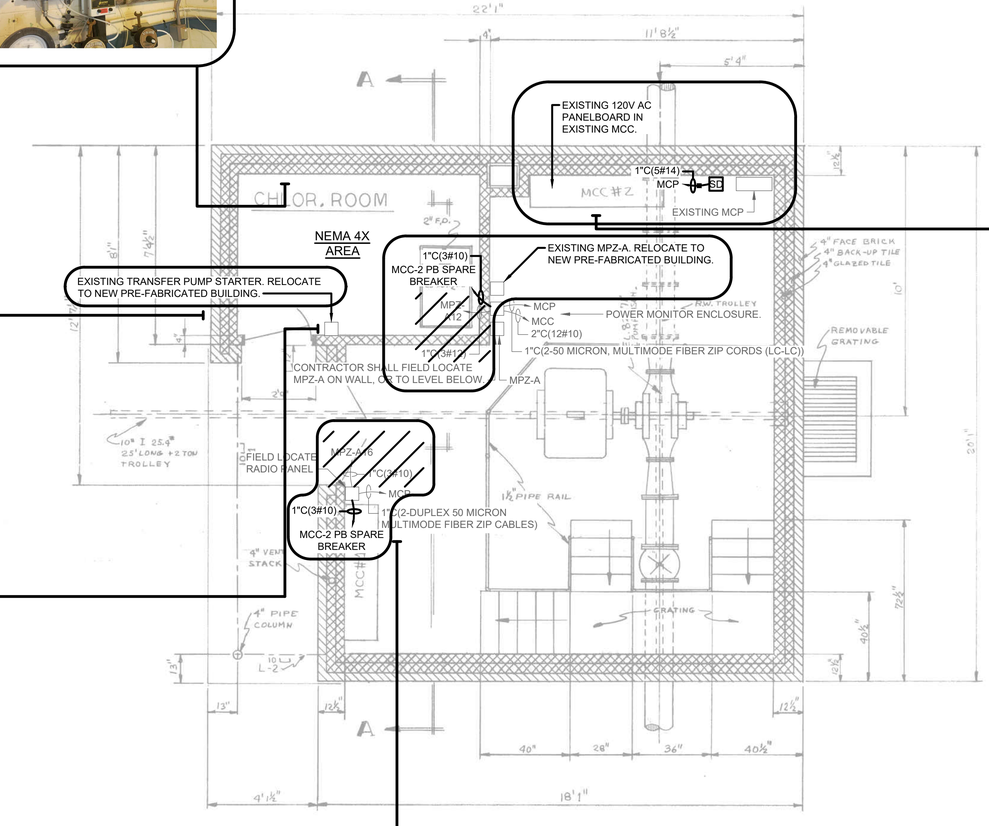
EXISTING TERMINAL BOXES TO REMAIN.



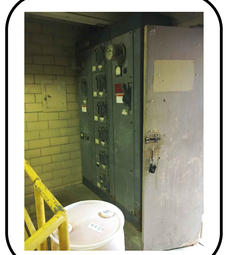
MCP
1"C(4#14)
HEAT TRACE
1"C(4-2/C#16SH)
MCP
MCP
C
30A
1"C(3#10)
MPZ-A15
1"C(14#14)
MPZ-A7
1"C(3#10)
CHEMICAL UNLOADING INDICATOR/ALARM PANEL.

EXISTING TRANSFER PUMP STARTER. RELOCATE TO NEW PRE-FABRICATED BUILDING.





PLAN AT UPPER FLOOR



PUMP STATION NO.8 ELECTRICAL BACKGROUND PLAN PROPOSED WORK
SCALE: 3/8"=1'-0"

N

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

EXISTING DRAWING FROM PREVIOUS PROJECT. PROPOSED WORK SHOWN BOLD, CROSSHATCHED, AND/OR CIRCLED.

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WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

PUMP STATION NO.8
BACKGROUND PLAN
PROPOSED WORK

Project No.:	200-19743-19004
Designed By:	GCJ
Drawn By:	JLS
Checked By:	WAP/GCJ

E-307
OF 43

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Bar Measures 1 inch

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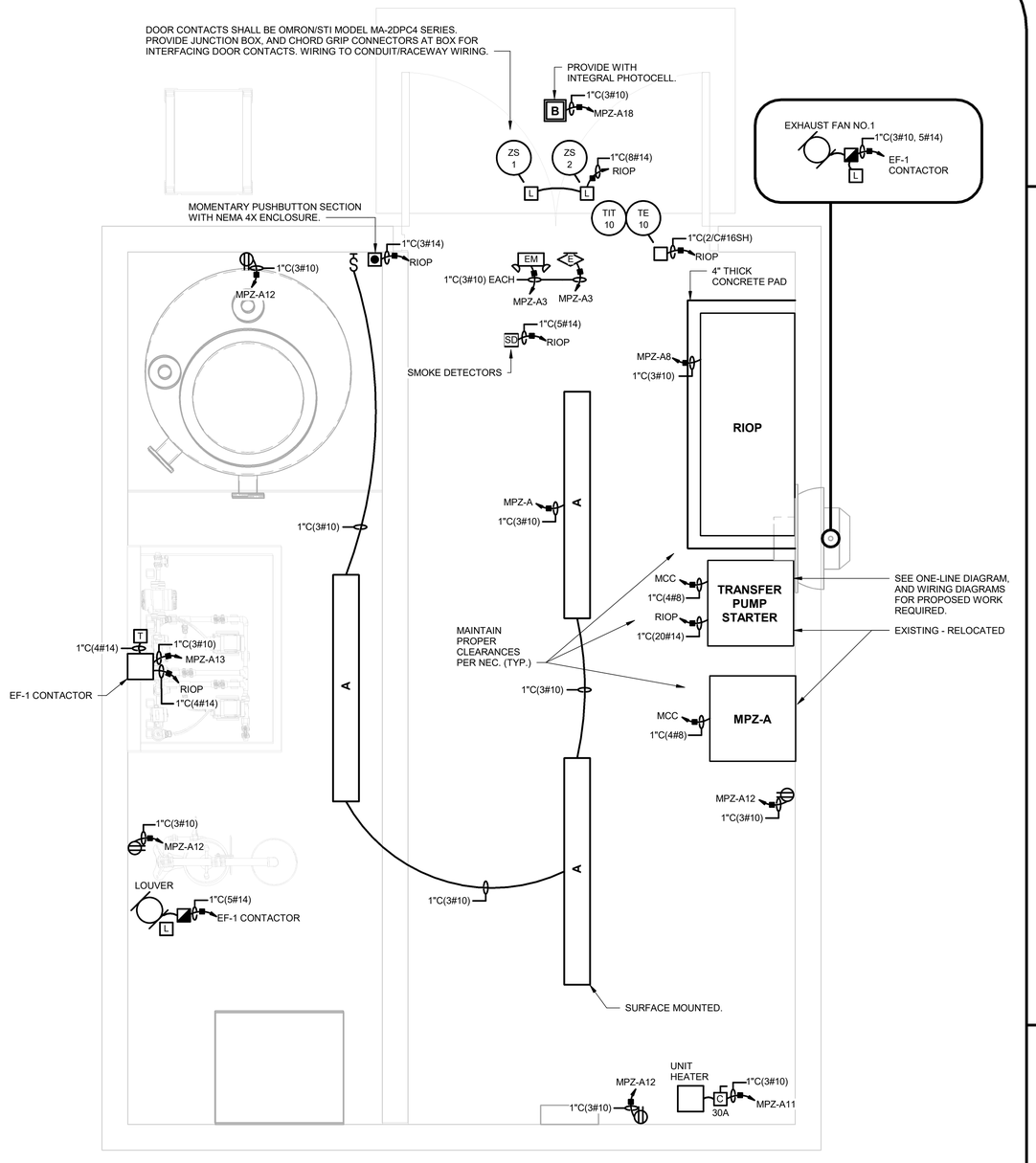
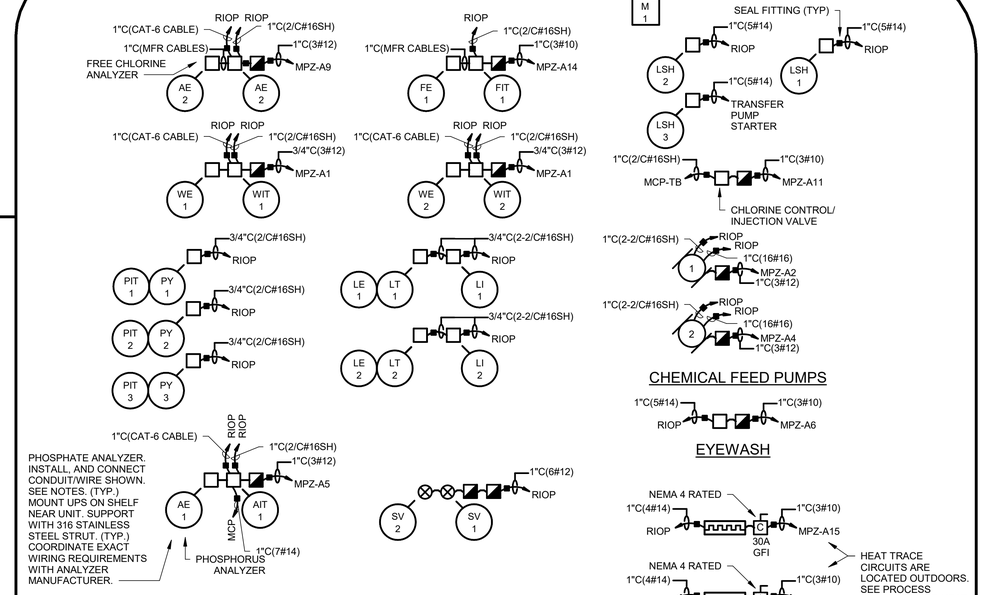


ELECTRICAL PLAN

SCALE: 3/4" = 1'-0"
NEMA 4X AREA

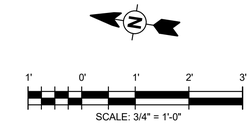


NOTES:

1. REMOTE IO PANEL TO CONTAIN TWO DOORS THAT OPEN FROM THE MIDDLE. DIMENSION NOT TO EXCEED 52 INCHES WIDE BY 62 INCHES HIGH BY 22 INCHES DEEP.
2. CONTRACTOR TO FURNISH AND INSTALL LIGHTS, OUTLETS AND WIRING FOR THE PREFABRICATED BUILDING SHOWN.
3. CONTRACTOR TO FURNISH STRUT FOR MOUNTING EQUIPMENT TO WALLS. COORDINATE WITH PREFABRICATED BUILDING MANUFACTURER.
4. LOCATE ELECTRICAL EQUIPMENT WITHIN PREFABRICATED BUILDING. MAINTAIN PROPER CLEARANCES PER NEC.
5. INSTALL MINI POWER ZONE, AND TRANSFER PUMP STARTER WITHIN BUILDING. MOUNT ON STRUT SUPPORT RACK.

NOTES:

1. CONDUIT IN NEMA 4X AREAS SHALL BE PVC SCHEDULE 80.
2. COORDINATE WITH THE PUMP MANUFACTURER AND FURNISH THE NECESSARY CONNECTORS TO INTERFACE THE CONTROL WIRES AND SHIELDED CABLES FROM THE PUMPS TO THE CONDUIT/WIRE/RACEWAY SYSTEM. PROVIDE MANUFACTURER CONNECTORS, CORDS, ETC., AS REQUIRED.
3. FURNISH SEAL FITTINGS ON CONDUIT RUNS EXITING CHEMICAL AREAS.
4. NEW PREFABRICATED BUILDINGS ARE BEING PROVIDED FOR FOUR STATIONS. (STATIONS NO.8, NO.12, NO.14, AND NO.22.)
5. THE EQUIPMENT IN THESE BUILDINGS IS TO BE WIRED TO A NEW REMOTE IO PANEL. THIS PANEL WILL BE CONNECTED TO THE EXISTING MAIN PROCESSOR PANEL (MCP) WITH 50 MICRON MULTIMODE FIBER OPTIC CABLING BY CONTRACTOR THIS CONTRACT AS SHOWN ON DRAWINGS.
6. THE EXISTING MINI POWER ZONE AND TRANSFER PUMP STARTER PREVIOUSLY INSTALLED IN PRIOR CONTRACT ARE TO BE RELOCATED AND REWIRED AS SHOWN ON THE CONTRACT DRAWINGS TO EACH NEW PREFABRICATED BUILDING.
7. WITHIN THE NEW PREFABRICATED BUILDINGS, FURNISH AND INSTALL NEW LIGHTS, SWITCHES, OUTLETS, FIXTURES, CONDUIT AND WIRE. FURNISH AND INSTALL THE NEW HEAT TRACE AS SHOWN. FURNISH AND INSTALL STAINLESS STEEL STRUT FOR SUPPORTING AND MOUNTING NEW PANELS, CONDUIT AND WIRE WITHIN THE NEW PREFABRICATED BUILDINGS.
8. NEW STRUT SUPPORTS FOR EQUIPMENT IS TO BE BOLTED TO NEW CONCRETE PAD AND SUPPORTED TO WALL AND CEILING. CONTRACTOR IS TO COORDINATE WITH PREFABRICATED BUILDING MANUFACTURER FOR MOUNTING AND SUPPORTING OF STRUT, CONDUITS, AND ELECTRICAL AND INSTRUMENTATION EQUIPMENT SHOWN TO BE INSTALLED.
9. FURNISH, AND INSTALL INSTRUMENTATION EQUIPMENT SHOWN IN NEW BUILDINGS.



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BY

CITY OF KALAMAZOO, MICHIGAN
WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

NEW PUMP STATION NO.8 ELECTRICAL PLAN

PROJ:	200-19743-19004
DESN:	GCJ
DRWN:	JLS
CHKD:	WAP/GCJ

E-308
OF 43

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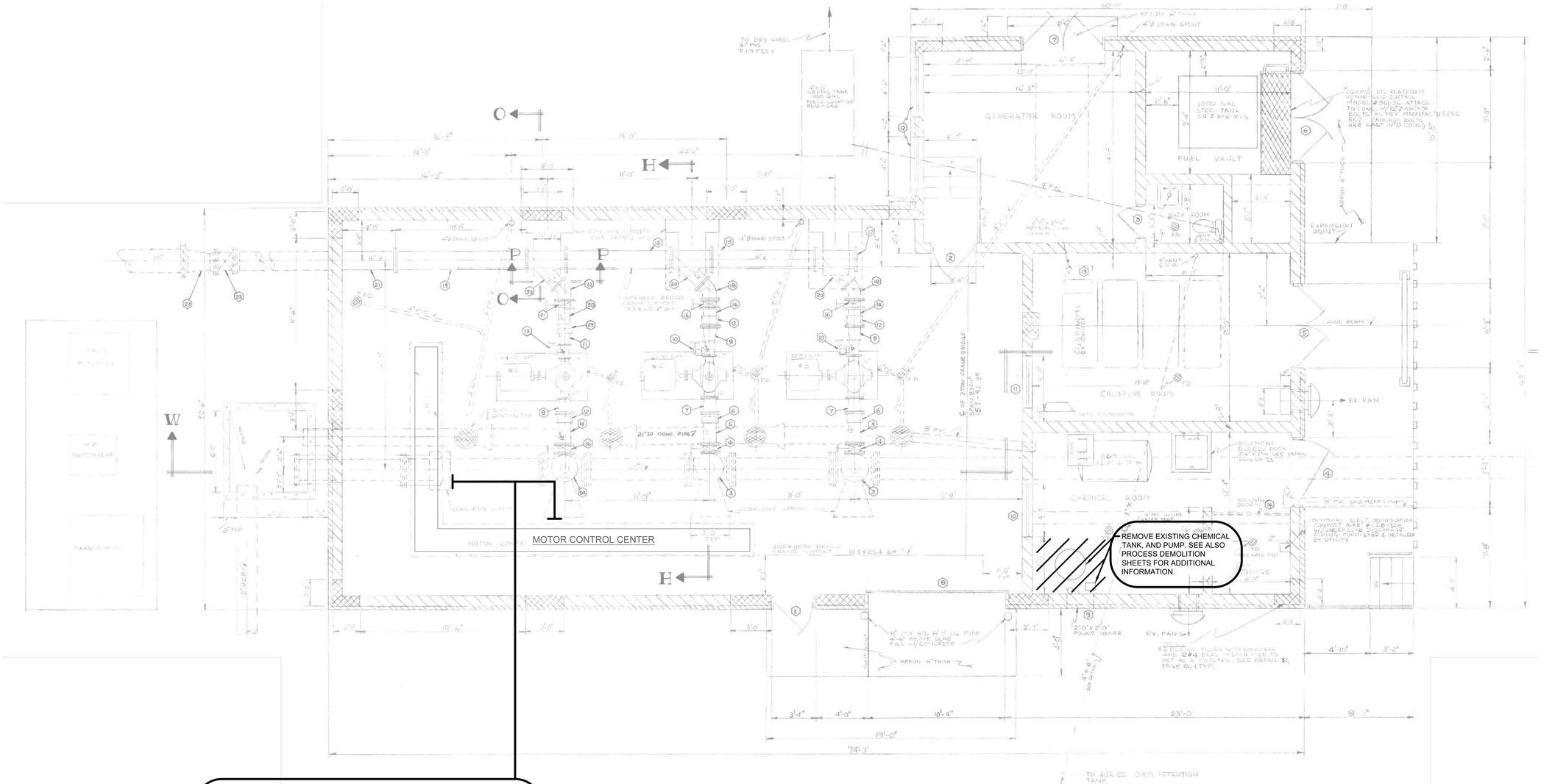
Bar measures 1 inch, otherwise drawing is not to scale

NOTES:

1. REFER TO PROCESS DEMOLITION DRAWINGS. DEMOLISH EXISTING CONDUIT, WIRE, DISCONNECT SWITCHES, SHIELDED CABLES, ETC. FOR PUMPS, TANKS, SENSORS, ETC.
2. PATCH HOLES IN WALL AND FLOOR FROM DEMOLISHED ELECTRICAL EQUIPMENT. SEAL HOLES IN WALL AND FLOOR WITH MORTAR.
3. FIELD VERIFY EXACT EXTENT OF DEMOLITION REQUIRED PRIOR TO BIDS AT EACH PUMP STATION.
4. DUCT SEAL CONDUITS ENTERING AND EXITING BOXES, ENCLOSURES, CONTROL PANELS ETC., IN THE CHEMICAL ROOM AND OUTSIDE OF THE CHEMICAL ROOM.



PUMP STATION NO.9 ELECTRICAL BACKGROUND PLAN DEMOLITION

SCALE 1/4"=1'-0"

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

EXISTING DRAWING FROM PREVIOUS PROJECT. PROPOSED WORK SHOWN BOLD, CROSSHATCHED, AND/OR CIRCLED.

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MARK	DATE	DESCRIPTION
	11/29/23	ISSUED FOR BID

CITY OF KALAMAZOO, MICHIGAN
WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

PUMP STATION NO.9 BACKGROUND PLAN DEMOLITION

Project No.:	200-19743-19004
Designed By:	GCJ
Drawn By:	JLS
Checked By:	WAP/GCJ

E-309

OF 43

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Bar Measures 1 inch

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NOTES:

1. CONDUIT IN NEMA 4X AREAS SHALL BE PVC SCHEDULE 80.
2. COORDINATE WITH THE PUMP MANUFACTURER AND FURNISH THE NECESSARY CONNECTORS TO INTERFACE THE CONTROL WIRES AND SHIELDED CABLES FROM THE PUMPS TO THE CONDUIT/WIRE/RACEWAY SYSTEM. PROVIDE MANUFACTURER CONNECTORS, CORDS, ETC., AS REQUIRED.
3. FURNISH SEAL FITTINGS ON CONDUIT RUNS EXITING CHEMICAL AREAS.
4. TERMINAL BOXES WERE INSTALLED IN PREVIOUS CONTRACT FOR 120VAC POWER TO MPZ-A, 4-20MA WIRING BACK TO MAIN CONTROL PANEL. (MCP), DISCRETE IO BACK TO MAIN CONTROL PANEL. (MCP), AND ETHERNET CABLES BACK TO MAIN CONTROL PANEL. (MCP).
5. NEW CONDUIT AND WIRE WITHIN THE CHEMICAL ROOM IS TO HOMERUN TO EACH OF THESE TERMINAL BOXES. CONNECTIONS ALREADY EXIST BACK TO THE MAIN CONTROL PANEL. (MCP).
6. PRIOR TO MAKING ANY CONNECTIONS WITHIN THE EXISTING ABOVE TERMINAL BOXES, OBTAIN FROM OWNER A SET OF THE WEST MICHIGAN INSTRUMENTATION SYSTEMS INC., SET OF WIRING DIAGRAMS TO ASSIST IN MAKING WIRE CONNECTIONS WITHIN THE BOXES AND MAIN CONTROL PANEL.
7. AT STATION NO.9, AND STATION NO.22 THE EXISTING UNLOADING INDICATOR PANEL IS TO BE RELOCATED TO SUIT THE NEW DOORWAY. RELOCATE THIS PANEL AS SHOWN. REWORK EXISTING CONDUITS FOR POWER, CONTROL AND SIGNAL BACK TO THE TERMINAL BOXES WITHIN THE EXISTING CHEMICAL ROOM. RECONNECT TO MATCH EXISTING. SEAL HOLES IN WALL AS REQUIRED. INSTALL NEW SEAL FITTINGS AND GROUND AS REQUIRED.

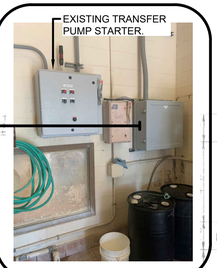
NOTE (CONDUIT/WIRE REQUIREMENTS FOR CHEMICAL SYSTEM INSTRUMENTS, AND CHEMICAL PUMPS):

CONDUIT, AND WIRE REQUIREMENTS FOR CHEMICAL EQUIPMENT/INSTRUMENTS, AND CHEMICAL PUMPS/TRANSFER PUMP.

1. INSTALL CONDUIT/POWER/CONTROL/SHIELDED CABLES TO THE EXISTING TERMINAL BOXES SHOWN. THESE WERE PROVIDED, AND INSTALLED/WIRED BACK TO MCP, AND MPZ-A UNDER PREVIOUS CONTRACT.

2"C(10-CAT-6 CABLES) — TB — MCP, ETHERNET

EXISTING TRANSFER PUMP STARTER.



EXISTING BOXES TO REMAIN. SEE NOTES NO.4, AND NO.5.

TB — MCP, 2"C(50#14) — CONTROL
TB — MPZ-A, 2"C(20#12) — POWER
TB — MCP, 2"C(20-2/C#16SH) — SIGNAL

SE — MCP, 1"C(5#14)

NEMA 4 AREA

RADIO PANEL — MPZ-A16 — MCP
1"C(3#10)
1"C(2-DUPLEX 50 MICRON MULTIMODE FIBER ZIP CABLES)

1"C(3#10) — MPZ-A12 — FACE OF EXISTING MCC

FIELD LOCATE CONDUIT ROUTING TO AVOID EXISTING OVERHEAD CRANE.

SEE ONE-LINE DIAGRAM AND WIRING DIAGRAMS FOR PROPOSED WORK REQUIRED.

EXISTING TRANSFER PUMP STARTER
2"C(4#8) — MCC
MCP — 1"C(20#14)

1"C(2/C#16SH) EACH. — MCP, MCP

1"C(2/C#16SH) EACH. — MCP, MCP, MCP, MCP

1"C(2/C#16SH) EACH. — MCP, MCP

NEMA 4X AREA

MOTOR CONTROL CENTER — MPZ-A12 — MCP, MCC, 2"C(12#10) — POWER MONITOR ENCLOSURE.
1"C(2-50 MICRON, MULTIMODE FIBER ZIP CORDS (LC-LC))
1"C(3#10)

RELOCATE EXISTING CONDUITS FOR LIGHT SWITCH, AND OUTLET TO SUIT NEW DOOR.

1"C(3#10)
1"C(4-2/C#16SH)
1"C(10#14)

SEE NOTE NO.7

RELOCATE EXISTING UNLOADING PANEL, AND HEAT TRACE DISCONNECT TO SUIT NEW DOOR. RE-WORK 4-1" CONDUITS. INSTALL NEW CABLES BACK TO TERMINAL BOXES IN CHEMICAL ROOM FOR POWER, CONTROLS, AND SIGNAL.

CHEM. RETENTION

1"C(4-2/C#16SH) — MCP, MCP — MCP — HEAT TRACE
1"C(4#14) — C — 30A — 1"C(3#10) — MPZ-A15
1"C(14#14) — MPZ-A7 — 1"C(3#10)

CHEMICAL UNLOADING INDICATOR/ALARM PANEL.

EXISTING DRAWING FROM PREVIOUS PROJECT. PROPOSED WORK SHOWN BOLD, CROSSHATCHED, AND/OR CIRCLED.

FREE CHLORINE ANALYZER — 1"C(MFR. CABLES) — MCP-TB SIGNAL — 1"C(2/C#16SH) — MPZ-A3 TB POWER 1"C(3#12) — AE 2 — AIT 2

MCP-TB SIGNAL — 1"C(MFR. CABLES) — 1"C(2/C#16SH) — MPZ-A14 TB POWER 1"C(3#10) — FE 1 — FIT 1

MCP-TB SIGNAL — MCP-TB-ENET — 1"C(2/C#16SH) — 1"C(CAT-6) — MPZ-A1 TB POWER 3/4"C(3#12) — WE 1 — WIT 1

MCP-TB SIGNAL — MCP-TB-ENET — 1"C(2/C#16SH) — 1"C(CAT-6) — MPZ-A1 POWER 3/4"C(3#12) — WE 2 — WIT 2

PIT 1, PY 1 — MCP-TB SIGNAL — 3/4"C(2/C#16SH)
PIT 2, PY 2 — MCP-TB SIGNAL — 3/4"C(2/C#16SH)
PIT 3, PY 3 — MCP-TB SIGNAL — 3/4"C(2/C#16SH)

LE 1, LT 1 — 3/4"C(2-2/C#16SH) — MCP-TB SIGNAL — LI 1
LE 2, LT 2 — 3/4"C(2-2/C#16SH) — MCP-TB SIGNAL — LI 2

M 1

LSH 2 — SEAL FITTING. (TYP.) — MCP-TB CONTROL 1"C(5#14) — MCP-TB CONTROL 1"C(5#14) — LSH 1
LSH 3 — TRANSFER PUMP STARTER 1"C(5#14)
MCP-TB SIGNAL 1"C(2/C#16SH) — MPZ-A9 TB POWER 1"C(3#10) — CHLORINE CONTROL/ INJECTION VALVE.

1"C(2-2/C#16SH) — MCP-TB CONTROL 1"C(16#16) — 1 — MPZ-A2 TB POWER 1"C(3#12)
1"C(2-2/C#16SH) — MCP-TB CONTROL 1"C(16#16) — 2 — MPZ-A4 TB POWER 1"C(3#12)

CHEMICAL FEED PUMPS

MCP-TB CONTROL 1"C(5#14) — MPZ-A6 TB POWER 1"C(3#10) — EYEWASH

NOTE:

1. CONDUIT SHALL BE PVC - SCHEDULE 80. GROUND SEAL FITTINGS AS REQUIRED.
2. REFER TO PROCESS DRAWINGS FOR EXACT EQUIPMENT LOCATIONS. (TYP. OF 12 LOCATIONS.)

NEMA 4X AREA
REFER TO PROCESS DRAWINGS FOR EXACT EQUIPMENT LOCATIONS. (TYP.)

PUMP STATION NO.9 ELECTRICAL BACKGROUND PLAN PROPOSED WORK

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

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

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BY

CITY OF KALAMAZOO, MICHIGAN
WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

PUMP STATION NO.9
BACKGROUND PLAN
PROPOSED WORK

Project No.:	200-19743-19004
Designed By:	GCJ
Drawn By:	JLS
Checked By:	WAP/GCJ

E-310
OF 43

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Bar Measures 1 inch

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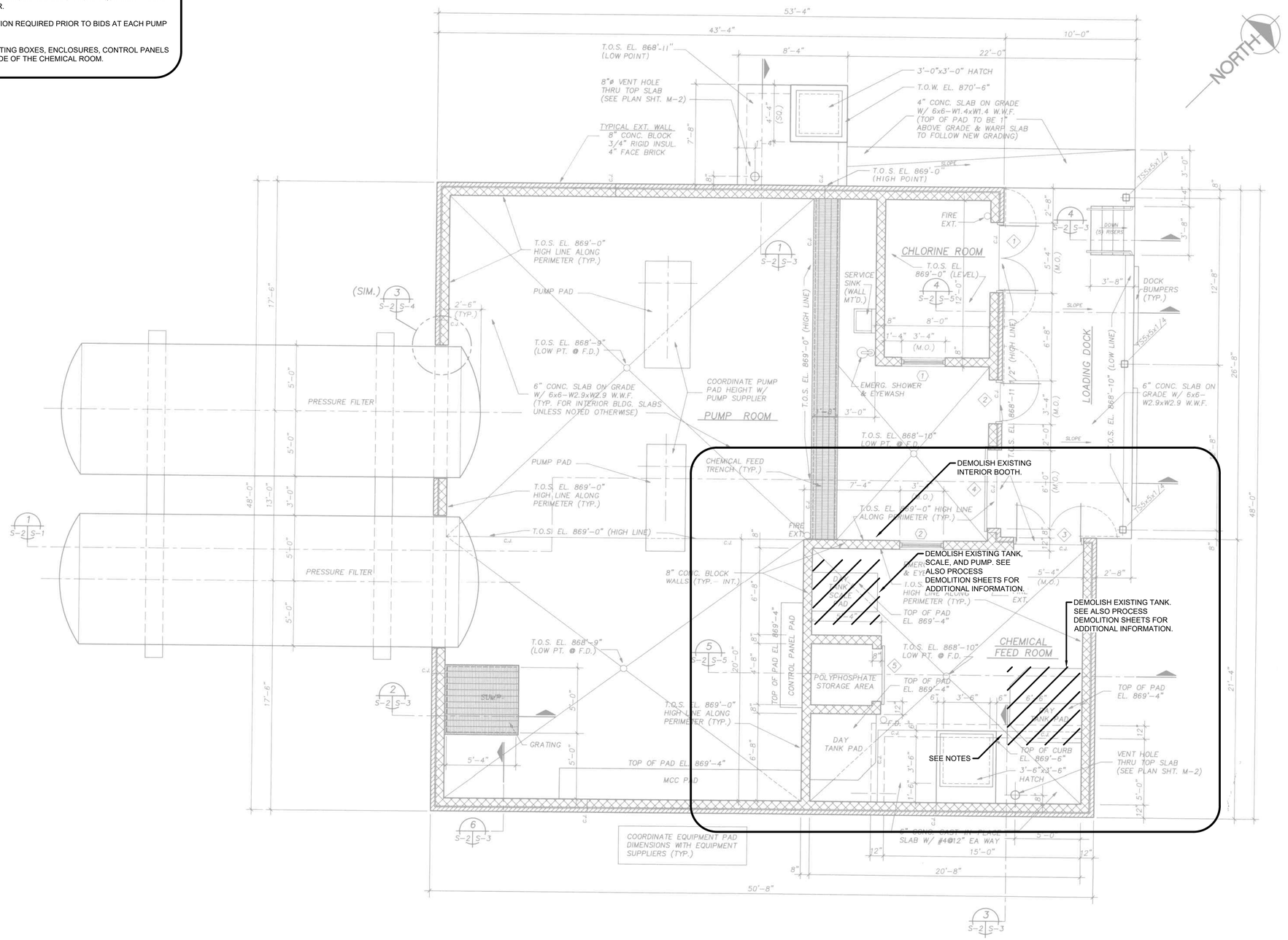
NOTES:

1. REFER TO PROCESS DEMOLITION DRAWINGS. DEMOLISH EXISTING CONDUIT, WIRE, DISCONNECT SWITCHES, SHIELDED CABLES, ETC. FOR PUMPS, TANKS, SENSORS, ETC.
2. PATCH HOLES IN WALL AND FLOOR FROM DEMOLISHED ELECTRICAL EQUIPMENT. SEAL HOLES IN WALL AND FLOOR WITH MORTAR.
3. FIELD VERIFY EXACT EXTENT OF DEMOLITION REQUIRED PRIOR TO BIDS AT EACH PUMP STATION.
4. DUCT SEAL CONDUITS ENTERING AND EXITING BOXES, ENCLOSURES, CONTROL PANELS ETC., IN THE CHEMICAL ROOM AND OUTSIDE OF THE CHEMICAL ROOM.



FILTER BUILDING FLOOR PLAN

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

PUMP STATION NO.11 ELECTRICAL BACKGROUND PLAN DEMOLITION

SCALE 1/4"=1'-0"

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

EXISTING DRAWING FROM PREVIOUS PROJECT. PROPOSED WORK SHOWN BOLD, CROSSHATCHED, AND/OR CIRCLED.

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CITY OF KALAMAZOO, MICHIGAN
WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

PUMP STATION NO.11
BACKGROUND PLAN
DEMOLITION

Project No.:	200-19743-19004
Designed By:	GCJ
Drawn By:	JLS
Checked By:	WAP/GCJ

E-311
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Bar Measures 1 inch

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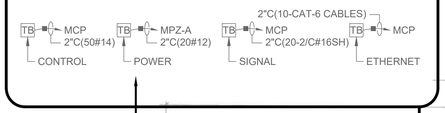
NOTES:

1. CONDUIT IN NEMA 4X AREAS SHALL BE PVC SCHEDULE 80.
2. COORDINATE WITH THE PUMP MANUFACTURER AND FURNISH THE NECESSARY CONNECTORS TO INTERFACE THE CONTROL WIRES AND SHIELDED CABLES FROM THE PUMPS TO THE CONDUIT/WIRE/RACEWAY SYSTEM. PROVIDE MANUFACTURER CONNECTORS, CORDS, ETC., AS REQUIRED.
3. FURNISH SEAL FITTINGS ON CONDUIT RUNS EXITING CHEMICAL AREAS.
4. TERMINAL BOXES WERE INSTALLED IN PREVIOUS CONTRACT FOR 120VAC POWER TO MPZ-A, 4-20MA WIRING BACK TO MAIN CONTROL PANEL. (MCP), DISCRETE IO BACK TO MAIN CONTROL PANEL. (MCP), AND ETHERNET CABLES BACK TO MAIN CONTROL PANEL. (MCP).
5. NEW CONDUIT AND WIRE WITHIN THE CHEMICAL ROOM IS TO HOMERUN TO EACH OF THESE TERMINAL BOXES. CONNECTIONS ALREADY EXIST BACK TO THE MAIN CONTROL PANEL. (MCP).
6. PRIOR TO MAKING ANY CONNECTIONS WITHIN THE EXISTING ABOVE TERMINAL BOXES, OBTAIN FROM OWNER A SET OF THE WEST MICHIGAN INSTRUMENTATION SYSTEMS INC., SET OF WIRING DIAGRAMS TO ASSIST IN MAKING WIRE CONNECTIONS WITHIN THE BOXES AND MAIN CONTROL PANEL.

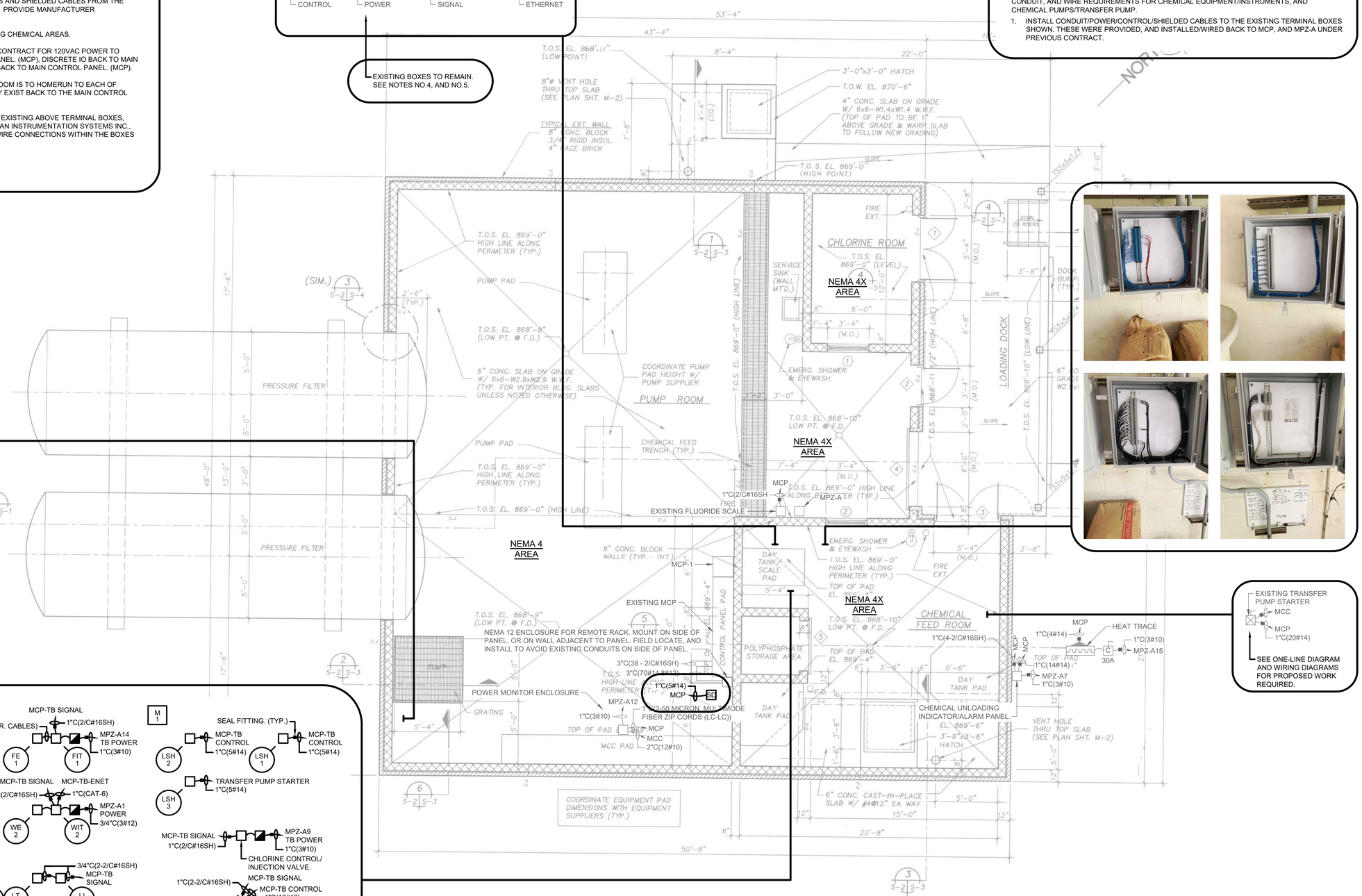


EXISTING BOXES TO REMAIN. SEE NOTES NO.4, AND NO.5.

NOTE (CONDUIT/WIRE REQUIREMENTS FOR CHEMICAL SYSTEM INSTRUMENTS, AND CHEMICAL PUMPS):

CONDUIT, AND WIRE REQUIREMENTS FOR CHEMICAL EQUIPMENT/INSTRUMENTS, AND CHEMICAL PUMPS/TRANSFER PUMP.

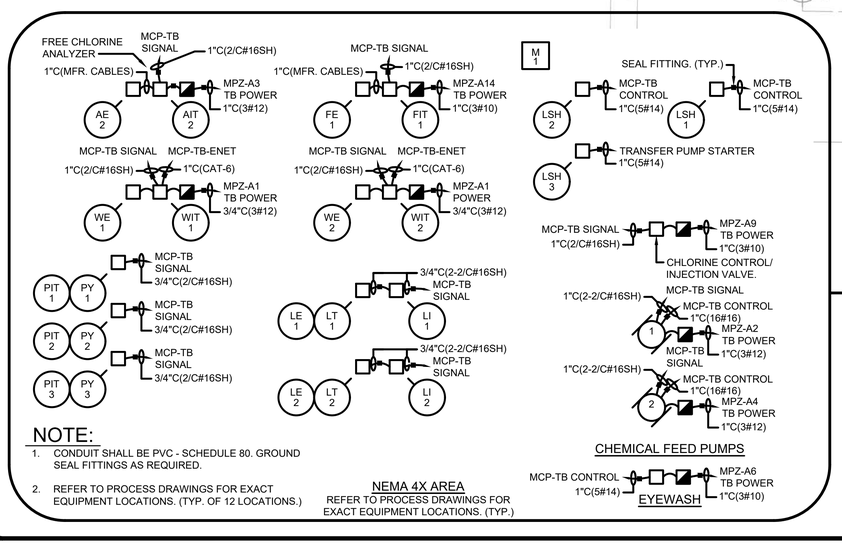
1. INSTALL CONDUIT/POWER/CONTROL/SHIELDED CABLES TO THE EXISTING TERMINAL BOXES SHOWN. THESE WERE PROVIDED, AND INSTALLED/WIRED BACK TO MCP, AND MPZ-A UNDER PREVIOUS CONTRACT.



FILTER BUILDING FLOOR PLAN

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

EXISTING TRANSFER PUMP STARTER
MCC
MCP
1"C(20#14)
SEE ONE-LINE DIAGRAM AND WIRING DIAGRAMS FOR PROPOSED WORK REQUIRED.



NOTE:

1. CONDUIT SHALL BE PVC - SCHEDULE 80. GROUND SEAL FITTINGS AS REQUIRED.
2. REFER TO PROCESS DRAWINGS FOR EXACT EQUIPMENT LOCATIONS. (TYP. OF 12 LOCATIONS.)

NEMA 4X AREA
REFER TO PROCESS DRAWINGS FOR EXACT EQUIPMENT LOCATIONS. (TYP.)

PUMP STATION NO.11 ELECTRICAL BACKGROUND PLAN PROPOSED WORK

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

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

EXISTING DRAWING FROM PREVIOUS PROJECT. PROPOSED WORK SHOWN BOLD, CROSSHATCHED, AND/OR CIRCLED.

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CITY OF KALAMAZOO, MICHIGAN
WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

PUMP STATION NO.11 BACKGROUND PLAN PROPOSED WORK

Project No.:	200-19743-19004
Designed By:	GCJ
Drawn By:	JLS
Checked By:	WAP/GCJ

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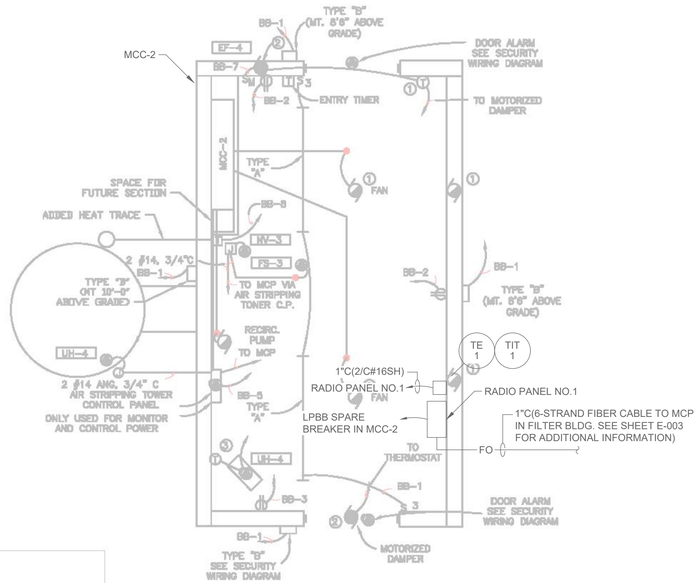

AIR STRIPPING BUILDING
ELECTRICAL PLAN
SCALE: 1/4" = 1'-0"

NEMA 4 AREA

PUMP STATION NO.11 ELECTRICAL
BACKGROUND PLAN PROPOSED WORK
SCALE: 1/4"=1'-0"

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

NOTE: THIS SHEET SHOWN FOR
INFORMATION ONLY

EXISTING DRAWING FROM PREVIOUS PROJECT.
PROPOSED WORK SHOWN BOLD,
CROSSHATCHED, AND/OR CIRCLED.

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CITY OF KALAMAZOO, MICHIGAN
WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

PUMP STATION NO.11
BACKGROUND PLAN
PROPOSED WORK

Project No.:	200-19743-19004
Designed By:	GCJ
Drawn By:	JLS
Checked By:	WAP/GCJ

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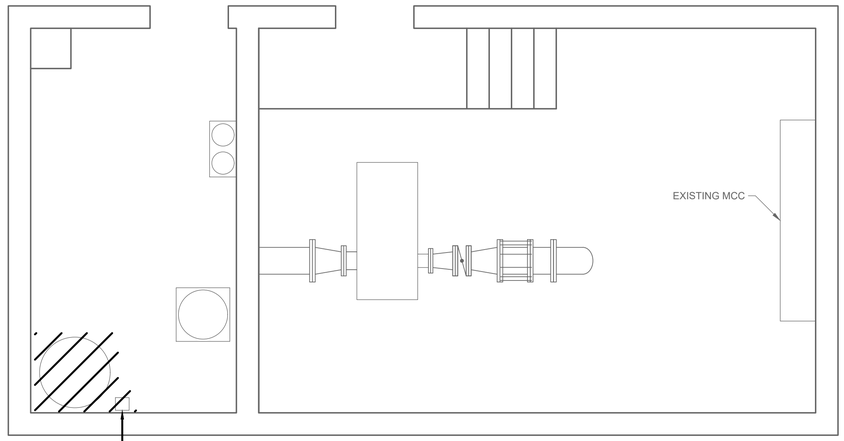
NOTES:

1. REFER TO PROCESS DEMOLITION DRAWINGS. DEMOLISH EXISTING CONDUIT, WIRE, DISCONNECT SWITCHES, SHIELDED CABLES, ETC. FOR PUMPS, TANKS, SENSORS, ETC.
2. PATCH HOLES IN WALL AND FLOOR FROM DEMOLISHED ELECTRICAL EQUIPMENT. SEAL HOLES IN WALL AND FLOOR WITH MORTAR.
3. FIELD VERIFY EXACT EXTENT OF DEMOLITION REQUIRED PRIOR TO BIDS AT EACH PUMP STATION.
4. DUCT SEAL CONDUITS ENTERING AND EXITING BOXES, ENCLOSURES, CONTROL PANELS ETC., IN THE CHEMICAL ROOM AND OUTSIDE OF THE CHEMICAL ROOM.



PUMP STATION NO.12 ELECTRICAL BACKGROUND PLAN DEMOLITION

SCALE 3/8"=1'-0"

N

0 1'-4" 2'-8" 5'-4"

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

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BY

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WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

PUMP STATION NO.12 BACKGROUND PLAN DEMOLITION

Project No.:	200-19743-19004
Designed By:	GCJ
Drawn By:	JLS
Checked By:	WAP/GCJ

E-314

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Bar Measures 1 inch

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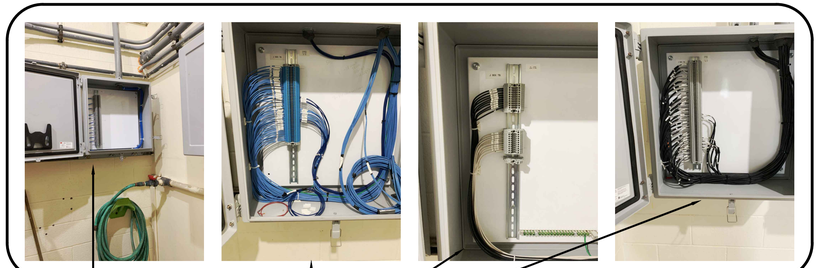

EXISTING TERMINAL BOXES TO REMAIN.

TB — MCP — 2"C(50#14) — CONTROL
TB — MPZ-A — 2"C(20#12) — POWER
TB — MCP — 2"C(10-CAT-6 CABLES) — 2"C(20-2/C#16SH) — SIGNAL
TB — MCP — ETHERNET

MCP
1"C(4#14)
HEAT TRACE
1"C(4-2/C#16SH)
MCP
MCP
1"C(3#10)
C
30A
MPZ-A15
1"C(14#14)
MPZ-A7
1"C(3#10)

CHEMICAL UNLOADING INDICATOR/ALARM PANEL.

1"C(3#10)
C
30A
MPZ-15

EXISTING MCC

NEMA 4X AREA

NEMA 12 AREA

MCP
MCP
1"C(2-2/C#16SH)
1"C(12#14)
1"C(3#10)
MCP
1"C(3#10)
EXISTING MOTORIZED VALVE ACTUATOR
MPZ-A20
POWER MONITOR ENCLOSURE
1"C(2-DUPLEX 50 MICRON MULTIMODE FIBER ZIP CABLES)

1"C(5#14)
MCP
SB

MPZ-A
RADIO PANEL
MPZ-A16
1"C(3#10)
1"C(3#10)
MCC PB SPARE BREAKER
MCP
1"C(3#10)
MPZ-12
1"C(3#10)
MCP
MCC
2"C(12#10)
1"C(2-50 MICRON, MULTIMODE FIBER ZIP CORDS (LC-LC))
EXISTING MCP
1"C(3#10)
MCC PB SPARE BREAKER

EXISTING TRANSFER PUMP STARTER TO BE RELOCATED TO NEW PREFABRICATED BUILDING.

SEE ONE-LINE DIAGRAM AND WIRING DIAGRAMS FOR PROPOSED WORK REQUIRED.

TO BE RELOCATED.

PUMP STATION NO.12 ELECTRICAL BACKGROUND PLAN DEMOLITION

SCALE 3/8"=1'-0"

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

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MARK	DATE	DESCRIPTION	BY
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CITY OF KALAMAZOO, MICHIGAN
WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

PUMP STATION NO.12 BACKGROUND PLAN PROPOSED WORK

Project No.:	200-19743-19004
Designed By:	GCJ
Drawn By:	JLS
Checked By:	WAP/GCJ

E-315
OF 43

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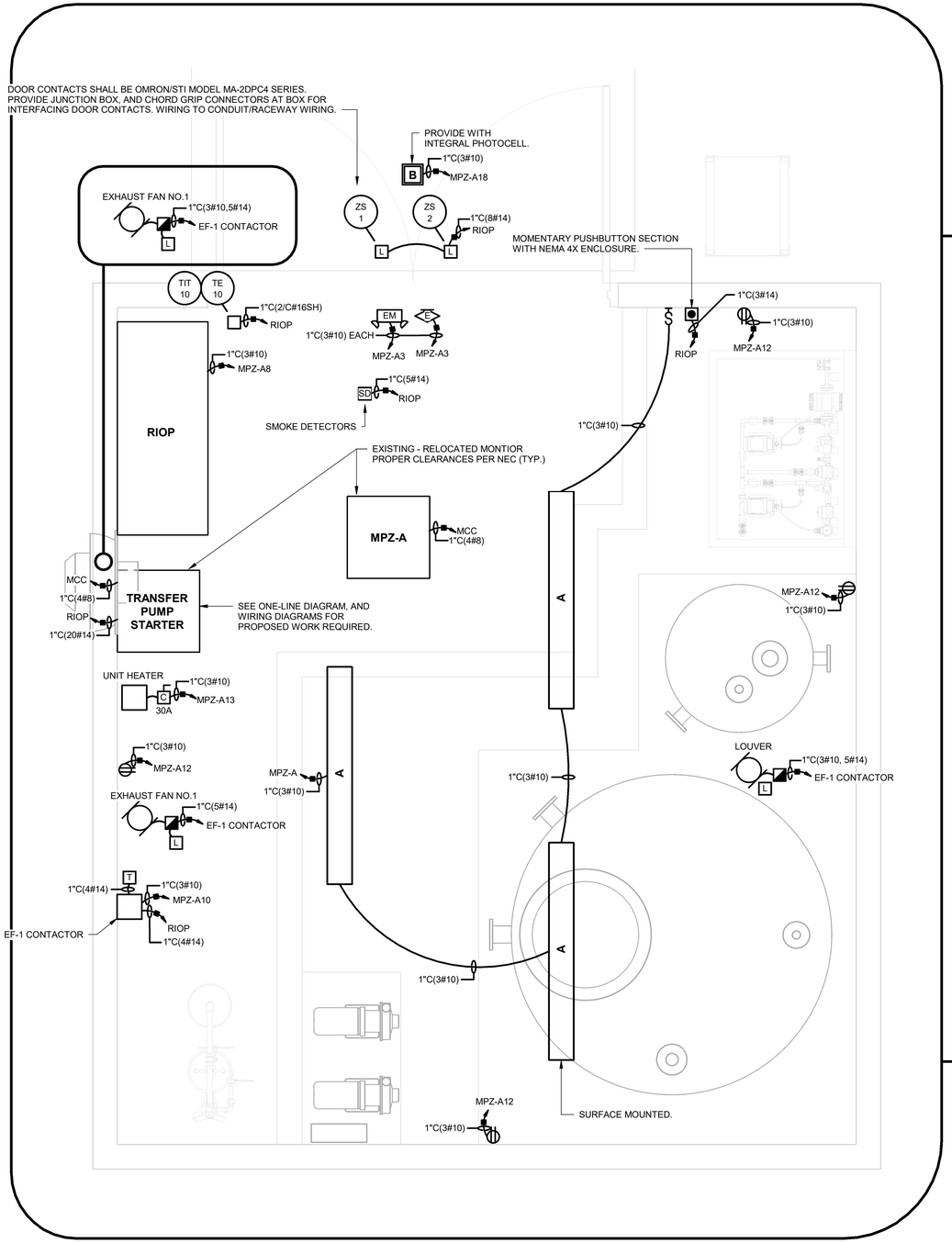
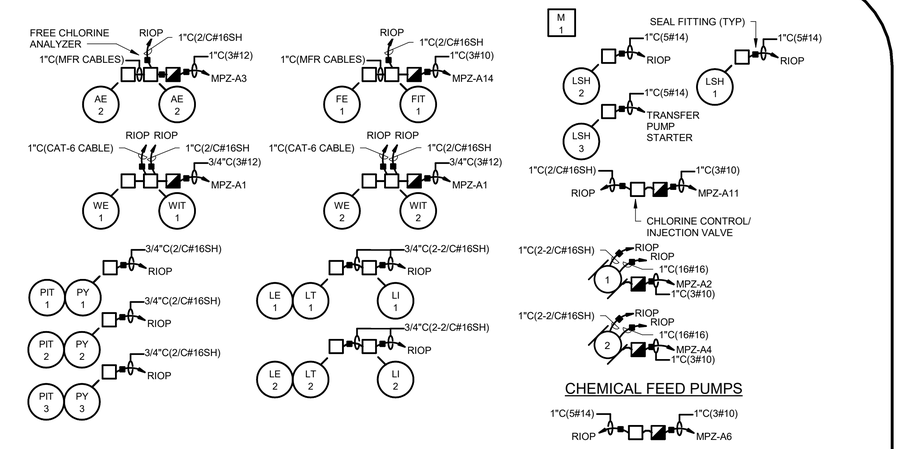


ELECTRICAL PLAN

SCALE: 3/4" = 1'-0"
NEMA 4X AREA



NOTES:

1. REMOTE IO PANEL TO CONTAIN TWO DOORS THAT OPEN FROM THE MIDDLE. DIMENSION NOT TO EXCEED 52 INCHES WIDE BY 62 INCHES HIGH BY 22 INCHES DEEP.
2. CONTRACTOR TO FURNISH AND INSTALL LIGHTS, OUTLETS AND WIRING FOR THE PREFABRICATED BUILDING SHOWN.
3. CONTRACTOR TO FURNISH STRUT FOR MOUNTING EQUIPMENT TO WALLS. COORDINATE WITH PREFABRICATED BUILDING MANUFACTURER.
4. LOCATE ELECTRICAL EQUIPMENT WITHIN PREFABRICATED BUILDING. MAINTAIN PROPER CLEARANCES PER NEC.
5. INSTALL MINI POWER ZONE, AND TRANSVER PUMP STARTER WITHIN BUILDING. MOUNT ON STRUT SUPPORT RACK.

NOTES:

1. CONDUIT IN NEMA 4X AREAS SHALL BE PVC SCHEDULE 80.
2. COORDINATE WITH THE PUMP MANUFACTURER AND FURNISH THE NECESSARY CONNECTORS TO INTERFACE THE CONTROL WIRES AND SHIELDED CABLES FROM THE PUMPS TO THE CONDUIT/WIRE/RACEWAY SYSTEM. PROVIDE MANUFACTURER CONNECTORS, CORDS, ETC., AS REQUIRED.
3. FURNISH SEAL FITTINGS ON CONDUIT RUNS EXITING CHEMICAL AREAS.
4. NEW PREFABRICATED BUILDINGS ARE BEING PROVIDED FOR FOUR STATIONS. (STATIONS NO.8, NO.12, NO.14, AND NO.22.)
5. THE EQUIPMENT IN THESE BUILDINGS IS TO BE WIRED TO A NEW REMOTE IO PANEL. THIS PANEL WILL BE CONNECTED TO THE EXISTING MAIN CONTROL PANEL. (MCP) WITH 50 MICRON MULTIMODE FIBER OPTIC CABLING BY CONTRACTOR THIS CONTRACT AS SHOWN ON DRAWINGS.
6. THE EXISTING MINI POWER ZONE AND TRANSFER PUMP STARTER PREVIOUSLY INSTALLED IN PRIOR CONTRACT ARE TO BE RELOCATED AND REWIRED AS SHOWN ON THE CONTRACT DRAWINGS TO EACH NEW PREFABRICATED BUILDING.
7. WITHIN THE NEW PREFABRICATED BUILDINGS, FURNISH AND INSTALL NEW LIGHTS, SWITCHES, OUTLETS, FIXTURES, CONDUIT AND WIRE. FURNISH AND INSTALL THE NEW HEAT TRACE AS SHOWN. FURNISH AND INSTALL STAINLESS STEEL STRUT FOR SUPPORTING AND MOUNTING NEW PANELS, CONDUIT AND WIRE WITHIN THE NEW PREFABRICATED BUILDINGS.
8. NEW STRUT SUPPORTS FOR EQUIPMENT IS TO BE BOLTED TO NEW CONCRETE PAD AND SUPPORTED TO WALL AND CEILING. CONTRACTOR IS TO COORDINATE WITH PREFABRICATED BUILDING MANUFACTURER FOR MOUNTING AND SUPPORTING OF STRUT, CONDUITS, AND ELECTRICAL AND INSTRUMENTATION EQUIPMENT SHOWN TO BE INSTALLED.
9. FURNISH, AND INSTALL INSTRUMENTATION EQUIPMENT SHOWN IN NEW BUILDINGS.

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MARK	DATE	DESCRIPTION
	11/29/23	ISSUED FO BID

BY

CITY OF KALAMAZOO, MICHIGAN
WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

NEW PUMP STATION NO.12 ELECTRICAL EQUIPMENT PLAN

PROJ:	200-19743-19004
DESN:	GCJ
DRWN:	JLS
CHKD:	WAP/GCJ

E-316
OF 43

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

Bar measures 1 inch, otherwise drawing is not to scale

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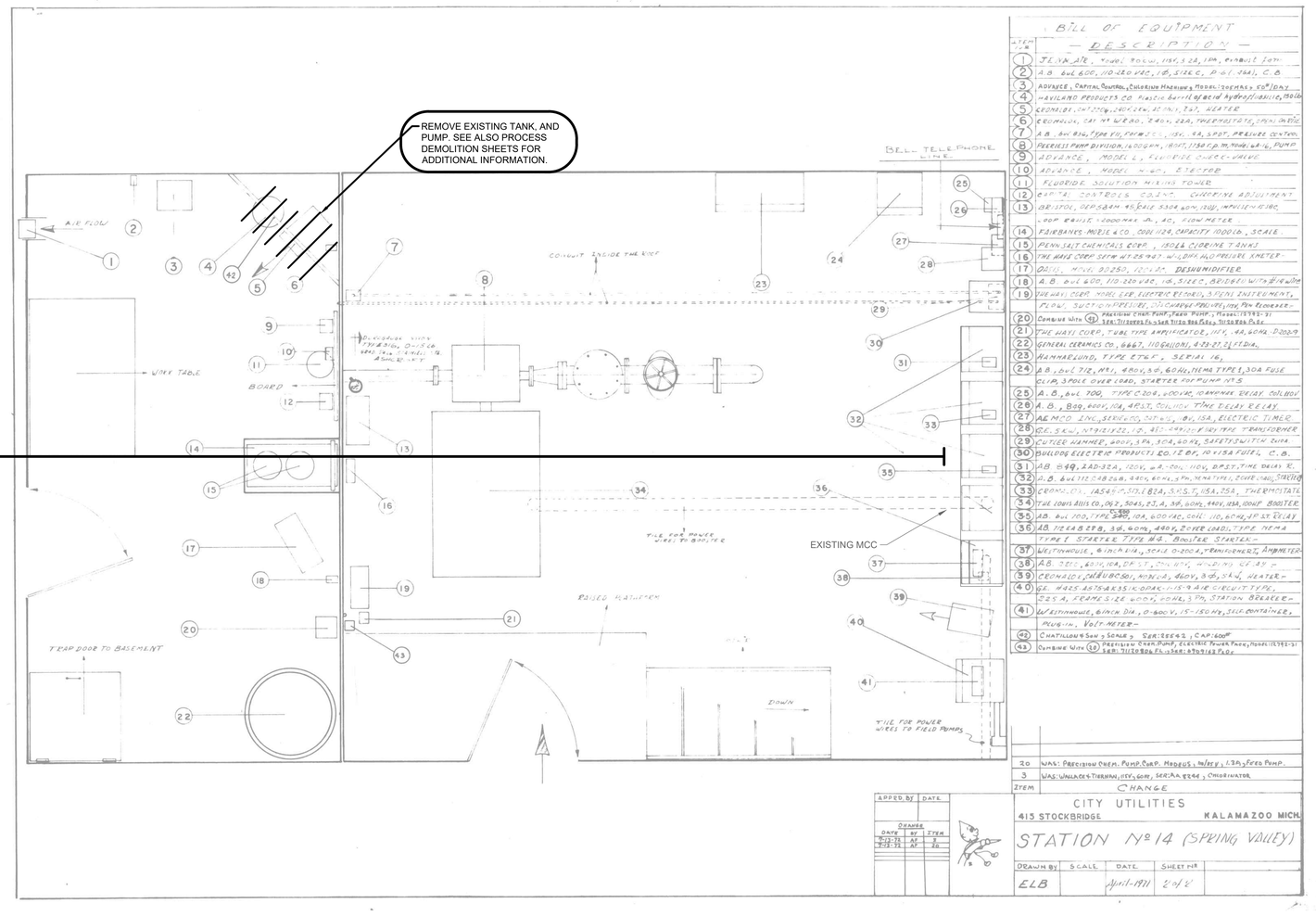
11/28/2023 4:05:08 PM Autodesk Docs://200-19743-19004-KZOO PS UPGRADES/E-PS-19743-19004-2023.rvt

NOTES:

1. REFER TO PROCESS DEMOLITION DRAWINGS. DEMOLISH EXISTING CONDUIT, WIRE, DISCONNECT SWITCHES, SHIELDED CABLES, ETC. FOR PUMPS, TANKS, SENSORS, ETC.
2. PATCH HOLES IN WALL AND FLOOR FROM DEMOLISHED ELECTRICAL EQUIPMENT. SEAL HOLES IN WALL AND FLOOR WITH MORTAR.
3. FIELD VERIFY EXACT EXTENT OF DEMOLITION REQUIRED PRIOR TO BIDS AT EACH PUMP STATION.
4. DUCT SEAL CONDUITS ENTERING AND EXITING BOXES, ENCLOSURES, CONTROL PANELS ETC., IN THE CHEMICAL ROOM AND OUTSIDE OF THE CHEMICAL ROOM.

REMOVE EXISTING TANK, AND PUMP. SEE ALSO PROCESS DEMOLITION SHEETS FOR ADDITIONAL INFORMATION.



BILL OF EQUIPMENT

ITEM	DESCRIPTION
1	JENN-AIR, MODEL 90DW, 115V, 5.2A, 10A, 6-INPUT JOG
2	A.B. BUL 600, 110-120 VAC, 1Ø, SIZE C, P-61-362, C.B.
3	ADVANCE, CAPITAL CONTROL, CHLORINE HANDLING, MODEL 100 HAS, 50 LB/DAY
4	HAVILAND PRODUCTS CO. PLASTIC BARREL (5 GALLON) HYDROFLUORIC, 150 LB.
5	KEDMAR, CAT. NO. 1-1176, 120 VOLTS, 60 AMPS, 7.5 KW, HEATER
6	FERMALOX, CAT. NO. 1-1280, 240 V, 22A, THERMOSTATIC, 2 PH. 3 WIRE
7	A.B. BUL 814, TYPE EU, CAT. NO. 814-5, 15A, 4A, SPDT, PRESSURE CONTROL
8	PEERLESS PUMP DIVISION, 1½ DOUGHM, 1 HORSE, 1750 R.P.M., 7000 GAL, PUMP
9	ADVANCE, MODEL L, FLUORIDE CHECK-VALVE
10	ADVANCE, MODEL H-60, ETECTOR
11	FLUORIDE SOLUTION MIXING TOWER
12	CAPITAL CONTROLS CO. INC. CHLORINE ADJUSTMENT
13	BRISTOL, DEPS & AM 45, RANGE 5304 60M, 120V, IMPELLER 4-180, LOOP RANGE 1-6000 MAX. GPH, AC, FLOW METER
14	FAIRBANKS-MORSE & CO. CODE 1124, CAPACITY 10000 LB., SCALE
15	PENN SALT CHEMICALS CORP., 150 LB. CHLORINE TANKS
16	THE MAIS CORP. SERIES HT-25-967-W-L, DIFF. H2O PRESSURE XMETER
17	DAIKIN, MODEL DD250, 120 V AC. DESHUMIDIFIER
18	A.B. BUL 600, 110-220 VAC, 1Ø, SIZE C, BRIDGED WITH #12 WIRE
19	THE HAYDON CORP. MODEL 62P, ELECTRIC RECORD, SPECIAL INSTRUMENT, FLOW, SUCTION PRESSURE, DISCHARGE PRESSURE, 1000 PSIG RECORDER-PRECISION CHEM. PUMP, TWIN PUMP, MODEL 1137-E2-31
20	COMBINE WITH (43) SEE: TITUSVILLE, FLA. SER. TITUS 1004, FEED, TITUS 1004, FLEX
21	THE HAYDON CORP., TUBE TYPE AMPLIFICATOR, 115 V, 4A, 60 HZ, D-2029
22	GENERAL CERAMICS CO., 6667, 110 GALLONS, 4-23-27, 2% FLUORIDE
23	HAMMARLUND, TYPE ETEF, SERIAL 16,
24	A.B., BUL 312, MR1, 480V, 3Ø, 60HZ, NEMA TYPE 1, 30A FUSE CLIP, 3 POLE OVERLOAD, STARTER FOR PUMP NO. 5
25	A.B., BUL 700, TYPE C206, 600VAC, IGNITRON RELAY, COIL 110V
26	A.B., B66, 600V, 10A, 4PST, COIL 110V, TIME DELAY RELAY
27	AC MOTOR SYNC., SERVE NO. 31-1-1, 480V, 3Ø, 60HZ, 5 PH, 1 RATING, 2 CYCLE, 1800 STARTER
28	A.B., BUL 312 CAT 2248, 240V, 60HZ, 3 PH, 1 RATING, 2 CYCLE, 1800 STARTER
29	CUTLER HAMMER, 600V, 3 PH, 30A, 60 HZ, SAFETY SWITCH 30HA
30	BULLDOG ELECTRIC PRODUCTS CO. 12 BP, 10-15A FUSE, C.B.
31	AB 849, 2AD-32A, 120V, 4A-CONTACTS, DPST, TIME DELAY RELAY
32	A.B. BUL 312 CAT 2248, 240V, 60HZ, 3 PH, 1 RATING, 2 CYCLE, 1800 STARTER
33	CROMPTON, 1A54P1, 57, 1-82A, 3 POLE, 115A, 75A, THERMOSTATIC
34	THE LOBDELL CO., CAT. 2045, 23, A, 3Ø, 60HZ, 440V, 115A, 100HP BOOSTER
35	A.B. BUL 700, TYPE C207, 10A, 600VAC, COIL: 110, 60HZ, 4PST RELAY
36	AB 1164 A 2PB, 3Ø, 60HZ, 440V, POWER LOAD, TYPE NEMA TYPE 1 STARTER TYPE M-2. BOOSTER STARTER
37	WESTINGHOUSE, 6 INCH DIA., SCALE 0-200 A, TRANSFORMER, AMMETER
38	A.B. 7816, 60 A, 10A, DPST, COIL 110V, HOLDING CLASS
39	CROMPTON, 2AD 1 A 0-250 A, 460V, 3Ø, 60 A, HEATER
40	GE. MARS-A2T5-AK3S1K-0DAK-11S-9 AIR CIRCUIT TYPE, 225 A, FRAME SIZE 600 V, 60 HZ, 3 PH, STATION BREAKER
41	WESTINGHOUSE, 6 INCH DIA., 0-600 V, 15-150 HZ, SELF-CONTAINED, PLUG-IN, VOLT METER
42	CHATILLON & SON, SCALE, SER: 155642, CAP: 600#
43	COMBINE WITH (20) PRECISION CHEM. PUMP, ELECTRIC POWER PACK, MODEL 1137E2-31 SER: TITUS 804, FEED, TITUS 804, FLEX

ITEM	CHANGE
20	WAS: PRECISION CHEM. PUMP, CAP. MODEL 1137E2, 1.3A, FEED PUMP.
3	WAS: WALLACE & TIERNAN, 115V, 60HZ, SER. AA 6264, CHLORINATOR

APP'D BY	DATE

CHANGES		
DATE	BY	ITEM
9-12-72	AF	3
9-18-72	AF	20

CITY UTILITIES
415 STOCKBRIDGE — KALAMAZOO MICH.

STATION Nº 14 (SPRING VALLEY)

DRAWN BY	SCALE	DATE	SHEET NR
ELB		April 1971	2 of 2

PUMP STATION NO.14 ELECTRICAL BACKGROUND PLAN DEMOLITION
NO SCALE

EXISTING DRAWING FROM PREVIOUS PROJECT. PROPOSED WORK SHOWN BOLD, CROSSHATCHED, AND/OR CIRCLED.

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MARK	DATE	DESCRIPTION	BY
	11/29/23	ISSUED FOR BID	

CITY OF KALAMAZOO, MICHIGAN
WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

PUMP STATION NO.14
BACKGROUND PLAN
DEMOLITION

Project No.:	200-19743-19004
Designed By:	GCJ
Drawn By:	JLS
Checked By:	WAP/GCJ

E-317
OF 43

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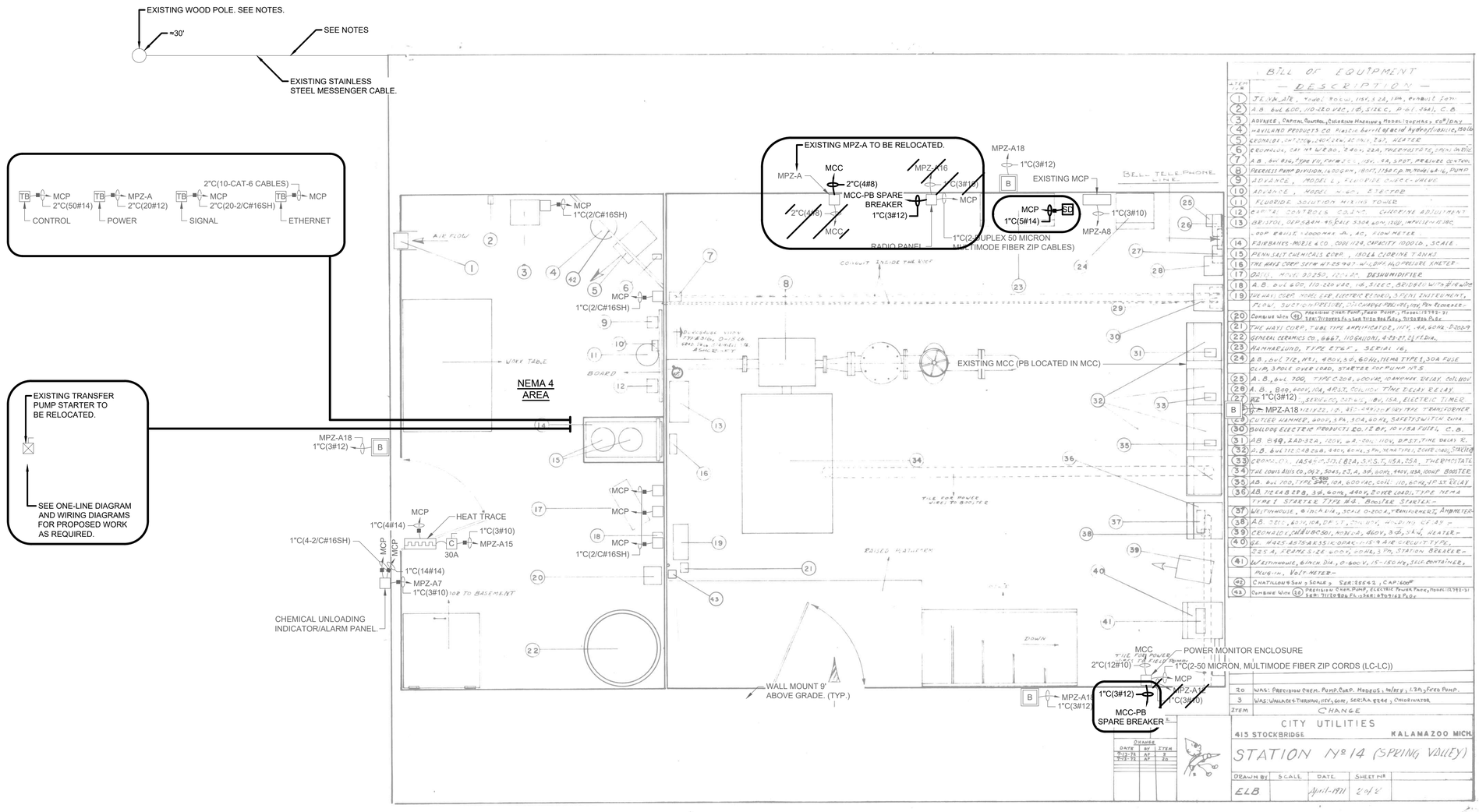
Bar Measures 1 inch

11/28/2023 3:13:05 PM - \\TT.LOCAL\ER\PROJECTS\ANN ARBOR\ER\19743\200-19743-19004\CAD\SHEETFILES\E\WATER SYSTEM CORROSION CONTROL IMPROVEMENTS\E-317_PS 14 BACKGROUND PLAN DEMO.DWG - SHANK, JASON



PUMP STATION NO.14 ELECTRICAL BACKGROUND PLAN PROPOSED WORK

NO SCALE

EXISTING DRAWING FROM PREVIOUS PROJECT. PROPOSED WORK SHOWN BOLD, CROSSHATCHED, AND/OR CIRCLED.

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MARK	DATE	DESCRIPTION
	11/29/23	ISSUED FOR BID

CITY OF KALAMAZOO, MICHIGAN
WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

PUMP STATION NO.14
BACKGROUND PLAN
PROPOSED WORK

Project No.:	200-19743-19004
Designed By:	GCJ
Drawn By:	JLS
Checked By:	WAP/GCJ

E-318
OF 43

Copyright: Tetra Tech

Bar Measures 1 inch

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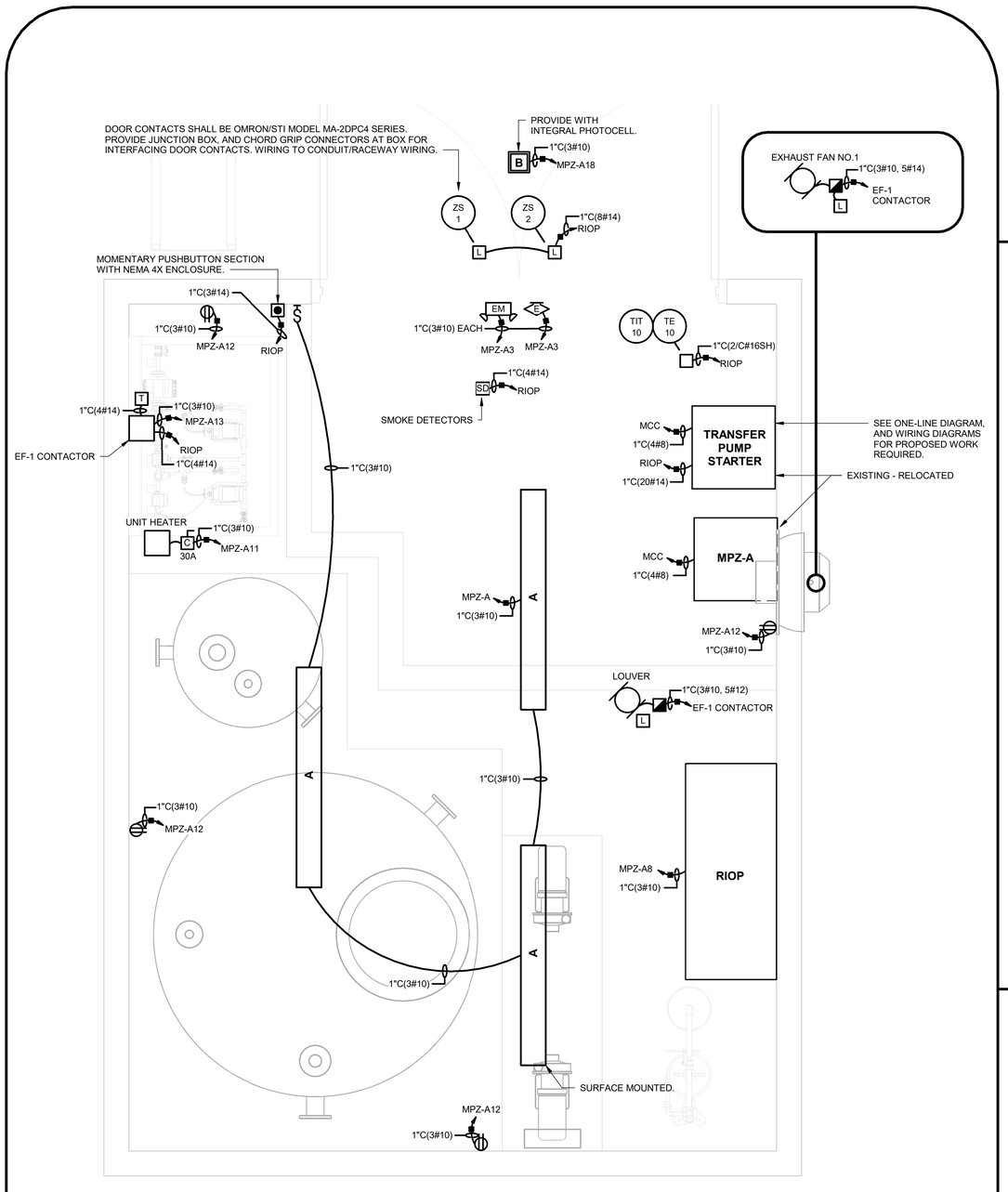

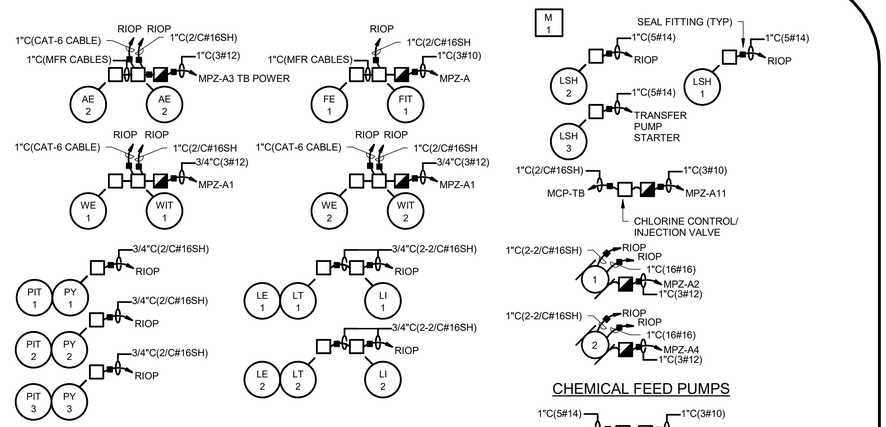

NOTES:

1. REMOTE IO PANEL TO CONTAIN TWO DOORS THAT OPEN FROM THE MIDDLE. DIMENSION NOT TO EXCEED 52 INCHES WIDE BY 62 INCHES HIGH BY 22 INCHES DEEP.
2. CONTRACTOR TO FURNISH AND INSTALL LIGHTS, OUTLETS AND WIRING FOR THE PREFABRICATED BUILDING SHOWN.
3. CONTRACTOR TO FURNISH STRUT FOR MOUNTING EQUIPMENT TO WALLS. COORDINATE WITH PREFABRICATED BUILDING MANUFACTURER.
4. LOCATE ELECTRICAL EQUIPMENT WITHIN PREFABRICATED BUILDING. MAINTAIN PROPER CLEARANCES PER NEC.
5. INSTALL MINI POWER ZONE, AND TRANSFER PUMP STARTER WITHIN BUILDING. MOUNT ON STRUT SUPPORT RACK.

NOTES:

1. CONDUIT IN NEMA 4X AREAS SHALL BE PVC SCHEDULE 80.
2. COORDINATE WITH THE PUMP MANUFACTURER AND FURNISH THE NECESSARY CONNECTORS TO INTERFACE THE CONTROL WIRES AND SHIELDED CABLES FROM THE PUMPS TO THE CONDUIT/WIRE/RACEWAY SYSTEM. PROVIDE MANUFACTURER CONNECTORS, CORDS, ETC., AS REQUIRED.
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6. THE EXISTING MINI POWER ZONE AND TRANSFER PUMP STARTER PREVIOUSLY INSTALLED IN PRIOR CONTRACT ARE TO BE RELOCATED AND REWIRED AS SHOWN ON THE CONTRACT DRAWINGS TO EACH NEW PREFABRICATED BUILDING.
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8. NEW STRUT SUPPORTS FOR EQUIPMENT IS TO BE BOLTED TO NEW CONCRETE PAD AND SUPPORTED TO WALL AND CEILING. CONTRACTOR IS TO COORDINATE WITH PREFABRICATED BUILDING MANUFACTURER FOR MOUNTING AND SUPPORTING OF STRUT, CONDUITS, AND ELECTRICAL AND INSTRUMENTATION EQUIPMENT SHOWN TO BE INSTALLED.
9. FURNISH, AND INSTALL INSTRUMENTATION EQUIPMENT SHOWN IN NEW BUILDINGS.

ELECTRICAL PLAN

SCALE: 3/4" = 1'-0"
NEMA 4X AREA

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

Bar measures 1 inch, otherwise drawing is not to scale

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	11/29/23	ISSUED FO BID

BY

CITY OF KALAMAZOO, MICHIGAN
WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

NEW PUMP STATION NO.14 ELECTRICAL EQUIPMENT PLAN

PROJ:	200-19743-19004
DESN:	GCJ
DRWN:	JLS
CHKD:	WAP/GCJ

E-319
OF 43

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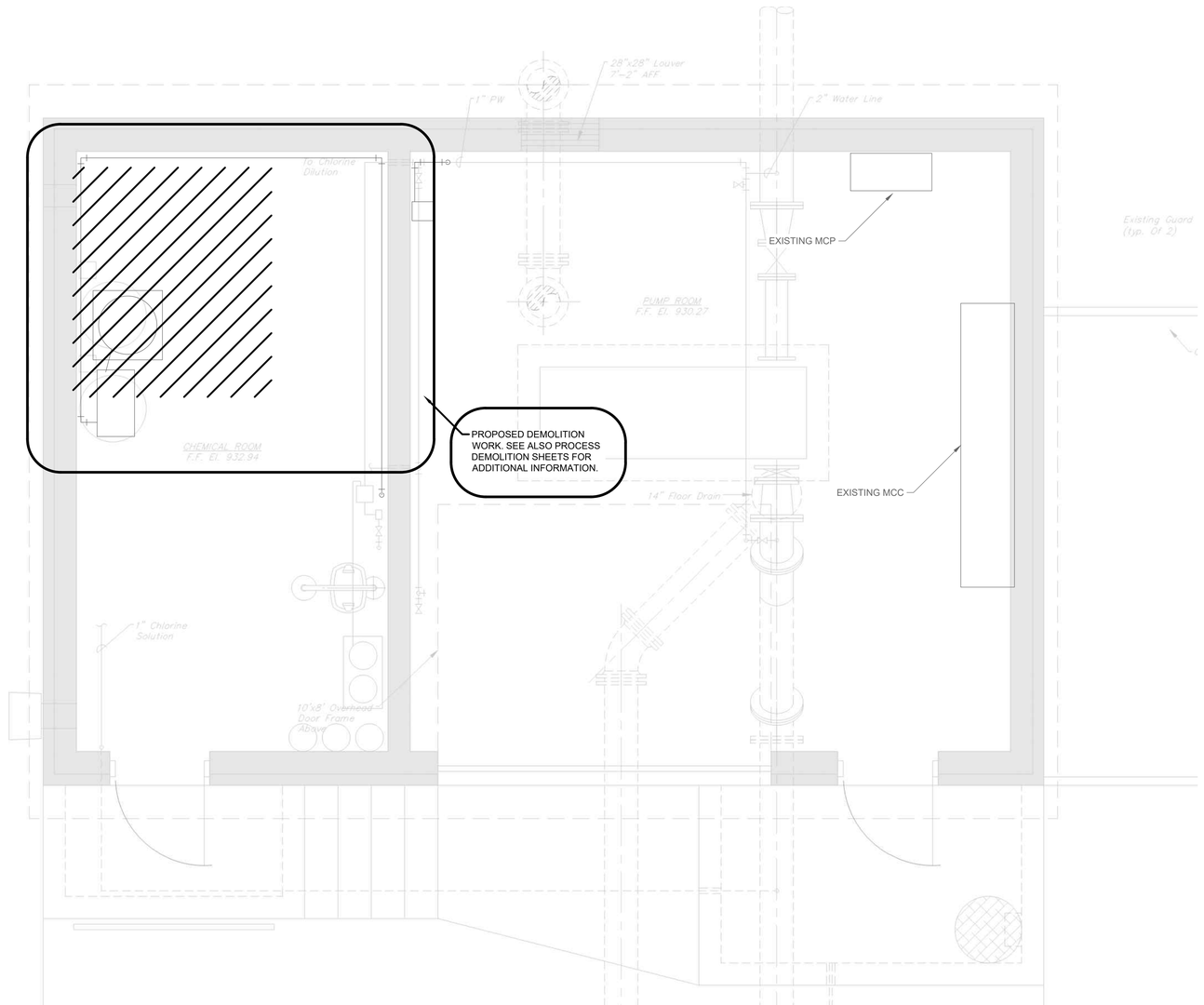
NOTES:

1. REFER TO PROCESS DEMOLITION DRAWINGS. DEMOLISH EXISTING CONDUIT, WIRE, DISCONNECT SWITCHES, SHIELDED CABLES, ETC. FOR PUMPS, TANKS, SENSORS, ETC.
2. PATCH HOLES IN WALL AND FLOOR FROM DEMOLISHED ELECTRICAL EQUIPMENT. SEAL HOLES IN WALL AND FLOOR WITH MORTAR.
3. FIELD VERIFY EXACT EXTENT OF DEMOLITION REQUIRED PRIOR TO BIDS AT EACH PUMP STATION.
4. DUCT SEAL CONDUITS ENTERING AND EXITING BOXES, ENCLOSURES, CONTROL PANELS ETC., IN THE CHEMICAL ROOM AND OUTSIDE OF THE CHEMICAL ROOM.



PUMP STATION NO.22 ELECTRICAL BACKGROUND PLAN DEMOLITION

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

0 2' 4' 8'

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

EXISTING DRAWING FROM PREVIOUS PROJECT. PROPOSED WORK SHOWN BOLD, CROSSHATCHED, AND/OR CIRCLED.

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CITY OF KALAMAZOO, MICHIGAN

WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

PUMP STATION NO.22 BACKGROUND PLAN DEMOLITION

Project No.:	200-19743-19004
Designed By:	GCJ
Drawn By:	JLS
Checked By:	WAP/GCJ

E-320

OF 43

Copyright: Tetra Tech

Bar Measures 1 inch

11/28/2023 3:13:18 PM - \\TT.LOCAL\IER\PROJECTS\ANN ARBOR\IER\19743\200-19743-19004\CAD\SHEETFILES\IE\WATER SYSTEM CORROSION CONTROL IMPROVEMENTSIE-320_PS 22 BACKGROUND PLAN_DEMO.DWG - SHANK, JASON

EXISTING TRANSFER PUMP STARTER TO BE RELOCATED TO NEW PREFABRICATED BUILDING. SEE ONE-LINE DIAGRAM AND WIRING DIAGRAMS FOR PROPOSED WORK AS REQUIRED.

RELOCATE EXISTING CHEMICAL UNLOADING INDICATOR/ALARM PANEL TO THIS AREA. SEE SHEET E-007.

TB — MCP — 2"C(50#14) — CONTROL
TB — MPZ-A — 2"C(20#12) — POWER
TB — MCP — 2"C(20-2/C#16SH) — 2"C(10-CAT-6 CABLES) — SIGNAL
TB — MCP — ETHERNET

EXISTING BOXES TO REMAIN.

28"x28" Louver 7'-2" AFF

2"C(12#10)
MCC MPZ-A12
1"C(3#10)
MPZ-A16
RADIO PANEL
1"C(2-DUPLEX 50 MICRON MULTIMODE FIBER ZIP CABLES)
1"C(2 - 50 MICRON DUPLEX MULTIMODE FIBER ZIP CORDS)
MCP
EXISTING MPZ-A TO BE RELOCATED.
SD — MCP — 1"C(5#14)
1"C(3#10) MCC-PB SPARE BREAKER
POWER MONITOR ENCLOSURE
1"C(3#10) MCC-PB SPARE BREAKER
EXISTING MCP
1"C(2-2/C#16SH)
MCP MCP
1"C(3#12) MPZ-A20
1"C(12#14)
MCP
1"C(3#12)
EXISTING MOTORIZED ACTUATOR
EXISTING MCP
Existing Guard (typ. Of 2)

PUMP ROOM F.F. El. 933.27

NEMA 4 AREA

CHEMICAL ROOM F.F. El. 932.94

NEMA 4X AREA

MCP
1"C(2/C#16SH)
MCP
MCP
MCP
1"C(2/C#16SH) EACH
EXISTING MCC (EXISTING PB LOCATED IN MCC)
14" Floor Drain
1" Chlorine Solution
10"x8" Transfer Opening
MCP
HEAT TRACE
1"C(4#14)
1"C(3#10)
1"C(4-2/C#16SH)
MCP MCP
C
30A
MPZ-A15
1"C(14#14)
MPZ-A7
1"C(3#10)

EXISTING CHEMICAL UNLOADING INDICATOR/ALARM PANEL. RELOCATE TO NEW LOCATION. SEE SHEET E-007.

PUMP STATION NO.22 ELECTRICAL BACKGROUND PLAN PROPOSED WORK

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

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

EXISTING DRAWING FROM PREVIOUS PROJECT. PROPOSED WORK SHOWN BOLD, CROSSHATCHED, AND/OR CIRCLED.

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MARK	DATE	DESCRIPTION
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CITY OF KALAMAZOO, MICHIGAN
WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

PUMP STATION NO.22 BACKGROUND PLAN PROPOSED WORK

Project No.:	200-19743-19004
Designed By:	GCJ
Drawn By:	JLS
Checked By:	WAP/GCJ

E-321
OF 43

Copyright: Tetra Tech

Bar Measures 1 inch

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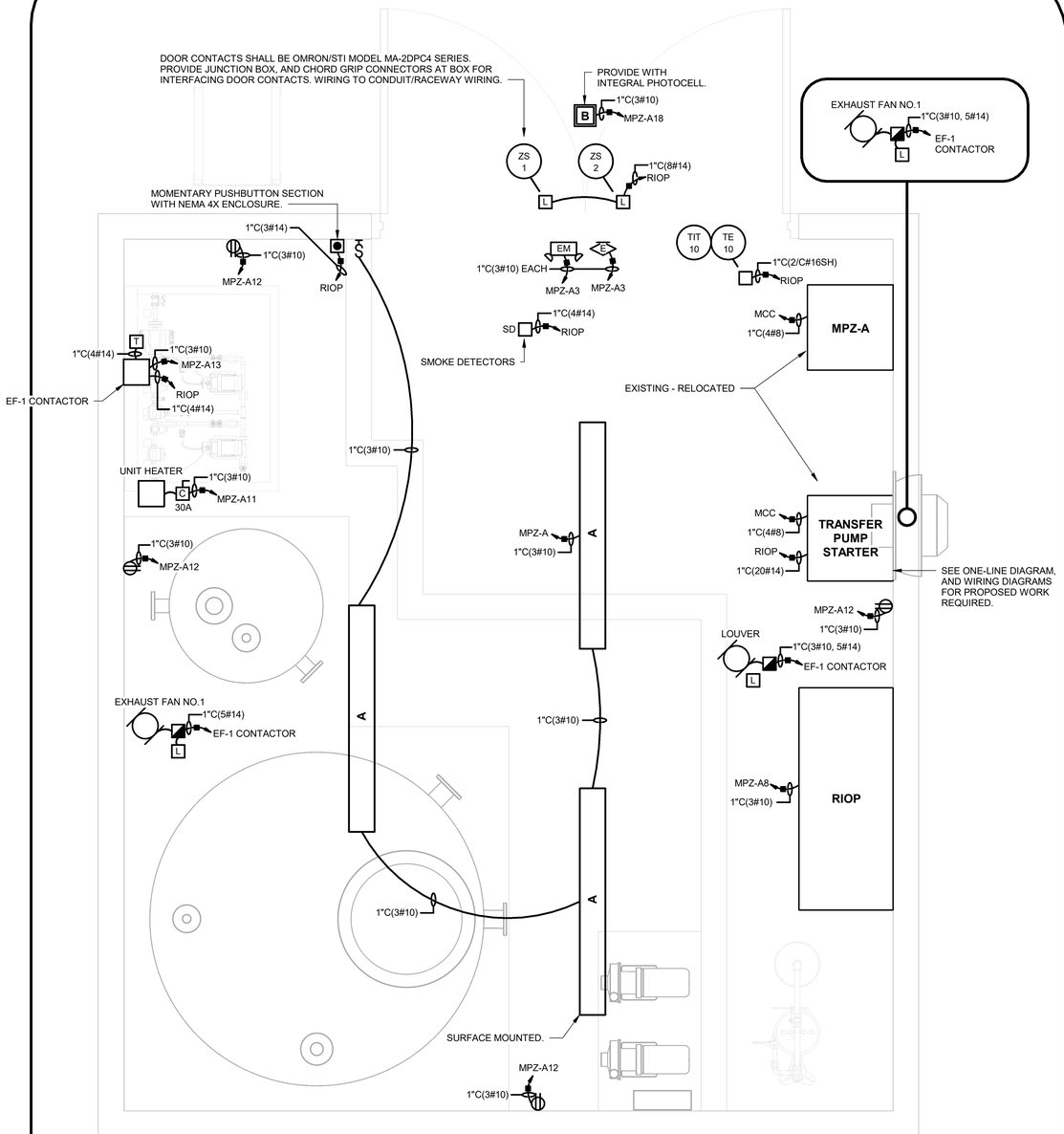
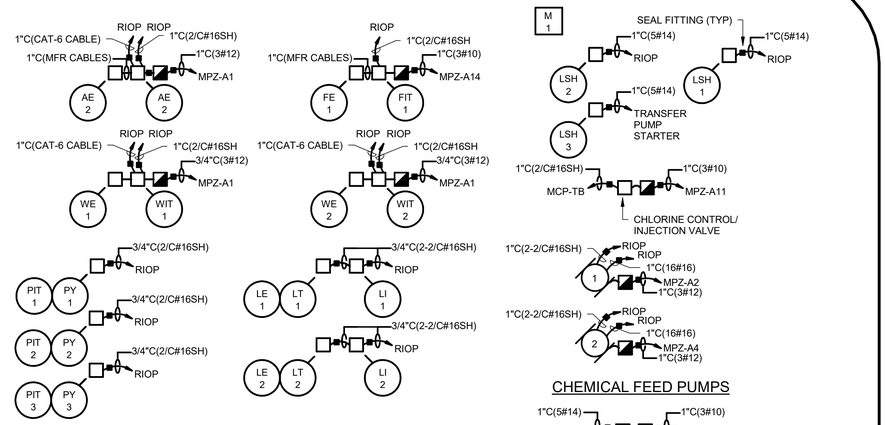


ELECTRICAL PLAN

SCALE: 3/4" = 1'-0"
NEMA 4X AREA



NOTES:

1. REMOTE IO PANEL TO CONTAIN TWO DOORS THAT OPEN FROM THE MIDDLE. DIMENSION NOT TO EXCEED 52 INCHES WIDE BY 62 INCHES HIGH BY 22 INCHES DEEP.
2. CONTRACTOR TO FURNISH AND INSTALL LIGHTS, OUTLETS AND WIRING FOR THE PREFABRICATED BUILDING SHOWN.
3. CONTRACTOR TO FURNISH STRUT FOR MOUNTING EQUIPMENT TO WALLS. COORDINATE WITH PREFABRICATED BUILDING MANUFACTURER.
4. LOCATE ELECTRICAL EQUIPMENT WITHIN PREFABRICATED BUILDING. MAINTAIN PROPER CLEARANCES PER NEC.
5. INSTALL MINI POWER ZONE, AND TRANSFER PUMP STARTER WITHIN BUILDING. MOUNT ON STRUT SUPPORT RACK.

NOTES:

1. CONDUIT IN NEMA 4X AREAS SHALL BE PVC SCHEDULE 80.
2. COORDINATE WITH THE PUMP MANUFACTURER AND FURNISH THE NECESSARY CONNECTORS TO INTERFACE THE CONTROL WIRES AND SHIELDED CABLES FROM THE PUMPS TO THE CONDUIT/WIRE/RACEWAY SYSTEM. PROVIDE MANUFACTURER CONNECTORS, CORDS, ETC., AS REQUIRED.
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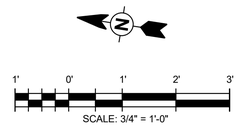
4. NEW PREFABRICATED BUILDINGS ARE BEING PROVIDED FOR FOUR STATIONS. (STATIONS NO.8, NO.12, NO.14, AND NO.22.)
5. THE EQUIPMENT IN THESE BUILDINGS IS TO BE WIRED TO A NEW REMOTE IO PANEL. THIS PANEL WILL BE CONNECTED TO THE EXISTING MAIN CONTROL PANEL (MCP) WITH 50 MICRON MULTIMODE FIBER OPTIC CABLING BY CONTRACTOR THIS CONTRACT AS SHOWN ON DRAWINGS.
6. THE EXISTING MINI POWER ZONE AND TRANSFER PUMP STARTER PREVIOUSLY INSTALLED IN PRIOR CONTRACT ARE TO BE RELOCATED AND REWIRED AS SHOWN ON THE CONTRACT DRAWINGS TO EACH NEW PREFABRICATED BUILDING.
7. WITHIN THE NEW PREFABRICATED BUILDINGS, FURNISH AND INSTALL NEW LIGHTS, SWITCHES, OUTLETS, FIXTURES, CONDUIT AND WIRE. FURNISH AND INSTALL THE NEW HEAT TRACE AS SHOWN. FURNISH AND INSTALL STAINLESS STEEL STRUT FOR SUPPORTING AND MOUNTING NEW PANELS, CONDUIT AND WIRE WITHIN THE NEW PREFABRICATED BUILDINGS.
8. NEW STRUT SUPPORTS FOR EQUIPMENT IS TO BE BOLTED TO NEW CONCRETE PAD AND SUPPORTED TO WALL AND CEILING. CONTRACTOR IS TO COORDINATE WITH PREFABRICATED BUILDING MANUFACTURER FOR MOUNTING AND SUPPORTING OF STRUT, CONDUITS, AND ELECTRICAL AND INSTRUMENTATION EQUIPMENT SHOWN TO BE INSTALLED.
9. FURNISH, AND INSTALL INSTRUMENTATION EQUIPMENT SHOWN IN NEW BUILDINGS.



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BY

CITY OF KALAMAZOO, MICHIGAN
WATER SYSTEM CORROSION CONTROL IMPROVEMENTS
NEW PUMP STATION NO.22
ELECTRICAL EQUIPMENT PLAN

PROJ:	200-19743-19004
DESN:	GCJ
DRWN:	JLS
CHKD:	WAP/GCJ

E-322
OF 43

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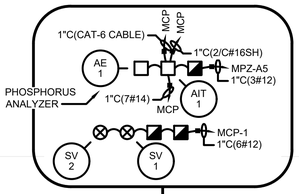
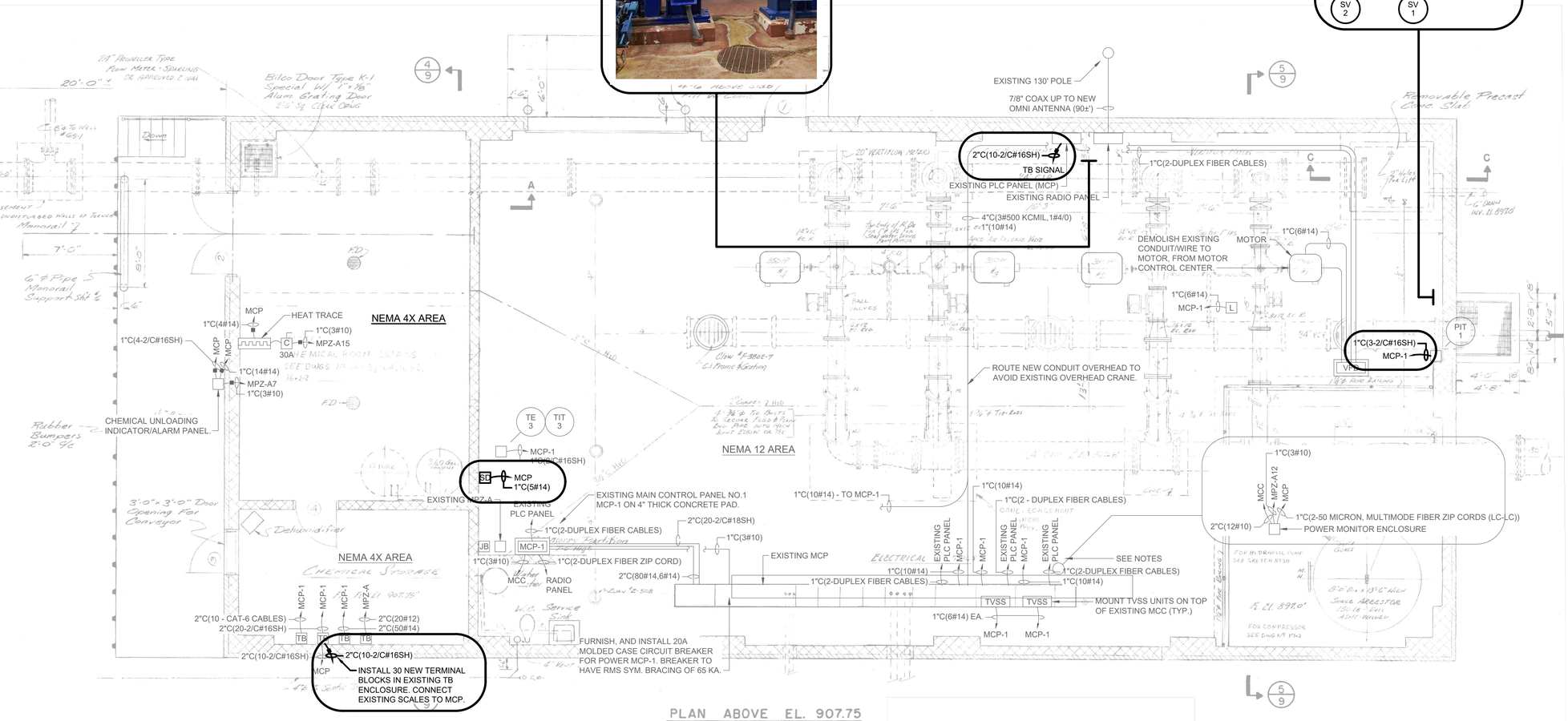
Bar measures 1 inch, otherwise drawing is not to scale

NOTES:

1. REFER TO PROCESS DEMOLITION DRAWINGS. DEMOLISH EXISTING CONDUIT, WIRE, DISCONNECT SWITCHES, SHIELDED CABLES, ETC. FOR PUMPS, TANKS, SENSORS, ETC.
2. PATCH HOLES IN WALL AND FLOOR FROM DEMOLISHED ELECTRICAL EQUIPMENT. SEAL HOLES IN WALL AND FLOOR WITH MORTAR.
3. FIELD VERIFY EXACT EXTENT OF DEMOLITION REQUIRED PRIOR TO BIDS AT EACH PUMP STATION.
4. DUCT SEAL CONDUITS ENTERING AND EXITING BOXES, ENCLOSURES, CONTROL PANELS ETC., IN THE CHEMICAL ROOM AND OUTSIDE OF THE CHEMICAL ROOM.





PUMP STATION NO.24 ELECTRICAL BACKGROUND PLAN DEMOLITION

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

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

EXISTING DRAWING FROM PREVIOUS PROJECT. PROPOSED WORK SHOWN BOLD, CROSSHATCHED, AND/OR CIRCLED.

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MARK	DATE	DESCRIPTION	BY
	11/29/23	ISSUED FOR BID	

CITY OF KALAMAZOO, MICHIGAN
WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

PUMP STATION NO.24
BACKGROUND PLAN
PROPOSED WORK

Project No.:	200-19743-19004
Designed By:	GCJ
Drawn By:	JLS
Checked By:	WAP/GCJ

E-323
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Bar Measures 1 inch

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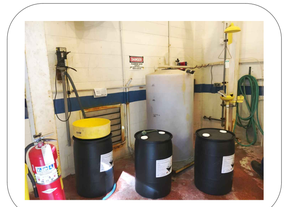

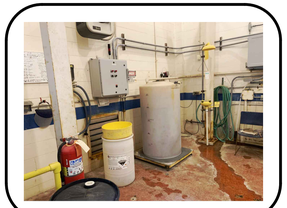

DEMOLISH EXISTING SODIUM HEXAMETAPHOSPHATE PUMP, AND TANK.

EXISTING CHLORINE FEED SYSTEM TO REMAIN.

1"C(2/C#16SH) — MCP-1

TE 1 — TIT 1

2 1/2"C(4#4) — MCC — MPZ-A

MCP-1 — 1"C(6#12,20#14) — JB

1"C(2/C#16SH) — MCP-1 — 1"C(3#10) — MPZ-A2

WIT 1

CONDUIT IN THIS AREA TO BE PVC SCHEDULE 80. PROVIDE SEAL FITTINGS ON CONDUITS EXITING THIS AREA. GROUND SEAL FITTINGS AS REQUIRED.

CHEMICAL STORAGE ROOM
NEMA 4X AREA

EXISTING TRANSFER PUMP STARTER
2"C(4#8) — MCC
MCP — 1"C(20#14)

SEE ONE-LINE DIAGRAM AND WIRING DIAGRAMS FOR PROPOSED WORK REQUIRED.

EXISTING BOXES TO REMAIN. SEE NOTES NO.5, AND NO.6.

LOCATED IN LEVEL BELOW

TE 2 — TIT 2

1"C(2/C#16SH) — MCP-1

TB — MCP-1 — 2"C(50#14) — TB — MPZ-A — 2"C(20#12) — TB — MCP-1 — 2"C(20-2/C#16SH) — TB — MCP-1 — 2"C(10-CAT-6 CABLES)

2"C(10-2/C#16SH) — MCP

INSTALL 30 NEW TERMINAL BLOCKS IN EXISTING ENCLOSURE FOR NEW SHIELDED CABLES.

NOTE (CONDUIT/WIRE REQUIREMENTS FOR CHEMICAL SYSTEM INSTRUMENTS, AND CHEMICAL PUMPS):

CONDUIT, AND WIRE REQUIREMENTS FOR CHEMICAL EQUIPMENT/INSTRUMENTS, AND CHEMICAL PUMPS, TRANSFER PUMP.

1. INSTALL CONDUIT/POWER/CONTROL/SHIELDED CABLES TO THE EXISTING TERMINAL BOXES SHOWN. THESE WERE PROVIDED, AND INSTALLED/WIRED BACK TO MCP, AND MPZ-A UNDER PREVIOUS CONTRACT.

NOTES:

1. TERMINAL BOXES WERE INSTALLED IN PREVIOUS CONTRACT FOR 120VAC POWER, 4-20MA WIRING BACK TO MAIN CONTROL PANEL. (MCP), DISCRETE IO BACK TO MAIN CONTROL PANEL NO.1. (MCP-1), AND ETHERNET CABLES BACK TO MAIN CONTROL PANEL NO.1. (MCP-1).
2. NEW CONDUIT AND WIRE WITHIN THE CHEMICAL ROOM IS TO HOMERUN TO EACH OF THESE TERMINAL BOXES. CONNECTIONS ALREADY EXIST BACK TO THE MAIN CONTROL PANEL NO.1. (MCP-1).
3. PRIOR TO MAKING ANY CONNECTIONS WITHIN THE EXISTING ABOVE TERMINAL BOXES, OBTAIN FROM OWNER A SET OF THE WEST MICHIGAN INSTRUMENTATION SYSTEMS INC., SET OF WIRING DIAGRAMS TO ASSIST IN MAKING WIRE CONNECTIONS WITHIN THE BOXES AND MAIN CONTROL PANEL.
4. NEW CONDUIT AND WIRE WITHIN THE CHEMICAL ROOM IS TO HOMERUN TO EACH OF THESE TERMINAL BOXES. CONNECTIONS ALREADY EXIST BACK TO THE MAIN CONTROL PANEL NO.1 (MCP-1).

FREE CHLORINE ANALYZER — MCP-TB SIGNAL — 1"C(2/C#16SH) — 1"C(MFR. CABLES) — AE 2 — AIT 2 — MPZ-A3 TB POWER 1"C(3#12)

MCP-TB SIGNAL — 1"C(2/C#16SH) — 1"C(MFR. CABLES) — FE 1 — FIT 1 — MPZ-A14 TB POWER 1"C(3#10)

M 1 — SEAL FITTING. (TYP.) — LSH 2 — LSH 1 — MCP-TB CONTROL 1"C(5#14) — MCP-TB CONTROL 1"C(5#14) — LSH 3 — TRANSFER PUMP STARTER 1"C(5#14)

MCP-TB SIGNAL — MCP-TB-ENET — 1"C(2/C#16SH) — 1"C(CAT-6) — WE 1 — WIT 1 — MPZ-A1 TB POWER 3/4"C(3#12)

MCP-TB SIGNAL — MCP-TB-ENET — 1"C(2/C#16SH) — 1"C(CAT-6) — WE 2 — WIT 2 — MPZ-A1 POWER 3/4"C(3#12)

MCP-TB SIGNAL — 1"C(2/C#16SH) — MPZ-A9 TB POWER 1"C(3#10) — CHLORINE CONTROL/ INJECTION VALVE.

PIT 1 — PY 1 — MCP-TB SIGNAL — 3/4"C(2/C#16SH)
PIT 2 — PY 2 — MCP-TB SIGNAL — 3/4"C(2/C#16SH)
PIT 3 — PY 3 — MCP-TB SIGNAL — 3/4"C(2/C#16SH)

LE 1 — LT 1 — 3/4"C(2-2/C#16SH) — MCP-TB SIGNAL — LI 1
LE 2 — LT 2 — 3/4"C(2-2/C#16SH) — MCP-TB SIGNAL — LI 2

1"C(2-2/C#16SH) — MCP-TB SIGNAL — MCP-TB CONTROL 1"C(16#16) — MPZ-A2 TB POWER 1"C(3#12) — 1
1"C(2-2/C#16SH) — MCP-TB SIGNAL — MCP-TB CONTROL 1"C(16#16) — MPZ-A4 TB POWER 1"C(3#12) — 2

NOTE:

1. CONDUIT SHALL BE PVC - SCHEDULE 80. GROUND SEAL FITTINGS AS REQUIRED.
2. REFER TO PROCESS DRAWINGS FOR EXACT EQUIPMENT LOCATIONS. (TYP. OF 12 LOCATIONS.)

NEMA 4X AREA
REFER TO PROCESS DRAWINGS FOR EXACT EQUIPMENT LOCATIONS. (TYP.)

CHEMICAL FEED PUMPS

MCP-TB CONTROL 1"C(5#14) — MPZ-A6 TB POWER 1"C(3#10)

EYEWASH

PUMP STATION NO.24 ELECTRICAL BACKGROUND PLAN PROPOSED WORK

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

N

0 1'-4" 2'-8" 5'-4"

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

EXISTING DRAWING FROM PREVIOUS PROJECT. PROPOSED WORK SHOWN BOLD, CROSSHATCHED, AND/OR CIRCLED.

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BY

CITY OF KALAMAZOO, MICHIGAN
WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

PUMP STATION NO.24 BACKGROUND PLAN PROPOSED WORK

Project No.:	200-19743-19004
Designed By:	GCJ
Drawn By:	JLS
Checked By:	WAP/GCJ

E-324
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Bar Measures 1 inch

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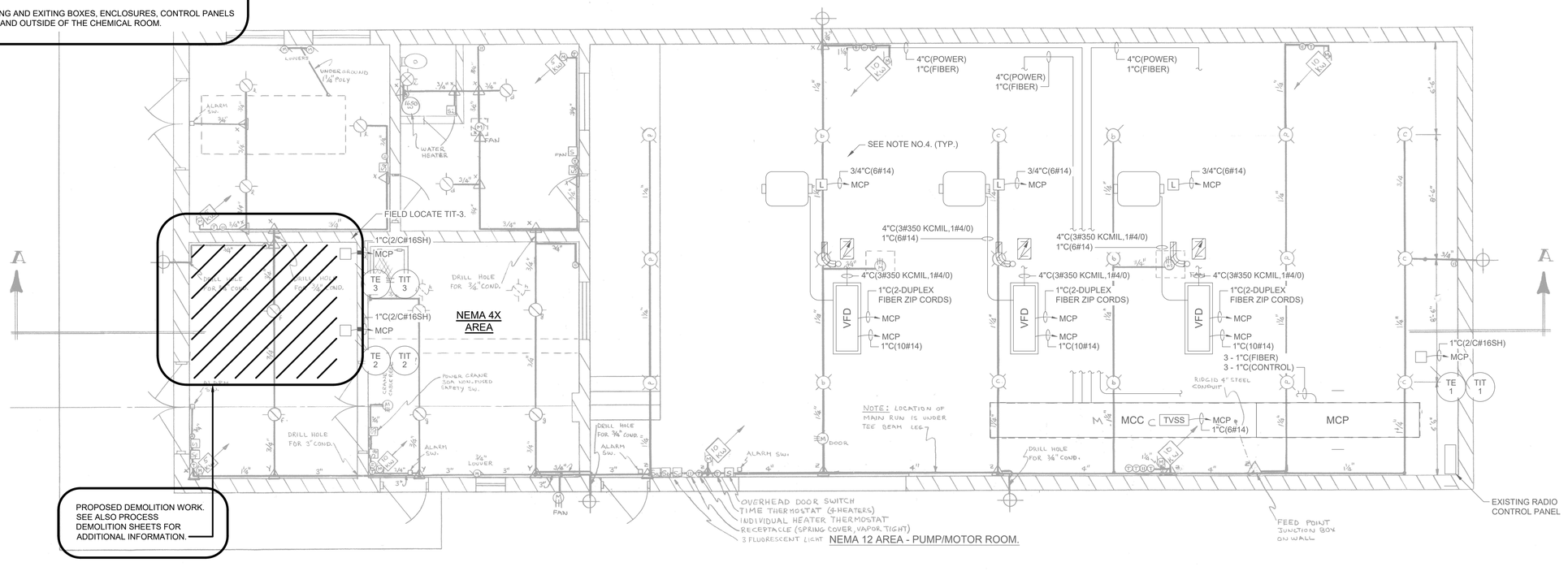
NOTES:

1. REFER TO PROCESS DEMOLITION DRAWINGS. DEMOLISH EXISTING CONDUIT, WIRE, DISCONNECT SWITCHES, SHIELDED CABLES, ETC. FOR PUMPS, TANKS, SENSORS, ETC.
2. PATCH HOLES IN WALL AND FLOOR FROM DEMOLISHED ELECTRICAL EQUIPMENT. SEAL HOLES IN WALL AND FLOOR WITH MORTAR.
3. FIELD VERIFY EXACT EXTENT OF DEMOLITION REQUIRED PRIOR TO BIDS AT EACH PUMP STATION.
4. DUCT SEAL CONDUITS ENTERING AND EXITING BOXES, ENCLOSURES, CONTROL PANELS ETC., IN THE CHEMICAL ROOM AND OUTSIDE OF THE CHEMICAL ROOM.



TOP VIEW

SECTION A-A

PUMP STATION NO.25 ELECTRICAL BACKGROUND PLAN DEMOLITION

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

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

EXISTING DRAWING FROM PREVIOUS PROJECT. PROPOSED WORK SHOWN BOLD, CROSSHATCHED, AND/OR CIRCLED.

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CITY OF KALAMAZOO, MICHIGAN

WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

PUMP STATION NO.25 BACKGROUND PLAN DEMOLITION

Project No.:	200-19743-19004
Designed By:	GCJ
Drawn By:	JLS
Checked By:	WAP/GCJ

E-325

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Bar Measures 1 inch

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NOTES:

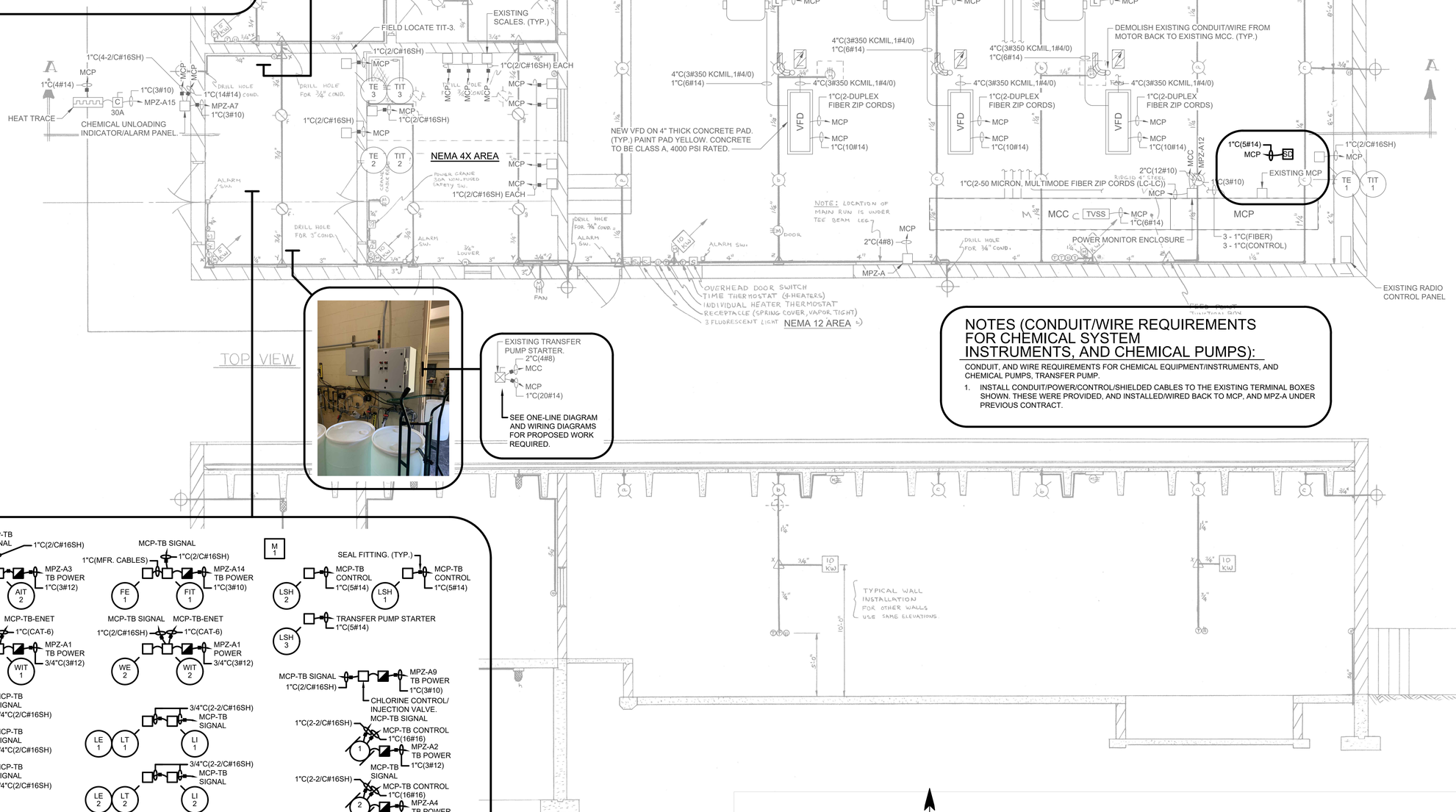
1. CONDUIT IN NEMA 4X AREAS SHALL BE PVC SCHEDULE 80.
2. COORDINATE WITH THE PUMP MANUFACTURER AND FURNISH THE NECESSARY CONNECTORS TO INTERFACE THE CONTROL WIRES AND SHIELDED CABLES FROM THE PUMPS TO THE CONDUIT/WIRE/RACEWAY SYSTEM. PROVIDE MANUFACTURER CONNECTORS, CORDS, ETC., AS REQUIRED.
3. FURNISH SEAL FITTINGS ON CONDUIT RUNS EXITING CHEMICAL AREAS.
4. TERMINAL BOXES WERE INSTALLED IN PREVIOUS CONTRACT FOR 120VAC POWER MPZ-A, 4-20MA WIRING BACK TO MAIN CONTROL PANEL. (MCP), DISCRETE IO BACK TO MAIN CONTROL PANEL. (MCP), AND ETHERNET CABLES BACK TO MAIN CONTROL PANEL. (MCP).
5. NEW CONDUIT AND WIRE WITHIN THE CHEMICAL ROOM IS TO HOMERUN TO EACH OF THESE TERMINAL BOXES. CONNECTIONS ALREADY EXIST BACK TO THE MAIN CONTROL PANEL. (MCP).
6. PRIOR TO MAKING ANY CONNECTIONS WITHIN THE EXISTING ABOVE TERMINAL BOXES, OBTAIN FROM OWNER A SET OF THE WEST MICHIGAN INSTRUMENTATION SYSTEMS INC., SET OF WIRING DIAGRAMS TO ASSIST IN MAKING WIRE CONNECTIONS WITHIN THE BOXES AND MAIN CONTROL PANEL.

EXISTING BOXES TO REMAIN. SEE NOTES NO.4, AND NO.5.

TB — MCP — 2"C(50#14) — CONTROL
TB — MPZ-A — 2"C(20#12) — POWER
TB — MCP — 2"C(10-CAT-6 CABLES) 2"C(20-2/C#16SH) — SIGNAL
TB — MCP — ETHERNET

EXISTING TRANSFER PUMP STARTER.
2"C(4#8) — MCC
MCP — 1"C(20#14)
SEE ONE-LINE DIAGRAM AND WIRING DIAGRAMS FOR PROPOSED WORK REQUIRED.

TOP VIEW



NOTES (CONDUIT/WIRE REQUIREMENTS FOR CHEMICAL SYSTEM INSTRUMENTS, AND CHEMICAL PUMPS):

CONDUIT, AND WIRE REQUIREMENTS FOR CHEMICAL EQUIPMENT/INSTRUMENTS, AND CHEMICAL PUMPS, TRANSFER PUMP.

1. INSTALL CONDUIT/POWER/CONTROL/SHIELDED CABLES TO THE EXISTING TERMINAL BOXES SHOWN. THESE WERE PROVIDED, AND INSTALLED/WIRED BACK TO MCP, AND MPZ-A UNDER PREVIOUS CONTRACT.

MCP-TB SIGNAL — ANALYZER — 1"C(2/C#16SH) — 1"C(MFR. CABLES) — MPZ-A3 TB POWER 1"C(3#12) — AE 2 AIT 2

MCP-TB SIGNAL — 1"C(2/C#16SH) — 1"C(MFR. CABLES) — MPZ-A14 TB POWER 1"C(3#10) — FE 1 FIT 1

MCP-TB SIGNAL MCP-TB-ENET — 1"C(2/C#16SH) — 1"C(CAT-6) — MPZ-A1 TB POWER 3/4"C(3#12) — WE 1 WIT 1

MCP-TB SIGNAL MCP-TB-ENET — 1"C(2/C#16SH) — 1"C(CAT-6) — MPZ-A1 POWER 3/4"C(3#12) — WE 2 WIT 2

PIT 1 PY 1 — MCP-TB SIGNAL 3/4"C(2/C#16SH)
PIT 2 PY 2 — MCP-TB SIGNAL 3/4"C(2/C#16SH)
PIT 3 PY 3 — MCP-TB SIGNAL 3/4"C(2/C#16SH)

LE 1 LT 1 LI 1 — 3/4"C(2-2/C#16SH) MCP-TB SIGNAL
LE 2 LT 2 LI 2 — 3/4"C(2-2/C#16SH) MCP-TB SIGNAL

M 1 — SEAL FITTING. (TYP.)
LSH 2 — MCP-TB CONTROL 1"C(5#14)
LSH 1 — MCP-TB CONTROL 1"C(5#14)
LSH 3 — TRANSFER PUMP STARTER 1"C(5#14)

MCP-TB SIGNAL 1"C(2/C#16SH) — MPZ-A9 TB POWER 1"C(3#10) — CHLORINE CONTROL/ INJECTION VALVE.

1"C(2-2/C#16SH) — MCP-TB SIGNAL — MCP-TB CONTROL 1"C(16#16) — 1 — MPZ-A2 TB POWER 1"C(3#12)

1"C(2-2/C#16SH) — MCP-TB SIGNAL — MCP-TB CONTROL 1"C(16#16) — 2 — MPZ-A4 TB POWER 1"C(3#12)

CHEMICAL FEED PUMPS

MCP-TB CONTROL 1"C(5#14) — MPZ-A6 TB POWER 1"C(3#10) — EYEWASH

NOTE:

1. CONDUIT SHALL BE PVC - SCHEDULE 80. GROUND SEAL FITTINGS AS REQUIRED.
2. REFER TO PROCESS DRAWINGS FOR EXACT EQUIPMENT LOCATIONS. (TYP. OF 12 LOCATIONS.)

NEMA 4X AREA
REFER TO PROCESS DRAWINGS FOR EXACT EQUIPMENT LOCATIONS. (TYP.)

PUMP STATION NO.25 ELECTRICAL BACKGROUND PLAN PROPOSED WORK

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

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

EXISTING DRAWING FROM PREVIOUS PROJECT. PROPOSED WORK SHOWN BOLD, CROSSHATCHED, AND/OR CIRCLED.

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MARK	DATE	DESCRIPTION
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CITY OF KALAMAZOO, MICHIGAN
WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

PUMP STATION NO.25
BACKGROUND PLAN
PROPOSED WORK

Project No.:	200-19743-19004
Designed By:	GCJ
Drawn By:	JLS
Checked By:	WAP/GCJ

E-326
OF 43

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Bar Measures 1 inch

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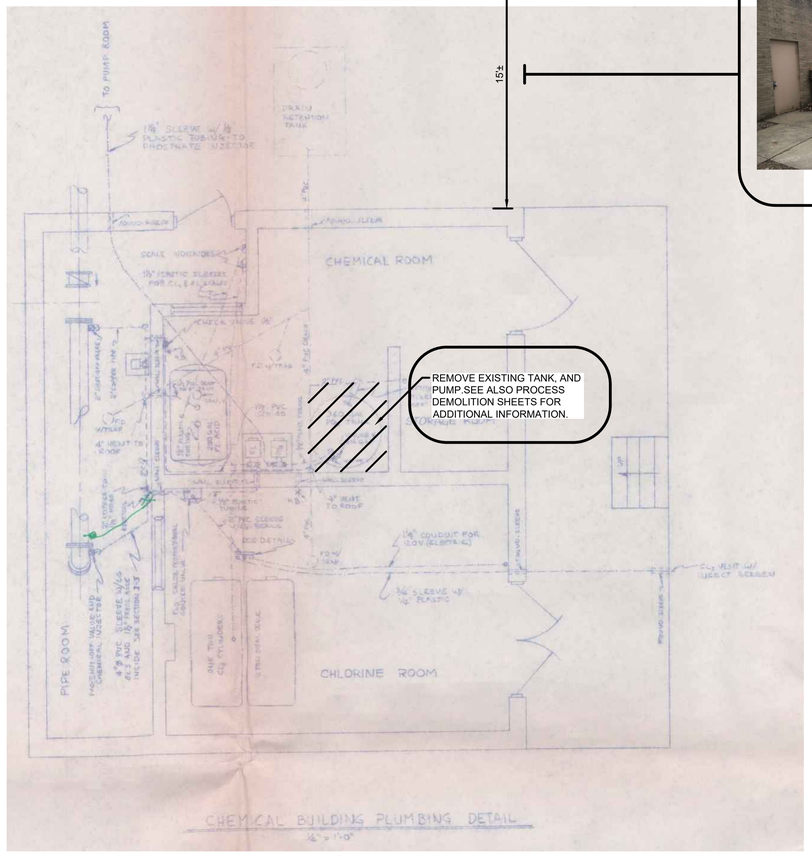
NOTES:

1. REFER TO PROCESS DEMOLITION DRAWINGS. DEMOLISH EXISTING CONDUIT, WIRE, DISCONNECT SWITCHES, SHIELDED CABLES, ETC. FOR PUMPS, TANKS, SENSORS, ETC.
2. PATCH HOLES IN WALL AND FLOOR FROM DEMOLISHED ELECTRICAL EQUIPMENT. SEAL HOLES IN WALL AND FLOOR WITH MORTAR.
3. FIELD VERIFY EXACT EXTENT OF DEMOLITION REQUIRED PRIOR TO BIDS AT EACH PUMP STATION.
4. DUCT SEAL CONDUITS ENTERING AND EXITING BOXES, ENCLOSURES, CONTROL PANELS ETC., IN THE CHEMICAL ROOM AND OUTSIDE OF THE CHEMICAL ROOM.

PUMP BUILDING



REMOVE EXISTING TANK, AND PUMP.SEE ALSO PROCESS DEMOLITION SHEETS FOR ADDITIONAL INFORMATION.

15'±

PUMP STATION NO.39 ELECTRICAL BACKGROUND PLAN DEMOLITION

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

0 2' 4' 8'

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

EXISTING DRAWING FROM PREVIOUS PROJECT. PROPOSED WORK SHOWN BOLD, CROSSHATCHED, AND/OR CIRCLED.

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MARK	DATE	DESCRIPTION
	11/29/23	ISSUED FOR BID

CITY OF KALAMAZOO, MICHIGAN
WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

PUMP STATION NO.39 BACKGROUND PLAN DEMOLITION

Project No.:	200-19743-19004
Designed By:	GCJ
Drawn By:	JLS
Checked By:	WAP/GCJ

E-327

OF 43

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Bar Measures 1 inch

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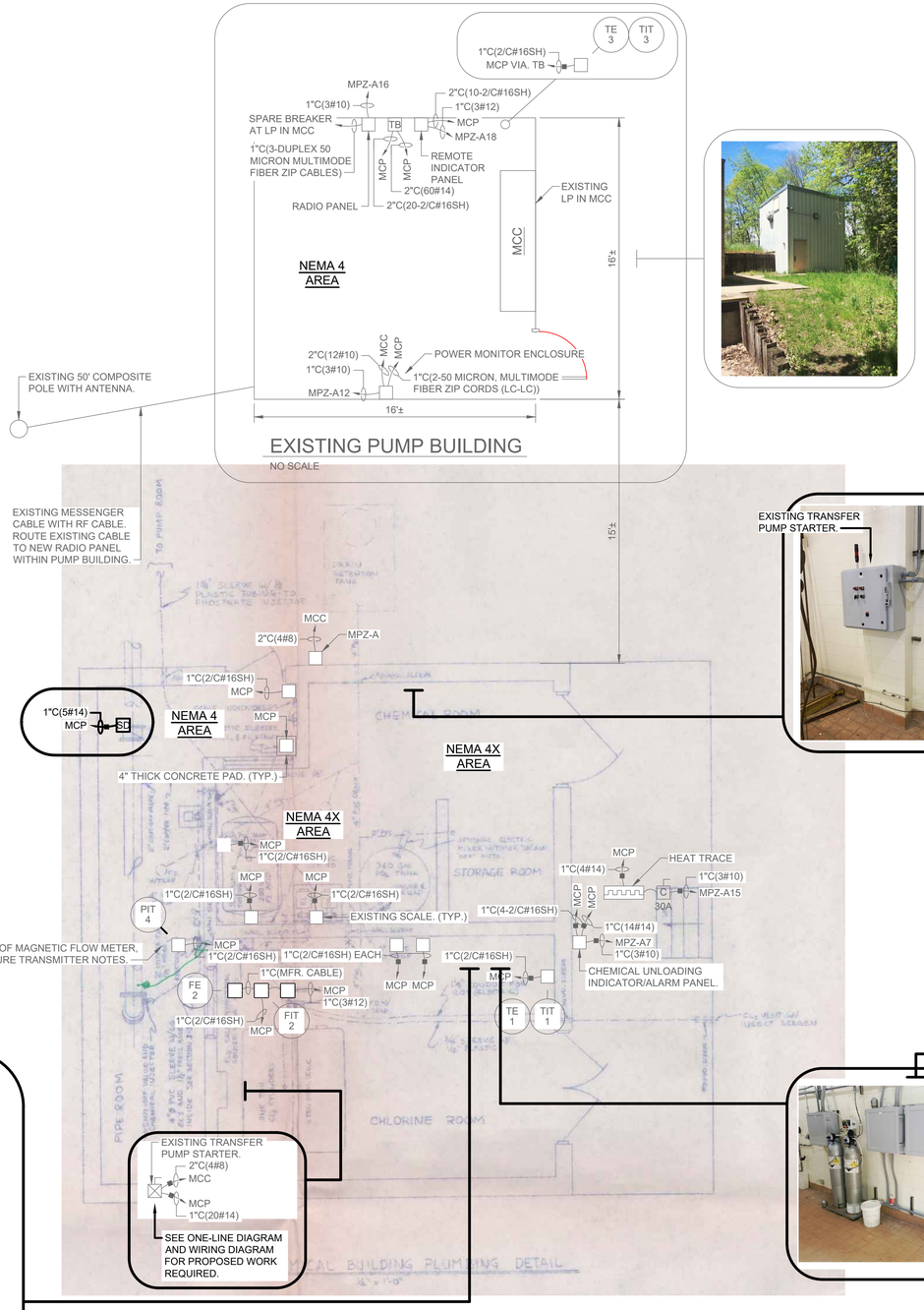
NOTES:

1. CONDUIT IN NEMA 4X AREAS SHALL BE PVC SCHEDULE 80.
2. COORDINATE WITH THE PUMP MANUFACTURER AND FURNISH THE NECESSARY CONNECTORS TO INTERFACE THE CONTROL WIRES AND SHIELDED CABLES FROM THE PUMPS TO THE CONDUIT/WIRE/RACEWAY SYSTEM. PROVIDE MANUFACTURER CONNECTORS, CORDS, ETC., AS REQUIRED.
3. FURNISH SEAL FITTINGS ON CONDUIT RUNS EXITING CHEMICAL AREAS.
4. INSTALL NEW CONDUIT ON EXISTING WALL AREA OUTDOORS BETWEEN THE PUMP BUILDING AND THE CHEMICAL BUILDING. SUPPORT CONDUIT AS REQUIRED. CONDUIT TO BE PVC RGS. PROVIDE SEALS ON ALL CONDUITS EXITING THE CHEMICAL AREA TO THE PUMP BUILDING.
5. TERMINAL BOXES WERE INSTALLED IN PREVIOUS CONTRACT FOR 120VAC POWER TO MPZ-A, 4-20MA WIRING BACK TO MAIN CONTROL PANEL. (MCP), DISCRETE IO BACK TO MAIN CONTROL PANEL. (MCP), AND ETHERNET CABLES BACK TO MAIN CONTROL. (MCP) PANEL.
6. NEW CONDUIT AND WIRE WITHIN THE CHEMICAL ROOM IS TO HOMERUN TO EACH OF THESE TERMINAL BOXES. CONNECTIONS ALREADY EXIST BACK TO THE MAIN CONTROL PANEL. (MCP).
7. PRIOR TO MAKING ANY CONNECTIONS WITHIN THE EXISTING ABOVE TERMINAL BOXES, OBTAIN FROM OWNER A SET OF THE WEST MICHIGAN INSTRUMENTATION SYSTEMS INC., SET OF WIRING DIAGRAMS TO ASSIST IN MAKING WIRE CONNECTIONS WITHIN THE BOXES AND MAIN CONTROL PANEL. (MCP)

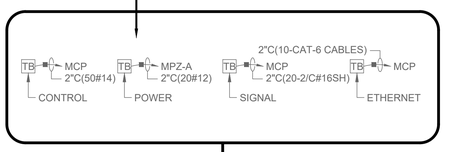
NOTE (CONDUIT/WIRE REQUIREMENTS FOR CHEMICAL SYSTEM INSTRUMENTS, AND CHEMICAL PUMPS):

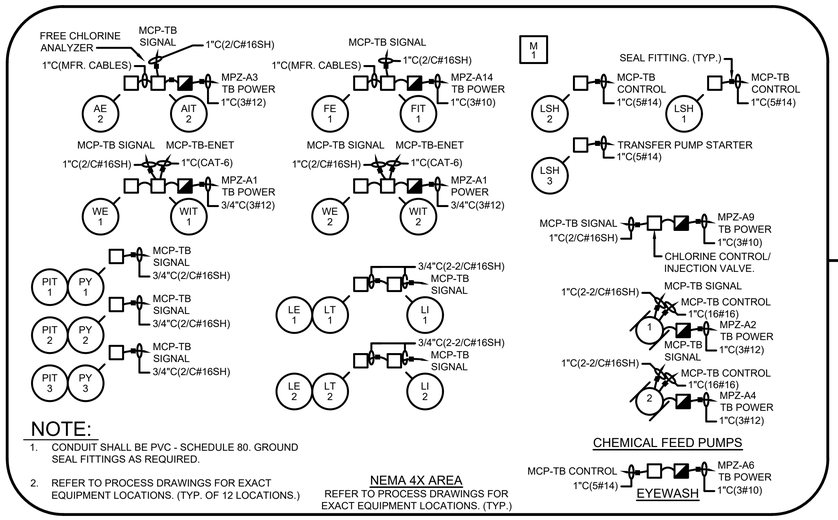
CONDUIT, AND WIRE REQUIREMENTS FOR CHEMICAL EQUIPMENT/INSTRUMENTS, AND CHEMICAL PUMPS, TRANSFER PUMP.

1. INSTALL CONDUIT/POWER/CONTROL/SHIELDED CABLES TO THE EXISTING TERMINAL BOXES SHOWN. THESE WERE PROVIDED, AND INSTALLED/WIRED BACK TO MCP, AND MPZ-A UNDER PREVIOUS CONTRACT.



EXISTING BOXES TO REMAIN. SEE NOTES NO.5, NO.6, AND PHOTOS BELOW.





NOTE:

1. CONDUIT SHALL BE PVC - SCHEDULE 80. GROUND SEAL FITTINGS AS REQUIRED.
2. REFER TO PROCESS DRAWINGS FOR EXACT EQUIPMENT LOCATIONS. (TYP. OF 12 LOCATIONS.)

NEMA 4X AREA
REFER TO PROCESS DRAWINGS FOR EXACT EQUIPMENT LOCATIONS. (TYP.)

EXISTING DRAWING FROM PREVIOUS PROJECT. PROPOSED WORK SHOWN BOLD, CROSSHATCHED, AND/OR CIRCLED.

PUMP STATION NO.39 ELECTRICAL BACKGROUND PLAN PROPOSED WORK

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

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

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MARK	DATE	DESCRIPTION
	11/29/23	ISSUED FOR BID

CITY OF KALAMAZOO, MICHIGAN
WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

PUMP STATION NO.39
BACKGROUND PLAN
PROPOSED WORK

Project No.:	200-19743-19004
Designed By:	GCJ
Drawn By:	JLS
Checked By:	WAP/GCJ

E-328
OF 43

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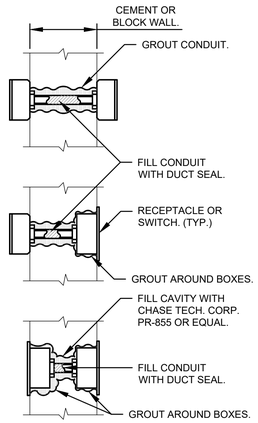
Bar Measures 1 inch

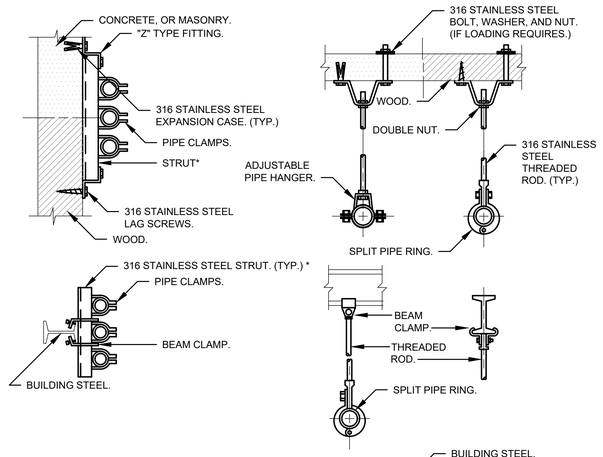
11/28/2023 3:14:32 PM - \\TT-LOCAL\IER\PROJECTS\ANN ARBOR\IER\19743\200-19743-19004\CAD\SHEETFILES\E\WATER SYSTEM CORROSION CONTROL IMPROVEMENTSIE-328_PS 39 BACKGROUND PLAN PR.DWG - SHANK, JASON

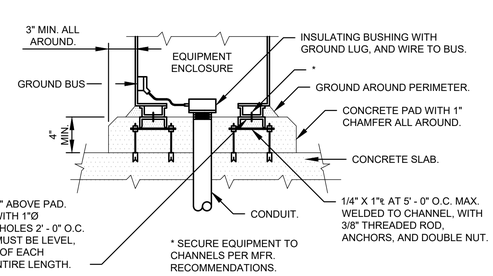


WALL BOXES BACK-TO-BACK

NO SCALE

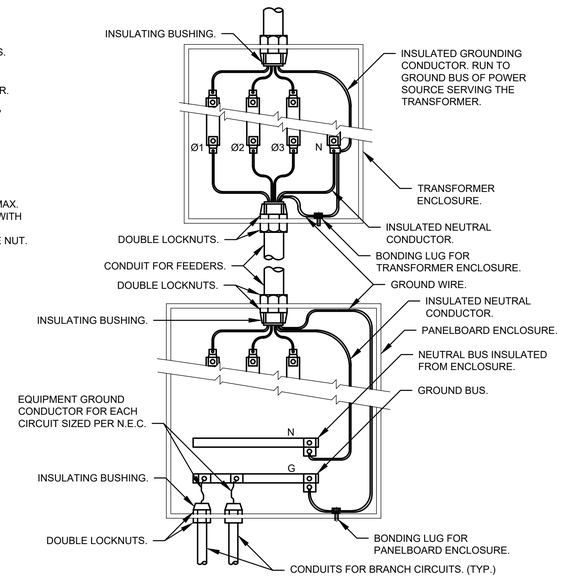
- FOR SOUND PROOFING





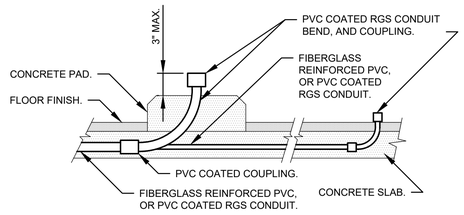
OUTDOOR PAD MOUNTED EQUIPMENT DETAIL

NO SCALE



CONDUIT GROUNDING DETAILS FOR TRANSFORMERS, DISTRIBUTION PANELS, AND WALL MOUNTED ENCLOSURES

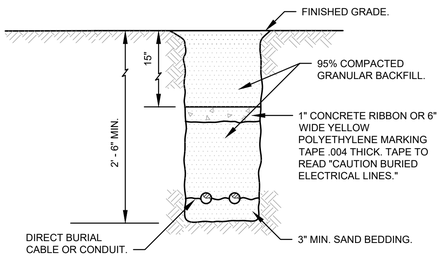
NO SCALE



NOTE:
PVC COATED CONDUIT BENDS, AND FITTINGS SHALL BE USED WHERE CONCEALED CONDUIT RUNS ARE STUBBED UP FROM THE SLAB. RISERS ON POLES SHALL BE PVC COATED RGS INCLUDING WEATHERHEADS.

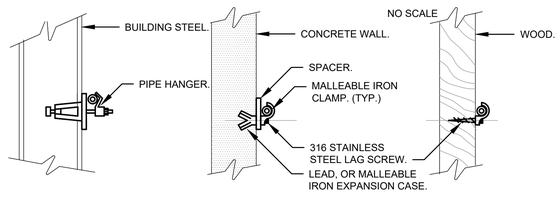
CONDUIT STUB-UP DETAIL

NO SCALE



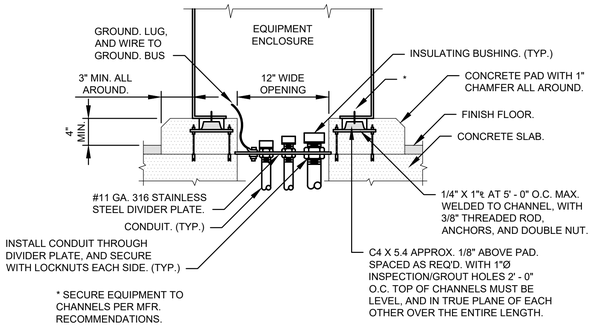
TRENCHING DETAIL

NO SCALE



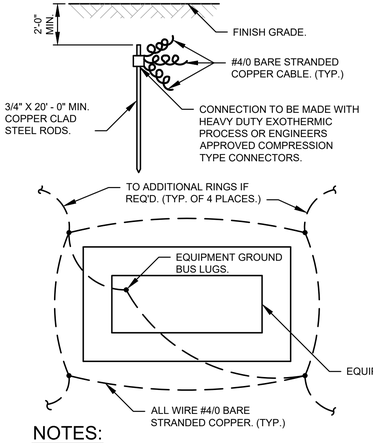
VERTICAL AND HORIZONTAL CONDUIT RACKS AND HANGERS

NO SCALE



INTERIOR PAD MOUNTED EQUIPMENT DETAIL

NO SCALE

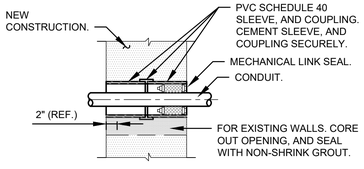


NOTES:

ADDITIONAL CONCENTRIC RINGS SHALL BE ADDED AS REQ'D. TO MEET THE (5) OHM SPECIFIED RESISTANCE. EACH RING TO HAVE 4 GROUND RODS, AND SPACE 10 FEET FROM THE INNER RING.

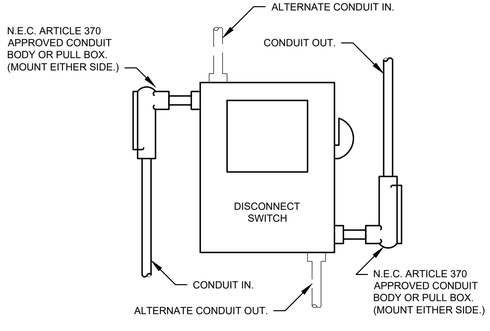
GROUND MAT DETAIL

NO SCALE



EXTERIOR WALL CONDUIT SLEEVE DETAIL

NO SCALE
DO NOT USE BELOW GRADE.



SERVICE ENTRANCE AND DISCONNECT SWITCHES

NO SCALE
FOR NO.4 WIRE, AND LARGER.

ALL HARDWARE IS TO BE 316 STAINLESS STEEL INCLUDING NUTS, BOLTS, WASHERS, ANCHORS, STRUTS, ETC. THIS REQUIREMENT HAS PRECEDENCE OVER STANDARD DETAILS, AND PROJECT MANUAL/SPECIFICATIONS.

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MARK	DATE	DESCRIPTION	BY
	11/29/23	ISSUED FOR BID	

CITY OF KALAMAZOO, MICHIGAN
WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

ELECTRICAL DETAILS

Project No.:	200-19743-19004
Designed By:	GCJ
Drawn By:	JLS
Checked By:	WAP/GCJ

E-400
OF 43

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Bar Measures 1 inch

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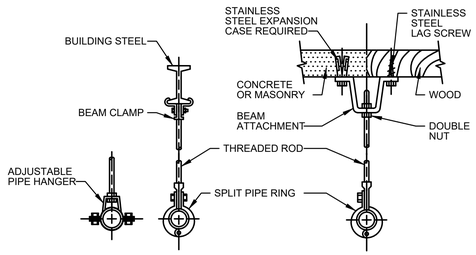
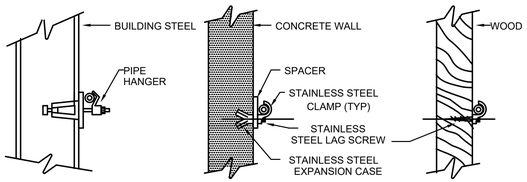


SINGLE CONDUIT HANGERS

NO SCALE

NOTES:

1. ALL MOUNTING HARDWARE AND SUPPORTS TO BE 316 STAINLESS STEEL.

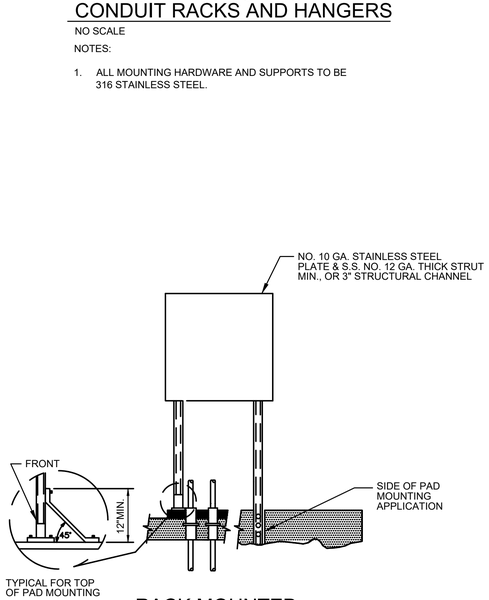


VERTICAL AND HORIZONTAL CONDUIT RACKS AND HANGERS

NO SCALE

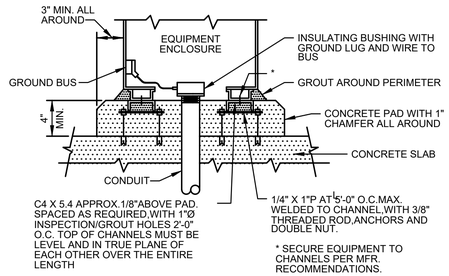
NOTES:

1. ALL MOUNTING HARDWARE AND SUPPORTS TO BE 316 STAINLESS STEEL.



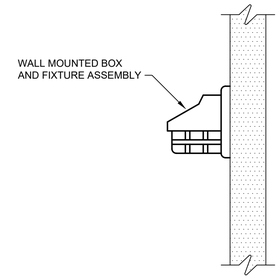
RACK MOUNTED EQUIPMENT DETAIL

NO SCALE



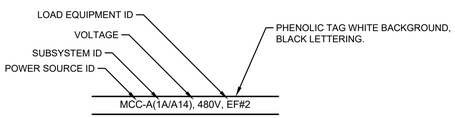
PAD MOUNTED EQUIPMENT DETAIL

NO SCALE



VAPORTIGHT OR WEATHERPROOF FIXTURE WALL MOUNTING DETAIL

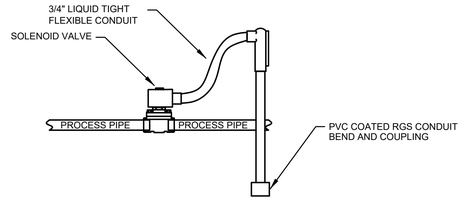
NO SCALE



FEEDER & BRANCH CIRCUIT RACEWAY LABELS

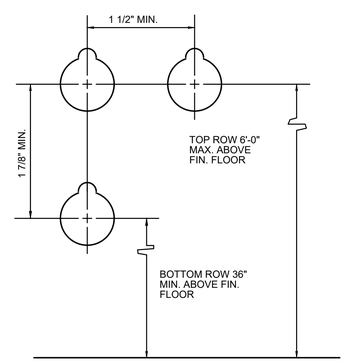
NOTE:

1. IN ACCESSIBLE CEILING SPACES AND EXPOSED IN UNFINISHED AREAS, LABEL CONDUIT WITH PANEL AND CIRCUIT NUMBERS OF CONDUCTORS ROUTED THROUGH THE CONDUIT. LABEL CONDUIT AT WALL PENETRATIONS AND CONNECTIONS TO ALL PANELS, JUNCTION BOXES, AND EQUIPMENT SERVED.



SOLENOID STUB-UP DETAIL

NO SCALE



TYPICAL PUSHBUTTON, PILOTLIGHT SELECTOR SWITCH PANEL SPACING

NO SCALE

ALL HARDWARE IS TO BE 316 STAINLESS STEEL INCLUDING NUTS, BOLTS, WASHERS, ANCHORS, STRUTS, ETC. THIS REQUIREMENT HAS PRECEDENCE OVER STANDARD DETAILS, AND PROJECT MANUAL/SPECIFICATIONS.

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MARK	DATE	DESCRIPTION
	11/29/23	ISSUED FOR BID

BY

CITY OF KALAMAZOO, MICHIGAN
WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

ELECTRICAL DETAILS

Project No.:	200-19743-19004
Designed By:	GCJ
Drawn By:	JLS
Checked By:	WAP/GCJ

E-401

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Bar Measures 1 inch

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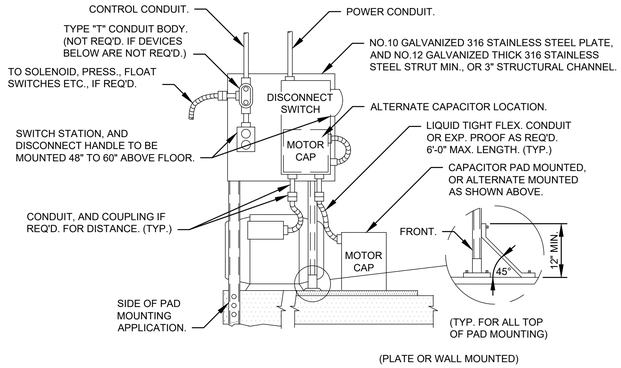
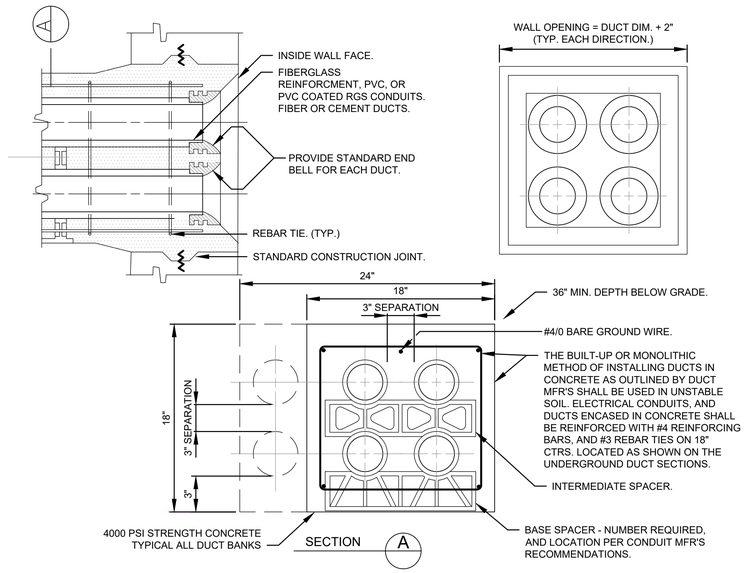


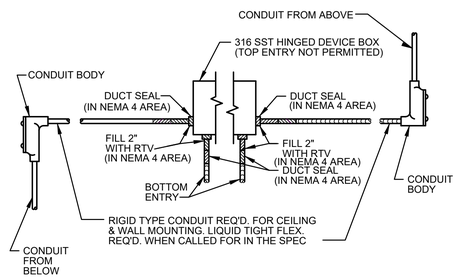
MOTOR CONDUIT DETAIL

NO SCALE
CONDUIT FROM ABOVE POWER AND CONTROL IN SEPARATE CONDUIT.



DUCT DETAILS

NO SCALE



DEVICE BOX CONDUIT DETAIL

NO SCALE

NOTES:

1. TAG ALL CABLES PASSING THROUGH BOX.
2. USE WATER-TIGHT HUBS.

ALL HARDWARE IS TO BE 316 STAINLESS STEEL INCLUDING NUTS, BOLTS, WASHERS, ANCHORS, STRUTS, ETC. THIS REQUIREMENT HAS PRECEDENCE OVER STANDARD DETAILS, AND PROJECT MANUAL/SPECIFICATIONS.

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MARK	DATE	DESCRIPTION	BY
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CITY OF KALAMAZOO, MICHIGAN
WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

ELECTRICAL DETAILS

Project No.:	200-19743-19004
Designed By:	GCJ
Drawn By:	JLS
Checked By:	WAP/GCJ

E-402

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GRAPHIC SYMBOLS FOR INSTRUMENTATION ITEMS

	DESCRIPTION	SYMBOL	DESCRIPTION
	DEVICE MOUNTED ON PANEL		FLOW ACTUATED SWITCH - NC
	BOARD OR PANEL MOUNTED DEVICE - DEVICE MOUNTED INSIDE PANEL		TEMPERATURE SWITCH - NO
	FIELD OR LOCALLY MOUNTED DEVICE		TEMPERATURE SWITCH - NC
	PROGRAMMED FUNCTION NOT NORMALLY ACCESSIBLE TO OPERATOR		LIMIT SWITCH (PROXIMITY TYPE) - NORMALLY OPEN
	PROGRAMMED FUNCTION ACCESSIBLE THROUGH OPERATOR'S INTERFACE DEVICE		LIMIT SWITCH (PROXIMITY TYPE) - NORMALLY CLOSED
	PLC INPUT OR OUTPUT POINT		LIMIT SWITCH (PROXIMITY TYPE) - NORMALLY CLOSED - HELD OPEN
	INTERLOCKING		LIMIT SWITCH (PROXIMITY TYPE) - NORMALLY OPEN - HELD CLOSED
XOR	EXCLUSIVE OR		CONTROL RELAY CONTACT - NORMALLY OPEN
A	ALTERNATOR		CONTROL RELAY CONTACT - NORMALLY CLOSED
OR	OR		LIGHTING ARRESTOR
AND	AND	ETI	ELAPSED TIME INDICATOR
S	MOTOR STARTER	T	TIMING RELAY COIL
P	PURGE	T 1	TIMING RELAY COIL (OFF DELAY)
L	COMPLEX LOGIC	G	INDICATING LIGHT
	COMPUTER LOGIC SYSTEM		PUSH-TO-TEST INDICATING LIGHT
	TERMINAL OR TRANSITION POINT		BATTERY
	FLOAT SWITCH	X1 X2	SECONDARY TRANSFORMER
	PARTIAL FLUME		VARIABLE RESISTOR
	MIXER		RESISTOR
	SEAL		MOLDED CASE CIRCUIT BREAKER
	OFF PAGE CONNECTOR		SPEED SWITCH
	PROCESS MACHINERY MOTOR		MOMENTARY PUSHBUTTON OPERATOR - NORMALLY CLOSED
	VENTURI OR INSERT FLOW TUBE		MOMENTARY PUSHBUTTON OPERATOR - NORMALLY OPEN
	IN-FLOW ELEMENT (PROPELLER TYPE)		SELECTOR SWITCH - NORMALLY OPEN
	IN-LINE FLOW ELEMENT (MAGNETIC TYPE)		PUSHBUTTON OPERATOR WITH MUSHROOM HEAD
	IN-LINE FLOW ELEMENT (ULTRASONIC)		SOLENOID OR CLUTCH
	FLOW ORIFICE		THERMAL OVERLOAD
	TURBIDITY METER	(F)	FIELD LOCATED
	ROTOMETER		TERMINAL POINT
	PUMP		TERMINAL
	BLOWER		LOW VOLTAGE FUSE
	GENERAL USE DISCONNECTING SWITCH		FUSIBLE TERMINAL BLOCK
	TIME CLOSED CONTACT ON ENERGIZATION		CIRCUIT BREAKER WITH STAB CONNECTION
	TIME OPENED CONTACT ON ENERGIZATION		CONTROL POWER TRANSFORMER
	TIME CLOSED CONTACT ON DE-ENERGIZATION	CR L / CR U	TWO COIL LATCHING RELAY
	TIME OPENED CONTACT ON DE-ENERGIZATION		RECEPTACLE
	FLOAT ACTUATED SWITCH - NO	OFF HAND AUTO	SELECTOR SWITCH OPERATOR WITH FUNCTION SHOWN
	FLOAT ACTUATED SWITCH - NC		
	PRESSURE ACTUATED SWITCH - NO		
	PRESSURE ACTUATED SWITCH - NC		
	FLOW ACTUATED SWITCH - NO		

GRAPHIC SYMBOLS FOR INSTRUMENTATION ITEMS

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
FOC-DI(X) FOC-DO(X)	DISCRETE INPUT TO FIBER CONVERTER (PROVIDE WITH 120V AC P/S FIBER CONVERTER TO DISCRETE OUTPUT) (PROVIDE WITH 120V AC P/S (WEED EOTEC - 2S07/2H07 WITH 120V AC P/S)) QUANTITY (X) AS NOTED ON DRAWINGS	FOC-AI(X) FOC-AO(X)	ANALOG INPUT TO FIBER CONVERTER. FIBER CONVERTER TO ANALOG INPUT (WEED EOTEC 2T14/2R14 WITH P/S AS REQUIRED) QUANTITY (X) AS NOTED ON DRAWINGS
FOC	FIBER OPTIC CONVERTER - TYPE, AND STYLE AS NOTED		FLANGED DIAPHRAGM SEAL
FOPP	FIBER OPTIC PATCH PANEL - CONNECTORS, AND QUANTITY AS REQUIRED		

GRAPHIC SYMBOLS FOR VALVES

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	STROKE OR POSITION ACTUATOR CYLINDER (OPEN-SHUT)		CHECK VALVE
	STROKE OR POSITION ACTUATOR CYLINDER (THROTTLING)		PLUG VALVE
	PNEUMATIC DIAPHRAGM OR POSITIONER (OPEN-SHUT)		BUTTERFLY VALVE, DAMPER OR LOUVER
	PNEUMATIC DIAPHRAGM OR POSITIONER (THROTTLING)	S	TWO - WAY SOLENOID VALVE OPERATOR
M	MOTOR OPERATED (THROTTLING)	M	ELECTRONICALLY CONTROLLED CHECK VALVE
M	MOTOR OPERATED (OPEN - SHUT)	S D	TWO - WAY SOLENOID VALVE OPERATOR - DETENTED
	SLIDE - STOP GATE	S	THREE - WAY SOLENOID VALVE OPERATOR
	SLUICE GATE	S	FOUR - WAY SOLENOID VALVE OPERATOR
	AIR SET ASSEMBLY	S-S LM MD	MANIFOLD STYLE BLOCK I/O SOLENOID VALVE - DUAL COILS
	BALL VALVE		
	GLOBE VALVE		
	GATE VALVE OR KNIFE GATE		

NOTE: THE PLC I/O ADDRESS SHALL BE USED AS THE WIRING TAG SCHEME FOR ALL PANEL AND FIELD CONTROL WIRING. COORDINATE WITH ELECTRICAL CONTRACTOR.

INSTRUMENTATION LINE SYMBOLS

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	ELECTRICAL SIGNAL	E-NET	ETHERNET COMMUNICATION SIGNAL-UNSHIELDED TWISTED PAIR (UTP)-SPEED AS INDICATED
// //	AIR LINE/PNEUMATIC SIGNAL		
L	HYDRAULIC SIGNAL	E-FO	ETHERNET FIBER OPTIC COMMUNICATIONS SIGNAL
	ELECTROMAGNETIC OR SONIC SIGNAL	FO	PLC REMOTE I/O FIBER OPTIC COMMUNICATION SIGNAL
O	SOFTWARE SIGNAL	V-FO	ETHERNET VIDEO FIBER OPTIC
	CONNECTION TO PROCESS, OR MECHANICAL LINK		

I.S.A. STANDARD LETTER FUNCTIONS

SYMBOL	FIRST LETTER	SUCCEEDING LETTERS
A	ANALYSIS, ANALOG	ALARM
B	BURNER, FLAME	BATCH
C	CONDUCTIVITY, COMMAND	CONTROL (FEEDBACK TYPE)
D	DENSITY, SPECIFIC GRAVITY	
E	VOLTAGE	PRIMARY ELEMENT
F	FLOW RATE	RATIO
G	GAGING	GLASS
H	HAND, MANUAL	HIGH
I	CURRENT	INDICATE
J	POWER	SCAN
K	TIME, TIME SCHEDULE	CONTROL (NO FEEDBACK)
L	LEVEL, LIGHT	LOW
M	MOISTURE, HUMIDITY	MIDDLE, MODULATE
N		
O	OVERLOAD	ORIFICE
P	PRESSURE, VACUUM	POINT
Q	QUANTITY	TOTALIZE, INTEGRATE
R	RADIOACTIVITY	RECORD, PRINT, RECEIVE
S	SPEED, FREQUENCY, SOLENOID	SWITCH
T	TEMPERATURE, TURBIDITY	TRANSMIT, TRANSFORM
U	MULTIVARIABLE	MULTIFUNCTION
V	VIBRATION, VISCOSITY	VALVE, DAMPER, LOUVER
W	WEIGHT, FORCE	
X		
Y		RELAY, COMPUTE
Z	POSITION	DRIVE, ACTUATE

ABBREVIATIONS

SYMBOL	DESCRIPTION
R	RESET
T	TRIP
AS	AIR SUPPLY
DO	DISSOLVED OXYGEN
GS	GAS SUPPLY
HS	HYDRAULIC SUPPLY
NS	NITROGEN SUPPLY
ORP	OXYGEN REDUCTION POTENTIAL
SS	STEAM SUPPLY
SP	SET POINT
WS	WATER SUPPLY
PV	PROCESS VARIABLE
F.O.	FAIL OPEN
F.C.	FAIL CLOSE
SBPP	SCREEN BUILDING PROCESSOR PANEL
TFBMPP	TERTIARY FILTER BUILDING MAIN PROCESSOR PANEL
HVACP	HEATING VENTILATION AIR CONDITIONING CONTROL PANEL - I/O
MD	MAIN DISCONNECT
%	GAIN OR PROPORTIONAL CONTROL
∫	INTEGRAL OR RESET CONTROL
D	DERIVATIVE OR RATE CONTROL
V	VELOCITY ALGORITHM
1-0	ON - OFF CONTROL
√	SQUARE ROOT EXTRACTOR
Σ	ADD OR TOTALIZE
Δ	SUBTRACT OR DIFFERENCE
>	HIGHEST MEASURED VARIABLE
<	LOWEST MEASURED VARIABLE
E/I , I/P	CONVERT ONE TO ANOTHER
* , /	MULTIPLY, DIVIDE
±	BIAS OR REVERSING
f(x)	CHARACTERIZE - (EQUATION / /D/%/ETC.)

NOTE:

NOTE: I/O WIRE TAGS FOR CONTROL WIRING INSIDE ALL CONTROL PANELS TO BE POLYPROPYLENE.

NOTE: FIBER, AND ETHERNET PATCH CABLES SHALL BE THE FOLLOWING COLORS

PINK - BUSINESS NETWORK

YELLOW - VIDEO NETWORK

BLUE - SCADA/LAN NETWORK - WATER

ORANGE - PLC-I/O NETWORK

RED - AUDIO NETWORK (IP PHONE)

GREEN - SCADA/LAN NETWORK - WASTEWATER

COPPER, AND FIBER PATCH CABLES: (6 FEET IN LENGTH MINIMUM, EACH)

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www.tetratech.com
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PHONE: (734) 665-6000 FAX: (734) 213-3003

MARK	DATE	DESCRIPTION
	11/29/23	ISSUED FOR BID

BY

CITY OF KALAMAZOO, MICHIGAN
WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

INSTRUMENTATION LEGEND

Project No.:	200-19743-19004
Designed By:	GCJ
Drawn By:	JLS
Checked By:	WAP/GCJ

I-001
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NOTES:

1. FIELD VERIFY CONDUIT ROUTING AT THE PUMP STATIONS WITH OWNER. CORE HOLES AS REQUIRED TO SUIT INSTALLATION OF THE CONDUITS SHOWN. PATCH WITH NON-SHRINK GROUT.
2. TURN OVER TO OWNER AT PROJECT COMPLETION OPERATION AND MAINTENANCE MANUALS (QUANTITY AS SPECIFIED) TO OWNER.
3. MULTIMODE FIBER OPTIC PATCH CABLES, AND ETHERNET PATCH CABLES SUPPLIED IN THE PROJECT SHALL BE COLORED BLUE.
4. FIBER OPTIC PATCH PANELS SHALL BE THE PRODUCT OF CORNING CABLE SYSTEMS. (RACK OR SURFACE MOUNTED AS SHOWN", ST OR LC STYLE CONNECTORS, WITH QUANTITY OF BULKHEADS AS SHOWN.
5. PLC PROGRAMMING, INTOUCH PROGRAMMING BY TETRATECH.
6. PLC HARDWARE TO BE ROCKWELL AS SHOWN.
7. FURNISH EXTENDED TERMINAL BLOCK HOUSINGS FOR CONTROL LOGIX I/O CARDS.

GENERAL CONSTRUCTION NOTES:

1. ELECTRICAL MATERIALS AND EQUIPMENT ITEMS SHOWN IN LIGHT LINE WEIGHTS ON THE DRAWINGS ARE EXISTING ITEMS TO REMAIN. ELECTRICAL MATERIALS AND EQUIPMENT ITEMS SHOWN IN HEAVY LINE WEIGHTS ARE NEW THIS CONTRACT.
2. ITEMS SHOWN OR NOTED TO BE DEMOLISHED ON THE DRAWINGS ARE EXISTING ITEMS TO BE REMOVED FROM SITE BY CONTRACTOR UNLESS NOTED TO BE TURNED OVER TO OWNER.
3. FOR ITEMS INDICATED AS "FIELD LOCATE", THE CONTRACTOR SHALL FIELD VERIFY FOR INTERFERENCE AND FOR LOCATIONS OF MOUNTING FLANGES, CONNECTION POINTS, ETC.
4. CONDUIT ROUTINGS SHOWN ON BACKGROUND PLANS ARE INTENDED ROUTINGS ONLY. EXACT CONDUIT ROUTINGS FOR CONDUITS, AND LENGTH SHALL BE FIELD LOCATED AND VERIFIED BY THE CONTRACTOR. COORDINATE CONDUIT ROUTING IN FINISHED AREAS WITH OWNER. CONDUIT TO BE CONCEALED IN THESE AREAS.
5. REFER TO THE CABLE MANUFACTURER'S RECOMMENDATIONS FOR MINIMUM BEND RADIUS FOR FIBER OPTIC CABLES. INSTALL NEW PULL BOXES (PB) AS REQUIRED FOR CONDUITS. SIZE PULL BOXES AS REQUIRED PER FIBER OPTIC CABLE MANUFACTURERS RECOMMENDATIONS.
6. CONDUITS/RACEWAYS, PULL BOXES AND JUNCTION BOXES TO BE INSTALLED WITH 316 STAINLESS STEEL CHANNEL STRUT. MINIMUM STRUT LENGTH TO BE 12 INCHES, WHERE POSSIBLE.
7. PANELS SHALL BE MOUNTED OFF WALLS WITH STRUT, CONDUITS SHALL BE MOUNTED ON STRUT INCLUDING SINGLE RUNS.
8. CONDUIT ENTERING CONTROL PANELS AND ELECTRICAL EQUIPMENT ENCLOSURES SHALL BE FILLED WITH DUCT SEAL, INCLUDING OPENINGS IN BOTTOM OF PANELS, AND EQUIPMENT.
9. REPAIR SIDEWALKS AND ROADWAYS DUE TO SITE WORK ADDITIONS, THE EXTENT OF THE REPAIR REQUIRED SHALL BE FIELD VERIFIED PRIOR TO BIDS IN CONJUNCTION WITH THE WORK SHOWN IN THE CONTRACT DOCUMENTS. PRIOR TO TRENCHING, FIELD LOCATE EXISTING GAS LINES, TELEPHONE LINES, SPRINKLER LINES, ETC. COORDINATE WITH OWNER
10. PULL CORDS SHALL BE INSTALLED IN CONDUITS CONTAINING NETWORK CABLES, AND FIBER OPTIC CABLES.
11. CORE HOLES AS REQUIRED TO SUIT INSTALLATION OF CONDUIT AND WIRING/CABLING AS SHOWN. FIELD VERIFY EXACT EXTENT OF WORK REQUIRED.
12. FURNISH PULL BOXES FOR FIBER OPTIC CABLE. COORDINATE EXACT BENDING RADIUS WITH MANUFACTURER.
13. NEW CONDUITS INSTALLED THIS CONTRACT WITH FIBER OPTIC CABLES ARE TO BE LABELED WITH PHENOLIC TAGS (AT BEGINNING TO END) TO INDICATE THE NUMBER OF STRANDS, ORIGINATION AND DESTINATION. TAGS TO BE COLOR CODED ORANGE FOR MULTIMODE.
14. WHERE NEW CONDUITS SHOWN TO BE INSTALLED PASS UNDER ROADWAYS, CONDUITS SHALL BE CONCRETE ENCASED.
15. PRIOR TO EXCAVATION, FIELD LOCATE EXISTING UTILITIES. COORDINATE WITH OWNER.
16. AREAS WHERE CAMERAS ARE SHOWN TO BE INSTALLED SHALL BE CLASSIFIED AS NEMA 4, UNLESS CALLED OUT OTHERWISE.
17. THE ASSOCIATED INSTRUMENTATION DRAWINGS SHOW EXISTING WIRES AND TERMINAL NUMBERS REQUIRED TO PROPERLY INTERFACE WITH NEW EQUIPMENT. THIS INFORMATION WAS COLLECTED FROM AS-BUILT DRAWINGS AND EXTENSIVE FIELD VERIFICATION. THE INFORMATION SHALL BE USED AS A GUIDE IN RE-TERMINATION. IT SHALL REMAIN THE CONTRACTOR'S RESPONSIBILITY TO EXAMINE THE WIRING AND TO REVISE TO SUIT AS REQUIRED. CHANGES IN THE CONTRACT OR COST WILL NOT BE GRANTED FOR THIS COORDINATION. IT IS THE CONTRACTOR'S RESPONSIBILITY TO EXAMINE PROPOSED WORK SHOWN.
18. CONDUIT ROUTINGS SHOWN ON BACKGROUND PLANS ARE PROPOSED ROUTINGS ONLY. EXACT CONDUIT ROUTINGS AND LENGTH SHALL BE FIELD LOCATED AND VERIFIED BY THE CONTRACTOR. COORDINATE CONDUIT ROUTING IN FINISHED AREAS WITH OWNER. CONDUIT TO BE CONCEALED IN THESE AREAS.
19. RACEWAYS, PULL BOXES AND JUNCTION BOXES TO BE INSTALLED WITH 316 STAINLESS STEEL FASTENERS SUPPORTS, AND THREADED ROD, ETC. (CHANNEL STRUT TO ALSO BE STAINLESS STEEL). MINIMUM STRUT LENGTH TO BE 12 INCHES, WHERE POSSIBLE. TYPICAL FOR NEMA 12, 4, AND 7 AREAS.
20. WIRING FOR STARTERS SHALL BE IN ACCORDANCE WITH NEMA CLASS II B STANDARDS. SUBMIT ENGINEERED SHOP DRAWINGS FOR ALL STARTERS SHOWN TO BE WIRED.
21. WIRE NUMBERS (1, 3, 5, ETC.) SHALL BE PREFIXED WITH STARTER TAG NUMBERS. THE WIRE NUMBER AFTER THE PREFIX SHALL BE THE MANUFACTURER'S WIRE NUMBERING SYSTEM. WIRE MARKERS SHALL BE USED AT EACH WIRE TERMINATION POINT.
22. IN AREAS WHERE EQUIPMENT AND CONDUIT IS REMOVED, REPAIR WALL AND FLOOR SURFACES AS REQUIRED TO MATCH SURROUNDING AREA. WHERE DEVICES ARE REMOVED FROM CONCEALED BOXES, FURNISH AND INSTALL A BLANK COVER ON THE BOX.
23. FIBER OPTIC CABLE SHALL BE AS CALLED OUT ON SYSTEM CONFIGURATION DRAWINGS, MULTIMODE, ALL DIELECTRIC, SUITABLE FOR INSTALLATION UNDERGROUND IN WET CONDUIT.

GENERAL NOTES:

1. PRIOR TO SUBMITTING A BID FOR THE WORK DETAILED UNDER THIS CONTRACT, BIDDER SHALL VISIT THE PUMPING STATIONS. THE BIDDER SHALL FULLY ACQUAINT ONESELF WITH EXISTING FIELD CONDITIONS AT EACH SITE. NO BULLETINS WILL BE WRITTEN FOR WORK DUE TO LACK OF VERIFICATION OF EXISTING SITE CONDITIONS AND WIRING.
2. NO WIRES SHALL BE TERMINATED TO TERMINAL STRIPS, OR OTHER EQUIPMENT WITHOUT FIRST VERIFYING SIGNAL TYPE. DAMAGES RESULTING IN LACK OF VERIFICATION SHALL BE BORNE BY THE CONTRACTOR. CONTRACTOR SHALL COORDINATE SIGNAL TYPE AND VOLTAGE WITH I/O CARDS SHOWN.
3. WITHIN CONTROL PANELS, NAMEPLATES SHALL BE PROVIDED TO INDICATE DIFFERENT VOLTAGE LEVELS WITHIN PANELS. ALSO, A NAME TAG (YELLOW BACKGROUND, RED LETTERING) SHALL BE LOCATED ON THE FRONT OF EVERY PANEL INDICATING THAT WHEN MAIN PANEL DISCONNECTED 120V IS STILL PRESENT FROM FIELD DEVICES (YELLOW WIRING/ISOLATED INPUT CARDS.)
4. PHENOLIC TAGS ON FACE OF CONTROL PANELS TO HAVE WHITE BACKGROUND AND BLACK LETTERING (EXCEPT WARNING TAGS; YELLOW BACKGROUND RED LETTERING).
5. PROVIDE SAFETY COVERS ON ALL 480V MOLDED CASE MAIN CIRCUIT BREAKERS TO INSULATE THE INCOMING CABLES AND SIDE CONDUCTORS FROM CONTACT. (TYP. FOR CONTROL PANELS.) PROVIDE BREAKER LOCKS FOR PUMP CIRCUIT BREAKERS (MCP)AND MAIN PANEL BREAKERS.
6. REFER TO WIRING DIAGRAMS FOR ADDITIONAL INFORMATION ON ISOLATED I/O. A COMMON NEUTRAL MAY BE USED FOR SEVERAL ISOLATED INPUTS FROM THE SAME STARTER. PROVIDE NEUTRAL JUMPERS WIRES WITHIN THE PANEL AS REQUIRED.
7. ELECTRICAL MATERIALS AND EQUIPMENT ITEMS SHOWN IN LIGHT LINE WEIGHTS ON THE DRAWINGS ARE EXISTING ITEMS TO REMAIN. ELECTRICAL MATERIALS AND EQUIPMENT ITEMS SHOWN IN HEAVY LINE WEIGHTS ARE NEW THIS CONTRACT.
8. ITEMS SHOWN CROSSHATCHED (OR NOTED TO BE DEMOLISHED) ON THE DRAWINGS ARE EXISTING ITEMS TO BE REMOVED, FROM SITE BY CONTRACTOR.
9. INSTALL A SINGLE CONDUCTOR INSULATED (RHW, THHN, OR XHHW) COPPER GROUND WIRE IN EACH CONDUIT, SIZE AS SHOWN ON DRAWINGS, OR AS A MINIMUM PER THE NATIONAL ELECTRICAL CODE. THIS GROUND WIRE SHALL BE CONNECTED AT EACH END TO THE EQUIPMENT GROUND. THIS ALSO INCLUDES INSTRUMENTATION DEVICES SUCH AS LEVEL, PRESSURE, FLOW TRANSMITTERS, LIMIT SWITCHES, CONDUITS, NETWORK AND I/O CABLES.
10. THE FOLLOWING EXAMPLE COMPONENT IDENTIFICATION SHALL BE USED AS APPROPRIATE:

(F) FIELD MOUNTED, NOT AT STARTER OR OTHER CONTROL PANELS
(S) STARTER PANEL MOUNTED
(MCP)AT MAIN CONTROL PANEL
(1) AT CONTROL PANEL NO.1
(2) AT CONTROL PANEL NO.2
(TCP) AT TEMPERATURE CONTROL PANEL

11. REFER TO DETAIL SHEETS. CONTRACTOR SHALL FURNISH AND INSTALL HARDWARE AND APPURTENANCES (I.E. PIPE TAPS, WETWELL BUBBLER TUBES, VALVES, COPPER TUBING, BALL VALVES, PNEUMATIC PIPING, SPOOL PIECES, ETC.) FOR FIELD DEVICES SHOWN (FLOWMETERS, PRESSURE TRANSMITTERS, LEVEL TRANSMITTERS, ETC.). WORK SHALL BE COORDINATED WITH OTHER TRADES (MECHANICAL INSTRUMENTATION, ETC.) CONTRACTOR SHALL BE RESPONSIBLE FOR SYSTEM COORDINATION AND INSTALLATION.
12. ETHERNET AND FIBER OPTIC TERMINATIONS SHALL BE PERFORMED BY A QUALIFIED REPRESENTATIVE OF CABLE MANUFACTURER, THE CABLES SHALL BE TESTED. NO SPLICING SHALL BE PERMITTED OF FIBER OPTIC CABLES, BETWEEN PANELS. FIBERS SHALL BE TERMINATED AT PATCH PANELS, INCLUDING SPARES.
13. REFER TO THE CABLE MANUFACTURER'S RECOMMENDATIONS FOR MINIMUM BEND RADIUS FOR FIBER OPTIC CABLES. INSTALL NEW PULL BOXES (PB) AS REQUIRED FOR CONDUITS. SIZE PULLBOXES AS REQUIRED PER FIBER OPTIC CABLE MANUFACTURERS RECOMMENDATIONS.
14. CONDUIT ENTERING CONTROL PANELS AND ELECTRICAL EQUIPMENT ENCLOSURES SHALL BE FILLED WITH DUCT SEAL, INCLUDING OPENINGS IN BOTTOM OF PANEL.
15. CABLES (INCLUDING FIBER, ETHERNET, CONTROL WIRE, ETC.) WHERE PASSING THROUGH A PULLBOX SHALL BE LABELED AND COMPLETELY IDENTIFIED WITH IDENTIFICATION NUMBERS AND ORIGINATION/DESTINATION. THIS ALSO INCLUDES ALL CABLE BUNDLES ENTERING CONTROL PANELS, PULLBOXES, ETC.
16. CONTROL WIRES SHALL BE TAGGED WITH THE PLC I/O ADDRESS IN THE FIELD AND AT THE PANEL.
17. THE FIELD DEVICES SHOWN ON THE P&ID'S, ELECTRICAL BACKGROUNDS, AND DETAILS SHEETS MAKEUP THE FIELD DEVICE EQUIPMENT REQUIREMENTS. NOT ALL FIELD DEVICES REQUIRED ARE SHOWN ON THE P&ID'S.
18. UPS SELECTED SHALL BE COMPATIBLE WITH ISOLATION TRANSFORMERS. (TYP.)
19. REFER TO I/O DRAWING LAYOUT FOR ADDITIONAL SIGNALS NOT SHOWN ON P&ID FLOW DIAGRAMS.
20. TAG WIRES WITH THE PLC I/O ADDRESS PLUS THE ISA NUMBER, AND DESCRIPTIVE NAME. TYP. EACH END - IN PANEL, AND IN FIELD. COORDINATE WITH ELECTRICAL CONTRACTOR.

1I 0117 PROCESSOR NO.1, INPUT RACK 0, SLOT (OR GROUP) 1, BIT 17

EXAMPLE OF P&ID I/O SYMBOL

NOTE: THE PLC I/O ADDRESS SHALL BE USED AS THE WIRING TAG SCHEME FOR ALL PANEL AND FIELD CONTROL WIRING. COORDINATE WITH ELECTRICAL CONTRACTOR.

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MARK	DATE	DESCRIPTION
	11/29/23	ISSUED FOR BID

CITY OF KALAMAZOO, MICHIGAN
WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

INSTRUMENTATION NOTES

Project No.:	200-19743-19004
Designed By:	GCJ
Drawn By:	JLS
Checked By:	WAP/GCJ

I-002
OF 36

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5.8 GHZ

5.8 GHZ

GPS

GSU

SYNCH

STATION NO.24 RADIO CONCENTRATOR PANEL. (RCS)

PS

TVSS

IDU-E

TVSS

POE

STRATIX SWITCH
1783-RMS10T
WITH 1783-SFP1GSX(2)

LAN SWITCH

E-NET

E-FO

TO UPS

TVSS

POE

3 FT. JUMPER

IP:

ORBIT 900 MHZ ACCESS POINT

E-NET

FOC-S

FO

FOC-S

SURGE ARRESTOR

3 FT. JUMPER

IP:

ORBIT 900 MHZ ACCESS POINT

E-NET

FOC-S

FO

FOC-S

20 FT. JUMPERS

POLYPHASOR DSXL ARRESTOR. (TYP.)

ORBIT 900 MHZ

E-NET

EXISTING MCP

INSTALL NEW 8 POINT ANALOG INPUT CARD (1756-IF8I) WIRING ARM, AND TERMINAL BLOCKS IN EXISTING MCP PANEL. WIRE ALL 8 INPUTS TO TERMINAL BLOCKS FOR CONTACT OF 8 - EXISTING SCALES.

STATION NO.24 COMMUNICATIONS PANEL. (PLC PANEL)

WATER

P/S | L71 | DI | COMM | AI | DO | ENET | ENET

E-NET

CAT-6 (TYP.)

E-NET — E-NET — PHOSPHATE ANALYZER

E-NET — E-NET — SCALE

E-NET — E-NET — SCALE

E-FO — PM

E-NET — E-NET — E-NET

(WWTP)

L33ER | COMM | P/S

RS-232

STRATIX 8000 SWITCH

I/O SWITCH

E-FO

STRATIX SWITCH
1783-MS10T
WITH 1783-SFP1GSX(2)

LAN SWITCH

DUPLEX FIBER PATCH CABLES (2). (TYP.)
(LC-LC) (TYP.)

EXISTING MCP-1

TO WELL PAD-B OMNI ANTENNA

L33ER | IA 8I 1 | IA 8I 2 | OW 8I 3 | P/S

E-NET

ORBIT 900 MHZ

WELL PAD-C

TO WELL PAD-B OMNI ANTENNA

L33ER | IA 8I 1 | IA 8I 2 | OW 8I 3 | P/S

END CAP. (TYP.)

E-NET

ORBIT 900 MHZ

WELL PAD-D

L33ER | IA 8I 1 | IA 8I 2 | OW 8I 3 | P/S

END CAP. (TYP.)

E-NET

ORBIT 900 MHZ

WELL PAD-B

COMMUNICATIONS PANEL

LOCATED IN MOTOR ROOM NEAR EXISTING CONTROL PANEL

PURPLE

INSTALL NEW E-NET CARD TO EXISTING VFD NO.2, NO.3, AND NO.4.

VFD NO.1

STRATIX 2000 SWITCH

VFD POWER FLEX 753 SERIES

GREEN

VFD NO.2

STRATIX 2000 SWITCH

VFD POWER FLEX 753 SERIES

BLUE

VFD NO.3

STRATIX 2000 SWITCH

VFD POWER FLEX 753 SERIES

RED

VFD NO.4

STRATIX 2000 SWITCH

VFD POWER FLEX 753 SERIES

P/S | ENET | 17-SLOT I/O RACK RACK-1

STRATIX 5700 SWITCH

I/O SWITCH

I/O SWITCH

STRATIX 5700 SWITCH

LAN SWITCH

MAIN CONTROL PANEL NO.1 - (MCP-1)

LOCATED IN PUMP ROOM

EXISTING DRAWING FROM PREVIOUS PROJECT.
PROPOSED WORK SHOWN BOLD,
CROSSHATCHED, AND/OR CIRCLED.

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BY

CITY OF KALAMAZOO, MICHIGAN

WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

INSTRUMENTATION EXISTING SYSTEM ARCHITECTURE DRAWING PUMP STATION NO.24

Project No.:	200-19743-19004
Designed By:	GCJ
Drawn By:	JLS
Checked By:	WAP/GCJ

I-100

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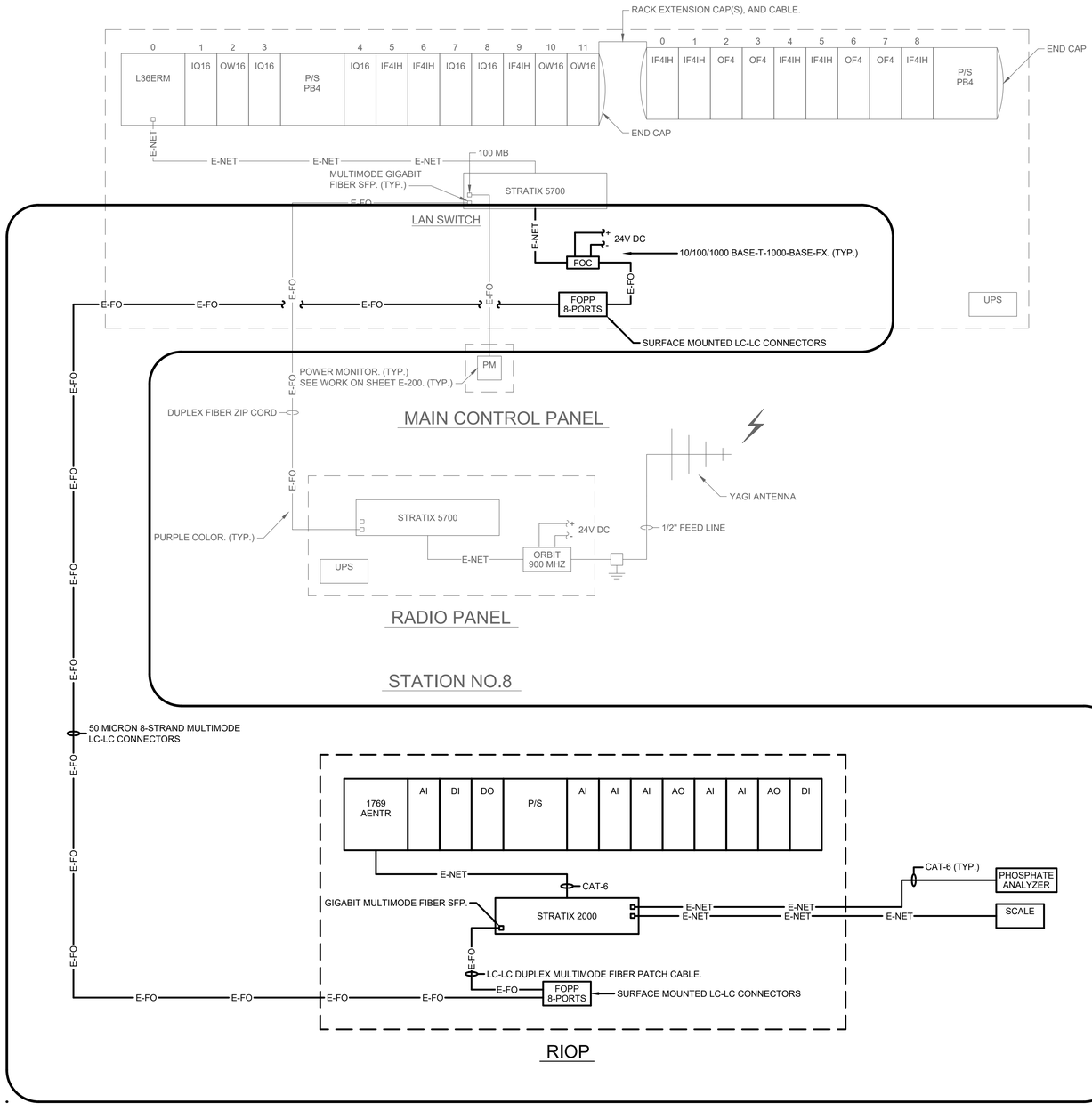

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PROPOSED WORK SHOWN BOLD, CROSSHATCHED, AND/OR CIRCLED.

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CITY OF KALAMAZOO, MICHIGAN
WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

INSTRUMENTATION
PUMP STATION NO.8
SYSTEM CONFIGURATION DRAWING
PROPOSED WORK

Project No.:	200-19743-19004
Designed By:	GCJ
Drawn By:	JLS
Checked By:	WAP/GCJ

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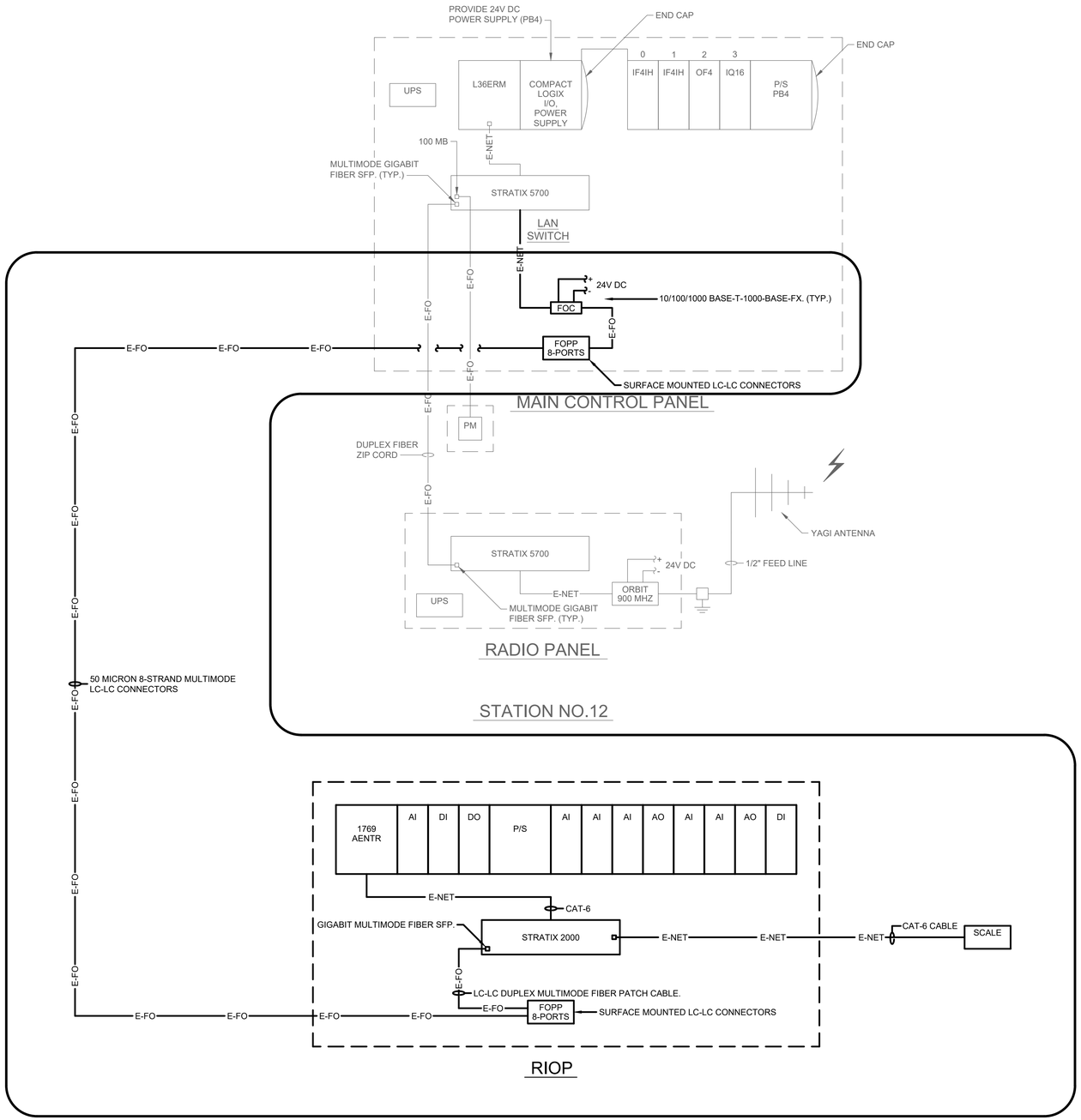

EXISTING DRAWING FROM PREVIOUS PROJECT.
PROPOSED WORK SHOWN BOLD,
CROSSHATCHED, AND/OR CIRCLED.

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CITY OF KALAMAZOO, MICHIGAN
WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

INSTRUMENTATION
PUMP STATION NO.12
SYSTEM CONFIGURATION DRAWING
PROPOSED WORK

Project No.:	200-19743-19004
Designed By:	GCJ
Drawn By:	JLS
Checked By:	WAP/GCJ

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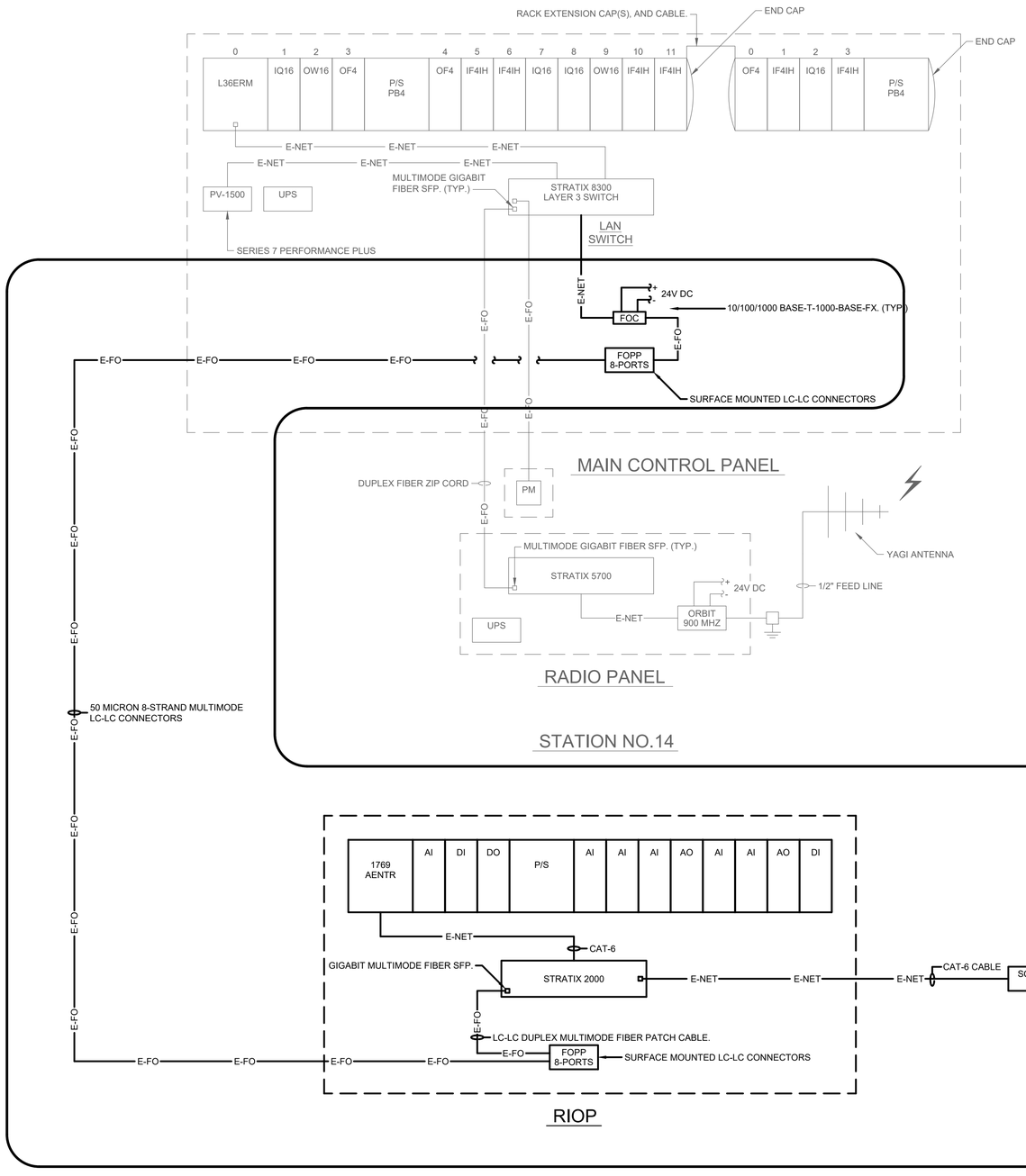

EXISTING DRAWING FROM PREVIOUS PROJECT.
PROPOSED WORK SHOWN BOLD, CROSSHATCHED, AND/OR CIRCLED.

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CITY OF KALAMAZOO, MICHIGAN
WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

INSTRUMENTATION
PUMP STATION NO.14
SYSTEM CONFIGURATION DRAWING
PROPOSED WORK

Project No.:	200-19743-19004
Designed By:	GCJ
Drawn By:	JLS
Checked By:	WAP/GCJ

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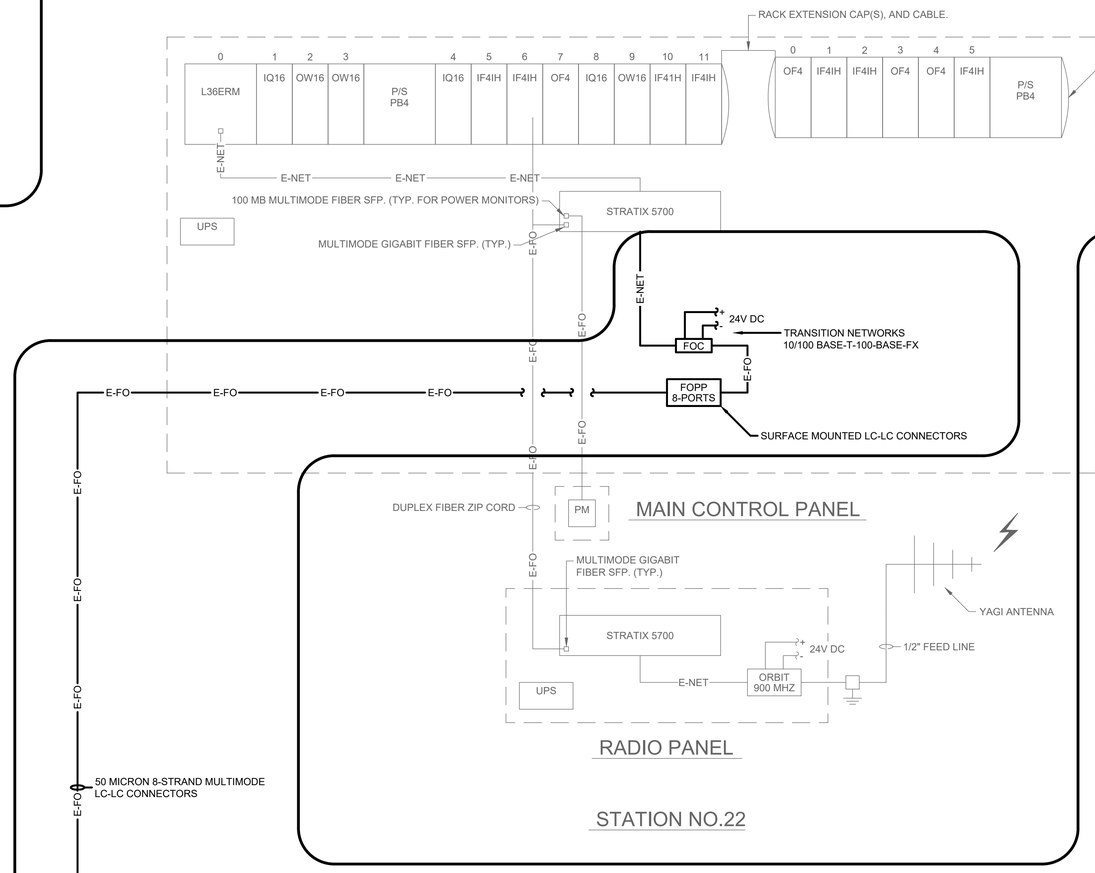
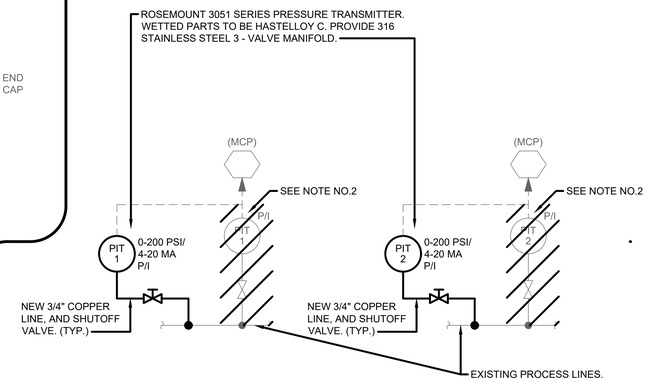
NOTE:

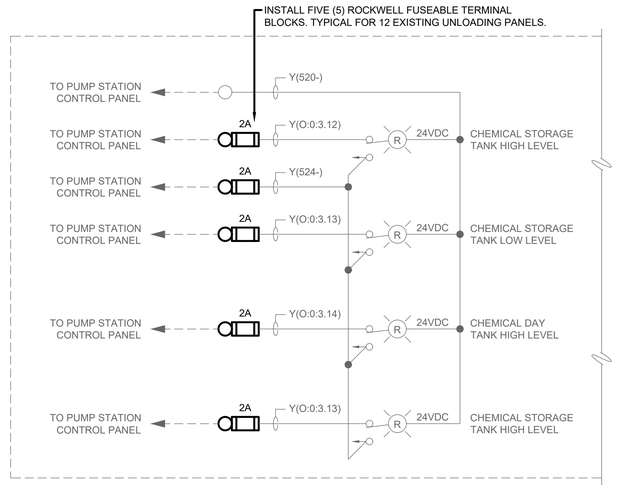
1. FOR WATER STATIONS 8, 12, 14, AND 22 FURNISH AND INSTALL WITHIN EACH EXISTING MAIN CONTROL PANEL TWO ROCKWELL 1485MA SERIES 15A DIN RAIL MOUNTED CIRCUIT BREAKERS FOR PROVIDING 120VAC POWER TO THE EXISTING RADIO PANEL AND THE EXISTING POWER MONITORING PANEL. THIS IS TYPICAL FOR 8 TOTAL BREAKERS.
2. REMOVE EXISTING SUCTION AND DISCHARGER PRESSURE TRANSMITTERS. FURNISH AND INSTALL NEW ROSEMOUNT 3051C PRESSURE TRANSMITTERS AS SHOWN. PROVIDE NEW COPPER TUBING AND BRASS BALL SHUT OFF VALVE. DISCONNECT EXISTING CONDUIT AND SHIELDED CABLE AND RECONNECT EXISTING CONDUIT AND SHIELDED CABLE TO NEW PRESSURE TRANSMITTERS. TURN OVER EXISTING TRANSMITTERS TO OWNER.
3. INCLUDE IN BID FOR 5-8 HOUR DAYS AT THE JOB SITE INCLUDING TRAVEL AND EXPENSES FOR GUIDANCE LOGIC (810-991-4096) TO CONFIGURE SWITCHES, AS DIRECTED BY OWNER/TETRATECH. COORDINATE WORK WITH OWNER/TETRATECH.





NEW SUCTION, AND DISCHARGE PRESSURE TRANSMITTER (MISCELLANEOUS STATIONS PROPOSED WORK)

(WORK TYP. OF 12 PUMP STATIONS. (24-TOTAL PRESSURE TRANSMITTERS.))



EXISTING CHEMICAL UNLOADING INDICATOR PANEL PROPOSED WORK (MISCELLANEOUS STATIONS PROPOSED WORK)

(WORK TYP. OF 12 PANELS (60 TOTAL FUSES TO BE INSTALLED.))

EXISTING DRAWING FROM PREVIOUS PROJECT.
PROPOSED WORK SHOWN BOLD,
CROSSHATCHED, AND/OR CIRCLED.

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	11/29/23	ISSUED FOR BID

CITY OF KALAMAZOO, MICHIGAN
WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

INSTRUMENTATION

PUMP STATION NO.22, AND MISCELLANEOUS STATIONS SYSTEM CONFIGURATION DRAWING, WIRING DIAGRAM, AND MISCELLANEOUS FIELD DEVICES PROPOSED WORK

Project No.:	200-19743-19004
Designed By:	GCJ
Drawn By:	JLS
Checked By:	WAP/GCJ

I-104
OF 36

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Bar Measures 1 inch

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MISCELLANEOUS DEVICES

(MCP-1) LSH 1 ROD TYPE FLOAT SWITCH

(MCP-1) LSH 2 ROD TYPE FLOAT SWITCH

NEW ROD TYPE FLOAT SWITCHES SHALL BE GEMS LS-1900 SERIES 100VA RATED MIN. BUNA-N, DRY CONTACT RATED FOR 2A.

PRECISION DIGITAL LOOP POWERED DIGITAL INDICATOR IN NEMA 4X ENCLOSURE. (TYP.)

VENT TO ATMOSPHERE.

(MCP)

LI 3 — 3" V

LI 3 / LIT 3 / LE 3 — 0-7 FT/ 4-20MA

VEGA C21 SERIES. PROVIDE MOUNTING HARDWARE AS REQUIRED. COORDINATE WITH TANK SUPPLIER. SENSOR MATERIALS TO BE SUITABLE FOR CHEMICAL SHOWN. (TYP.)

STORAGE TANK NO.2

STORAGE TANK NO.2

PRECISION DIGITAL LOOP POWERED DIGITAL INDICATOR IN NEMA 4X ENCLOSURE. (TYP.)

VENT TO ATMOSPHERE

(MCP)

LI 2 — 3" V

LI 2 / LIT 2 / LE 2 — 0-7 FT/ 4-20MA

VEGA C21 SERIES. PROVIDE MOUNTING HARDWARE AS REQUIRED. COORDINATE WITH TANK SUPPLIER. SENSOR MATERIALS TO BE SUITABLE FOR CHEMICAL SHOWN. (TYP.)

STORAGE TANK NO.1

STORAGE TANK NO.1

VENT TO ATMOSPHERE.

VENT TO ATMOSPHERE.

CALIBRATION COLUMN — 1" V

3" V

ROD TYPE FLOAT SWITCH. GEMS - FLOAT MATERIAL AND ROD TO BE RATED FOR CHEMICAL SHOWN. (TYP.) COORDINATE OPENING WITH TANK MANUFACTURER.

LSH 3 — TO SWITCH

(MCP)

WIT 1 — 0-1500 LBS./ 4-20MA — E-NET

FEED TANK

1" D

3/4"

WE 1

METTLER - TOLEDO WEIGHT SCALE TRANSMITTER

PLC I/O POINTS ARE EXISTING. (TYP. FOR STATIONS NO.1, 3, 4, 9, 11, 24, 25, AND 39)
PLC I/O POINTS ARE NEW (TYP. FOR STATIONS NO.8, 12, 14, AND 22.)

(MCP) (MCP) (MCP) (MCP)

COORDINATE RANGE WITH FILTER MANUFACTURER. (TYP.)

METERING CONTAINMENT PUMP SKID

1/2" — PRV

(MCP) — PIT 1 — 0-70 PSI/ 4-20MA

1/2"

3/4"

METERING PUMP NO.1

PULSATION DAMPENER

PY 1

(MCP) — PIT 3 — 0-70 PSI/ 4-20MA

ROSEMOUNT 3051 SERIES (TYP.) WETTED PARTS TO BE SUITABLE FOR CHEMICAL SHOWN. (TYP.)

BACK PRESSURE VALVE

POA

D

1/2"

PY 3

PROVIDE WITH WETTED PORTS SUITABLE FOR CHEMICAL SHOWN. (TYP.)

(MCP) — FIT 1 — FE 1 — 1/2" 0-15 GPHR

ROSEMOUNT OR YOKOGAWA MAGNETIC FLOW METER THIS METER. METER TO BE RATED FOR PULSATION FLOW. FURNISH METER WITH KYNER GASKETS, TANTELUM ELECTRODES, TEFLON LINER, AND HASTELLOY C GROUND RINGS. METER BODY TO BE EPOXY COATED. METER TO BE SUITABLE FOR PULSATING FLOW.

1/2" — PRV

(MCP) — PIT 2 — 0-70 PSI/ 4-20MA

1/2"

3/4"

METERING PUMP NO.2

PULSATION DAMPENER

PY 2

(MCP) (MCP) (MCP) (MCP)

YSI ORTHO PHOSPHATE ANALYZER ALYZAIQ P04-110 PN 825510Y. PROVIDE HARDWARE, AND EQUIPMENT FOR COMPLETE SYSTEM. PROVIDE 2 - 8 HOUR DAYS OF FACTORY STARTUP, CALIBRATION, AND 1 - 8 HOUR DAY OF FIELD TRAINING FOR OWNER AT SITE. FURNISH, AND INSTALL ONLINE UPS (EATON 9PX SERVER. 1 KVA.) FOR ANALYZER.

EX. WM — STATION FLOW

AE 1 — 0-5 MG/L — IQSN CABLE

AIT 1

UPS EATON 9PX - SERIES 1 KVA

TO RIOP — E-NET — CONTROLLER/ GATEWAY — E-NET

(MPP)

PROVIDE WITH MC3 ETHERNET MODULE TO TALK TO ROCKWELL CONTROL LOGIX.

CONTROLLER YSI DIQ/S282 PN 472114Y

NOTE:

1. OBTAIN THE SERVICES OF A VEGA FACTORY ENGINEER TO REVIEW THE MOUNTING METHODS FOR EACH RADAR LEVEL TRANSMITTER SHOWN ON THE CONTRACT DRAWINGS AND TO CONFIGURE EACH TRANSMITTER FOR PROPER OPERATION. ASSUME 3 FULL WEEKS OF START-UP TIME AT THE SITES (96 HOURS AND 12 INDIVIDUAL VISITS). (TYP. FOR ALL STATIONS. 1 - VISIT PER STATION.)

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	11/29/23	ISSUED FOR BID	

CITY OF KALAMAZOO, MICHIGAN
WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

INSTRUMENTATION P&ID PUMP STATION NO.1

Project No.:	200-19743-19004
Designed By:	GCJ
Drawn By:	JLS
Checked By:	WAP/GCJ

I-200

OF 36

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Bar Measures 1 inch

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(MCP-1)
LSH 1 ROD TYPE FLOAT SWITCH

(MCP-1)
LSH 2 ROD TYPE FLOAT SWITCH

NEW ROD TYPE FLOAT SWITCHES SHALL BE GEMS LS-1900 SERIES 100VA RATED MIN. BUNA-N, DRY CONTACT RATED FOR 2A.

MISCELLANEOUS DEVICES

PRECISION DIGITAL LOOP POWERED DIGITAL INDICATOR IN NEMA 4X ENCLOSURE. (TYP.)

VENT TO ATMOSPHERE.

(MCP)
LI 2
LIT 2 0-9 FT/ 4-20MA
LE 2

VEGA C21 SERIES. PROVIDE MOUNTING HARDWARE AS REQUIRED. COORDINATE WITH TANK SUPPLIER. SENSOR MATERIALS TO BE SUITABLE FOR CHEMICAL SHOWN. (TYP.)

3" V

STORAGE TANK

STORAGE TANK

VENT TO ATMOSPHERE.

3" V

ROD TYPE FLOAT SWITCH. GEMS - FLOAT MATERIAL AND ROD TO BE RATED FOR CHEMICAL SHOWN. (TYP.) COORDINATE OPENING WITH TANK MANUFACTURER.

LSH 3 TO SWITCH

(MCP)
WIT 1 0-1000 LBS./ 4-20MA
E-NET

FEED TANK

1" D

3/4"

WE 1

METTLER - TOLEDO WEIGHT SCALE TRANSMITTER

VENT TO ATMOSPHERE.

(MCP) (MCP) (MCP) (MCP)

CALIBRATION COLUMN

COORDINATE RANGE WITH FILTER MANUFACTURER. (TYP.)

METERING CONTAINMENT PUMP SKID

1/2"

PRV

(MCP)
PIT 1 0-80 PSI/ 4-20MA

1/2"

3/4"

METERING PUMP NO.1

PULSATION DAMPENER

PY 1

(MCP)
PIT 3 0-80 PSI/ 4-20MA

ROSEMOUNT 3051 SERIES (TYP.)

BACK PRESSURE VALVE

POA

D

1/2"

PY 3

(MCP)
FIT 1

1/2" 0-15 GPHR

FE 1

ROSEMOUNT OR YOKOGAWA MAGNETIC FLOW METER THIS METER. METER TO BE RATED FOR PULSATION FLOW. FURNISH METER WITH KYNER GASKETS, TANTELUM ELECTRODES, TEFLON LINER, AND HASTELLOY C GROUND RINGS. METER BODY TO BE EPOXY COATED. METER TO BE SUITABLE FOR PULSATING FLOW.

1/2"

1/2"

(MCP)
PIT 2 0-80 PSI/ 4-20MA

PRV

1/2"

3/4"

METERING PUMP NO.2

PULSATION DAMPENER

PY 2

(MCP) (MCP) (MCP) (MCP)

EX. WM

STATION FLOW

YSI ORTHO PHOSPHATE ANALYZER ALYZAIQ P04-110 PN 825510Y. PROVIDE HARDWARE, AND EQUIPMENT FOR COMPLETE SYSTEM. PROVIDE 2 - 8 HOUR DAYS OF FACTORY STARTUP, CALIBRATION, AND 1 - 8 HOUR DAY OF FIELD TRAINING FOR OWNER AT SITE. FURNISH, AND INSTALL ONLINE UPS (EATON 9PX SERVER. 1 KVA.) FOR ANALYZER.

TO RIOP E-NET

CONTROLLER/ GATEWAY E-NET

AIT 1

AE 1

0-5 MG/L IQSN CABLE

UPS EATON 9PX - SERIES 1 KVA

(MPP)

PROVIDE WITH MC3 ETHERNET MODULE TO TALK TO ROCKWELL CONTROL LOGIX.

CONTROLLER YSI DIQ/S282 PN 472114Y

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CITY OF KALAMAZOO, MICHIGAN
WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

INSTRUMENTATION P&ID PUMP STATION NO.3

Project No.:	200-19743-19004
Designed By:	GCJ
Drawn By:	JLS
Checked By:	WAP/GCJ

I-201
OF 36

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Bar Measures 1 inch

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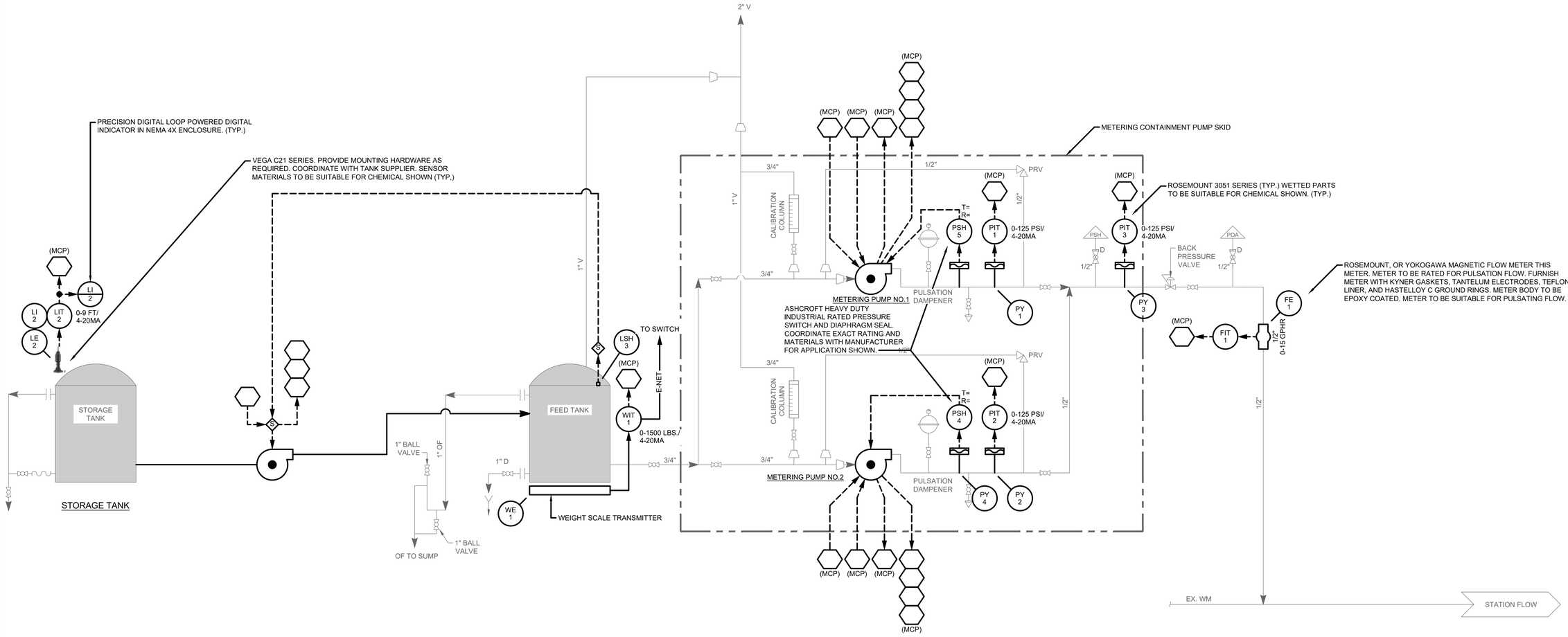
(MCP-1)
LSH 1
ROD TYPE FLOAT SWITCH

(MCP-1)
LSH 2
ROD TYPE FLOAT SWITCH

NEW ROD TYPE FLOAT SWITCHES SHALL BE GEMS LS-1900 SERIES 100VA RATED MIN. BUNA-N, DRY CONTACT RATED FOR 2A.

MISCELLANEOUS DEVICES



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CITY OF KALAMAZOO, MICHIGAN
WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

INSTRUMENTATION P&ID PUMP STATION NO.4

Project No.:	200-19743-19004
Designed By:	GCJ
Drawn By:	JLS
Checked By:	WAP/MSJ

I-202
OF 36

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Bar Measures 1 inch

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DOOR CONTACTS SHALL BE OMRON/STI MODEL MA-2DPC4 SERIES. PROVIDE JUNCTION BOX AND CHORD GRIP CONNECTORS AT BOX FOR INTERFACING DOOR CONTACTS. WIRING TO CONDUIT/RACEWAY WIRING.

(MCP-1) LSH 1 ROD TYPE FLOAT SWITCH

(MCP-1) LSH 2 ROD TYPE FLOAT SWITCH

NEW ROD TYPE FLOAT SWITCHES SHALL BE GEMS LS-1900 SERIES 100VA RATED MIN. BUNA-N, DRY CONTACT RATED FOR 2A.

(RIOP) ZS 1

(RIOP) ZS 2

(RIOP) HS

MOMENTARY PUSHBUTTON STATION IN NEMA 4X ENCLOSURE (NORMALLY OPEN PUSHBUTTON)

(RIOP) TIT 10

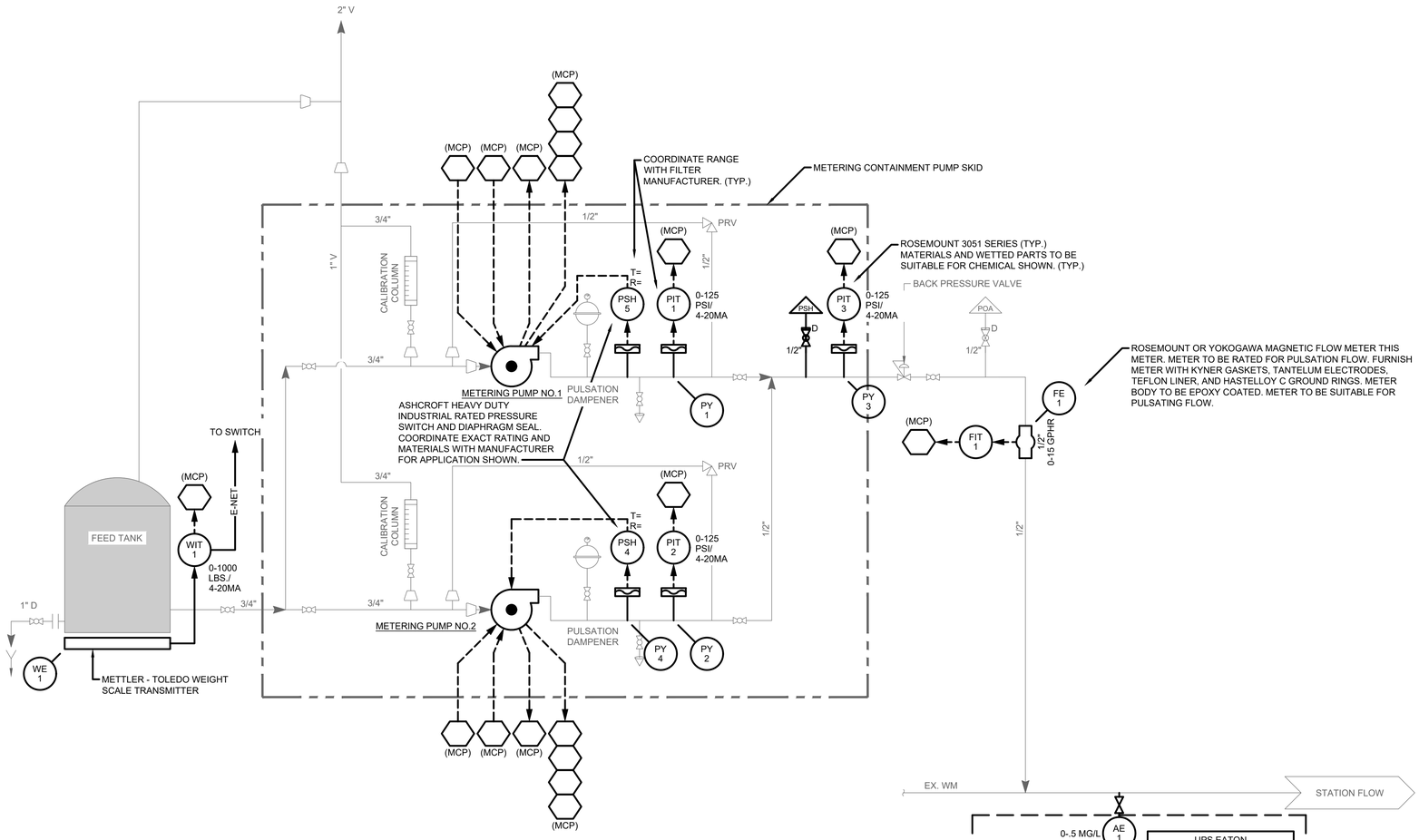
TE 10

SAMPLE PICTURE

PYROMATION 2215-RBF18L3-T-440-385U-S (0-150°F) (TYP.) FURNISH WITH 6' X 6' PVC SCHEDULE 80 BOX, AND MOUNT ON FACE OF BOX. (TYP.)

MOUNT ON SIDE OF RIOP.

MISCELLANEOUS DEVICES



YSI ORTHO PHOSPHATE ANALYZER ALYZAIQ P04-110 PN 825510Y. PROVIDE HARDWARE, AND EQUIPMENT FOR COMPLETE SYSTEM. PROVIDE 2 - 8 HOUR DAYS OF FACTORY STARTUP, CALIBRATION, AND 1 - 8 HOUR DAY OF FIELD TRAINING FOR OWNER AT SITE. FURNISH, AND INSTALL ONLINE UPS (EATON 9PX SERVER. 1 KVA.) FOR ANALYZER.

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CITY OF KALAMAZOO, MICHIGAN
WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

INSTRUMENTATION P&ID PUMP STATION NO.8

Project No.:	200-19743-19004
Designed By:	GCJ
Drawn By:	JLS
Checked By:	WAP/GCJ

I-203
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Bar Measures 1 inch

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(MCP-1)
LSH 1 ROD TYPE FLOAT SWITCH

(MCP-1)
LSH 2 ROD TYPE FLOAT SWITCH

NEW ROD TYPE FLOAT SWITCHES SHALL BE GEMS LS-1900 SERIES 100VA RATED MIN. BUNA-N, DRY CONTACT RATED FOR 2A.

MISCELLANEOUS DEVICES

PRECISION DIGITAL LOOP POWERED DIGITAL INDICATOR IN NEMA 4X ENCLOSURE. (TYP.)

VENT TO ATMOSPHERE.

(MCP)
LI 2
LIT 2 0-9 FT/ 4-20MA
LE 2

VEGA C21 SERIES. PROVIDE MOUNTING HARDWARE AS REQUIRED. COORDINATE WITH TANK SUPPLIER. SENSOR MATERIALS TO BE SUITABLE FOR CHEMICAL SHOWN. (TYP.)

3" V

STORAGE TANK

STORAGE TANK

VENT TO ATMOSPHERE.

3" V

ROD TYPE FLOAT SWITCH. GEMS - FLOAT MATERIAL AND ROD TO BE RATED FOR CHEMICAL SHOWN. (TYP.) COORDINATE OPENING WITH TANK MANUFACTURER.

FEED TANK

LSH 3 TO SWITCH

(MCP)

WIT 1 0-5000 LBS./ 4-20MA

E-NET

1" D

3/4"

WE 1

METTLER - TOLEDO WEIGHT SCALE TRANSMITTER

VENT TO ATMOSPHERE.

CALIBRATION COLUMN

(MCP) (MCP) (MCP) (MCP)

COORDINATE RANGE WITH FILTER MANUFACTURER. (TYP.)

METERING CONTAINMENT PUMP SKID

1/2"

PRV

(MCP)

PIT 1 0-125 PSI/ 4-20MA

PY 1

3/4"

METERING PUMP NO.1

PULSATION DAMPENER

1/2"

PRV

(MCP)

PIT 2 0-125 PSI/ 4-20MA

PY 2

1/2"

3/4"

METERING PUMP NO.2

PULSATION DAMPENER

(MCP) (MCP) (MCP) (MCP)

(MCP)

ROSEMOUNT 3051 SERIES (TYP.) WETTED PARTS TO BE SUITABLE FOR CHEMICAL SHOWN. (TYP.)

(MCP)

PIT 3 0-125 PSI/ 4-20MA

PY 3

BACK PRESSURE VALVE

POA

D

1/2"

ROSEMOUNT OR YOKOGAWA MAGNETIC FLOW METER THIS METER. METER TO BE RATED FOR PULSATION FLOW. FURNISH METER WITH KYNER GASKETS, TANTELUM ELECTRODES, TEFLON LINER, AND HASTELLOY C GROUND RINGS. METER BODY TO BE EPOXY COATED. METER TO BE SUITABLE FOR PULSATING FLOW.

FE 1

1/2" 0-15 GPHR

(MCP)

FIT 1

1/2"

EX. WM

STATION FLOW

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CITY OF KALAMAZOO, MICHIGAN
WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

INSTRUMENTATION P&ID PUMP STATION NO.9

Project No.:	200-19743-19004
Designed By:	GCJ
Drawn By:	JLS
Checked By:	WAP/GCJ

I-204
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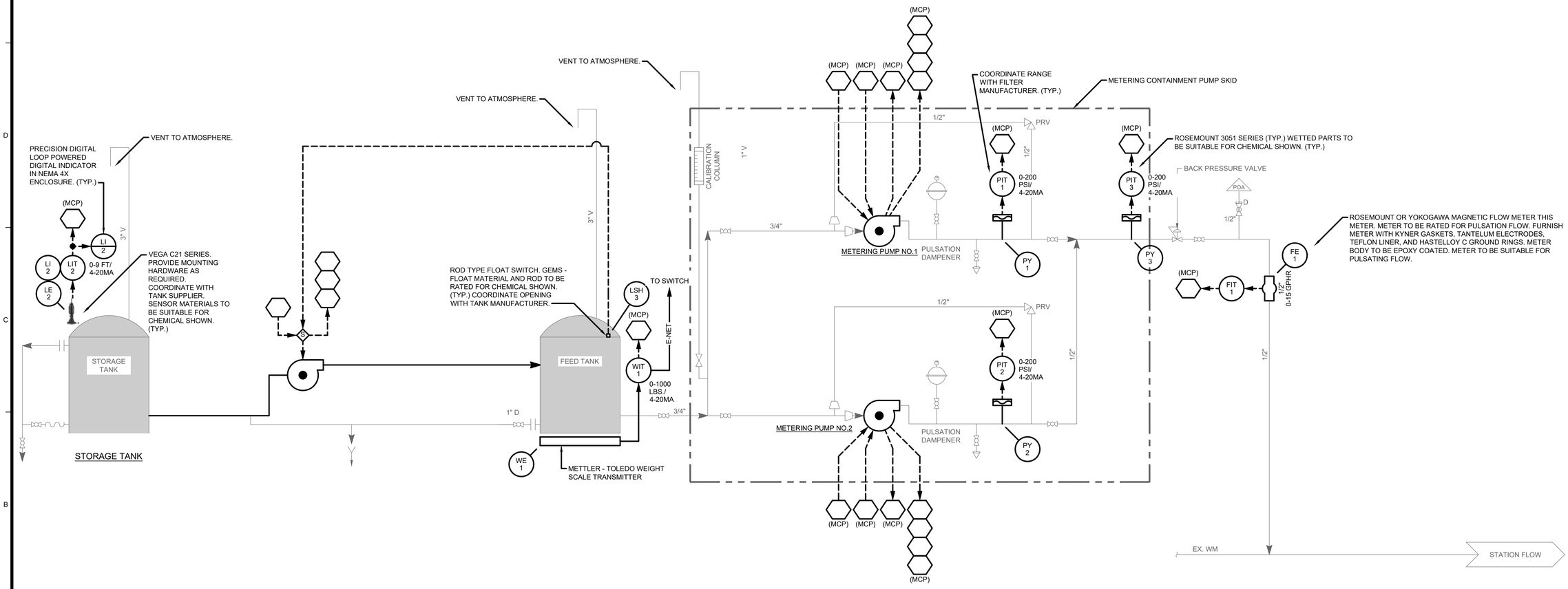
(MCP-1)
LSH 1
ROD TYPE FLOAT SWITCH

(MCP-1)
LSH 2
ROD TYPE FLOAT SWITCH

NEW ROD TYPE FLOAT SWITCHES SHALL BE GEMS LS-1900 SERIES 100VA RATED MIN. BUNA-N, DRY CONTACT RATED FOR 2A.

MISCELLANEOUS DEVICES



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CITY OF KALAMAZOO, MICHIGAN
WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

INSTRUMENTATION P&ID PUMP STATION NO.11

Project No.:	200-19743-19004
Designed By:	GCJ
Drawn By:	JLS
Checked By:	WAP/GCJ

I-205
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Bar Measures 1 inch

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DOOR CONTACTS SHALL BE OMRON/STI MODEL MA-2DPC4 SERIES. PROVIDE JUNCTION BOX AND CHORD GRIP CONNECTORS AT BOX FOR INTERFACING DOOR CONTACTS. WIRING TO CONDUIT/RACEWAY WIRING.

(MCP-1) LSH 1 ROD TYPE FLOAT SWITCH

(MCP-1) LSH 2 ROD TYPE FLOAT SWITCH

(RIOP) ZS 1

(RIOP) ZS 2

(RIOP) HS

(RIOP) TIT 10 / TE 10

NEW ROD TYPE FLOAT SWITCHES SHALL BE GEMS LS-1900 SERIES 100VA RATED MIN. BUNA-N, DRY CONTACT RATED FOR 2A.

MOMENTARY PUSHBUTTON STATION IN NEMA 4X ENCLOSURE (NORMALLY OPEN PUSHBUTTON)

SAMPLE PICTURE

PYROMATION 2215-RBF18L3-T-440-385U-S (0-150°F) (TYP.) FURNISH WITH 6' X 6' PVC SCHEDULE 80 BOX, AND MOUNT ON FACE OF BOX. (TYP.)

MOUNT ON SIDE OF RIOP.

MISCELLANEOUS DEVICES

VENT TO ATMOSPHERE.

VENT TO ATMOSPHERE.

PRECISION DIGITAL LOOP POWERED DIGITAL INDICATOR IN NEMA 4X ENCLOSURE. (TYP.)

VENT TO ATMOSPHERE.

(MCP) LI 2 / LIT 2 / LE 2 — 0-5 FT/ 4-20MA

VEGA C21 SERIES. PROVIDE MOUNTING HARDWARE AS REQUIRED. COORDINATE WITH TANK SUPPLIER. SENSOR MATERIALS TO BE SUITABLE FOR CHEMICAL SHOWN. (TYP.)

STORAGE TANK 300 GAL

STORAGE TANK

3" V

3" V

ROD TYPE FLOAT SWITCH. GEMS - FLOAT MATERIAL AND ROD TO BE RATED FOR CHEMICAL SHOWN. (TYP.) COORDINATE OPENING WITH TANK MANUFACTURER.

LSH 3 — TO SWITCH

(MCP) WIT 1 — 0-1000 LBS./ 4-20MA — E-NET

FEED TANK

1" D

3/4"

WE 1 — METTLER - TOLEDO WEIGHT SCALE TRANSMITTER

(MCP) (MCP) (MCP) (MCP)

COORDINATE RANGE WITH FILTER MANUFACTURER. (TYP.)

METERING CONTAINMENT PUMP SKID

CALIBRATION COLUMN

1/2"

PRV

(MCP) PIT 1 — 0-100 PSI/ 4-20MA — PY 1

3/4"

METERING PUMP NO.1

PULSATION DAMPENER

(MCP) PIT 3 — 0-100 PSI/ 4-20MA — PY 3

ROSEMOUNT 3051 SERIES (TYP.) MATERIALS AND WETTED PARTS TO BE SUITABLE FOR CHEMICAL SHOWN. (TYP.)

BACK PRESSURE VALVE

POA

D

1/2"

1/2"

PRV

(MCP) PIT 2 — 0-100 PSI/ 4-20MA — PY 2

1/2"

3/4"

METERING PUMP NO.2

PULSATION DAMPENER

(MCP) (MCP) (MCP) (MCP)

(MCP) FIT 1 — 1/2" 0-15 GPHR — FE 1

ROSEMOUNT OR YOKOGAWA MAGNETIC FLOW METER THIS METER. METER TO BE RATED FOR PULSATION FLOW. FURNISH METER WITH KYNER GASKETS, TANTELUM ELECTRODES, TEFLON LINER, AND HASTELLOY C GROUND RINGS. METER BODY TO BE EPOXY COATED. METER TO BE SUITABLE FOR PULSATING FLOW.

1/2"

EX. WM

STATION FLOW

TETRA TECH

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	11/29/23	ISSUED FOR BID	

CITY OF KALAMAZOO, MICHIGAN
WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

INSTRUMENTATION P&ID PUMP STATION NO.12

Project No.:	200-19743-19004
Designed By:	GCJ
Drawn By:	JLS
Checked By:	WAP/GCJ

I-206

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Bar Measures 1 inch

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DOOR CONTACTS SHALL BE OMRON/STI MODEL MA-2DPC4 SERIES. PROVIDE JUNCTION BOX AND CHORD GRIP CONNECTORS AT BOX FOR INTERFACING DOOR CONTACTS. WIRING TO CONDUIT/RACEWAY WIRING.

(MCP-1) LSH 1 ROD TYPE FLOAT SWITCH

(MCP-1) LSH 2 ROD TYPE FLOAT SWITCH

(RIOP) 31 1

(RIOP) 31 2

(RIOP) HS

(RIOP) TIT 10 / TE 10

NEW ROD TYPE FLOAT SWITCHES SHALL BE GEMS LS-1900 SERIES 100VA RATED MIN. BUNA-N, DRY CONTACT RATED FOR 2A.

MOMENTARY PUSHBUTTON STATION IN NEMA 4X ENCLOSURE (NORMALLY OPEN PUSHBUTTON)

SAMPLE PICTURE

PYROMATION 2215-RBF18L3-T-440-385U-S (0-150°F) (TYP.) FURNISH WITH 6' X 6' PVC SCHEDULE 80 BOX, AND MOUNT ON FACE OF BOX. (TYP.)

MOUNT ON SIDE OF RIOP.

MISCELLANEOUS DEVICES

VENT TO ATMOSPHERE.

VENT TO ATMOSPHERE.

PRECISION DIGITAL LOOP POWERED DIGITAL INDICATOR IN NEMA 4X ENCLOSURE. (TYP.)

VENT TO ATMOSPHERE.

(MCP) LI 2 / LIT 2 / LE 2 — 0-5 FT/ 4-20MA

VEGA C21 SERIES. PROVIDE MOUNTING HARDWARE AS REQUIRED. COORDINATE WITH TANK SUPPLIER. SENSOR MATERIALS TO BE SUITABLE FOR CHEMICAL SHOWN. (TYP.)

3" V

STORAGE TANK 300 GAL

STORAGE TANK

ROD TYPE FLOAT SWITCH. GEMS - FLOAT MATERIAL AND ROD TO BE RATED FOR CHEMICAL SHOWN. (TYP.) COORDINATE OPENING WITH TANK MANUFACTURER.

3" V

FEED TANK

LSH 3 — TO SWITCH

(MCP) WIT 1 — 0-1000 LBS./ 4-20MA — E-NET

1" D

3/4"

WE 1 — METTLER - TOLEDO WEIGHT SCALE TRANSMITTER

(MCP) (MCP) (MCP) (MCP)

COORDINATE RANGE WITH FILTER MANUFACTURER. (TYP.)

METERING CONTAINMENT PUMP SKID

CALIBRATION COLUMN

1/2"

PRV

(MCP) PIT 1 — 0-100 PSI/ 4-20MA

3/4"

METERING PUMP NO.1

PULSATION DAMPENER

PY 1

(MCP) PIT 3 — 0-100 PSI/ 4-20MA

ROSEMOUNT 3051 SERIES (TYP.) MATERIALS AND WETTED PARTS TO BE SUITABLE FOR CHEMICAL SHOWN. (TYP.)

BACK PRESSURE VALVE

POA

D

1/2"

PY 3

(MCP) FIT 1 — 1/2" 0-15 GPHR — FE 1

ROSEMOUNT OR YOKOGAWA MAGNETIC FLOW METER THIS METER. METER TO BE RATED FOR PULSATION FLOW. FURNISH METER WITH KYNER GASKETS, TANTELUM ELECTRODES, TEFLON LINER, AND HASTELLOY C GROUND RINGS. METER BODY TO BE EPOXY COATED. METER TO BE SUITABLE FOR PULSATING FLOW.

1/2"

1/2"

PRV

(MCP) PIT 2 — 0-100 PSI/ 4-20MA

1/2"

3/4"

METERING PUMP NO.2

PULSATION DAMPENER

PY 2

(MCP) (MCP) (MCP) (MCP)

EX. WM

STATION FLOW

MARK	DATE	DESCRIPTION
	11/29/23	ISSUED FOR BID

BY

CITY OF KALAMAZOO, MICHIGAN

WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

INSTRUMENTATION P&ID PUMP STATION NO.14

Project No.:	200-19743-19004
Designed By:	GCJ
Drawn By:	JLS
Checked By:	WAP/GCJ

I-207

OF 36

Bar Measures 1 inch

TETRA TECH
www.tetratech.com
1136 OAK VALLEY DRIVE, SUITE 100
ANN ARBOR, MI 48108
PHONE: (734) 665-6000 FAX: (734) 213-3003

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11/28/2023 3:16:15 PM - \\TT.LOCAL\ER\PROJECTS\ANN ARBOR\ER\19743\200-19743-19004\CAD\SHEETFILES\EIWATER SYSTEM CORROSION CONTROL IMPROVEMENTS\I-207_PS 14 P&ID.DWG - SHANK, JASON

DOOR CONTACTS SHALL BE OMRON/STI MODEL MA-2DPC4 SERIES. PROVIDE JUNCTION BOX AND CHORD GRIP CONNECTORS AT BOX FOR INTERFACING DOOR CONTACTS. WIRING TO CONDUIT/RACEWAY WIRING.

(MCP-1) LSH 1 ROD TYPE FLOAT SWITCH

(MCP-1) LSH 2 ROD TYPE FLOAT SWITCH

(RIOP) 31 1

(RIOP) 31 2

(RIOP) HS

(RIOP) TIT 10

(RIOP) TE 10

NEW ROD TYPE FLOAT SWITCHES SHALL BE GEMS LS-1900 SERIES 100VA RATED MIN. BUNA-N, DRY CONTACT RATED FOR 2A.

MOMENTARY PUSHBUTTON STATION IN NEMA 4X ENCLOSURE (NORMALLY OPEN PUSHBUTTON)

SAMPLE PICTURE

PYROMATION 2215-RBF18L3-T-440-385U-S (0-150°F) (TYP.) FURNISH WITH 6' X 6' PVC SCHEDULE 80 BOX, AND MOUNT ON FACE OF BOX. (TYP.)

MOUNT ON SIDE OF RIOP.

MISCELLANEOUS DEVICES

VENT TO ATMOSPHERE.

VENT TO ATMOSPHERE.

VENT TO ATMOSPHERE.

PRECISION DIGITAL LOOP POWERED DIGITAL INDICATOR IN NEMA 4X ENCLOSURE. (TYP.)

(MCP) LI 2

LI 2 LIT 2 LE 2 0-9 FT/ 4-20MA

VEGA C21 SERIES. PROVIDE MOUNTING HARDWARE AS REQUIRED. COORDINATE WITH TANK SUPPLIER. SENSOR MATERIALS TO BE SUITABLE FOR CHEMICAL SHOWN. (TYP.)

3" V

3" V

STORAGE TANK

STORAGE TANK

ROD TYPE FLOAT SWITCH. GEMS - FLOAT MATERIAL AND ROD TO BE RATED FOR CHEMICAL SHOWN. (TYP.) COORDINATE OPENING WITH TANK MANUFACTURER.

TO SWITCH

LSH 3

(MCP) WIT 1 0-1000 LBS./ 4-20MA

E-NET

FEED TANK

1" D

3/4"

WE 1

METTLER - TOLEDO WEIGHT SCALE TRANSMITTER

(MCP) (MCP) (MCP) (MCP)

COORDINATE RANGE WITH FILTER MANUFACTURER. (TYP.)

METERING CONTAINMENT PUMP SKID

CALIBRATION COLUMN

1/2"

PRV

(MCP) PIT 1 0-125 PSI/ 4-20MA

3/4"

METERING PUMP NO.1

PULSATION DAMPENER

PY 1

(MCP) PIT 3 0-125 PSI/ 4-20MA

ROSEMOUNT 3051 SERIES (TYP.) MATERIALS AND WETTED PARTS TO BE SUITABLE FOR CHEMICAL SHOWN. (TYP.)

BACK PRESSURE VALVE

POA

D

1/2"

PY 3

(MCP) FIT 1 1/2" 0-15 GPHR

FE 1

ROSEMOUNT OR YOKOGAWA MAGNETIC FLOW METER THIS METER. METER TO BE RATED FOR PULSATION FLOW. FURNISH METER WITH KYNER GASKETS, TANTELUM ELECTRODES, TEFLON LINER, AND HASTELLOY C GROUND RINGS. METER BODY TO BE EPOXY COATED. METER TO BE SUITABLE FOR PULSATING FLOW.

1/2"

1/2"

PRV

(MCP) PIT 2 0-125 PSI/ 4-20MA

1/2"

3/4"

METERING PUMP NO.2

PULSATION DAMPENER

PY 2

(MCP) (MCP) (MCP) (MCP)

EX. WM

STATION FLOW

TETRA TECH

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MARK	DATE	DESCRIPTION	BY
	11/29/23	ISSUED FOR BID	

CITY OF KALAMAZOO, MICHIGAN

WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

INSTRUMENTATION P&ID PUMP STATION NO.22

Project No.:	200-19743-19004
Designed By:	GCJ
Drawn By:	JLS
Checked By:	WAP/GCJ

I-208

OF 36

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Bar Measures 1 inch

11/28/2023 3:16:21 PM - \\TT.LOCAL\IER\PROJECTS\ANN ARBOR\IER\19743\200-19743-19004\CAD\SHEETFILES\IEWATER SYSTEM CORROSION CONTROL IMPROVEMENTS\I-208_PS 22 P&ID.DWG - SHANK, JASON

VENT TO ATMOSPHERE.

PRECISION DIGITAL LOOP POWERED DIGITAL INDICATOR IN NEMA 4X ENCLOSURE. (TYP.)

(MCP)

LI 3

3" V

LI 3 | LIT 3 | 0-9 FT/ 4-20MA

LE 3

VEGA C21 SERIES. PROVIDE MOUNTING HARDWARE AS REQUIRED. COORDINATE WITH TANK SUPPLIER. SENSOR MATERIALS TO BE SUITABLE FOR CHEMICAL SHOWN. (TYP.)

STORAGE TANK NO.2

STORAGE TANK NO.2

VENT TO ATMOSPHERE

PRECISION DIGITAL LOOP POWERED DIGITAL INDICATOR IN NEMA 4X ENCLOSURE. (TYP.)

(MCP)

LI 2

3" V

LI 2 | LIT 2 | 0-9 FT/ 4-20MA

LE 2

VEGA C21 SERIES. PROVIDE MOUNTING HARDWARE AS REQUIRED. COORDINATE WITH TANK SUPPLIER. SENSOR MATERIALS TO BE SUITABLE FOR CHEMICAL SHOWN. (TYP.)

STORAGE TANK NO.1

STORAGE TANK NO.1

(MCP-1)

LSH 1 ROD TYPE FLOAT SWITCH

(MCP-1)

LSH 2 ROD TYPE FLOAT SWITCH

NEW ROD TYPE FLOAT SWITCHES SHALL BE GEMS LS-1900 SERIES 100VA RATED MIN. BUNA-N, DRY CONTACT RATED FOR 2A.

MISCELLANEOUS DEVICES

VENT TO ATMOSPHERE.

VENT TO ATMOSPHERE.

ROD TYPE FLOAT SWITCH. GEMS - FLOAT MATERIAL AND ROD TO BE RATED FOR CHEMICAL SHOWN. (TYP.) COORDINATE OPENING WITH TANK MANUFACTURER.

LSH 3

TO SWITCH

(MCP)

WIT 1

E-NET

0-1000 LBS./ 4-20MA

FEED TANK

1" D

3/4"

WE 1

METTLER - TOLEDO WEIGHT SCALE TRANSMITTER

3" V

CALIBRATION COLUMN

1" V

(MCP) (MCP) (MCP) (MCP)

COORDINATE RANGE WITH FILTER MANUFACTURER. (TYP.)

METERING CONTAINMENT PUMP SKID

1/2"

PRV

(MCP)

PIT 1 0-125 PSI/ 4-20MA

1/2"

3/4"

METERING PUMP NO.1

PULSATION DAMPENER

PY 1

(MCP)

PIT 3 0-125 PSI/ 4-20MA

ROSEMOUNT 3051 SERIES (TYP.) WETTED PARTS TO BE SUITABLE FOR CHEMICAL SHOWN. (TYP.)

BACK PRESSURE VALVE

POA

D

1/2"

PY 3

ROSEMOUNT OR YOKOGAWA MAGNETIC FLOW METER THIS METER. METER TO BE RATED FOR PULSATION FLOW. FURNISH METER WITH KYNER GASKETS, TANTELUM ELECTRODES, TEFLON LINER, AND HASTELLOY C GROUND RINGS. METER BODY TO BE EPOXY COATED. METER TO BE SUITABLE FOR PULSATING FLOW.

FE 1

1/2" 0-15 GPHR

(MCP)

FIT 1

1/2"

1/2"

PRV

(MCP)

PIT 2 0-125 PSI/ 4-20MA

1/2"

3/4"

METERING PUMP NO.2

PULSATION DAMPENER

PY 2

(MCP) (MCP) (MCP) (MCP)

EX. WM

STATION FLOW

TETRA TECH

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MARK	DATE	DESCRIPTION	BY
	11/29/23	ISSUED FOR BID	

CITY OF KALAMAZOO, MICHIGAN
WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

INSTRUMENTATION P&ID PUMP STATION NO.24

Project No.:	200-19743-19004
Designed By:	GCJ
Drawn By:	JLS
Checked By:	WAP/GCJ

I-209
OF 36

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Bar Measures 1 inch

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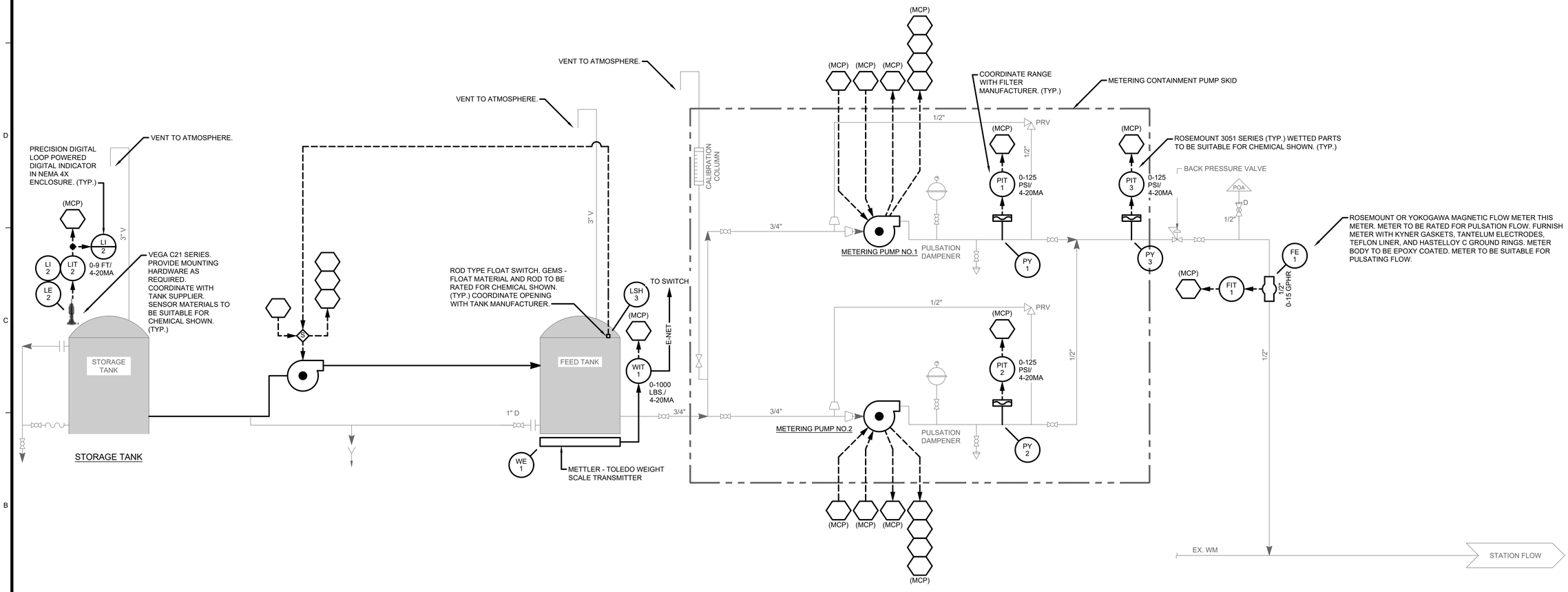
(MCP-1)
LSH 1
ROD TYPE FLOAT SWITCH

(MCP-1)
LSH 2
ROD TYPE FLOAT SWITCH

NEW ROD TYPE FLOAT SWITCHES SHALL BE GEMS LS-1900 SERIES 100VA RATED MIN. BUNA-N, DRY CONTACT RATED FOR 2A.

MISCELLANEOUS DEVICES



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CITY OF KALAMAZOO, MICHIGAN
WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

INSTRUMENTATION P&ID PUMP STATION NO.25

Project No.:	200-19743-19004
Designed By:	GCJ
Drawn By:	JLS
Checked By:	WAP/GCJ

I-210
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Copyright: Tetra Tech

Bar Measures 1 inch

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(MCP-1)
LSH 1
ROD TYPE FLOAT SWITCH

(MCP-1)
LSH 2
ROD TYPE FLOAT SWITCH

NEW ROD TYPE FLOAT SWITCHES SHALL BE GEMS LS-1900 SERIES 100VA RATED MIN. BUNA-N, DRY CONTACT RATED FOR 2A.

MISCELLANEOUS DEVICES

PRECISION DIGITAL LOOP POWERED DIGITAL INDICATOR IN NEMA 4X ENCLOSURE. (TYP.)

VENT TO ATMOSPHERE.

(MCP)
LI 2
LIT 2
LE 2
0-9 FT/ 4-20MA

VEGA C21 SERIES. PROVIDE MOUNTING HARDWARE AS REQUIRED. COORDINATE WITH TANK SUPPLIER. SENSOR MATERIALS TO BE SUITABLE FOR CHEMICAL SHOWN. (TYP.)

STORAGE TANK

STORAGE TANK

VENT TO ATMOSPHERE.

3" V

ROD TYPE FLOAT SWITCH. GEMS - FLOAT MATERIAL AND ROD TO BE RATED FOR CHEMICAL SHOWN. (TYP.) COORDINATE OPENING WITH TANK MANUFACTURER.

FEED TANK

TO SWITCH
LSH 3
(MCP)
WIT 1
0-1000 LBS./ 4-20MA
E-NET

1" D

WE 1
METTLER - TOLEDO WEIGHT SCALE TRANSMITTER

VENT TO ATMOSPHERE.

CALIBRATION COLUMN

(MCP) (MCP) (MCP) (MCP)

COORDINATE RANGE WITH FILTER MANUFACTURER. (TYP.)

METERING CONTAINMENT PUMP SKID

1/2"

PRV

(MCP)
PIT 1
0-150 PSI/ 4-20MA

3/4"

METERING PUMP NO.1

PULSATION DAMPENER

PY 1

(MCP)
PIT 3
0-150 PSI/ 4-20MA

ROSEMOUNT 3051 SERIES (TYP.) WETTED PARTS TO BE SUITABLE FOR CHEMICAL SHOWN. (TYP.)

BACK PRESSURE VALVE

POA

D

1/2"

PY 3

(MCP)
FIT 1
1/2" 0-15 GPHR

FE 1

ROSEMOUNT OR YOKOGAWA MAGNETIC FLOW METER THIS METER. METER TO BE RATED FOR PULSATION FLOW. FURNISH METER WITH KYNER GASKETS, TANTELUM ELECTRODES, TEFLON LINER, AND HASTELLOY C GROUND RINGS. METER BODY TO BE EPOXY COATED. METER TO BE SUITABLE FOR PULSATING FLOW.

1/2"

(MCP)
PIT 2
0-150 PSI/ 4-20MA

PRV

1/2"

3/4"

METERING PUMP NO.2

PULSATION DAMPENER

PY 2

1/2"

(MCP) (MCP) (MCP) (MCP)

EX. WM

STATION FLOW

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CITY OF KALAMAZOO, MICHIGAN
WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

INSTRUMENTATION P&ID PUMP STATION NO.39

Project No.:	200-19743-19004
Designed By:	GCJ
Drawn By:	JLS
Checked By:	WAP/GCJ

I-211
OF 36

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Bar Measures 1 inch

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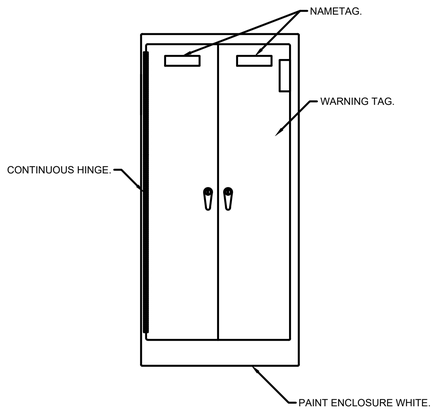
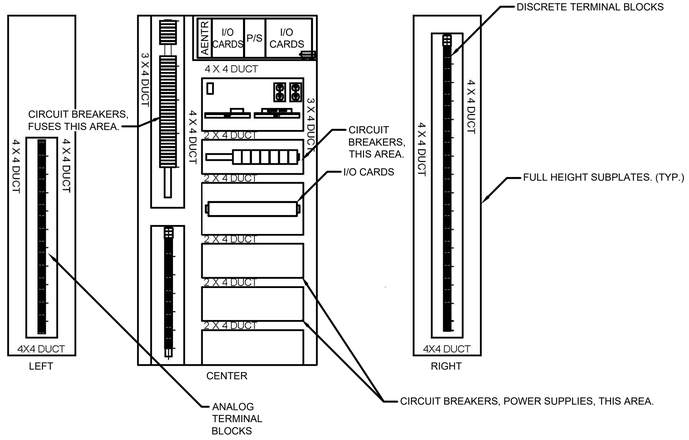


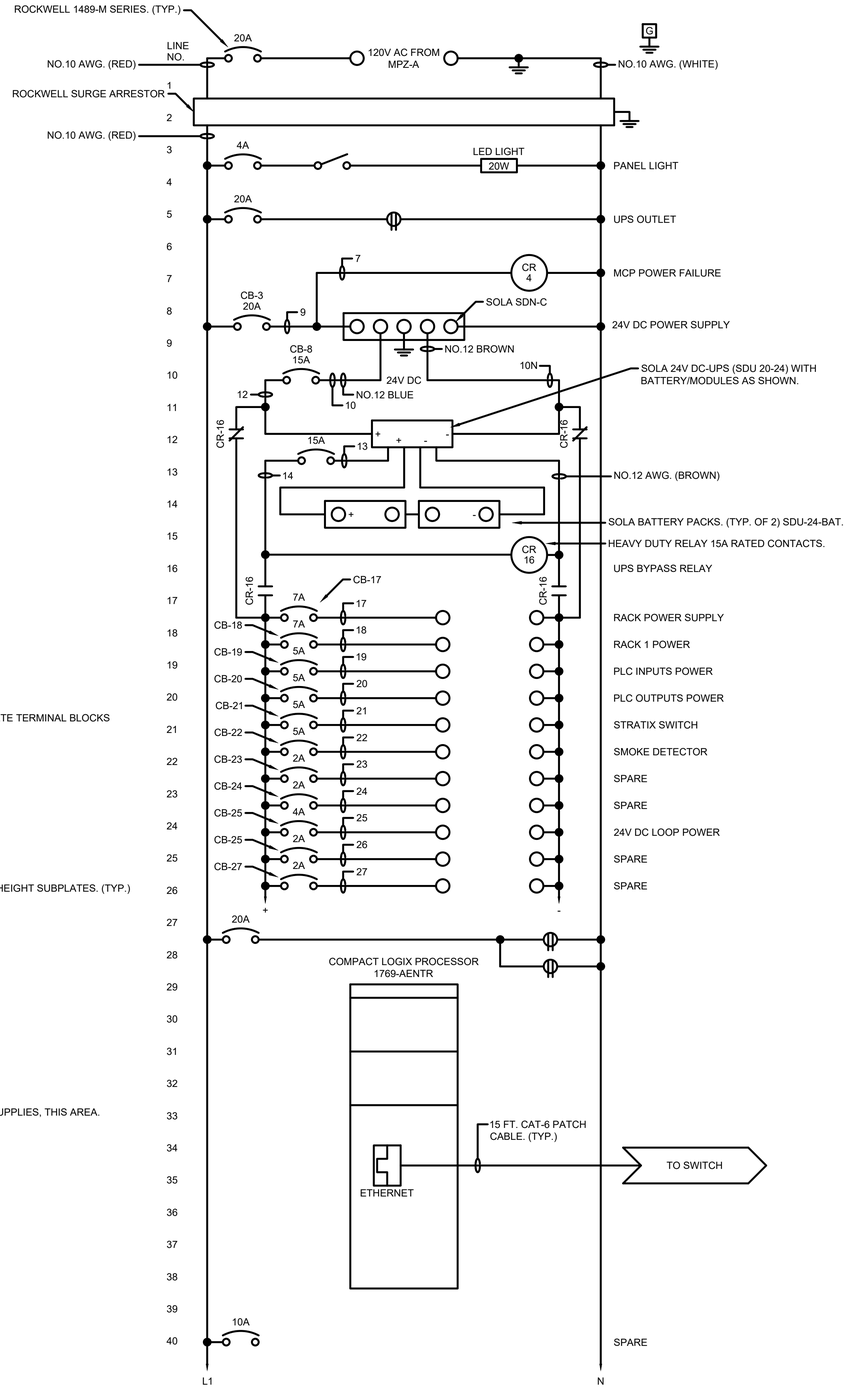
PUMP STATION NO.8 MAIN CONTROL PANEL LAYOUT

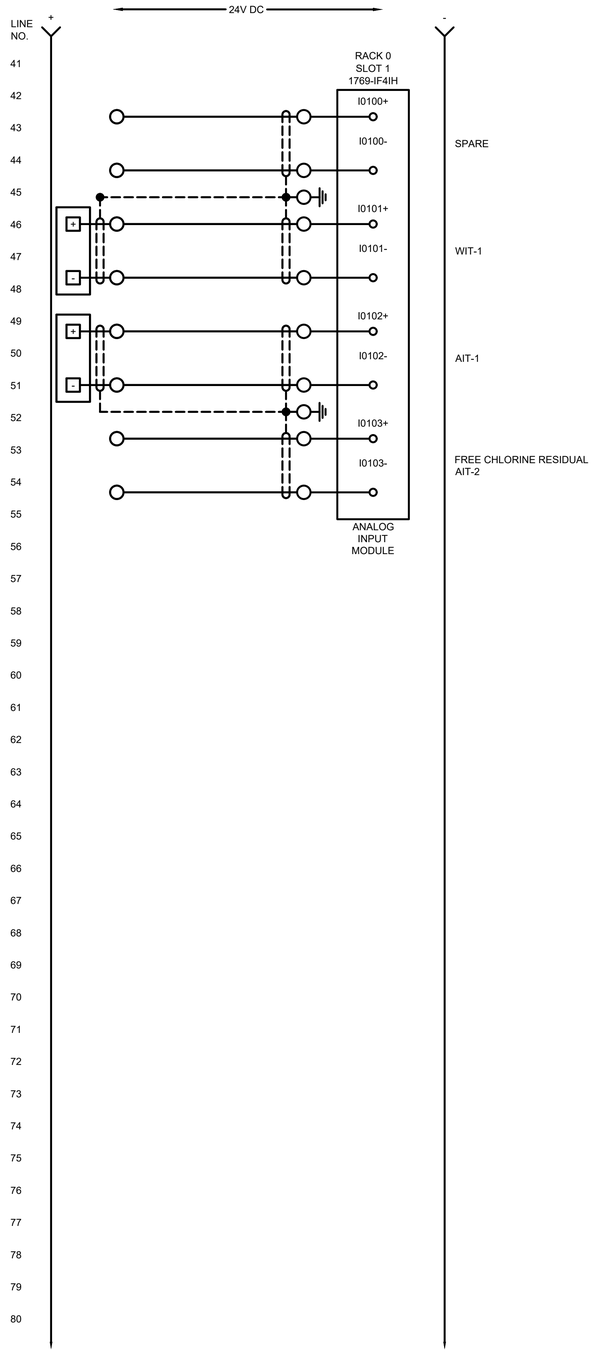
NEMA 12 ENCLOSURE
SIZE: PROCESSOR SECTION - 60"H X 52"W X 22"D (MIN.)
PAINT ENCLOSURE WHITE



GENERAL SUBPLATE LAYOUT

1/16"=1"
PAINT INSIDE GLOSS WHITE
NOTE: NOT ALL SUBPLATE DEVICES ARE SHOWN





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PHONE: (734) 665-6000 FAX: (734) 213-3003

MARK	DATE	DESCRIPTION
	11/29/23	ISSUED FOR BID

CITY OF KALAMAZOO, MICHIGAN
WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

INSTRUMENTATION
RIOP PANEL 8 WIRING DIAGRAM

Project No.:	200-19743-19004
Designed By:	GCJ
Drawn By:	JLS
Checked By:	WAP/GCJ

I-300
OF 36

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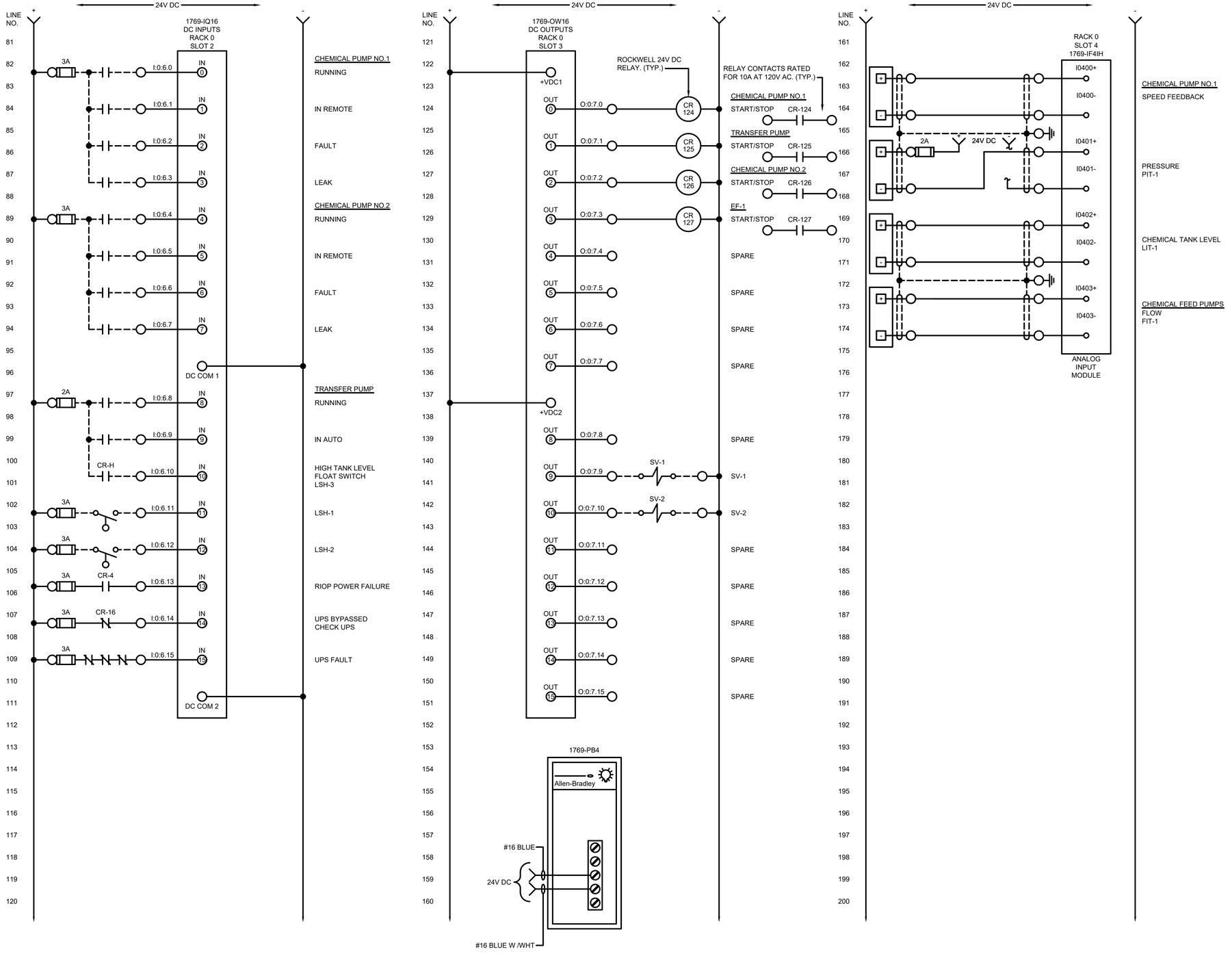
Bar Measures 1 inch

11/28/2023 3:16:45 PM - \\TT.LOCAL\ER\PROJECTS\ANN ARBOR\ER\19743\200-19743-19004\CAD\SHEETFILES\EWATER SYSTEM CORROSION CONTROL IMPROVEMENTS\I-300_PS PNL 8 WIR DIA.DWG - SHANK, JASON



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1136 OAK VALLEY DRIVE, SUITE 100
ANN ARBOR, MI 48108
PHONE: (734) 665-6000 FAX: (734) 213-3003

MARK	DATE	DESCRIPTION	BY
	11/29/23	ISSUED FOR BID	

CITY OF KALAMAZOO, MICHIGAN
WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

INSTRUMENTATION
RIOP PANEL 8 WIRING DIAGRAM

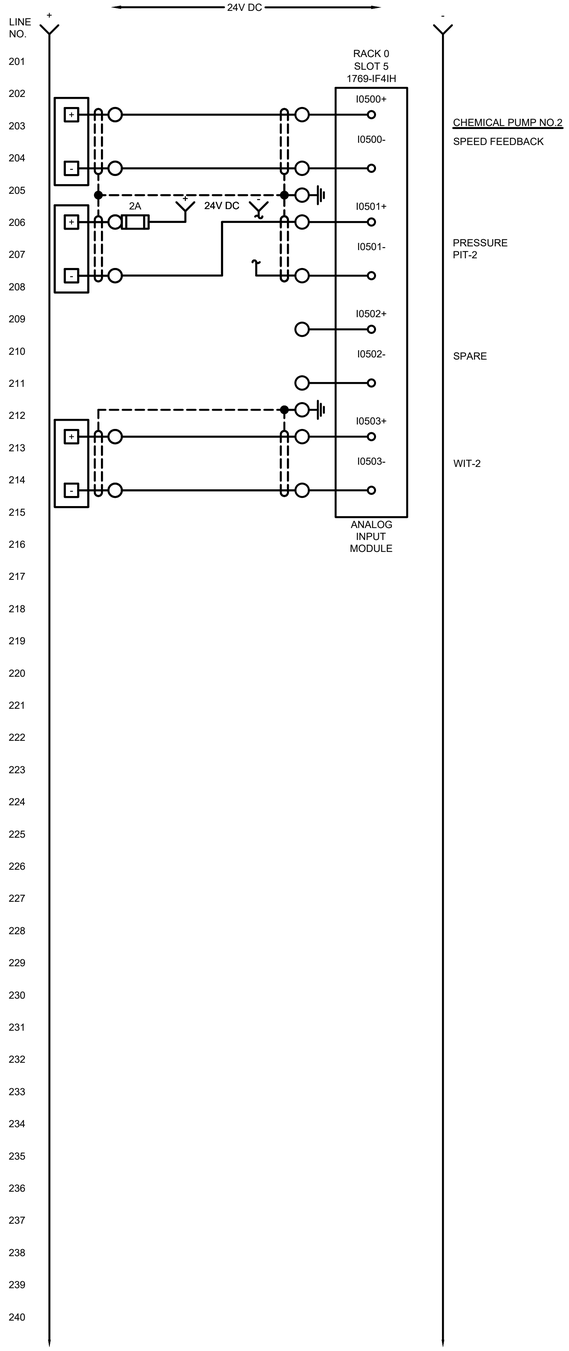
Project No.:	200-19743-19004
Designed By:	GCJ
Drawn By:	JLS
Checked By:	WAP/GCJ

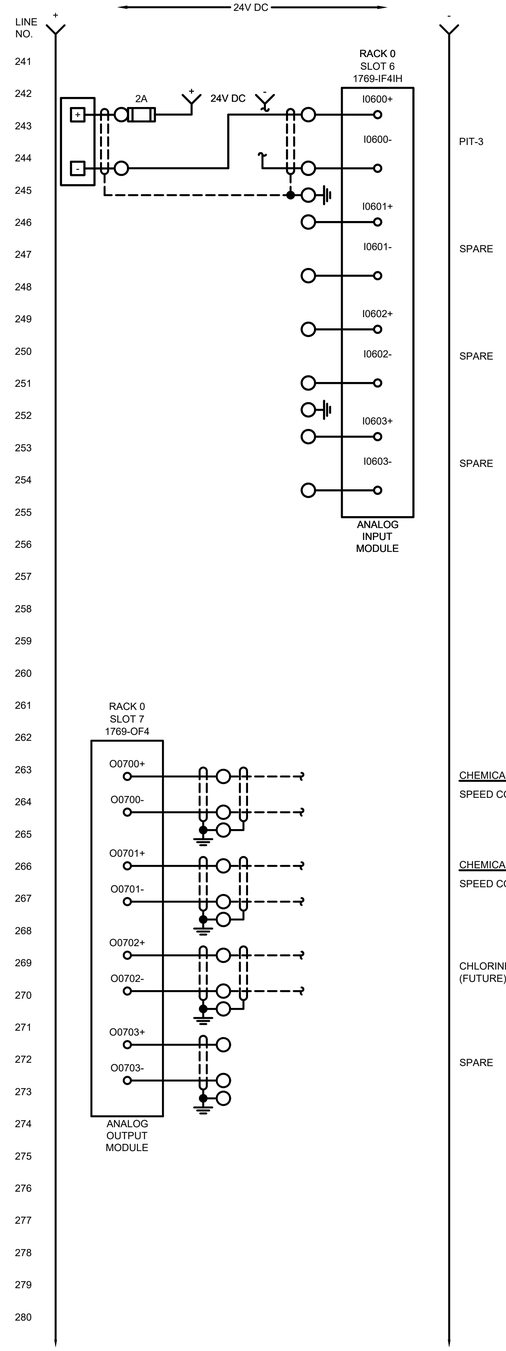
I-301
OF 36

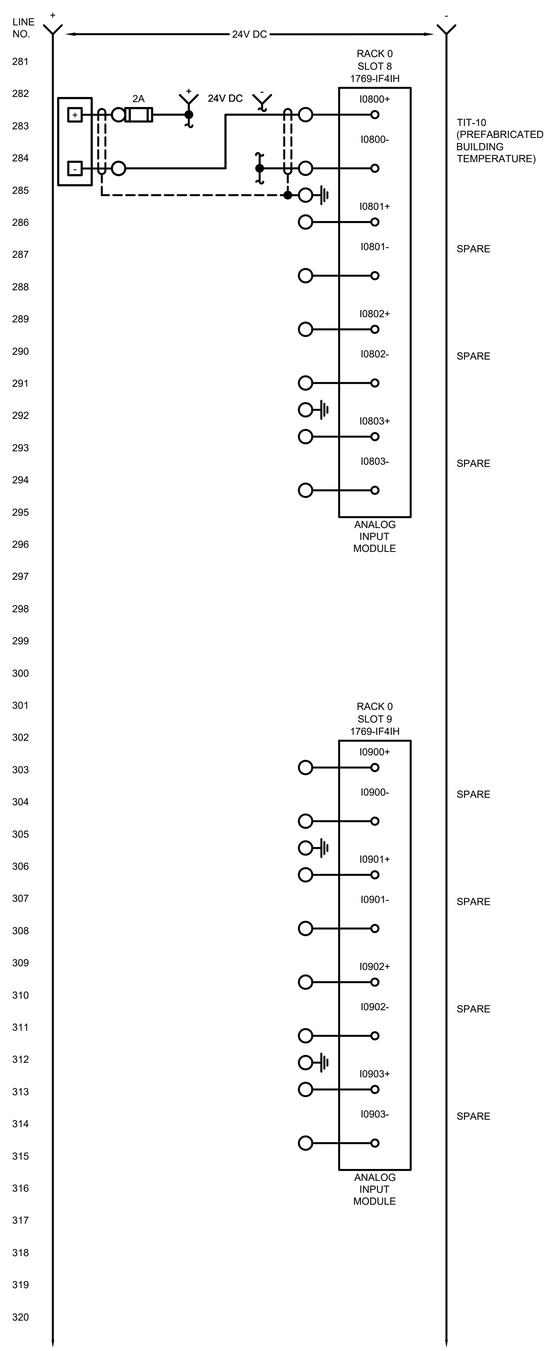
Copyright: Tetra Tech

Bar Measures 1 inch

11/28/2023 3:16:51 PM - \\TT.LOCAL\IER\PROJECTS\ANN ARBOR\IER\19743\200-19743-19004\CAD\SHEETFILES\E\WATER SYSTEM CORROSION CONTROL IMPROVEMENTS\I-301_PS PNL 8 WIR DIA_II.DWG - SHANK, JASON







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ANN ARBOR, MI 48108
PHONE: (734) 665-6000 FAX: (734) 213-3003

MARK	DATE	DESCRIPTION	BY
	11/29/23	ISSUED FOR BID	

CITY OF KALAMAZOO, MICHIGAN
WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

INSTRUMENTATION
RIOP PANEL 8 WIRING DIAGRAM

Project No.:	200-19743-19004
Designed By:	GCJ
Drawn By:	JLS
Checked By:	WAP/GCJ

I-302
OF 36

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Bar Measures 1 inch

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TETRA TECH
www.tetratech.com
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ANN ARBOR, MI 48108
PHONE: (734) 665-6000 FAX: (734) 213-3003

MARK	DATE	DESCRIPTION
	11/29/23	ISSUED FOR BID

BY

CITY OF KALAMAZOO, MICHIGAN
WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

INSTRUMENTATION
RIOP PANEL 8 WIRING DIAGRAM

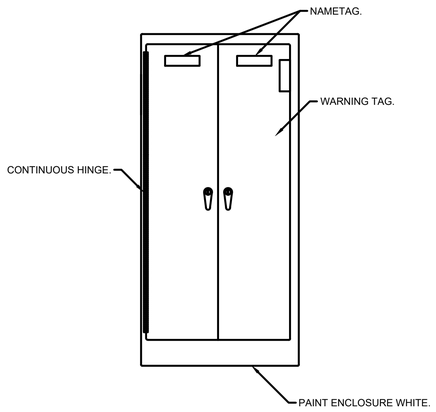
Project No.:	200-19743-19004
Designed By:	GCJ
Drawn By:	JLS
Checked By:	WAP/GCJ

I-303
OF 36

Copyright: Tetra Tech

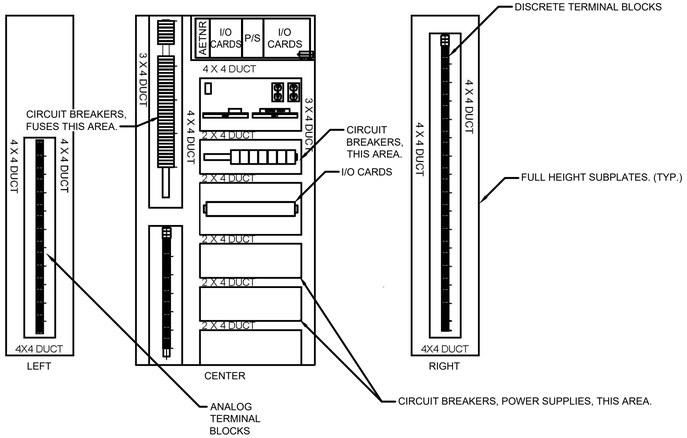
Bar Measures 1 inch

11/28/2023 3:17:02 PM - \\TT.LOCAL\IER\PROJECTS\ANN ARBOR\IER\19743\200-19743-19004\CAD\SHEETFILES\E\WATER SYSTEM CORROSION CONTROL IMPROVEMENTS\I-303_PS PNL 8 WIR DIA_IV.DWG - SHANK, JASON



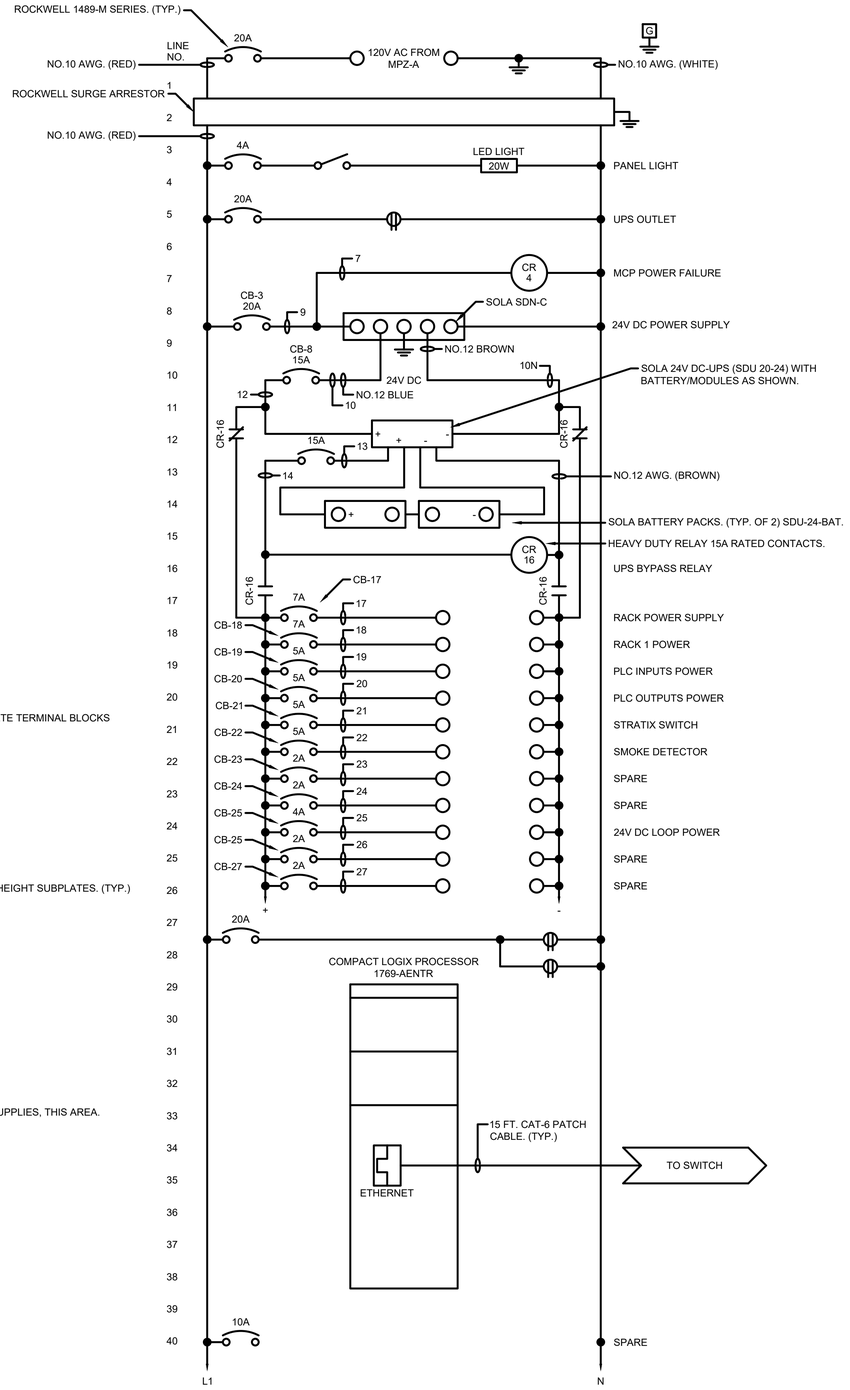
PUMP STATION NO.12 MAIN CONTROL PANEL LAYOUT

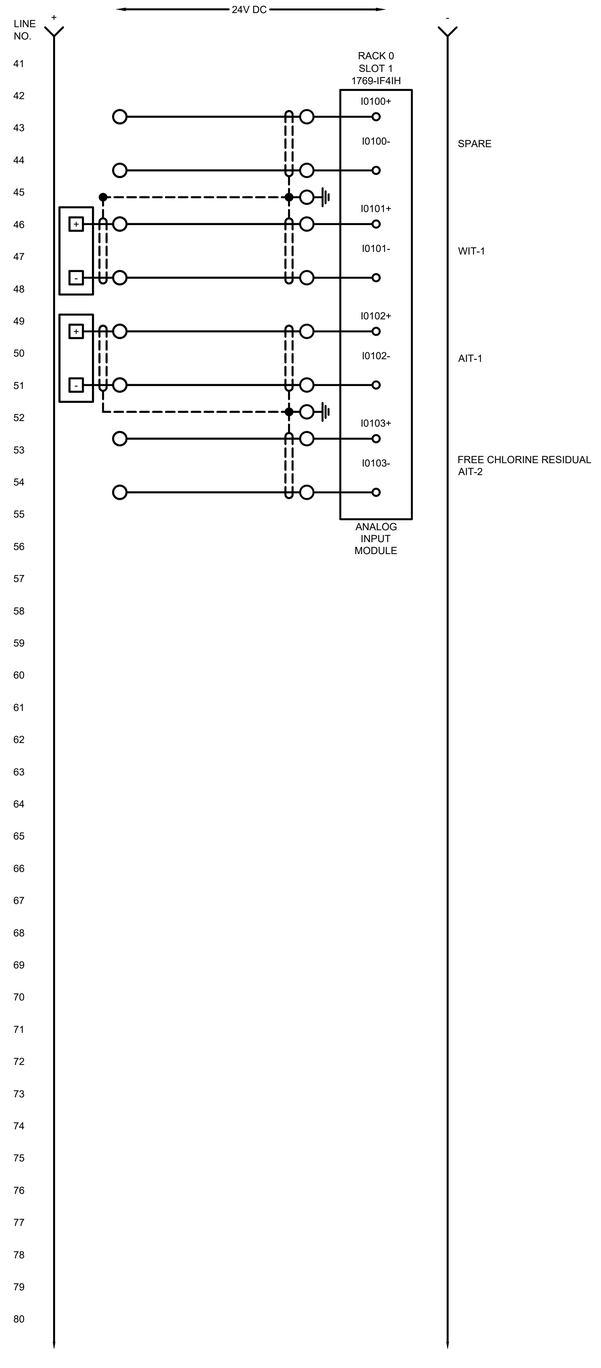
NEMA 12 ENCLOSURE
SIZE: PROCESSOR SECTION - 60"H X 52"W X 22"D (MIN.)
PAINT ENCLOSURE WHITE



GENERAL SUBPLATE LAYOUT

1/16"=1"
PAINT INSIDE GLOSS WHITE
NOTE: NOT ALL SUBPLATE DEVICES ARE SHOWN





TETRA TECH
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1136 OAK VALLEY DRIVE, SUITE 100
ANN ARBOR, MI 48108
PHONE: (734) 665-6000 FAX: (734) 213-3003

MARK	DATE	DESCRIPTION
	11/29/23	ISSUED FOR BID

CITY OF KALAMAZOO, MICHIGAN
WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

INSTRUMENTATION
RIOP PANEL 12 WIRING DIAGRAM

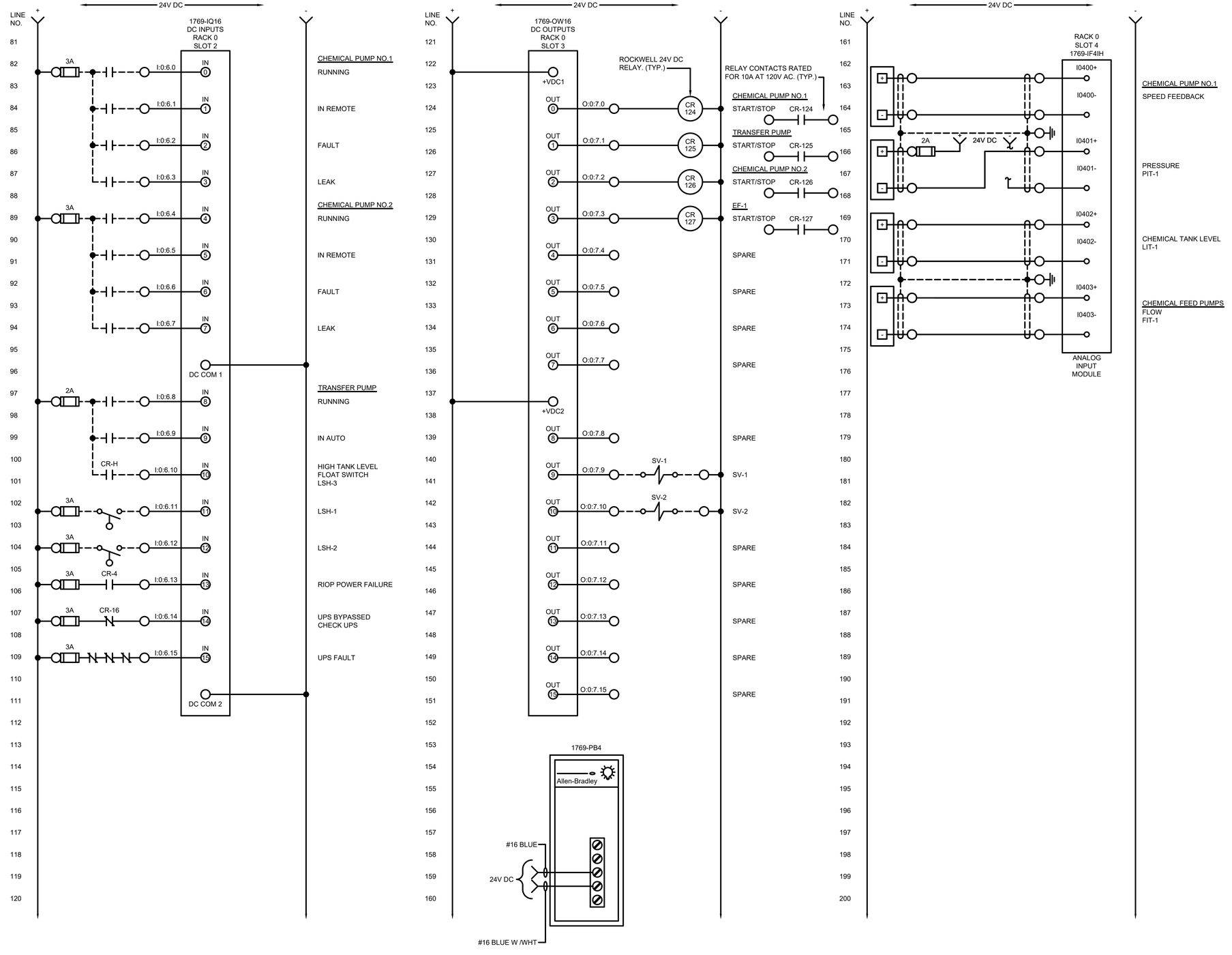
Project No.:	200-19743-19004
Designed By:	GCJ
Drawn By:	JLS
Checked By:	WAP/GCJ

I-304
OF 36

Copyright: Tetra Tech

Bar Measures 1 inch

11/28/2023 3:17:07 PM - \\TT.LOCAL\ER\PROJECTS\ANN ARBOR\ER\19743\200-19743-19004\CAD\SHEETFILES\EWATER SYSTEM CORROSION CONTROL IMPROVEMENTS\I-304_PS PNL 12 WIR DIA.DWG - SHANK, JASON



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1136 OAK VALLEY DRIVE, SUITE 100
ANN ARBOR, MI 48108
PHONE: (734) 665-6000 FAX: (734) 213-3003

MARK	DATE	DESCRIPTION	BY
	11/29/23	ISSUED FOR BID	

CITY OF KALAMAZOO, MICHIGAN
WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

INSTRUMENTATION
RIOP PANEL 12 WIRING DIAGRAM

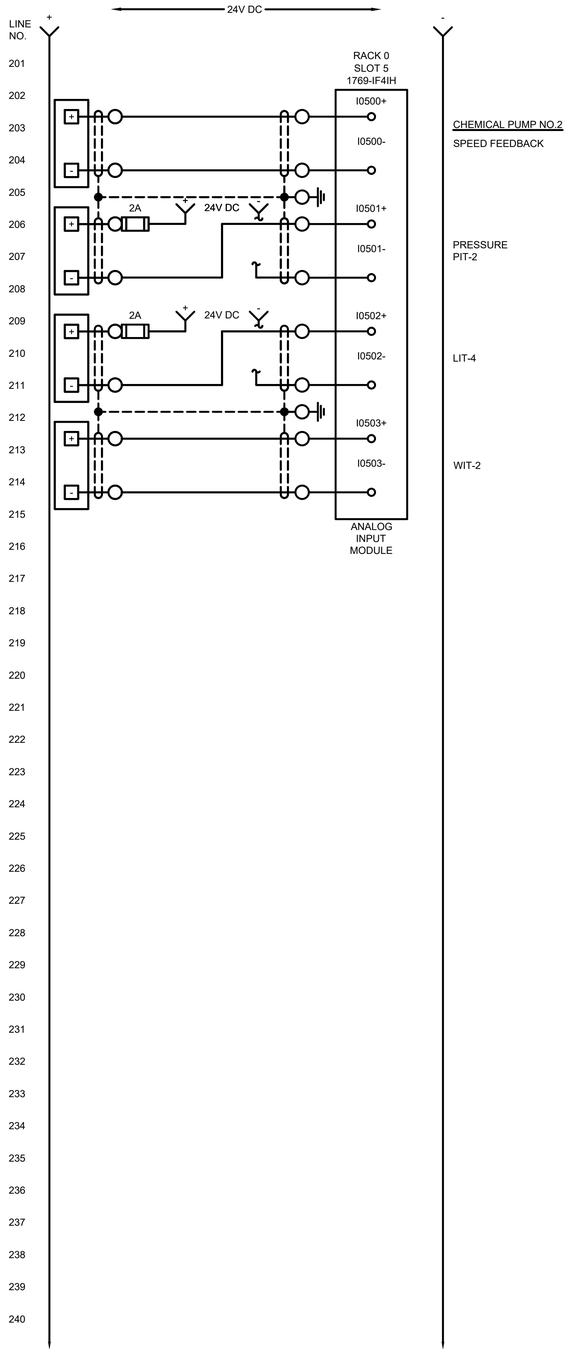
Project No.:	200-19743-19004
Designed By:	GCJ
Drawn By:	JLS
Checked By:	WAP/GCJ

I-305
OF 36

Copyright: Tetra Tech

Bar Measures 1 inch

11/28/2023 3:17:12 PM - \\TT.LOCAL\IER\PROJECTS\ANN ARBOR\IER\19743\200-19743-19004\CAD\SHEETFILES\E\WATER SYSTEM CORROSION CONTROL IMPROVEMENTS\I-305_PS PNL 12 WIR DIA_II.DWG - SHANK, JASON



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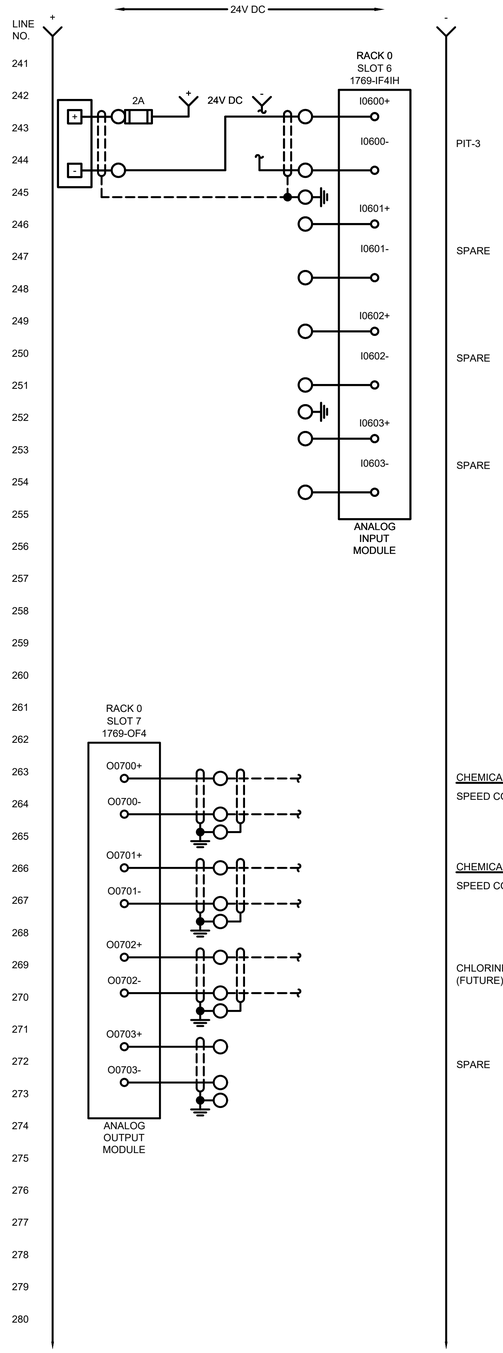
CHEMICAL PUMP NO.2
SPEED FEEDBACK

PRESSURE
PIT-2

LIT-4

WIT-2



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PIT-3

SPARE

SPARE

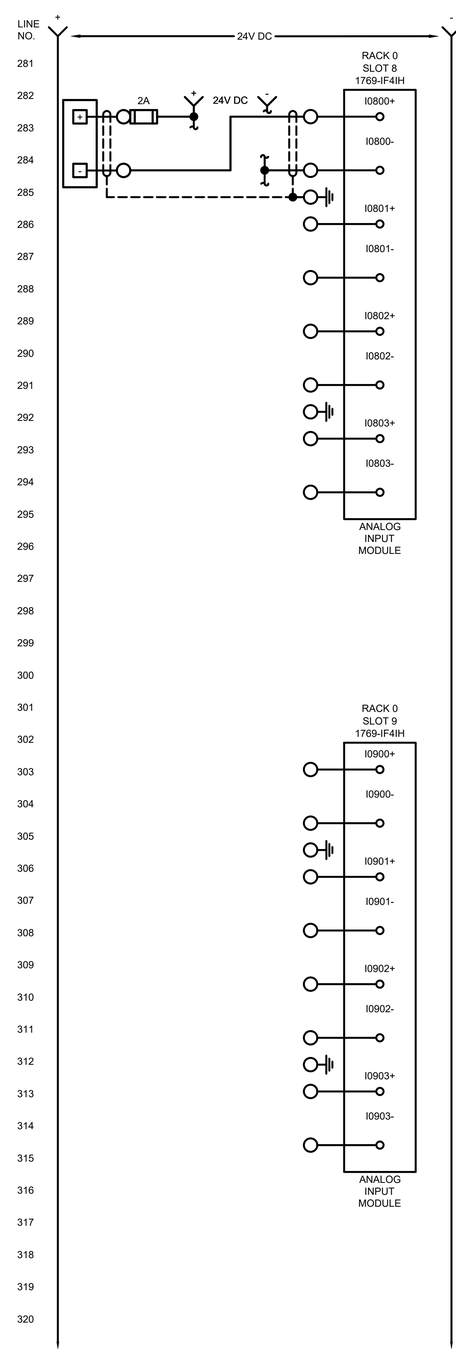
SPARE

CHEMICAL PUMP NO.1
SPEED CONTROL

CHEMICAL PUMP NO.2
SPEED CONTROL

CHLORINE CONTROL VALVE
(FUTURE)

SPARE



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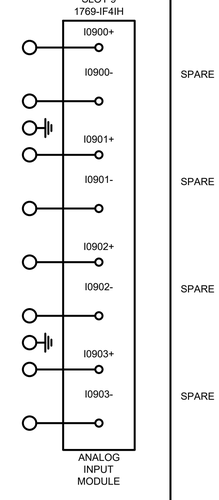
TIT-10
(PREFABRICATED
BUILDING
TEMPERATURE)

SPARE

SPARE

SPARE



SPARE

SPARE

SPARE

SPARE

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MARK	DATE	DESCRIPTION
	11/29/23	ISSUED FOR BID

BY

CITY OF KALAMAZOO, MICHIGAN
WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

INSTRUMENTATION
RIOP PANEL 12 WIRING DIAGRAM

Project No.:	200-19743-19004
Designed By:	GCJ
Drawn By:	JLS
Checked By:	WAP/GCJ

I-306
OF 36

Copyright: Tetra Tech

Bar Measures 1 inch

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MARK	DATE	DESCRIPTION
	11/29/23	ISSUED FOR BID

BY

CITY OF KALAMAZOO, MICHIGAN
WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

INSTRUMENTATION
RIOP PANEL 12 WIRING DIAGRAM

Project No.:	200-19743-19004
Designed By:	GCJ
Drawn By:	JLS
Checked By:	WAP/GCJ

I-307
OF 36

Copyright: Tetra Tech

Bar Measures 1 inch

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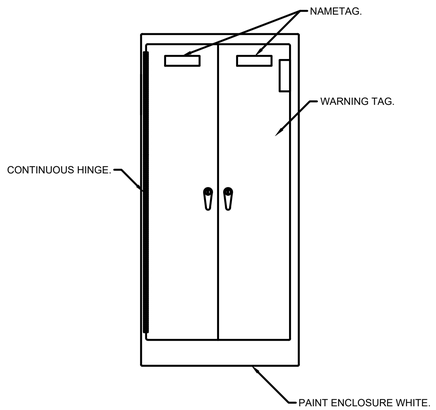
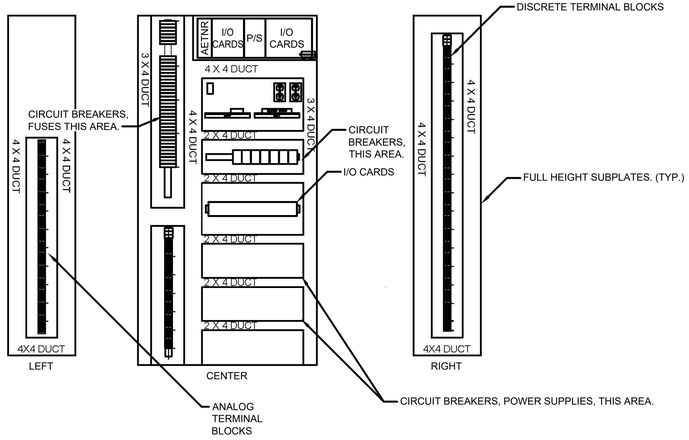


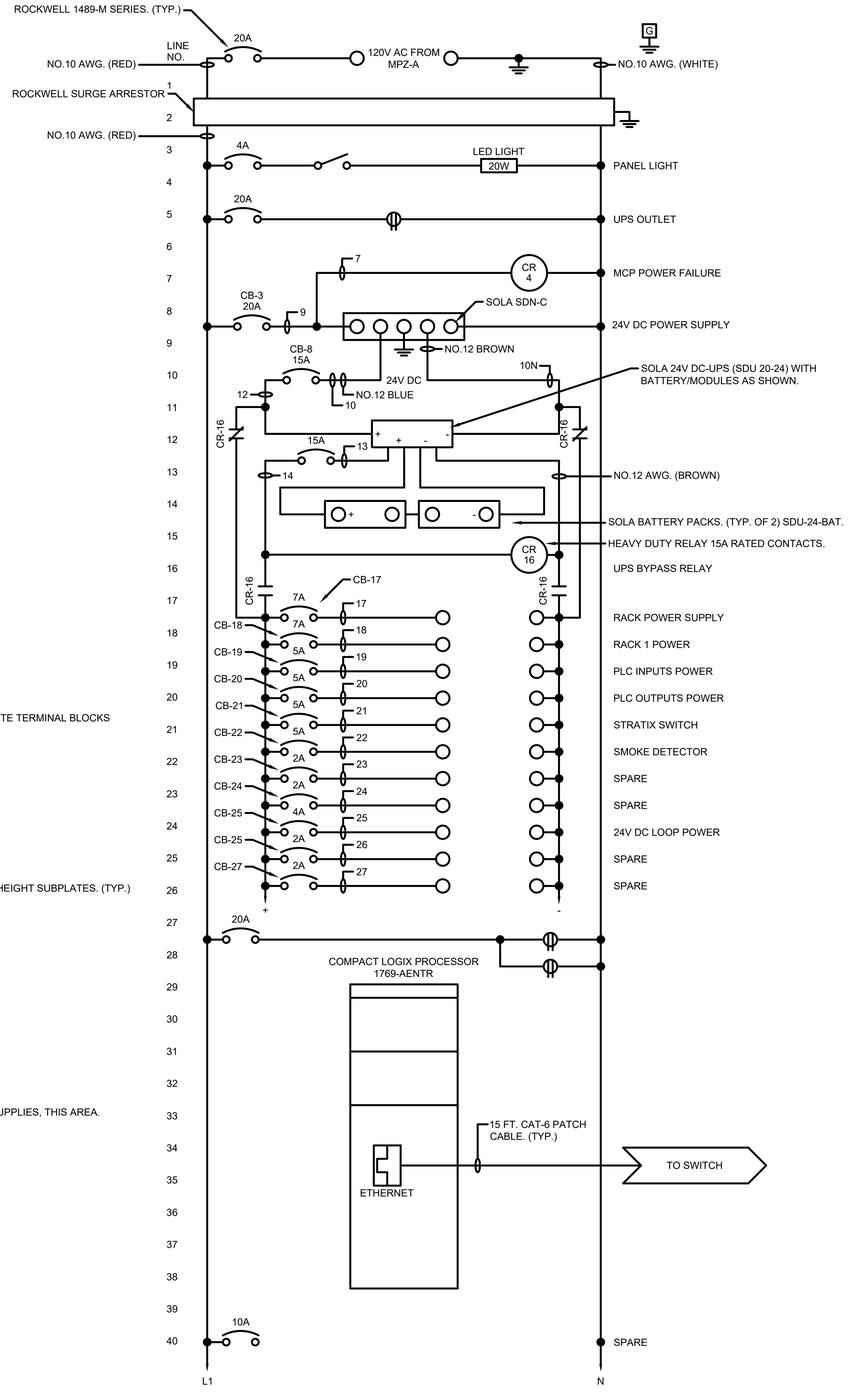
PUMP STATION NO.14 MAIN CONTROL PANEL LAYOUT

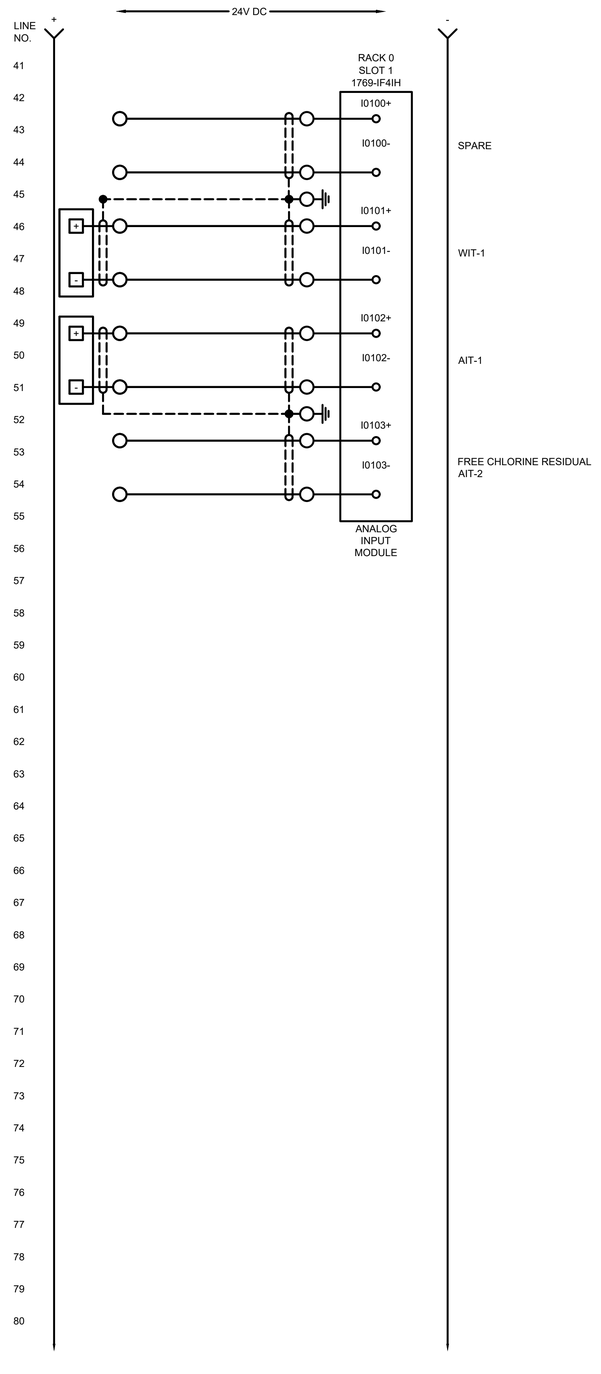
NEMA 12 ENCLOSURE
SIZE: PROCESSOR SECTION - 60"H X 52"W X 22"D (MIN.)
PAINT ENCLOSURE WHITE



GENERAL SUBPLATE LAYOUT

1/16"=1"
PAINT INSIDE GLOSS WHITE
NOTE: NOT ALL SUBPLATE DEVICES ARE SHOWN





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MARK	DATE	DESCRIPTION
	11/29/23	ISSUED FOR BID

CITY OF KALAMAZOO, MICHIGAN
WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

INSTRUMENTATION
RIOP PANEL 14 WIRING DIAGRAM

Project No.:	200-19743-19004
Designed By:	GCJ
Drawn By:	JLS
Checked By:	WAP/GCJ

I-308
OF 36

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Bar Measures 1 inch

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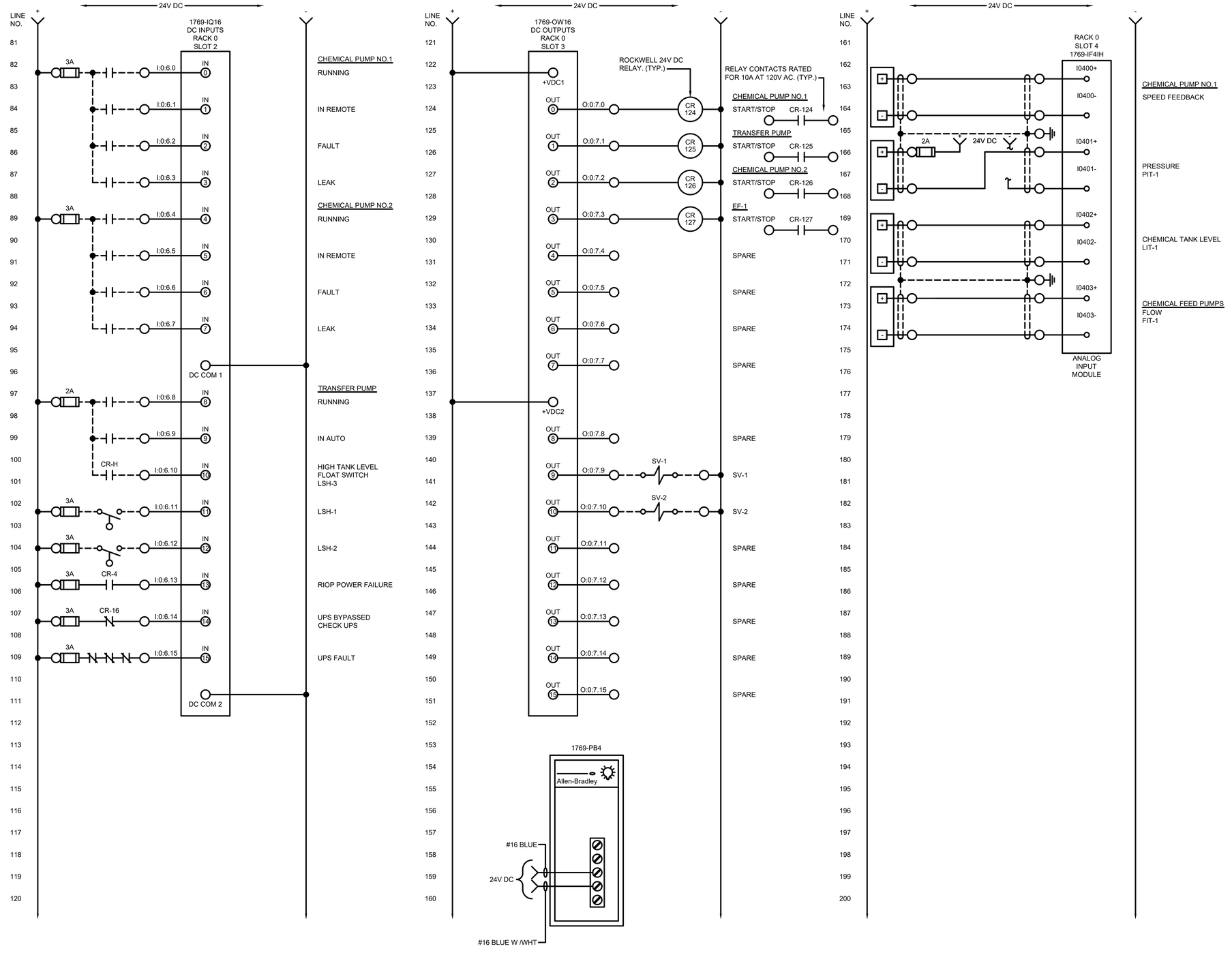

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PHONE: (734) 665-6000 FAX: (734) 213-3003

MARK	DATE	DESCRIPTION	BY
	11/29/23	ISSUED FOR BID	

CITY OF KALAMAZOO, MICHIGAN
WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

INSTRUMENTATION
RIOP PANEL 14 WIRING DIAGRAM

Project No.:	200-19743-19004
Designed By:	GCJ
Drawn By:	JLS
Checked By:	WAP/GCJ

I-309
OF 36

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Bar Measures 1 inch

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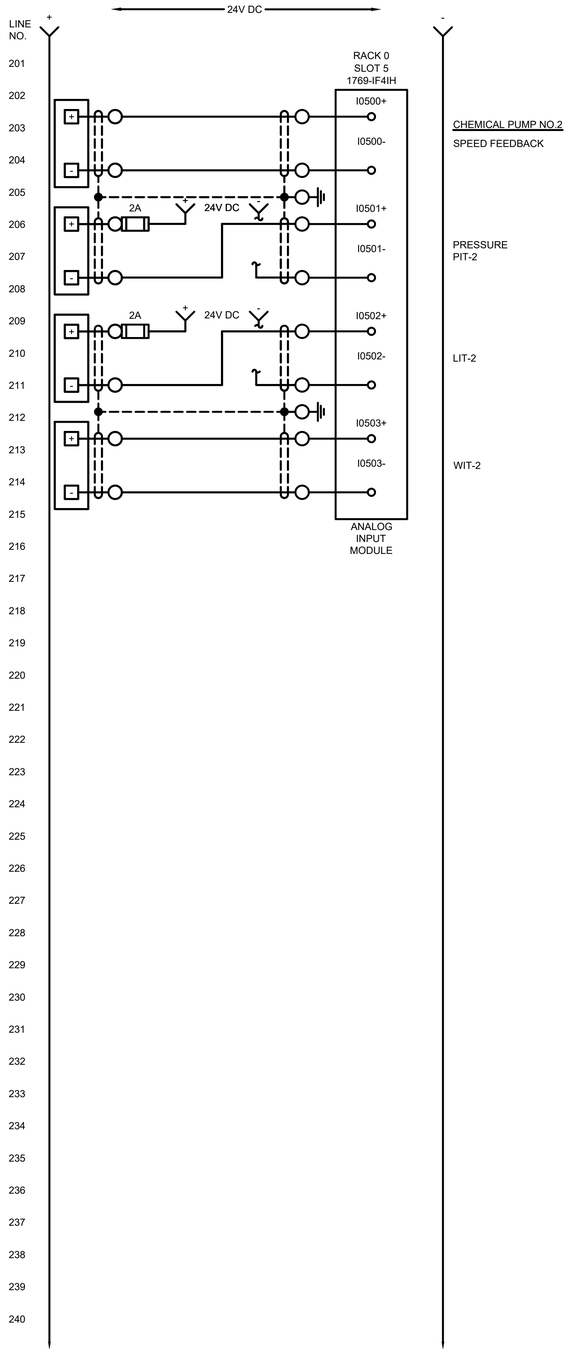

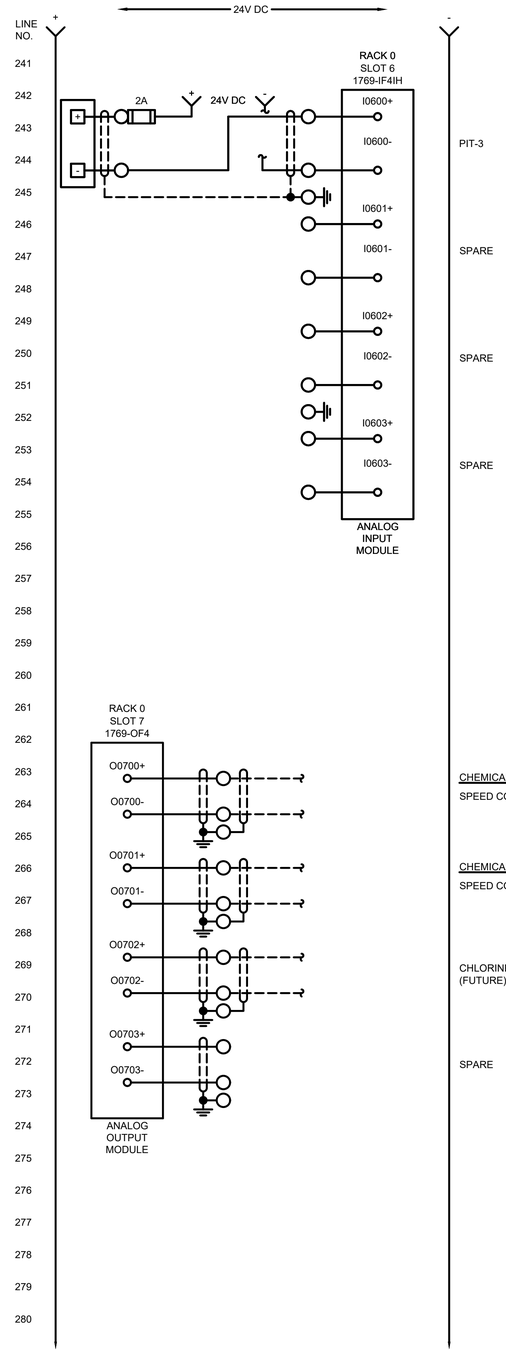

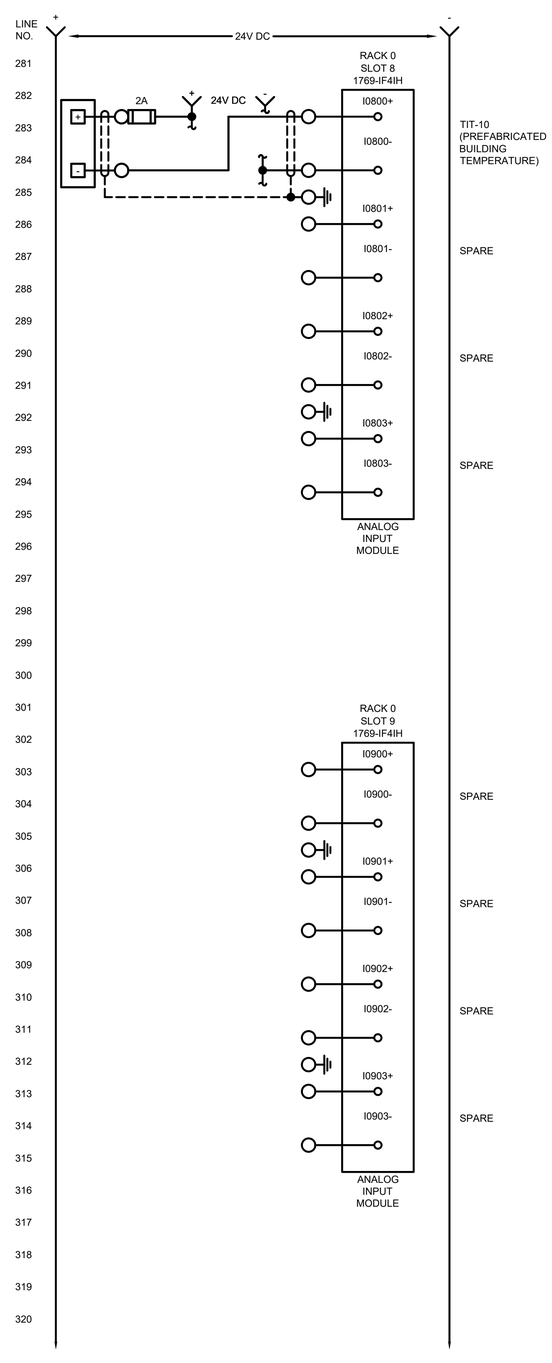

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CITY OF KALAMAZOO, MICHIGAN
WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

INSTRUMENTATION
RIOP PANEL 14 WIRING DIAGRAM

Project No.:	200-19743-19004
Designed By:	GCJ
Drawn By:	JLS
Checked By:	WAP/GCJ

I-310
OF 36

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Bar Measures 1 inch

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PHONE: (734) 665-6000 FAX: (734) 213-3003

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WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

INSTRUMENTATION
RIOP PANEL 14 WIRING DIAGRAM

Project No.:	200-19743-19004
Designed By:	GCJ
Drawn By:	JLS
Checked By:	WAP/GCJ

I-311
OF 36

Copyright: Tetra Tech

Bar Measures 1 inch

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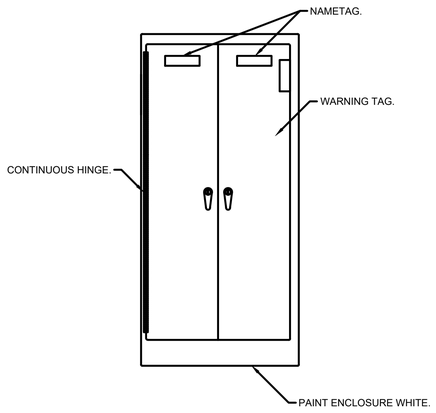
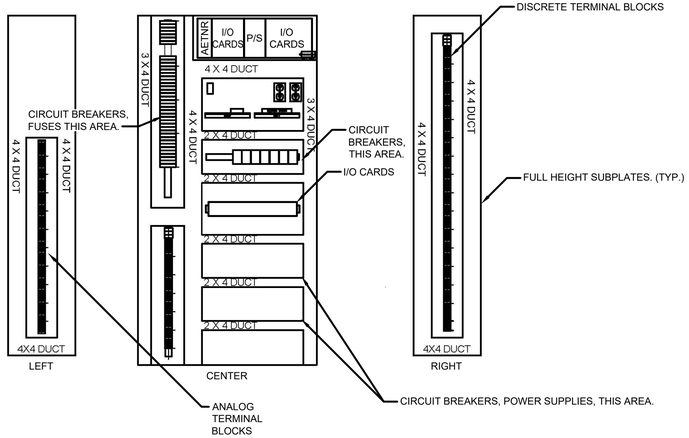


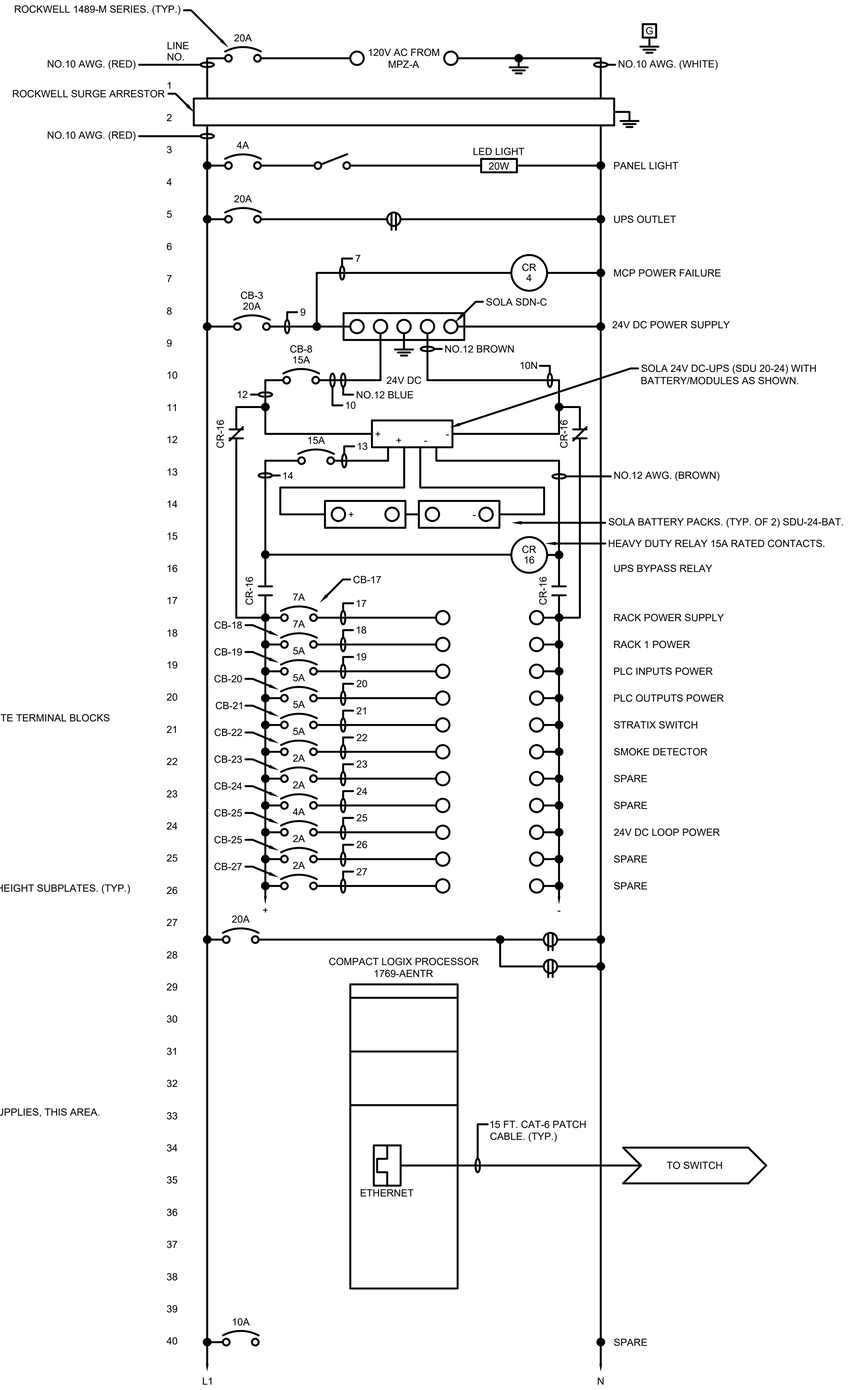
PUMP STATION NO.22 MAIN CONTROL PANEL LAYOUT

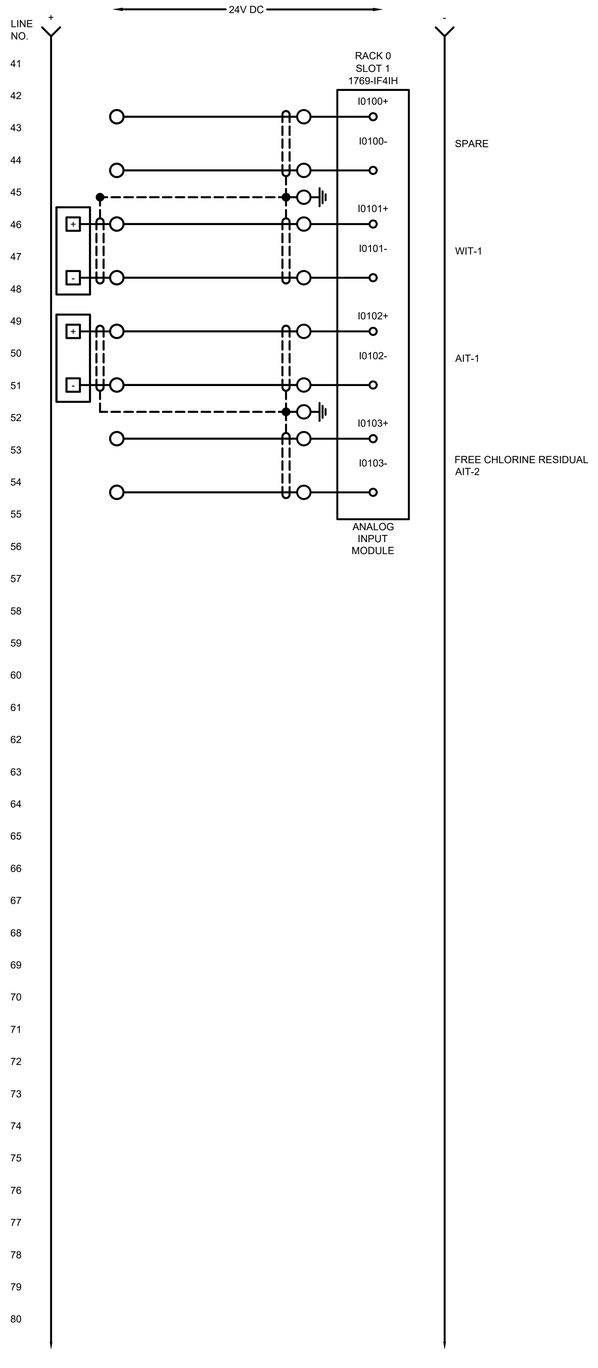
NEMA 12 ENCLOSURE
SIZE: PROCESSOR SECTION - 60"H X 52"W X 22"D (MIN.)
PAINT ENCLOSURE WHITE



GENERAL SUBPLATE LAYOUT

1/16"=1"
PAINT INSIDE GLOSS WHITE
NOTE: NOT ALL SUBPLATE DEVICES ARE SHOWN





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ANN ARBOR, MI 48108
PHONE: (734) 665-6000 FAX: (734) 213-3003

MARK	DATE	DESCRIPTION	BY
	11/29/23	ISSUED FOR BID	

CITY OF KALAMAZOO, MICHIGAN
WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

INSTRUMENTATION
RIOP PANEL 22 WIRING DIAGRAM

Project No.:	200-19743-19004
Designed By:	GCJ
Drawn By:	JLS
Checked By:	WAP/GCJ

I-312
OF 36

Copyright: Tetra Tech

Bar Measures 1 inch

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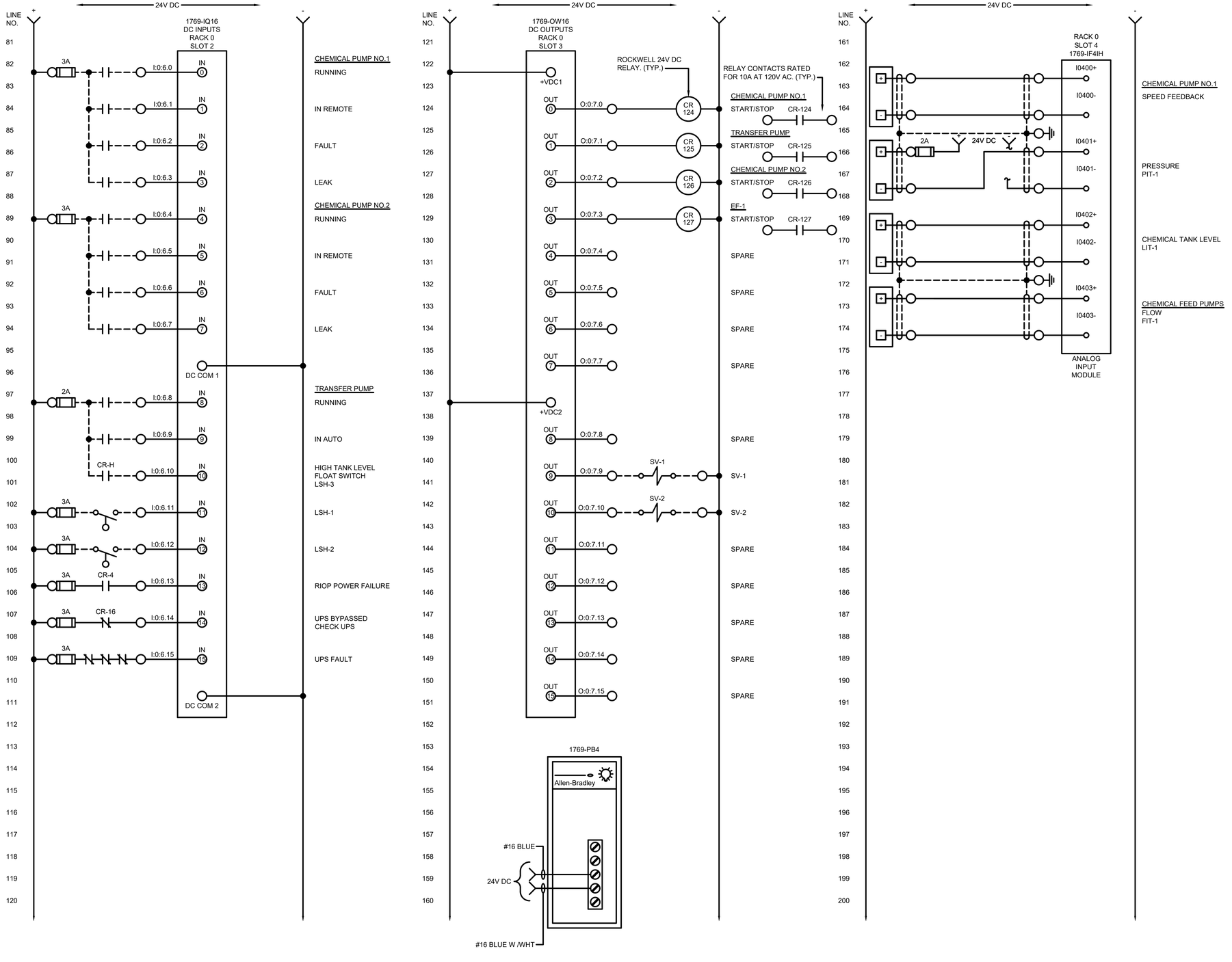

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PHONE: (734) 665-6000 FAX: (734) 213-3003

MARK	DATE	DESCRIPTION
	11/29/23	ISSUED FOR BID

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CITY OF KALAMAZOO, MICHIGAN
WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

INSTRUMENTATION
RIOP PANEL 22 WIRING DIAGRAM

Project No.:	200-19743-19004
Designed By:	GCJ
Drawn By:	JLS
Checked By:	WAP/GCJ

I-313
OF 36

Copyright: Tetra Tech

Bar Measures 1 inch

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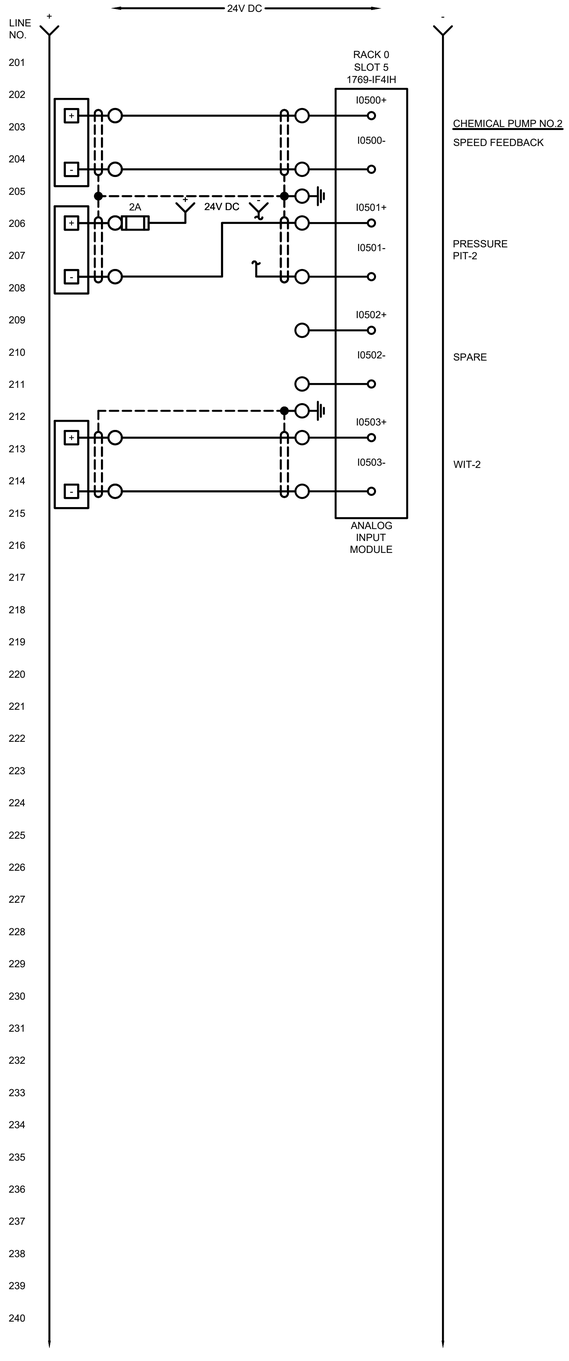

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CHEMICAL PUMP NO.2	
SPEED FEEDBACK	
PRESSURE PIT-2	
SPARE	
WIT-2	

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ANN ARBOR, MI 48108
PHONE: (734) 665-6000 FAX: (734) 213-3003

MARK	DATE	DESCRIPTION
	11/29/23	ISSUED FOR BID

BY

CITY OF KALAMAZOO, MICHIGAN
WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

INSTRUMENTATION
RIOP PANEL 22 WIRING DIAGRAM

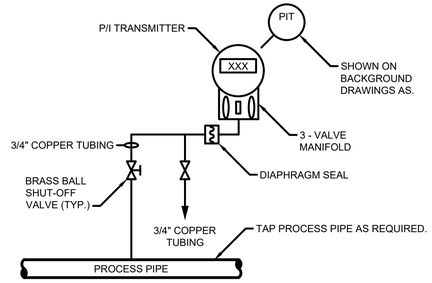
Project No.:	200-19743-19004
Designed By:	GCJ
Drawn By:	JLS
Checked By:	WAP/GCJ

I-315
OF 36

Copyright: Tetra Tech

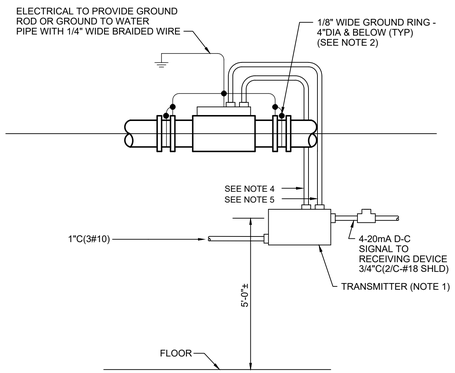
Bar Measures 1 inch

11/28/2023 3:18:08 PM - \\TT.LOCAL\IER\PROJECTS\ANN ARBOR\IER\19743\200-19743-19004\CAD\SHEETFILES\IE\WATER SYSTEM CORROSION CONTROL IMPROVEMENTS\I-315_PS PNL 22 WIR DIA_IV.DWG - SHANK, JASON



TYPICAL PRESSURE TRANSMITTER DETAIL

NO SCALE



NOTES:

1. LOCATION FOR TRANSMITTERS NOT INTEGRALLY MOUNTED ON THE FLOW METER.
2. GROUND MAGMETER AS INSTRUCTED BY THE MANUFACTURER.
3. INSTALL SEPARATELY MOUNTED INDICATOR.
4. POWER WIRING, 1"C(MFR CABLE) OR AS SUPPLIED BY MANUFACTURER.
5. SIGNAL WIRING, 1"C(MFR CABLE) OR AS SUPPLIED BY MANUFACTURER.

MAGNETIC FLOW METER INSTALLATION

SEE "DEVICE BOX CONDUIT DETAIL" FOR INSTALLATION
NO SCALE

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MARK	DATE	DESCRIPTION
	11/29/23	ISSUED FOR BID

CITY OF KALAMAZOO, MICHIGAN
WATER SYSTEM CORROSION CONTROL IMPROVEMENTS

INSTRUMENTATION DETAILS

Project No.:	200-19743-19004
Designed By:	GCJ
Drawn By:	JLS
Checked By:	WAP/GCJ

I-500
OF 36

Copyright: Tetra Tech

Bar Measures 1 inch

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